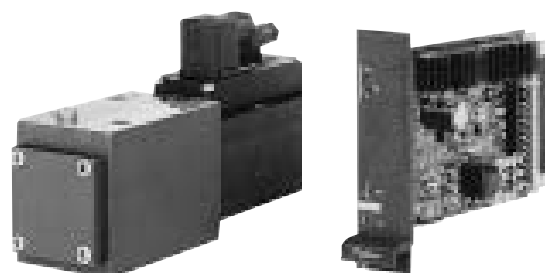


Servo solenoid valves with electrical position feedback (LvdT DC/DC ± 10 V)

Type 4WRPH 10



Size 10
Unit series 2X
Maximum working pressure P, A, B 315 bar, T 250 bar
Nominal flow rate 50...100 l/min (Δp 70 bar)

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Features

- Directly operated servo solenoid valve NG10, 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 4401-05-04-0-94
- Subplates as per catalogue section RE 45055 (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 injection-moulding 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	10		B		- 2X / G24	Z4 / M	*
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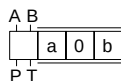
For **external**
trigger electronics = **no desig.**

Control piston/sleeve = H

Size 10 = 10

Symbols

4/4-way version



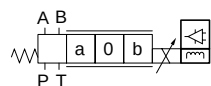
= C3, C5

= C4, C1

With symbols C5 and C1:

$$P \rightarrow A: q_v \quad B \rightarrow T: q_v/2$$
$$P \rightarrow B: q_v/2 \quad A \rightarrow T: q_v$$

Side of inductive position transducer



(Standard) = **B**

Further information
in plain text

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

Electrical connection

Z4 = with line socket, with plug to
DIN 43560-AM2

Line socket included in scope of delivery

Voltage supply of trigger electronics

G24 = +24 V DC

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

Flow characteristic

L = Linear

P = Non-linear curve

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

Size 10

50 = 50 l/min

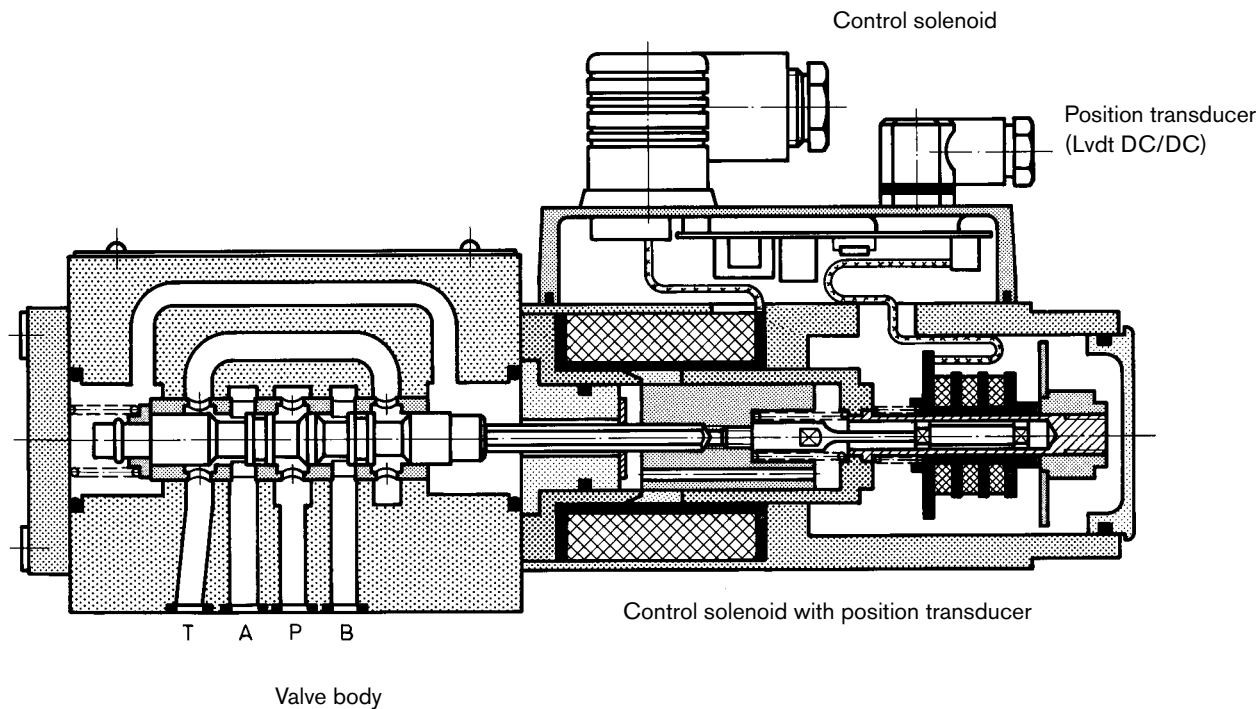
100 = 100 l/min

Preferred types (available at short notice)

Type 4WRPH 10		Type 4WRPH 10	
C3/C5		C1/C4	
4WRPH 10 C3B50L –2X/G24Z4 / M		4WRPH 10 C4B50L –2X/G24Z4 / M	
4WRPH 10 C3B100L –2X/G24Z4 / M		4WRPH 10 C4B100L –2X/G24Z4 / M	
4WRPH 10 C5B100L –2X/G24Z4 / M		4WRPH 10 C1B100L –2X/G24Z4 / M	
4WRPH 10 C3B50P –2X/G24Z4 / M		4WRPH 10 C4B50P –2X/G24Z4 / M	
4WRPH 10 C3B100P –2X/G24Z4 / M		4WRPH 10 C4B100P –2X/G24Z4 / M	
4WRPH 10 C5B100P –2X/G24Z4 / M		4WRPH 10 C1B50P –2X/G24Z4 / M	
		4WRPH 10 C1B100P –2X/G24Z4 / M	

Function, sectional diagram

Servo solenoid valve 4WRPH 10



Symbols

	Linear	p: kink 40%
	C3, C4, C5, C1	

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 NG10 (ISO 4401-05-04-0-94)	
Installation position	Optional	
Ambient temperature range	°C	−20 ... +50
Weight	kg	6.8
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	mm²/s	20 ... 100			
	max. permitted	mm²/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	50 (1:1)	50 (2:1)	100 (1:1)	100 (2:1)
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	160	160
$q_{Vnom} > q_N$ valves		 bar	250	250	100	100
Leakage at 100 bar		cm³/min	<1200	<1200	<1500	<1000
		cm³/min	<600	<500	<600	<600

Electrical

Cyclic duration factor	%	100	
Power supply		24 V _{nom} (external amplifier)	
Degree of protection		IP 65 to DIN 40050	
Solenoid connector		Connector DIN 43650/ISO 4400 M16x1.5 (2P+PE)	
Position transducer connector		Connector Pg7 (4P)	
Max. solenoid current	A	3.7	
Coil resistance R_{20}	Ω	2.4	
Max. power consumption at 100% load and operational temperature	VA	60	
Position transducer DC/DC technology		Supply: +15 V/35 mA -15 V/25 mA	Signal: 0...±10 V ($R_L \geq 10\text{ k}\Omega$)

Static/Dynamic

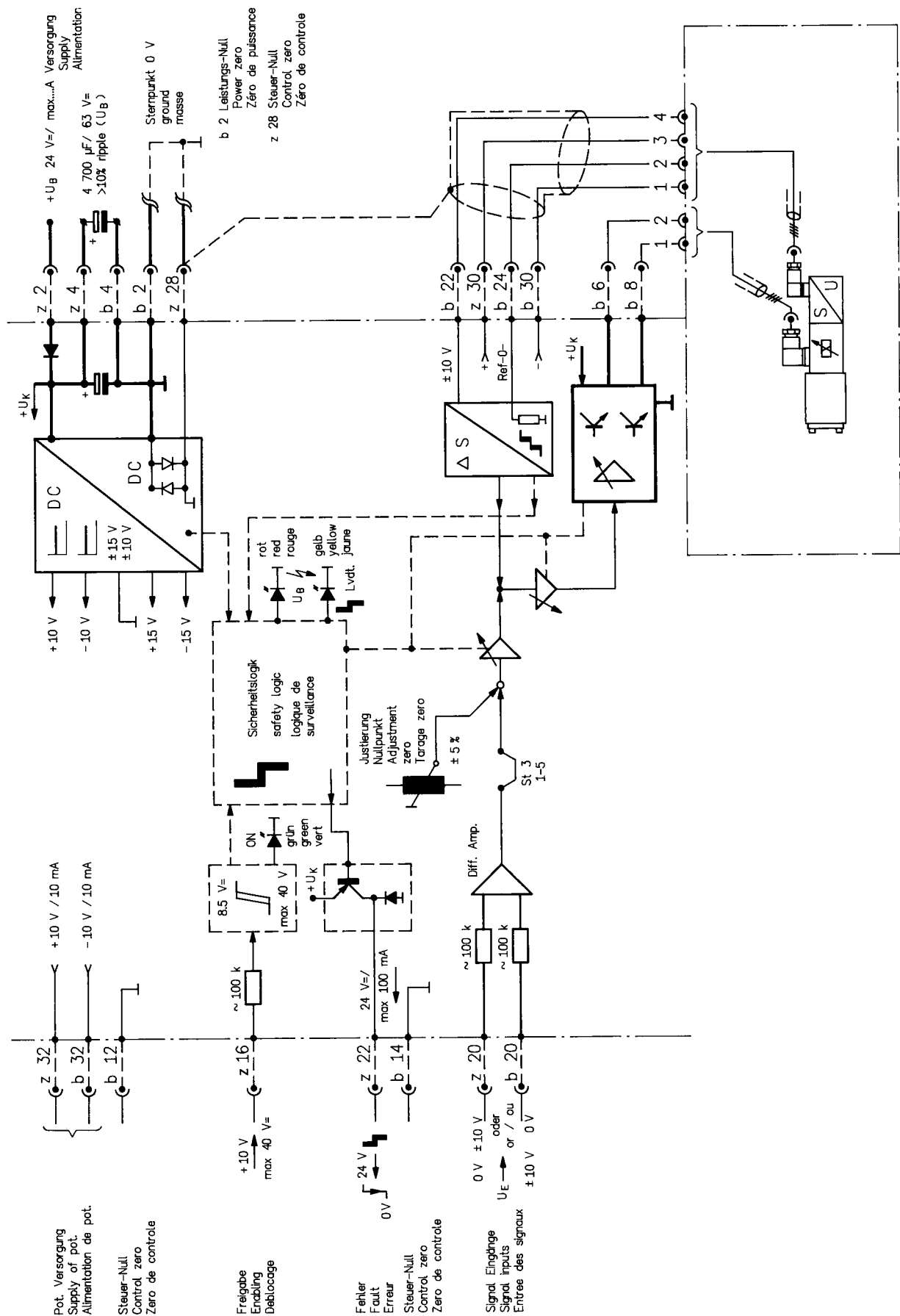
Hysteresis	%	≤ 0.2
Manufacturing tolerance for q_{max}	%	< 10
Response time for signal change 0 ... 100 %	ms	< 25
Thermal drift	Zero point displacement < 1 % at $\Delta T = 40^{\circ}\text{C}$	

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 $q_x = q_{nom} \cdot \sqrt{\frac{\Delta p_x}{35}}$

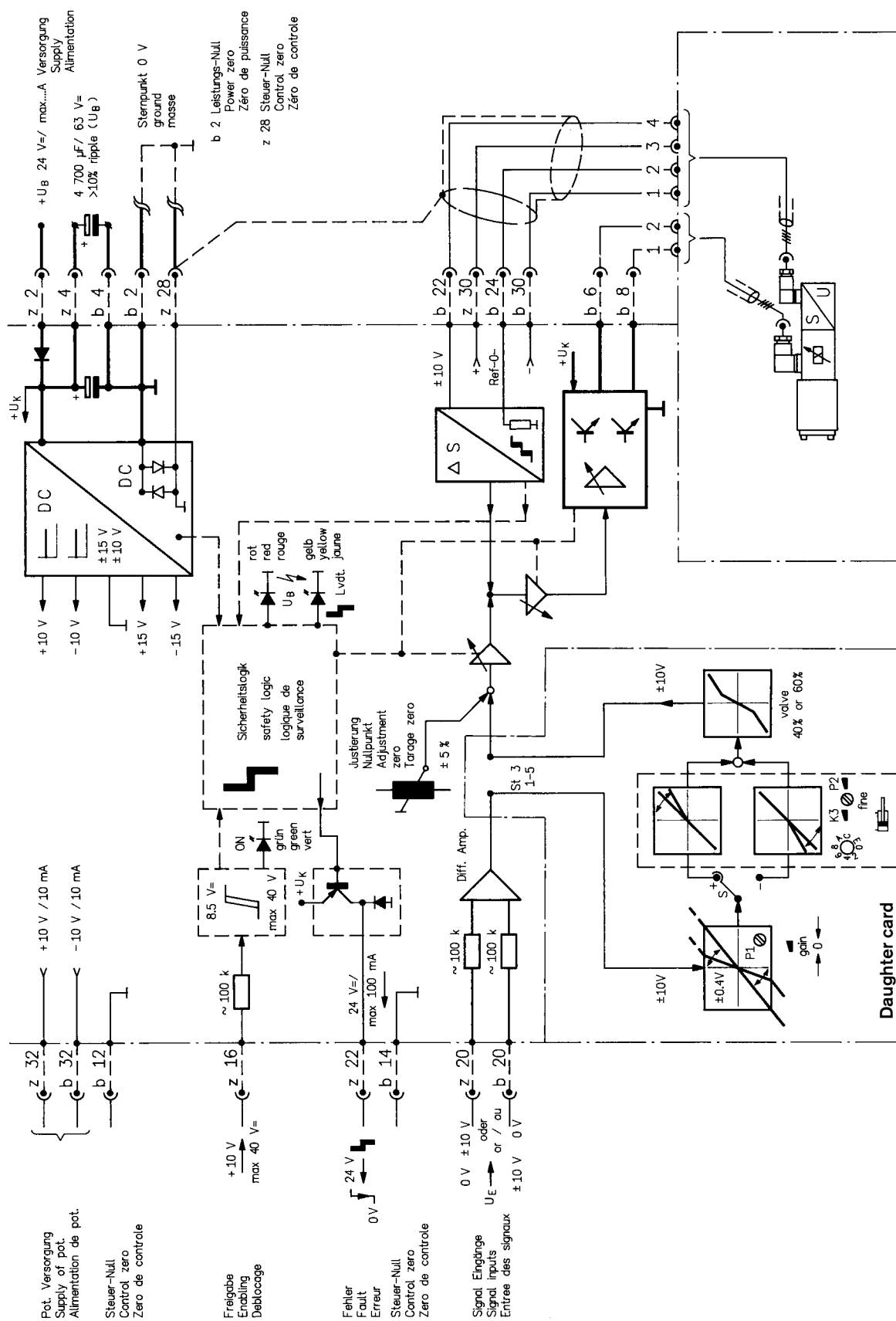
Valve with external trigger electronics (standard linear curve: L)

Block diagram/pin assignment



Valve with external trigger electronics (standard non-linear curve: P)

Block diagram/pin assignment



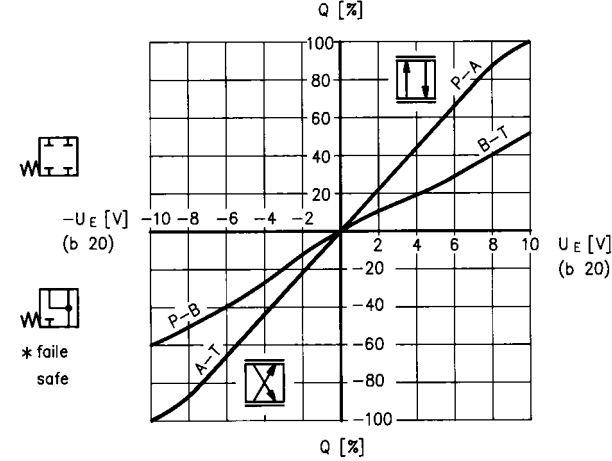
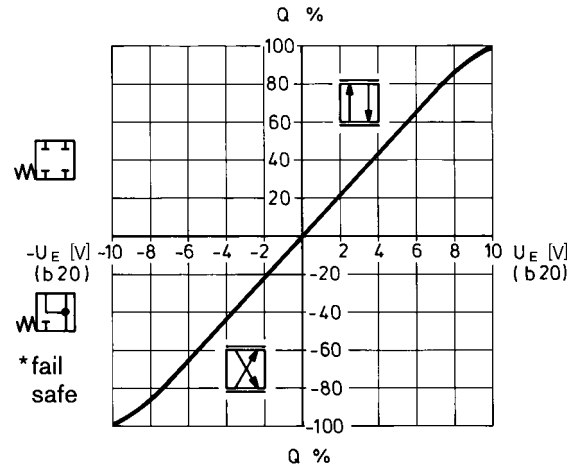
Performance curves (measured with HLP 46, $\vartheta_{oil} = 40^{\circ}\text{C} \pm 5^{\circ}\text{C}$)

Flow rate/Signal function

$Q = f(U_E)$

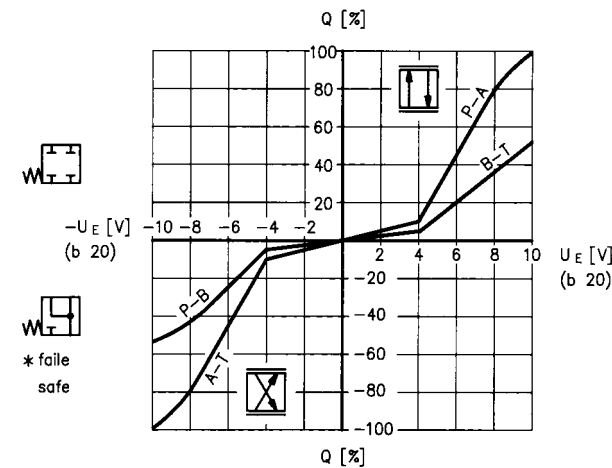
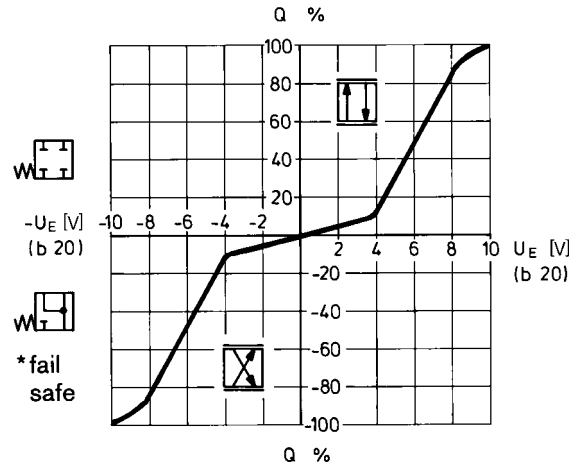
L: Linear

L: (linear) 2:1



P: (kink 40%)**

P: (kink 40%) 2:1**



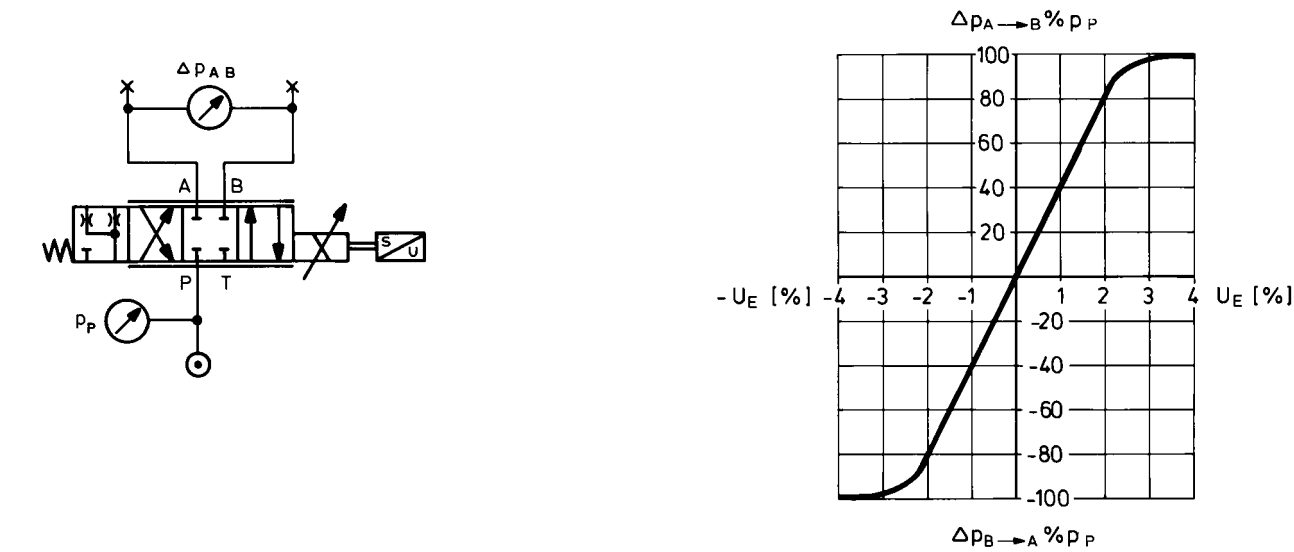
*Fail-safe when enabling is not released.

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

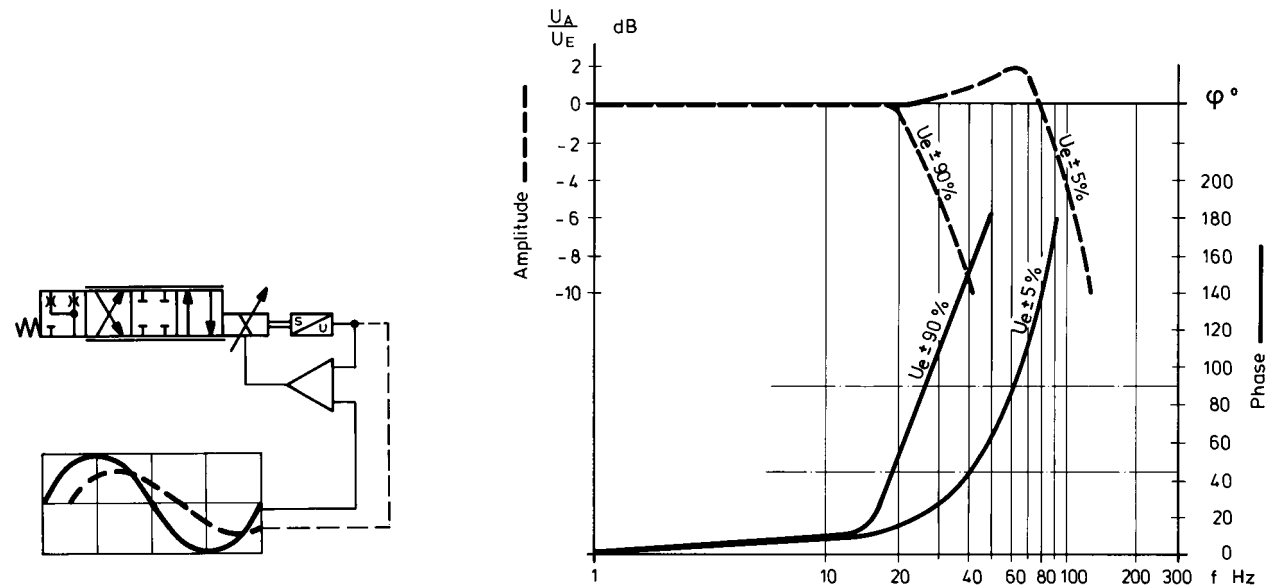
	Leakage at	100 bar	P-A	50 cm ³ /min
			P-B	70 cm ³ /min
	Flow at	$\Delta p = 35$ bar	A-T	10 ... 100 l/min
		q_N 50/100 l/min	B-T	10 ... 25 l/min
	Leakage at	100 bar	P-A	50 cm ³ /min
			P-B	70 cm ³ /min
			A-T	70 cm ³ /min
			B-T	50 cm ³ /min
	Fail-safe	$p = 0$ bar → 12 ms	Enable off	
		$p = 100$ bar → 16 ms		

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

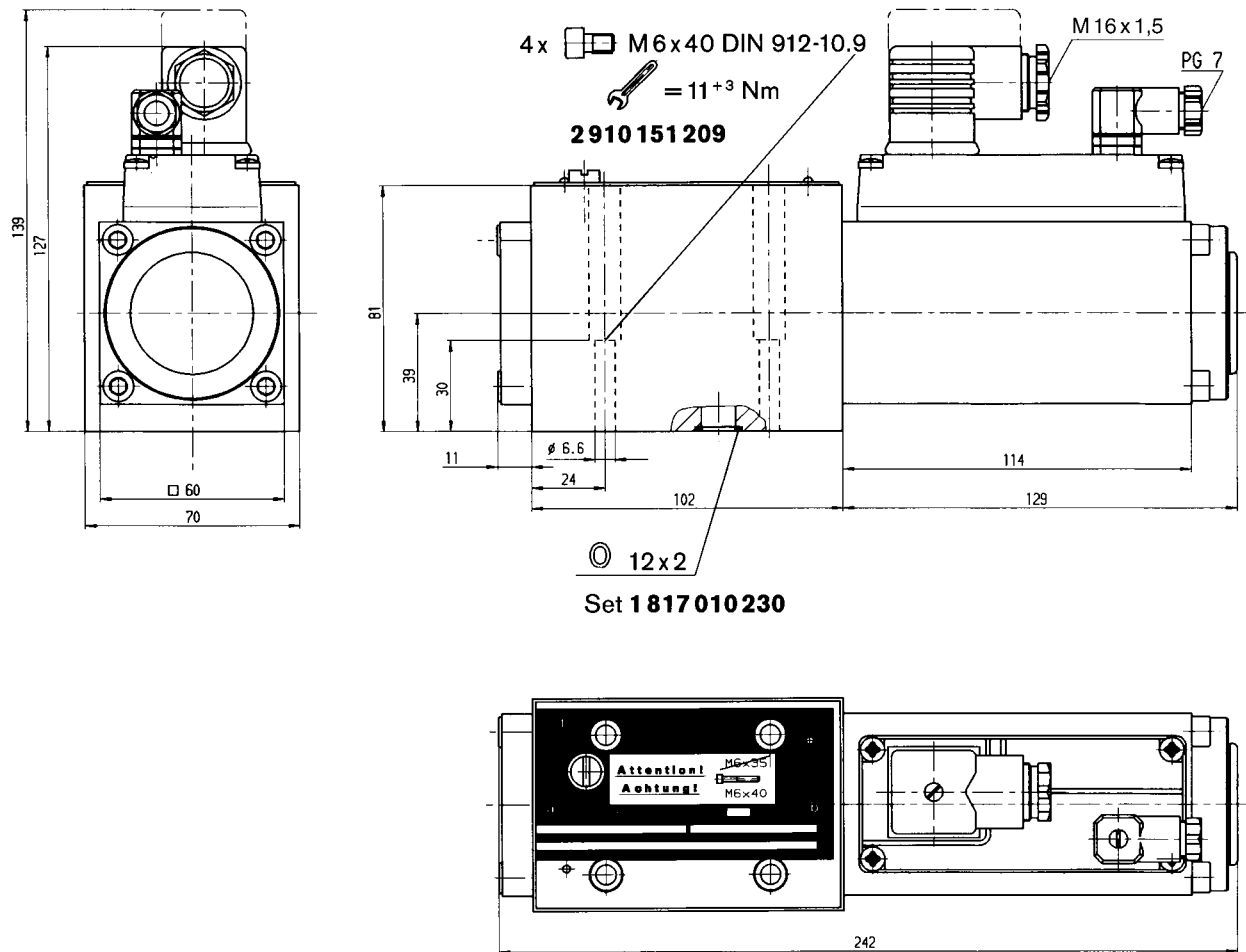
Pressure gain



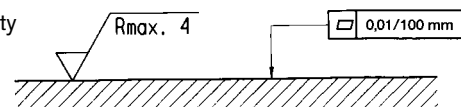
Bode diagram



Unit dimensions (nominal dimensions in mm)



Required surface quality
of mating component



Mounting hole configuration: NG10

(ISO 4401-05-04-0-94)

¹⁾ Deviates from standard

²⁾ Thread depth:

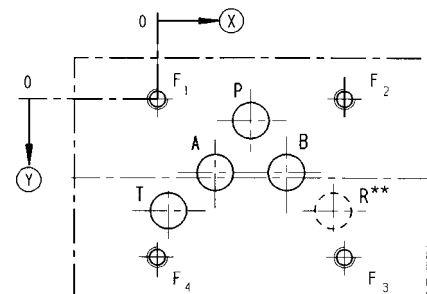
Ferrous metal 1.5xØ*

Non-ferrous 2 x Ø

* (NG10 min. 10.5 mm)

** 5/3 – NG10

R = P₂



	P	A	T	B	F ₁	F ₂	F ₃	F ₄	R
⊗	27	16.7	3.2	37.3	0	54	54	0	50.8
⊙	6.3	21.4	32.5	21.4	0	0	46	46	32.5
∅	10.5 ¹⁾	10.5 ¹⁾	10.5 ¹⁾	10.5 ¹⁾	M6 ²⁾	M6 ²⁾	M6 ²⁾	M6 ²⁾	10.5 ¹⁾