



## Oil Condition Sensor HYDACLab®

### Description

The HYDACLab® is a multifunctional sensor for real-time monitoring of oil condition. The user receives up-to-the-minute information on changes in the fluid and can take immediate action in the case of deteriorating operating conditions.

By measuring the relative change in viscosity, temperature, relative humidity and dielectric constant, assertions can be made as to the condition of the oil e.g. whether ageing or the addition of foreign oils has occurred. On the electrical output side of the HYDACLab® the values are available as analogue or as switching signals (e.g. warning, alarm).

### Features

- Real-time condition monitoring of oils
- Analogue output for:
  - temperature
  - relative humidity
  - relative change in viscosity
  - relative change in dielectric constant
- Switching output
- Compact construction
- Simple cartridge mounting
- Fluid compatibility:
  - Mineral oils HLP
  - (HLP-D on request),
  - ester HEES, HETG

### Technical details

Input data	
Relative humidity	0 .. 100% saturation
Temperature	-25 .. +100 °C
Viscosity	1 .. 1000 cst
Dielectric constant	1.5 .. 10
Operating pressure	< 50 bar
Pressure resistance	< 600 bar
Flow velocity	< 5 m/s
Output data for rel. humidity measurement	
Output signal	4 .. 20 mA (0 .. 100 %)
Calibration accuracy	≤ ± 2 % FS max.
Accuracy when measuring in media*	≤ ± 3 % FS typ.
Output data for temperature measurement	
Output signal	4 .. 20 mA (-25 .. +100 °C)
Accuracy	≤ ± 3 % FS max.
Output data for rel. change in viscosity and rel. change in dielectric constant	
Output signal	12 mA ± 8 mA (± 30 % of initial value)
Measurement accuracy	**
Switching output	
Signal 1 (N/C)	PNP switching output 0.5 A max. High level U <sub>B</sub> - 4 V
Default warning SP1 humidity	≥ 85 %
Default warning SP1 temperature	≥ 80 °C
Default warning SP1 viscosity	± 10 % (temperature compensated)
Default warning SP1 dielectric constant	± 15 % (temperature compensated)
Ambient conditions	
Nominal temperature range	+20 .. +80 °C
Ambient temperature range	-25 .. +85 °C
Fluid temperature range	-40 .. +100 °C
Storage temperature	-40 .. +90 °C
CE mark	EN 61000-6-1, EN 61000-6-2 EN 61000-6-3, EN 61000-6-4
Protection class to DIN 40050	IP 67
Other data	
Supply voltage U <sub>B</sub>	10 .. 36 V DC
Residual ripple supply voltage	≤ 5 %
Mechanical connection	G ¾ DIN 3852 E
Torque value	30 Nm
Electrical connection	M12x1, 5 pole
Reverse polarity protection, Short circuit protection	Provided
Housing	stainless steel
Seal material	FPM
Weight	approx. 205 g

Note: **FS (Full Scale)** = relative to full measuring range

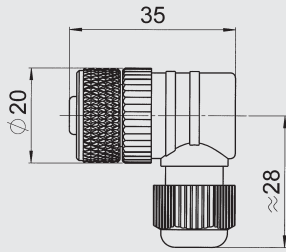
\* The maximum accuracy when measuring humidity is heavily dependent on the type of oil or on additives used. More detailed information is available on request.

\*\* The measurement accuracy when measuring the relative change in viscosity or dielectric constant is dependent on the application, the type of oil and the individual calibration of the sensor. Detailed information is available on request.

## Electrical accessories

### ZBE 08 (5 pole)

Connector M12x1, right-angled  
Order no.: 6006786



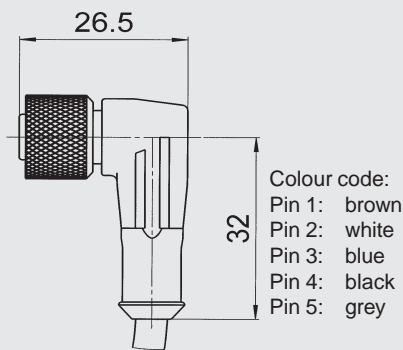
**ZBE 08-02** (5 pole) with 2m cable  
Order no.:6006792

**ZBE 08-05** (5 pole) with 5m cable  
Order no.:6006791

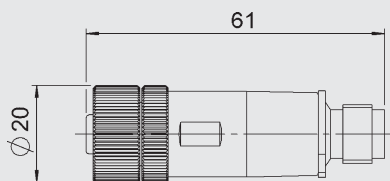
**ZBE 08S-02** (5 pole) with 2m  
screened cable  
Order no.:6019455

**ZBE 08S-05** (5 pole) with 5m  
screened cable  
Order no.:6019456

**ZBE 08S-10** (5 pole) with 10m  
screened cable  
Order no.:6023102



**ZBE 025** Reset adaptor  
Order no.:909695



### HDA 5500-0-2-zC-005

The digital display unit HDA 5500 can display the sequential analogue output of the HYDACLab® and provides the user with 4 programmable switching outputs.

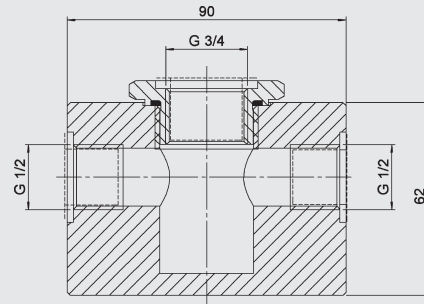
HDA5500-0-2-AC-005(HLB1k)  
Order no.: 909730

HDA5500-0-2-DC-005(HLB1k)  
Order no.: 909731

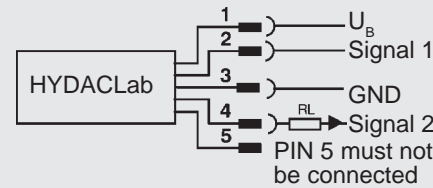
## Mechanical accessories

### ZBM 21

Adaptor for inserting into a G 1/2" line



## Electrical connection



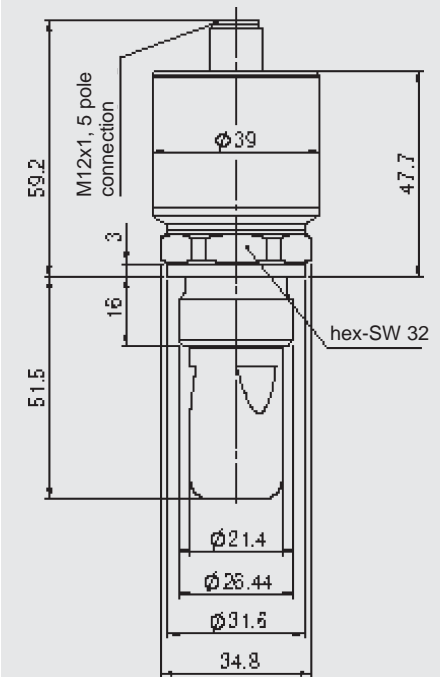
Signal 1: PNP switching output  
Signal 2: sequential analogue output  
(4 .. 20 mA) for relative change  
in viscosity, dielectric constant,  
measurements of humidity and  
temperature

$$R_{Lmax} = (U_B - 5V) / 20 \text{ mA} [\text{k}\Omega] \text{ and } R_L \leq 500\Omega$$

### Note

The load resistance  $R_L$  is produced by the measuring resistance inside the evaluation unit and line resistance of the connection line.

## Dimensions



## Model code

**HLB 1 0 0 8 - 1 C - 000 - F 1**

### Mechanical connection

4 = G3/4 A DIN 3852 (male)

### Electrical connection

8 = M12x1, 5 pole  
(connector not supplied)

### Signal technology output 1

1 = switching output / N/C

### Signal technology output 2

C = analogue output 4 .. 20 mA, 3 conductor technology

### Modification number

000 = standard (cannot be adjusted)  
001 = programmable

### Material of seal (in contact with fluid)

F = FPM seal

### Material of connection (in contact with fluid)

1 = stainless steel

## 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.

**HYDAC ELECTRONIC GMBH**  
Hauptstraße 27,  
D-66128 Saarbrücken  
Tel: +49 (0)681 7099-0,  
Fax: +49 (0)681 7099-202  
E-Mail: electronic@hydac.com,  
Internet: www.hydac.com