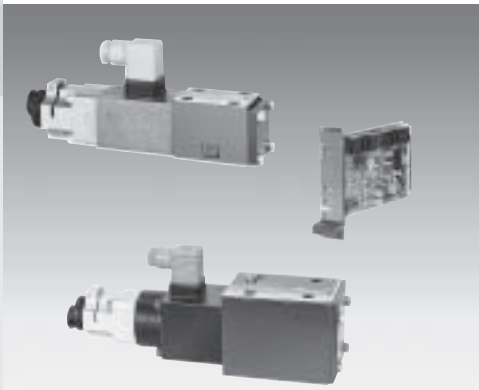
4/2 servo solenoid valves with positive overlap and position feedback (Lvdt AC/AC)

RE 29020/08.05 1/14
Replaces: 01.05

Type 4WRP..EA..



Size 6, 10
Unit series 1X
Maximum working pressure of P, A, B 315 bar, T 250 bar
Nominal flow rate 8...28 l/min (NG6), 16...63 l/min (NG10)

List of contents

Contents	Page
Features	1
Ordering data	2
Preferred types	2
Function, sectional diagram, symbols	3 and 4
Technical data	5 and 6
External trigger electronics	7 and 8
Characteristic curves	9 to 11
Unit dimensions	12 and 13

Features

- Directly operated NG6 and NG10 valves with positive overlap and external valve electronics
- Actuated on one side, symbol E
- Control solenoid with 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 30052 and RE 30054
- Subplates as per catalog section, NG6 RE 45053, NG10 RE 45055 (order separately)
- Solenoid and position transducer plug-in connectors included in scope of delivery

Variants on request

- For standard applications
- Special symbols and characteristic curves

Ordering data

4WRP			E	A		S	–1X	/	G24	Z4	/	M	*

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

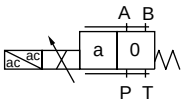
Size 6 **= 6**

Size 10 **= 10**

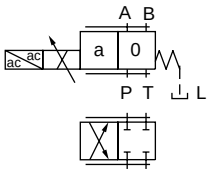
Symbols

4/2-way version

NG6

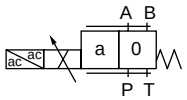


NG10[1)]



= E

Side of inductive position transducer



(Standard) **= A**

[1)] Type 4WRP10
Mounting hole configuration with additional “L” port

Further information in plain text

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

Electrical connection

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

Voltage supply of trigger electronics

G24 = +24 V DC

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

Flow characteristic

S = Progressive

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

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

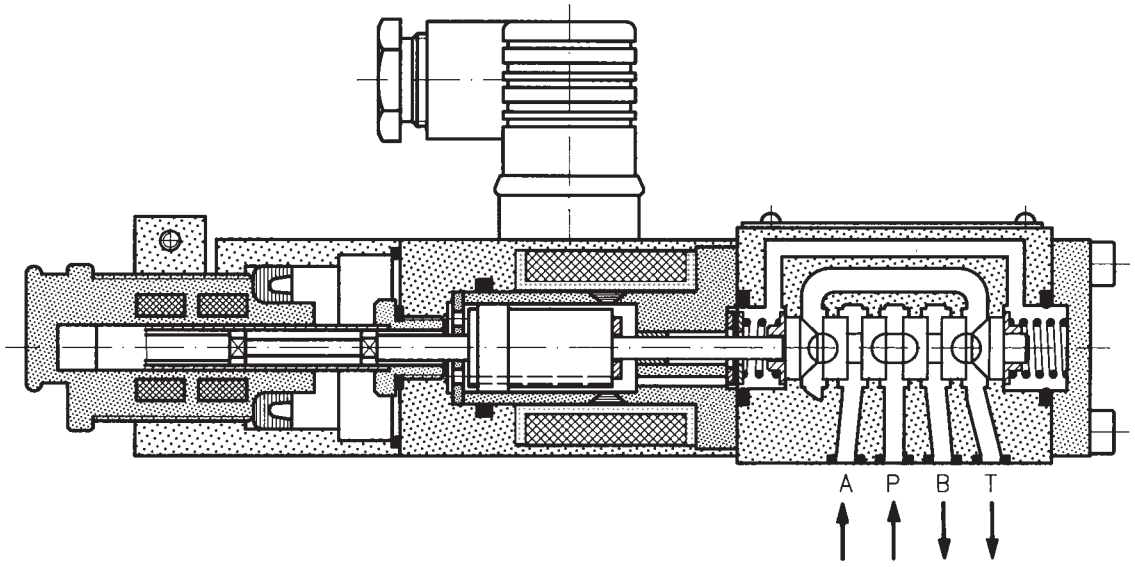
Preferred types

Type 4WRP6	Material No.	Typ 4WRP10	Material No.
4WRP6EA08S–1X/G24Z/M755*)	0 811 403 100	4WRP10EA16S–1X/G24Z/M	0 811 403 003
4WRP6EA16S–1X/G24Z/M755*)	0 811 403 101	4WRP10EA32S–1X/G24Z/M	0 811 403 002
4WRP6EA28S–1X/G24Z/M	0 811 403 126	4WRP10EA63S–1X/G24Z/M	0 811 403 001

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

Function, sectional diagram

Type 4WRP6E..



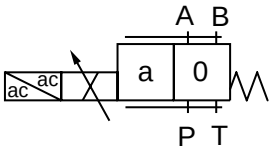
Position feedback (Lvdt AC/AC)

Control solenoid with position transducer

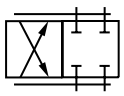
Valve body

Symbols

Position transducer: A-side



..E..



Accessories

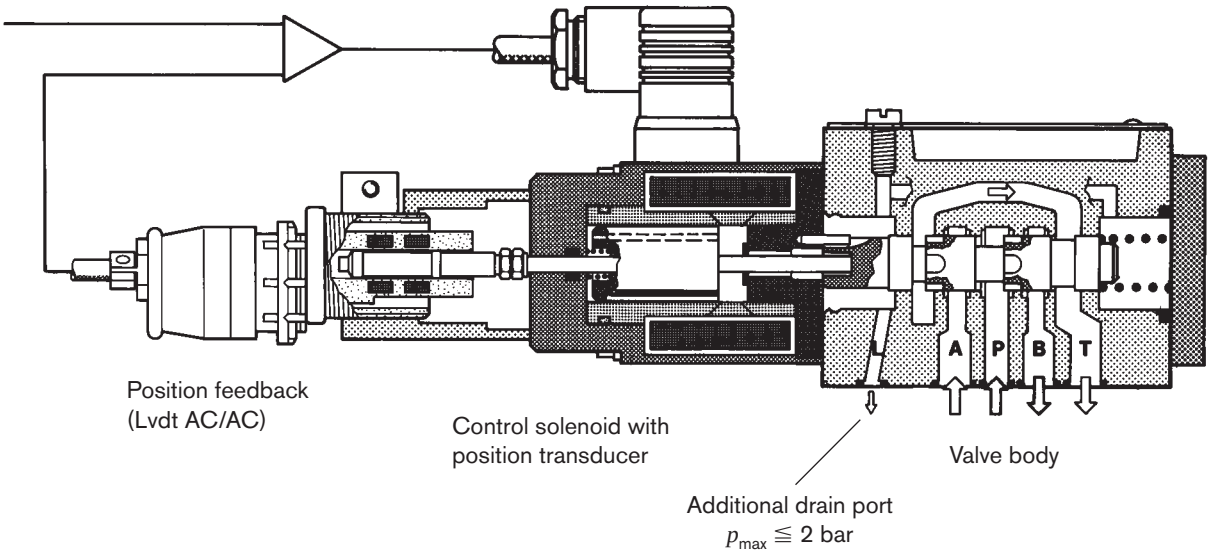
(4x) ISO 4762-M5x30-10.9	Fastening bolts	2 910 151 166
	VT-VRPA1-527-10/V0/QV, see RE 30052	0 811 405 098
	VT-VRPA1-527-10/V0/QV-RTP, see RE 30054	0 811 405 103
	VT-VRPA1-527-10/V0/QV-RTS, see RE 30056	0 811 405 177
	Plug-in connector 2P+PE (M16x1.5) and 3P (Pg7) included in scope of delivery, see also RE 08008	

Testing and service equipment

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

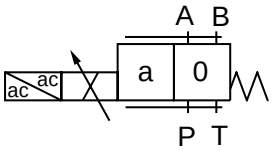
Function, sectional diagram

Type 4WRP10E..

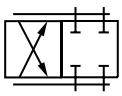


Symbols

Position transducer: A-side



..E..



Accessories

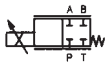
(4x) ISO 4762-M6x35-10.9	Fastening bolts	2 910 151 207
	VT-VRPA1-537-10/V0/QV, see RE 30052	0 811 405 099
	VT-VRPA1-537-10/V0/QV-RTP, see RE 30054	0 811 405 104
	VT-VRPA1-537-10/V0/QV-RTS, see RE 30056	0 811 405 178
	Plug-in connector 2P+PE (M16x1.5) and 3P (Pg7) included in scope of delivery, see also 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 4WRP6EA..)

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	2.2
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	mm^2/s	20...100		
	max. permitted	mm^2/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	8	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)	$I_m = 0$		 ≦ 80 cm^3/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, M16x1.5 (2P+PE)
Position transducer connection		Unit plug Pg7 (4P)
Max. solenoid current	A	2.7
Coil restistance 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}		%	≈ 10
Response time	100 % signal change	ms	≈ 12
	10 % signal change	ms	≈ 7

[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 $q_x = q_{nom} \cdot \sqrt{\frac{\Delta p_x}{5}}$

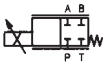
[3] All specifications achieved in conjunction with proportional amplifier: 0 811 405 098

Technical data (type 4WRP10EA..)

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	7.0
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	mm^2/s	20...100		
	max. permitted	mm^2/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	16	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)		$I_m = 0$	 ≦ 80 cm^3/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, M16x1.5 (2P+PE)
Position transducer connection		Unit plug Pg7 (4P)
Max. solenoid current	A	3.7
Coil restistance R_{20}	Ω	2.5
Max. power consumption at 100 % load and operating temperature	VA	60

Static/Dynamic[3]

Hysteresis		%	≦ 0.3
Range of inversion		%	≦ 0.2
Manufacturing tolerance for Q_{max}		%	≈ 10
Response time	100 % signal change	ms	≈ 25
	10 % signal change	ms	≈ 15

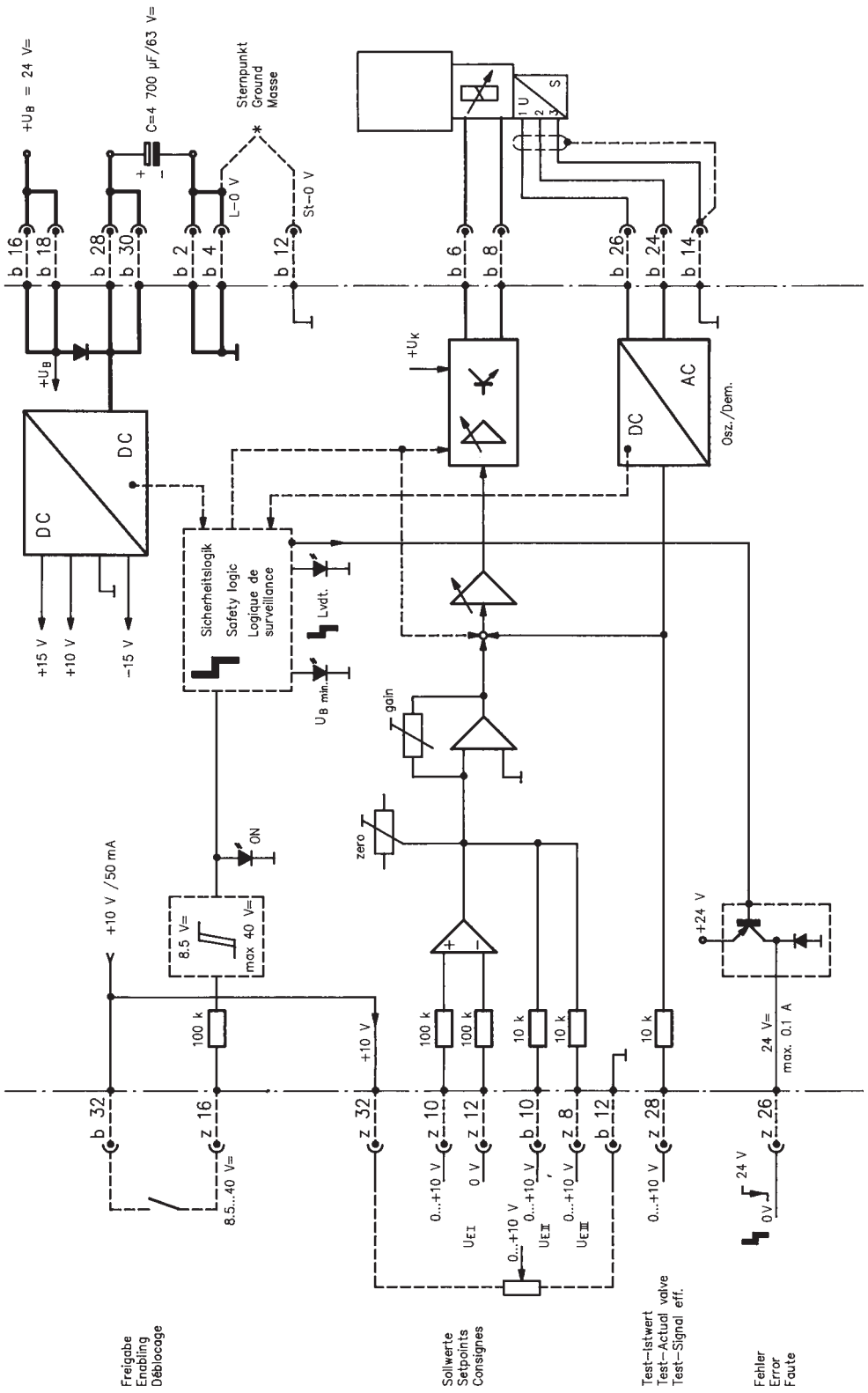
[1] The purity classes stated for the components must be complied with in hydraulic systems. Effective filtration prevents problems and also extends the service life of components. For a selection of filters, see catalog sections RE 50070, RE 50076 and RE 50081.

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

[3] All specifications achieved in conjunction with proportional amplifier: 0 811 405 099

Valve with external trigger electronics (standard without ramps, RE 30052)

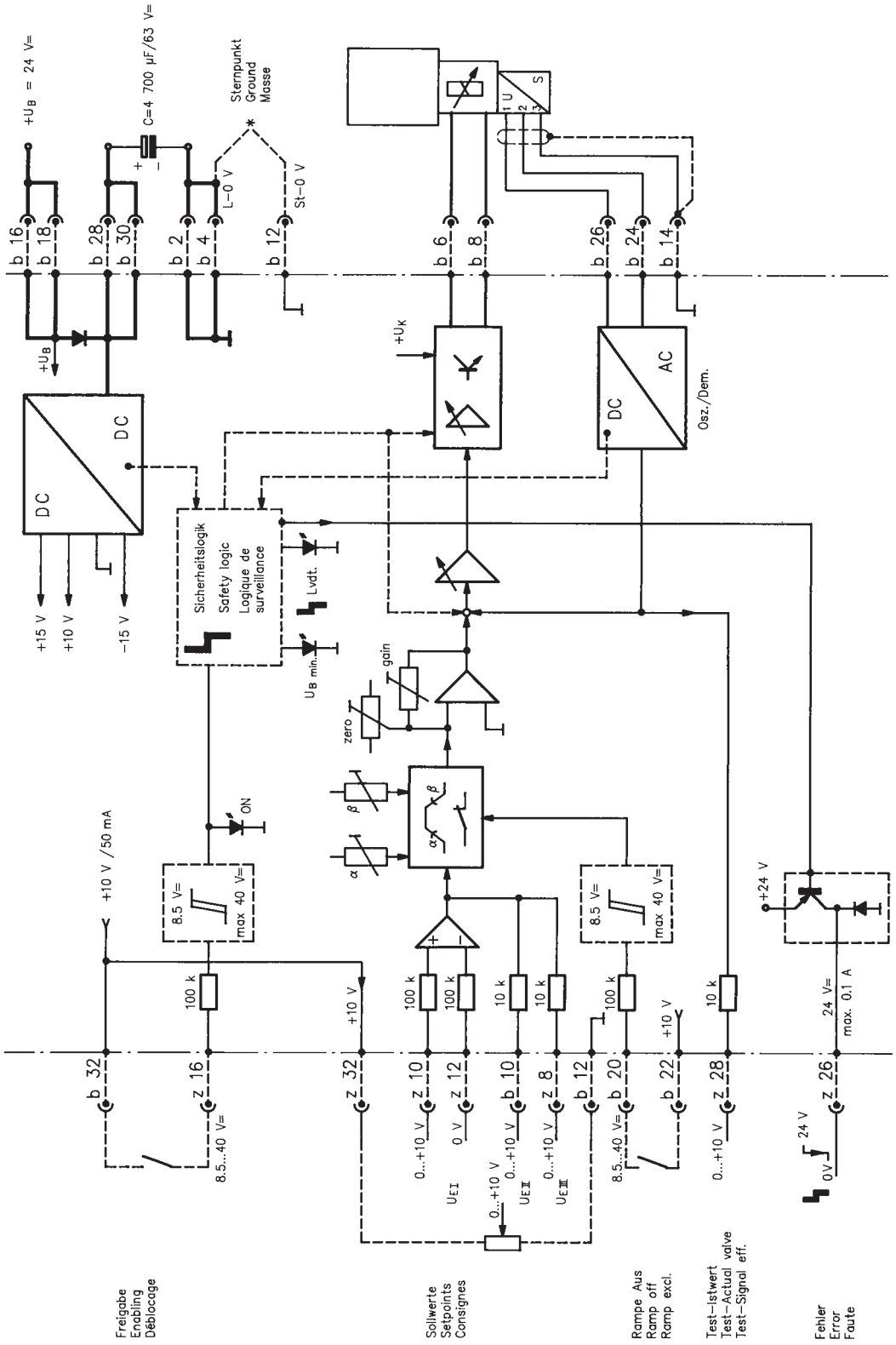
Circuit diagram/pin assignment



Versions of trigger electronics:
– With ramps, see page 8 and RE 30054

Valve with external trigger electronics (with ramps, RE 30054)

Circuit diagram/pin assignment

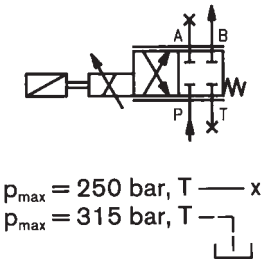


Versions of trigger electronics:
– With ramps, see page 7
and RE 30052

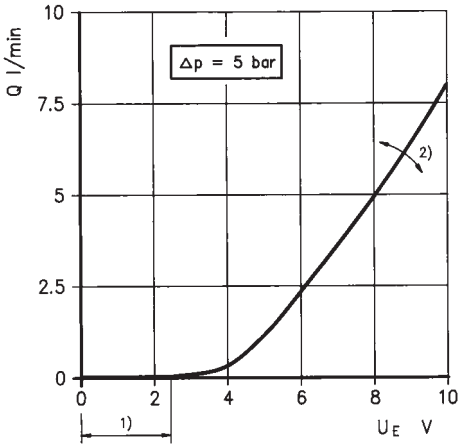
Characteristic curves type 4WRP6E.. (measured with HLP 46, $\vartheta_{oil} = 40\,°C \pm 5\,°C$)

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

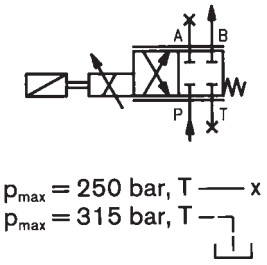
$Q_{nom} = 8$ l/min



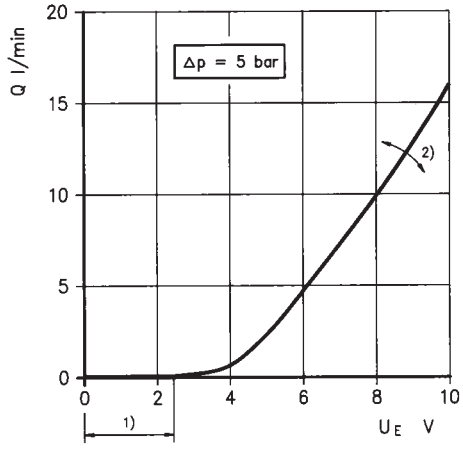
$p_{max} = 250$ bar, T — x
$p_{max} = 315$ bar, T — ⌐



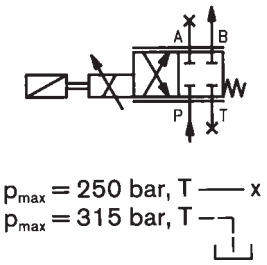
$Q_{nom} = 16$ l/min



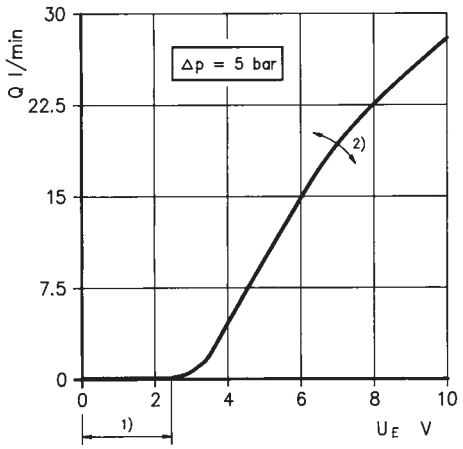
$p_{max} = 250$ bar, T — x
$p_{max} = 315$ bar, T — ⌐



$Q_{nom} = 28$ l/min



$p_{max} = 250$ bar, T — x
$p_{max} = 315$ bar, T — ⌐

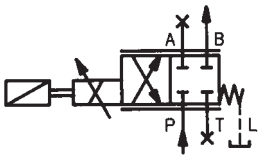


Valve amplifier
[1] Zero adjustment
[2] Sensitivity adjustment

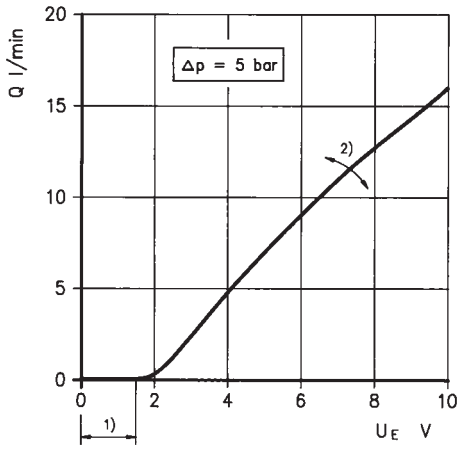
Characteristic curves type 4WRP10E.. (measured with HLP 46, $\vartheta_{oil} = 40\,°C \pm 5\,°C$)

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

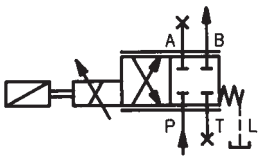
$Q_{nom} = 16$ l/min



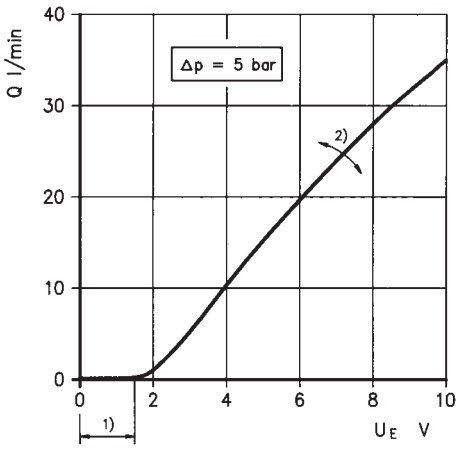
$p_{max} = 315$ bar



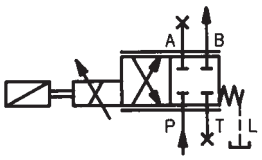
$Q_{nom} = 32$ l/min



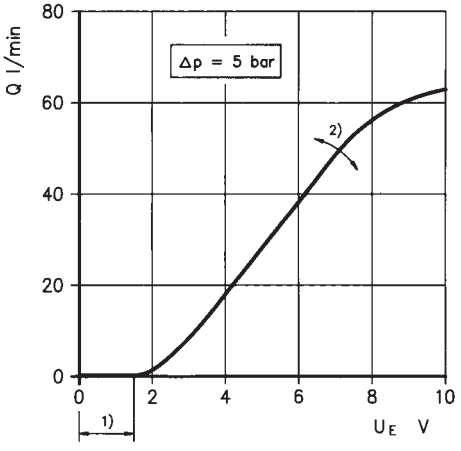
$p_{max} = 315$ bar



$Q_{nom} = 63$ l/min



$p_{max} = 315$ bar



Valve amplifier
1) Zero adjustment
2) Sensitivity adjustment

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

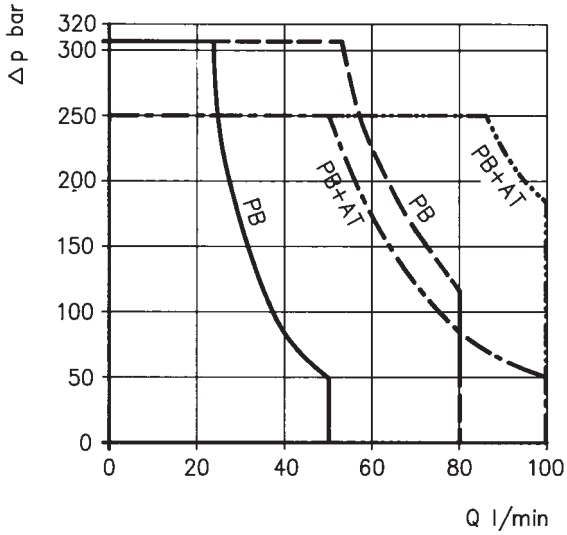
Type 4WRP6EA..

Q_N 16 ——— single flow

—·—·—·— double flow

Q_N 28 — — — — single flow

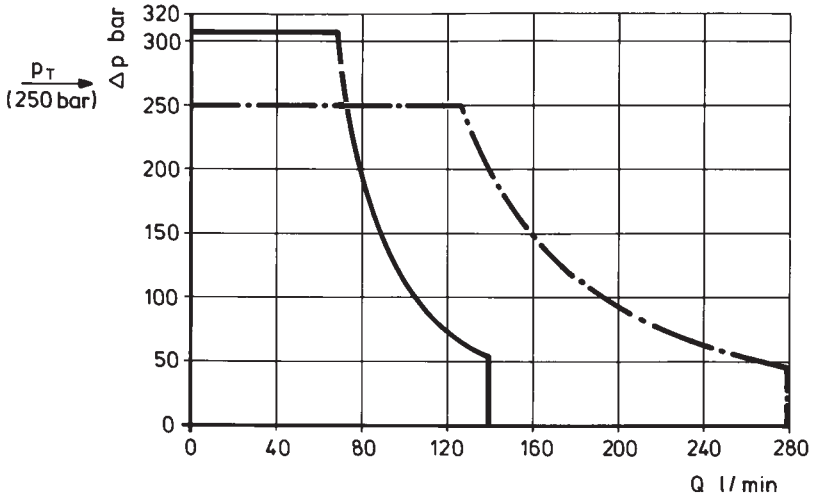
——— ·· ——— double flow



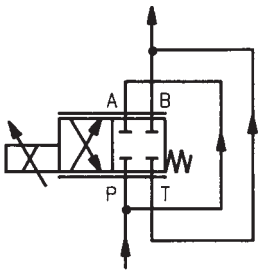
Type 4WRP10EA..

——— single flow

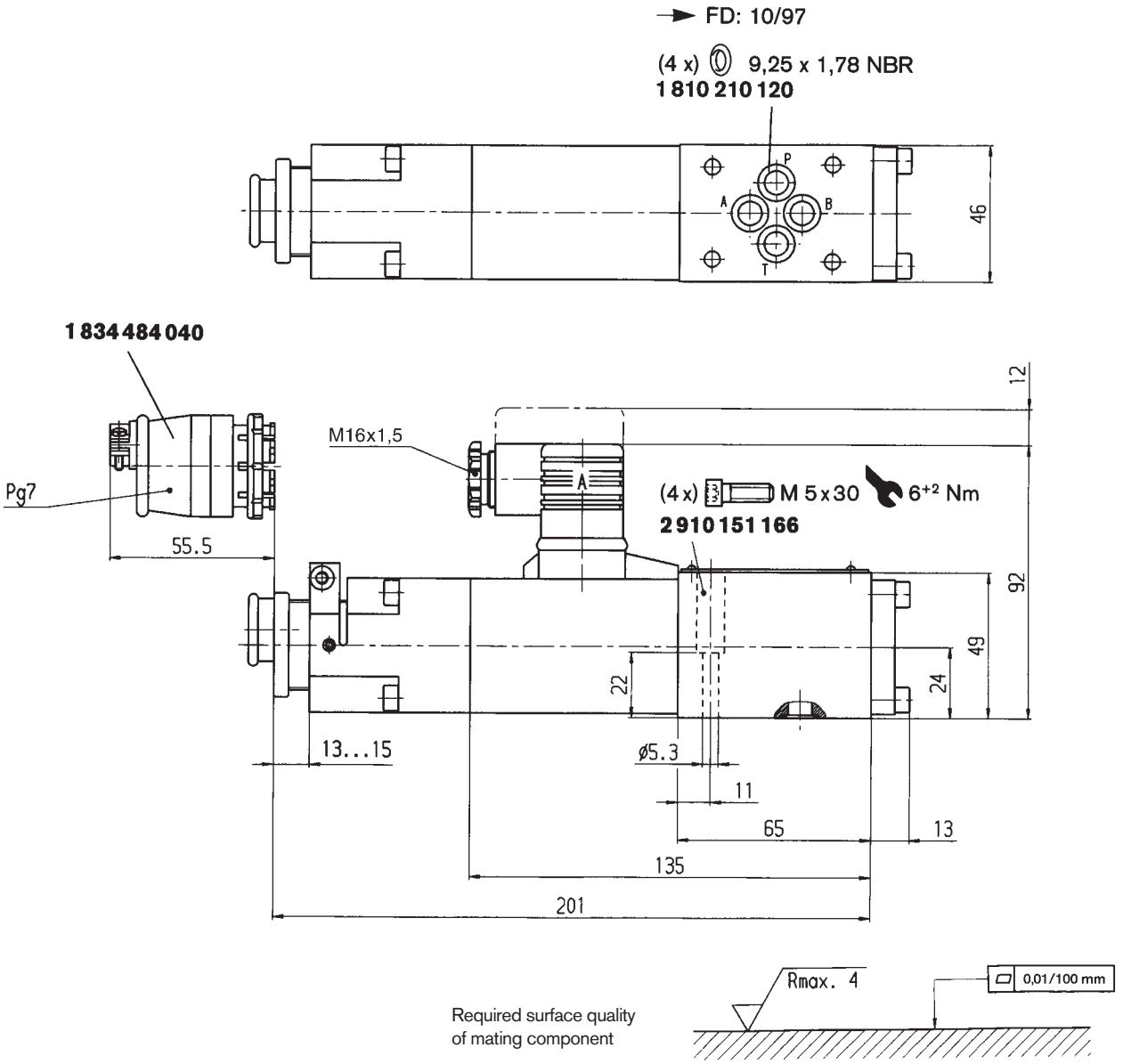
—·—·—·— double flow

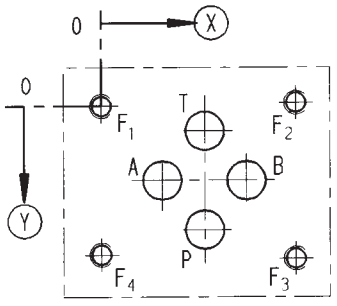


Doubled flow rate
$p_{max} = 250$ bar



Unit dimensions type 4WRP6E.. (nominal dimensions in mm)



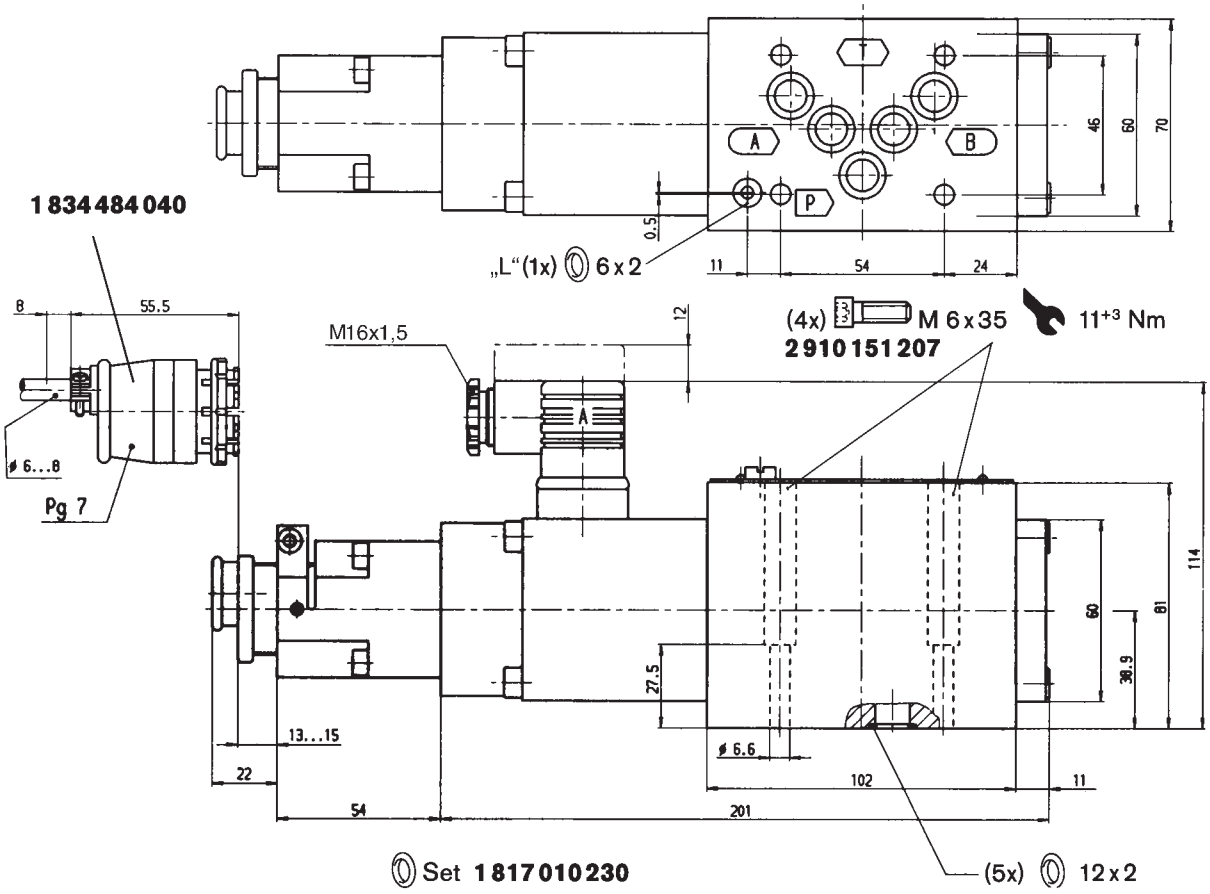


Mounting hole configuration: NG6 (ISO 4401-03-02-0-94)
For subplates, see catalog section RE 45053

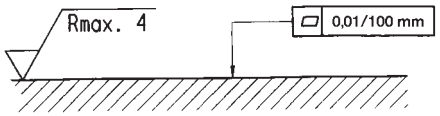
[1] Deviates from standard
[2] Thread depth:
Ferrous metal 1.5 x Ø
Non-ferrous 2 x Ø

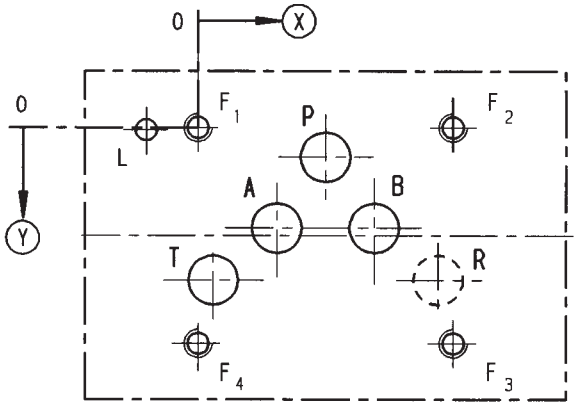
	P	A	T	B	F_1	F_2	F_3	F_4
Ⓧ	21.5	12.5	21.5	30.2	0	40.5	40.5	0
Ⓨ	25.9	15.5	5.1	15.5	0	–0.75	31.75	31
∅	8 [1]	8 [1]	8 [1]	8 [1]	M5 [2]	M5 [2]	M5 [2]	M5 [2]

Unit dimensions type 4WRP10E.. (nominal dimensions in mm)



Required surface quality of mating component





Mounting hole configuration: NG10 (ISO 4401-05-06-0-94)
Fur 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

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