

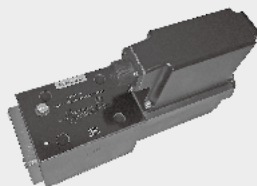


6.20

Proportional directional valves

Type 4WRPEH10...L2X

NG 10
Up to 315 bar
Up to 100 L/min



Contents

Function and configuration	02
Ordering code	03
Symbols	03
Technical data	04
Electrical connection	05
Integrated electronics	06-07
Characteristic curves	08-09
Unit dimensions	10

Features

- Directly actuated controlled directional valve, with control spool and sleeve in servo quality
- Single-side operated, 4/4 fail-safe position in deactivated state
- Electric position feedback and integrated electronics (OBE), calibrated in the factory
- Electric port 6P+PE Signal input of differential amplifier with interface A1: $\pm 10V$ or interface F1: 4...20mA ($R_{sH}=200\Omega$)
- Subplate mounting, porting pattern to ISO 4401-05-04

Function and configuration

The 4WRPEH type high-response valve is a pilot-operated directional control valve with electrical position feedback and integrated electronics (OBE).

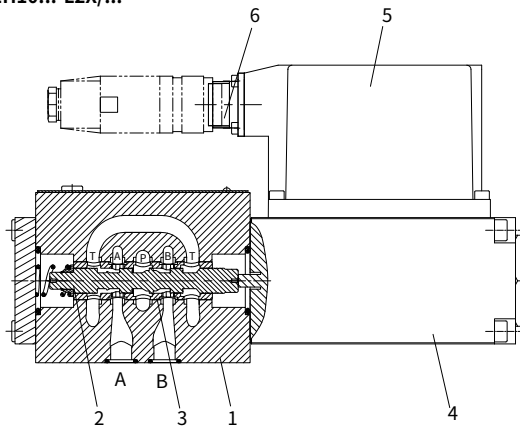
The valves basically consists of the housing (1), spool (2), sleeve (3), control solenoid with position transducer (4) and so on.

The specified command value is compared with the actual position value in the integrated electronics (OBE). In the event of a control deviation, the stroke solenoid is activated, which adjusts the control spool against the spring due to the change in the magnetic force.

Lifting/control cross-section is proportionally regulated to the command value. In case of a command value presetting of 0V, the electronics adjusts the control spool against the spring to central position. In deactivated condition, the spring is untensioned to a maximum and the valve is in fail-safe position.

With the electronics switched off, the valve moves immediately into the relevant safe basic position (fail-safe). The switch position P-B/A-T is passed through during this process, which can result in movements on the controlled component. This must be taken into account in system designs.

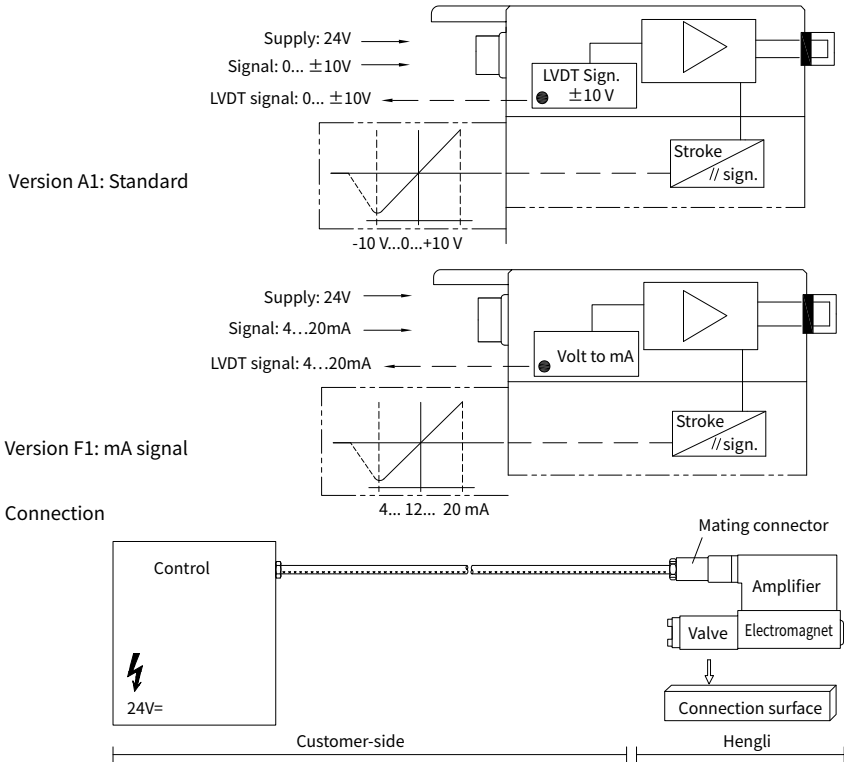
Type 4WRPEH10...-L2X/...



Technical data

General			
Design		Spool valve, directly operated, with steel sleeve	
Actuation		Proportional solenoid with position control, OBE	
Connection type		Plate port, porting pattern (ISO 4401-05-04-0-05)	
Installation position		Any	
Ambient temperature range		°C	-20...+50
Weight		Kg	7.1
Maximum vibration resistance (test condition)		Max. 25 g, space vibration test in all directions (24h)	
Hydraulic (measured with HLP 46, $\vartheta_{oil} = 40^{\circ}\text{C} \pm 5^{\circ}\text{C}$)			
Hydraulic fluid		Hydraulic oil according to DIN 51524...535	
Viscosity range	Recommended	mm ² /s	20...100
	Max. admissible	mm ² /s	10...800
Hydraulic fluid temperature range		°C	-20 to +70
Max. admissible degree of contamination of the hydraulic fluid, cleanliness class according to ISO 4406 (c)		Class 18/16/13	
Rated flow ($\Delta p = 35$ bar per edge)		L/min	50 100
Maximum operating pressure		bar	Port P, A, B: 315
Maximum operating pressure		bar	Port T: 250
Leakage flow at 100 bar	Linear	cm ³ /min	<1200 <1500
	Nonlinear	cm ³ /min	<600 <600
Static/Dynamic			
Hysteresis		%	≤ 0.2
Actuating time for signal step 0 ... 100%		ms	25
Temperature drift		Zero shift < 1% at $\Delta T = 40^{\circ}\text{C}$	
Zero compensation		Ex factory $\pm 1\%$	
Electric, control electronics integrated in the valve			
Relative duty cycle		%	100ED
Protection class		IP 65 (with mating connector mounted and locked)	
Connection		Mating connector 6P+PE, DIN 43563	
Supply voltage		24VDC _{nom}	
Terminal A		min. 21VDC / max. 40VDC	
Terminal B: 0V		Ripple max. 2 VDC	
Fuse protection, external		A _F	2.5
Input, version "A1"		Differential amplifier, Ri = 100 kΩ	
Terminal D (U _D)		0... ±10V	
Terminal E		0V	
Input, version "F1"		Load, R _{sh} = 200 Ω	
Terminal D (I _{D,E})		4...12...20mA	
Terminal E (I _{D,E})		Current loop I _{D,E} return	
Test signal, version "A1"		LVDT	
Terminal F (U _{Test})		0... ±10V	
Terminal C		Reference 0 V	
Test signal, version "F1"		LVDT	
Terminal F (I _{F,C})		4...20 mA output	
Terminal C (I _{F,C})		Current loop I _{F,C} feedback	

Electrical connection



Technical data for the cable

- Version: - Multi-core wire
- Litz wire structure, extra fine wire according to VDE 0295, class 6
- Protective earthing conductor, green-yellow
- Cu shielding braid
- Number of wires: - Determined by the valve type, connector type and signal configuration
- Line Ø: - 0.75 mm² to 20 m of length
- 1.0 mm² to 40 m of length
- OuterØ: - 9.4...11.8 mm
- 12.7...13.5 mm

Note:
Supply voltage 24 V DC_{nom}

if the value falls below 18V DC= an internal fast switch-off is effected which can be compared with "Release OFF".

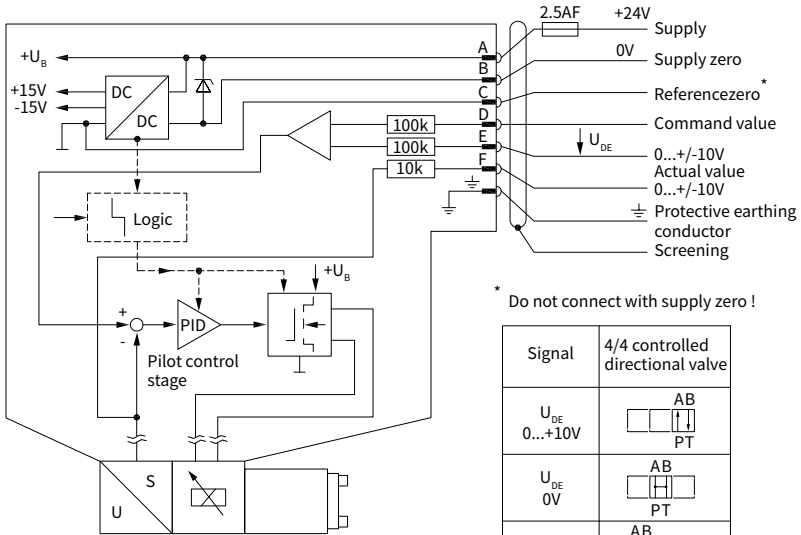
Additionally for version F1:
I_{D-E} ≥ 3mA - valve is active
I_{D-E} ≤ 2mA - valve is deactivated.

Electric signals taken out via control electronics (e.g. actual value) may not be used for the switch-off of safety-relevant machine functions! (See also the European standard "Safety requirements for fluid power systems and their components - Hydraulics", EN 982.)

Integrated electronics

Block diagram/pin assignment

Version A1: $U_{D-E} 0... \pm 10V$



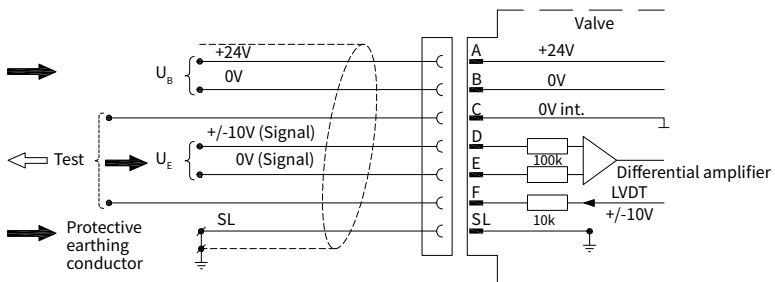
* Do not connect with supply zero !

Signal	4/4 controlled directional valve
$U_{D-E} 0...+10V$	
$U_{D-E} 0V$	
$U_{D-E} 0...-10V$	

06

Pin assignment 6P+PE

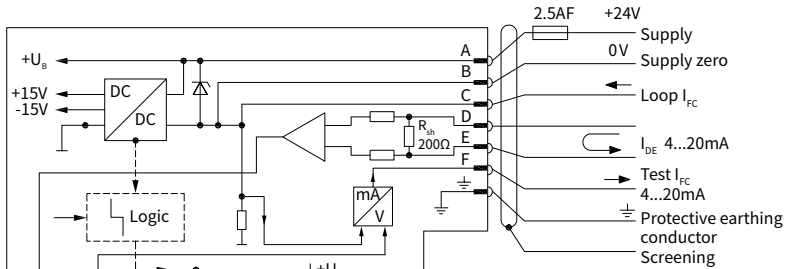
Version A1: $U_{D-E} 0... \pm 10V$



Integrated electronics

Block diagram/Pinout

Version F1: I_{D-E} 4...20mA

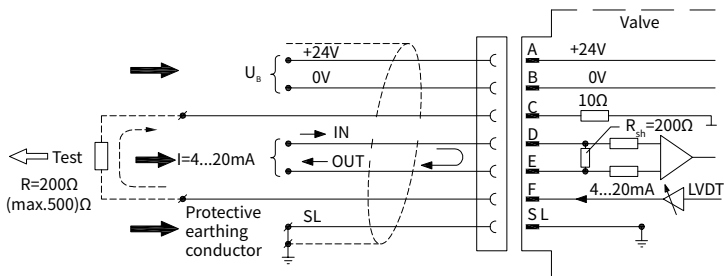


Signal	4/4 controlled directional valve
I_{D-E} 12...20mA	
I_{D-E} 12mA	
I_{D-E} 4...12mA	

$I_{D-E} \leq 2\text{mA}$, Valve inactive

Pin assignment 6P+PE

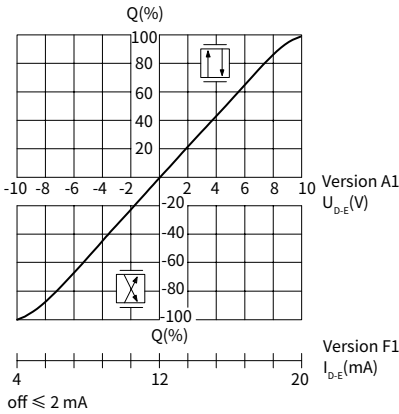
Version F1: I_{D-E} 4...20mA



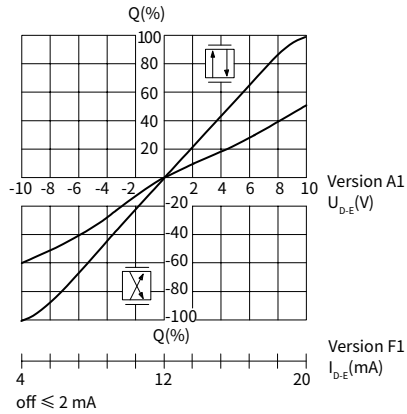
Characteristic curves (measured with HLP46, $\vartheta_{oil}=40^{\circ}\text{C} \pm 5^{\circ}\text{C}$)

Flow-signal function $Q=f(U_{D-E}), Q=f(I_{D-E})$

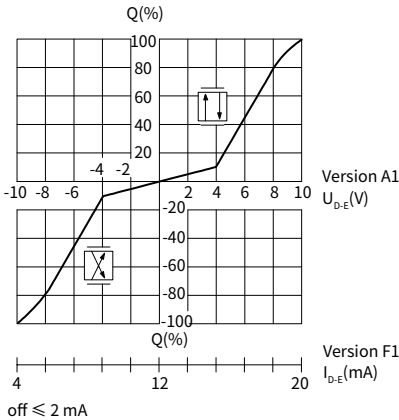
Linear characteristic curve (version "L", 1 : 1)



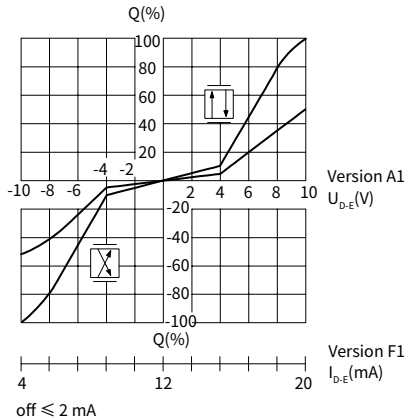
Linear characteristic curve (version "L", 2 : 1)



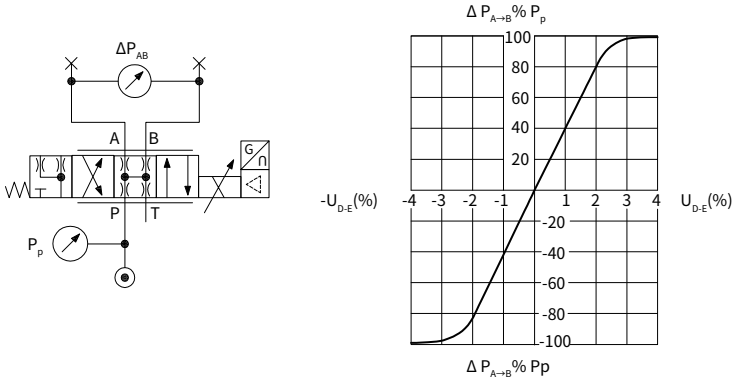
Inflected characteristic curve "P",
inflection at 40% , 1 : 1



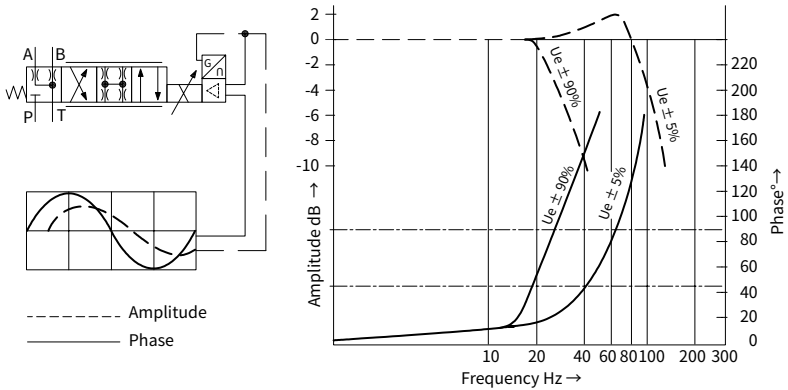
Inflected characteristic curve "P",
inflection at 40% , 2 : 1



Characteristic curves: Pressure amplification (measured with HLP46, $\vartheta_{oil} = 40^\circ\text{C} \pm 5^\circ\text{C}$)



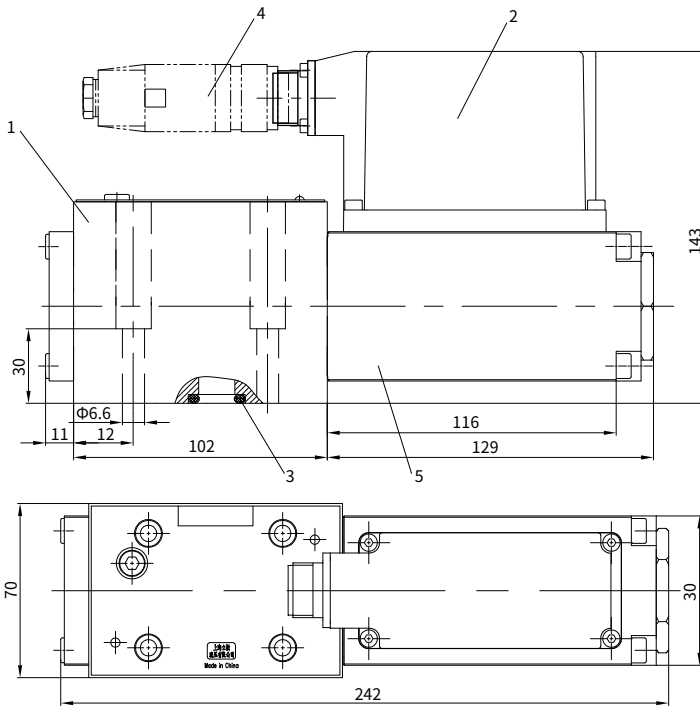
Characteristic curves: Bode diagram



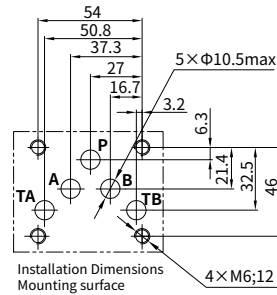
06

Unit dimensions

(nominal dimensions in mm)



- 1 Valve housing
- 2 Integrated electronics
- 3 Identical seal rings for ports A, B, P and T
- 4 Plug-in connector
- 5 Proportional solenoid with inductive position transducer



Valve mounting screws

The following valve fixing screws are recommended:

- 4 GB/T 70.1 - M6×40 - 10.9
- Tightening torque $M_A = 11+3 \text{ Nm}$

