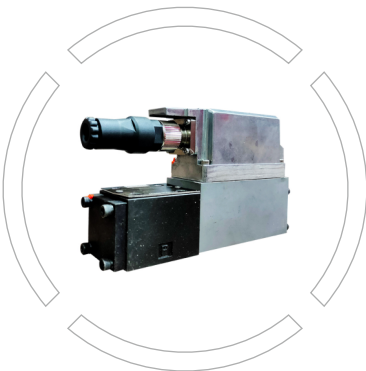


4WRPEH6

Direct operated servo solenoid direction control valve ,
with integrated position feedback and built in Amplifier card
Unit series 2X
Max. working Pressure : 315 bar
Nominal flow rate 40L/min, max.(p = 70 bar)



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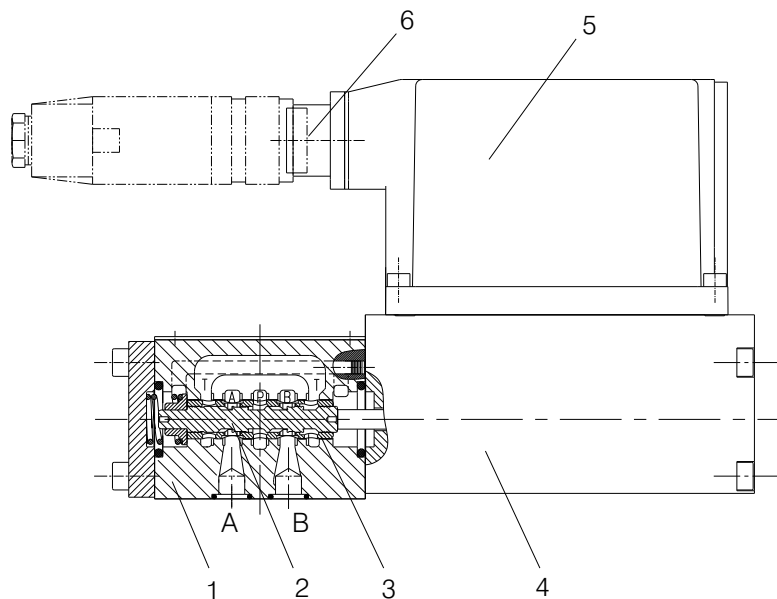
Features

- 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($R_{sh} = 200\Omega$)
- Use for electro-hydraulic controls in production and testing systems.
- For sub-plate attachment, mounting hole configuration to DIN 24 340 A, ISO 4401 and CETOP-RP 121 H.
- Integral electronics, CPU adopts 32 bit high-speed processor, optimized positional PID control calculations.

Function and configuration

The 4WRPEH type high-response valve is a direct-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. Switch-off behavior 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.

Type 4WRPEH6...-2XT/G24...



Ordering code

4WRP	E	H	6		B		-2XT / G24	/			*
------	---	---	---	--	---	--	------------	---	--	--	---

Directional control valve direct operated

With integrated electronics

Control spool sleeve = H

NG6 = 6

Spool symbols

= C3, C5

 = C4, C1

 = C

With symbols C5 and C1:
 $P \rightarrow A : q_v$ $B \rightarrow T : q_v/2$
 $P \rightarrow B : q_v/2$ $A \rightarrow T : q_v$

Solenoid position

= B (Standard)

Further information in plain text

V = FKM seals
No code = NBR seals

A1 = Command/actual value $\pm 10V$
F1 = Command/actual value 4 to 20mA

K31 = With component plug,
Without plug-in connector
Z31 = With component plug and
plug-in connector

Supply voltage of the control electronics
G24 = +24VDC

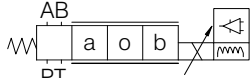
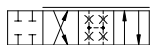
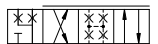

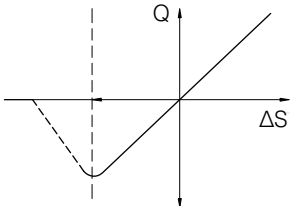
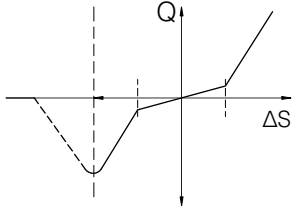
2XT = 20 to 29 series unchanged installation
and connecting dimensions

Flow characteristics
L = Linear
P = Non-linear curve

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

02 =	02 = 2L/min
04 =	04 = 4L/min
12 =	12 = 12L/min
24 =	24 = 24L/min
40 =	40 = 40L/min

Symbol

	<p>L = Linear</p>	<p>P : Non-linear</p>
<div data-bbox="167 1885 323 1930">  </div> <div data-bbox="344 1891 430 1917"> <p>C4,C1</p> </div> <div data-bbox="167 1983 323 2027">  </div> <div data-bbox="344 1990 430 2013"> <p>C3,C5</p> </div> <div data-bbox="167 2070 323 2116">  </div> <div data-bbox="344 2077 373 2103"> <p>C</p> </div>	<div data-bbox="565 1864 857 2070">  </div> <div data-bbox="607 2112 813 2137"> <p>C3,C5,C4,C1,C</p> </div>	<div data-bbox="971 1845 1006 1873"> <p>m</p> </div> <div data-bbox="1057 1864 1347 2070">  </div> <div data-bbox="1156 2112 1362 2137"> <p>C3,C5,C4,C1</p> </div>



Technical data

General								
Construction		Spool type , operated directly, with hardened steel sleeve						
Actuation		Proportional solenoid with position control and integrated electronics						
Type of mounting		Sub-plate, mounting hole configuration NG6 ISO 4401-03-02-0-05						
Installation position		Optional						
Ambient temperature range		-20~ +55 °C						
Weight		2.85 Kg						
Vibration resistance, test condition		Max. 25g, shaken in 3 dimensions (24h)						
Hydraulic (measured with HLP46, oil temperature 40+5 C								
Pressure fluid		Hydraulic oil to DIN 51 524.....535, other fluids after prior consultation						
Viscosity range	Max. permitted mm²/s	10.....800						
	Recommended mm²/s	20.....100						
Pressure fluid temperature range °C		-25~70						
Maximum permissible degree of contamination of pressure fluid purity class to ISO4406 (C)		Class 18/16/13 ¹⁾						
Flow direction		See symbol						
Nominal flow at p = 35 bar per notch ²⁾ L/min		2	4	12	15	24	25	40
Max. working pressure	P, A, B bar	315						
	T bar	250						
Operating limit p Q _{vnom} > Q _{vnom}	C, C3, C5 bar	315	315	315	315	315	315	160
	C1, C4 bar	315	315	315	280	250	250	100
Leakage at 100 bar	L cm³/min	<150	<180	<300	-	<500	-	<900
	P cm³/min	-	<150	-	<200	-	<300	<450
Fail-safe position								
C flow (Δp = 35 bar per notch) l/min		2	4	10	13	18	18	20
C3, C5 leakage (100 bar)	P→A cm³/min	50						
	P→B cm³/min	70						
C3, C5 flow (Δp = 35 bar per notch)	A→T l/min	10...20						
	B→T l/min	7...20						
C4, C1 leakage (100 bar)	P→A cm³/min	50						
	P→B cm³/min	70						
	A→T cm³/min	70						
	B→T cm³/min	50						
Response time	0 bar ms	7						
	10 bar ms	10						



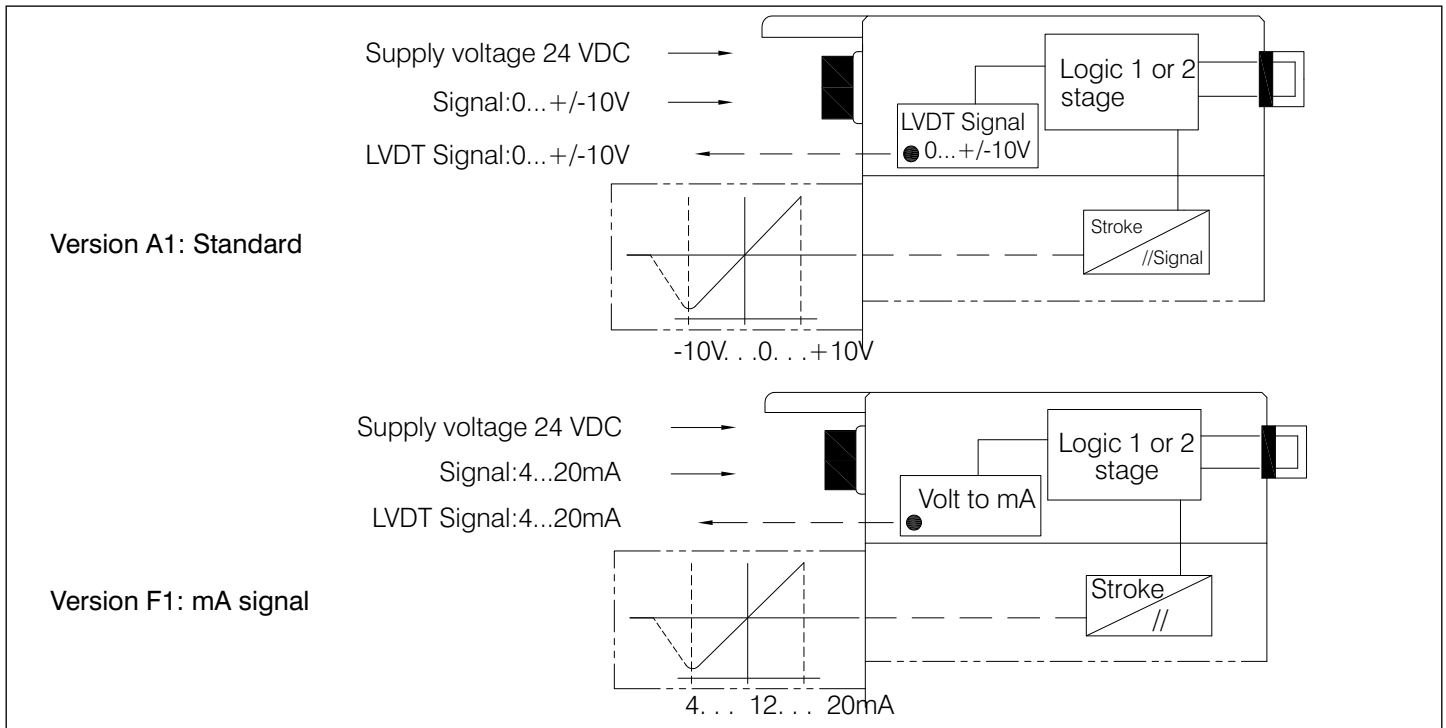
Technical data

Static/dynamic					
Mystersis		%	≤ 0.2		
Manufacturing tolerance for Qmax		%	< 10		
Response time for signal change(0...100%)ms			≤ 10		
Thermal drift		%	Zero point displacement < 1 at ΔT = 40°C		
Zero adjustment		%	< ±1		
Cyclic duration factor		%	100		
Degree of protection			IP 60 to EN 60529 and IEC 14434/5		
Connection			Line socket 6P+PE, DIN 43563		
Power supply	Terminal A	+UB	24 VDC, min 21 VDC, max 40 VDC		
	Terminal B	0V	Ripple max2 VDC		
Max power consumption			40VA		
Input signal	A1	Terminal D	UE	0...±10 V	Differential input, Ri = 100 kΩ
		Terminal E	/Uref	0 V	
	F1	Terminal D	/D-E	4...20 mA; loading Ri = 100 Ω (4 mA=- 100%;12	
		Terminal E	/D-E	mA=0 % ; 20 mA=+ 100 %)	
Max differential input voltage at 0V			D→B E→B } Max 18 VDC		
Feedback	A1	Terminal F	/Utest	0.....+10V	LVDT
		Terminal C	/Uref	0V	
	F1	Terminal F	/F-C	4.....20 mA; Loading Ri = 200.....500Ω	
		Terminal C	/F-C		
Protective conductor and screen			See pin assignment (installation conforms to CE)		
Calibration			Calibrated at the factory, see valve performance curve		
Electromagnetic compatibility			To EN 61000-6-2: 2005-08		
			To EN 61000-6-3: 2007-01		

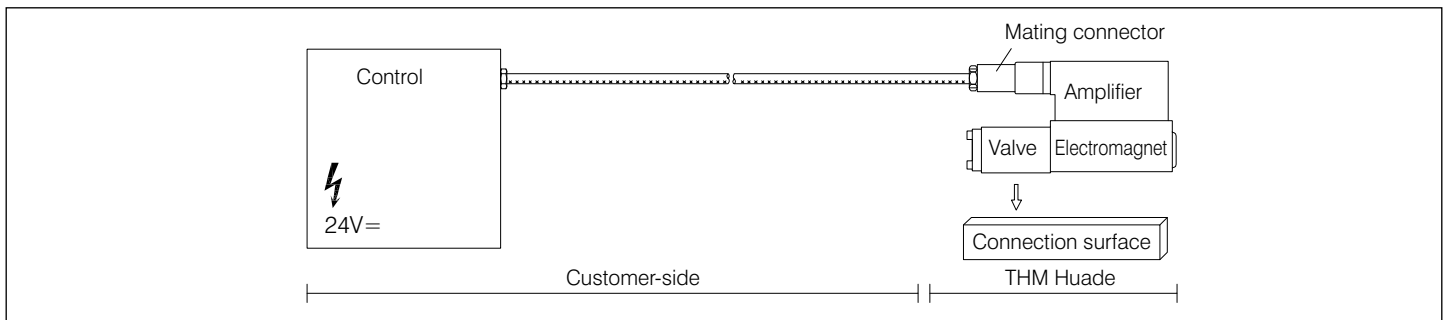


Connection Diagram

- The oil contamination stated for the valve must be complied with in hydraulic systems. Effective filtration prevent problems and also extends the service life of components.
- Flow rate at a different Δp $Q_x = Q_{nom} \sqrt{\frac{\Delta P_x}{35}}$



Electric Connection



Technical data for cable

Version :

- Multi-corewire
- Litz wire structure, extra-fine wire according to VDE0295, class6
- Protective earthing conductor, green-yellow
- Cu shielding braid

Number of wires: Determined by the valve type, connector type and signal configuration

Line Ø:

0.75mm² to 20m of length

1.00mm² to 40m of length

Outer Ø:

9.4.....11.8mm

12.7.....13.5mm

Note:

Supply voltage 24V 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:

ID-E > 3mA - valve is active

ID-E < 2mA - valve is deactivated

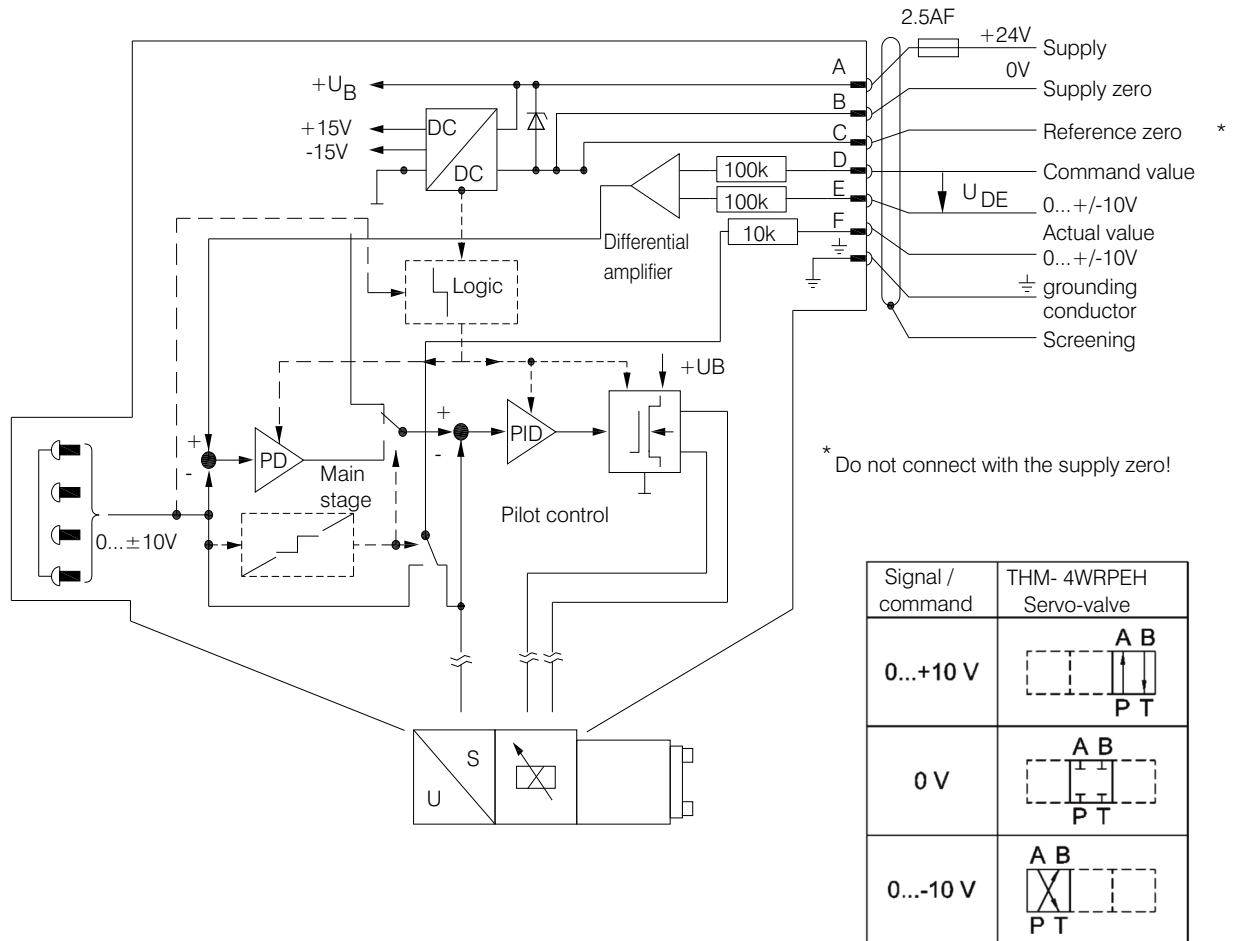
Electrical signals taken out via control electronics (e.g. actual value) may not be used for the switch-off of safety-relevant machine functions! (See also the European standard "Safety requirements for fluid power systems and their components - Hydraulics", EN 982.)



Integrated electronics (OBE)

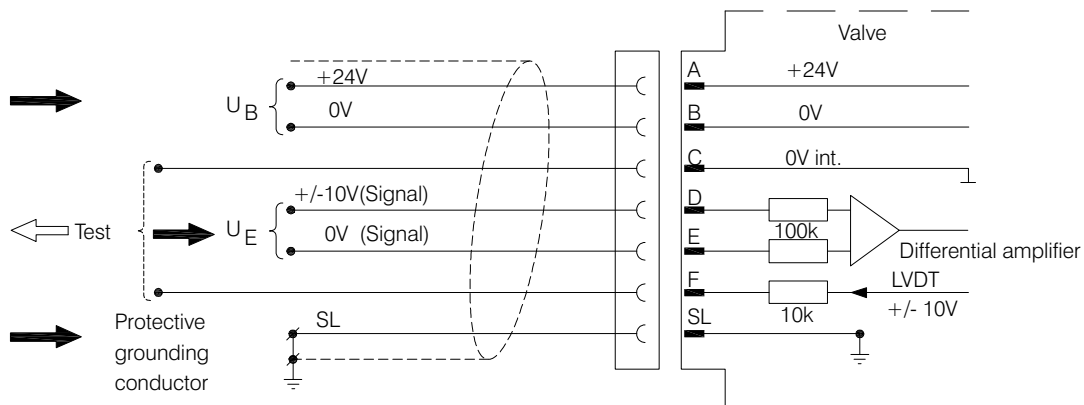
Block diagram/pin assignment

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



In assignment 6P+PE

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

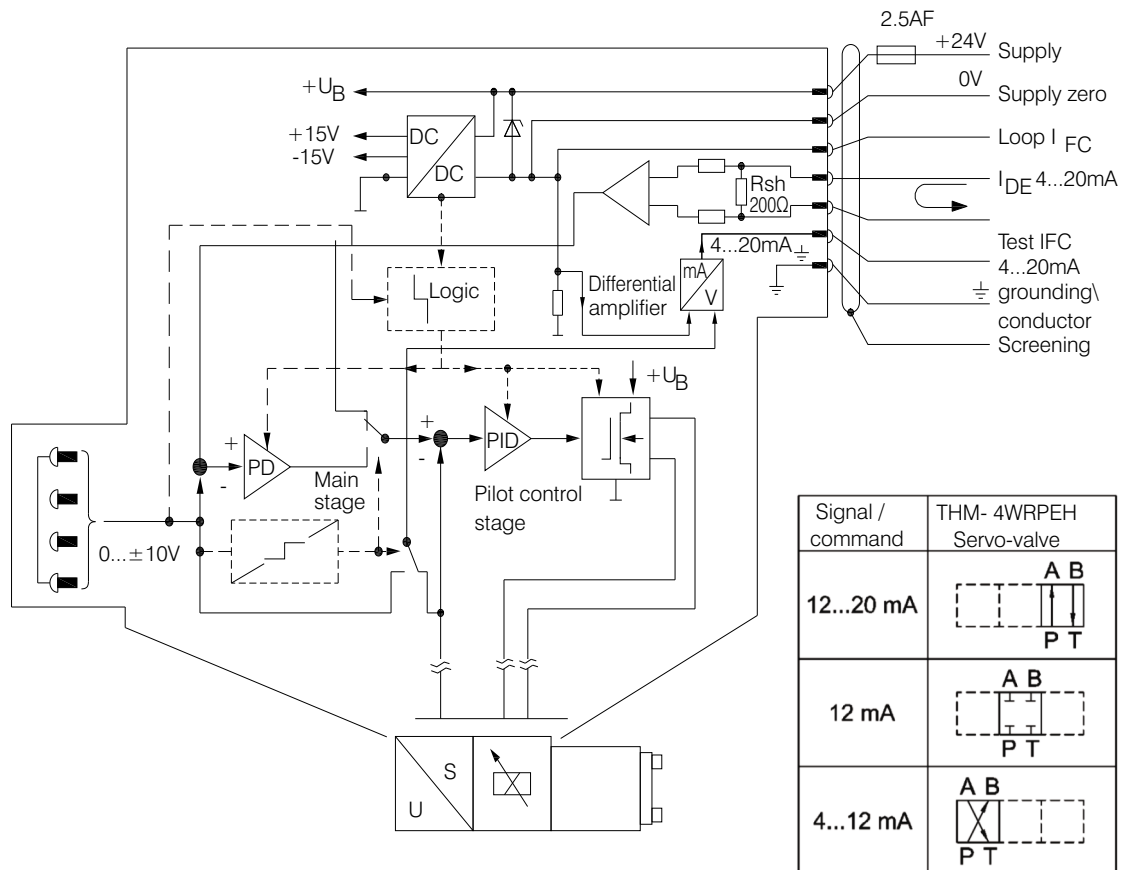




Integrated electronics (OBE)

Block diagram/pin assignment

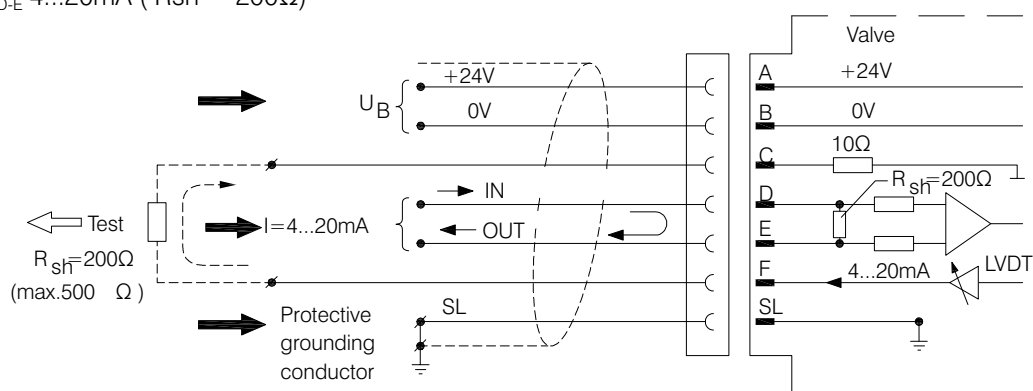
F1: I_{D-E} 4...20mA



$I_{DE} \leq 2\text{mA}$, Valve inactive

In assignment 6P+PE

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

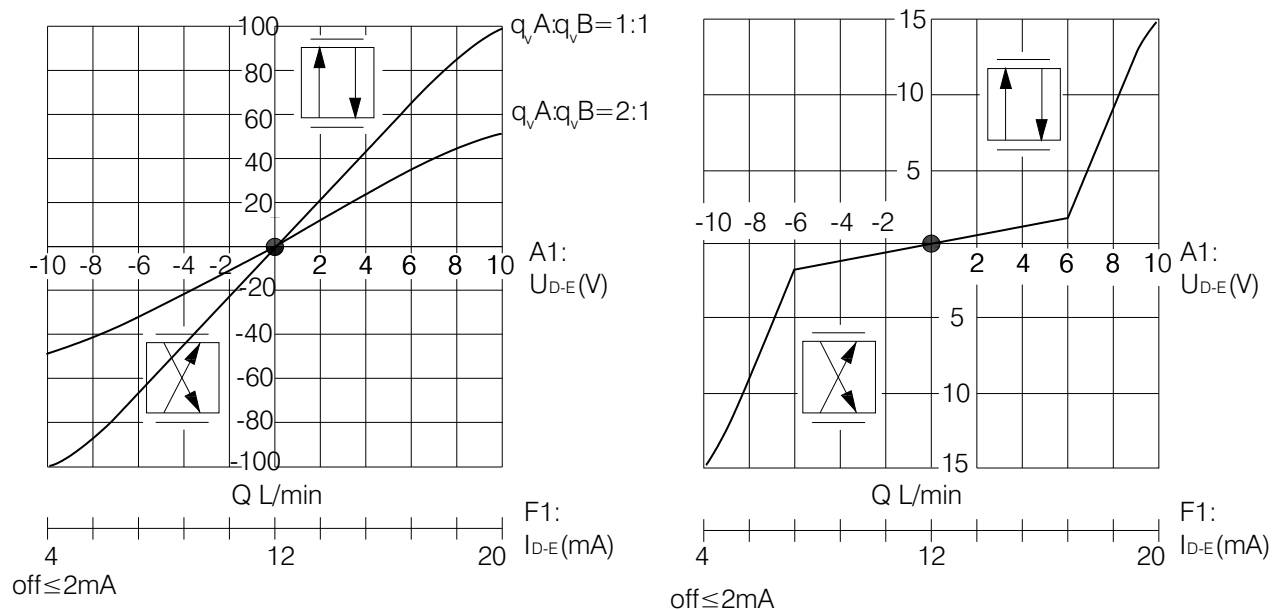




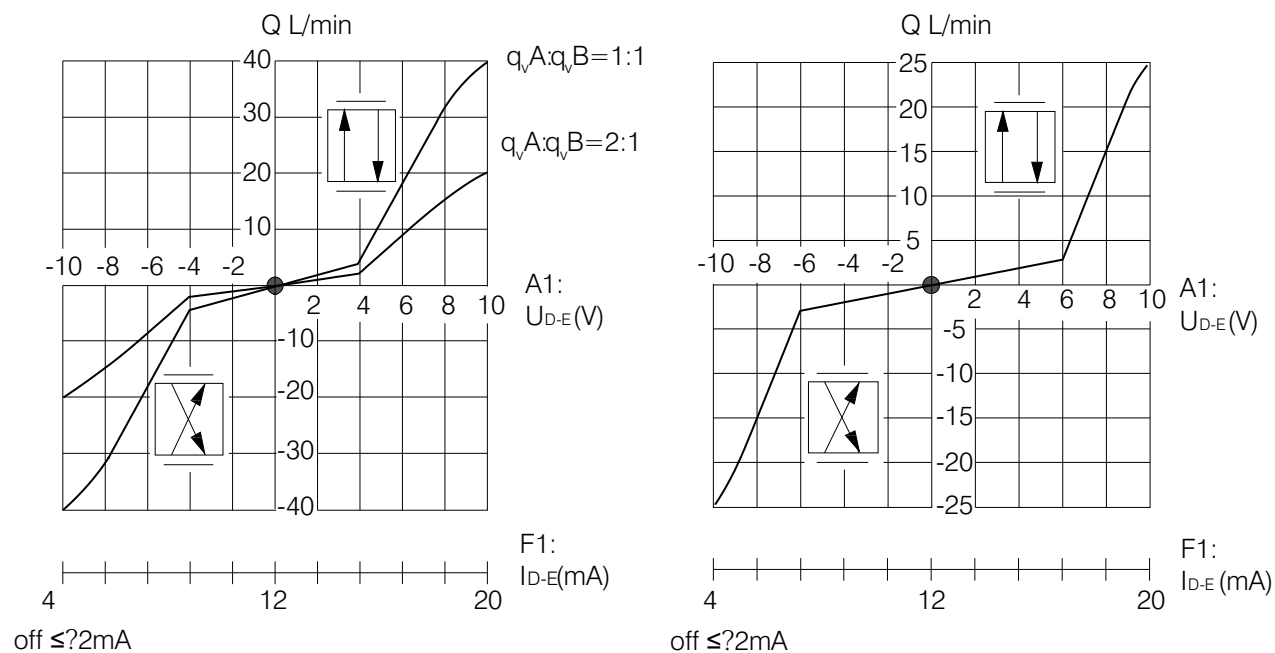
Characteristic curves (measures at $p = 100\text{bar}$, with HLP46, $t = 40^\circ\text{C}$)

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

Linear characteristic curve (version "L")



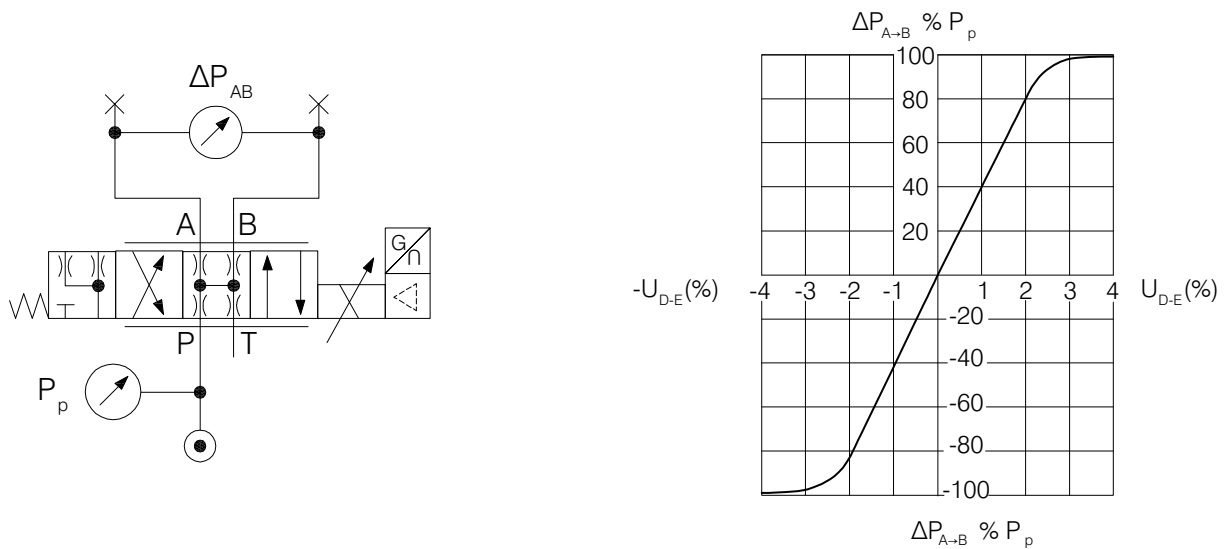
Inflected characteristic curve "P",
inflection at 40%



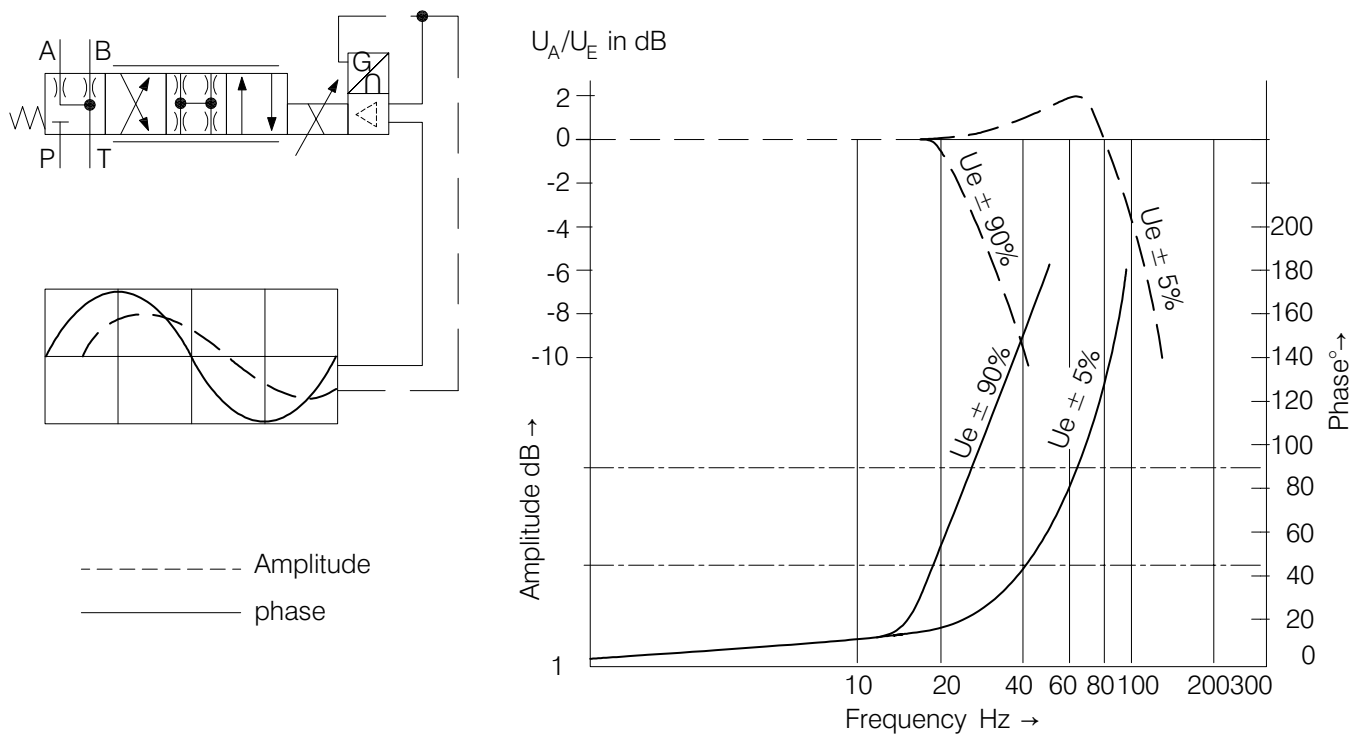


Characteristic curves

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



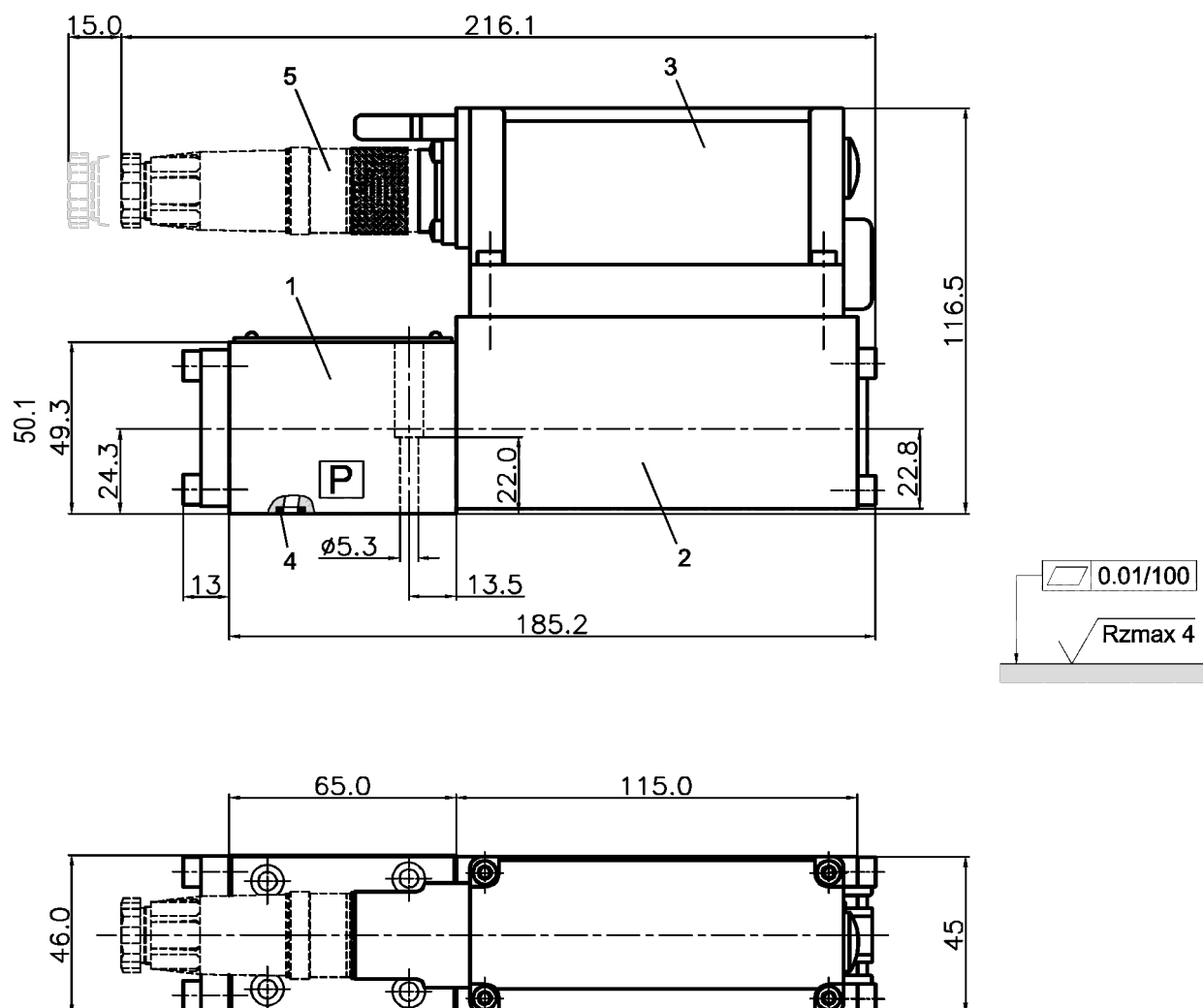
Bode diagram (measured at $p = 100\text{bar}$, with HLP46, $t = 40^\circ\text{C} \pm 5^\circ\text{C}$)



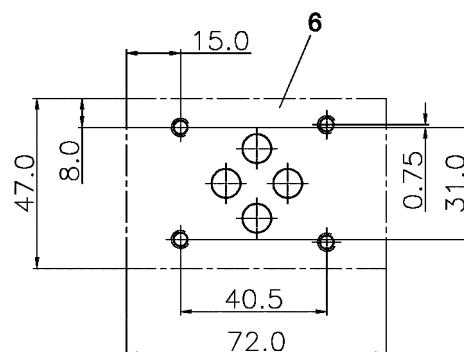


Unit Dimensions

(Dimension in mm)



- 1). Valve
- 2). Electromagnet
- 3). Controller
- 4). O type ring O 9.25 x 1.78 (P, A, B, T)
- 5). Plug is not included,
Ordering code : on request, contact THM
- 6). Mounting hole configuration (ISO 4401-03-02-0-05),
- 7). Subplate - Order separately contact THM



**Screw (Order separately)
Recommended :**

To ISO 4762-M5 x 30-10.9-N67F82170, MA = 6+2 NM

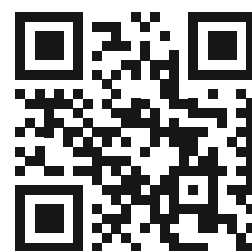


The specified data is for product description purposes only and may not be deemed to be guaranteed unless expressly confirmed in the contract.



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