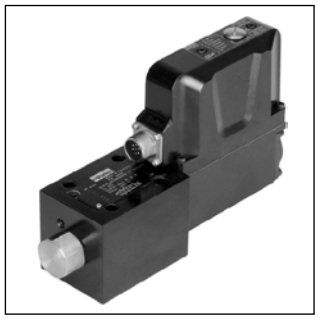
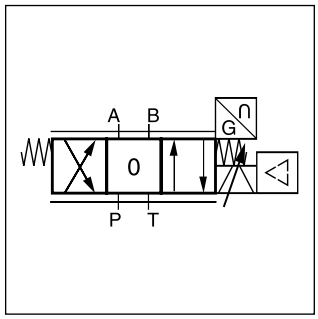
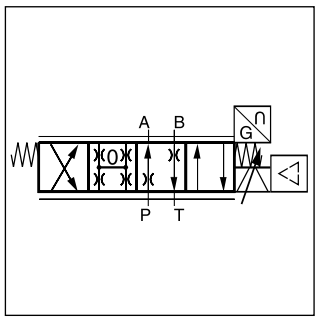
The direct operated control valve D3FP of the nominal size NG10 (CETOP05) shows extremly high dynamics combined with high flow. First of all it is used for highest accuracy in positioning of hydraulic axis and controlling of pressure and velocity.

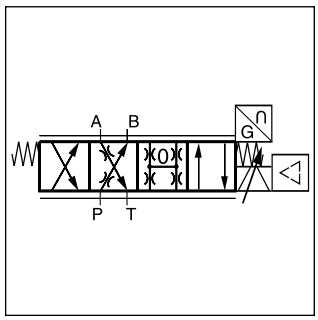
Driven by the new patented VCD® actuator the D3FP reaches the frequency response of real servovalves.

At power-down the spool moves in a defined position. All common input signals are available.





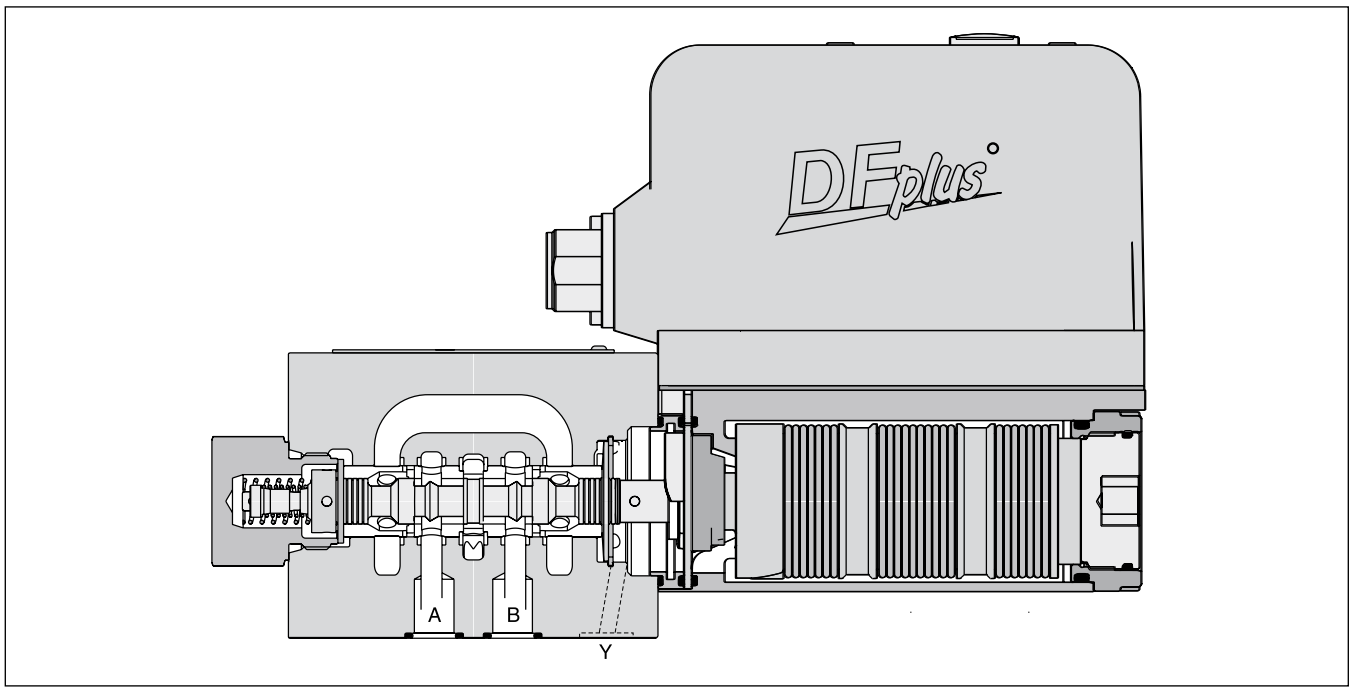




Technical features

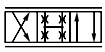
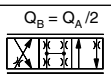
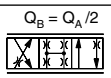
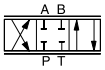
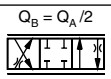
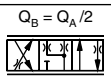
- Real servovalve dynamics (-3dB/350Hz at ±5% input signal)
- Max. tank pressure 350 bar (with external drain port Y)
- Defined spool positioning at power-down - optional P-A/B-T or P-B/A-T or center position (for overlapped spools)
- Onboard electronics
- Spool / sleeve design

CE



D	3	F	P			9				0	
Direct. control valve	**Size DIN NG10 CETOP05 NFPA D05**	**Proportional control**	**VCD**	**Spool type**	**Spool position on power down [1]**	**Y-port (plugged) [4]**	**Seals**	**Command-signal**	**Acces-sories**	**Spool/ sleeve design**	**Design series** (not required for ordering)

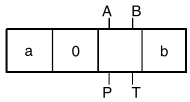
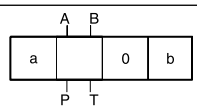
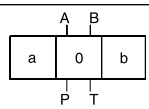
3

Code	Spool type	Flow [l/min] at Δp 35bar per metering edge
	Zerolap	
E50Y		**100**
E50P		**50**
B60Y	$Q_B = Q_A/2$ 	**100**
B60P	$Q_B = Q_A/2$ 	**50**
	Underlap approx. -0.5%	
E55Y		**100**
E55P		**50**
	Overlap 18%	
E01Y **E01P**		**100** **50**
E02Y **E02P**		**100** **50**
B31Y **B31P**	$Q_B = Q_A/2$ 	**100 / 50** **50 / 25**
B32Y **B32P**	$Q_B = Q_A/2$ 	**100 / 50** **50 / 25**

Code	Connection type
0	**6 + PE acc. EN175201-804**
5	**11 + PE acc. EN175201-804**
7	**6 + PE + Enable**

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

Code	Seals
N	NBR
V	FPM
H	for HFC fluid

Code	Spool pos. at power down
A [2]	
B [2]	
C [3]	

[1] On power down the spool moves in a defined position. This cannot be guaranteed 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.

[2] approx. 10% opening, only zerolapped spools and underlapped spools.

[3] only for overlapped spools

[4] needs to be removed at tank pressure >35 bar

Please order connector separately.
See chapter 3 accessories.

Bold letters =
Short-term availability

General			
Design			Direct operated proportional DC valve
Actuation			VCD® actuator
Size			NG10/CETOP05/NFPA D05
Mounting interface			DIN 24340 / ISO 4401 / CETOP RP121 / NFPA
Mounting position			unrestricted
Ambient temperature		[°C]	-20...+50
$MTTF_D$ value		[years]	75
Weight		[kg]	6.5
Vibration resistance		[g]	10 Sinus 5...2000 Hz acc. IEC 68-2-6 30 Random noise 20...2000 Hz acc. IEC 68-2-36 15 Shock acc. IEC 68-2-27
Hydraulic			
Max. operating pressure		[bar] [bar]	Ports P, A, B 350 Port T max. 35, port Y max. 35 [1]
Fluid			Hydraulic oil as per DIN 51524...535, other on request
Fluid temperature		[°C]	-20...+60
Viscosity	permitted	[cSt] / [mm^2/s]	20...380
	recommended	[cSt] / [mm^2/s]	30...80
Filtration			ISO 4406 (1999) 18/16/13 (meet NAS 1638: 7)
Flow nominal at Δp=35bar per control edge [2]		[l/min]	50 / 100
Flow maximum		[l/min]	150
Leakage at 100 bar		[ml/min]	<400 (Zerolap spool); <100 (Overlap spool)
Static / Dynamic			
Step response at 100% step [3]		[ms]	<6
Frequency response (±5% signal) [3]		[Hz]	200 (amplitude ratio -3dB), 200 (phase lag -90°)
Hysteresis		[%]	<0.05
Sensitivity		[%]	<0.03
Temperature drift		[%/K]	<0.025
Electrical characteristics			
Duty ratio		[%]	100
Protection class			IP65 in accordance with EN 60529 (with correctly mounted plug-in connector)
Supply voltage/ripple		[V]	22 ... 30, ripple <5% eff., surge free
Current consumption max.		[A]	3.5
Pre-fusing		[A]	4.0 medium lag
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 <3.6 mA = disable, >3.8 mA = according to NAMUR NE43
	Impedance	[Ohm]	250
Differential input max.			
	Code 0	[V]	30 for terminal D and E against PE (terminal G)
	Code 5	[V]	30 for terminal 4 and 5 against PE (terminal ⏚)
	Code 7	[V]	30 for terminal D and E against PE (terminal G)
Enable signal	(only code 5/7)	[V]	5...30, Ri = 9 kOhm
Diagnostic signal		[V]	+10...0...-10 / +Ub, rated max. 5mA
EMC			EN 61000-6-2, EN 61000-6-4
Electrical connection		Code 0/7 Code 5	6 + PE acc. EN 175201-804 11 + PE acc. EN 175201-804
Wiring min.	Code 0/7	[mm^2]	7 x 1.0 (AWG 18) overall braid shield
	Code 5	[mm^2]	8 x 1.0 (AWG 18) overall braid shield
Wiring lenght max.		[m]	50

[1] For applications with p_T>35 bar the Y-port has to be connected and the plug in the Y-port has to be removed.

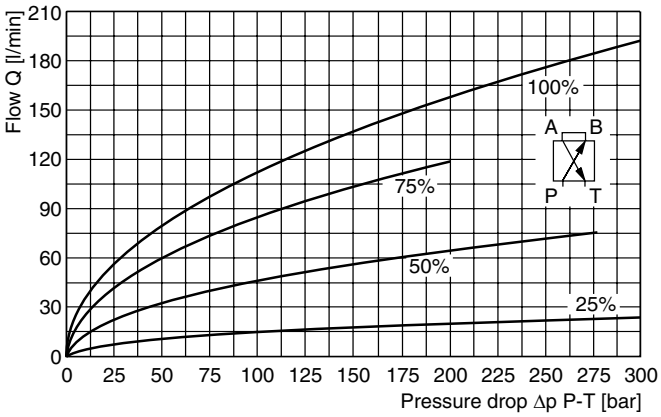
[2] Flow rate for different Δp per control edge: $Q_x = Q_{Nom.} \cdot \sqrt{\frac{\Delta p_x}{\Delta p_{Nom.}}}$

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

3

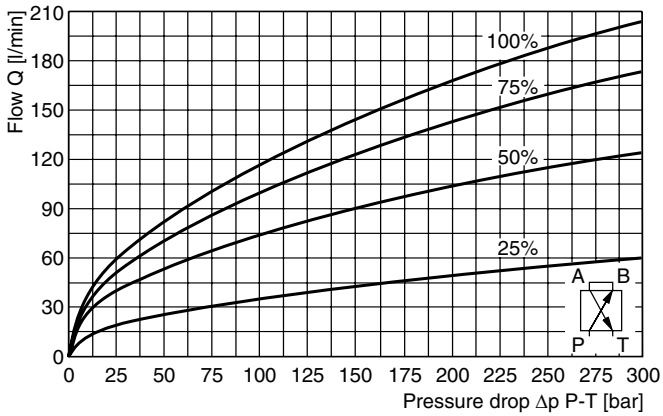
Functional limits*
at 25%, 50%, 75% and 100% command signal

Spool type **E01/E02**



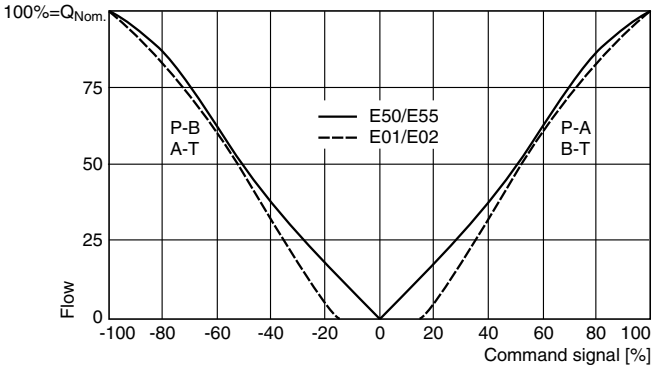
Functional limits*
at 25%, 50%, 75% and 100% command signal

Spool type **E50/E55**



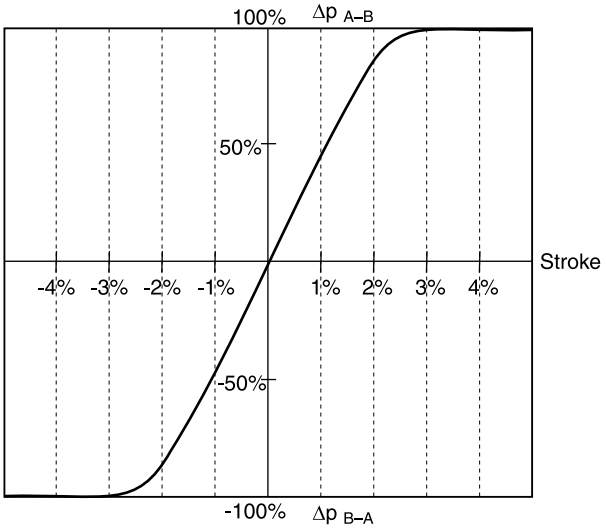
Flow curves
at Δp = 35 bar per metering edge

Spool type **E50/E55, E01/E02**



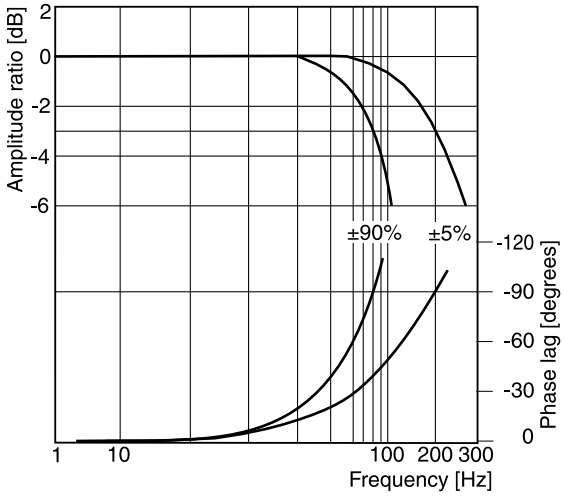
*** When exceeding the functional limits, for a period of time the valve will go into fail safe and power supply needs to be switched off/on to re-enable the valve.**

Pressure gain

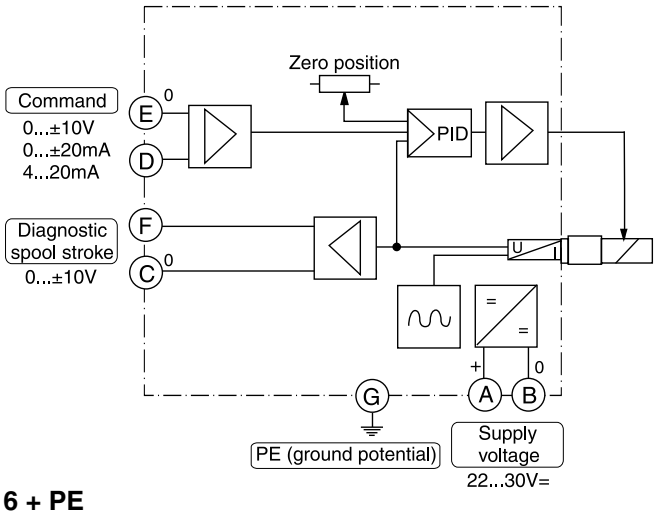


Frequency response
±5% command signal

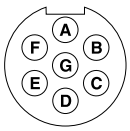
±90% command signal



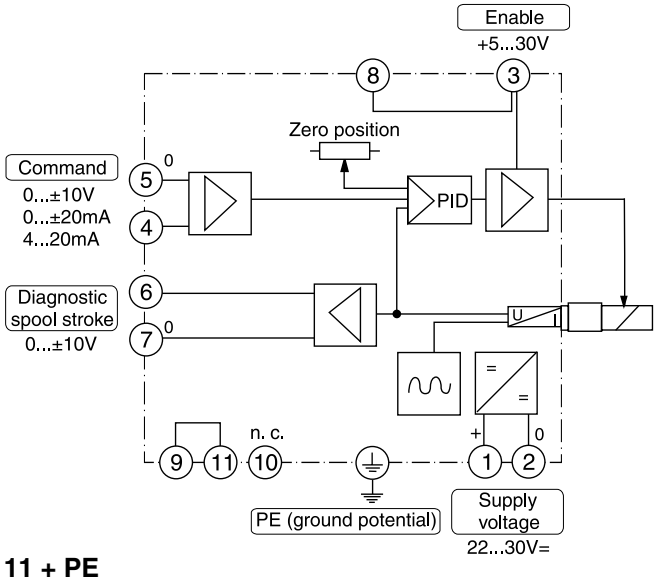
Code 0



6 + PE

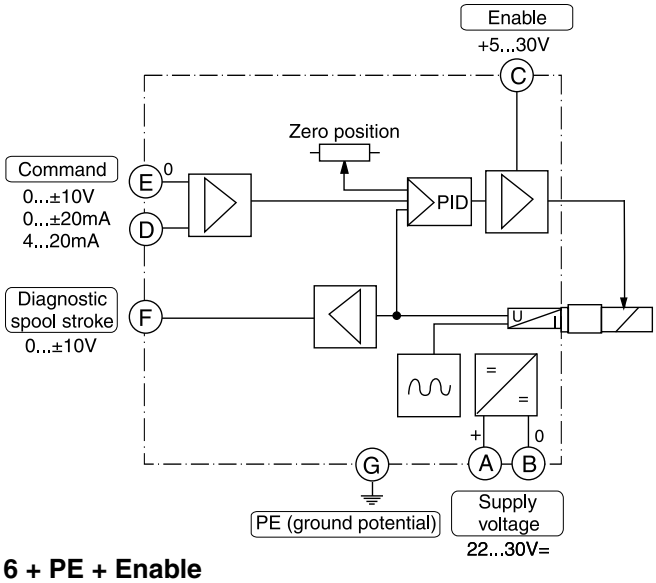


Code 5

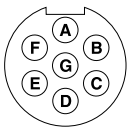


11 + PE

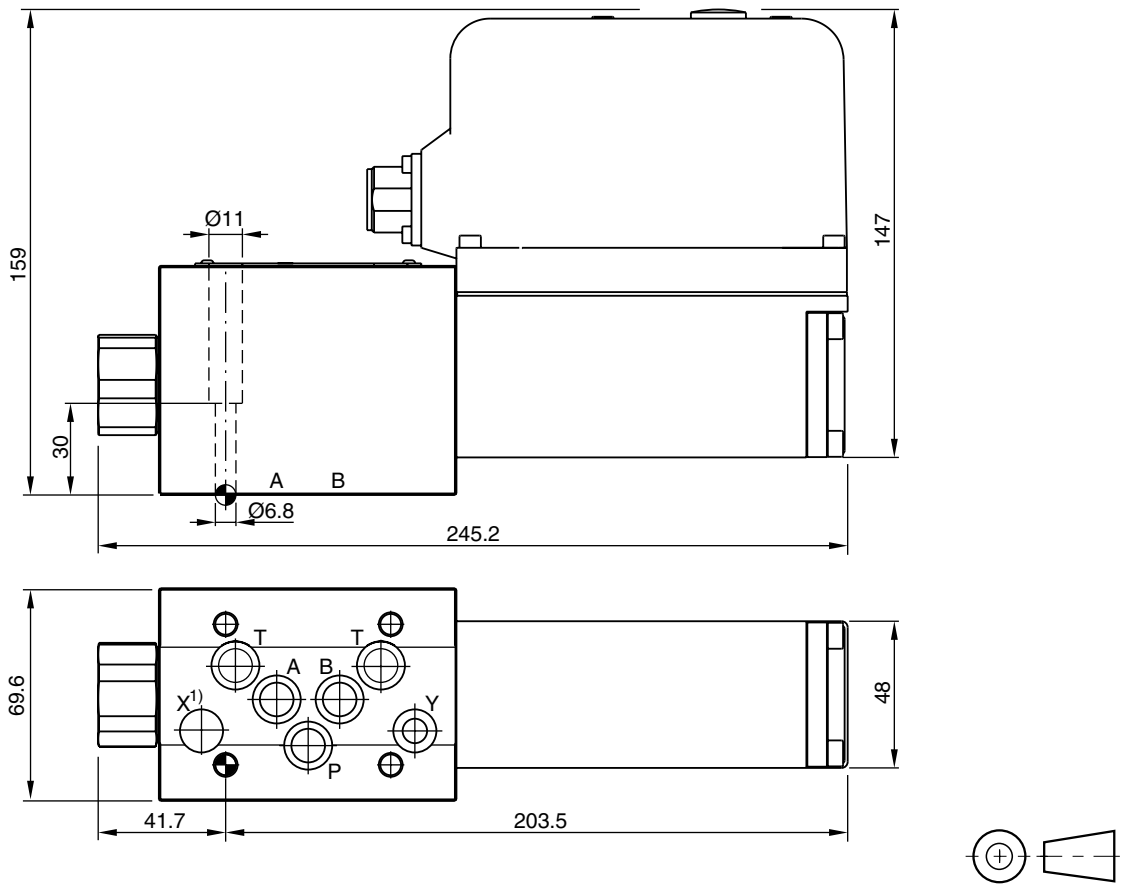
Code 7



6 + PE + Enable



3



1) O-ring recess diameter on valve body.

Surface finish	Kit			Kit
$\sqrt{R_{max}6.3}$ 0.01/100	BK385	4xM6x40 DIN 912 12.9	13.2 Nm ±15%	NBR: SK-D3FP FPM: SK-D3FP-V HFC: SK-D3FP-H