

Hydrostatic Pump Repair

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Rexroth
Bosch Group

4/3 directional control valve,
directly controlled, with electrical
position feedback and integrated
electronics (OBE)

Type 4WRREH 6

Size 6

Component series 1X

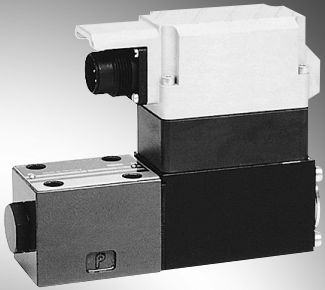
Maximum operating pressure P, A, B 315 bar, T 100 bar

Rated flow 4...40 l/min (Δp 70 bar)

RE 29041/03.10

1/12

Replaces: 01.05



Type 4WRREH 6

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Features

- Directly operated high-response 4/3 directional control valve with control spool and sleeve in servo quality
- Double stroke solenoid with electrical position feedback and integrated electronics (OBE), calibrated in the factory
- Prepared pilot valve, among others for 3/2 control cartridge with position transducer, position-controlled
- Electrical connection 11P-PE
signal input of differential amplifier with interface B5 ± 10 V
- Use for electrohydraulic controls in production and test systems

Information on available spare parts:
www.boschrexroth.com/spc

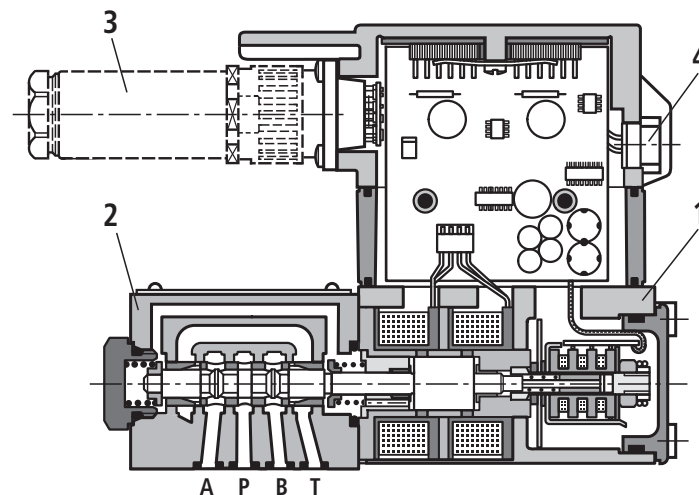
2) Inflection 60 % with rated flow "15" and "25", otherwise 40 %

Function, section

General

In the integrated electronics, the specified command value is compared with the actual position value. In case of control deviations, the double-stroke solenoid is activated which adjusts the control spool by means of changed solenoid force.

Stroke/control cross-section is controlled proportionally to the command value. In case of a command value specification of 0 V the electronics controls the control spool in center position. In switched-off state, the valve is undefined in P-B/A-T or P-A/B-T. Therefore, "additional isolation valves" are required in many applications and must be taken into account for the On/Off switching line.



- 1 Control solenoid with position transducer
- 2 Valve body
- 3 Mating connector
- 4 Plug-in connector prob. 2nd stage

Symbols

	L: Linear	P: Inflection 60 % [Q_n 15, 25 l/min]	P: Inflection 40 % [Q_n 15, 40 l/min]
	V		
	Standard = 1:1		

Test and service devices

- Type VT-VETSY-1 service case with test device, see RE 29685
- 11P+PE Type VT-PA-1 measuring adapter, see RE 30067

Technical data

general									
Type			Gate valve, directly operated, with steel sleeve						
Actuation			Proportional double-stroke solenoid with position control, OBE						
Type of connection			Plate connection, porting pattern according to ISO 4401-03-02-0-05						
Installation position			Any						
Ambient temperature range		°C	−20...+50						
Weight		kg	2.5						
Vibration resistance, test condition			Max. 25 g, room vibration test in all directions (24 h)						
hydraulic (measured with HLP 46, $\vartheta_{oil} = 40\text{ °C} \pm 5\text{ °C}$)									
Hydraulic fluid			Hydraulic oil according to DIN 51524...535, other media upon request						
Viscosity range	Recommended	mm²/s	20...100						
	Max admissible	mm²/s	10...800						
Hydraulic fluid temperature range		°C	−20...+65						
Maximum admissible degree of contamination of the hydraulic fluid cleanliness class according to ISO 4406 (c)			Class 18/16/13 ¹⁾						
Flow direction			According to symbol						
Rated flow at $\Delta p = 35\text{ bar}$ per edge ²⁾		l/min	4	8	12	15	24	25	40
Max operating pressure Ports P, A, B		bar	315						
Orifice T		bar	100						
Limitation of use Δp		bar	315	315	315	315	315	315	250
Zero flow at 100 bar	Linear characteristic curve L	cm³/min	< 180	< 250	< 300	–	< 500	–	< 900
	Inflected characteristic curve P	cm³/min	–	–	–	< 180	–	< 250	–
static/dynamic									
Hysteresis		%	≅ 0.2						
Manufacturing tolerance Q_{max}		%	< 10						
Actuating time for signal step 0 ...100 %		ms	≅ 5						
Temperature drift			Zero shift < 1 % at $\Delta T = 40\text{ °C}$						
Zero compensation			ex factory ±1 %						

¹⁾ The cleanliness classes specified for the components must be complied with in hydraulic systems. Effective filtration prevents faults and at the same time increases the service life of the components. For the selection of filters see technical data sheets RE 50070, RE 50076 and RE 50081.

²⁾ Flow at different Δp $Q_x = Q_{nom} \cdot \sqrt{\frac{\Delta p_x}{35}}$

Technical data

electric, control electronics integrated in the valve			
Relative duty cycle	%	100 ED, max. power consumption 30 VA (24 V =)	
Protection class		IP 65 according to DIN 40050 and IEC 14434/5	
Port		Plug-in connector, 11P+PE	Data
Supply 24 V = _{nom} ¹⁾	2)	1 2	+24 V = _{nom} , fuse protection 2.5 A _F (output stages) 0 V power ground
	3)	9 10	+24 V = _{nom} Signal part 0 V Signal ground
Input signal ±10 V	4)	4 5	$\frac{U_{IN}}{U_{IN}}$ } Differential amplifier, R _i = 100 kΩ
Actual value signal (LVDT)		6 7	±10 V =, R _a = 1 kΩ 0 V, reference point
Release input		3	> 8.5 V to 24 V = _{nom} (max. 40 V =) R _i = 10 kΩ
Messages	5)	8 11	Enable acknowledgement +24 V = Error message: No error +24 V =
Protective earthing conductor			Connect only if the transformer of the 24 V = -System does not comply with the VDE 0551 standard
Electromagnetic compatibility tested according to		EN 61000-6-2: 2005-08 EN 61000-6-3: 2007-01	

1) 24 V =_{nom} – min. 21 V =
– max. 40 V =

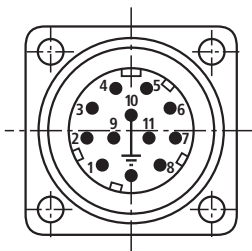
2) U_B (Pin 1) = Output stage supply
– “OFF” valve < 13.4 V =
– “ON” valve > 16.8 V =
No error message (Pin 11)

3) U_S (Pin 9) = Electronic supply
– “OFF” valve < 16.8 V =
Error message (Pin 11)
– “ON” valve > 19.5 V =
No error message (Pin 11)

4) Inputs: Voltage resistant up to max. 50 V.

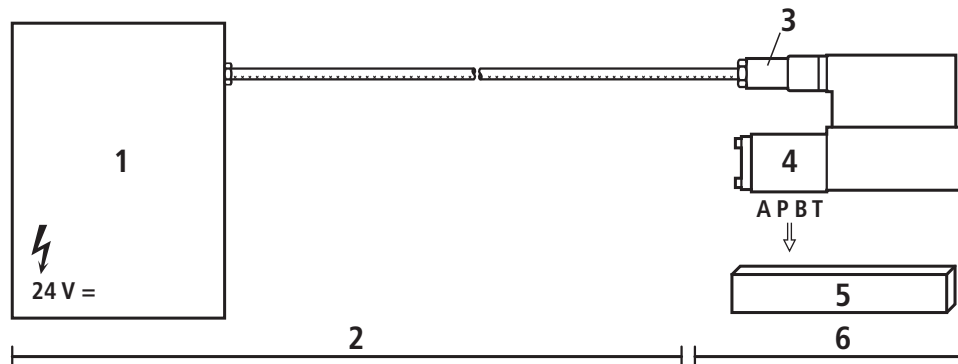
5) Messages loadable up to max. 20 mA
and short-circuit-proof against earth.

11P+PE



Electrical connection

Electrical data, see page 5



- 1 Control
- 2 On customer side
- 3 Mating connector
- 4 Valve
- 5 Contact surface
- 6 On Rexroth side

Technical instructions for the cable

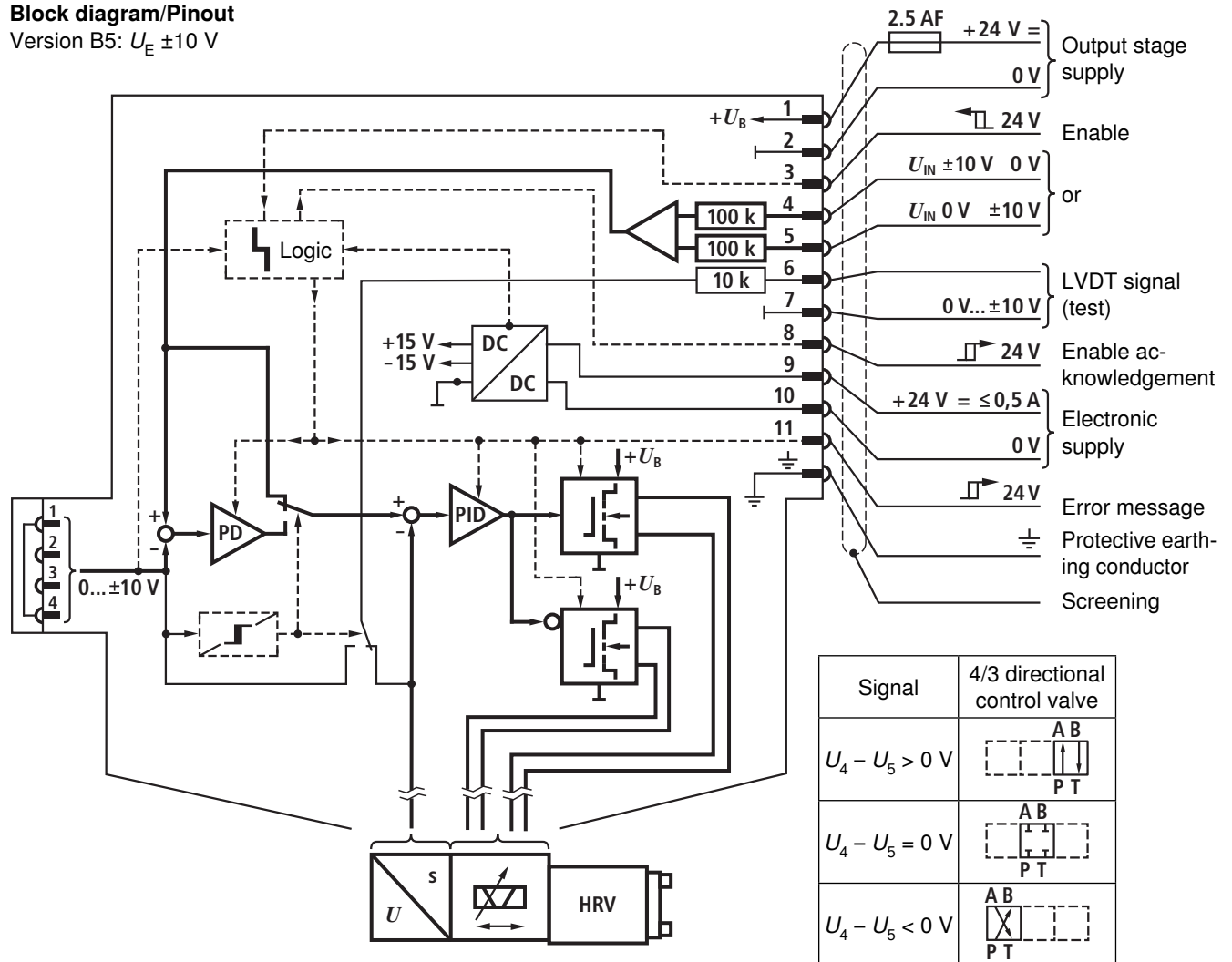
- Version:**
- Multi-wire cable
 - Litz wire structure, very fine wire according to VDE 0295, class 6
 - Protective earthing conductor, green-yellow
 - Cu shielding braid
- Type:**
- e.g. Oilflex-FD 855 CP (Lappkabel)
- Number of wires:**
- Depends on valve type, plug type and signal assignment
- Line Ø:**
- 0.75 mm² up to a length of 20 m
 - 1.0 mm² to 40 m of length
- Outer Ø:**
- 9.4...11.8 mm – Pg11
 - 12.7...13.5 mm – Pg16

Note

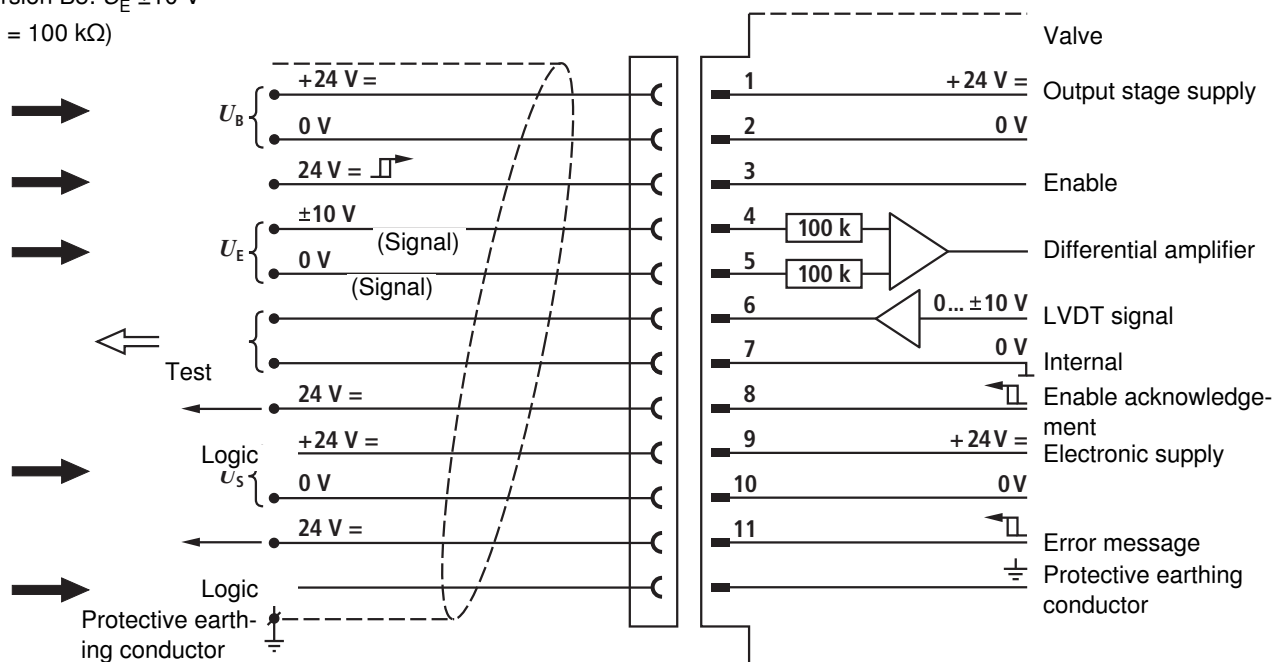
Electric signals taken out via control electronics (e.g. signal Actual value) may not be used for the switching off of safety-relevant machine functions!
(See also the European standard “Safety requirements for fluid power systems and their components – Hydraulics”, EN 982!)

Integrated electronics

Block diagram/Pinout

Version B5: $U_E \pm 10\text{ V}$ 

Pin assignment 11P+PE

Version B5: $U_E \pm 10\text{ V}$ $(R_i = 100\text{ k}\Omega)$ 

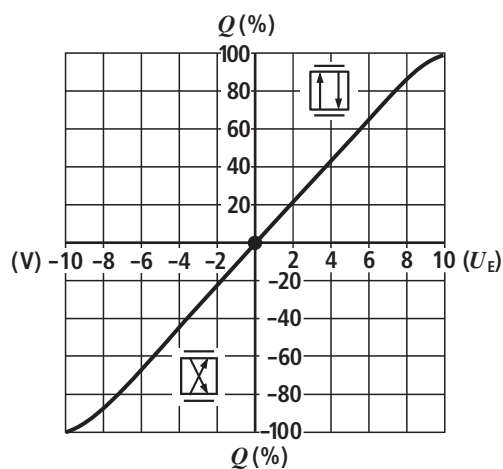
Characteristic curves (measured with HLP 46, $\vartheta_{oil} = 40\text{ °C} \pm 5\text{ °C}$)

Flow - signal function

$$Q = f(U_E)$$

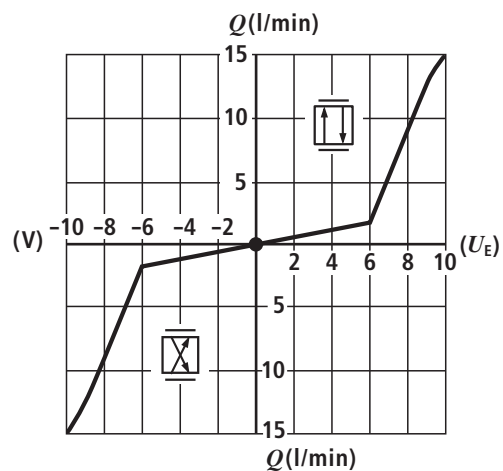
Flow characteristics

L: Linear



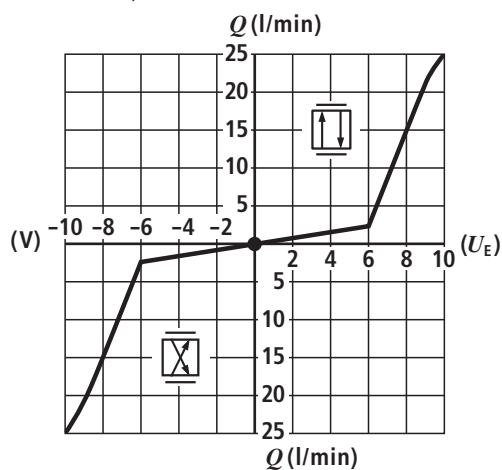
Flow characteristics

P: (Inflection 60 %)



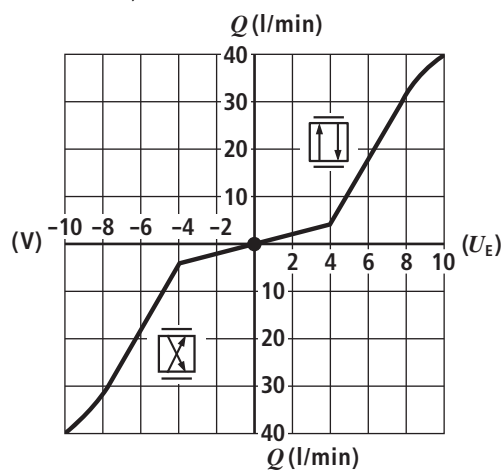
Flow characteristics

P: (Inflection 60 %)



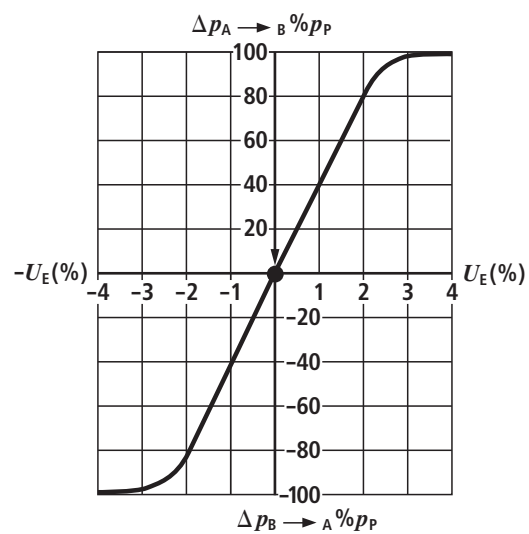
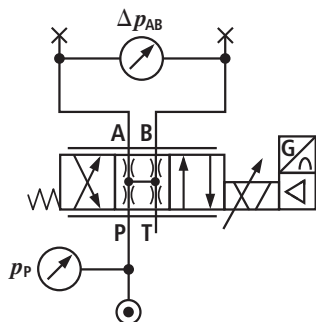
Flow characteristics

P: (Inflection 40 %)

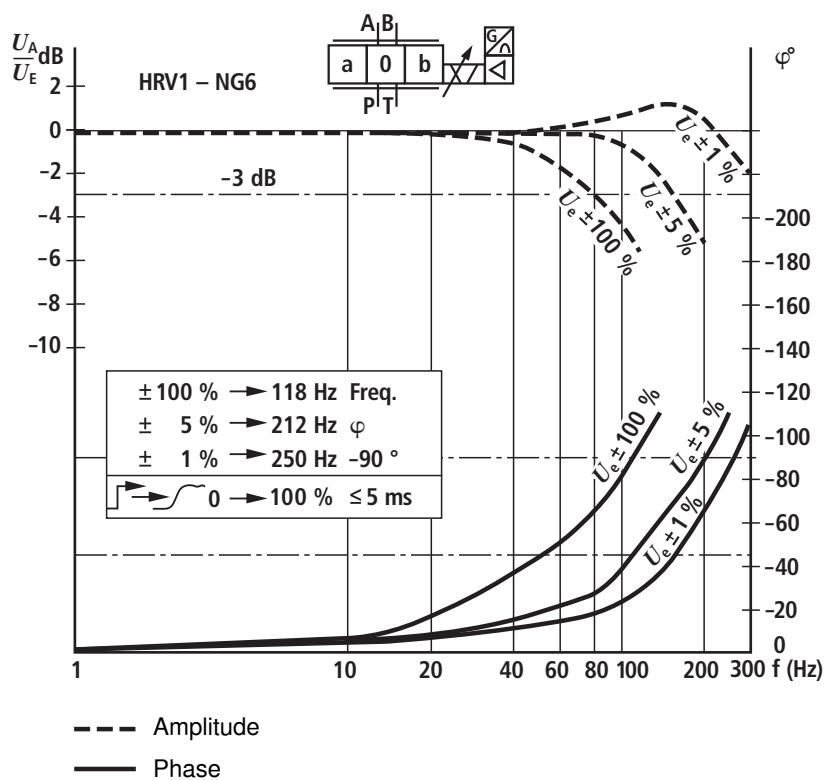


Characteristic curves (measured with HLP 46, $\vartheta_{oil} = 40\text{ °C} \pm 5\text{ °C}$)

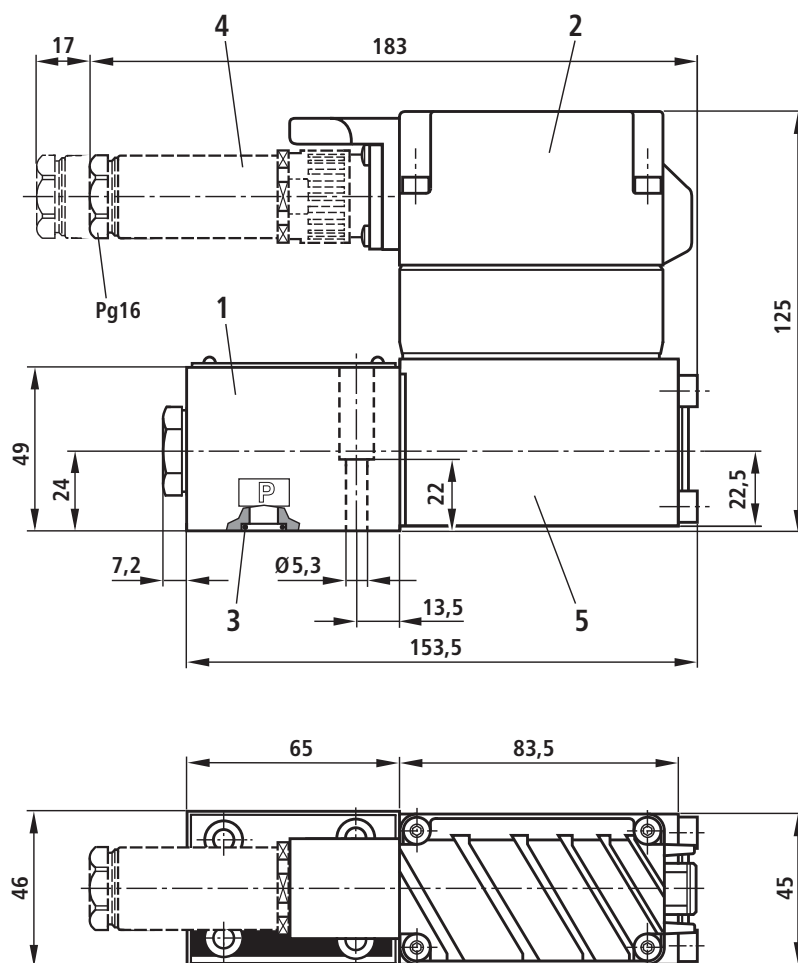
Pressure gain



Bode diagram



Unit dimensions (dimensions in mm)



- 1 Valve housing
- 2 Integrated electronics
- 3 O-rings Ø 9.25x1.78 (ports P, A, B, T)
- 4 Mating connector no included in the scope of delivery, see technical data sheet RE 08008 (separate order)
- 5 Control solenoid with position transducer
- 6 Machined valve mounting face, porting pattern according to ISO 4401-03-02-0-05
Deviating from the standard:
Ports P, A, B, T Ø 8 mm

Subplates according to technical data sheet RE 45053 (separate order)

Valve mounting screws (separate order)

The following valve mounting screws are recommended:

4 cylinder screws ISO 4762-M5x30-10.9-N67F82170

(galvanized according to N67F82170)

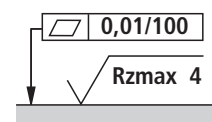
Tightening torque $M_A = 6+1$ Nm

Mat.-no. 2910151166

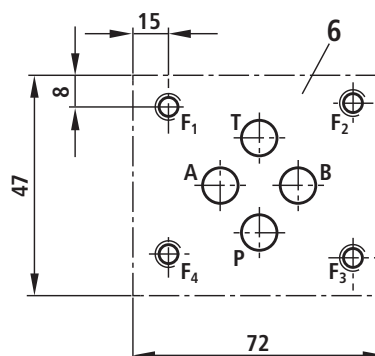
or

4 cylinder screws ISO 4762-M5x30-10.9

(friction coefficient $\mu_{\text{total}} = 0.12-0.17$)



Required surface quality of the valve mounting face



Notes

Notes
