HYDAC INTERNATIONAL

# Pressure switches

## EDS 3100

Up to 2 switch outputs
Analogue output

**Absolute pressure** | **Display**

### Features

- With display
- The display can be moved in two planes.
- Any installation position
- Measured value can be displayed in bar, psi or MPa

### Description

The EDS 3100 is a compact electronic pressure switch with integrated digital display for absolute pressure measurement in the low pressure range.

It has a ceramic measuring cell with thick-film strain gauge. The instrument can have one or two switching outputs, and there is the option of a reversible analogue output signal (4 .. 20 mA or 0 .. 10 V).

A special design feature of the EDS 3100 is that the display can be moved in two planes. The device can be installed in almost any position and the display can be turned to the optimum position without the usual additional expense of a mechanical adapter.

The 4-digit display can indicate the pressure in bar, psi or MPa. The user can select the particular measurement unit. When changing to a different measurement unit, the device automatically converts all the switching settings to the new unit of measurement.

The EDS 3100 is also available in a variant with menu navigation in accordance with VDMA.

### Application fields

The main applications of the EDS 3100 are primarily in hydraulics and pneumatics, as well as in refrigeration and air conditioning technology.

# Technical details

| | | | |
|---|---|---|---|
| **Input data** | | | |
| Measurement ranges | bar | 1 | 2.5 |
| Overload pressures | bar | 3 | 8 |
| Burst pressure | bar | 5 | 12 |
| Mechanical connection | | See model code | |
| Tightening torque, recommended | | 20 Nm (G1/4); 45 Nm (G1/2) | |
| Parts in contact with fluid | | Mechanical connection<br>stainless steel sensor element Ceramic<br>Seal: Copper (G1/2) / FKM / EPDM (as per model code) | |
| **Output variables** | | | |
| Switching outputs | | 1 or 2 PNP transistor outputs<br>Switching current: max. 1.2 A per output<br>Switching cycles: > 100 million | |
| Analogue output, permitted load resistance | | Selectable:<br>4 .. 20 mA<br>0 .. 10 V | <br>load resist.: max. 500 Ω<br>load resist.: min. 1 kΩ |
| Accuracy acc. to DIN 16086,<br>terminal based | | ≤ ± 0.5 % FS typ.<br>≤ ± 1.0 % FS max. | |
| Temperature compensation<br>zero point | | ≤ ± 0.015 % FS / °C typ.<br>≤ ± 0.025 % FS / °C max. | |
| Temperature compensation<br>span | | ≤ ± 0.015 % FS / °C typ.<br>≤ ± 0.025 % FS / °C max. | |
| Repeatability | | ≤ ± 0.25 % FS max. | |
| Reaction time | | < 10 ms | |
| Long-term drift | | ≤ ± 0.3 % FS typ. / year | |
| **Ambient conditions** | | | |
| Compensated temperature range | | -10 .. +70 °C | |
| Operating temperature range | | -25 .. +80 °C (-25 to +60 °C acc. to UL spec.) | |
| Storage temperature range | | -40 .. +80 °C | |
| Fluid temperature range | | -25 .. +80 °C | |
| CE mark | | EN 61000-6-1 / 2 / 3 / 4 | |
| c UL us mark [1] | | Certificate no.: E318391 | |
| Vibration resistance acc. to DIN EN 60068-2-6 at 10 .. 500 Hz | | ≤ 10 g | |
| Shock resistance acc. to DIN EN 60068-2-27 (11 ms) | | ≤ 50 g | |
| Protection class acc. to DIN EN 60529 [2] | | IP 67 | |
| **Other data** | | | |
| Supply voltage<br><br>when applied acc. to UL specifications | | 9 .. 35 V DC without analogue output<br>18 .. 35 V DC with analogue output<br>-limited energy- according to 9.3 UL 61010; Class 2;<br>UL 1310 / 1585; LPS UL 60950 | |
| Residual ripple of supply voltage | | ≤ 5 % | |
| Current consumption | | ≤ 2.455 A total<br>≤ 35 mA with inactive switching output<br>≤ 55 mA with inactive switching output and analogue output | |
| Display | | 4-digit, LED, 7 segment, red, height of digits 7 mm | |
| Weight | | ~ 120 g | |

Note: Reverse polarity protection of the supply voltage, overvoltage, override and short circuit protection are provided.

**FS** (**F**ull **S**cale) = relative to complete measuring range

[1] Environmental conditions according to 1.4.2 UL 61010-1; C22.2 no. 61010-1

[2] With mounted mating connector in corresponding protection type

## Setting options: Standard design

All settings offered by the EDS 3100 are grouped in 2 easy-to-navigate menus. In order to prevent unauthorised adjustment of the device, a programming disable can be set.

## Setting ranges for the switching outputs

Switch point function

| Measuring ranges in bar | Switch point in bar | Hysteresis in bar | Increment* in bar |
|---|---|---|---|
| 0 .. 1 | 0.016 .. 1.000 | 0.006 .. 0.990 | 0.002 |
| 0 .. 2.5 | 0.040 .. 2.500 | 0.015 .. 2.475 | 0.005 |

Window function

| Measuringrange in bar | Lower switch value in bar | Upper switch value in bar | Increment* in bar |
|---|---|---|---|
| 0 .. 1 | 0.016 .. 0.982 | 0.024 .. 0.990 | 0.002 |
| 0 .. 2.5 | 0.040 .. 2.455 | 0.060 .. 2.475 | 0.005 |

* All ranges shown in the table can be adjusted by the increments shown.

## Setting options: menu navigation acc. to VDMA

All terms and symbols used for setting the EDS 3100 as well as the menu structure comply with the specifications in the VDMA Standard (VDMA 24574-1) for pressure switches.
The EDS 3100 can easily be adjusted via three buttons.

## Setting ranges for the switching outputs

| Measuring range in bar | Lower limit of RP / FL in bar | Upper limit of SP / FH in bar | Min. difference betw. RP and SP & FL and FH | Increment* in bar |
|---|---|---|---|---|
| 0 .. 1 | 0.010 | 1.000 | 0.010 | 0.002 |
| 0 .. 2.5 | 0.025 | 2.500 | 0.025 | 0.005 |

* All ranges shown in the table can be adjusted by the increments shown.
SP = switch point; RP = switch-back point
FL = temperature window lower value; FH = temperature window upper value

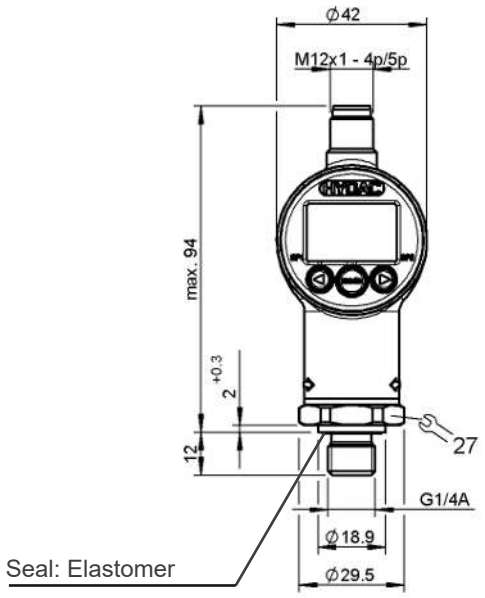
## Additional functions

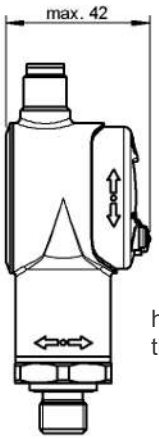
- Switching mode of the outputs adjustable (switch point function or window function)
- Switching direction of the switch outputs adjustable (N/C or N/O)
- Switch-on and switch-back delay adjustable from 0.00 .. 99.99 seconds
- Analogue output signal selectable 4 .. 20 mA or 0 .. 10 V
- Pressure can be displayed in measurement units bar, psi, MPa; other units of force, weight, etc. can also be set by the user.

## Additional features of the standard design

- Choice of display (actual pressure, peak value, switch point 1, switch point 2, display off)
- Display filter for smoothing the display value during pressure pulsations

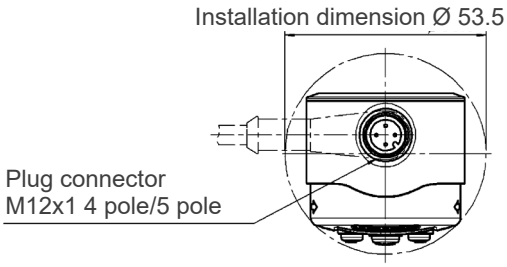
# Dimensions



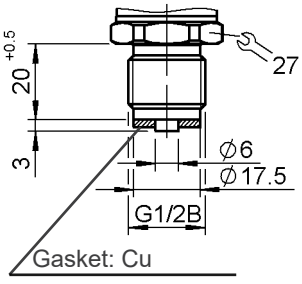
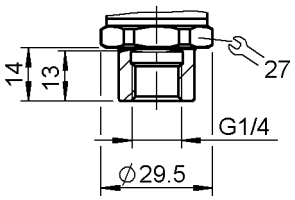




display turns through 270°

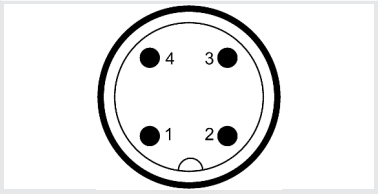
housing turns through 340°



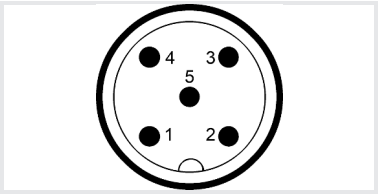

**Mechanical Connection Variants**

| G1/2 B DIN EN 837<br>Tightening torque, recommended 45 Nm | Threaded port DIN 3852-G1/4<br>Tightening torque, recommended: 20 Nm |
|---|---|
|  |  |

## Pin connections

| M12x1, 4 pole | Pin | Output: 1 | Output: 2 | Output: 3 |
|---|---|---|---|---|
|  | 1 | $+U_B$ | $+U_B$ | $+U_B$ |
| | 2 | n.c. | SP2 | Analogue |
| | 3 | 0 V | 0 V | 0 V |
| | 4 | SP1 | SP1 | SP1 |



| M12x1, 5 pole | Pin | Output: 5 |
|---|---|---|
|  | 1 | $+U_B$ |
| | 2 | Analogue |
| | 3 | 0 V |
| | 4 | SP1 |
| | 5 | SP2 |



## Model code

**EDS 3 1 _ _ - _ - XXXX - _ _ - X 1**

1 = G1/2 B DIN EN 837
4 = G1/4 A ISO 1179-2
9 = Threaded port DIN 3852-G1/4

6 = Plug connector M12x1, 4 pole (mating connector not included), only for output models "1", "2" and "3"
8 = Plug connector M12x1, 5 pole (mating connector not included), only for output model "5" and modification "000"

1 = 1 switching output — only in conjunction with electrical connection type "6"
2 = 2 switching outputs — only in conjunction with electrical connection type "6"
3 = 1 switching output and 1 analogue output — only in conjunction with electrical connection type"6"
5 = 2 switching outputs and 1 analogue output — only in conjunction with electrical connection type "8" and modification "000"

01.0; 02.5

000 = Standard
V00 = Menu navigation in accordance with the VDMA (standard sheet 24574)

**Seal material (parts in contact with fluid)**

F = FKM seal (e.g. for hydraulic oils)
E = EPDM seal (e.g. for water, refrigerants)

**Connection material (parts in contact with fluid)**

1 = Stainless steel

**Accessories:**
Appropriate accessories, such as mating connectors, can be found in the Accessories brochure.

## Note

The information in this brochure relates to the operating conditions and applications described.
For applications or operating conditions not described, please contact the relevant technical department.
Subject to technical modifications.