

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

RA 29022/01.05

1/14

Model 4WRP ..E.. / ..W..

Size 6, 10
Unit series 1X
Maximum working pressure of P, A, B 315 bar (4568 PSI),
Nominal flow rate 6...28 l/min (1.6...7.4 GPM) [NG6],
32...63 l/min (8.5...16.6 GPM) [NG10]

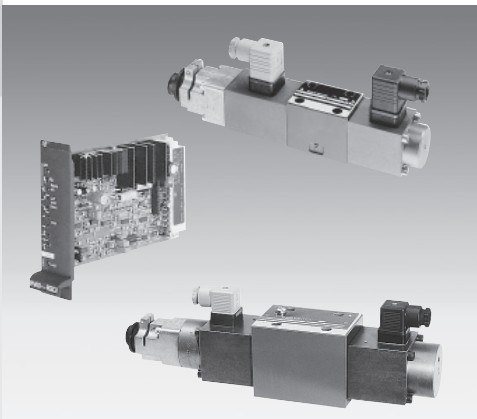


Table of contents

Contents	Page
Features	1
Ordering data and scope of delivery	2
Standard types	2
Function, sectional diagram, symbols	3 and 4
Technical data	5 and 6
Valve with external trigger electronics	7 and 8
Characteristic curves	9 to 11
Unit dimensions	12 and 13

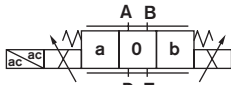
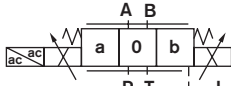
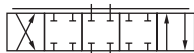
Features

- 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				Further information in plain text		
Size 6				= 6				M = NBR seals, suitable for mineral oils (HL, HLP) to DIN 51524		
Size 10				= 10						
Symbols 4/3-way version								Electrical connection with plug to DIN 43560-AM2 with line socket, line socket included in scope of delivery		
				NG6						
				NG10 ¹⁾						
								= 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}						
								S = Unit series (installation and connection dimensions unchanged)		
								G24 = Voltage supply of trigger electronics +24 V DC		
								1X = Flow characteristic Progressive		
								S = Nominal flow rate at 10 bar valve pressure difference (5 bar per metering notch)		
								Size 6		
								Size 10		
								06 = 6 l/min (1.59 GPM)		
								08 = 8 l/min (2.11 GPM)		
								14 = 14 l/min (3.70 GPM)		
								16 = 16 l/min (4.23 GPM)		
								28 = 28 l/min (7.40 GPM)		
								32 = 32 l/min (8.45 GPM)		
								63 = 63 l/min (16.64 GPM)		

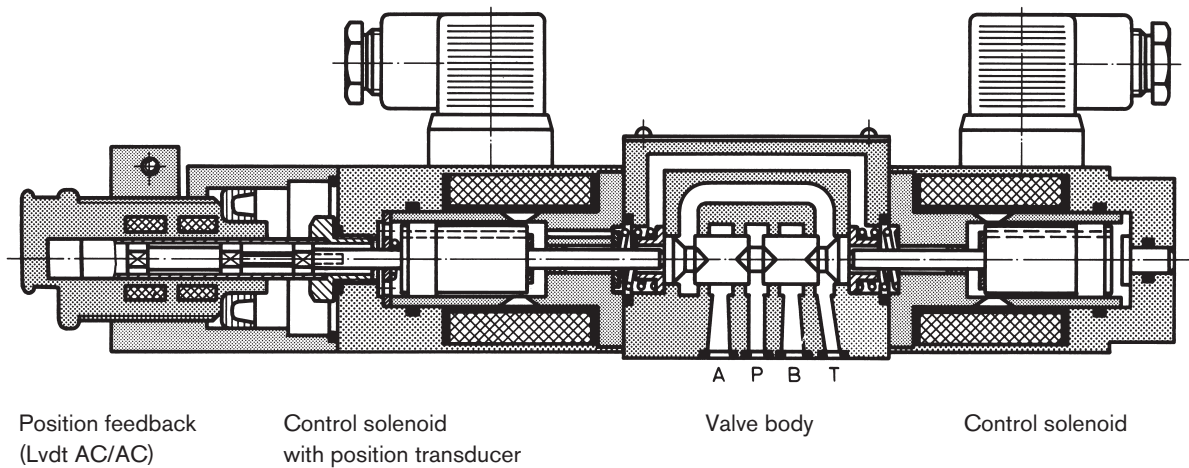
Standard types

Type 4WRP 6	Material No.	Type 4WRP 10	Material No.
Symbol E		Symbol E, E1	
4WRP 6 E 08S -1X/G24Z4/M 755 ^{*)}	0 811 404 101	4WRP 10 E 32S -1X/G24Z4/M	0 811 404 003
4WRP 6 E 16S -1X/G24Z4/M 755 ^{*)}	0 811 404 100	4WRP 10 E 63S -1X/G24Z4/M	0 811 404 001
4WRP 6 E 28S -1X/G24Z4/M	0 811 404 119	4WRP 10 E1 63S -1X/G24Z4/M	0 811 404 086
Symbol W		Symbol W, W1	
4WRP 6 W 06S -1X/G24Z4/M	0 811 404 126	4WRP 10 W 32S -1X/G24Z4/M	0 811 404 081
4WRP 6 W 14S -1X/G24Z4/M	0 811 404 120	4WRP 10 W 63S -1X/G24Z4/M	0 811 404 080
4WRP 6 W 28S -1X/G24Z4/M	0 811 404 121	4WRP 10 W1 63S -1X/G24Z4/M	0 811 404 087

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

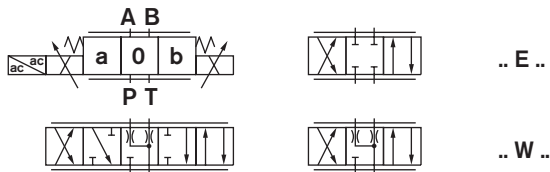
Function, sectional diagram

Type 4WRP 6 ..



Symbols

Position transducer: A-side



Accessories

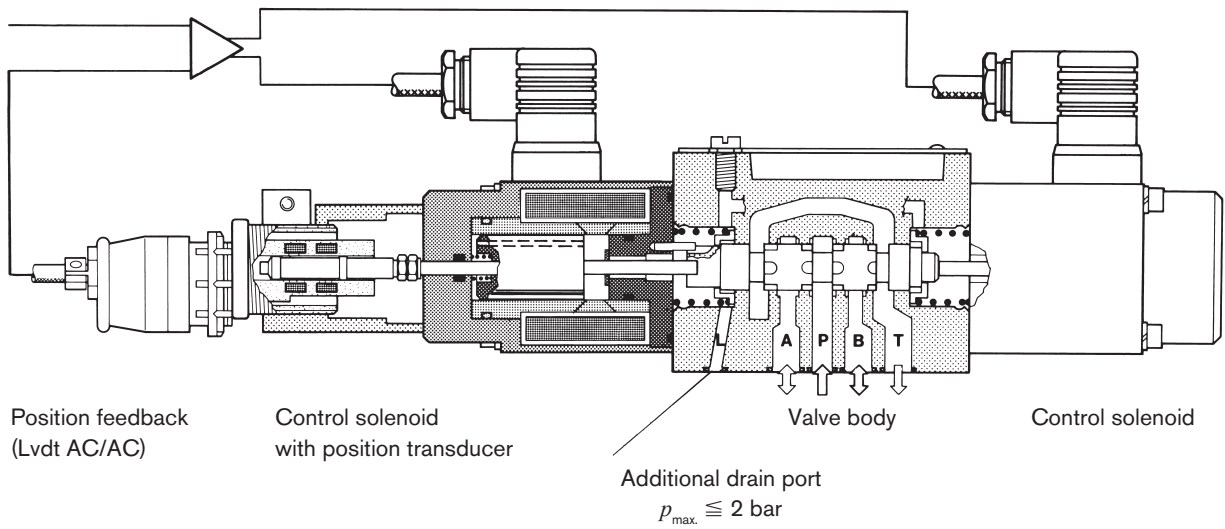
(4 x)  M5 x 30 DIN 912-10.9	Fastening bolts	2 910 151 166
 	VT-VRPA2-527-10 / V0 / RTP, see RE 30048	0 811 405 119
	VT-VRPA2-527-10 / V0 / RTS, see RE 30047	0 811 405 137
 2P+PE  3P	Line socket 2P+PE (M16 x 1.5) and 3P (Pg7) included in scope of delivery, see also RE 08008	

Testing and service equipment

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

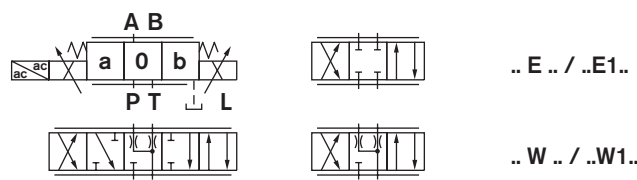
Function, sectional diagram

Type 4WRP 10 ..



Symbols

Position transducer: A-side



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
2P+PE 3P	Line socket 2P+PE (M16 x 1.5) and 3P (Pg7) included in scope of delivery, see also RE 08008	

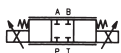
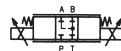
Testing and service equipment

- 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 (°F) -20...+50 (-4...122)
Weight	kg (lbs) 2.8 (6.17)
Vibration resistance, test condition	max. 25 g, shaken in 3 dimensions (24 h)

Hydraulic [measured with HLP 46, $\vartheta_{oil} = 40^{\circ}\text{C} \pm 5^{\circ}\text{C} (104^{\circ}\text{F} \pm 41^{\circ}\text{F})$]

Pressure fluid			Hydraulic oil to DIN 51524 ... 535, other fluids after prior consultation				
Viscosity range	recommended	mm²/s (SUS)	20...100 (93...464)				
	max. permitted	mm²/s (SUS)	10...800 (46...3708)				
Pressure fluid temperature range		°C (°F)	−20...+80 (−4...+176)				
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 (GPM)	6 (1.59)	8 (2.12)	14 (3.70)	16 (4.23)	28 (7.4)	
Max. working pressure		bar (PSI)	Port P, A, B: 315 (4569)				
Max. pressure		bar (PSI)	Port T: 250 (3626)				
Leakage per metering edge ($\Delta p = 100$ bar)		$I_m = 0$			A  T = 80 cm³/min (4.88 in³/min) B  T = 80 cm³/min (4.88 in³/min)		
Leakage drain ($\Delta p = 5$ bar)					A  T = 0.8...1.6 l/min (0.21...0.42 GPM) B  T = 0.8...1.6 l/min (0.21...0.42 GPM)		

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/Dynamic³⁾

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.

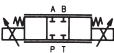
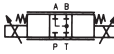
²⁾ Flow rate at a different Δp $q_x = q_{nom} \cdot \sqrt{\frac{\Delta p_x}{5}}$

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 (°F) -20...+50 (-4...122)
Weight	kg (lbs) 8.0 (17.63)
Vibration resistance, test condition	max. 25 g, shaken in 3 dimensions (24 h)

Hydraulic [measured with HLP 46, $\vartheta_{oil} = 40^{\circ}\text{C} \pm 5^{\circ}\text{C}$ (104°F $\pm$ 41°F)]

Pressure fluid	Hydraulic oil to DIN 51524 ... 535, other fluids after prior consultation	
Viscosity range	recommended	mm ² /s (SUS) 20...100 (93...464)
	max. permitted	mm ² /s (SUS) 10...800 (46...3708)
Pressure fluid temperature range	°C (°F)	-20...+80 (-4...+176)
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 (GPM)	32 (8.45) 63 (16.64)
Max. working pressure	bar (PSI)	Port P, A, B: 315 (4569)
Max. pressure	bar (PSI)	Port T: 250 (3626)
	bar (PSI)	Port L: 2 (29)
Leakage per metering edge ($\Delta p = 100$ bar)	$I_m = 0$	 A  T = 80 cm ³ /min (4.88 in ³ /min) B  T = 80 cm ³ /min (4.88 in ³ /min)
Leakage drain ($\Delta p = 5$ bar)		 A  T = 0.4...0.8 l/min (0.11...0.21 GPM) B  T = 0.4...0.8 l/min (0.11...0.21 GPM)

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/Dynamic³⁾

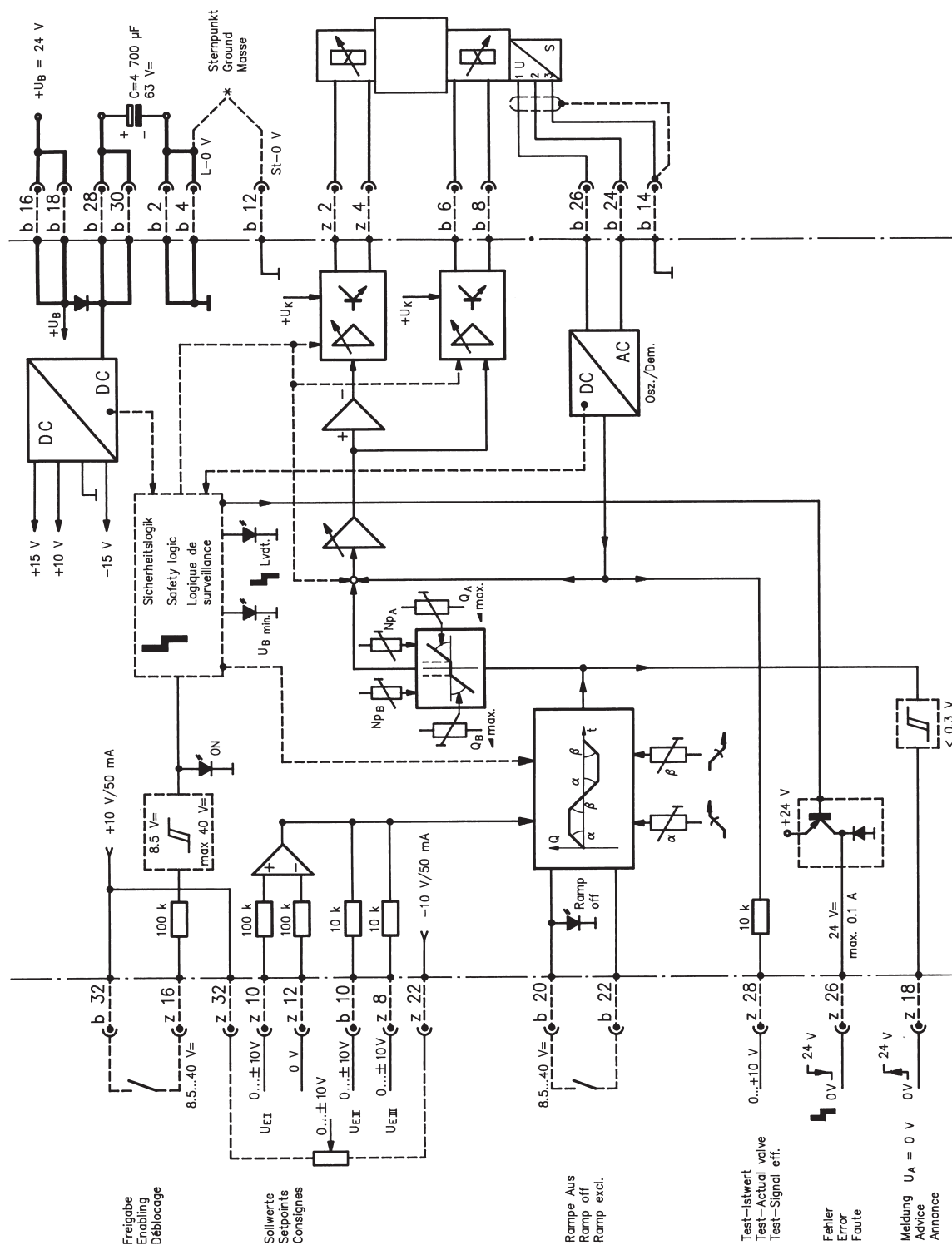
Hysteresis	%	≤ 0.75
Range of inversion	%	≤ 0.5
Manufacturing tolerance for $\underline{Q}_{max}$	%	≈ 10
Response time 100 % signal change	ms	≈ 50
	10 % signal change	ms ≈ 20

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

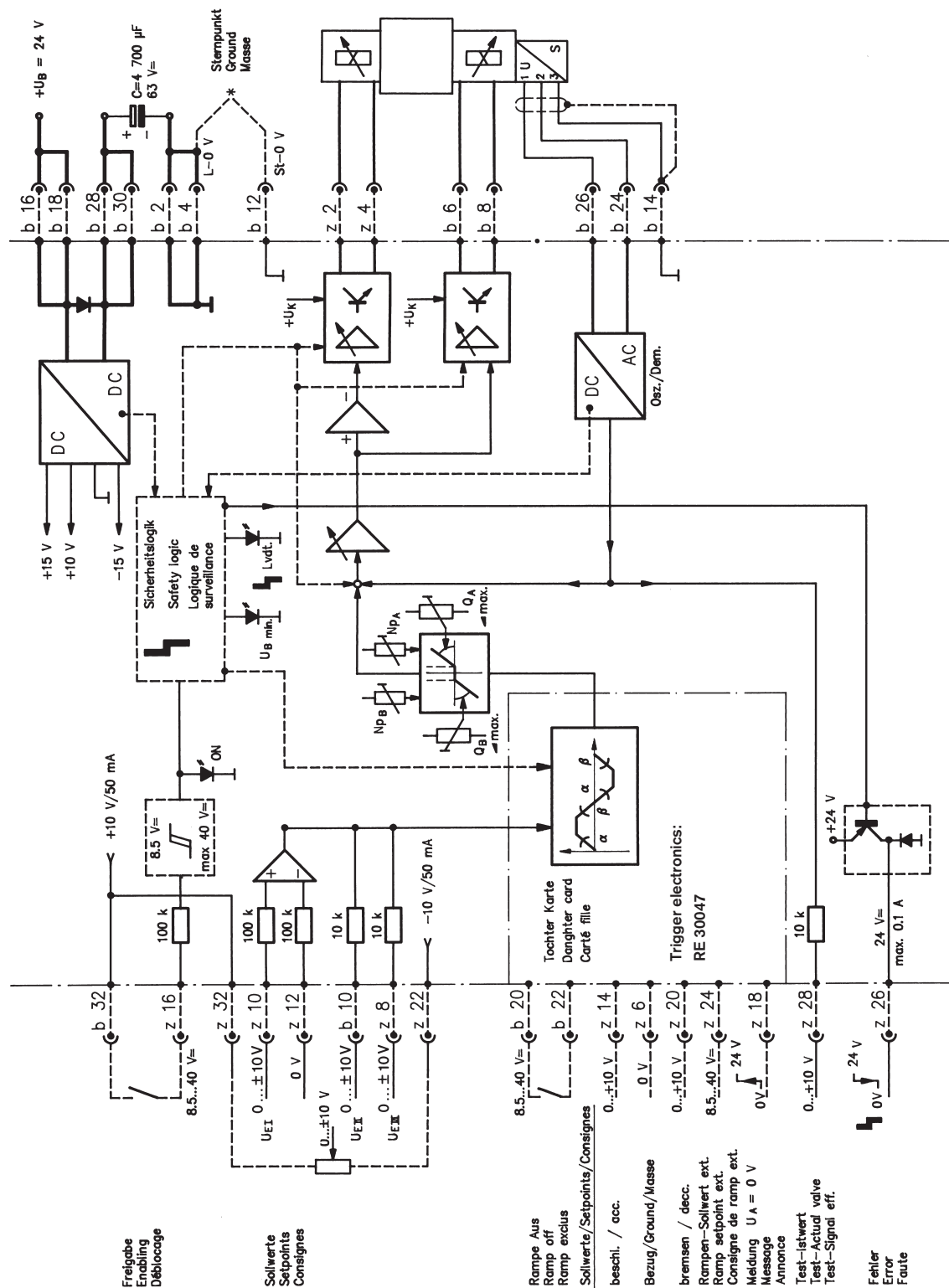
³⁾ All specifications achieved in conjunction with proportional amplifier: 0 811 405 120

Circuit diagram/pin assignment



Courtesy of CMA/Flodyne/Hydradyne • Motion Control • Hydraulic • Pneumatic • Electrical • Mechanical • (800) 426-5480 • www.cmafh.com

Circuit diagram/pin assignment



Versions of trigger electronics:

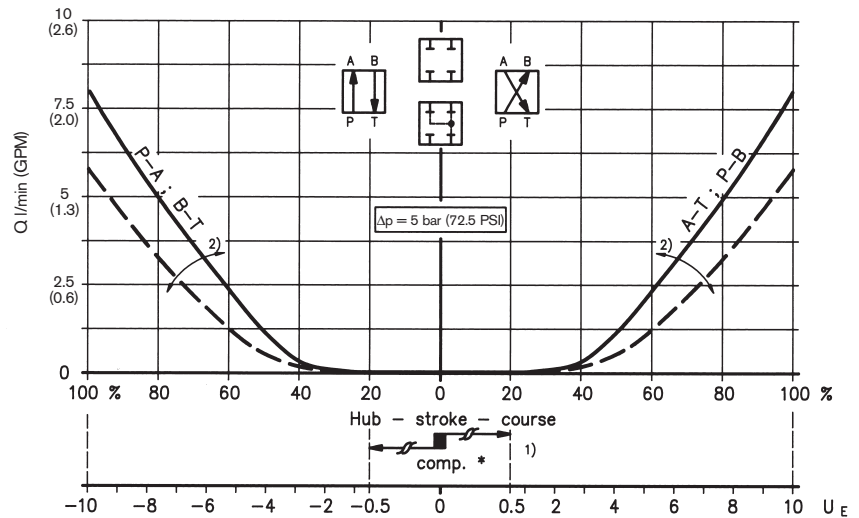
- With ramps, see page 7 and RE 30048

Characteristic curves type 4WRP 6 E .. / W.. - measured with HLP 46, $\vartheta_{oil} = 40^\circ\text{C} \pm 5^\circ\text{C}$ (104°F $\pm$ 41°F)

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

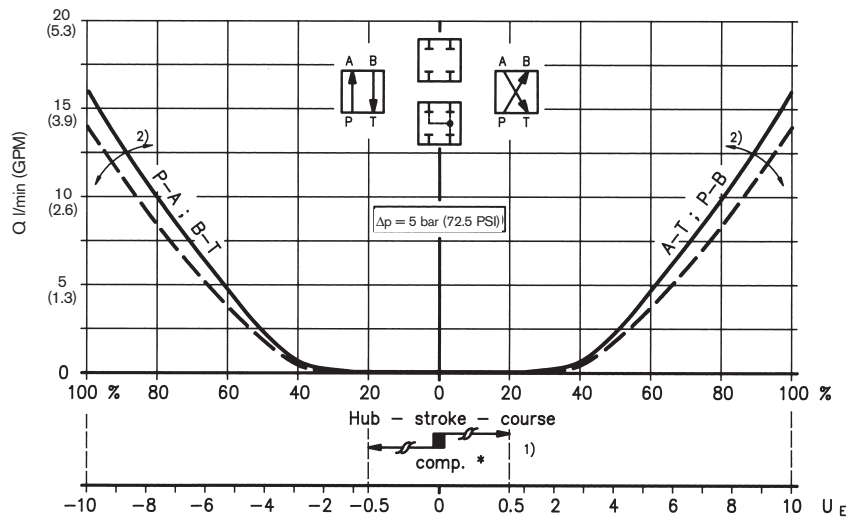
$Q_{nom} = 5.8/8$ l/min (1.53/2.12 GPM)

— $Q_N = 8$ l/min (2.12 GPM)
 - - - $Q_N = 5.8$ l/min (1.53 GPM)

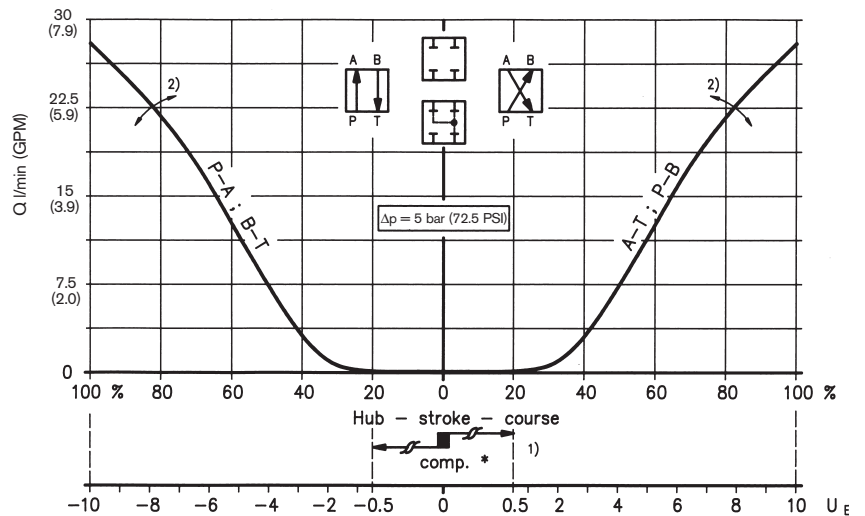


$Q_{nom} = 14/16$ l/min (3.70/4.23 GPM)

— $Q_N = 16$ l/min (4.23 GPM)
 - - - $Q_N = 14$ l/min (3.70 GPM)



$Q_{nom} = 28$ l/min (7.40 GPM)



Valve amplifier

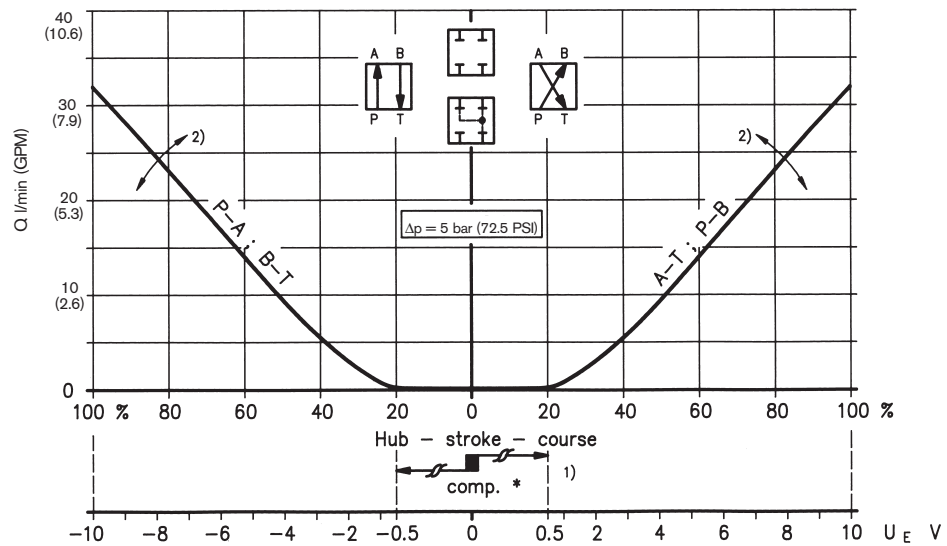
1) Zero adjustment ± 0.5 V

2) Sensitivity adjustment

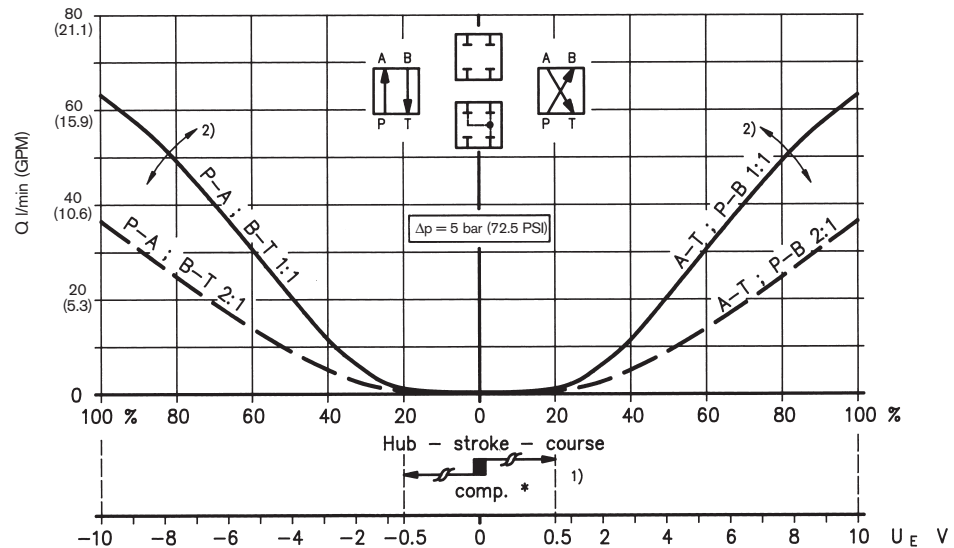
Characteristic curves type 4WRP 10 E .. / W.. - measured with HLP 46, $\vartheta_{oil} = 40^\circ\text{C} \pm 5^\circ\text{C}$ (104°F $\pm$ 41°F)

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

$Q_{nom} = 32$ l/min (8.45 GPM)



$Q_{nom} = 63$ l/min (16.64 GPM)



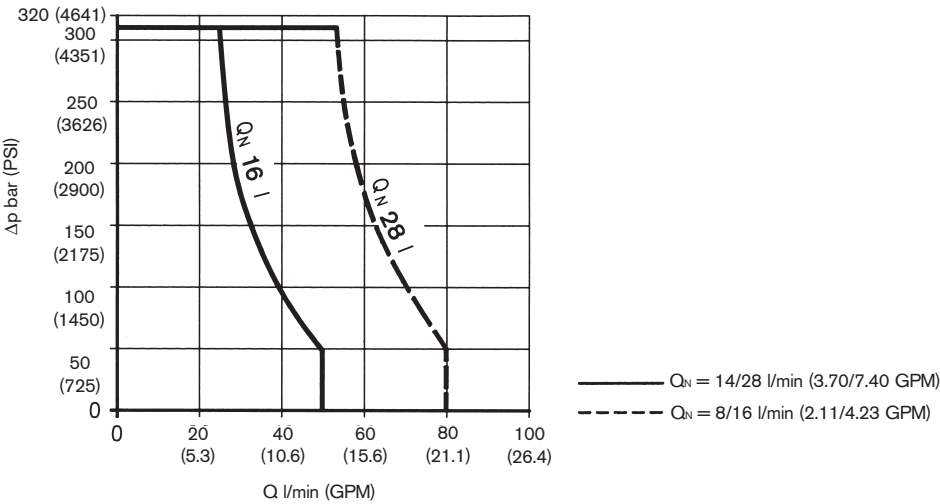
Valve amplifier

¹⁾ Zero adjustment ± 0.5 V

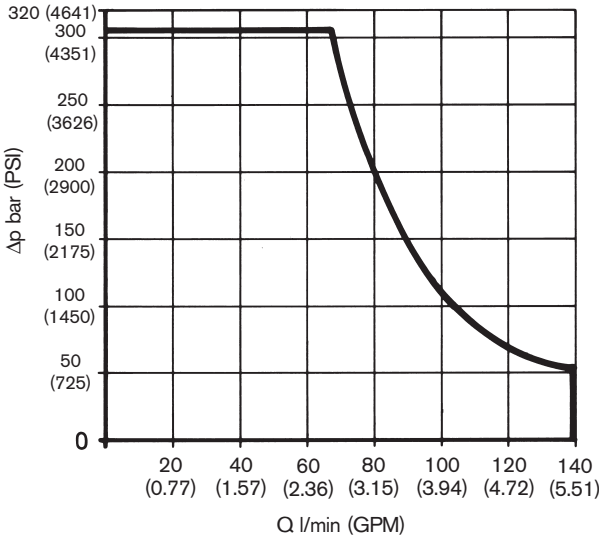
²⁾ Sensitivity adjustment

Operating limits - measured with HLP 46, $\vartheta_{oil} = 40^{\circ}\text{C} \pm 5^{\circ}\text{C}$ (104°F $\pm$ 41°F)

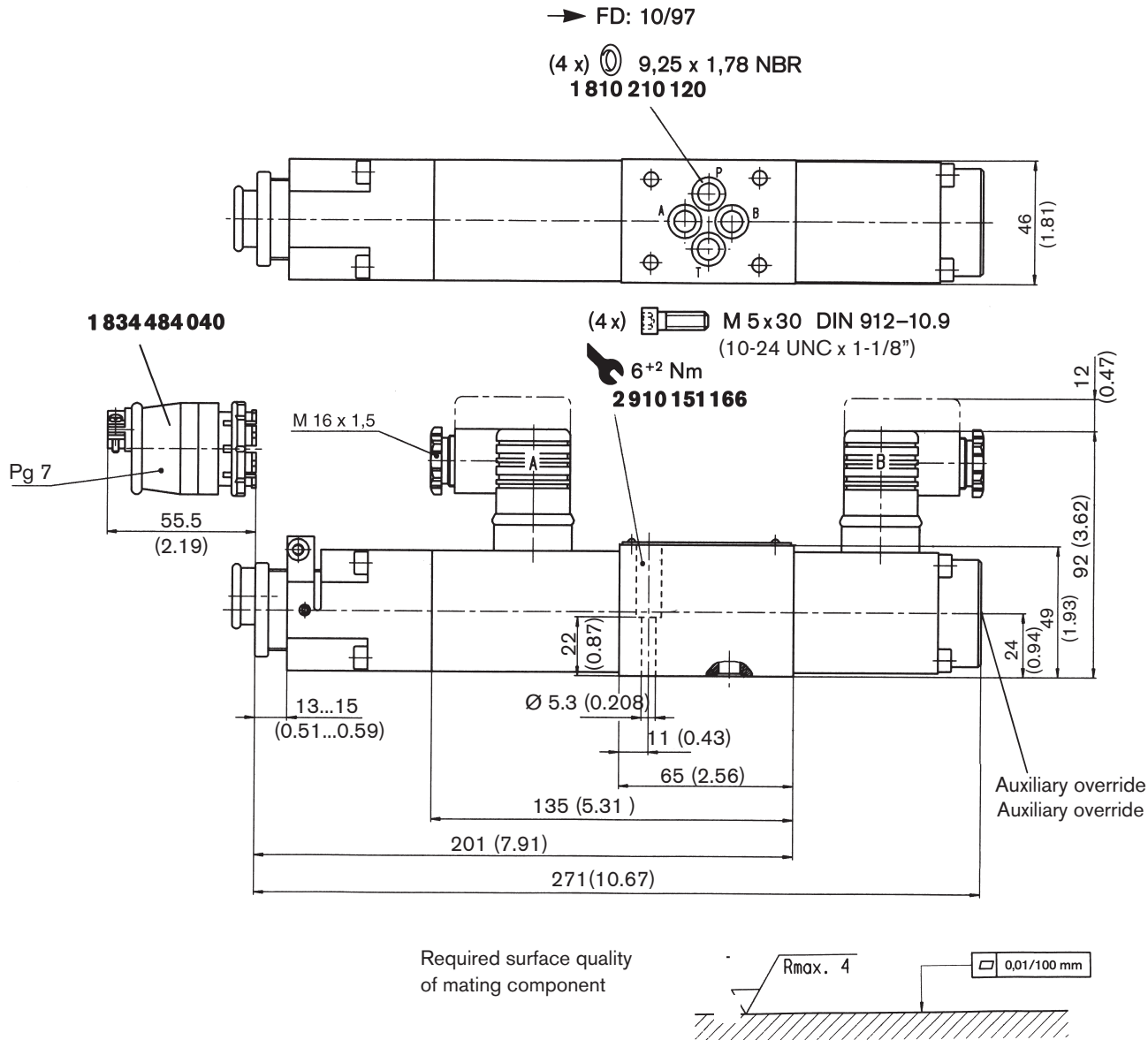
Type 4WRP 6 E .. / W..



Type 4WRP 10 E .. / W..

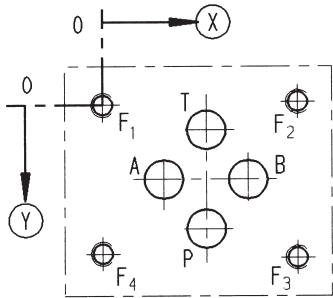


Unit dimensions type 4WRP 6 E .. / W.. - nominal dimensions in mm (inches)



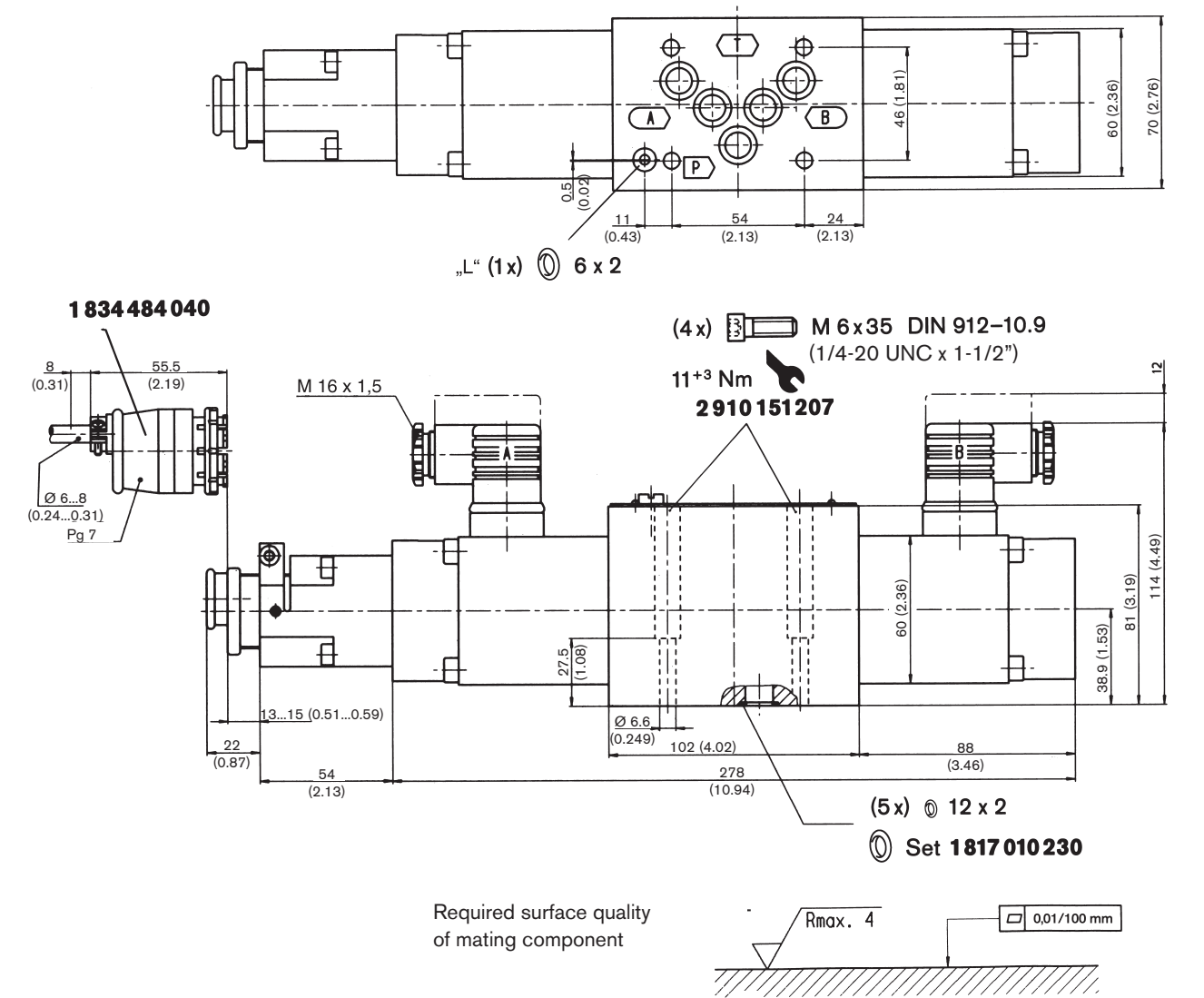
Mounting hole configuration: NG6 (ISO 4401-03-02-0-94)
For subplates see catalog section RE 45053

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



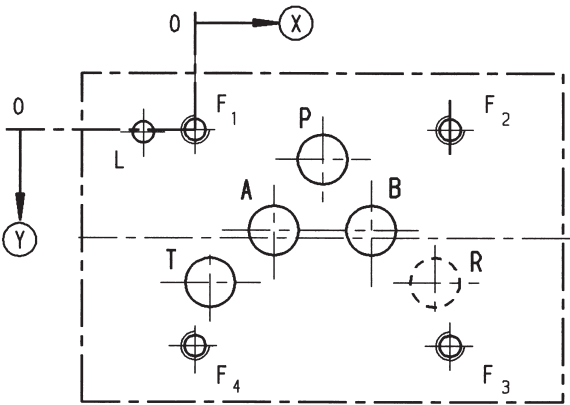
	P	A	T	B	F ₁	F ₂	F ₃	F ₄
⊗	21.5 (0.85)	12.5 (0.49)	21.5 (0.85)	30.2 (1.19)	0	40.5 (1.59)	40.5 (1.59)	0
⊙	25.9 (1.02)	15.5 (0.61)	5.1 (0.20)	15.5 (0.61)	0	-0.75 (-0.03)	31.75 (1.25)	31 (1.22)
∅	8 ¹⁾	8 ¹⁾	8 ¹⁾	8 ¹⁾	M5 ²⁾	M5 ²⁾	M5 ²⁾	M5 ²⁾

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



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 $\varnothing$ *
 - Non-ferrous 2 x $\varnothing$
- * (NG10 min. 10.5 mm)



	P	A	T	B	F ₁	F ₂	F ₃	F ₄	R	L
⊗	27 (1.06)	16.7 (0.66)	3.2 (0.13)	37.3 (1.47)	0	54 (2.13)	54 (2.13)	0	50.8 (2.00)	-11 (-0.43)
⊙	6.3 (0.25)	21.4 (0.84)	32.5 (1.28)	21.4 (0.84)	0	0	46 (1.81)	46 (1.81)	32.5 (1.28)	0.5 (0.02)
∅	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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