Service

RE 25802-XC/03.17 Replaces: 01.07

1/12

Pressure relief valve, pilot-operated

Type DB...XC

Sizes (NG) 10, 25, 32 Component series 5X Maximum operating pressure 350 bar

Safety valves - For potentially explosive areas

Information on explosion protection:

Area of application in accordance with the Explosion Protection Directive 2014/34/EU: IM2, II2G, II2D

Type of protection of the valve: c (EN 13463-5)

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Features

 For subplate mounting
 Porting pattern according to: ISO 6264-06-09 (NG10), ISO 6264-08-13 (NG25), ISO 6264-10-17 (NG32)
 For threaded port
– Adjustment type: Rotary knob
 – 5 pressure ratings

Notice:

With the attachment of an additional directional spool valve type 3WE 6..., the valve can be extended for solenoid-actuated unloading (see page 10 and 11).

CE



Ordering code



Symbols



Function, section, symbols

Valves of type DB are pilot-operated pressure limitation valves. They serve to limit the operating pressure and mainly consist of the main valve (1) with main spool insert (3), the pilot control valve (2) and the closing plate (16).

The pressure in channel P acts on the main spool (3). Simultaneously, the pressure is applied via the control lines (6) and (7), which are equipped with nozzles (4) and (5), to the spring-loaded side of the main spool (3) and to the ball (8) in the pilot control valve (2). If the pressure in channel P is increased due to the value which is set at the spring (9), the ball (8) opens against the spring (9). The signal for this is sent internally via the control lines (10) and (6) from channel P. The hydraulic fluid on the spring-loaded side of the main spool (3) now flows via the control line (7), nozzle bore (11) and ball (8) in the spring chamber (12). From here, it is passed on to the container internally with type DB...-... via control line (13) or externally with type DB...Y... via control line (14). Due to nozzles (4) and (5), there is a pressure drop at the main spool (3). The connection from channel P to channel T is free. Now, the hydraulic fluid flows from channel P to channel T while the set operating pressure is maintained.

Via port "X" (15), the pressure relief valve can be relieved or switched to a different pressure (second pressure rating).



See also "General information" on page 11.

Technical data

general						
Size			NG10	NG25	NG32	
Installation position			Any			
Ambient temperature ran	ige	°C	-20+80			
Storage temperature ran	ge	°C	-20+80			
Weight	Subplate mounting	kg	2.6 3.5		4.4	
	Threaded port	kg	5.3	5.1	4.8	
Surface protection		Standard	Painting, maximum la	yer thickness 100 µm		
hydraulic						
Maximum operating	– Port P, X bar		350			
pressure	– Port T	bar	r 315 (tank preloading is added to set pressure)			
Maximum counter	– Port Y (DB) bar		315 (tank preloading is added to set pressure)			
pressure	 Port Y, T (with directional spool valve) 	l bar	See data sheets fror	e data sheets from table on page 11		
Maximum set pressure 1)	•	bar	50; 100; 200; 315; 3	350		
Minimum set pressure 1)			Flow-dependent (see	e characteristic curve	on page 5)	
Maximum flow	 Subplate mounting 	l/min	250	500	650	
	- Threaded port	l/min	250	500	650	
Hydraulic fluid			See table below			
Hydraulic fluid temperature range °C			-20 +80			
Viscosity range mm ² /s			10 800			
Maximum admissible degree of contamination of the hydraulic fluid Cleanliness class according to ISO 4406 (c)			Class 20/18/15 2)			

Hydraulic fluid		Classification	Suitable sealing materials	Standards	Data sheet
Mineral oils		HL, HLP	FKM	DIN 51524	90220
Bio-degradable	Insoluble in water	HETG	FKM	100 15000	90221
		HEES	FKM	150 15380	
	Soluble in water	HEPG	FKM	ISO 15380	

Important information on hydraulic fluids:

 The ignition temperature of the hydraulic fluid used must be 50 K higher than the maximum surface temperature.

 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.). - **Bio-degradable** Small amounts of dissolved zinc may get into the hydraulic system during use of these hydraulic fluids.

Information on explosion protection

Area of application according to directive 2014/34/EU	IM2, II2G	II2D
Type of protection valve	c (EN 13463-5)	c (EN 13463-5)
Maximum surface temperature ³⁾ °C	-	100
Temperature class	T4	_
Protection class	-	IP 65

¹⁾ To avoid exceeding the maximum admissible response pressure, the response pressure must be checked using a suitable measuring device during adjustments. Available filters can be found at www.boschrexroth.com/filter.

³⁾ Due to the surface temperatures of the solenoid coils, the standards ISO 13732-1 and ISO 4413 (contact protection) must be observed.

²⁾ 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. Standard version

Characteristic curves (measured with HLP46, $\vartheta_{Oil} = 40$ °C ± 5 °C)



Minimum set pressure and circulation pressure dependent on the flow ¹⁾

Design "U"

Minimum set pressure and circulation pressure dependent on the flow $^{1\!\mathrm{)}}$



Notice:

The characteristic curves were measured with **external depressurized pilot oil return.** With internal pilot oil return, the inlet pressure increases by ¹⁾ The characteristic curves apply to an output pressure $p_T = 0$ over the entire flow range!

With internal pilot oil return, the inlet pressure increases by the output pressure at port T.

Characteristic curves (measured with HLP46, $\vartheta_{\text{Oil}} =$ 40 °C \pm 5 °C)



Inlet pressure dependent on the flow

Notice:

The characteristic curves were measured with **external depressurized pilot oil return.** With internal pilot oil return, the inlet pressure increases by the output pressure at port T.



Flow in I/min \rightarrow

Dimensions: Subplate mounting "-" (dimensions in mm)





0,01/100

Required surface quality of the valve contact surface

NG	L1	L2	L3	L4	L5	L6	L7	L8	L9	B1	B2	ØD1
10	91	53.8	22.1	27.5	22.1	47.5	0	25.5	2	78	53.8	14
20	116	66.7	33.4	33.3	11.1	55.6	23.8	22.8	10.5	100	70	18
32	147.5	88.9	44.5	41	12.7	76.2	31.8	20	21	115	82.6	20

Item explanations see page 9.

Dimensions: Threaded port "G" (dimensions in mm)



NG	D1	ØD2	T1
10	G1/2	34	14
20	G1	47	18
32	G1 1/2	65	22

Item explanations see page 9.

Dimensions

- 1 Name plate
- 2 Port X for external pilot oil supply
- 3 Port Y for external pilot oil return
- 4 Adjustment type "1"
- 5 Locking pin
- 6 Valve mounting bore
- 7 Not applicable with internal pilot oil return
- 8 Measuring port
- **9** Lock nut, wrench size 17, tightening torque $M_A = 10^{+5}$ Nm
- **10** Lock nut, wrench size 17, tightening torque $M_A = 10^{+5}$ Nm
- 11 Cover plate
- 12 Sealing plate

Subplates (separate order) with porting pattern according to ISO 6264 see data sheet 45100.

Valve mounting screws (subplate mounting) (separate order)

For reasons of stability, exclusively the following valve mounting screws may be used:

- NG10
 - 4 screws ISO 4762 M12 x 50 10.9-flZn/nc/480h/C friction coefficient $\mu_{Total} = 0.09 \dots 0.14$ tightening torque $M_A = 75$ Nm ±10 % material no. R913015611
- NG25
- 4 screws ISO 4762 M16 x 50 10.9-flZn/nc/480h/C friction coefficient $\mu_{Total} = 0.09 \dots 0.14$ tightening torque $M_A = 185$ Nm ±10 % material no. R913015664
- NG32

4 screws DIN912 - M18 x 50 - 10.9 tightening torque M_A = 248 Nm ±10 % material no. R900002245

Valve mounting screws for valves with threaded port available on request:

2 screws M10 x ...
 (see dimensions on page 8, item 6)

Solenoid-actuated unloading

By attaching a type 3WE 6... directional spool valve, the valve can be modified so that it can be switched to depressurized circulation by electric control (main control spool unloaded).

Before attaching a directional spool valve type 3WE6... to a pilot-operated pressure relief valve type DB...XC, it must be checked whether the category and protection class which result from this combination meet the requirements of the relevant potentially explosive area.

The directional spool valves which are suitable for attachment and the resulting categories and protection classes are shown in the table below.

Important information:

- The unloading function with directional valve may not be used for safety functions!
- For the installation, the corresponding operating instructions which are included in the scope of delivery of the directional spool valves must be observed.
- Set-up or modification without the operating instructions is not admissible.
- Prior to assembly all parts are to be identified based on the corresponding name plates.

The directional spool valve determines the category according to the explosion protection directive 2014/34/EU:

Directional spool valve	Category according to 2014/34/EU	Data sheet			
3WE 65X/XH	ll2G	RE 23177-XH			
3WE 65X/XM	IM2	RE 23177-XH			
3WE 66X/XD	IM2; II2G	RE 23178-XD			
3WE 66X/XE	ll2G	RE 23178-XE			
3WE 66X/XN	II3G; II3D	RE 23178-XN			
Example:					
Type DBXC plus 3WE 6 6X/XN ¹⁾ results in a possible use in category II3G; II3D					

¹⁾ Please also observe the possible circuit variations on page 11 when selecting a valve.

Example:

Attachment of a directional spool valve type 3WE 6...6X/...XE

The installation of the directional valve (disassembly of the closing plate) is described in the operating instructions 25802-XC-B.



Solenoid-actuated unloading: circuit variations

For each type of pilot oil supply of a pressure relief valve, two circuit variations for solenoid-actuated unloading are possible:

- normally closed
- normally open

The required circuit variation is determined by the control spool selected for the directional spool valve type 3WE 6...



General information

The hydraulic counter pressures in port T with internal pilot oil return or in port Y with external pilot oil return add up 1:1 to the response pressure of the valve which is set at the pilot control.

Example:

Pressure adjustment of the valve by spring preload (item 12, page 3) in the pilot control valve/adjustment type $p_{\text{Spring}} = 200 \text{ bar}$

Hydraulic counter pressure in port T with internal pilot oil return $\rho_{\rm Hydraulic} = 50 \text{ bar}$

 \Rightarrow response pressure = $p_{\text{Spring}} + p_{\text{Hydraulic}} = 250 \text{ bar}$

Further information

Subplates
Hydraulic fluids on mineral oil basis
Environmentally compatible hydraulic fluids
Flame-resistant, water-free hydraulic fluids
Flame-resistant hydraulic fluids - containing water (HFAE, HFAS, HFB, HFC)
Hydraulic valves for industrial applications

Selection of the filters

Information on available spare parts

Data sheet 45100 Data sheet 90220 Data sheet 90221 Data sheet 90222 Data sheet 90223 Operating instructions 07600-B www.boschrexroth.com/filter www.boschrexroth.com/spc

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