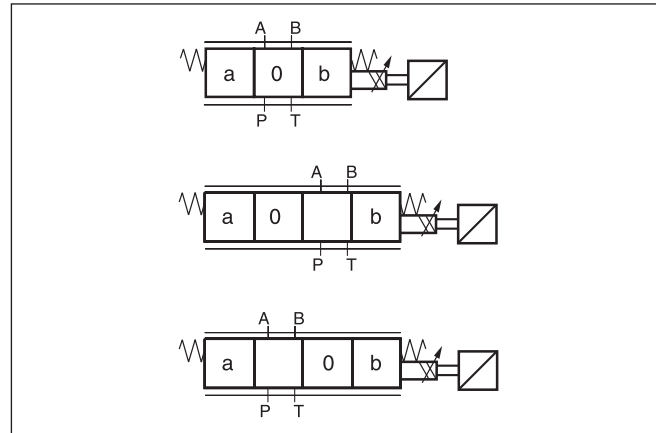


Characteristics

Direct-Operated Proportional DC Valve Series D1FP

The direct-operated control valve D1FP of the nominal size NG6 (CETOP 3) shows extremely high dynamics combined with maximum flow. First of all it is used for highest accuracy in positioning of hydraulic axis and controlling of pressure and velocity.

Driven by the new patented VCD® actuator the D1FP reaches the frequency response of real servovalves. Compared with solenoid driven valves the D1FP can also be used in applications with pressure drops up to 350bar across the valve. Because of the high flow capability the D1FP can be a substitute for NG10 valves in some cases. A loss of the power supply lets the spool move in a defined position. All common input signals are available.

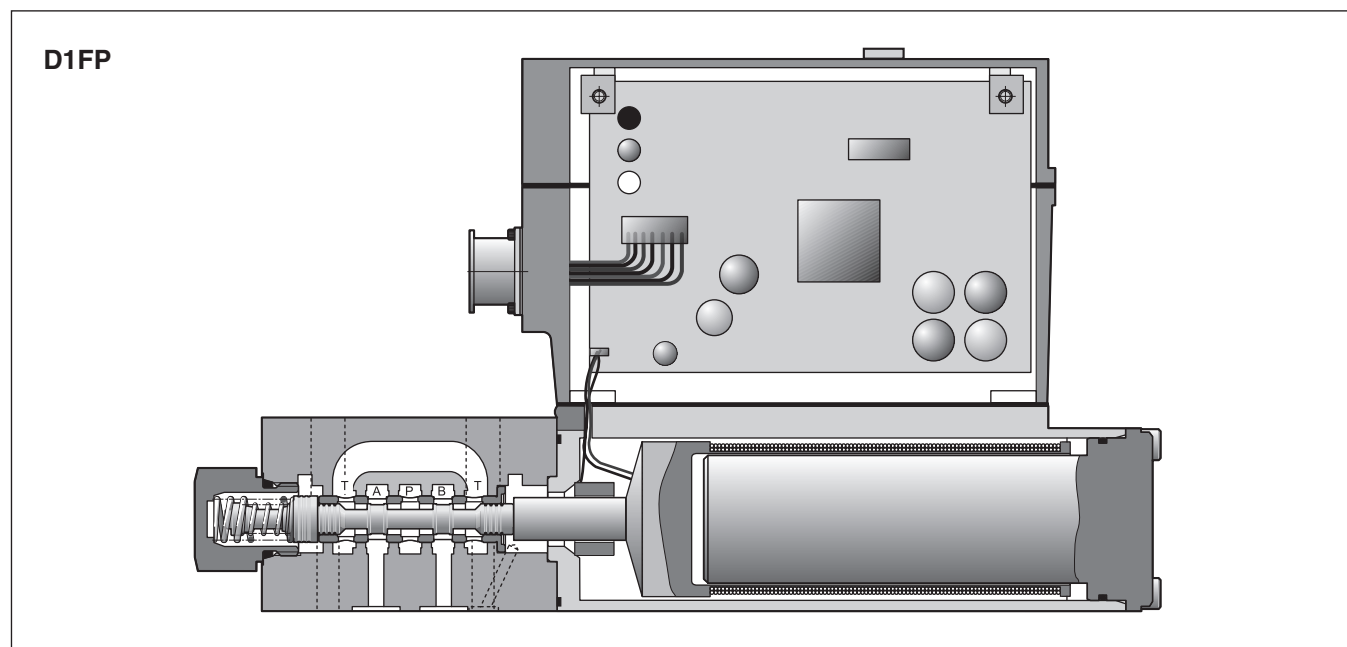


Technical features

- Real servovalve dynamics (-3dB/350Hz at ±5% input signal)
- No flow limit up to 350 bar pressure drop through the valve
- Max. tank pressure 350 bar (with external leakage port y)
- High flow
- Defined spool positioning in case of power supply breakdown
- Onboard electronics

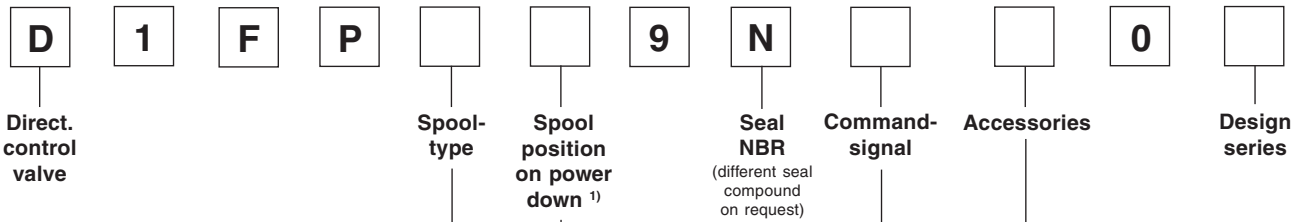


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D1FP.PMD CM





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Code	Spooltype	Flow [l/min] at Δp 35bar per metering edge
Zerolap		
E50M		40
E50H		25
E50F		12
E50C		6
E50B		3
B60M	$Q_B = Q_A / 2$	40 / 20
Overlap 25%		
E01M		40
E01H		25
E01F		12
E01C		6
E01B		3
B31M	$Q_B = Q_A / 2$	40 / 20
E02M		40
E02H		25
B32M	$Q_B = Q_A / 2$	40 / 20

Code	Spool pos. on power down
A²⁾	
B²⁾	
C³⁾	

Code	Connection type
0	6 + PE acc. DIN 43563
5	11 + PE acc. DIN 41651

Code	Signal	Flow direction
B	+/- 10V	0...+10V -> P-A
E	+/- 20mA	0...+20mA -> P-A
S	4...20mA	12...20mA -> P-A

**Bold letters =
 Short-term availability**

¹⁾ On power down the spool moves in a defined position. In case of single flow path on the control edge A – T resp. B – T with pressure drops above 120 bar or contamination in the hydraulic fluid, this cannot be guaranteed.

²⁾ approx. 25% opening, only zero lapped spools

³⁾ only for overlapped spools

Please order plugs separately.
 See chapter 3 accessories.

Technical Data

General		
Design		Direct-operated proportional DC valve
Actuation		VCD® actuator
Size		NG6 (CETOP 3)
Mounting interface		DIN 24340 / ISO 4401 / CETOP RP121 / NFPA
Mounting position		Any
Ambient temperature	[°C]	-20...+50
Weight	[kg]	4.5
Vibration resistance	[g]	25 acc. DIN IEC68, part 2-6
Hydraulic		
Max. operating pressure	[bar]	Ports P, A, B max. 350; Port T max. 35 (350 at discharged port Y) ¹⁾
Fluid		Hydraulic oil as per DIN 51524...535, other on request
Fluid temperature	[°C]	-20...+50
Viscosity permitted	[mm ² /s]	20...380
Viscosity recommended	[mm ² /s]	30...80
Filtration		ISO 4406 (1999) 18/16/13 (acc. NAS 1683: 7)
Flow nominal at Δp=35bar per control edge ²⁾	[l/min]	3 / 6 / 12 / 25 / 40
Flow maximum	[l/min]	90 (at Δp=350bar over two control edges)
Leakage at 100 bar	[ml/min]	<400 (zero lapped spool); <50 (over lapped spool)
Static / Dynamic		
Step response at 100% step ³⁾	[ms]	<3.5
Frequency response (+5% signal) ³⁾		350 (amplitude ratio -3dB), 350 (phase lag -90°)
Hysteresis	[%]	<0.05
Sensitivity	[%]	<0.03
Temperature drift	[%/°K]	<0.025
Electrical characteristics		
Duty ratio	[%]	100
Protection class		IP65
Supply voltage/ripple	[V]	22 ... 30, ripple <5% eff.
Current consumption max.	[A]	3.5
Switch-on current typical	[A]	22 for 0.2 ms
Input signal		
Voltage	[V]	10...0...-10, ripple <0.01% eff., surge free, 0...+10V P->A
Impedance	[kOhm]	100
Current	[mA]	20...0...-20, ripple <0.01% eff., surge free, 0...+20mA P->A
Impedance	[Ohm]	250
Current	[mA]	4...12...20, ripple <0.01% eff., surge free, 12...20mA P->A
Impedance	[Ohm]	250
Differential input max.	[V]	30 for terminal D and E against PE
Enable signal (only code 5)	[V]	5...30, R _i = 9 kOhm
Diagnostic signal	[V]	+10...0...-10 / +U _b , rated max. 5mA
Pre-fusing	[A]	4.0 medium lag
EMC		EN 50081-2 / EN50082-2
Electrical connection		
Code 0		6+PE acc. DIN 43563
Code 5		11+PE acc. DIN 41651
Wiring min.		
Code 0	[mm ²]	7x1.0 (AWG 18) overall braid shield
Code 5	[mm ²]	12x1.0 (AWG 18) overall braid shield
Wiring length max.	[m]	50

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¹⁾ For applications with p_T>35 bar the Y-port has to be used. Remove the plug in the Y-port of the valve and connect the Y-port to unpressurized tank.

²⁾ Flow rate for different Δp per control edge:

$$Q_x = Q_{Nom.} \cdot \sqrt{\frac{\Delta p_x}{\Delta p_{Nom.}}}$$

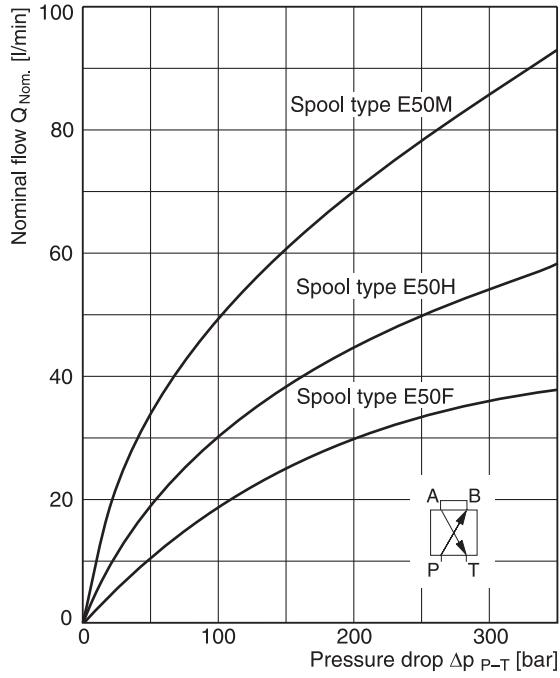
³⁾ Measured with load (100 bar pressure drop/two control edges)

D1FP.PMD CM

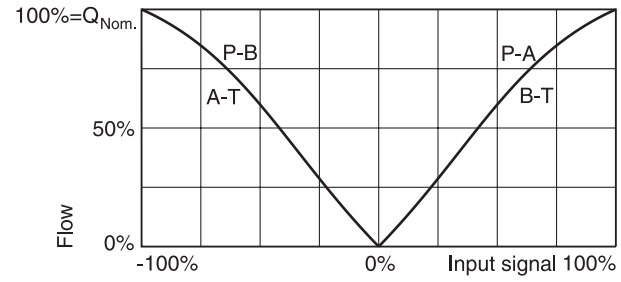


Flow curves

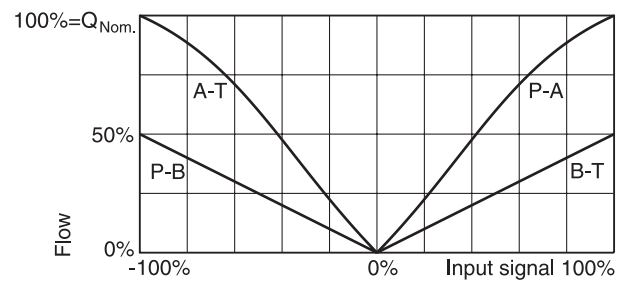
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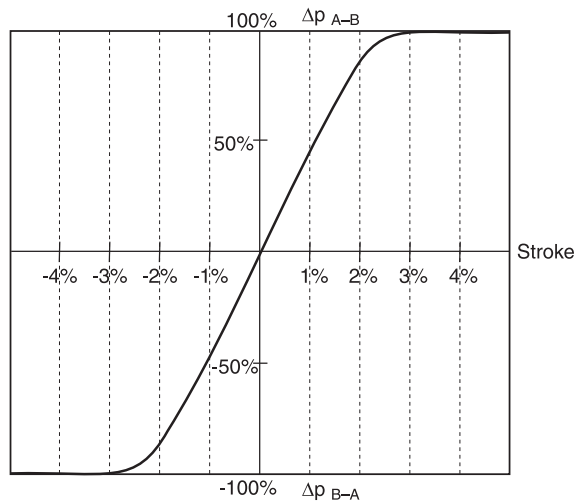
Spool type E50



Spool type B60

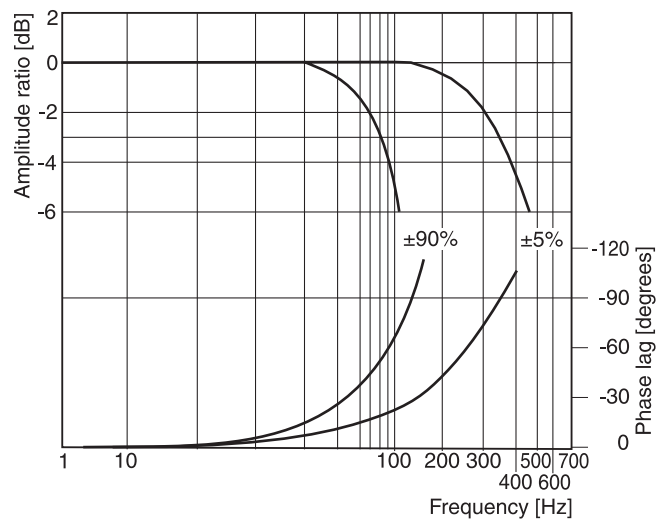


Pressure gain



Frequency response

$\pm 5\%$ input signal
 $\pm 90\%$ input signal

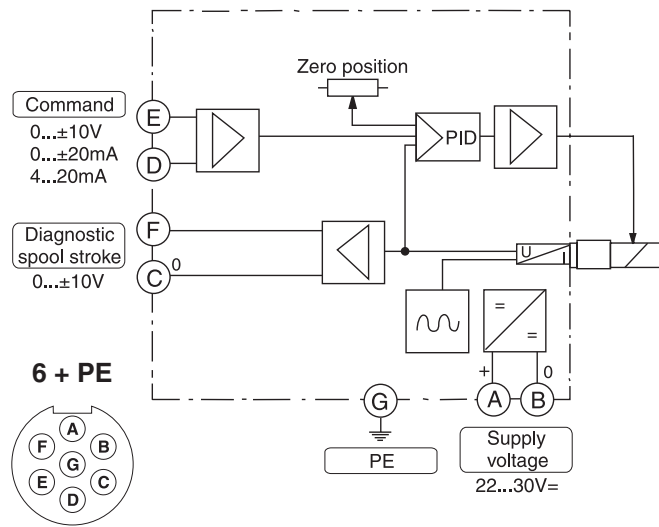


D1FP.PMD CM

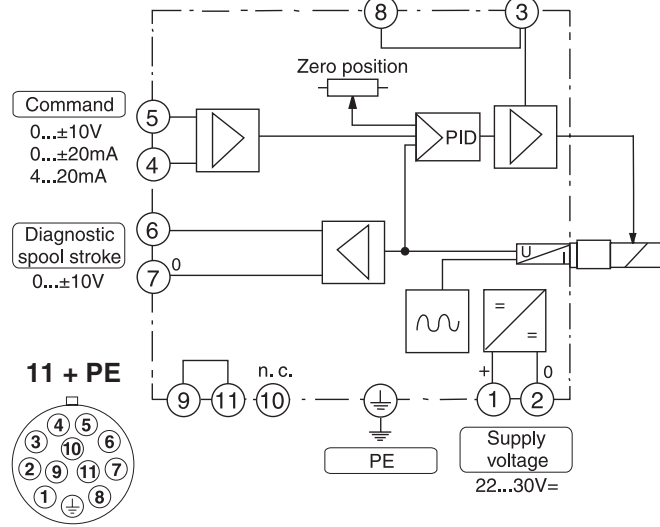


Block diagrams

Code 0

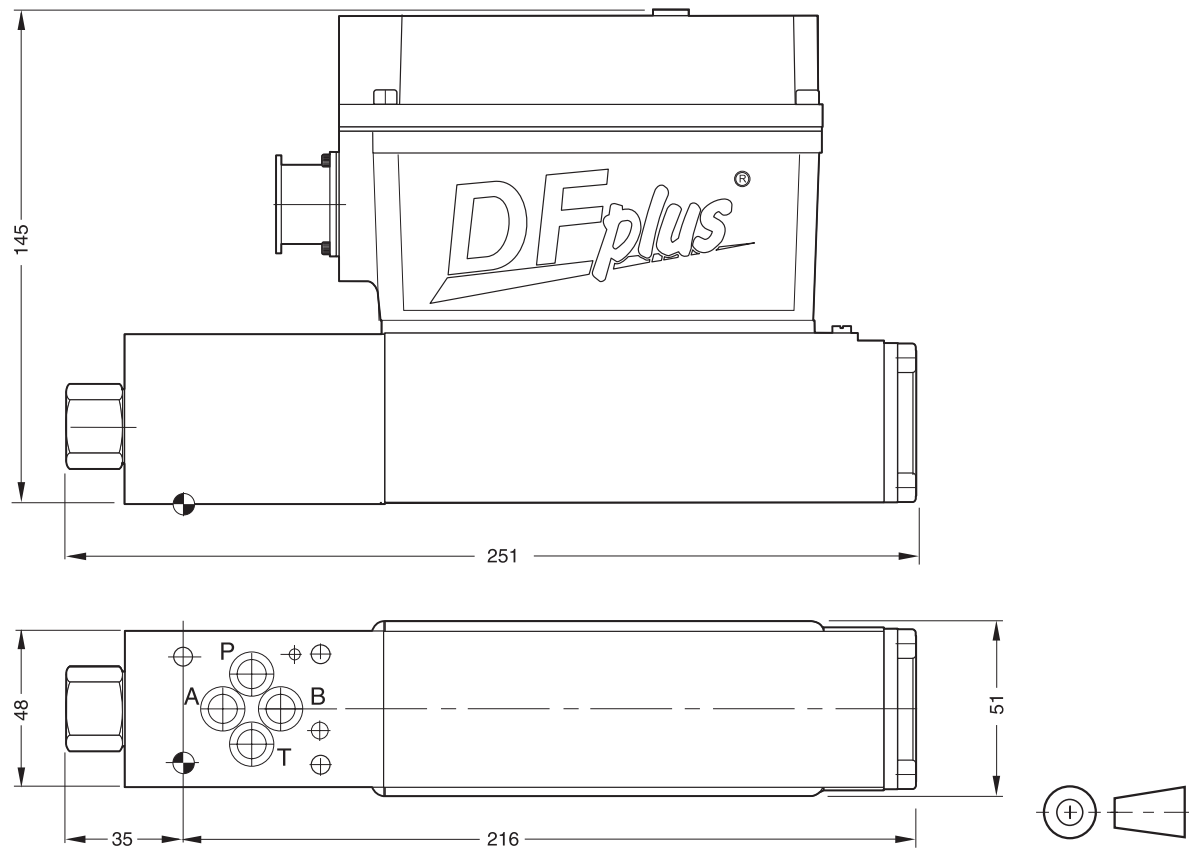


Code 5



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Dimensions



Surface finish	Kit	4x M5x30 DIN 912 12.9	6.8 Nm ±15 %
$\sqrt{R_{max} 6.3}$ $\square 0.01/100$	BK375		

D1FP.PMD CM



