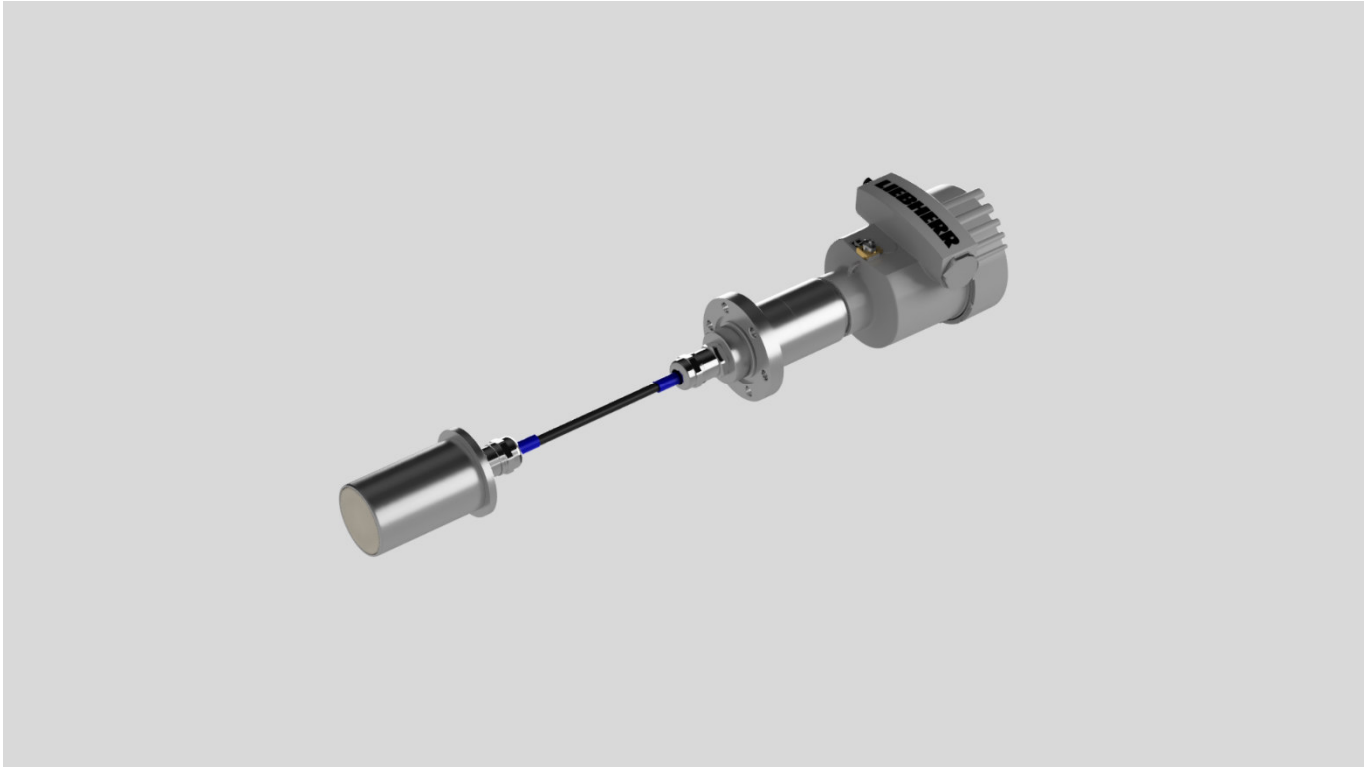Technical data

Litronic-WMS II planar sensor P45-GD

Planar sensor P45-GD

Features

- Evaluation of the complex dielectric in the high frequency stray field
- Freely scalable measuring range
- Material curve switching
- Sensor replacement without recalibration
- Temperature compensation
- Integrated microprocessor with mean value calculation
- Limit value analysis
- Digital measuring value transmission
- Medium contacted parts 1.4571 (AISI 316TI) 2.4819, Hastelloy®C-276, Alloy C-276 and PEEK
- Electronics integrated in transmitter head
- Transmitter head multiprotocol: 4-20 mA, HART
- External display in separate housing (accessories)

Subject to change without notice

Technical data planar sensor P45-GD

Physical principle	Capacitance determination in the high-frequency stray field
Measuring range	0 bis 100 % moisture content
Frequency	22 MHz
Cycle of up-date	65,535 ms
Measuring precision measurement of temperature	± 0,5 °C
Measured value transmission – Sensor-display unit	Current loop with 4...20 mA for external display (option)
Measured value transmission – Sensor-PLC or Central computer	Analog: 4...20 mA aktive at 500 Ohm digital: Hart Modem
Valid measurement	3,75 mA to 21,6 mA (NAMUR)
Error display	<3,6 mA to >22 mA (NAMUR)
Signal resolution interface	16 bit
Max. length of connection cable	1000 m (cable type dependent)
Supply voltage	U_n = 12 V DC (SELV/PELV)
Medium temperature	-5 °C* to 80 °C
Ambient temperature sensor head	5 °C to 80 °C
Ambient temperature transmitter head	5 °C to 70 °C
Storage temperature	-25 °C to 80 °C
Pressure	-1 bar to 75 bar
Protection class transmitter head	IP 65
Protection claas sensor	IP 68
Material housing	1.4571 (AISI 316TI) Optional: 2.4819, Hastelloy®C-276, Alloy C-276
Material transmitter head	Die-cast aluminium, copper content max. 0,1 %
Housing transmitter head W/H/D	88 mm / 160 mm / 143 mm
Material measuring field/wear protection	PEEK
Measuring field position	front
Sensor diameter	45 mm
Cable length between sensor and transmitter head	10 m

*under special conditions

Subject to change without notice
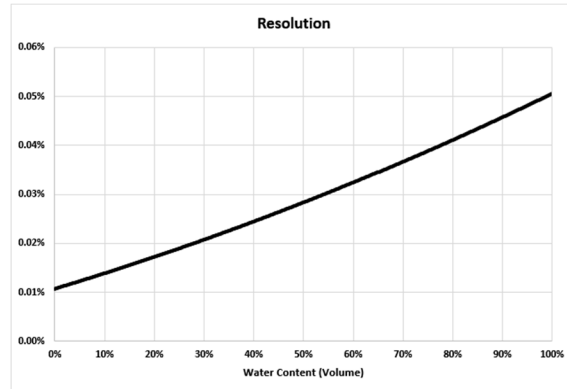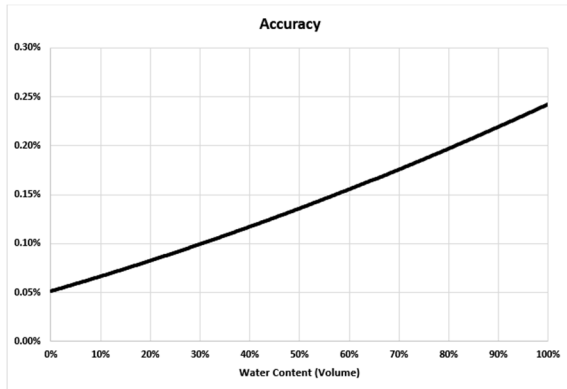
Accuracy

Water Content	Accuracy	Resolution	With Damping value
0-1 %	+/- 0.05 %	0.011 %	0,005 %
0-10 %	+/- 0.07 %	0.014 %	0,005 %
0-20 %	+/- 0.08 %	0.017 %	0,005 %
0-50 %	+/- 0.14 %	0.029 %	0,005 %
0-100 %	+/- 0.24 %	0.050 %	0,005 %

Remarks:

These values apply if the customer creates his own material calibration curve and if this material calibration curve is determined individually for each sensor.
A precondition for exact and reproducible results is a well-mixed emulsion with a constant consistence.

For optimal measurement of the water content, the temperature should be kept as constant as possible.
If this is not possible, the temperature should change as slowly as possible.
Deviations are to be expected if the temperature changes more than 1K/min.

The measurement of the water content is based on the difference between the relative permittivity of the material
(e.g. Oil) and the relative permittivity of water. If the relative permittivity of the material is temperature-dependent and major
temperature changes are to be expected and the requirements for accuracy are high, temperature
compensation must be used.

In order to achieve the best possible measurement results, a sensor check should be carried out regularly.

The accuracy depends on how well the parameters for the user calibration curve were determined and how many control points
were used to calculate the calibration curve. It also depends on how well the samples reflect the actual water content.

The density should remain constant during the measurement. If the density changes during the measurement,
an external density signal and an external computing unit must be used to compensate for this value.

If other substances (e.g. contamination) are involved in the process, deviations can occur if these substances
have a different permittivity.

The damping value in the WIO software can be used for signal conditioning.

Subject to change without notice

Certificates

ATEX / UKEX:
EU-type examination certificate number: EPS 21 ATEX 1 140 X
                                            EPS 22 UKEX 1 159 X

EN IEC 60079-0:2018, EN 60079-1:2014, EN 60079-11:2012, EN 60079-26:2015, EN 60079-31:2014

Gas EX-protection:
(Ex) II 1/2 G Ex db/ia IIC T4 Ga/Gb
Dust EX-protection:
(Ex) II 1/2 D Ex tb/ia IIIC T135°C Da/Db

IECEx:
Certificate number: IECEx EPS 21.0047X

IEC 60079-0:2017 Edition: 7.0, IEC 60079-1:2014-06 Edition: 7.0, IEC 60079-11:2011 Edition: 6.0
IEC 60079-26:2014-10 Edition: 3.0, IEC 60079-31:2013 Edition: 2

Gas EX-protection:
Ex db/ia IIC T4 Ga/Gb
Dust EX-protection:
Ex tb/ia IIIC T135°C Da/Db

Further remarks

- The welding process connection for integration in pipe or the implementation in your plant must be provided by customer, following the specifications of Liebherr.
- For the water in oil measurement, a factory basic calibration will be done.
- The sensor has been specially designed to measure the water content in binary emulsions and powder&bulk.
- A basic calibration is carried out at the factory for water in oil measurement.
- A precise technical clarification is absolutely necessary.

- The Liebherr address, the Liebherr Logo, as the manufacturer / distributor must always be read in full, so it is not allowed to paste or cover it.

Observe special conditions of use

- For the power supply of the sensor use only a power supply for the relevant device category.
- Build-up of electrostatic charge on the painted enclosure shall be avoided.
  High charge generating processes shall be excluded.
- The flameproof joints are not intended to be repaired.
- The cable can only be installed movable if the ambient temperature around is between 5 °C and 70 °C.
- If the cable has to be connected within the potentially explosive area, the cable must have a minimum protection class of IP-6x or another accepted type of protection for that area.
- The allowed sensor head ambient temperature in process is between 5 °C to 80 °C
- The allowed transmitter head ambient temperature in process is between 5 °C to 70 °C

Litronic-WMS PC-SOFTWARE WIO

For commissioning and service of Litronic-WMS II sensors.

Features:
- Operation with standard HART modem and PC (MS-Windows 10)
- Parameterization of the sensors
- Diagnostic function with display of measuring parts, water content, media temperature
- Input of media-specific curves (linear or polynomial up to 3rd order) and offset
- Curve switching measurement and data recording in file (for import into Microsoft Excel)

Default language of the software and the online help is German, English and French.

Note: Translation into other languages is possible at additional costs.