



4WRPEH6...type Servo Valve

4WRPEH6...2XJ...type

Size 6

Max. Working Pressure: 315 bar

Max. Flow: 40 L/min



Contents

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

Features

- With control spool and sleeve in servo quality
- Operated on one side, 4/4-fail-safe position in switched off state
- Electric position feedback and integrated electronics(OBE), calibrated in the factory
- Electrical connection 6P+PE signal input differential amplifier with interface "A1": $\pm 10V$ or interface "F1": 4...20mA ($R_{sh} = 200\Omega$)
- Subplate mounting, porting pattern to ISO 4401-03-02

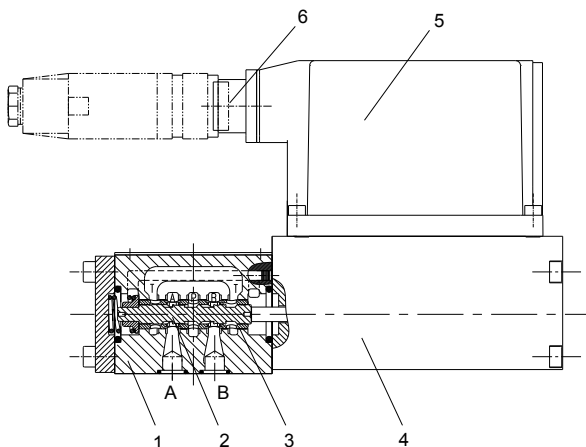
Function and configuration

4WRPEH type high-response valve is a pilot-operated directional control valve with electrical position feedback and integrated electronics (OBE). The valve consists of the valve 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 0 V, 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 4WRPEH6....-2XJ/G24...



Ordering code

4WRP

E

H

6

B

-2XJ /G24

/

*

Directional control valve

direct operated

With integrated electronics

Control spool/sleeve

NG 6

Spool symbols

AB

PT

Transitional symbols

With symbols C5 and C1:

P→A:qv B→T:qv/2

P→B:qv/2 A→T:qv

Solenoid position

AB

(Standard) =Type B

Further information in plain text

V = FKM Seals

No code = NBR Seals

A1= Command/ actual value ±10 V

F1 = Command/ actual value 4 to 20 mA

K31= With component plug, Without plug-in connector

Z31= With component plug and plug-in connector

Supply voltage of the control electronics

G24= + 24 V DC

2XJ= 20J to 29J: unchanged installation and connection dimensions

Flow characteristics:

Linear

Inflected characteristic curve

Rated flow of with 70 bar pressure differential (35bar/control edge)

02=2 L/min 04=4 L/min 12=12L/min

24=24L/min 40=40L/min

Directional control valve

direct operated

With integrated electronics

Control spool/sleeve

NG 6

Spool symbols

AB

PT

Transitional symbols

With symbols C5 and C1:

P→A:qv B→T:qv/2

P→B:qv/2 A→T:qv

Solenoid position

AB

(Standard) =Type B

Symbols

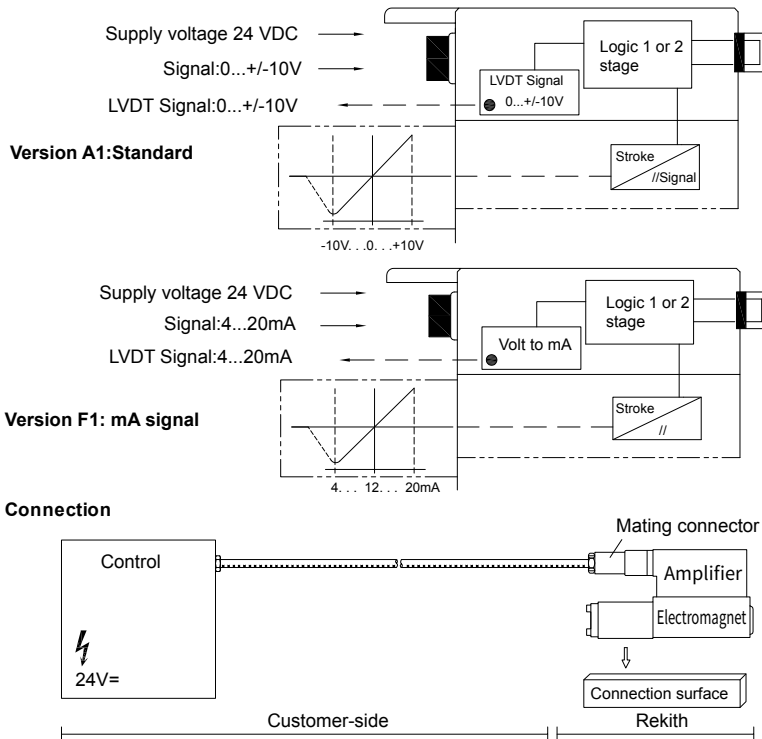
AB PT	Linear	P:Inflection 40%
	C3,C5,C4,C1,C	C3,C5,C4,C1

Technical data

General							
Design		Spool valve, direct operated, with steel sleeve					
Actuation		Proportional solenoid with position control, OBE					
Connection type		Subplate mounting, porting pattern according to ISO 4401-03-02-0-05					
Installation position		Any					
Ambient temperature range		°C	-20~+50				
Weight		Kg	~2.75				
Maximum vibration resistance (test condition)		Max. 25 g, space vibration test in all directions (24h)					
Hydraulic (measured at p=100bar, with HLP46 at $\vartheta_{oil} = 40^{\circ}\text{C} \pm 5^{\circ}\text{C}$)							
pressure fluid		Mineral oil (HL, HLP) to DIN 51 524					
Viscosity range	Recommended	mm ² /s	20...100				
	Maximum admissible	mm ² /s	10...800				
Hydraulic fluid temperature range		°C	-20 to +70				
Maximum 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	2	4	12	24	40
Maximum operating pressure		bar	Port A, B, P: 315				
Maximum operating pressure		bar	Port T: 250				
Leakage flow at 100 bar	Linear	cm ³ /min	< 150	< 180	< 300	< 500	< 900
	Nonlinear	cm ³ /min	—	—	—	< 300	< 450
Static/Dynamic							
Hysteresis		%	≤ 0.2				
Actuating time for signal step 0 ... 100%		ms	10				
Temperature drift		Zero shift < 1% at $\Delta T = 40^{\circ}\text{C}$					
Zero compensation		Ex factory ± 1%					

Electric, control electronics integrated in the valve		
Relative duty cycle	%	100ED
Protection class according to EN 60529		IP 65.
Connection		Plug-in connector 6P+PE, DIN 43563
Supply voltage		24VDC _{nom}
Terminal A		min. 21VDC / max. 40VDC
Terminal B		0V (ripple max. 2)
Fuse protection, external	A _F	2.5
Input, version "A1"		Differential amplifier, R _i = 100 kΩ
Terminal D (U _E)		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 signal 4 ... (12) ... 20 mA on external load
Terminal F (I _{F-C})		200 ... 500 Ωmaximum
Terminal C (I _{F-C})		4 ... (12) ... 20mA (output)
		Current loop I _{F-C} return
Adjustment		calibrated before delivery , see characteristic curves

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
Outer Ø: - 9.4...11.8 mm
12.7...13.5 mm

Note:

Supply voltage 24 V DC_{nom}

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

Additionally for version F1:

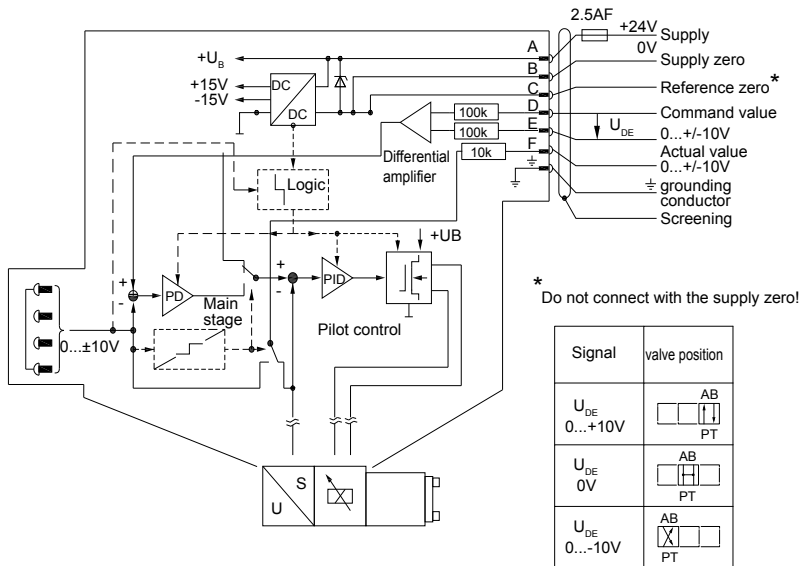
$I_{D-E} \geq 3\text{mA}$ - valve is active
 $I_{D-E} \leq 2\text{mA}$ - valve is deactivated.

Electric signals taken out via control electronics may not be used for the switch-off of safety-relevant machine functions!

Integrated electronics (OBE)

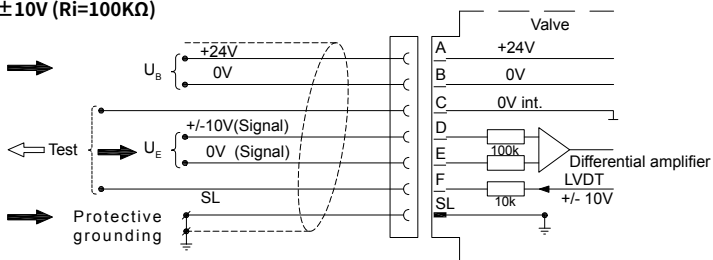
Block diagram/pin assignment

A1:U_{D-E} 0...±10V



In assignment 6P+PE

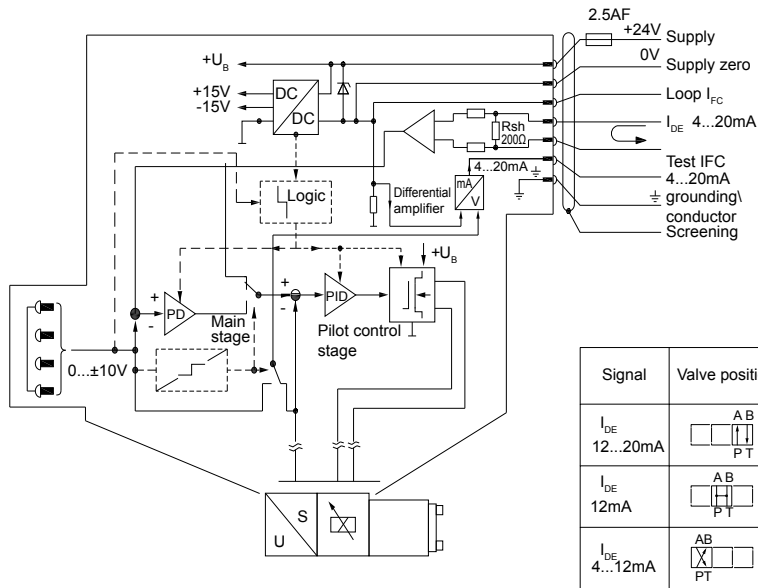
A1:U_{D-E} ±10V (Ri=100KΩ)



Integrated electronics (OBE)

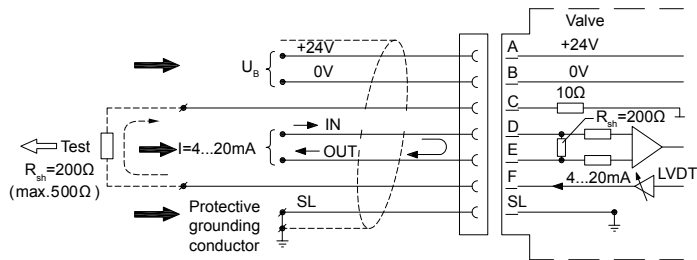
Block diagram/pin assignment

F1: $I_{D,E}$ 4...20mA



In assignment 6P+PE

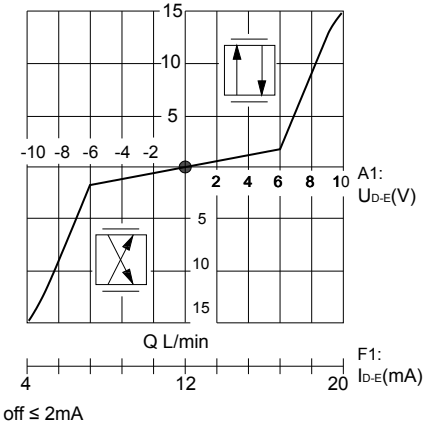
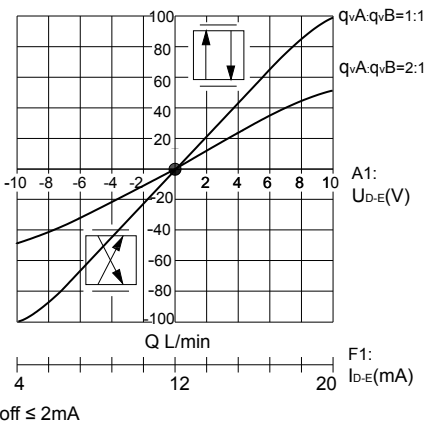
F1: $I_{D,E}$ 4...20mA ($R_{sh} = 200\ \Omega$)



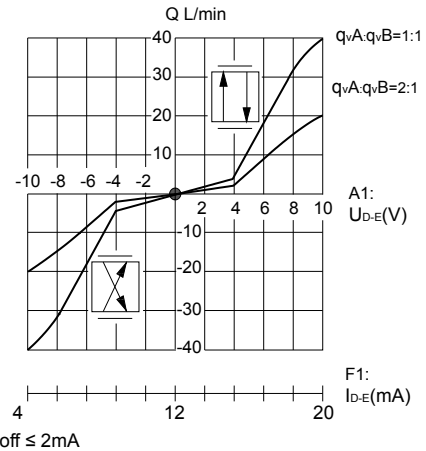
Characteristic curves (measured at p =100bar, with HLP46, $\vartheta_{oil}=40^{\circ}\text{C} \pm 5^{\circ}\text{C}$)

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

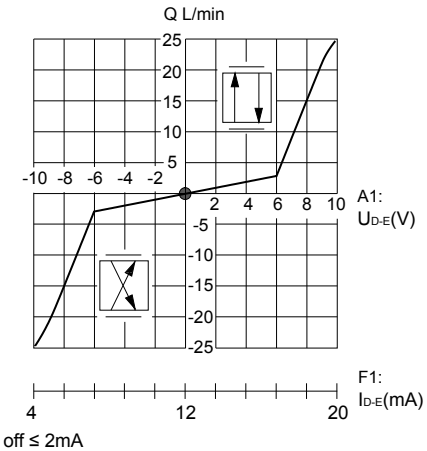
Linear characteristic curve (version "L")



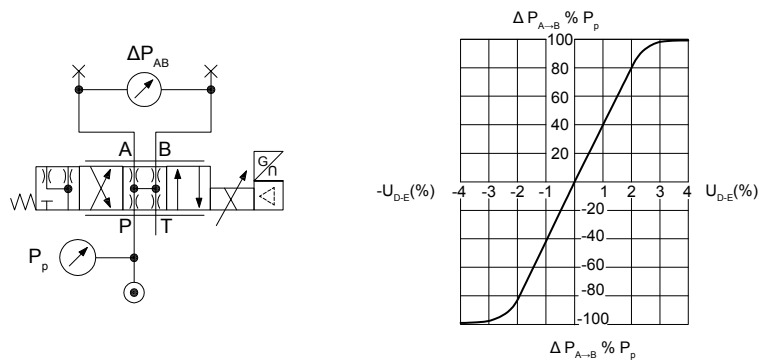
**Inflected characteristic curve "P",
inflection at 40%**



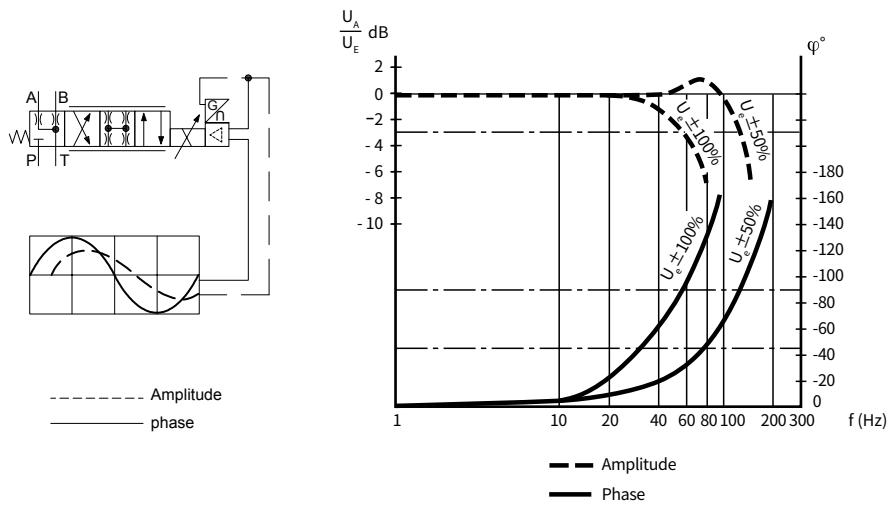
**Inflected characteristic curve "P",
inflection at 60%**



Characteristic curves: Pressure amplification (measured at $p=100\text{bar}$, with HLP46, $\vartheta_{\text{oil}}=40^{\circ}\text{C} \pm 5^{\circ}\text{C}$)



Characteristic curves: Bode diagram (measured at $p=100\text{bar}$, with HLP46, $\vartheta_{\text{oil}} t=40^{\circ}\text{C} \pm 5^{\circ}\text{C}$)



Unit dimensions

(Dimensions in mm)

