

Electric Drives
and Controls

Hydraulics

Linear Motion and
Assembly Technologies

Pneumatics

Service

Rexroth
Bosch Group

Pressure relief valve, direct operated

RE 25710/03.13
Replaces: 01.09

1/8

Type DBD..K

Size 4
Component series 1X
Maximum operating pressure 500 bar
Maximum flow 20 l/min



K4942-1

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Features

- Screw-in cartridge valve
- 8 pressure ratings
- 2 adjustment types, optionally:
 - Setscrew with hexagon socket
 - Hand wheel

Ordering code

	DBD		4	K	1X	V	*
Pressure relief valve, direct operated	= DBD						Further details in the clear text
Adjustment type							Type testing
Setscrew with hexagon socket	= S						No code = Without type testing
Hand wheel	= H						E = Type tested safety valve according to PED 97/23/EC
Size 4		= 4					Seal material
Screw-in cartridge valve			= K			V =	FKM seals (other seals upon request) Attention! Observe compatibility of seals with hydraulic fluid used!
Component series 10 to 19 (10 to 19: unchanged installation and connection dimensions)				= 1X			
Pressure rating							
Set pressure up to 25 bar					= 25		
Set pressure up to 50 bar					= 50		
Set pressure up to 100 bar					= 100		
Set pressure up to 200 bar					= 200		
Set pressure up to 315 bar					= 315		
Set pressure up to 350 bar					= 350		
Set pressure up to 420 bar					= 420		
Set pressure up to 500 bar					= 500		

Standard types

Type	Material number
DBDS 4 K1X/25V	R900377429
DBDS 4 K1X/50V	R900400423
DBDS 4 K1X/100V	R900529359
DBDS 4 K1X/200V	R900393389

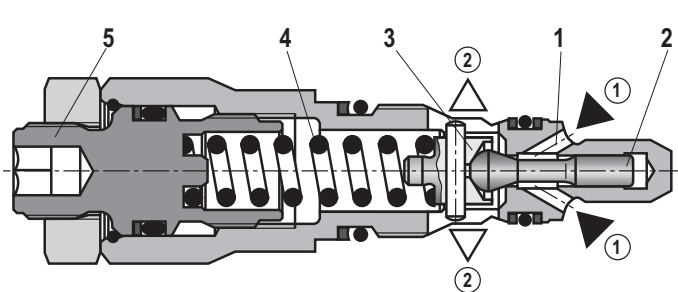
Type	Material number
DBDS 4 K1X/315V	R900528882
DBDS 4 K1X/420V	R900965798
DBDS 4 K1X/500V	R900969131

Further standard types and components are contained in the EPS (standard price list).

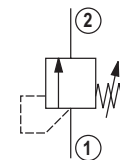
Function, section, symbol

The pressure valve type DBD.. K.. is a direct operated pressure relief valve to be installed in blocks. It is used to limit a system pressure. The system pressure can be set using the adjustment element (5).

In the initial position the valve is closed. The pressure in the main port ① acts on spring plate (3) via pilot line (1) and poppet (2). If the pressure in the main port ① rises above the value set at the compression spring (4), poppet (2) opens and the pressure fluid flows into the main port ②.



Type DBDS 4 K1X/V



① = Main port 1 (P)
② = Main port 2 (T)

Technical data (For applications outside these parameters, please consult us!)

general

Weight	kg	ca. 0.3
Installation position		Any
Ambient temperature range	°C	-20 to +80

hydraulic

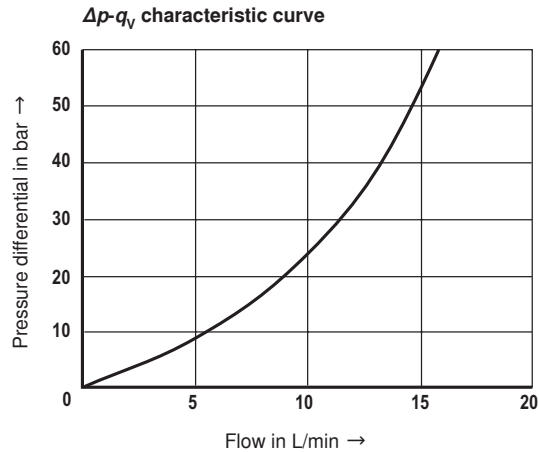
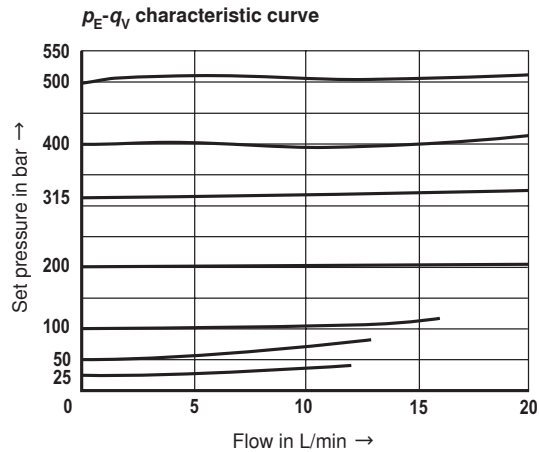
Maximum operating pressure	- Input	bar	500
	- Output	bar	315 (50 bar at set pressure 500 bar)
Maximum set pressure		bar	25; 50; 100; 200; 315; 350; 420; 500
Maximum volume flow		L/min	20
Hydraulic fluid			Mineral oil (HL, HLP) according to DIN51524; quickly bio-degradable hydraulic fluids according to VDMA 24568 (see also RE 90221); HETG (rape oil); HEPG (polyglycols); HEES (synthetic esters); other pressure fluids upon request
Hydraulic fluid temperature range		°C	-20 to +80
Viscosity range		mm ² /s	10 to 800
Maximum permitted degree of contamination of the hydraulic fluid - cleanliness class according to ISO 4406 (c)			Class 20/18/15 ¹⁾

¹⁾ The cleanliness classes specified for the components need to be met in hydraulic systems. Efficient filtration prevents malfunctions and at the same time prolongs the service life of components.

For the selection of the filters, see data sheets RE 50070, RE 50076, RE 50081, RE 50086, RE 50087, and RE 50088.

Deviating technical data for type tested safety valves, see page 7.

Characteristic curves (measured with HLP46, $\vartheta_{oil} = 40^\circ\text{C} \pm 5^\circ\text{C}$)



Attention!

The characteristic curves apply to initial pressure = zero over the entire volume flow range and were measured without housing resistance!

General notes

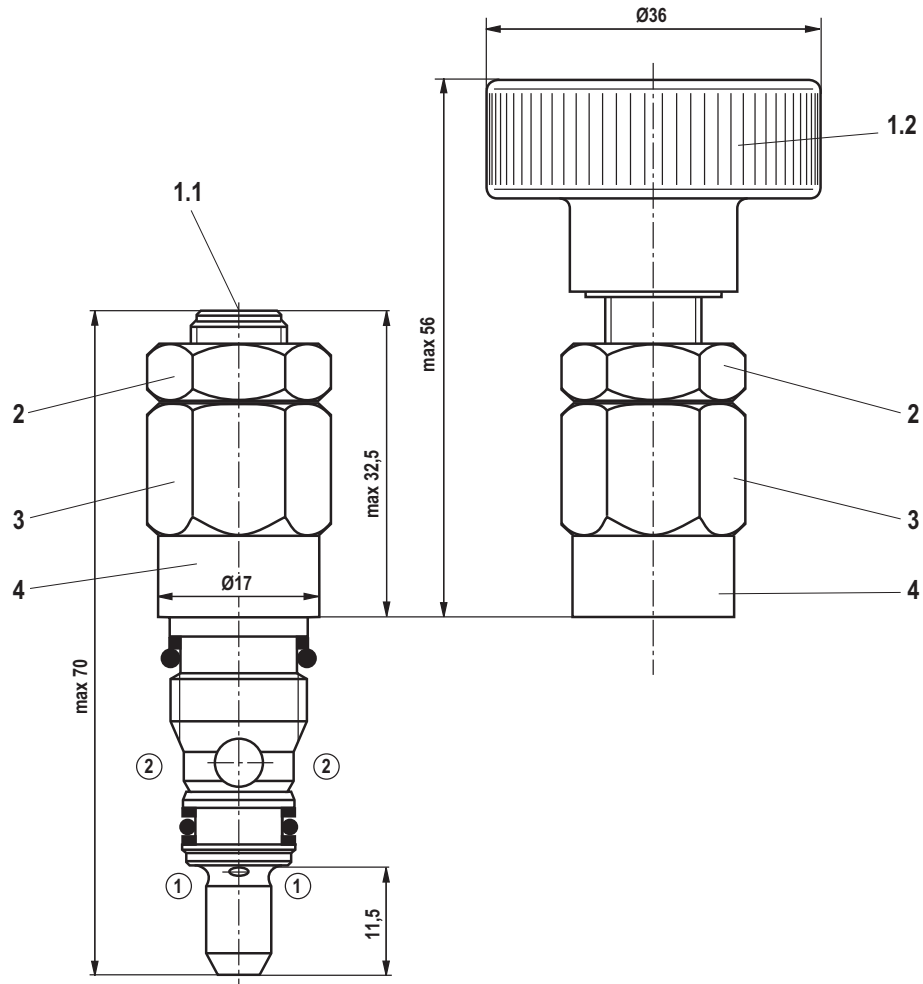
Hydraulic backpressures in the main port ② (T) add 1:1 to the response pressure of the valve set at the adjustment element.

Example:

- Pressure setting of the valve through spring pretensioning (item. 4 on page 2) $p_{Spring} = 200 \text{ bar}$
- Hydraulic backpressure in the main port ② (T):
 $p_{hydraulic} = 50 \text{ bar}$

⇒ Response pressure = $p_{Spring} + p_{hydraulic} = 250 \text{ bar}$

Unit dimensions (dimensions in mm)

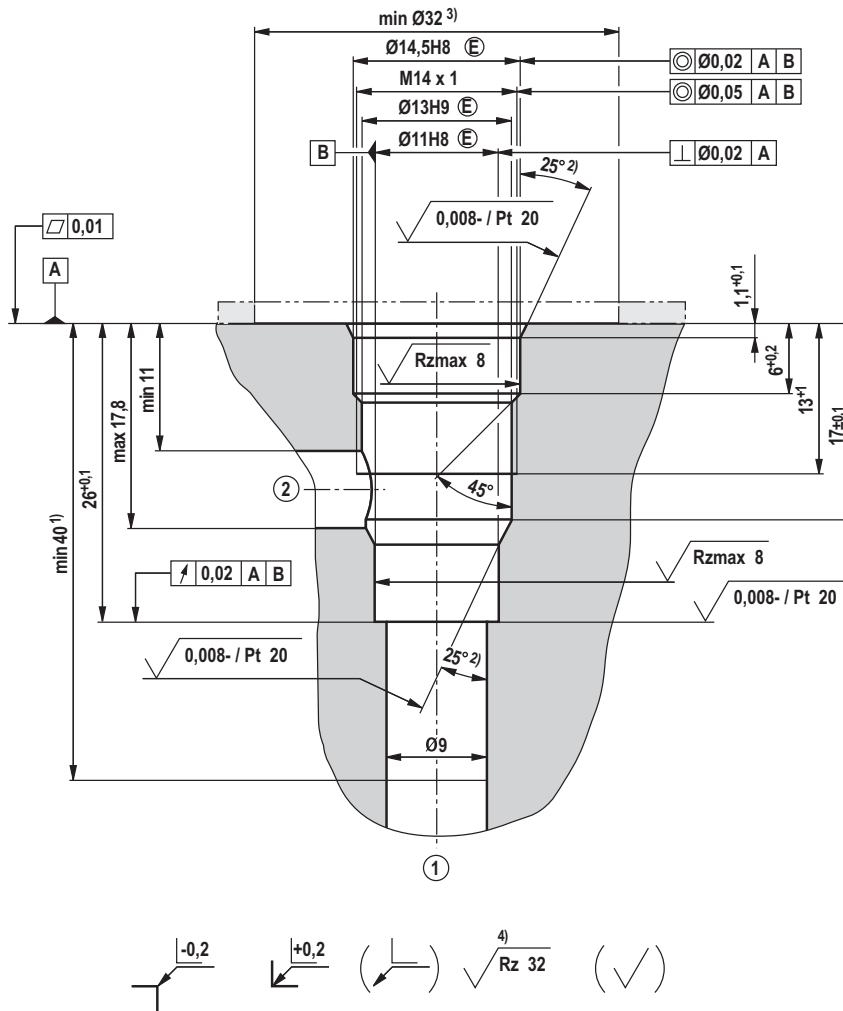


- 1.1 Adjustment type "S", hexagon socket 5 A/F
- 1.2 Adjustment type "H", hand wheel
- 2 Lock nut 17 A/F, tightening torque $M_T = 10+5$ Nm
- 3 Hexagon head 17 A/F, tightening torque when screwing in $M_T = 23\pm 2$ Nm
- 4 Embossed type designation

① = Main port 1 (P)

② = Main port 2 (T)

Mounting cavity R/DBD . 4K; 2 main ports; thread M14 x 1 (dimensions in mm)



¹⁾ Depth for moving parts

²⁾ All seal ring insertion chamfers are rounded and free of burrs

³⁾ With countersink

⁴⁾ Visual inspection

① = Main port 1 (P)

② = Main port 2 (T), optional circumferential arrangement

LS = (location shoulder)

Tolerance for all angles ±0.5°

Ordering code for type tested safety valves type DBD..K../..E, series 1X

Type testing according to Pressure Equipment Directive 97/23/EC

Size	Designation	Part identification	Maximum admissible flow $q_{V \max}$ in l/min	Set response overpressure p in bar
4	DBDS 4 K1X/ <input type="checkbox"/> E	TÜV.SV.- <input type="checkbox"/> -1038.4.F.G.p	10	60 to 315
	DBDH 4 K1X/ <input type="checkbox"/> E		17	320 to 500

- The pressure has to be entered in the type designation by the customer! Pressure settings ≥ 60 bar and in 5 bar increments possible.
- Value entered in the factory

Deviating technical data for type tested safety valves ²⁾

hydraulic

Maximum flow	See characteristic curves on page 8
Hydraulic fluid	Mineral oil (HL, HLP) according to DIN 51524-1 and DIN 51524-2
Hydraulic fluid temperature range	°C -15 to +60
Viscosity range	mm ² /s 12 to 230

²⁾ For applications outside these parameters, please consult us!

Safety notes on type tested safety valves (type DBD..K../..E) according to Pressure Equipment Directive 97/23/EC

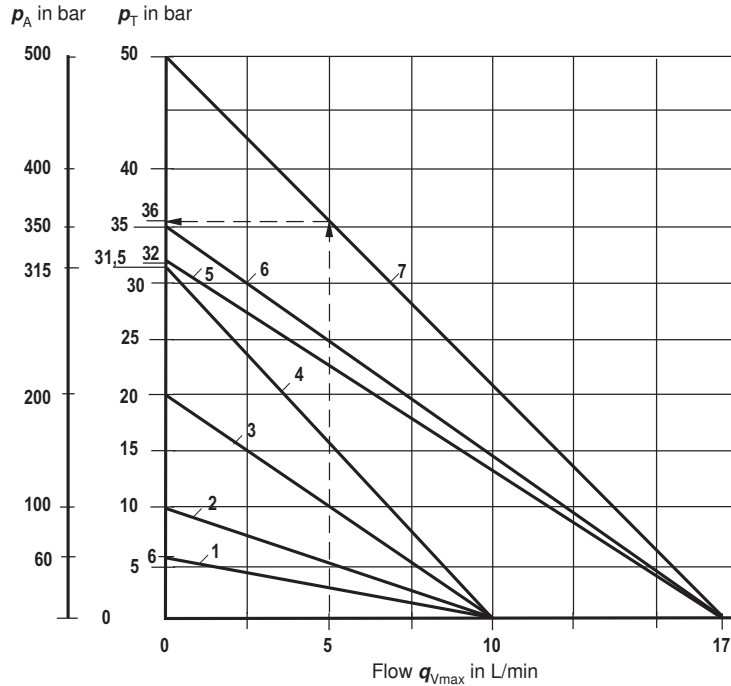
- Before ordering a type tested safety valve, please observe that at the desired **response pressure p** the maximum admissible **flow $q_{V \max}$** of the safety valve is higher than the maximum possible flow of the system/accumulator to be protected.
The corresponding regulations have to be observed!
 - **According to PED 97/23/EC**, the increase in system pressure caused by the flow must not exceed 10% of the set response pressure (see part identification).
The maximum admissible flow $q_{V \max}$ (= numerical value at the position of letter "G" in part identification, see above) specified in the part identification must not be exceeded. Discharge lines of safety valves have to end in a non-dangerous manner. The accumulation of fluids in the discharge system is **not** admissible (see AD2000 - data sheet A2).
- It is imperative to observe the application instructions!**
- The maximum admissible flow specified in the part identification applies to applications without backpressure in the discharge line (port "T").
 - By removing the lead seal at the safety valve, the approval according to PED becomes void!
 - Generally, the requirements of the Pressure Equipment Directive and of data sheet AD2000 A2 have to be observed!
 - We recommend securing type tested screw-in cartridge valves against inadmissible removal from the screw-in housing/block by wiring and sealing with the housing/block.
- Attention!**

As the flow rises the system pressure increases by the backpressure in the blow-off line (port "T").
(observe AD2000 - data sheet A2, item 6.3!)

In order that the increase in system pressure caused by the flow will not exceed the value of 10 % of the set response pressure, the admissible flow has to be reduced depending on the backpressure in the blow-off line (port T), see characteristic curves, page 8.

Safety notes on type tested safety valves (type DBD..K../.E)
according to pressure equipment directive 97/23/EC

Maximum admissible flow q_{Vmax} depending on the backpressure p_T in the discharge line



Characteristic curves	Response pressure p_a in bar
1	60
2	100
3	200
4	315
5	320
6	350
7	500

Characteristic curves for intermediate values can be generated by interpolation. Further explanations see below.

p_A = Response pressure in bar

p_T = Maximum admissible backpressure in bar (sum of all possible backpressures; see also AD2000 - data sheet A2)

q_{Vmax} = Maximum admissible flow in L/min

p_{Tmax} = 10% x p_A (at $q_V = 0$) according to PED 97/23/EC

Explanation of the graph:

- Known:
- Flow of the system/accumulator to be protected $q_{Vmax} = 5$ l/min
 - Set response pressure of the safety valve $p_A = 500$ bar

Unknown: p_T

Solution: See arrows in graph above; $p_T \sim 36$ bar (5 l/min; 500 bar)

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