

# Proportional pressure reducing valve, pilot operated

RE 29197/07.05

1/10

## Type DRE10Z

Nominal size 10  
 Unit series 1X  
 Maximum working pressure A, B, X 315 bar, Y 2 bar  
 Maximum flow rate  $Q_{nom}$  120 l/min



## Overview of Contents

### Contents

Features	
Ordering data	
Preferred types, symbol	
Function, sectional diagram	
Technical data	
External trigger electronics	
Characteristic curves	
Unit dimensions	

## Features

Page	
1	– Pilot operated valves for reducing system pressure (pilot oil internal only, with relief port X)
2	– Adjustable by means of the solenoid current, see Characteristic Curve, Technical Data and selected valve electronics
2	– Solenoid type $I_{max} = 0.8 \text{ A}$
3	– Pressure limitation to a safe level even with faulty electronics (solenoid current $I > I_{max}$ )
4	– For subplate attachment, mounting hole configuration to ISO 5781-AG-06-2-A
5 to 7	Subplates as per catalog sheet RE 45055 (order separately)
8	– Plug-in connector to DIN 43650-AM2 included in scope of delivery
9	– External trigger electronics with ramps and valve calibration in the following versions/designs (order separately)
	• Plug, setpoint 0...+10 V or 4...20 mA, RE 30264
	• Module, setpoint 0...+10 V, RE 30222
	• Europe card, setpoint 0...+10 V, RE 30109

## Ordering data

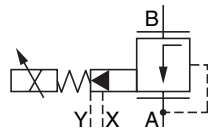
DRE10	Z	-1X/	XY	M	G24	-8	N	Z4	M	*	
Proportional pressure reducing valve NG10, pilot operated											Further information in plain text
Mounting hole configuration to ISO 5781-AG-06-2-A	= Z										M = NBR seals, suitable for mineral oils (HL, HLP) to DIN 51524
Unit series 10 to 19 (10 to 19: installation and connection dimensions unchanged)		= 1X									Z4 = <b>Electrical connection</b> Unit plug to DIN 43650-AM2 Plug-in connector included in scope of delivery
<b>Max. pressure stage</b> up to 180 bar											N = <b>Manual auxiliary override</b>
up to 315 bar											8 = <b>Solenoid type (current)</b> Solenoid current 0.8 A max.
Relief port X											
External pilot oil drain Y			= XY								
Without non-return valve				= M							
Voltage supply of trigger electronics 24 V DC					= G24						

## Preferred types

Solenoid 0.8 A	
Type	Material Number
DRE10Z-1X/180XYMG24-8NZ4M	0 811 402 153
DRE10Z-1X/315XYMG24-8NZ4M	0 811 402 154

## Symbol

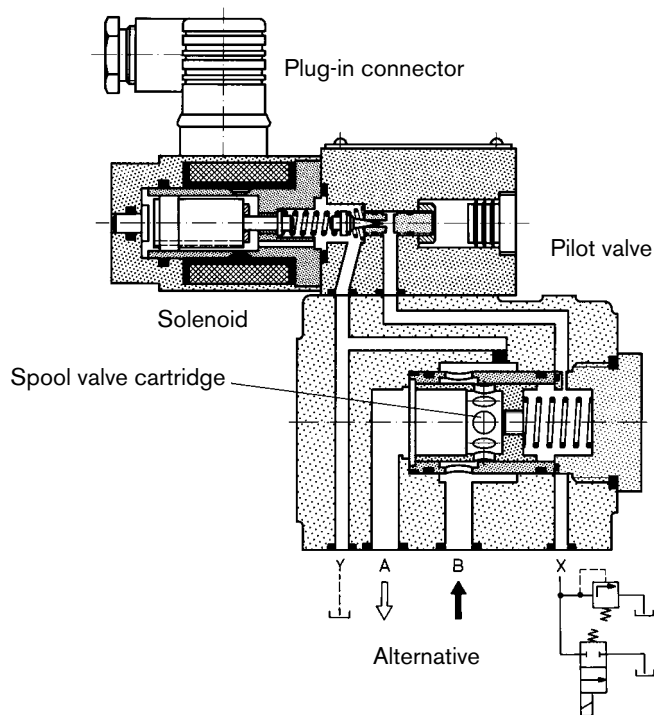
For external trigger electronics



## Function, sectional diagram

### General

Type DRE10Z proportional pressure reducing valves are pilot operated and are used to reduce system pressure. The valves are actuated by a proportional solenoid without position control acting against spring force at the cone. The valve body contains a logic element (spool valve) of the "normally open" type. This is pilot operated and is in conical seat design.



### Basic principle



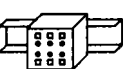

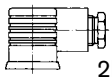
To adjust the system pressure, a setpoint is set in the trigger electronics. Based on this setpoint, the electronics control the solenoid coil with regulated PWM (pulse-width-modulated) current. The current is modulated with a dither, to ensure minimal hysteresis.

The proportional solenoid converts the current to a mechanical force, which acts on a main spring in the pilot valve via the armature plunger. The pilot valve is supplied with oil at a flow rate of <math>< 0.8 \text{ l/min}</math> via a bore in the main spool. The " $p_{\text{max}}$ " pressure stage is determined by the cone and seating bore configuration in the pilot valve.

### Pressure limitation for maximum safety

If a fault occurs in the electronics, so that the solenoid current ( $I_{\text{max}}$ ) 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-M10x80-10.9	Cheese-head bolts			2 910 151 309
Plug 	VT-SSPA1-508-20/V0	(0.8 A)	RE 30264	0 811 405 144
	VT-SSPA1-508-20/V0/I	(0.8 A)		0 811 405 162
Module 	VT-MSPA1-508-10/V0	(0.8 A)	RE 30222	0 811 405 126
Europe card 	VT-VSPA1-508-10/V0/RTP	(0.8 A)	RE 30109	0 811 405 081
Plug-in connector 	Plug-in connector 2P+PE (M16x1.5) included in scope of delivery, see also RE 08008			

### Testing and service equipment

Test box type VT-PE-TB1, see RE 30063

Current measuring adapter type VT-PA-5, see RE 30073

## Technical data

### General

Construction	Pilot stage	Poppet valve
	Main stage	Pressure reducing valve
	Valve cartridge	Spool valve, normally open
Actuation	Proportional solenoid without position control, external amplifier	
Connection type	Subplate, mounting hole configuration NG10 (ISO 5781-AG-06-2-A)	
Mounting position	Optional	
Ambient temperature range	°C	-20...+50
Weight	kg	7
Vibration resistance, test condition	Max. 25 g, shaken in 3 dimensions (24 h)	

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

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...+80
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 (at $Q_{min} = 1$ l/min)	bar	180      315
Minimum pressure (at $Q_{min} = 1$ l/min)	bar	6      8
Max. mechanical pressure limitation level, e.g. when solenoid current $I > I_{max}$	bar	< 190      < 325
Max. working pressure	bar	Port A, B: 315
		Port Y: ≤ 2 external pilot oil drain
		Port X: 315 relief port
Internal pilot oil flow	l/min	≤ 0.8
Max. flow	l/min	120 for $Q_{max}$ , see characteristic curves

### Electrical

Cyclic duration factor	%	100 %
Degree of protection	IP 65 to DIN 40050 and IEC 14434/5	
Solenoid connection	Unit plug DIN 43650/ISO 4400, M16x1.5 (2P+PE)	
Max. solenoid current	$I_{max}$	0.8 A
Coil resistance $R_{20}$	$\Omega$	22
Max. power consumption at 100% load and operating temperature	VA	25

### Static/Dynamic<sup>2)</sup>

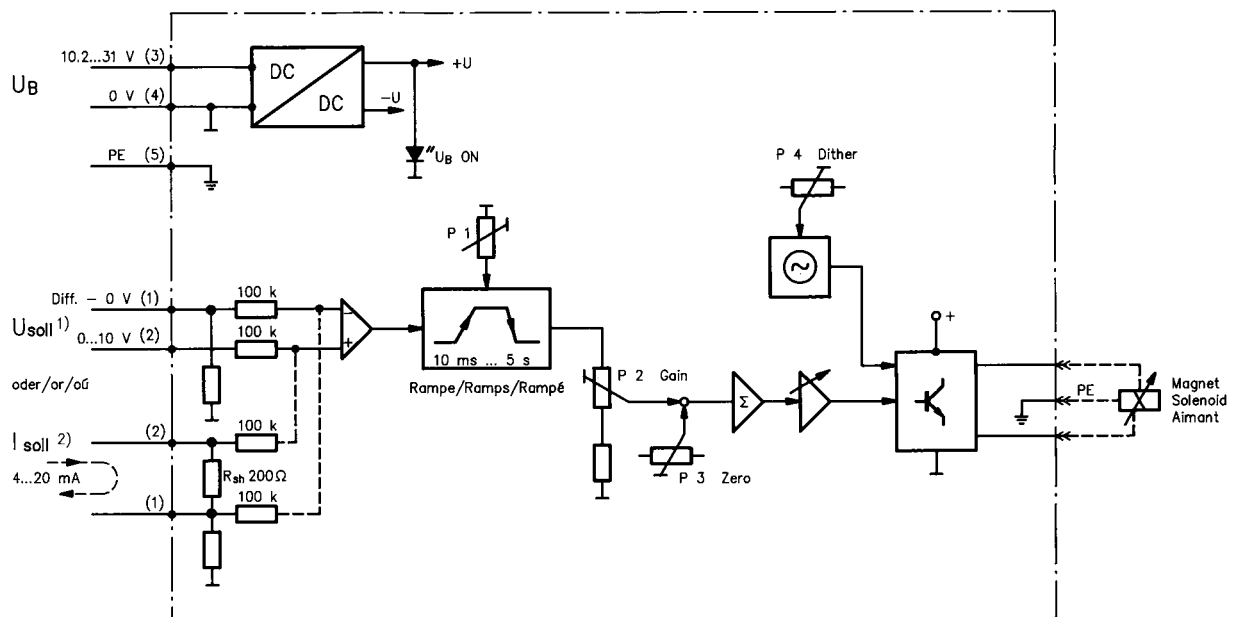
Hysteresis	%	≤ 5
Manufacturing tolerance for $p_{max}$	%	≤ 10
Response time 100% signal change	ms	≈ 90 dependent on dead volume or system volume

<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.

<sup>2)</sup> All characteristic values ascertained using amplifier 0 811 405 081 for the 0.8 A solenoid.

## Valve with external trigger electronics (plug, RE 30264)

### Circuit diagram/pin assignment



1) Version with 0...+10 V signal

2) Version with 4...20 mA signal

### Connection/calibration

P1 – Ramp time

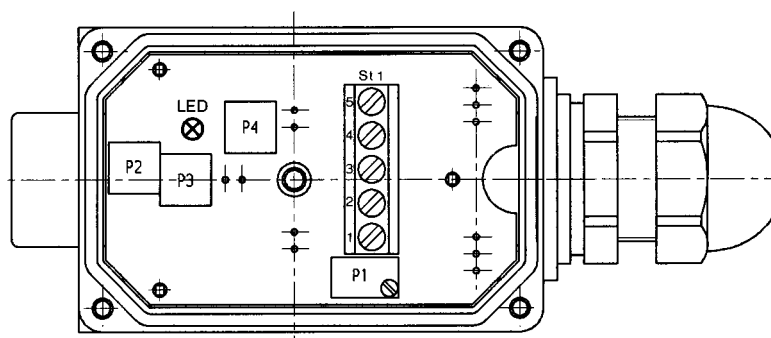
P2 – Sensitivity

P3 – Zero

P4 – Dither frequency

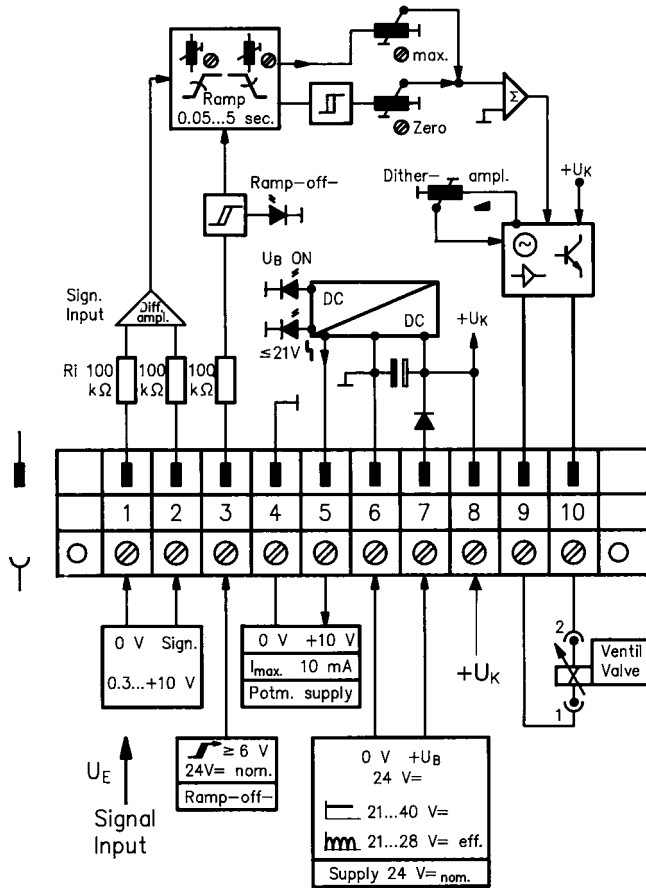
St1 – Terminal

LED –  $U_B$  display

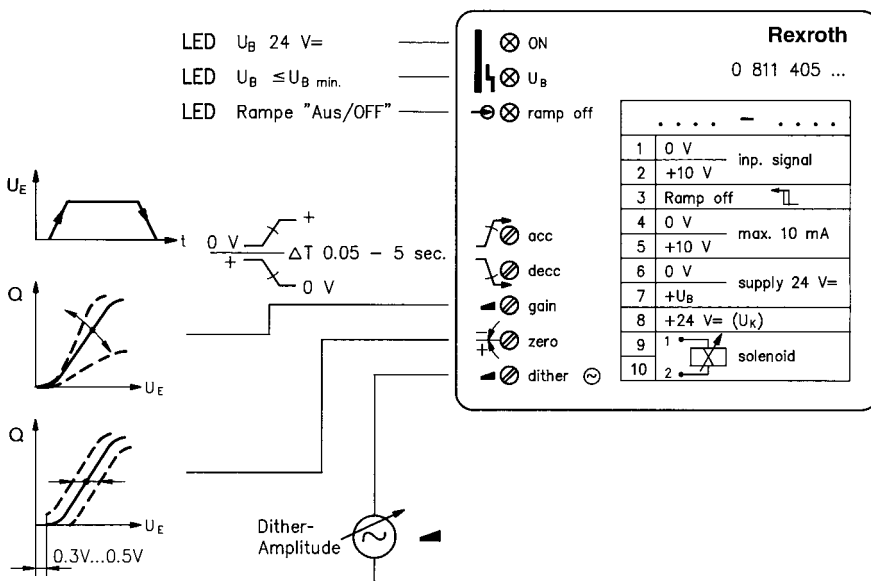


# Valve with external trigger electronics (module, RE 30222)

## Circuit diagram/pin assignment

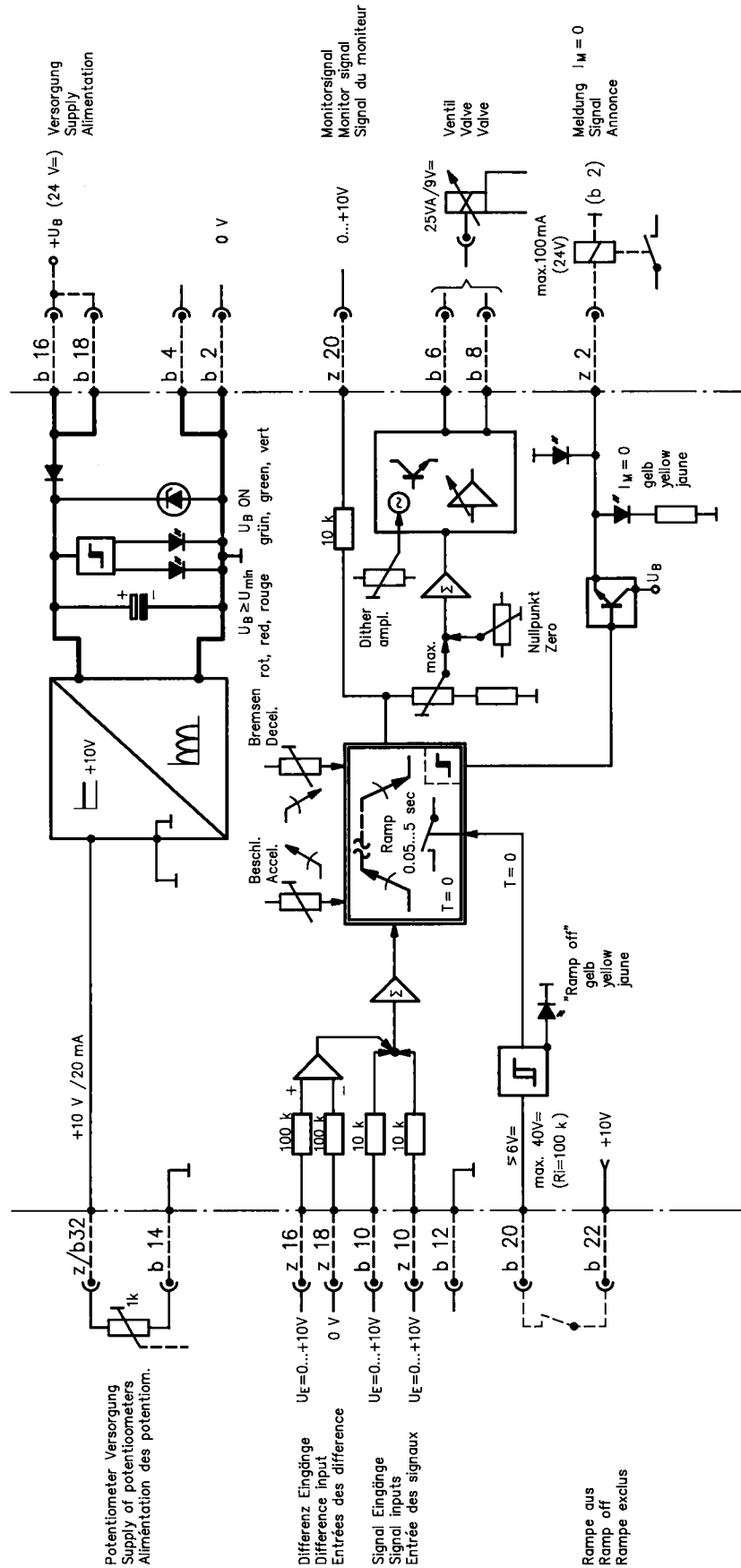


## Front view/calibration



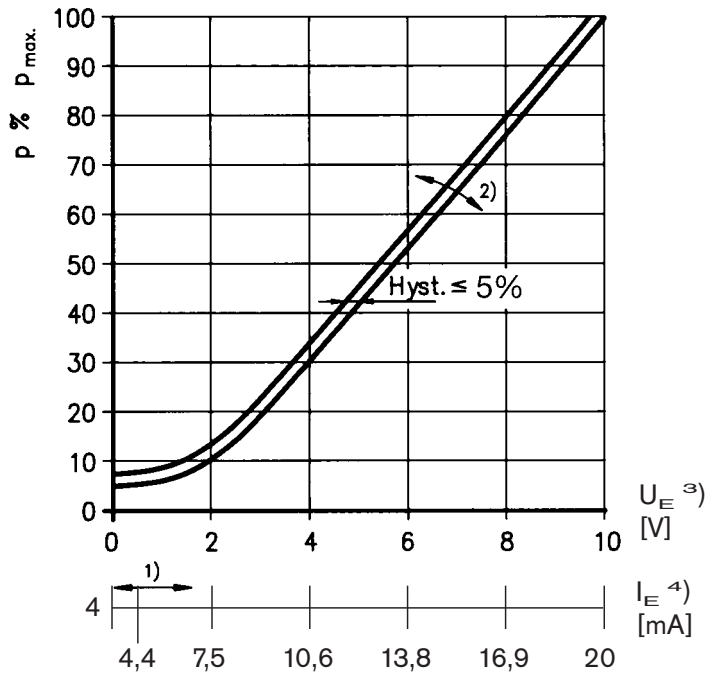
Valve with external trigger electronics (europe card, RE 30109)

Circuit diagram/pin assignment



**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

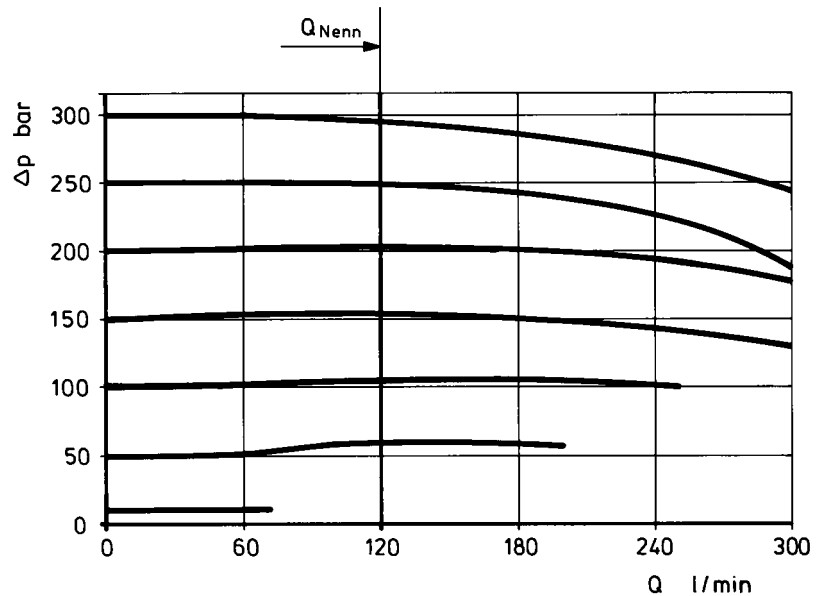
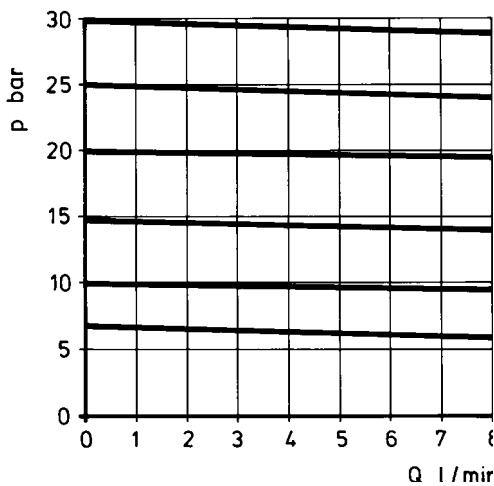


**Valve amplifier**

- 1) Zero adjustment
- 2) Sensitivity adjustment
- 3) Version:  $U_E = 0 \dots +10 \text{ V}$
- 4) Version:  $I_E = 4 \dots 20 \text{ mA}$

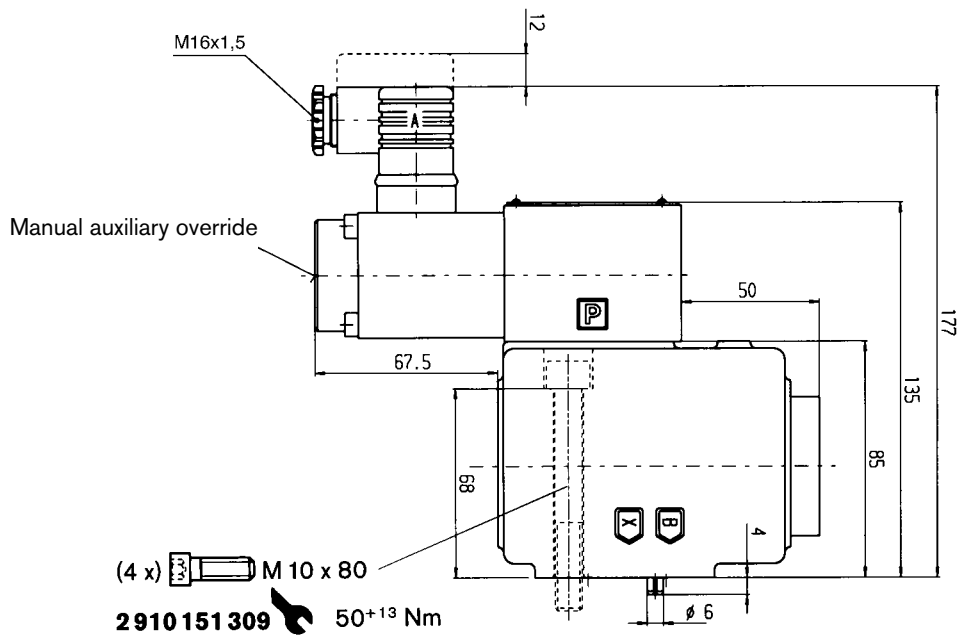
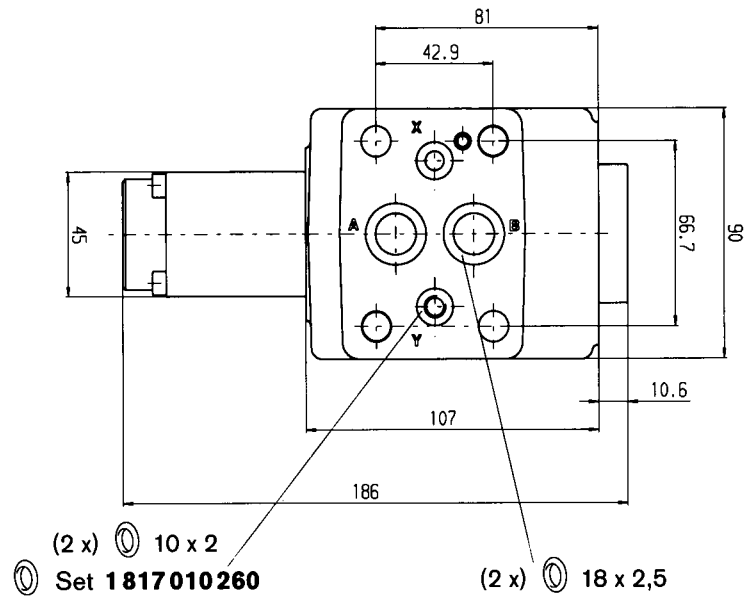
Pressure in port A as a function of the main stage nominal flow rate

$p = f(Q)$





**Unit dimensions** (nominal dimensions in mm)

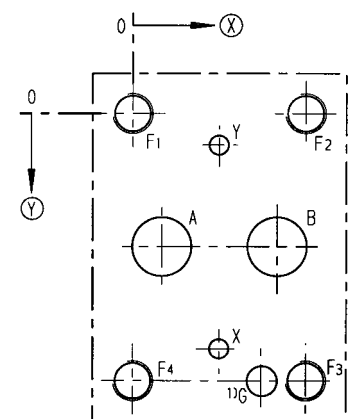
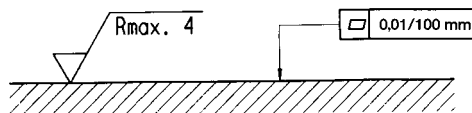


**Mounting hole configuration: NG10 (ISO 5781-AG-06-2-A)**

For subplates see catalog sheet RE 45055

- 1) Deviates from standard
- 2) Thread depth:  
 Ferrous metal 1.5 x Ø\*  
 Non-ferrous 2 x Ø
- \* NG10 min. 10.5 mm

Required surface quality  
of mating component



	A	B	X	Y	G	F <sub>1</sub>	F <sub>2</sub>	F <sub>3</sub>	F <sub>4</sub>
⊗	7.2	35.8	21.4	21.4	31.8	0	42.9	42.9	0
⊙	33.35	33.35	58.7	7.9	66.7	0	0	66.7	66.7
∅	14.7	14.7	4.8	4.8	7.5	M10 <sup>2)</sup>	M10 <sup>2)</sup>	M10 <sup>2)</sup>	M10 <sup>2)</sup>

## Notes

---

## Notes

---

Bosch Rexroth AG  
Hydraulics  
Zum Eisengießer 1  
97816 Lohr am Main, Germany  
Telefon +49 (0) 93 52 / 18-0  
Telefax +49 (0) 93 52 / 18-23 58  
documentation@boschrexroth.de  
www.boschrexroth.de

© This document, as well as the data, specifications and other information set forth in it, are the exclusive property of Bosch Rexroth AG. It may not be reproduced or given to third parties without its consent.

The data specified above only serve to describe the product. No statements concerning a certain condition or suitability for a certain application can be derived from our information. The information given does not release the user from the obligation of own judgement and verification. It must be remembered that our products are subject to a natural process of wear and aging.

## Notes

---

Bosch Rexroth AG  
Hydraulics  
Zum Eisengießer 1  
97816 Lohr am Main, Germany  
Telefon +49 (0) 93 52 / 18-0  
Telefax +49 (0) 93 52 / 18-23 58  
documentation@boschrexroth.de  
www.boschrexroth.de

© This document, as well as the data, specifications and other information set forth in it, are the exclusive property of Bosch Rexroth AG. It may not be reproduced or given to third parties without its consent.  
The data specified above only serve to describe the product. No statements concerning a certain condition or suitability for a certain application can be derived from our information. The information given does not release the user from the obligation of own judgement and verification. It must be remembered that our products are subject to a natural process of wear and aging.