Electronic Pressure Switch

EDS 8000
(Menu navigation according to VDMA)

User Manual
(Translation of original instructions)
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1 Safety Information

Before commissioning,
- check the instrument and any accessories supplied
- read the operating instructions
- ensure that the instrument is suitable for your application.

If the instrument is not handled correctly, or if the operating instructions and specifications are not adhered to, damage to property or personal injury can result.

2 Functions of the EDS 8000

Depending on which model you have, the instrument offers the following functions:
- Display of the actual pressure in psi, Mpa or bar
- Switching of the switch outputs in accordance with the pressure and the pre-set switching parameters
- Menu navigation in accordance with the VDMA standard 24574-1
- Coloured LED backlight indicates the switching status

3 Installation

The EDS 8000 can be mounted directly via the pressure connection or indirectly on a hydraulic block using a hose or a minimess line (for torque value, see Chapter 9 - Technical specifications).

For optimum alignment, we recommend connecting the EDS 8000 mechanically using a rotating adapter (for Mechanical Accessories see Chapter 12.2).

The electrical connection must be carried out by a qualified electrician according to the relevant regulations of the country concerned (VDE 0100 in Germany). The housing of the pressure switch must be properly earthed. When fitting into a hydraulic block, it is sufficient if the block is earthed via the hydraulic system. When installing with a minimess hose, the housing must be earthed separately (e.g. with a screened cable).

CAUTION:
The EDS 8000 must be fitted using a suitable open-end wrench (across flats 27) on the hexagon nut of the pressure connection.
Do not install the EDS 8000 by gripping the housing, as this would damage the housing or the entire instrument.

Additional installation suggestions which, from experience, reduce the effect of electromagnetic interference:
- Make line connections as short as possible
- Use screened cabling (e.g. LIYCY 4 x 0.5 mm²)
- The cable screening must be fitted by qualified personnel subject to the ambient conditions and with the aim of suppressing interference
- Keep the unit well away from the electrical supply lines of power equipment, as well as from any electrical or electronic equipment causing interference
4 Controls of the EDS 8000

- 2 keys (↑↓ and E) for adjusting the switch points, switchback points and additional functions
- 4-digit digital display
- LED backlight to indicate switch points (red = active / green = inactive)

Use the keys to select the next menu point, or alternatively to adjust the values.

- To scroll through the menu
- To increase the value
- Hold the key down to fast-scroll through the parameter values
- To select the menu point
- To confirm value

5 Digital display

Once the power supply has been switched on, the device briefly flashes "EdS", and then begins to show the actual pressure.

To check the unit of measurement being used for the pressure indication, press the right-hand key. Depending on the setting, bar, psi or MPa will be shown.

The backlight changes colour according to the settings of the switch outputs and their switch points, i.e. when the switch output is inactive or low-level, the relevant backlight is "green", when the switch output is active or high-level, the relevant backlight is "red".

Backlight for switching output 1
Backlight for switching output 2
### Reading the digital display

<table>
<thead>
<tr>
<th>Description</th>
<th>Representation on 7-segment display</th>
<th>ASCII representation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Switch point, output 1</td>
<td>5P</td>
<td>SP1</td>
</tr>
<tr>
<td>Switch-back point, output 1</td>
<td>rP</td>
<td>RP1</td>
</tr>
<tr>
<td>Switch point, output 2</td>
<td>5P2</td>
<td>SP2</td>
</tr>
<tr>
<td>Switch-back point, output 2</td>
<td>rP2</td>
<td>RP2</td>
</tr>
<tr>
<td>Pressure window upper value, output 1</td>
<td>FH</td>
<td>FH1</td>
</tr>
<tr>
<td>Pressure window lower value, output 1</td>
<td>FL</td>
<td>FL1</td>
</tr>
<tr>
<td>Pressure window upper value, output 2</td>
<td>FH2</td>
<td>FH2</td>
</tr>
<tr>
<td>Pressure window lower value, output 2</td>
<td>FL2</td>
<td>FL2</td>
</tr>
<tr>
<td>Extended functions</td>
<td>EF</td>
<td>EF</td>
</tr>
<tr>
<td>Reset</td>
<td>rE5</td>
<td>RES</td>
</tr>
<tr>
<td>Switch delay time, output 1</td>
<td>dS</td>
<td>dS1</td>
</tr>
<tr>
<td>Switch delay time, output 2</td>
<td>dS2</td>
<td>dS2</td>
</tr>
<tr>
<td>Switch-back delay time, output 1</td>
<td>dR</td>
<td>dR1</td>
</tr>
<tr>
<td>Switch-back delay time, output 2</td>
<td>dR2</td>
<td>dR2</td>
</tr>
<tr>
<td>Output 1</td>
<td>Ou1</td>
<td>Ou1</td>
</tr>
<tr>
<td>Output 2</td>
<td>Ou2</td>
<td>Ou2</td>
</tr>
<tr>
<td>Normally open when hysteresis function is active</td>
<td>HNO</td>
<td>HNO</td>
</tr>
<tr>
<td>Normally open when window function is active</td>
<td>FNO</td>
<td>FNO</td>
</tr>
<tr>
<td>Normally closed when hysteresis function is active</td>
<td>HNC</td>
<td>HNC</td>
</tr>
<tr>
<td>Normally closed when window function is active</td>
<td>FNC</td>
<td>FNC</td>
</tr>
<tr>
<td>Unit conversion</td>
<td>Uni</td>
<td>Uni</td>
</tr>
<tr>
<td>Units in bar</td>
<td>bRr</td>
<td>Bar</td>
</tr>
<tr>
<td>Units in MPa</td>
<td>NPR</td>
<td>MPa</td>
</tr>
<tr>
<td>Units in psi</td>
<td>PS</td>
<td>psi</td>
</tr>
<tr>
<td>Maximum value</td>
<td>HI</td>
<td>HI</td>
</tr>
<tr>
<td>Error indication</td>
<td>Err</td>
<td>ERR</td>
</tr>
<tr>
<td>Delete</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>Extended functions</td>
<td>EF</td>
<td>EF</td>
</tr>
<tr>
<td>Yes</td>
<td>YES</td>
<td>Yes</td>
</tr>
<tr>
<td>No</td>
<td>no</td>
<td>No</td>
</tr>
<tr>
<td>Version</td>
<td>UEr</td>
<td>Ver</td>
</tr>
</tbody>
</table>
NOTE:

• If the actual pressure exceeds the instrument's nominal pressure it can no longer be displayed. The nominal pressure flashes in the display. As a result, when the menu point Max Value (Hi) is selected, the value of the highest measured pressure which has been stored flashes until the instrument is reset (rES).

• If the actual pressure is less than 0.6 % of the nominal range, 0 bar is displayed.
6 Output function

6.1 Switching Outputs

The EDS 8000 has 2 switching outputs. The following settings can be made under the basic settings:

6.1.1 Switch point setting (SP)

One switch point and one switch-back point can be set for each switching output. The particular output will switch when the set switch point is reached and switch back when the pressure drops below the switch-back point.

Example for switch point 1 (normally closed and normally open function):

Abbreviations:

- "SP1", "SP2" = switch point 1 / switch point 2
- "RP1", "RP2" = switch-back point 1 / switch-back point 2
- "HNO", "HNC" = normally open when hysteresis function is active
- normally closed when hysteresis function is active

NOTE:
- It is only possible to set the switch point (SP) if it is higher than the respective switch-back point (RP). In the case of low SPs we recommend setting the RP first.

6.1.2 Window function setting (Fno / Fnc)

The window function allows you to monitor a range. An upper and a lower switch value can be entered for each switch output. These values determine the range.

The relevant output will then switch when the pressure enters this range. When the pressure leaves this range, i.e. when the switch-back point has been reached, the output switches back. The lower switch-back value is just below the lower switch value. The upper switch-back value is just above the upper switch value. The range between the switch value and the switch-back value forms a safety margin which prevents unwanted switching operations from being triggered (such as those triggered by the pulsations of a pump).
Example for switch output 1 (normally closed and normally open function):

Abbreviations:
- "FH1", "FH2" = upper switch value 1 / upper switch value 2
- "FL1", "FL2" = lower switch value 1 / lower switch value 2
- "FNO" = normally open when window function is active
- "FNC" = normally closed when window function is active

**NOTE:**
- It is only possible to set the switch point (SP) if it is higher than the respective switch-back point (RP). In the case of low SPs we recommend setting the RP first.
- The window function only works properly (switching on and off) if all switch values (including the safety margin) are above 0 bar and below the nominal pressure range.

### 6.2 Setting ranges for the switching outputs

<table>
<thead>
<tr>
<th>Measuring range</th>
<th>Lower limit of RP / FL</th>
<th>Upper limit of SP / FH</th>
<th>Min. difference between RP and SP or FL and FH</th>
<th>Increment</th>
</tr>
</thead>
<tbody>
<tr>
<td>in psi</td>
<td>in psi</td>
<td>in psi</td>
<td>in psi</td>
<td>in psi</td>
</tr>
<tr>
<td>0.. 500</td>
<td>0.. 25</td>
<td>5</td>
<td>0,25</td>
<td>1</td>
</tr>
<tr>
<td>0..1000</td>
<td>0.. 40</td>
<td>10</td>
<td>0,40</td>
<td>2</td>
</tr>
<tr>
<td>0..3000</td>
<td>0..100</td>
<td>30</td>
<td>1,00</td>
<td>5</td>
</tr>
<tr>
<td>0..6000</td>
<td>0..250</td>
<td>60</td>
<td>2,50</td>
<td>10</td>
</tr>
<tr>
<td>0..9000</td>
<td>0..400</td>
<td>90</td>
<td>4,00</td>
<td>20</td>
</tr>
<tr>
<td>0..600</td>
<td>0..600</td>
<td>600</td>
<td>6,00</td>
<td>1,00</td>
</tr>
</tbody>
</table>

*All ranges given in the table can be adjusted by the increments shown.*
7 Menu navigation

The EDS 8000 can be adapted to suit the particular application as required by changing multiple settings. These settings are combined in a single menu.

NOTE:
- If no key is pressed for approx. 60 seconds, the menu closes automatically, and any changes that may have been made will not be saved.
- If both keys are pressed at the same time, the menu closes automatically and any changes made are saved.
- When an adjusted parameter is confirmed, the set value is displayed for a second before returning to the relevant menu point.

7.1 Main menu

![Diagram of menu structure]
7.2 Extended functions
8 Error message
If an error is detected, a corresponding error message appears that must be acknowledged by pressing any key.
Possible error messages:

E.10   A data error was detected in the saved settings. This could be due to strong electromagnetic interference or a component fault.

Action: Press $E$ and confirm "RES" by pressing "Yes". The factory settings will be restored for all adjustable parameters and all minimum and maximum values will be deleted. Enter the data again from the beginning.

E.12   An error was detected in the saved calibration data. This could be due to strong electromagnetic interference or a component fault.

Action: Disconnect then reconnect the supply voltage to the instrument. If the error persists, the instrument must be returned to the factory for recalibration or repair.

E.21   A communication error was detected within the instrument. This could be due to strong electromagnetic interference or a component fault.

Solution: Press $E$. If the error persists, disconnect then reconnect the supply voltage to the instrument. If the error still persists, please contact our service department.

9 Pin assignment
Version with 2 switch outputs:

Male 4 pole, M12x1

![Diagram of pin assignment](image_url)
10 Technical specifications

Input data

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Measuring ranges</th>
<th>Overload pressures</th>
<th>Burst pressure</th>
<th>Mechanical connection</th>
<th>Torque value</th>
<th>Parts in contact with fluid</th>
</tr>
</thead>
<tbody>
<tr>
<td>Measuring ranges</td>
<td>500; 1000; 3000; 6000; 9000 psi 25; 40; 100; 250; 400; 600 bar</td>
<td>1160; 2900; 7250; 11600; 14500 psi 80; 80; 200; 500; 800; 1000 bar</td>
<td>2900; 7250; 14500; 29000; 29000 psi 200; 200; 500; 1000; 2000; 2000 bar</td>
<td>SAE 6 9/16-18UNF2A; G1/4 A DIN 3852, Form E</td>
<td>15 lb-ft (20 Nm)</td>
<td>Mechanical connection: stainless steel Sensor cell: stainless steel Seal: FPM</td>
</tr>
</tbody>
</table>

Output data

| Parameter                  | Accuracy to DIN 16086, ≤ ± 0.5 % FS typ. | Max. setting (Display) ≤ ± 1 % FS max. | Repeatability ≤ ± 0.5 % FS max. | Temperature drift ≤ ± 0.017 % FS / °F [0.03 % / °C] max. zero point | Temperature drift ≤ ± 0.017 % FS / °F [0.03 % / °C] max. range | Long-term stability ≤ ± 0.25 % FS / year max. |

Switch outputs

<table>
<thead>
<tr>
<th>Parameter</th>
<th>2 PNP transistor outputs</th>
<th>max. 250 mA per switching output</th>
<th>&gt; 100 million</th>
<th>&lt; 10 ms</th>
</tr>
</thead>
</table>

Ambient Conditions

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Compensated temperature range -13 .. +185 °F [-25 .. + 85 °C]</th>
<th>Operating temperature range * -13 .. +212 °F [-25 .. + 100 °C]</th>
<th>Storage temperature range -40 .. +185 °F [-40 .. + 85 °C]</th>
<th>Fluid temperature range * -13 .. +257 °F [-25 .. + 125 °C]</th>
<th>Nominal temperature range of display (read-out) +5 .. +185 °F [-15 .. + 70 °C]</th>
</tr>
</thead>
</table>

Emark mark EN 61000-6-1 / 2 / 3 / 4

Vibration resistance to DIN EN 60068-2-6 at 0 .. 500 Hz approx. 10 g

Shock resistance to DIN EN 60068-2-29 (11 ms) approx. 50 g

Protection class to DIN 40050 IP 67 (when an IP 67 connector is used)

Other data

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Supply voltage 9.6 .. 32 V DC</th>
<th>Current consumption max. 35 mA (inactive switch output)</th>
<th>Display: 4-digit, LED, 7-segment, Height of digits 4.5 mm</th>
<th>Life expectancy &gt; 10 million cycles (0 .. 100 %)</th>
<th>Weight: approx. 70 g</th>
</tr>
</thead>
</table>

FS (Full Scale) = relative to the complete measuring range

* extended temperature range possible. By separate request.
11 Ordering details

**Version (technology)**

4 = Thin-film sensor cell

**Mechanical connection**

4 = G 1/4 A DIN 3852 (male)
   *(only in combination with bar ranges)*

7 = SAE 6 9/16-18UNF2A (male)
   *(only in combination with psi ranges)*

**Electrical connection**

6 = male M12x1, 4 pole
   *(connector not supplied)*

**Output**

2 = 2 switching outputs

**Pressure range**

0500; 1000; 3000; 6000; 9000 psi
   *(only in combination with mechanical connection “7” -SAE6-)*

0025; 0040; 0100; 0250; 0400; 0600 bar
   *(only in combination with mechanical connection “4” -G 1/4-)*

**Modification number**

400 = Standard in psi

000 = Standard in bar
12 Accessories

12.1 For electrical connection

**ZBE 06 (4 pole)**
Female connector, right-angle
Part No.: 6006788

**ZBE 06-02 (4 pole)**
Female connector, right-angle with 2m cable,
Part No.: 6006790

**ZBE 06-05 (4 pole)**
Female connector, right-angle with 5m cable
Part No.: 6006789

Colour code: Pin 1: brown
Pin 2: white
Pin 3: blue
Pin 4: black

12.2 For mechanical connection

**ZBM 14**
Adapter female thread G1/4 - male thread G1/4 (rotating)
Part No.: 907818
13 Instrument dimensions
HYDAC ELECTRONIC GMBH
Hauptstr.27
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Germany

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Fax.: +49 (0)6897 509-1726

HYDAC Service
For enquiries about repairs or alterations, please contact HYDAC Service.

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Note
The information in this manual relates to the operating conditions and applications described. For applications and operating conditions not described, please contact the relevant technical department.

If you have any questions, suggestions, or encounter any problems of a technical nature, please contact your Hydac representative.

Subject to technical modifications.