

The pilot operated proportional directional valves D*1FB are available in 4 sizes:

- D31FB - NG10 (CETOP 05)
- D41FB - NG16 (CETOP 07)
- D91FB - NG25 (CETOP 08)
- D111FB - NG32 (CETOP 10)

The valves are available with and without onboard electronics (OBE).

D*1FB OBE

The digital onboard electronics is situated in a robust metal housing, which allows the usage under rough environmental conditions.

The nominal values are factory set. The cable connection to a serial RS232 interface is available as accessory.

D*1FB for external electronics

The parameters can be saved, changed and duplicated in combination with the digital power amplifier PWD00A-400.

The valve parameters can be edited with the common ProPxD software for both versions.

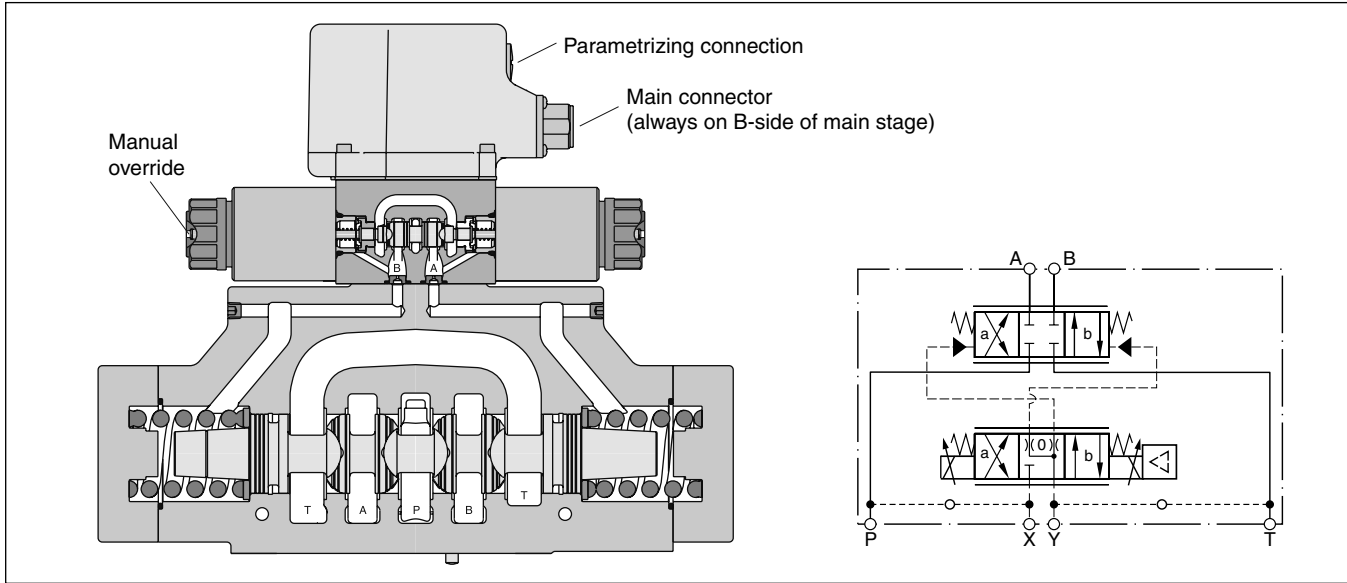
The D*1FB valves work with barometric feedback of the main stage to the pressure reducing pilot valve. The pilot control pressure of 25 bar allows high flow rates at maximum stability.

The innovative integrated regenerative function into the A-line (optional) allows energy saving circuits for differential cylinders. The hybrid version can be switched between regenerative mode and standard mode at any time.

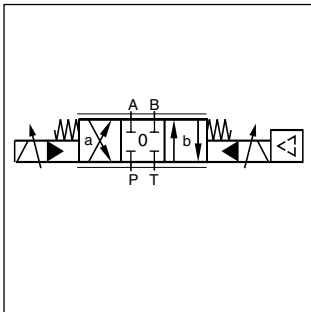
Valves with explosion proof solenoids EEx me II see catalogue HY11-3343.

Download: www.parker.com/euro_hcd - see "Literature"

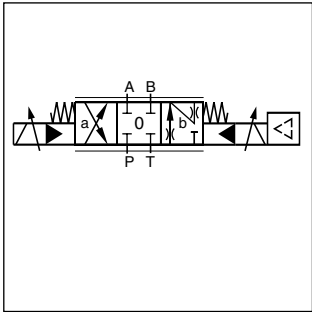
D91FB OBE



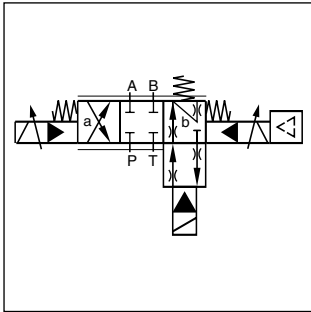
D91FB OBE



Standard D*1FB OBE



A-regeneration D*1FBR OBE



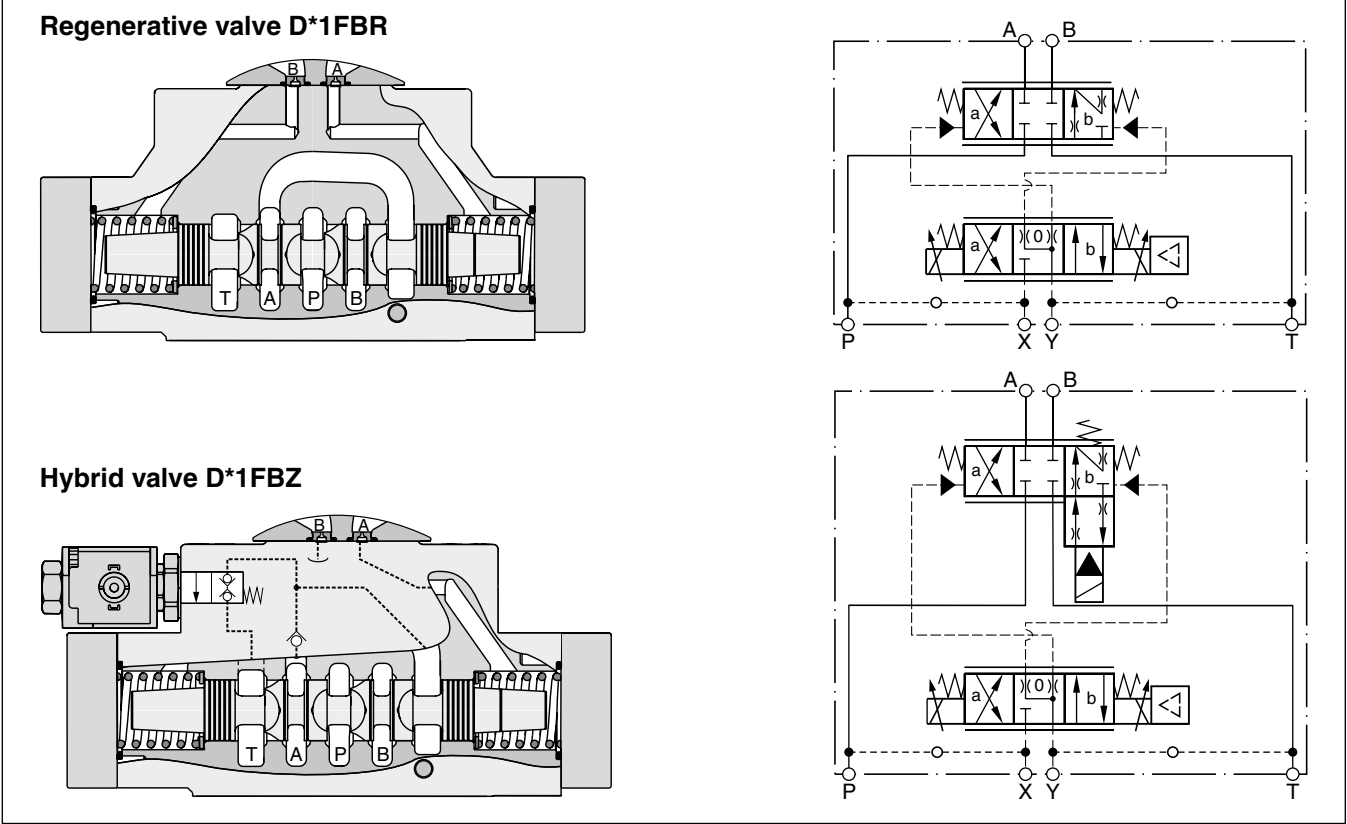
Hybrid D*1FBZ OBE

Technical Features

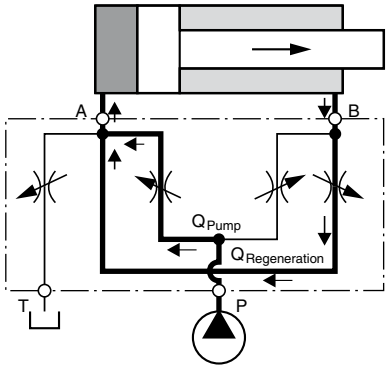
- Progressive flow characteristics for sensitive adjustment of flow rate
- High flow capacity
- Digital onboard electronics optional
- Centre position monitoring optional
- Energy saving A-regeneration optional
- Switchable hybrid version optional

Further literature about the opportunities of energy savings and more functional details of the integrated regeneration is available on request.

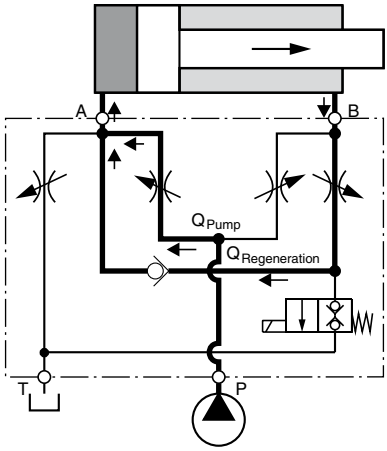
D*1FBR and D*1FBZ



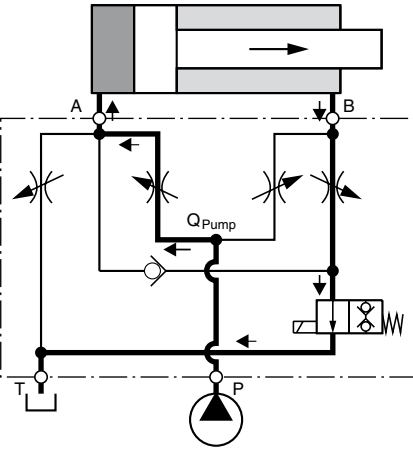
D*1FBR (regenerative valve)
Cylinder extending



D*1FBZ (hybrid valve)
Cylinder extending
regenerative mode
(high speed)



Cylinder extending
standard mode
(high force)

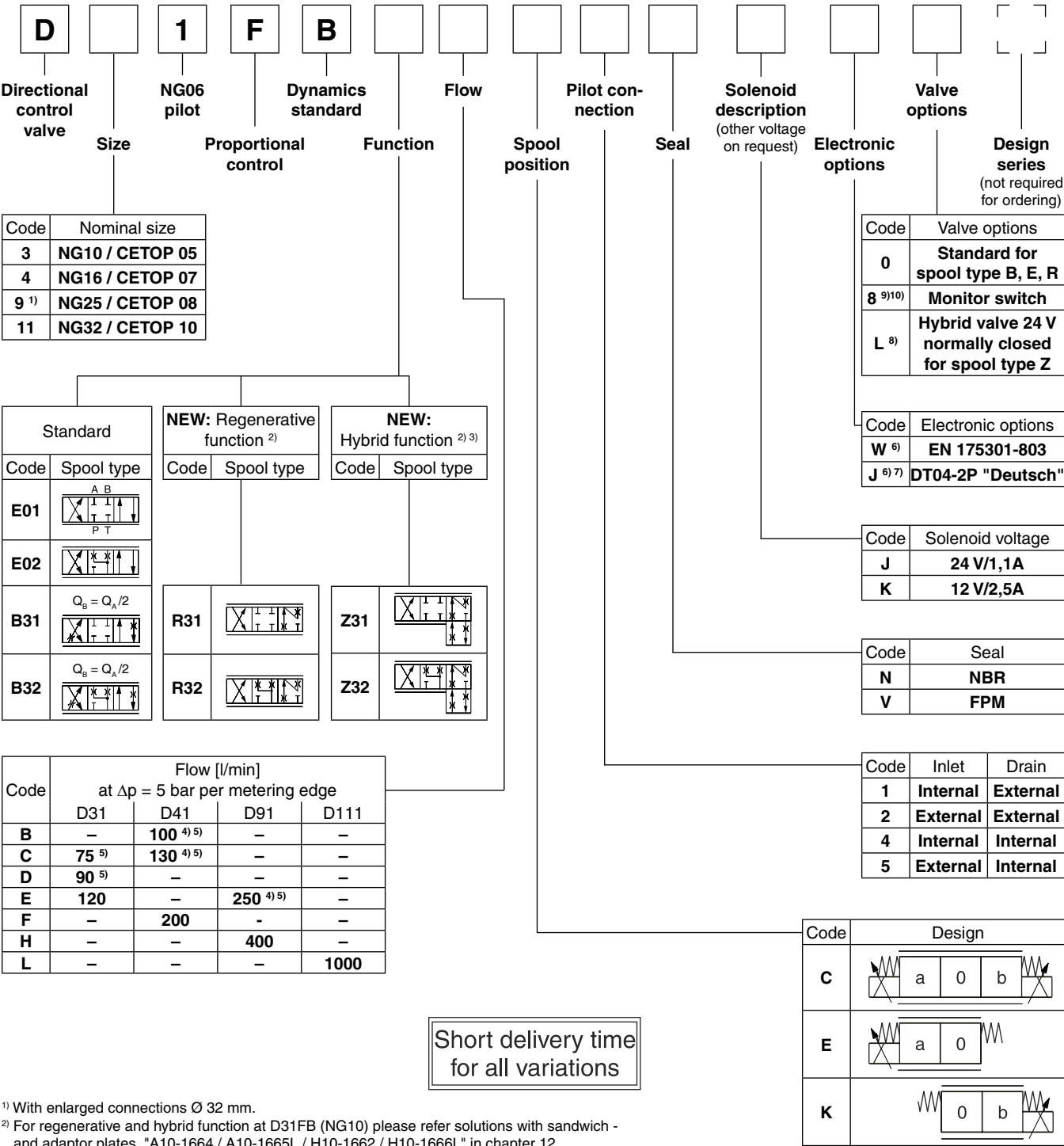


Flow rate in % of nominal flow

Size ¹⁾	spool	Port					
		A-T	P-A	P-B	B-A (R-valve)	B-A (hybrid)	B-T (hybrid)
D41FBR/Z	31/32	100 %	50 %	100 %	50 %	45 %	20 %
D91FBR/Z	31/32	100 %	50 %	100 %	50 %	50 %	25 %
D111FBR/Z	31/32	100 %	50 %	100 %	50 %	50 %	20 %

¹⁾ D31FB: For size NG10 please refer solution with sandwich- and adaptor plates "A10-1664 / A10-1665L / H10-1662 / H10-1666L" in chapter 12.

D*1FB



¹⁾ With enlarged connections Ø 32 mm.

²⁾ For regenerative and hybrid function at D31FB (NG10) please refer solutions with sandwich - and adaptor plates "A10-1664 / A10-1665L / H10-1662 / H10-1666L" in chapter 12.

D31FB spool type: R31 R32

³⁾ Not for D31FB.

⁴⁾ Not for spool type B31 und B32.

⁵⁾ Not for regenerative and hybrid function.

⁶⁾ Please order plugs separately. See accessories.

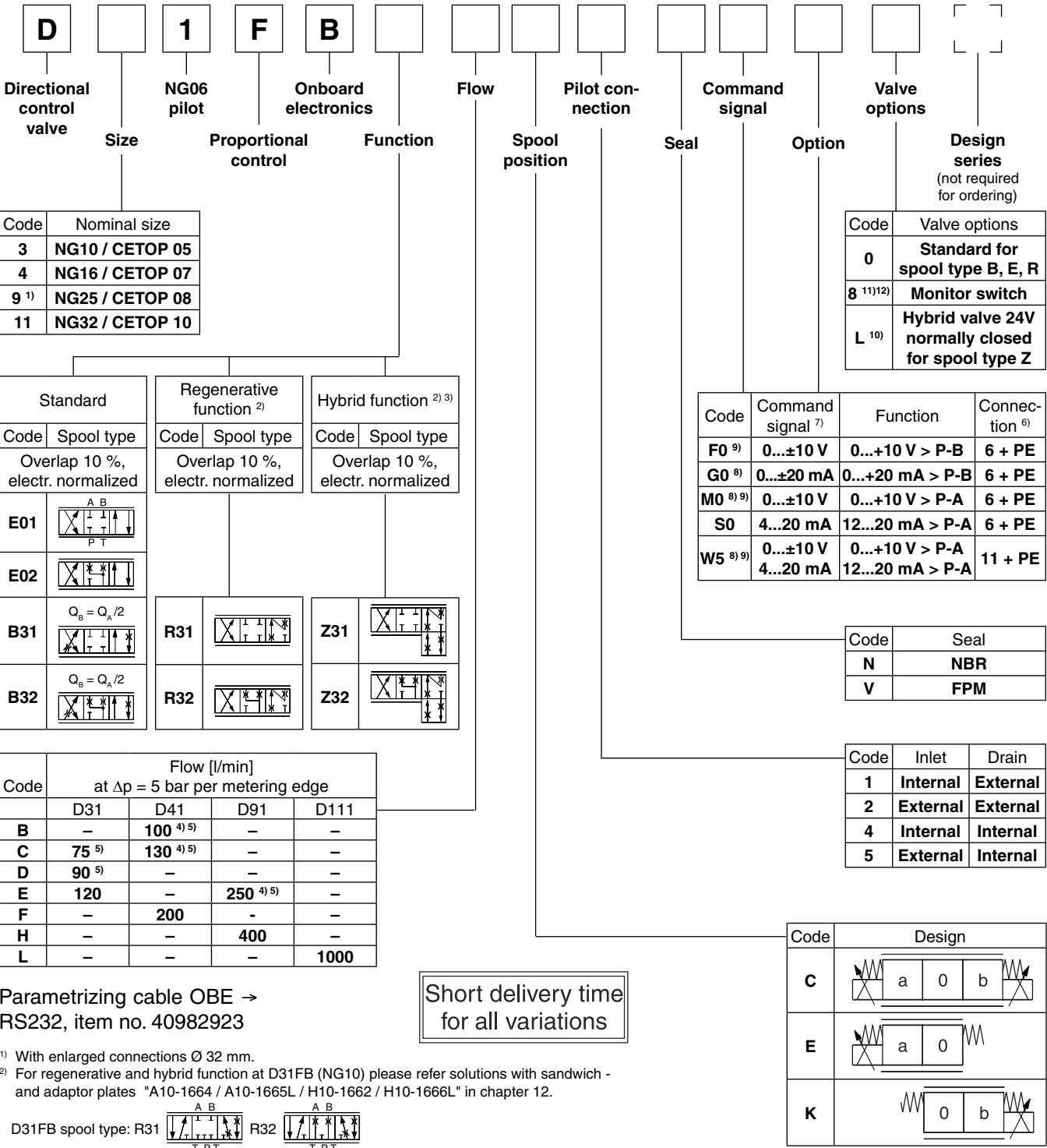
⁷⁾ Not for hybrid function.

⁸⁾ See page "regenerative and hybrid function" (not for D31FB).

⁹⁾ Not for D111FBZ*.

¹⁰⁾ Monitor switch for hybrid valves: code 8 includes options of code L (24 V normally closed)

D*1FB OBE



¹⁾ With enlarged connections Ø 32 mm.

²⁾ For regenerative and hybrid function at D31FB (NG10) please refer solutions with sandwich - and adaptor plates "A10-1664 / A10-1665L / H10-1662 / H10-1666L" in chapter 12.

D31FB spool type: R31 R32

³⁾ Not for D31FB.

⁴⁾ Not for spool type B31 und B32.

⁵⁾ Not for regenerative and hybrid function.

⁶⁾ Please order plugs separately, see accessories .

⁷⁾ For 1 solenoid 0...+10 V respectively 4...20 mA.

⁸⁾ Not for spool position E and K.

⁹⁾ F0, M0 potentiometer supply, W5 command channel & potentiometer supply.

¹⁰⁾ See page "regenerative and hybrid function" (not for D31FB).

¹¹⁾ Not for D111FBZ*.

¹²⁾ Monitor switch for hybrid valves: code 8 includes options of code L (24 V normally closed)

General					
Design		Pilot operated DC valve			
Actuation		Proportional solenoid			
Size		NG10 (CETOP 05)	NG16 (CETOP 07)	NG25 (CETOP 08)	NG32 (CETOP 10)
Mounting interface		DIN 24340 / ISO 4401 / CETOP RP121 / NFPA			
Mounting position		unrestricted			
Ambient temperature	[°C]	-20...+60			
MTTF _D value ¹⁾	[years]	75			
Weight (OBE)	[kg]	8.6 (9.3)	11.9 (12.6)	20.4 (21.1)	68 (68.7)
Vibration resistance	[g]	10 Sinus 5...200 Hz acc. IEC 68-2-6			
		30 Random noise 20...20 Hz acc. IEC 68-2-36			
		15 Shock acc. IEC 68-2-27			
Hydraulic					
Max. operating pressure	[bar]	Pilot drain internal: P, A, B, X 350; T, Y 185			
	[bar]	Pilot drain external: P, A, B, T, X 350; Y 185			
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 (1999); 18/16/13			
Nominal flow					
at Δp=5 bar per control edge ²⁾	[l/min]	75/90/120	130/200	250/400	1000
Leakage at 100 bar	[ml/min]	100	200	600	1000
Overlap with OBE	[%]	electrically normalized at 10 (see flow characteristics)			
Pilot supply pressure	[bar]	min. 30 (+ T/Y pressure)			
	[bar]	max. 350			
	[bar]	optimal dynamics at 50			
Pilot flow at 100 bar	[l/min]	<0.5	<1.2	<1.2	<1.2
Pilot flow, step response	[l/min]	2.0	1.9	4.5	18
Static / Dynamic					
Step response at 100 % step	[ms]	50	75	100	180
Hysteresis	[%]	<5			
Electrical characteristics					
Duty ratio	[%]	100 ED; CAUTION: Coil temperature up to 150 °C possible			
Protection class		Standard (as per EN175301-803) IP65 in accordance with EN 60529 DT04-2P "Deutsch" IP69K (with correctly mounted plug-in connector)			
Solenoid	Code	K		J	
Supply voltage	[V]	12		24	
Current consumption	[A]	2.5		1.1	
Resistance	[Ohm]	4.4		18.6	
Solenoid connection		Connector as per EN 175301-803 (code W), DT04-2P "Deutsch" connector (code J). Solenoid identification as per ISO 9461.			
Wiring min.	[mm²]	3x1.5 (AWG 16) overall braid shield			
Wiring lenght 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⁾ Flow rate for different Δp per control edge:

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

Electrical characteristics (D*1FB OBE)			
Duty ratio	[%]	100 ED; CAUTION: coil temperature up to 150 °C possible	
Protection class		IP65 in accordance with EN 60529 (with correctly mounted plug-in connector)	
Supply voltage/ripple DC	[V]	18...30, ripple < 5 % eff., surge free	
Current consumption max.	[A]	2.0	
Pre fusing medium lag	[A]	2.5	
Input signal voltage			
	Codes F0, M0, W5	[V]	+10...0...-10, ripple < 0.01 % eff., surge free, Ri = 100 kOhm
	Code G0	[V]	+20...0...-20, ripple < 0.01 % eff., surge free, Ri = 200 Ohm
Codes S0 & W5 current	[mA]		4...12...20, ripple < 0.01 % eff., surge free, Ri = 200 Ohm
			< 3.6 mA = enable off,
			> 3.8 mA = enable on (acc. to NAMUR NE43)
Differential input max.	Codes F0, M0 G0 & S0	[V]	30 for terminal D and E against PE (terminal G)
		[V]	11 for terminal D and E against 0V (terminal B)
	Code W5	[V]	30 for terminal 4 and 5 against PE (terminal PE)
		[V]	11 for terminal 4 and 5 against 0V (terminal 2)
Channel recall signal		[V]	0...2.5: off / 5...30: on / Ri = 100 kOhm
Adjustment ranges	Min	[%]	0...50
	Max	[%]	50...100
	Ramp	[s]	0...32.5
Interface	RS 232, parametrizing connection 5pole		
EMC	EN 61000-6-2, EN 61000-6-4		
Central connection	Codes F0, M0 G0 & S0 Code W5		6 + PE acc. to EN 175201-804
			11 + PE acc. to EN 175201-804
Wiring min.	Codes F0, M0 G0 & S0 Code W5	[mm²]	7 x 1.0 (AWG16) overall braid shield
		[mm²]	11 x 1.0 (AWG16) overall braid shield
Wiring length max.			50

Electrical characteristics hybrid option

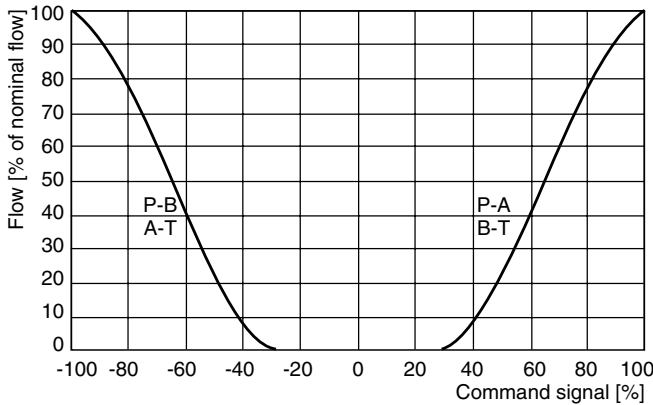
Duty ratio	[%]	100 ED; CAUTION: Coil temperature up to 150 °C possible		
Protection class		IP 65 in accordance with EN 60529 (with correctly mounted plug-in connector)		
Supply voltage	[V]	D41	D91	D111
		24	24	24
		±10	±10	±10
Tolernace supply voltage	[%]			
Current consumption	[A]	1.21	0.96	1.29
Power consumption	[W]	29	23	31
Solenoid connection	Connector as per EN 175301-803			
Wiring min.	[mm²]	3 x 1.5 recommended		
Wiring length max.	[m]	50 recommended		

With electrical connections the protective conductor (PE ⚡) must be connected according to the relevant regulations.

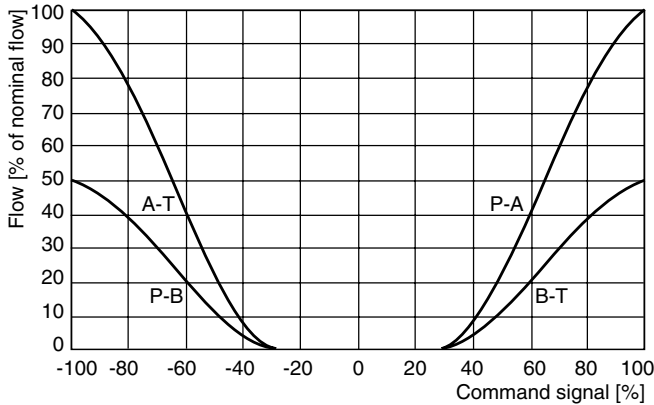
D*1FB B/E Flow characteristics

at Δp = 5 bar per metering edge

Spool code E01/02



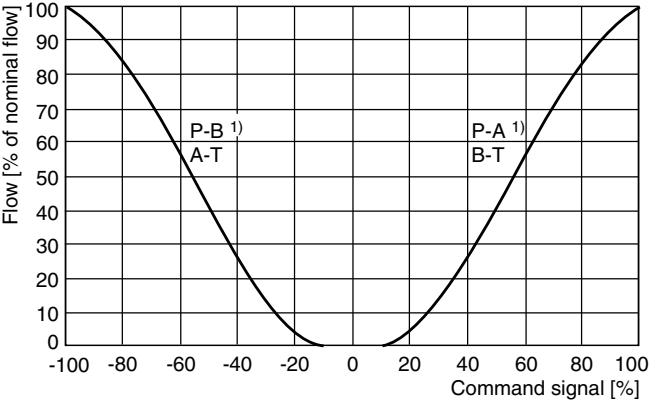
Spool code B31/32*



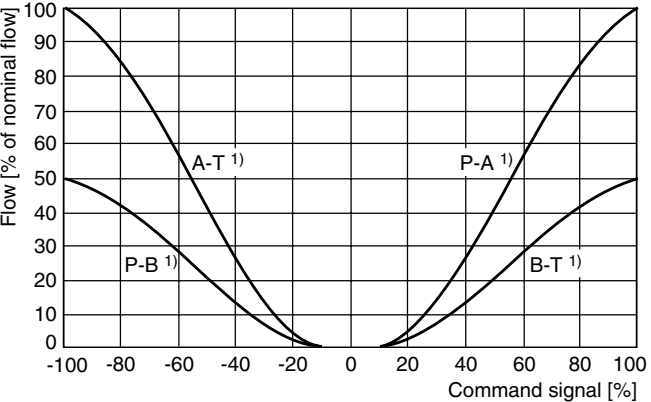
All characteristic curves measured with HLP46 at 50 °C.

D*1FB B/E OBE
Flow characteristics
(Electrically set to opening point 10 %)
at $\Delta p = 5$ bar per metering edge

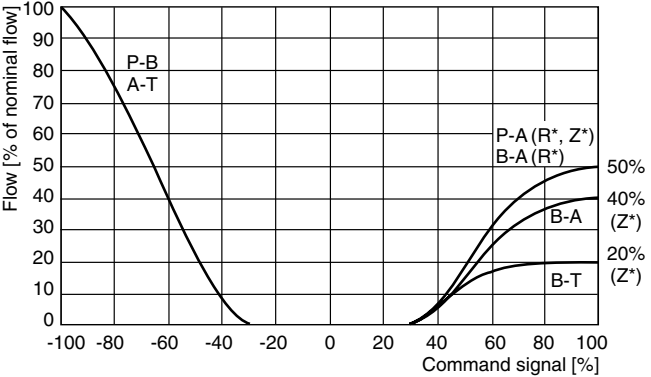
Spool code **E01/02**



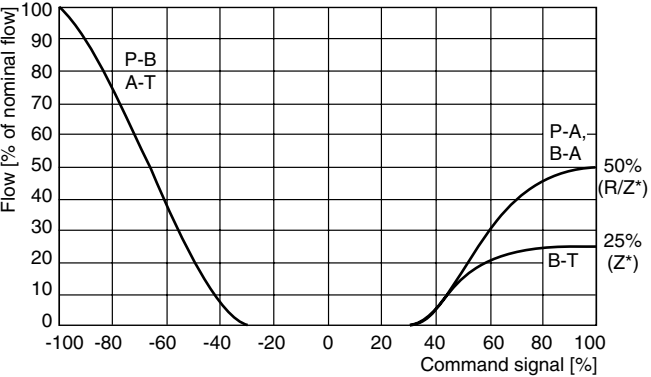
Spool code **B31/32**



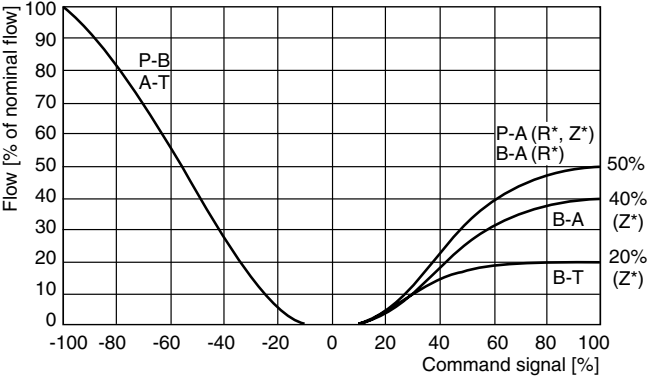
D*1FB R/Z (regenerative and hybrid)
D41FB R/Z
Spool code **R/Z31/32**



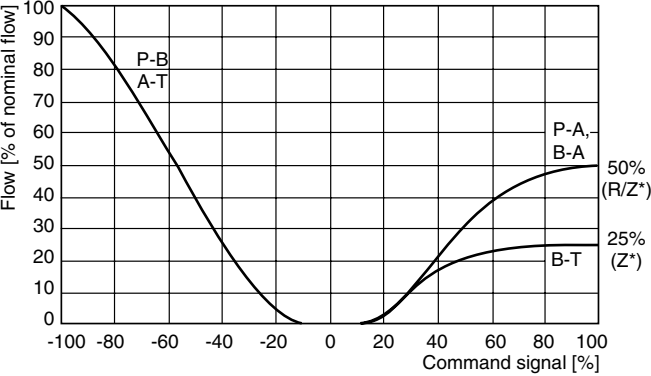
D91FB R/Z
Spool code **R/Z31/32**



D41FB R/Z OBE
Spool code **R/Z31/32**
(electrically set to opening point 10 %)



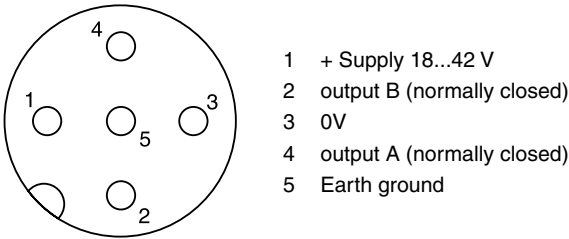
D91FB R/Z OBE
Spool code **R/Z31/32**



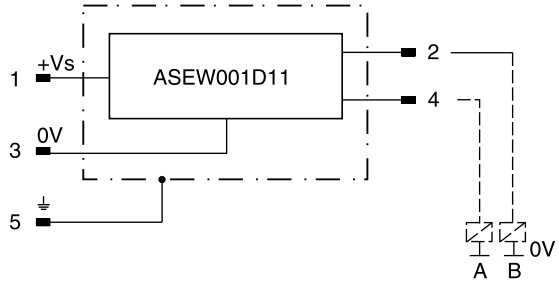
All characteristic curves measured with HLP46 at 50 °C.

¹⁾ Flow direction depending on ordering code.

Monitor switch M12x1 pin assignment



Signal	Output A (pin 4)	Output B (pin 2)
neutral	closed	closed
	open	closed
	closed	open

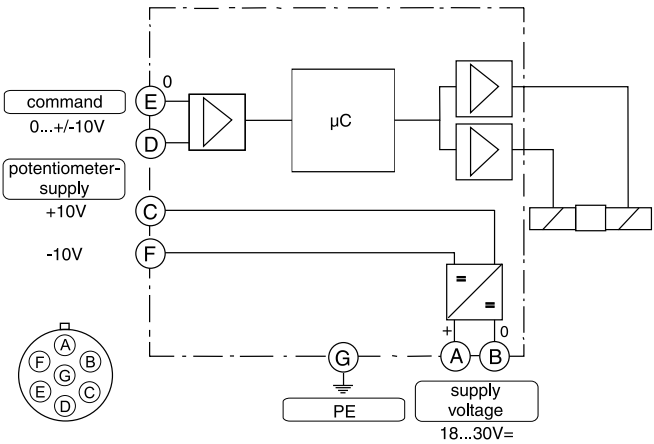


The neutral position is monitored. The signal changes after less than 10 % of the spool stroke.

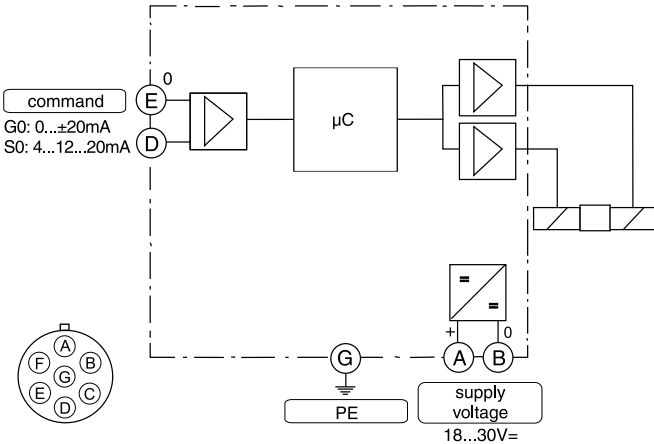
Electrical monitor switch

Protection class	IP65 in accordance with EN 60529 (with correctly mounted plug-in connector)
Ambient temperature	[°C] 0-70
Supply voltage/ripple	[V] 18...42, ripple < 10 % eff.
Current consumption without load	[mA] < 30
Max. output current per channel, ohmic	[mA] 400
Min. output load per channel, ohmic	[kOhm] 100
Max. output drop at 0.2 A	[V] < 1.1
Max. output drop at 0.4 A	[V] < 1.6
EMC	EN61000-6-2, EN61000-6-4
Max. tol. ambient field strength	[A/m] 1200
Min. distance to next AC solenoid	[m] 0.1
Interface	4+PE acc. IEC 61076-2-101 (M12)
Wiring min.	[mm²] 5 x 0.5 (AWG 20) overall braid shield
Wiring lenght max.	[m] 50

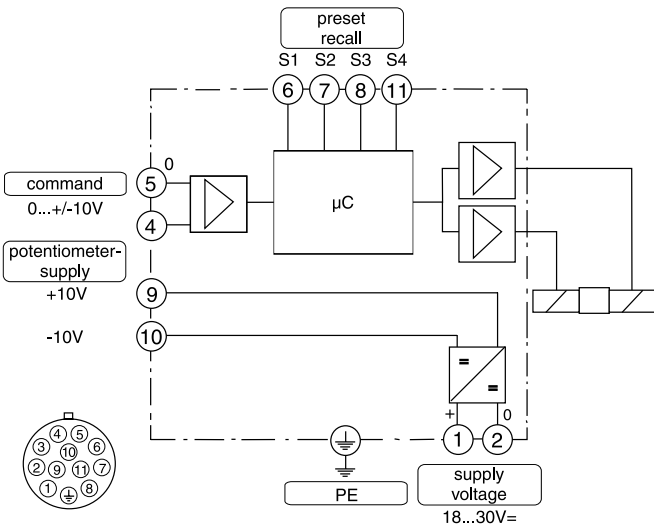
Code F0, M0
6 + PE acc. to EN 175201-804



Code G0, S0
6 + PE acc. to EN 175201-804



Code W5
11 + PE acc. to EN 175201-804



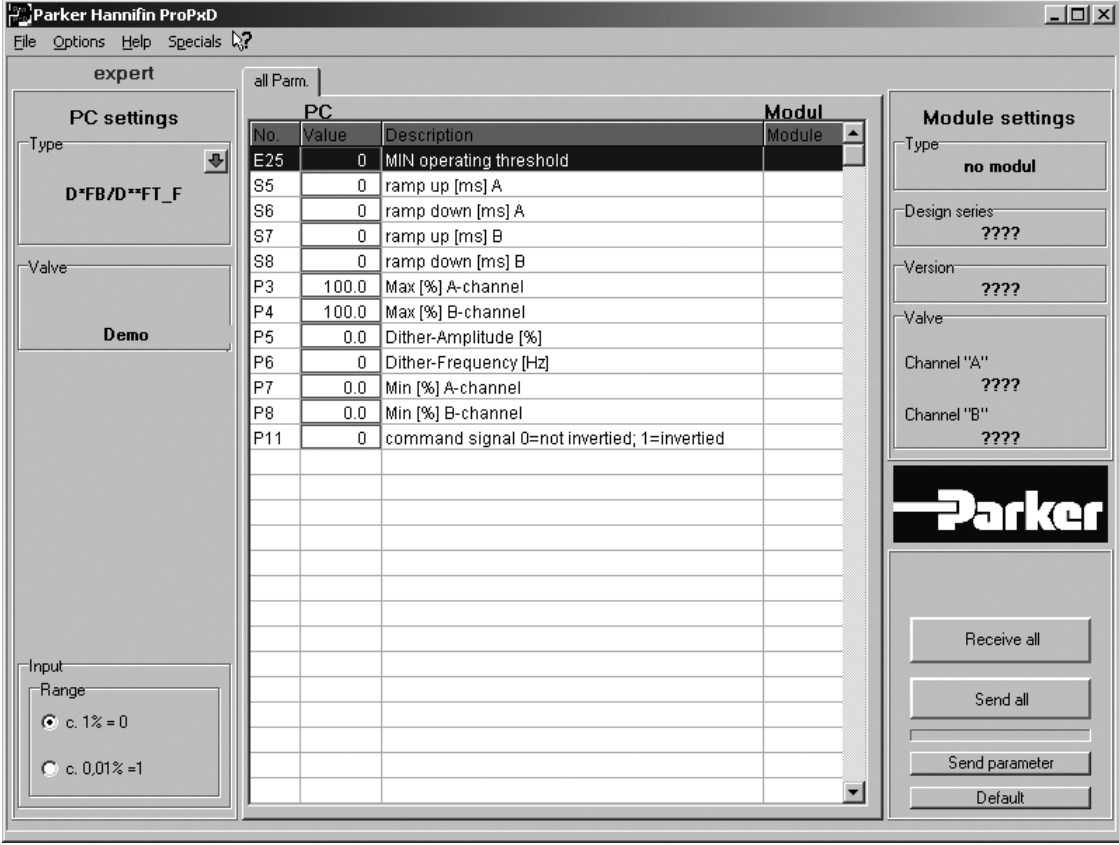
ProPx interface program

The ProPx software permits comfortable parameter setting for the module electronics. Via the clearly arranged entry mask the parameters can be noticed and modified. Storage of complete parameter sets is possible as well as printout or record as a text file for further documentation. Stored parameter sets may be loaded anytime and transmitted to other valves. Inside the electronics a non-volatile memory stores the data with the option for recalling or modification.

The PC software can be downloaded free of charge at www.parker.com/euro_hcd – see page “Support”.

Features

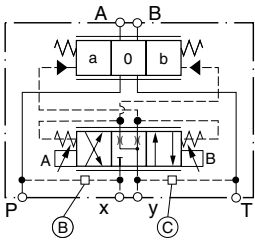
- Comfortable editing of all parameters
 - Depiction and documentation of parameter sets
 - Storage and loading of optimized parameter adjustments
 - Executable with all actual Windows® operating systems from Windows® 95 upwards
 - Plain communication between PC and electronics via serial interface RS-232
- The parametrizing cable may be ordered under item no.40982923.**



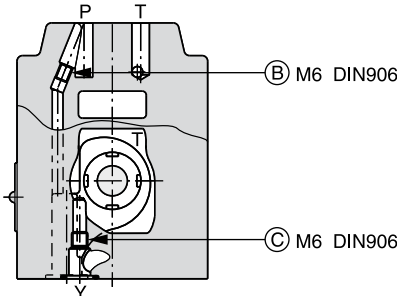
Pilot oil inlet (supply) and outlet (drain)

○ open, ● closed

Pilot oil		B	C
Inlet	Drain		
internal	external	○	●
external	external	●	●
internal	internal	○	○
external	internal	●	○

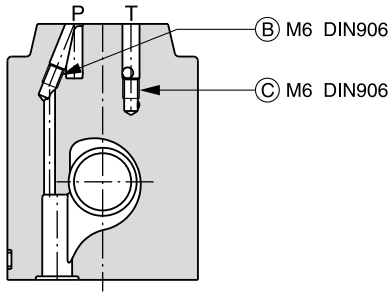


D31FBB/E

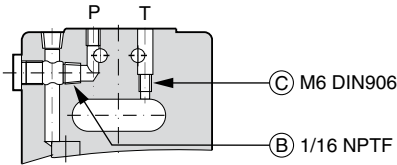


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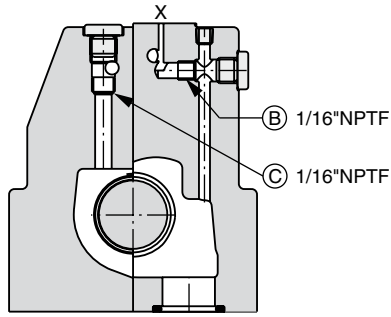
D31FBR



D41FBB/E

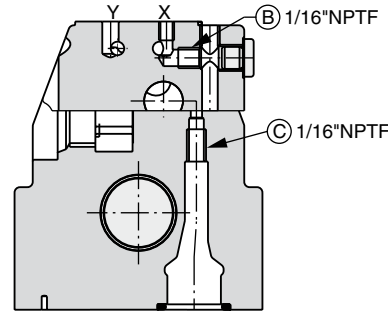


D41FBR



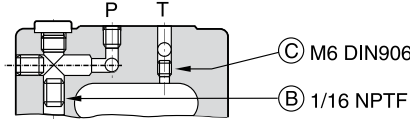
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D41FBZ

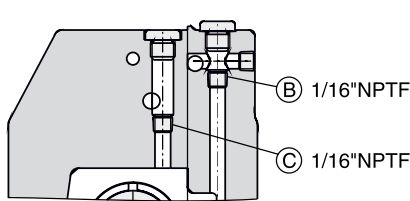


(drawn offset)

D91FBB/E

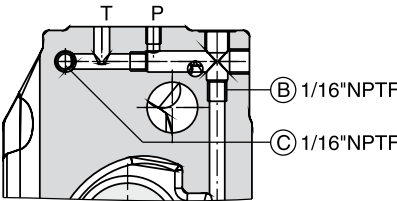


D91FBR

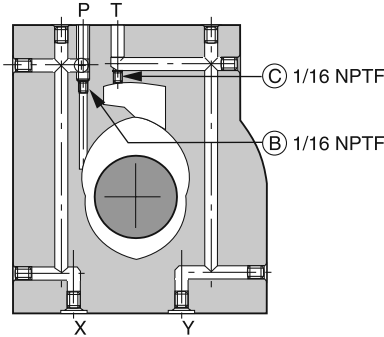


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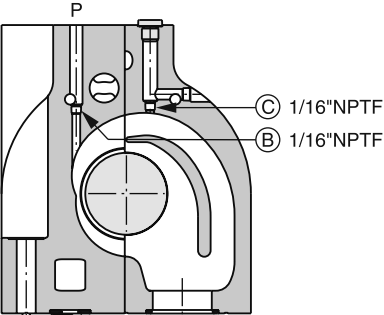
D91FBZ



D111FBB/E

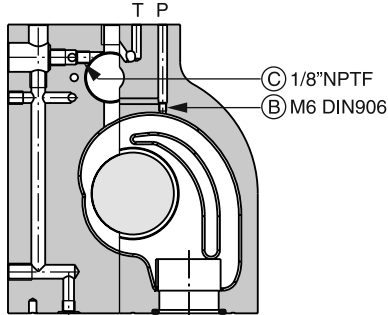


D111FBR



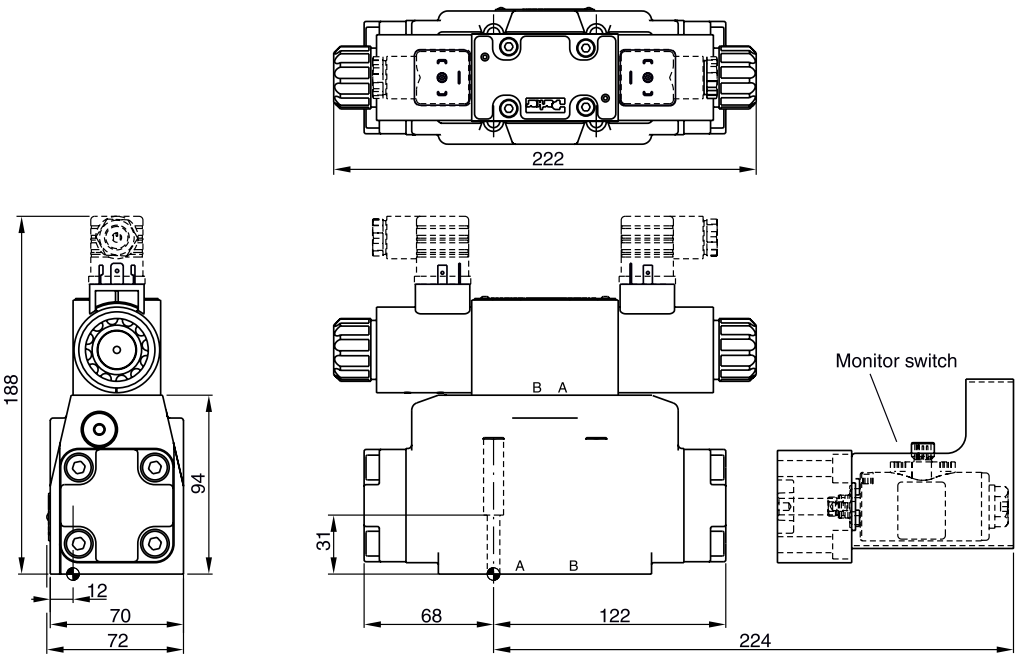
(drawn offset)

D111FBZ



(drawn offset)

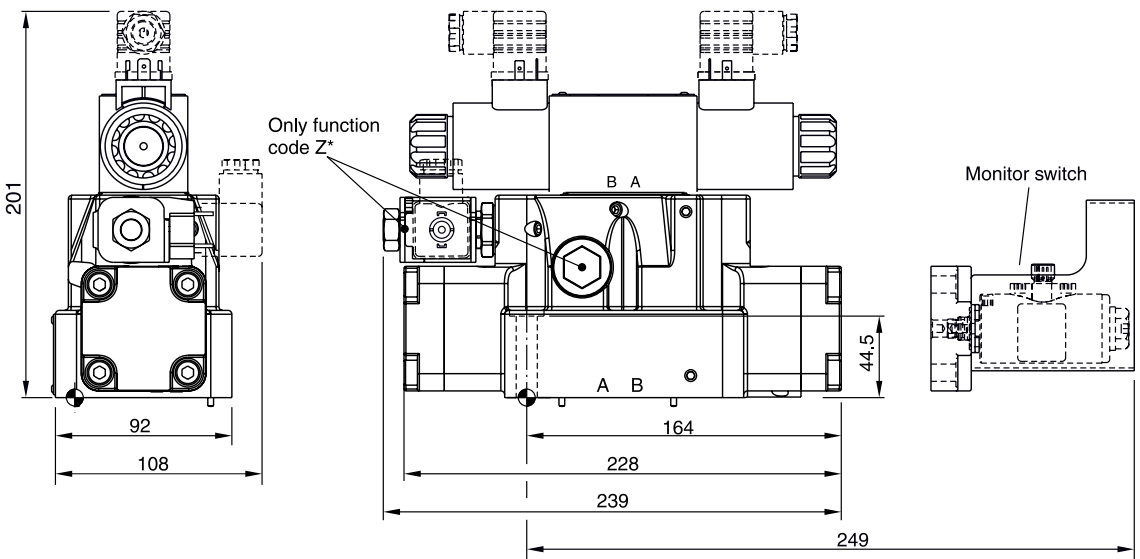
D31FB



Regenerative and hybrid function with additional plate "H10-1666L / H10-1662 / A10-1664 / A10-1665L", see chapter 12.

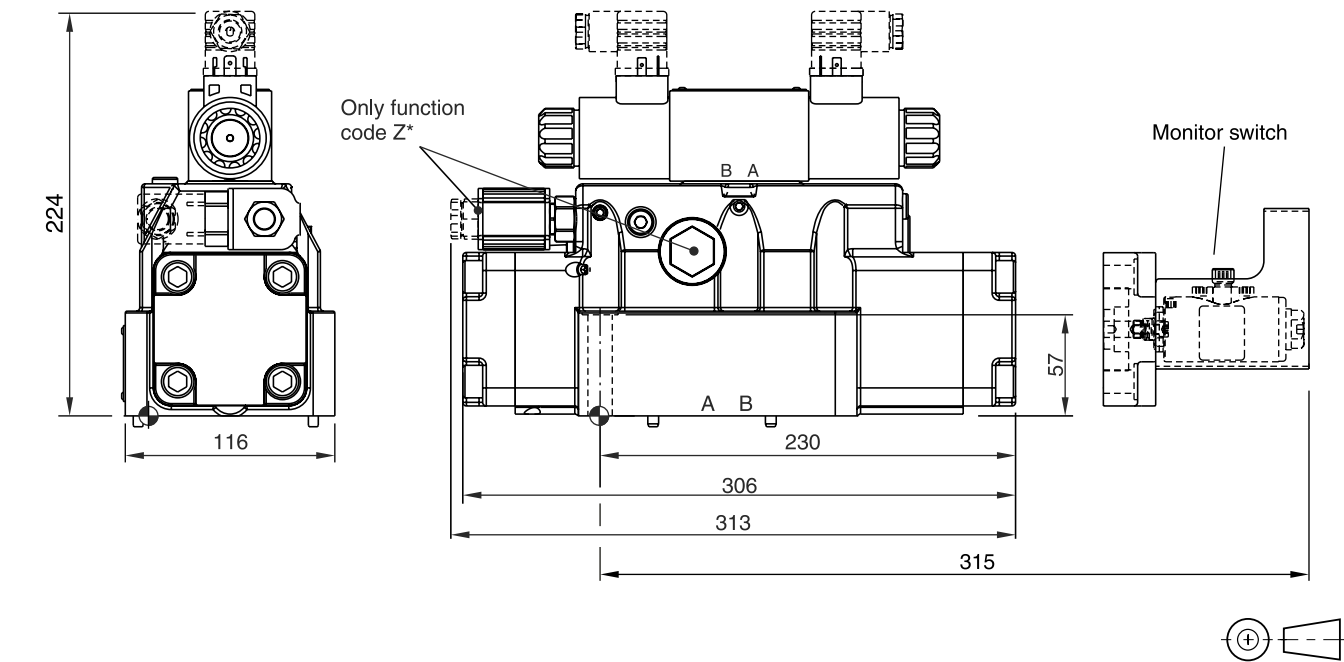
Surface finish	Kit	Kit	Kit	Kit
$\sqrt{R_{max} 6.3}$ $\square 0.01/100$	BK385	4x M6x40 ISO 4762-12.9	13.2 Nm ±15 %	NBR: SK-D31FB FPM: SK-D31FB-V

D41FB



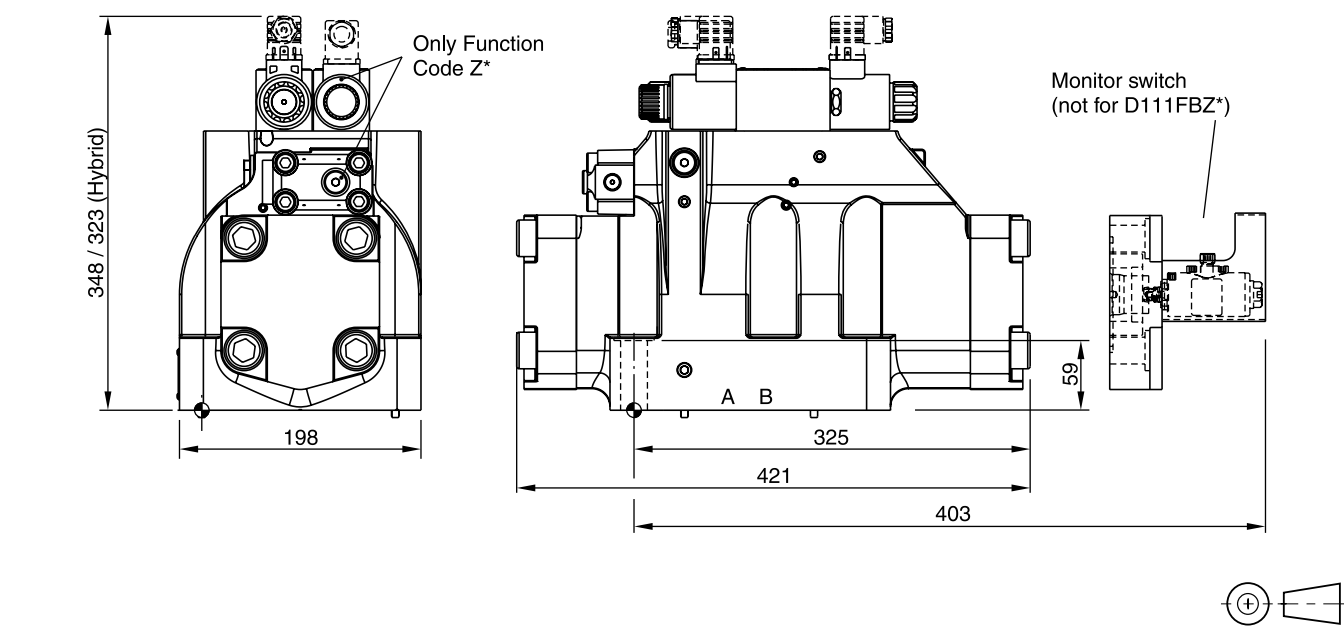
Surface finish	Kit	Kit	Kit	Kit
$\sqrt{R_{max} 6.3}$ $\square 0.01/100$	BK320	2x M6x55 4x M10x60 ISO 4762-12.9	13.2 Nm ±15 % 63 Nm ±15 %	NBR: SK-D41FB FPM: SK-D41FB-V

D91FB



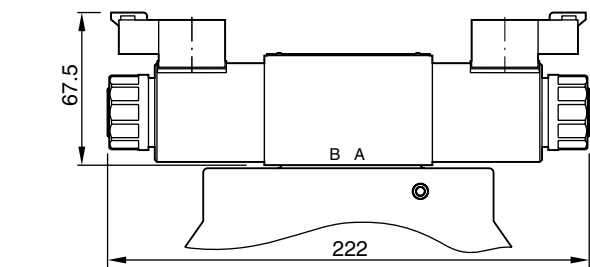
Surface finish	 Kit	 Kit	 Kit	 Kit
$\sqrt{R_{max} 6.3}$ 	BK360	6x M12x75 ISO 4762-12.9	108 Nm ±15 %	NBR: SK-D91FB FPM: SK-D91FB-V

D111FB

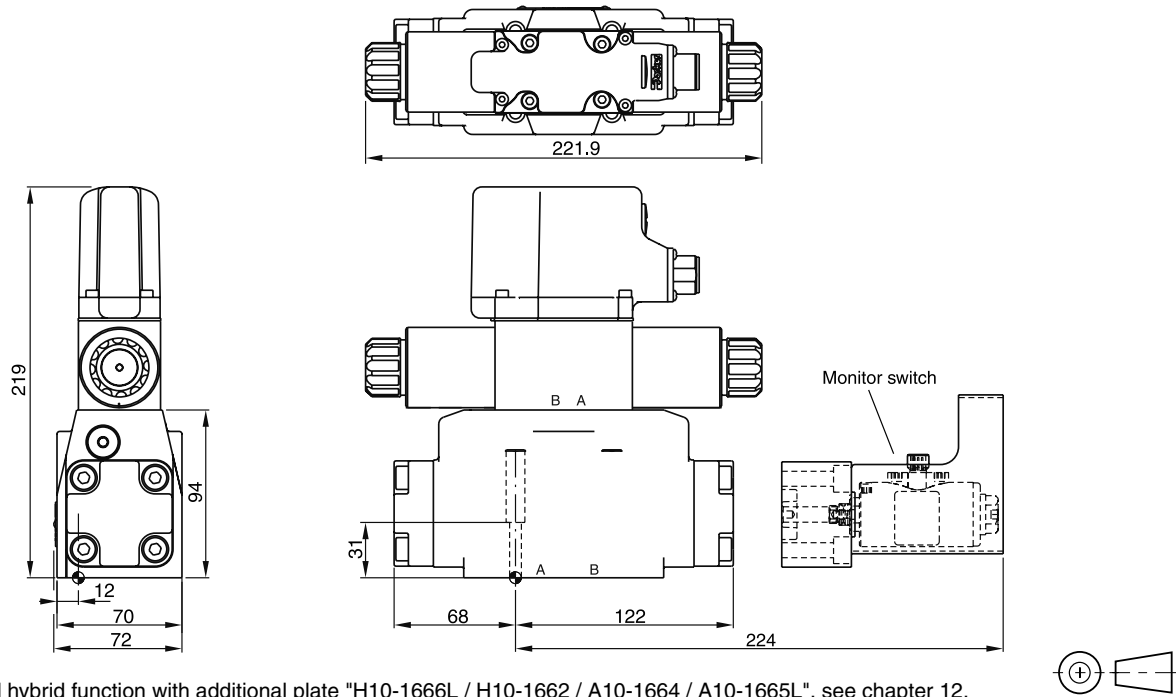


Surface finish	 Kit	 Kit	 Kit	 Kit
$\sqrt{R_{max} 6.3}$ 	BK386	6x M20x90 ISO 4762-12.9	517 Nm ±15 %	NBR: SK-D111FB FPM: SK-D111FB-V

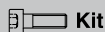
Dimension with DT04-2P "Deutsch" Connector



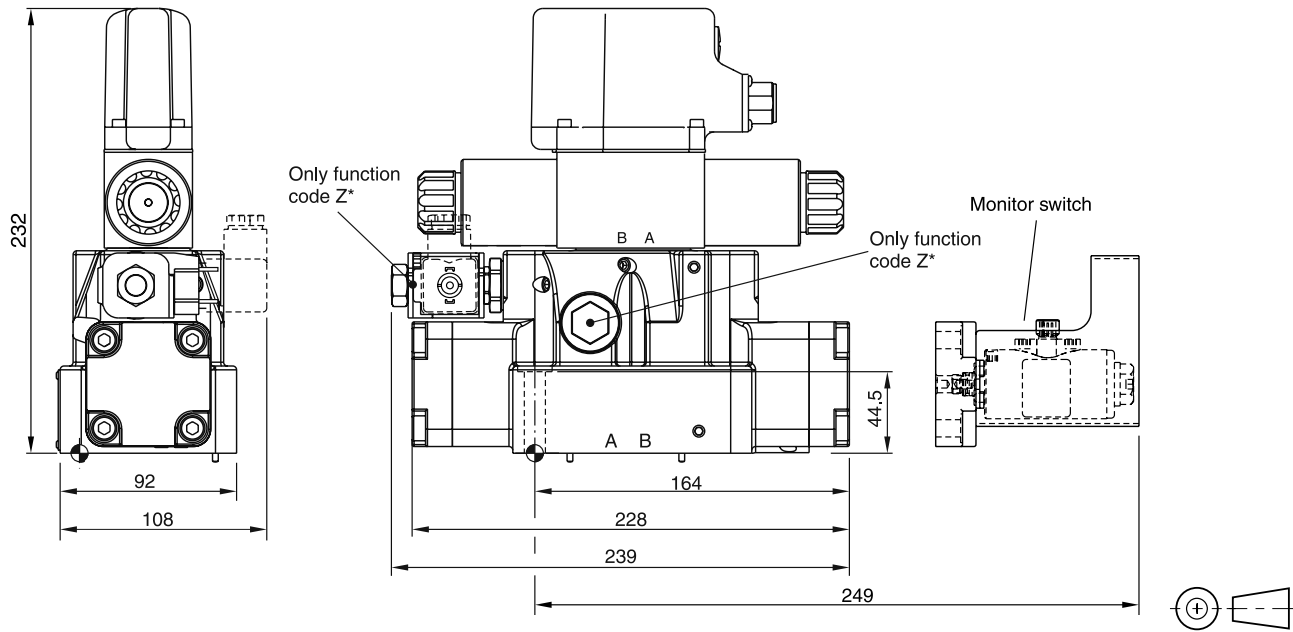
D31FB OBE

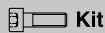


Regenerative and hybrid function with additional plate "H10-1666L / H10-1662 / A10-1664 / A10-1665L", see chapter 12.

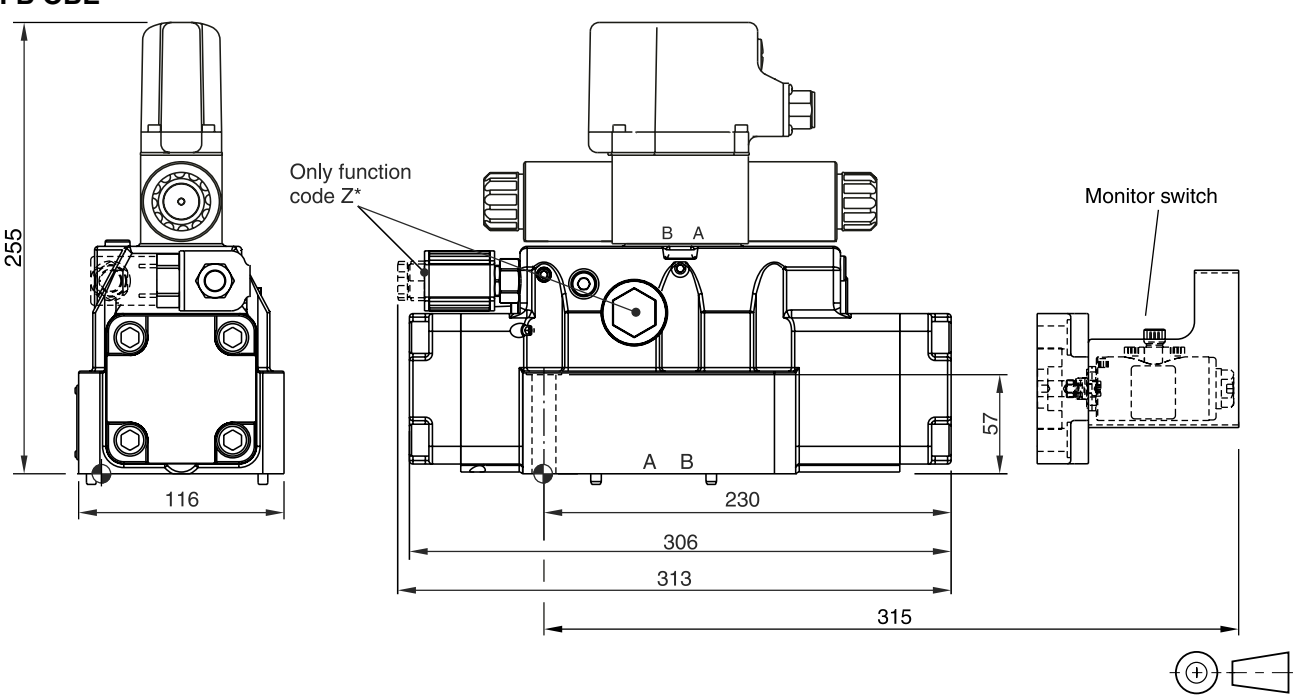
Surface finish	 Kit			 Kit
$\sqrt{R_{max}6.3}$ $\downarrow$ $\square 0.01/100$	BK385	4x M6x40 ISO 4762-12.9	13.2 Nm $\pm 15\%$	NBR: SK-D31FB FPM: SK-D31FB-V

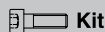
D41FB OBE



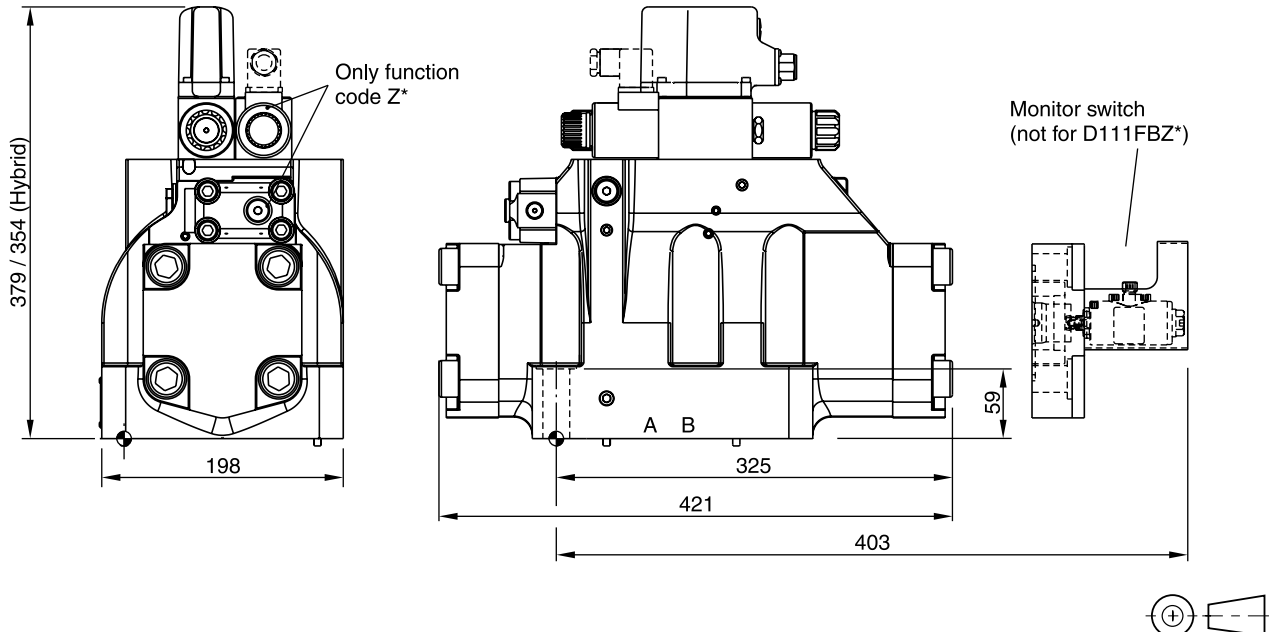
Surface finish	 Kit			 Kit
$\sqrt{R_{max}6.3}$ $\downarrow$ $\square 0.01/100$	BK320	2x M6x55 4x M10x60 ISO 4762-12.9	13.2 Nm $\pm 15\%$ 63 Nm $\pm 15\%$	NBR: SK-D41FB FPM: SK-D41FB-V

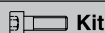
D91FB OBE



Surface finish	 Kit			 Kit
$\sqrt{R_{max}6.3}$ $\downarrow$ $\square 0.01/100$	BK360	6x M12x75 ISO 4762-12.9	108 Nm $\pm 15\%$	NBR: SK-D91FB FPM: SK-D91FB-V

D111FB OBE



Surface finish	 Kit			 Kit
$\sqrt{R_{max}6.3}$ $\downarrow$ $\square 0.01/100$	BK386	6x M20x90 ISO 4762-12.9	517 Nm $\pm 15\%$	NBR: SK-D111FB FPM: SK-D111FB-V