

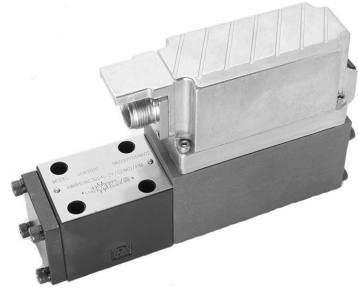
# AH-4WRPEH6...type Servo Valve

AH-4WRPEH6...20S...type

Size 6

Max. Working Pressure: 315 bar

Max. Flow: 40 L/min



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## Features

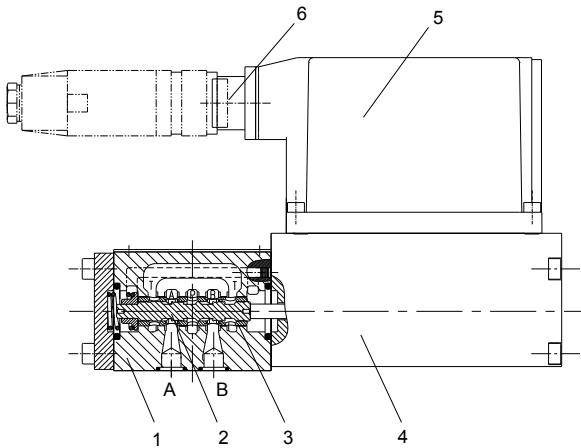
- With control spool and sleeve in servo quality
- Operated on one side, 4/4-fail-safe position in switched off state
- Electric position feedback and integrated electronics(OBE), calibrated in the factory
- Electrical connection 6P+PE signal input differential amplifier with interface "A1":  $\pm 10V$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

## Function and configuration

AH-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 AH-4WRPEH6...-20S/G24...



# Ordering code

	AH-4WRP	E	H	6		B		-20S/G24	/		*
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Directional control valve  
direct operated


With integrated electronics


Control spool/sleeve =H


NG 6 =6


Spool symbols

AB

 =C3, C5

 =C4, C1

 =C

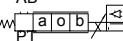
 =C

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

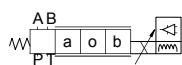

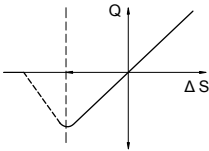
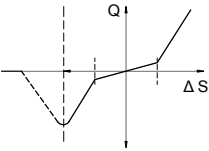

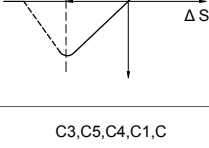
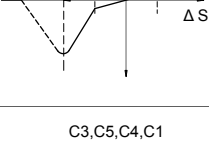

20S= 20S to 29S: unchanged installation and  
connection dimensions

Flow characteristics:  
L= Linear  
P= 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

# Symbols

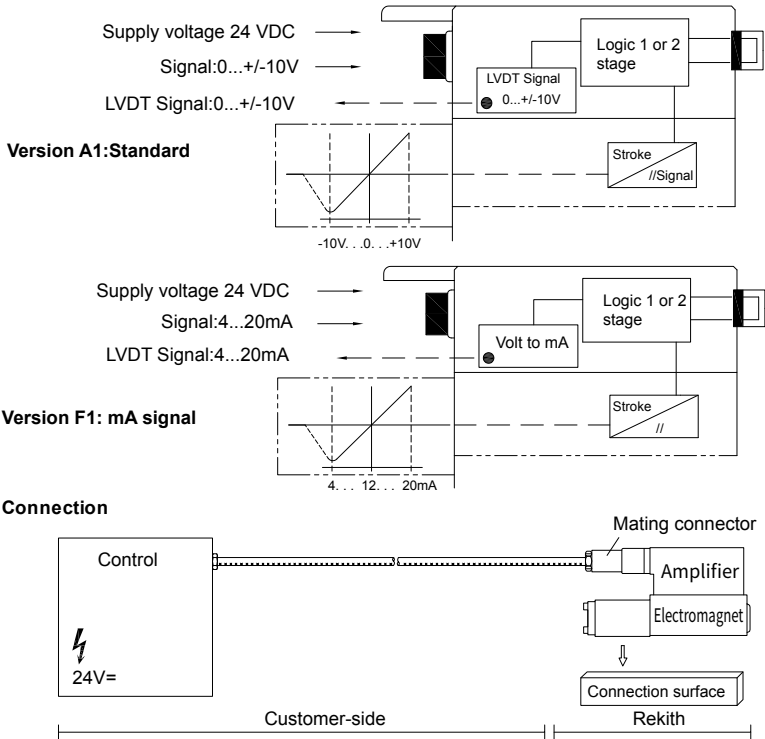
	Linear	P:Inflection 40%
 C4, C1		
 C3, C5		
 C	C3, C5, C4, C1, C	C3, C5, C4, C1

## 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 <sup>2</sup> /s	20...100				
	Maximum admissible	mm <sup>2</sup> /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 <sup>3</sup> /min	< 150	< 180	< 300	< 500	< 900
	Nonlinear	cm <sup>3</sup> /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 $\pm 1\%$					

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 <sub>nom</sub>				
Terminal A		min. 21VDC / max. 40VDC				
Terminal B		0V (ripple max. 2)				
Fuse protection, external		A <sub>F</sub>	2.5			
Input, version "A1"		Differential amplifier, Ri = 100 kΩ				
Terminal D (U <sub>d</sub> )		0... ±10V				
Terminal E		0V				
Input, version "F1"		Load, R <sub>sh</sub> = 200 Ω				
Terminal D (I <sub>D,E</sub> )		4...12...20mA				
Terminal E (I <sub>D,E</sub> )		Current loop I <sub>D,E</sub> return				
Test signal, version "A1"		LVDT				
Terminal F (U <sub>Test</sub> )		0... ±10V				
Terminal C		Reference 0 V				
Test signal, version "F1"		LVDT signal 4 ... (12) ... 20 mA on external load				
Terminal F (I <sub>F,C</sub> )		200 ... 500 Ω maximum				
Terminal C (I <sub>F,C</sub> )		4 ... (12) ... 20mA (output)				
		Current loop I <sub>F,C</sub> 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 mm<sup>2</sup> to 20 m of length  
 - 1.0 mm<sup>2</sup> to 40 m of length  
 Outer Ø: - 9.4...11.8 mm  
 12.7...13.5 mm

**Note:**  
 Supply voltage 24 V DC<sub>nom</sub>

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

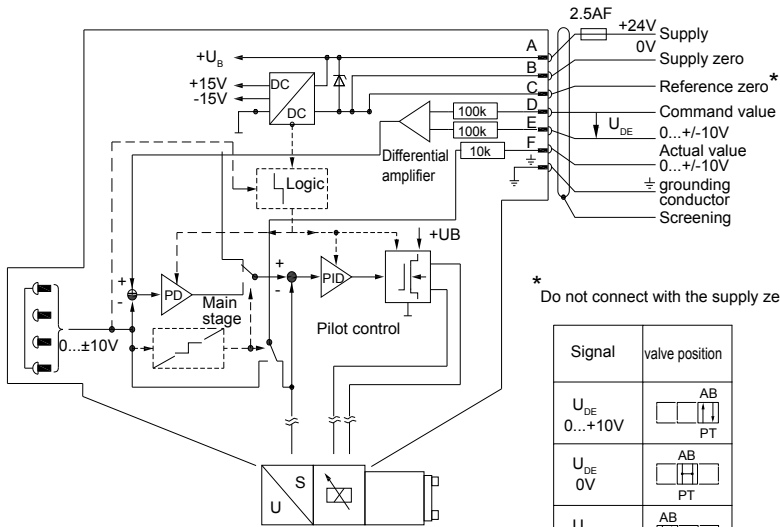
Additionally for version F1:  
 $I_{D,E} \geq 3\text{mA}$  - valve is active  
 $I_{D,E} \leq 2\text{mA}$  - valve is deactivated.

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:  $U_{D,E}$   $0 \dots \pm 10V$

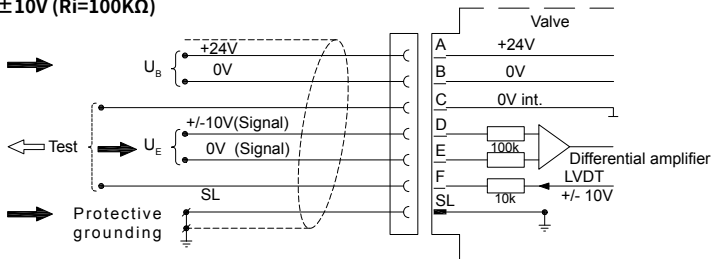


\* Do not connect with the supply zero!

Signal	valve position
$U_{D,E}$ $0 \dots +10V$	
$U_{D,E}$ $0V$	
$U_{D,E}$ $0 \dots -10V$	

## In assignment 6P+PE

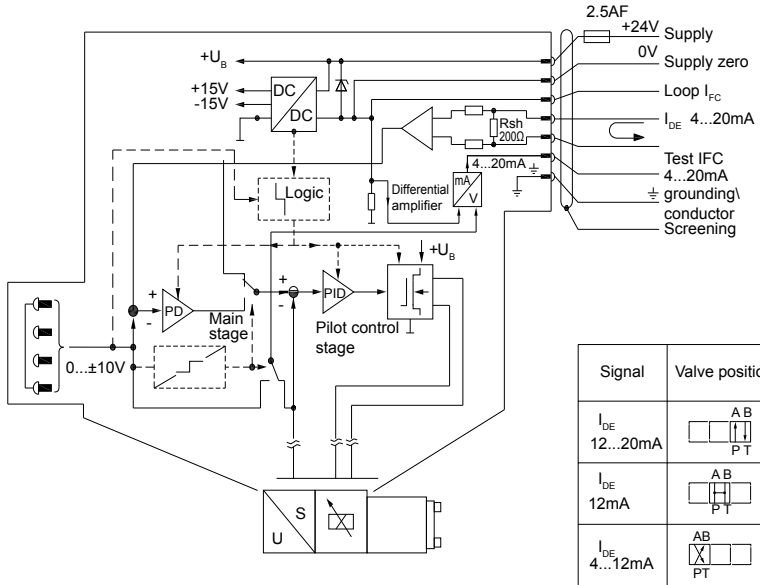
A1:  $U_{D,E} \pm 10V$  ( $R_i=100K\Omega$ )



# Integrated electronics (OBE)

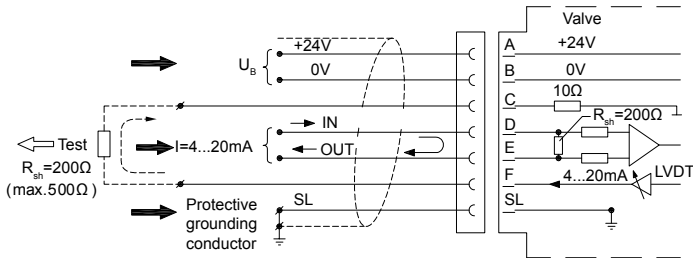
## Block diagram/pin assignment

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



## In assignment 6P+PE

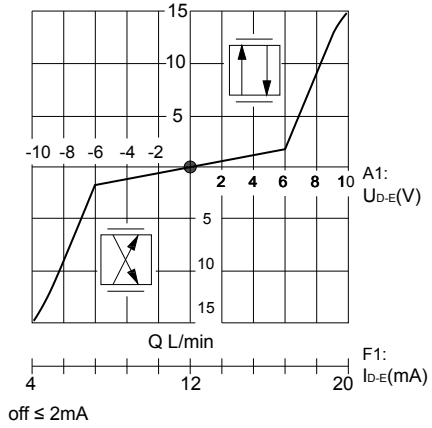
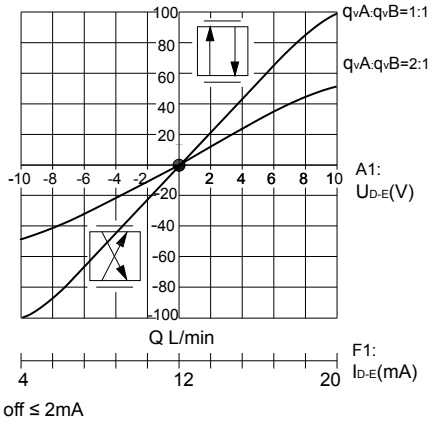
F1:  $I_{D,E}$  4...20mA (R<sub>sh</sub> = 200 Ω)



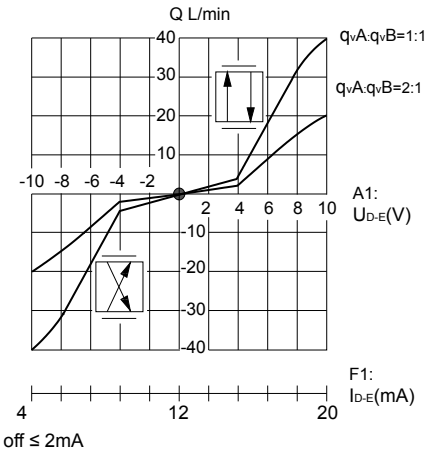
# Characteristic curves (measured at p=100bar, with HLP46, $\vartheta_{oil}=40^{\circ}\text{C} \pm 5^{\circ}\text{C}$ )

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

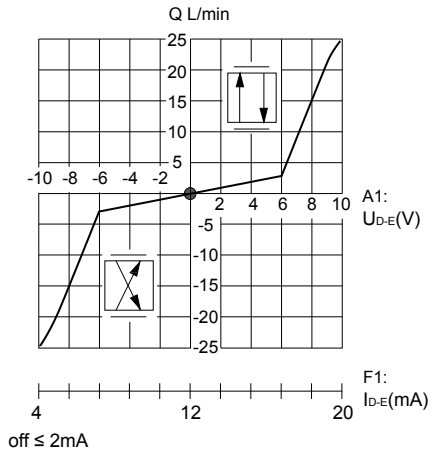
## Linear characteristic curve (version "L")



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

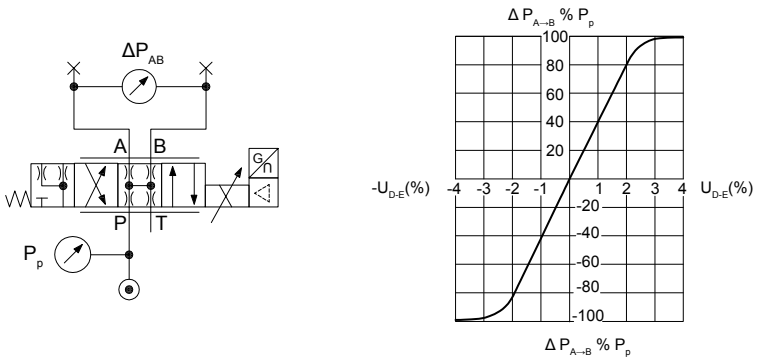


## Inflected characteristic curve "P", inflection at 60%

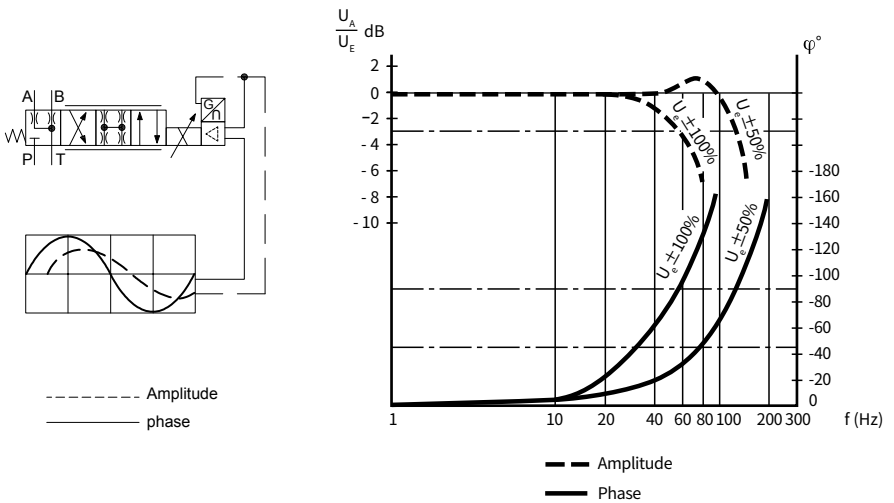




**Characteristic curves:** Pressure amplification (measured at  $p=100\text{bar}$ , with HLP46,  $\vartheta_{\text{oil}}=40^\circ\text{C} \pm 5^\circ\text{C}$ )



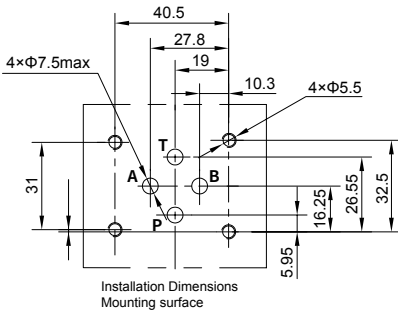
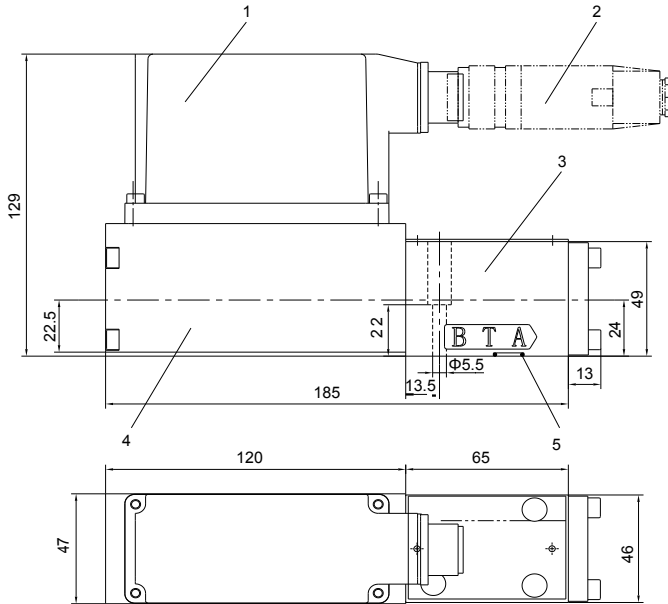
**Characteristic curves:** Bode diagram (measured at  $p=100\text{bar}$ , with HLP46,  $\vartheta_{\text{oil}}=40^\circ\text{C} \pm 5^\circ\text{C}$ )



06

# Unit dimensions

(Dimensions in mm)



- 1 Integrated electronics (OBE)
- 2 Mating connectors
- 3 Valve housing
- 4 Control solenoid with position transducer
- 5 O-ring 9.25×1.78 (for ports P, A, B, T)

