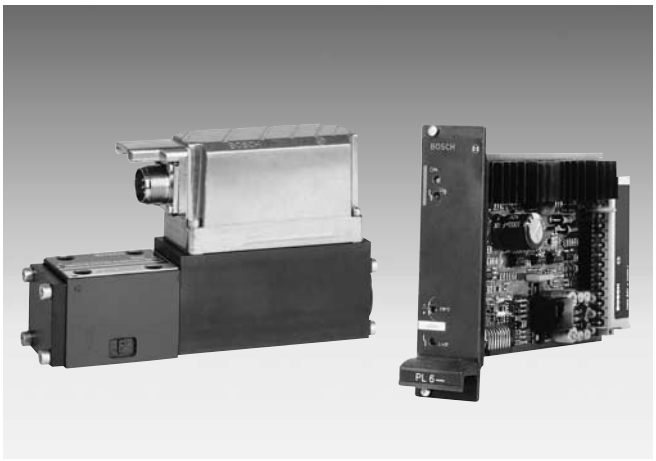
RE 29 026/11.02

Servo solenoid valves with electrical position feedback (Lvdt DC/DC) (ruggedized design) Type 4WRPH 6

Size 6
Series 2X
Maximum working pressure 315 bar
Maximum flow rate 40 l/min (Δp 70 bar)



Type 4WRPH 6 ..B..-2X/G24...

Servo solenoid valves with electrical position feedback (Lvdt DC/DC) (ruggedized design) Type 4WRPH 10

Size 10
Series 2X
Maximum working pressure 315 bar
Maximum flow rate 100 l/min (Δp 70 bar)

Type 4WRPH 10 ..B..-2X/G24...

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Features

- Directly operated servo solenoid valve NG 6, 10, with control piston and sleeve in servo quality and sturdy design
- Actuated on one side, 4/4 fail-safe position when switched off
- "Ruggedized" design 40 *g* with central plug
- Suitable for the wood industry and in systems with difficult ambient conditions
- For subplate attachment, mounting hole configuration to DIN 24 340 Form A, ISO 4401 and CETOP-RP 121 H
- Subplates as per catalogue section RE 45 053 and RE 45 055 (order separately)

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Ordering data

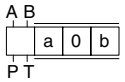
4WRP | | H | | | B | | | -2X/G24 | K0/ | M | -750

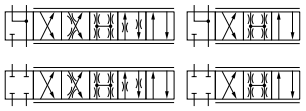
For **external** trigger electronics **= no desig.**

Control piston/sleeve **= H**

Size 6, 10 **= 6** **= 10**

Symbols
4/4-way version



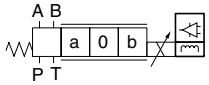


= C3, C5

= 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 transducer



(Standard) **= B**

Electrical connection
K0 = without line socket, with plug to DIN 43 563-AM6
Order line socket separately

M = NBR seals, suitable for mineral oils (HL, HLP) to DIN 51 524

-750 = Ruggedized design

Voltage supply of trigger electronics
G24 = +24 V DC

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

Flow characteristic
L = Linear
P = [2]) Non-linear curve

Nominal flow rate at 70 bar valve pressure difference

Size 6	Size 10
12 = 12 l/min	**50** = 50 l/min
15[1]) = 15 l/min	**100** = 100 l/min
24 = 24 l/min	
25[1]) = 25 l/min	
40 = 40 l/min	

[1]) Only in connection with flow characteristic "p"
[2]) Kink 60% for NG 6 with nominal flow rate "15" and "25", otherwise kink 40%
[3]) q_v 2:1 only with nominal flow rate ≧ 40 l/min

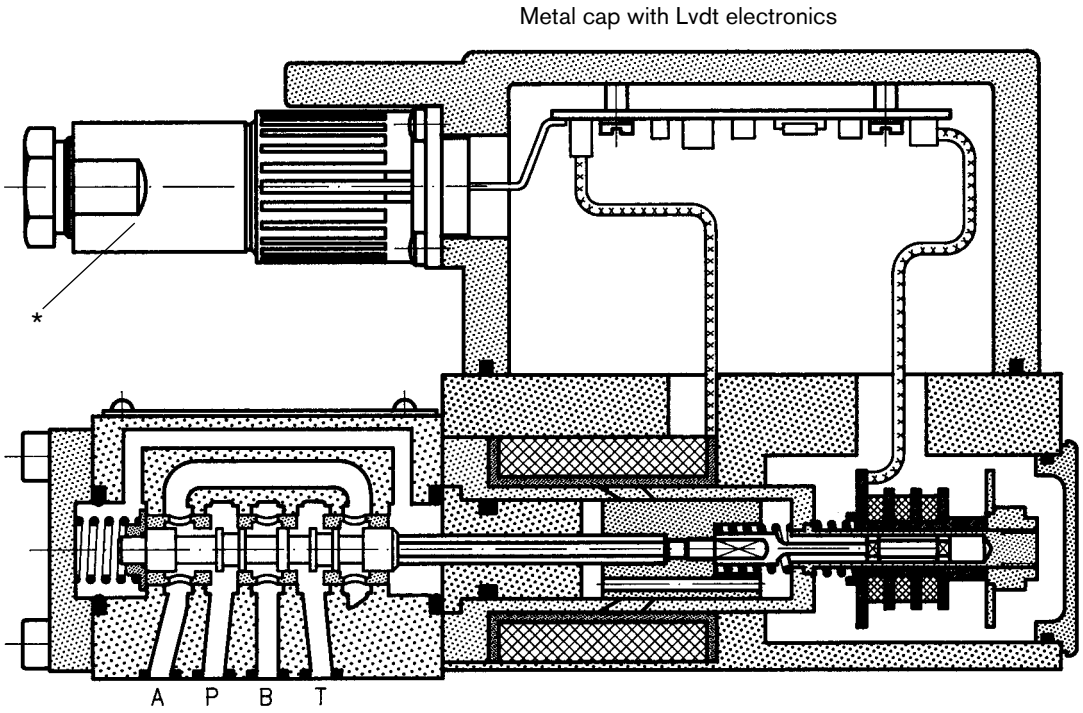
Preferred types (available at short notice)

Material no.	Type 4WRPH 6
	C3 / C4
0 811 404 169	4WRPH 6 C3B24L –2X/G24K0 / M-750
0 811 404 170	4WRPH 6 C3B40L –2X/G24K0 / M-750
0 811 404 167	4WRPH 6 C4B24L –2X/G24K0 / M-750
0 811 404 171	4WRPH 6 C4B40L –2X/G24K0 / M-750
0 811 404 173	4WRPH 6 C4B15P –2X/G24K0 / M-750
0 811 404 178	4WRPH 6 C4B40P –2X/G24K0 / M-750

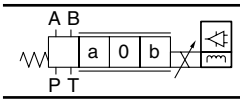
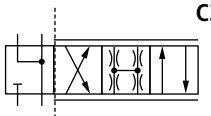
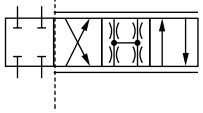
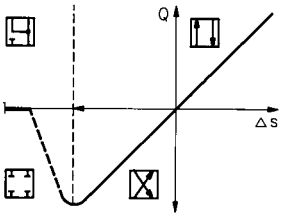
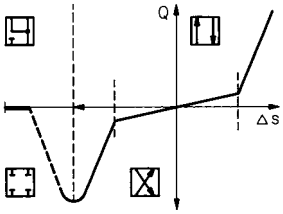
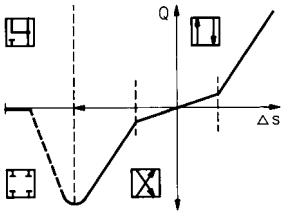
Material no.	Type 4WRPH 10
	C1 / C4
0 811 404 069	4WRPH 10 C4B100L –2X/G24K0 / M-750
0 811 404 901	4WRPH 10 C1B100L –2X/G24K0 / M-750
0 811 404 088	4WRPH 10 C4B100P –2X/G24K0 / M-750
0 811 404 089	4WRPH 10 C1B100P –2X/G24K0 / M-750

Function, sectional diagram

Servo solenoid valve 4WRPH 6...-750



Symbols

	Linear	p: kink 60 %	p: kink 40 %
C3, C5  **C4, C1** 			
	C3, C4	C5, C1	C5, C1

Accessories, not included in scope of delivery

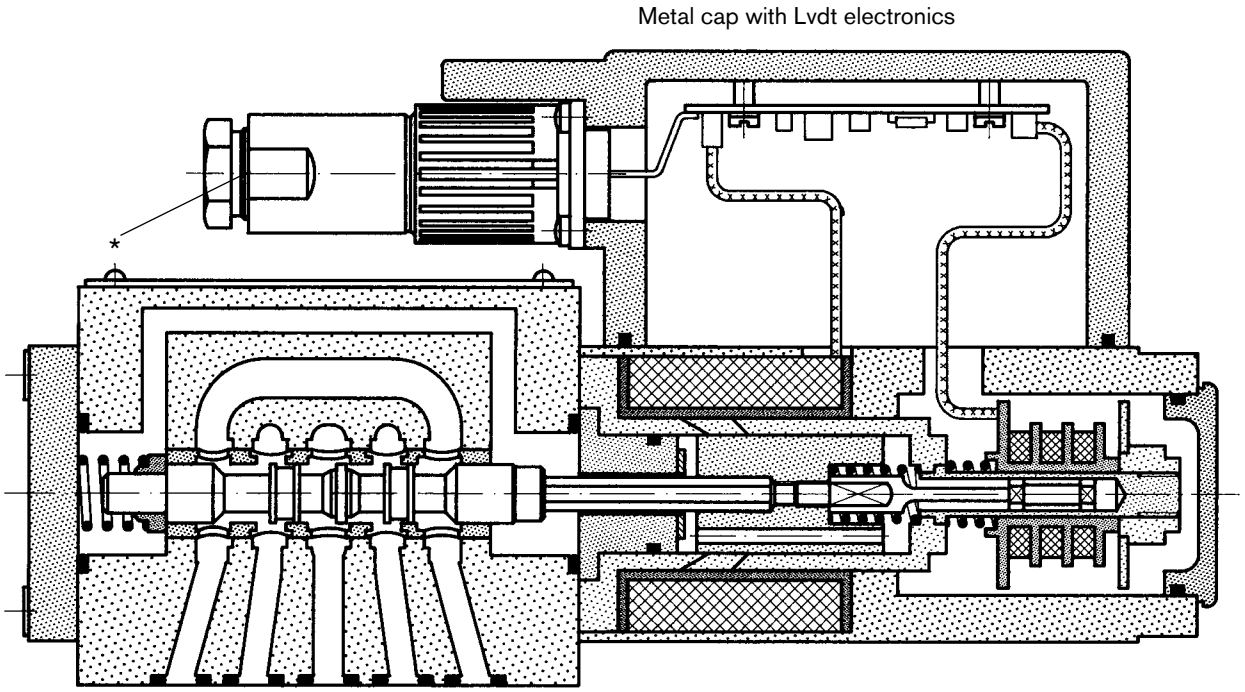
(4 x) M 5 x 30 DIN 912–10.9	Fastening screws	2 910 151 166
	VT-VRRA1-527-20 / V0, see RE 30 041	0 811 405 060
	VT-VRRA1-527-20 / V0 / K60-AGC, see RE 30 040	0 811 405 066
	VT-VRRA1-527-20 / V0 / K40-AGC, see RE 30 040	0 811 405 065
* 6P + PE (Pg16)	Line socket not included in scope of delivery, also see RE 08 008	1 834 482 024

Testing and service equipment

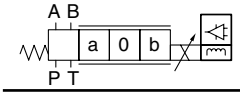
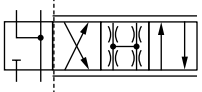
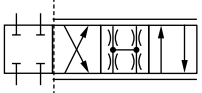
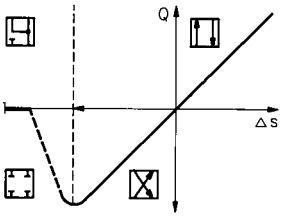
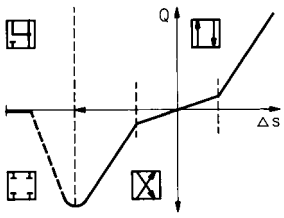
– Test box type VT-PE-TB2, see RE 30 064.
– Test adapter type VT-PA-3, see RE 30 070.

Function, sectional diagram

Servo solenoid valve 4WRPH 10...-750



Symbols

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

Accessories, not included in scope of delivery

(4 x) M 6 x 40 DIN 912–10.9	Fastening screws	2 910 151 209
	VT-VRRA1-537-20 / V0, see RE 30 041	0 811 405 061
	VT-VRRA1-537-20 / V0 / K40-AGC, see RE 30 040	0 811 405 067
* 6P + PE (Pg16)	Line socket not included in scope of delivery, also see RE 08 008	1 834 482 024

Testing and service equipment

– Test box type VT-PE-TB2, see RE 30 064.
– Test adapter type VT-PA-3, see RE 30 070.

Technical data for 4WRPH 6 (For device applications beyond the stated values, please consult us!)

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 NG 6 (ISO 4401 and CETOP-RP 121 H)			
Installation position	Optional			
Ambient temperature range	–20 … +60 °C			
Weight	2.5 kg			
Vibration resistance, test condition	Max. 40 *g*, shaken in 3 dimensions (24 h)			
Hydraulic (measured with HLP 46, ϑ_{oil} = 40 °C ±5 °C)				
Pressure fluid	Hydraulic oil to DIN 51 524 … 535, other fluids after prior consultation			
Viscosity range, recommended max. permitted	20 … 100 mm²/s 10 … 800 mm²/s			
Pressure fluid temperature range	–20 … +70 °C			
Purity class to ISO code	Maximum permitted degree of contamination of pressure fluid to ISO 4406 (C) Class 18/16/13 [1])			
Flow direction	See symbol			
Nominal flow [l/min] at Δp = 35 bar per notch*	12	15	24	40
Max. working pressure	Port P, A, B: 315 bar			
Max. pressure	Port T: 250 bar			
Operating limits at Δp [bar] Pressure drop at valve	315	315	315	160
$q_{vnom.}$: > q_N valves	315	280	250	100
Leakage [cm³/min] at 100 bar	< 300	–	< 500	< 900
	–	< 180	< 300	< 450

Electrical		
Cyclic duration factor	100 %	
Power supply	24 $V_{nom.}$ (external amplifier)	
Degree of protection	IP 66 to DIN 40 050, line socket 1 834 482 024, mounted	
Connectors for solenoid and position transducer	To DIN 43 563-AM6 (line socket 1 834 482 024) Pg 16 For pin assignment see block diagram on pages 7 and 8	
Solenoid current	2.7 A max.	
Coil resistance R_{20}	2.5 Ω	
Max. power consumption at 100 % load and operational temperature	40 VA max.	
Position transducer DC/DC technology	Supply: +15 V/35 mA –15 V/25 mA	Signal: 0...±10 V ($R_L \geqq$ 10 kΩ)

Static/Dynamic	
Hysteresis	≦ 0.2 %
Manufacturing tolerance for $q_{max.}$	<10 %
Response time for signal change 0 … 100 %	< 10 ms
Thermal drift	Zero point displacement <1 % at ΔT= 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. For a selection of filters, see catalogue sections RE 50 070, RE 50 076 and RE 50 081.

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

Technical data for 4WRPH 10 (For device applications beyond the stated values, please consult us!)

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 NG 10 (ISO 4401 and CETOP-RP 121 H)			
Installation position	Optional			
Ambient temperature range	–20 … +60 °C			
Weight	7 kg			
Vibration resistance, test condition	Max. 40 *g*, shaken in 3 dimensions (24 h)			
Hydraulic (measured with HLP 46, ϑ_{oil} = 40 °C ±5 °C)				
Pressure fluid	Hydraulic oil to DIN 51 524 … 535, other fluids after prior consultation			
Viscosity range, recommended max. permitted	20 … 100 mm²/s 10 … 800 mm²/s			
Pressure fluid temperature range	–20 … +70 °C			
Purity class to ISO code	Maximum permitted degree of contamination of pressure fluid to ISO 4406 (C) Class 18/16/13 [1]			
Flow direction	See symbol			
Nominal flow [l/min] at Δp = 35 bar per notch*	50 (1:1)	50 (2:1)	100 (1:1)	100 (2:1)
Max. working pressure	Port P, A, B: 315 bar			
Max. pressure	Port T: 250 bar			
Operating limits at Δp [bar] Pressure drop at valve	315	315	160	160
$q_{vnom.}$: > q_N valves	250	250	100	100
Leakage [cm³/min] at 100 bar	< 1200	< 1200	< 1500	< 1000
	< 600	< 500	< 600	< 600

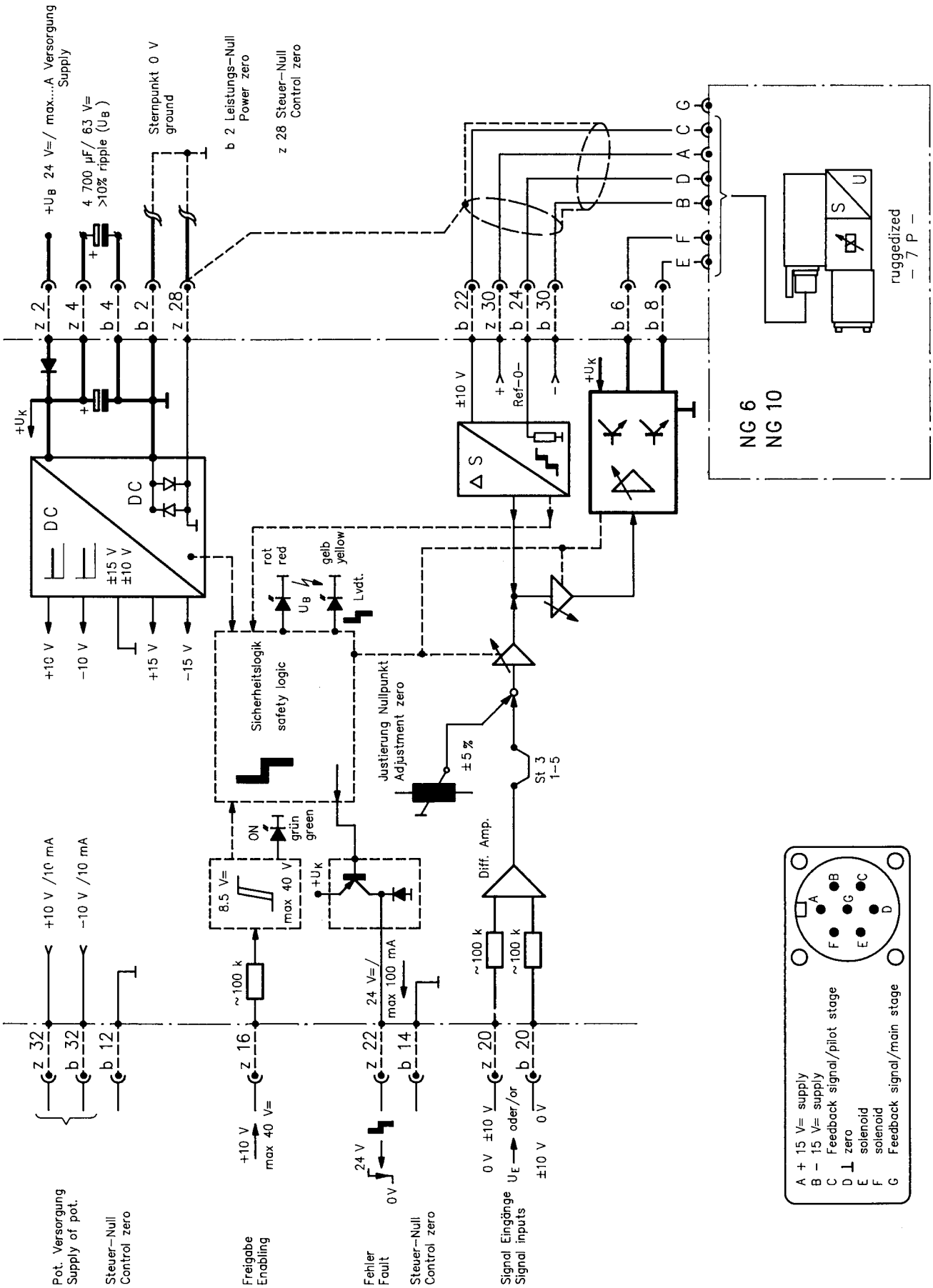
Electrical		
Cyclic duration factor	100 %	
Power supply	24 $V_{nom.}$ (external amplifier)	
Degree of protection	IP 66 to DIN 40 050, line socket 1 834 482 024, mounted	
Connectors for solenoid and position transducer	To DIN 43 563-AM6 (line socket 1 834 482 024) Pg 16 For pin assignment see block diagram on pages 7 and 8	
Solenoid current	3.7 A max.	
Coil resistance R_{20}	2.4 Ω	
Max. power consumption at 100 % load and operational temperature	60 VA max.	
Position transducer DC/DC technology	Supply: +15 V/35 mA –15 V/25 mA	Signal: 0...±10 V (R_L ≧ 10 kΩ)

Static/Dynamic	
Hysteresis	≦ 0.2 %
Manufacturing tolerance for $q_{max.}$	<10 %
Response time for signal change 0 … 100 %	≦ 25 ms
Thermal drift	Zero point displacement <1 % at ΔT= 40 °C

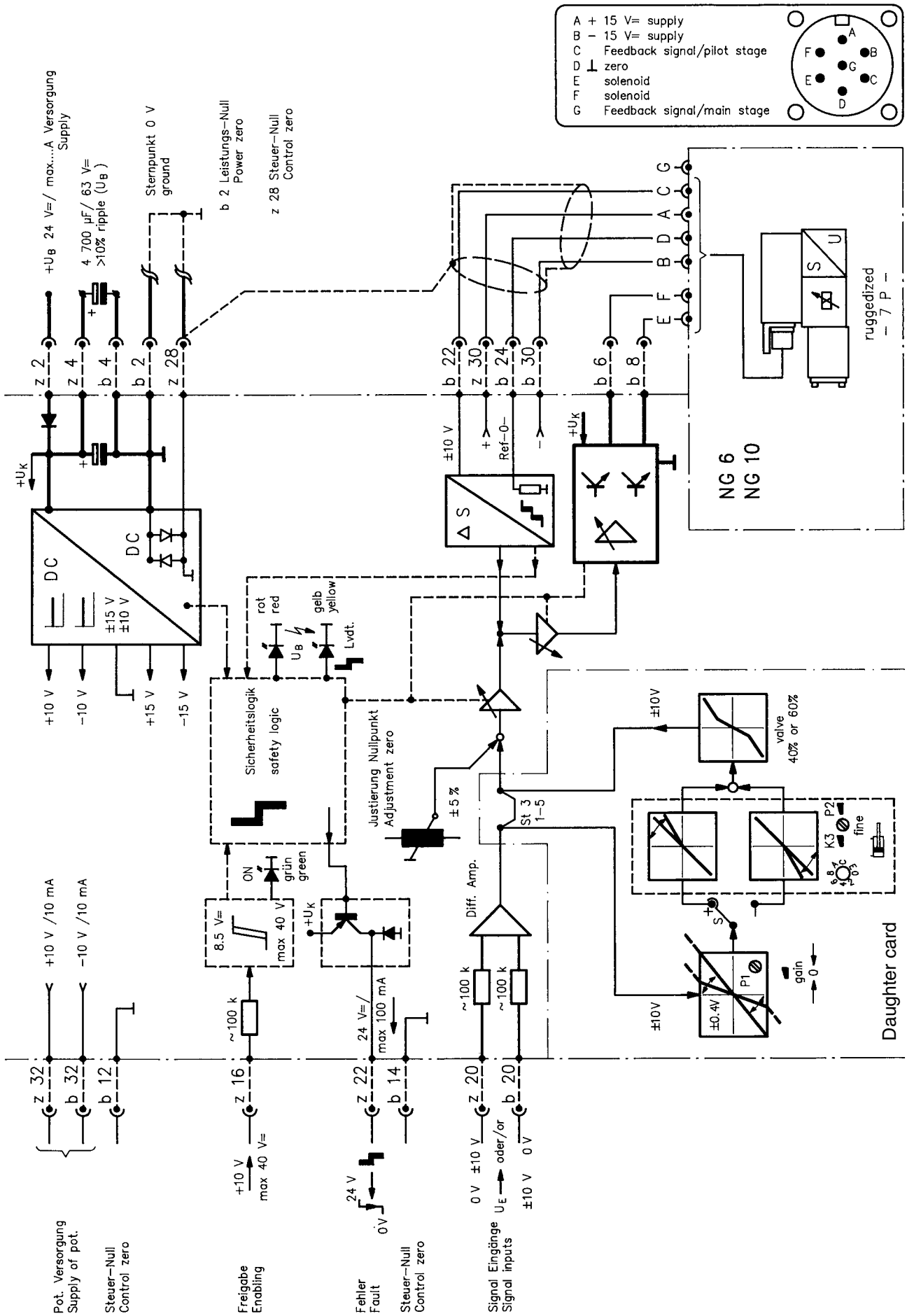
[1] The purity classes stated for the components must be complied with in hydraulic systems. Effective filtration prevents problems and also extends the service life of components. For a selection of filters, see catalogue sections RE 50 070, RE 50 076 and RE 50 081.

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

Block diagram / pin assignment



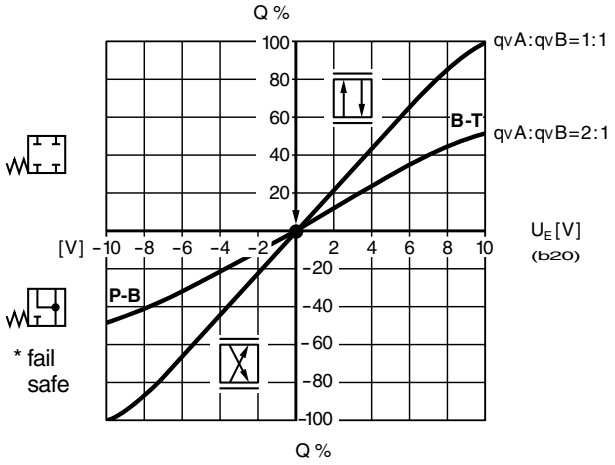
Block diagram / pin assignment



Flow rate/Signal function (with 70 bar pressure drop at valve)

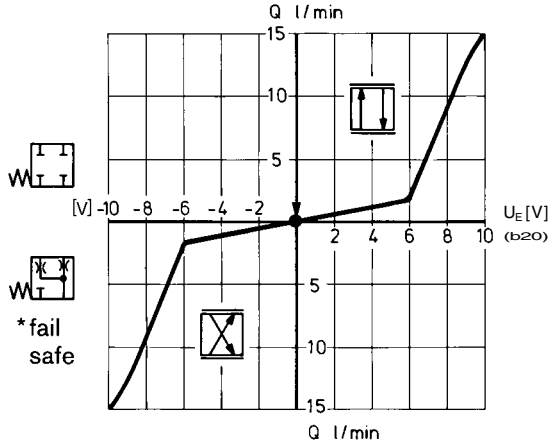
NG 6, NG 10

L: Linear 1:1 and 2:1



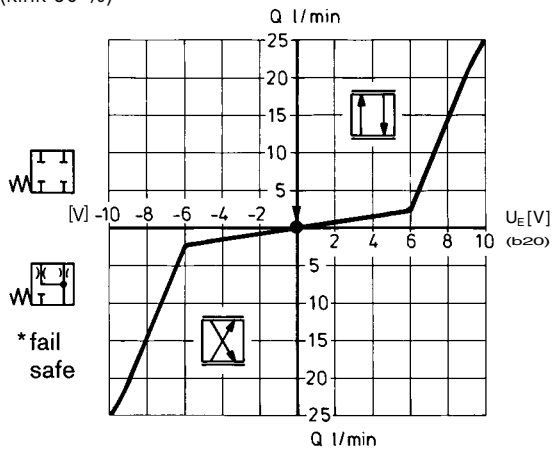
NG 6

P: (kink 60 %)**



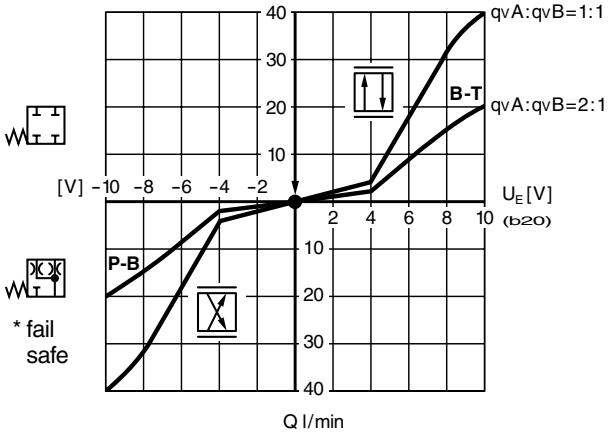
NG 6

P: (kink 60 %)**



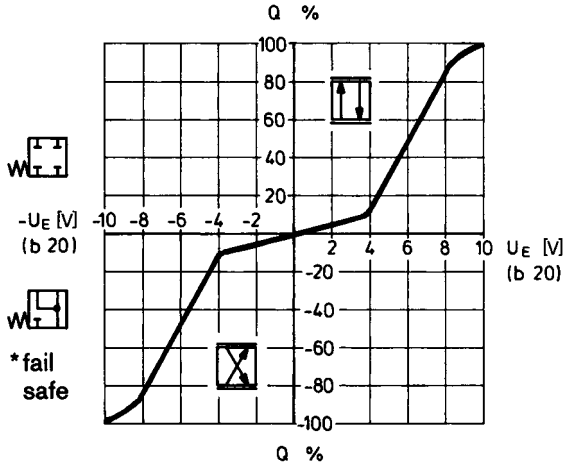
NG 6

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



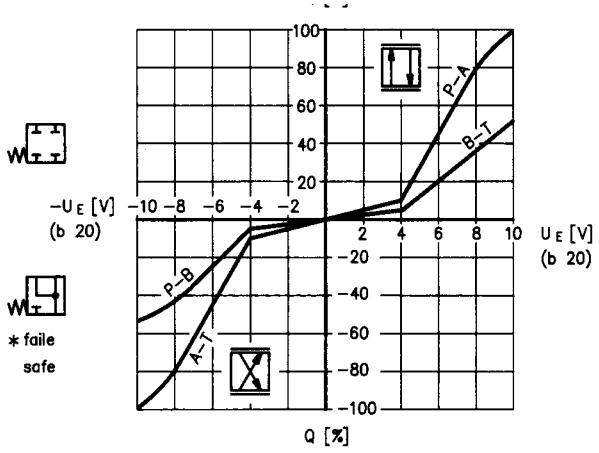
NG 10

P: (kink 40 %)**



NG 10

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



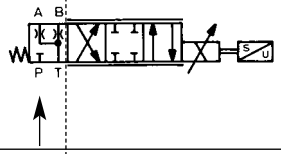
*Fail-safe when enabling is not released.

**Q-kink = 10 % Q_N.

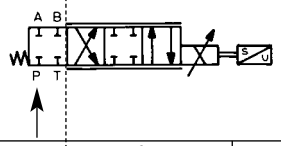
Fail-safe position

NG 6

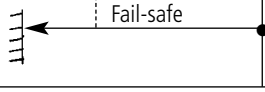
Fail-safe position



Leakage at	100 bar	P–A	50 cm³/min
		P–B	70 cm³/min
Flow at	Δp = 35 bar	A–T	10 … 20 l/min
		B–T	7 … 20 l/min



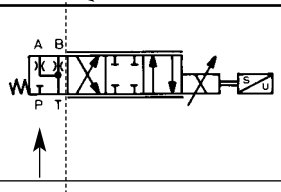
Leakage at	100 bar	P–A	50 cm³/min
		P–B	70 cm³/min
		A–T	70 cm³/min
		B–T	50 cm³/min



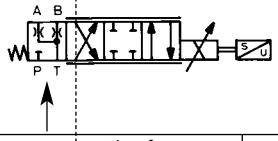
Fail-safe	p = 0 bar →	7 ms	Enable off
	p = 100 bar →	10 ms	

NG 10

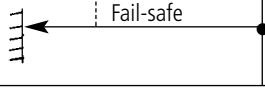
Fail-safe position



Leakage at	100 bar	P–A	50 cm³/min
		P–B	70 cm³/min
Flow at	Δp = 35 bar	A–T	10 … 100 l/min
	q_N 50/100 l/min	B–T	10 … 25 l/min

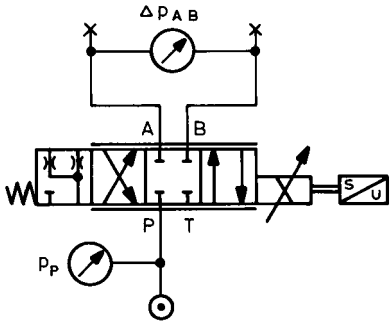


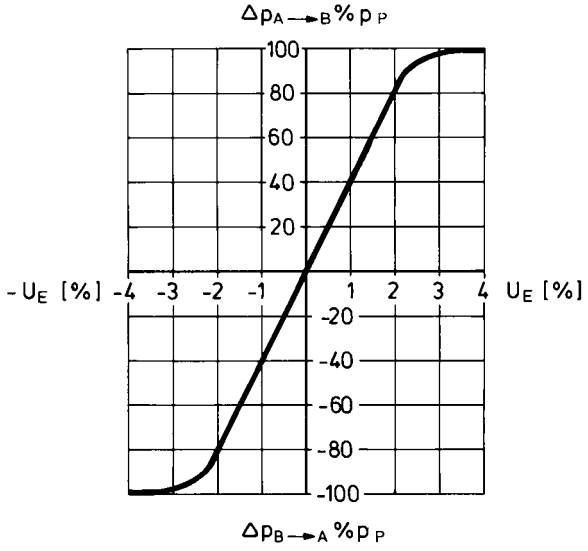
Leakage at	100 bar	P–A	50 cm³/min
		P–B	70 cm³/min
		A–T	70 cm³/min
		B–T	50 cm³/min



Fail-safe	p = 0 bar →	12 ms	Enable off
	p = 100 bar →	16 ms	

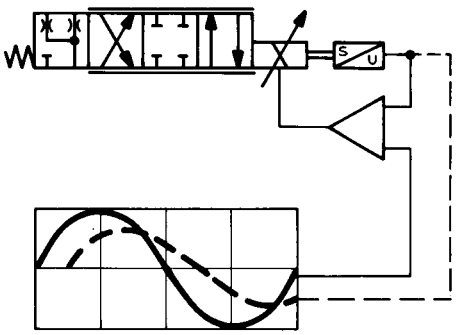
Pressure gain

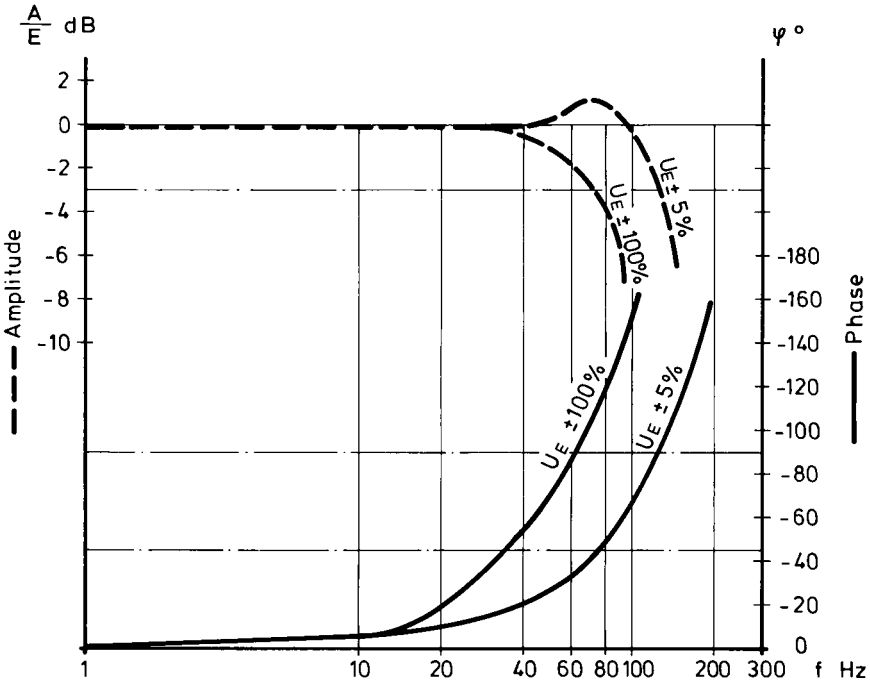




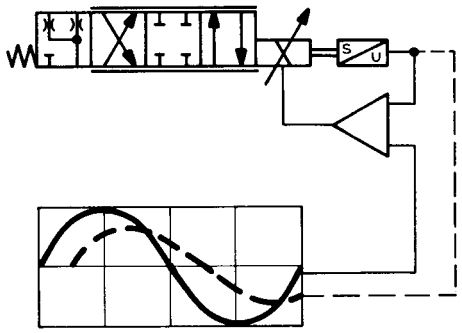
Bode diagram

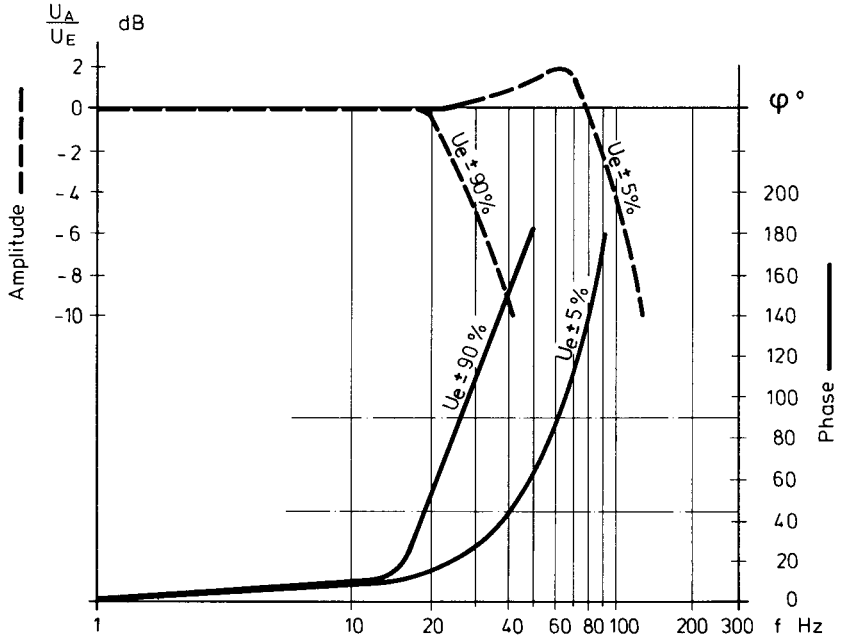
NG 6

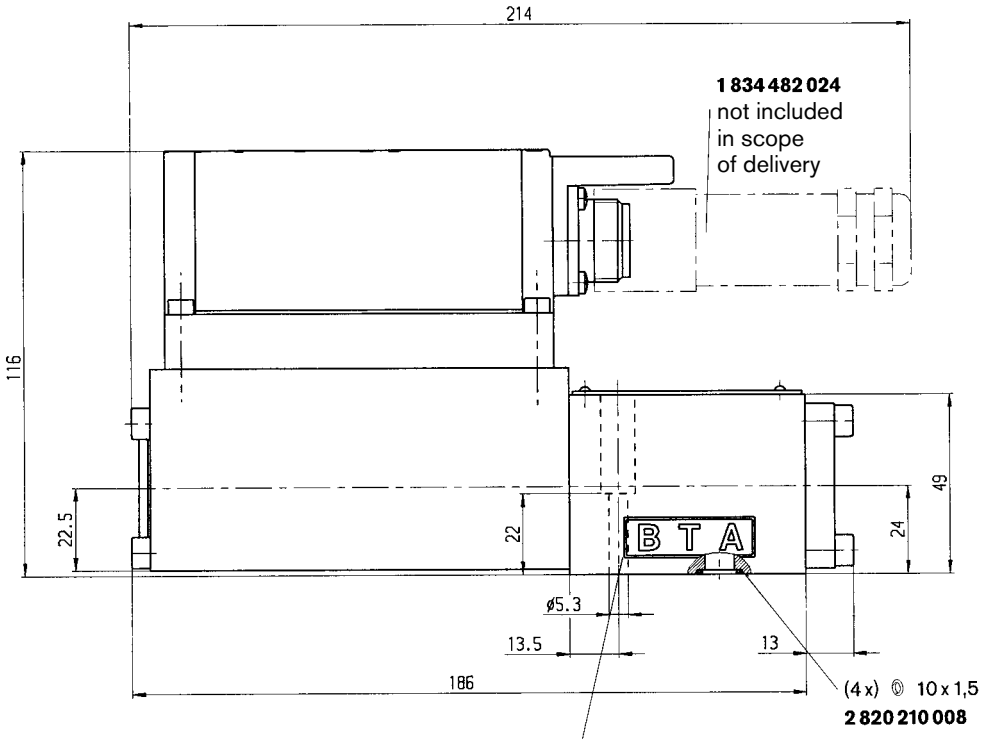


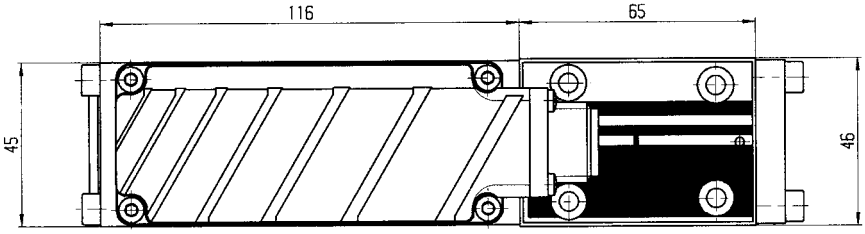


NG 10

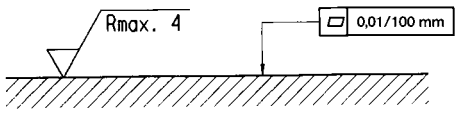






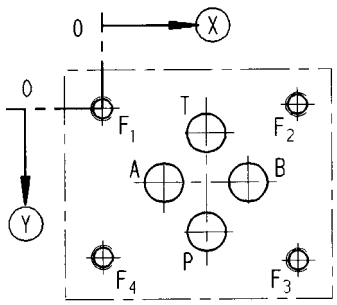


Required surface quality of mating component



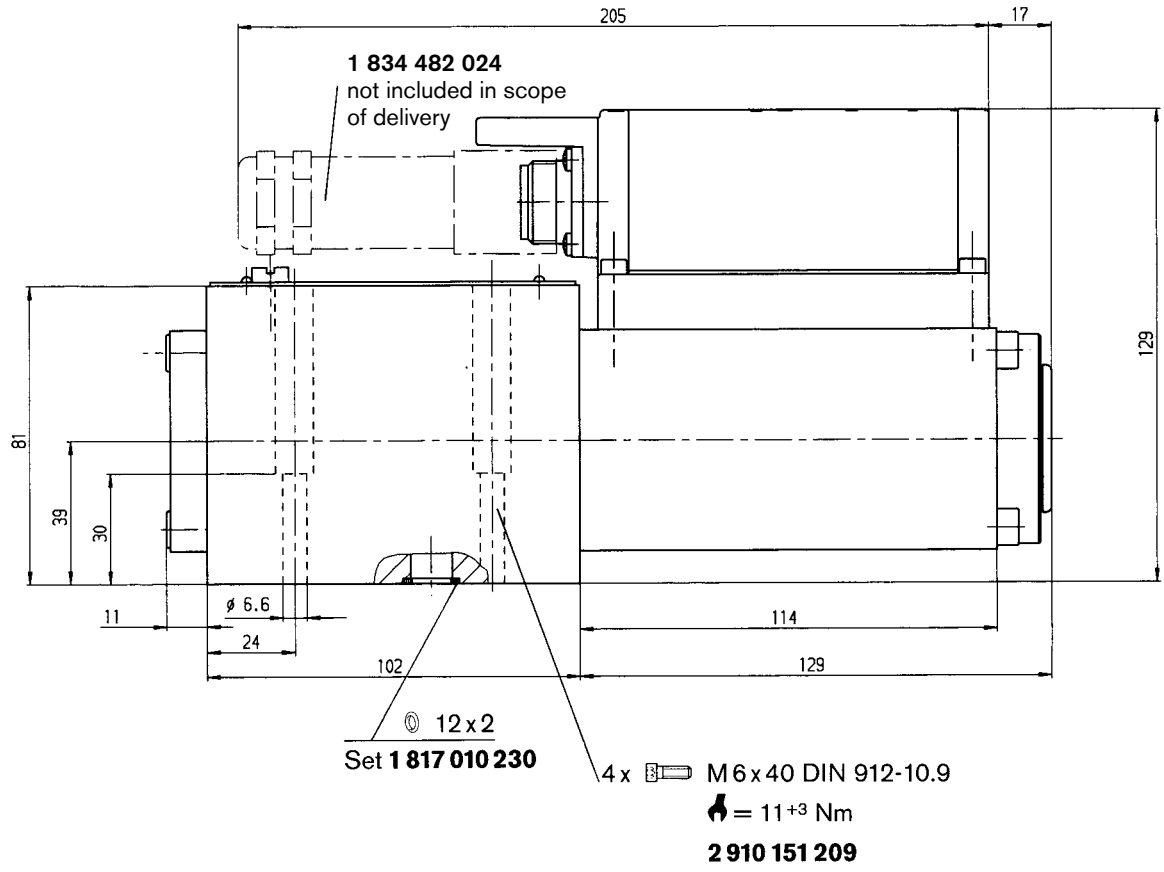
Mounting hole configuration: NG 6 (DIN 24 340 Form A, ISO 4401 and CETOP-RP 121 H)

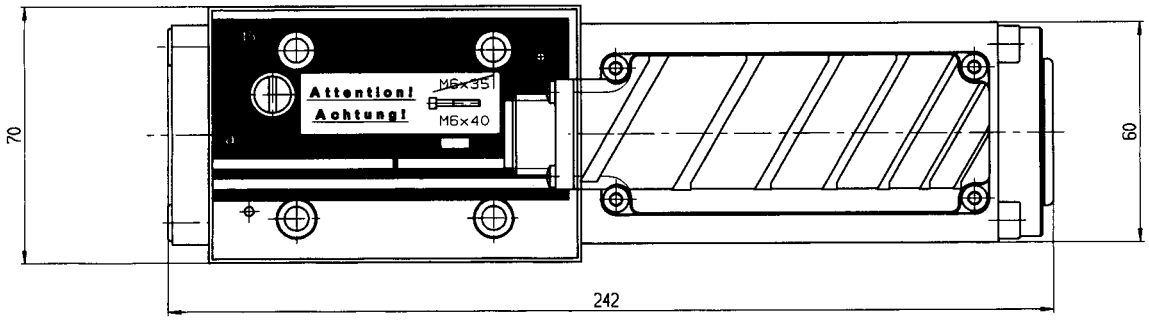
For subplates, see catalogue section RE 45 053



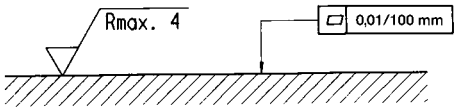
[1]) Deviates from standard
[2]) Thread depth: Ferrous metal 1.5 x ∅*
Non-ferrous 2 x ∅
* (NG 10 min. 10.5 mm)

	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
Ø	8[1)]	8[1)]	8[1)]	8[1)]	M5[2)]	M5[2)]	M5[2)]	M5[2)]



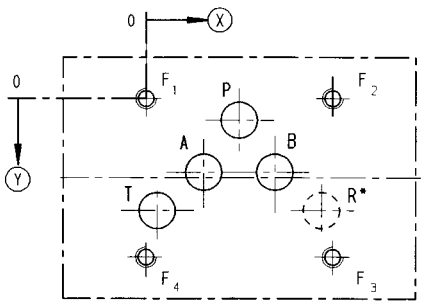


Required surface quality
of mating component



Mounting hole configuration: NG 10 (DIN 24 340 Form A, ISO 4401 and CETOP-RP 121 H)

For subplates, see catalogue section RE 45 055



1) Deviates from standard
2) Thread depth: Ferrous metal 1.5 x ∅*
Non-ferrous 2 x ∅
* (NG 10 min. 10.5 mm)

*5/3 – NG 10
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)]	M 6[2)]	M 6[2)]	M 6[2)]	M 6[2)]	10.5[1)]

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