

Characteristics

**Pilot-Operated Proportional DC Valve
Series D*1FS**

The D*1FS pilot-operated proportional valve series of the nominal sizes NG10 to NG32 (CETOP 5 to 10) provides flow rate control.

An additional spool position feedback leads the hysteresis to a minimum.

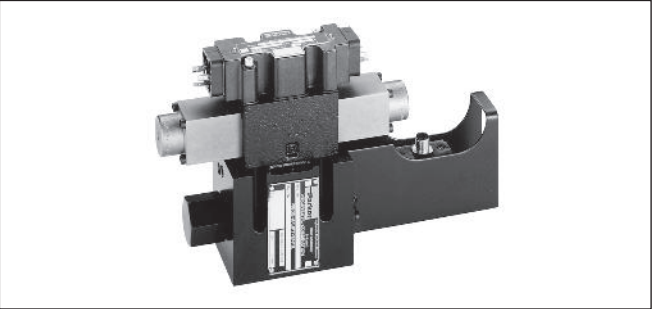
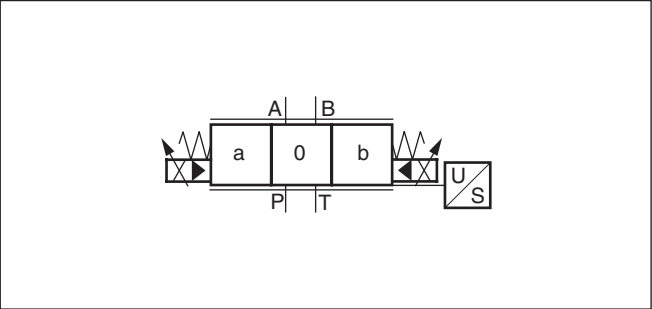
The D*1FS is suited for ambitious standard applications with controlling position and velocity, particularly with regard to functions on identic machines, which need only to be adjusted once. In combination with the digital power amplifier PWDXXA-40*, the valve parameters can be saved, changed and duplicated.

Typical applications are:

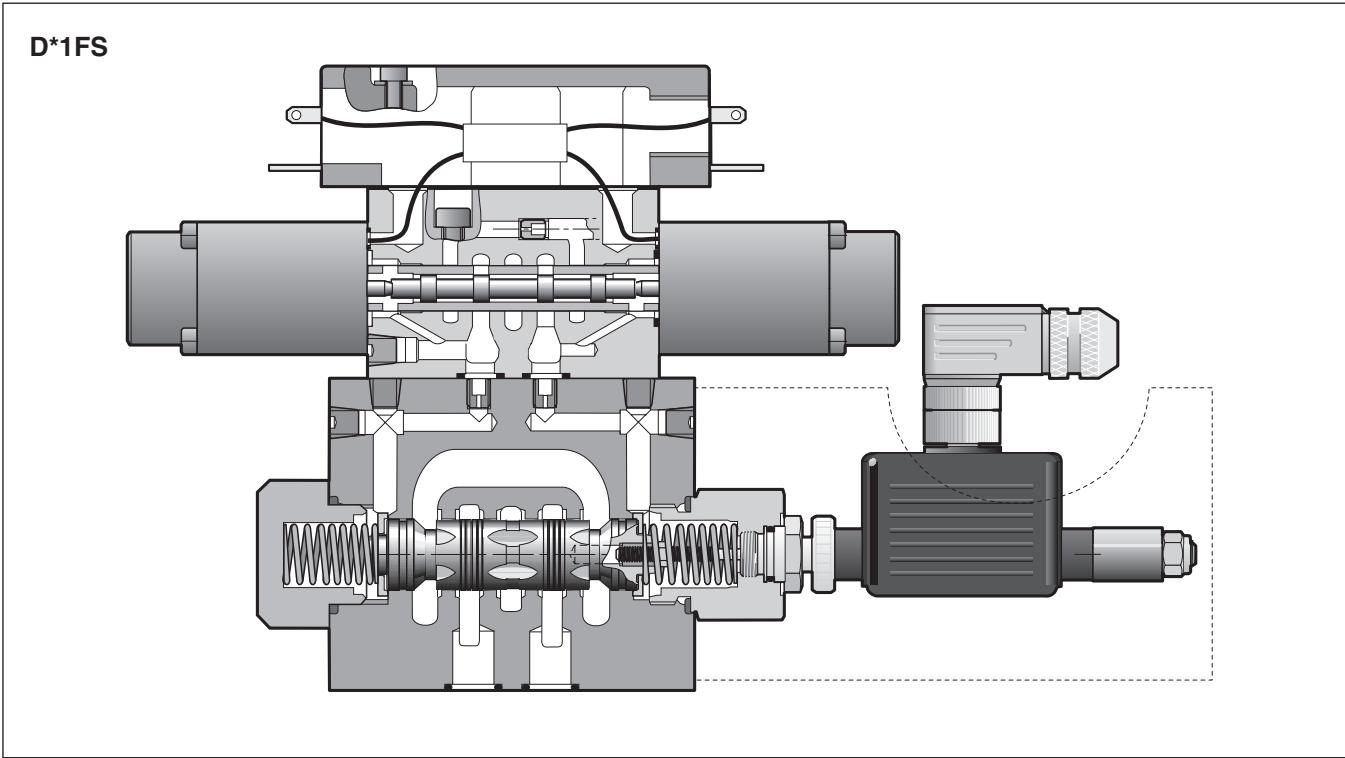
Exact and reproducible adjustment of flow rates, movement of the drive in rapid / slow speed profile and the soft acceleration and deceleration to improve the drive characteristics.

Technical features

- Sensitive flow rate adjustment
- Spool position feedback
- Fail-safe centre position
- Center position monitoring optional



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D_1FS.PMD CM

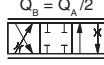


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D		1	F	S				N		W		
DC valve	Nominal size		Flow control	with spool position feedback (plug included)	Spool type	Nominal flow	Pilot connection	Seal NBR (different seal compound on request)	Solenoid description	Valve accessories	Design series	

Code	Nominal size
3	NG10 / CETOP 5
4	NG16 / CETOP 7
8	NG25 / CETOP 8
9 ¹⁾	NG25 / CETOP 8
11	NG32 / CETOP 10

¹⁾ with enlarged connections
Ø 32mm

Code	Spool type
E01	
E02	
B31	 $Q_B = Q_A / 2$
B32	 $Q_B = Q_A / 2$
B11	
B12	

Code	Inlet	Drain
1	Internal	External
2	External	External
4	Internal	Internal
5	External	Internal

Code	Flow [l/min] at Δp 5bar per metering edge				
	D31	D41	D81	D91	D111
B	45 (65)	-	-	-	-
C	-	120 (180)	-	-	-
E	-	-	300 (360)	-	-
H	-	-	-	400 (360)	-
L	-	-	-	-	1000 (850)

() flow for spool B11/B12

Please order plugs separately.
See chapter 3 accessories.

Bold letters =
Short-term availability

Technical Data

General		Pilot-operated DC Valve			
Design		Proportional solenoid			
Actuation					
Size		NG10 (CETOP 5)	NG16 (CETOP 7)	NG25 (CETOP 8)	NG32 (CETOP 10)
Mounting interface		DIN 24340 / ISO 4401 / CETOP RP121 / NFPA			
Mounting position		Any			
Ambient temperature		-20...+60			
Weight		7.1	10.8	19	62
Hydraulic					
Max. operating pressure		Ports P, A, B, T, X max. 350; Port Y max. 10			
Fluid		Hydraulic oil as per DIN 51524...535, other by request			
Fluid temperature		-20...+60			
Viscosity permitted		20...380			
Viscosity recommended		30...80			
Filtration		ISO 4406 (1999) 18/16/13 (acc. NAS 1683: 7)			
Flow nominal at Δp=5bar per control edge *		45	120	300/400	1000
Leakage at 100 bar		100	200	600	1000
Pilot supply pressure		20-350 (optimal dynamics at 50)			
Pilot flow		<1.2			
Pilot flow, step response		0.8	1.7	3.8	7.6
Static / Dynamic					
Step response at 100% step		35	60	80	200
Hysteresis		<0.5			
Sensitivity		<0.2			
Electrical characteristics					
Duty ratio		100%			
Protection class		IP54			
Solenoid		Code L			
Supply voltage		6			
Current consumption		2.5			
Resistance		2.2			
Coil insulation class		F (155 °C)			
Electrical connection		2+PE acc. EN 175301-801			
Wiring min.		3x1.5 (AWG 16) overall braid shield			
Wiring lenght max.		50			
Electrical monitor switch					
Protection class		IP65			
Ambient temperature		0-70			
Supply voltage/ripple		18...42, ripple <10% eff.			
Current consumption without load		<30			
Max. output current per channel, ohmic		400			
Min. output load per channel, ohmic		100			
Max. output drop at 0.2A		<1.1			
Max. output drop at 0.4A		<1.6			
EMC		EN 50081-1 / EN50082-2			
Max. tol. ambient field strength		1200			
Min. distance to next AC solenoid		0.1			
Interface		4+PE acc. IEC 61076-2-101 (M12)			
Wiring min.		4x0.5 (AWG 20) overall braid shield			
Wiring lenght max.		50			
Electrical LVDT					
Protection class		IP65			
Ambient temperature		-20...+50			
Supply voltage/ripple		18...36, ripple <10% eff.			
Current consumption		<50			
EMC		EN 50081-1 / EN50082-2			
Interface		4+PE acc. IEC 61076-2-101 (M12)			
Wiring min.		5x0.5 (AWG 20) overall braid shield			
Wiring lenght max.		50			

* Flow rate for different Δp per control edge:

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

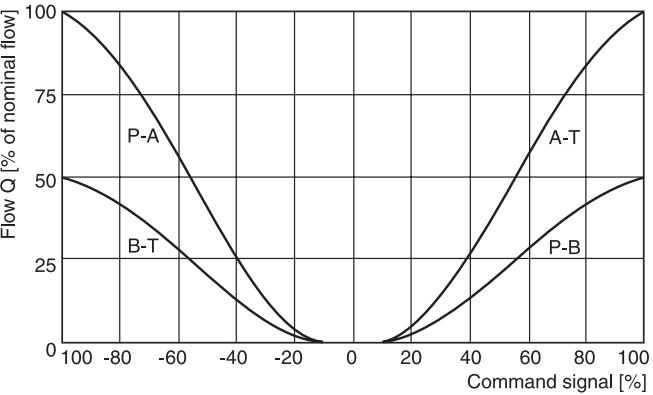
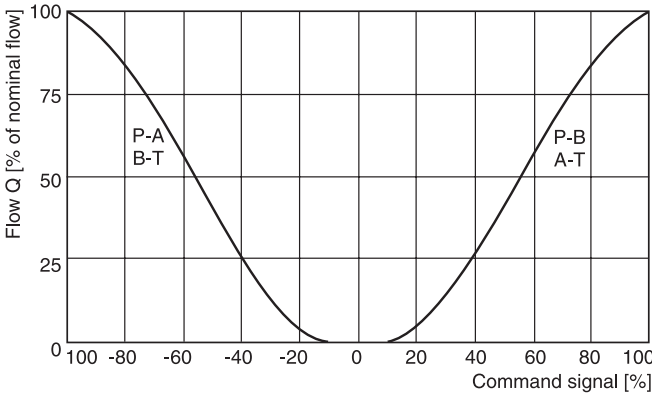
D_1FS.PMD CM



Flow characteristics
at $\Delta p = 5\text{bar}$ per metering edge

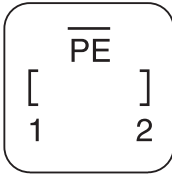
Spool code **E***

Spool code **B***



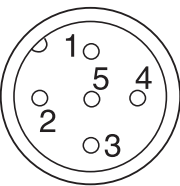
Plugs

Solenoid coil



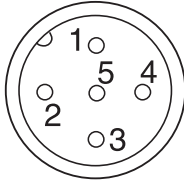
- 1 = coil connection
- 2 = coil connection
- PE = ground potential

Spool position feedback



- 1 = output, actual spool position
- 2 = supply (18...36 VDC)
- 3 = GND (0V)
- 4 = not used
- 5 = PE

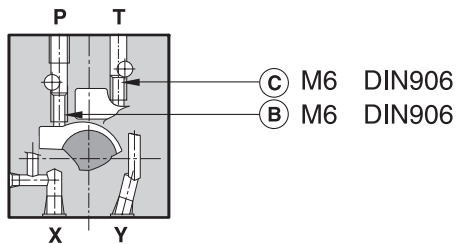
Monitor switch



- 1 = output B (normally closed)
- 2 = supply (18...42 VDC)
- 3 = output A (normally closed)
- 4 = GND (0V)
- 5 = PE

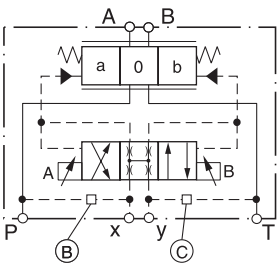
Pilot oil inlet (supply) and outlet (drain)

D31FS

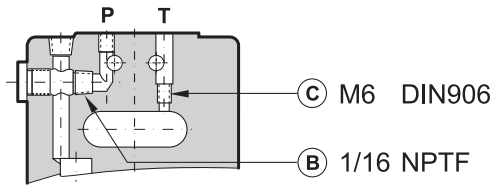


○ open, ● closed

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

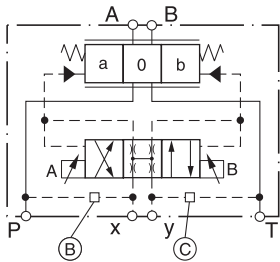


D41FS

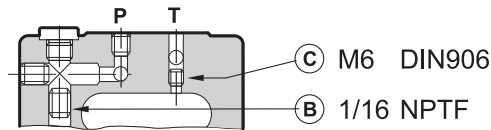


○ open, ● closed

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

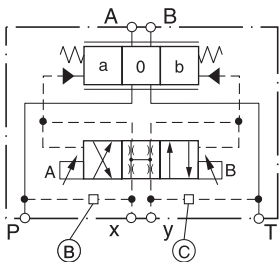


D81/91FS

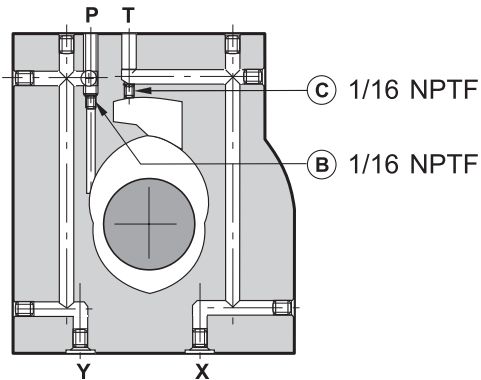


○ open, ● closed

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

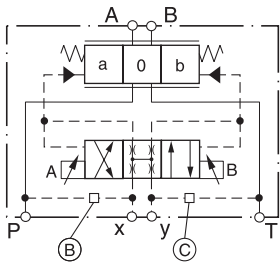


D111FS



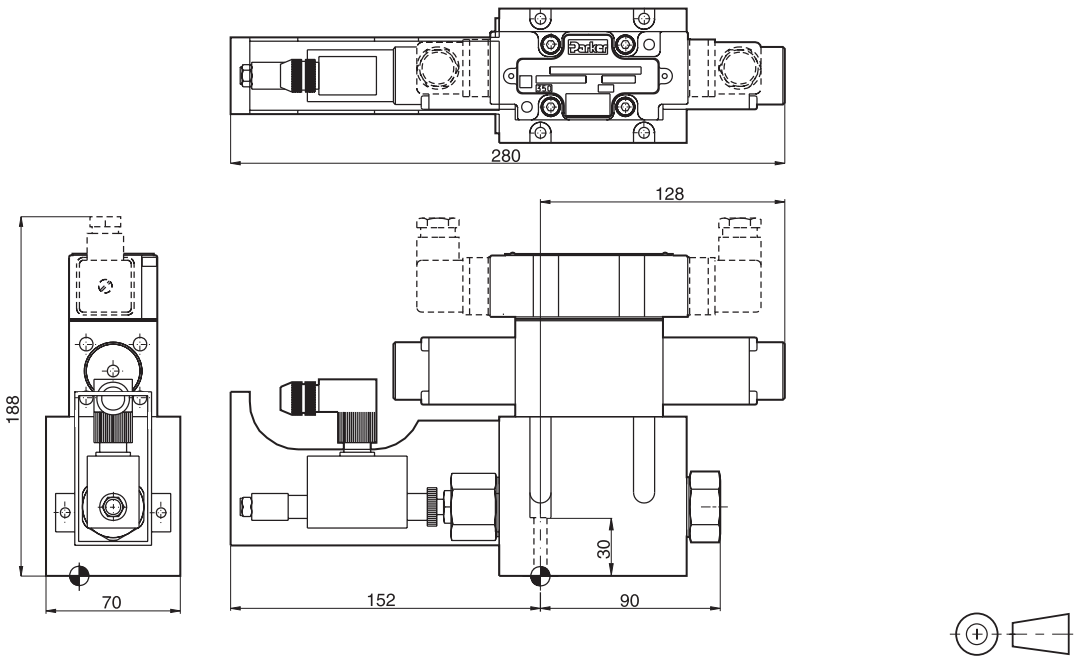
○ open, ● closed

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



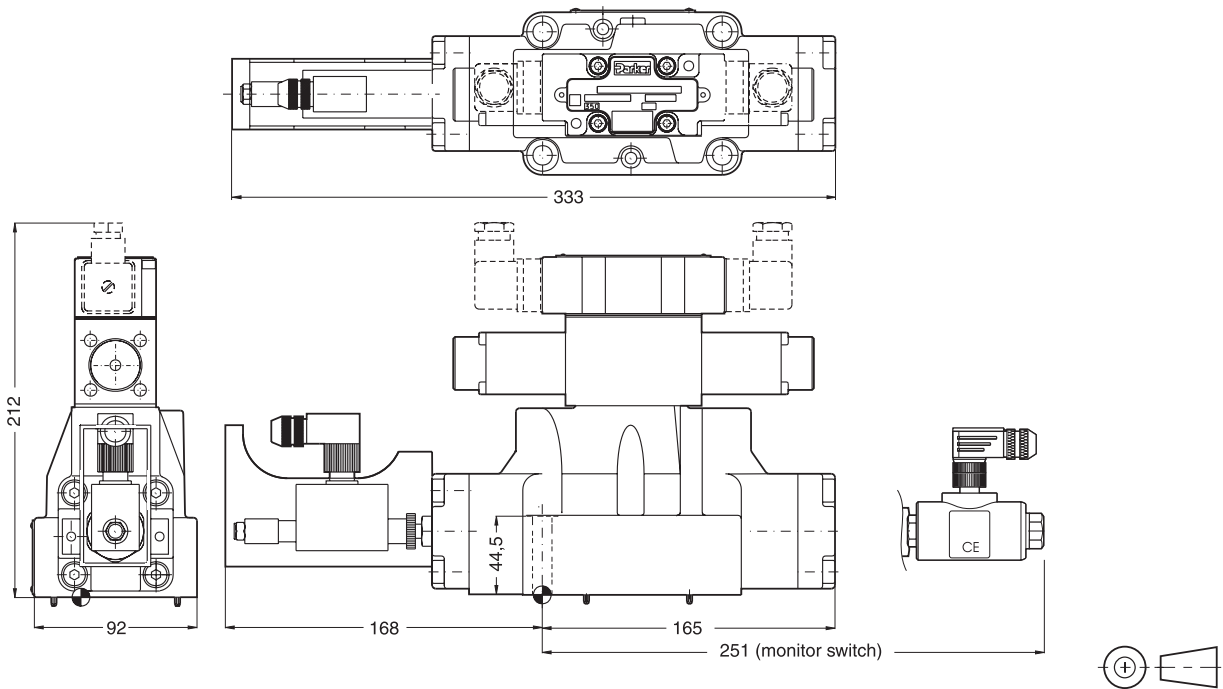
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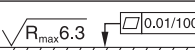
D31FS



Surface finish	 Kit			 Kit NBR
	BK385	4x M6x40 DIN 912 12.9	11 Nm ±15 %	SK-D31FS-N30

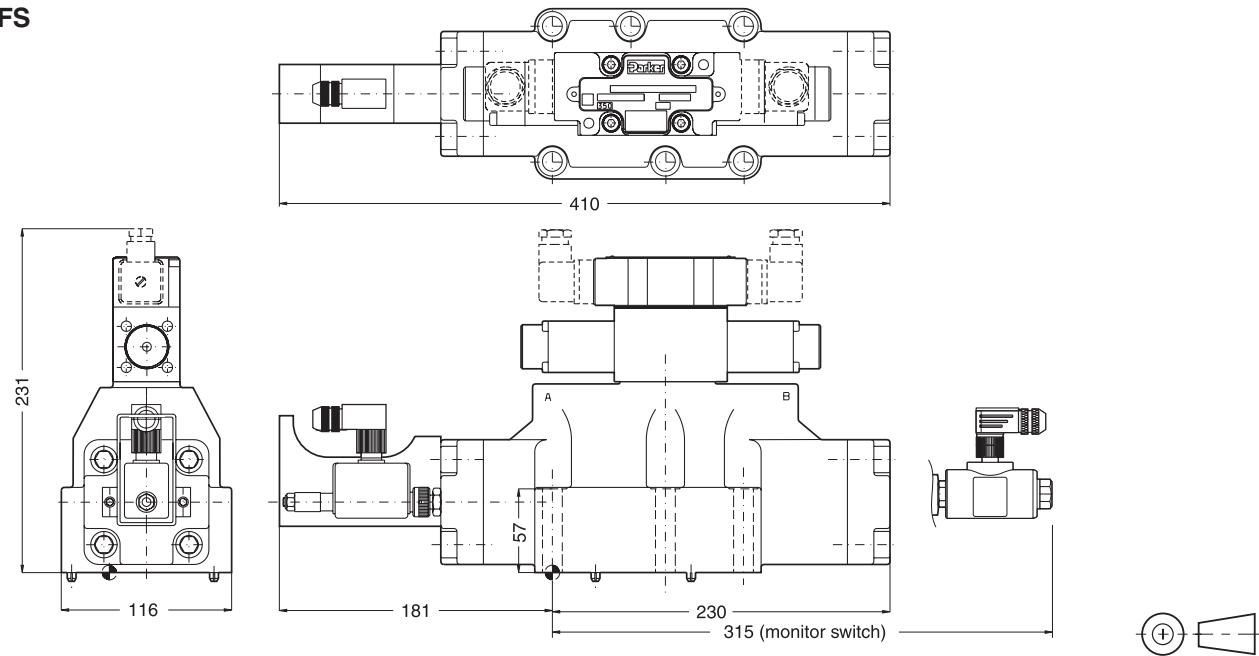
D41FS



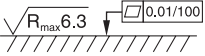
Surface finish	 Kit			 Kit NBR
	BK320	2x M6x55 4x M10x60 DIN 912 12.9	11 Nm 54 Nm ±15 %	SK-D41FS-N30

D_1FS.PMD CM

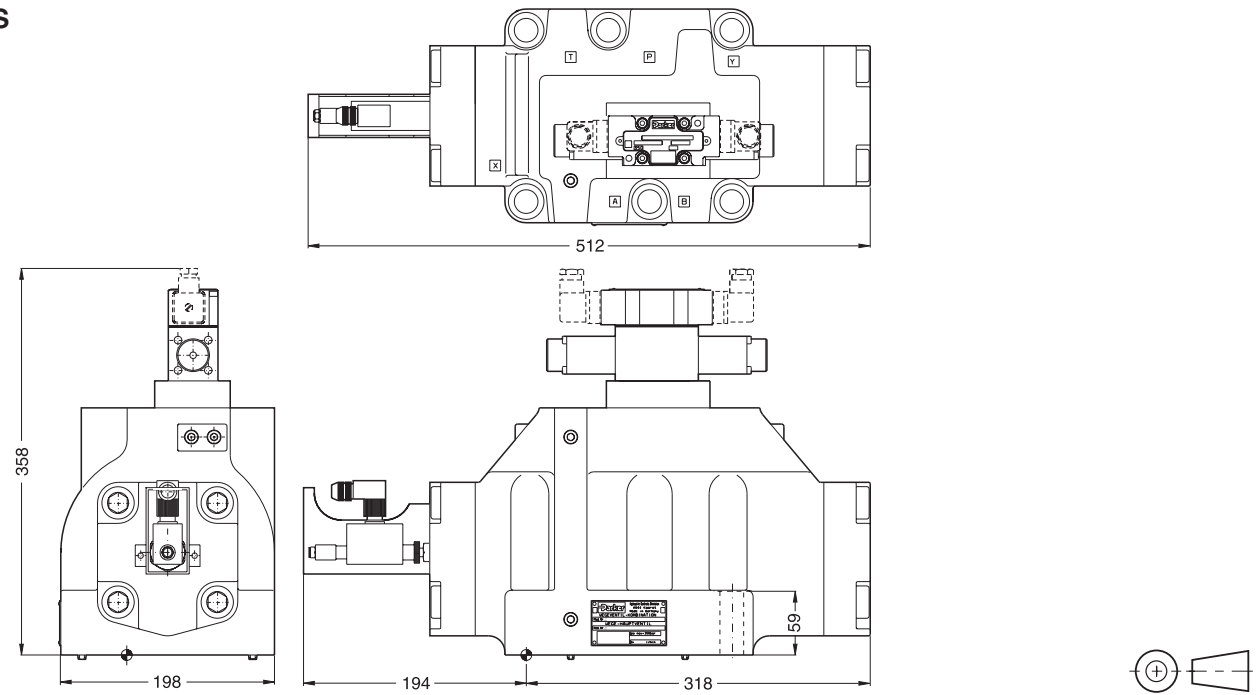
D81/91FS

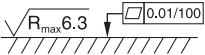


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Surface finish	 Kit			 Kit NBR
	BK360	6x M12x95 DIN 912 12.9	94 Nm ±15 %	SK-D81FS-N20 SK-D91FS-N20

D111FS



Surface finish	 Kit			 Kit NBR
	BK386	6x M20x90 DIN 912 12.9	460 Nm ±15 %	SK-D111FS-N20

Catalogue HY11-2500/UK

Notes

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