



Servo solenoid valves with electrical position feedback (Lvdt DC/DC ± 10 V)

1/10

Type 4WRPH6



Size 6
Unit series 2X
Maximum working pressure P, A, B 315 bar, T 250 bar
Nominal flow rate 2...40 l/min (Δp 70 bar)

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Features

- Directly operated servo solenoid valve NG6, with control piston and sleeve in servo quality
- Actuated on one side, 4/4 fail-safe position when switched off
- Control solenoid with integral position feedback and electronics for position transducer (Lvdt DC/DC)
- Suitable for electrohydraulic controllers in production and testing systems
- For subplate attachment, mounting hole configuration to ISO 4401-03-02-0-94
- Subplates (order separately)
- Line sockets to DIN 43560-AM2
Solenoid 2P+PE/M16 x 1.5, position transducer 4P/Pg7 in scope of delivery
- External trigger electronics (order separately)

Variants on request

- For standard applications
- Special symbols for plastic machines
- Sturdy "ruggedized" version for applications up to 40 g, valve with metal cap and central plug (7P).

Ordering data and scope of delivery

4WRP		H	6		B		-2X/G24	Z4/ M	*
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For external trigger electronics = no desig.

Control piston/sleeve = H

Size 6 = 6

Symbols

4/4-way version

= C3, C5

= C4, C1

With symbols C5 and C1:³⁾
 P → A: q_v B → T: $q_v/2$
 P → B: $q_v/2$ A → T: q_v

Side of inductive position tranducer

(Standard) = B

Further information in plain text

M = NBR seals, suitable for mineral oils (HL, HLP) to DIN 51524

Electronical connection
 Z4 = with line socket, with plug to DIN 43560-AM2
 Line socket in scope of delivery

Voltage supply of trigger electronics
 G24 = +24V DC

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

Flow characteristic
 L = Linear
 P = Non-linear curve²⁾

Nominal flow rate at 70 bar valve pressure difference (35 bar /metering notch)

Size 6

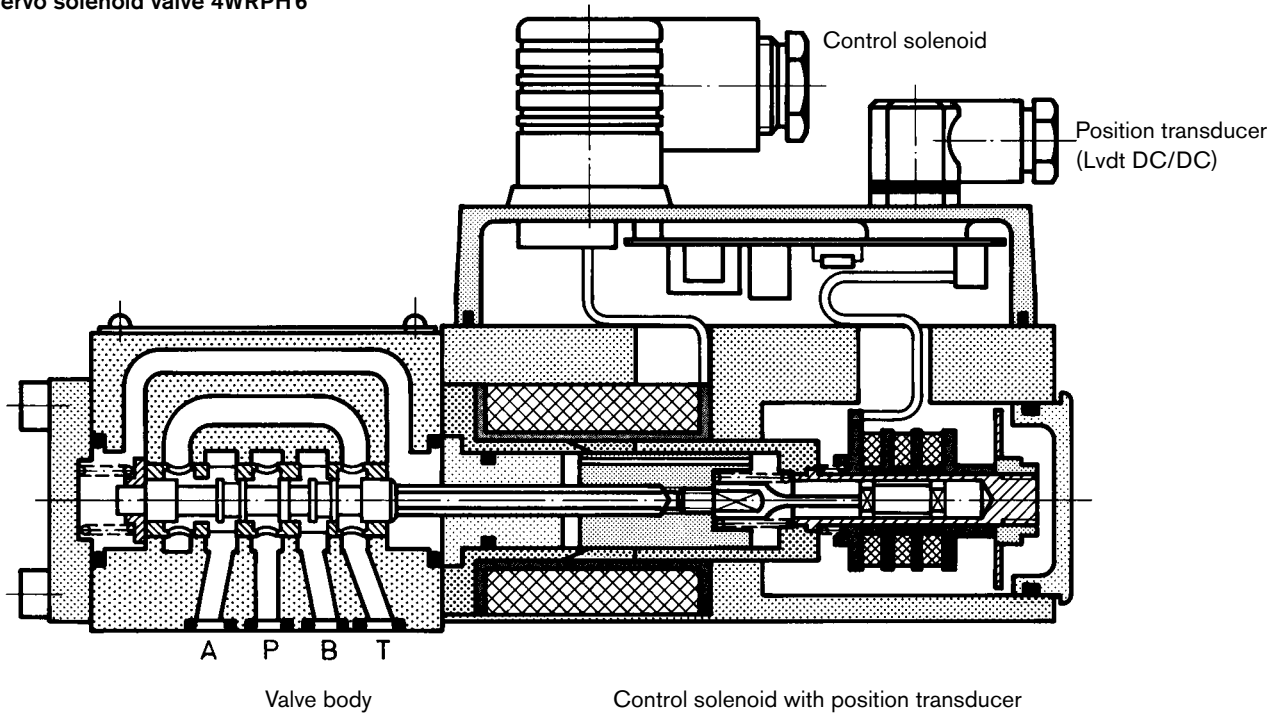
02 = 2 l/min
 04 = 4 l/min
 12 = 12 l/min
 15¹⁾ = 15 l/min
 24 = 24 l/min
 25¹⁾ = 25 l/min
 40³⁾ = 40 l/min

Preferred types (available at short notice)

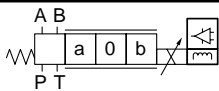
Type 4WRPH 6	Type 4WRPH 6
C3/C5	C1/C4
4WRPH 6 C3B02L -2X/G24Z4 / M	4WRPH 6 C4B02L -2X/G24Z4 / M
4WRPH 6 C3B04L -2X/G24Z4 / M	4WRPH 6 C4B04L -2X/G24Z4 / M
4WRPH 6 C3B12L -2X/G24Z4 / M	4WRPH 6 C4B12L -2X/G24Z4 / M
4WRPH 6 C3B24L -2X/G24Z4 / M	4WRPH 6 C4B24L -2X/G24Z4 / M
4WRPH 6 C3B40L -2X/G24Z4 / M	4WRPH 6 C4B40L -2X/G24Z4 / M
4WRPH 6 C5B40L -2X/G24Z4 / M	4WRPH 6 C1B40L -2X/G24Z4 / M
4WRPH 6 C3B15P -2X/G24Z4 / M	4WRPH 6 C4B15P -2X/G24Z4 / M
4WRPH 6 C3B25P -2X/G24Z4 / M	4WRPH 6 C4B25P -2X/G24Z4 / M
4WRPH 6 C3B40P -2X/G24Z4 / M	4WRPH 6 C4B40P -2X/G24Z4 / M
4WRPH 6 C5B40P -2X/G24Z4 / M	4WRPH 6 C1B40P -2X/G24Z4 / M

Function, sectional diagram

Servo solenoid valve 4WRPH6



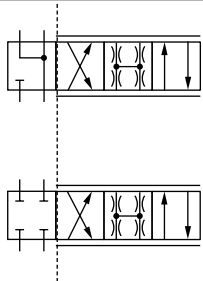
Symbols



Linear

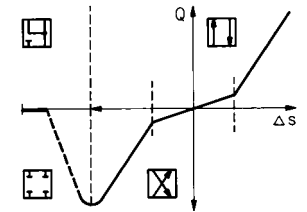
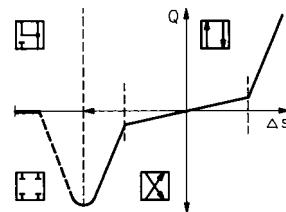
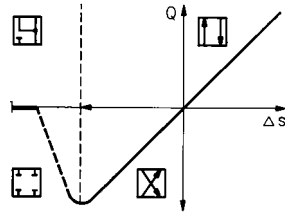
p: kink 60%
[q_n 15,25 l/min]

p: kink 40%
[q_n 40 l/min]



C3, C5

C4, C1



C3, C5, C4, C1





Standard = 1:1, from q_n 40 l/min also 2:1

Technical Data

General

Construction	Spool type valve, operated directly, with steel sleeve	
Actuation	Proportional solenoid with position control, external amplifier	
Type of mounting	Subplate, mounting hole configuration NG6 (ISO 4401-03-02-0-94)	
Installation position	Optional	
Ambient temperature range	°C	-20 ... +50
Weight	kg	2.3
Vibration resistance, test condition	Max. 25 g, shaken in 3 dimensions (24 h)	

Hydraulic (measured with HLP 46, $\vartheta_{oil} = 40^\circ\text{C} \pm 5^\circ\text{C}$)

Pressure fluid	Hydraulic oil to DIN 51524 ... 535, other fluids after prior consultation						
Viscosity range	recommended	mm ² /s	20 ... 100				
	max. permitted	mm ² /s	10 ... 800				
Pressure fluid temperature range	°C	-20 ... +80					
Maximum permissible degree of contamination of pressure fluid Purity class to ISO 4406 (c)	Class 18/16/13 ¹⁾						
Flow direction	See symbol						
Nominal flow at $\Delta p = 35$ bar per notch ²⁾	l/min	2	4	12	15	24	40
Max. working pressure	bar	Port P, A, B: 315					
Max. pressure	bar	Port T: 250					
Operating limits at Δp Pressure drop at valve	 bar	315	315	315	315	315	160
$q_{Vnom} > q_N$ valves	 bar	315	315	315	280	250	100
Leakage at 100 bar	 cm ³ /min	<150	<180	<300	-	<500	<900
	 cm ³ /min	-	-	-	<180	<300	<450

Electrical

Cyclic duration factor	%	100 ED	
Power supply	24 V _{nom} (external amplifier)		
Degree of protection	IP 65 to DIN 40050		
Solenoid connector	Connector DIN 43650/ISO 4400 M16 x 1.5 (2P + PE)		
Position transducer connector	Special Connector Pg7 (4P)		
Max. solenoid current	A	2.7	
Coil resistance R_{20}	Ω	2.5	
Max. power consumption at 100% load and operational temperature	VA	40	
Position transducer DC/DC technology	Supply: +15 V/35 mA -15 V/35 mA		Signal: 0...±10 V ($R_L \geq 10$ kΩ)

Static/Dynamic

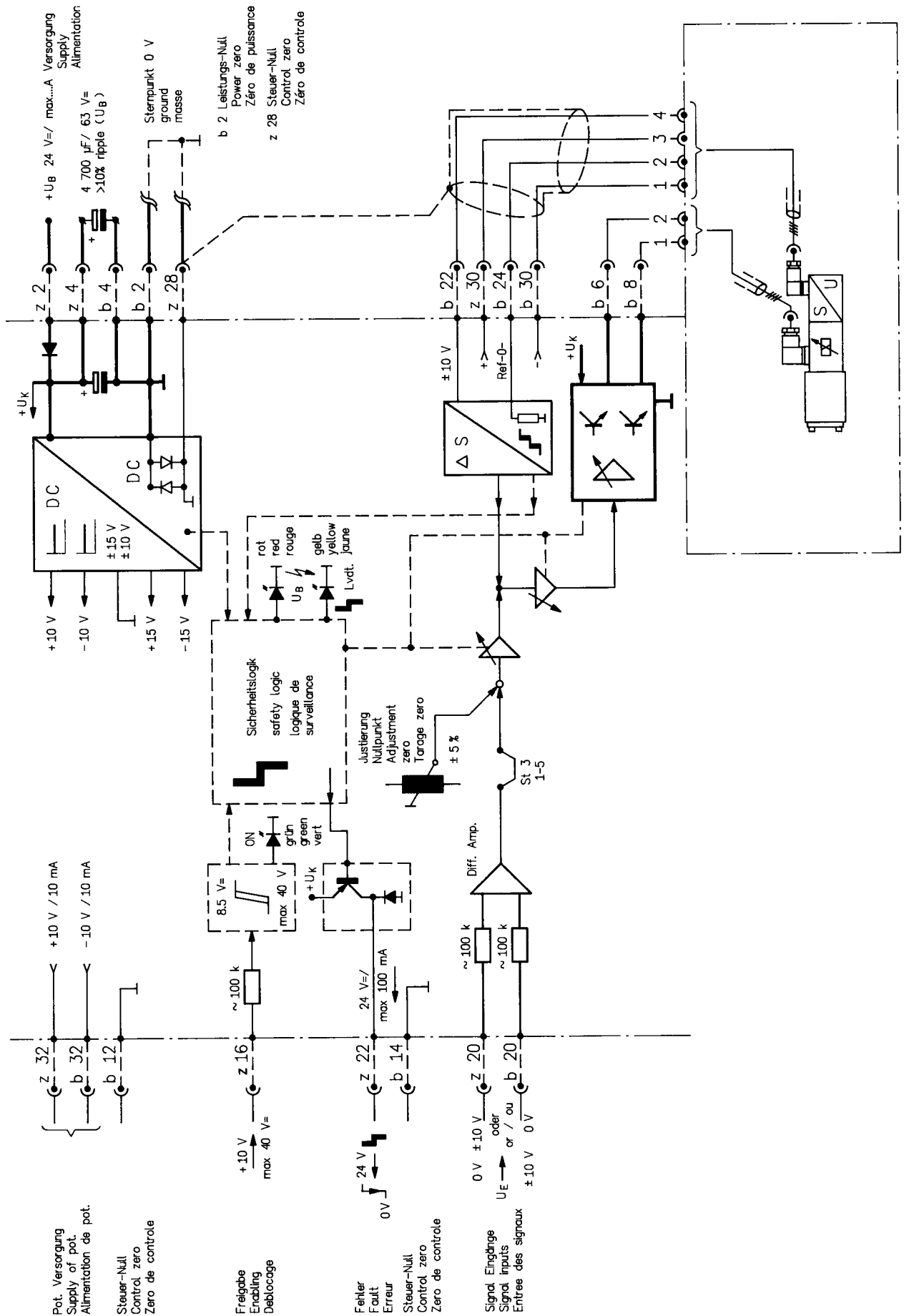
Hysteresis	%	≤ 0.2
Manufacturing tolerance for q_{max}	%	< 10
Response time for signal change 0 ... 100 %	ms	< 10
Thermal drift	Zero point displacement < 1 % at $\Delta T = 40^\circ\text{C}$	

¹⁾ The purity classes stated for the components must be complied with in hydraulic systems. Effective filtration prevents problems and also extends the service life of components.

²⁾ Flow rate at a different Δp $q_x = q_{nom} \cdot \sqrt{\frac{\Delta p_x}{35}}$

Valve with external trigger electronics (standard linear curve: L)

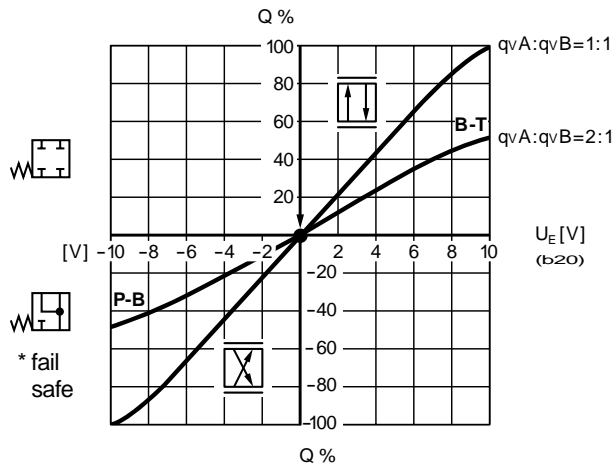
Block diagram/pin assignment



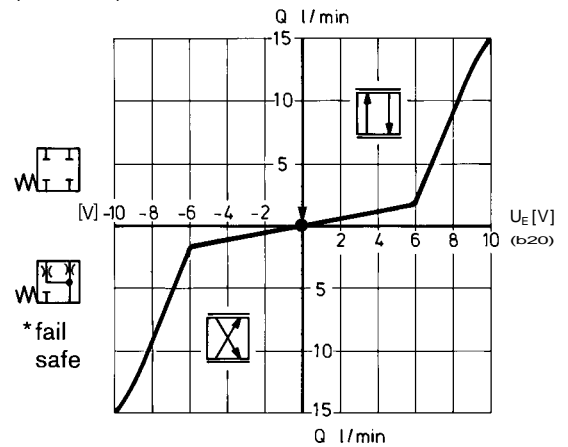
Performance curves (measured with HLP46, $\vartheta_{oil} = 40\text{ }^{\circ}\text{C} \pm 5\text{ }^{\circ}\text{C}$)

Flow rate/Signal function $Q = f(U_E)$

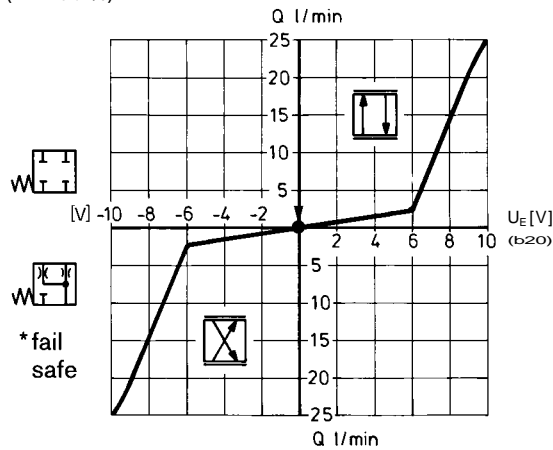
L: Linear



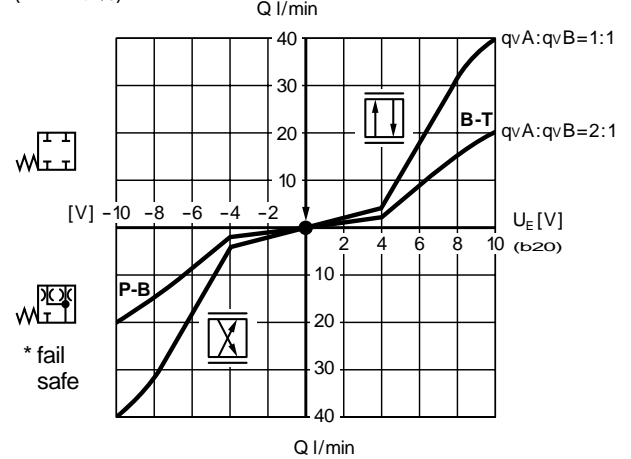
P: (kink 60%)**



P: (kink 60%)



P: (kink 40%)**



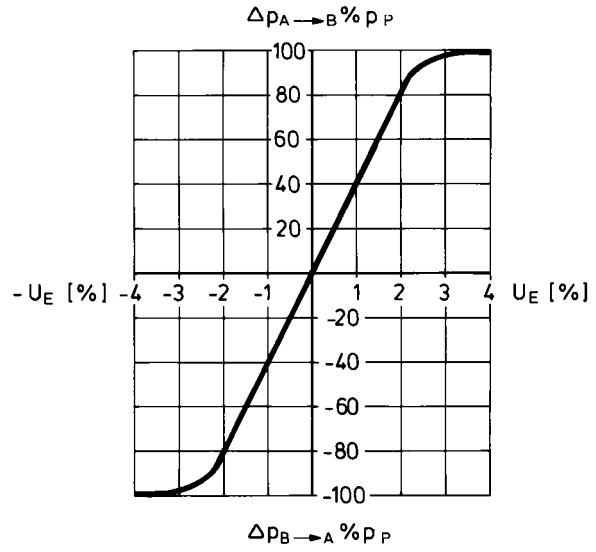
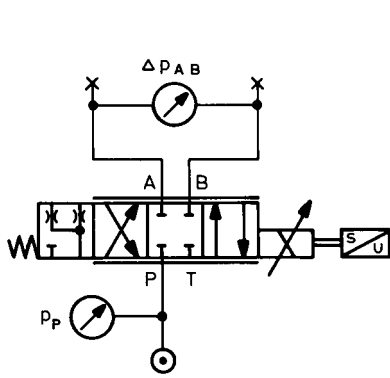
*Fail-safe when enabling is not released.

** $Q_{\text{kink}} = 10\% Q_N$.

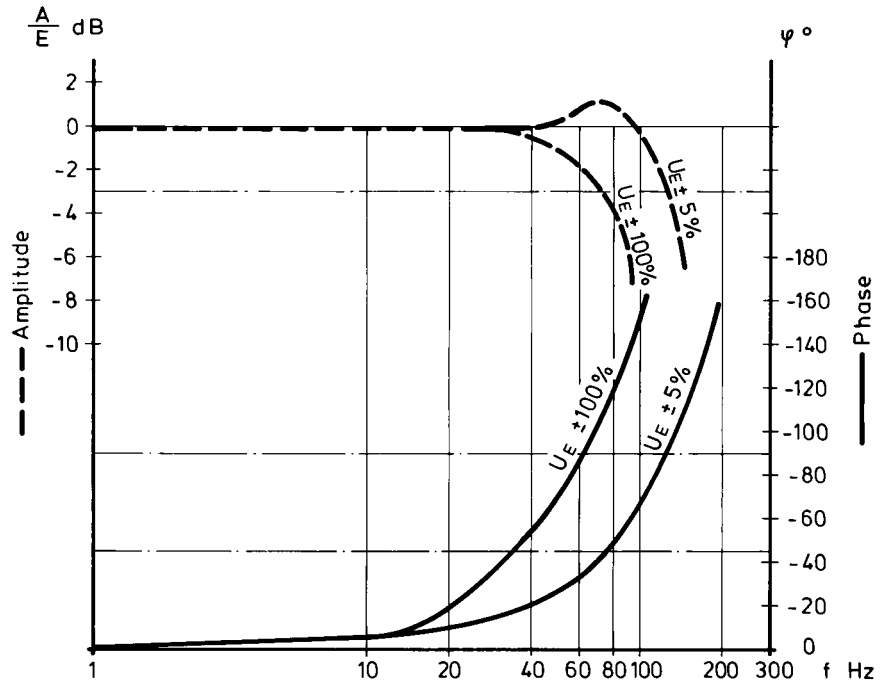
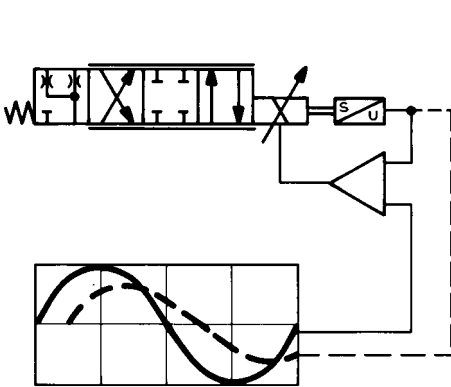
		Fail-safe position	
	Leakage at	100 bar	P-A 50 cm ³ /min P-B 70 cm ³ /min
	Flow rate at	$\Delta p = 35$ bar	A-T 10 ... 20 l/min B-T 7 ... 20 l/min
	Leakage at	100 bar	P-A 50 cm ³ /min P-B 70 cm ³ /min A-T 70 cm ³ /min B-T 50 cm ³ /min
		Fail-safe $p = 0$ bar \rightarrow 7 ms $p = 100$ bar \rightarrow 10 ms	Enable off

Performance curves (measured with HLP 46, $\vartheta_{oil} = 40^{\circ}\text{C} \pm 5^{\circ}\text{C}$)

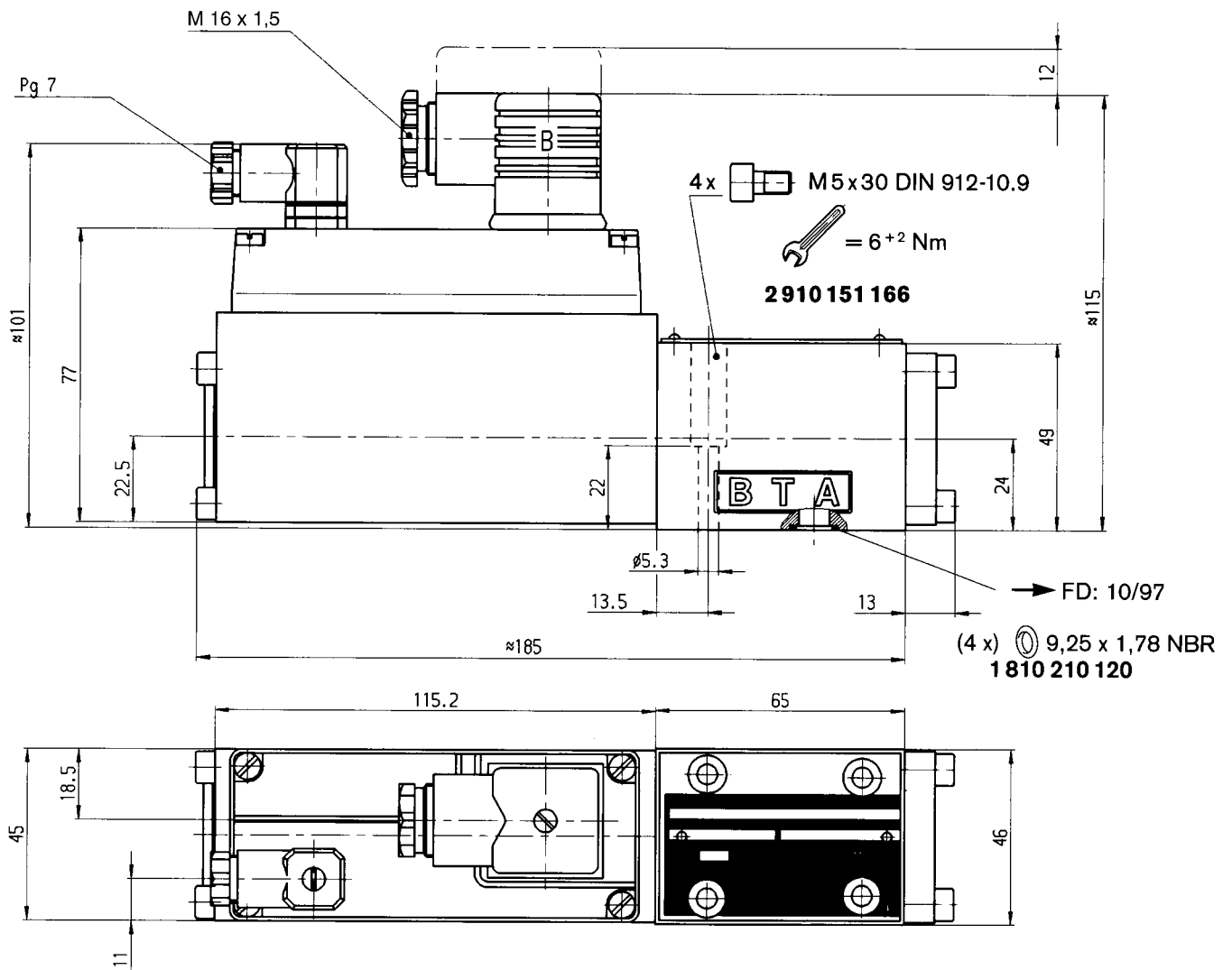
Pressure gain



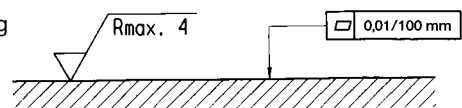
Bode diagram



Unit dimensions (nominal dimensions in mm)

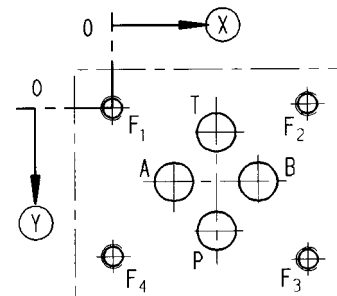


Required surface quality of mating component



Mounting hole configuration: NG6 (ISO 4401-03-02-0-94)

- 1) Deviates from standard
- 2) Thread depth:
 Ferrous metal $1.5 \times \phi$
 Non-ferrous $2 \times \phi$



	P	A	T	B	F ₁	F ₂	F ₃	F ₄
⊗	21.5	12.5	21.5	30.2	0	40.5	40.5	0
⊙	25.9	15.5	5.1	15.5	0	-0.75	31.75	31
∅	8 ¹⁾	8 ¹⁾	8 ¹⁾	8 ¹⁾	M5 ²⁾	M5 ²⁾	M5 ²⁾	M5 ²⁾