Proportional pressure relief valve, direct-operated

Type DBETX

RE 29161
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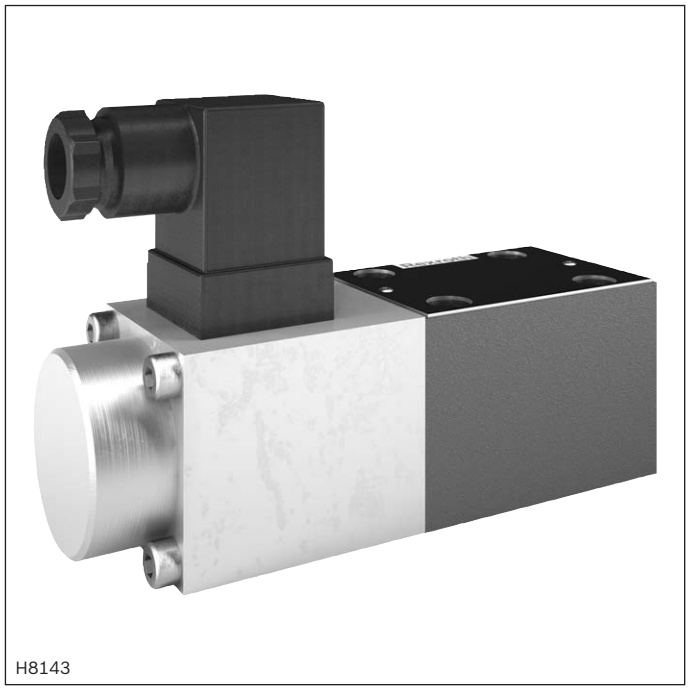

H8143

- Size 6
- Component series 1X
- Maximum operating pressure 315 bar
- Maximum flow 1.5 l/min

Features

- Subplate mounting
- Porting pattern according to ISO 4401-03-02-0-05 (however, without locating hole)
- Adjustable by solenoid current
- Solenoid variants I_{max} = 0.8 A or I_{max} = 2.5 A
- Maximum pressure limitation, even with defective electronics
- External control electronics with ramp and valve calibration

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Ordering code

01	02		03		04	05		06	07	08	09	10
DBET	**X**	**–**	**1X**	**/**		**G24**	**–**		**N**	**Z4**	**M**	*****

01	Proportional pressure relief valve	**DBET**
02	Porting pattern according to ISO 4401-03-02-0-05	**X**
03	Component series 10 ... 19 (10 ... 19: unchanged installation and connection dimensions)	**1X**

Maximum pressure rating

04	50 bar	**50**
	80 bar	**80**
	180 bar	**180**
	250 bar	**250**
	315 bar	**315**

Supply voltage of the control electronics

05	24 V DC voltage	**G24**

Maximum solenoid current

06	0.8 A	**8**
	2.5 A	**25**
07	**With** manual override	**N**

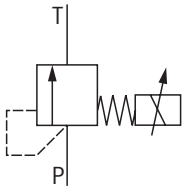
Electrical connection

08	Connector 3-pole (2 + PE) according to DIN EN 175301-803, mating connector included in the scope of delivery	**Z4**

Seal material

09	NBR seals	**M**
	Observe compatibility of seals with hydraulic fluid used. (Other seals upon request)	
10	Further details in the plain text	

Symbols



Function, section

General information

Proportional pressure relief valves type DBETX are remote control valves (pilot control valves) in poppet seat design. They are used for limiting a system pressure.

Operation is effected by means of a proportional solenoid. The interior of the solenoid is connected to port T and is filled with the hydraulic fluid.

These valves enable stepless adjustment of the system pressure to be limited by means of control electronics dependent on the solenoid current and at a flow ≤ l/min remaining as constant as possible.

The valves mainly consist of the housing (1), a proportional solenoid (2), the valve seat (3) and the valve poppet (4).

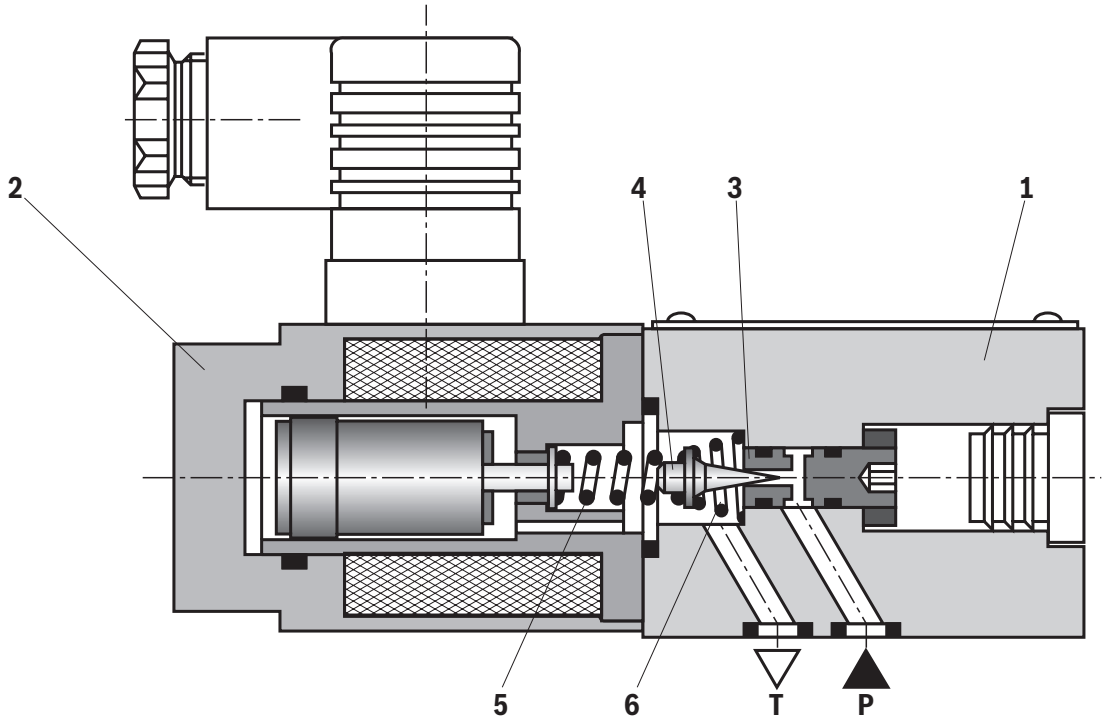
Basic principle

For the setting of the system pressure, a command value is specified at the control electronics.

Dependent on the command value, the solenoid coil is actuated by the electronics by means of a regulated PWM current (pulse width modulation). The proportional solenoid (2) converts the current into mechanical force that acts on the main spring (5) via the armature plunger. The compression spring (6) between poppet (4) and valve seat (3) supports stability and minimum residual pressure. The spring force at the poppet (4) and the pressure in the valve seat (3) are balanced at constant oil flow (0.7 ... 1 l/min). The maximum pressure rating is defined by the configuration of the poppet/seat bore.

Maximum pressure limitation

In case of failure or defect of control electronics and uncontrolled exceeding of the solenoid current (I_{max}), the maximum spring force remains decisive for pressure limitation.



Technical data
(for applications outside these values, please consult us!)

General							
Installation position			any				
Ambient temperature range		°C	–20 ... +50				
Weight		kg	1.9				
Vibration resistance, test condition			max. 25 g, room vibration test in all directions (24 h)				

Hydraulic							
Maximum operating pressure [1]	▶ Port P	bar	315 [2]				
	▶ Port T		250				
Maximum set pressure [1]		bar	50	80	180	250	315
Maximum pressure limitation, mechanical (e. g. at solenoid current $I > I_{max}$)		bar	< 55	< 85	< 186	< 258	< 325
Minimum set pressure [1]		bar	see characteristic curves on page 6				
Rated flow		l/min	1				
Maximum flow		l/min	1.5				
Hydraulic fluid			see table on page 5				
Hydraulic fluid temperature range		°C	–20 ... +80				
Viscosity range	▶ Recommended	mm^2/s	20 ... 100				
	▶ Maximum admissible	mm^2/s	10 ... 800				
Maximum admissible degree of contamination of the hydraulic fluid, cleanliness class according to ISO 4406 (c)			Class 18/16/13 [3]				

[1] At rated flow 1 l/min

[2] 350 bar upon request

[3] The cleanliness classes specified for the components must be adhered to in hydraulic systems. Effective filtration prevents faults and simultaneously increases the life cycle of the components.
For the selection of filters, see www.boschrexroth.com/filter.

Technical data
(for applications outside these values, please consult us!)

Hydraulic fluid		Classification	Suitable sealing materials	Standards	Data sheet
Mineral oils		HL, HLP	NBR, FKM	DIN 51524	90220
Bio-degradable	▶ Insoluble in water	HETG	FKM	ISO 15380	90221
		HEES	FKM		
	▶ Soluble in water	HEPG	FKM	ISO 15380	
Flame-resistant	▶ Water-free	HFDU (glycol base)	FKM	ISO 12922	90222
		HFDU (ester base)	FKM		
		HFDR	FKM		
	▶ Containing water	HFC (Fuchs: Hydrotherm 46M, Renosafe 500; Petrofer: Ultra Safe 620; Houghton: Safe 620; Union: Carbide HP5046)	NBR	ISO 12922	90223

☞ **Important information on hydraulic fluids:**

- For further information and data on the use of other hydraulic fluids, please refer to the data sheets above or contact us.
- There may be limitations regarding the technical valve data (temperature, pressure range, life cycle, maintenance intervals, etc.).
- The ignition temperature of the hydraulic fluid used must be 50 K higher than the maximum surface temperature.
- **Bio-degradable and flame-resistant – containing water:**
  If components with galvanic zinc coating (e.g. version "J3" or "J5") or parts containing zinc are used, small amounts of dissolved zinc may get into the hydraulic system and cause accelerated aging of the hydraulic fluid. Zinc soap may form as a chemical reaction product, which may clog filters, nozzles and solenoid valves - particularly in connection with local heat input.
- **Flame-resistant – containing water:**
  - Due to increased cavitation tendency with HFC hydraulic fluids, the life cycle of the component may be reduced by up to 30% as compared to the use with mineral oil HLP. In order to reduce the cavitation effect, it is recommended - if possible specific to the installation - to back up the return flow pressure in ports T to approx. 20% of the pressure differential at the component.
  - Dependent on the hydraulic fluid used, the maximum ambient and hydraulic fluid temperature must not exceed 50 °C. In order to reduce the heat input into the component, the command value profile is to be adjusted for proportional and high-response valves.

Electric			
Relative duty cycle	%	100 ED	
Maximum solenoid current I_{max}	A	0.8	2.5
Coil resistance R_{20}	Ω	22	3
Maximum power consumption (at 100% load and operating temperature)	VA	25	30
Protection class according to DIN EN 60529		IP65 (with mating connector mounted and locked)	

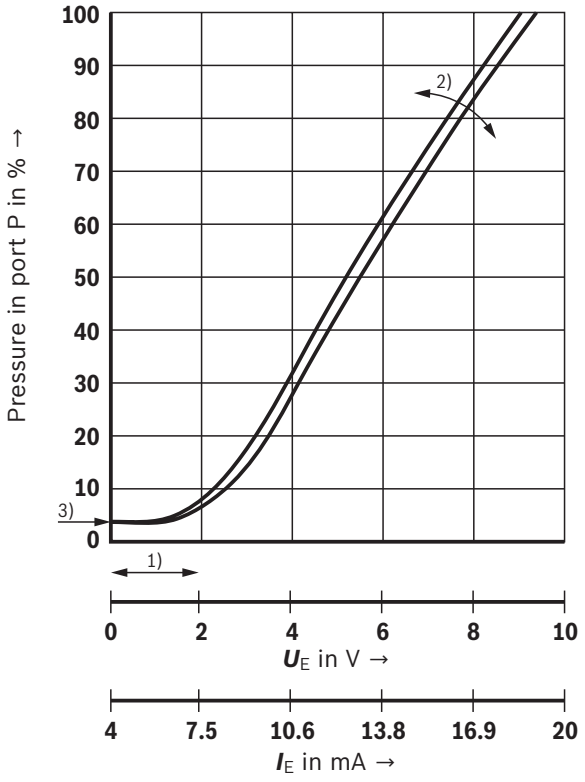
Static/dynamic			
Hysteresis		%	≤ 4
Range of inversion		%	≤ 3
Manufacturing tolerance		%	≤ 10
Actuating time (100% signal step)	▶ ON	ms	60
	▶ OFF	ms	70

Control electronics	
Analog amplifier in Europe format	VT-VSPA1 (data sheet 30109)
Analog connector amplifier	VT-SSPA1 (data sheet 30264)
Modular design	VT-MSPA1-2X (data sheet 30232)

Characteristic curves

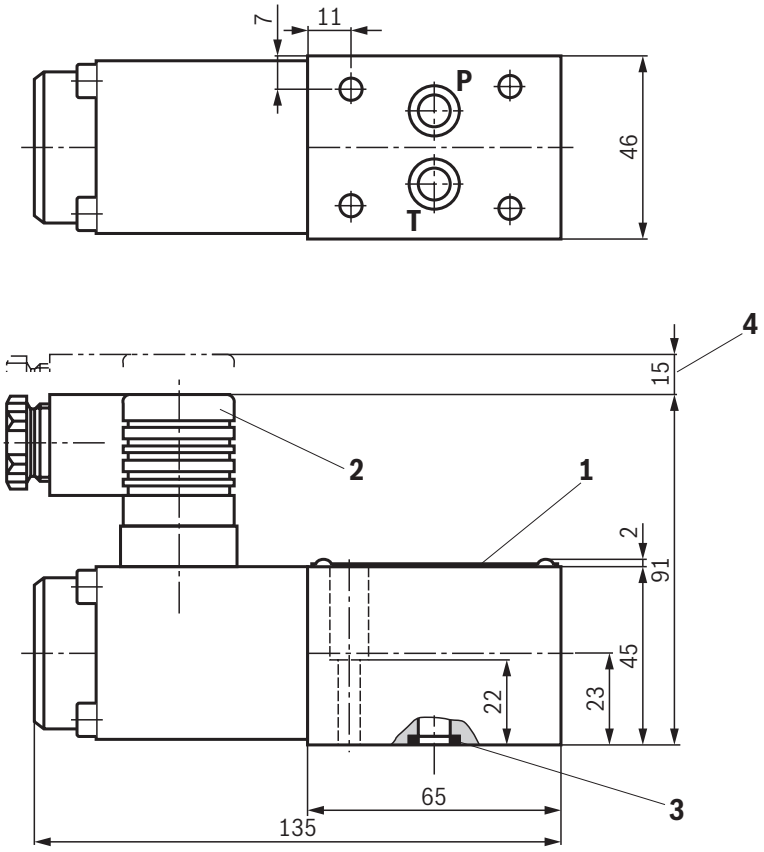
(measured with HLP46, ϑ_{oil} = 40 ±5 °C)

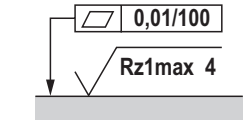
Pressure in port P dependent on the command value (rated flow 1 l/min)



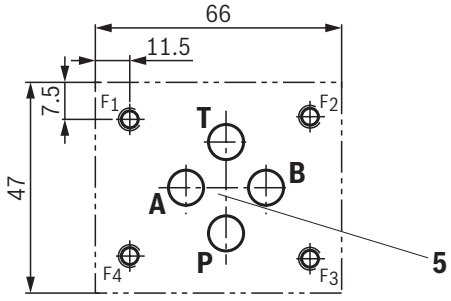
1) Zero point adjustment
2) Sensitivity adjustment
3) $p_{min} \leq 3\%\ p_{max}$

Dimensions
(dimensions in mm)





Required surface quality
of the valve contact surface



1 Name plate

2 Mating connectors 2-pole + PE, for connector "K4" (included within the scope of delivery)

3 Identical seal rings for ports A, B, P, T

4 Space required for removing the mating connector

5 Porting pattern according to ISO 4401-03-02-0-05 (however, without locating hole)
- ▶ Deviating from the standard:
  - – Ports P, A, B and T Ø8mm;
- ▶ Minimum screw-in depth:
  - – Ferrous metal 1.5 x Ø
  - – Non-ferrous 2 x Ø

Valve mounting screws (separate order)

Size	Quantity	Hexagon socket head cap screws	Material number
6	4	**ISO 4762 - M5 x 30 - 10.9-CM-Fe-Zn-5-An-T0-H-B** Friction coefficient μ_{total} = 0.09 ... 0.14; tightening torque M_A = 7 Nm ±10%	**R913022141**

Subplates (separate order) with porting pattern according to ISO 4401, see data sheet 45100.

Further information

▶ Electric amplifiers	Data sheet 30109
▶ Plug-in amplifier	Data sheet 30264
▶ Valve amplifier for proportional valves without electrical position feedback	Data sheet 30232
▶ Subplates	Data sheet 45100
▶ Hydraulic fluids on mineral oil basis	Data sheet 90220
▶ Environmentally compatible hydraulic fluids	Data sheet 90221
▶ Flame-resistant, water-free hydraulic fluids	Data sheet 90222
▶ Flame-resistant hydraulic fluids - containing water (HFAE, HFAS, HFB, HFC)	Data sheet 90223
▶ Mating connectors and cable sets for valves and sensors	Data sheet 08006
▶ Hydraulic valves for industrial applications	Operating instructions 07600-B
▶ Selection of filters	www.boschrexroth.com/filter
▶ Information on available spare parts	www.boschrexroth.com/spc

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