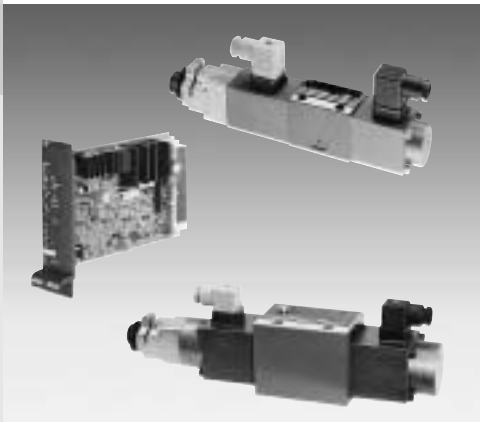
4/3 servo solenoid valves with positive overlap and position feedback (Lvdt AC/AC)

RE 29022/01.05 1/14
Replaces: 05.04

Type 4WRP ..E.. / ..W..



Size 6, 10
Unit series 1X
Maximum working pressure of P, A, B 315 bar, T 250 bar
Nominal flow rate 6...28 l/min (NG6), 32...63 l/min (NG10)

List of contents

Features

- Directly operated NG6 and 10 valves with positive overlap and external valve electronics
- Actuated on both sides, symbol E or W
- Control solenoids with A-side position feedback (Lvdt AC/AC)
- Suitable for use in electrohydraulic controls in production plants
- For subplate attachment, mounting hole configuration NG6 to ISO 4401-03-02-0-94 and NG10 with additional “L” port to ISO 4401-05-06-0-94
- External trigger electronics (order separately), see catalog section RE 30048 and RE 30047
- Solenoid and position transducer connectors included in scope of delivery
- Subplates as per catalog section RE 45053 and RE 45055 (order separately)

Variants on request

- For standard applications
- Special symbols and characteristic curves

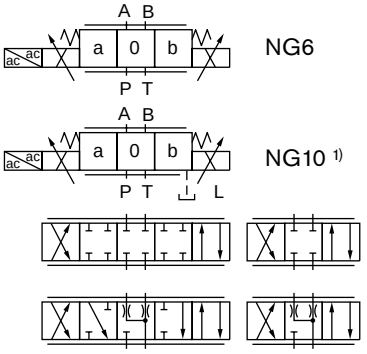
Ordering data and scope of delivery

4WRP					S –	1X /	G24	Z4 /	M	*

For **external** trigger electronics **= no code**

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

Symbols
4/3-way version



= E
E1
= W
W1

1) Type 4WRP 10
Mounting hole configuration with additional “L” port

With symbol E1- and W1-

P → A = $q_v$max B → T = $q_{v/2}$

P → B = $q_{v/2}$ A → T = $q_v$max

Nominal flow rate at 10 bar valve pressure difference (5 bar per metering notch)

Size 6	Size 10
06 = 6 l/min	**32 =** 32 l/min
08 = 8 l/min	**63 =** 63 l/min
14 = 14 l/min	
16 = 16 l/min	
28 = 28 l/min	

S = **Flow characteristic** Progressive

1X = Unit series (installation and connection dimensions unchanged)

G24 = **Voltage supply of trigger electronics** +24 V DC

Z4 = **Electrical connection** with plug to DIN 43560-AM2 **with** line socket, line socket included in scope of delivery

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

Further information in plain text

Preferred types (available at short notice)

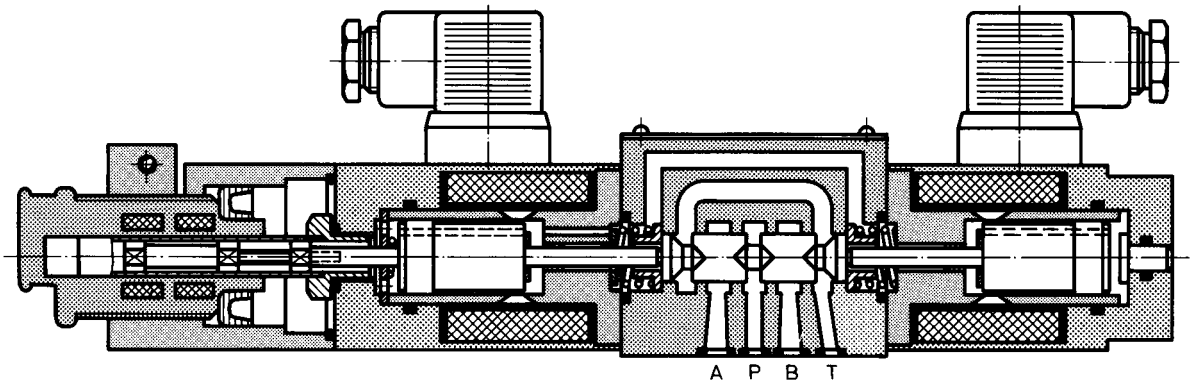
Type 4WRP 6	Material No.
Symbol E	
4WRP 6 E 08S –1X/G24Z4/M 755 *)	**0 811 404 101**
4WRP 6 E 16S –1X/G24Z4/M 755 *)	**0 811 404 100**
4WRP 6 E 28S –1X/G24Z4/M	**0 811 404 119**
Symbol W	
4WRP 6 W 06S –1X/G24Z4/M	**0 811 404 126**
4WRP 6 W 14S –1X/G24Z4/M	**0 811 404 120**
4WRP 6 W 28S –1X/G24Z4/M	**0 811 404 121**

Type 4WRP 10	Material No.
Symbol E, E1	
4WRP 10 E 32S –1X/G24Z4/M	**0 811 404 003**
4WRP 10 E 63S –1X/G24Z4/M	**0 811 404 001**
4WRP 10 E1 63S –1X/G24Z4/M	**0 811 404 086**
Symbol W, W1	
4WRP 10 W 32S –1X/G24Z4/M	**0 811 404 081**
4WRP 10 W 63S –1X/G24Z4/M	**0 811 404 080**
4WRP 10 W1 63S –1X/G24Z4/M	**0 811 404 087**

*) Progressive characteristic curve, with triangular notch (standard = semicircular notch)

Function, sectional diagram

Type 4WRP 6 ..



Position feedback (Lvdt AC/AC)

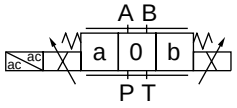
Control solenoid with position transducer

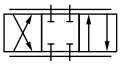
Valve body

Control solenoid

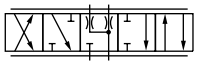
Symbols

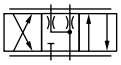
Position transducer: A-side





.. E ..





.. W ..

Accessories

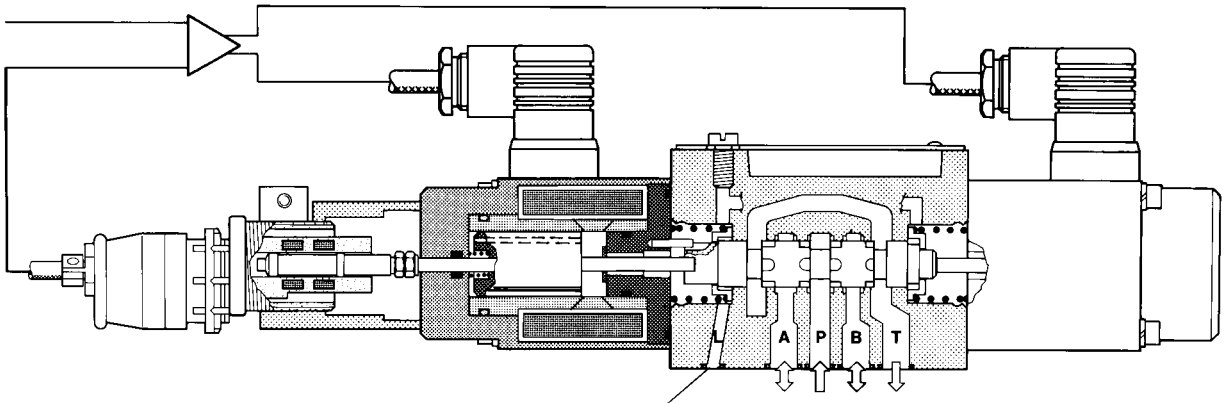
(4 x) ⊟ M5 x 30 DIN 912–10.9	Fastening bolts	**2 910 151 166**
	VT-VRPA2-527-10 / V0 / RTP, see RE 30048	**0 811 405 119**
	VT-VRPA2-527-10 / V0 / RTS, see RE 30047	**0 811 405 137**
	Line socket 2P+PE (M16 x 1.5) and 3P (Pg7) included in scope of delivery, see also RE 08008	

Testing and service equipment

– Test box type VT-PE-TB1, see RE 30063
– Test adapter type VT-PA-3, see RE 30070

Function, sectional diagram

Type 4WRP 10 ..



Position feedback (Lvdt AC/AC)

Control solenoid with position transducer

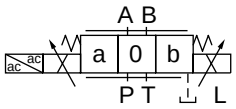
Valve body

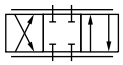
Control solenoid

Additional drain port
$p_{max.} \leqq 2$ bar

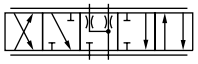
Symbols

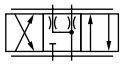
Position transducer: A-side





.. E .. / ..E1..





.. W .. / ..W1..

Accessories

(4 x) ⊟ M6 x 35 DIN 912–10.9	Fastening bolts	**2 910 151 207**
	VT-VRPA2-537-10 / V0 / RTP, see RE 30048	**0 811 405 120**
	VT-VRPA2-537-10 / V0 / RTS, see RE 30047	**0 811 405 138**
	Line socket 2P+PE (M16 x 1.5) and 3P (Pg7) included in scope of delivery, see also RE 08008	

Testing and service equipment

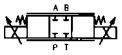
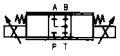
– Test box type VT-PE-TB1, see RE 30063
– Test adapter type VT-PA-3, see RE 30070

Technical data (type 4WRP 6 ..)

General

Construction		Spool type valve
Actuation		Proportional solenoid with position control, external amplifier
Connection type		Subplate, mounting hole configuration NG6 (ISO 4401-03-02-0-94)
Mounting position		Optional
Ambient temperature range	°C	−20 … +50
Weight	kg	2.8
Vibration resistance, test condition		max. 25 g, shaken in 3 dimensions (24 h)

Hydraulic (measured with HLP 46, $\vartheta_{oil} = 40$ °C ±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]			
Direction of flow			See symbol			
Nominal flow at $\Delta p = 5$ bar per notch [2]		l/min	6	8	14	16	28
Max. working pressure		bar	Port P, A, B: 315			
Max. pressure		bar	Port T: 250			
Leakage per metering edge ($\Delta p = 100$ bar)	$I_m = 0$			A → T = 80 cm³/min B → T = 80 cm³/min		
Leakage drain ($\Delta p = 5$ bar)				A → T = 0.8...1.6 l/min B → T = 0.8...1.6 l/min		

Electrical

Cyclic duration factor	%	100
Power supply		24 V_{nom} (external amplifier)
Degree of protection		IP 65 to DIN 40050 and IEC 14434/5
Solenoid connection		Unit plug DIN 43650/ISO 4400, M16 x 1.5 (2P+PE)
Position transducer connection		Unit plug Pg7 (4P)
Max. solenoid current	A	2.7
Coil resistance R_{20}	Ω	3
Max. power consumption at 100 % load and operating temperature	VA	40

Static/Dynamic [3]

Hysteresis		%	≦ 0.3
Range of inversion		%	≦ 0.2
Manufacturing tolerance for $Q_{max.}$		%	≈ 5
Response time	100 % signal change	ms	≈ 30
	10 % signal change	ms	≈ 15

[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 catalog sections RE 50070, RE 50076 and RE 50081.

[2] Flow rate at a different Δp $q_x = q_{nom} \cdot \sqrt{\frac{\Delta p_x}{5}}$

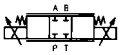
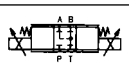
[3] All specifications achieved in conjunction with proportional amplifier: **0 811 405 119**

Technical data (type 4WRP 10 ..)

General

Construction			Spool type valve
Actuation			Proportional solenoid with position control, external amplifier
Connection type			Subplate, mounting hole configuration NG10 (ISO 4401-05-06-0-94)
Mounting position			Optional
Ambient temperature range		°C	–20 … +50
Weight		kg	8.0
Vibration resistance, test condition			max. 25 g, shaken in 3 dimensions (24 h)

Hydraulic (measured with HLP 46, $\vartheta_{oil} = 40$ °C ±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]	
Direction of flow			See symbol	
Nominal flow at $\Delta p = 5$ bar per notch [2]		l/min	32	63
Max. working pressure		bar	Port P, A, B: 315	
Max. pressure		bar	Port T: 250	
		bar	Port L: 2	
Leakage per metering edge ($\Delta p = 100$ bar)	$I_m = 0$			A → T = 80 cm³/min B → T = 80 cm³/min
Leakage drain ($\Delta p = 5$ bar)				A → T = 0.4...0.8 l/min B → T = 0.4...0.8 l/min

Electrical

Cyclic duration factor	%	100
Power supply		24 V_{nom} (external amplifier)
Degree of protection		IP 65 to DIN 40050 and IEC 14434/5
Solenoid connection		Unit plug DIN 43650/ISO 4400, M16 x 1.5 (2P+PE)
Position transducer connection		Unit plug Pg7 (4P)
Max. solenoid current	A	3.7
Coil resistance R_{20}	Ω	2.5
Max. power consumption at 100 % load and operating temperature	VA	60

Static/Dynamic [3]

Hysteresis		%	≦ 0.75
Range of inversion		%	≦ 0.5
Manufacturing tolerance for $Q_{max.}$		%	≈ 10
Response time	100 % signal change	ms	≈ 50
	10 % signal change	ms	≈ 20

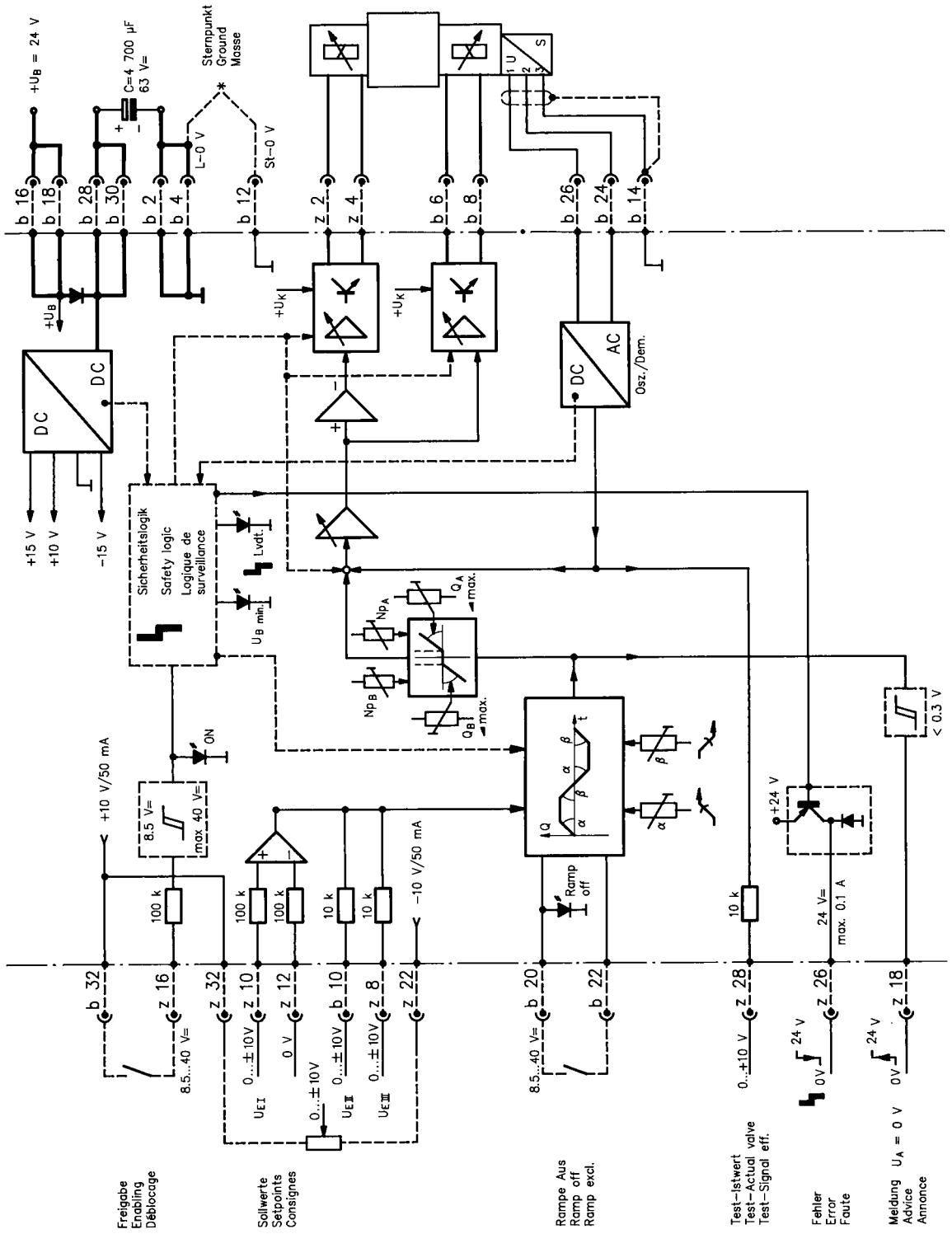
[1] The purity classes stated for the components must be complied with in hydraulic systems. Effective filtration prevents problems and also extends the service life of components. For a selection of filters, see catalog sections RE 50070, RE 50076 and RE 50081.

[2] Flow rate at a different Δp $q_x = q_{nom} \cdot \sqrt{\frac{\Delta p_x}{5}}$

[3] All specifications achieved in conjunction with proportional amplifier: **0 811 405 120**

Valve with external trigger electronics (standard with ramps, RE 30048)

Circuit diagram/pin assignment

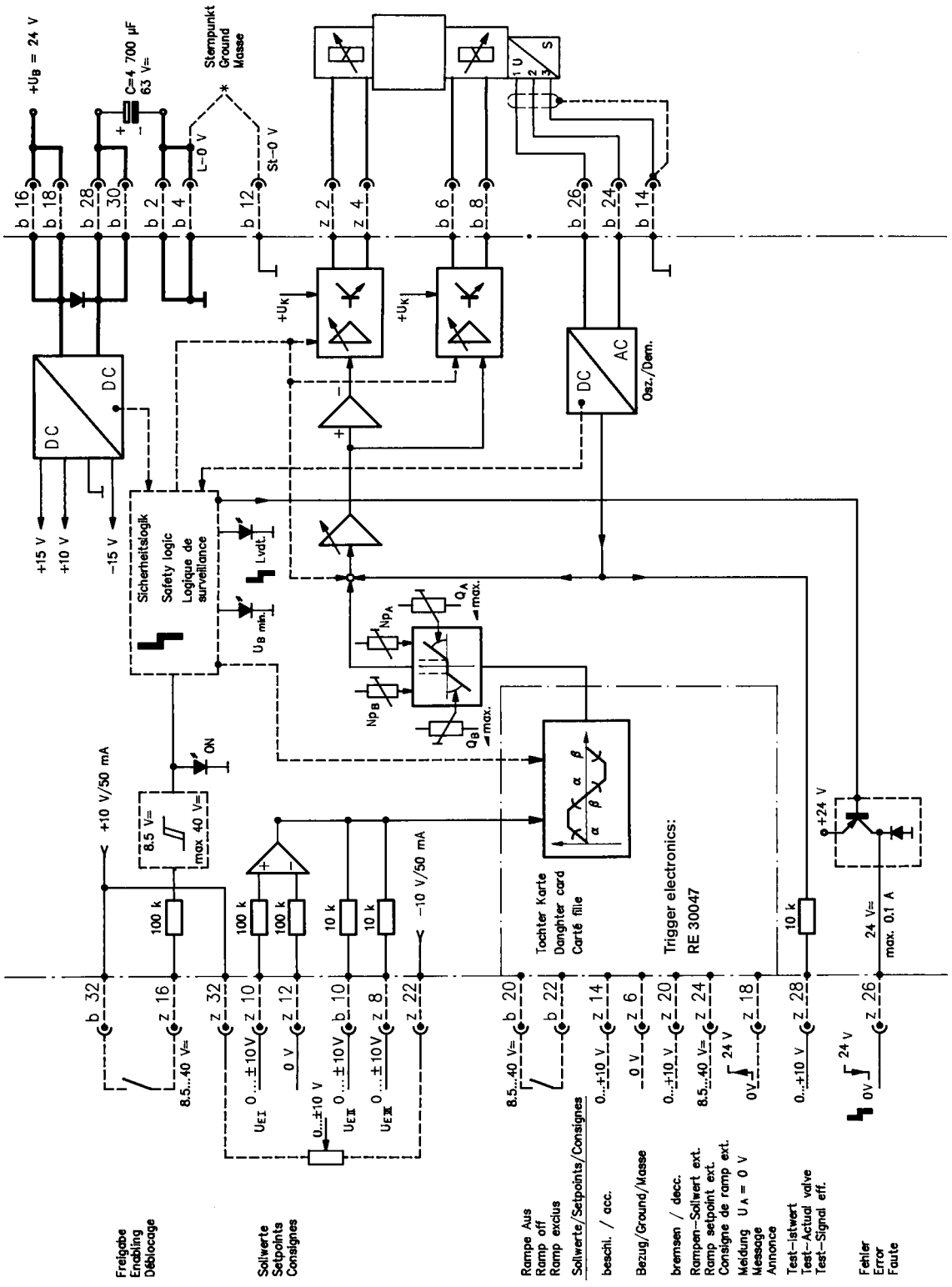


Versions of trigger electronics:

– With voltage-controlled ramps, see page 8 and RE 30047

Valve with external trigger electronics (with voltage-controlled ramps, RE 30047)

Circuit diagram/pin assignment



Versions of trigger electronics:

– With ramps, see page 7 and RE 30048

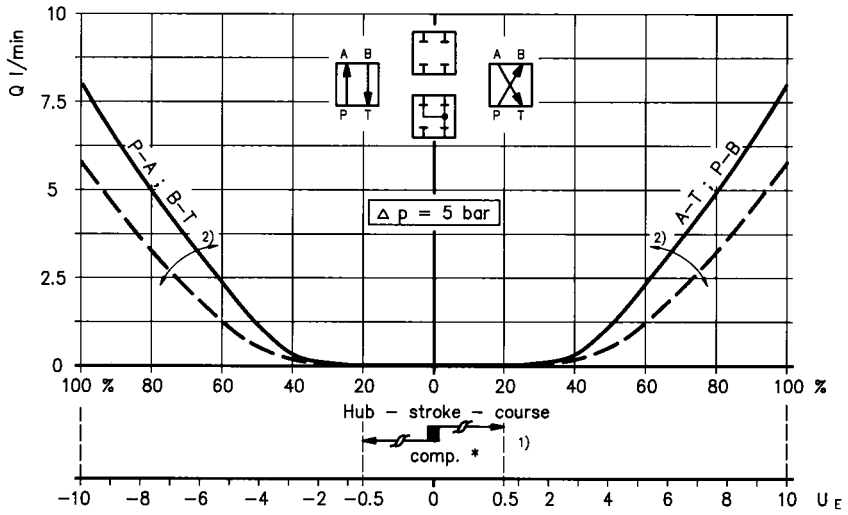
Characteristic curves type 4WRP 6 E .. / W.. (measured with HLP 46, $\vartheta_{oil} = 40$ °C ±5 °C)

Flow rate/Signal function (at $\Delta p = 5$ bar per notch)

Q_{nom} = 5.8/8 l/min

——— $Q_N =$ 8 l/min

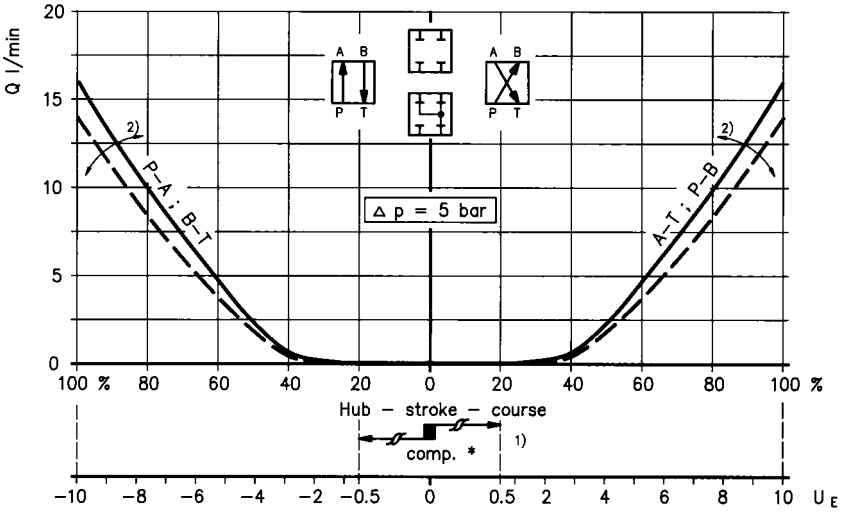
- - - - - - $Q_N =$ 5.8 l/min



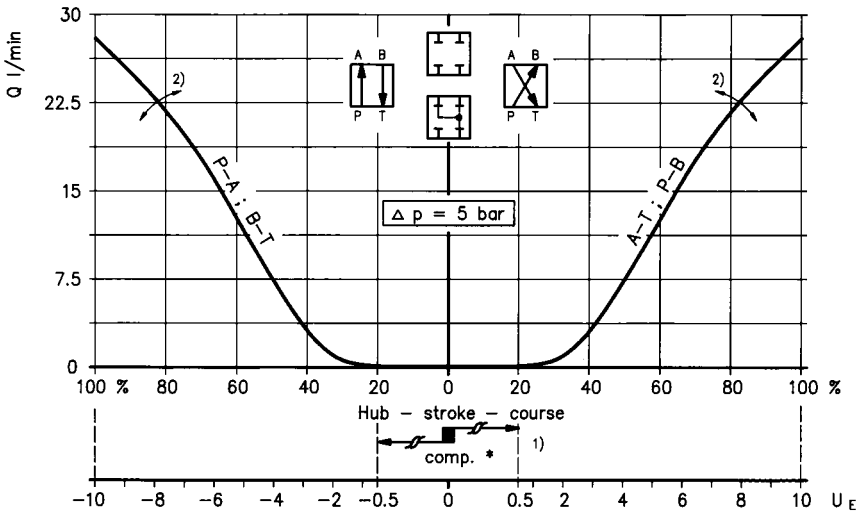
Q_{nom} = 14/16 l/min

——— $Q_N =$ 16 l/min

- - - - - - $Q_N =$ 14 l/min



Q_{nom} = 28 l/min



Valve amplifier

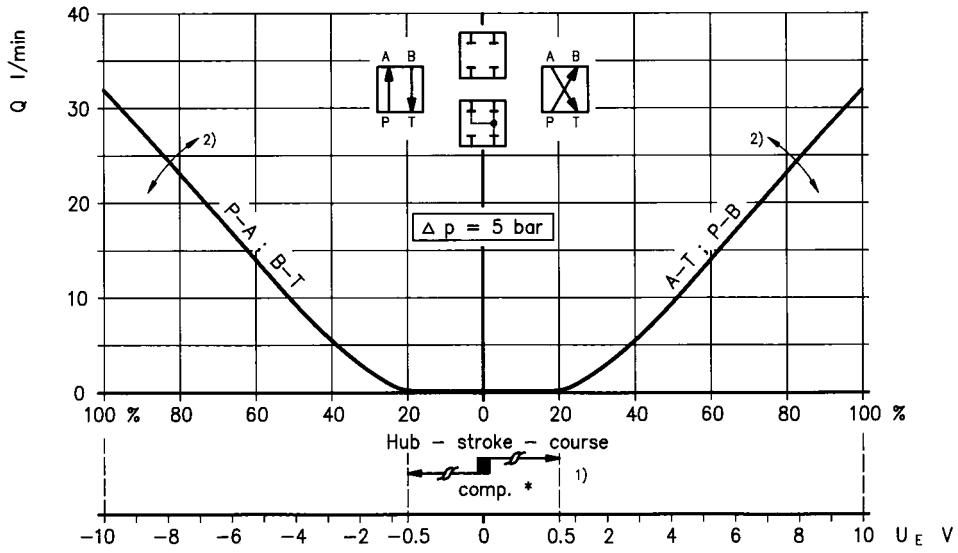
[1] Zero adjustment → ±0.5 V

[2] Sensitivity adjustment

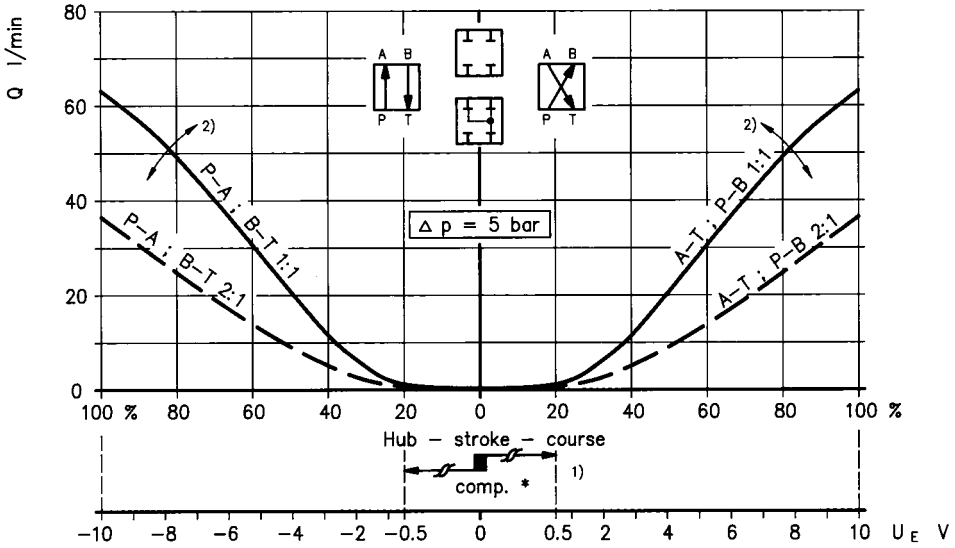
Characteristic curves type 4WRP 10 E .. / W.. (measured with HLP 46, ϑ_{oil} = 40 °C ±5 °C)

Flow rate/Signal function (at Δp = 5 bar per notch)

Q_{nom} = 32 l/min



Q_{nom} = 63 l/min



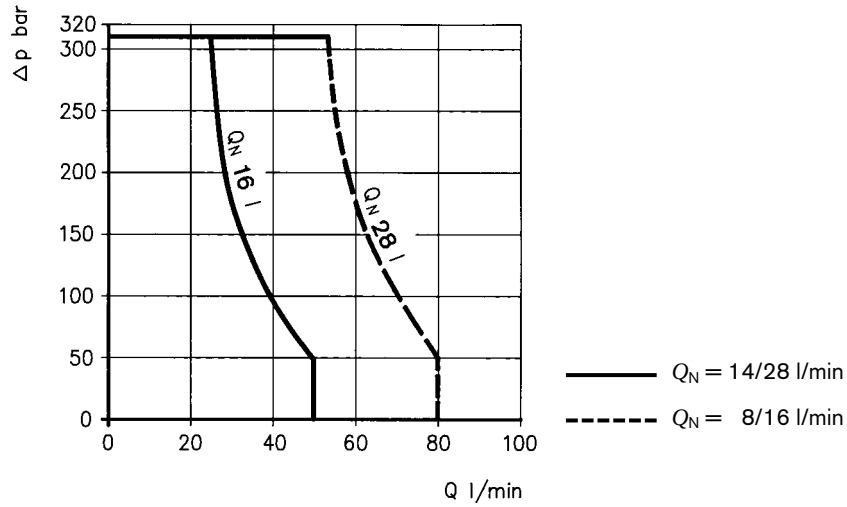
Valve amplifier

[1] Zero adjustment → ±0.5 V

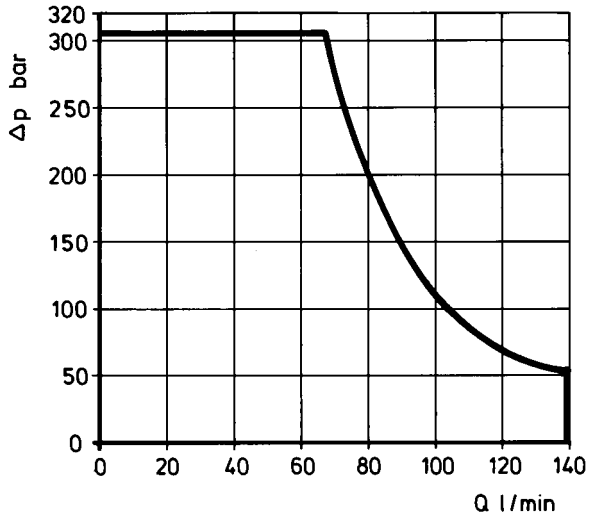
[2] Sensitivity adjustment

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

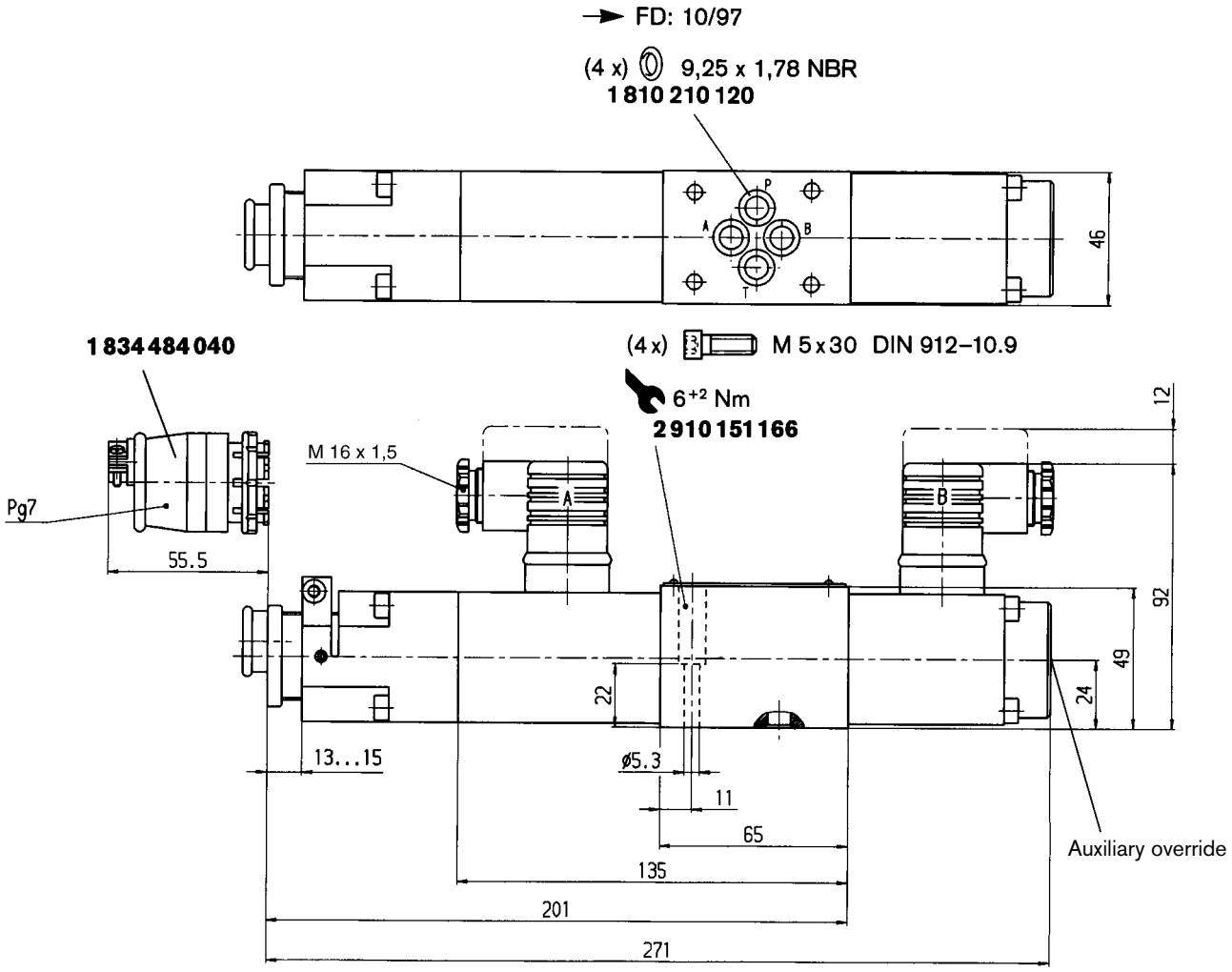
Type 4WRP 6 E .. / W..



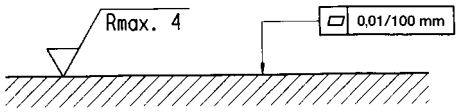
Type 4WRP 10 E .. / W..

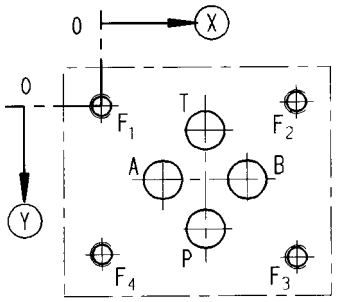


Unit dimensions type 4WRP 6 E .. / W.. (nominal dimensions in mm)



Required surface quality of mating component



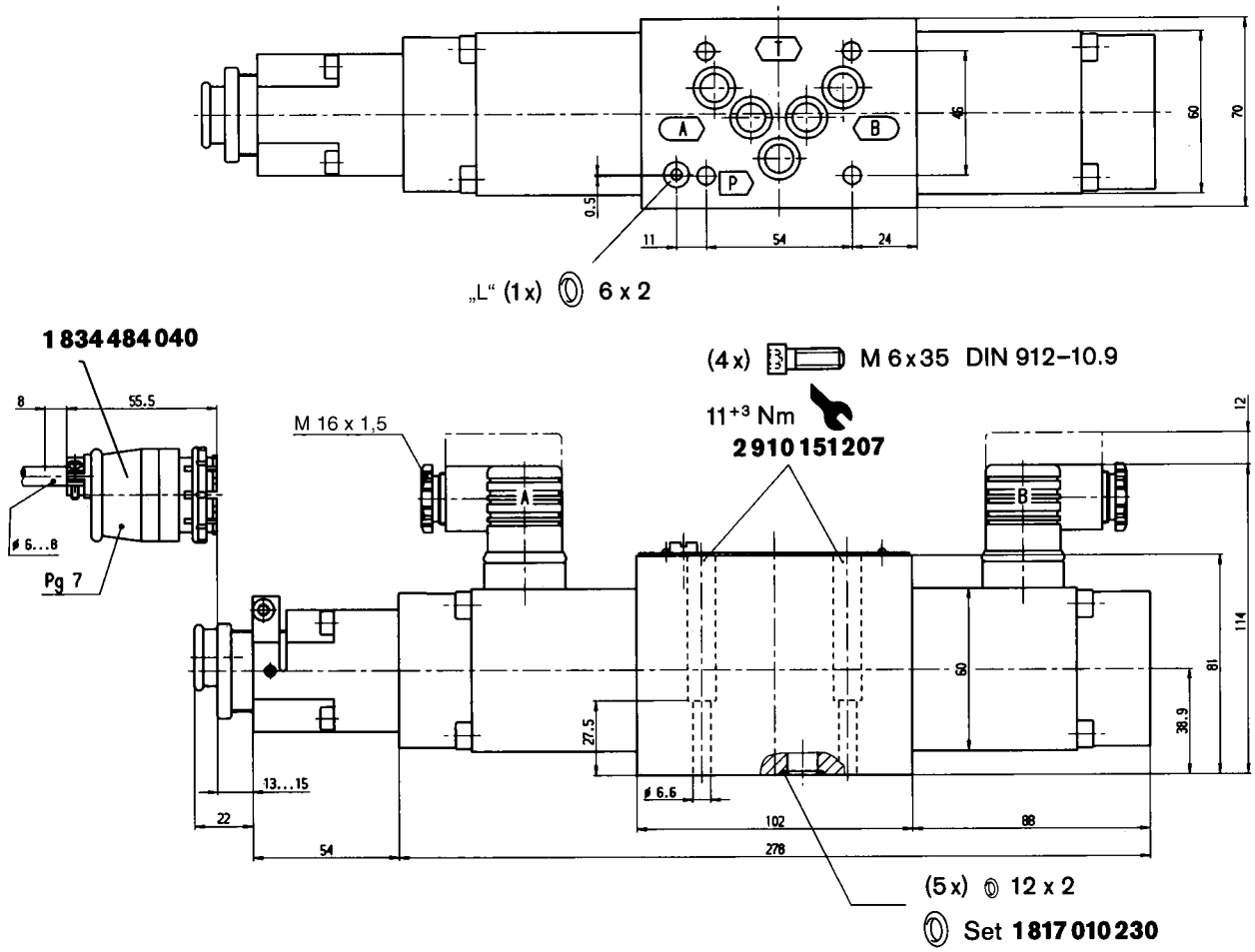


Mounting hole configuration: NG6 (ISO 4401-03-02-0-94)
For subplates see catalog section RE 45053

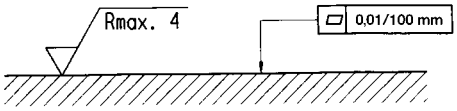
1) Deviates from standard
2) Thread depth:
Ferrous metal 1.5 x Ø
Non-ferrous 2 x Ø

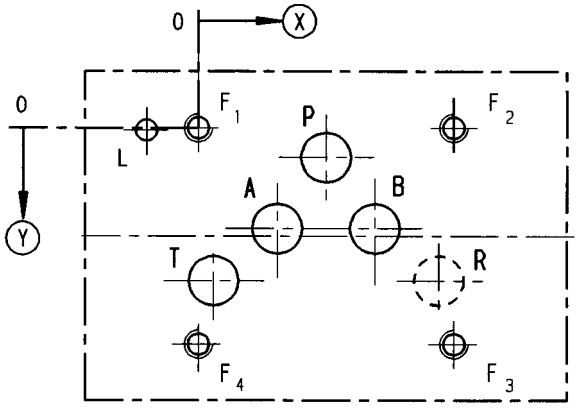
	P	A	T	B	F_1	F_2	F_3	F_4
⊗	21.5	12.5	21.5	30.2	0	40.5	40.5	0
Ⓨ	25.9	15.5	5.1	15.5	0	–0.75	31.75	31
∅	8 1)	8 1)	8 1)	8 1)	M5 2)	M5 2)	M5 2)	M5 2)

Unit dimensions type 4WRP 10 E .. / W.. (nominal dimensions in mm)



Required surface quality of mating component





Mounting hole configuration: NG10 (ISO 4401-05-06-0-94)
For subplates see catalog section RE 45055

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

	P	A	T	B	F_1	F_2	F_3	F_4	R	L
⊗	27	16.7	3.2	37.3	0	54	54	0	50.8	–11
Ⓨ	6.3	21.4	32.5	21.4	0	0	46	46	32.5	0.5
∅	10.5 1)	10.5 1)	10.5 1)	10.5 1)	M6 2)	M6 2)	M6 2)	M6 2)	10.5 1)	4.5

Notes

Bosch Rexroth AG
Industrial Hydraulics
Zum Eisengießer 1
D-97816 Lohr am Main, Germany
Telefon +49 (0) 93 52 / 18-0
Telefax +49 (0) 93 52 / 18-23 58
documentation@boschrexroth.de
www.boschrexroth.de

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Bosch Rexroth AG
Industrial Hydraulics
Zum Eisengießer 1
D-97816 Lohr am Main, Germany
Telefon +49 (0) 93 52 / 18-0
Telefax +49 (0) 93 52 / 18-23 58
documentation@boschrexroth.de
www.boschrexroth.de

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