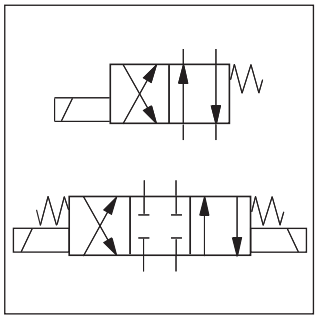
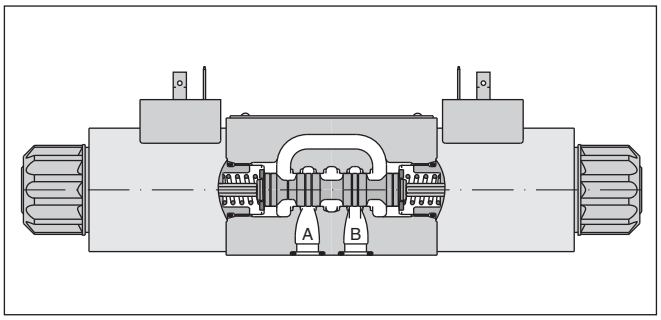
The NG06 directional control valve series D1VW provides high functional limits up to 80 l/min in combination with a very low, energy-saving pressure drop.

A wide variety of spool options allows to design an unlimited number of hydraulic circuits.

Versions with 8 watt coils, position control, Atex approval, surface protection and connector variants are shown in the following chapters.





Technical data

General							
Design			Directional spool valve				
Actuation			Solenoid				
Nominal size			DIN NG06 / CETOP 03 / NFPA D03				
Mounting interface			DIN 24340 A6 / ISO 4401 / CETOP RP 121-H / NFPA D03				
Mounting position			unrestricted, preferably horizontal				
Ambient temperature		[°C]	-25...+50				
$MTTF_D$ value		[years]	150				
Weight		[kg]	1.5 (1 solenoid), 2.1 (2 solenoids)				
Hydraulic							
Max. operating pressure		[bar]	P, A, B: 350; T: 210 (DC), T: 140 (AC)				
Fluid			Hydraulic oil in accordance with DIN 51524 / 51525				
Fluid temperature		[°C]	-25 ... +70				
Viscosity permitted		[cSt] / [mm²/s]	2.8...400				
Viscosity recommended		[cSt] / [mm²/s]	30...80				
Filtration			ISO 4406 (1999); 18/16/13 (meet NAS 1638: 7)				
Flow max.		[l/min]	80 (see shift limits)				
Leakage at 50 bar		[ml/min]	Up to 10 per flow path, depending on spool, up to 15 per flow path for spool type 008 + 009				
Static / Dynamic							
Step response			see table response time				
Electrical characteristics							
Duty ratio			100% ED; CAUTION: coil temperature up to 150 °C possible				
Max. switching frequency		[1/h]	15000 (not for soft shift)				
Protection class			IP 65 in accordance with EN 60529 (plugged and mounted)				
		Code	K	J	U	G	Y	T
Supply voltage		[V]	12 V =	24 V =	98 V =	205 V =	110V at 50Hz/ 120V at 60Hz	230V at 50Hz/ 240V at 60Hz
Tolerance supply voltage		[%]	±10	±10	±10	±10	±5	±5
Current consumption	hold	[A]	2.72	1.29	0.33	0.15	0.6 / 0.55	0.3 / 0.27
Current consumption	in rush	[A]	2.72	1.29	0.33	0.15	2.5 / 2.4	1.25 / 1.2
Power consumption	hold		32.7 W	31 W	31.9 W	30.2 W	70 / 70 VA	70 / 70 VA
Power consumption	in rush		32.7 W	31 W	31.9 W	30.2 W	280 / 290 VA	280 / 290 VA
Solenoid connection			Connector as per EN 175301-803, solenoid identification as per ISO 9461 (code W).					
Wiring min.		[mm²]	3 x 1.5 recommended					
Wiring length max.		[m]	50 recommended					

With electrical connections the protective conductor (PE ⏚) must be connected according to the relevant regulations.

2

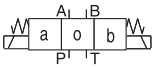
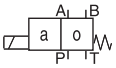
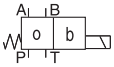
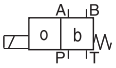
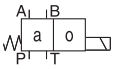
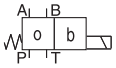
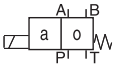
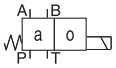
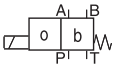
D	1	V	W			
Directional control valve	**Size DIN NG06 CETOP 03 NFPA D03**	**3-chamber valve**	**Wet pin armature solenoid, threaded in tube**	**Spool type**	**Spool position**	**Seals**

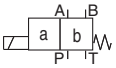
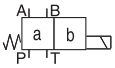
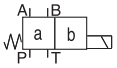
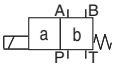
3 position spools	
Code	Spool type a 0 b
001	
002	
003	
004	
005	
006	
007	
008 [1]	
009 [1]	
010	
011	
014	
015	
016	
021	
022	
031	
032	
034	
035	
061	
081	
082	
102	
204 [1]	
205 [1]	

2 position spools	
Code	Spool type a b
020	
026	
030	
083 [1]	
101	
208	

[1] Consider specific spool position.

Code	Seals
N	**NBR**
V	FPM

3 position spools			
Code	Spool position		
C			**3 positions. Spring offset in position “0“. Operated in position “a“ or “b“.**
	Standard	Spool type 008,009, 204, 205	
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			
Code	Spool position		
	Standard	Spool type 083	
B			**2 positions. Spring offset in position “b“. Operated in position “a“.**
D			**2 positions. Operated in position “a“ or “b“. No center or offset position.**
H			**2 positions. Spring offset in position “a“. Operated in position “b“.**

Bold letters =
Short-term availability

	W		
Solenoid voltage	**Solenoid connector as per EN 175301-803, without plug** (other connectors are available for D1MW Series)	**Solenoid option**	**Design series** (not required for ordering)

Code	Solenoid option
omit	**Standard solenoid with manual override**
T	without manual override
S2 [3]	Soft shift orifice size 0.5 mm.
S3 [3]	Soft shift orifice size 0.75 mm.
4N [3]	with lockable manual override

[3] DC only

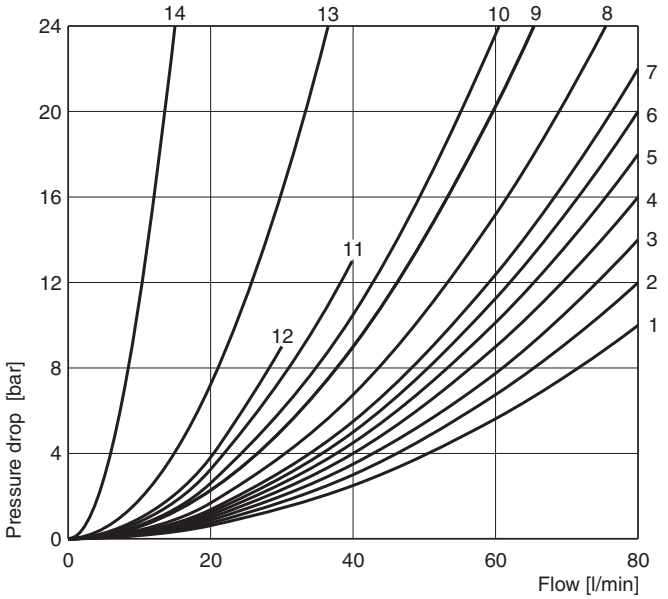
Code	Voltage
K	**12V =**
J	**24V =**
U [2]	98V =
G [2]	205V =
Y	110V 50Hz / 120V 60Hz
T	230V 50Hz / 240V 60Hz

[2] Rectifier needed for DC solenoid when used with AC input.

Further spool types, solenoid voltages and connectors on request.

2

Flow curve



All characteristic curves measured with HLP46 at 50°C.

Spool	Position "b"			Position "a"			Position "0"				
	P-A	B-T	P-B	P-B	A-T	P-A	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
003	3	4		3	6				7		
004	2	3		2	3				7	7	
005	2	2		2	2		12				
006	1	4		1	4		7	7			
007	3	2		2	2			3		2	7
010	3			3							
011	2	2		2	2				14	14	
014	3	2		2	2		3		2		7
015	3	6		3	4					7	
016	2	2		2	2			12			
020B	4	4		2	3						
026B	4			4							
030B	2	3		1	2						
034	4		8	3	3				5	7	
035	3	3		4		8			7	5	
081	13	13		13	13						
082	13	13		13	13				[1]	[1]	
101B	11	10		10	9						
102	1	4		1	4		5	5	8	8	6
61	1	3		1	3		3	2			
83H	5	2		5	2						
104	1			2	5		3		14		14
208	3			2							
	P-B	A-T		P-A	B-T		P-A	P-B	A-T	B-T	P-T
008	4	5		4	5						9
009	5	5		6	7						7
83B	5	2		5	2						
204	1	3		4	3		7		4		7
205	4	3		1	3			7		4	5

Spool	Position "b"			Position "a"		
	P-A	P-B	A-B	P-B	A-T	
021	2	4		4	2	
	P-A	B-T		P-A	P-B	A-B
022	6	2		5	2	
	2	2				
				2	2	

[1] Only for pressure compensation, no high flow possible.

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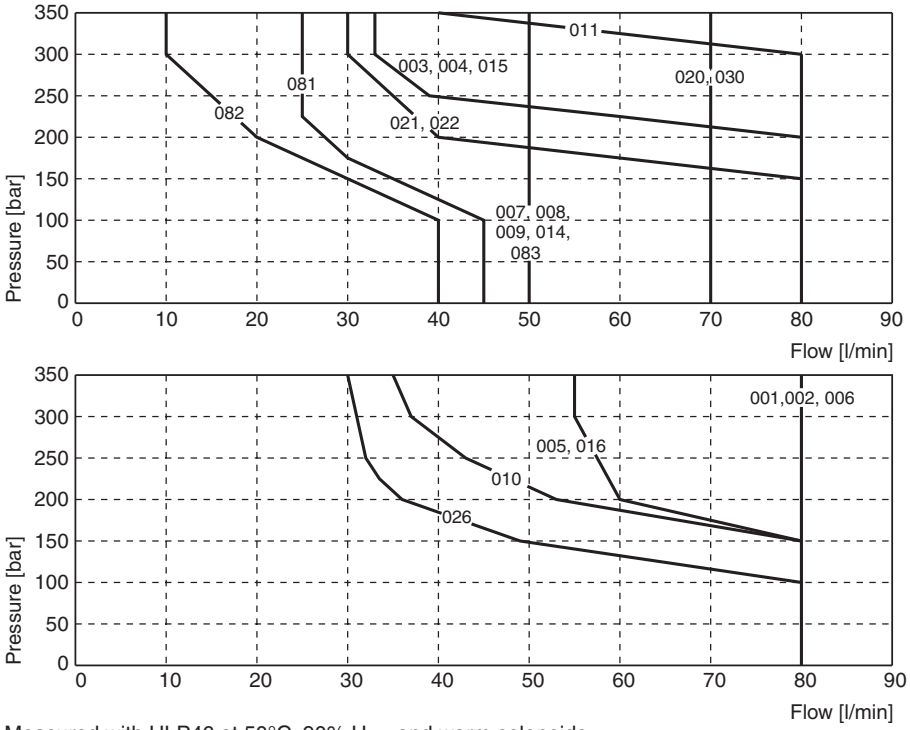
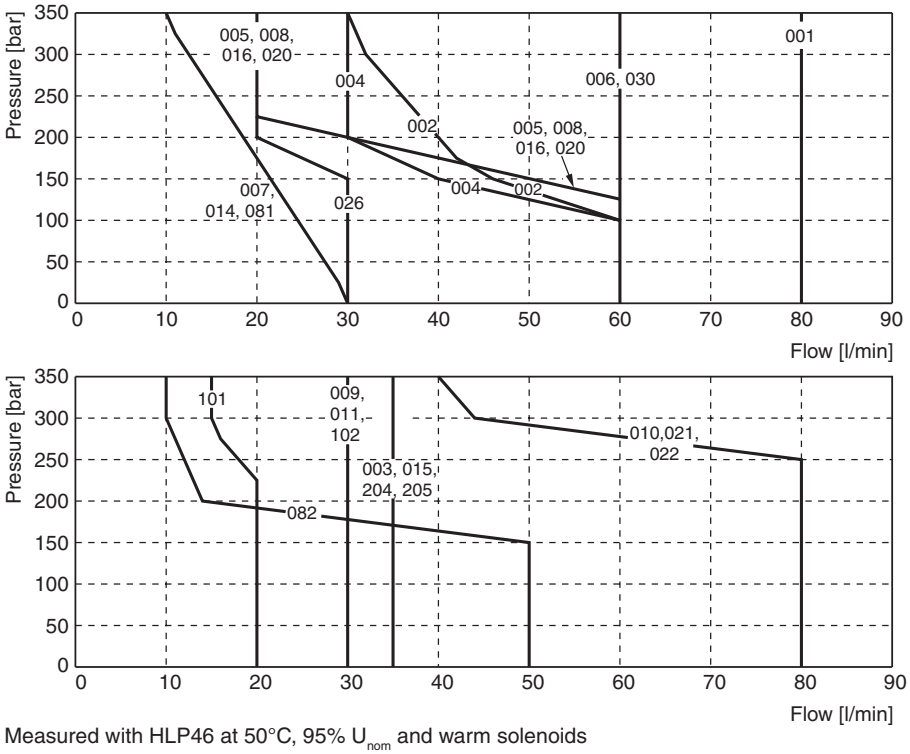
The diagram below specifies the shift limits for valves with DC solenoids. Valves with spool position “F” or “M” can only be operated up to 70% of the limits. The specifications apply to a viscosity of 40mm²/s and balanced flow conditions. The shift limits can be considerably lower at unbalanced flow conditions. To avoid flow rates beyond the shift limits, a plug-in orifice can be inserted in the P-port.

Valve with standard DC solenoid



Measured with HLP46 at 50°C, 90% U_{nom} and warm solenoids

Valve with standard AC solenoid



Measured with HLP46 at 50°C, 95% U_{nom} and warm solenoids

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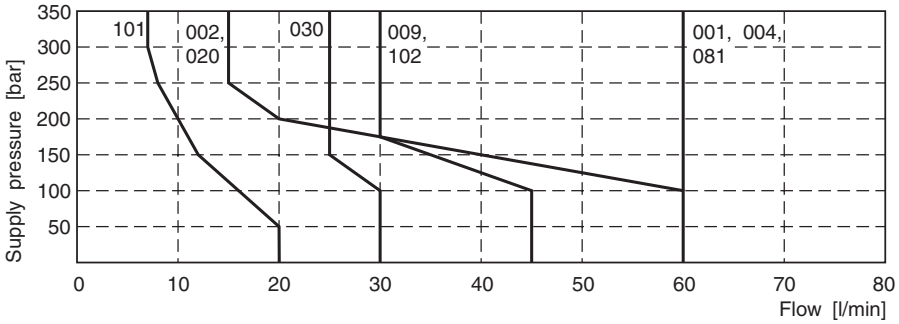
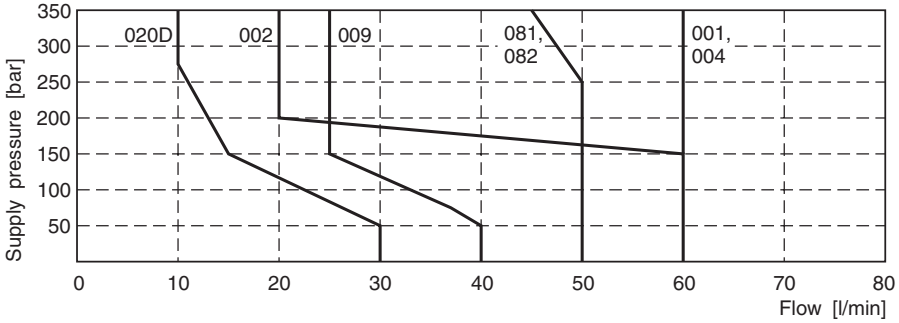
2

Shift limit diagram - Soft shift with 1 DC solenoid



Shift limit diagram - Soft shift with 2 DC solenoid



Measured with HLP46 at 50°C, 90% U_{nom} and warm solenoids

Response times D1VW Standard and Soft Shift

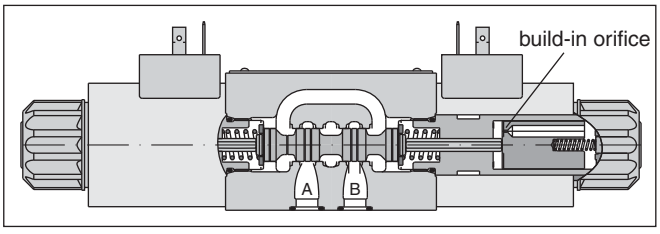
Standard solenoid		Energize	De-energize
Standard DC	w/o	45 - 60	20 - 30
Standard AC	w/o	13	20
Standard DC with rectifier plug	w/o	60 -70	70- 90

Response times Soft Shift	Orifice size	2 solenoid valve		2 solenoid valve		1 solenoid valve	
		3 positions		3 positions		2 positions	
Code		Center position: Closed		Center position: Open			
		Energize	De-energize	Energize	De-energize	Energize	De-energize
S2	0.50mm	200 - 750	310 - 650	220 - 400	350 - 750	90 - 350	160 - 500
S3	0.75mm	180 - 300	300 - 400	200 - 350	300 - 500	90 - 350	130 - 350

The lower value applies to small flow rates and low pressure, the upper value to high flow rates and high pressure

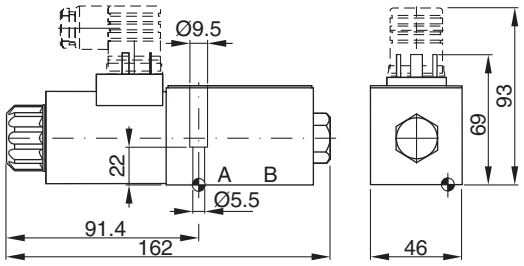
Step response times were obtained under the following conditions: HLP46 at 50°C with the valve operating at nominal pressure and flow. Published response times are nominal and may vary with spool, flow, pressure and temperature.

Acceleration for orifice size 0.75, code “S3” (measured against a standard valve)

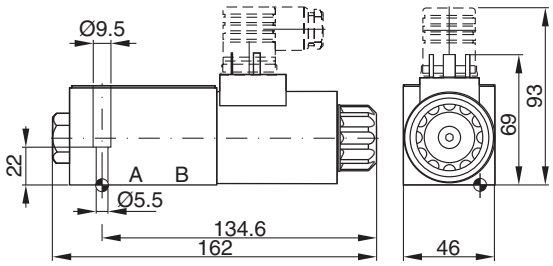


For even softer shifting, the proportional spools 081, 082, 101 and 102 can be used.

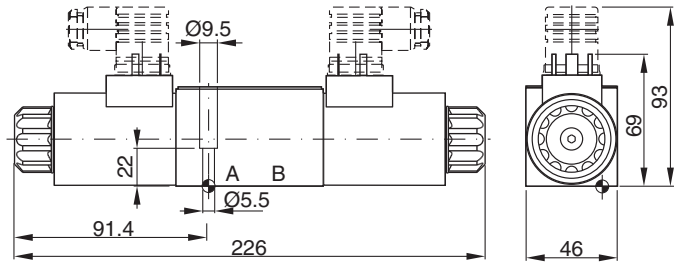
Interface EN 175301-803, DC solenoid
B, E, F -style



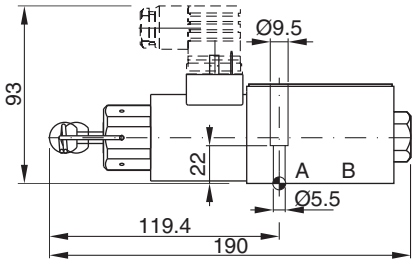
H, K, M -style



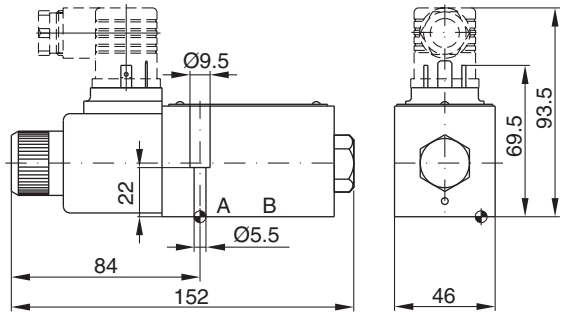
C, D -style



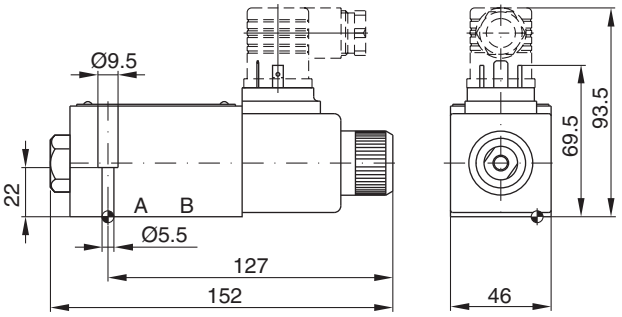
Option 4N, with lockable manual override (available for all styles, DC only)



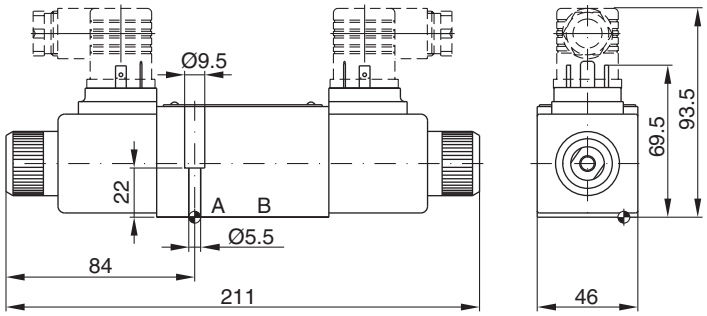
Interface EN 175301-803, AC solenoid
B, E, F -style



H, K, M -style



C, D -style



Surface finish	Kit			Kit
R_{max}6.3 ⏥ 0.01/100	BK375	4x M5x30 DIN 912 12.9	7.6 Nm ±15%	NBR: SK-D1VW-N-91 FPM: SK-D1VW-V-91

The space necessary to remove the plug per EN 175301-803, design type AF is at least 15 mm.
The torque for the screw M3 of the plug has to be 0.5 to 0.6 Nm.

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Notes