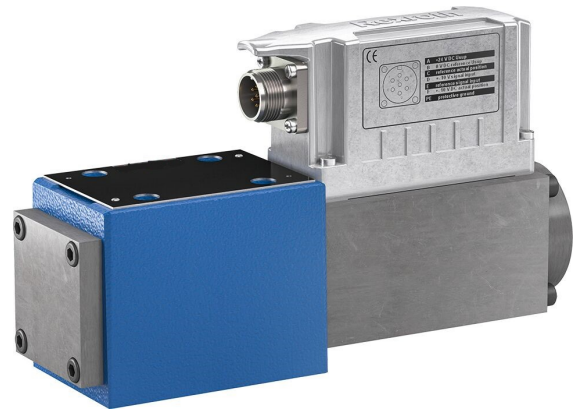# Servo solenoid valves with electrical position feedback (Lvdt DC/DC ±10 V)

Type AL 4WRPH10

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)

List of contents

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).

https://alttechprom.ru

Ordering data and scope of delivery

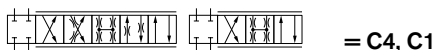| 4WRP	H	10	B		– 2X	/ G24	Z4 / M	*

For **external**
trigger electronics   = no desig.

Control piston/sleeve   = H

Size 10   = 10

Symbols

4/4-way version

= C3, C5

= C4, C1
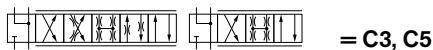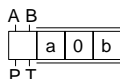
With symbols C5 and C1:

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

Side of inductive position transducer
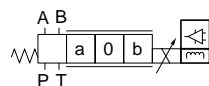
(Standard) = B

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
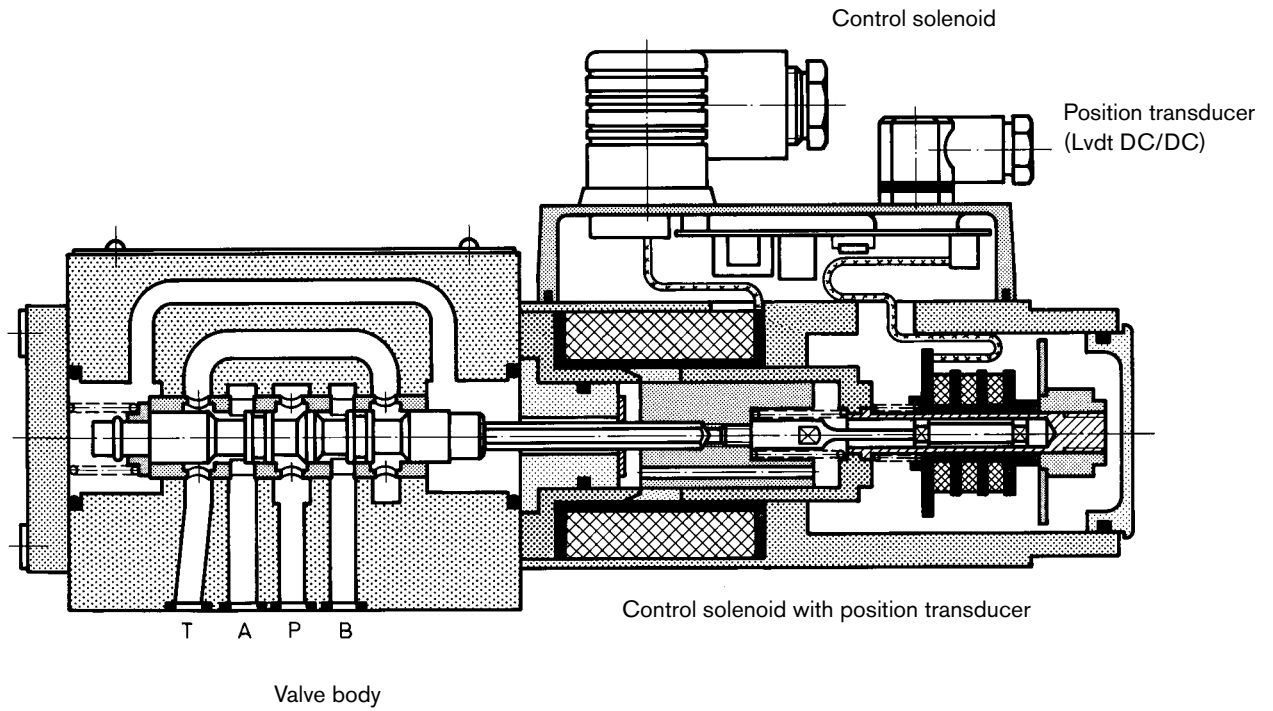 **50 =**   50 l/min
100 = 100 l/min

Preferred types (available at short notice)

Type 4WRPH10	
C3/C5	
4WRPH 10 C3B50L –2X/G24Z4 /M	
4WRPH 10 C3B100L –2X/G24Z4 /M	
4WRPH 10 C5B100L –2X/G24Z4 /M	
4WRPH 10 C3B50P –2X/G24Z4 /M	
4WRPH 10 C3B100P –2X/G24Z4 /M	
4WRPH 10 C5B100P –2X/G24Z4 /M	

Type 4WRPH10	
C1/C4	
4WRPH 10 C4B50L –2X/G24Z4 /M	
4WRPH 10 C4B100L –2X/G24Z4 /M	
4WRPH 10 C1B100L –2X/G24Z4 /M	
4WRPH 10 C4B50P –2X/G24Z4 /M	
4WRPH 10 C4B100P –2X/G24Z4 /M	
4WRPH 10 C1B50P –2X/G24Z4 /M	
4WRPH 10 C1B100P –2X/G24Z4 /M	

Function, sectional diagram

Servo solenoid valve 4WRPH10

Control solenoid

Position transducer
(Lvdt DC/DC)

Control solenoid with position transducer

T A P B

Valve body

Symbols

A B ⌐ a 0 b ⌐	Linear	p: kink 40%
C3, C5 / **C4, C1**		
	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, $\vartheta_{oil} = 40\,°C \pm 5\,°C$)

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 M16 x 1.5 (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 ($R_L \geqq 10\ k\Omega$)

Static/Dynamic

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

[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.

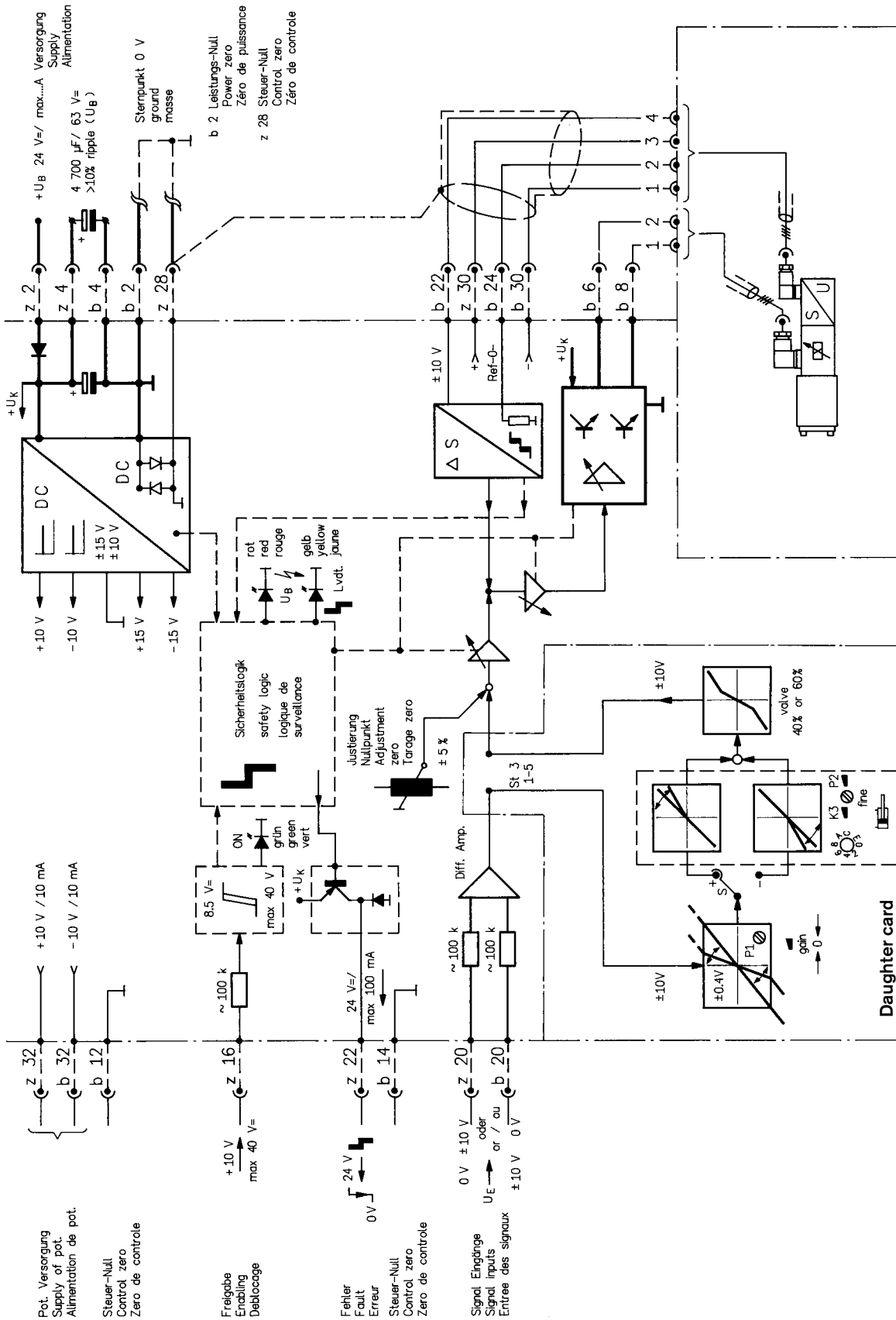[2] Flow rate at a different Δp $q_x = q_{nom} \cdot \sqrt{\dfrac{\Delta p_x}{35}}$

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

Block diagram/pin assignment
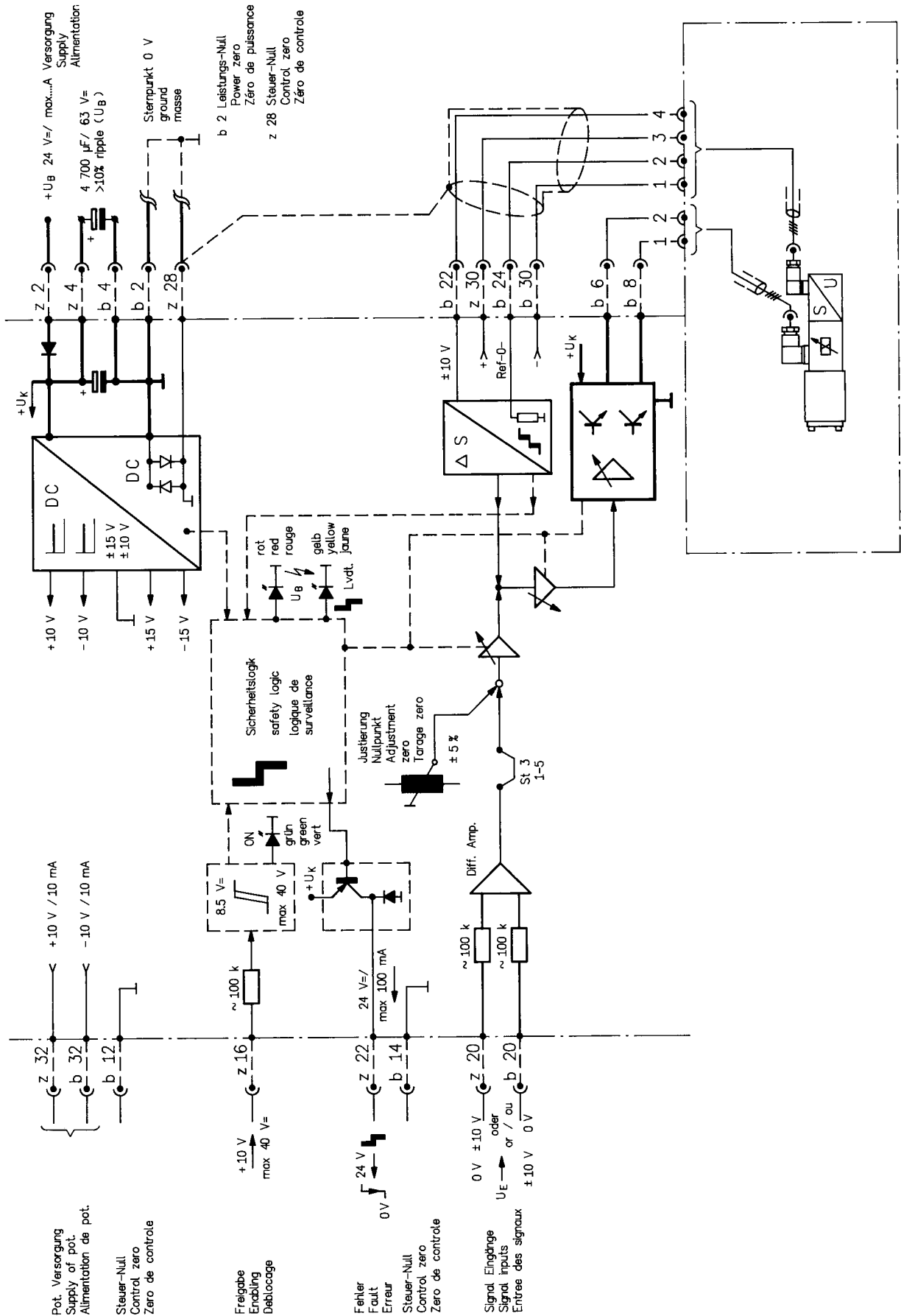
Valve with external trigger electronics (standard non-linear curve: P)
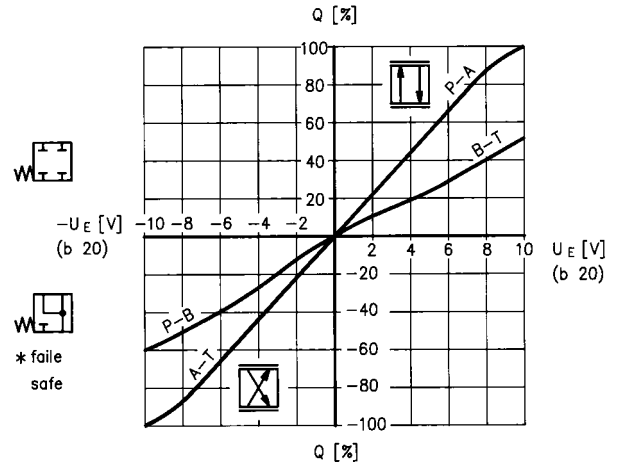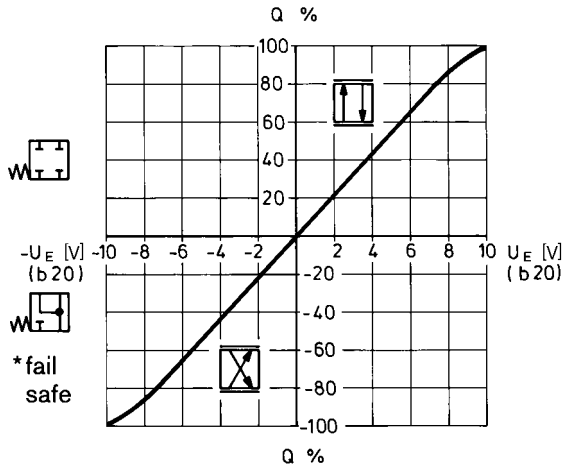
Block diagram/pin assignment

Performance curves (measured with HLP 46, $\vartheta_{oil} = 40\,°C \pm 5\,°C$)
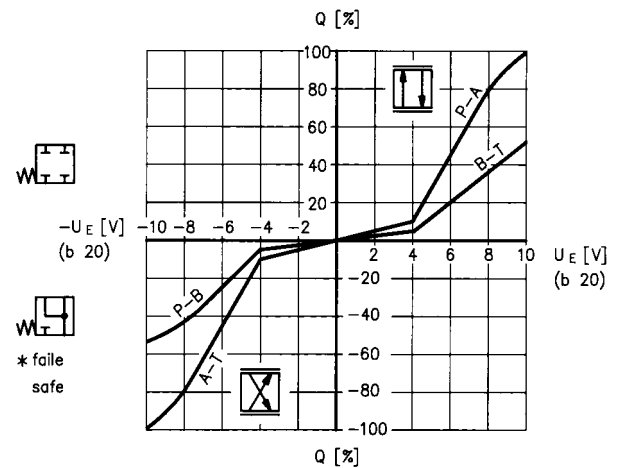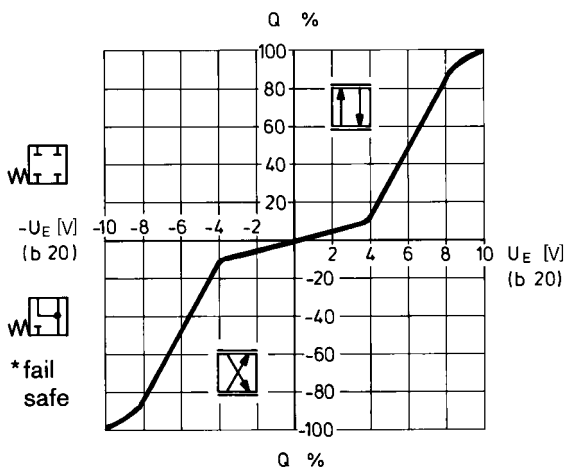
Flow rate/Signal function $\quad Q = f\,(U_E)$

L: Linear
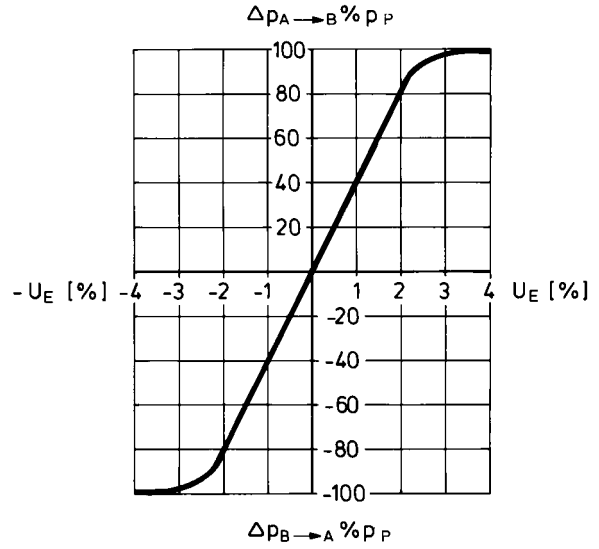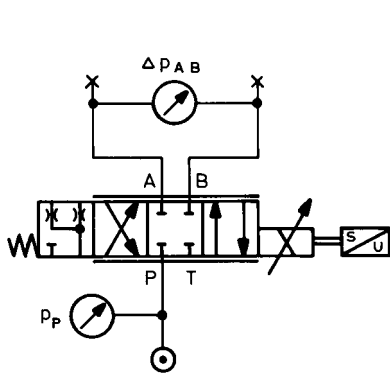
L: (linear) 2:1

P: (kink 40%)**

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

*Fail-safe when enabling is not released.
**Q_N-kink = 10% Q_N.

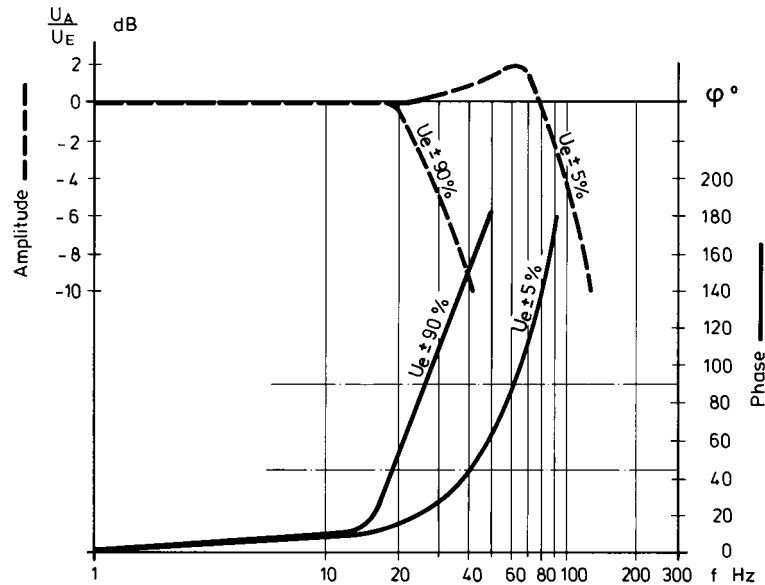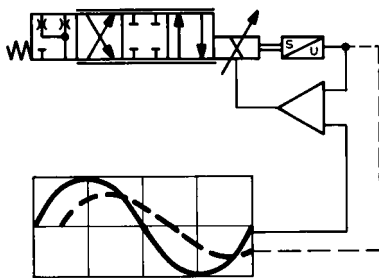**Fail-safe position**

Leakage at	100 bar	P–A	50 cm³/min
		P–B	70 cm³/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 cm³/min
		P–B	70 cm³/min
		A–T	70 cm³/min
		B–T	50 cm³/min

Fail-safe	$p = \quad 0$ bar $\rightarrow$ 12 ms	Enable off
	$p = 100$ bar $\rightarrow$ 16 ms	

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

Pressure gain

Bode diagram

Unit dimensions (nominal dimensions in mm)

4x ⬚ M 6 x 40 DIN 912-10.9

🔧 = 11⁺³ Nm

2 910 151 209

M 16 x 1,5

PG 7

⌀ 6.6

◎ 12 x 2

Set **1 817 010 230**
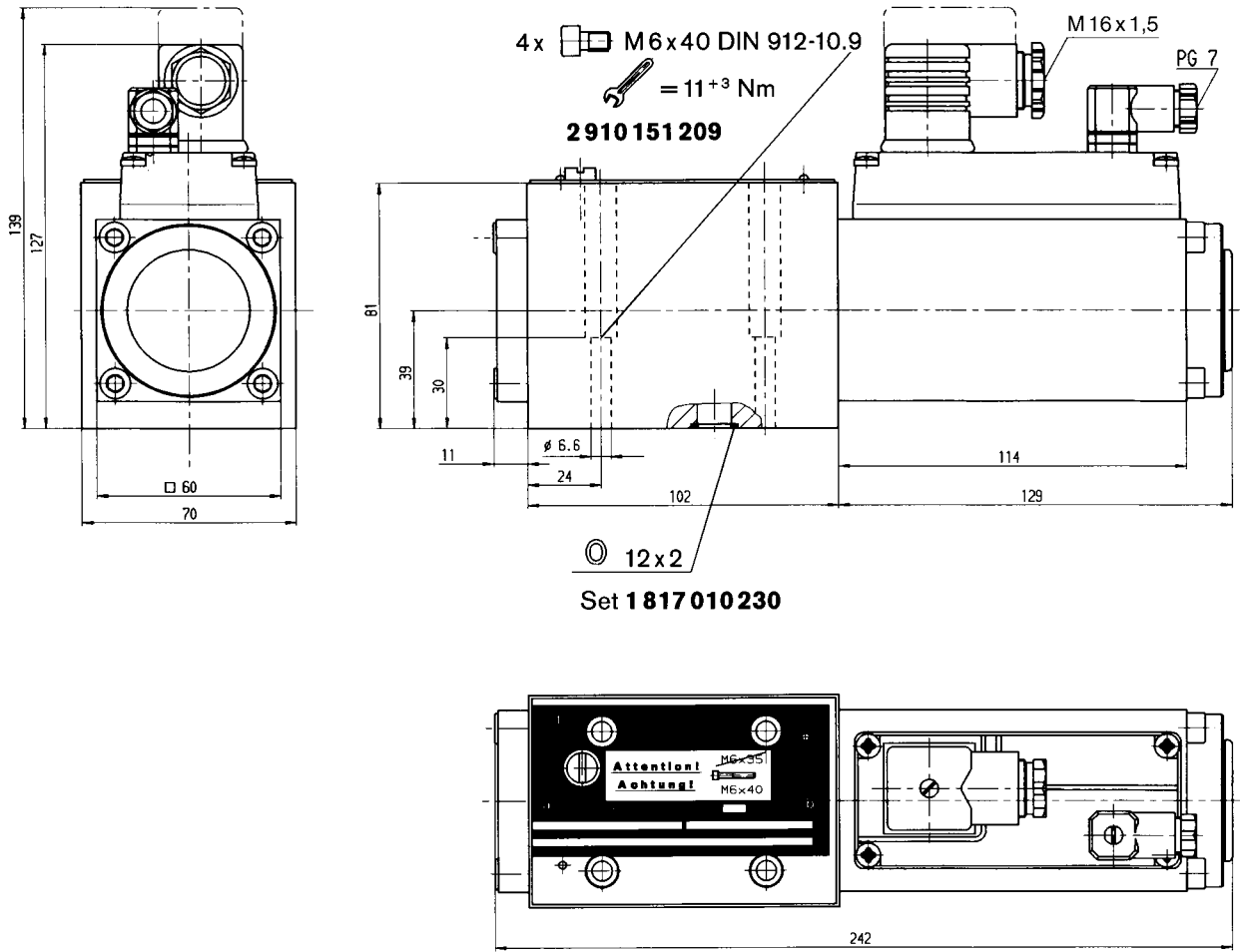
Required surface quality of mating component — Rmax. 4 — ⬜ 0,01/100 mm
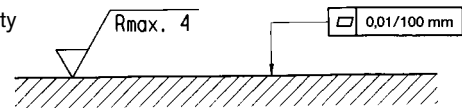
Mounting hole configuration: NG10
(ISO 4401-05-04-0-94)

[1] Deviates from standard
[2] Thread depth:
   Ferrous metal 1.5 x Ø*
   Non-ferrous 2 x Ø
* (NG10 min. 10.5 mm)

** 5/3 – NG10
   $R = P_2$
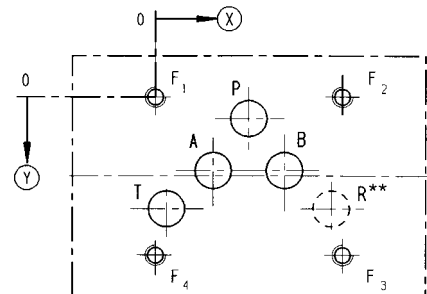
	P	A	T	B	F_1	F_2	F_3	F_4	R
⊗	27	16.7	3.2	37.3	0	54	54	0	50.8
Ⓨ	6.3	21.4	32.5	21.4	0	0	46	46	32.5
Ø	10.5 [1]	10.5 [1]	10.5 [1]	10.5 [1]	M6 [2]	M6 [2]	M6 [2]	M6 [2]	10.5 [1]