Pressure relief valve, direct operated
Type DBD, DBD...-E according to RE 25402

Setting instructions

Size 6 to 30
Component series 1X
Maximum operating pressure 630 bar [9150 psi]
Maximum flow 330 l/min [87 US gpm]
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.

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The cover shows an example configuration. The product supplied may therefore differ from the photo shown.
1 About this documentation

1.1 Validity of the documentation
These setting instructions apply to the pressure relief valve type DBD, component series 1X, sizes 6 to 30.

This documentation aims at commissioning personnel and service engineers.
This documentation contains important information for the safe and appropriate setting of the pressure relief valve type DBD.

1.2 Necessary and amending documentation

- The pressure setting at the pressure relief valve must not be changed until you have been provided with the documentation marked with the book symbol and you have understood and observed it.

Table 1: Necessary and amending documentation

<table>
<thead>
<tr>
<th>Title</th>
<th>Document number</th>
<th>Document type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pressure relief valve, direct operated</td>
<td>RE 25402</td>
<td>Data sheet</td>
</tr>
<tr>
<td>Safety valves direct operated</td>
<td>RE 25010-B</td>
<td>Operating instructions</td>
</tr>
<tr>
<td>General Operating Instructions for Hydraulic Power Units and Assemblies</td>
<td>RE 07009-B</td>
<td>Operating instructions</td>
</tr>
<tr>
<td>Installation, commissioning and maintenance of industrial valves</td>
<td>RE 07300</td>
<td>Data sheet</td>
</tr>
</tbody>
</table>

1.3 Illustration of information
Consistent safety instructions, symbols, terms and abbreviations are used so that you can quickly and safely work with your product using this documentation. For a better understanding, they are explained in the following sections.

1.3.1 Safety instructions
In this documentation, safety instructions are indicated whenever sequences of operations are explained which bear the risk of personal injury or damage to property. The measures described for preventing these dangers must be observed.

Safety instructions are set out as follows:

<table>
<thead>
<tr>
<th>SIGNAL WORD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type and source of danger</td>
</tr>
<tr>
<td>Consequences in case of non-compliance</td>
</tr>
<tr>
<td>▶ Measures for the prevention of dangers</td>
</tr>
<tr>
<td>▶ &lt;Enumeration&gt;</td>
</tr>
</tbody>
</table>

• **Warning sign:** Draws attention to the danger  
• **Signal word:** Identifies the degree of danger  
• **Type and source of danger:** Specifies the type or source of danger  
• **Consequences:** Describes the consequences of non-compliance  
• **Precautions:** Specifies how the danger can be prevented

<table>
<thead>
<tr>
<th>Warning sign, signal word</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>DANGER</strong></td>
<td>Indicates a dangerous situation which may cause death or severe personal injuries if not avoided.</td>
</tr>
<tr>
<td><strong>WARNING</strong></td>
<td>Indicates a dangerous situation which may cause death or severe personal injuries if not avoided.</td>
</tr>
<tr>
<td><strong>CAUTION</strong></td>
<td>Indicates a dangerous situation which may cause minor or medium personal injuries if not avoided.</td>
</tr>
<tr>
<td><strong>NOTE</strong></td>
<td>Damage to property: The product or the environment could be damaged.</td>
</tr>
</tbody>
</table>

### 1.3.2 Symbols

The following symbols indicate notes which are not safety-relevant but increase the understanding of the documentation.

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image" alt="i" /></td>
<td>If this information is not observed, the product cannot be used and/or operated optimally.</td>
</tr>
<tr>
<td><img src="image" alt="►" /></td>
<td>Individual, self-dependent step</td>
</tr>
<tr>
<td>1.</td>
<td>Numbered instruction: The numbers indicate that the steps must be carried out one after the other.</td>
</tr>
<tr>
<td>2.</td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td></td>
</tr>
</tbody>
</table>

### 1.3.3 Abbreviations

The following abbreviations are used in this documentation:

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>DBD</td>
<td>Pressure relief valve, direct operated</td>
</tr>
<tr>
<td>DBD...E</td>
<td>Type-tested pressure relief valve, direct operated</td>
</tr>
</tbody>
</table>
2 Setting the pressure relief valve

For setting the system pressure in your hydraulic system, safe procedures are necessary. You must therefore follow the instructions in the following sections.

2.1 Prerequisites for the safe pressure setting

Before starting settings at the pressure valve, the following prerequisites have to be satisfied:

- The valid hydraulic scheme must be available. The scheme must contain information on the setting of the system pressure.
- The system pressure at port "P" of the pressure relief valve must be permanently measured during the pressure setting.
- At port "T" of the pressure relief valve, free discharge of the entire oil volume must be guaranteed.
- During setting, the pressure change must be monitored.
- Familiarize with the scheme and check whether:
  - There is a pressure gauge or pressure measurement directly at port "P".
  - Free discharge is guaranteed at port "T".
  - Values for the pressure setting have been specified.
- Keep the necessary tools and measuring equipment (e.g. pressure gauge) ready.

1. Determine the admissible pressure settings.
2. Check the pressure setting at the valve.
3. Set the pressure at the valve.

2.2 Determining the admissible pressure settings

The admissible values for the pressure setting can be seen from the type designation. The type designation is impressed into the valve. The following figure shows the information relevant for the pressure setting. For a detailed explanation of the type designation refer to “Ordering code” in the data sheet RE 25402.

Upon delivery, the pressure relief valve is either preset to 0 bar or to a certain pressure (pressure setting)

<table>
<thead>
<tr>
<th>Type designation - information on the pressure setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>DBD</td>
</tr>
<tr>
<td>Adjustment type for pressure setting</td>
</tr>
<tr>
<td>Size</td>
</tr>
<tr>
<td>Type of connection</td>
</tr>
<tr>
<td>Pressure rating</td>
</tr>
<tr>
<td>Pressure setting</td>
</tr>
</tbody>
</table>

Fig. 1: Type designation - information on the pressure setting
Setting the pressure relief valve

**Pressure rating**

The pressure rating specifies the maximum pressure that can be set. The pressure adjustment range is 0 bar to the specified pressure rating value.

**Pressure setting**

If a value is specified for the pressure setting, the pressure relief valve has been "preset" upon delivery. The pressure relief valve is set to the specified value.

### 2.2.1 Pressure relief valves at manifolds or power units

Pressure relief valves mounted at manifolds or power units may have a preset pressure. In this case, the pressure setting can not be seen from the type designation but from the hydraulic scheme and the setting spindle position.

Observe the following to check whether a pressure setting has been made:

- Apart from the DBD symbol, the hydraulic scheme also contains the following information: "Set to".
- Check the position of the setting spindle according to table 6 "Pressure relief valve - Depressurized setting": If dimension "L" is less than specified in the table, the valve has already been preset to a certain pressure.

### 2.2.2 Type tested safety valves, type DBD...1X/...E

Type tested safety valves according to PED 97/23/EC have a tested pressure setting. With the correct design, they hold the system pressure at the set value.

The pressure setting can be seen from the type designation.

Using the following figure, you can identify the set pressure. A detailed explanation of the type designation is contained in the "Ordering code": Type tested safety valves type DBD" in data sheet RE 25402.

![Type designation - information on the pressure setting of type tested safety valves](image)

**Pressure setting**

The specified value is the tested pressure setting. In case of safety valves with adjustment type "H" (manual), this value must not be exceeded.
Setting the pressure relief valve

### Safety valve
#### Type DBDS ... 1X/.. E
Safety valves with adjustment type "S" are set to a fixed system pressure. They are protected against adjustment by means of lead seal and non-removable protective cap. At these valves, no pressure setting must be made. If the protective cap is destroyed or the lead seal is removed, the warranty for the safety function will become void.

#### Type DBDH ... 1X/.. E
Safety valves with adjustment type "H" are set to the maximum system pressure. In case of adjustment, you may only set a lower pressure.

### 2.3 Checking the pressure setting at the valve
The pressure setting can be checked using the adjustment position. The following table shows the pressure relief valve with the different adjustment types with pressure setting 0 bar. The valve is in a depressurized condition.

- Check the "L" dimension at your pressure relief valve. If the value is lower than specified in the table, a certain pressure has already been set at the valve.

<table>
<thead>
<tr>
<th>Table 5: Pressure relief valve - Depressurized setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pressure relief valve, direct operated</td>
</tr>
<tr>
<td>----------------------------------------</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>
Setting the pressure relief valve

Table 5: Pressure relief valve - Depressurized setting

<table>
<thead>
<tr>
<th>Pressure relief valve, direct operated</th>
<th>Dimension “L” max. in mm [inch]</th>
<th>Type</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>32 [1.26]</td>
<td>DBD S with external hexagon and protective cap, sizes 25 and 30</td>
</tr>
<tr>
<td></td>
<td>To the end of the scale ring</td>
<td>DBD A with lockable rotary knob, sizes 6 - 20</td>
</tr>
</tbody>
</table>

2.3.1 Safety valve type DBDH ... 1X/ .. E

Table 6: Safety valve - Depressurized setting

<table>
<thead>
<tr>
<th>Pressure relief valve, direct operated</th>
<th>Dimension “L” max. in mm [inch]</th>
<th>Type</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>63 [2.48]</td>
<td>DBDH ... 1X/ .. E with rotary knob, sizes 6, 10, 20</td>
</tr>
<tr>
<td></td>
<td>54 [2.13]</td>
<td>DBDH ... 1X/ .. E with hand wheel, size 30</td>
</tr>
</tbody>
</table>
2.4 Setting the pressure

The pressure is set by turning the setting spindle. The setting elements are shown under "Unit dimensions: screw-in valve" in the data sheet RE 25402.

2.4.1 Tools, tightening torque lock nut

Only use manual tools without extension for the pressure setting. Electrically or pneumatically driven tools must not be used!

Depending on the adjustment type and size, you need the following tools:
- Torque power screwdriver
- Open-end wrench SW 19
- Allen wrench SW 6
- Open-end wrench SW 13
- Open-end wrench SW 30

Tightening torque lock nut

The lock nut must be tightened applying a tightening torque of $M_a = 10^{+5}$ Nm with all adjustment types and sizes.

2.4.2 Increasing the pressure

The pressure at the pressure relief valve is increased by clockwise rotation.

**Fig. 3: Direction of rotation for pressure increase**

1. Loosen the lock nut at the pressure relief valve.

**WARNING!** Pressurized valve!!

Risk of injury from leaking oil or components.
- Stop the setting works immediately and depressurize the system
  - if the valve does not behave as expected or
  - if there is any leakage.
- Secure external loads.
- Find the fault and replace the leaking valve by a new one, if necessary.
Setting the pressure relief valve

1. Loosen the lock nut at the pressure relief valve.

**WARNING!** Pressurized valve!!
Risk of injury from leaking oil or components.

- Stop the setting works immediately and depressurize the system
  - if the valve does not behave as expected or
  - if there is any leakage.
- Secure external loads.
- Find the fault and replace the leaking valve by a new one, if necessary.

2. Slowly turn the hexagon head and/or the hexagon socket head cap screw clockwise, using a suitable wrench, until the pressure increases to the desired value. While doing so, observe the pressure gauge at the measuring device in the "P" line.

3. Fix the setting by tightening the lock nut by means of a torque power screwdriver.

The pressure has been set.

**DBD S - Valve with hexagon head or hexagon socket head cap screw**

2. Slowly turn the hand wheel clockwise until the pressure has been increased to the desired value. While doing so, observe the pressure gauge at the measuring device in the "P" line.

3. Fix the setting by tightening the lock nut by means of a torque power screwdriver.

The pressure has been set.

**DBD A - Valve with lockable rotary knob**

2. Firstly turn the key at the rotary knob of the pressure relief valve clockwise in order to enable the adjustment of the pressure setting.

**WARNING!** Pressurized valve!!
Risk of injury from leaking oil or components.

- Stop the setting works immediately and depressurize the system
  - if the valve does not behave as expected or
  - if there is any leakage.
- Secure external loads.
- Find the fault and replace the leaking valve by a new one, if necessary.

3. Slowly turn the rotary knob clockwise until the pressure has been increased to the desired value. While doing so, observe the pressure gauge at the measuring device in the "P" line.

4. Turn the key at the pressure relief valve counterclockwise again.

5. Remove the key from the rotary knob of the pressure relief valve and keep it in a safe place.

The pressure has been set.
### 2.4.3 Reducing the pressure

**Setting a lower pressure**

The system pressure may in any case only be set in the pressure increase direction. When setting a lower pressure, you must first of all reduce the pressure to a value just under the system pressure to be set.

**How to proceed**

1. Reduce the pressure to a value just under the setting.
2. Increase the pressure to the necessary value.

The pressure at the pressure relief valve is reduced by counterclockwise rotation. Please note that in the pressure reduction, the adjustment device may maximally be screwed out to the dimension "L". For the value of dimension "L", please refer to table 6 in chapter 2.3 "Checking the pressure setting at the valve".

---

**WARNING**

Pressurized valve! Risk of injury in case of incorrect setting if the adjustment type is screwed out against the internal stop!

Risk of injury from leaking oil or components.

- It must be possible to rotate the adjustment type smoothly.
- Only screw the adjustment device out of the valve to the maximum value of dimension "L". For the maximum value, please refer to table 6 in chapter 2.3 "Checking the pressure setting at the valve".

Pressurized valve!!

Risk of injury from leaking oil or components.

- Stop the setting works immediately and depressurize the system
  - if the valve does not behave as expected or
  - if there is any leakage.
- Secure external loads.
- Find the fault and replace the leaking valve by a new one, if necessary.

1. Loosen the lock nut at the pressure relief valve.
Setting the pressure relief valve

2. Slowly turn out the hand wheel counterclockwise until the pressure has been reduced to the desired value. While doing so, observe the pressure gauge at the measuring device in the "P" line.

3. If necessary, slowly turn the hand wheel in the opposite direction until the pressure has been increased to the desired value. While doing so, observe the pressure gauge at the measuring device in the "P" line.

4. Fix the setting by tightening the lock nut by means of a torque power screwdriver.

The pressure has been set.

DBD S - Valve with hexagon head or hexagon socket head cap screw

WARNING

Pressurized valve! Risk of injury in case of incorrect setting if the adjustment type is screwed out against the internal stop!

Risk of injury from leaking oil or components.

- It must be possible to rotate the adjustment type smoothly.
- Only screw the adjustment device out of the valve to the maximum value of dimension "L". For the maximum value, please refer to table 6 in chapter 2.3 "Checking the pressure setting at the valve".

Pressurized valve!

Risk of injury from leaking oil or components.

- Stop the setting works immediately and depressurize the system if the valve does not behave as expected or if there is any leakage.
- Secure external loads.
- Find the fault and replace the leaking valve by a new one, if necessary.

1. Loosen the lock nut at the pressure relief valve.

2. Slowly turn the hexagon head and/or the hexagon socket head cap screw counterclockwise, using a suitable wrench, until the pressure is reduced to the desired value. While doing so, observe the pressure gauge at the measuring device in the "P" line.

3. Slowly turn the hexagon head and/or the hexagon socket head cap screw in the opposite direction, using a suitable wrench, until the pressure increases to the desired value. While doing so, observe the pressure gauge at the measuring device in the "P" line.

4. Fix the setting by tightening the lock nut by means of a torque power screwdriver.

The pressure has been set.
Setting the pressure relief valve

DBD A - Valve with lockable rotary knob

**WARNING**

Pressurized valve! Risk of injury in case of incorrect setting if the adjustment type is screwed out against the internal stop!

Risk of injury from leaking oil or components.

- It must be possible to rotate the adjustment type smoothly.
- Only screw the adjustment device out of the valve to the maximum value of dimension "L". For the maximum value, please refer to table 6 in chapter 2.3 "Checking the pressure setting at the valve".

Pressurized valve!!

Risk of injury from leaking oil or components.

- Stop the setting works immediately and depressurize the system
  - if the valve does not behave as expected or
  - if there is any leakage.
- Secure external loads.
- Find the fault and replace the leaking valve by a new one, if necessary.

1. Loosen the lock nut at the pressure relief valve.
2. If necessary, turn the key at the rotary knob of the pressure relief valve counterclockwise first in order to enable the adjustment of the pressure setting.
3. Slowly turn out the rotary knob counterclockwise until the pressure has been reduced to the desired value. While doing so, observe the pressure gauge at the measuring device in the "P" line.
4. Slowly turn the rotary knob in the opposite direction until the pressure has been increased to the desired value. While doing so, observe the pressure gauge at the measuring device in the "P" line.
5. Fix the setting by tightening the lock nut by means of a torque power screwdriver.
6. Turn the key at the pressure relief valve counterclockwise again.
7. Remove the key from the rotary knob of the pressure relief valve and keep it in a safe place.

The pressure has been set.
2.5 Reducing the pressure at type tested safety valves

The pressure setting at type tested safety valves of type “H” may only be reduced.

**WARNING**

Pressurized valve! Risk of injury in case of incorrect setting if the adjustment type is screwed out against the internal stop!

Risk of injury from leaking oil or components.
- It must be possible to rotate the adjustment type smoothly.
- Only screw the adjustment device out of the valve to the maximum value of dimension “L”. For the maximum value, please refer to table 6 in chapter 2.3 “Checking the pressure setting at the valve”.

Pressurized valve!!

Risk of injury from leaking oil or components.
- Stop the setting works immediately and depressurize the system if the valve does not behave as expected or if there is any leakage.
- Secure external loads.
- Find the fault and replace the leaking valve by a new one, if necessary.

1. Loosen the lock nut at the safety valve.
2. Slowly turn out the hand wheel counterclockwise until the pressure has been reduced to the desired value. While doing so, observe the pressure gauge at the measuring device in the “P” line.
3. If necessary, slowly turn the hand wheel in the opposite direction until the pressure has been increased to the desired value. While doing so, observe the pressure gauge at the measuring device in the “P” line.
4. Fix the setting by tightening the lock nut by means of a torque power screwdriver.

The pressure has been set.