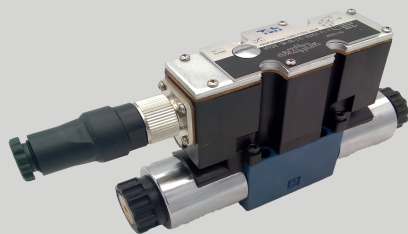


## PROPORTIONAL DIRECTIONAL VALVES



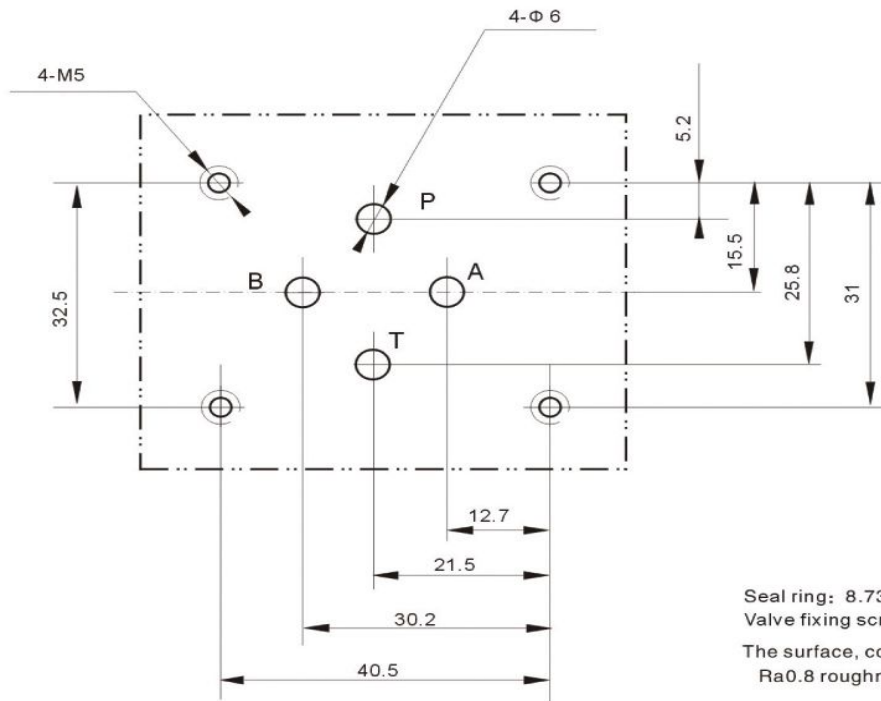
### Technical

Size	6	10
Operating pressure (MPa)	31.5	31.5
Flow rate (L/min)	42	75
Oil temperature range(°C)	-20 / 80	-20 / 80
Weight(KGS)	2.2	6.8
	2.2	6.8
Viscosity-Range (mm <sup>2</sup> /s)	20 / 380	
Oil cleanliness	NAS1638 class 9 and ISO4406 class 20/18/15	

### Electrical

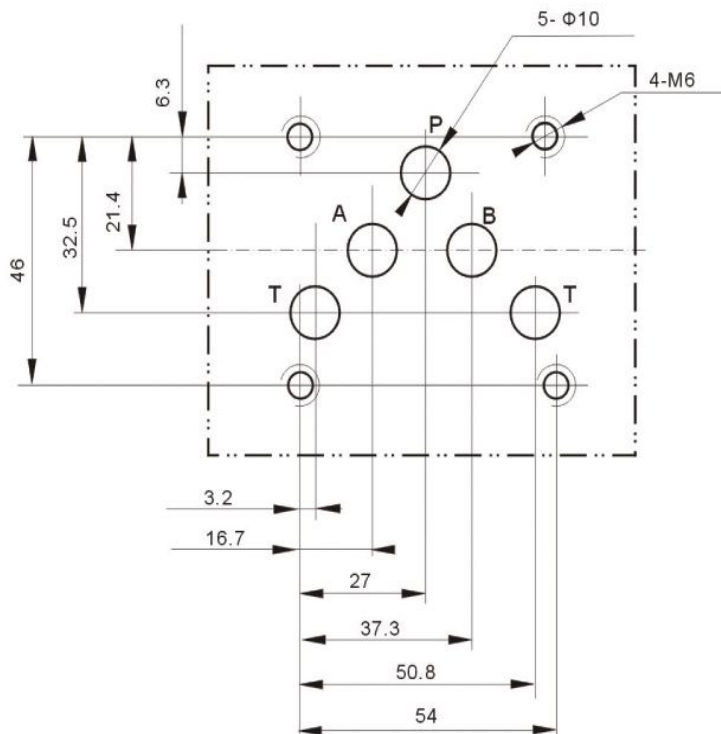
Voltage type		Direct voltage
BFWN	Voltage input "A1" (V)	± 10
Command signal	Current input "F1" (mA)	4~20
Max. current per solenoid (A)		2.5
Solenoid coil Resistance (Ω)	Cold value at 20 °C	2
	Max. warm value	3
Duty cycle (%)		100
Max.Coil temperature <sup>2)</sup>		up to150
Electrical connection		Plug-in connector to DIN EN 175301-803 and ISO 4400
		Plug-in connector to DIN EN 175301-803 and ISO 4400 Plug-in connector to DIN 43563-AM-3
Insulation of valve to DIN 40 050		IP 65

▶ VPTSHE SM-06 Subplate Installation Dimensions



Seal ring: 8.73 × 1.78  
 Valve fixing screw: 4-M5 × 45-12.9(GB70-85)  
 The surface, connecting with the valve, should be Ra0.8 roughness, and 0.01/100mm flatness.

▶ VPTSHE SM-10 Subplate Installation Dimensions



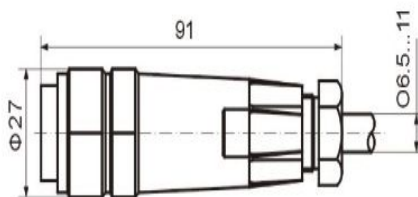
Seal ring: 8.73 × 1.78  
 Valve fixing screw: 4-M5 × 45-12.9(GB70-85)  
 The surface, connecting with the valve, should be Ra0.8 roughness, and 0.01/100mm flatness.

▶ VPTSHE Control electronics

VPTSHE	Analogue command value module		Integrated into the valves	
Supply voltage	Nominal voltage	VDC	24	
	Lower limiting value	V	21/22	19
Amplifier current consumption	$I_{max}$	A	1.8	1.8
	Max. impulse current	A	3	3

▶ Electrical connection, plug-in connectors

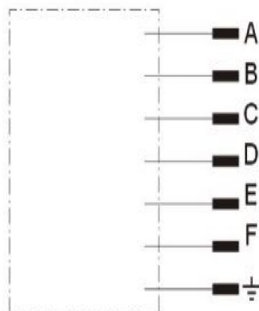
(with integrated electronics (OBE) and for version "J" = sea water-resistant) Plug-in connector see the block circuit diagram below



Plug-in connector:  
DIN 43 563-BF6-3/Pg11

### Integrated electronics for type

Pin allocation of the component plug



	Contact	Signal
Supply voltage	A	24VDC (19~35VDC)
	B	GND
	C	n.c. <sup>(1)</sup>
Differential amplifier input	D	Com. value (±10V/4-20mA) reference potential
	E	
	F	n.c. <sup>(1)</sup>

Positive command value (0 to 10 V or 12 to 20 mA) at D and reference potential to E causes flow from P to A and B to T. Negative command value (0 to 10 V or 12 to 4 mA) at D and reference potential to E causes flow from P to B and A to T. For valves with a solenoid on side "a" (spool variants EA and WA) a positive command value at D and reference potential to E (NS 6: 4 to 20 mA and NS 10: 12 to 20 mA) causes flow from P to B and A to T.

#### Recommendation:

- up to 25 m cable length type LiYCY 5 x 0.75 mm<sup>2</sup>
- up to 50 m cable length type LiYCY 5 x 1.0 mm<sup>2</sup>
- External diameter 6.5 to 11 mm
- Connect screen to PE only on the supply side

▶ Model description

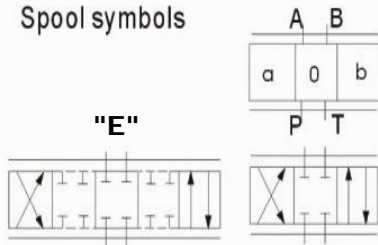
VPTSH – E – \* – \* – \* – **2X – G24** – \* – \* – \* – \* – \*

Directional proportional valve

No code Without integrated electronics  
With integrated electronics

SM – Without monitoring

Spool symbols



With spool symbols:  
P → A:  $q_{vmax}$  B → T:  $q_v/2$   
P → B:  $q_v/2$  A → T:  $q_{vmax}$

DN 6  
DN 10

Nominal flow at valve pressure differential  $\Delta p = 10$  bar

	DN 6	DN 10
07	7 L/min	
15	15 L/min	
30	26 L/min	
		DN 10
30	30 L/min	
60	60 L/min	

Further details in clear text

Omit Nitrile rubber sealing  
V NBR seals suitable for mineral oil  
(HL, HLP) to DIN 51 524

No code BFW BFWN  
A1 Command value input  $\pm 10V$   
F1 Command value input  $4\sim 20mA$

<sup>2)</sup>K4 Electrical connection For BFW (type)  
with plug component DIN EN 175301-803  
See page A.3.3

<sup>2)</sup>K31 with plug component DIN 43 650-AM2  
See page A.3.4

Special protection  
No code Without special protection  
<sup>1)</sup>J Seawater-resistant (only for DN6)

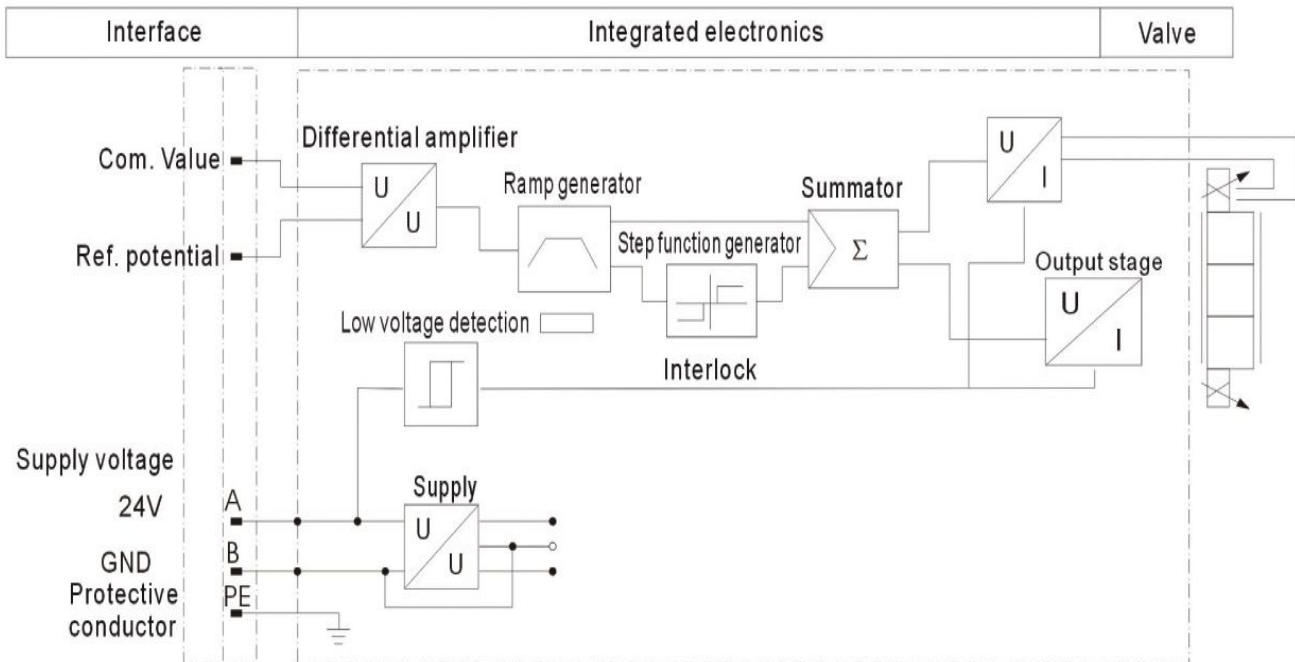
No code 24V 24 VDC

2X Component series 20 to 29 (20 to 29  
unchanged installation and connection dimensions)

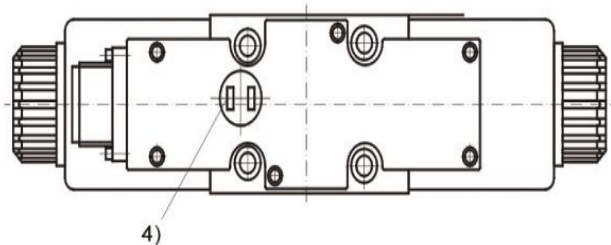
1. Other types of electrical protection on request

2. Only available with DN6: We can only supply "31" in sea water  
resistant design "J" !

► Block circuit diagram / connection allocation

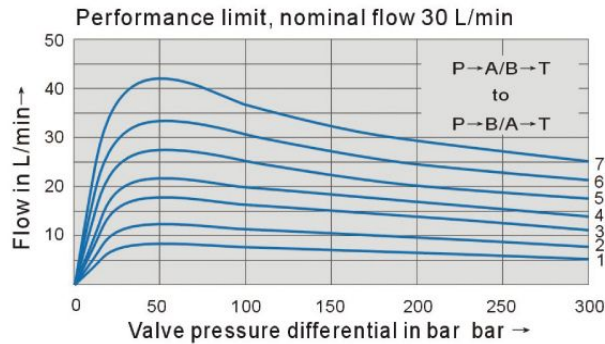
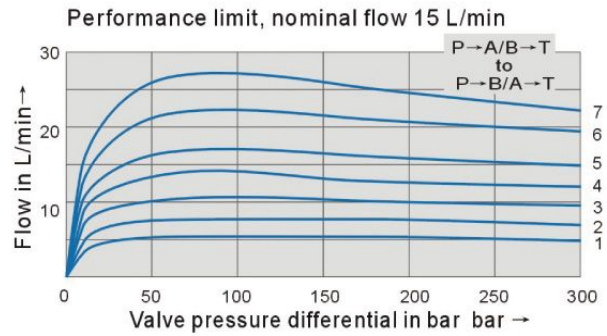
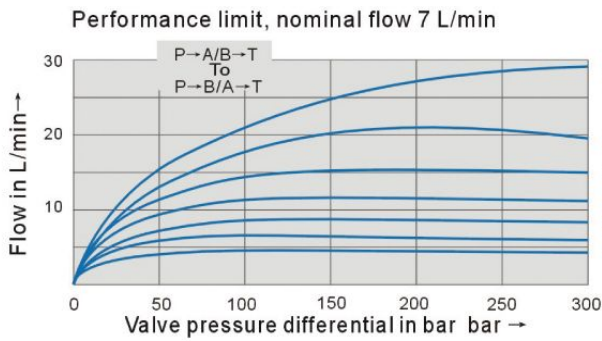
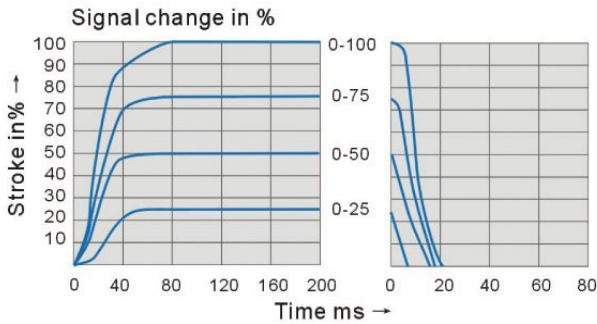


- 1) Contacts C and F must not be connected!  
Block circuit diagram / connection allocation
- 2) PE is connected to the cooling body and the valve housing
- 3) Protective conductor screwed to the valve housing and cover
- 4) Ramp can be externally adjusted from 0 to 2.5 s; the same applies for  $T_{up}$  and  $T_{down}$
- 5) Output stages current regulated
- 6) Low voltage detection is not carried out for component type BFWN-03-2X



► Transition functions with electrical step input signals

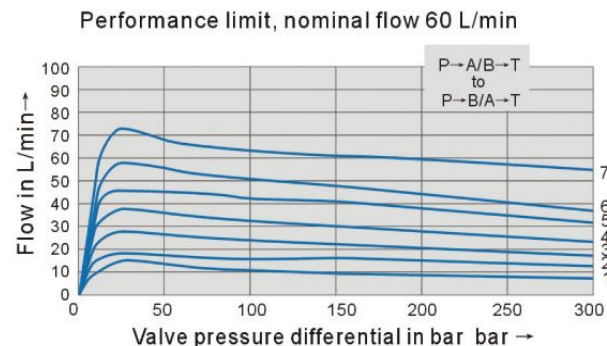
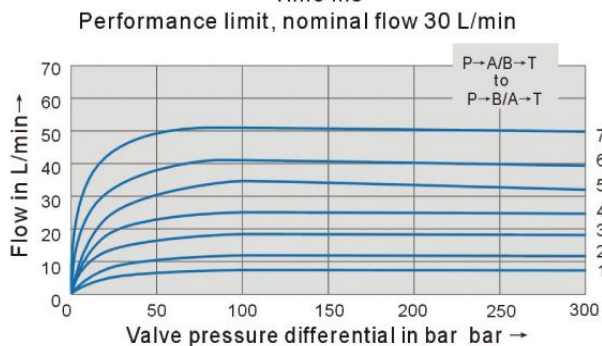
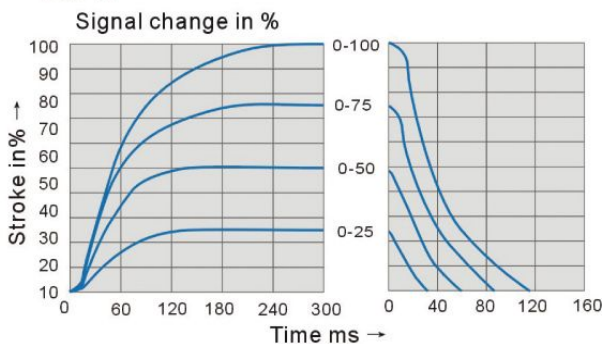
**6DN**



- 1 Com. Value=40%
- 2 Com. Value=50%
- 3 Com. Value=60%
- 4 Com. Value=70%
- 5 Com. Value=80%
- 6 Com. Value=90%
- 7 Com. Value=100%

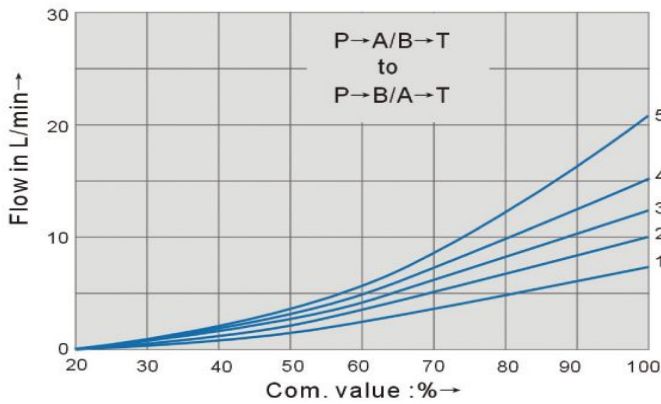
If the performance limits are exceeded, then the movement of spool will be unstable.

**10DN**

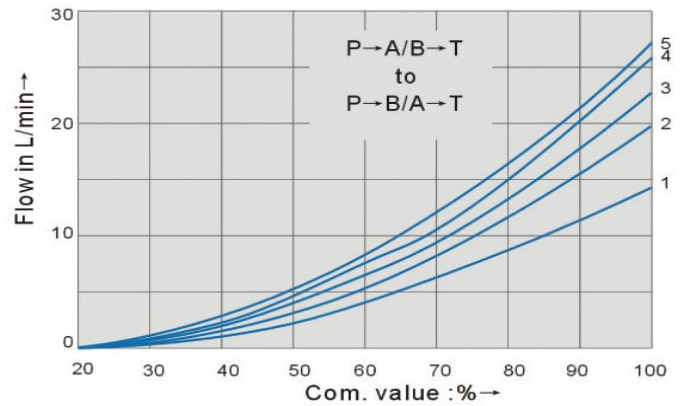


► Characteristic curves (measured with HLP46, Coil =40°C ± 5°C) DN6

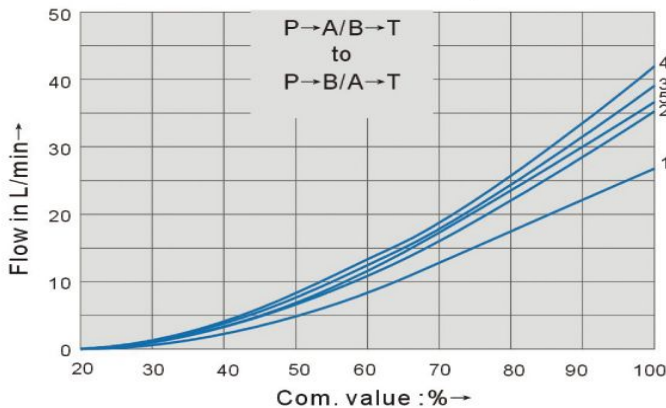
7 l/min nominal flow at differential pressure 10 bar



15 l/min nominal flow at differential pressure 10 bar

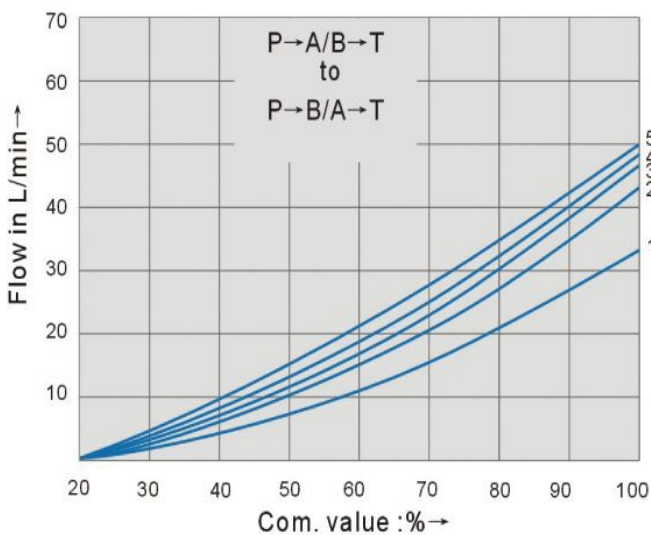


30 l/min nominal flow at differential pressure 10 bar

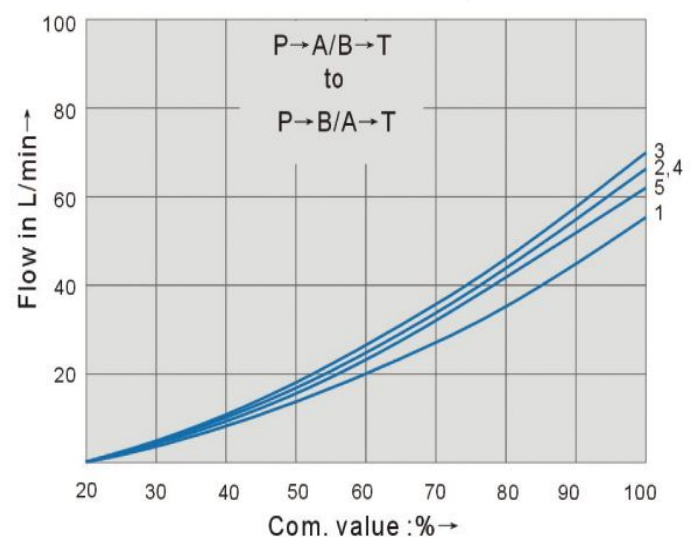


► Characteristic curves (measured with HLP46, Coil =40°C ± 5°C) DN10

30 l/min nominal flow at differential pressure 10 bar



60 l/min nominal flow at differential pressure 10 bar



- 1  $\Delta p=10$  bar Constant
- 2  $\Delta p=20$  bar Constant
- 3  $\Delta p=30$  bar Constant
- 4  $\Delta p=50$  bar Constant
- 5  $\Delta p=100$  bar Constant

$\Delta p$  = Valve pressure differential  
(inlet pressure  $P_p$  minus load  
pressure  $P_L$  and minus return pressure  $P_T$ )