Hydraulically operated directional control valves are available in 5 sizes:

D1VP*4L NG06 – operated via end caps
D1VP*90 NG06 – operated via end caps and mounting interface (X, Y)
D3DP NG10 – operated via mounting interface (X, Y)
D4P NG16 – operated via mounting interface (X, Y)
D9P NG25 – operated via mounting interface (X, Y)
D11P NG32 – operated via mounting interface (X, Y)

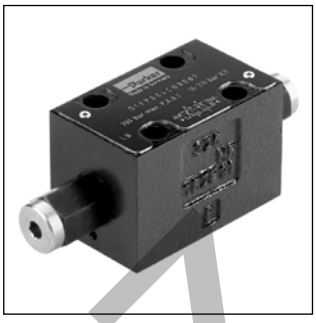
Size NG06 (D1VP) is available in two different designs:

- D1VP*4L for operating pressure >10 bar (over tank pressure) with control ports in the end caps.
- D1VP*90 for operating pressure >15 bar with control ports in the end caps and mounting interface (X, Y).

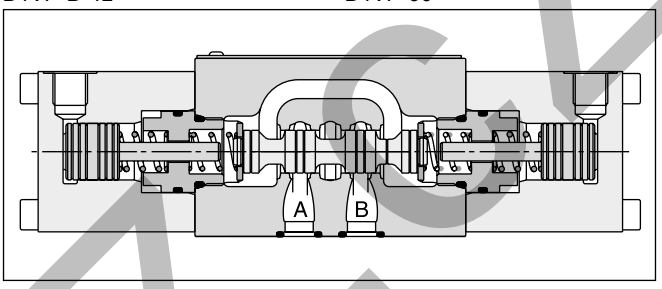
All other series are operated only via mounting interface (X, Y).

The shifting time is depending on the pilot pressure. For safe operation the minimum pilot pressure has to be ensured in all operating conditions. The maximum pilot pressure varies from the maximum operating pressure in some sizes.

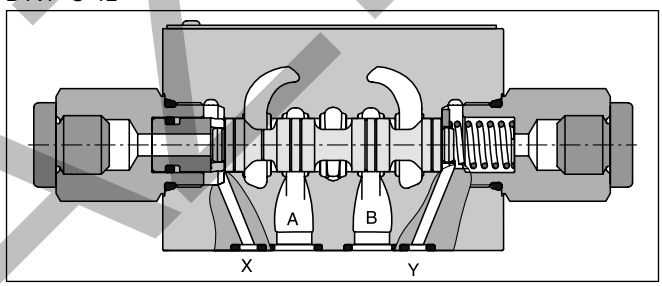
D1VP*B*4L



D1VP*90



D1VP*C*4L



D1VP*90

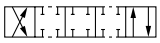
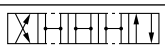
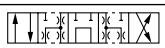
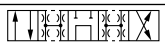
Technical data

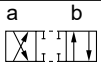
General							
Design		Directional spool valve					
Actuation		Hydraulic					
Series		**D1VP*4L**	**D1VP*90**	**D3DP**	**D4P**	**D9P**	**D11P**
Size		NG06	NG06	NG10	NG16	NG25	NG32
Weight	[kg]	1.3	1.3	3.7	9.0	17.0	66.0
Mounting interface		DIN 24340 A06 ISO 4401 NFPA D03	DIN 24340 A06 ISO 4401 NFPA D03	DIN 24340 A10 ISO 4401 NFPA D05	DIN 24340 A16 ISO 4401 NFPA D07	DIN 24340 A25 ISO 4401 NFPA D08	DIN 24340 A32 ISO 4401 NFPA D10
		CETOP RP 121-H					
Mounting position		unrestricted, preferably horizontal					
Ambient temperature	[°C]	-25...+60					
$MTTF_D$ value	[years]	150					
Hydraulic							
Max. operating pressure	[bar]	P, A B: 350; T: 140	P, A B; T: 350; X, Y: 210	P, A B, T: 350; X, Y: 210	P, A B, T: 350; X, Y: 350	P, A B, T: 350; X, Y: 350	P, A B, T: 350; X, Y: 350
Fluid		Hydraulic oil according to DIN 51524					
Fluid temperature	[°C]	-20 ... +70 (NBR: -25...+70)					
Viscosity permitted	[cSt] / [mm²/s]	2.8...400					
Viscosity recommended	[cSt] / [mm²/s]	30...80					
Filtration		ISO 4406 (1999); 18/16/13					
Flow max.	[l/min]	60 [1]	60 [1]	130	300	700	2000
Leakage at 350 bar (per flow path)	[ml/min]	up to 60 [2]	up to 60 [2]	up to 100 [2]	up to 200 [2]	up to 800 [2]	up to 5000 [2]
Operating pressure (min/max)	[bar]	10 [3] / 210	15 / 210	15 / 210	5 / 350	5 / 350	5 / 350
Pilot volume (start position to end position)	[cm³]	0.59	0.34	1.1	4.2	12.3	59.7
Static / Dynamic							
Step response		The response times depend on the pilot oil pressure and on the speed of the increase / decrease of the pilot pressure.					

[1] Depending on spool, see shift limits. [2] Depending on spool. [3] > tank pressure.

2

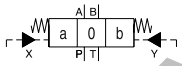
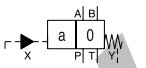
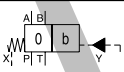
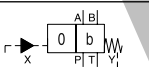
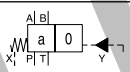
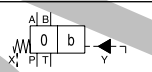
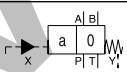
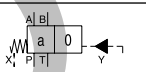
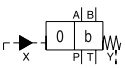
D	1	V	P					
Directional control valve	**Size DIN NG06 CETOP 03 NFPA D03**	**3-/5-chamber design** [2]	**Hydraulically operated**	**Spool type**	**Spool position**	**Seals**	**Pilot port**	**Design series** (not required for ordering)

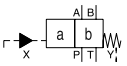
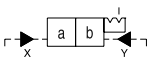
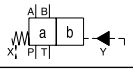
3 position spools	
Code	Spool type a 0 b
001	
002	
004	
006	
008 [1]	
009 [1]	

2 position spools	
Code	Spool type a b
020	
026	
030	

Code	Pilot port
4L	High tank pressure, indirect operated via pilot spool, 3-chamber
90	Direct operated via X, Y port or pipe thread G¼, 5-chamber

Code	Seals
N	NBR
V	FPM

3 position spools [3]			
Code	Spool position		
C			3 positions. Spring offset in position “0“. Operated in position “a“ or “b“.
	Standard	Spool type 008 and 009	
E	 Operated in position “a“.	 Operated in position “b“.	2 positions. Spring offset in position “0“.
F	 Spring offset in position “b“.	 Spring offset in position “a“.	2 positions. Operated in position “0“.
K	 Operated in position “b“.	 Operated in position “a“.	2 positions. Spring offset in position “0“.
M	 Spring offset in position “a“.	 Spring offset in position “b“.	2 positions. Operated in position “0“.

2 position spools [3]		
Code	Spool position	
B		Spring offset in position “b“. Operated in position “a“.
D		Detent, operated in position “a“ or “b“. No centre or offset position.
H		Spring offset in position “a“. Operated in position “b“.

[1] Consider specific spool position.
[2] Depending on pilot port.
[3] Code 4L without ports X and Y.

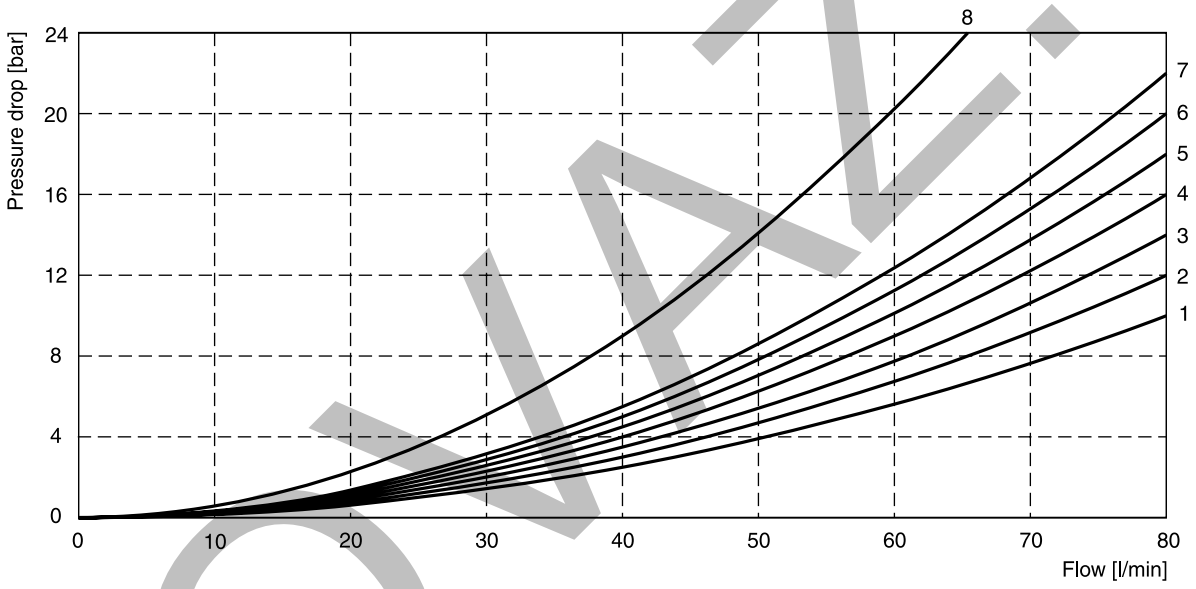
Further spool types and styles on request.

2

The flow curve diagram shows the flow versus pressure drop curves for all spool types. The relevant curve number for each spool type, operating position and flow direction is given in the table below.

	Position „b“		Position „a“		Position „0“				
Spool	**P->A**	**B->T**	**P->B**	**A->T**	**P->A**	**P->B**	**A->T**	**B->T**	**P->T**
001	2	2	2	2	–	–	–	–	–
002	1	4	1	4	1	1	5	5	2
004	2	3	2	3	–	–	7	7	–
006	1	4	1	4	7	7	–	–	–
020	4	4	2	3	–	–	–	–	–
026	4	–	4	–	–	–	–	–	–
030	2	3	1	2	–	–	–	–	–
	P->B	A->T	P->A	B->T	P->A	P->B	A->T	B->T	P->T
008	4	5	4	5	–	–	–	–	8
009	5	5	6	7	–	–	–	–	7

Flow curves

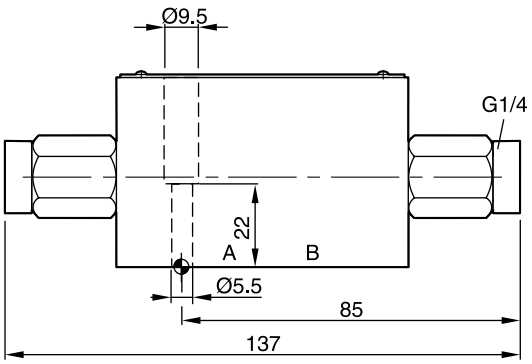


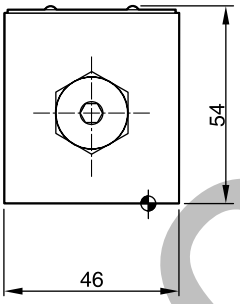
All characteristic curves measured with HLP46 at 50°C.

Shift limits

Spool	Shift limit [l/min]
001	60
002	
004	
006	
020	
030	
008	40
009	
026	20

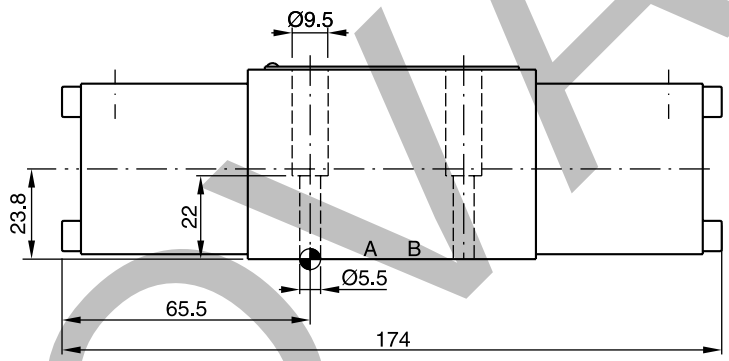
D1VP*90

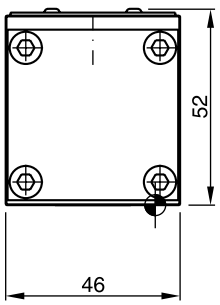


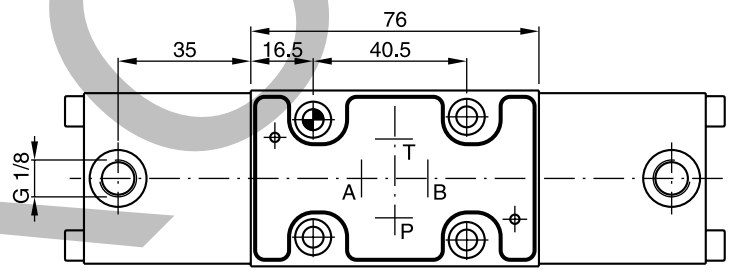


Surface finish	Kit			Kit
$R_{max}6.3$ 0.01/100	BK375	4x M5x30 ISO 4762-12.9	7.6 Nm ±15 %	**NBR: SK-D1VP-N-87** FPM: SK-D1VP-V-87

D1VP*4L







Surface finish	Kit			Kit
$R_{max}6.3$ 0.01/100	BK375	4x M5x30 ISO 4762-12.9	7.6 Nm ±15 %	**NBR: SK-D1VP-N4-91** FPM: SK-D1VP-V4-91