

# Proportional pressure reducing valve, pilot operated, with on-board elec- tronics (OBE) and position feedback

**RE 29195/05.06**  
Replaces: 07.05

1/10

## Type DREBE6X

Nominal size (NG) 6  
Unit series 1X  
Maximum working pressure P 315 bar, T 250 bar  
Maximum flow rate 40 l/min



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## Features

- Pilot operated valves with position feedback and on-board electronics for reducing system pressure in the consumer (pilot oil internal only)
- 3-way version (P–A/A–T),  $p_{\min} = p_T$
- Adjustable through the position of the armature against the compression spring
- Position-controlled, minimal hysteresis < 1 %, rapid response times, see Technical data
- Pressure limitation to a safe level even with faulty electronics (solenoid current  $I > I_{\max}$ )
- For subplate attachment, mounting hole configuration to ISO 4401-03-02-0-05. Subplates as per catalog sheet RE 45053 (order separately)
- Plug-in connector to DIN 43563-AM6, see catalog sheet RE 08008 (order separately)
- Data for the on-board trigger electronics
  - Complies with CE, EMC directives EN 61000-6-2: 2002-08 and EN 61000-6-3: 2002-08
  - $U_B = 24 V_{\text{nom}}$  DC
  - Electrical connection 6P+PE
  - Signal actuation
    - Standard 0...+ 10 V (A1)
    - Version 4...20 mA (F1)
  - Valve curve calibrated at the factory

Ordering data

DREB

E

6

X-1X/

M

G24

K31

M

\*

Proportional 3-way pressure reducing valve with inductive position transducer, pilot operated

With on-board electronics = E

Nominal size = 6

Mounting hole configuration to ISO 4401-03-02-0-05 = X

Unit series 10 to 19 (10 to 19: installation and connection dimensions unchanged) = 1X

Max. pressure stage

up to 75 bar = 75

up to 175 bar = 175

up to 310 bar = 310

Without non-return valve = M

Voltage supply of trigger electronics 24 V DC = G24

Further information in plain text

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

Interface for trigger electronics

A1 = Setpoint input 0...+10 V

F1 = Setpoint input 4...20 mA

K31 =

Electrical connection without plug-in connector, with unit plug to DIN 43563-AM6

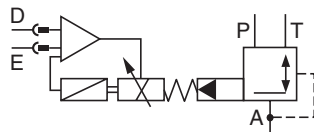
Order plug-in connector separately

Preferred types

Type....A1 (0...+10 V)	Material Number	Type....F1 (4...20 mA)	Material Number
DREBE6X-1X/75MG24K31A1M	0 811 402 082	DREBE6X-1X/175MG24K31F1M	0 811 402 083
DREBE6X-1X/175MG24K31A1M	0 811 402 080	DREBE6X-1X/310MG24K31F1M	0 811 402 085
DREBE6X-1X/310MG24K31A1M	0 811 402 081		

Symbol

For on-board electronics



## Function, sectional diagram

### General

Type DREBE6X proportional pressure reducing valves are pilot operated with a 3-way main stage.

The pilot valve (pressure relief valve pilot stage) is supplied internally with a controlled flow of pilot oil via P.

The valves are actuated by means of a position-controlled proportional solenoid with on-board electronics.

With these valves, the pressure in A (consumer) can be infinitely adjusted and reduced in relation to the setpoint.

**CE** EN 61000-6-2: 2002-08  
EN 61000-6-3: 2002-08

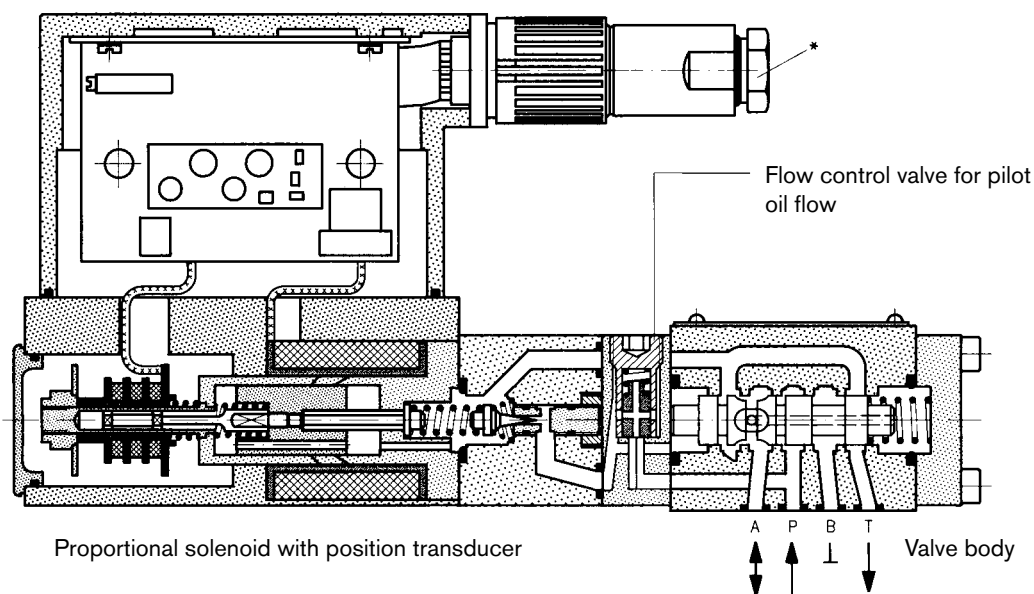
### Basic principle

To adjust the system pressure in A, a setpoint is set in the trigger electronics. Based on this setpoint, the electronics control the position of the solenoid against the spring force. The proportional solenoid is positioned precisely on the spring characteristic curve. The pilot stage is supplied with oil from P at a flow rate of  $< 0.6 \text{ l/min}$  via a flow control valve. The pilot pressure is compared with the consumer pressure (plus spring) in A and regulated.



The spring results in  $p_{Amin} = p$  in T.

#### Pressure limitation for maximum safety

If a fault occurs in the electronics, so that the solenoid current ( $I_{max}$ ) would exceed its specified level in an uncontrolled manner, the pressure cannot rise above the level determined by the maximum spring force.



### Accessories

Type	Material Number	
(4 x)  ISO 4762-M5x30-10.9	Cheese-head bolts	2 910 151 166
* 	Plug-in connectors 6P+PE, see also RE 08008	KS
		KS
		MS
		MS
		KS 90°
		1 834 482 022
		1 834 482 026
		1 834 482 023
		1 834 482 024
		1 834 484 252

### Testing and service equipment

Test box type VT-PE-TB3, see RE 30065

Measuring adapter 6P+PE type VT-PA-2, see RE 30068


## Technical data

General		
Construction	Pilot stage	Poppet valve
	Main stage	Spool valve
Actuation	Proportional solenoid with position control and OBE	
Connection type	Subplate, mounting hole configuration NG6 (ISO 4401-03-02-0-05)	
Mounting position	Optional	
Ambient temperature range	°C	−20...+50
Weight	kg	3.3
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 <sup>2</sup> /s	20...100		
	max. permitted mm <sup>2</sup> /s	10...800		
Pressure fluid temperature range	°C	−20...+70		
Maximum permitted degree of contamination of pressure fluid Purity class to ISO 4406 (c)	Class 18/16/13 <sup>1)</sup>			
Direction of flow	See symbol			
Max. set pressure in A (at $Q_{\min} = 1$ l/min)	bar	75	175	310
Minimum pressure in A	bar	0 (relative) or pressure in T		
Min. inlet pressure in P	bar	$p_P = p_A + \geq 5$		
Max. working pressure	bar	Port P: 315		
Max. pressure	bar	Port T: 250 (B sealed)		
Internal pilot oil flow	l/min	approx. 0.6 (with closed-loop control)		
Max. flow	l/min	40		

## Static/Dynamic

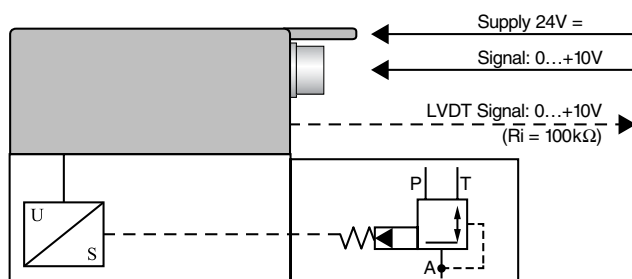
Hysteresis	%	≤ 1 of max. set pressure	
Manufacturing tolerance	%	≤ ±5 of max. set pressure	
Response time	100 % signal change	ms	50
	10 % signal change	ms	20
Thermal drift	<1% at ΔT = 40 °C		
Conformity	 EN 61000-6-2: 2002-08 EN 61000-6-3: 2002-08		

<sup>1)</sup> 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 sheets RE 50070, RE 50076 and RE 50081.

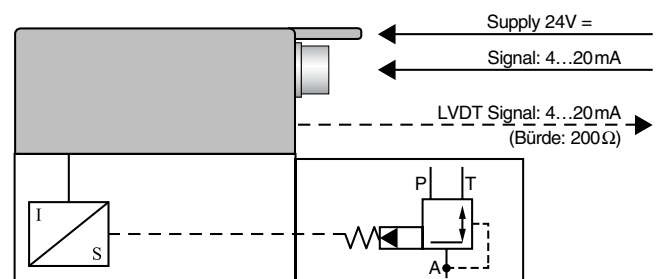
## Technical data

<b>Electrical</b> , trigger electronics integrated in 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
Supply voltage		24 V DC <sub>nom</sub>
Terminal A:		Min. 21 V DC/max. 40 V DC
Terminal B: 0 V		Ripple max. 2 V DC
Power consumption		Solenoid $\square$ 45 mm = 40 VA max.
External fuse		2.5 A <sub>F</sub>
Input, "standard" version	A1	Differential amplifier, $R_i = 100 \text{ k}\Omega$
Terminal D: $U_E$		0...+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. voltage to differential inputs over 0 V		$D \rightarrow B \left. \vphantom{\begin{matrix} D \rightarrow B \\ E \rightarrow B \end{matrix}} \right\} \text{max. } 18 \text{ V DC}$ $E \rightarrow B \left. \vphantom{\begin{matrix} D \rightarrow B \\ E \rightarrow B \end{matrix}} \right\}$
Test signal, "standard" version	A1	LVDT
Terminal F: $U_{\text{Test}}$		0...+10 V
Terminal C:		Reference 0 V
Test signal, "mA signal" version	F1	LVDT signal 4...20 mA at external load 200...500 $\Omega$ 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 in conformity with CE)
Recommended cable		See pin assignment up to 20 m 7 x 0.75 mm <sup>2</sup> up to 40 m 7 x 1 mm <sup>2</sup>
Calibration		Calibrated at the factory, see valve curve

### Version A1: Standard

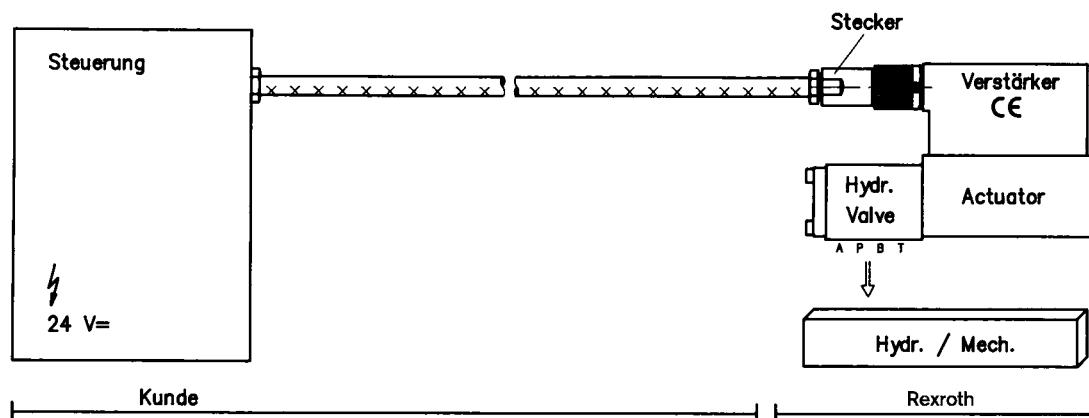


### Version F1: mA signal



## Connection

For electrical data, see page 5 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
- Type:**
- e.g. Ölflex-FD 855 CP (from Lappkabel company)
- No. of wires:**
- Determined by type of valve, plug type and signal assignment
- Cable Ø:**
- 0.75 mm<sup>2</sup> up to 20 m long
  - 1.0 mm<sup>2</sup> up to 40 m long
- Outside Ø:**
- 9.4...11.8 mm – Pg 11
  - 12.7...13.5 mm – Pg 16

### 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.

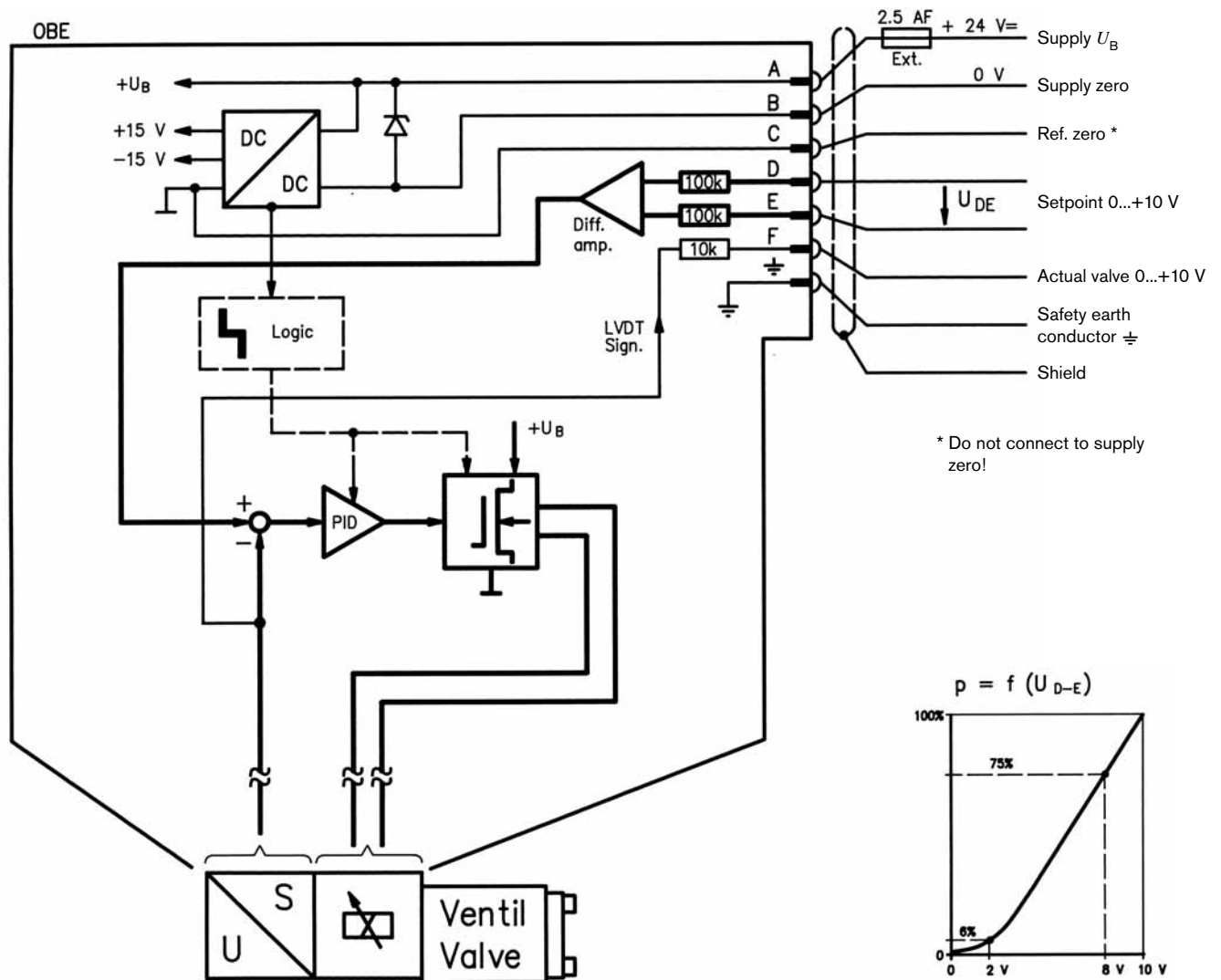
Electrical signals emitted via the trigger electronics (e.g. actual values) must not be used to shut down safety-relevant machine functions!

(See also European Standard, “Technical Safety Requirements for Fluid-Powered Systems and Components – Hydraulics”, EN 982.)

## On-board trigger electronics

### Circuit diagram/pin assignment

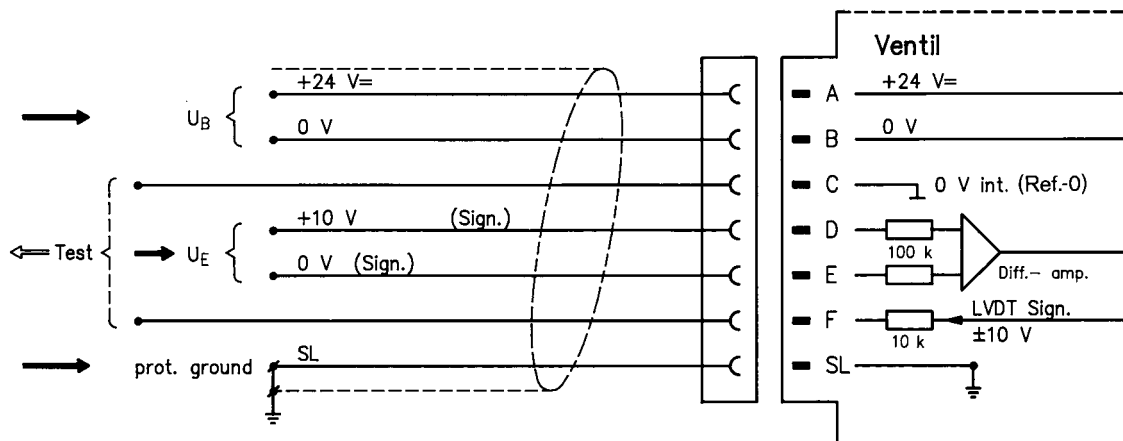
Version A1:  $U_{D-E}$  0...+10 V



### Pin assignment

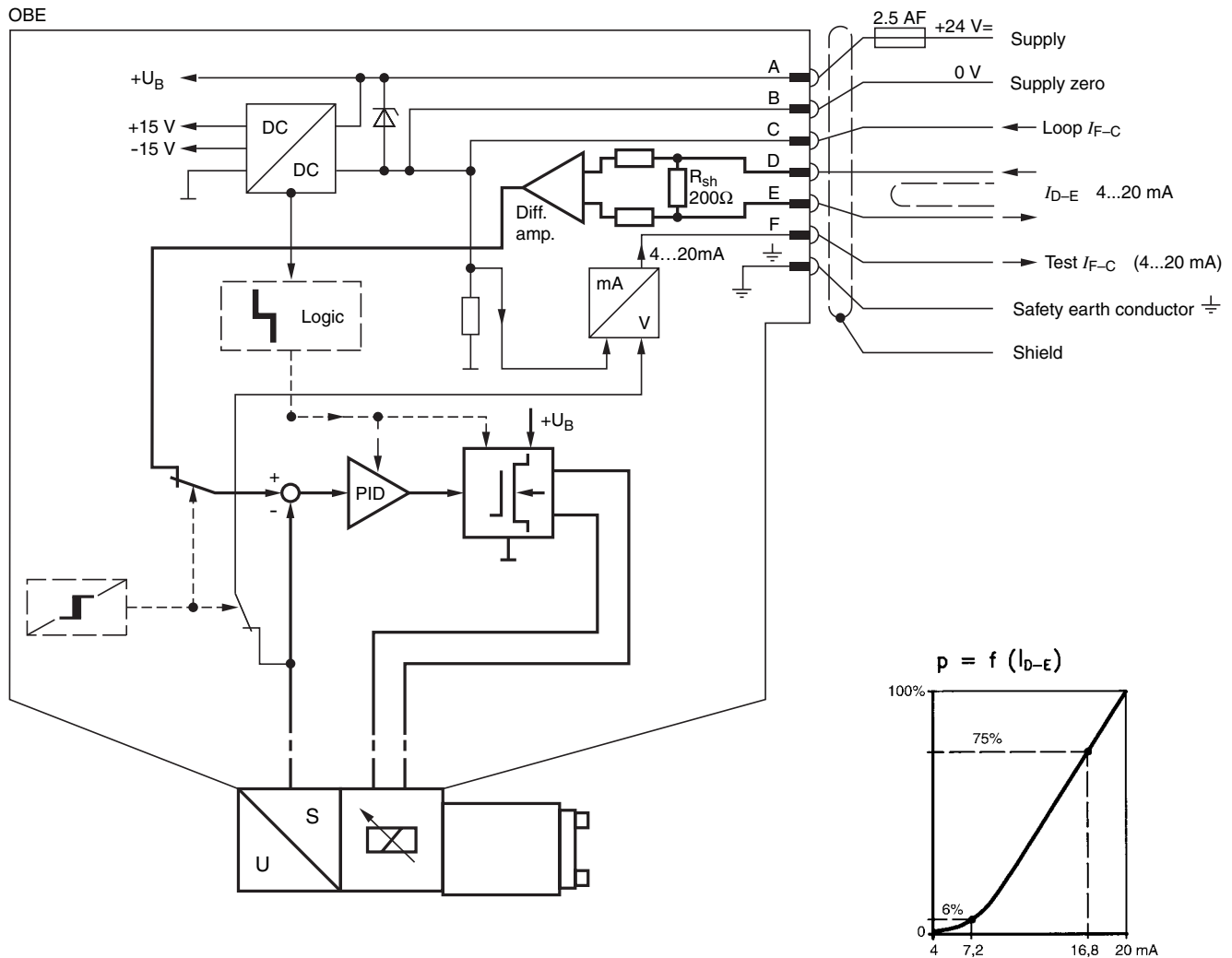
Version A1:  $U_{D-E}$  0...+10 V

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

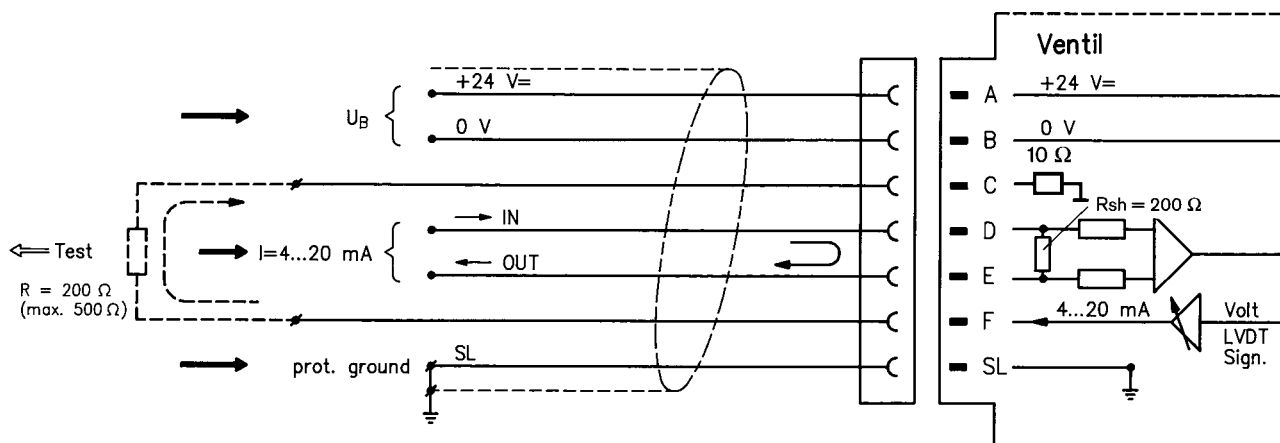


## On-board trigger electronics

### Circuit diagram/pin assignment

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

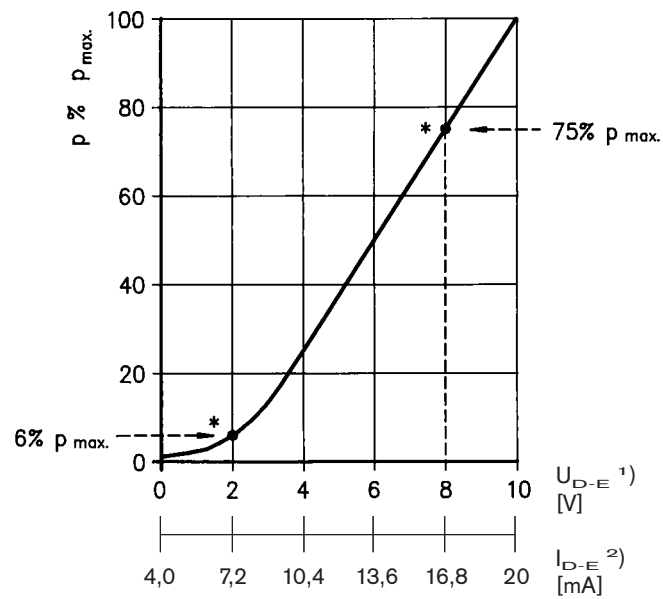
### Pin assignment 6P+PE

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



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

Pressure in port A as a function of the setpoint

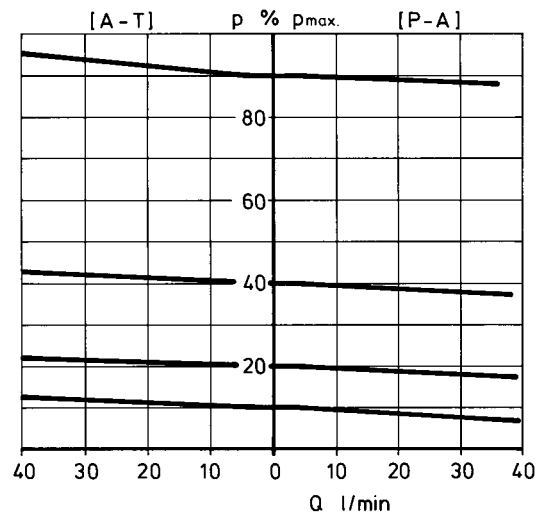


\* Factory setting at  $Q = 1$  l/min  
+5 % manufacturing tolerance  
(of max. set pressure)

1) Version:  $U_{D-E} = 0 \dots +10$  V

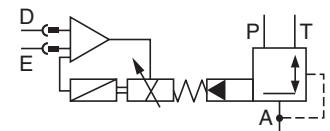
2) Version:  $I_{D-E} = 4 \dots 20$  mA

Pressure in port A proportionate to the maximum flow rate of the main stage

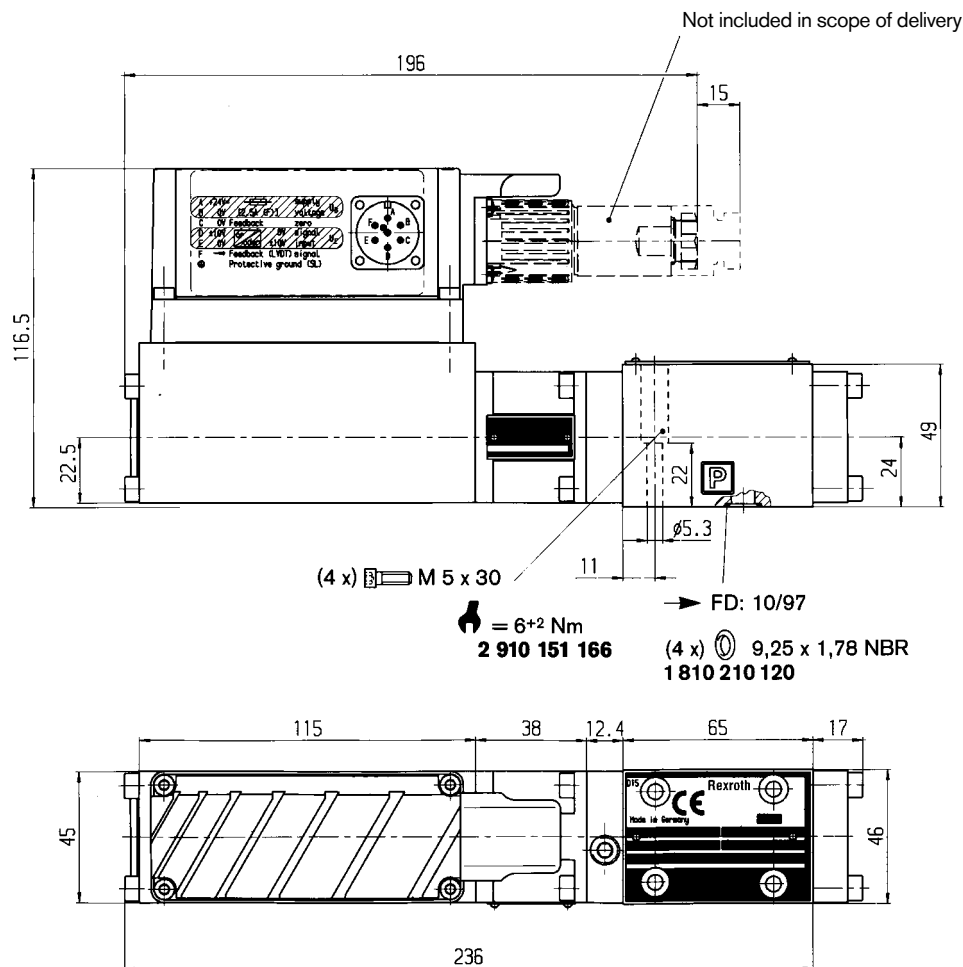


Set pressure

$$p \% p_{max} = f(Q_{P-A}/Q_{A-T})$$



## Unit dimensions (nominal dimensions in mm)



### Mounting hole configuration: NG6

(ISO 4401-03-02-0-05)

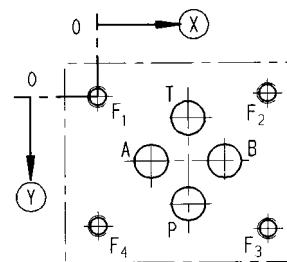
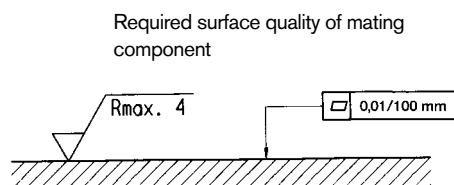
For subplates, see catalog sheet RE 45053

<sup>1)</sup> Deviates from standard

<sup>2)</sup> Thread depth:

Ferrous metal 1.5 x Ø

Non-ferrous 2 x Ø



	P	A	T	B	F <sub>1</sub>	F <sub>2</sub>	F <sub>3</sub>	F <sub>4</sub>
⊗	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 <sup>1)</sup>	8 <sup>1)</sup>	8 <sup>1)</sup>	8 <sup>1)</sup>	M5 <sup>2)</sup>	M5 <sup>2)</sup>	M5 <sup>2)</sup>	M5 <sup>2)</sup>

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## Notes

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