Pressure relief valve, pilot operated

Types DB and DBW

Sizes 10 to 32
Component series 5X
Maximum operating pressure 350 bar
Maximum flow 650 L/min

Table of contents

Contents | Page
--- | ---
Features | 1
Ordering code | 2
Cable sockets | 3
Symbols | 4
Standard types | 4
General notes | 5
Function, section | 5, 6
Technical data | 7
Characteristic curves | 8, 9
Unit dimensions | 10 to 14

Type-tested safety valves of type DB(W)…E, component series 5X, to Pressure Equipment Directive 97/23/EC (in the following “PE” in short)

Ordering code | 15
Deviating technical data | 16
Safety notes | 16 to 18

Features

- For subplate mounting:
  - Porting pattern to ISO 6264-AR-06-2-A (size 10), ISO 6264-AS-08-2-A (size 25), ISO 6264-AT-10-2-A (size 32)
- For threaded connection
- For installation into manifolds
- 4 adjustment elements for pressure setting, optional:
  - Rotary knob
  - Sleeve with hexagon and protective cap
  - Lockable rotary knob with scale
  - Rotary knob with scale
- 5 pressure stages
- Solenoid operated unloading via built-on directional spool valve or directional poppet valve
- Heavy duty solenoid
- Explosion-protected solenoid (on enquiry)
- Switching shock damping, optional (only type DBW)
- Further information:
  - High-performance directional valves RE 23178 and RE 22058
  - Subplates RE 45064

Information on available spare parts:
www.boschrexroth.com/spc
Ordering code

Without directional valve = No code
With built-on directional valve = W

Pilot operated valve (complete) = No code
Pilot valve without main spool insert (do not enter size) = C
Pilot valve with main spool insert (enter valve size 10 or 30) = C
Pilot valve without main spool insert for subplate mounting (do not enter size) = T

<table>
<thead>
<tr>
<th>Size</th>
<th>Subplate mounting</th>
<th>Threaded connection</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>10 (G1/2)</td>
<td>10 (G1/2)</td>
</tr>
<tr>
<td>16</td>
<td>15 (G3/4)</td>
<td>15 (G3/4)</td>
</tr>
<tr>
<td>25</td>
<td>20 (G1)</td>
<td>20 (G1)</td>
</tr>
<tr>
<td>25</td>
<td>25 (G1 1/4)</td>
<td>25 (G1 1/4)</td>
</tr>
<tr>
<td>32</td>
<td>30 (G1 1/2)</td>
<td>30 (G1 1/2)</td>
</tr>
</tbody>
</table>

For subplate mounting and installation into manifolds = No code
For threaded connection = G

Adjustment element for pressure adjustment
- Rotary knob = 1
- Sleeve with hexagon and protective cap = 2
- Lockable rotary knob with scale = 3
- Rotary knob with scale = 7

With main spool Ø24 mm (all sizes) = –
With main spool Ø28 mm (only for size 32) = N

Component series 50 to 59 (50 to 59: unchanged installation and connection dimensions) = 5X

Pressure setting up to 50 bar = 50
Pressure setting up to 100 bar = 100
Pressure setting up to 200 bar = 200
Pressure setting up to 315 bar = 315
Pressure setting up to 350 bar = 350

1) DBT/DBWT corresponds to DBC/DBWC, but with plugged central bore
2) Ordering code required only for version with built-on directional valve (DBW).
3) H-key with material no. R900008158 is included in the scope of supply.
4) Data sheet RE 23178 (directional spool valve) or RE 22058 (directional poppet valve)
5) Cable sockets, separate order, see page 3.
6) Ordering code required only for version with built-on directional valve and switching shock damping feature (DBW/…/…S…).
7) Possible only up to pressure stage 315 bar
8) Hyphen “–” required only for version with built-on directional valve (DBW), without indication of “U” or “S”.
9) Not for version DBC/DBWC

For ordering code for type-tested safety valves, see page 15.
**Type testing**

- No code = Without type testing
- E = Type-tested safety valve according to PED 97/23/EC

**Seal material**

- No code = NBR seals
- V = FKM seals
- (other seals on enquiry)

**Caution!**

Observe compatibility of seals with hydraulic fluid used!

**Electrical connection**

- K4 2; 5) = Without cable socket
- Individual connection with component plug to DIN EN 175301-803
- N9 2) = With concealed manual override (standard)
- N 2) = With manual override
- No code = Without manual override
- G24 2) = AC voltage 230 V 50/60 Hz
- W230 2) = 24 V DC

**Pilot oil supply and pilot oil drain**

- – 8) = Pilot oil supply and pilot oil drain internal
- X = Pilot oil supply external, pilot oil drain internal
- Y = Pilot oil supply internal, pilot oil drain external
- XY = Pilot oil supply and pilot oil drain external

---

**Cable sockets** to DIN EN 175301-803

<table>
<thead>
<tr>
<th>Colour</th>
<th>Material no.</th>
<th>Without circuitry</th>
<th>With indicator lamp 12 ... 240 V</th>
<th>With rectifier 12 ... 240 V</th>
<th>With indicator lamp and Zener-diode suppressor circuit 24 V</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grey</td>
<td>R901017010</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>Black</td>
<td>R901017011</td>
<td>R901017022</td>
<td>R901017025</td>
<td>R901017026</td>
<td></td>
</tr>
</tbody>
</table>
Further standard types and components can be found in the EPS (standard price list).

### Standard types

<table>
<thead>
<tr>
<th>Type</th>
<th>Material number</th>
</tr>
</thead>
<tbody>
<tr>
<td>DB 10-2-5X/50</td>
<td>R900590645</td>
</tr>
<tr>
<td>DB 10-2-5X/100</td>
<td>R900590646</td>
</tr>
<tr>
<td>DB 10-2-5X/200</td>
<td>R900587772</td>
</tr>
<tr>
<td>DB 10-2-5X/315</td>
<td>R900590334</td>
</tr>
<tr>
<td>DB 10-2-5X/350</td>
<td>R900597992</td>
</tr>
<tr>
<td>DB 20-2-5X/50</td>
<td>R900597212</td>
</tr>
<tr>
<td>DB 20-2-5X/100</td>
<td>R900589433</td>
</tr>
<tr>
<td>DB 20-2-5X/200</td>
<td>R900590768</td>
</tr>
<tr>
<td>DB 20-2-5X/315</td>
<td>R900593530</td>
</tr>
<tr>
<td>DB 20-2-5X/350</td>
<td>R900590618</td>
</tr>
<tr>
<td>DB 20 G2-5X/50</td>
<td>R900590328</td>
</tr>
<tr>
<td>DB 20 G2-5X/200</td>
<td>R900597307</td>
</tr>
<tr>
<td>DB 20 G2-5X/315</td>
<td>R900597747</td>
</tr>
<tr>
<td>DB 20 G2-5X/350</td>
<td>R900599232</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Type</th>
<th>Material number</th>
</tr>
</thead>
<tbody>
<tr>
<td>DB 30-2-5X/50</td>
<td>R900593564</td>
</tr>
<tr>
<td>DB 30-2-5X/100</td>
<td>R900594677</td>
</tr>
<tr>
<td>DB 30-2-5X/200</td>
<td>R900588131</td>
</tr>
<tr>
<td>DB 30-2-5X/315</td>
<td>R900591128</td>
</tr>
<tr>
<td>DB 30-2-5X/350</td>
<td>R900504902</td>
</tr>
<tr>
<td>DB 30 G2-5X/50</td>
<td>R900598338</td>
</tr>
<tr>
<td>DB 30 G2-5X/100</td>
<td>R900502598</td>
</tr>
<tr>
<td>DB 30 G2-5X/200</td>
<td>R900500719</td>
</tr>
<tr>
<td>DB 30 G2-5X/315</td>
<td>R900594426</td>
</tr>
<tr>
<td>DB 30 G2-5X/350</td>
<td>R900535222</td>
</tr>
</tbody>
</table>
General notes

- The unloading function (directional valve function on DBW) must not be used for safety-related functions!
- Type DBW..B..5X/... changes to the lowest settable pressure (circulation pressure) in the event of a power failure or cable break.
- Type DBW..A..5X/... changes over to the pressure limitation function in the event of a power failure or cable break.
- In the case of internal pilot oil drain, hydraulic backpressures in port T, or, in the case of external pilot oil drain, hydraulic backpressures in port Y, fully add to the response pressure of the valve set on the pilot control.

Example:
Pressure setting of the valve by spring-pretensioning (item 12 on page 5) in the pilot valve/adjustment unit
\[ p_{\text{spring}} = 200 \text{ bar} \]

Hydraulic backpressure in port T with internal pilot oil drain \[ p_{\text{hydraulic}} = 50 \text{ bar} \]

\[ => \text{Response pressure} = p_{\text{spring}} + p_{\text{hydraulic}} = 250 \text{ bar} \]

Function, section: Type DB...

General
Pressure control valves of types DB and DBW are pilot operated pressure relief valves. They are used for the limitation (DB) or limitation and solenoid operated unloading (DBW) of the operating pressure.

Pressure relief valves (DB) basically consist of main valve (1) with main spool insert (3) and pilot valve (2) with pressure adjustment element.

Pressure relief valve type DB
The pressure present in channel P acts on main spool (3). At the same time, the pressure is applied via pilot lines (6) and (7) that are provided with orifices (4) and (5) to the spring-loaded side of main spool (3) and to ball (8) in pilot valve (2). When the pressure in channel P rises to a value above that set on spring (9), ball (8) opens against spring (9). The signal for this process is provided internally via pilot lines (10) and (6) from channel P. The hydraulic fluid on the spring-loaded side of main spool (3) can now flow via pilot line (7), orifice bore (11) and ball (8) into spring chamber (12). From here, it is fed internally via pilot line (13) in the case of type DB...–, or externally via pilot line (14) in the case of type DB...Y, back to the tank. Orifices (4) and (5) generate a pressure differential across main spool (3), and the connection from channel P to channel T opens. The hydraulic fluid now flows from channel P to channel T while the set operating pressure is maintained.

The pressure relief valve can be unloaded or changed over to another pressure (second pressure stage) via port “X” (15).
**Function, section: Type DBW…**

**Pressure relief valve type DBW**

In principle, the function of this valve corresponds to that of type DB. However, unloading through main spool (3) is achieved by operating the built-on directional spool valve (16).

Pressure relief valve with switching shock damping (sandwich plate), type DBW…/..S6...R12

When a switching shock damping valve (17) is used, the connection from B2 to B2 opens with a delay, which prevents pressure peaks and acoustic unloading shocks in the return line. The valve is installed between pilot valve (2) and directional valve (16).

The degree of damping (unloading shock) is determined by the size of orifice (18). We recommend orifice Ø1.2 mm (ordering code ..R12...).
**Technical data** (for applications outside these parameters, please consult us!)

### General

<table>
<thead>
<tr>
<th>Sizes</th>
<th>Subplate mounting</th>
<th>Port P, X</th>
<th>Port Y (DB)</th>
<th>Ports Y, T (DBW)</th>
<th>Subplate mounting</th>
<th>Threaded connection</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weight</td>
<td>DB…</td>
<td>2.6</td>
<td>–</td>
<td>3.5</td>
<td>–</td>
<td>4.4</td>
</tr>
<tr>
<td></td>
<td>DBW…</td>
<td>4.05</td>
<td>–</td>
<td>4.95</td>
<td>–</td>
<td>5.85</td>
</tr>
<tr>
<td></td>
<td>DBC…</td>
<td>1.2</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td></td>
<td>DBWC…</td>
<td>2.65</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td></td>
<td>DBC 10 or 30 …</td>
<td>1.5</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td></td>
<td>DBWC 10 or 30 …</td>
<td>2.95</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
</tr>
</tbody>
</table>

### Hydraulic

<table>
<thead>
<tr>
<th>Maximum operating pressure</th>
<th>Ports P, X</th>
<th>bar</th>
<th>350</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Port T</td>
<td>bar</td>
<td>315</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Maximum backpressure</th>
<th>Port Y (DB)</th>
<th>bar</th>
<th>315</th>
</tr>
</thead>
</table>
|                             | Ports Y, T (DBW) | bar | 210 with DC solenoid  
|                             | –           |     | 160 with AC solenoid  |

| Minimum set pressure        | bar | 50; 100; 200; 315; 350 |
| Minimum set pressure        | Depends on flow (see characteristic curves on page 8) |

<table>
<thead>
<tr>
<th>Maximum flow</th>
<th>Subplate mounting</th>
<th>L/min</th>
<th>250</th>
<th>–</th>
<th>500</th>
<th>–</th>
<th>650</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Threaded connection</td>
<td>L/min</td>
<td>250</td>
<td>500</td>
<td>500</td>
<td>650</td>
<td></td>
</tr>
</tbody>
</table>

| Hydraulic fluid          | Mineral oil (HL, HLP) to DIN 51524 1; fast bio-degradable hydraulic fluids to VDMA 24568 (see also RE 90221); HETG (rape seed oil) 1; HEPG (polyglycols) 2; HEES (synthetic esters) 2; other hydraulic fluids on enquiry |

<table>
<thead>
<tr>
<th>Hydraulic fluid temperature range</th>
<th>ºC</th>
<th>–30 to +80 (NBR seals)</th>
<th>–15 to +80 (FKM seals)</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Viscosity range</th>
<th>mm²/s</th>
<th>10 to 800</th>
</tr>
</thead>
</table>

| Max. permissible degree of contamination of the hydraulic fluid - cleanliness class to ISO 4406 (c) | Klasse 20/18/15 3 |

---

1) Suitable for NBR and FKM seals  
2) Suitable only for FKM seals  
3) 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.
**Characteristic curves** (measured with HLP46, $\theta_{\text{oil}} = 40 \, ^\circ\text{C} \pm 5 \, ^\circ\text{C})$

Minimum set pressure and circulation pressure in dependence upon the flow $^1$)

**Standard version**

![Characteristic curves](image1)

- 1 Size 10
- 2 Size 25
- 3 Size 32 (N)
- 4 DBC 30
- DBWC 30

Minimum set pressure and circulation pressure in dependence upon the flow $^1$)

**Version “U”**

![Characteristic curves](image2)

- 1 Size 10
- 2 Size 25
- 3 Size 32 (N)
- 4 DBC 30
- DBWC 30

---

**Note!**

The characteristic curves were measured with **external, pressureless pilot oil drain**.

In the case of internal pilot oil drain, the inlet pressure increases by the outlet pressure present in port T.

---

$^1$ The characteristic curves are valid for an outlet pressure of $p_T = 0$ over the entire flow range!
**Characteristic curves** (measured with HLP46, $\theta_{\text{oil}} = 40 \, ^\circ\text{C} \pm 5 \, ^\circ\text{C})

---

**Note!**

The characteristic curves were measured with external, pressureless pilot oil drain.

In the case of internal pilot oil drain, the inlet pressure increases by the outlet pressure present in port T.

---

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

---
Unit dimensions: Threaded connection (nominal dimensions in mm)

For the dimensions of the built-on directional valve, see pages 11 and 12

For explanations of items, see page 14

<table>
<thead>
<tr>
<th>Type</th>
<th>D1</th>
<th>ØD2</th>
<th>T1</th>
</tr>
</thead>
<tbody>
<tr>
<td>DB 10 G</td>
<td>G1/2</td>
<td>34</td>
<td>14</td>
</tr>
<tr>
<td>DB 15 G</td>
<td>G3/4</td>
<td>42</td>
<td>16</td>
</tr>
<tr>
<td>DB 20 G</td>
<td>G1</td>
<td>47</td>
<td>18</td>
</tr>
<tr>
<td>DB 25 G</td>
<td>G1 1/4</td>
<td>58</td>
<td>20</td>
</tr>
<tr>
<td>DB 30 G</td>
<td>G1 1/2</td>
<td>65</td>
<td>22</td>
</tr>
</tbody>
</table>
### Unit dimensions: Subplate mounting with directional spool valve (nominal dimensions in mm)

![Diagram of subplate mounting with directional spool valve]

- **Type** | **L1** | **L2** | **L3** | **L4** | **L5** | **L6** | **L7** | **L8** | **L9** | **B1** | **B2** | **ØD1**
- **DB. 10** | 91 | 53.8 | 22.1 | 27.5 | 22.1 | 47.5 | 0 | 25.5 | 2 | 78 | 53.8 | 14
- **DB. 20** | 116 | 66.7 | 33.4 | 33.3 | 11.1 | 55.6 | 23.8 | 22.8 | 10.5 | 100 | 70 | 18
- **DB. 30** | 147.5 | 88.9 | 44.5 | 41 | 12.7 | 76.2 | 31.8 | 20 | 21 | 115 | 82.6 | 20

**For explanations of items, see page 14**
Unit dimensions: Subplate mounting with directional poppet valve (nominal dimensions in mm)

<table>
<thead>
<tr>
<th>Type</th>
<th>L1</th>
<th>L2</th>
<th>L3</th>
<th>L4</th>
<th>L5</th>
<th>L6</th>
<th>L7</th>
<th>L8</th>
<th>L9</th>
<th>B1</th>
<th>B2</th>
<th>ØD1</th>
</tr>
</thead>
<tbody>
<tr>
<td>DB. 10</td>
<td>91</td>
<td>53.8</td>
<td>22.1</td>
<td>27.5</td>
<td>22.1</td>
<td>47.5</td>
<td>0</td>
<td>25.5</td>
<td>2</td>
<td>78</td>
<td>53.8</td>
<td>14</td>
</tr>
<tr>
<td>DB. 20</td>
<td>116</td>
<td>66.7</td>
<td>33.4</td>
<td>33.3</td>
<td>11.1</td>
<td>55.6</td>
<td>23.8</td>
<td>22.8</td>
<td>10.5</td>
<td>100</td>
<td>70</td>
<td>18</td>
</tr>
<tr>
<td>DB. 30</td>
<td>147.5</td>
<td>88.9</td>
<td>44.5</td>
<td>41</td>
<td>12.7</td>
<td>76.2</td>
<td>31.8</td>
<td>20</td>
<td>21</td>
<td>115</td>
<td>82.6</td>
<td>20</td>
</tr>
</tbody>
</table>

For explanations of items, see page 14

Required surface quality of valve mounting face

Rzmax 4

0,01/100mm
Unit dimensions: Pilot valve with (DBC 10 or 30) or without (DBC, DBT) main spool insert (nominal dimensions in mm)

For dimensions of the built-on directional valve, see pages 11 and 12

For explanations of items, see page 14
Unit dimensions: Explanations of items

1. Nameplate
2. Port X for external pilot oil supply
3. Port Y for external pilot oil drain
4. Adjustment element “1”
5. Adjustment element “2”
6. Adjustment element “3”
7. Adjustment element “7”
8. Hexagon A/F 10
9. Space required to remove key
10. Locating pin
11. Valve fixing bore
12.1 Directional spool valve size 6, see RE 23178
12.2 Directional poppet valve size 6, see RE 22058
13. Solenoid “a”
14. Dimension for valve without manual override
15. Cable socket without circuitry (separate order, see page 3)
16. Cable socket with circuitry (separate order, see page 3)
17. Switching shock damping valve, optional
18. Space required to remove cable socket
19. Not provided in the case of internal pilot oil drain
20. Seal ring
21. Main spool insert
22. Bore Ø32 can intersect Ø45 at any point. However, care must be taken that connection bore X and the fixing bore are not damaged!
23. The back-up ring and the seal ring must be inserted into this bore prior to the installation of the main spool.
24. Orifice (separate order)
25. Seal ring
26. Seal ring
27. Seal ring
28. Back-up ring
29. Back-up ring
30. Dimension for valve with manual override “N”
31. Dimension () for valve with AC solenoid
32. Dimension for valve with DC solenoid
33. Space required to remove solenoid coil
34. Dimension for valve with concealed manual override “N9”
35. Locknut A/F 17, tightening torque $M_t = 10^{-5}$ Nm

Subplates to data sheet RE 45064 (separate order)
- Type DB/DBW 10
  - G 545/01 (G3/8)
  - G 546/01 (G1/2)
- Type DB/DBW 20
  - G 408/01 (G3/4)
  - G 409/01 (G1)
- Type DB/DBW 30
  - G 410/01 (G1 1/4)
  - G 411/01 (G1 1/2)
- Type DBTN/DBWNT
  - G 51/01 (G1/4)

Caution!
The subplates mentioned above are not approved for use with type-tested safety valves according to Pressure Equipment Directive 97/23/EC.

Valve fixing screws (separate order)
For strength reasons, only the following valve fixing screws may be used:
- Type DB/DBW 10
  - 4 off ISO 4762 - M12 x 50 - 10.9-flZn-240h-L at friction coefficient $\mu_{\text{total}} = 0.09$ to 0.14,
  - tightening torque $M_t = 75$ Nm ± 10%, material no. R913000283
- Type DB/DBW 20
  - 4 off ISO 4762 - M16 x 50 - 10.9-flZn-240h-L at friction coefficient $\mu_{\text{total}} = 0.09$ to 0.14,
  - tightening torque $M_t = 185$ Nm ± 10%, material no. R913000378
- Type DB/DBW 30
  - 4 off ISO 4762 - M18 x 50 - 10.9-flZn-240h-L at friction coefficient $\mu_{\text{total}} = 0.09$ to 0.14,
  - tightening torque $M_t = 248$ Nm ± 10%, material no. R900002245
- Type DBC/DBWC
  - type DBC 10/DBWC 10 and type DBC 30/DBWC 30
    - 4 off ISO 4762 - M8 x 40 - 10.9-flZn-240h-L at friction coefficient $\mu_{\text{total}} = 0.09$ to 0.14,
    - tightening torque $M_t = 31$ Nm ± 10%, material no. R91300205
- Type DBC/DBWC
  - type DBC 10/DBWC 10 and type DBC 30/DBWC 30
    - 4 off ISO 4762 - M8 x 40 - 10.9-flZn-240h-L at friction coefficient $\mu_{\text{total}} = 0.09$ to 0.14,
    - tightening torque $M_t = 31$ Nm ± 10%, material no. R91300205

The tightening torques given are guidelines when screws with the specified friction coefficients and a torque wrench (tolerance ±10%) are used.
**Ordering code:** Type-tested safety valves of type DB(W)...E, component series 5X according to Pressure Equipment Directive 97/23/EC

<table>
<thead>
<tr>
<th>Designation</th>
<th>Component identification</th>
<th>Max. permissible flow $q_{v\text{max}}$ in L/min with pilot oil drain external &quot;Y&quot;</th>
<th>Set response pressure $p$ in bar</th>
</tr>
</thead>
<tbody>
<tr>
<td>DB 10 2 3 4 5 6</td>
<td>TÜV.SV. – 851.12.F.G.p</td>
<td>170 230 230 230</td>
<td>30 to 60 61 to 110 111 to 210</td>
</tr>
<tr>
<td>DBW 10 2 3 4 5 6</td>
<td></td>
<td>230 200 200</td>
<td>211 to 350</td>
</tr>
<tr>
<td>DB 20 2 3 4 5 6</td>
<td>TÜV.SV. – 852.22.F.G.p</td>
<td>250 270 420</td>
<td>30 to 60 61 to 110 111 to 210</td>
</tr>
<tr>
<td>DBW 20 2 3 4 5 6</td>
<td></td>
<td>230 200 400</td>
<td>211 to 350</td>
</tr>
<tr>
<td>DB 30 2 3 N5 4 5 6</td>
<td>TÜV.SV. – 853.22.F.G.p</td>
<td>600 600 650</td>
<td>30 to 60 61 to 110 111 to 210</td>
</tr>
<tr>
<td>DBW 30 2 3 N5 4 5 6</td>
<td></td>
<td>600 650 700</td>
<td>211 to 350</td>
</tr>
</tbody>
</table>

1. Directional valve, normally closed = A
2. Directional valve, normally open = B
3. For subplate mounting = No code
4. For threaded connection = G
5. Adjustment element, hand wheel = 1
6. Adjustment element with sealed protective cap (adjustment/unloading impossible) = 2
7. Pressure in the designation to be entered by customer, e.g. pressure setting ≥ 30 bar and in 5-bar increments possible = 150
8. Pilot oil supply and drain internal = Y
9. Recommendation: Pilot oil supply internal, pilot oil drain external = EG24N9K4
10. NBR seals = No code
11. FKM seals = V
12. Data entered in the factory

1) Hyphen "−" required only for version with built-on directional valve (DBW)
2) Pilot oil supply external "X" impossible!
Deviating technical data: Type-tested safety valves of type DB(W)…E, component series 5X according to Pressure Equipment Directive 97/23/EC

<table>
<thead>
<tr>
<th>Hydraulic</th>
<th>Maximum backpressure</th>
<th>DB../..</th>
<th>DB../..Y</th>
<th>DBW../..</th>
<th>DBW../..Y</th>
</tr>
</thead>
<tbody>
<tr>
<td>Port Y</td>
<td>bar</td>
<td>–</td>
<td>0</td>
<td>–</td>
<td>0</td>
</tr>
<tr>
<td>Port T</td>
<td>bar</td>
<td>$p_t &lt; 15$</td>
<td>$p_t &lt; 15$</td>
<td>$p_t &lt; 15$</td>
<td>$p_t &lt; 15$</td>
</tr>
<tr>
<td>Maximum flow</td>
<td>See table on page 15 and characteristic curves on pages 17 and 18</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hydraulic fluid</td>
<td>Mineral oil (HL, HLP) to DIN 51524 and DIN 51524-1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hydraulic fluid temperature range</td>
<td>°C</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Port Y</td>
<td>–20 to +60 (NBR seals)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Port T</td>
<td>–15 to +60 (FKM seals)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Viscosity range</td>
<td>mm²/s</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>12 to 230</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

1) For applications outside these parameters, please consult us!
2) See characteristic curves and explanations for max. permissible backpressures on pages 17 and 18

Safety notes: Type-tested safety valves of type DB(W)…E, component series 5X according to Pressure Equipment Directive 97/23/EC

- Before ordering a type-tested valve, make sure that at the desired response pressure $p$ the max. permissible flow $q_{V \text{ max}}$ of the safety valve is greater than the max. possible flow of the system / accumulator to be protected. Observe relevant regulations!
- According to PED 97/23/EC the increase in the system pressure caused by the flow must not be greater than 10% of the set response pressure (see component identification).
- Return lines (ports T and Y) of safety valves must provide a safe outlet. No fluid is allowed to collect in the return lines.
- When a seal is removed from the safety valve, the approval according to the PED becomes invalid!
- Generally observe the requirements laid down in Pressure Equipment Directive 97/23 EC and the AD2000 sheet A2!
- Caution! The unloading function provided by the directional valve must not be used for safety-relevant functions! If an unloading function is required for safety-relevant tasks, an additional unloading valve must be installed.

Strictly observe the application notes!

The response pressure indicated in the component identification is factory-set at a flow of 2 L/min.

The permissible maximum flow $q_{V \text{ max}}$ indicated in the component identification (= numerical value in the place of letter “G” in the component identification, see page 15) must not be exceeded.

The following is valid:
- Pilot oil drain “external” (= Y in the ordering code) without backpressure in return line Y, permissible backpressure in the return line (port T) < 15 bar
- Pilot oil drain “internal” (= No code in the ordering code). The max. permissible flow is only permitted without backpressure in the return line (port T).

With internal pilot oil drain, the system pressure increases by the backpressure in the drain line (port T) (AD2000 - sheet A2, observe section 6.31).

In order to prevent this increase in the system pressure caused by the flow from exceeding 10% of the set response pressure, the permissible flow must be reduced in dependence upon the backpressure in the return line (port T) (see diagrams on pages 17 and 18).
**Safety notes:** Type-tested safety valves of type DB(W)...E, component series 5X according to Pressure Equipment Directive 97/23/EC

Max. permissible flow $q_{Vmax}$ in dependence on the backpressure $p_T$ in the return line with internal pilot oil drain

### Type DB(W) 10 ...5X/...E

<table>
<thead>
<tr>
<th>Char. curve</th>
<th>Response pressure $p_A$ in bar</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>30</td>
</tr>
<tr>
<td>2</td>
<td>60</td>
</tr>
<tr>
<td>3</td>
<td>65</td>
</tr>
<tr>
<td>4</td>
<td>110</td>
</tr>
<tr>
<td>5</td>
<td>210</td>
</tr>
<tr>
<td>6</td>
<td>350</td>
</tr>
</tbody>
</table>

Characteristic curves for intermediate values can be determined by way of interpolation.

### Type DB(W) 20 ...5X/...E

<table>
<thead>
<tr>
<th>Char. curve</th>
<th>Response pressure $p_A$ in bar</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>30</td>
</tr>
<tr>
<td>2</td>
<td>60</td>
</tr>
<tr>
<td>3</td>
<td>65</td>
</tr>
<tr>
<td>4</td>
<td>110</td>
</tr>
<tr>
<td>5</td>
<td>115</td>
</tr>
<tr>
<td>6</td>
<td>210</td>
</tr>
<tr>
<td>7</td>
<td>215</td>
</tr>
<tr>
<td>8</td>
<td>350</td>
</tr>
</tbody>
</table>

Characteristic curves for intermediate values can be determined by way of interpolation.
**Safety notes:** Type-tested safety valves of type DB(W)…E, component series 5X according to Pressure Equipment Directive 97/23/EC

Max. permissible flow $q_{v_{\text{max}}}$ in dependence on the backpressure $p_T$ in the return line with internal pilot oil drain.

**Type DB(W) 30 …-5X/…E**

<table>
<thead>
<tr>
<th>Characteristic curve</th>
<th>Response pressure $p_{R}$ in bar</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>30</td>
</tr>
<tr>
<td>2</td>
<td>60</td>
</tr>
<tr>
<td>3</td>
<td>65</td>
</tr>
<tr>
<td>4</td>
<td>110</td>
</tr>
<tr>
<td>5</td>
<td>115</td>
</tr>
<tr>
<td>6</td>
<td>210</td>
</tr>
<tr>
<td>7</td>
<td>215</td>
</tr>
<tr>
<td>8</td>
<td>350</td>
</tr>
</tbody>
</table>

Characteristic curves for intermediate values can be determined by way of interpolation.

$q_{v_{\text{max}}}$ in L/min

---

<table>
<thead>
<tr>
<th>Response pressure $p_{R}$ in bar</th>
</tr>
</thead>
<tbody>
<tr>
<td>250-bar characteristic curve</td>
</tr>
<tr>
<td>80-bar characteristic curve</td>
</tr>
</tbody>
</table>

$\rho_A$ = Response pressure in bar

$\rho_T$ = Max. permissible backpressure in the return line (port T) (sum of all possible backpressures, see also AD2000 sheet - A2)

$\rho_{T_{\text{max}}} = 10\% \times \rho_A$ (at $q_v = 0$ L/min) to PED 97/23/EC

$q_{v_{\text{max}}}$ = Max. permissible flow in L/min

**Explanation of diagrams** (example DB(W) 30 …E)

**Example 1:**

Given: Flow of the system / accumulator to be safeguarded $q_{v_{\text{max}}} = 300$ L/min

Set response pressure of the safety valve $p_R = 250$ bar

Required: $p_T = ?$

Solution: See arrows on the diagram:

$p_T (300 \text{ L/min}; 250 \text{ bar}) \sim 12$ bar

**Example 2:**

Given: Flow of the system / accumulator to be safeguarded $q_{v_{\text{max}}} = 300$ L/min

Set response pressure of the safety valve $p_R = 80$ bar

Required: $p_T = ?$

Solution: See arrows on the diagram:

$p_T (300 \text{ L/min}; 80 \text{ bar}) \sim 1$ bar