

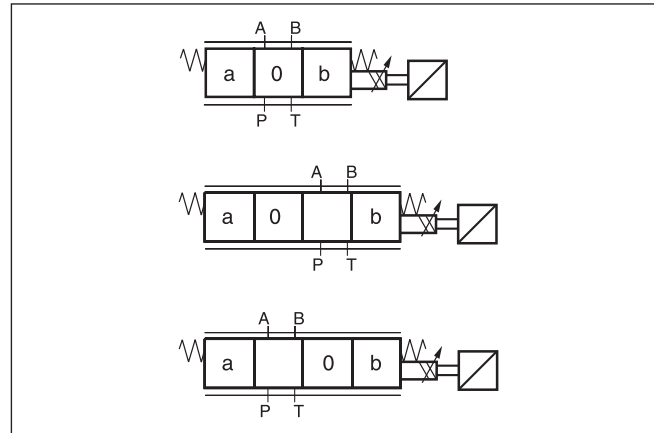
Characteristics

**Direct-Operated Proportional DC Valve
Series D1FP*S**

The direct-operated control valve D1FP*S of the nominal size 04 (ISO 10372) shows extremely high dynamics combined with maximum flow. The valve mounting pattern is designed to replace servo valves of size 04 (ISO 10372) with the D1FP*S.

Driven by the new patented VCD® technology the D1FP*S shows all advantages of the DFplus® series as robustness, high dynamics and no flow limit up to 350 bar*.

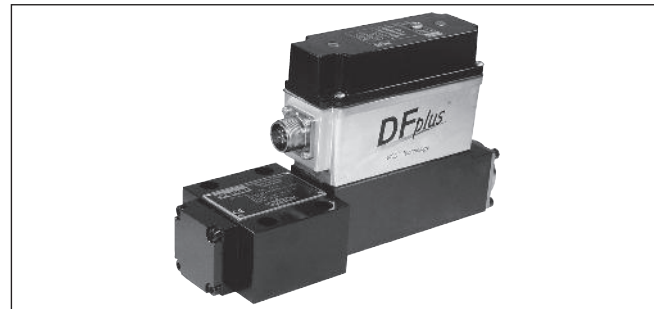
Additional features are low leakage and a defined spool position in case of power supply breakdown. Maintenance and contamination restrictions correspond to common solenoid driven valves and pilot supply is not required. All common input signals are available.



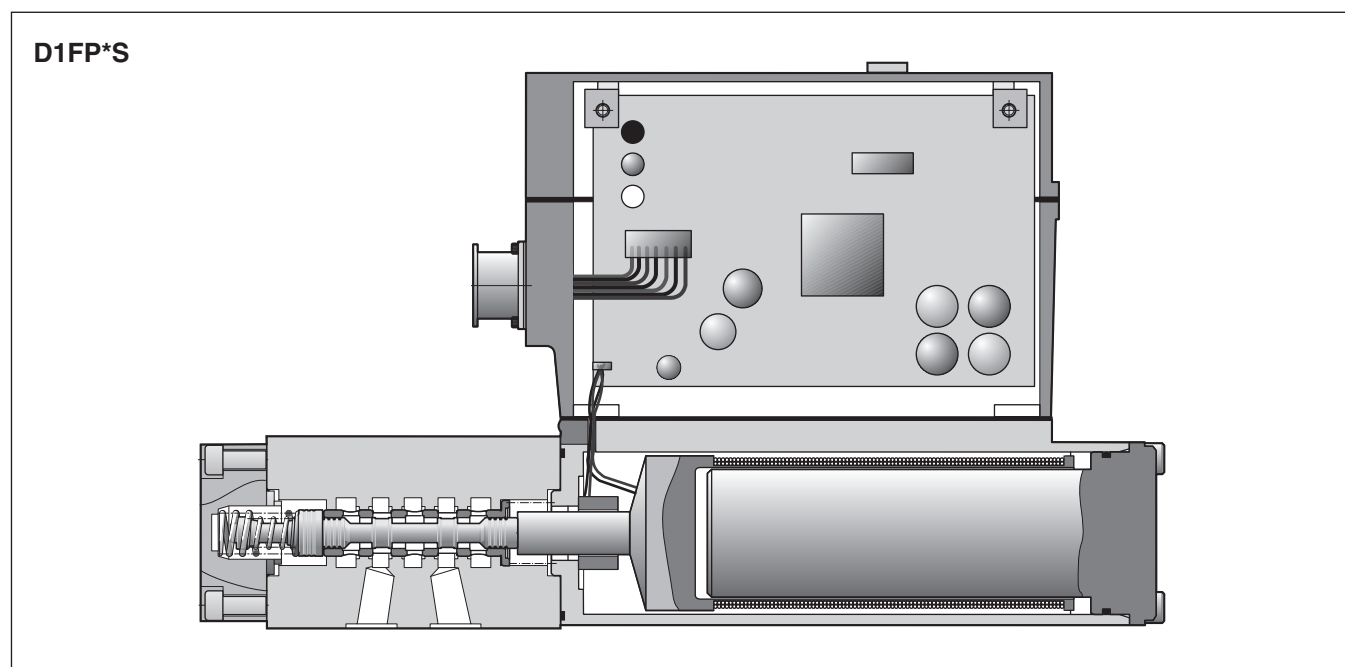
Technical features

- Servo valve size 04 (ISO 10372) mounting pattern
- Real servo valve dynamics (-3db/350Hz with ± 5% input signal)
- Low leakage
- 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

*flow over two control edges

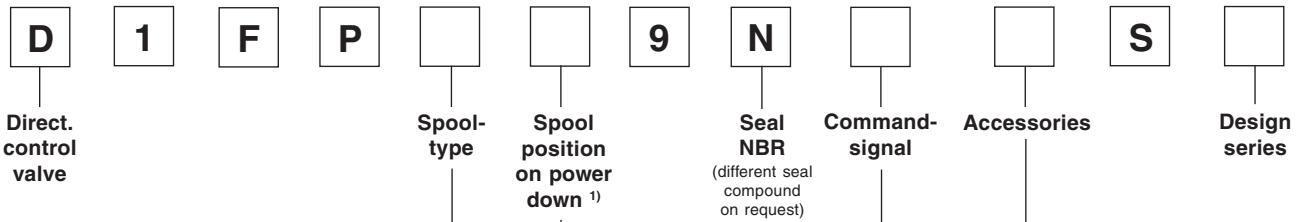


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Code	Spooltype	Flow [l/min] at Δp 35bar per metering edge
Zerolap		
E50M		40
E50H		25
E50F		12
E50C		6
E50B		3
B60M	$Q_B = Q_A / 2$	40 / 20
Overlap 25%		
E01M		40
E01H		25
E01F		12
E01C		6
E01B		3
B31M	$Q_B = Q_A / 2$	40 / 20
E02M		40
E02H		25
B32M	$Q_B = Q_A / 2$	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		ISO 10372 size 04
Mounting interface ¹⁾		Acc. ISO 10372-04-04-0-92 (x port used as y unpressurized tank)
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 (terminal G)
Enable signal (only code 5)	[V]	5...30, R _i = 9 kOhm
Diagnostic signal	[V]	+10...0...-10 / +Ub, 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_r>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.

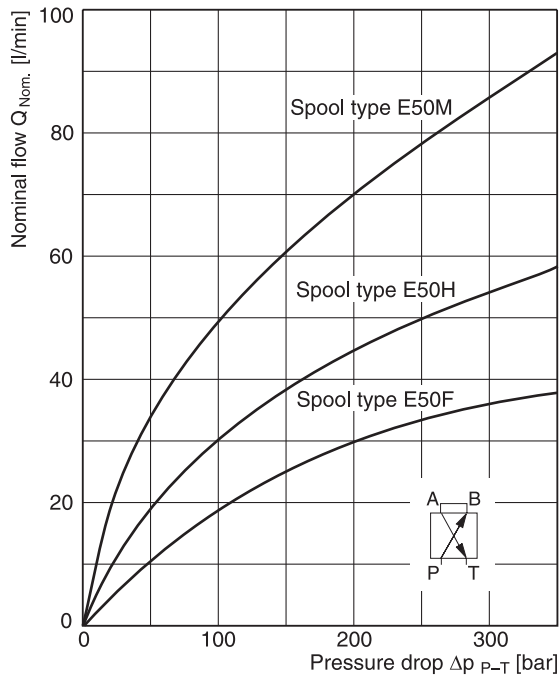
²⁾ Flow rate for different Δp per control edge:

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

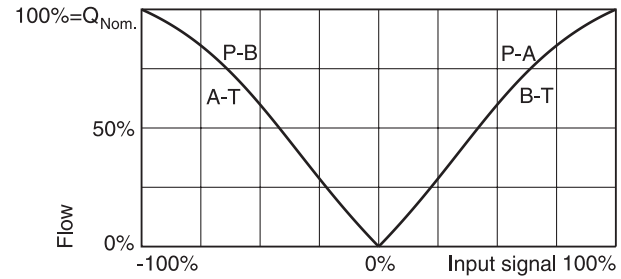
³⁾ Measured with load (100 bar pressure drop/two control edges)

Flow curves

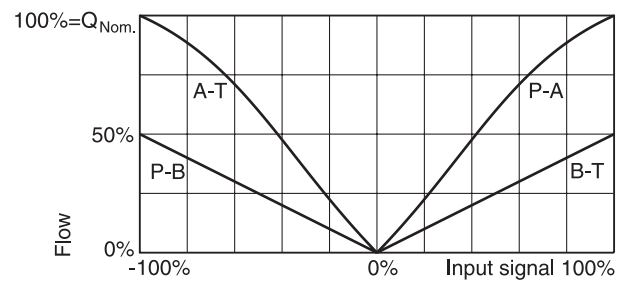
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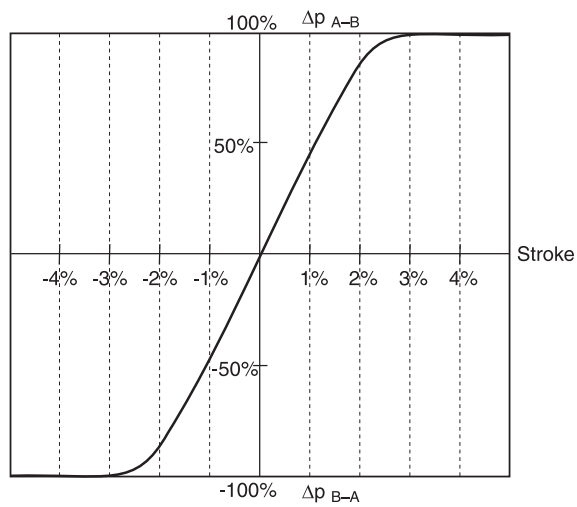
Spool type E50



Spool type B60

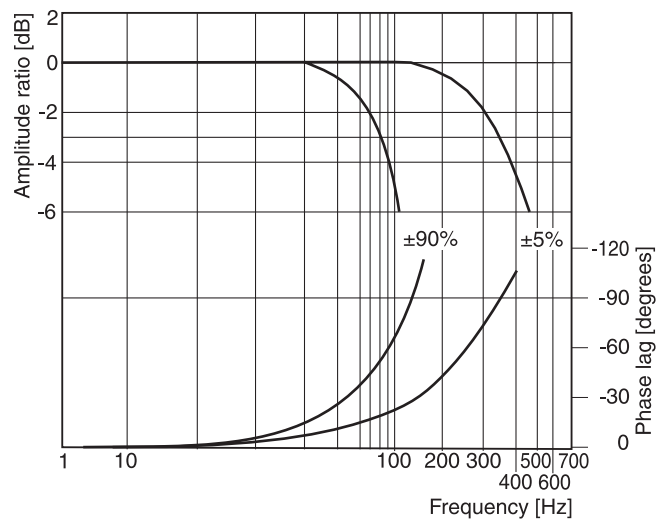


Pressure gain



Frequency response

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

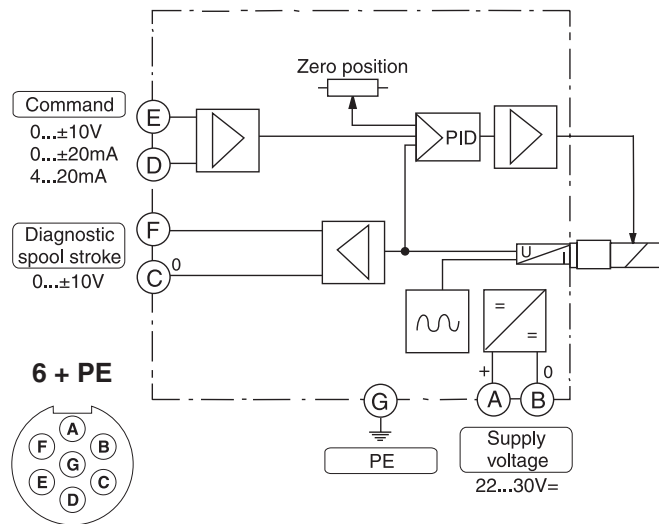


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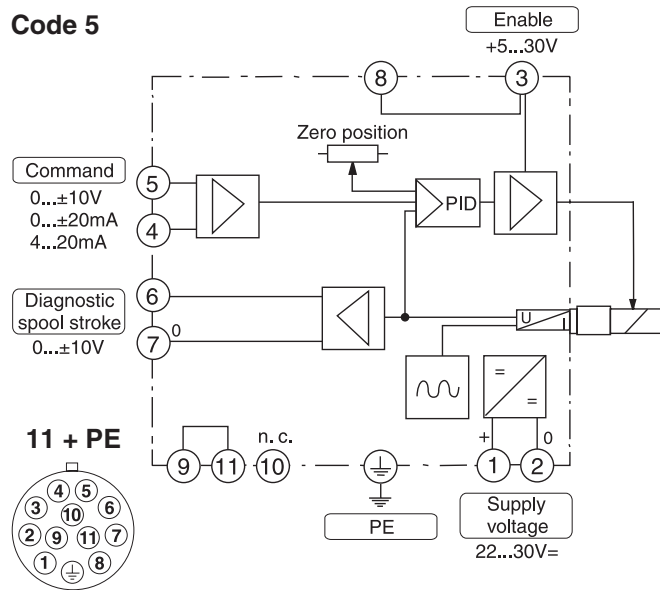


Block diagrams

Code 0

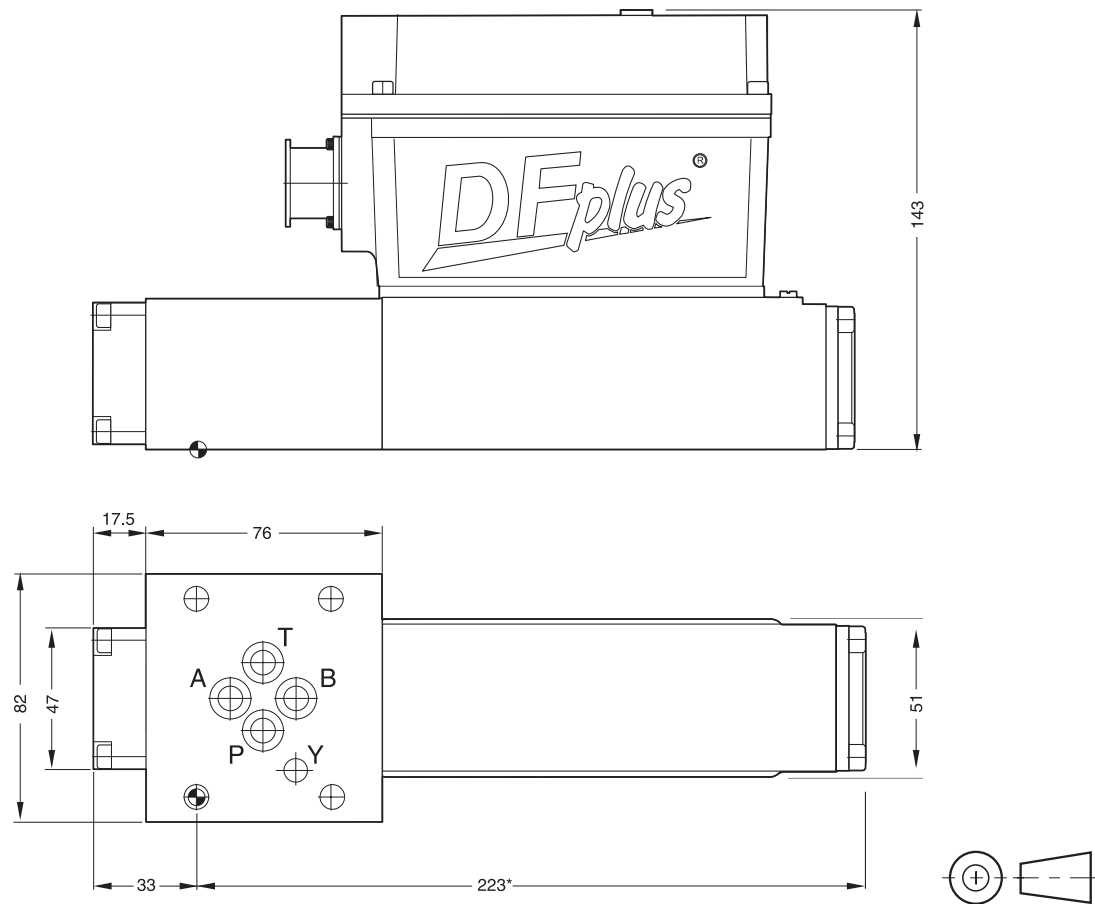


Code 5



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Dimensions



* valve drive on opposite side on request

Surface finish	Kit		
$\sqrt{R_{max} 6.3}$ $\square 0.01/100$	BK414	4x M8x40 DIN 912 12.9	33 Nm ±15 %

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