



Oil condition sensor HYDACLAB® HLB 1400

Sequential analogue and switching output

Oil condition

4 measured variables

Features

- Online condition monitoring of oils
- Oil condition indicated by LEDs
- Use in stationary and mobile applications possible
- Analogue output sequence for:
 - Saturation Level
 - Temperature
 - Conductivity and relative change in the electrical conductivity
 - Dielectric constant and relative change in the dielectric constant
- Simple screw in mounting

Description

The HYDACLAB® HLB 1400 is a multifunctional sensor for online monitoring of the condition of standard and bio degradable oils in industrial and mobile applications.

The user is informed about real time of changes in the fluids and can implement measures against improper operating conditions without delay.

Assumptions can be made about the condition of the oil, e.g. ageing or mixing with other fluids, on the basis of the measured values of the dielectric constant and it's relative change, the electric conductivity and the relative change, the saturation level and the temperature.

These measurements are available as sequential analogue signals and/or switching signals on the electrical output of the HYDACLAB® (e.g. for activating warning devices or alarms). The measurement values can be visualised and configured on various HYDAC display and measurement devices.

Application fields

Applications are mainly in condition monitoring.

The HLB 1400 therefore enables oils to be monitored accurately, continuously and online.

Technical details

Input data	
Saturation Level	0 .. 100 %
Temperature	-25 .. 100 °C
Dielectric constant	1 .. 10
Change in the dielectric constant	-30 .. 30 %
Electrical conductivity	0 .. 100 nS/m
Change in the electrical conductivity	-100 .. 200 %
Operating pressure	< 50 bar
Pressure resistance	< 600 bar
Flow velocity	< 5 m/s
Mechanical connection	G 3/4 A ISO 1179-2
Tightening torque, recommended	30 Nm
Parts in contact with the fluid	Mechanical connection: Stainless steel / vacuum-metallised ceramic glass seal thin-film metallic coating / FKM
Output variable saturation level	
Output signal (0 .. 100 %)	4 .. 20 mA / 0 ... 10 V
Calibration accuracy	≤ ± 2 % FS max.
Accuracy ¹⁾	≤ ± 3 % FS typ.
Output variable temperature	
Output signal (-25 .. 100 °C)	4 .. 20 mA / 0 ... 10 V
Accuracy	≤ ± 3 % FS max.
Output variable dielectric constant	
Output signal (1 .. 10)	4 .. 20 mA / 0 ... 10 V
Accuracy	≤ ± 5 % FS max.
Output variable change in the dielectric constant	
Output signal (± 30 % of IV)	4 .. 20 mA / 0 ... 10 V
Accuracy	See below ²⁾
Output variable electric conductivity(not applicable for Mod 001)	
Output signal (0 .. 100 nS/m / 0 .. 10 nS/m selectable)	4 .. 20 mA / 0 ... 10 V
Accuracy	≤ ± 5 % FS max.
Output variable change in electrical conductivity(not applicable for Mod 001)	
Output signal (-100 .. 200 %)	4 .. 20 mA / 0 ... 10 V
Accuracy	See below ²⁾
Switching output (default settings)	
Signal 1 (N/C)	PNP switching output 250 mA max., switching level ≥ U _B - 4 V
Default value SP1 relative humidity	≥ 85 %
Default value level SP1 temperature	≥ 80 %
Default value level SP1 rel. change in dielectric constant	± 15 %
Default value SP1 rel. change in conductivity (not applicable for Mod. 001)	± 15 %
Environmental conditions	
Nominal temperature range	+20 .. +80 °C
Storage temperature range / Fluid temperature range	-30 .. +100 °C
Fluid compatibility	Suited for hydraulic and lubrication oils
CE mark	EN 61000-6-1 / -2 / -3 / -4
Viscosity range	1 .. 5000 cSt
Shock resistance acc. to DIN EN 60068-2-27	50 g / 11 ms / half sine
Vibration resistance to DIN EN 60068-2-6 at 5 .. 2000 Hz	10 g / sine
Protection class to DIN EN 60529 ³⁾	IP 67
Other data	
Supply voltage U _B	10 .. 36 V DC
Residual ripple of supply voltage	≤ 5 %
Current consumption	Max. 100 mA without outputs
Housing	Stainless steel
Weight	~ 215 g

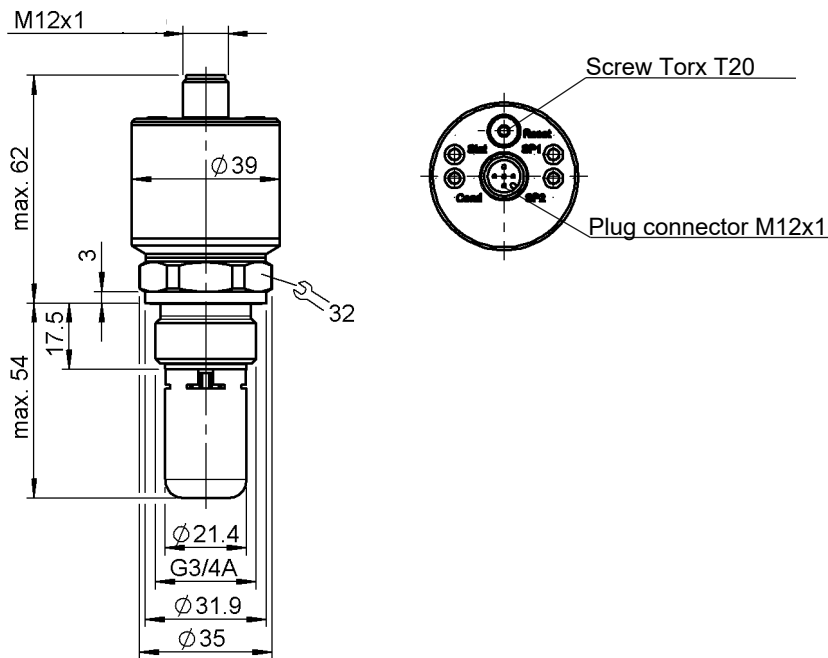
Note: Reverse polarity protection, short circuit protection provided.

FS (Full Scale) = relative to complete measuring range

IV (Initial Value)

- ¹⁾ The max. accuracy achievable when measuring relative humidity is heavily dependent on the type of fluid or fluid additive. More precise information on this is available on request.
- ²⁾ The accuracies when defining the change of dielectric constant and the electrical conductivity depend on the application, the oil type and the auto-calibration of the sensor. Detailed information available on request.
- ³⁾ With mating connector of corresponding protection type fitted

Dimensions



Pin connections

M12x1, 5 pole	Pin	Output: 1C000
	1	+U _B
	2	SP1/AA1
	3	GND
	4	SP2/AA2
	5	HSI
HSI = HYDAC Sensor Interface (HYDAC's own communication interface) SP = Switching point AA = Analogue output (sequence)		

M12 x 1, 8 pole	Pin	Output: 1CS12
	1	+U _B
	2	SP1/AA1
	3	GND
	4	PE
	5	HSI
	6	RS485A
	7	RS485B
	8	SP2/AA2
HSI = HYDAC Sensor Interface (HYDAC's own communication interface) SP = Switching point AA = Analogue output (sequence)		

Display, read-out and configuration options

HMG 510

Portable double channel data recorder, especially designed for the display of measured values in combination with HSI and condition monitoring sensors
Order no.: 909889

HMG 2500 / HMG 4000

Portable data recorders with full colour graphics for displaying, recording and processing measured values as well as for the configuration of HSI and condition monitoring sensors

CMU 1000

Electronic evaluation unit for online measured value monitoring as well as for the configuration of HSI and condition monitoring sensors
Order no.: 920718

CSI-B-2

Interface module, enables the configuration of HSI and condition monitoring sensors using HYDAC PC software CMWIN
Order no.: 920134

Information on other read-out options can be found on our website at www.hydac.com or please contact your HYDAC representative.

Model code

HLB 1 4 J X - XXXXX - 000

Measured variables

4 = 4 Measured variables:

- saturation (rel. humidity)
- temperature
- electrical conductivity (not applicable for Mod 001)
- dielectric constant (DC)

Mechanical connection

J = G3/4 A ISO 1179-2

Connection code, electrical

8 = Plug M12X1, 5 pole (mating connector not included)
P = Plug M12X1, 8 pole (mating connector not included)

Signal technology

5 pole:

1C000 = 1 switching output / analogue output
00S12 = RS485

8 pole:

1CS12 = Switching output / analogue output / RS485

Modification number

000 = Standard
001 = General info ¹⁾

Accessories:

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

Notice:

¹⁾ HLB 14J8-1C000-001 serves as one-to-one replacement for HLB 1300. The analogue output 2 of this device is pre-set in a way that no conductivity values will be displayed.

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.

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