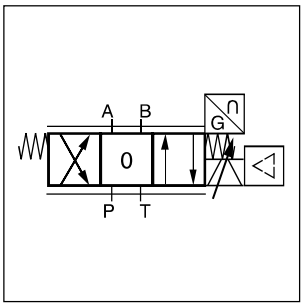
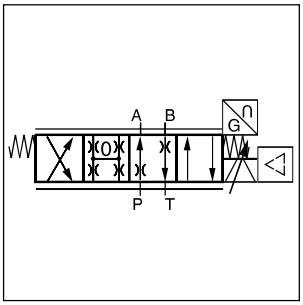
3

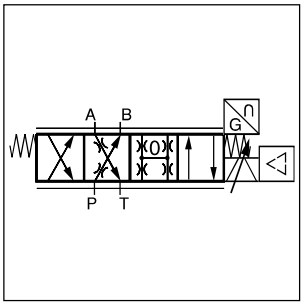
The direct operated control valve D1FP of the nominal size NG06 (CETOP 03) shows extremly high dynamics combined with maximum flow. It is the preferred choice for highest accuracy in positioning of hydraulic axis and controlling of pressure and velocity.

Driven by the 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 350 bar across the valve. Because of the high flow capability the D1FP can be a substitute for NG10 valves in some cases.

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



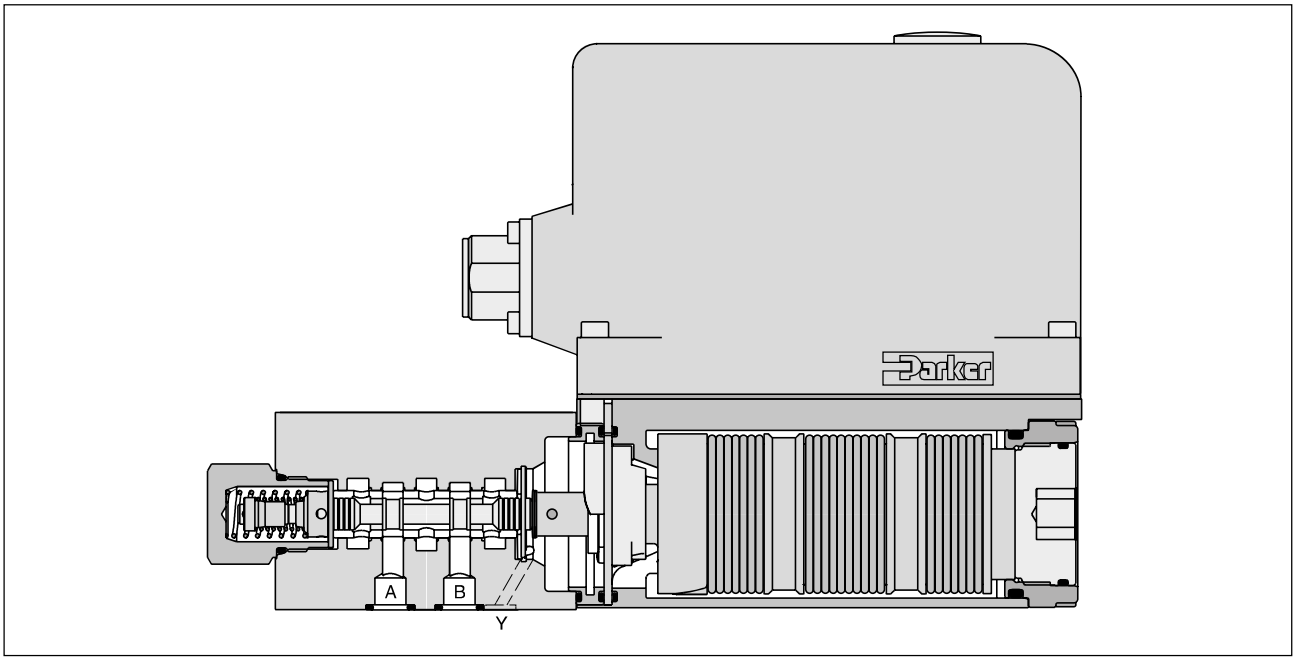




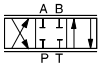
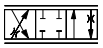
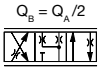
Features

- Real servovalve dynamics (-3 dB / 350 Hz at ±5 % input signal)
- No flow limit up to 350 bar pressure drop through the valve
- Max. tank pressure 350 bar (with external drain port y)
- High flow
- Defined spool positioning at power-down - optional P-A/B-T or P-B/A-T or center position (for overlapped spools)
- Onboard electronics

CE



D	1	F	P			9				0	
Directional control valve	Size DIN NG06 CETOP 03 NFPA D03	Proportional control	VCD	Spool type	Spool position on power down [1]	Y-port (plugged) [5]	Seals	Command signal	Electronics option	Spool/ sleeve design	Design series (not required for ordering)

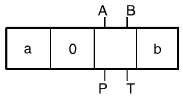
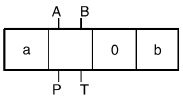
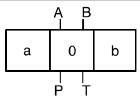
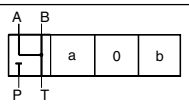
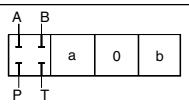
Code	Spool type	Flow [l/min] at Δp 35 bar per metering edge
	Zerolap	
E50B		3
E50C		6
E50F		12
E50G		16
E50H		25
E50M		40
B60C	$Q_B = Q_A/2$	6 / 3
B60F		12 / 6
B60G		16 / 8
B60H		25 / 12.5
B60M		40 / 20
	Underlap	
E55B		3
E55C		6
E55F		12
E55G		16
E55H		25
E55M		40
	Overlap	
E01B		3
E01C		6
E01F		12
E01G		16
E01H		25
E01M		40
B31C	$Q_B = Q_A/2$ 	6 / 3
B31F		12 / 6
B31G		16 / 8
B31H		25 / 12.5
B31M		40 / 20
E02B		3
E02C		6
E02F		12
E02G		16
E02H		25
E02M		40
B32C	$Q_B = Q_A/2$ 	6 / 3
B32F		12 / 6
B32G		16 / 8
B32H		25 / 12.5
B32M		40 / 20

Short delivery time for all variations

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

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

Code	Seals
N	NBR
V	FPM
H	for HFC fluid

Code	Spool position at power down
A [2]	
B [2]	
C [3]	
H [4]	
J [4]	

Note:

Adapter plate for ISO 4401 to ISO 10372 size 04, Ordering code HAP04WV06-1661
Please order connector separately, see chapter 3 accessories.
Parametrizing cable OBE -> RS232, item no. 40982923

[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 zero lapped spools and underlap spools.
[3] Only for overlapped spools.
[4] Flow for code M: 35 l/min at Δp 35 bar.
[5] Plug in the Y-port needs to be removed at tank pressure >35 bar.

3

General			
Design			Direct operated servo proportional DC valve
Actuation			VCD® actuator
Size			**NG06 / CETOP 03 / NFPA D03**
Mounting interface			DIN 24340 / ISO 4401 / CETOP RP121 / NFPA
Mounting position			unrestricted
Ambient temperature		[°C]	-20...+50
$MTTF_D$ value [1]		[years]	150
Weight		[kg]	3.6
Vibration resistance		[g]	10 Sinus 5...2000 Hz acc. IEC 68-2-6 10 (RMS) Random noise 20...2000 Hz acc. IEC 68-2-36 15 Shock acc. IEC 68-2-27
Hydraulic			
Max. operating pressure		[bar]	Ports P, A, B 350, port T 35 for internal drain, 350 for external drain, port Y 35 [2]
Fluid			Hydraulic oil according to DIN 51524 ... 535, other on request
Fluid temperature		[°C]	-20...+60 (NBR: -25...+60)
Viscosity	permitted	[cSt]/ mm²/s]	20...400
	recommended	[cSt]/ mm²/s]	30...80
Filtration			ISO 4406; 18/16/13
Nominal flow at Δp=35 bar per control edge [3]		[l/min]	3 / 6 / 12 / 16 / 25 / 40
Flow maximum		[l/min]	90 (at Δp=350 bar over two control edges)
Leakage at 100 bar		[ml/min]	<400 (zerolap spool); <50 (overlap spool)
Opening point		[%]	set to 23 command signal (see flow characteristics)
Static / Dynamic			
Step response at 100 % step [4]		[ms]	<3.5
Frequency response (±5 % signal) [4]		[Hz]	350 (amplitude ratio -3 dB), 350 (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]	DC 22 ... 30, electric shut-off at < 19, ripple < 5 % eff., surge free
Current consumption max.		[A]	3.5
Pre-fusing		[A]	4.0 medium lag
Input signal			
Code B	Voltage	[V]	10...0...-10, ripple <0.01 % eff., surge free, 0...+10 V P->A
	Impedance	[kOhm]	100
Code E	Current	[mA]	20...0...-20, ripple <0.01 % eff., surge free, 0...+20 mA P->A
	Impedance	[Ohm]	<250
Code S	Current	[mA]	4...12...20, ripple <0.01 % eff., surge free, 12...20 mA 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 = > 8 kOhm
Diagnostic signal		[V]	+10...0...-10 / +12.5 error detection, rated max. 5 mA
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	[mm²]	7x1.0 (AWG 16) overall braid shield
	Code 5	[mm²]	8x1.0 (AWG 16) overall braid shield
Wiring length max.		[m]	50

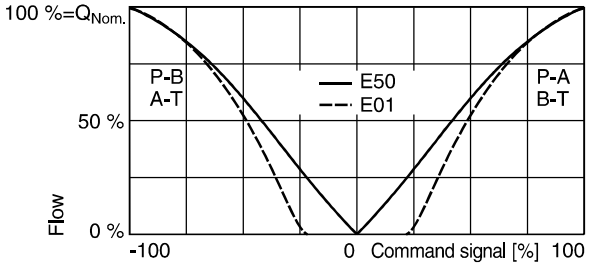
[1] If valves with onboard electronics are used in safety-related parts of control systems, in case the safety function is requested, the valve electronics voltage supply is to be switched off by a suitable switching element with sufficient reliability.

[2] For applications with p_T>35 bar (max. 350 bar) the Y-port has to be connected and the plug in the Y-port has to be removed.

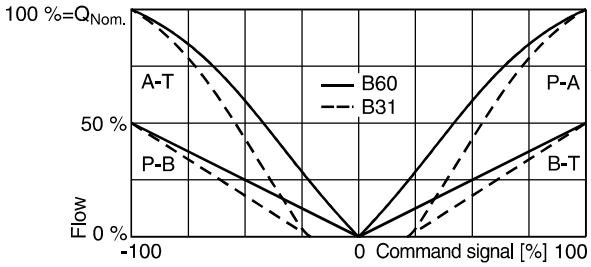
[3] Flow rate for different Δp per control edge: $Q_x = Q_{Nom.} \cdot \sqrt{\frac{\Delta p_x}{\Delta p_{Nom.}}}$

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

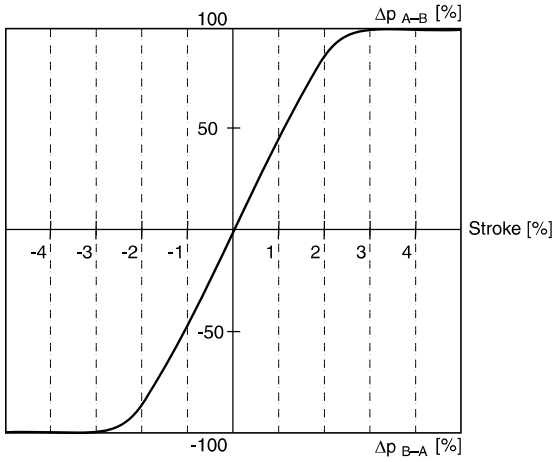
Flow curves
(Overlapped spool opening point 23 %)
at Δp = 35 bar per metering edge
Spool type **E01/E50**



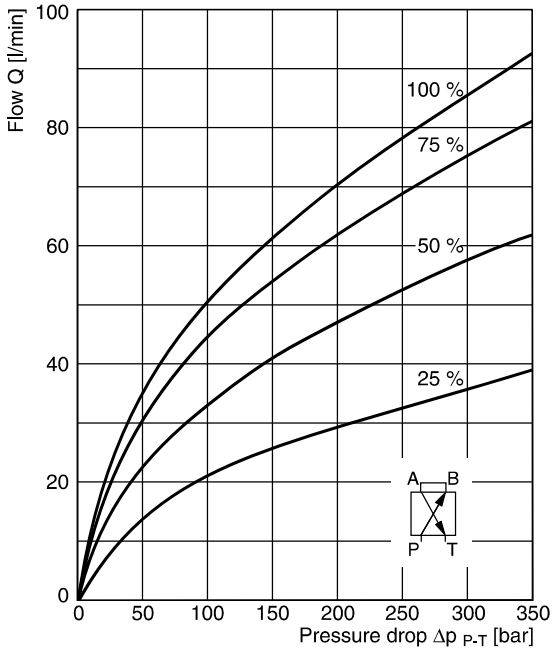
Spool type **B31/B60**



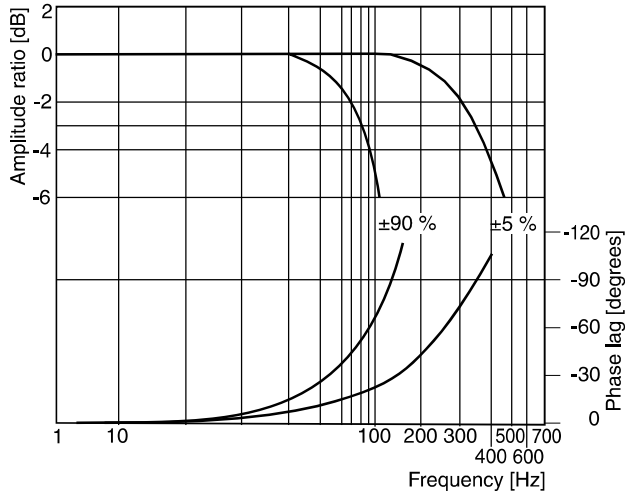
Pressure gain



Functional limits
at 25 %, 50 %, 75 % and 100 % command signal
Spool type **E01M/E50M**



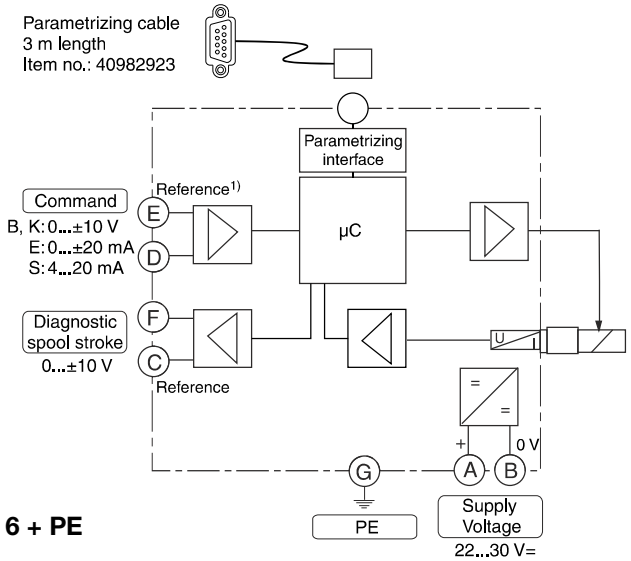
Frequency response
±5 % command signal
±90 % command signal



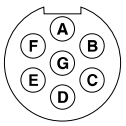
All characteristic curves measured with HLP46 at 50 °C.

3

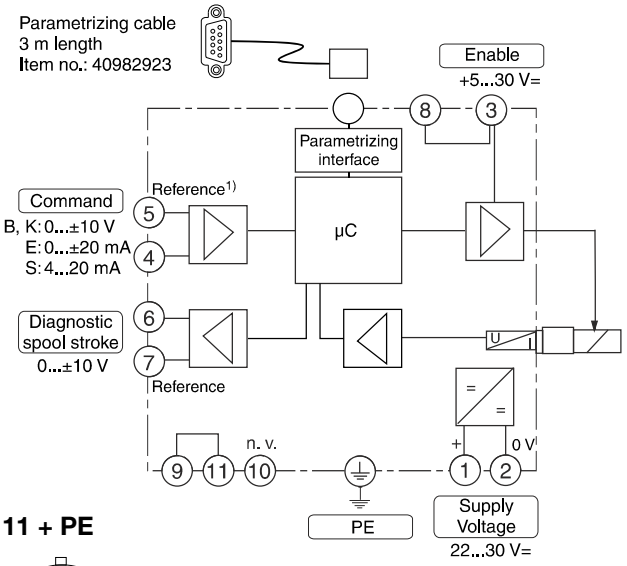
Code 0



6 + PE

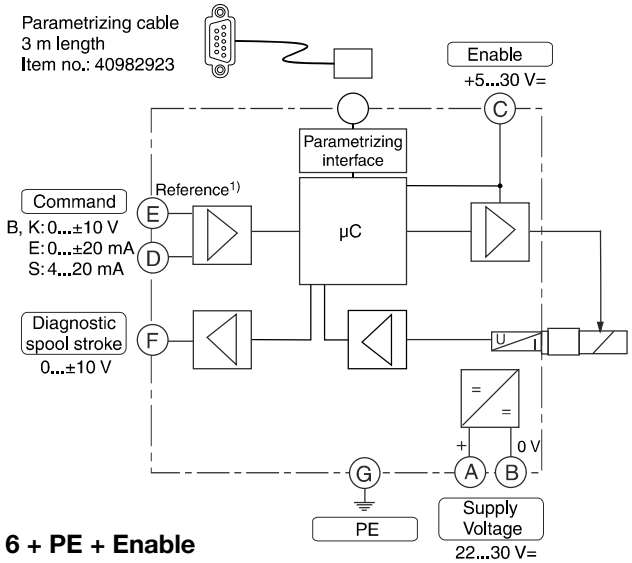


Code 5

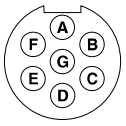


11 + PE

Code 7



6 + PE + Enable



[1] Do not connect with supply voltage zero.

ProPxD interface program

The ProPxD software allows quick and easy setting of the digital valve electronics. Individual parameters as well as complete settings can be viewed, changed and saved via the comfortable user interface. Parameter sets saved in the non-volatile memory can be loaded to other valves of the same type or printed out for documentation purposes.

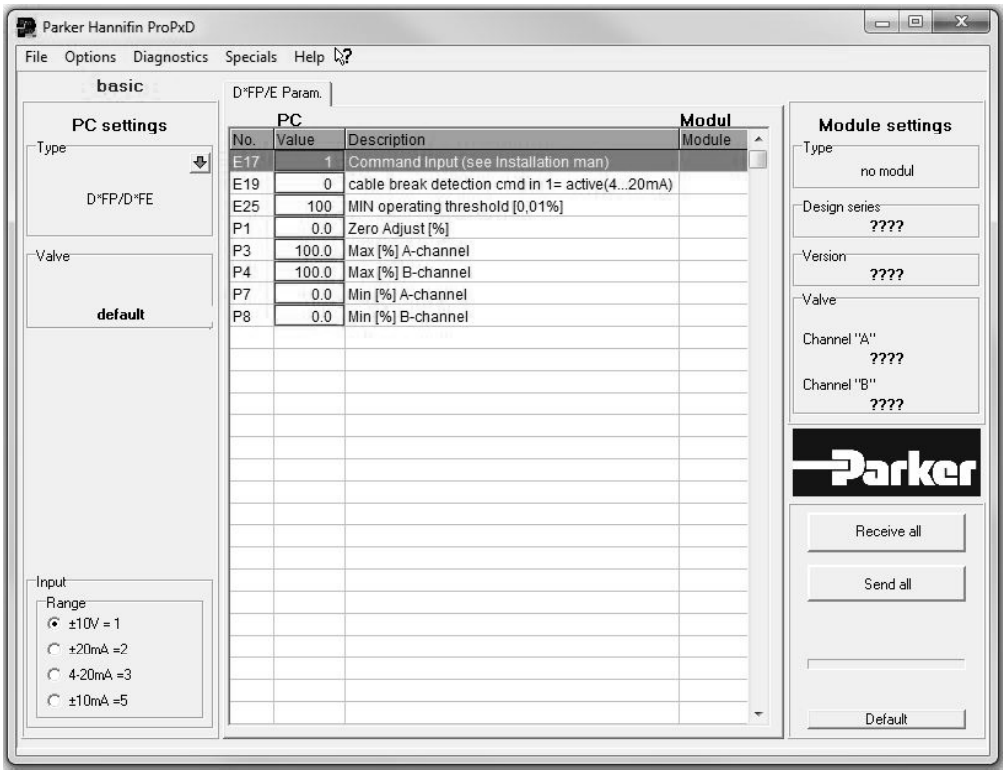
The PC software can be downloaded free of charge at www.parker.com/isde – see page “Support" or directly at www.parker.com/propxd.

Features

- Comfortable editing of valve parameters
- Saving and loading of customized parameter sets
- Executable with all Windows® operating systems from Windows® XP upwards
- Simple communication between PC and valve electronics via serial interface RS232C

The valve electronics cannot be connected to a PC with a standard USB cable – this can result in damages of PC and/or valve electronics.

The parametrizing cable may be ordered under item no. 40982923.



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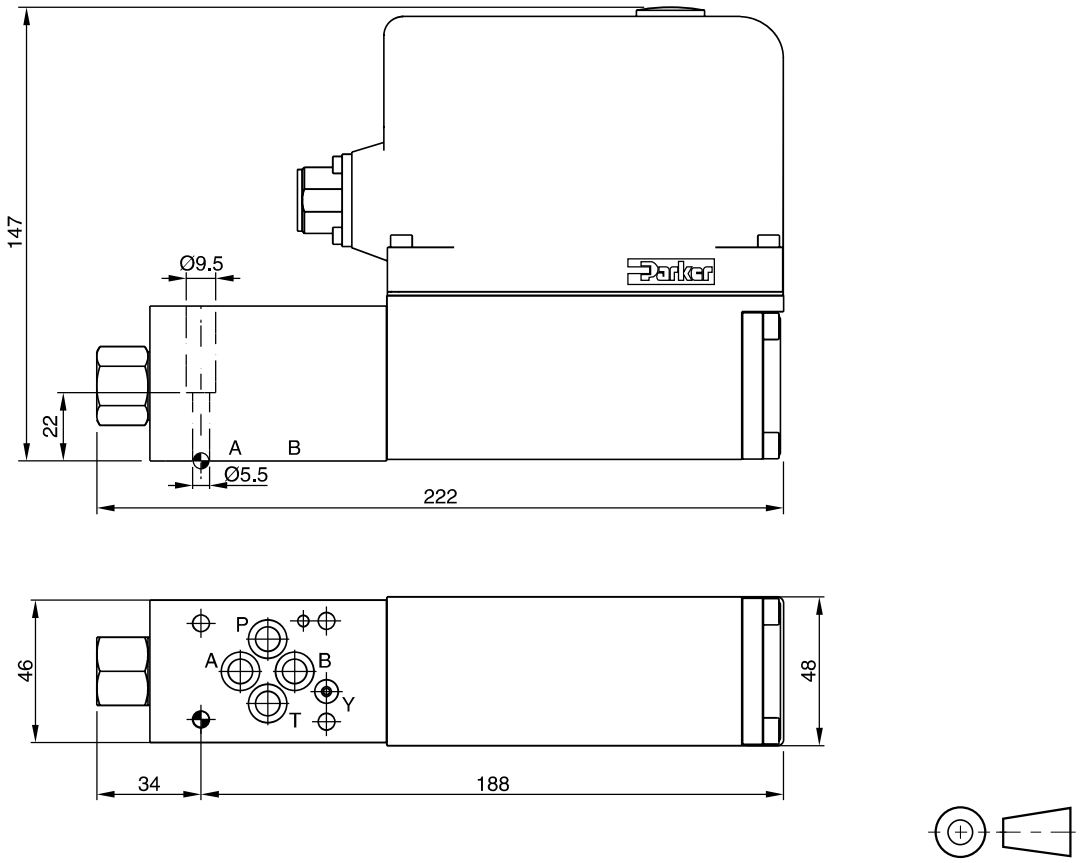
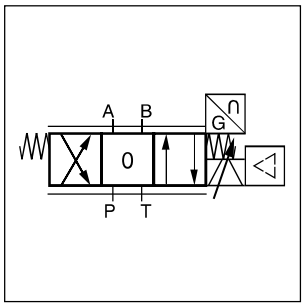


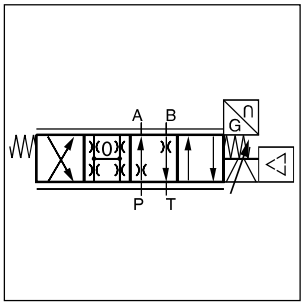
Surface finish	Kit			Kit
R_{max}6.3 ⏥ 0.01/100	BK375	4x M5x30 ISO 4762-12.9	7.6 Nm ±15 %	NBR: SK-D1FP FPM: SK-D1FP-V HFC: SK-D1FP-H

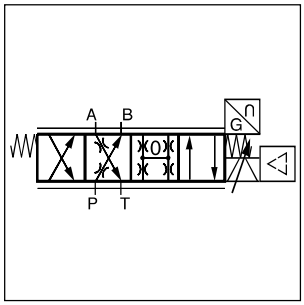
The direct operated control valve D3FP of the nominal size NG10 (CETOP 05) shows extremly high dynamics combined with high flow. It is the preferred choice for highest accuracy in positioning of hydraulic axis and controlling of pressure and velocity.

Driven by the 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.



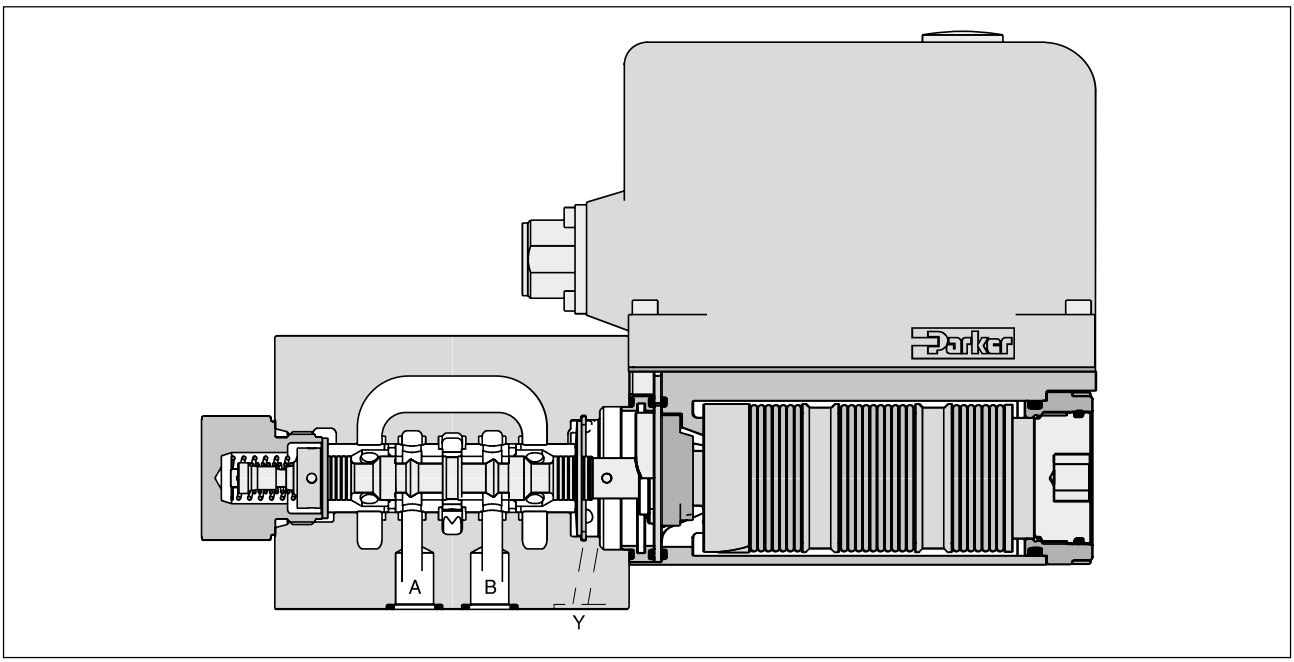




Features

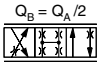
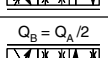
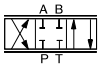
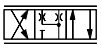
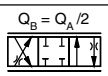
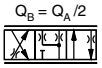
- Real servovalve dynamics
  (-3 dB / 350 Hz at ±5 % input signal)
- Max. tank pressure 250 bar
  (with external drain port Y)
- Defined spool positioning at power-down - optional
  P-A/B-T or P-B/A-T or center position
  (for overlapped spools)
- Onboard electronics
- Spool / sleeve design

CE



D	3	F	P			9				0	
Direct. control valve	**Size DIN NG10 CETOP 05 NFPA D05**	**Proportional control**	**VCD**	**Spool type**	**Spool position on power down [1]**	**Y-port (plugged) [4]**	**Seals**	**Command signal**	**Electronics option**	**Spool/ sleeve design**	**Design series** (not required for ordering)

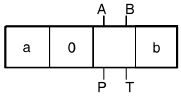
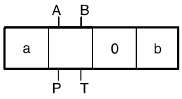
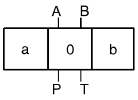
3

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

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

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

Code	Seals
N	**NBR**
V	**FPM**
H	**for HFC fluid**

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

Short delivery time for all variations

For regenerative and hybrid function please refer solutions with sandwich- and adaptor plates "A10-1664 / A10-1665L / H10-1662 / H10-1666L" in chapter 12.

Please order connector separately, see chapter 3 accessories.

Parametrizing cable OBE -> RS232, item no. 40982923

[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] Plug in the Y-port needs to be removed at tank pressure >35 bar.

General			
Design			Direct operated servo proportional DC valve
Actuation			VCD® actuator
Size			NG10 / CETOP 05 / NFPA D05
Mounting interface			DIN 24340 / ISO 4401 / CETOP RP121 / NFPA
Mounting position			unrestricted
Ambient temperature		[°C]	-20...+50
$MTTF_D$ value [1]		[years]	150
Weight		[kg]	6.5
Vibration resistance		[g]	10 Sinus 5...2000 Hz acc. IEC 68-2-6 10 (RMS) Random noise 20...2000 Hz acc. IEC 68-2-36 15 Shock acc. IEC 68-2-27
Hydraulic			
Max. operating pressure		[bar]	Ports P, A, B 350, port T 35 for internal drain, 250 for external drain, port Y 35 [2]
Fluid			Hydraulic oil according to DIN 51524 ... 535, other on request
Fluid temperature		[°C]	-20...+60 (NBR: -25...+60)
Viscosity	permitted	[cSt]/[mm²/s]	20...400
	recommended	[cSt]/[mm²/s]	30...80
Filtration			ISO 4406; 18/16/13
Flow nominal at Δp=35 bar per control edge [3]		[l/min]	50 / 100
Flow maximum		[l/min]	150
Leakage at 100 bar		[ml/min]	<400 (zerolap spool); <100 (overlap spool)
Opening point		[%]	set to 19 command signal (see flow characteristics)
Static / Dynamic			
Step response at 100 % step [4]		[ms]	<6
Frequency response (±5 % signal) [4]		[Hz]	200 (amplitude ratio -3 dB), 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, electric shut-off at < 19, ripple <5 % eff., surge free
Current consumption max.		[A]	3.5
Pre-fusing		[A]	4.0 medium lag
Input signal			
Code B	Voltage	[V]	10...0...-10, ripple <0.01 % eff., surge free, 0...+10 V P->A
	Impedance	[kOhm]	100
Code E	Current	[mA]	20...0...-20, ripple <0.01 % eff., surge free, 0...+20 mA P->A
	Impedance	[Ohm]	<250
Code S	Current	[mA]	4...12...20, ripple <0.01 % eff., surge free, 12...20 mA 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 = > 8 kOhm
Diagnostic signal		[V]	+10...0...-10 / +12.5 error detection, rated max. 5 mA
EMC			EN 61000-6-2, EN 61000-6-4
Electrical connection		Code 0/7	6 + PE acc. EN 175201-804
		Code 5	11 + PE acc. EN 175201-804
Wiring min.	Code 0/7	[mm²]	7 x 1.0 (AWG 16) overall braid shield
	Code 5	[mm²]	8 x 1.0 (AWG 16) overall braid shield
Wiring length max.		[m]	50

[1] If valves with onboard electronics are used in safety-related parts of control systems, in case the safety function is requested, the valve electronics voltage supply is to be switched off by a suitable switching element with sufficient reliability.

[2] For applications with p_T>35 bar (max. 250 bar) the Y-port has to be connected and the plug in the Y-port has to be removed.

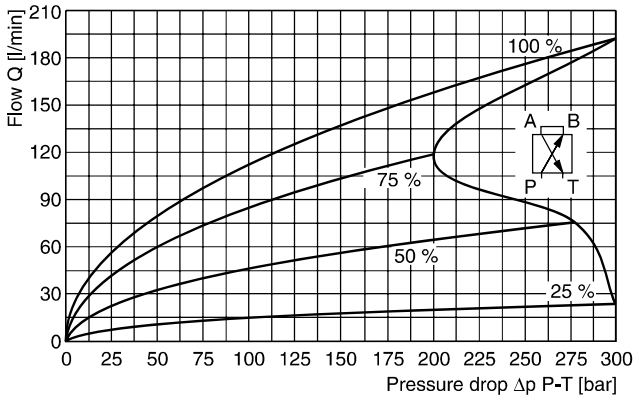
[3] Flow rate for different Δp per control edge: $Q_x = Q_{Nom.} \cdot \sqrt{\frac{\Delta p_x}{\Delta p_{Nom.}}}$

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

3

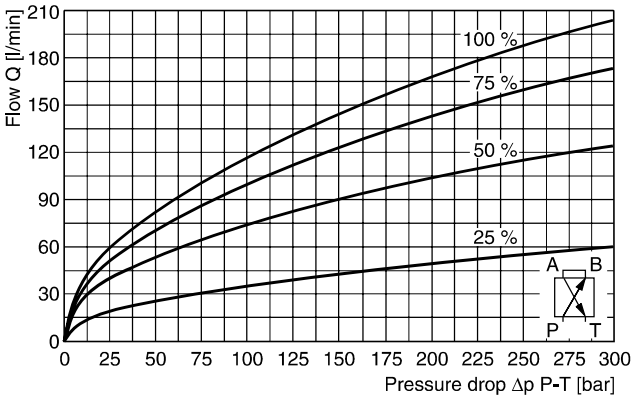
Functional limits [1)]
at 25 %, 50 %, 75 % and 100 % command signal

Spool type **E01Y/E02Y**



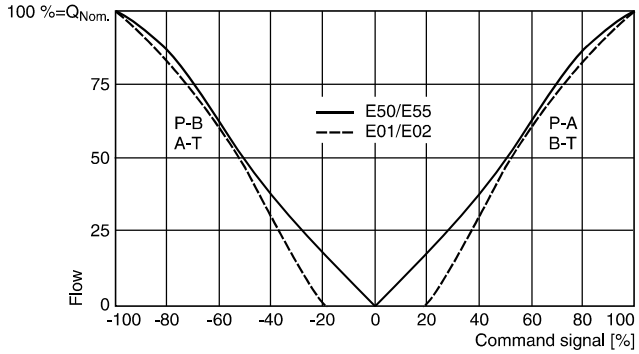
Functional limits [1)]
at 25 %, 50 %, 75 % and 100 % command signal

Spool type **E50Y/E55Y**

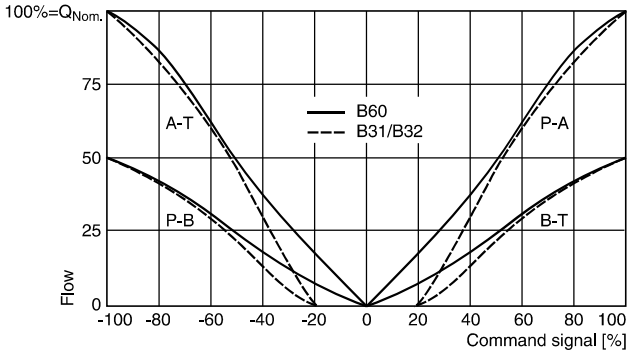


Flow curves
(Overlapped spool set to opening point 19 %)
at Δp = 35 bar per metering edge

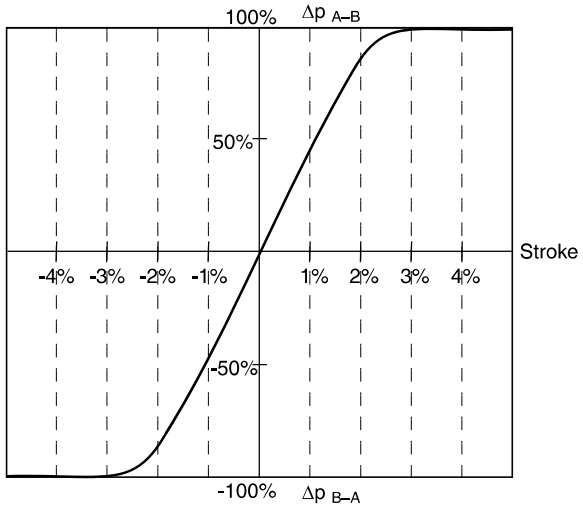
Spool type **E50/E55, E01/E02**



Spool type **B31/B32, B60**

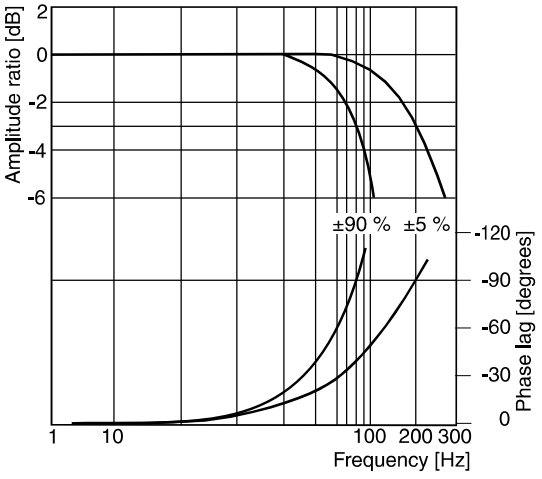


Pressure gain



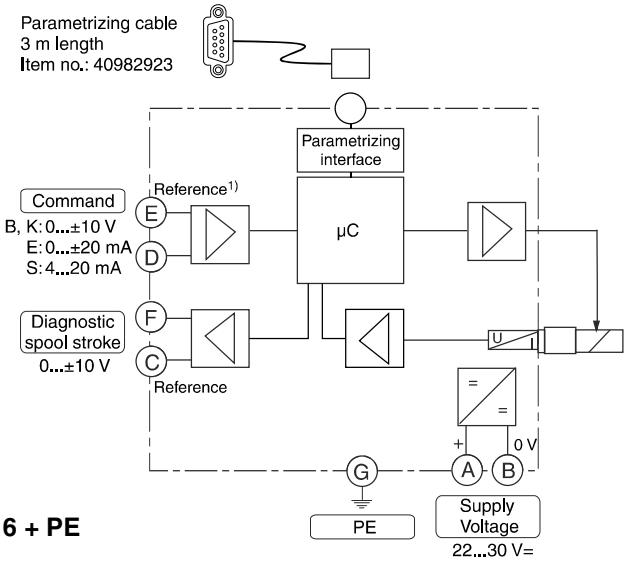
Frequency response
±5 % command signal

±90 % command signal

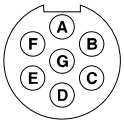


[1)] When exceeding the functional limits, for a period of time the valve will go into fail safe and power supply needs to be switched off/on to re-enable the valve.

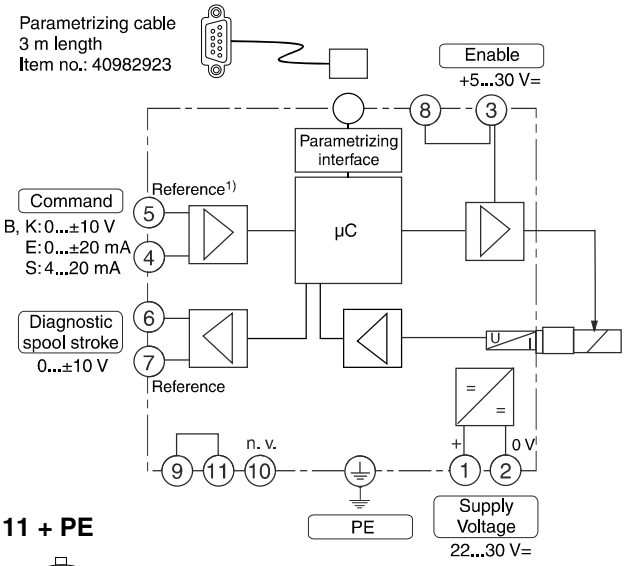
Code 0



6 + PE

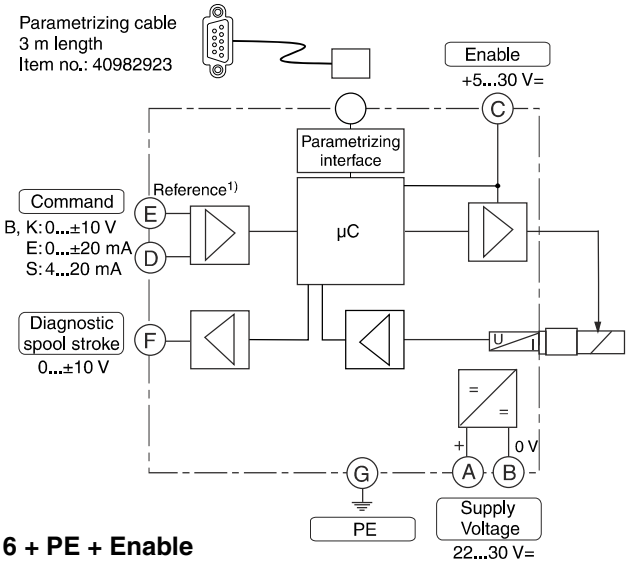


Code 5

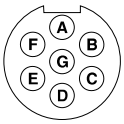


11 + PE

Code 7



6 + PE + Enable



[1] Do not connect with supply voltage zero.

3

ProPxD interface program

The ProPxD software allows quick and easy setting of the digital valve electronics. Individual parameters as well as complete settings can be viewed, changed and saved via the comfortable user interface. Parameter sets saved in the non-volatile memory can be loaded to other valves of the same type or printed out for documentation purposes.

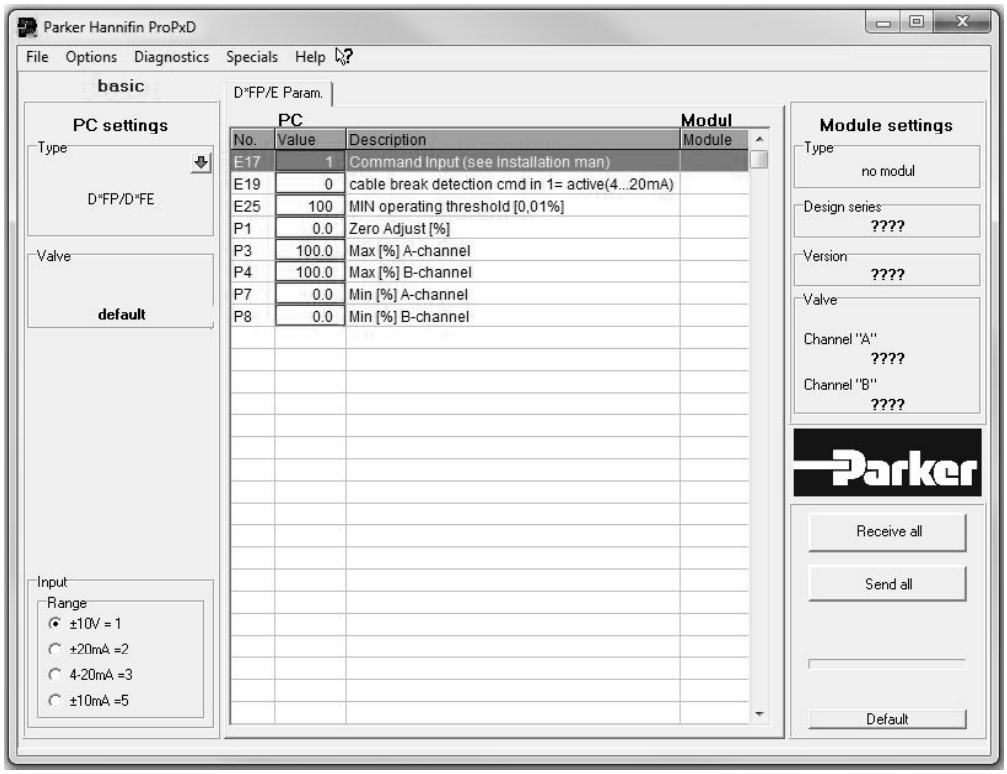
The PC software can be downloaded free of charge at www.parker.com/isde – see page “Support" or directly at www.parker.com/propxd.

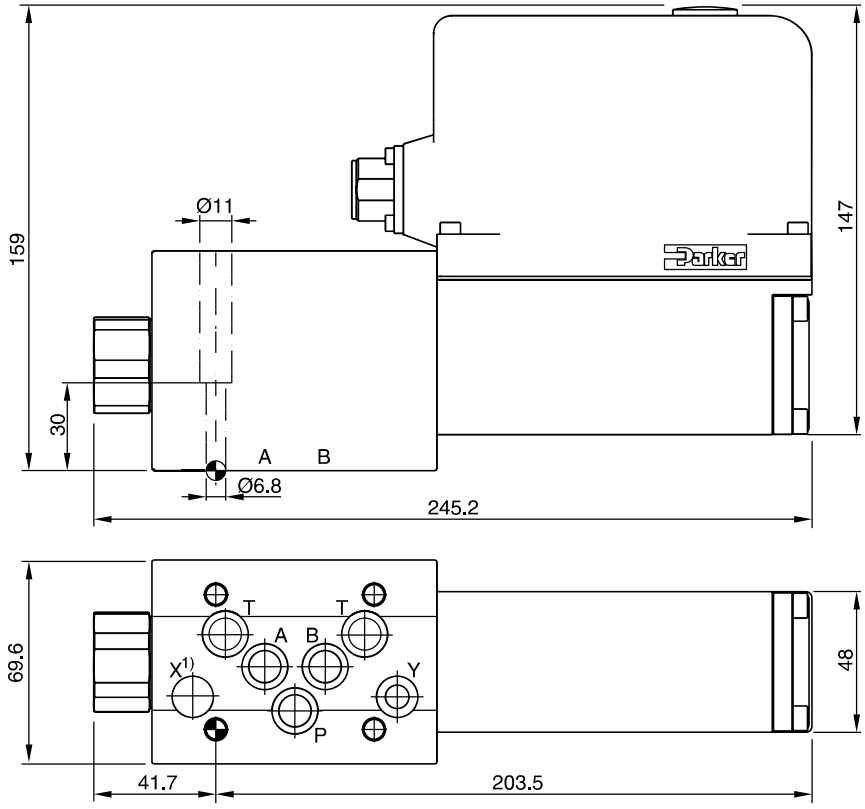
Features

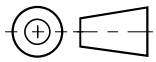
- Comfortable editing of valve parameters
- Saving and loading of customized parameter sets
- Executable with all Windows® operating systems from Windows® XP upwards
- Simple communication between PC and valve electronics via serial interface RS232C

The valve electronics cannot be connected to a PC with a standard USB cable – this can result in damages of PC and/or valve electronics.

The parametrizing cable may be ordered under item no. 40982923.







Surface finish	Kit			Kit
$R_{max}6.3$ 0.01/100	BK385	4xM6x40 ISO 4762-12.9	13.2 Nm ±15 %	NBR: SK-D3FP FPM: SK-D3FP-V HFC: SK-D3FP-H

1) O-ring recess diameter on valve body.