

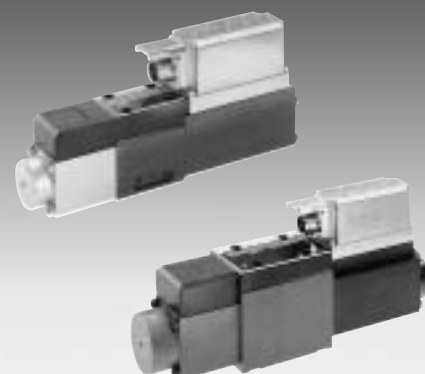
4/3 servo solenoid valves with on-board electronics (OBE), positive overlap and position feedback

RE 29025/01.05
Replaces: 05.04

1/16

Type 4WRPE ..E.. / ..W..

Size 6, 10
 Unit series 2X
 Maximum working pressure of P, A, B 315 bar, T 200 bar
 Nominal flow rate 8...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 or W
- 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.
 - Valve electronics 11P+PE (plug-in connector)

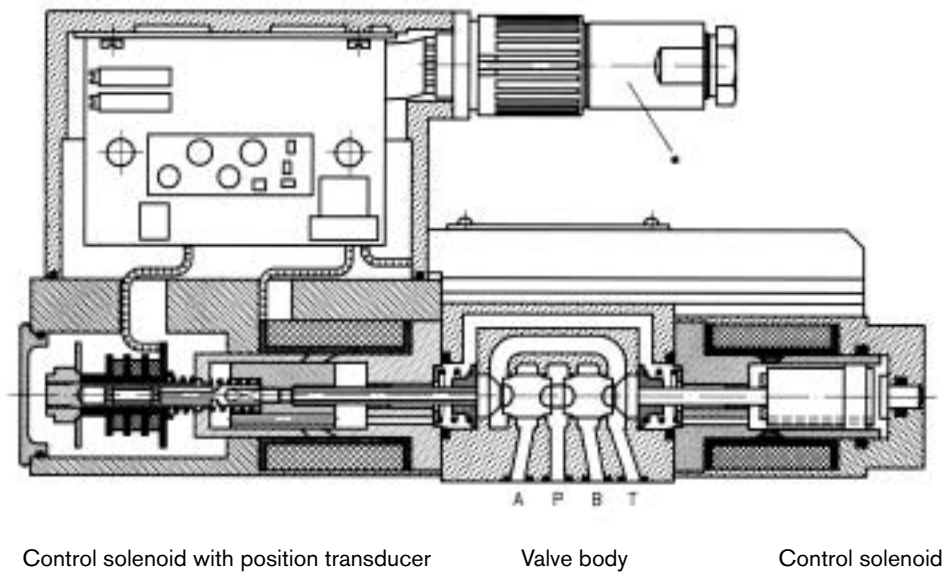
Ordering data and scope of delivery

4WRP		E				S	J	-2X/ G24	K0/		M	*
With on-board trigger electronics		= E										Further information in plain text
Size 6		= 6									M =	NBR seals, suitable for mineral oils (HL, HLP) to DIN 51524
Size 10		= 10										
Symbols												Interface for trigger electronics
4/3 version											A1 =	setpoint input ±10 V
											F1 =	setpoint input 4...12...20 mA ¹⁾
												Electrical connection
										K0 =		without plug-in connector, with unit plug to DIN 43563-AM6 ²⁾
												Order plug-in connector separately
												Voltage supply of trigger electronics
										G24 =		+24 V DC
												Unit series
										2X =		(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

Function, sectional diagram

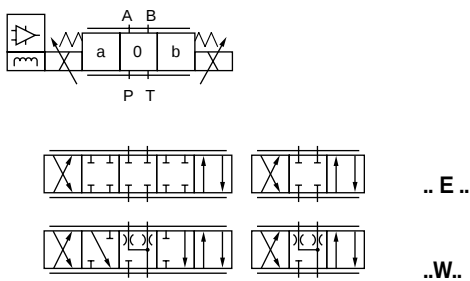
Type 4WRPE 6..

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



Symbols

Position transducer: A-side



Accessories, not included in scope of delivery

(4 x)  M5 x 30 DIN 912-10.9	Fastening bolts		2 910 151 166
	Plug-in connectors 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

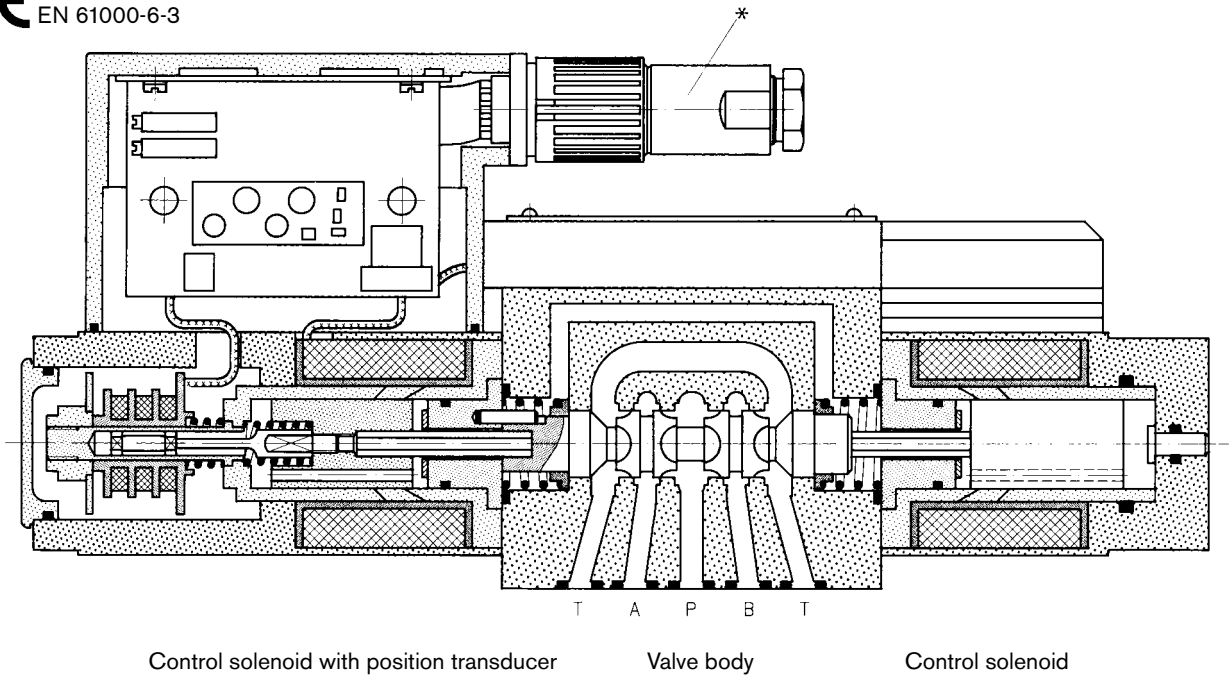
Testing and service equipment

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

Function, sectional diagram

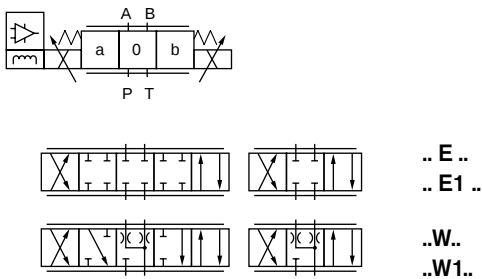
Type 4WRPE 10..

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



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
 *	Plug-in connectors 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

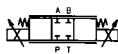
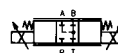
Testing and service equipment

- 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 ..)**General**

Construction	Spool type valve, directly operated, without steel sleeve
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 3.9
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	l/min	8	18	32	
$\Delta p = 5$ bar per notch ²⁾	Q_A at 8 V	5.5 ± 3 %	13 ± 3 %	26 ± 3 %	
Max. working pressure		bar	Port P, A, B: 315		
Max. pressure		bar	Port T: 200		
Operating limits			See chart		
Leakage per metering edge ($\Delta p = 100$ bar)			 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		

Static/Dynamic

Hysteresis	%	≤ 0.3
Range of inversion	%	< 0.2
Manufacturing tolerance	%	≤ ±3
Response time	100 % signal change	ms 20
	10 % signal change	ms 5
Thermal drift	< 1% at $\Delta T = 40\text{ °C}$	
Conformity	 EN 61000-6-2 EN 61000-6-3	

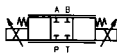
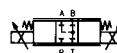
¹⁾ The purity classes stated for the components must be complied with in hydraulic systems.
 Effective filtration prevents problems and also extends the service life of components.
 For a selection of filters, see catalog sections RE 50070, RE 50076 and RE 50081.

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

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

Construction	Spool type valve, directly operated, without steel sleeve	
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	8.3
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	mm²/s	20 ... 100	
	max. permitted	mm²/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	l/min	50	80	
$\Delta p = 5$ bar per notch ²⁾	Q_A at 8 V	40 ± 3 %	70 ± 3 %	
Max. working pressure		bar	Port P, A, B: 315	
Max. pressure		bar	Port T: 200	
Operating limits			See chart	
Leakage per metering edge ($\Delta p = 100$ bar)			 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	

Static/Dynamic

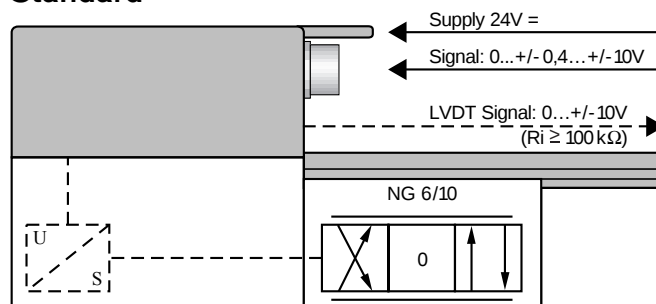
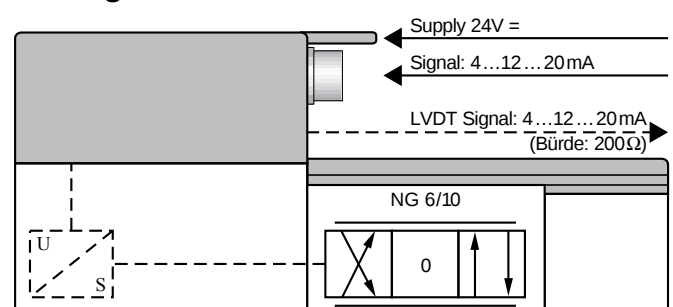
Hysteresis	%	≅ 0.3	
Range of inversion	%	< 0.2	
Manufacturing tolerance	%	≅ ±3	
Response time	100 % signal change	ms	40
	10 % signal change	ms	10
Thermal drift	< 1% at ΔT = 40 °C		
Conformity	CE EN 61000-6-2 EN 61000-6-3		

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

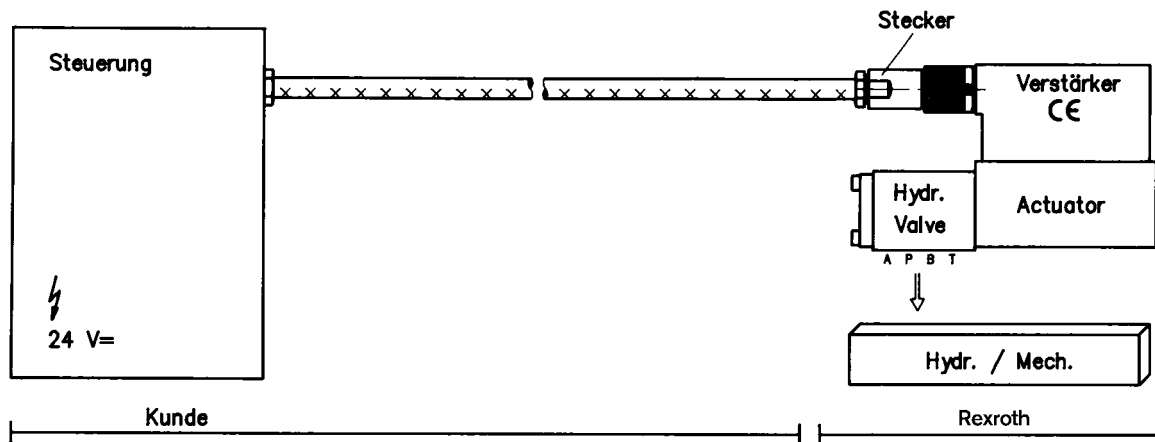
Technical data (type 4WRPE ..E.. / ..W..)**Electrical**, trigger electronics integrated in the valve

Cyclic duration factor	%	100
Degree of protection		IP 65 to DIN 40050 and IEC 14434/5
Connection		Plug-in connector 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 ... ± 0.4 ... $\pm 10 \text{ V}$
Terminal E:		0 V
Input, "mA signal" version	F1	Burden, $R_{sh} = 200 \Omega$
Terminal D: I_{D-E}		4 ... 12 ... 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 ... ± 0.4 ... $\pm 10 \text{ V}$
Terminal C:		Reference 0 V
Test signal, "mA signal" version	F1	LVDT signal 4 ... 12 ... 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.

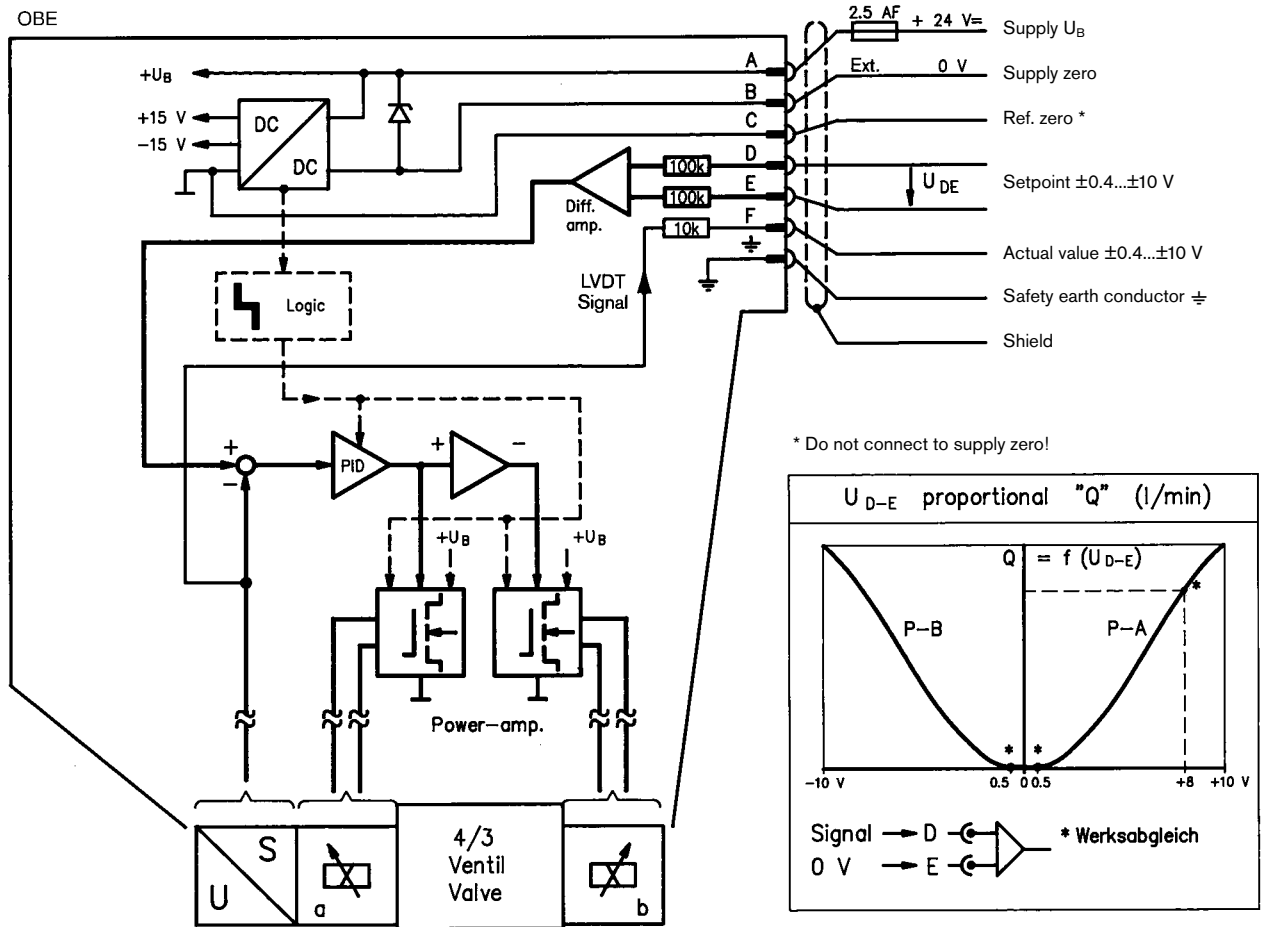
Electrical signals emitted via the trigger electronics
(e.g. actual values) must not be used to shut down safety-
relevant machine functions!

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

On-board trigger electronics

Circuit diagram/pin assignment

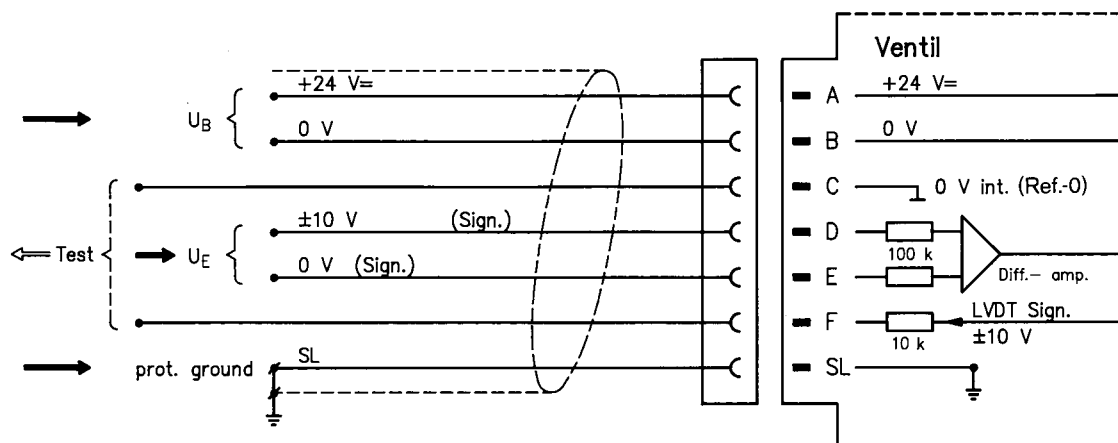
Version A1: U_{D-E} 0... ± 0.4 ... ± 10 V



Pin assignment 6P+PE

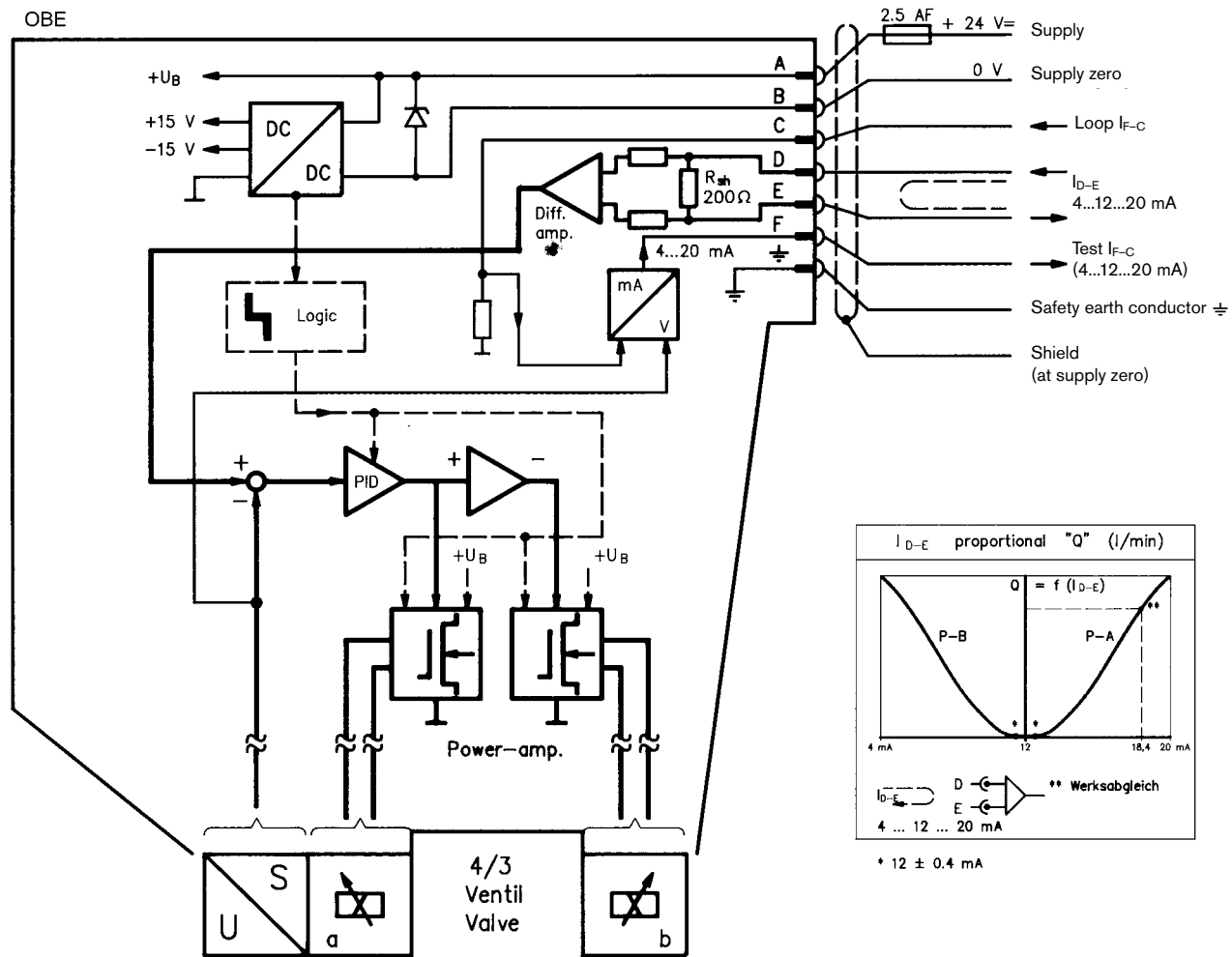
Version A1: U_{D-E} 0... ± 0.4 ... ± 10 V

($R_i = 100$ k Ω)

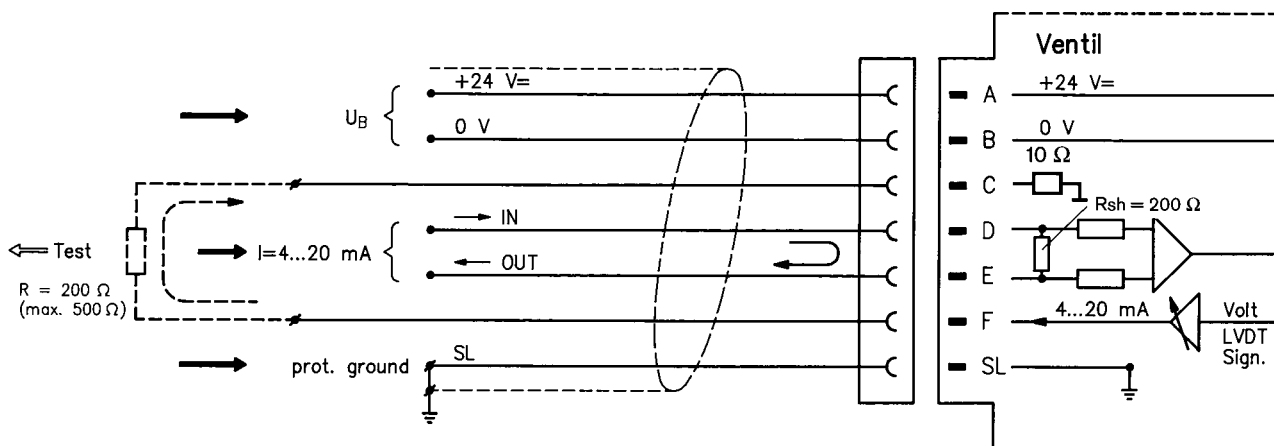


On-board trigger electronics

Circuit diagram/pin assignment

Version F1: I_{D-E} 4...12...20 mA

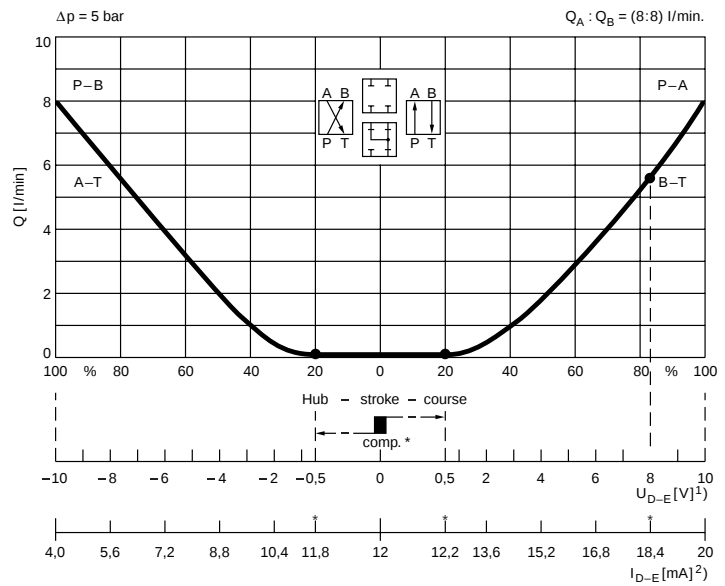
Pin assignment 6P+PE

Version F1: I_{D-E} 4...12...20 mA $(R_{sh} = 200 \text{ k}\Omega)$ 

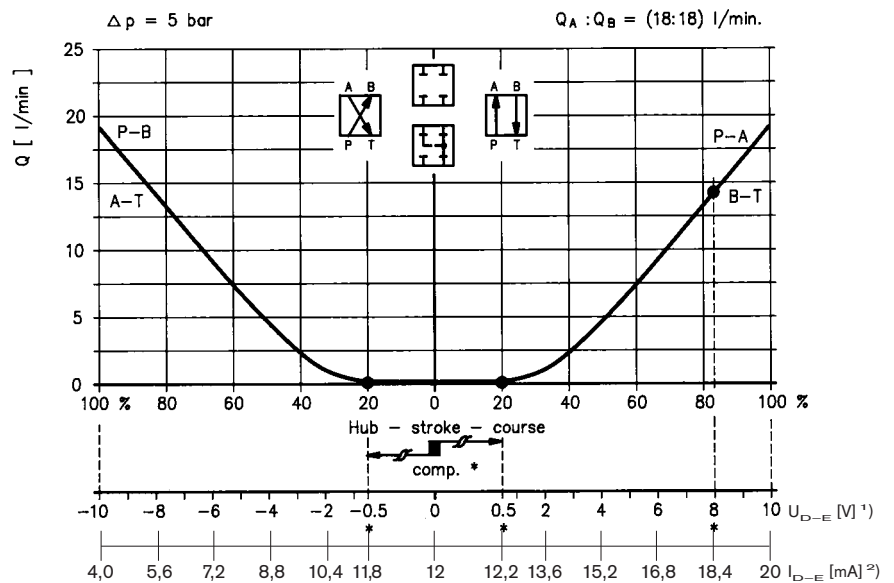
Characteristic curves type 4WRPE 6 .. (measured with HLP 46, $\vartheta_{oil} = 40\text{ °C} \pm 5\text{ °C}$)

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

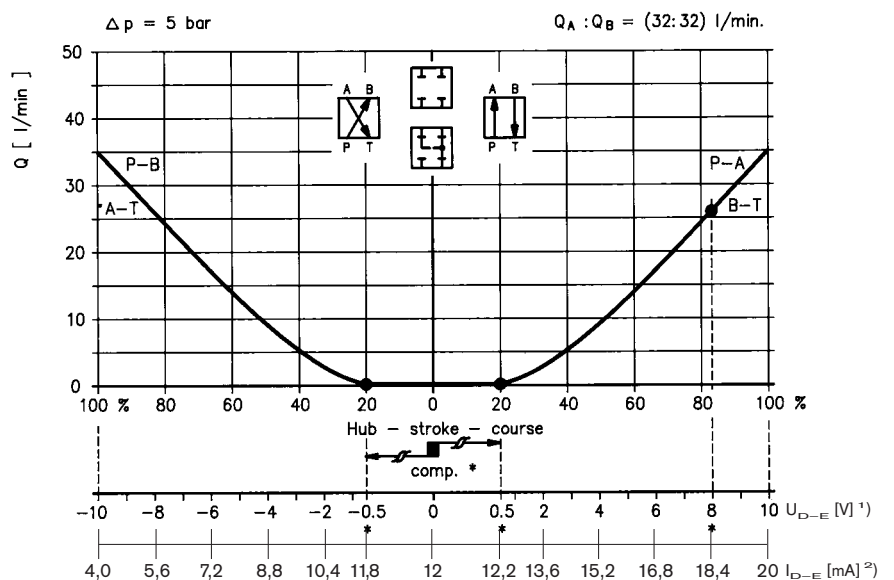
$Q_{nom} = 8\text{ l/min}$



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



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



* Factory setting $\leq \pm 3\%$

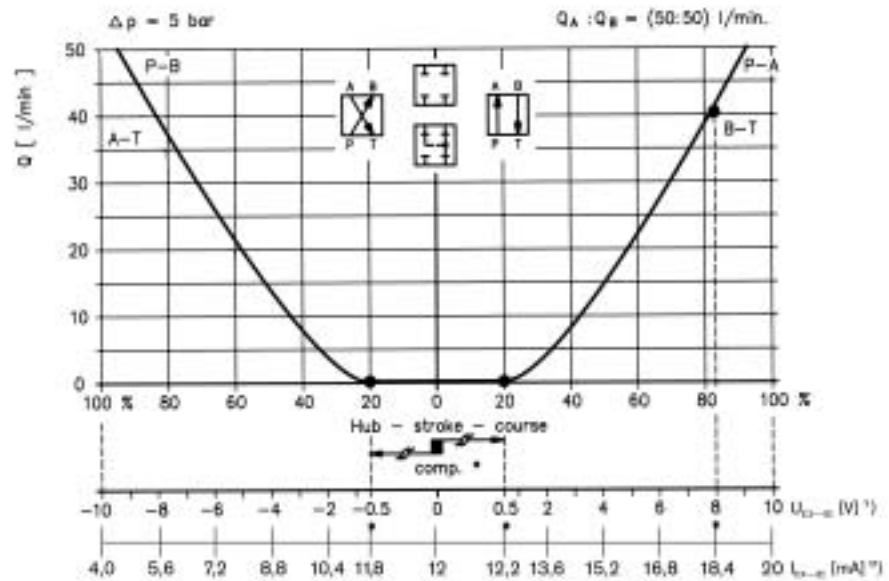
¹⁾ Version: $U_E = \pm 0.4 \dots \pm 10\text{ V}$

²⁾ Version: $I_E = 4 \dots 12 \dots 20\text{ mA}$

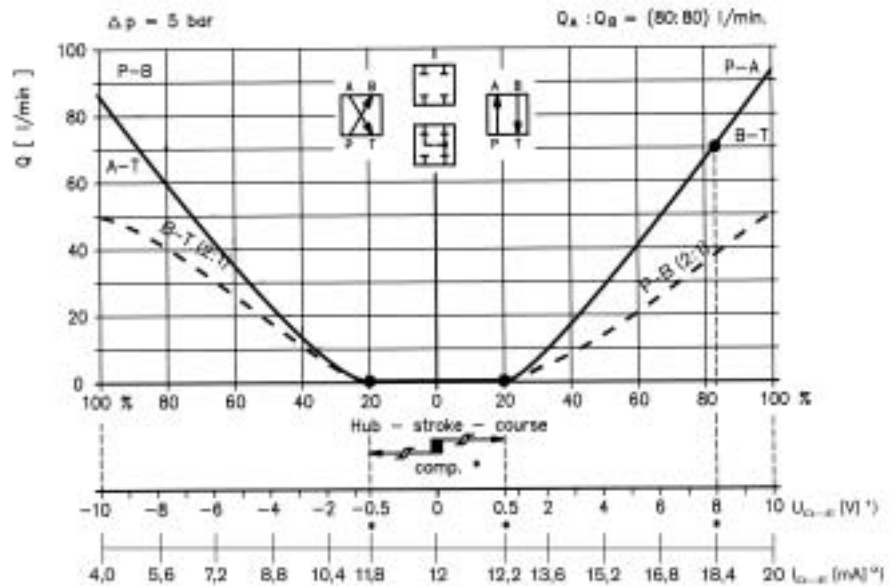
Characteristic curves type 4WRPE 10 .. (measured with HLP 46, $\vartheta_{oil} = 40 \text{ }^{\circ}\text{C} \pm 5 \text{ }^{\circ}\text{C}$)

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

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



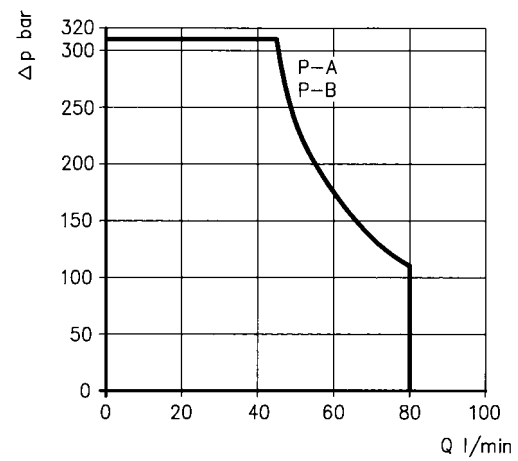
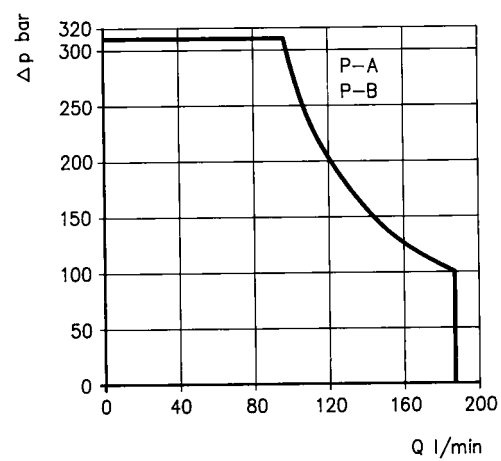
$Q_{nom} = 80 \text{ l/min}$



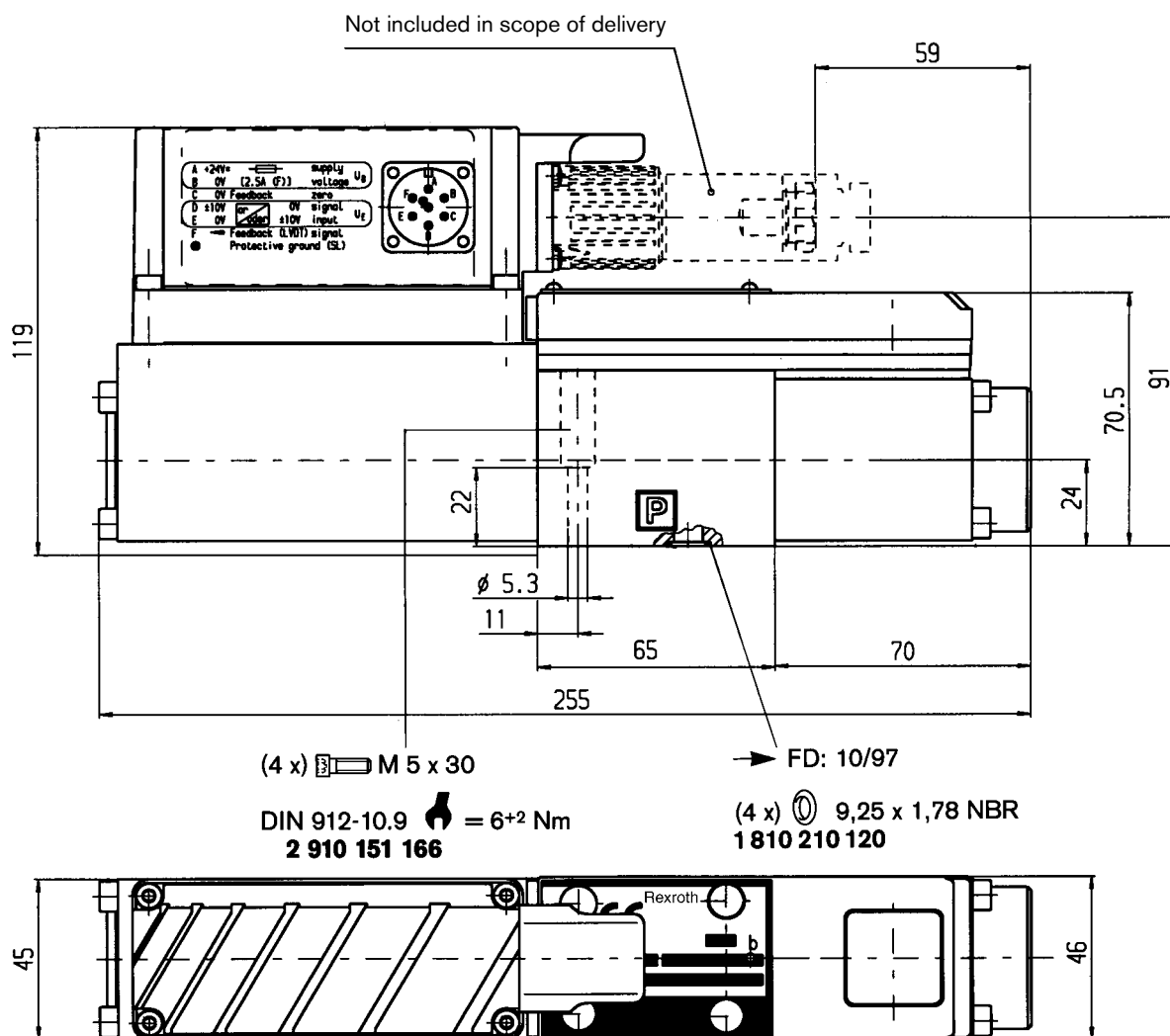
* Factory setting $\leq \pm 3 \%$

¹⁾ Version: $U_E = \pm 0.4 \dots \pm 10 \text{ V}$

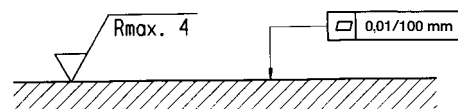
²⁾ Version: $I_E = 4 \dots 12 \dots 20 \text{ mA}$

Operating limits (measured with HLP 46, $\vartheta_{oil} = 40\text{ °C} \pm 5\text{ °C}$)**Type 4WRPE 6 ..****Type 4WRPE 10 ..**

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



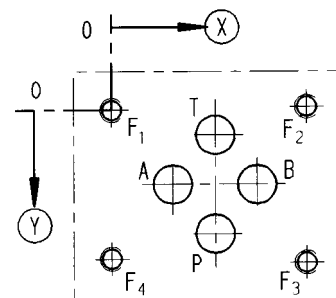
Required surface quality of
mating component



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

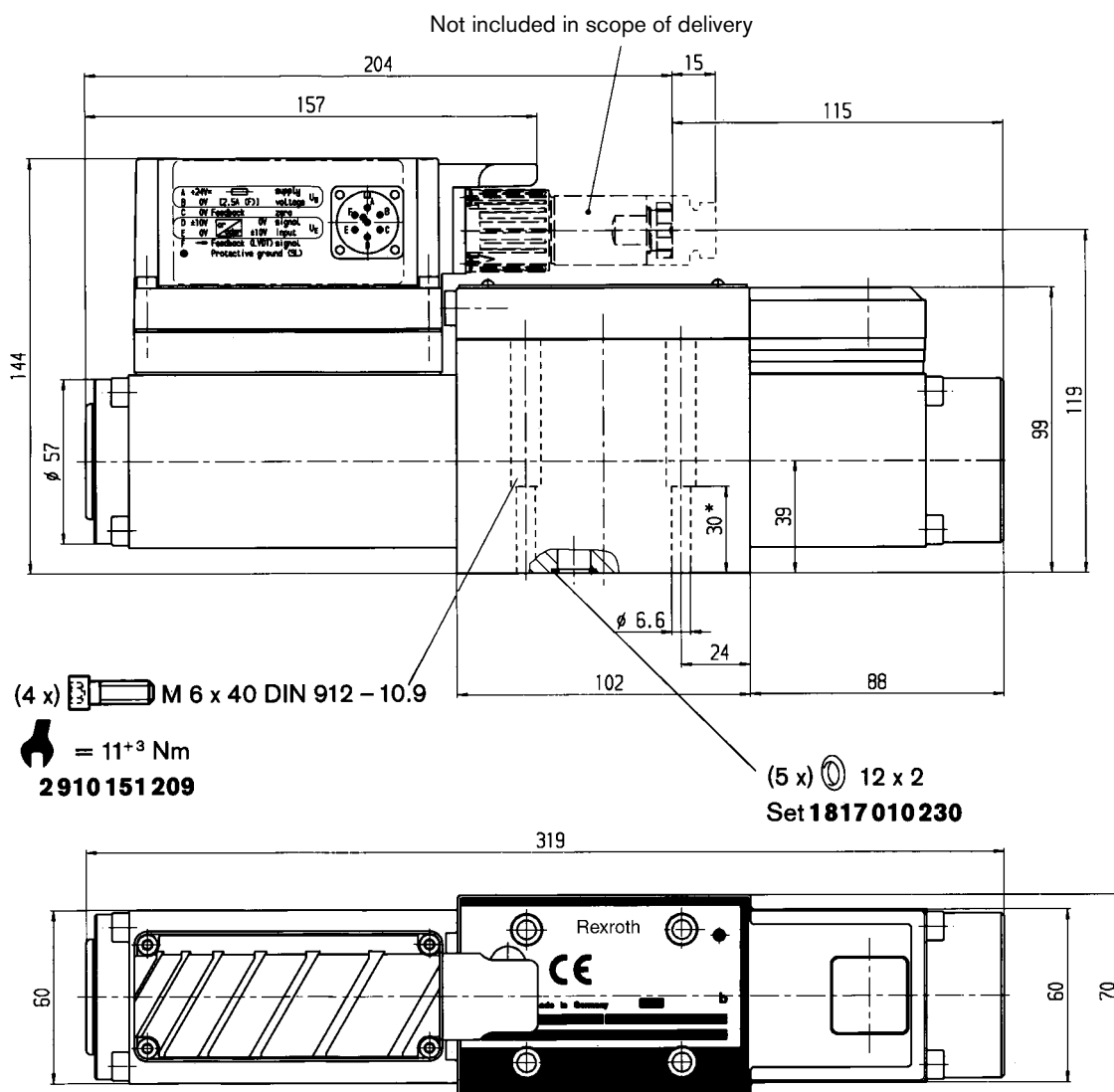
For subplates, see catalog section RE 45053

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

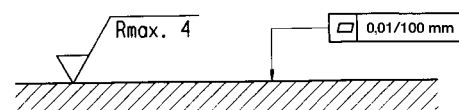


	P	A	T	B	F ₁	F ₂	F ₃	F ₄
⊗	21.5	12.5	21.5	30.2	0	40.5	40.5	0
⊙	25.9	15.5	5.1	15.5	0	-0.75	31.75	31
∅	8 ¹⁾	8 ¹⁾	8 ¹⁾	8 ¹⁾	M5 ²⁾	M5 ²⁾	M5 ²⁾	M5 ²⁾

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

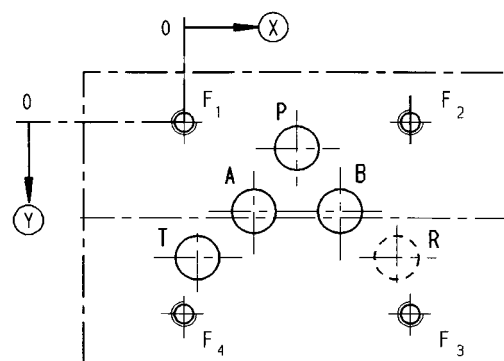


Required surface quality of
mating component



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 $1.5 \times \varnothing^*$
Non-ferrous $2 \times \varnothing$
* (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
