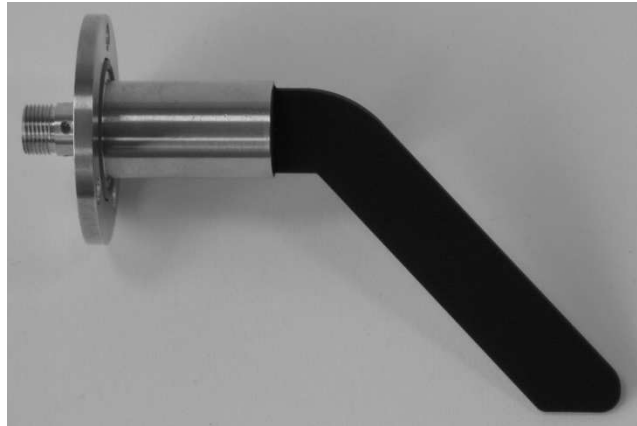


## LCC1...

# Capacitive level meter / switch incl. temperature control



- Designed for oil level detection in crankcases and flat oil containers with high swamping effects
- No moving parts
- Switch output (push pull) and analogue output (4..20 mA, 0..10 V)
- Parameter programming allows to adapt to different requirements and applications
- Simplest installation
- Compact size
- price sensitive OEM version

### Benefit / Principle

The capacitive level meter and switch LCC1 was designed for oil measurement and controlling. Especially in flat containers (compressors, engine oil pans, gearboxes...), where oil level is oscillating. The programmed **damping parameter** can reduce the oscillating of the signal by using average mean values without reducing accuracy.

The **hysteresis** of the switch point can also be programmed by a parameter.

To see all possible programmable parameters, please have a look to the datasheet of the **flex-electronics**, which is more or less compatible with the electronics of the LCC1.

The LCC1 has a **reference structure** at the end of the tip to compensate different permittivity's. This gives also the chance to detect different oils without recalibrating the sensor.

The capacitive technology allows to work with **different viscosities** in oil, linked to different oil temperatures.

This device was designed under the rules of intelligent sensors from HONSBURG. Therefore the configurator can be used to change a lot of parameters of the instruments to fit it optimal into the different applications. This can be done by Honsberg depending to the order or by the customer itself using the configurator.

### Operating / programming

Before installation please check power supply!

Fastening of the sensor is designed for M6 screws, please see drilling plan in chapter dimensions.

The flange area should be free of moisture and must be free of mechanical scratches.

Screws must be forced until flange is in contact with the container wall (not more!)

The **magnet clip** may be used to **teach the switch point** or the end of range of an analogue output (has to be ordered!).

Sensitive area is marked at the label. Tip with the magnet for 1sec. to this sensitive area and the actual value is taken (Please see also "general description Flex-electronics")

If you ordered "switch point programmable":

- Run the switch point in your process (or the operating level of oil level, if you ordered an offset).
- Hold the magnet to the program. marking
- LED will flicker after a while
- take away the magnet and see two LED pulses as a signal for "switch point accepted".

## Data

### Type LCC1...

<b>Range</b>	30 mm (others on request)	
<b>Process temperature</b>	-20...+85 °C	
<b>Ambient temperature</b>	60 °C	
<b>Working pressure</b>	5 bar	
<b>Max. pressure overload</b>	1.5X working pressure = 7,5 bar	
<b>Accuracy</b>	±1,5 mm	
<b>Repeatability</b>	± 1 mm	
<b>Longtime stability</b>	± 1 mm after 100.000 cycles (0...100%) depending to the liquid!	
<b>Temperature dependence</b>	± 0,005mm/ 1K	
<b>Process connection</b>	3 hole flange	
<b>Material, media touched</b>	Housing: O-ring:  Tip:  Potting:	Ms Viton (EPDM, NBR) FR4 (Epoxy + Glasfaser), Cu goldplated High temp. PU
<b>Material, not media touched</b>	Housing: O-ring: Plug:	Ms NBR PA66
<b>Power supply</b>	18...30 VDC (regulated)	
<b>Quiescent current consumption</b>	15 mA	
<b>1x analogue output</b>	0...10 V, 4...20 mA short-circuit-proof revers polarity protected	
<b>1x switch</b>	Push pull, 100 mA max short-circuit-proof revers polarity protected	
<b>1x LED (4 side view)</b>	Yellow on = oil in range blinking = 10% above min out = oil under min level or Temp >100°C nected or defect. Indicates also flickering during teaching with magnet	
<b>Conformity</b>	CE	
<b>Certificate</b>	3.1b on request	
<b>Weight</b>	200 g	

## Electrical connections

Z

Z

4

3

2

0 V

Analogue output

18...30 VDC

black

blue

white

brown

Switch (frequency output)

PNP NPN

Z = Load

M12x1 plug system

## Dimensions

20mA

Range

4mA

Reference

19,5

Flange A

## Order nomenclature

LCC1	-	A	A	126	-65	V	I	P	S		sample
		A								o	shape angled
		B								+	shape straight
			A							o	flange A
			B							+	flange B
				126							dimension A see drawing (mm)
					65						dimension B see drawing (mm)
						V				+	Flange O-ring Viton
							I			+	4..20mA
							U			+	0...10V
								Y		o	switch programmable
								N		o	switch non programmable
									S		M12x1 4pol plug

O Standard

+ Option

**Optionen:**

<b>Special range analogue output:</b>					mm
<= Range (standard=range)					
<b>Special range frequency output:</b>					mm
<= Range (standard=range)					
<b>Frequency range</b> (max. 2000 Hz)					Hz
<b>Switch on delay</b>					s (0)
(from alarm to O.K.)					
<b>Switch off delay</b>					s (0)
(from O.K. To alarm)					
<b>Power-On-Delay</b>					s (0)
(Time between powerd device and switch output active.					
<b>Switch output fixed</b> (referred to FS)					%
<b>Special hysteresis</b> (standard= 2% FS)					%
<b>Temperature control value</b> (max100°C)					°C (90)

Default values will be taken if no options was chosen (...).

**Accessories**

**Cable and plugs**

**Cable**

K04	PU-	2				sample
K04					o	Incl. moulded plug
KB04					o	self connectable, 4pol
	PU-				o	cable material PUR
		2			o	Length 2 m
		5			o	Length 5 m
		10			o	length 10 m
			S		o	Shield connected
			N		+	Shield not connected
				G	o	plug straight
				W	o	plug angled 90°

o Standard  
+ Option

### Program Interface ECI-1



The interface ECI-1 allows to **program all parameters** of the sensor (filter, hysteresis, power on delay, switch delay, range, ...) using the normal plug output of the sensor and an **USB Interface** of a PC (see separate data sheet ECI-1). This interface is only an additional possibility to change parameters in the field or by an OEM customer. Normally the sensor will be programmed by HONSBURG to satisfy the requirements of the customer.

### Associated products



#### omni-TA

The compact front panel instrument, can take the signal from the LCC1 to show the level value on a graphic display and to give two programmable switchpoints and an additional analogue 4...20mA or 0...10V signal. The instrument offers an IP67 front.

### Applications

**Oil controlling in compressors.**



**Oil controlling in central lubrication units.**

**Oil controlling in gear boxes.**

**Oil controlling in motors.**