

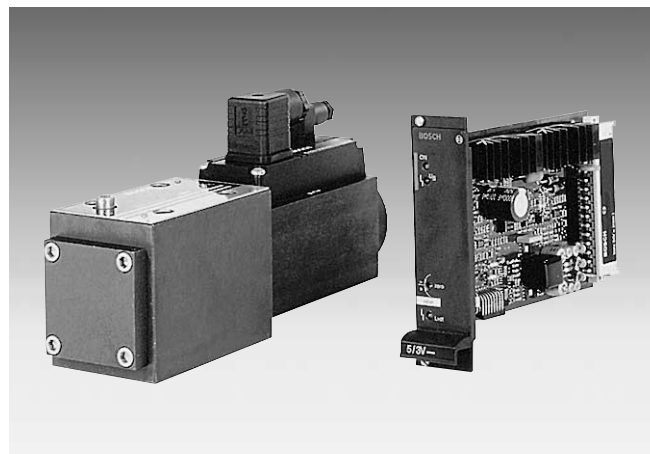
RE 29 043/01.03

**Servo solenoid valves with electrical
position feedback (Lvdt DC/DC ± 10 V)
Type 5WRP 10**

Size 10

Series 2X

Maximum working pressure 210 bar

Maximum flow rate 140 l/min (Δp 11 bar)

Type 5WRP 10 ..B..-2X/G24...

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Features

- Directly operated servo solenoid valve NG 10, with p/Q 5/3 directional control symbol in servo quality
- Actuated on one side, A-T fail-safe position when switched off
- Control solenoid with integral position feedback and electronics for position transducer (Lvdt DC/DC)
- Suitable for electrohydraulic controllers in production and testing systems
- For subplate attachment, mounting hole configuration to DIN 24 340 Form A, ISO 4401 and CETOP-RP 121 H
- Subplates as per catalogue section RE 45 055 (order separately)
- Line sockets to DIN 43 563-AM2
- Solenoid 2P + PE/Pg 11, position transducer 4P/Pg 7 in scope of delivery, see catalogue section RE 08 008
- External trigger electronics (order separately)
 - Electric amplifier for standard curve "L" 0 811 405 062, see catalogue section RE 30 041
 - Electric amplifier with p/Q compensator 0 811 405 154, see catalogue section RE 30 058

Important

With external trigger electronics ("standard"), closed-loop control of p/Q is achieved with an external pressure compensator (accessory).



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We must reserve the right to make changes on the grounds of continual product development. No liability can be accepted for incomplete or inaccurate information.

Ordering data

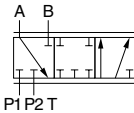
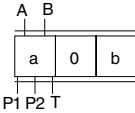
5WRP			10	B		-2X/G24	Z4/	M	*
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For **external** trigger electronics = no desg.

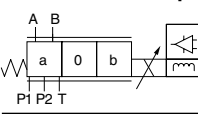
Without sleeve no designation

Size 10 = 10

Symbols
5/3-way version



Side of inductive position transducer



(Standard) = B

Electrical connection
Z4 = with line socket, with plug to DIN 43 563-AM2
Line socket included in scope of delivery

Voltage supply of trigger electronics
G24 = +24 V DC

2X = Series 20 to 29
(installation and connection dimensions unchanged)

Flow characteristic
L = Linear

Nominal flow rate at 70 bar valve pressure differencez
70 = 70 l/min (11 bar / metering notch) Size 10


Further information in plain text

M = NBR seals, suitable for mineral oils (HL, HLP) to DIN 51 524

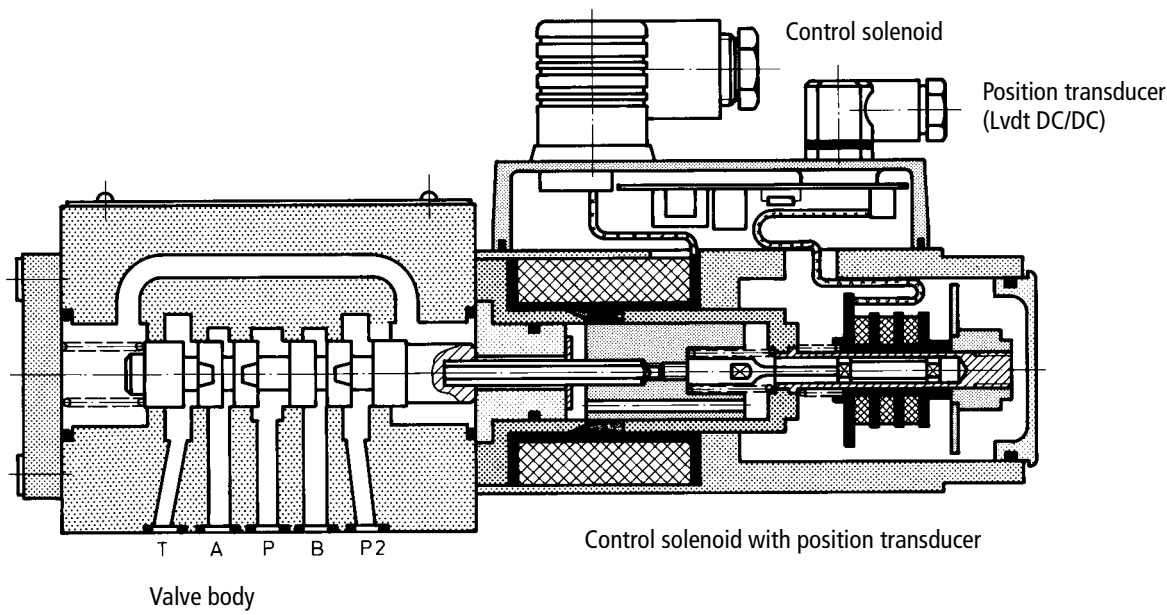
Preferred types (available at short notice)

Material no.	Type 5WRP 10
	F
0 811 402 113	5WRP 10 FB70L -2X/G24 Z4 / M

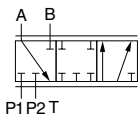
Accessory, pressure compensator

	See pressure compensator on pages 9 and 10	m	Material no.
		6 kg	0 811 401 219




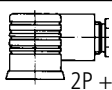

Servo solenoid valve 5WRP 10



Symbol



Accessories, not included in scope of delivery

(4 x)  M 6 x 40 DIN 912–10.9	Fastening screws	2 910 151 209
 	VT-VRPA1-537-10 / V0, see RE 30 041	0 811 405 062
	VT-VARAP1-537-20 / V0 / 5/3V, see RE 30 058	0 811 405 154
 2P + PE  4P	Line sockets 2P + PE (Pg 11) and 4P (Pg 7) included in scope of delivery, also see RE 08 008	


Testing and service equipment

- Test box type VT-PE-TB2, see RE 30 064.
- Test adapter type VT-PA-3, see RE 30 070.

Technical data (For device applications beyond the stated values, please consult us!)**General**

Construction	Spool type valve, operated directly
Actuation	Proportional solenoid with position control, external amplifier
Type of mounting	Subplate, mounting hole configuration NG 10 (ISO 4401 and CETOP-RP 121 H)
Installation position	Optional
Ambient temperature range	-20 ... +50 °C
Weight	6.8 kg
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 51 524 ... 535, other fluids after prior consultation	
Viscosity range, recommended max. permitted	20 ... 100 mm ² /s 10 ... 800 mm ² /s	
Pressure fluid temperature range	-20 ... +80 °C	
Purity class to ISO code	Maximum permitted degree of contamination of pressure fluid to ISO 4406 (C) Class 18/16/13 ¹⁾	
Flow direction	See symbol	
Nominal flow [l/min] at $\Delta p = 11\text{ bar}$ per notch*	$P_1 \rightarrow A$	70
	$P_1 \rightarrow A + P_2 \rightarrow B$	70 + 70
	$A \rightarrow T$	65
Max. working pressure	Port P_1, P_2, A, B : 210 bar	
Max. pressure	Port T: 50 bar	
Operating limits at Δp [bar]	See diagram	
Leakage [cm ³ /min] at 100 bar		<1,200

Electrical

Cyclic duration factor	100 %	
Power supply	24 V _{nom.} (external amplifier)	
Degree of protection	IP 65 to DIN 40 050	
Solenoid connector	Connector DIN 43 650/ISO 4400 Pg 11 (2P + PE)	
Position transducer connector	Connector Pg 7 (4P)	
Solenoid current	3.7 A max.	
Coil resistance R_{20}	2.4 Ω	
Max. power consumption at 100 % load and operational temperature	60 VA max.	
Position transducer DC/DC technology	Supply: +15 V/35 mA -15 V/25 mA	Signal: 0...±10 V ($R_L \geq 10\text{ k}\Omega$)

Static/Dynamic

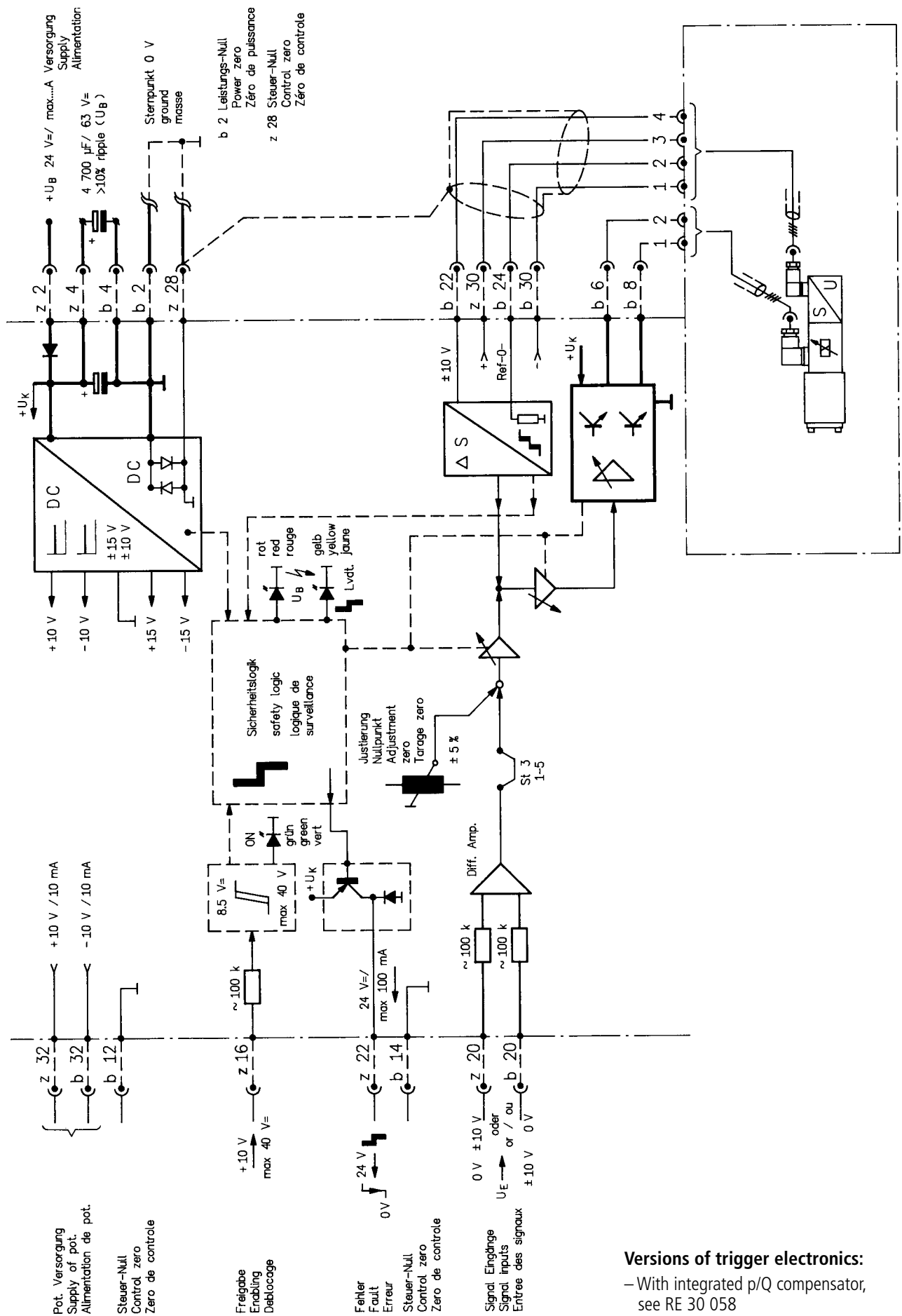
Hysteresis	$\leq 0.3\text{ %}$
Manufacturing tolerance for $q_{max.}$	<10 %
Response time for signal change 0 ... 100 %	<25 ms
Thermal drift	Zero point displacement <1 % at $\Delta T = 40\text{ °C}$

All characteristics in connection with electric amplifier 0 811 405 062.

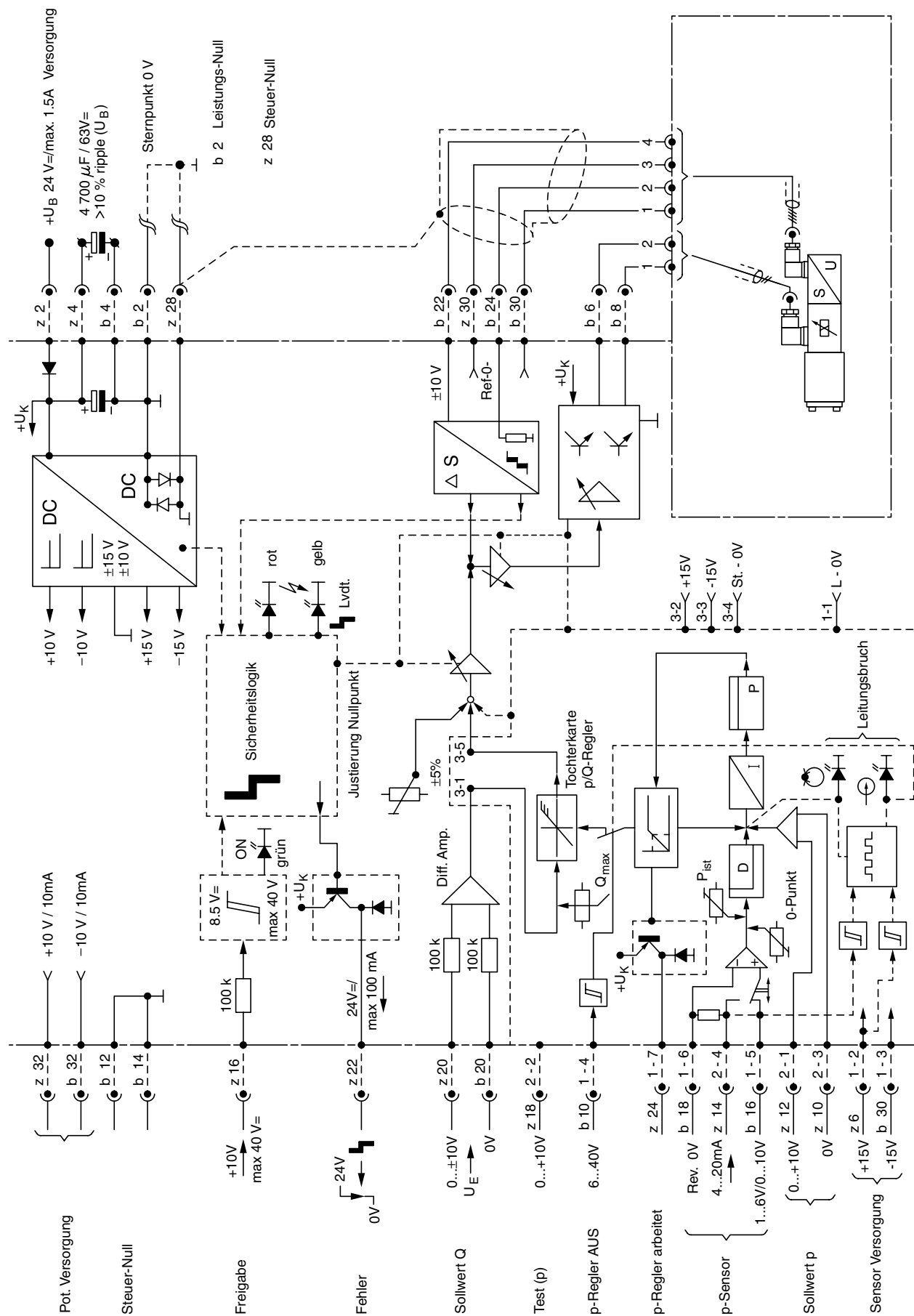
- ¹⁾ The purity classes stated for the components must be complied with in hydraulic systems.
Effective filtration prevents problems and also extends the service life of components.
For a selection of filters, see catalogue sections RE 50 070, RE 50 076 and RE 50 081.

* Flow rate at a different Δp $q_x = q_{nom.} \cdot \sqrt{\frac{\Delta p_x}{11}}$

Block diagram / pin assignment



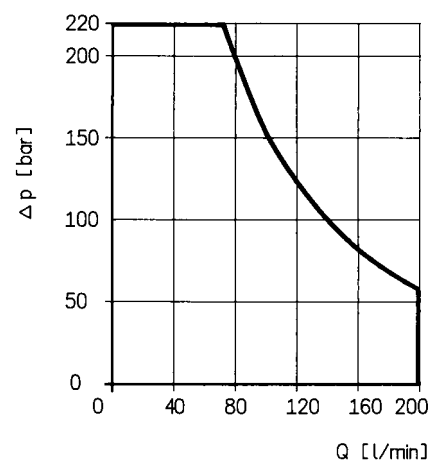
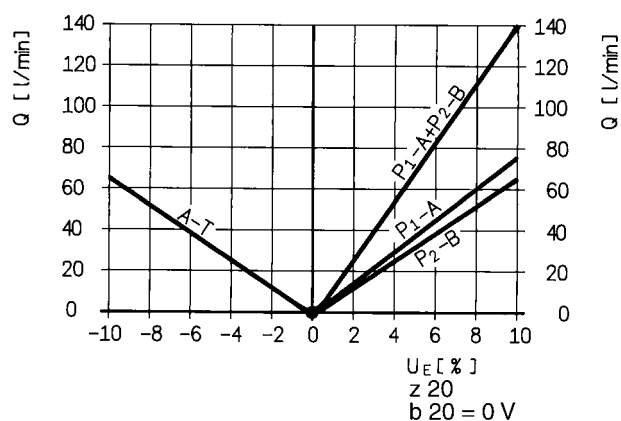
Block diagram / pin assignment



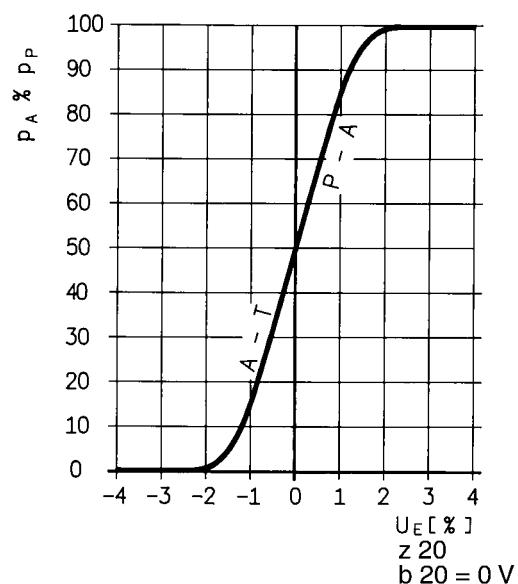
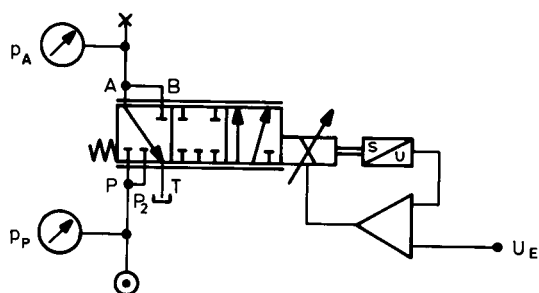
Versions of trigger electronics: – with standard linear curve, see RE 30 041

Flow rate/Signal function

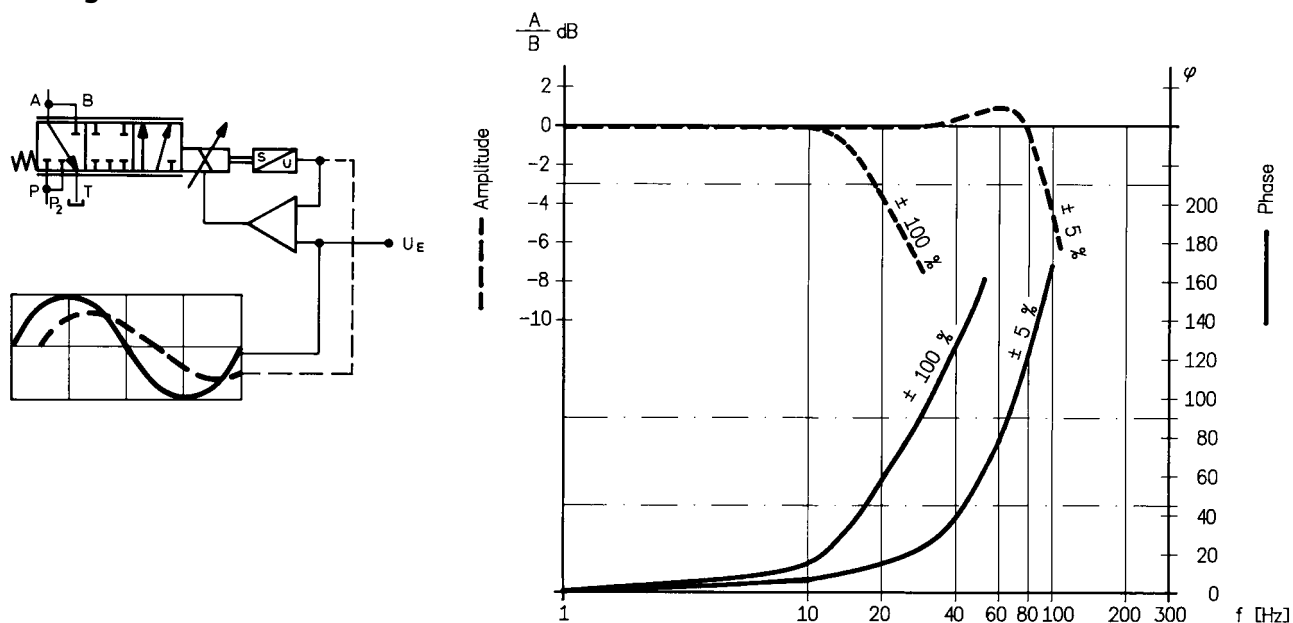
Operating limits

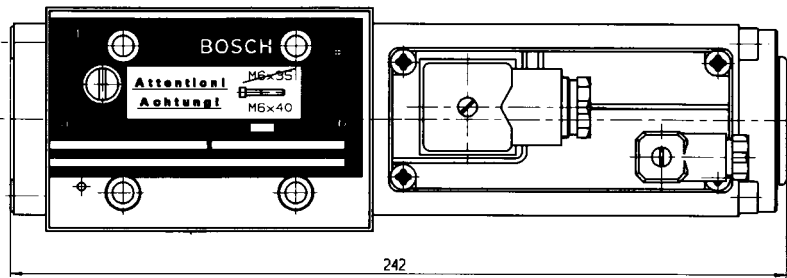


Pressure gain



Bode diagram





	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⁾	M 6 ²⁾	M 6 ²⁾	M 6 ²⁾	M 6 ²⁾	10.5 ¹⁾

Pressure compensator

Size 10



Application

A combination of flow rate control and pressure compensation. The **flow rate Q** is determined by the throttle cross-sections P1, R, A and P2, R, B. Either a single or a double flow may be selected. In many applications, the valve is combined with a variable-displacement pump. The pressure/flow compensator keeps the pressure drops through the valve at a constant level (see Fig. 1 on page 10). The same function is achieved in constant-displacement pumps, too, by means of a pressure compensator. Here, Q_{max} is determined by the control springs of the pressure compensator (see Fig. 2 on page 10).

The **pressure p** is measured by an external pressure sensor and transmitted to an electronic pressure compensator as an actual value. Just as the build-up of pressure in the consumer takes place and approaches the setpoint value, the valve function is determined by the pressure compensator. Even in situations where the pressure is decreasing, the valve can regulate the oil as necessary via the A-T metering notch. Pressure compensation can be achieved both by means of electronics provided by the customer and using a Bosch Rexroth pressure compensator.

Important

Details about pressure sensors and p/Q compensators can be found in the publication 1 987 761 327.

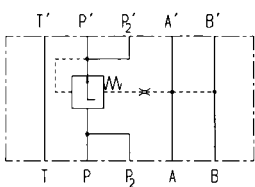

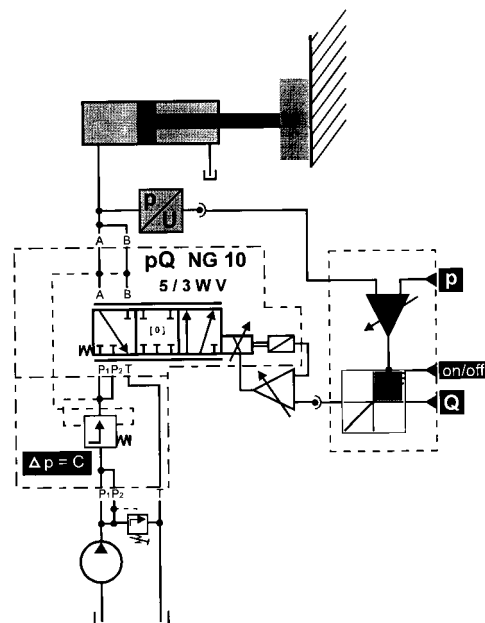
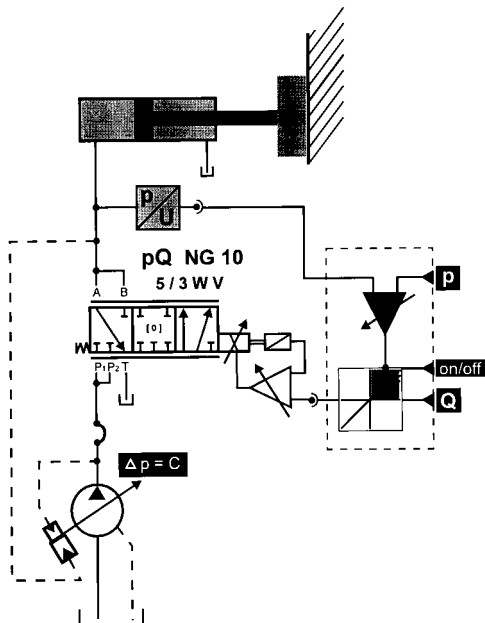
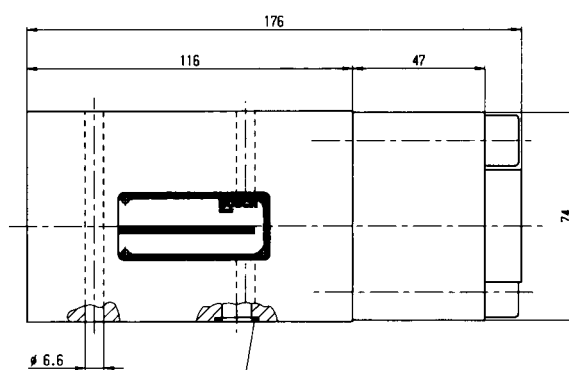
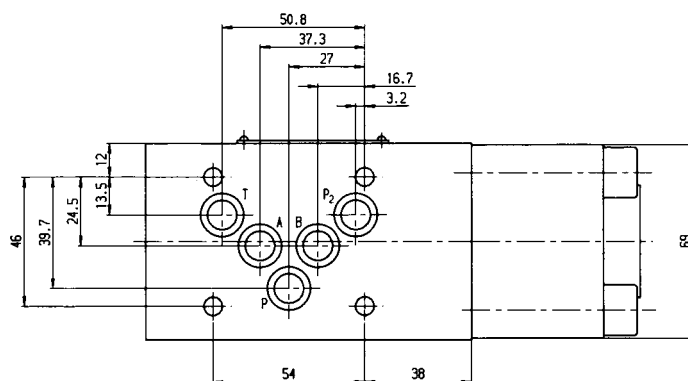
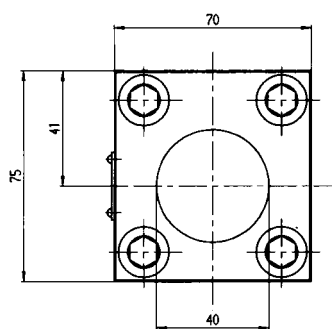
Symbol		p_{max} [bar]	Δp [bar]	Q_{nom} [l/min]	[kg]	
	p/Q-NG 10	210	8	120	6,0	0 811 401 219
	M 6 x 115 DIN 912-10.9					—
	M 6 x 120 DIN 912-10.9					2 910 151 227

Figure 1: with variable-displacement pump

Figure 2: with pressure compensator 0 811 401 219





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