

4/2 servo solenoid valves with on-board electronics (OBE), positive overlap and position feedback

RE 29024/01.05
Replaces: 05.04

1/16

Type 4WRPE ..EA..

Size 6, 10

Unit series 2X

Maximum working pressure of P, A, B 315 bar, T 250 bar (NG6)

Maximum working pressure of P, A, B 315 bar, T 200 bar (NG10)

Nominal flow rate 18...32 l/min (NG6), 50...80 l/min (NG10)



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Features

- Directly operated NG6 and 10 valves with positive overlap, actuated on both sides and position-controlled, symbol E
- Control solenoid with on-board electronics (OBE), deadband compensation and gain calibrated at the factory
- Electrical connection 6P+PE (standard), signal input: differential amplifier with interface A1 = +10 V (F1 on request)
- For subplate attachment, mounting hole configuration NG6 to ISO 4401-03-02-0-94 and NG10 to ISO 4401-05-04-0-94
- Plug-in connectors to DIN 43563-AM6, see catalog section RE 08008 (order separately)
- Subplates as per catalog section RE 45053 and RE 45055 (order separately)

Variants on request

- For standard applications, such as e.g.
 - 280 bar in P, A, B, T (NG10 + Y, GGG 50)
 - Valve electronics 11P+PE (plug-in connector)

Ordering data and scope of delivery

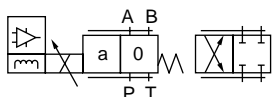
4WRP	E	E	A	S	J	-2X/	G24	K0/	M	*
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With on-board trigger electronics = E

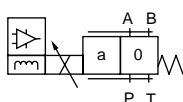
Size 6 = 6
Size 10 = 10

Symbols

4/2-way version = E



Side of inductive position transducer



(Standard) = A

¹⁾ F1 = 4...20 mA on request
²⁾ Valve electronics 11P+PE on request

Further information in plain text

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

Interface for trigger electronics

A1 = setpoint input +10 V
F1 = setpoint input 4...20 mA¹⁾

Electrical connection

K0 = without line socket, with unit plug to DIN 43563-AM6 ²⁾
Order line socket separately

Voltage supply of trigger electronics

G24 = +24 V DC

2X = Unit series (installation and connection dimensions unchanged)

Overlap compensating signal

J = See curve range 0...+0.5

Flow characteristic

S = Progressive

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

Size 6	Size 10
18 = 18 l/min	50 = 50 l/min
32 = 32 l/min	80 = 80 l/min

Preferred types (available at short notice)

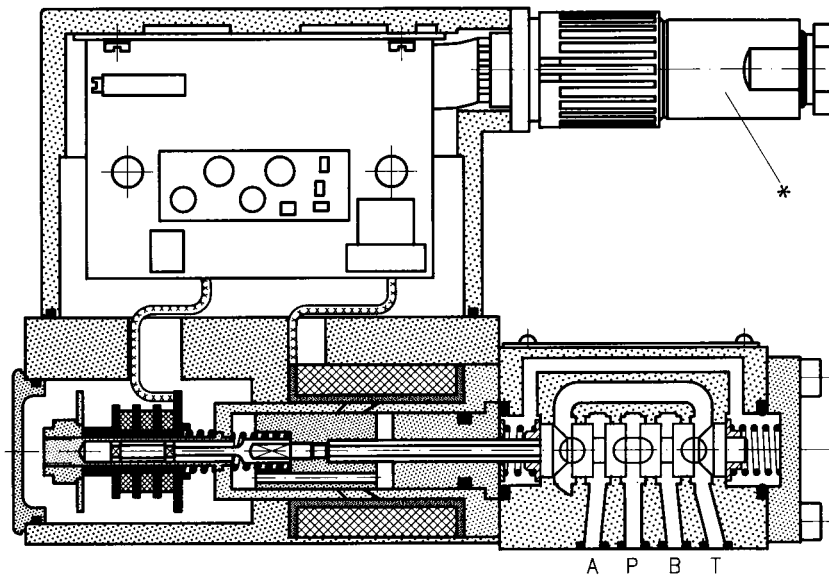
Type 4WRPE 6 EA	Material No.
4WRPE 6 EA 18SJ-2X/G24K0/M	0 811 403 129
4WRPE 6 EA 32SJ-2X/G24K0/M	0 811 403 128

Type 4WRPE 10 EA	Material No.
4WRPE 10 EA 50SJ-2X/G24K0/M	0 811 404 751
4WRPE 10 EA 80SJ-2X/G24K0/M	0 811 404 750

Function, sectional diagram

Type 4WRPE 6 E ..

CE EN 61000-6-2
EN 61000-6-3

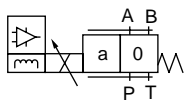


Control solenoid with position transducer

Valve body

Symbols

Position transducer: A-side



.. E ..

Accessories, not included in scope of delivery

(4 x) M5 x 30 DIN 912-10.9

*



Fastening bolts

2 910 151 166

Line sockets 6P+PE, see also RE 08008

KS

1 834 482 022

KS

1 834 482 026

MS

1 834 482 023

MS

1 834 482 024

KS 90°

1 834 484 252

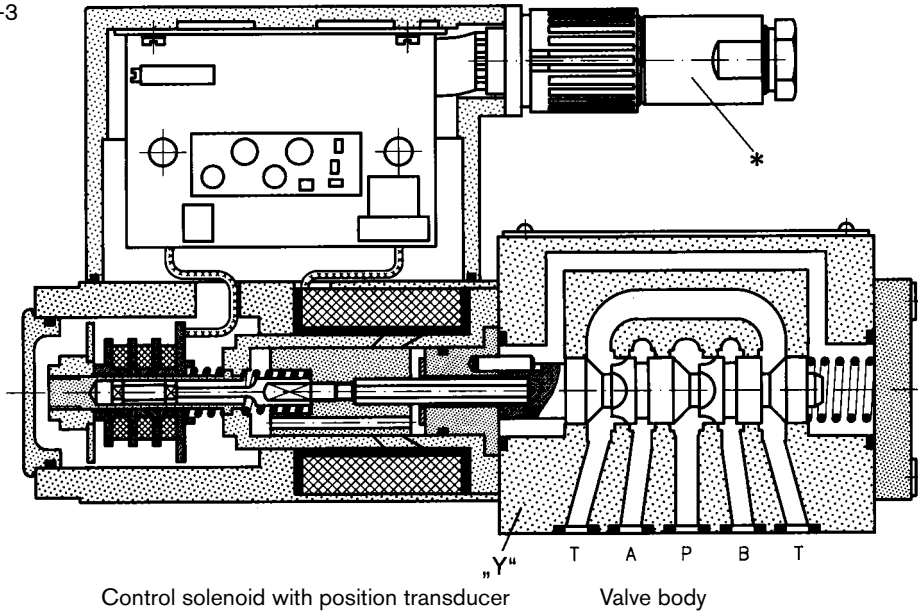
Testing and service equipment

- Test box type VT-PE-TB3, see RE 30065
- Test adapter type 6P+PE type VT-PA-2, see RE 30068

Function, sectional diagram

Type 4WRPE 10 E ..

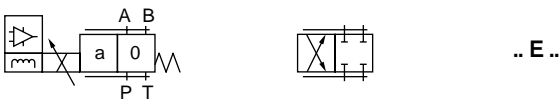
CE EN 61000-6-2
EN 61000-6-3



Control solenoid with position transducer Valve body
Leakage drain "Y" on request (GGG 50)

Symbols

Position transducer: A-side



Accessories, not included in scope of delivery

(4 x) M6 x 40 DIN 912-10.9	Fastening bolts		2 910 151 209
	Line sockets 6P+PE, see also RE 08008	KS	1 834 482 022
		KS	1 834 482 026
		MS	1 834 482 023
		MS	1 834 482 024
		KS 90°	1 834 484 252


Testing and service equipment

- Test box type VT-PE-TB3, see RE 30065
- Test adapter type 6P+PE type VT-PA-2, see RE 30068


Technical data (type 4WRPE 6 EA..)**General**

Construction	Spool type valve, directly operated	
Actuation	Proportional solenoid with position control, OBE	
Connection type	Subplate, mounting hole configuration NG6 (ISO 4401-03-02-0-94)	
Mounting position	Optional	
Ambient temperature range	°C	-20 ... +50
Weight	kg	3
Vibration resistance, test condition	Max. 25 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⁾		
Direction of flow	See symbol		
Nominal flow at $\Delta p = 5 \text{ bar per notch}^2)$	l/min	18	32
Max. working pressure	bar	Port P, A, B: 315	
Max. pressure	bar	Port T: 250	
Operating limits	See chart		
Leakage at 100 bar per metering edge	 $\leq 80 \text{ cm}^3/\text{min}$		

Static/Dynamic

Hysteresis	%	≤ 0.3		
Range of inversion	%	< 0.2		
Manufacturing tolerance	%	$\leq \pm 3$		
Response time 100 % signal change	ms	≈ 12		
	10 % signal change	ms	≈ 7	
Thermal drift	$< 1\%$ at $\Delta T = 40 \text{ °C}$			
Q_N type	l/min	18	30	
Calibration (factory setting) $\pm 3\%$ $\Delta p = 5 \text{ bar}$	l/min	$U_{D-E} = 1 \text{ V} =$	0.45	0.78
		$U_{D-E} = 8 \text{ V} =$	15	30
Conformity	 EN 61000-6-2 EN 61000-6-3			


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


Technical data (type 4WRPE 10 EA..)**General**

Construction	Spool type valve, directly operated	
Actuation	Proportional solenoid with position control, OBE	
Connection type	Subplate, mounting hole configuration NG10 (ISO 4401-05-04-0-94)	
Mounting position	Optional	
Ambient temperature range	°C	-20 ... +50
Weight	kg	7.1
Vibration resistance, test condition	Max. 25 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⁾		
Direction of flow	See symbol		
Nominal flow at $\Delta p = 5 \text{ bar}$ per notch ²⁾	l/min	50	80
Max. working pressure	bar	Port P, A, B: 315	
Max. pressure	bar	Port T: 200	
Operating limits	See chart		
Leakage at 100 bar per metering edge	 $\leq 80 \text{ cm}^3/\text{min}$		

Static/Dynamic

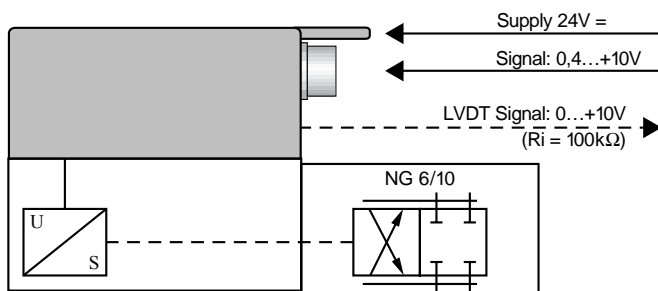
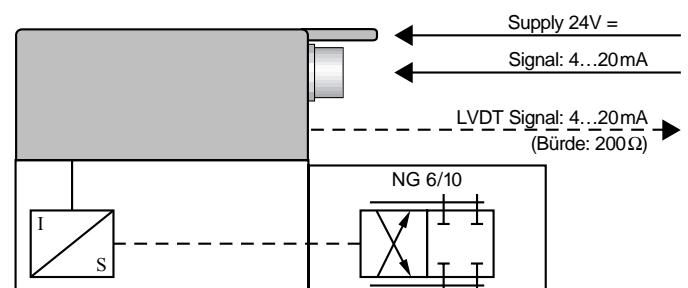
Hysteresis	%	≤ 0.3		
Range of inversion	%	< 0.2		
Manufacturing tolerance	%	$\leq \pm 3$		
Response time 100 % signal change	ms	≈ 25		
	10 % signal change	ms	≈ 10	
Thermal drift	$< 1\%$ at $\Delta T = 40 \text{ °C}$			
Q_N type	l/min	50	80	
Calibration (factory setting) $\pm 3\%$ $\Delta p = 5 \text{ bar}$	l/min	$U_{D-E} = 0.6 \text{ V} =$	0.15	0.34
		$U_{D-E} = 8 \text{ V} =$	40	70
Conformity	 EN 61000-6-2 EN 61000-6-3			

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

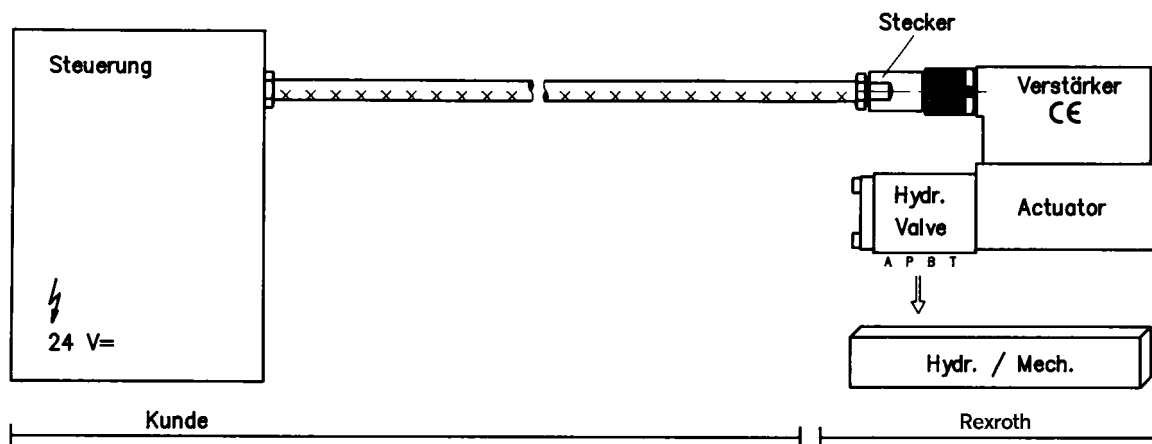
Technical data (type 4WRPE ..EA..)**Electrical**, trigger electronics integrated in the valve

Cyclic duration factor	%	100
Degree of protection		IP 65 to DIN 40050 and IEC 14434/5
Connection		Line socket 6P+PE, DIN 43563
Power supply		24 V DC _{nom}
Terminal A:		min. 21 V DC/max. 40 V DC
Terminal B: 0 V		Ripple max. 2 V DC
Power consumption	NG6	Solenoid \square 45 mm = 40 VA max.
	NG10	Solenoid \square 60 mm = 60 VA max.
External fuse		2.5 A _F
Input, "Standard" version	A1	Differential amplifier, $R_i = 100 \text{ k}\Omega$
Terminal D: U_E		+0.4 ... +10 V
Terminal E:		0 V
Input, "mA signal" version	F1	Burden, $R_{sh} = 200 \Omega$
Terminal D: I_{D-E}		4 ... 20 mA
Terminal E: I_{D-E}		Current loop I_{D-E} feedback
Max. differential input voltage at 0 V		$\left. \begin{array}{l} D \rightarrow B \\ E \rightarrow B \end{array} \right\} \text{max. } 18 \text{ V DC}$
Test signal, "Standard" version	A1	LVDT
Terminal F: U_{Test}		+0.4 ... +10 V
Terminal C:		Reference 0 V
Test signal, "mA signal" version	F1	LVDT signal 4 ... 20 mA at external load 200 ... 500 Ω max.
Terminal F: I_{F-C}		4 ... 20 mA output
Terminal C: I_{F-C}		Current loop I_{F-C} feedback
Safety earth conductor and shield		See pin assignment (installation conforms to CE)
Recommended cable		See pin assignment up to 20 m 7 x 0.75 mm ² up to 40 m 7 x 1 mm ²
Calibration		Calibrated at the factory, see valve curve

Version A1:
Standard**Version F1:**
mA-Signal

Connection

For electrical data see page 7 and
Operating Instructions 1 819 929 083



Technical notes for the cable

- Version:**
- Multi-wire cable
 - Extra-finely stranded wire to VDE 0295, Class 6
 - Safety earth conductor, green/yellow
 - Cu braided shield
- Types:**
- e.g. Ölflex-FD 855 CP (from Lappkabel company)
- No. of wires:**
- Determined by type of valve, plug types and signal assignment
- Cable Ø:**
- 0.75 mm² up to 20 m length
 - 1.0 mm² up to 40 m length
- Outside Ø:**
- 9.4 ... 11.8 mm – Pg11
 - 12.7 ... 13.5 mm – Pg16

Important

Voltage supply 24 V DC nom, if voltage drops below 18 V DC, rapid shutdown resembling “Enable OFF” takes place internally.

In addition, with the “mA signal” version:

$I_{D-E} \geq 3 \text{ mA}$ – valve is active

$I_{D-E} \leq 2 \text{ mA}$ – valve is deactivated.

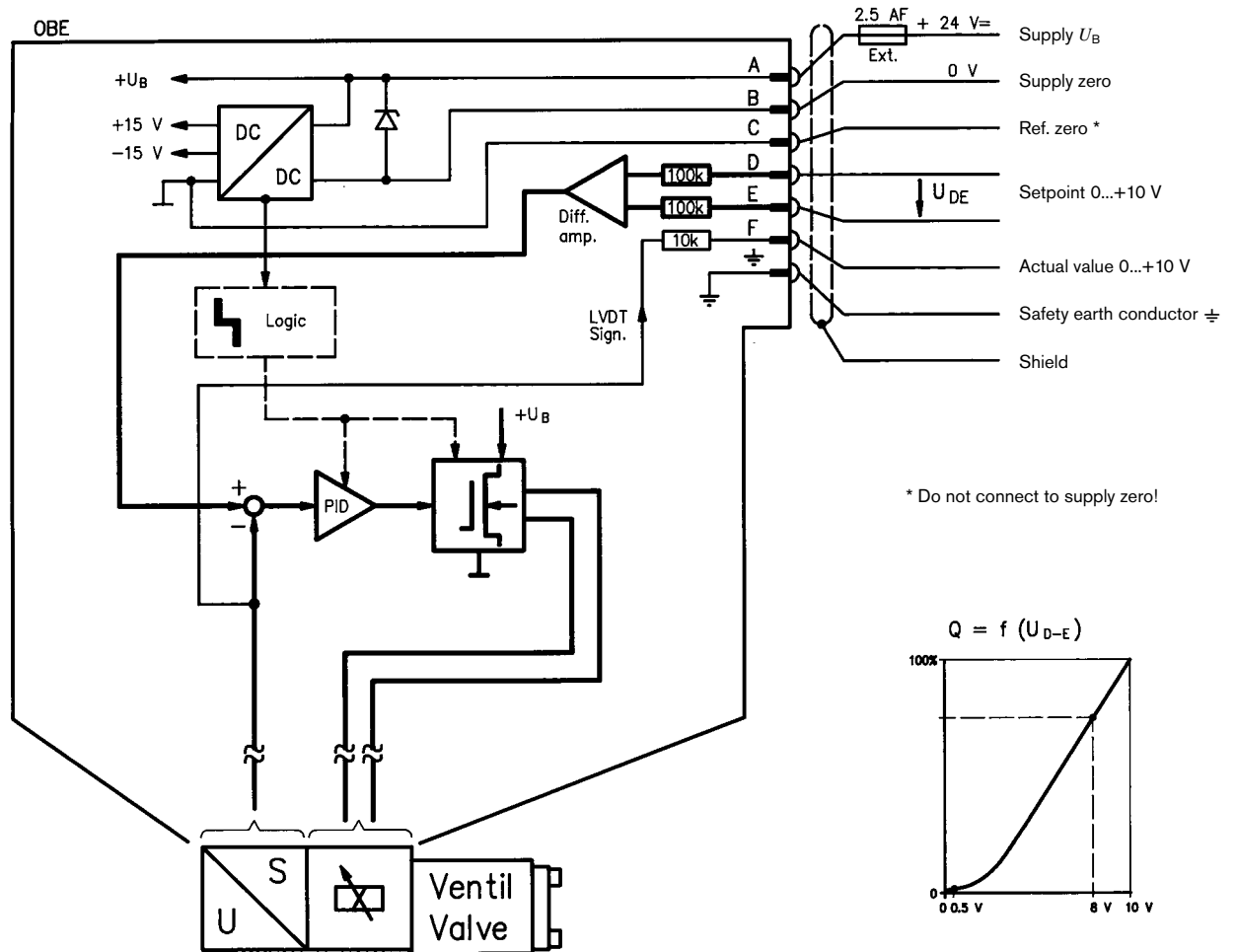
Electrical signals emitted via the trigger electronics (e.g. actual values) must not be used to shut down safety-relevant machine functions!

(Also see European Standard, “Technical Safety Requirements for Fluid-Powered Systems and Components – Hydraulics”, EN 982!)

On-board trigger electronics

Circuit diagram/pin assignment

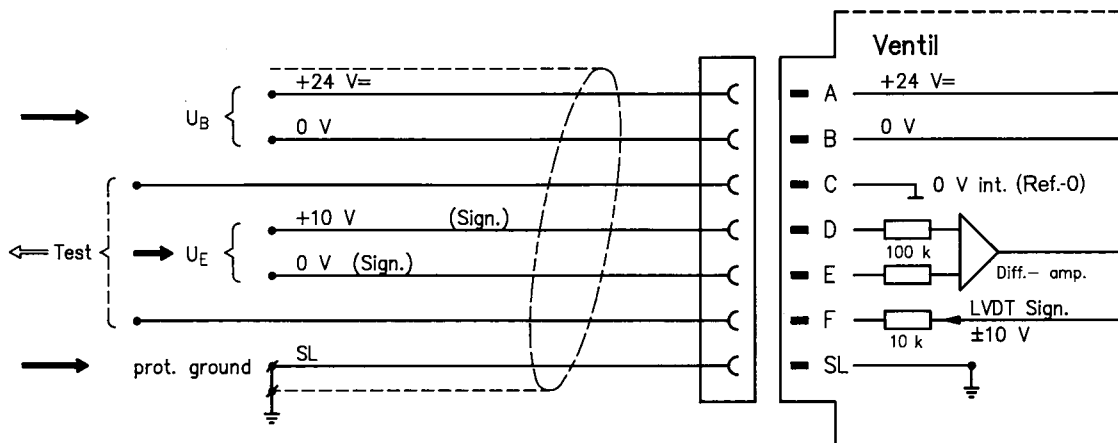
Version A1: $U_{D-E} +0,4...+10\text{ V}$



Pin assignment 6P+PE

Version A1: $U_{D-E} +0,4...+10\text{ V}$

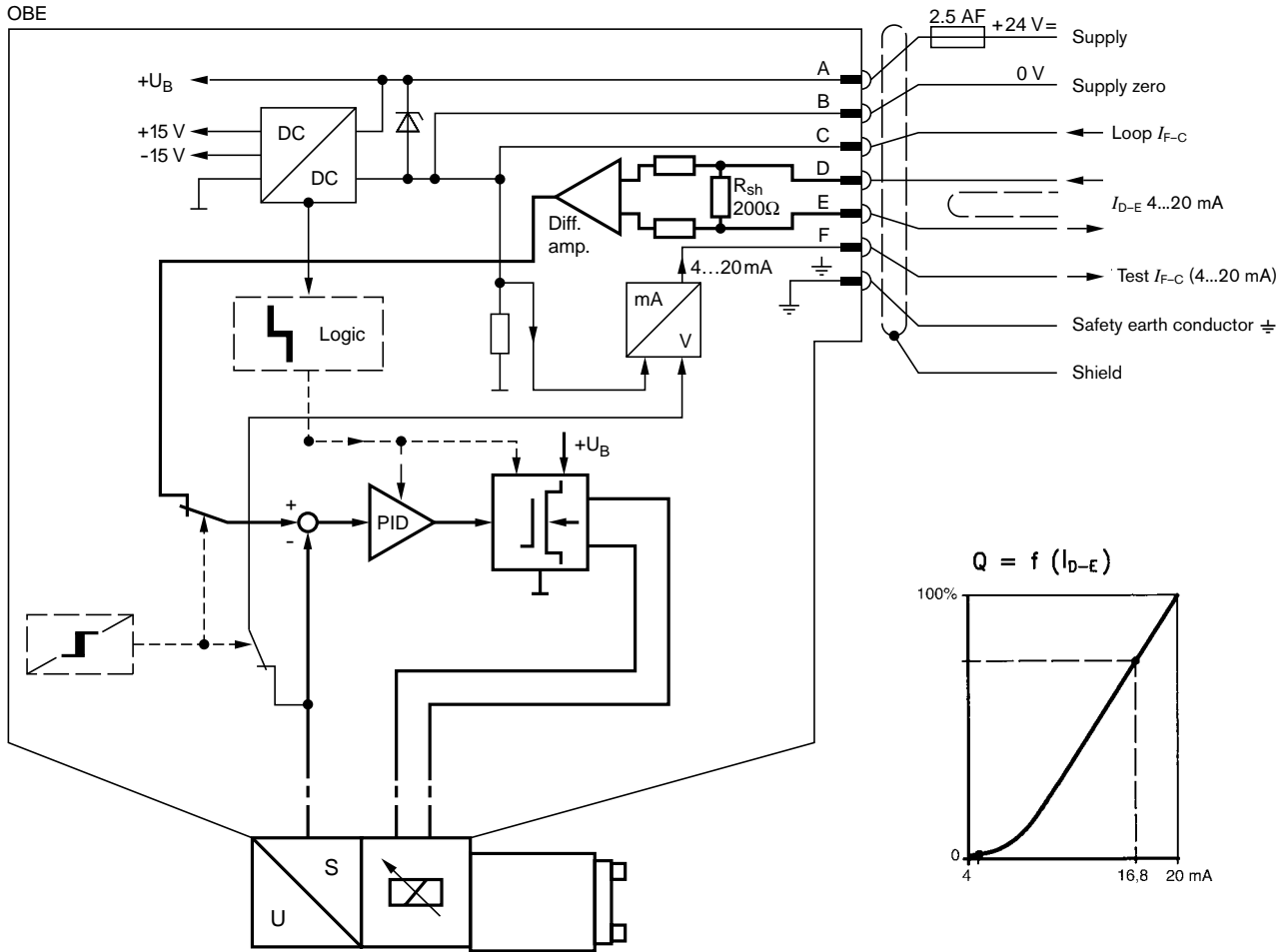
($R_i = 100\text{ k}\Omega$)



On-board trigger electronics

Circuit diagram/pin assignment

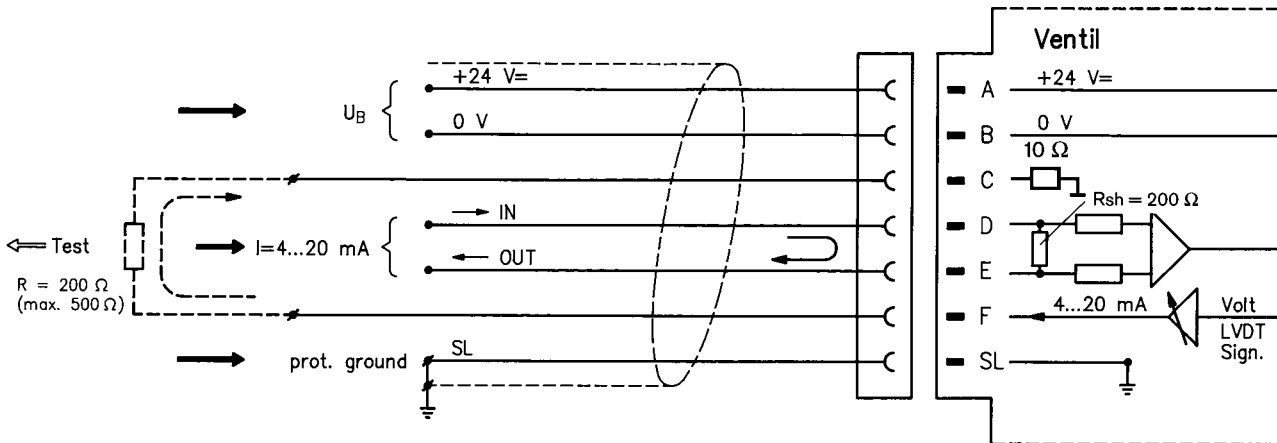
Version F1: I_{D-E} 4...20 mA



Pin assignment 6P+PE

Version F1: I_{D-E} 4...20 mA

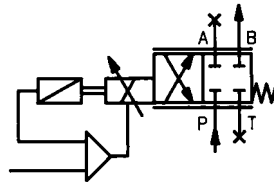
($R_{sh} = 200 \text{ k}\Omega$)



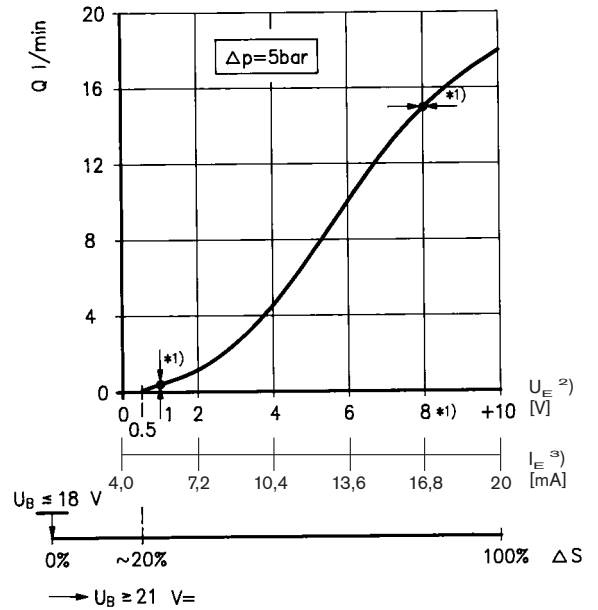
Characteristic curves type 4WRPE 6 EA .. (measured with HLP 46, $\vartheta_{oil} = 40\text{ °C} \pm 5\text{ °C}$)

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

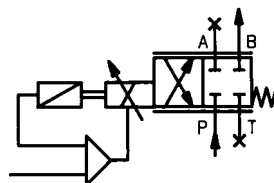
$Q_{nom} = 18\text{ l/min}$



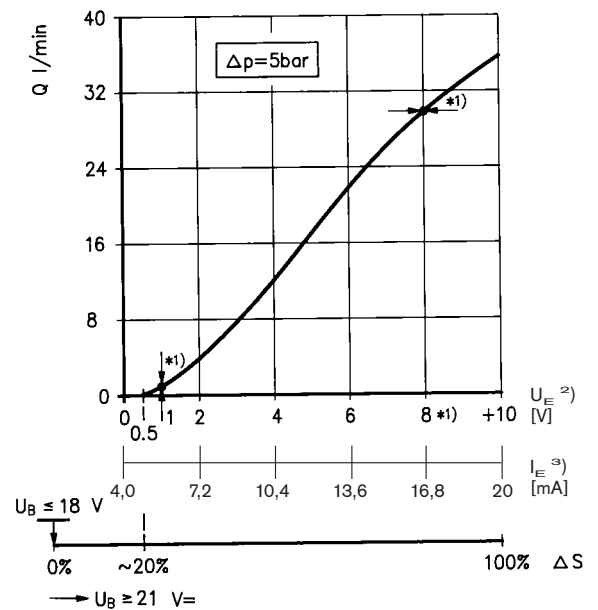
$p_{max} = 315\text{ bar}$



$Q_{nom} = 32\text{ l/min}$



$p_{max} = 315\text{ bar}$



1) Factory setting $\cong \pm 3\%$

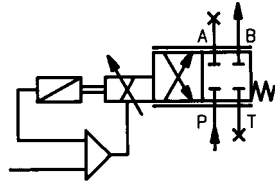
2) Version: $U_E = +0.4 \dots +10\text{ V}$

3) Version: $I_E = 4 \dots 20\text{ mA}$

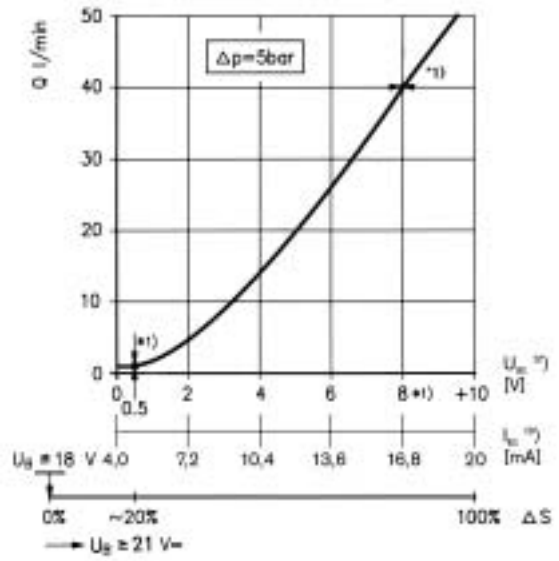
Characteristic curves type 4WRPE 10 EA .. (measured with HLP 46, $\vartheta_{oil} = 40\text{ }^{\circ}\text{C} \pm 5\text{ }^{\circ}\text{C}$)

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

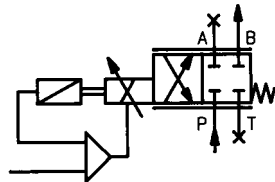
$Q_{nom} = 50\text{ l/min}$



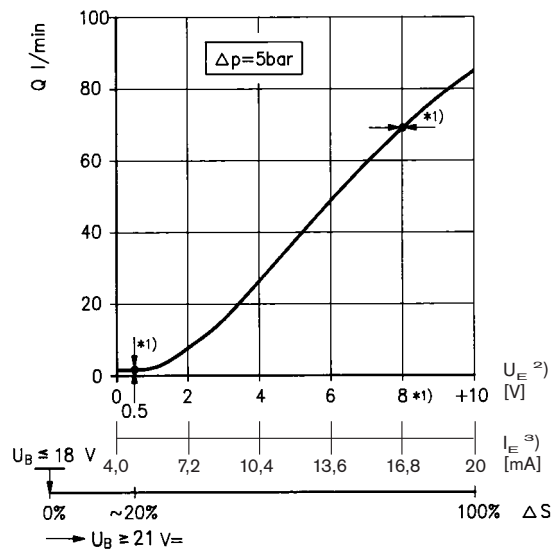
$p_{max} = 315\text{ bar}$



$Q_{nom} = 80\text{ l/min}$



$p_{max} = 315\text{ bar}$

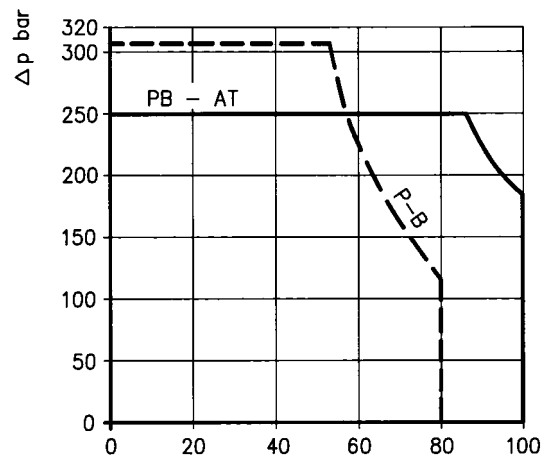


- 1) Factory setting $\cong \pm 3\text{ }%$
- 2) Version: $U_E = +0.4 \dots +10\text{ V}$
- 3) Version: $I_E = 4 \dots 20\text{ mA}$

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

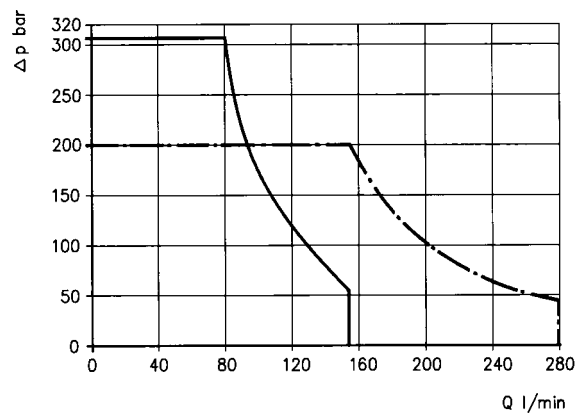
Type 4WRPE 6 EA ..

- - - - single flow
- double flow
- $p_{max} = 250 \text{ bar}$

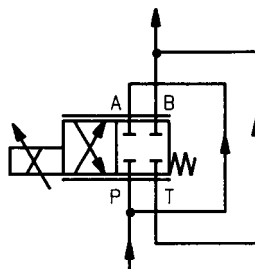


Type 4WRPE 10 EA ..

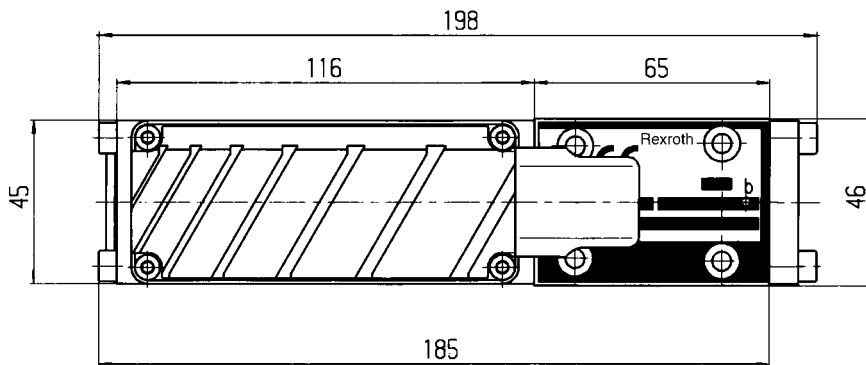
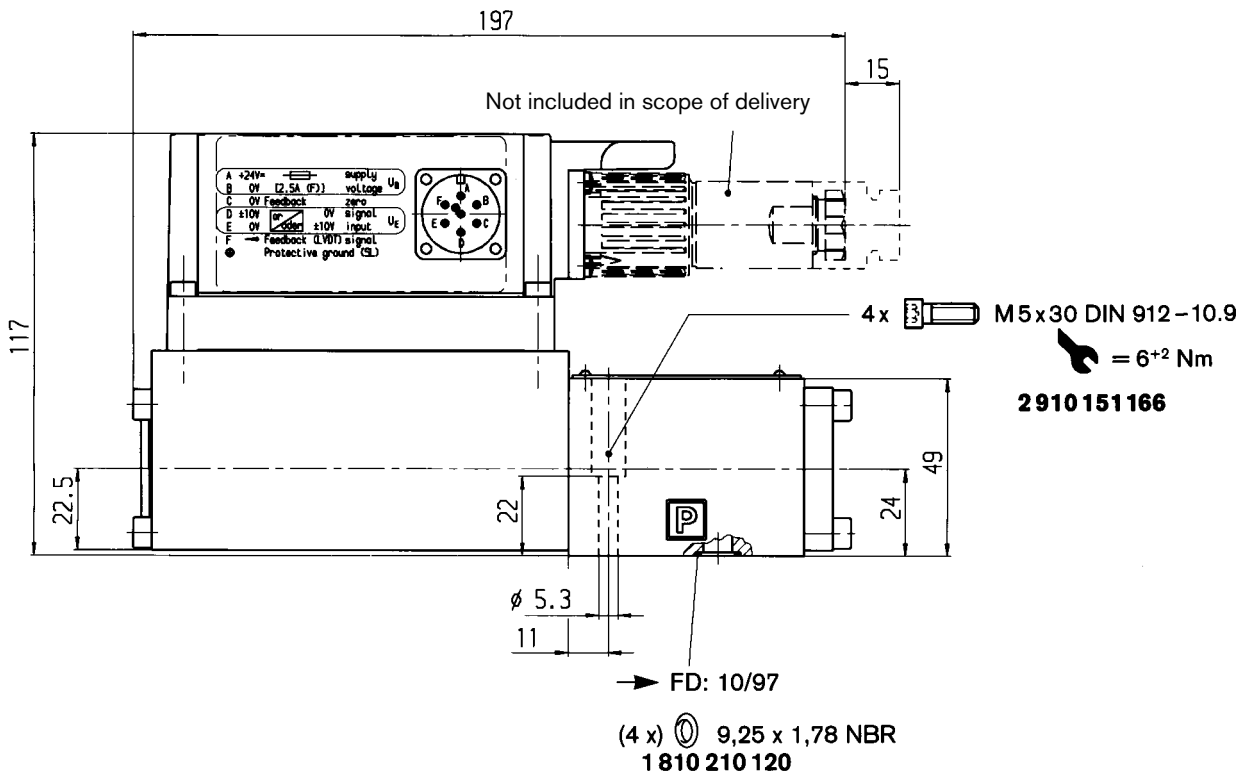
- single flow
- . . . double flow
- $p_{max} = 200 \text{ bar}$



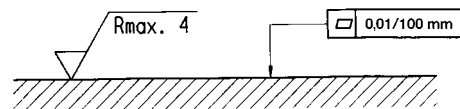
Doubled flow rate



Unit dimensions type 4WRPE 6 EA .. (nominal dimensions in mm)

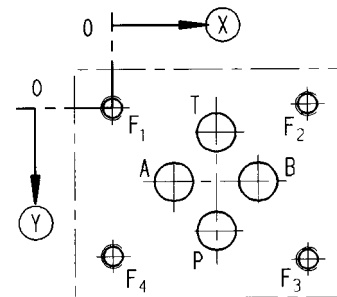


Required surface quality of mating component



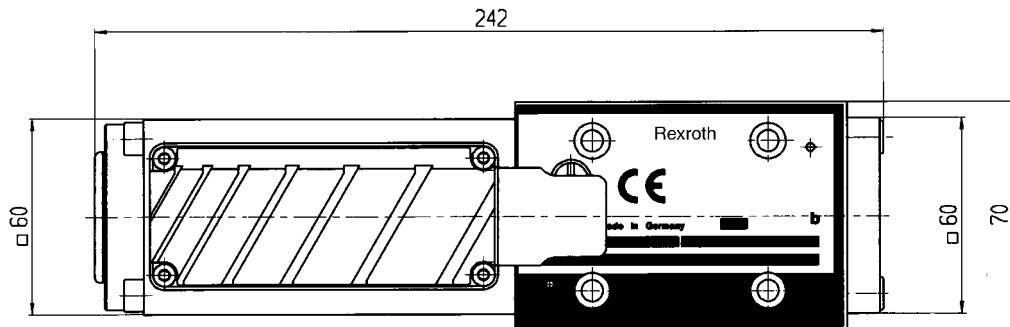
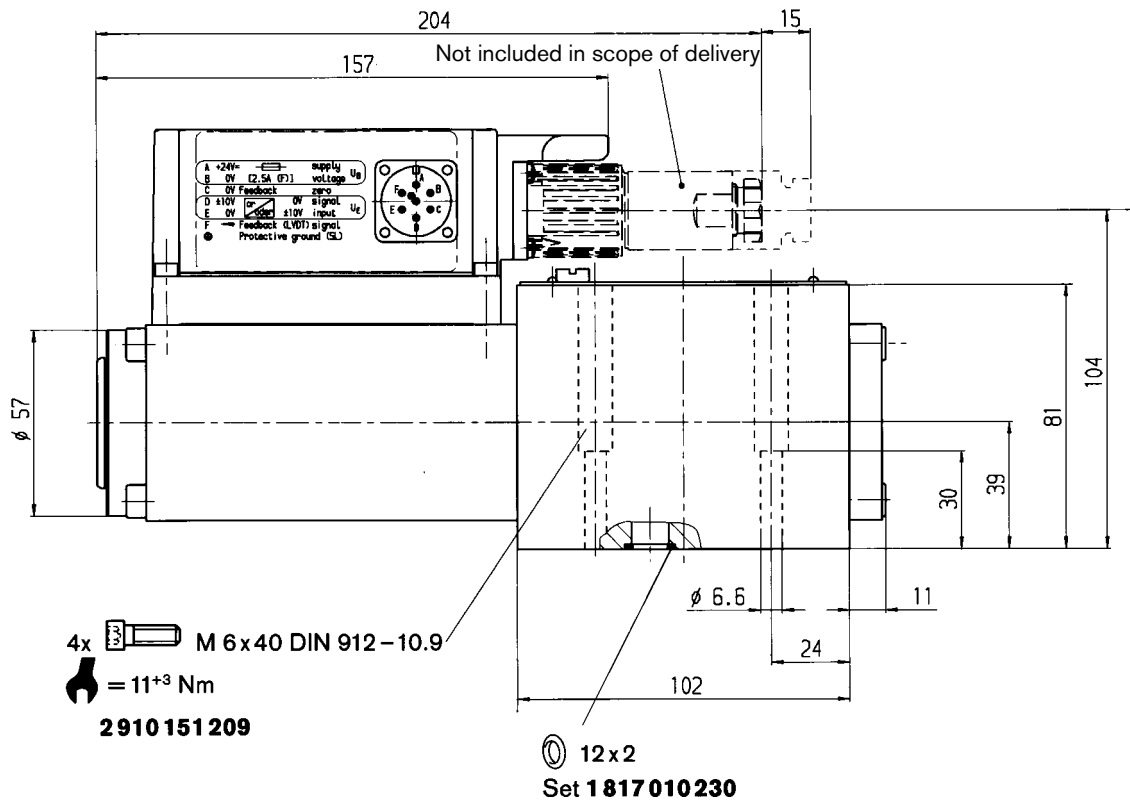
Mounting hole configuration: NG6 (ISO 4401-03-02-0-94)
 For subplates, see catalog section RE 45053

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

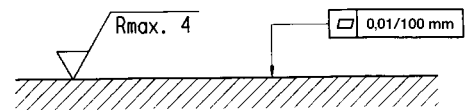


	P	A	T	B	F ₁	F ₂	F ₃	F ₄
⊗	21.5	12.5	21.5	30.2	0	40.5	40.5	0
⊙	25.9	15.5	5.1	15.5	0	-0.75	31.75	31
∅	8 ¹⁾	8 ¹⁾	8 ¹⁾	8 ¹⁾	M5 ²⁾	M5 ²⁾	M5 ²⁾	M5 ²⁾

Unit dimensions type 4WRPE 10 EA .. (nominal dimensions in mm)

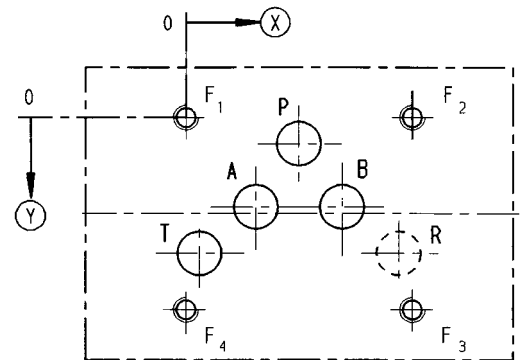


Required surface quality of mating component



Mounting hole configuration: NG10 (ISO 4401-05-04-0-94)
For subplates, see catalog section RE 45055

- 1) Deviates from standard
- 2) Thread depth:
Ferrous metal $1.5 \times \phi^*$
Non-ferrous $2 \times \phi$
- * (NG10 min. 10.5 mm)



	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
