

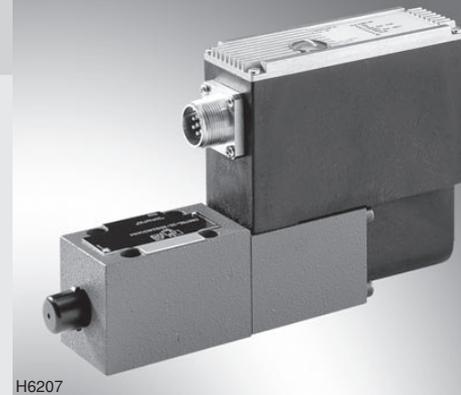
# Proportional pressure relief valve

**RE 29168/09.08**  
Replaces: 11.99

1/10

## Type DBETRE

Size 6  
 Component series 2X  
 Maximum operating pressure 350 bar  
 Maximum flow 3 l/min



H6207

## Table of contents

Content	Page
Features	1
Ordering code	2
Standard types	2
Symbol	2
Function, section	3
Technical data	4
Electrical connection	5
Integrated electronics (OBE)	6
Characteristic curves	7 and 8
Unit dimensions	9

## Features

- Direct operated valve for limiting a system pressure
- Actuation by proportional solenoid with position transducer
- For subplate mounting:  
Porting pattern to ISO 4401-03-02-0-05 without bore for locating pin
- Integrated electronics (OBE)
  - Low tolerance of the command value/pressure characteristic curve
  - Low hysteresis
  - Good repeatability
- Electrical connection using plug-in connection to DIN EN 175201-804

Information on available spare parts:  
[www.boschrexroth.com/spc](http://www.boschrexroth.com/spc)

## Ordering code

DBETRE	-2X/	G24	K31	A1		*
--------	------	-----	-----	----	--	---

Proportional pressure relief valve with integrated electronics (OBE)

Component series 20 to 29 (20 to 29: unchanged installation and connection dimensions)

**Pressure rating**

Up to 30 bar	= 30
Up to 80 bar	= 80
Up to 180 bar	= 180
Up to 250 bar	= 250
Up to 315 bar	= 315
Up to 350 bar	= 350

Further details in clear text

**Seal material**

M = NBR seals, suitable for mineral oil (HL, HLP) to DIN 51524  
 V = FKM seals

**Electronics interface**

A1 = Command value 0 to 10 V

**Electrical connection**

K31 = Without mating connector, With component plug to DIN EN 175201-804

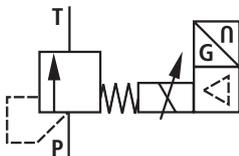
**Supply voltage of integrated electronics (OBE)**

G24 = DC voltage 24 V

## Standard types

Type	Material no.
DBETRE-2X/80G24K31A1M	R900966782
DBETRE-2X/180G24K31A1M	R900969416
DBETRE-2X/250G24K31A1M	R900969417
DBETRE-2X/315G24K31A1M	R900969418

## Symbol



## Function, section

Proportional pressure relief valves of type DBETRE are direct operated valves of seat design and serve to limit a system pressure.

With these valves, the system pressure can be infinitely adjusted in dependence on the command value applied to the integrated electronics (OBE):

### Technical construction:

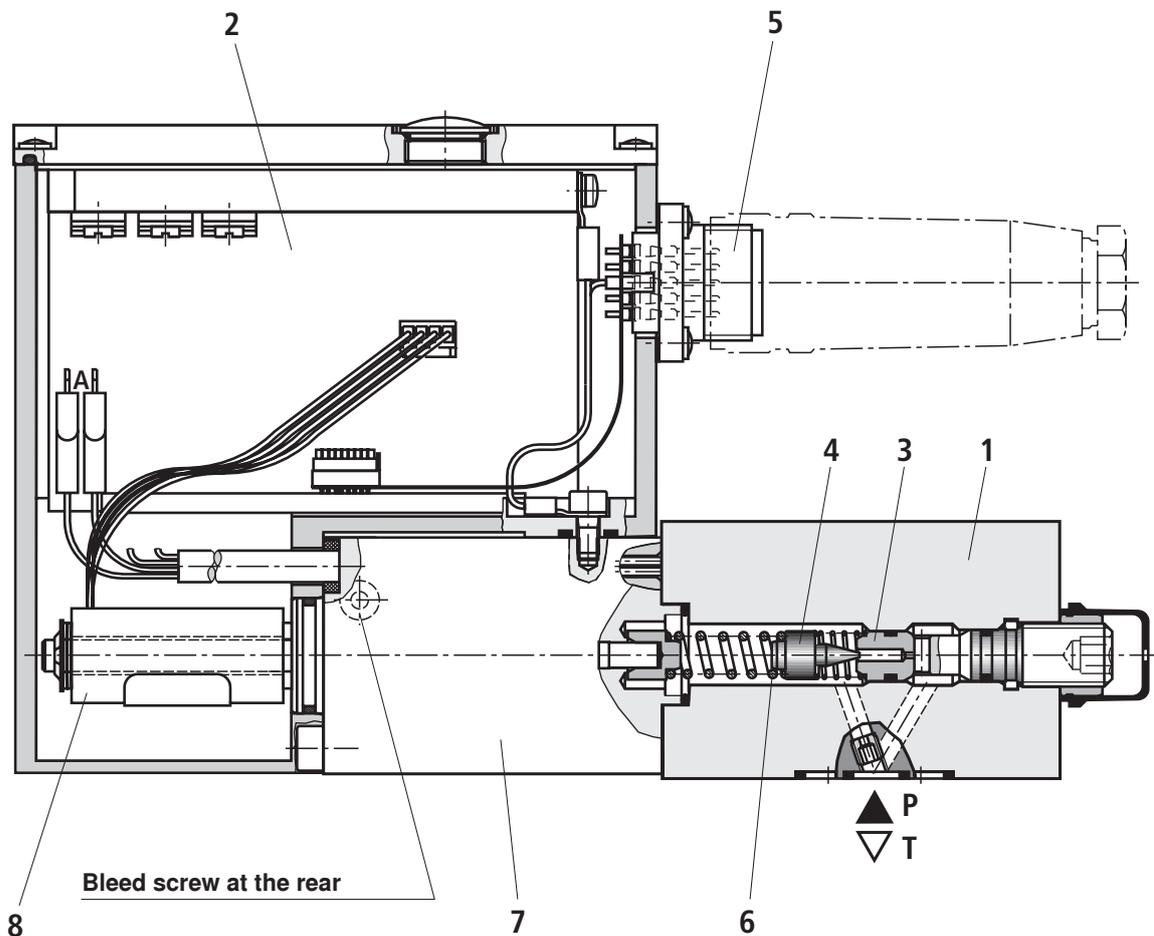
The valve consists of the following main component parts:

- Housing (1)
- Proportional solenoid (7) with position transducer (8) and integrated electronics (OBE) (2)
- Valve seat (3)
- Valve poppet (4)
- Compression spring (6)

### Functional description:

- The pressure is adjusted by applying the command value to component plug (5).

- Via the integrated electronics (OBE) the command value input influences the position of the solenoid armature of proportional solenoid (7) and hence the pretensioning rate of compression spring (6).
- Compression spring (6) pushes valve poppet (4) against valve seat (3). The system pressure present in channel P acts on valve poppet (4) and hence counteracts the force of compression spring (6) or proportional solenoid (2). When the hydraulic force that acts on valve poppet (4) equals the spring force, the valve adjusts the pressure to the set value by lifting valve poppet (4) off valve seat (3), thus allowing hydraulic fluid to flow from P to T.
- Any position deviations of the solenoid armature from the command value are corrected by the closed-loop position control.
- The closed-loop position control compensates for magnetic friction. The advantages are low hysteresis and good repeatability.
- In the case of a command value of zero or a failure of the power supply, the system is set to the lowest pressure.
- For information on the integrated electronics (OBE), see page 6.



**Technical data** (for applications outside these parameters, please consult us!)**General**

Weight	kg	2.4
Installation position		Optional, preferably as shown on page 3
Ambient temperature range	°C	-20 to +50
Storage temperature range	°C	-20 to +80

**Hydraulic** (measured with HLP46,  $\vartheta_{oil} = 40 \text{ °C} \pm 5 \text{ °C}$ )

Maximum operating pressure	Port P	bar	380
Maximum set pressure	Pressure rating 30 bar	bar	The maximum set pressure depends on the flow. See characteristic curves of pressure setting in bar / command value voltage in %, pages 7 and 8)
	Pressure rating 80 bar	bar	
	Pressure rating 180 bar	bar	
	Pressure rating 250 bar	bar	
	Pressure rating 315 bar	bar	
	Pressure rating 350 bar	bar	
Min. set pressure with zero command value		bar	See characteristic curves on pages 7 and 8
Return flow pressure (port T)			Separately and pressureless to tank
Maximum flow	Pressure rating 30 bar	l/min	3
	Pressure rating 80 bar	l/min	2.5
	Pressure rating 180 bar	l/min	2.5
	Pressure rating 250 bar	l/min	2.5
	Pressure rating 315 bar	l/min	2
	Pressure rating 350 bar	l/min	2
Hydraulic fluid			Mineral oil (HL, HLP) to DIN 51524, further hydraulic fluids on request!
Hydraulic fluid temperature range		°C	-20 to +70
Viscosity range		mm <sup>2</sup> /s	15 to 380
Permissible maximum degree of contamination of the hydraulic fluid, cleanliness class to ISO 4406 (c)			Class 20/18/15 <sup>1)</sup>
Hysteresis		%	≤ 1 of maximum pressure setting
Range of inversion		%	≤ 0.2 of maximum pressure setting
Response sensitivity		%	≤ 0.2 of maximum pressure setting
Manufacturing tolerance		%	±1.5 of maximum pressure setting
Step response ( $T_u + T_d$ ) 0 → 100 % and 100 % → 0		ms	30 to 120 (depending on system)

**Electrical**

Supply voltage	Nominal voltage	VDC	24
Current consumption		A	2.8 (maximum 3.35)
Command value input		V	0 to 10
Actual value output		V	0 to 10
Type of protection of the valve to EN 60529			IP 65 with mating connector mounted and locked

**Note:**

For details on environment testing in the fields of EMC (electromagnetic compatibility), climate and mechanical stress, see RE 29067-U (declaration on environmental compatibility).

<sup>1)</sup> The cleanliness classes specified for components must be adhered to in hydraulic systems. Effective filtration prevents malfunction and, at the same time, prolongs the service life of components.

For the selection of filters, see data sheets RE 50070, RE 50076, RE 50081, RE 50086 and RE 50088.

## Electrical connection (dimensions in mm)

Component plug pinout	Contact	Pinout of interface "A1"
Supply voltage	A	24 VDC, ( $u(t) = 19.4 \text{ V to } 35 \text{ V}$ ), $I_{\text{nom}} = 2.8 \text{ A}$ ; $I_{\text{max}} = 3.35 \text{ A}$
	B	0 V
Actual value reference potential	C	0 V reference contact F; $R_i > 50 \text{ k}\Omega$
Differential amplifier input	D	0 to 10 V command value; $R_i > 50 \text{ k}\Omega$
	E	0 V reference potential; $R_i > 50 \text{ k}\Omega$
Measuring output (actual value)	F	0 to 10 V actual value ( $I_{\text{max}} = 2 \text{ mA}$ )
Protective earth conductor	PE	Connected to solenoid and valve body

**Command value:** Positive command value at D and reference potential at E causes an increase in pressure

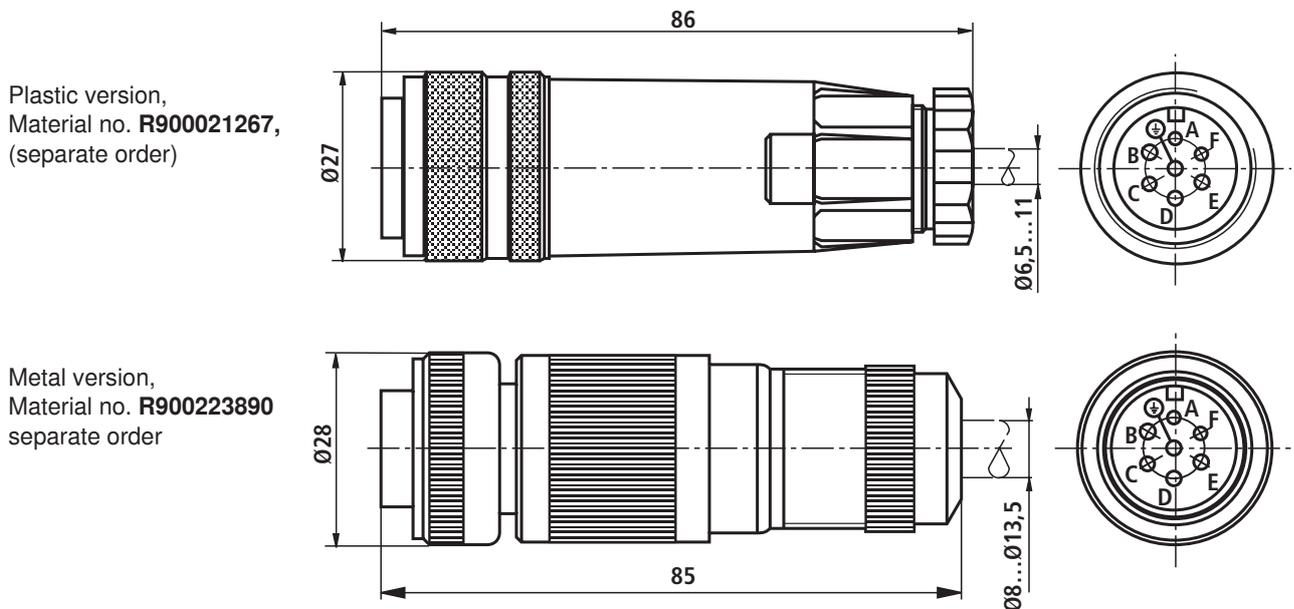
**Actual value:** Positives signal at F and reference potential at C means an increase in pressure.  
Connect contact C on the control side (star-shaped) to  $\perp$ .

**Connection cable:** Recommendation:

- Up to a cable length of 25 m type LiYCY 7 x 0.75 mm<sup>2</sup>
- Up to a cable length of 50 m type LiYCY 7 x 1.0 mm<sup>2</sup>

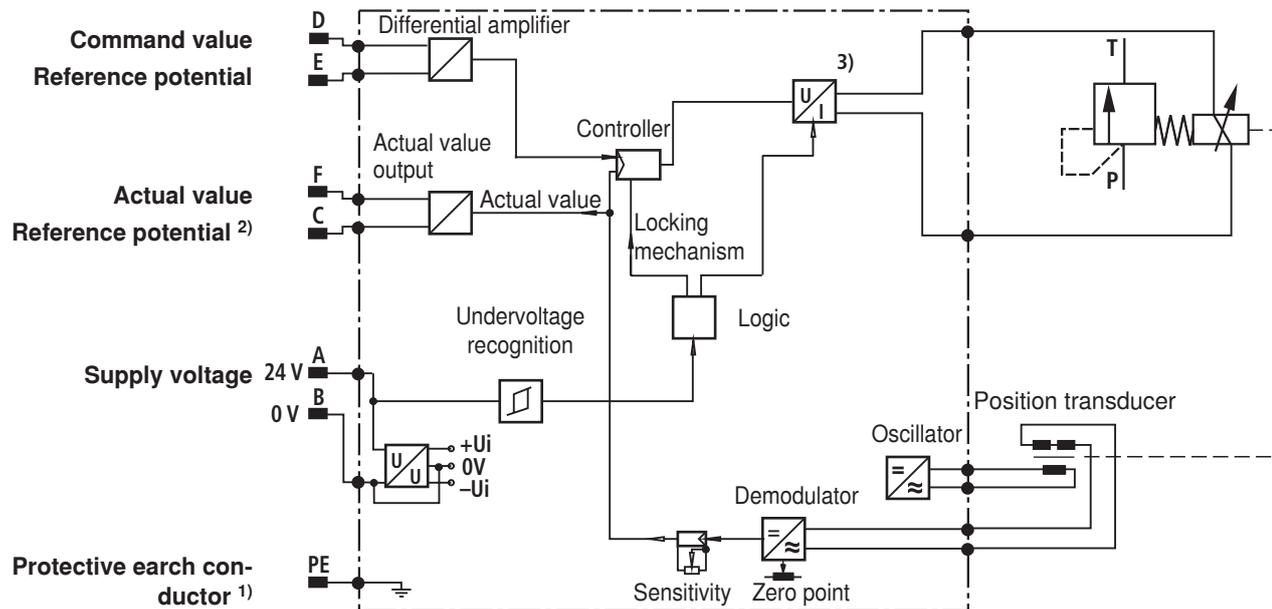
Outer diameter 6.5 to 11 mm (mating connector made of plastic)  
Outer diameter 8 to 13.5 mm (mating connector made of metal)  
Connect shield to  $\perp$  only on the supply side.

### Mating connectors to DIN EN 175201-804, soldered contacts for cable cross-section of 0.5 to 1.5 mm<sup>2</sup>



## Integrated electronics (OBE)

### Block circuit diagram / pinout of integrated electronics (OBE)



#### Note:

Electrical signals (e.g. actual value) brought out via integrated electronics (OBE) must not be used for switching off safety-relevant machine functions! (See also European standard "Safety requirements for fluid power systems and components - hydraulics", EN 982!)

<sup>1)</sup> PE connection is connected to heat sink and valve housing

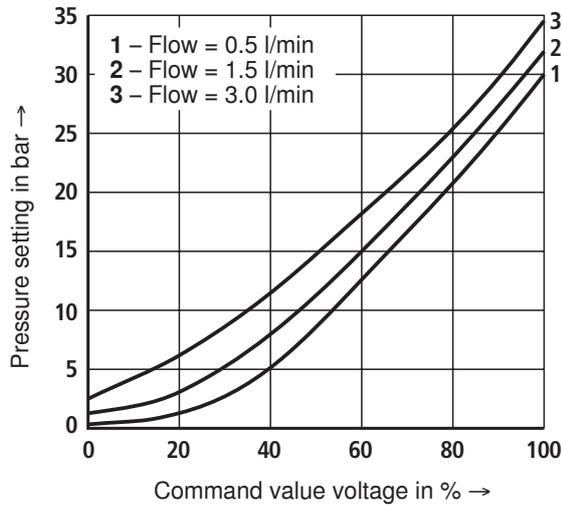
<sup>2)</sup> Connect connection C to  $\perp$  on the control side

<sup>3)</sup> Current-regulated output stage

**Characteristic curves** (measured at  $v = 41 \text{ mm}^2/\text{s}$  and  $\vartheta = 50 \text{ }^\circ\text{C}$ )

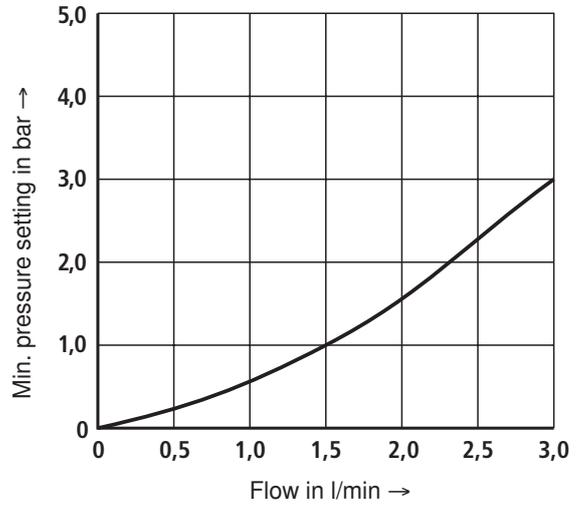
**Pressure in port P in dependence upon the command value**

**Pressure rating 30 bar**

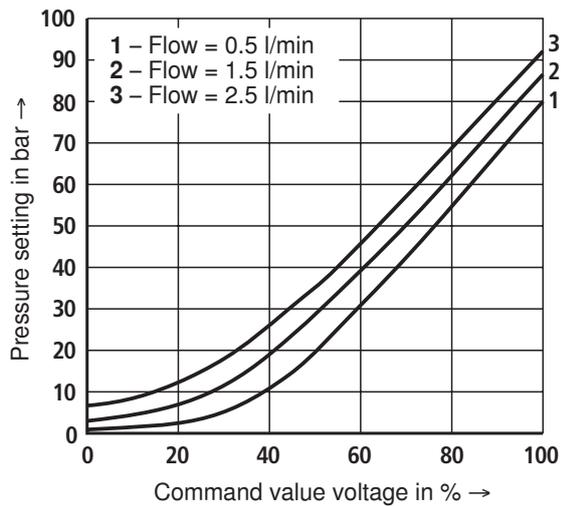


**Minimum pressure setting in P with 0 command value**

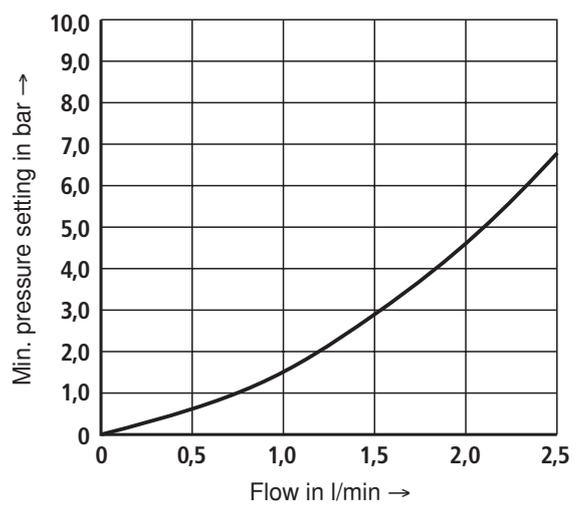
**Pressure rating 30 bar**



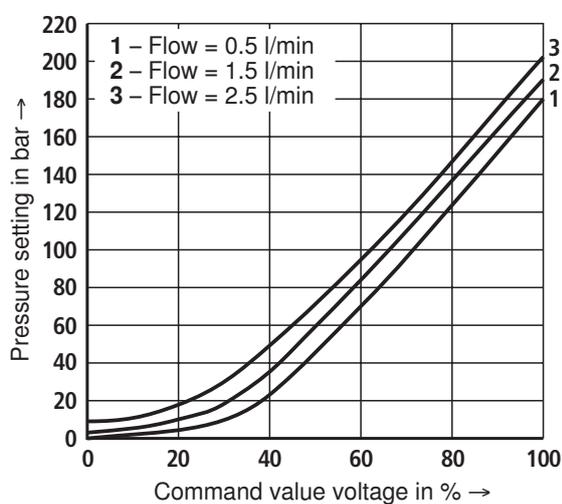
**Pressure rating 80 bar**



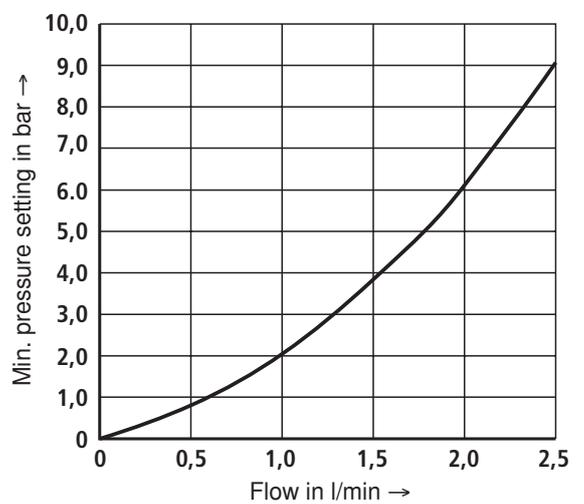
**Pressure rating 80 bar**



**Pressure rating 180 bar**



**Pressure rating 180 bar**

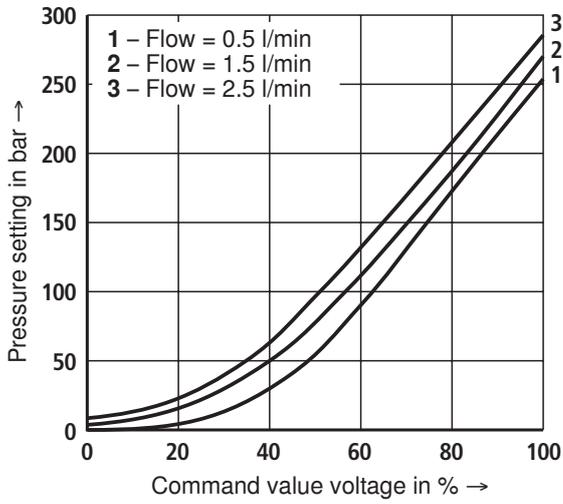


**Characteristic curves** (measured at  $v = 41 \text{ mm}^2/\text{s}$  and  $\vartheta = 50 \text{ }^\circ\text{C}$ )

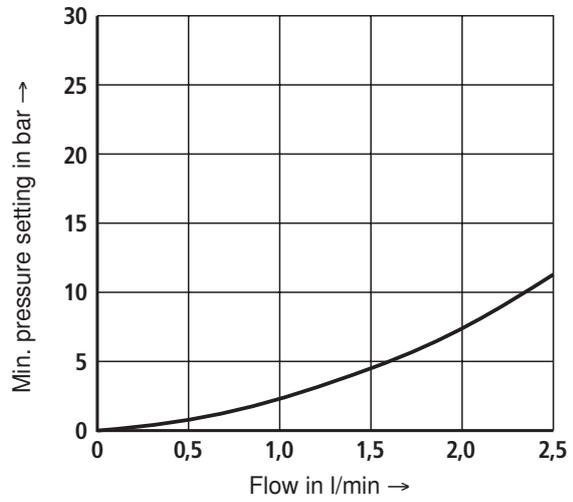
**Pressure in port P in dependence upon the command value**

**Minimum pressure setting in P with 0 command value**

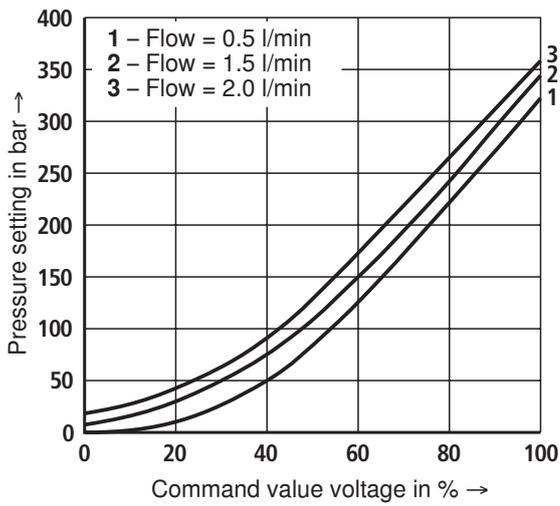
**Pressure rating 250 bar**



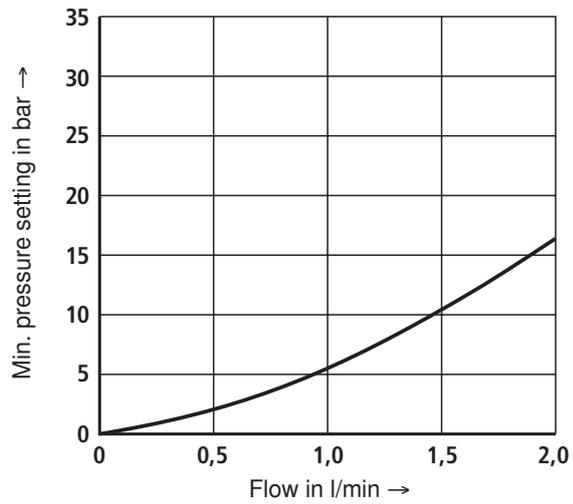
**Pressure rating 250 bar**



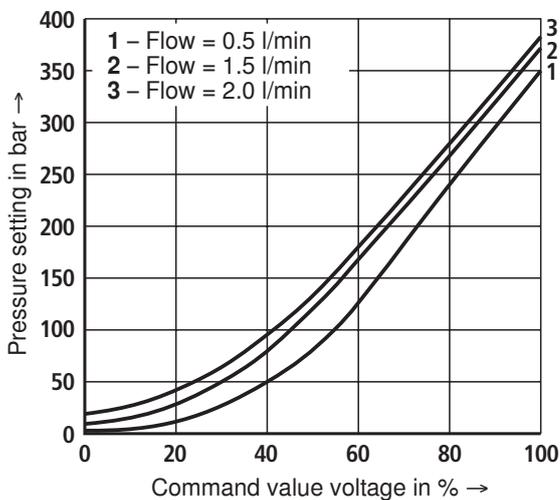
**Pressure rating 315 bar**



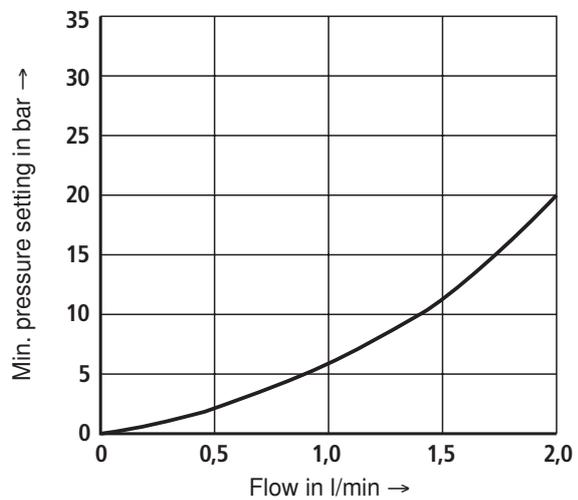
**Pressure rating 315 bar**



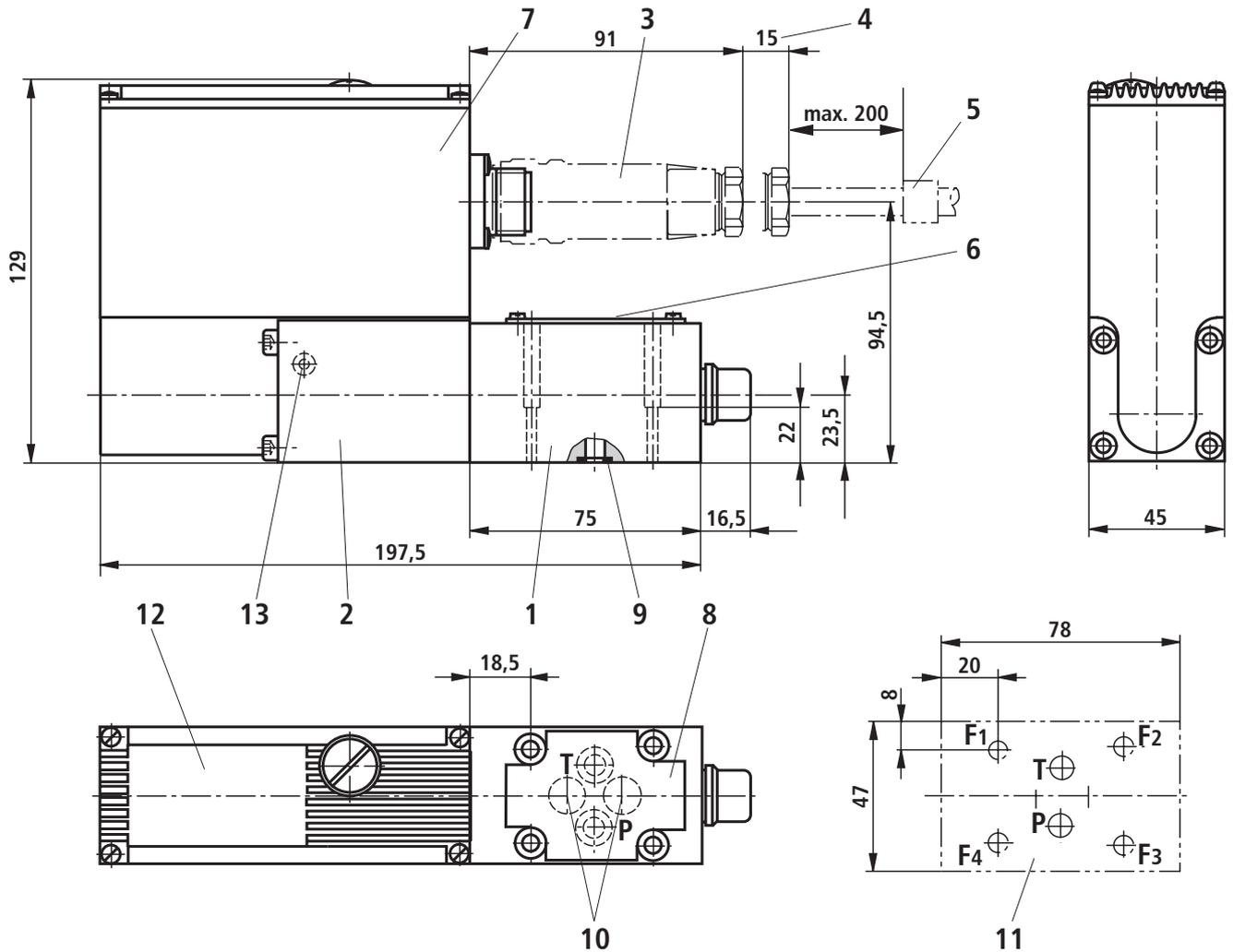
**Pressure rating 350 bar**



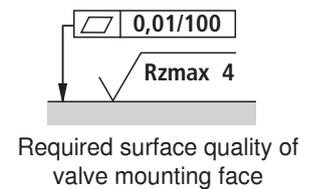
**Pressure rating 350 bar**



## Unit dimensions (dimensions in mm)



- 1 Valve housing
- 2 Proportional solenoid with position transducer
- 3 Mating connector to DIN EN 175201-804, plastic version, separate order, see page 5
- 4 Space required to remove mating connector
- 5 Cable mount
- 6 Nameplate
- 7 Integrated electronics (OBE) with component plug
- 8 Nameplate
- 9 Identical seal rings for ports P and T
- 10 Blind countersink
- 11 Machined valve mounting face, porting pattern to ISO 4401-03-02-0-05  
Deviating from standard:
  - “A” and “B” channels not bored
  - No bore provided for locating pin
- 12 Label with indication of pinout of items 3 and 7
- 13 Bleed screw



### Valve mounting screws

(not included in the scope of supply)

#### 4 hexagon socket head cap screws

ISO4762-M5X30-10.9-f1Zn-240h-L

(friction coefficient, total: 0.09-0.14 to VDA 235-101),  
 $M_T = 7 \text{ Nm} \pm 10\%$

Material no.: **R913000316**

### Subplates to data sheet RE 45052

(not included in the scope of supply)

G 341/01 (G1/4), Material no. **R900424447**

G 341/60 (G1/4), Material no. **R901027119**

## Notes

---

Bosch Rexroth AG  
Hydraulics  
Zum Eisengießer 1  
97816 Lohr am Main, Germany  
Phone +49 (0) 93 52 / 18-0  
Fax +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 judgment 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  
Phone +49 (0) 93 52 / 18-0  
Fax +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 judgment 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  
Phone +49 (0) 93 52 / 18-0  
Fax +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 judgment and verification. It must be remembered that our products are subject to a natural process of wear and aging.