

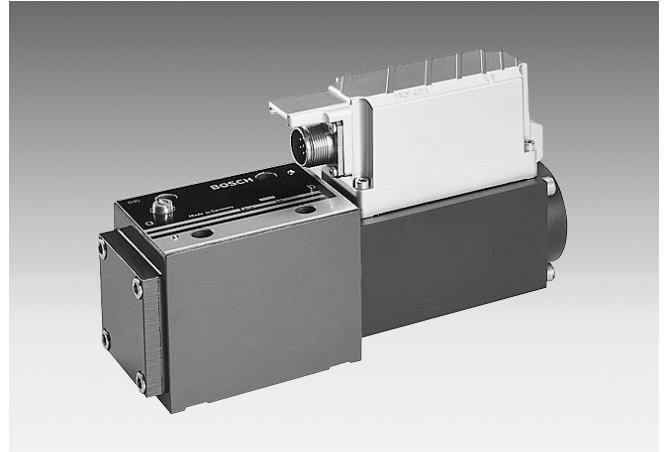
RE 29 045/11.02

**Servo solenoid valves with on-board electronics (OBE)
Type 5WRPE 10**

Size 10

Series 2X

Maximum working pressure 210 bar

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

00102432

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

List of contents

Contents	Page
Features	1
Ordering data	2
Preferred types	2
Function, sectional diagram	3
Symbols	3
Technical data	4 to 6
On-board trigger electronics	7
Performance curves	8
Device dimensions	9
Pressure compensator	10 and 11

Features

- Directly operated servo solenoid valve NG 10, with pQ 5/3-way symbol in servo quality
- Actuated on one side, A-T fail-safe position when switched off
- Control solenoid with integral position feedback and on-board electronics (OBE), calibrated at the factory
- Electrical connection 6P+PE
Signal input difference amplifier with interface A1 + 10 V
- 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-AM6, see catalogue section RE 08 008 (order separately)

Variants on request

Closed-loop control of p/Q is achieved with an external pressure compensator (accessory).



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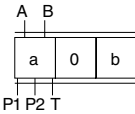
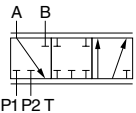
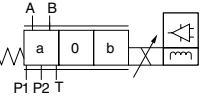
by Bosch Rexroth AG, Industrial Hydraulics, D-97813 Lohr am Main

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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	E	10	B	-2X/G24	K0/	M	*
With on-board trigger electronics = E							Further information in plain text
Without sleeve no designation							M = NBR seals, suitable for mineral oils (HL, HLP) to DIN 51 524
Size 10 = 10							
Symbols							
5/3-way version				= F			
Side of inductive position transducer							
		(Standard) = B					
Interface for trigger electronics							A1 = Setpoint input ±10 V
Electrical connection							K0 = without line socket with plug to DIN 43 563-AM6 Order line socket separately
Voltage supply of trigger electronics							G24 = +24 V DC
Flow characteristic							L = Linear
Nominal flow rate at 11 bar valve pressure difference (11 bar / metering notch)							70 = 70 l/min
Size 10							

Preferred types (available at short notice)

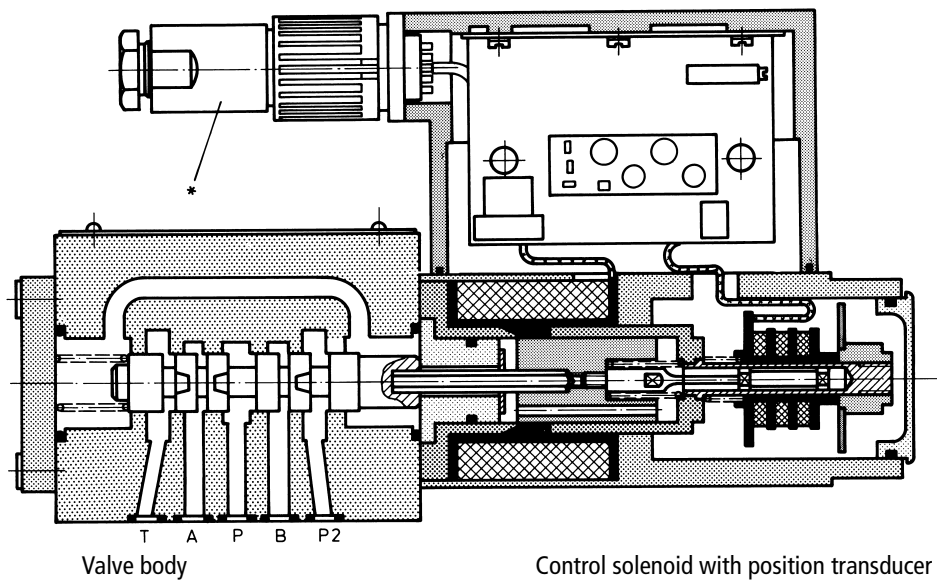
Material no.	Type 5WRPE 10
	F
0 811 402 107	5WRPE 10 FB70L-2X/G24K0 / A1M

Accessory, pressure compensator

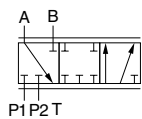
	See pressure compensator on pages 11 and 12	m	Material no.
		6 kg	0 811 401 219

Function, sectional diagram

Servo solenoid valve 5WRPE 10



Symbols



Accessories, not included in scope of delivery

(4 x) M 6 x 40 DIN 912–10.9	Fastening screws	2 910 151 209
	* Line sockets 6P+PE	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 30 065
- Test adapter 6P+PE type VT-PA-2, see RE 30 068


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, OBE
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	7.1 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 ... +70 °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 → A	70
	P ₁ → A + P ₂ → B	70 + 70
	A → T	65
Max. working pressure	Port P, 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

Static/Dynamic

Hysteresis	≤ 0.3 %
Manufacturing tolerance for q_{max} .	< 10 %
Response time for signal change 0 ... 100 %	≤ 25 ms
Thermal drift	Zero point displacement < 1 % at $\Delta T = 40 \text{ °C}$
Zero adjustment	Factory-set ± 1 %
Conformity	 EN 50 081-1 EN 50 082-2

- 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.

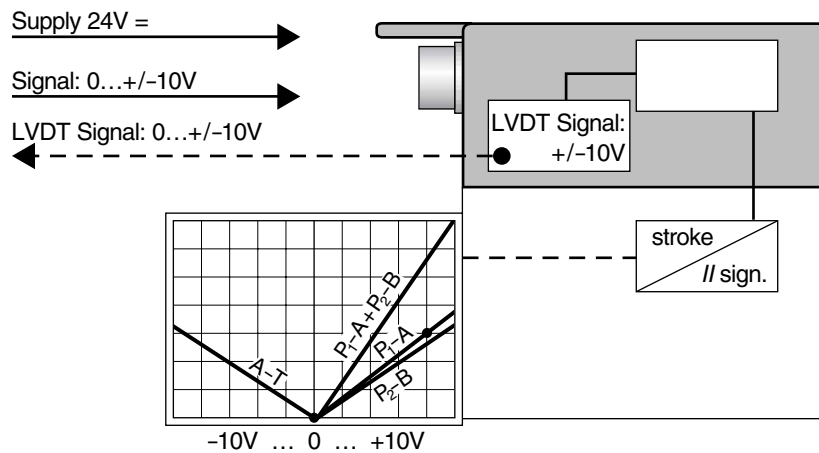
* Flow rate at a different Δp

$$q_x = q_{nom.} \cdot \sqrt{\frac{\Delta p_x}{11}}$$

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

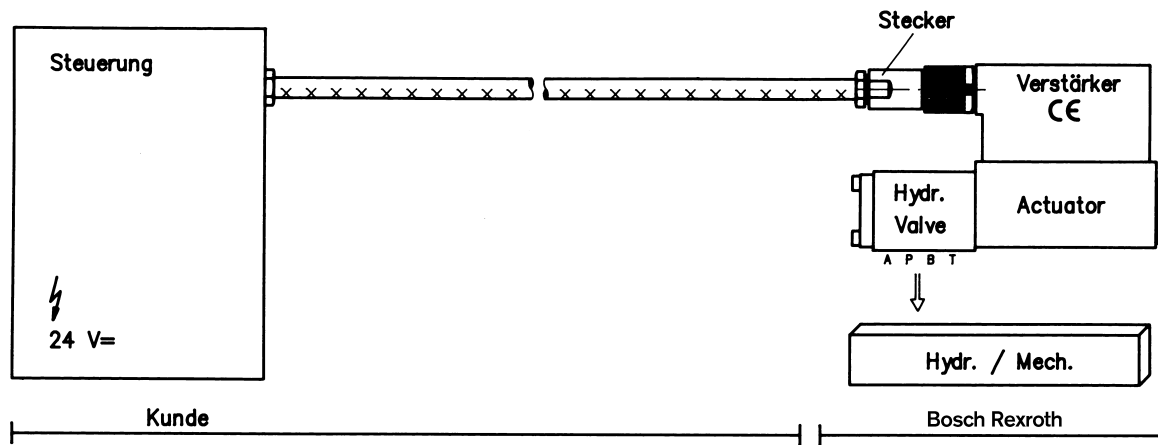
Electrical, trigger electronics integrated in the valve

Cyclic duration factor	100 %
Degree of protection	IP 65 to DIN 40 050 and IEC 14 434/5
Connection	Line socket 6P+PE, DIN 43 563
Power supply Terminal A: B: 0 V	24 V DC _{nom.} min. 21 V DC/max. 40 V DC Ripple max. 2 V DC
Power consumption	Solenoid \square 60 mm = 60 VA max.
External fuse	2.5 A _F
Input, "Standard" version Terminal D: U_E E:	Difference amplifier, $R_i = 100 \text{ k}\Omega$ 0 ... $\pm 10 \text{ V}$ 0 V
Max. differential input voltage at 0 V	$D \rightarrow B$ } max. 18 V DC $E \rightarrow B$ }
Test signal, "Standard" version Terminal F: U_{Test} C:	LVDT 0 ... $\pm 10 \text{ V}$ Reference 0 V
Protective conductor and screen	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 performance curve



Connection

For electrical data, see page 5 and
Operating Instructions 1 819 929 083



Technical notes on the cable

- Version:**
- Multi-wire cable
 - Extra-finely stranded wire to VDE 0295, Class 6
 - Protective conductor, green/yellow
 - Cu braided screen
- 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 – Pg 11
 - 12.7 ... 13.5 mm – Pg 16

Note

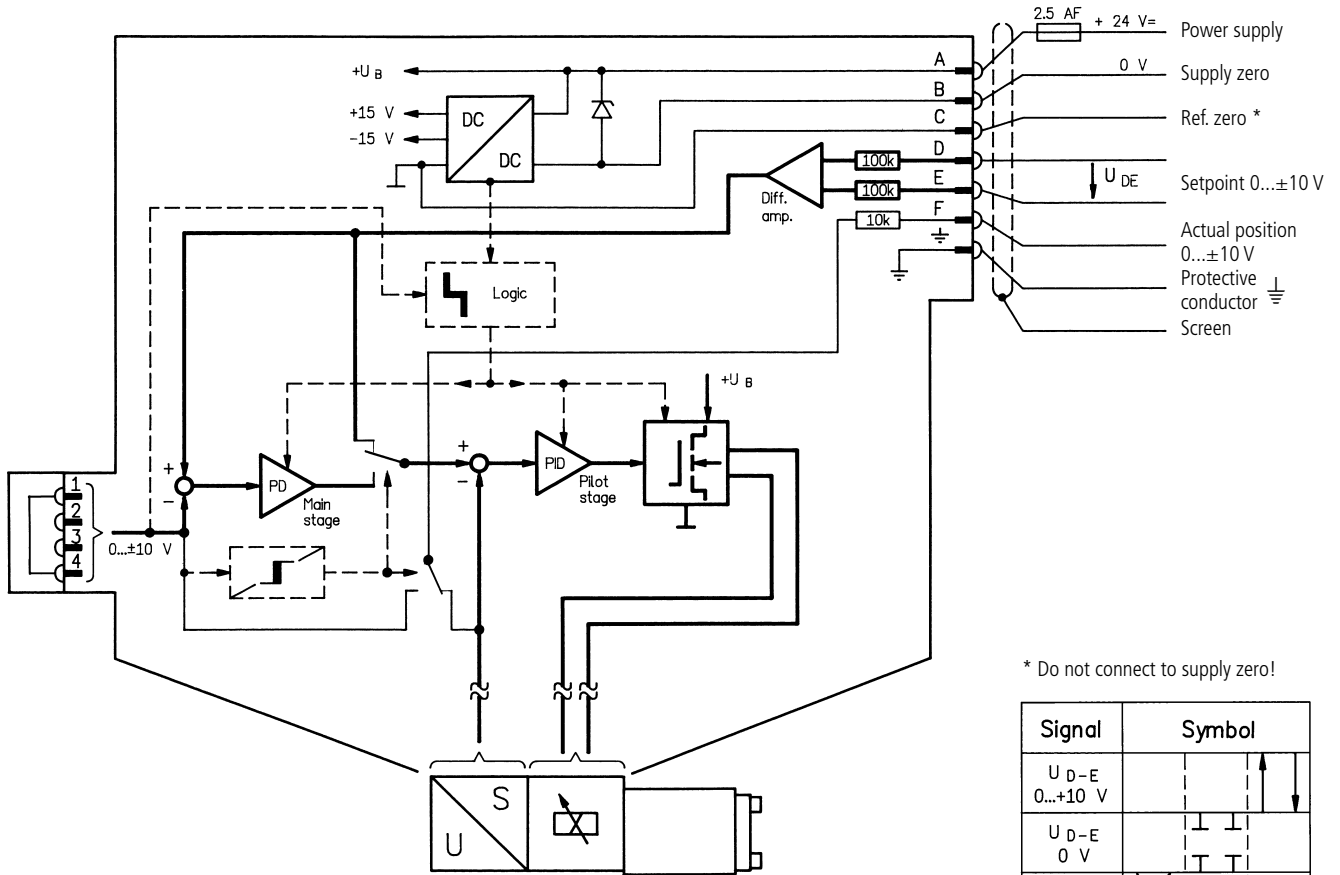
Voltage supply 24 V DC nom., if voltage drops below 18 V DC, rapid shutdown resembling "Enable OFF" takes place internally.

Electrical signals emitted via the trigger electronics (e.g. actual values) must not be used to shut down safety-relevant machine functions! (See European Standard, "Technical Safety Requirements for Fluid-Powered Systems and Components – Hydraulics", EN 982.)

On-board trigger electronics

Block diagram / pin assignment

Version A1: $U_{D-E} \pm 10\text{ V}$



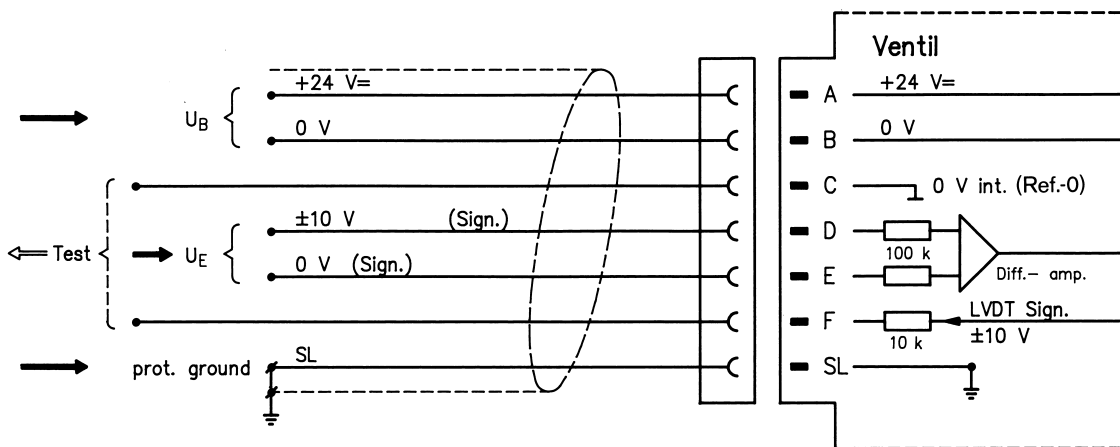
* Do not connect to supply zero!

Signal	Symbol
U_{D-E} 0...+10 V	
U_{D-E} 0 V	
U_{D-E} 0...-10 V	

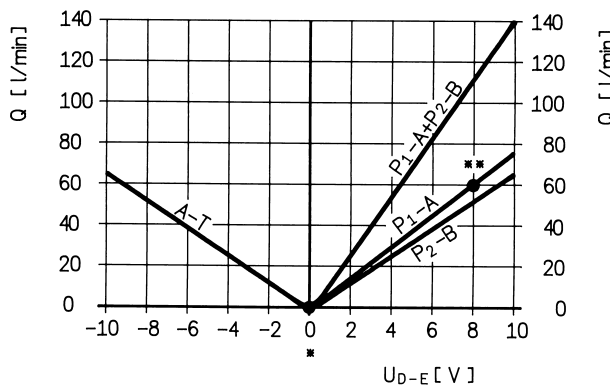
Pin assignment 6P + PE

Version A1: $U_{D-E} \pm 10\text{ V}$

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

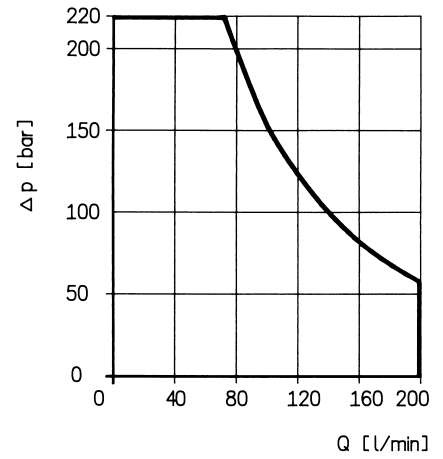


Flow rate/Signal function

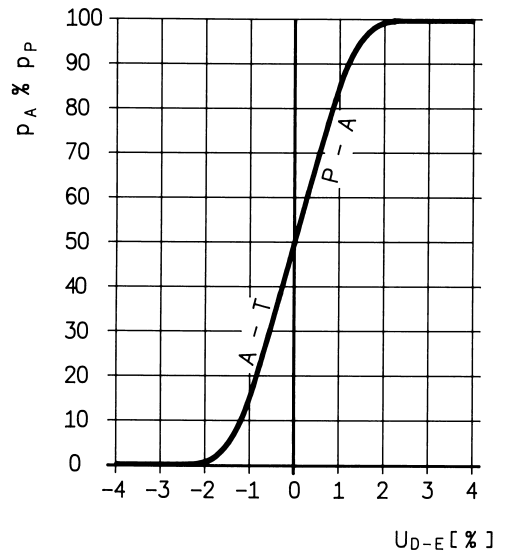
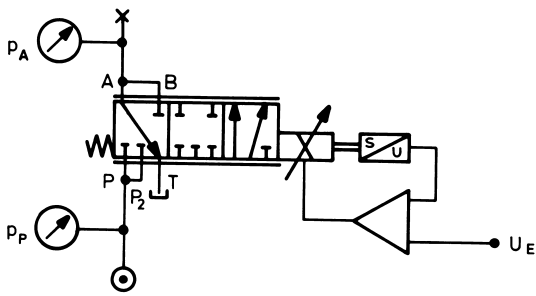


* calibrated $\pm 1\%$
 ** calibrated $\pm 5\%$

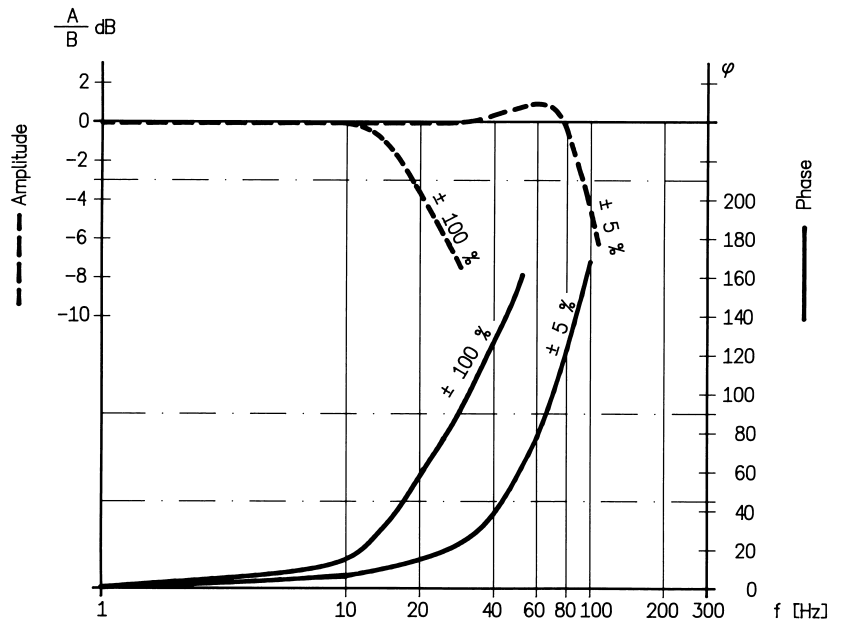
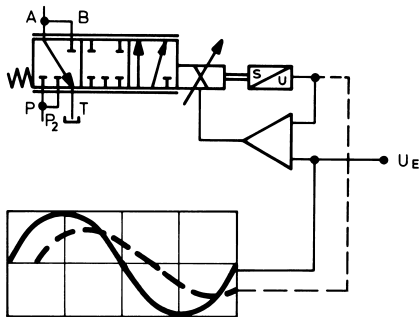
Operating limits



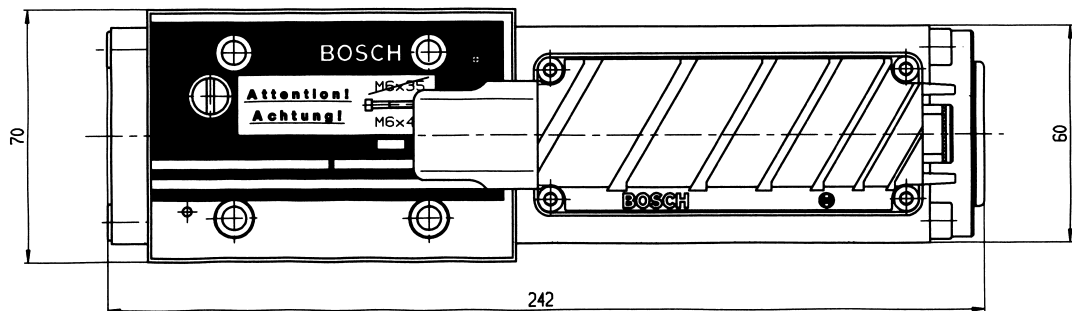
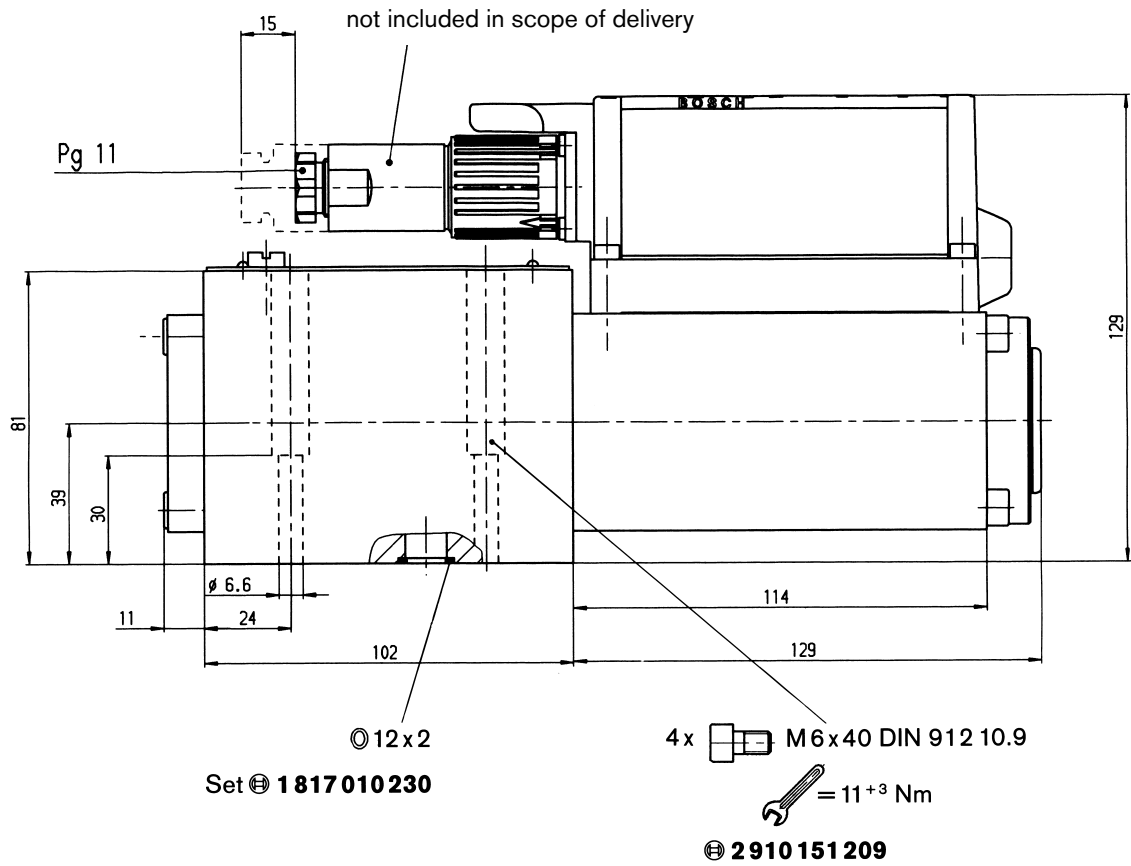
Pressure gain



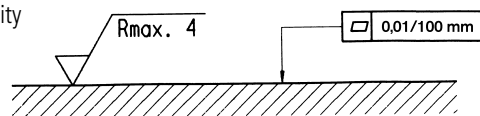
Bode diagram



Device dimensions (in mm)



Required surface quality of mating component



Mounting hole configuration: NG 10 (DIN 24 340 Form A, ISO 4401 and CETOP-RP 121 H)

For subplates, see catalogue section RE 45 055

¹⁾ Deviates from standard

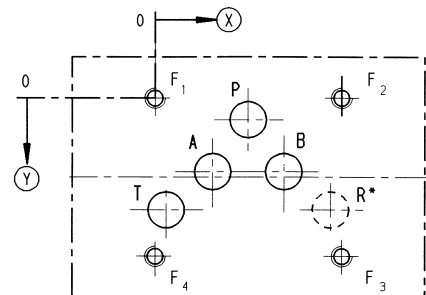
²⁾ Thread depth: Ferrous metal 1.5 x ∅*

Non-ferrous 2 x ∅

* (NG 10 min. 10.5 mm)

*5/3 – NG 10

R = P₂



	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 11).

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 11).

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.

Note

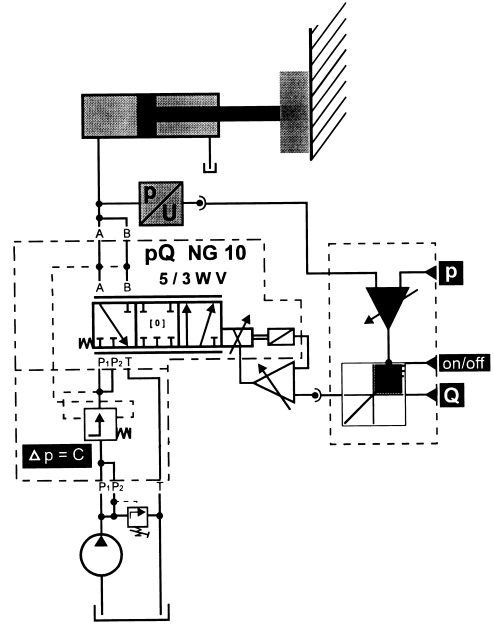
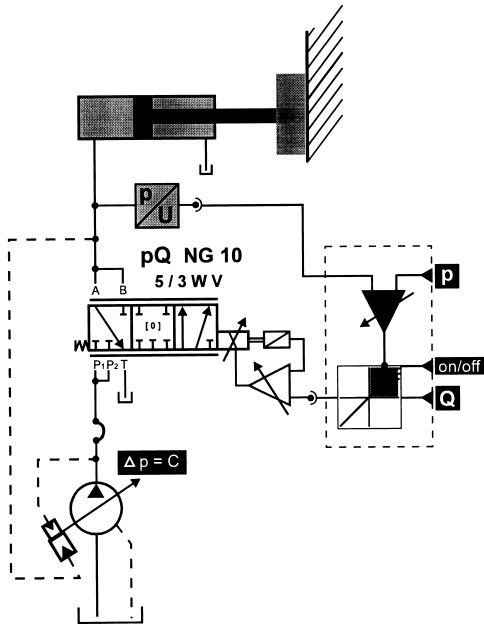
Details about pressure sensors and p/Q compensators can be found in the publication 1 987 761 327.

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

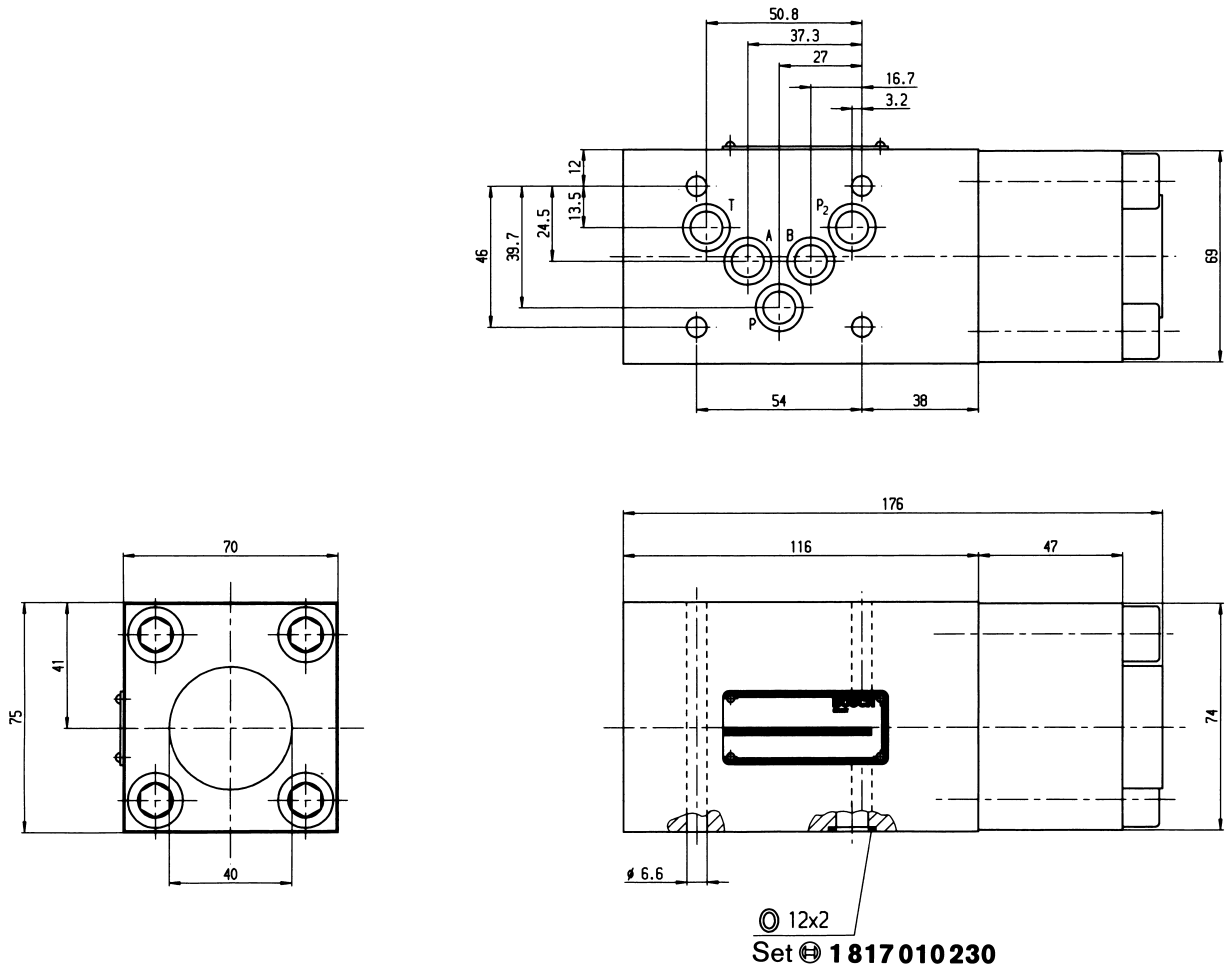
Application

Figure 1: with variable-displacement pump

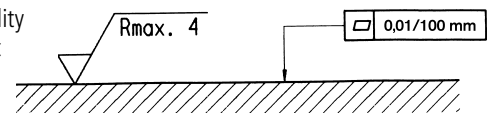
Figure 2: with pressure compensator 0 811 401 219



Device dimensions (in mm)



Required surface quality of mating component



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