

Servo solenoid valves with electrical position feedback (Lvdv DC/DC) (ruggedized design)

RE 29026/01.05
Replaces: 11.02

1/14

Type 4WRPH

Size 6, 10
Unit series 2X
Maximum working pressure P, A, B 315 bar, T 250 bar
Nominal flow rate 12...40 l/min (NG6), 50...100 l/min (NG10)



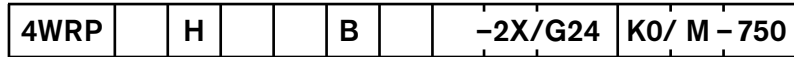
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Features

- Directly operated servo solenoid valve NG6, 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 NG6 to ISO 4401-03-02-0-94 and NG10 to ISO 4401-05-04-0-94
- Subplates as per catalogue section NG6 RE 45053 and NG10 RE 45055 (order separately)

Ordering data and scope of delivery



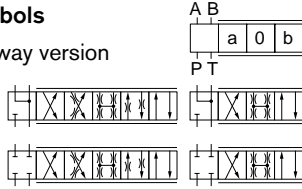
For external trigger electronics = no desig.

Control piston/sleeve = H

Size 6 = 6
Size 10 = 10

Symbols

4/4-way version



= C3, C5

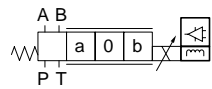
= C4, C1

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

- 1) Only in connection with flow characteristic "p"
- 2) Kink 60% for NG6 with nominal flow rate "15" and "25", otherwise kink 40%
- 3) q_v 2:1 only with nominal flow rate ≥ 40 l/min

750 = Ruggedized design

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

Electrical connection
K0 = without line socket, with plug to DIN 43563-AM6
Order line socket separately

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 curve²⁾

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	

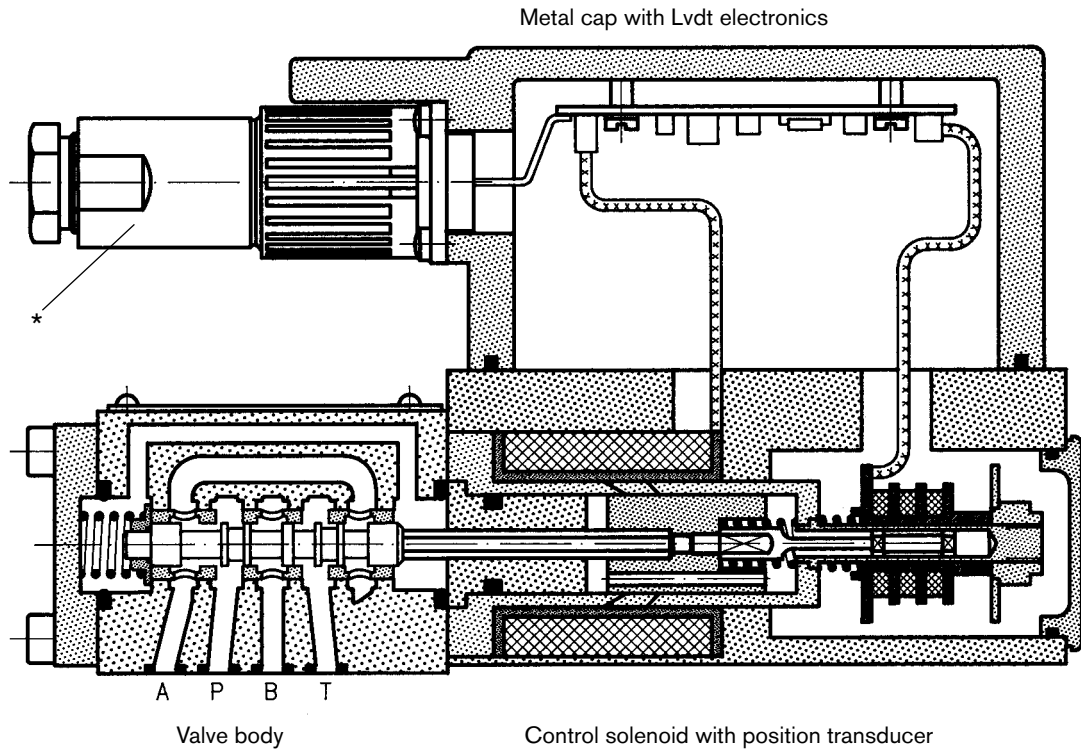
Preferred types (available at short notice)

Type 4WRPH6	Material no.
C3/C4	
4WRPH 6 C3B24L -2X/G24K0 /M-750	0 811 404 169
4WRPH 6 C3B40L -2X/G24K0 /M-750	0 811 404 170
4WRPH 6 C4B24L -2X/G24K0 /M-750	0 811 404 167
4WRPH 6 C4B40L -2X/G24K0 /M-750	0 811 404 171
4WRPH 6 C4B15P -2X/G24K0 /M-750	0 811 404 173
4WRPH 6 C4B40P -2X/G24K0 /M-750	0 811 404 178

Type 4WRPH10	Material no.
C3	
4WRPH 10 C3B100L -2X/G24K0 /M-750	0 811 404 902
C1/C4	
4WRPH 10 C4B100L -2X/G24K0 /M-750	0 811 404 069
4WRPH 10 C1B100L -2X/G24K0 /M-750	0 811 404 901
4WRPH 10 C4B100P -2X/G24K0 /M-750	0 811 404 088
4WRPH 10 C1B100P -2X/G24K0 /M-750	0 811 404 089

Function, sectional diagram

Servo solenoid valve 4WRPH 6...-750



Symbols

	Linear	p: kink 60%	p: kink 40%
<p>C3, C5</p>			
<p>C4, C1</p>			
	C3, C4	C5, C1	C5, C1

Accessories, not included in scope of delivery

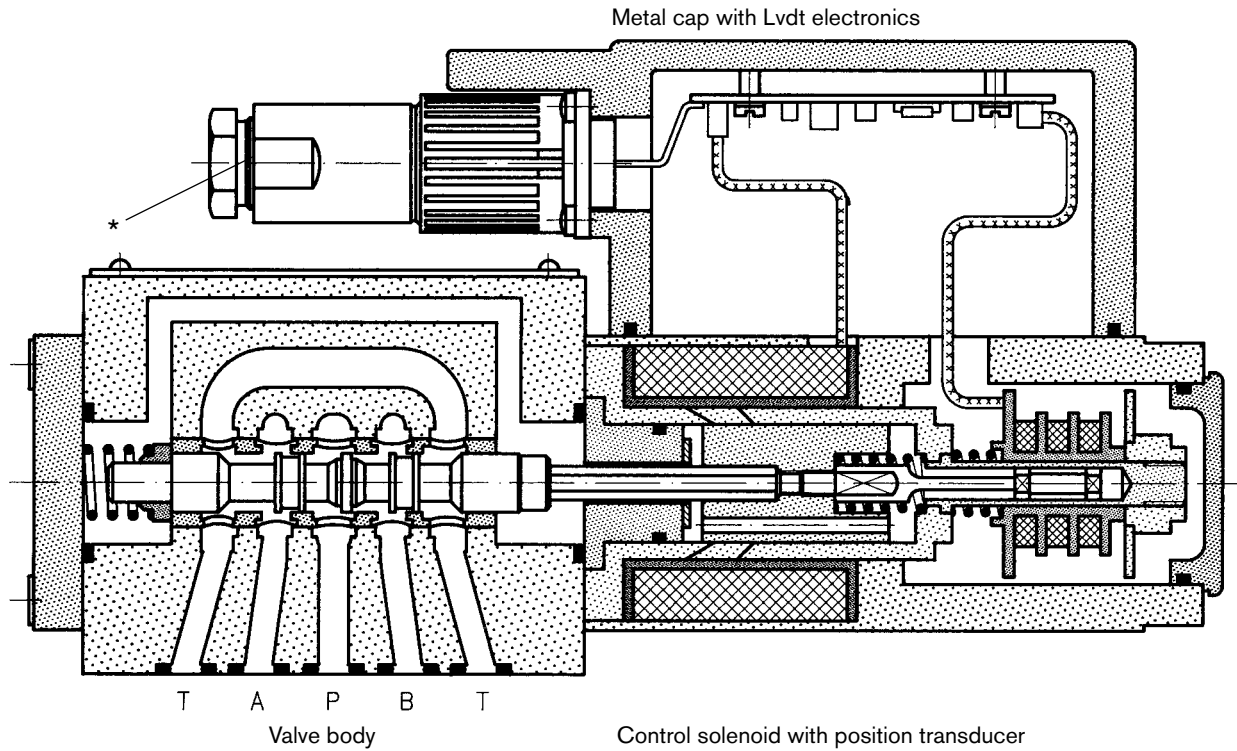
(4x) M5x30 DIN 912-10.9	Fastening screws	2910151166
7 TE	VT-VVRA1-527-20/V0, see RE 30041	0811405060
	VT-VVRA1-527-20/V0/K60-AGC, see RE 30040	0811405066
	VT-VVRA1-527-20/V0/K40-AGC, see RE 30040	0811405065
<p>*</p>	Line socket not included in scope of delivery, see also RE 08008	1834482024
6P+PE (Pg16)		

Testing and service equipment

- Test box type VT-PE-TB2, see RE 30064.
- Test adapter type VT-PA-3, see RE 30070.

Function, sectional diagram

Servo solenoid valve 4WRPH 10...-750



Symbols

	<p>Linear</p>	<p>p: kink 40%</p>
<p>C3, C5</p> <p>C4, C1</p>		
	<p>C3, C4</p>	<p>C5, C1</p>

Accessories, not included in scope of delivery

<p>(4x) M6x40 DIN 912-10.9</p>	<p>Fastening screws</p>	<p>2910151209</p>
	<p>VT-VRRRA1-537-20/V0, see RE 30041</p>	<p>0811405061</p>
	<p>VT-VRRRA1-537-20/V0/K40-AGC, see RE 30040</p>	<p>0811405067</p>
<p>*</p> <p>6P+PE (Pg16)</p>	<p>Line socket not included in scope of delivery, see also RE 08008</p>	<p>1834482024</p>





Testing and service equipment

- Test box type VT-PE-TB2, see RE 30064.
- Test adapter type VT-PA-3, see RE 30070.

Technical data (Type 4WRPH 6)**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 ... +60	
Weight	kg	2.5	
Vibration resistance, test condition	Max. 40 g, shaken in 3 dimensions (24 h)		

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

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 ... +70			
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 $\Delta p = 35\text{ bar}$ per notch ²⁾	l/min	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 $q_{vnom} > q_N$ valves	 bar	315	315	315	160
	 bar	315	280	250	100
Leakage at 100 bar	 cm ³ /min	<300	-	<500	<900
	 cm ³ /min	-	<180	<300	<450

Electrical

Cyclic duration factor	%	100		
Power supply	24 V _{nom} (external amplifier)			
Degree of protection	IP 66 to DIN 40050, line socket 1 834 482 024, mounted			
Connectors for solenoid and position transducer	To DIN 43563-AM6 (line socket 1 834 482 024) Pg16 For pin assignment see block diagram on pages 7 and 8			
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/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	< 10
Thermal drift	Zero point displacement < 1% at $\Delta T = 40\text{ °C}$	





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. For a selection of filters, see catalogue sections RE 50070, RE 50076 and RE 50081.

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

Technical data (Type 4WRPH 10)**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 ... +60	
Weight	kg	7.0	
Vibration resistance, test condition	Max. 40 g, shaken in 3 dimensions (24 h)		

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

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 ... +70			
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 $\Delta p = 35\text{ bar}$ 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 $q_{vnom} > q_N$ valves	 bar	315	315	160	160
	 bar	250	250	100	100
Leakage at 100 bar	 cm ³ /min	<1200	<1200	<1500	<1000
	 cm ³ /min	<600	<500	<600	<600

Electrical

Cyclic duration factor	%	100		
Power supply	24 V _{nom} (external amplifier)			
Degree of protection	IP 66 to DIN 40050, line socket 1 834 482 024, mounted			
Connectors for solenoid and position transducer	To DIN 43563-AM6 (line socket 1 834 482 024) Pg16 For pin assignment see block diagram on pages 7 and 8			
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

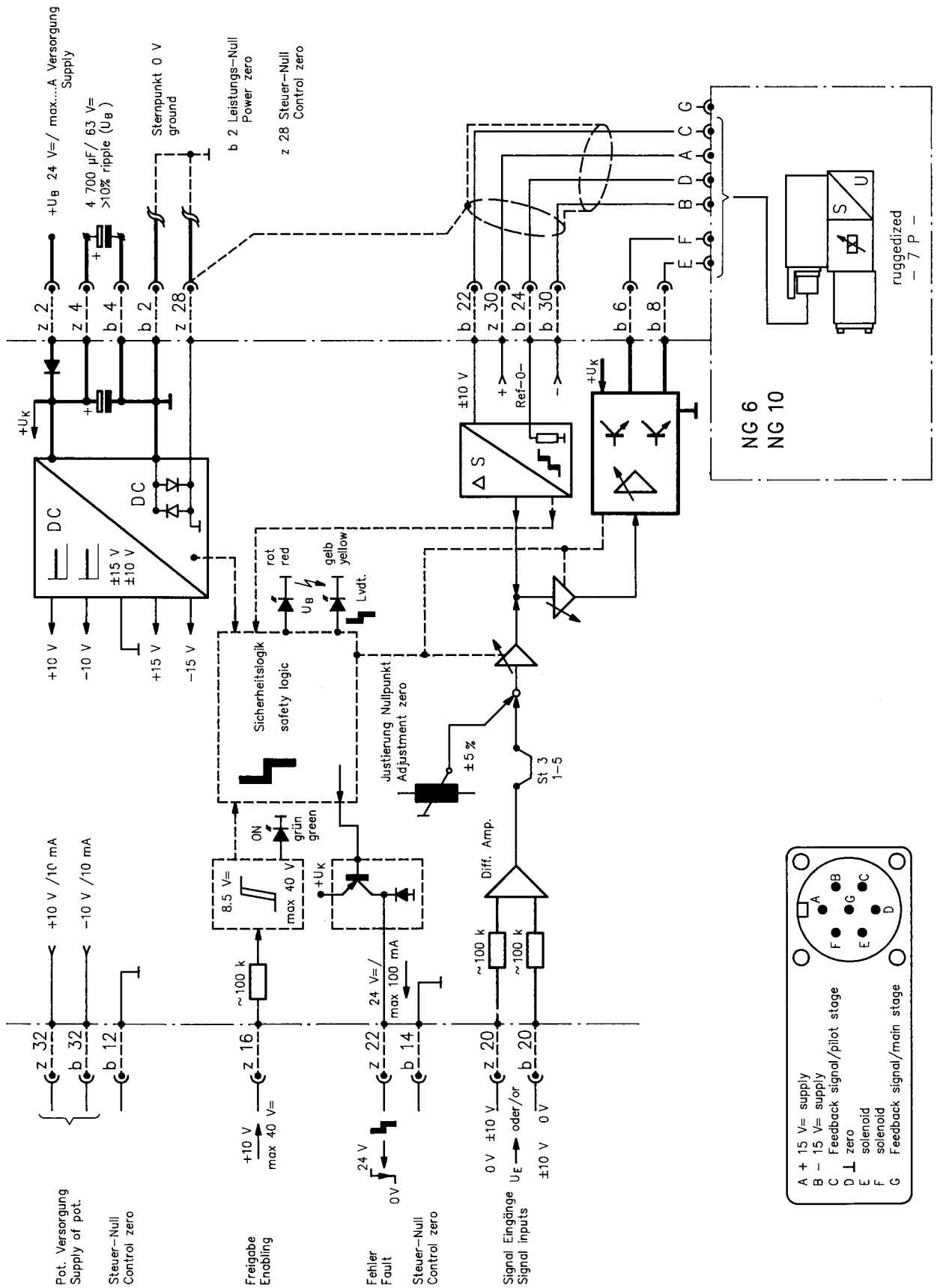
Hysteresis	%	≤ 0.2
Manufacturing tolerance for q_{max}	%	< 10
Response time for signal change 0 ... 100 %	ms	≤ 25
Thermal drift	Zero point displacement < 1 % at $\Delta T = 40\text{ °C}$	

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.
For a selection of filters, see catalogue sections RE 50070, RE 50076 and RE 50081.

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

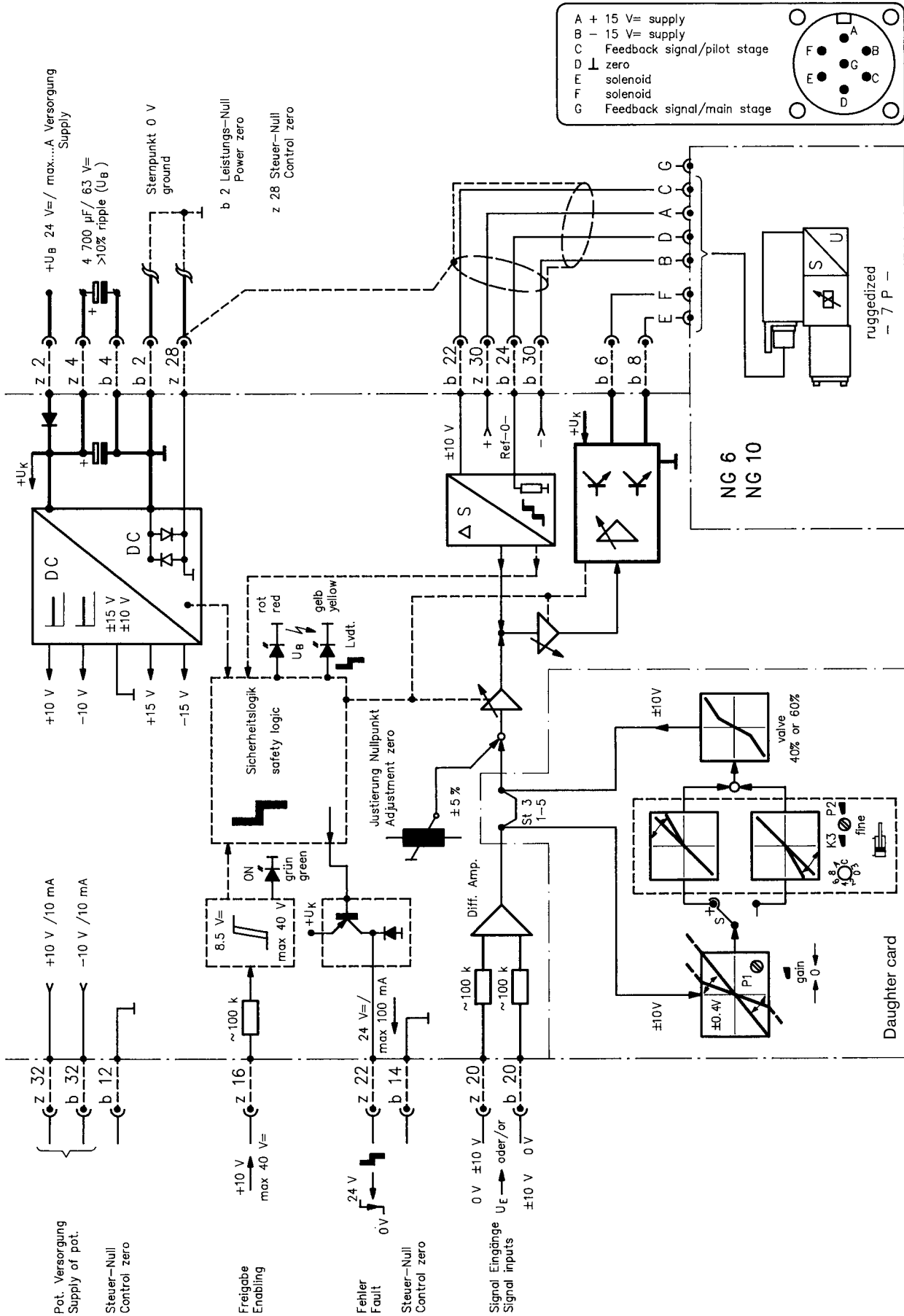
Valve with external trigger electronics (standard linear curve: L)

Block diagram/pin assignment



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

Block diagram/pin assignment

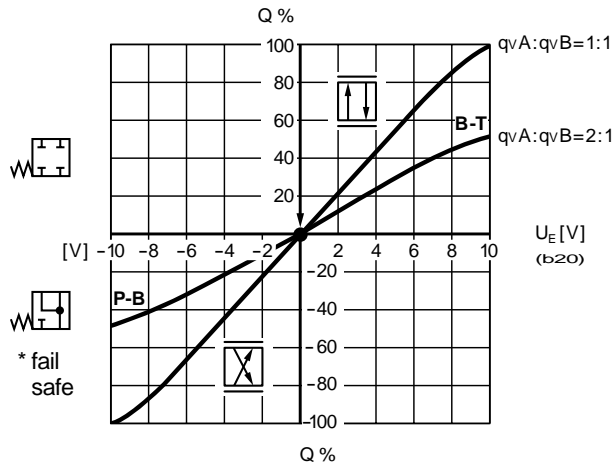


Performance curves (measured with HLP 46, $\vartheta_{oil} = 40^\circ\text{C} \pm 5^\circ\text{C}$)

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

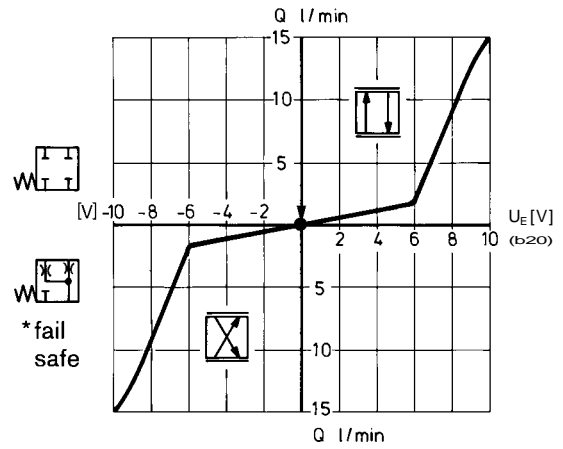
NG6, NG10

L: Linear 1:1 and 2:1



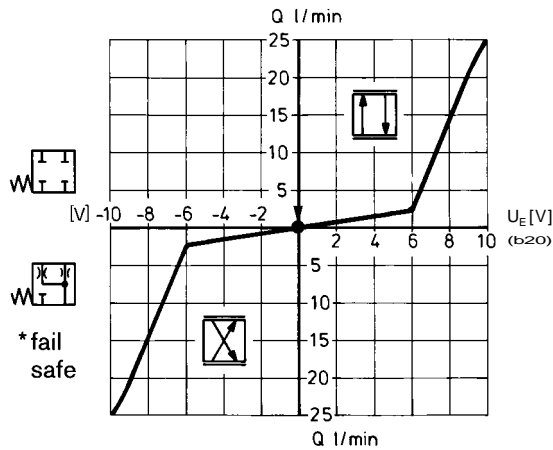
NG6

P: (kink 60%)**



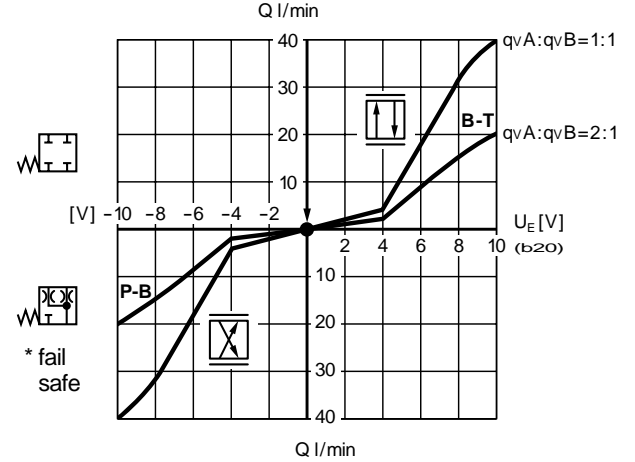
NG6

P: (kink 60%)**



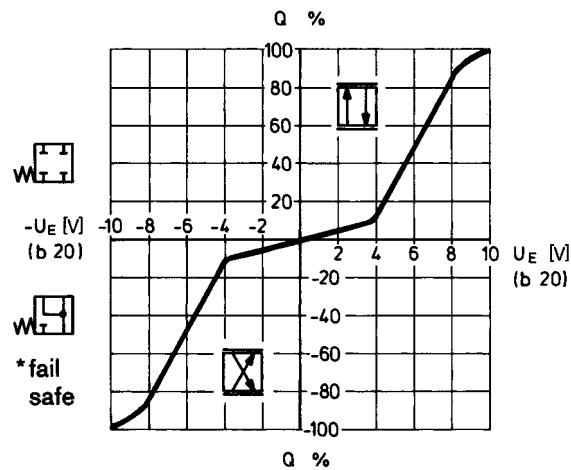
NG6

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



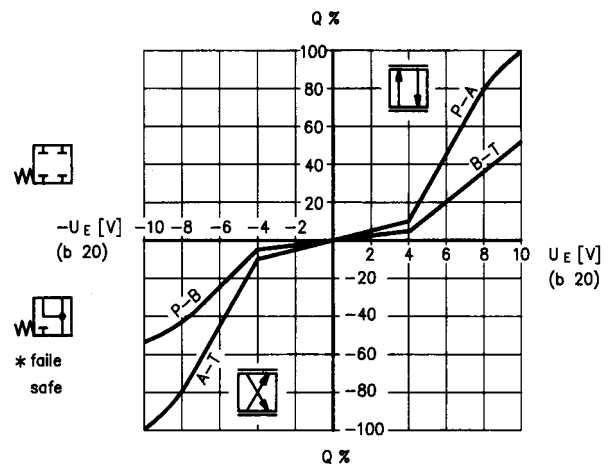
NG10

P: (kink 40%)**



NG10

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

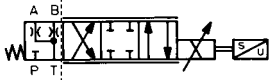
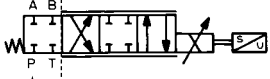
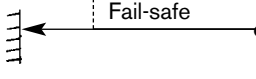



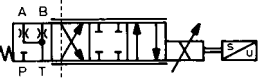
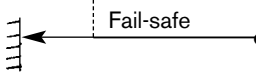
* Fail-safe when enabling is not released.

** Q-kink = 10% Q_N.

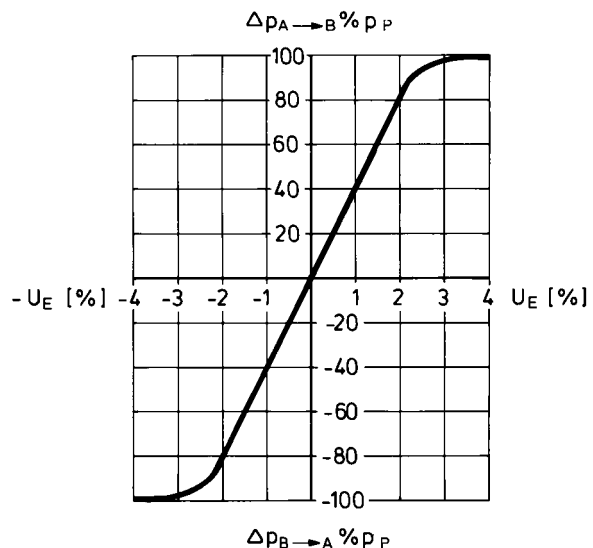
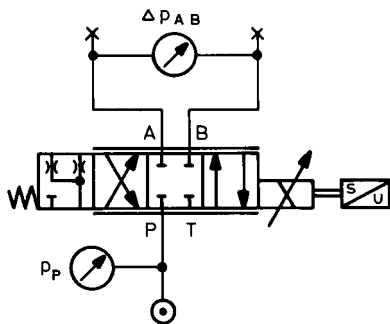
Performance curves (measured with HLP 46, $\vartheta_{oil} = 40^\circ\text{C} \pm 5^\circ\text{C}$)

Fail-safe position

NG6		Fail-safe position			
	Leakage at	100 bar	P-A	50 cm ³ /min	
			P-B	70 cm ³ /min	
	Flow at	$\Delta p = 35 \text{ bar}$	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	$p = 0 \text{ bar} \rightarrow 7 \text{ ms}$	Enable off		
		$p = 100 \text{ bar} \rightarrow 10 \text{ ms}$			

NG10		Fail-safe position			
	Leakage at	100 bar	P-A	50 cm ³ /min	
			P-B	70 cm ³ /min	
	Flow at	$\Delta p = 35 \text{ bar}$ $q_N 50/100 \text{ l/min}$	A-T	10 ... 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	$p = 0 \text{ bar} \rightarrow 12 \text{ ms}$	Enable off		
		$p = 100 \text{ bar} \rightarrow 16 \text{ ms}$			

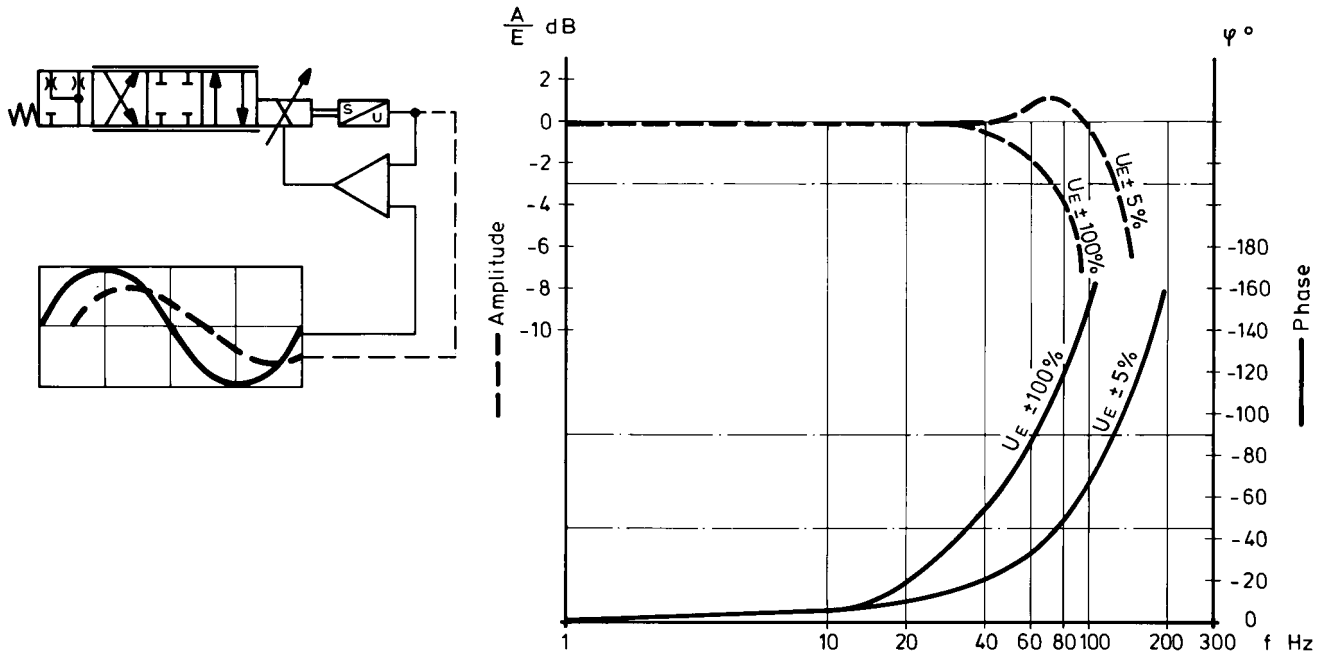
Pressure gain



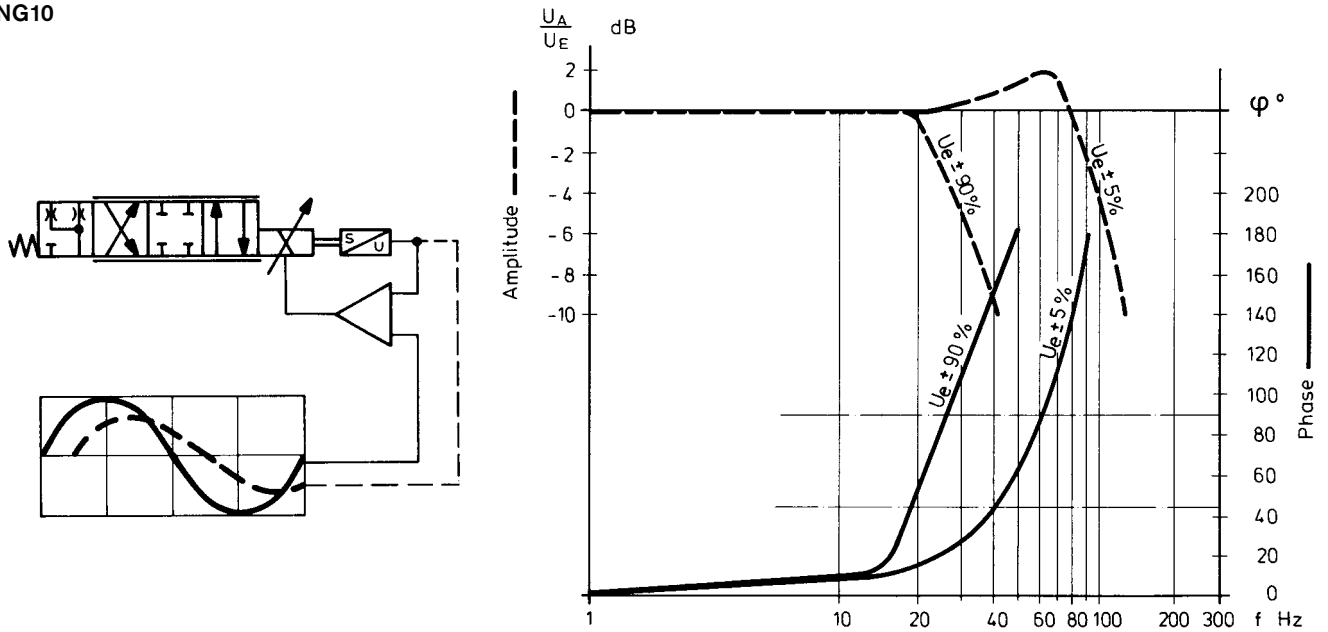
Performance curves (measured with HLP46, $\vartheta_{oil} = 40^\circ\text{C} \pm 5^\circ\text{C}$)

Bode diagram

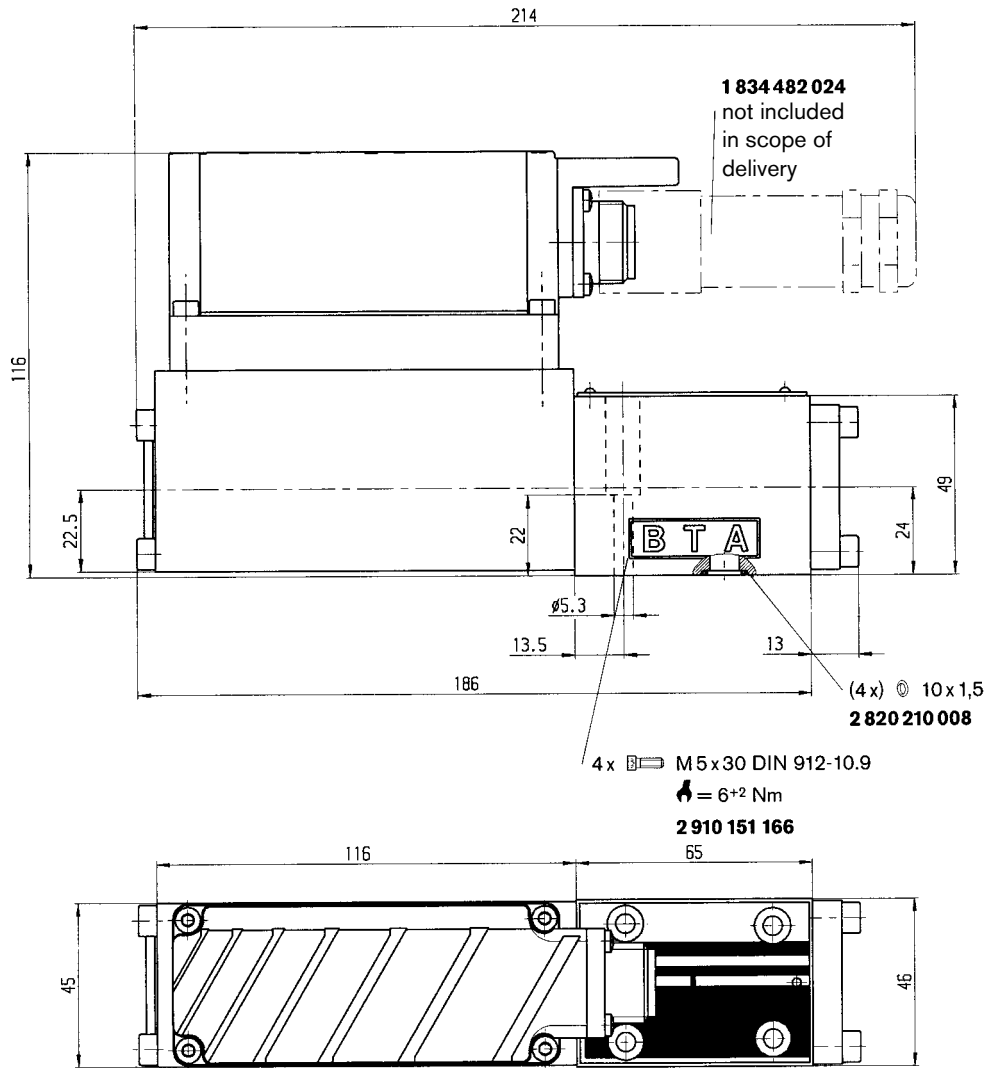
NG6



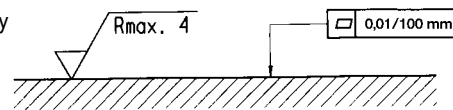
NG10



Unit dimensions for NG6 (nominal dimensions in mm)



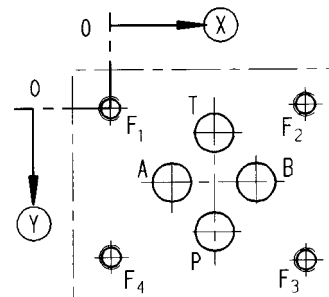
Required surface quality of mating component



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

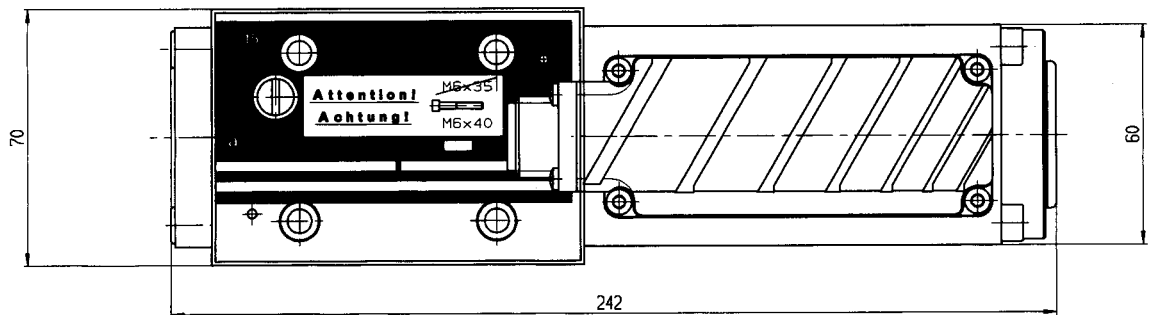
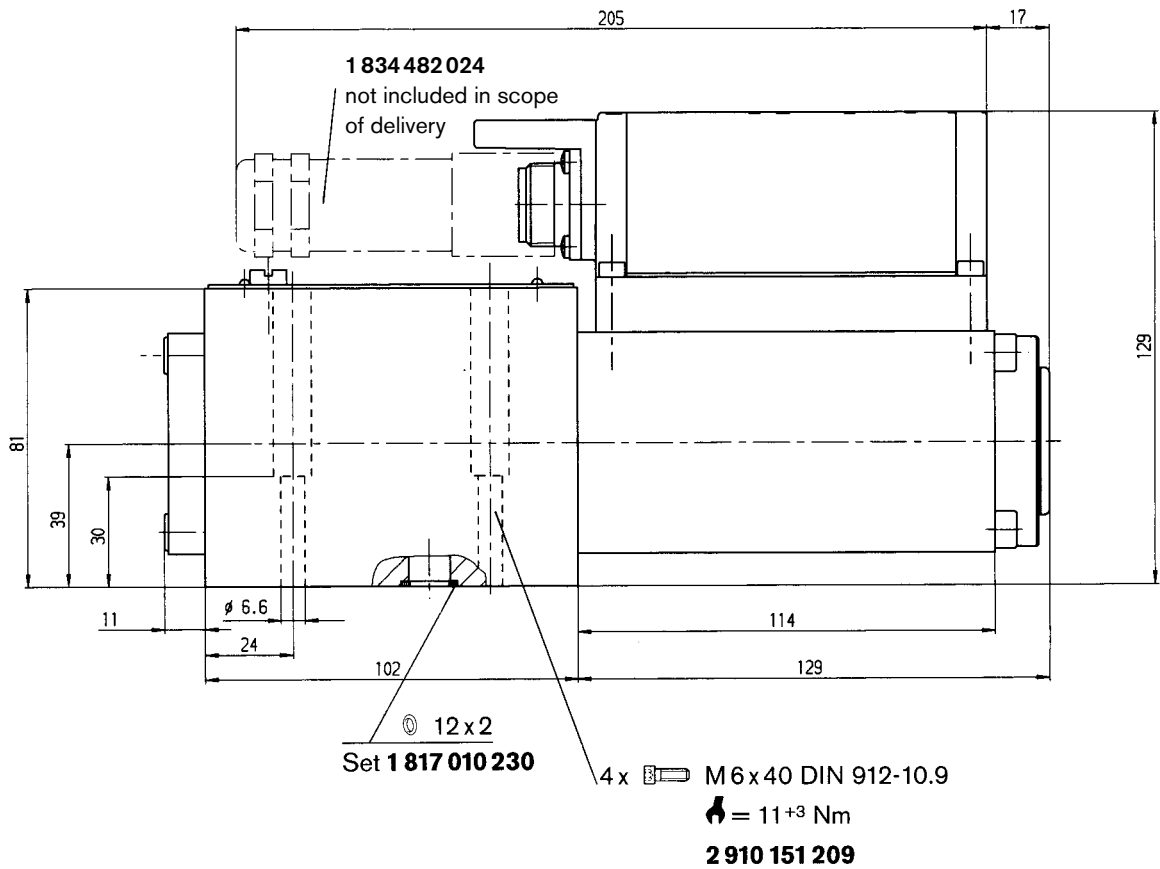
For subplates, see catalogue section RE 45053

- 1) Deviates from standard
- 2) Thread depth:
Ferrous metal 1.5x \varnothing
Non-ferrous 2 x \varnothing

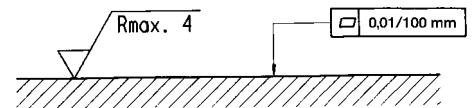


	P	A	T	B	F ₁	F ₂	F ₃	F ₄
⊗	21.5	12.5	21.5	30.2	0	40.5	40.5	0
⊙	25.9	15.5	5.1	15.5	0	-0.75	31.75	31
∅	8 ¹⁾	8 ¹⁾	8 ¹⁾	8 ¹⁾	M5 ²⁾	M5 ²⁾	M5 ²⁾	M5 ²⁾

Unit dimensions for NG10 (nominal dimensions in mm)



Required surface quality
of mating component

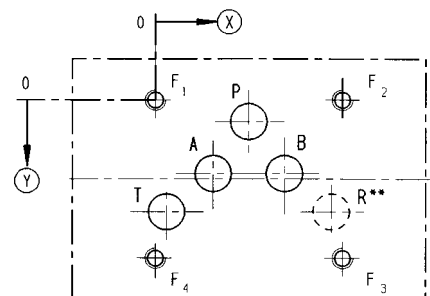


Mounting hole configuration: NG10 (ISO 4401-05-04-0-94)

For subplates, see catalogue section RE 45055

- 1) Deviates from standard
- 2) Thread depth:
Ferrous metal 1.5xØ*
Non-ferrous 2 xØ
- * (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⁾

Notes

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