

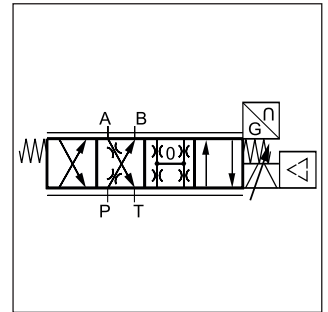
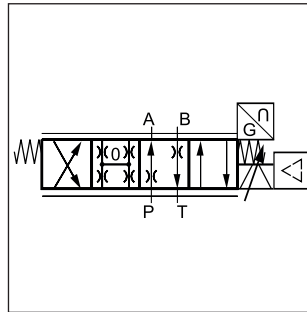
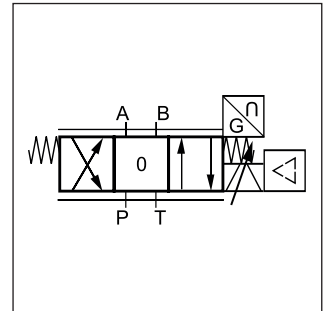
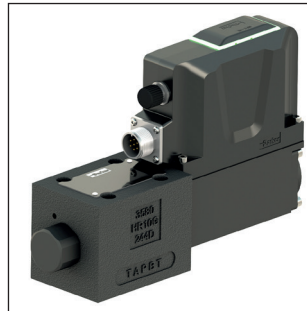
The direct operated control valve D3FP of the nominal size NG10 (CETOP 05) shows extremely high dynamics combined with high flow. It is the preferred choice for highest accuracy in positioning of hydraulic axis and controlling of pressure and velocity.

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

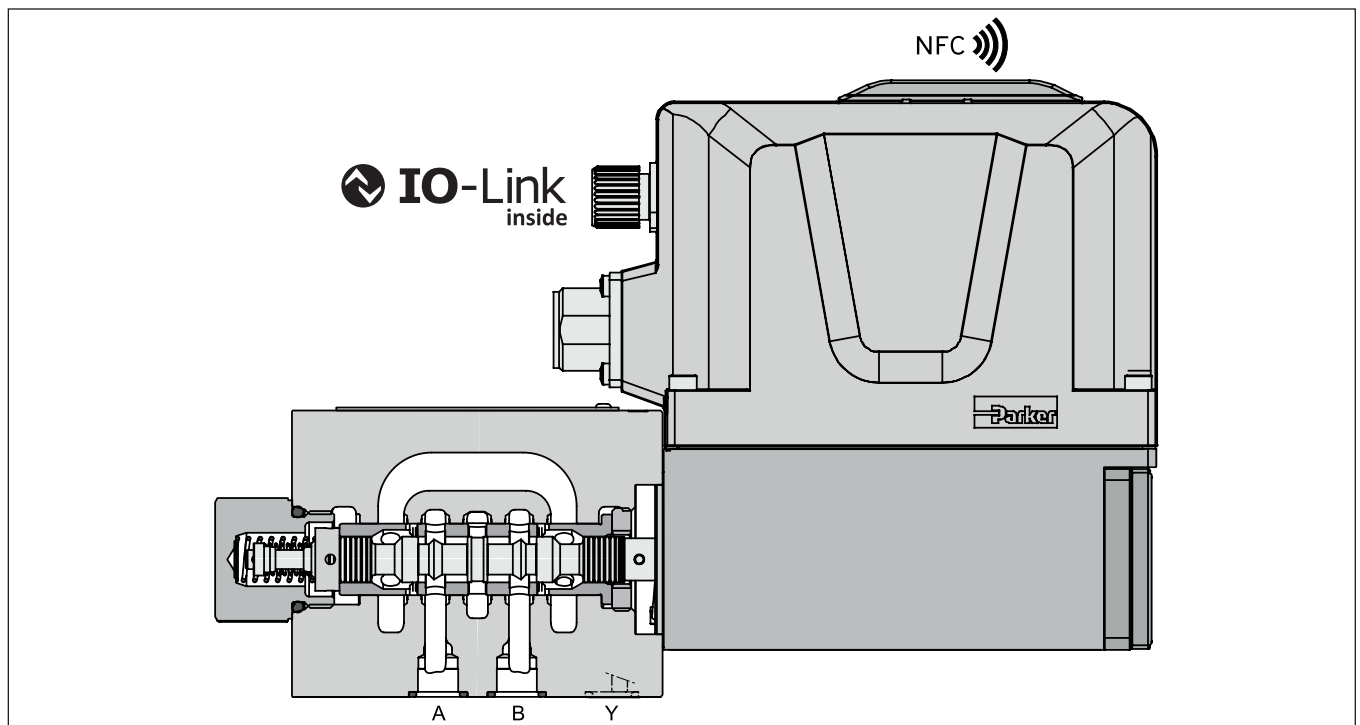
At power-down the spool moves in a defined position. All common input signals are available.

Features

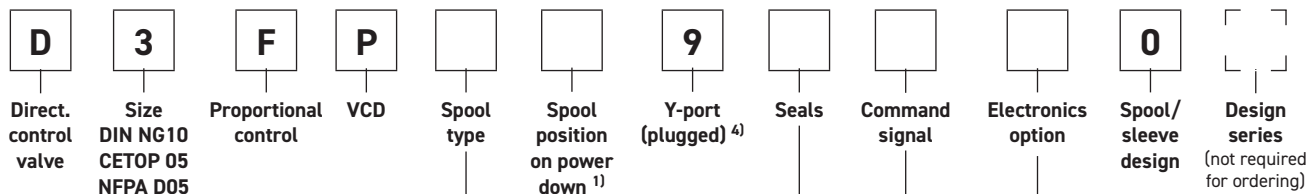
- Real servovalve dynamics
(-3 dB / 200 Hz at $\pm 5\%$ input signal)
- Max. tank pressure 250 bar
(with external drain port Y)
- Defined spool positioning at power-down – optional P-A/B-T or P-B/A-T or center position
(for overlapped spools)
- Onboard electronics
- Spool / sleeve design
- IO-Link Class A parameterization and communication
- interface included as standard
- IO-Link Class B interface available
- RGB Diode for optical status check
- NFC interface
- Adjustable setpoint signal



D3FP with IO-Link Class A interface



Ordering Code

Direct Operated Proportional DC Valve
Series D3FP

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		50
E01Y		100
E02P		50
E02Y		100
B31P	$Q_B = Q_A / 2$ 	50 / 25
B31Y		100 / 50
B32P	$Q_B = Q_A / 2$ 	50 / 25
B32Y		100 / 50

Code	Command	Description
0	B; E; S; Y; W	6 + PE acc. EN175201-804
5	B; E; S; Y; W	11 + PE acc. EN175201-804
7	B; E; S; Y; W	6 + PE + Enable
0	I	IO-Link Class B

Code	Signal	Function
B	0...±10 V	0...+10 V -> P-A
E	0...±20 mA	0...+20 mA -> P-A
S	4...20 mA	12...20 mA -> P-A
Y	0...±50 mA	0...+20 mA -> P-A
W ⁶⁾	adjustable	Default +/-10V
I	IO-Link Class B	—

Code	Seals
N	NBR
V	FPM
H	for HFC fluid

Code	Spool position at power down
A ²⁾	
B ²⁾	
C ³⁾	
J ⁵⁾	

Short delivery time
for all variations

Note:

The above mentioned 1:1 spools are available with a inflected characteristic curve. Inflection at 20%; 40% and 60%. Characteristic curves at page 4

Please order connector separately, see accessories.

IO-LINK-MASTER-USB order no. 40983544

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.

⁵⁾ Flow for code Y: 80 l/min at Δp 35 bar.

⁶⁾ Available command signals – see technical data.

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...+60
MTTF _D value ¹⁾	[years]		150
Weight	[kg]		6.5
Vibration resistance	[g]		10 Sinus 5...2000 Hz acc. IEC 60068-2-6 20 (RMS) Random noise 20...2000 Hz acc. IEC 60068-2-64 15 Shock acc. IEC 60068-2-27
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 recommended	[cSt]/[mm ² /s] [cSt]/[mm ² /s]	20...400 30...80
Filtration			ISO 4406; 18/16/13
Flow nom. 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
Interfaces			
IO-Link			IEC 61131-9
NFC			ISO/IEC 15693 - NFC Forum Type 5 tag certified by the NFC Forum Frequency 13.56 MHz; -27.2 dBμA/m at 10 meters distance
Electrical characteristics			
Duty ratio		[%]	100
Protection class			IP65 in accordance with EN 60529 (with correctly mounted plug-in connector) 6 = Full protection against contact, dust tight 5 = Protection against water jets (nozzle) from any angle
Supply voltage/ripple		[V]	24 V nominal (tolerance range 22 ... 30V), electric shut-off at < 19, ripple < 5 % eff., surge free
Current consumption max.		[A]	3.5
Pre-fusing		[A]	4.0 medium lag
Command			Depending on choosen signal type
Voltage	signal	[V]	10...0...-10, ripple <0.01 % eff., surge free
	impedance	[kOhm]	100
Current	signal	[mA]	20...0...-20, ripple <0.01 % eff., surge free
	impedance	[Ohm]	<250
Current	signal	[mA]	"4...12...20, ripple <0.01 % eff., surge free <3.6 mA = disable, >3.8 mA = according to NAMUR NE43"
	impedance	[Ohm]	<250
Current	signal	[mA]	10...0...-10, ripple <0.01 % eff., surge free
	impedance	[Ohm]	<250
Current	signal	[mA]	50...0...-50, ripple <0.01 % eff., surge free
	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]	acc. EN 61131-2; Type 3; Low -3...+5; High 11...30; input current 3 mA
Diagnostic signal		[V]	+10...0...-10; 4...12...20 (max. 5mA)
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	[mm ²]	7 x 1.0 (AWG 16) overall braid shield
	Code 5	[mm ²]	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.

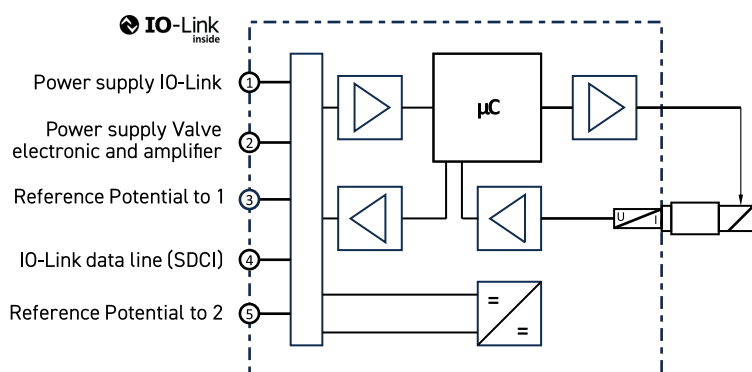
²⁾ For applications with p_T>35 bar (max. 250 bar) the Y-port has to be connected and the plug in the Y-port has to be removed.

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).

Electrical characteristics		
Duty ratio	[%]	100
Protection class		IP65 in accordance with EN 60529 (with correctly mounted plug-in connector) 6 = Full protection against contact, dust tight 5 = Protection against water jets (nozzle) from any angle
Directive		IO-Link Interface and System Specification Version 1.1.2
Valve amplifiers Supply voltage/ripple	[V]	24 V nominal (tolerance range 22 ... 30V), electric shut-off at < 19, ripple < 5 % eff., surge free
Valve amplifiers max. power consumption	[A]	3.5
Valve amplifiers Pre-fusing	[A]	4.0 medium lag
IO-Link Interface Supply voltage/ripple	[V]	24 V nominal (tolerance range 22 ... 30V), electric shut-off at < 19, ripple < 5 % eff., surge free
IO-Link Interface max. power consumption	[A]	1.2
Functional ground and screening		Provide via valve block
Required master port class		Class B
EMC		EN 61000-6-2, EN 61000-6-4
Electrical connection		M12 sensor/actuator connection line, 5-pole; M12 connector/bush, A-coded, without shield
Wiring min.	[mm ²]	0.34 mm ² for a cable length of up to 5 m
Wiring length max.	[m]	20

Block diagram



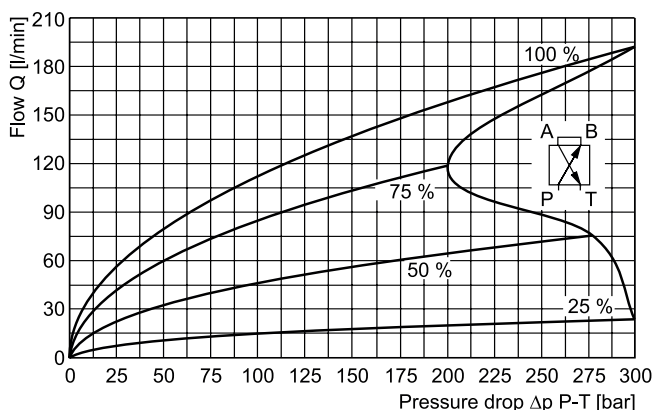
Pin	Signal	Signal - IO-Link B Class / viewing direction of the valve	
1	L+	Voltage Supply IO-Link	
2	P24	Voltage supply valve electronics and power part power consumption 4A	
3	L-	Reference potential pin 1	
4	C/Q	IO-Link data line (SDCI)	
5	N24	Reference potential pin 2	

Pin 3 and 5 are linked with each other in the valve electronics. The reference potentials L- and N24 of the two supply voltages must also be linked with each other on the power supply unit side.

Functional limits ¹⁾

at 25 %, 50 %, 75 % and 100 % command signal

Spool type **E01Y/E02Y**

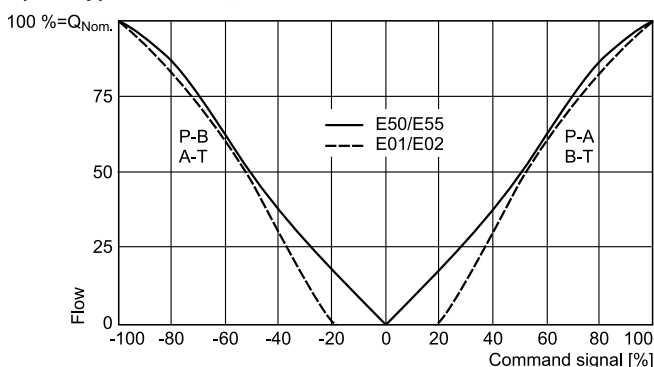


Flow curves

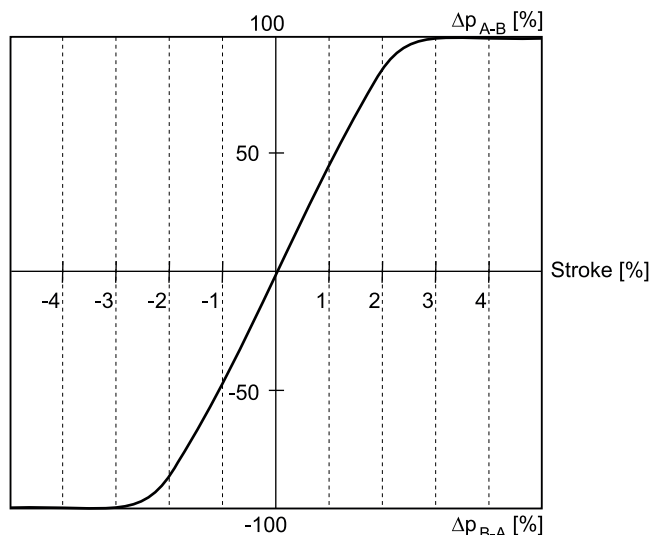
(Overlapped spool set to opening point 19 %)

at $\Delta p = 35$ bar per metering edge

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



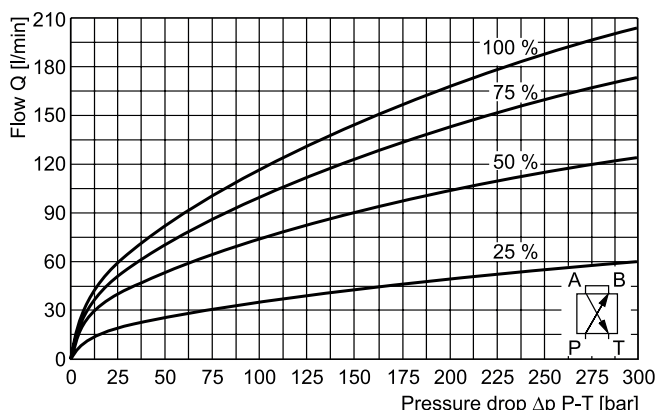
Pressure gain



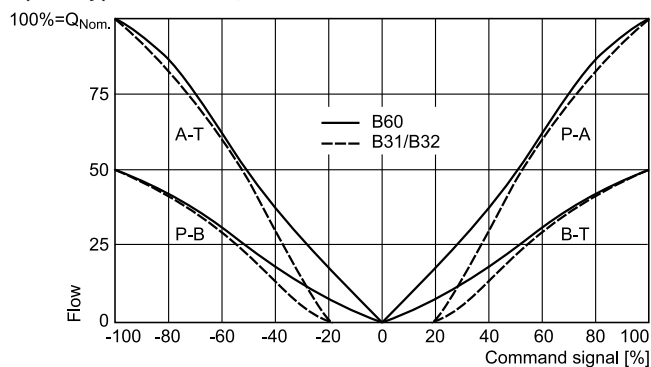
Functional limits ¹⁾

at 25 %, 50 %, 75 % and 100 % command signal

Spool type **E50Y/E55Y**



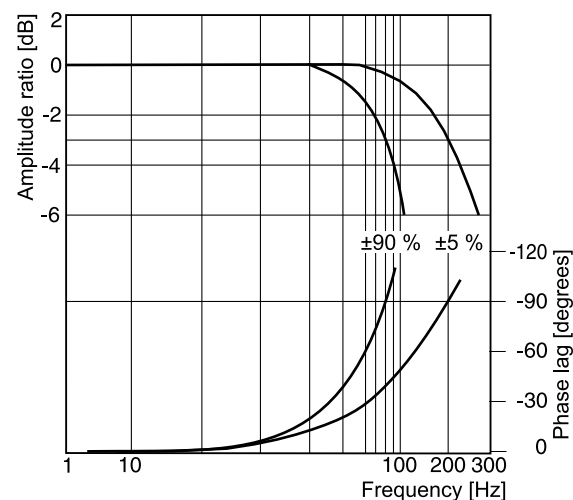
Spool type **B31/B32, B60**



Frequency response

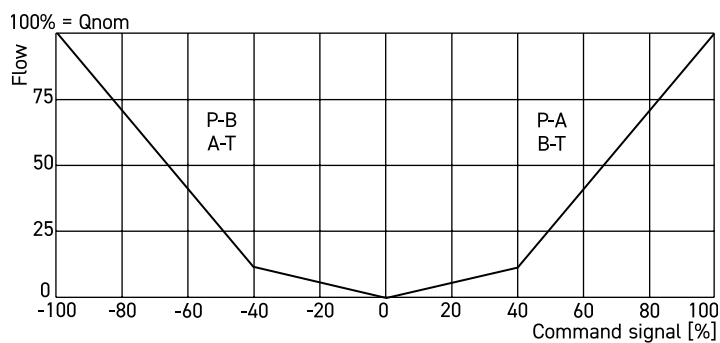
±5 % command signal

±90 % command signal

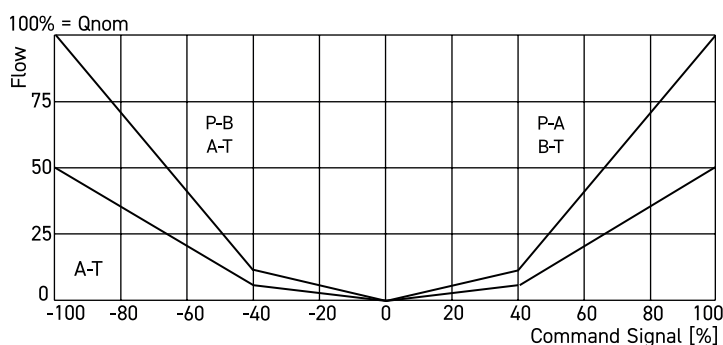


¹⁾ When exceeding the functional limits, for a period of time the valve will go into fail safe and power supply needs to be switched off/on to re-enable the valve.

Flow curve at $\Delta p = 35$ bar per metering edge
 Zero lap spool EP4 inflection at 40 %

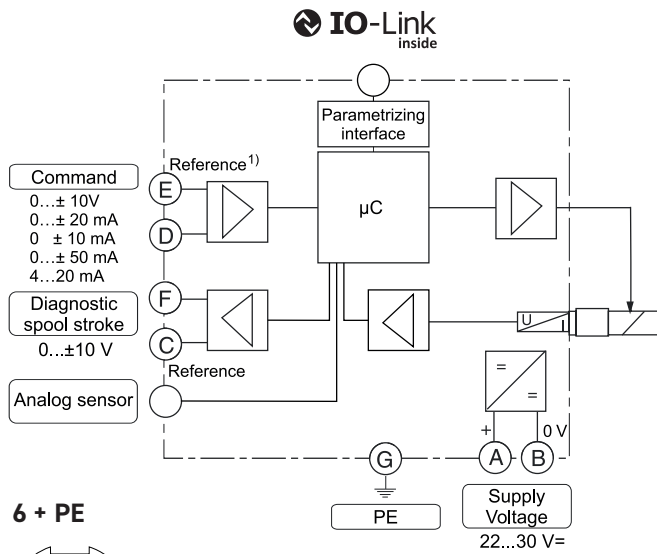


Flow curve at $\Delta p = 35$ bar per metering edge
 Zero lap spool BP4 inflection at 40 %

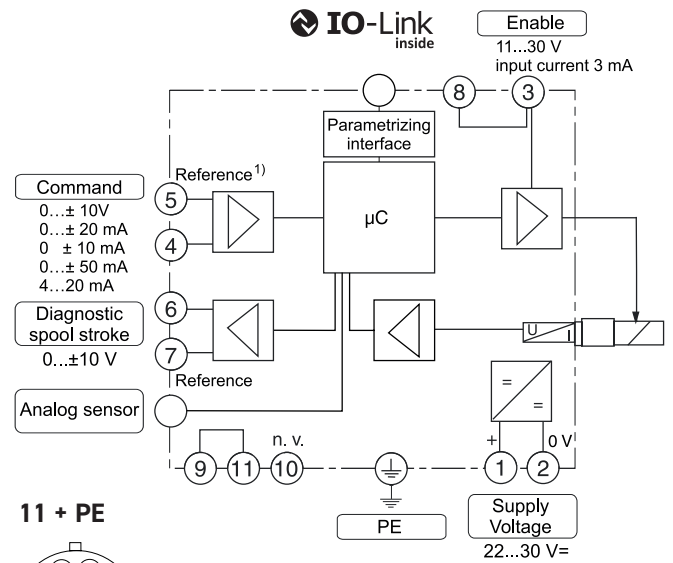


Note: The characteristic of the inflected flow-rate curves is generated by linearization.

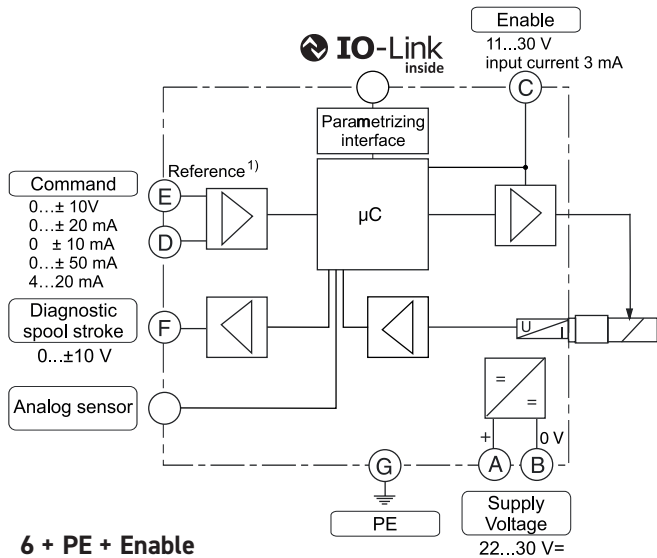
Code 0



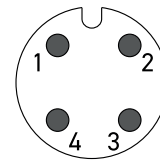
Code 5



Code 7



Pin assignment IO-Link (parametrizing) interface, M12 socket / viewing direction of the valve



PIN assignment acc. IEC 60974-5-2

- Pin 1: 24 VDC
- Pin 3: GND
- Pin 4: IO-Link Communication (C/Q)

¹⁾ Do not connect with supply voltage zero.

IO-Link interface

IO Link communication and power supply is provided via the M12 interface, which is accessible from the outside. The IO Link interface allows external access to the available and accessible valve parameters via an IO Link Master or via the ProPxD software and the Parker IO-LINK MASTER USB.

For reliable parameterization of the valve, it is necessary to connect the power supply of the Parker IO-Link Master. It is not possible to operate the IO-Link B Class valve via the Parker IO-Link Master, as there is no power supply to the amplifiers.

Parker IO-LINK-MASTER-USB Best. Nr. 40983544

(Parameter overview in the operating instructions)

NFC-interface

The NFC interface allows a wireless access to valve data via the Parker APP Parker Device Control .

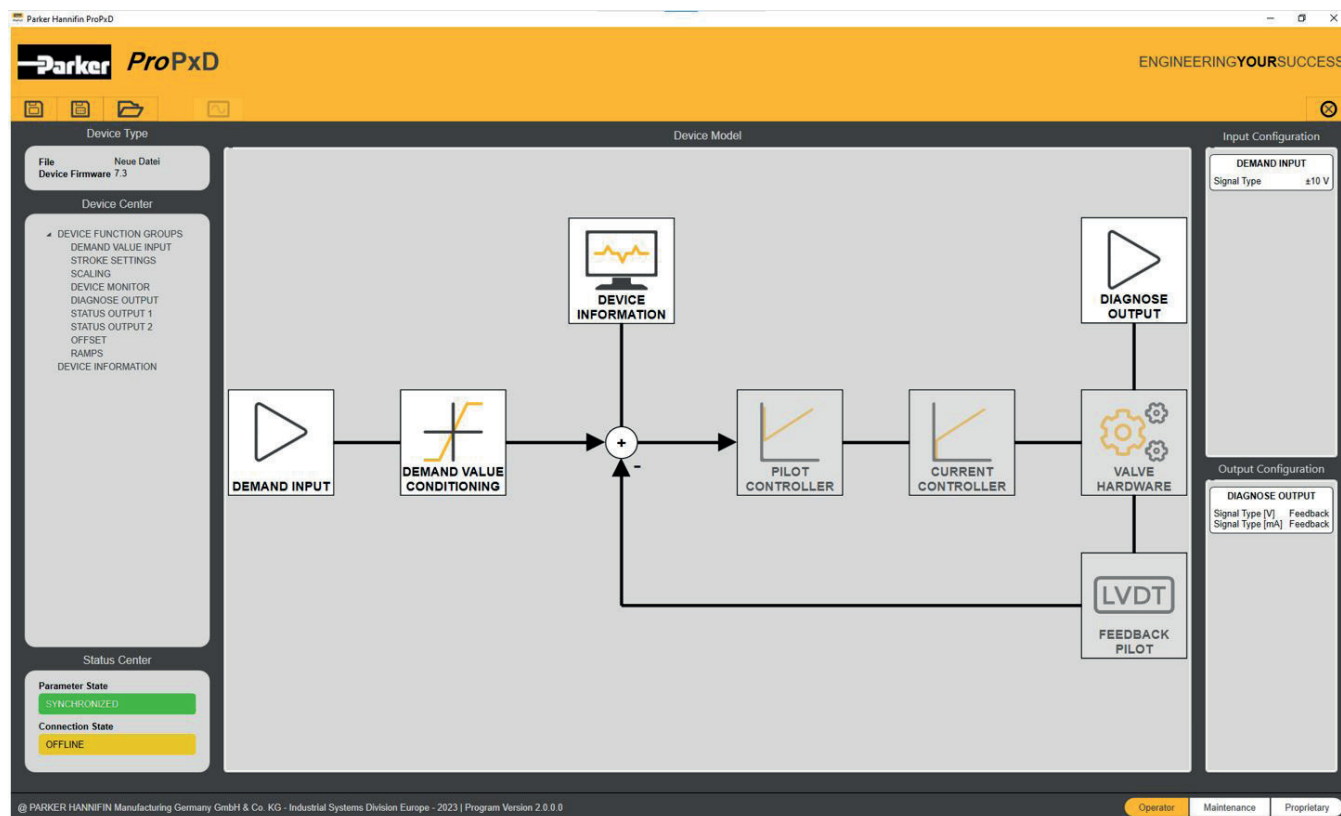
Available for free on the **App Store** and **Google Play Store**.

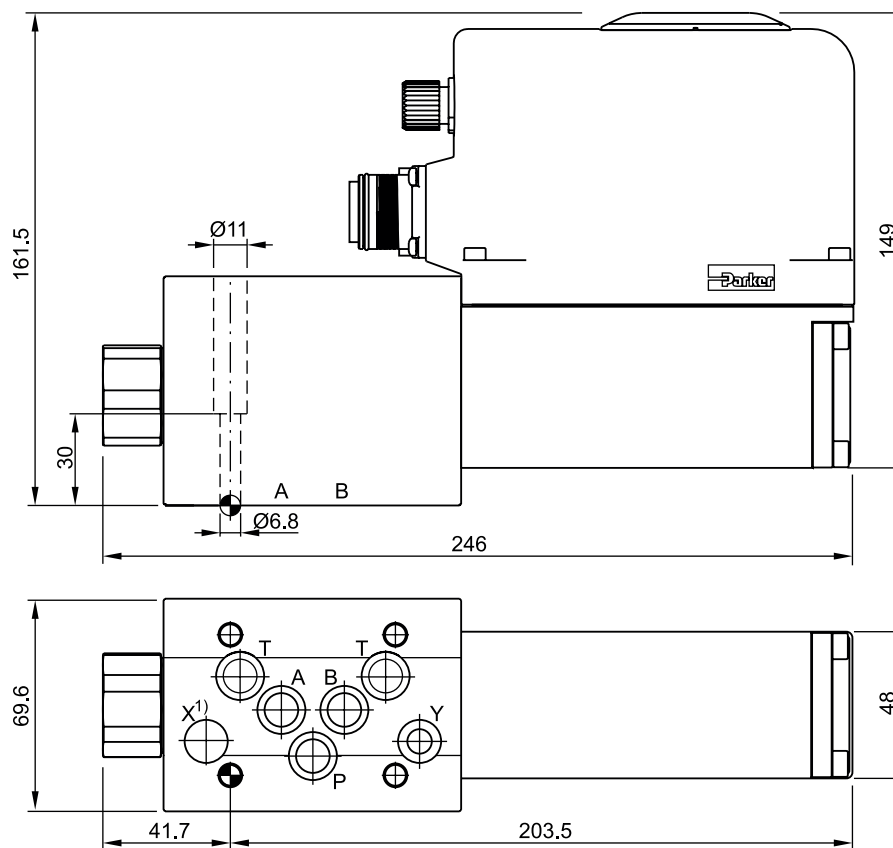
ProPxD parameterization software

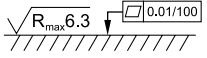
The ProPxD software allows quick and easy setting of the digital valve electronics. Individual parameters as well as complete settings can be viewed, changed and saved via the comfortable user interface.

Parameter sets saved in the non-volatile memory can be loaded to other valves of the same type or saved 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.

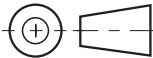
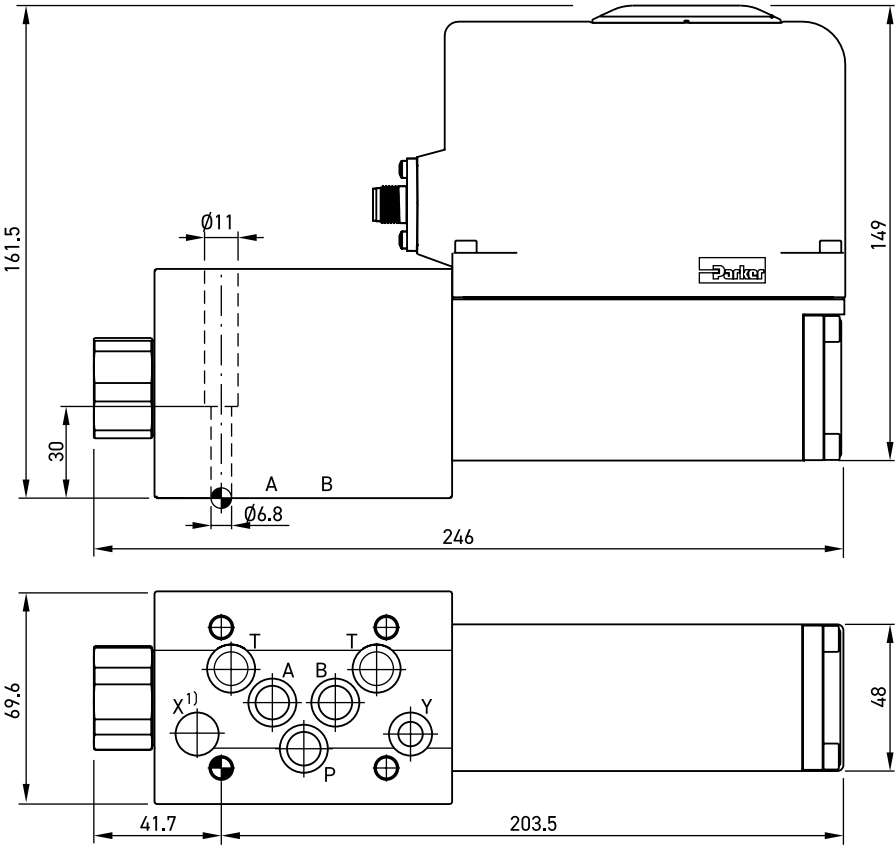


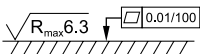


Surface finish	 Kit			 Kit
	BK385	4xM6x40 ISO 4762-12.9	13.2 Nm ±15 %	NBR: SK-D3FP FPM: SK-D3FP-V HFC: SK-D3FP-H

¹⁾ O-ring recess diameter on valve body.

3



Surface finish	 Kit			 Kit
	BK385	4xM6x40 ISO 4762-12.9	13.2 Nm ±15 %	NBR: SK-D3FP FPM: SK-D3FP-V HFC: SK-D3FP-H