

Characteristics

The series of regenerative and hybrid directional control valves are available in four sizes:

Direct operated valve:

D3DWR NG10 Hybrid function with adaptor plate (see chapter 12)

Pilot operated valves:

D31NWR NG10 Hybrid function with adaptor plate (see chapter 12)

D41VWR, D41VWZ NG16

D91VWR, D91VWZ NG25

D111VWR, D111VWZ NG32

The innovative integrated regenerative function in the A-line allows energy saving circuits with differential cylinders. The hybrid version can switch between regenerative mode and standard mode.

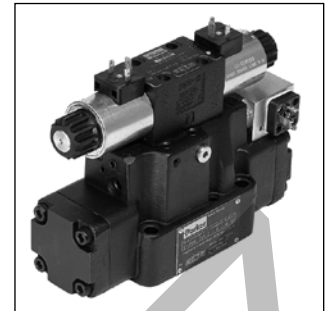
Features

- Energy saving A-regeneration
- Switchable hybrid version

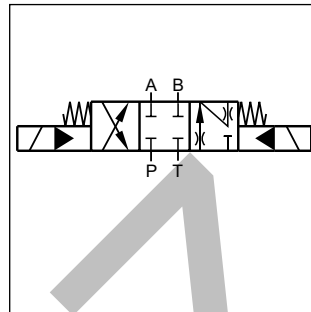
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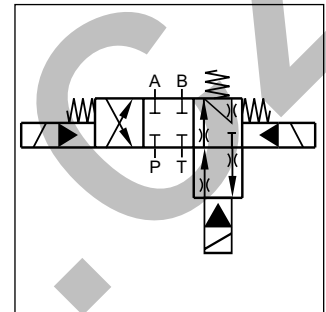
D41VWR



D41VWZ

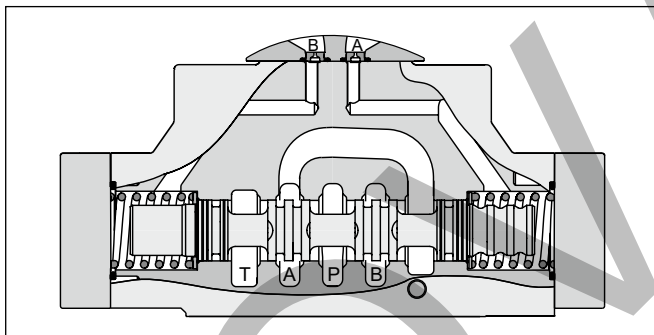


Regenerative D*1VWR

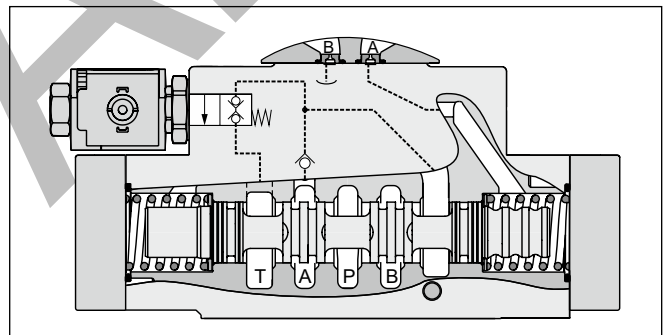


Hybrid D*1VWZ

Regenerative valve D*1VWR

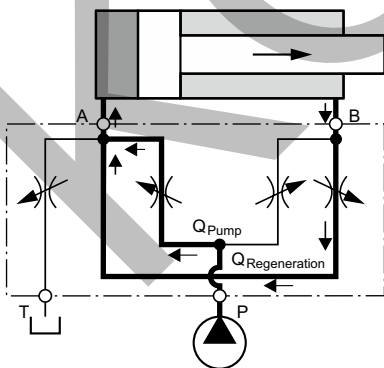


Hybrid valve D*1VWZ



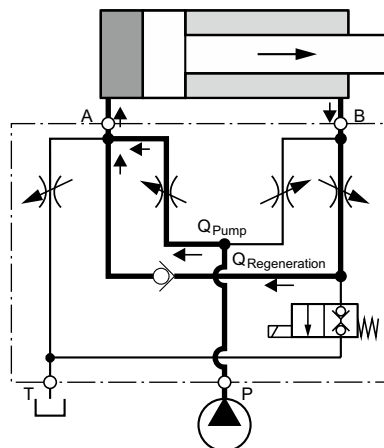
D*1VWR (regenerative valve)

Cylinder extending

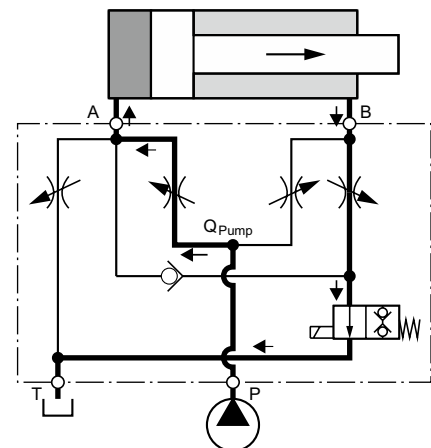


D*1VWZ (hybrid valve)

Cylinder extending regenerative mode (high speed)



Cylinder extending standard mode (high force)



D3DWR

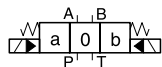
D3DW

Direct operated valve NG10

Spool type

C

3 spool position
 Spring offset in position "0".
 Operated in position "a" or "b".



Drain port

Seals

J

Solenoid voltage
 24 V =

W

Connector as per EN 175301-803, without connector
 (Please order plug separately)

Solenoid options

Design series

(not required for ordering)

2

Regenerative function ¹⁾

Code	Spool type
R01	
R04	
R81	
R82	

Code	Solenoid option
omit	manual override (Standard)
T	without manual override

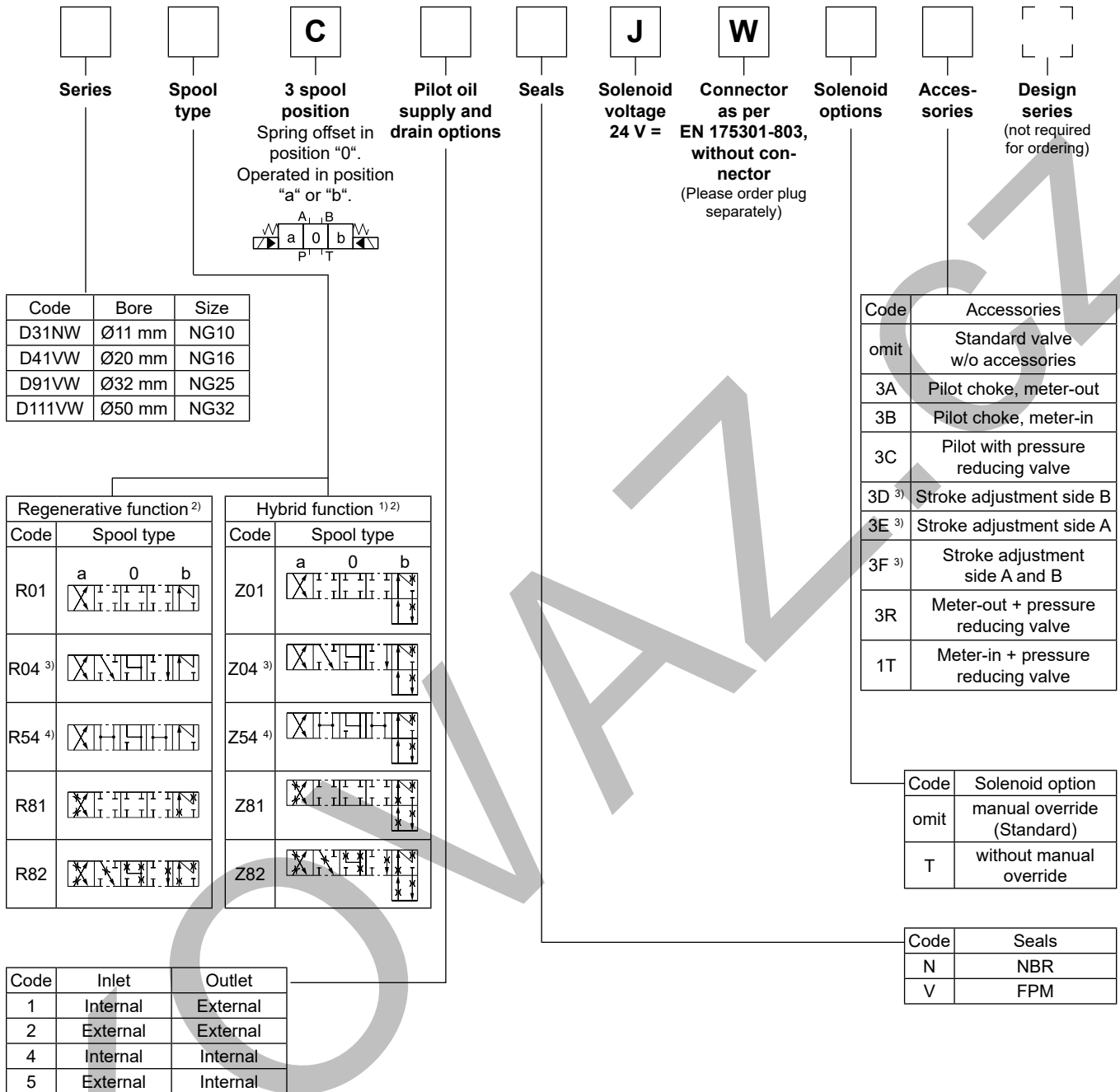
Code	Seals
N	NBR
V	FPM

Code	Drain port
omit	Standard
9	for high pressure in the connection T1 (tank) or T2 (regenerative function) the connection X and Y can be used as drain port

¹⁾ For regenerative and hybrid function please refer to solutions with sandwich- and adaptor plates "A10-1664 / A10-1665L / H10-1662 / H10-1666L" in chapter 12.

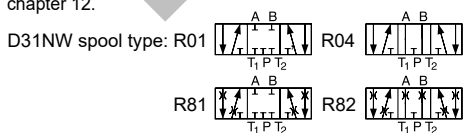
D31NWR, D*1VWR and D*1VWZ

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¹⁾ Not for D31NW.

²⁾ For regenerative and hybrid function for D31NW (NG10) please refer to solutions with sandwich- and adaptor plates "A10-1664 / A10-1665L / H10-1662 / H10-1666L" in chapter 12.



³⁾ Not for D111VW.

⁴⁾ Only for D111VW.

General						
Design		Directional spool valve				
Actuation		Solenoid				
Series		D3DWR	D31NWR	D41VW	D81/91VW	D111VW
Size		NG10	NG10	NG16	NG25	NG32
Weight	[kg]	6.3	8.1	10.3	18.6	68.0
Mounting interface		DIN 24340 A10 ISO 4401 NFFPA D05	DIN 24340 A10 ISO 4401 NFFPA D05	DIN 24340 A16 ISO 4401 NFFPA D07	DIN 24340 A25 ISO 4401 NFFPA D08	DIN 24340 A32 ISO 4401 NFFPA D10
		CETOP RP 121-H				
Mounting position		unrestricted, preferably horizontal				
Ambient temperature	[°C]	-25...+60				
MTTF _D value	[years]	75 / 150 (D3DWR)				
Hydraulic						
Max. operating pressure	[bar]	D3DWR: P, A, B: 350; T: 210; option 9 ¹⁾ : P, A, B, T: 350; X, Y: 210 Pilot drain internal: P, A, B, X: 350; T, Y: 140 Pilot drain external: P, A, B, T, X: 350; Y: 140				
Fluid		Hydraulic oil according to DIN 51524				
Fluid temperature	[°C]	-20 ... +70 (NBR: -25...+70)				
Viscosity permitted	[cSt] / [mm ² /s]	2.8...400				
Viscosity recommended	[cSt] / [mm ² /s]	30...80				
Filtration		ISO 4406; 18/16/13				
Flow max.	[l/min]	150	170	300	700	2000
Leakage at 350 bar (per flow path)	[ml/min]	up to 20* (at 50 bar)	72...422*	up to 200*	up to 800*	up to 5000*
*depending on spool						
Minimum pilot supply pressure	[bar]	—	7	—	5	—
Static / Dynamic						
Step response at 95 %	[ms]	Energized / de-energized				
DC solenoids at 65 l/min	175 bar	105 / 85	—	—	—	—
DC solenoids	Pilot pressure					
	50 bar	—	50 / 60	95 / 65	150 / 170	470 / 390
	100 bar	—	50 / 60	75 / 65	110 / 170	320 / 390
	250 bar	—	50 / 50	60 / 65	90 / 170	210 / 390
	350 bar	—	50 / 50	60 / 65	85 / 170	200 / 390
Electrical characteristics						
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)				
		D3DWR		D31NWR / D41VW / D91VW / D111VW		
Supply voltage / ripple	[V]	24 V =		24 V =		
Tolerance supply voltage	[%]	±10		±10		
Current consumption hold	[A]	1.5		1.29		
Current consumption in rush	[A]	1.5		1.29		
Power consumption hold	[W]	36		31		
Power consumption in rush	[W]	36		31		
Solenoid connection		Connector as per EN 175301-803, solenoid identification as per ISO 9461.				
Wiring min.	[mm ²]	3 x 1.5 recommended				
Wiring length max.	[m]	50 recommended				

Electrical characteristics hybrid option

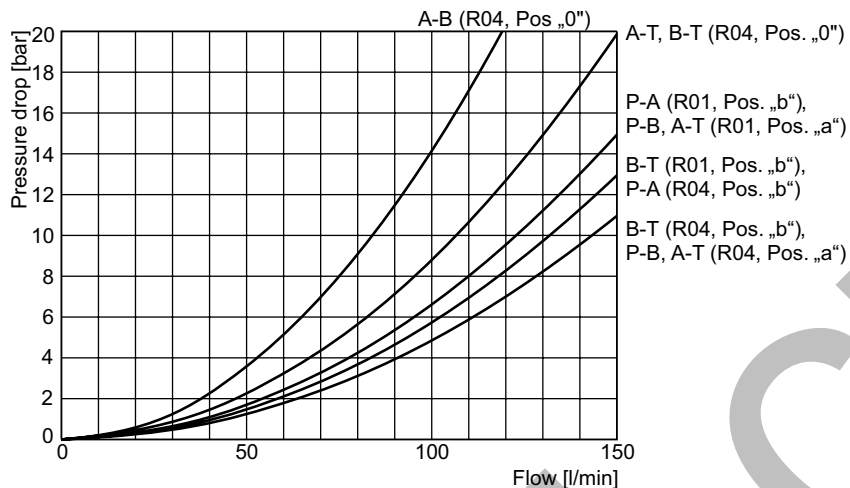
Duty ratio		100 %		
Protection class		IP65 in accordance with EN 60529 (with correctly mounted plug-in connector)		
		D41	D91	D111
Supply voltage	[V]	24	24	24
Tolerance supply voltage	[%]	±10	±10	±10
Current consumption	[A]	1.21	0.96	1.29
Power consumption	[W]	29	23	31
Solenoid connection		Connector as per EN 175301-803		
Wiring min.	[mm ²]	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.

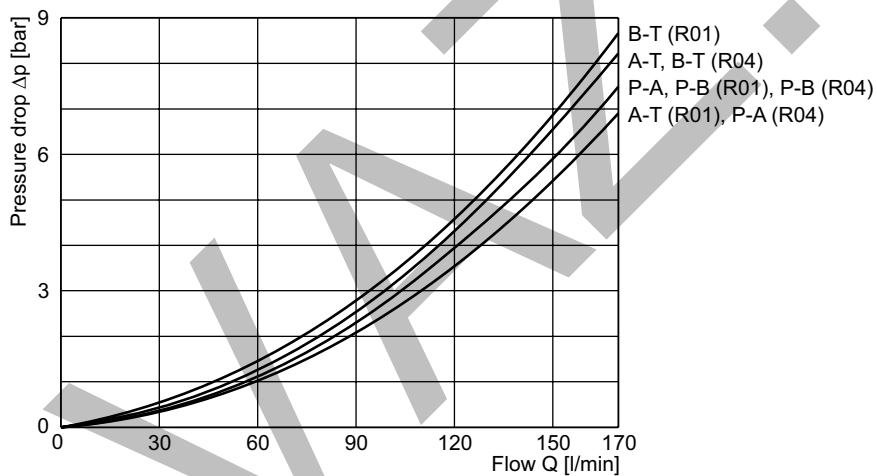
¹⁾ Bolts are not designed for simultaneous loading of all ports with maximum pressure.
 The total pressure profile has to be adapted to the tensile strength of the bolts.

D3DWR

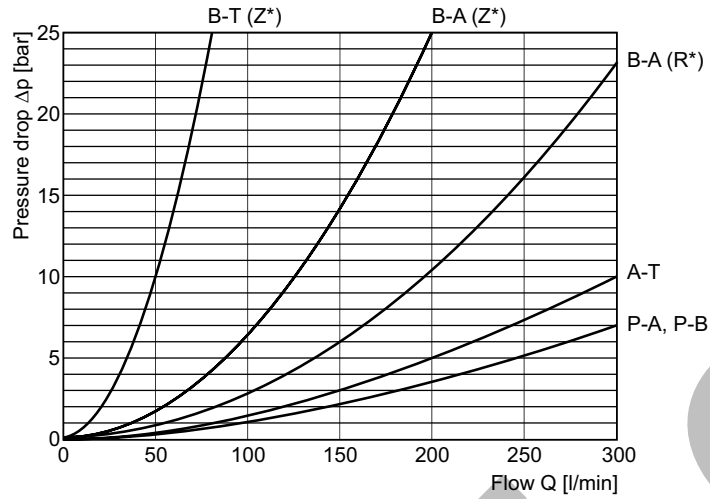
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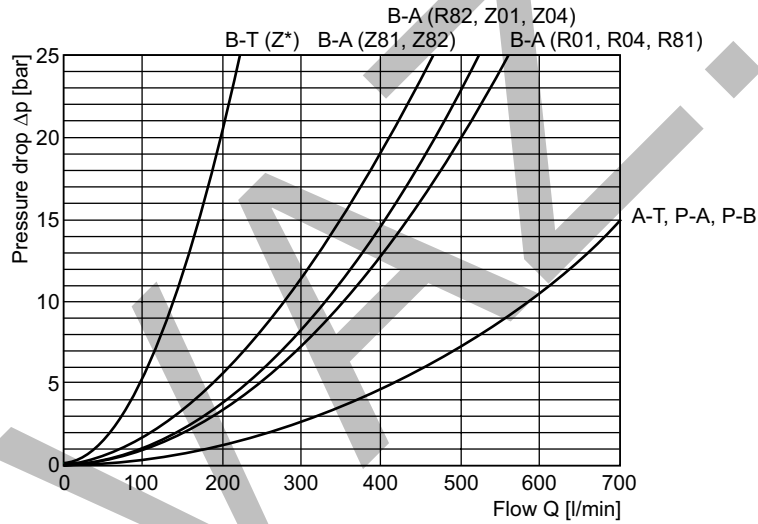
D31NWR



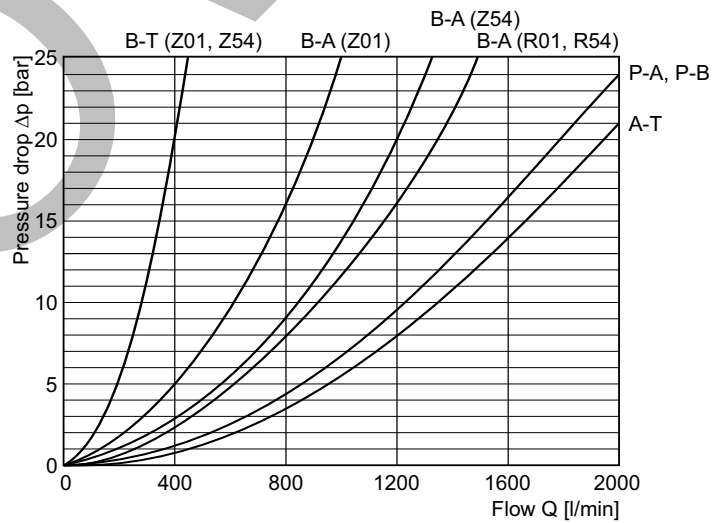
D41VW



D91VW



D111VW



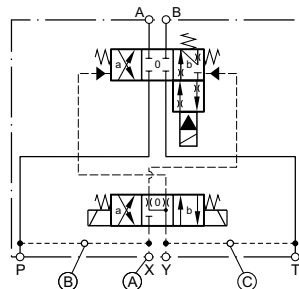
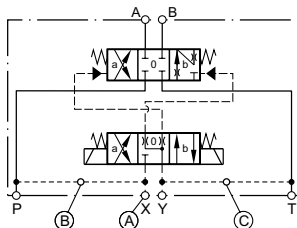
D31NW on request.

D3-D11 REG-HYB UK.indd 12.07.22

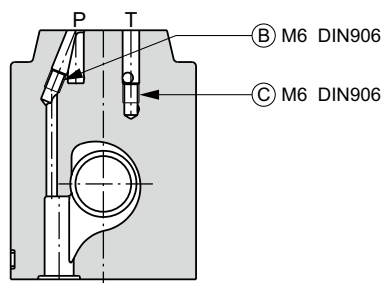
Pilot oil inlet (supply) and outlet (drain)

○ open, ● closed

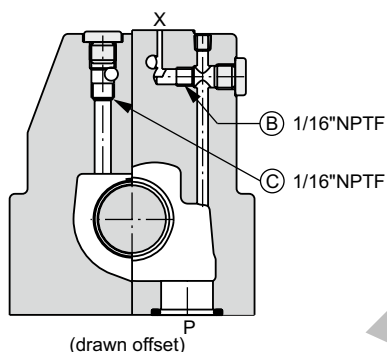
Pilot oil		B	C
Inlet	Drain		
internal	external	○	●
external	external	●	●
internal	internal	○	○
external	internal	●	○



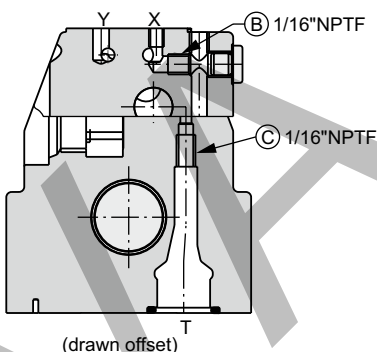
D31NWR



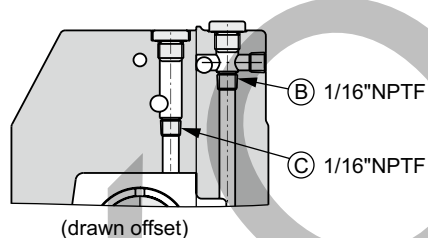
D41VWR



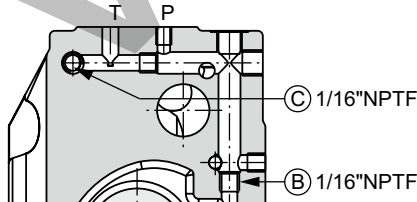
D41VWZ



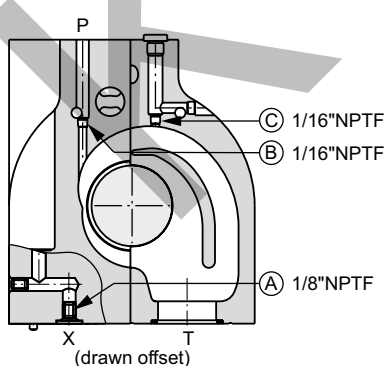
D91VWR



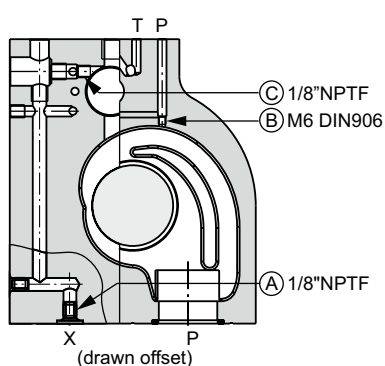
D91VWZ



D111VWR



D111VWZ

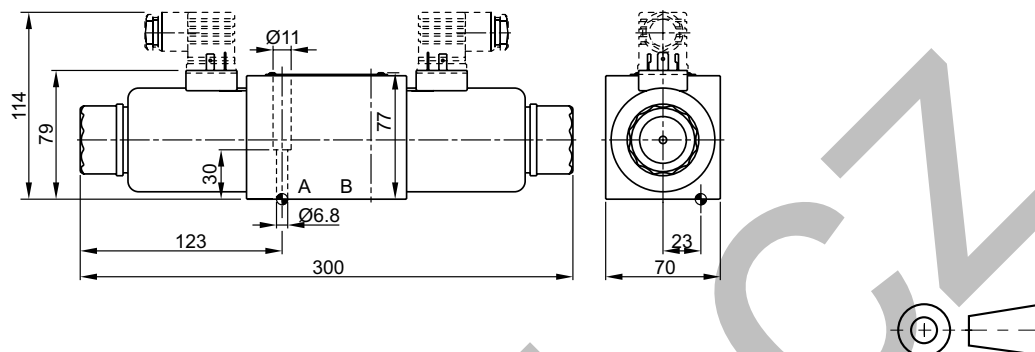


○ open, ● closed

Pilot oil		A	B	C
Inlet	Outlet			
internal	external	○	Orifice Ø1.5	●
external	external	Orifice Ø1.5	●	●
internal	internal	○	Orifice Ø1.5	○
external	internal	Orifice Ø1.5	●	○

D3DWR

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



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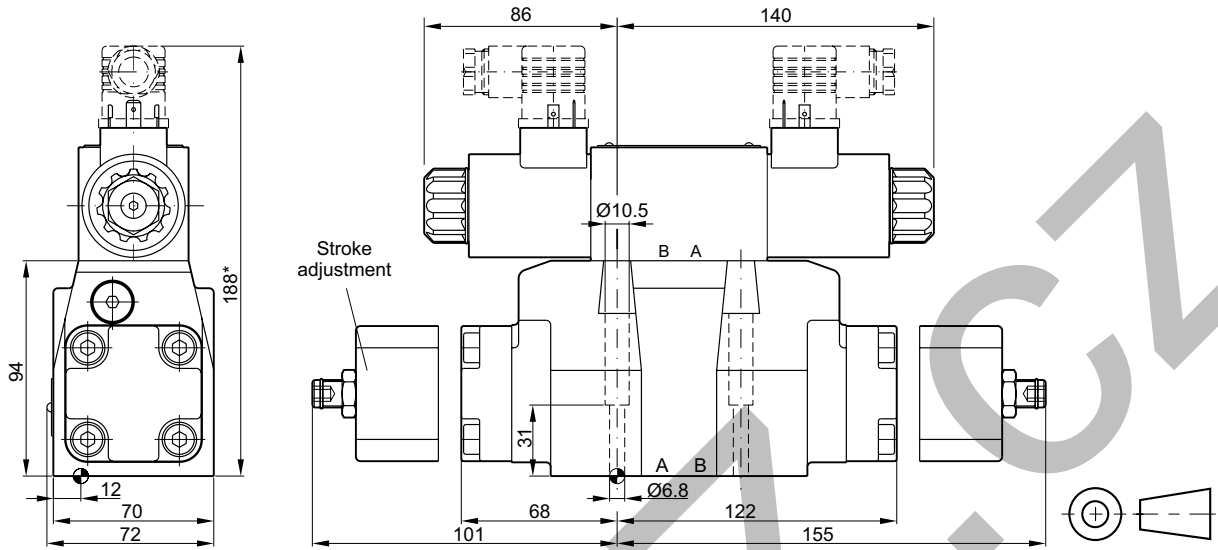
Surface finish	Kit	Kit	Kit	Kit
	BK385	4x M6x40 ISO 4762-12.9	13.2 Nm ±15 %	NBR: SK-D3W-30 FPM: SK-D3W-V-30

The space necessary to remove the plug per EN 175301-803, design type AF is at least 15 mm.
 The torque for the screw M3 of the plug has to be 0.5 to 0.6 Nm.

Dimensions

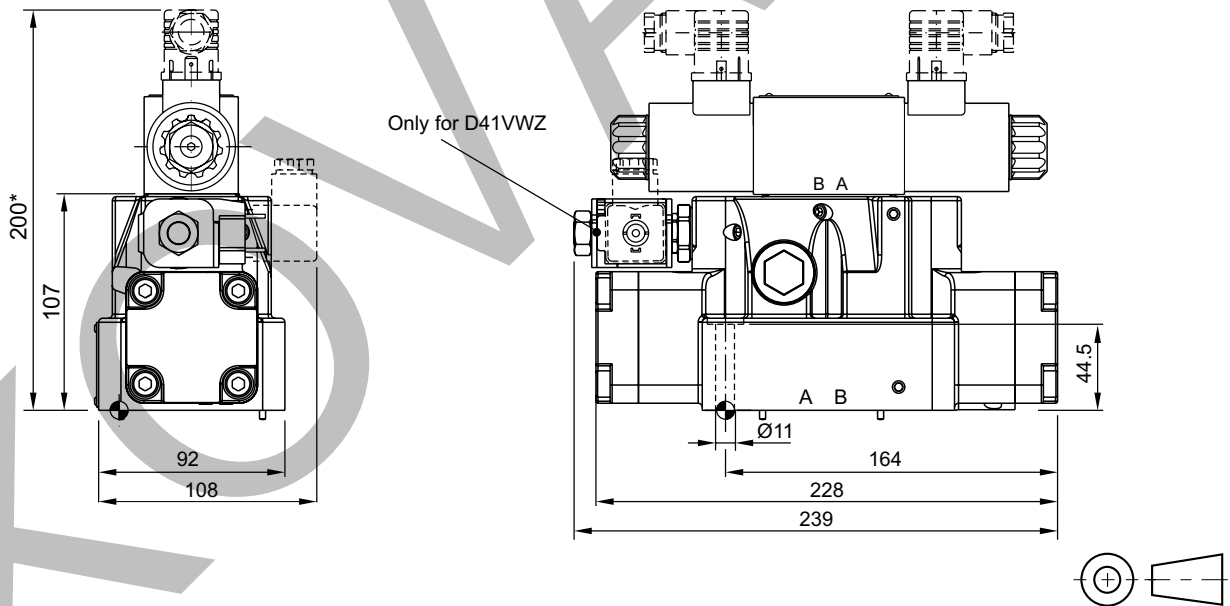
D31NWR

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



Surface finish	Kit	Kit	Kit	Kit
	BK385	4x M6x40 ISO 4762-12.9	13.2 Nm ±15 %	NBR: SK-D31NW-N-91 FPM: SK-D31NW-V-91

D41VWR/Z

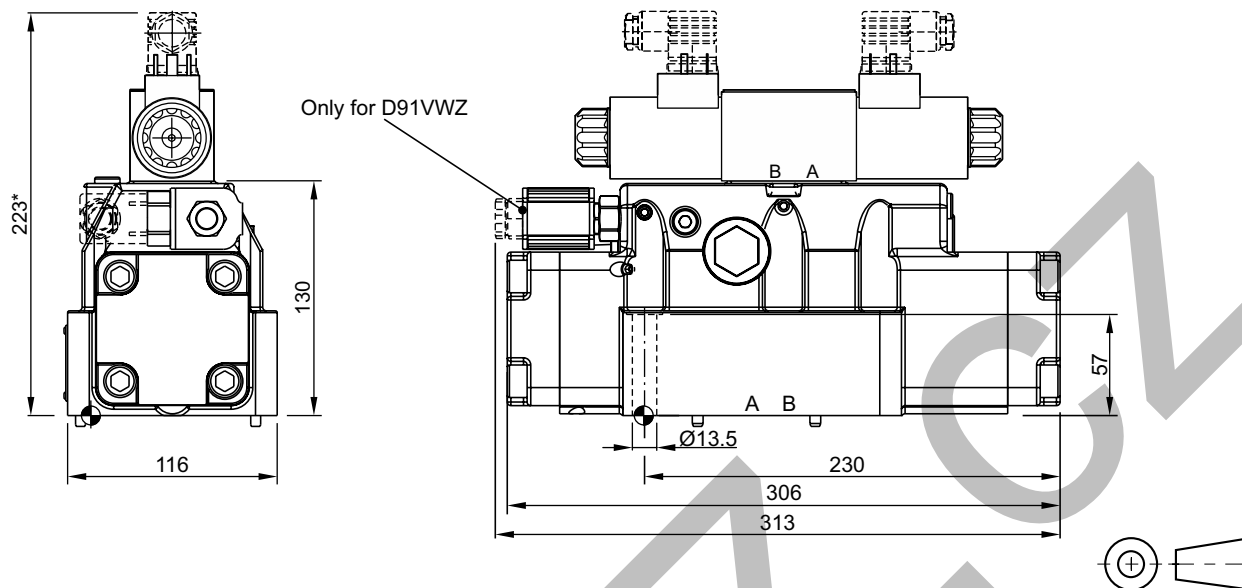


Surface finish	Kit	Kit	Kit	Kit
	BK320	4x M10x60 2x M6x55 ISO 4762-12.9	63 Nm ±15 % 13.2 Nm ±15 %	NBR: SK-D41VW-N-91 FPM: SK-D41VW-V-91


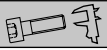


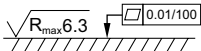
The space necessary to remove the plug per EN 175301-803, design type AF is at least 15 mm.
The torque for the screw M3 of the plug has to be 0.5 to 0.6 Nm.

* Please add for each sandwich plate +40 mm (pressure reducing valve, choke valve meter-in/-out).

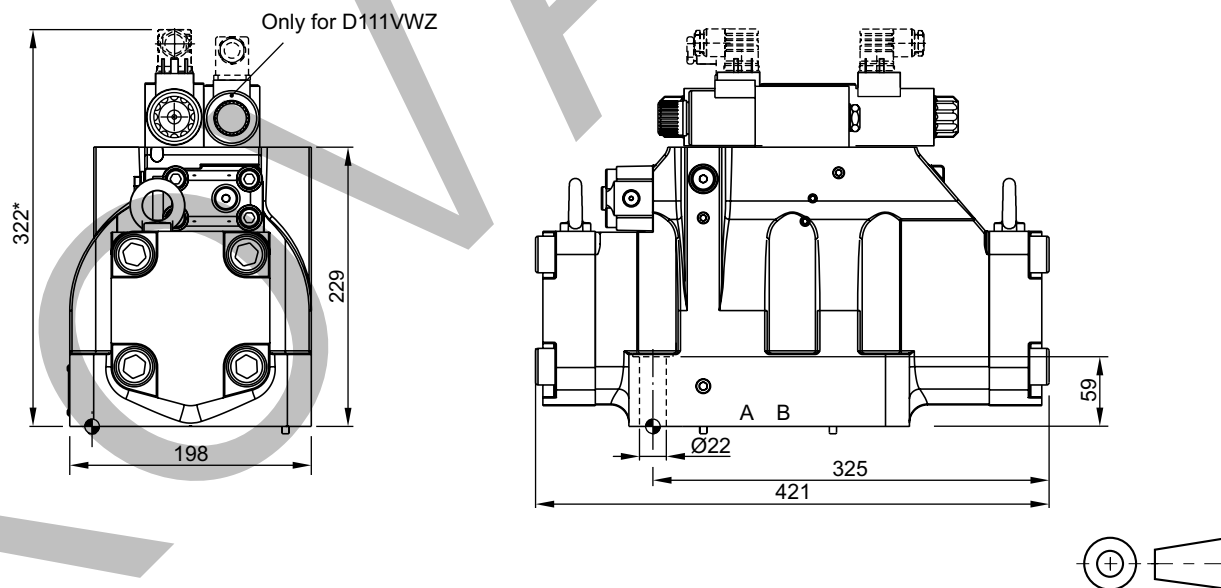
D91VWR/Z


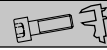


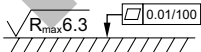


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Surface finish	 Kit			 Kit
	BK360	6x M12x75 ISO 4762-12.9	108 Nm ± 15 %	NBR: SK-D81VW-N-91 / SK-D91VW-N-91 FPM: SK-D81VW-V-91 / SK-D91VW-V-91

D111VW



Surface finish	 Kit			 Kit
	BK386	6x M20x90 ISO 4762-12.9	517 Nm ± 15 %	NBR: SK-D111VW-N-91 FPM: SK-D111VW-V-91

The space necessary to remove the plug per EN 175301-803, design type AF is at least 15 mm.
 The torque for the screw M3 of the plug has to be 0.5 to 0.6 Nm.

* Please add for each sandwich plate +40 mm (pressure reducing valve, choke valve meter-in/-out).

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