

Fill level / limit value / level



Characteristics

System	Fill level
Evaluating	Display Switching Measuring
Range	30 mm..8 m -1..+25 bar
Media	Water Oils Aggressive media Transported goods
Pressure resistance	Max. 40 bar
Temperature	-20..+200 °C
Approvals	ATEX

Applications

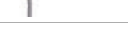
- Determination of water level in
 - Drinking water fountains
 - Tanks
 - Open watercourses
 - Drilled wells
 - Waste water treatment plants
 - Containers / agitators
-  applications

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Device overview

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Options	- Gooseneck - Speical connections - Plug DIN 43650-A / ISO 4400 with diodes	59
Accessories	- OMNI-TA (Panel meter) - KB... (Round plug connector 4/5-pin) - ECI-1 (Device configurator)	60

Float - horizontal installation

Device		Display	Switching	Measuring	Switch / sensor	Pressure resistance in bar	Medium temperature	Material	Medium			Page
									Water	Oil	Aggressive	
RW-015HKS			•		Reed switch	PN 5	-20...+120 °C	Stainless steel	•	•	•	6
RW-015HKL			•		Reed switch	PN 6	-20...+200 °C	Stainless steel	•	•	•	7
RWI-016P..			•		Reed switch	PN 3..6	-20...+130 °C	PP / PVDF	•	•	•	8
NW1			•		Reed switch	PN 10..25	-20...+110 °C	Brass / stainless steel	•	•		9
A-U1-2			•		ATEX switching unit I M1 Ex ia I II 1G Ex ia IIC T4 II 1D Ex iaD 20 T135		-20...+110 °C	Brass	•	•		10
NW3			•		Reed switch	PN 10..25	-20...+110 °C	Brass / stainless steel	•	•		11
MW3			•		Microswitch	PN 10..25	-20...+110 °C	Brass / stainless steel	•	•		12
MWI			•		Microswitch	PN 15	-20...+180 °C	Brass	•	•		13
VECTIS			•	•	Analog Hall sensor	PN 3	-20...+85 °C (-20...+150 °C)	Brass	•	•		14

Errors and technical modifications reserved.

Product Information

Sensors and Instrumentation

Float - vertical installation

Device		Display	Switching	Measuring	Switch	Length mm	Pressure resistance in bar	Medium temperature	Material	Medium			Page
										Water	Oil	Aggressive	
NBS		●			-	40..300	-	-20..+50 °C	Brass	●	●		18
NM-007HP		●			Reed switch	40	PN 5	-20..+60 °C	PP / PA	●	●		19
NM1-004HK		●			Reed switch	50	PN 30	-20..+105 °C	Stainless steel	●	●	●	20
NM-008HK		●			Reed switch	80	PN 40	-20..+105 °C	Stainless steel	●	●	●	21
NMS-004HM040		●			Reed switch	40	PN 20	-20..+105 °C	Brass	●	●		22
NMS-004HM047		●			Reed switch	47	PN 12	-20..+105 °C	Brass	●	●		23
NMS-004HM077		●			Reed switch	77	PN 12	-20..+105 °C	Brass	●	●		24
SB		●			Reed switch	100..500	PN 20	-20..+105 °C	Brass	●	●		25
NR		●			Reed switch	250..1000	PN 5	-5..+100 °C	Stainless steel / aluminium	●	●		26
NR-000		●			Switching unit for device range NR			-5..+100 °C	PA	●	●		27
LC		●			Reed switch chain	250..2000	PN 20..40	-20..+105 °C	Brass / stainless steel	●	●	●	28
FLEX-LC		●	●		Reed switch chain	250..2000	PN 20..40	-20..+105 °C	Brass / stainless steel	●	●	●	30
OMNI-LC		●	●	●	Reed switch chain	250..2000	PN 20..40	-20..+105 °C	Brass / stainless steel	●	●	●	34

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Product Information

Sensors and Instrumentation

Capacitive

Device		Display	Switching	Measuring	Metering range	Pressure resistance	Medium temperature	Material	Medium			Page
									Water	Oil	Aggressive	
LCC1		•	•		30	PN 5	-20..+85 °C	Brass / epoxy		•		37
LCC2		•			200, 400, 600 mm (other on request)	PN5	-20..+85 °C			•		40

Errors and technical modifications reserved.

Calorimetric

Device		Display	Switching	Measuring	Pressure resistance in bar	Medium temperature	Material	Medium			Page
								Water	Oil	Aggressive	
LK012		•	•		PN 6..40	-20..+70 °C	Stainless steel	•	•	•	46

Errors and technical modifications reserved.

Ultrasound

Device		Display	Switching	Measuring	Metering range	Temperature	Page
LS20		•	•		30 - 8000 mm	-25..+70 °C	48
EL		•	•		100 - 2500 mm	-20..+70 °C	49
OMNI-L		•	•	•	200 - 2500 mm	-20..+80 °C	50

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Product Information

Sensors and Instrumentation

Pressure

Device		Display	Switching	Measuring	Metering range	Temperature	Material	Medium			Page
								Water	Oil	Aggressive	
LS10		●	●		0.1..10 bar	-10..+60 °C	Stainless steel	●	●	●	54
IL10	 	●	●		0.1..25 bar	-10..+60 °C	Stainless steel	●	●	●	55
LK10		●	●		0.16..16 bar	0..50 °C	PVC	●	●	●	56

Errors and technical modifications reserved.

Sight glass

Device		Length mm	Pressure resistance	Medium temperature	Material	Medium			Page
						Water	Oil	Aggressive	
NA		40..300	-	-20..+80 °C	Brass	●	●		57
NB		40..300	-	-20..+80 °C	Brass	●	●		58

ECI-1		If required, all parameters can be set at any time on the sensor, using the ECI-1 device configurator.									61
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Errors and technical modifications reserved.

Product Information

Sensors and Instrumentation

Level Switch RW-015HKS

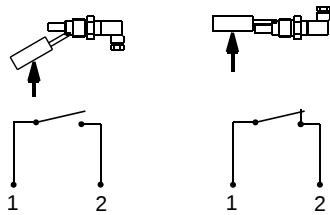


- Highly reproducible
- Normally open or normally closed contact
- Plug connection

Characteristics

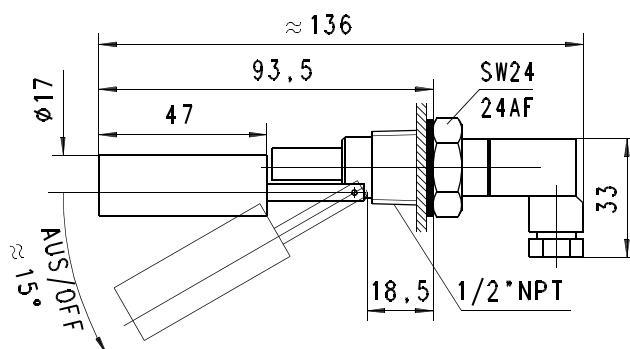
Mechanical level monitor for fluid media, with contact-free triggering of a reed contact.

Technical data

Switch	reed switch
Process connection	male thread 1/2"NPT
Density of medium	³ 0.75 g/cm ³
Pressure resistance	PN 5 bar
Medium temperature	-20..+120 °C
Ambient temperature	-20..+70 °C
Media	water, oils (aggressive media available on request)
Wiring	normally open (n.o.) No. 0.442 
Switching voltage	max. 50 V AC
Switching current	max. 0.5 A
Switching capacity	max. 25 VA

Protection class	3 - protective extra low voltage
Ingress protection	IP 65
Electrical connection	similar to DIN 43650-C plug contact separation 9.4 mm
Materials medium-contact	1.4301, 1.4436
Non-medium-contact materials	PA
Weight	0.11 kg
Installation location	horizontal installation

Dimensions



Handling and operation

- It must be ensured that the values given for voltage, current, and power are not exceeded.
- When switched on, a load must be connected in series.
- The electrical details apply to ohmic loads. Capacitive, inductive and lamp loads must be operated using a protective circuit.
- Not suitable for use in media with ferritic particles.

Ordering code

1. 2. 3. 4.
RW - 015 H K S

1. Connection size	015 threaded connection 1/2 "NPT
2. Process connection	H screw-in thread
3. Connection material	K stainless steel
4. Electronic connection	S plug

Product Information

Sensors and Instrumentation

Level Switch RW-015HKL



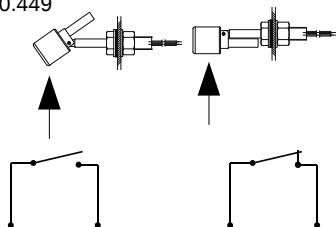
- Temperature up to 200 °C
- Highly reproducible
- Normally open or normally closed contact

Characteristics

Mechanical level monitor for fluid media, with contact-free triggering of a reed contact.

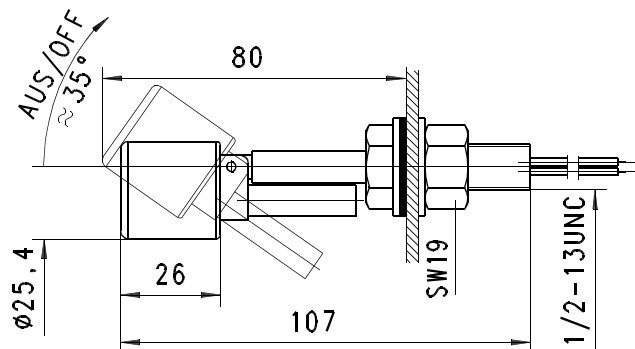
Technical data

Switch	reed switch
Process connection	male thread 1/2 -13 THD
Density of medium	³ 0.7 g/cm ³
Pressure resistance	PN 6 bar
Medium temperature	-20..+200 °C
Ambient temperature	-20..+70 °C
Media	water, oils (aggressive media available on request)
Wiring	'normally open' or 'normally closed' No. 0.449
Switching voltage	max. 220 V AC
Switching current	max. 0.14 A
Switching capacity	max. 30 VA



Protection class	2 - safety insulation
Ingress protection	IP 65
Electrical connection	wiring 600 mm
Materials medium-contact	1.4571
Weight	0.12 kg
Installation location	horizontal installation

Dimensions



Handling and operation

- It must be ensured that the values given for voltage, current, and power are not exceeded.
- When switched on, a load must be connected in series.
- The electrical details apply to ohmic loads. Capacitive, inductive and lamp loads must be operated using a protective circuit.
- Not suitable for use in media with ferritic particles.

Ordering code

RW - 1. 015 2. H 3. K 4. L

1. Connection size	015 threaded connection 1/2 13UNC
2. Process connection	H screw-in thread
3. Connection material	K stainless steel
4. Electronic connection	L wiring

Product Information

Level Switch RWI



- Installation from inside or outside
- Highly reproducible
- Normally open or normally closed contact

Characteristics

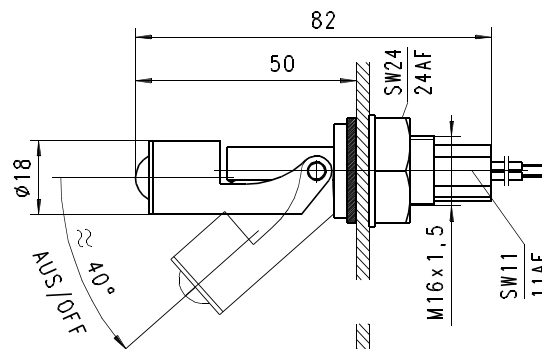
Mechanical level monitor for fluid media, with contact-free triggering of a reed contact.

Technical data

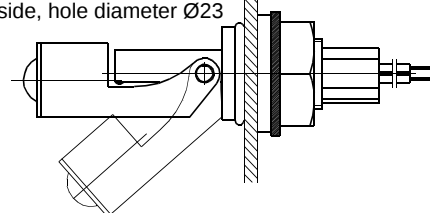
Switch	reed switch	
Process connection	male thread M16x1.5	
Density of medium	PP	³ 0.60 g/cm ³
	PVDF	³ 0.75 g/cm ³
Pressure resistance	PP	PN 3 bar
	PVDF	PN 6 bar
Medium temperature	PP	-20...+90 °C
	PVDF	-20...+130 °C
Ambient temperature	-20...+70 °C	
Media	water, oils	
Wiring	'normally open' or 'normally closed' No. 0.448	
Switching voltage	max. 250 V AC	
Switching current	max. 0.5 A	
Switching capacity	max. 50 VA	
Protection class	2 - safety insulation	
Ingress protection	IP 65 (optimal IP 00)	
Electrical connection	cable 0.5 m	
Materials medium-contact	PP model:	PVDF model:
	PP, FKM	PVDF, FKM
Weight	0.075 kg	
Installation location	horizontal installation	

Dimensions

Installation from inside, hole diameter Ø16.5



Installation from outside, hole diameter Ø23



Handling and operation

- It must be ensured that the values given for voltage, current, and power are not exceeded.
- When switched on, a load must be connected in series.
- The electrical details apply to ohmic loads. Capacitive, inductive and lamp loads must be operated using a protective circuit.
- Not suitable for use in media with ferritic particles.

Ordering code

RWI - 1. 016 2. P 3. 4.

○=Option

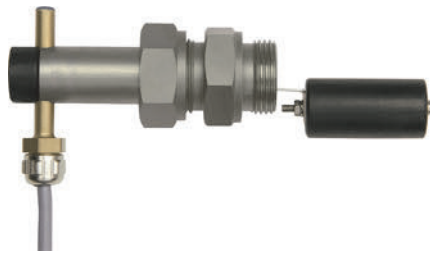
1.	Connection size
016	threaded connection M16x1.5
2.	Process connection
P	compression fitting
3.	Connection material
P	PP
V	PVDF
4.	Electronic connection
K	cable
F	○ Faston plug

Options

- Silicone seal
- Transformer 175 V AC, 0.25 A, 3 VA
- Brass connection G 3/4 A

Product Information

Level Switch NW1



- Highly reproducible
- Normally open or normally closed contact

Characteristics

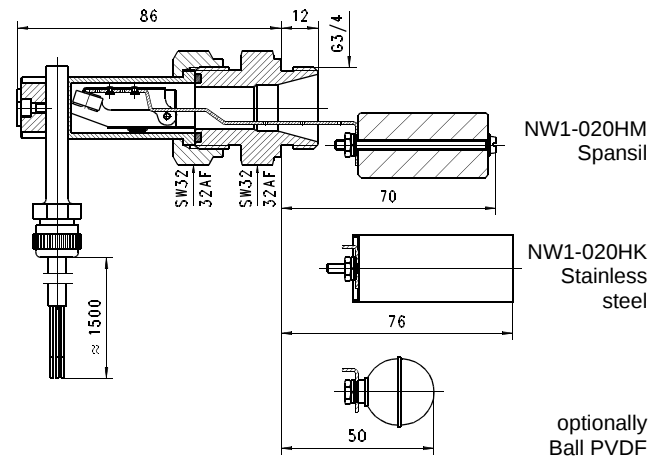
Mechanical level monitor for fluid media, with contact-free triggering of a reed contact.

Technical data

Switch	reed switch	
Process connection	male thread G $\frac{3}{4}$ A	
Density of medium	Spansil float	$^3 0.7 \text{ g/cm}^3$
	Stainless steel float	$^3 0.9 \text{ g/cm}^3$
Pressure resistance	Spansil float	PN 25 bar
	Stainless steel float	PN 10 bar
Medium temperature	-20...+110 °C (optional 150 °C)	
Ambient temperature	-20...+70 °C	
Media	water, oils	
Wiring	'normally open' or 'normally closed' No. 0.225	
Switching voltage	max. 230 V AC	
Switching current	max. 1 A	
Switching capacity	max. 50 VA	
Protection class	1 - PE connection	
Ingress protection	IP 65	
Electrical connection	cable 1.5 m	
Materials medium-contact	Brass construction:	Stainless steel construction:
	CW614N nickelled, 1.4301, 1.4571, Spansil (NBR), Hard ferrite, NBR	1.4305, 1.4571, Hard ferrite, FKM

Non-medium-contact materials	CW614N, nickelled, CW614N, NBR, PVC, POM
Weight	0.35 kg
Installation location	horizontal installation

Dimensions



Handling and operation

- It must be ensured that the values given for voltage, current, and power are not exceeded.
- When switched on, a load must be connected in series.
- The electrical details apply to ohmic loads. Capacitive, inductive and lamp loads must be operated using a protective circuit.
- Not suitable for use in media with ferritic particles.

Ordering code

NW1 - 1. 2. 3. 4.
020 H

○=Option

1.	Connection size	
	020	threaded connection G $\frac{3}{4}$ A
2.	Process connection	
	H	screw-in thread
3.	Connection material	
	M	brass
	K	stainless steel
4.	Switching unit option	
	○	for switching unit ATEX A-U1-2
A	The switching unit must be ordered in addition.	

Options

- Float ball PVDF
- Float cylinder stainless steel

Product Information

Switching Head A-U1-2

For device NW1



- I M1 Ex ia I
- II 1G Ex ia IIC T4
- II 1D Ex iaD 20 T135

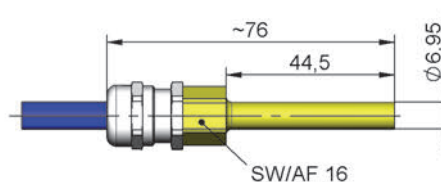
Characteristics

Intrinsically safe switching unit with reed switch and ATEX approval, for the NW1 range of devices, for use in intrinsically safe power circuits.

Technical data

Switch	reed switch
Medium temperature	-20...+110 °C
Ambient temperature	-20...+50 °C
Weight	0.05 kg additionally
Wiring	normally opened (n.o.) or normally closed (n.c.), no. 0.442
Switching voltage	max. 30 V
Switching current	max. 1 A
Switch performance	max. 50 W
Ingress protection	IP 65
Electrical connection	cable 2.5 m, other cable lengths up to max. 5 m are optionally available

Dimensions



Handling and operation

- For use only in intrinsically safe power circuits - Provide a suitable isolating amplifier.
- Cable lengths max. 5 m.
- It must be ensured that the values given for voltage, current, and power are not exceeded.
- When switched on, a load must be connected in series.
- The electrical details apply to ohmic loads. Capacitive, inductive and lamp loads must be operated using a protective circuit.

Ordering code

The base device is ordered e.g. NW1-020HMA with switching head A-U1-2.

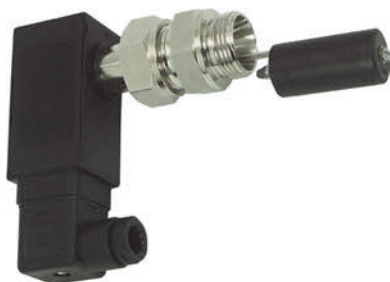
A-U1 - ^{1.}2

1.	Device series
2	For NW1

Product Information

Sensors and Instrumentation

Level Switch NW3



- Highly reproducible
- Normally open or normally closed contact
- Plug connection

Characteristics

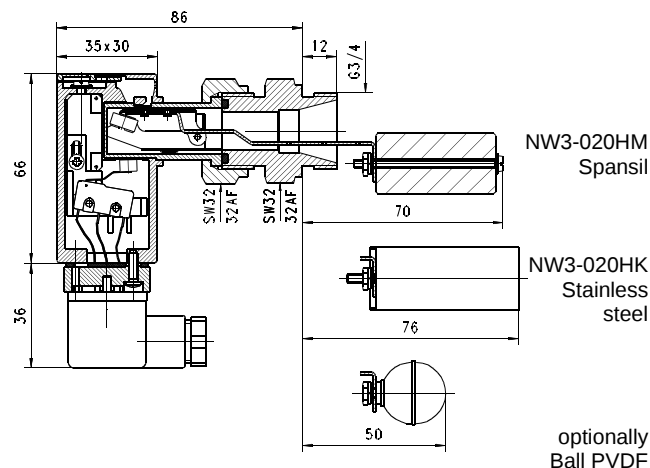
Mechanical level monitor for fluid media, with contact-free triggering of a reed contact.

Technical data

Switch	reed switch
Process connection	male thread G $\frac{3}{4}$ A
Density of medium	Spansil float $^3 0.7 \text{ g/cm}^3$
	Stainless steel float $^3 0.9 \text{ g/cm}^3$
Pressure resistance	Spansil float PN 25 bar
	Stainless steel float PN 10 bar
Medium temperature	-20...+110 °C
Ambient temperature	-20...+70 °C
Media	water, oils (aggressive media available on request)
Wiring	'normally open' or 'normally closed' No. 0.442
Switching voltage	max. 230 V AC
Switching current	max. 1 A
Switching capacity	max. 50 VA
Protection class	2 - safety insulation
Ingress protection	IP 65
Electrical connection	plug DIN 43650-A / ISO 4400

Materials medium-contact	Brass construction: CW614N nickelled, 1.4301, 1.4571, Spansil (NBR), hard ferrite, NBR	Stainless steel construction: 1.4305, 1.4571, Hard ferrite, FKM
Non-medium-contact materials	ABS, PA, NBR	
Weight	0.35 kg	
Installation location	horizontal installation	

Dimensions



Handling and operation

- When tightening the union nut, the connection piece must be counteracted using an open-ended spanner (SW 19).
- It must be ensured that the values given for voltage, current, and power are not exceeded.
- When switched on, a load must be connected in series.
- The electrical details apply to ohmic loads. Capacitive, inductive and lamp loads must be operated using a protective circuit.
- Not suitable for use in media with ferritic particles.

Ordering code

NW3 - 1. 020 2. H 3.

1. Connection size	020 threaded connection G $\frac{3}{4}$ A
2. Process connection	H screw-in thread
3. Connection material	M brass
	K stainless steel

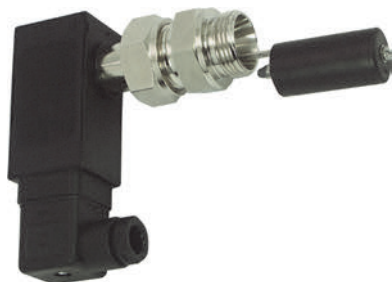
Options

- Connection for round plug connector M12x1, 4-pole
- Float ball PVDF
- Float cylinder stainless steel
- Signal lamp red or red/green with plug DIN 43650-A

Product Information

Sensors and Instrumentation

Level Switch MW3



- High switching current
- Highly reproducible
- Transformer
- Plug connection

Characteristics

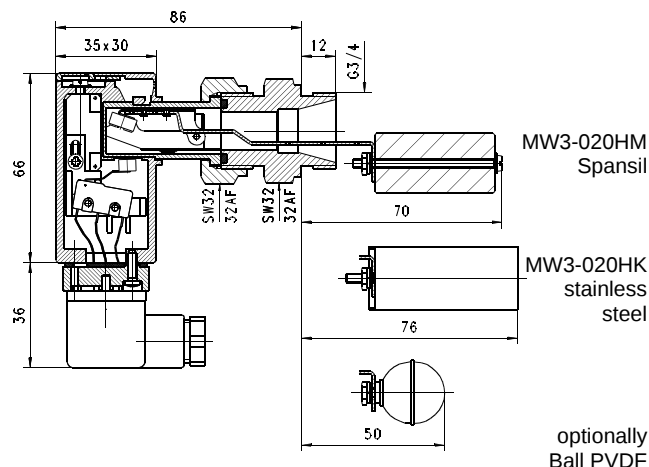
Mechanical level monitor for fluid media, with contact-free triggering of a micro switch.

Technical data

Switch	micro switch	
Process connection	male thread G $\frac{3}{4}$ A	
Density of medium	Spansil float	$^3 0.7 \text{ g/cm}^3$
	Stainless steel float	$^3 0.9 \text{ g/cm}^3$
Pressure resistance	Spansil float	PN 25 bar
	Stainless steel float	PN 10 bar
Medium temperature	-20...+110 °C	
Ambient temperature	-20...+70 °C	
Media	water, oils (aggressive media available on request)	
Wiring	transformer No. 0.444	
Switching voltage	max. 250 V AC	
Switching current	max. 5 A	
Protection class	2 - safety insulation	
Ingress protection	IP 65	
Electrical connection	plug DIN 43650-A / ISO 4400	
Materials medium-contact	<i>Brass construction:</i> CW614N nickelled, 1.4301, 1.4571, Spansil (NBR), hard ferrite, NBR	<i>Stainless steel construction:</i> 1.4305, 1.4571, Hard ferrite, FKM

Non-medium-contact materials	ABS, PA, NBR
Weight	0.35 kg
Installation location	horizontal installation

Dimensions



Handling and operation

- When tightening the union nut, the connection piece must be countered using an open-ended spanner (SW 19).
- It must be ensured that the values given for voltage, current, and power are not exceeded.
- When switched on, a load must be connected in series.
- The electrical details apply to ohmic loads. Capacitive and inductive loads must be operated using a protective circuit.
- Not suitable for use in media with ferritic particles.

Ordering code

1. 2. 3.
MW3 - 020 H

1. Connection size	020	threaded connection G $\frac{3}{4}$ A
2. Process connection	H	screw-in thread
3. Connection material	M	brass
	K	stainless steel

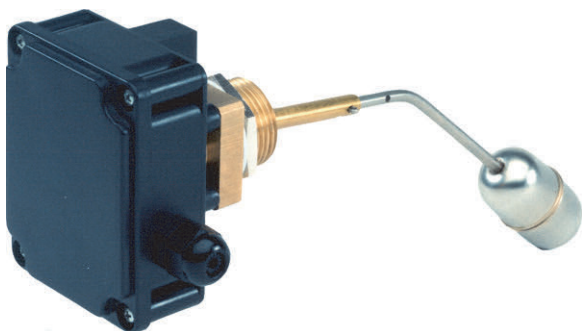
Options

- Connection for round plug connector M12x1, 4-pole - 250 V AC, 4 A
- Float ball PV DF
- Float cylinder stainless steel
- Signal lamp red or red/green with plug DIN 43650-A
- Gold contact 125 V AC / 30 V DC, 100 mA

Product Information

Sensors and Instrumentation

Level Switch MWI

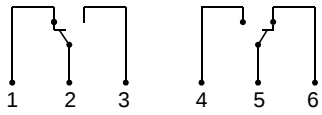


- Temperature up to 180 °C
- High switching current
- Transformer

Characteristics

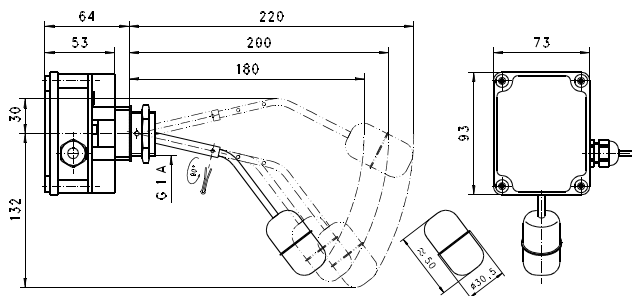
Mechanical level monitor for fluid media, with contact-free triggering of a micro switch.

Technical data

Switch	Micro switch
Process connection	male thread G 1 A
Density of medium	³ 0.7 g/cm ³
Pressure resistance	PN 15 bar
Medium temperature	-20..+180 °C
Ambient temperature	-20..+70 °C
Media	water, oils
Wiring	2 x changeover No. 0.392 
Switching voltage	max. 250 V AC
Switching current	max. 5 A
Protection class	2 - safety insulation

Ingress protection	IP 65
Electrical connection	cable screw gland Pg 9
Materials medium-contact	CW614N, 1.4571
Non-medium-contact materials	ABS
Weight	1.3 kg
Installation location	horizontal installation

Dimensions



Handling and operation

- It must be ensured that the values given for voltage, current, and power are not exceeded.
- When switched on, a load must be connected in series.
- The electrical details apply to ohmic loads. Capacitive and inductive loads must be operated using a protective circuit.
- Not suitable for use in media with ferritic particles.

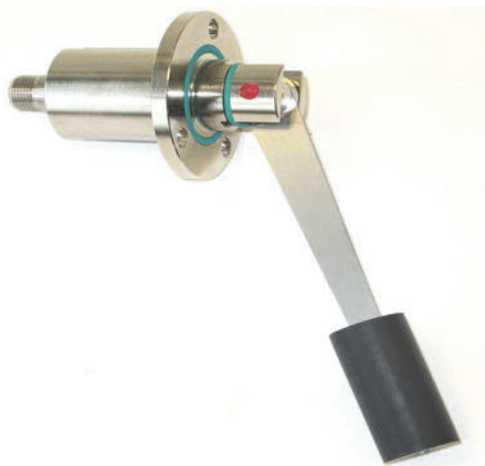
Ordering code

MWI - 1. 025 2. H 3.

○=Option

1. Connection size	025	threaded connection G 1 A
2. Process connection	H	screw-in thread
3. Connection material	M	brass
	K	○ stainless steel

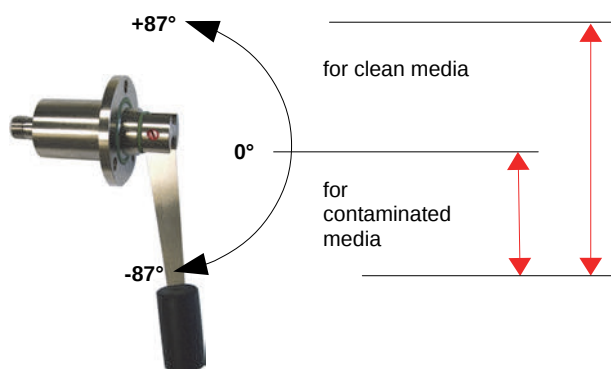
Level Transmitter / Switch VECTIS



- Lever arm level sensor with analog Hall sensor
- Analog output and/or switching/frequency output
- Designed for industrial use
- Small, compact construction
- Suitable for installation from the side and from above
- Including unlosable O-ring seal
- Very simple installation

Characteristics

The lightweight float arm is fitted with a magnet at its fulcrum. If there is a change in the level, the lever arm is displaced accordingly. The rotation of the magnet is then recorded by a Hall sensor, and is converted to a level by a microcontroller. The result can be output with the aid of an analog output (4...20 mA or 0...10 V). Here, the assignment of the signal to the level can be freely selected within broad limits. The float arm is available in different lengths, and therefore various metering ranges are available.



In addition to the analog output, an electronic switching output is available; this can signal the exceeding or falling short of a defined level. The switching point is programmed to the current level, using a supplied magnet clip. The status of the switching output is displayed by an integrated LED. Alternatively, the switching output can also be used as a frequency output.

The VECTIS level sensor is also suitable for viscous media. Like all intelligent sensors from HONSBERG, the transmitter can be connected to a PC and then configured with numerous parameters (damping, switching delays, hystereses, power-on delay...) and

adapted to the appropriate application, with the aid of a configurator (see separate product information ECI-1). Usually this happens during production at HONSBERG, as per the customer's wishes, but it can also be carried out in the field or for OEMs by the user himself.

High temperature model

A high temperature model is available for use at high temperatures. Here, the evaluation electronics are separated from the mechanical unit by means of a 30 cm long cable.



The high temperature model is equipped with only one output (analog output, switching output, or frequency output). Programming is not carried out using a magnetic clip; instead a voltage pulse of 0.5 to 2 seconds is applied to pin 2 of the connector. This model therefore has a different connection mode. The size of the plug gauge (separation of flange surface from fulcrum) of the high temperature model is always 39.5 mm.

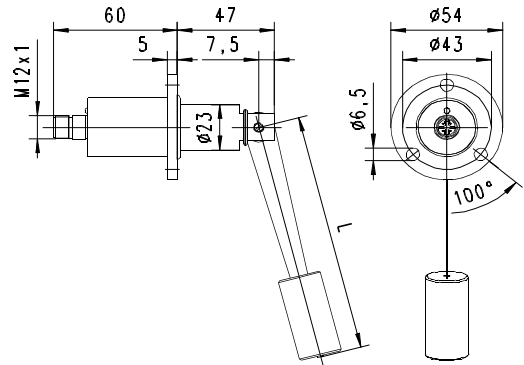
Technical data

Sensor	analog hall sensor
Process connection	3-hole flange (asymmetric)
Metering range	-87 °...+87 ° or parts of this Level height up to 1 m, depending on length of lever arm.
Measurement accuracy	typically ±0.5 °
Pressure resistance	max. 3 bar
Medium temperature	-20...+85 °C (high temperature model max. 150 °C)
Ambient temperature	-20...+60 °C
Storage temperature	-20...+85 °C
Media	water, oil, petrol
Supply voltage	18...30 V DC (controlled)
Current consumption	< 100 mA (for outputs not under load)
Analog output	0...10 V or 4...20 mA, resistant to short circuits, reversal polarity protected
Switching output	push-pull, 100 mA max. resistant to short circuits, reversed polarity protected
Hysteresis (Switch)	approx. 2 % F.S. or as desired, but not less than the resolution position of characteristic (minimum / maximum switch) depends
Frequency output	standard 1 kHz at F.S. / max. 2 kHz (alternative to switching output)

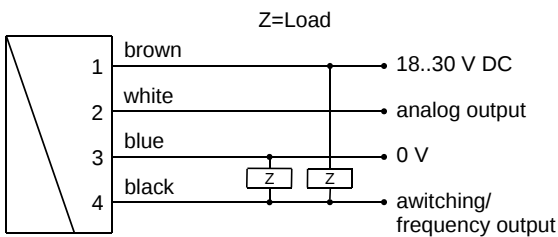
Product Information

LED	yellow On = all OK Off = level below minimum or above maximum Flashes = programming
Electrical connection	for round plug M12x1, 4-pole
Ingress protection	IP 67
Materials medium-contact	Body CW614N Float sparsil Arm stainless steel 1.4310 O-rings FKM, optional NBR, EPDM
Weight	approx. 0.2 kg
Conformity	CE

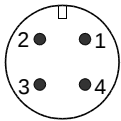
Dimensions



Wiring

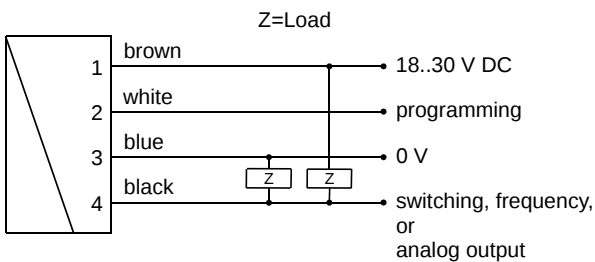


Connection example: PNP NPN



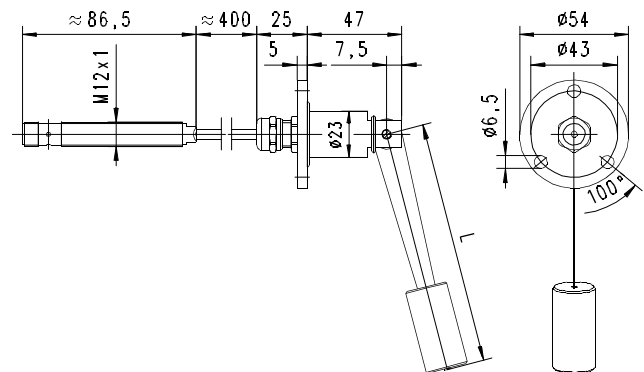
Before connecting the supply voltage, it must be ensured that this corresponds with the data sheet.
The use of shielded cabling is recommended.

High temperature model



Connection example: PNP NPN

High temperature model



Handling and operation

Note

The sensors are fully preconfigured at HONSBERG to customer wishes. However, as an option, the setting of one or more parameters using a magnetic clip through the enclosed housing (IP 67) is fully possible. For the high temperature model this can alternatively be done through setting the contact on pin 2 of the connector.

The parameters available are:

- Switching value of the level switch
- Upper position of the float arm at 20 mA / 10 V or maximum frequency

The parameter to be programmed must be specified when ordering.

Not suitable for use in media with ferritic particles.

Product Information

Sensors and Instrumentation

Programming

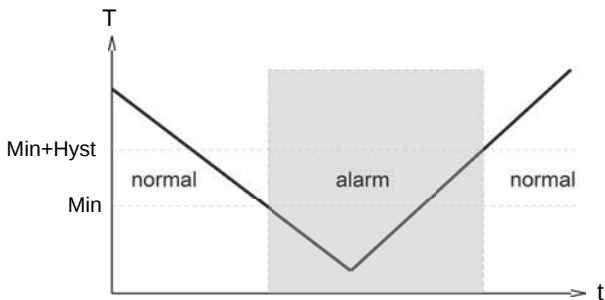
Models with a limit switch contain a magnetic contact, with the aid of which the currently measured value is stored as the limit value. Programming takes place when a magnet is applied for a period between 0.5 and 2 seconds to the marking located on the label.



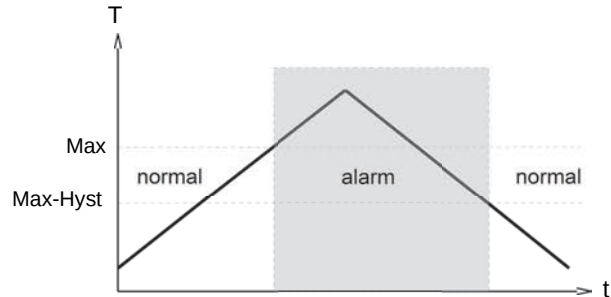
If the contact time is longer or shorter than this, no programming takes place (protection against external magnetic fields). Immediately after programming, the switching output goes into the normal state (see below).

The device has a yellow LED which flashes during the programming pulse. During operation, the LED serves as a status display for the switching output. With the high temperature model, instead of the magnet contact, pin 2 of the connector is used for programming. A pulse is correspondingly given by applying the supply voltage. After programming, the pin should be set to earth in order to prevent unintended programming. In order to avoid the need to transit to an undesired operating status during the teach-in, the device can be provided ex-works with a teach-offset. The teach-offset point is added to the currently measured value before saving.

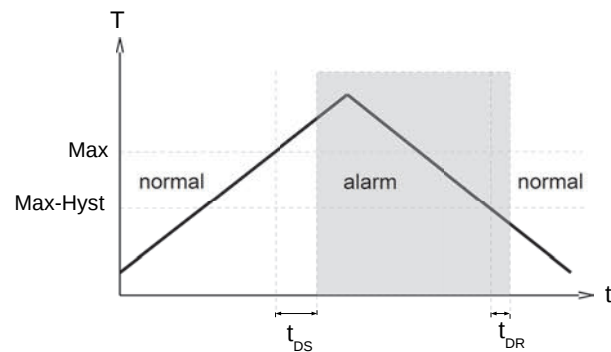
Example: The switching value is to be set to $+50^\circ$, because at this flow rate a critical process status is to be notified. However, only $+40^\circ$ can be achieved without danger. In this case, the device would be ordered with a "teach-offset" of $+10^\circ$. At $+40^\circ$ in the process, a switching value of $+50^\circ$ would then be stored during "teaching". The limit switch of the FLEX-P can be used to monitor minimal or maximal. With a minimum switch, falling below the limit value causes a switchover to the alarm state. Return to the normal state occurs when the limit value plus the set hysteresis is once more exceeded.



With a maximum-switch, exceeding the limit value causes a switchover to the alarm state. Return to the normal state occurs when the measured value once more falls below the limit value minus the set hysteresis.

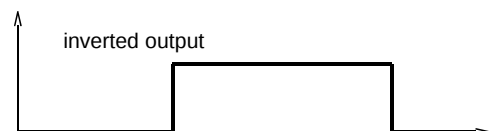
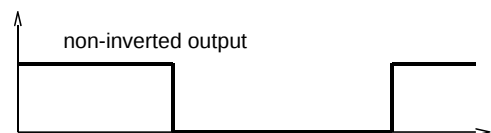


A switchover delay time (t_{DS}) can be applied to the switchover to the alarm state. Equally, one switch-back delay time (t_{DR}) of several can be applied to switching back to the normal state.



In the normal state the integrated LED is on, in the alarm state it is off, and this corresponds to its status when there is no supply voltage.

In the non-inverted (standard) model, while in the normal state the switching output is at the level of the supply voltage; in the alarm state it is at 0 V, so that a wire break would also display as an alarm state at the signal receiver. Optionally, an inverted switching output can also be provided, i.e. in the normal state the output is at 0 V, and in the alarm state it is at the level of the supply voltage.



A Power-On-Delay function (ordered as a separate option) makes it possible to maintain the switching output in the normal state for a defined period after application of the supply voltage.

Product Information

Installation

The flange is fixed with M6 bolts (see drilling diagram in the drawing)

The flange area must be flat, free of scratches, and clean. The bolts are tightened until the flange abuts against the tank surface, and not more.

Ordering code

1. 2. 3. 4. 5. 6. 7. 8.
VECTIS - **N**

○=Option

1. Plug gauge (separation of flange surface from fulcrum)	
165	16.5 mm
395	39.5 mm
2. Connection	
N	Standard flange
3. Length of lever arm (fulcrum to end of float)	
080	80 mm
120	120 mm
150	150 mm
200	200 mm
250	250 mm
300	300 mm
350	350 mm
400	400 mm
450	450 mm
500	500 mm
4. Analog output	
I	current output 4..20 mA
U	voltage output 0..10 V
5. Switching output	
T	push-pull
K	no switching output
6. Switching output function	
L	minimum-switch
H	maximum-switch
R	frequency output
K	no switching output
7. Switching output level	
O	standard
I	☐ inverted
8. Optional	
H	☐ high temperature

Options

For analog output:

Special range for analog output:

Start of metering range (4 mA or 0 V) at ° / mm

Standard = -87 °

End of metering range (20 mA or 10 V) at ° / mm

Standard = +87 °

For frequency output:

End frequency (max. 2000 Hz)

Hz

Standard = 2000 Hz

Special range for frequency output:

Start of metering range (0 Hz) at ° / mm

Standard = -87 °

End of metering range (end frequency) at ° / mm

Standard = +87 °

For switching output:

Switching delay period (0.0..99.9 s)

, s

(from Normal to Alarm)

Switch-back delay period (0.0..99.9 s)

, s

(from Alarm to Normal)

Switching output fixed at

° / mm

Switching hysteresis

%

Standard = 2 % of the metering range

General:

Power-On delay period (0..99 s)

s

Teach-offset (-87 °..+87 °)

° / mm

Standard = 0 °

Tropical model (oil filled)

☐

Further options available on request.

Accessories

- Cable/round plug connector (KB...) see additional information "Accessories"
- Device configurator ECI-1

Product Information

Level Indicator NBS



- Mounted in the cover
- Direct display

Characteristics

Mechanical level indicator for water: The level is displayed in a sight glass by means of a sight ring.

Technical data

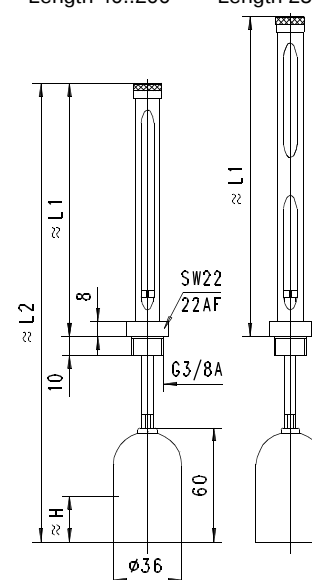
Switch	without
Process connection	male thread G $\frac{3}{8}$ A, optional G $\frac{1}{2}$ A
Density of medium	see table "Dimensions, density, and weights"
Pressure resistance	-
Medium temperature	-20...+50 °C
Ambient temperature	-20...+50 °C
Media	water, oils
Electrical data	none
Materials medium-contact	CW614N, natural glass, acrylic, NBR
Non-medium-contact materials	CW614N, natural glass, PVC, NBR
Weight	see table "Dimensions, density, and weights"
Installation location	vertical installation position

Dimensions, density, and weights

Types	L1	L2	H	Density Medium g/cm ³	Number of sight glasses	Weight kg
NBS-010HM040	40	185	21	≥ 0.60	1	0.10
NBS-010HM060	60	205	22	≥ 0.65		0.11
NBS-010HM080	80	225	23			
NBS-010HM100	100	245	24			
NBS-010HM125	125	270	25			
NBS-010HM150	150	295				
NBS-010HM200	200	345	27	≥ 0.70	2	0.16
NBS-010HM250	250	395	29	≥ 0.75		0.18
NBS-010HM300	300	445	30	> 0.80		

Length 40..200

Length 250..300



Vent drilling in cover.

Details of float location H for density 1 g/cm³.

Ordering code

NBS - 1. 2. 3. 4.

○=Option

1. Connection size	
010	threaded connection G $\frac{3}{8}$ A
015	○ threaded connection G $\frac{1}{2}$ A
2. Process connection	
H	screw-in thread
3. Connection material	
M	brass
4. Length	
040	40 mm
060	60 mm
080	80 mm
100	100 mm
125	125 mm
150	150 mm
200	200 mm
250	250 mm
300	300 mm

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Product Information

Sensors and Instrumentation

Level Switch NM-007HP



- Cover or base mounting for monitoring max. or min. level
- Normally closed or normally open contact

Characteristics

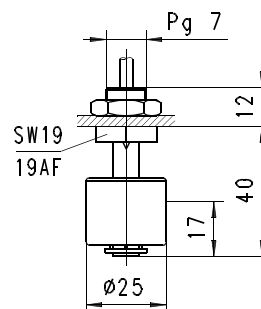
Mechanical level monitor for fluid media, with contact-free triggering of a reed contact.

Technical data

Switch	reed switch
Process connection	male thread Pg 7
Density of medium	$^3 0.8 \text{ g/cm}^3$
Pressure resistance	PN 5 bar
Medium temperature	-20...+60 °C
Ambient temperature	-20...+60 °C
Media	water, oil
Wiring	'normally open' or 'normally closed' No. 0.442
	The switching function can be modified by changing the float.
Switching voltage	max. 250 V AC

Switching current	max. 0.5 A
Switching capacity	max. 10 VA
Protection class	2 - safety insulation
Ingress protection	IP 65
Electrical connection	cabl 1.5 m
Materials medium-contact	PP
Non-medium-contact materials	PA, PVC
Weight	0.04 kg
Installation location	vertical installation position

Dimensions



Details of float location 17 mm for density 1 g/cm^3 .
The device is delivered without a seal.

Handling and operation

- It must be ensured that the values given for voltage, current, and power are not exceeded.
- When switched on, a load must be connected in series.
- The electrical details apply to ohmic loads. Capacitive, inductive and lamp loads must be operated using a protective circuit.
- Not suitable for use in media with ferritic particles.

Ordering code

NM - 1. 007 2. H 3. P

1. Connection size	007 threaded connection Pg 7
2. Process connection	H screw-in thread
3. Connection material	P PP

Level Switch NM1-004HK



- Cover or base mounting for monitoring max. or min. level
- normally closed or normally open contact

Characteristics

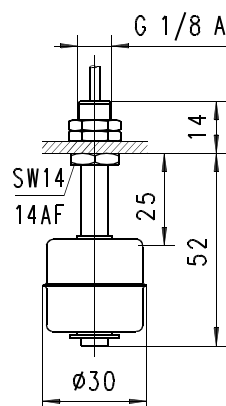
Mechanical level monitor for fluid media, with contact-free triggering of a reed contact.

Technical data

Switch	reed switch
Process connection	male thread G 1/8 A
Density of medium	³ 0.75 g/cm ³
Pressure resistance	PN 30 bar
Medium temperature	-20..+105 °C
Ambient temperature	-30..+55 °C
Media	water, oils
Wiring	'normally open' or 'normally closed' No. 0.442
	the switching function can be modified by changing the float.
Switching voltage	max. 150 V AC / DC
Switching current	max. 0.5 A
Switching capacity	max. 20 VA / W

Protection class	2 - safety insulation
Ingress protection	IP 65
Electrical connection	cabl 1.5 m
Materials medium-contact	1.4571
Non-medium-contact materials	PVC
Weight	0.06 kg
Installation location	vertical installation position

Dimensions



Details of float location 25 mm for density 1 g/cm³.
The device is delivered without a seal.

Handling and operation

- It must be ensured that the values given for voltage, current, and power are not exceeded.
- When switched on, a load must be connected in series.
- The electrical details apply to ohmic loads. Capacitive, inductive and lamp loads must be operated using a protective circuit.
- Not suitable for use in media with ferritic particles.

Ordering code

NM1 - 1. 004 2. H 3. K

1. Connection size	004	threaded connection G 1/8 A
2. Process connection	H	screw-in thread
3. Connection material	K	stainless steel

Product Information

Sensors and Instrumentation

Level Switch NM-008HK



- Cover or base mounting for monitoring max. or min. level
- Normally closed or normally open contact

Characteristics

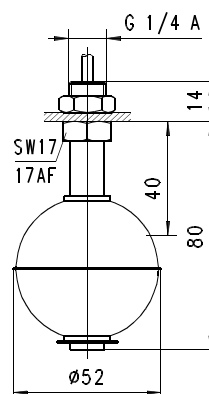
Mechanical level monitor for fluid media, with contact-free triggering of a reed contact.

Technical data

Switch	reed switch
Process connection	male thread G 1/4 A
Density of medium	$^3 0.7 \text{ g/cm}^3$
Pressure resistance	PN 40 bar
Medium temperature	-20...+105 °C
Ambient temperature	-20...+55 °C
Media	water, oils
Wiring	'normally opened' or 'normally closed' No. 0.442
	the switching function can be modified by changing the float.
Switching voltage	max. 250 V AC
Switching current	max. 1.3 A

Switching capacity	max. 80 VA
Protection class	2 - safety insulation
Ingress protection	IP 65
Electrical connection	cabl 1.5 m
Materials medium-contact	1.4571
Non-medium-contact materials	PVC
Weight	0.13 kg
Installation location	vertical installation position

Dimensions



Details of float location 40 mm for density 1 g/cm^3 .
The device is delivered without a seal.

Handling and operation

- It must be ensured that the values given for voltage, current, and power are not exceeded.
- When switched on, a load must be connected in series.
- The electrical details apply to ohmic loads. Capacitive, inductive and lamp loads must be operated using a protective circuit.
- Not suitable for use in media with ferritic particles.

Ordering code

1. 2. 3.
NM - 008 H K

1. Connection size	
008	threaded connection G 1/4 A
2. Process connection	
H	screw-in thread
3. Connection material	
K	stainless steel

Product Information

Sensors and Instrumentation

Level Switch NMS-004HM40



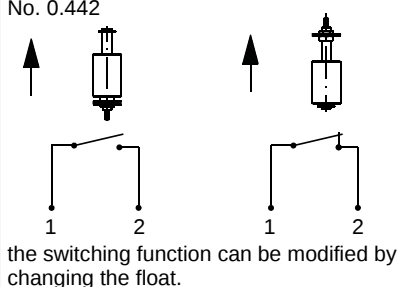
- Cover or base mounting for monitoring max. or min. level
- Normally closed or normally open contact

Characteristics

Mechanical level monitor for fluid media, with contact-free triggering of a reed contact.

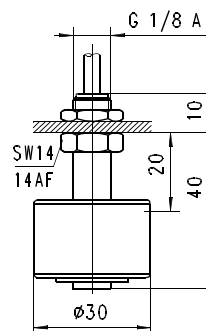
Technical data

Switch	reed switch
Process connection	male thread G 1/8 A
Density of medium	³ 0.4 g/cm ³
Pressure resistance	PN 20 bar
Medium temperature	-20..+105 °C
Ambient temperature	-20..+55 °C
Media	water, oils
Wiring	'normally open' or 'normally closed' No. 0.442
Switching voltage	max. 300 V AC
Switching current	max. 0.5 A



Switching capacity	max. 70 VA
Protection class	2 - safety insulation
Ingress protection	IP 65
Electrical connection	Cable 1.5 m
Materials medium-contact	CW614N nickelled, Spansil (NBR), bronze
Non-medium-contact materials	PVC
Weight	0.055 kg
Installation location	vertical installation position

Dimensions



Details of float location 20 mm for density 1 g/cm³.
The device is delivered without a seal.

Handling and operation

- It must be ensured that the values given for voltage, current, and power are not exceeded.
- When switched on, a load must be connected in series.
- The electrical details apply to ohmic loads. Capacitive, inductive and lamp loads must be operated using a protective circuit.
- Not suitable for use in media with ferritic particles.

Ordering code

1. 2. 3. 4.
NMS - 004 H M 040

○=Option

1. Connection size	004 threaded connection G 1/8 A
2. Process connection	H screw-in thread
3. Connection material	M brass
4. Length	040 40 mm

Product Information

Sensors and Instrumentation

Level Switch NMS-004HM47



- Cover or base mounting for monitoring max. or min. level
- Normally closed or normally open contact

Characteristics

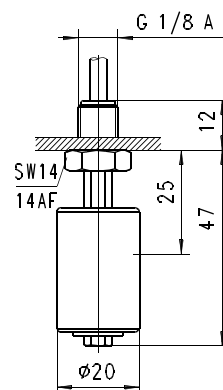
Mechanical level monitor for fluid media, with contact-free triggering of a reed contact.

Technical data

Switch	reed switch
Process connection	male thread G 1/8 A
Density of medium	³ 0.4 g/cm ³
Pressure resistance	PN 12 bar
Medium temperature	-20...+105 °C
Ambient temperature	-20...+55 °C
Media	water, oils
Wiring	'normally open' or 'normally closed' No. 0.442
	the switching function can be modified by changing the float.
Switching voltage	max. 300 V AC
Switching current	max. 0.5 A
Switching capacity	max. 70 VA

Protection class	2 -safety insulation
Ingress protection	IP 65
Electrical connection	cabl 1.5 m
Materials medium-contact	CW614N, Spansil (NBR), bronze
Non-medium-contact materials	PVC
Weight	0.065 kg
Installation location	vertical installation position

Dimensions



Details of float location 25 mm for density 1 g/cm³.
The device is delivered without a seal.

Handling and operation

- It must be ensured that the values given for voltage, current, and power are not exceeded.
- When switched on, a load must be connected in series.
- The electrical details apply to ohmic loads. Capacitive, inductive and lamp loads must be operated using a protective circuit.
- Not suitable for use in media with ferritic particles.

Ordering code

1. 2. 3. 4.
NMS - 004 H M 047

○=Option

1.	Connection size	004	threaded connection G 1/8 A
2.	Process connection	H	screw-in thread
3.	Connection material	M	brass
4.	Length	047	47 mm

Level Switch NMS-004HM77



- Cover or base mounting for monitoring max. or min. level
- Normally closed or normally open contact

Characteristics

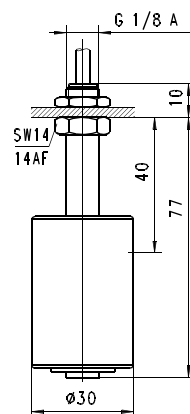
Mechanical level monitor for fluid media, with contact-free triggering of a reed contact.

Technical data

Switch	reed switch
Process connection	male thread G 1/8 A
Density of medium	³ 0.35 g/cm ³
Pressure resistance	PN 12 bar
Medium temperature	-20..+105 °C
Ambient temperature	-20..+55 °C
Media	water, oil
Wiring	'normally open' or 'normally closed' No. 0.442
	the switching function can be modified by changing the float.
Switching voltage	max. 250 V AC
Switching current	max. 1.3 A
Switching capacity	max. 80 VA

Protection class	2 - safety insulation
Ingress protection	IP 65
Electrical connection	cabl 1.5 m
Materials medium-contact	CW614N nickelled, Spansil (NBR), bronze
Non-medium-contact materials	PVC
Weight	0.075 kg
Installation location	vertical installation position

Dimensions



Details of float location 40 mm for density 1 g/cm³.
The device is delivered without a seal.

Handling and operation

- It must be ensured that the values given for voltage, current, and power are not exceeded.
- When switched on, a load must be connected in series.
- The electrical details apply to ohmic loads. Capacitive, inductive and lamp loads must be operated using a protective circuit.
- Not suitable for use in media with ferritic particles.

Ordering code

NMS - 1. 004 2. H 3. M 4. 077

○=Option

1. Connection size	004 threaded connection G 1/8 A
2. Process connection	H screw-in thread
3. Connection material	M brass
4. Length	077 77 mm

Product Information

Level Switch SB

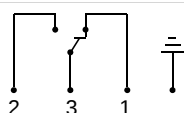


- Mounted in the cover
- Changeover contact

Characteristics

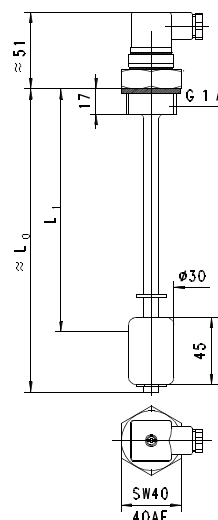
Mechanical level monitor for fluid media with contact-free actuation of a reed contact.

Technical data

Switch	reed switch
Process connection	male thread G 1 A
Density of medium	$^3 0.35 \text{ g/cm}^3$
Switching value	60..460 mm, for details see "Dimensions and weights"
Tolerance	±5 mm
Pressure resistance	PN 12 bar
Medium temperature	-20..+105 °C
Ambient temperature	-20..+55 °C
Media	water, oils
Wiring	changeover no. 0.280 
Switching voltage	max. 230 V AC
Switching current	max. 0.5 A
Switching capacity	max. 60 VA
Protection class	1 - PE connection
Ingress protection	IP 65
Electrical connection	plug DIN 43650-A / ISO 4400
Materials medium-contact	CW614N, Spansil (NBR), bronze, NBR
Non-medium-contact materials	PA
Weight	refer to table "Dimensions and weights"
Installation location	vertical installation position

Dimensions and weights

G	Types	L ₀	L ₁	Weight kg
G 1 A	SB-025HM0100	100	60	0.35
	SB-025HM0200	200	160	0.40
	SB-025HM0300	300	260	0.50
	SB-025HM0400	400	360	0.55
	SB-025HM0500	500	460	0.60



Details of float location L₁ mm for density 1 g/cm³
The device is delivered without a seal.

Handling and operation

- It must be ensured that the values given for voltage, current, and power are not exceeded.
- When switched on, a load must be connected in series.
- The electrical details apply to ohmic loads. Capacitive, inductive and lamp loads must be operated using a protective circuit.
- Not suitable for use in media with ferritic particles.

Ordering code

SB - 1. 025 2. H 3. M 4.

1. Connection size	025	threaded connection G 1 A
2. Process connection	H	screw-in thread
3. Connection material	M	brass
4. Length L ₀	0100	100 mm
	0200	200 mm
	0300	300 mm
	0400	400 mm
	0500	500 mm

Product Information

Level Switch NR



- Mounted in the cover
- Adjustable switching points in 10 mm grid
- Up to four contacts

Characteristics

Mechanical level monitor for fluid media, with contact-free triggering of a reed contact.

Technical data

Switch	reed switch	
Process connection	flange Ø120 or male thread G 2 A	
Density of medium	³ 0.66 g/cm³	
Overall length	250..1000 mm, for details see "Dimensions and weights"	
Pressure resistance	PN 5 bar	
Medium temperature	-5..+100 °C	
Ambient temperature	-5..+70 °C	
Media	water, oils	
Wiring	'normally open' / 'normally closed' or changeover	The switching units are to be ordered separately, see "Switching contact NR-000"
Switching voltage	max. 250 V AC	
Switching current	max. 1 A	
Switching capacity	max. 250 VA	
Protection class	2 - safety insulation	
Ingress protection	IP 65	
Electrical connection	cable screw gland Pg 13.5	
Materials medium-contact	flanged type	CW508L, GD-AISI12, 1.4571
	threaded type	1.4571
Non-medium-contact materials	GD-AISI 12, NBR, PA	
Weight	see table "Dimensions and weights"	
Installation location	vertical installation position	

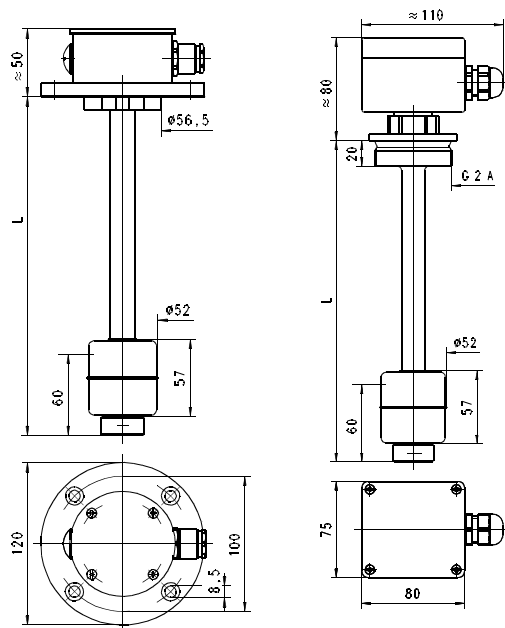
Dimensions and weights

Flanged type

Types	L	Maximum number of switching contacts to be ordered separately 'normally open' / 'normally closed' NR-000	Weight kg
NR-120EA0250	250	2	1.0
NR-120EA0500	500	3	1.1
NR-120EA0750	750	4	1.3
NR-120EA1000	1000		1.4

Threaded type

Types	L	Maximum number of switching contacts to be ordered separately 'normally open' / 'normally closed' NR-000	Weight kg
NR-050HK0250	250	2	1.3
NR-050HK0500	500	3	1.4
NR-050HK0750	750	4	1.6
NR-050HK1000	1000		1.7



Details of float location 60 mm for density 1 g/cm³.
The device is delivered without a seal.

Handling and Operation

Note

- It must be ensured that the values given for voltage, current, and power are not exceeded.
- When switched on, a load must be connected in series.
- The electrical details apply to ohmic loads. Capacitive, inductive and lamp loads must be operated using a protective circuit.
- Not suitable for use in media with ferritic particles.

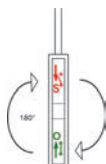
Product Information

Commissioning

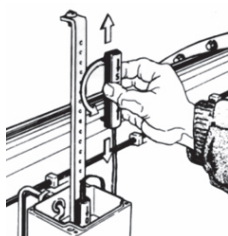
- Number of possible switching contacts:

Length Level monitor	'normally open' / 'normally closed'	optionally transformer
250	2	2
500	3	3
750	4	
1000		

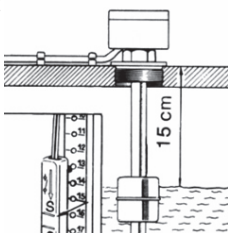
- The switching contacts must be activated before commissioning. By turning the switching module through 180°, the switching function is changed from 'normally open' to 'normally closed'. Minimum contact separation 80 mm.



- Release and pull out the perforated strip. The switching contacts can be fitted at a resolution of 10 mm.



- The switching points can be set exactly using the marking applied to the perforated strip.



Ordering code

NR - 1. 2.

1. Connection size / material	
120EA	flange Ø120 aluminium
050HK	male thread G 2 A stainless steel
2. Length	
0250	250 mm
0500	500 mm
0750	750 mm
1000	1000 mm

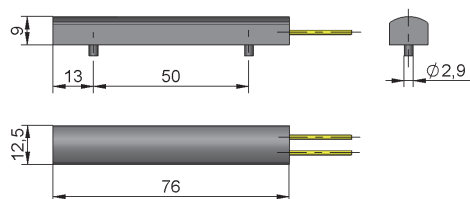
Switching Contact NR-000



Technical data

Switch	reed switch
Operating temperature	-5..+100 °C
Wiring	'normally open' / 'normally closed' No. 0.449
Switching voltage	max. 250 V
Switching current	max. 1,0 A
Switching capacity	max. 250 VA
Protection class	2 - safety insulation
Ingress protection	IP 65
Connection	wiring 2.1 m
Non-medium-contact materials	PA, PVC
Weight	0.04 kg

Dimensions



Ordering code

Please order switching contact(s) separately from devices NR-050HK... and NR-120EA...

NR - 1.

○=Option

1. Connection function	
000	'normally open' / 'normally closed'

Level Sensor LC-...HM / HK



- Mounted in the cover
- Materials combination may be selected

Characteristics

A float fitted with a magnet affects a chain of reed contacts within the guide tube. The reed contacts are fitted with resistances in such a way that in the very simplest model, behaviour is similar to a potentiometer. The measured value can therefore be evaluated as a resistance value or as a radiometric signal (depending on the supply voltage). Alternatively, a sensor model with 4..20 mA analog output (2 wire or 3 wire) or 0..10 V may be selected. The arrangement of the reed contacts ensures the clarity of the switching state, and therefore a clean detection of the level. Resolution is 10 or 20 mm. The device has high reproducibility.

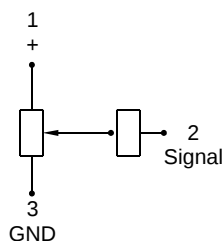
Technical data

Switch	reed switch chain with float fitted with magnet	
Mechanical Connection	LC-S45	G 1 A
	LC-S44	G 1½ A
	LC-K52	G2A
For metering ranges, lengths and divisions	see "Ranges, dimensions and weights"	
Length tolerance	±5 mm	
Pressure resistance	LC-S45	PN 20 bar
	LC-S44	PN 20 bar
	LC-K52	PN 40 bar
Medium temperature	-20..+105 °C	
Ambient temperature	-20..+70 °C	
Storage temperature	-20..+80 °C	
Density of medium	LC-S45	³ 0.34 g/cm ³
	LC-S44	³ 0.44 g/cm ³
	LC-K52	³ 0.66 g/cm ³

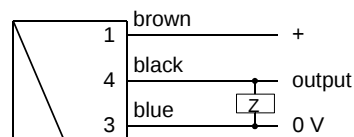
Output	resistor chain (radiometric), 4..20 mA or 0..10 V DC	
Electrical connection	plug DIN 43650-A / ISO 4400 or for round plug connector M12x1, 4-pole (only for electronic output)	
Ingress protection	IP 67	
Materials medium-contact	LC-S45	CW614N and Spansil
	LC-S44	CW614N and Spansil
	LC-K52	Stainless steel 1.4404
Materials Electronics housing	stainless steel 1.4305	
Weights	see table "Ranges, dimensions and weights"	
Conformity	CE	

Wiring

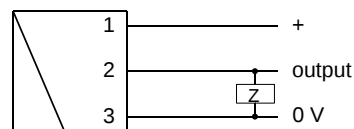
Reed switch chain Typ WB
with plug DIN 43650-A / ISO 4400



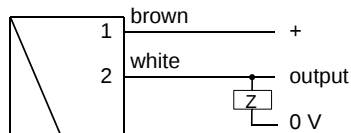
3 wire electronics Typ TS
for round plug connector M12x1, 4-pole



3 wire electronics Typ TB
with plug DIN 43650-A / ISO 4400



2 wire electronics Typ ZB



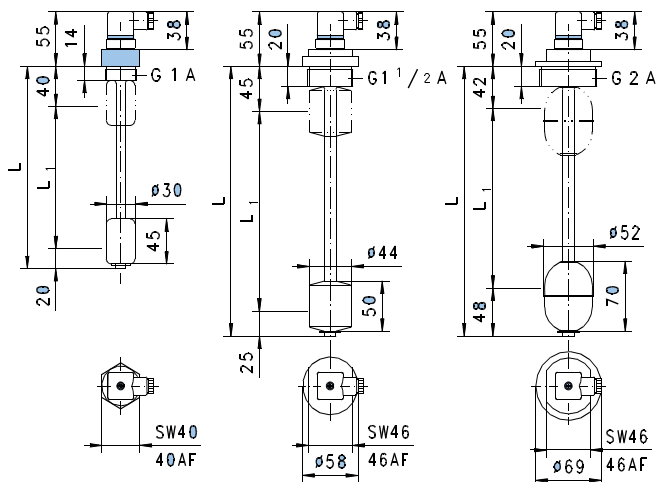
Product Information

Ranges, dimensions and weights

LC-S45HM

LC-S44HM

LC-K52HK



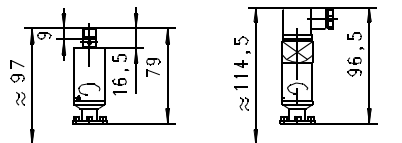
Types LC-	L	L1	Division mm	Resistance * R _{NENN} / Ohm	Tolerance Ohm	Weight kg
S45HM02 50	250	190	10	1800	±136	0.5
S45HM05 00	500	440		4300	±186	0.6
S45HM07 50	750	690		1503	± 52	0.6
S45HM10 00	1000	940		2055	± 64	0.7
S44HM10 00	1000	930	20	2295	± 95	0.7
S44HM15 00	1500	1430		3543	±121	0.8
S44HM20 00	2000	1930		4790	±146	0.8
K52HK02 50	250	160	10	1500	±130	1.0
K52HK05 00	500	410	20	4000	±280	1.0
K52HK07 50	750	660		1647	± 83	1.0
K52HK10 00	1000	910		2246	± 94	1.1
K52HK15 00	1500	1410		3493	±120	1.1
K52HK20 00	2000	1910		4741	±144	1.1

* + 1000 Ohm
Pre-resistance

Electronic attachments

Round plug connector

Plug
DIN 43650-A / ISO 4400



Handling and operation

Note:

Not suitable for use in media with ferritic particles.

Installation

Installation is carried out by screwing the sensor into a suitable threaded drilling on the upper side of the container. A flat seal is included in the scope of the delivery.

Ordering code

LC - 1. 2. 3. 4.

○=Option

1. Version			
S45HM	screw-in fitting G 1 A brass - float Span-sil		
S44HM	screw-in fitting G 1 1/2 A brass - float Spansil		
K52HK	screw-in fitting G 2 A stainless steel		
2. Tube length L			
0250	250 mm	●	●
0500	500 mm	●	●
0750	750 mm	●	●
1000	1000 mm	●	●
1500	1500 mm	●	●
2000	2000 mm	●	●
3. Output			
W	resistive sensors		
Z	○ 4..20 mA (2 wire)		
T	○ 4..20 mA (3 wire)		
V	○ 0..10 V		
4. Electrical connection			
B	plug DIN 43650-A / ISO 4400		
S	○ round plug connector M12x1, 4-pole		

Options

- Special lengths,
- Special divisions,
- Temperature 120 °C

Accessories

- Round plug connector/cable

Level Transmitter / Switch FLEX-LC



- Level sensor with Reed chain
- Analog output and/or switching output
- Alternatively with temperature sensor
- Various materials available
- Designed for industrial use
- Small, compact construction
- Very simple installation

Characteristics

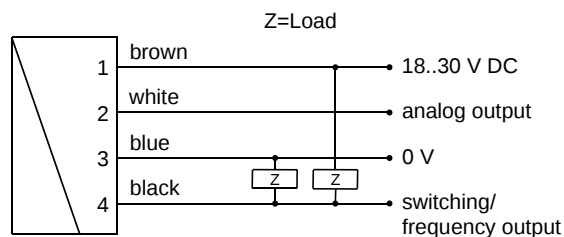
A float fitted with a magnet affects a Reed chain within the guide tube; the chain is connected as a potentiometer with resistances. The resolution is 10..20 mm and is highly reproducible. The FLEX sensor electronics use a microcontroller to convert the potentiometer values into standardised outputs, and offer both an analog and a switching output. A temperature sensor can optionally be integrated, and its measured value can be output either via the analog output or the switching output.

Technical data

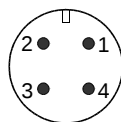
Switch	reed switch chain with float fitted with magnet	
Mechanical Connection	FLEX-LC45M	G 1 A
	FLEX-LC44M	G 1½ A
	FLEX-LC52K	G 2 A
For metering ranges, lengths and divisions	see "Ranges, dimensions and weights"	

Pressure resistance	FLEX-LC45M	PN 20 bar
	FLEX-LC44M	PN 20 bar
	FLEX-LC52K	PN 40 bar
Medium temperature	-20..+105 °C	
Ambient temperature	-20..+70 °C	
Storage temperature	-20..+80 °C	
Density of medium	FLEX-LC45M	³ 0.34 g/cm ³
	FLEX-LC44M	³ 0.44 g/cm ³
	FLEX-LC52K	³ 0.66 g/cm ³
Supply voltage	18..30 V DC	
Power consumption	< 100 mA	
Analog output	4..20 mA or 0..10 V DC	
Switching output	transistor output "push-pull" (resistant to short circuits and polarity reversal) $I_{out} = 100 \text{ mA max.}$	
Switching hysteresis	approx. 2 % or option, not smaller than division, position dependent on characteristics (minimum or maximum)	
Display	yellow LED for switching output: On = Normal / Off = Alarm, otherwise displays operating voltage	
Electrical connection	for round plug connector M12x1, 4-pole	
Materials medium-contact	FLEX-LC45M	CW614N and Spansil
	FLEX-LC44M	CW614N and Spansil
	FLEX-LC52K	Stainless steel 1.4404
Materials, non-medium-contact	stainless steel 1.4305, PA 6.6	
Ingress protection	IP 67	
weights	see "Ranges, dimensions and weights"	
Conformity	CE	

Wiring



Connection example: PNP NPN

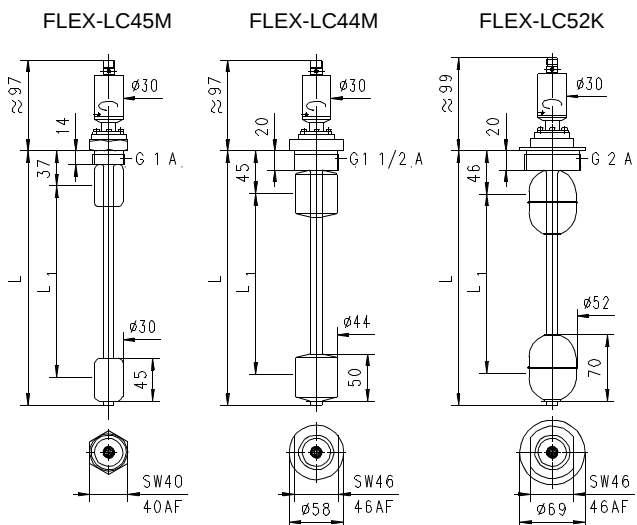


Before the electrical installation, it must be ensured that the supply voltage corresponds with the data sheet. It is recommended to use shielded wiring.

Product Information

Sensors and Instrumentation

Ranges, dimensions and weights



Types FLEX-	Division mm	L mm	L1 mm	Weight kg
LC45M0250	10	250	190	0.6
LC45M0500		500	440	0.7
LC45M0750		750	690	0.7
LC45M1000		1000	940	0.8
LC44M1000	20	1000	930	0.8
LC44M1500		1500	1430	0.9
LC44M2000		2000	1930	0.9
LC52K0250	20	250	160	1.1
LC52K0500		500	410	1.1
LC52K0750		750	660	1.1
LC52K1000		1000	910	1.2
LC52K1500		1500	1410	1.2
LC52K2000		2000	1910	1.2

Handling and operation

Note:

Not suitable for use in media with ferritic particles.

Installation

Installation is carried out by screwing the sensor into a suitable threaded drilling on the upper side of the container. A flat seal is included in the scope of the delivery.

Programming

The electronics contain a magnetic contact, with the aid of which different parameters can be programmed. Programming takes place when a magnet clip is applied for a period between 0.5 and 2 seconds to the marking located on the label. If the contact time is longer or shorter than this, no programming takes place (protection against external magnetic fields).



After the programming ("teaching"), the clip can either be left on the device, or removed to protect data.

The device has a yellow LED which flashes during the programming pulse. During operation, the LED serves as a status display for the switching output.

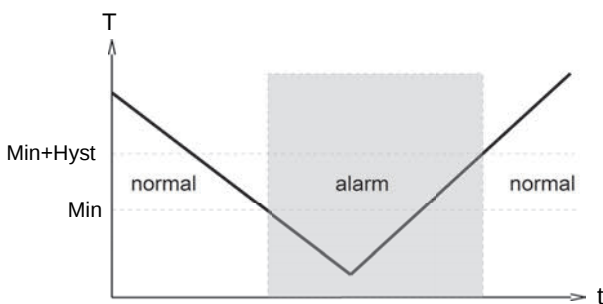
In order to avoid the need to transit to an undesired operating status during "teaching", the device can be provided ex-works with a "teach-offset". The "teach-offset" value is added to the currently measured value before saving (or is subtracted if a negative value is entered).

Example: The switching value is to be set to 70 % of the metering range, because at this flow rate a critical process status is to be notified. However, only 50 % can be achieved without danger. In this case, the device would be ordered with a "teach-offset" of +20 %. At 50 % in the process, a switching value of 70 % would then be stored during "teaching".

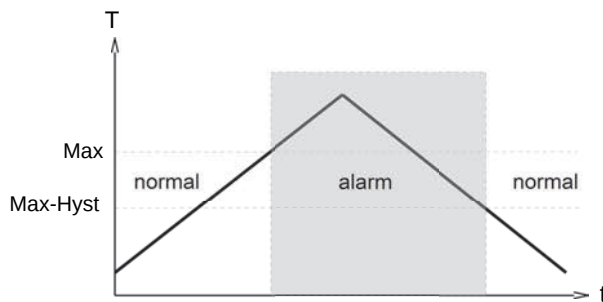
Normally, programming is used to set the limit switch. However, if desired, other parameters such as the end value of the analog or frequency output may also be set.

The limit switch can be used to monitor minimal or maximal.

With a minimum-switch, falling below the limit value causes a switchover to the alarm state. Return to the normal state occurs when the limit value plus the set hysteresis is again exceeded.

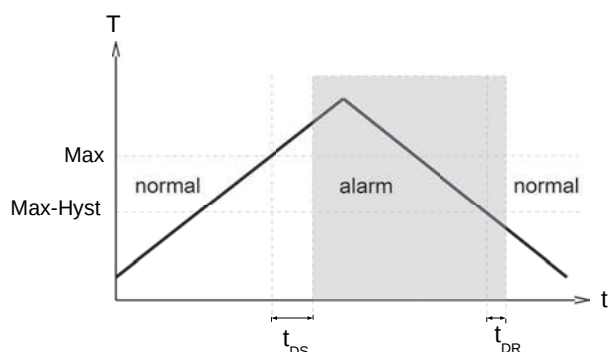


With a maximum-switch, exceeding the limit value causes a switchover to the alarm state. Return to the normal state occurs when the measured value once more falls below the limit value minus the set hysteresis.



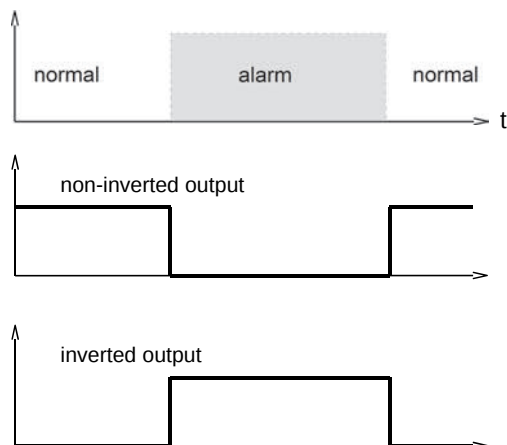
A switchover delay time (t_{DS}) can be applied to the switchover to the alarm state. Equally, one switch-back delay time (t_{DR}) of several can be applied to switching back to the normal state.

Product Information



In the normal state the integrated LED is on, in the alarm state it is off, and this corresponds to its status when there is no supply voltage.

In the non-inverted (standard) model, while in the normal state the switching output is at the level of the supply voltage; in the alarm state it is at 0 V, so that a wire break would also display as an alarm state at the signal receiver. Optionally, an inverted switching output can also be provided, i.e. in the normal state the output is at 0 V, and in the alarm state it is at the level of the supply voltage.



A Power-On delay function (ordered as a separate option) makes it possible to maintain the switching output in the normal state for a defined period after application of the supply voltage.

Combinations with FLEX

FLEX-evaluation electronics can be combined with very different types of pickup systems for flow rate, level, temperature, and pressure. This has created a family of sensors with which different types of applications can be supported.



Ordering code

FLEX-LC - 1. 2. 3. 4. 5. 6.

○=Option

1. Version	
45M	screw-in fitting G 1 A brass - float Spansil
44M	screw-in fitting G 1½ A brass - float spansil
52K	screw-in fitting G 2 A stainless steel
2. Tube length L	
0250	250 mm
0500	500 mm
0750	750 mm
1000	1000 mm
1500	1500 mm
2000	2000 mm
3. Analog output for	
I	4..20 mA
U	0..10 V
K	no analog output
4. Switching output	
L	level
T	temperature
K	No analog output
5. Switching output	
T	push-pull (PNP and NPN)
K	no switching output
6. Switching output for	
L	push-pull (PNP and NPN)
T	temperature
K	no switching output
7. Switching output function	
L	minimum-switch
H	maximum-switch
R	frequency output
K	no switching output
8. Switching output level	
O	standard
I	inverted

Product Information

Options

Special lengths and divisions available on request.

Special measuring range for temperature:

Maximum 120 °C (standard = 70 °C) °C

Minimum -20 °C (standard = 0 °C) °C

End frequency (max. 2000 Hz) Hz

Switching delay (from Normal to Alarm) . s

Switchback delay
(from Alarm to Normal) . s

Power-On delay (0..99 s) s
(time after power on, during which the
outputs are not actuated)

Switching output fixed °C/mm

Special hysteresis (standard = 2 % EW) %

If the field is not completed, the standard setting is selected automatically.

Accessories

- Cable/round plug connector
- Device configurator ECI-1 (KB...) see additional information "Accessories"

Level Transmitter / Switch OMNI-LC



- Level sensor with reed chain and integrated transmitter
- Analog output, two switching outputs
- Clear, easily legible, illuminated LCD display
- Modifiable units in the display
- Designed for industrial use
- Small, compact construction
- Very simple installation

Characteristics

A float fitted with a magnet switches a reed chain within the guide tube; the chain is connected as a potentiometer with resistances. The resolution is 10 to 20 mm. The device has high reproducibility.

The integrated OMNI sensor electronics evaluate the potentiometer values using a microcontroller. The current level is shown in the display and output as an analog signal (0/4..20 mA or 0/2..10 V). In addition, if set limit values are fallen short of or exceeded, this can be signalled by means of two switching outputs and a red LED.

Because the complete upper part of the housing can be turned, it is possible to simply and infinitely adjust the display and the cable outlet.

By turning the programming ring to right or left, it is simple to modify the parameters (e.g. switching point, hysteresis...). To protect from unintended programming, it can be removed, turned through 180 °, and replaced, or completely removed, thus acting as a key.



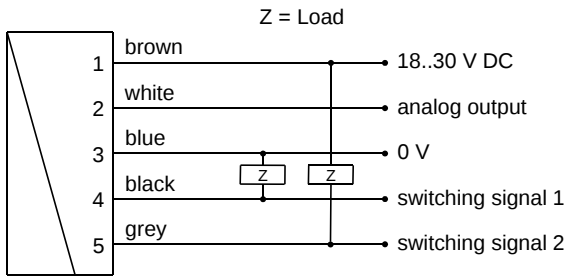
Technical data

Sensor	reed switch chain with float fitted with magnet	
Mechanical Connection	OMNI-LC-S45M	G 1 A
	OMNI-LC-S44M	G 1½ A
	OMNI-LC-S52K	G 2 A
For metering ranges, lengths and divisions	see "Ranges, dimensions and weights"	
Pressure resistance	OMNI-LC-S45M	PN 20 bar
	OMNI-LC-S44M	PN 20 bar
	OMNI-LC-S52K	PN 40 bar
Medium temperature	-20..+70 °C (with gooseneck max. 105 °C)	
Ambient temperature	-20..+70 °C	
Storage temperature	-20..+80 °C	
Density of medium	OMNI-LC-S45M	³ 0.34 g/cm ³
	OMNI-LC-S44M	³ 0.44 g/cm ³
	OMNI-LC-S52K	³ 0.66 g/cm ³
Voltage supply	18..30 V DC	
Power consumption	< 1 W	
Analog output	0/4..20 mA, max. load 500 Ohm or 0/2..10 V	
Switching output	transistor output "push-pull" (resistant to short circuits and polarity reversal) <i>I_{out}</i> = 100 mA max.	
Hysteresis	adjustable, not smaller than division, position dependent on characteristics (minimum or maximum)	
Display	backlit graphical LCD-Display (transreflective), extended temperature range -20..+70 °C, 32 x 16 pixels, background illumination, displays value and unit, flashing LED signal lamp with simultaneous message on the display.	
Electrical connection	for round plug connector M 12x1, 5-pole	
Ingress protection	IP 67	
Materials medium-contact	OMNI-LC-S45M	CW614N and Spansil
	OMNI-LC-S44M	CW614N and Spansil
	OMNI-LC-S52K	stainless steel 1.4404
Materials, non-medium-contact	Housing	stainless steel 1.4305
	Glass	mineral glass, hardened
	Magnet	samarium-Cobalt
Weights	see "Ranges, dimensions and weights"	
Conformity	CE	

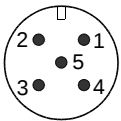
Product Information

Sensors and Instrumentation

Wiring

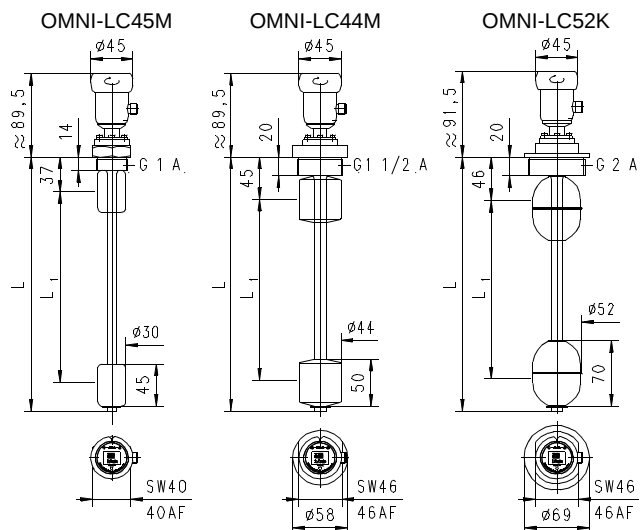


Connection example: PNP NPN



The switching outputs are self-configuring, depending on whether they are connected as PNP or NPN switches (push-pull). It is recommended to use shielded wiring.

Dimensions and weights



Types	Division	L	L1	Weight
OMNI-LC-	mm	mm	mm	kg
S45HM0250	10	250	190	0.6
S45HM0500		500	440	0.7
S45HM0750		750	690	0.7
S45HM1000		1000	940	0.8
S44HM1000	20	1000	930	0.8
S44HM1500		1500	1430	0.9
S44HM2000		2000	1930	0.9
K52HK0250	10	250	160	1.1
K52HK0500		500	410	1.1
K52HK0750		750	660	1.1
K52HK1000		1000	910	1.2
K52HK1500	20	1500	1410	1.2
K52HK2000		2000	1910	1.2

A gooseneck (optional) between the electronics head and the primary sensor provides freedom in the orientation and reading direction of the sensor. At the same time, this option ensures a thermal decoupling between the two units, so that media temperatures up to 105 °C become possible.

Handling and operation

Note:

Not suitable for use in media with ferritic particles.

Installation

Installation is carried out by screwing the sensor into a suitable threaded drilling on the upper side of the container. A flat seal is included in the scope of the delivery.

After it has been screwed in, the OMNI head can be turned to the reading direction, thanks to its free rotatability.

Programming

The annular gap of the programming ring can be turned to positions 1 and 2. The following actions are possible:



Set to 1 = continue (STEP)
Set to 2 = modify (EDIT)

Neutral position between 1 and 2

The ring can be removed to act as a key, or turned through 180 ° and replaced to create a programming protector.

Operation is by dialog with the display messages, which makes its use very simple. Starting from the normal display (currently measured value with unit), if 1 (STEP) is repeatedly selected, then the display shows the following information in this order:

Display of the parameters, using position 1

- Switching value S1 (switching point 1 in the selected unit)
- Switching characteristic of S1
- (MIN = monitoring of minimum value, hysteresis greater than switching value,
- MAX = monitoring of maximum value, hysteresis less than switching value)
- Hysteresis 1 (hysteresis value of S1 in the set unit)
- Switching value S2
- Switching characteristic of S2
- Hysteresis 2
- Code:
- After entering the code 111, further parameters can be defined:
- Filter (settling time of the display and output)
- Units: e.g. l/min or m³/h
- Output: 0..20 mA or 4..20 mA
- 0/4 mA (flow rate corresponding to 0/4 mA)
- 20 mA (flow rate corresponding to 20 mA)

Edit, using position 2

If the currently visible parameter is to be modified:

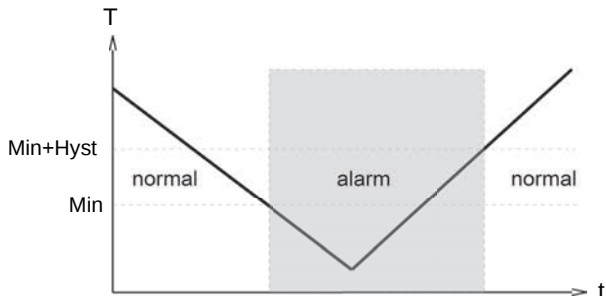
- Turn the annular gap to position 2, so that a flashing cursor appears which displays the position which can be modified.
- By repeatedly turning to position 2, values are increased; by turning to position 1, the next digit is reached.
- Leave the parameter by turning to position 1 (until the cursor leaves the row); this accepts the modification.
- If there is no action within 30 seconds, the device returns to the normal display range without accepting the modification.

The S1 and S2 limit switches can be used to monitor minimal or

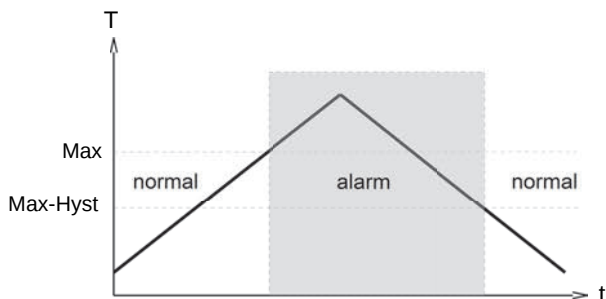
Product Information

maximal.

With a minimum-switch, falling below the limit value causes a switchover to the alarm state. Return to the normal state occurs when the limit value plus the set hysteresis is once more exceeded.



With a maximum-switch, exceeding the limit value causes a switchover to the alarm state. Return to the normal state occurs when the measured value once more falls below the limit value minus the set hysteresis.



The change to the alarm state is indicated by the integrated red LED and a cleartext in the display. While in the normal state the switching outputs are at the level of the supply voltage; in the alarm state they are at 0 V, so that a wire break would also display as an alarm state at the signal receiver. Overload of the switching output is detected, indicated on the display ("Check S 1 / S 2"), and the switching output is switched off.

Simulation mode

To simplify commissioning, the sensor supports a simulation mode for the analog output. It is possible to create a programmable value in the range 0..26 mA at the output (without modifying the process variable). This allows the wiring run between the sensor and the downstream electronics to be tested during commissioning. This mode is accessed by means of code 311.

Overload display

Overload of the switching output is detected, indicated on the display, and the switching output is set to high impedance.

Default setting

After setting the configuration parameters, they can be reset to factory values at any time, by means of code 989.

Starting from the normal display (currently measured value with unit), if 1 (STEP) is selected repeatedly, then the display shows the following information:

Display of the parameters, using position 1

- Switching values S1 and S2: Switching values in the selected unit.
- Hysteresis direction of S1 and S2:
Max = Hysteresis less than S1 or S2
Max = Hysteresis greater than S1 or S2
- Hystereses Hyst1 and Hyst2:

- Hysteresis values of the switching values in the set unit
- After entering code 111, further parameters can be defined (this should take place only if necessary)
- Filter: Selectable filter constant in seconds (affects display and output)
- Unit: e.g. bar or psi ...
- Output: 0..20 mA or 4..20 mA
- 0/4 mA: Displayed value for 0/4 mA
- 20 mA: Displayed value for 20 mA

Edit, using position 2

- If the **visible** parameter is to be modified:
- Turn the annular gap to position 2, so that a flashing cursor appears which displays the position which can be modified. By repeatedly turning to position 2, values are increased; by turning to position 1, the next digit is reached. In this way, every digit can be modified. If there is no action within 5 seconds, the device returns to the normal display range without accepting the modification.

Saving the changes using position 1

- After leaving the last value, turn once to position 1; this accepts the modification.

Ordering code

OMNI-LC - 1. 2. 3.

○=Option

1. Version			
S45HM	screw-in fitting G 1 A brass - float span-sil		
S44HM	screw-in fitting G 1½ A brass - float span-sil		
K52HK	screw-in fitting G 2 A stainless steel		
2. Tube length L			
0250	250 mm	●	●
0500	500 mm	●	●
0750	750 mm	●	●
1000	1000 mm	●	●
1500	1500 mm	●	●
2000	2000 mm	●	●
3. Optional			
H	○ model with gooseneck		

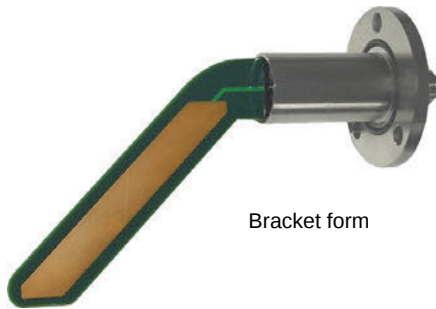
Options

- Tropical model (completely oil-filled for severe external applications or for rapidly changing temperatures. Reliably prevents condensation).
- Special lengths

Accessories

- Cable/round plug connector (KB...) see additional information "Accessories"
- Device configurator ECI-1

Capacitive Level Transmitter / -Switch Incl. Temperature Control LCC1



Bracket form

- Developed for oil sumps with highly disturbed level of fill
- No moving parts
- Automatic recognition of different types of oil via reference capacitance
- Temperature control can be integrated
- Switching output (push-pull) and analog output (4..20 mA or 0..10 V)
- Parameters can be programmed in order to achieve best possible adaptation to the application
- Simple installation
- Compact size
- Bracket and straight form

Characteristics

The capacitive LCC1 oil measurer and switch monitors the level of the oil in flat containers with heavily mobile oil surfaces (compressors, engine oil sumps, gearboxes...).

The LCC1 has a reference structure at the end of the sensor, which detects different oils (with different viscosity, at different temperatures) without recalibration.

The programmable filter calculates the running average, and thus reduces the variations in the output signal without negatively affecting the accuracy.

The hysteresis of the switching point can also be adjusted by setting parameters.

The electronics belong to the class of intelligent sensors from HONSBERG, and thus enable the use of the ECI-1 interface (configurator). The USB-compatible interface is used in the manufacture by HONSBERG in order to program the parameters desired by the customer.

Technical data

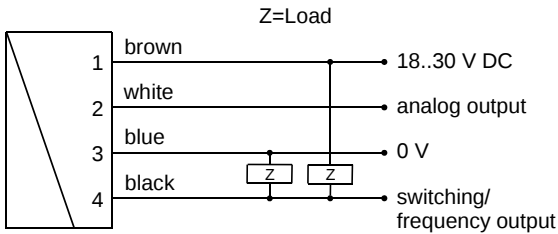
Sensor	capacitive	
Mechanical connection	3-hole flange or Thread G 1" (Screw flange as accessories)	
Metering range	30 mm (others available on request)	
Measurement accuracy	±1.5 mm	
Repeatability	±1 mm	
Pressure resistance	PN 5 bar	
Long term stability	±1 mm after 100.000 cycles (0..100 % of level)	
Temperature dependency	±0.005 mm/ 1 K	
Medium temperature	-20..+85 °C	
Ambient temperature	-20..+60 °C	
Supply voltage	18..30 V DC (controlled)	
Current consumption at rest	15 mA	
Analog Output	0..10 V or 4..20 mA	
Switching output	push-pull, 100 mA max. resistant to short circuits, reversal polarity protected	
LED (view from 4 sides)	yellow On = oil is within range Flashing = 10 % above min. level Off = oil is below min. level or > temperature limit (max. 95 °C) or defective. Flickering = during programming with magnet. 2 x flashing confirms successful programming.	
Ingress protection	IP 67	
Materials medium-contact	Housing	CW614N nickelled
	O-ring	FKM (EPDM)
	Sensor	FR4, epoxy resin + fibreglass, gold-plated Cu
	Potting	Bectron PK 4342
Materials non-medium-contact	Housing	CW614N nickelled
	O-ring	NBR
	Plug	PA6.6
Weight	0.2 kg	
Conformity	CE	

Product Information

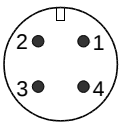
Wiring

Before the electrical installation is to make sure that the supply voltage corresponds to the data sheet.

It is recommended to use shielded cable.

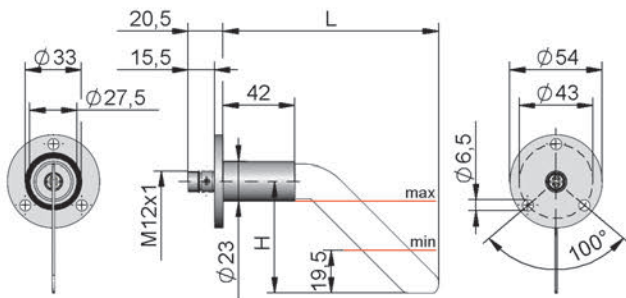


Connection example: PNP NPN



The push-pull switching output (push-pull output) the frequency or pulse output version can optionally be wired as a PNP or an NPN output.

Dimensions



Handling and operation

Before the installation, it must be ensured that the supply voltage corresponds with the data sheet.

The fastening for flange version is by means of 3 x M6 bolts. Refer to "Dimensions" on the drawing for drilling and sealing dimensions.

The flange must be free of contamination and mechanical damage. Bolts should be tightened only enough for the flange to abut against the housing wall.

The threaded version can either be directly screwed in (G1 ") or be attached in a bore (34 mm) by use of two nuts supplied with the instrument. Alternatively a flange can be screwed onto the thread, which can also be customized.

A magnet clip is used for programming the switching point - if this is desired - or for programming an offset to the start or full scales. Equally, the analog full scale may alternatively be programmed with the clip. The clip can be inserted onto the plug connection or can be removed as a key.

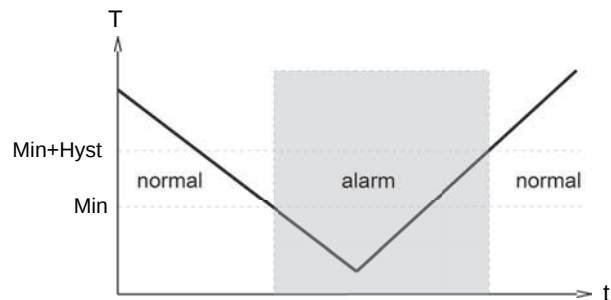
The location to which to apply the clip for one second is marked on the nameplate.



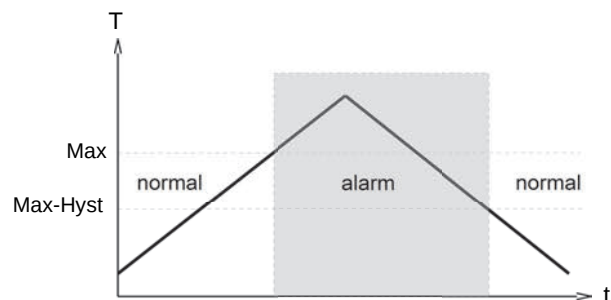
If the programmable switching point is desired:

- Set the level to the switching value or to the value from which the offset was desired.
- Hold the magnet against the marking
- LED flickers
- Remove the magnet from the marking. Two LED pulses mark the end of successful programming.

With a minimum-switch, falling below the limit value causes a switchover to the alarm state. Return to the normal state occurs when the limit value plus the set hysteresis is once more exceeded.

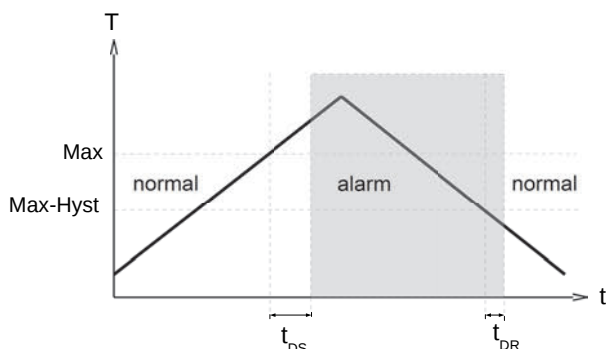


With a maximum-switch, exceeding the limit value causes a switchover to the alarm state. Return to the normal state occurs when the measured value once more falls below the limit value minus the set hysteresis.



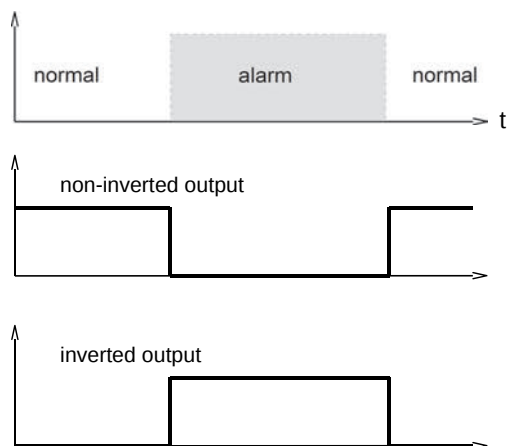
Product Information

A changeover delay time (t_{DS}) can be applied to the switch in the alarm state. Equally, one switch-back delay time (t_{DR}) of several can be applied to switching back to the normal state.



In the normal state the integrated LED is on, in the alarm state it is off, and this corresponds to its status when there is no supply voltage.

In the non-inverted (standard) model, while in the normal state the switching output is at the level of the supply voltage; in the alarm state it is at 0 V, so that a wire break would also display as an alarm state at the signal receiver. Optionally, an inverted switching output can also be provided, i.e. in the normal state the output is at 0 V, and in the alarm state it is at the level of the supply voltage.



A Power-On-Delay function (ordered as a separate option) makes it possible to maintain the switching output in the normal state for a defined period after application of the supply voltage.

Ordering code

LCC1 - 1. A 2. 126 3. 65 4. V 5. 6. 7. 8.

○=Option

1. Form	
A	Bracket form (side mounting)
2. Installation length	
126	126 mm (only with installation height 56)
xxx	Weitere auf Anfrage
3. Installation height	
65	65 mm (Form A)
xx	others on request
4. Seal	
V	FKM
5. Output signal	
I	current output 4..20 mA
U	voltage output 0..10 V
6. Switching function	
L	minimum-switch
H	maximum-switch
7. Programming	
N	cannot be programmed (no teaching)
P	○ programmable (teaching possible)
8. Switching output level	
O	standard
I	inverted
9. Electrical connection	
S	for round plug connector M12x1, 4-pole

Options

Special range for analog output: mm
<= Metering range (Standard=Metering range)

Special range for frequency output: mm
<= Metering range (Standard=Metering range)
End frequency (max. 2000 Hz) Hz
(Standard = 1000 Hz)

Switching delay s
(from Normal to Alarm)

Switchback delay s
(from Alarm to Normal)

Power-On delay s
(After connecting the supply, time during which the switching output is not activated)

Switching output hard coded %
(from the end value)

Special hysteresis (standard = 2 % EW) %
Temperature monitoring max. 100 °C °C
(Standard = 90 °C)

Protective tube (only for straight sensors) ☐ yes

If the field is not completed, the standard setting is selected automatically.

Accessories

- Cable/round plug connector (KB...) see additional information "Accessories"
- Device configurator ECI-1

Capacitive level transmitter / -switch incl. temperature control LCC2



- Developed for oil containers with highly disturbed level of fill
- No moving parts
- Automatic recognition of different types of oil via reference capacitance
- Temperature control can be integrated
- Switching output (push-pull) and analog output (4..20 mA or 0..10 V)
- Parameters can be programmed in order to achieve best possible adaptation to the application
- Simple adjustment
- Thread or flange fastening
- Compact size

Characteristics

The capacitive LCC2 oil measurer and switch monitors the level of the oil, even in containers with heavily mobile oil surfaces (compressors, engine oil sumps, gearboxes...).

The LCC2 measures the level in relationship to a reference structure at the end of the probe. As a result, levels are correctly detected with oil changes (different viscosity, at different temperatures or in the case of ageing of the oil) without recalibration. An influence of the measurement from the container wall is to be disregarded by means of earthing (shielding on plug).

The programmable filter calculates the running average, and thus reduces the variations in the output signal without negatively affecting the accuracy.

The hysteresis of the switching point can also be adjusted by setting parameters.

The electronics belong to the class of intelligent sensors from HONSBERG, and thus enable the use of the ECI-1 interface (configurator). The USB-compatible interface enables the adjustment of numerous parameters for adaptation to the application.

The devices are delivered pre-configured according to customer wishes.

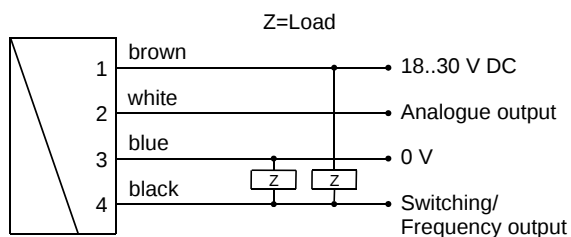
Technical data

Sensor	Capacitive	
Mechanical Connection	G1 thread with two fastening nuts (screw flange as accessory)	
Metering range	200, 400, 600 mm (others on request)	
Measurement uncertainty	±1 % full scale value	
Reproducibility	±1 mm	
Pressure resistance	PN 5 bar (with sealed sensor)	
Long term stability	±1 mm after 100,000 cycles (0..100 % of level)	
Temperature dependency	±0.005 mm/ 1 K	
Medium temperature	-20..+85 °C (optionally 100°C)	
Ambient temperature	-20..+ 60 °C	
Supply voltage	18..30 V DC (regulated)	
Current requirement at rest	15 mA	
Analog Output	0..10 V or 4..20 mA	
Switching output	Push-Pull, 100 mA max. resistant to short circuits, reversed polarity protected	
LED (view from 4 sides)	yellow On = oil is within range Flashing = 10 % above min. level Off = oil is below min. level or > temperature limit (max. 95 °C) or defective. Flickering = with switchpoint programming with magnet. 2 x flashing confirms successful programming.	
Ingress protection	IP 67	
Materials medium-contact	Housing	CW614N nickelled
	O-ring	FKM (EPDM optional)
	Sensor	(NBR) FR4 (epoxy resin + fibre-glass), gold-plated Cu
	Casting	Bectron PK 4342
Materials non-medium-contact	Housing	CW614N nickelled
	O-ring	NBR
	Plug	PA6.6
Weight	Sensor: 200 mm long 0.2 kg without flange Tube length: + 0.05 kg / 200 mm Flange: + 0.15 kg	
Conformity	CE 	

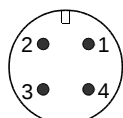
Product Information

Sensors and Instrumentation

Wiring



Connection example: PNP NPN

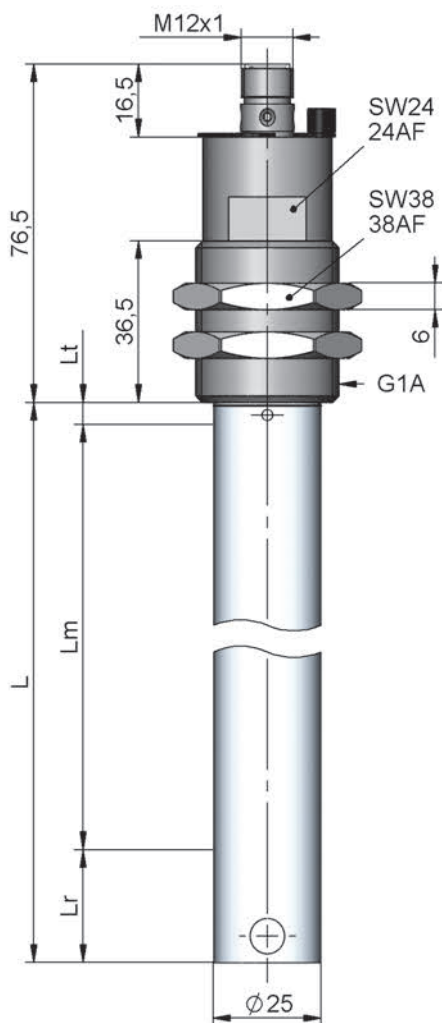


Before the electrical installation, it must be ensured that the supply voltage corresponds to the data sheet.

It is recommended to use shielded wiring.

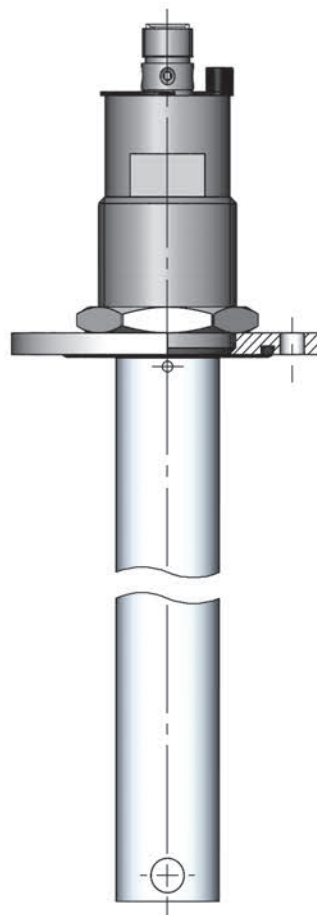
The push-pull output of the frequency or pulse output version can as desired be switched as a PNP or an NPN output.

Dimensions

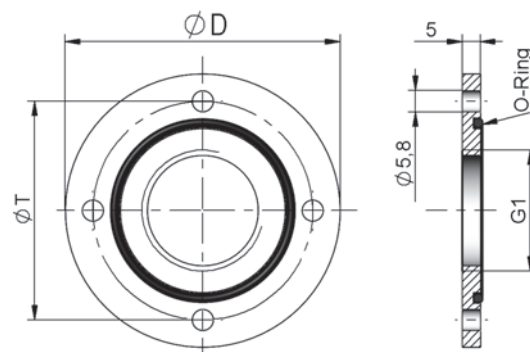


L = installation length (see ordering code),
L_m = metering range (L-L_t-L_r) Standard 0 – 100%
L_t = Dead zone 10 mm
L_r = Reference zone 26 mm
(always in the same medium as the measuring zone)
L_{min} = 10

LCC2 with flange



Standard flange dimensions



D= 75
T= 60
C1= Tank hole 34 – 40 mm

... professional Instruments "MADE IN GERMANY"

Product Information

Installation

The threaded version can be either directly screwed into (G1") a hole (34 mm) or fastened using two supplied nuts.

Alternatively, a screw-on flange can be fastened on the thread, which is also made specifically for the customer. In order to achieve a tight seal the flange must be made with a suitable thread seal on the LCC2 unit. The container must have a suitable sealing surface on which the O-ring seals the flange. The flange must be free of contamination and mechanical damage. Bolts should be tightened only enough for the flange to abut against the housing wall.

A magnet clip is used for programming the switching point - if this is desired - or for programming an offset to the start or full scales. Equally, the analog full scale may alternatively be programmed with the clip.

The clip can be inserted onto the plug connection or can be removed as a key.

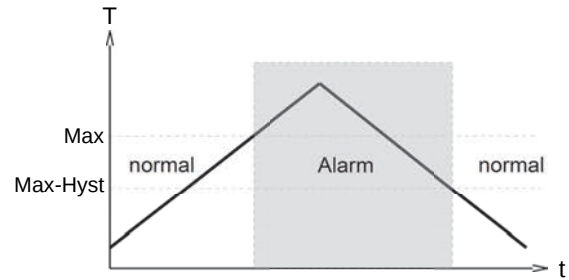
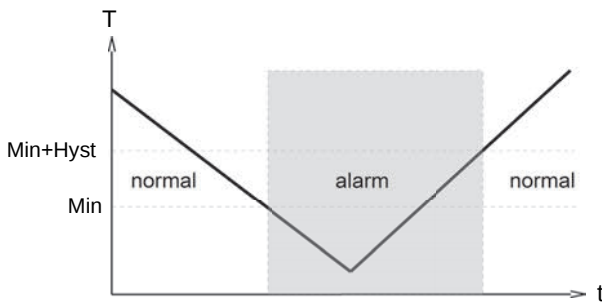
The location to which to apply the clip for one second is marked on the label.



If the programmable switching point is desired:

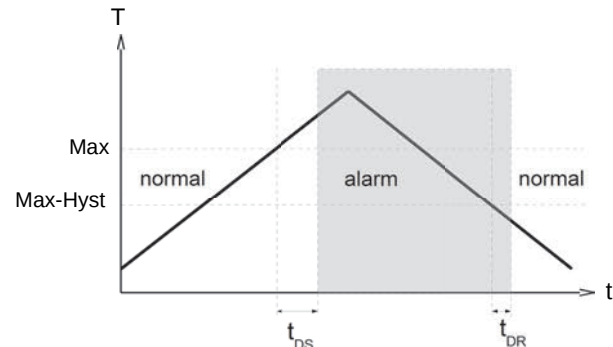
- Set the level to the switching value or to the value from which the offset was desired.
- Hold the magnet against the marking.
- LED flickers
- Remove the magnet from the marking. Two LED pulses acknowledge successful programming.

With a minimum-switch, falling below the limit value causes a switchover to the alarm state. Return to the normal state occurs when the limit value plus the set hysteresis is once more exceeded.



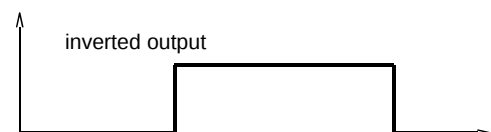
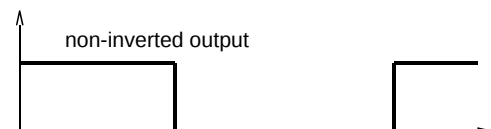
With a maximum-switch, exceeding the limit value causes a switchover to the alarm state. Return to the normal state occurs when the measured value once more falls below the limit value minus the set hysteresis.

A changeover delay time (t_{DS}) can be applied to switching to the alarm state. One switch-back delay time (t_{DR}) of several can likewise be applied to switching back to the normal state.



In the normal state the integrated LED is on, in the alarm state it is off, and this corresponds to its status when there is no supply voltage.

In the non-inverted (standard) model, while in the normal state the switching output is at the level of the supply voltage; in the alarm state it is at 0 V, so that a wire break would also display as an alarm state at the signal receiver. Optionally, an inverted switching output can also be provided, i.e. in the normal state the output is at 0 V, and in the alarm state it is at the level of the supply voltage.



Product Information

A PowerOn delay function (ordered as a separate option) makes it possible to maintain the switching output in the normal state for a defined period after application of the supply voltage.

Ordering code

LCC2 - 1. **B** 2. **H** 3. 4. 5. 6. 7. 8. **S**

O=Option

1. Form	
B	Straight form (installation from above) with protective tube
2. Connection	
H	Screw-in thread
3. Installation length L	
200	200 mm (Lm= 164 mm)
400	400 mm (Lm= 364 mm)
600	600 mm (Lm= 564 mm)
4. Output signal	
I	Current output 4..20 mA
U	Voltage output 0..10 V
5. Switching function	
L	Minimum switch
H	Maximum switch
6. Programming	
N	Cannot be programmed (no teaching)
P	☐ Programmable (teaching possible)
7. Switching output level	
O	Standard
I	Inverted
8. Electrical connection	
S	For round plug connector M12x1, 4-pole

Options

Filter time Off 0.2 0.5 1 2 4 8 16 32 sec
Special range for analogue output: mm
 <= Metering range (Standard=Metering range)
Switching delay s
 (from Normal to Alarm)
Switchback delay s
 (from Alarm to Normal)
Power-on delay s
 (After connecting the supply, time during which the switching output is not activated)
Switching output fixed (< Lm) mm
Special hysteresis (standard= 5mm) mm
Temperature monitoring max. 100 °C
 (Standard = 90 °C)

If the field is not completed, the standard setting is selected automatically.

Accessories

flange



incl. O-ring (cannot be lost). For the dimensions, refer to Dimensions.

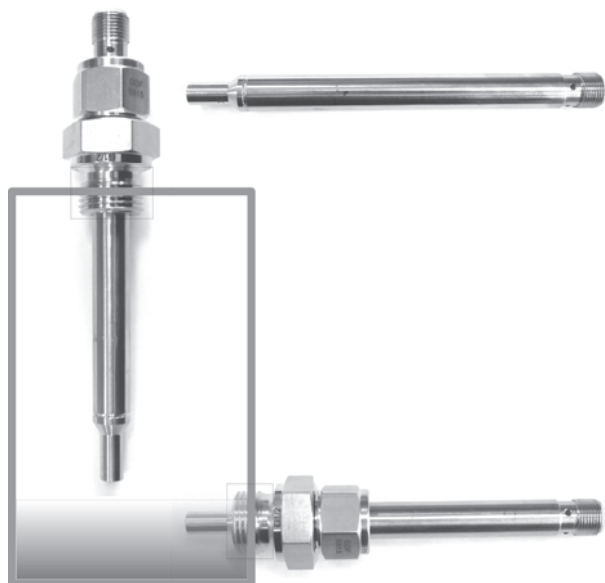
FL-LCC2 - 1. **75** 2. **M** 3. **4** 4. **60**

1. Outside diameter	75	Ø 75 mm
2. Connection material	M	CW614N nickelled
3. Perforation	4	Quadruple perforation
4. Pitch diameter	60	Ø 60 mm

- Customer-specific flange on request
- Round plug connector / cable (KB...)
- Device configurator ECI-1

Product Information

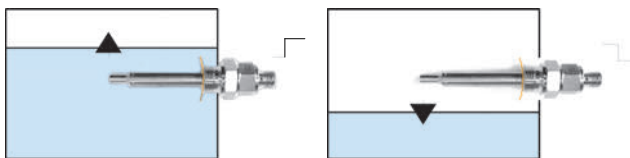
Level Switch or Drip Sensor LABO-LK012



- Complete electronic level switch in 12 mm housing
- Independent of conductivity, colour, ...
- Suitable for fluids and finer granulates
- Programmable hysteresis
- Suitable for very variable fluids
- Programmable power-on/power-off delays
- Very simple to use

Characteristics

The tips of the sensors of the LABO-LK012 family recognise a difference between fluid and air (gas). Temperature changes are compensated. The system is tolerant of contamination which lets water through (paper, mud, sugar solution, glue...).



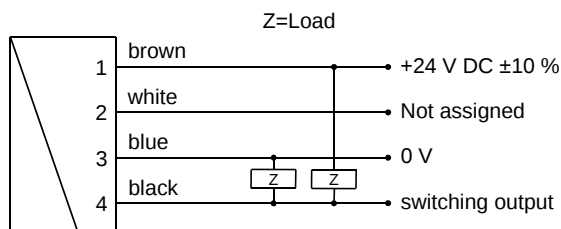
When set in sensitive mode, the LABO-LK012 sensor can be used as a drip sensor. Here, drops which hit the tip of the sensor create an output signal, and thereby indicate the presence of leaks.

The same design can be used as a calorimetric flow sensor, or as an electronic temperature switch.

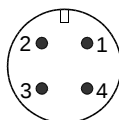
Technical data

Sensor	calorimetric measurement principle
Process connection	see "Dimensions"
Measurement accuracy	±2 mm (dependent on contamination)
Repeatability	±1 mm (dependent on contamination)
Medium temperature	-20...+70 °C
Ambient temperature	0...60 °C
Pressure resistance	PN 40 bar, with plastic cone PN 6 bar (Comply with tightening torques!)
Materials medium-contact	Housing 1.4571
Materials non-medium-contact	Plug PA6.6
Supply voltage	24 V DC ±10 % (controlled)
Power consumption	< 2,5 W
Switching output	transistor output "push-pull" (resistant to short circuits and polarity reversal) $I_{out} = 100$ mA max.
LED	yellow LED (On = Normal / Off = Alarm, flashing = programming or error)
Ingress protection	IP 67
Electrical connection	for round plug connector M12x1, 4-pole
Ingress protection	IP 67
Weight	ca. 0.05 kg (excluding screwed connections)
Conformity	CE

Wiring



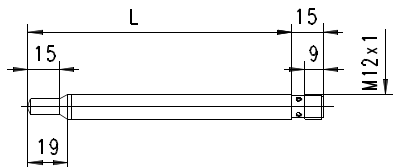
Connection example: PNP NPN



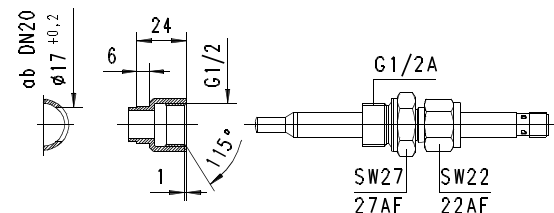
Before the electrical installation, it must be ensured that the supply voltage corresponds to the data sheet. It is recommended to use shielded wiring.

Product Information

Dimensions

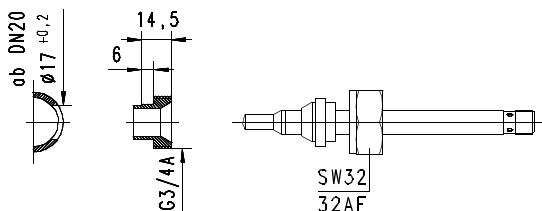


Optional accessories



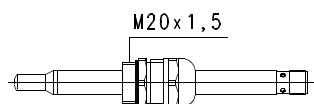
weld-on adapter

crimp screw joint
stainless steel



weld-on adapter

conical screw connection
plastic

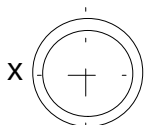


crimp screw joint
plastic

Handling and operation

The instrument is preset for the differentiation of air and water. An adjustment to other media is possible using the device configurator ECI-1, which is available as an accessory. It also allows to set many other parameters.

Installation



The sensor tip must be fully in contact with the medium. The marking (X) is at the side in order to achieve the lowest possible reaction time.

Wherever possible, build-ups of contamination should be removed from the sensor tip, as they can affect the system's sensitivity.

Ordering code

LABO-LK012 - 1. S 2. 3. K1 4. N 5. 6.

○=Option

1. Limit switch	
S	push-pull (compatible with PNP and NPN)
2. Sensor tip length L	
100	100 mm
150	150 mm
200	200 mm
3. Connection material	
K1	stainless steel 1.4571
4. Programming	
N	cannot be programmed (no teaching)
5. Switching function	
L	minimum-switch
H	maximum-switch
6. Switching output level	
O	standard
I	inverted

Options

Switching delay

(from Normal to Alarm)

s

Switchback delay

(from Alarm to Normal)

s

Power-On delay

(after connecting the supply, time during which the switching output is not activated)

s

Special hysteresis (standard = 2 % EW)

%

If no details are provided when ordering, the standard setting is automatically selected.

Accessories

- Cable/round plug connector (KB...) see additional information "Accessories"
- Device configurator ECI-1
- Screwed connections
- Weld-on adapter

Product Information

Sensors and Instrumentation

Ultrasonic Sensor Series LS20



- Measuring ranges from 30..8000 mm
- Switching- and analogue outputs
- Teach-In function
- Foreground fade-out
- Operating temperature -25..70 °C
- Protection class IP67

Characteristics

The LS20 measures the distance to an object within the detection zone contact less. Depending on the adjusted detect distance the switched output is set. LS sensors have internal temperature compensation. Because the sensors heat up on their own, the temperature compensation reaches its optimum working point after approximately 30 minutes of operation. The sensors indicate a blind zone, in which the distance cannot be measured. The operating range indicates the distance of the sensor that can be applied with normal reflectors with sufficient function reserve.

Technical data

Power supply

Supply voltage U_B : 9..30 V DC, reverse polarity protection
Voltage ripple : $\pm 10\%$
No-load supply current : ≤ 80 mA
Operating temperature : -25..70 °C
CE-conformity : EN60947-5-2

Detecting zones	MB1	MB2	MB3	MB4	MB5
Min. range [mm]	30	60	200	350	600
Optimal range [mm]	250	350	1300	3400	6000
Max. range [mm]	350	600	2000	5000	8000
Ultrasonic frequency [Hz]	320	400	200	120	80
Solution, sampling rate [mm]	0.18	0.18	0.18	0.18	0.18

Display

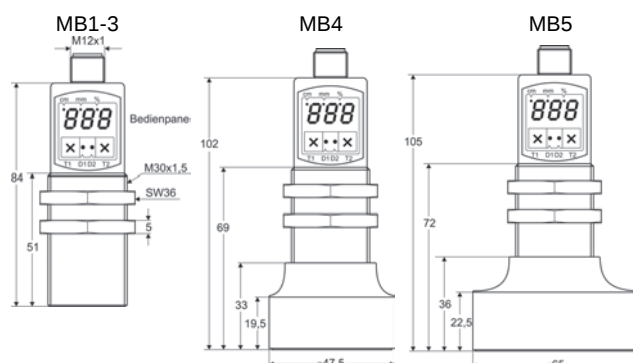
Indicating range : LED red, 7,6 mm
LED's : 0..999 Digit
LED's : output indicators, 3-colors

Output

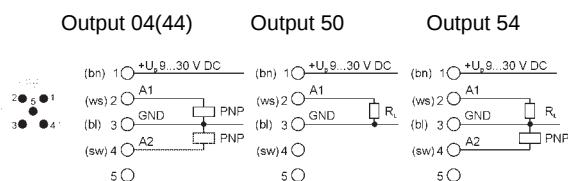
Switched output PNP : $U_S = U_B - 2$ V; I_{max} 200 mA, short circuit proof, NO or NC programmable
-Switching hysteresis : programmable
-Switching frequency : max. 11 Hz
-Response time : min. 50 ms
-Start-up delay : < 300 ms
Current output : 4..20 mA, $R_L \leq 100 \Omega$ at 9 V $\leq U_B \leq 20$ V
 $R_L \leq 500 \Omega$ at $U_B > 20$ V

Voltage output : 0..10 V $R_L \geq 100 \text{ k}\Omega$ at $U_B > 15$ V
Case : brass sleeve, nickel-plated;
Plastic parts : PBT, TPU;
Ultrasonic transducer : Polyurethane foam
Epoxy resin with glass content
Weight : 150..270 g
Connection : 5-pole plug M12, PBT
Protection class : IP67

Dimensions



Connection diagram



Ordering code

1. 2. 3.
LS20 - - -

1.	Ranges [mm] min..optimal/maximal detecting zones	
1	30..250/350	
2	60..350/600	
3	200..1300/2000	
4	350..3400/5000	
5	600..6000/8000	
2.	Output	
04	1 PNP-switching output	
44	2 PNP-switching outputs	
50	1 analogue output 4..20 mA/0..10 V DC	
54	1 analogue output, 1 PNP-switching output	
3.	Options	
00	without option	
VA	case stainless steel 1.4571	
Accessory connection cable		
SKM5E-02	2 m	
SKM5E-02VA	2 m, plug material stainless steel	
SKM5E-05	5 m	
SKM5E-05VA	5 m, plug material stainless steel	

Product Information

Ultrasound Level Transmitter EL



Characteristics

The level transmitter consists of an ultrasound sensor which, contact-free, determines the separations of media of different types (fluids, transported goods, solids). The ultrasound sensor works on the principle of end-to-end measurement. Emitted ultrasound impulses are reflected at the surfaces, and return to the transducer after a transit time. The transit time is proportional to the distance. The sensors have a control input which makes it possible to synchronise up to 12 sensors with one another, or also to switch off the sensor. In normal operation, the control input (pin 2) is left open.

To switch the sensor off, the control input is connected to 0 V. In this case, the signal last existing at the analog output is frozen until the sensor is released again.

In order to synchronise several sensors with one another, the control inputs of all sensors are connected to one another. The sensors' pulse packages are then emitted simultaneously. The received ultrasound echo from each individual sensor is then evaluated and presented at the analog output.

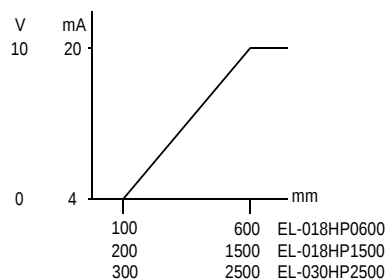
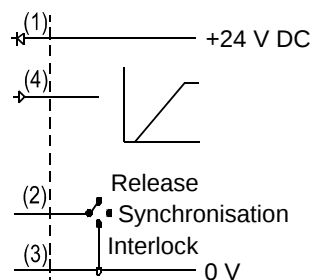
Technical data

Types	EL-018HP0600	EL-018HP1500	EL-030HP2500
Connection	M18x1	M18x1	M30x1.5
Metering range	100..600 mm	200..1500 mm	300..2500 mm
Response time (at 90 %EW)	< 50 ms	< 90 ms	< 150 ms
Weight	0.05 kg	0.05 kg	0.15 kg

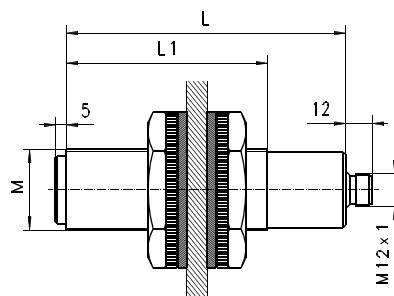
Combined data:

Sensor	piezoceramic ultrasound transducer
Sound beam	8 °
Linearity error	< 0.3 %
Repeatability	±2 mm
Temperature range	-20..+70 °C
Operating voltage	18..30 V DC
Output	0..10 V or 4..20 mA
Medium temperature	max. 90 °C
Construction material	PET 30 % glass fibre
Ingress protection	IP 67
Electrical connection	for round plug connector M12x1, 4-pole
Conformity	CE

Wiring



Dimensions



Types	L	L1
EL-018HP0600V	92	65
EL-018HP1500V	92	65
EL-030HP2500V	130	62

Ordering code

EL - 1. 2. 3. 4. 5.
EL - P S

○=Option

1. Connection size	
018H	screw-in fitting M18x1
030H	screw-in fitting M30x1.5
2. Connection material	
P	PET
3. Range	
0600	100.. 600 mm
1500	200..1500 mm
2500	300..2500 mm
4. Output signal	
V	0..10 V
T	○ 4..20 mA
5. Optional	
S	for round plug connector M12x1, 4-pole

Level Transmitter / Switch OMNI-L



- Ultrasound, level, and distance measurement with display
- Analog output, two switching outputs
- Compact construction
- Clear, easily legible, illuminated LCD display
- Modifiable units in the display
- Designed for industrial use
- Small, compact construction
- Very simple installation

Characteristics

The level sensor consists of the primary sensor (an ultrasound sensor) which, contact-free, determines the separations of media of different types (fluids, transported goods, solids). The ultrasound sensor works on the principle of end-to-end measurement. Emitted ultrasound impulses are reflected at the surfaces, and return to the transducer after a transit time. The transit time is proportional to the distance. The electronics convert the transit time into a distance, and output an analog output signal proportional to the separation. The separation is displayed in cm or inch (other units available on request).

By turning the programming ring to right or left, it is simple to modify the parameters (e.g. switching point, hysteresis...). To protect from unintended programming, it can be removed, turned through 180 °, and replaced, or completely removed, thus acting as a key.

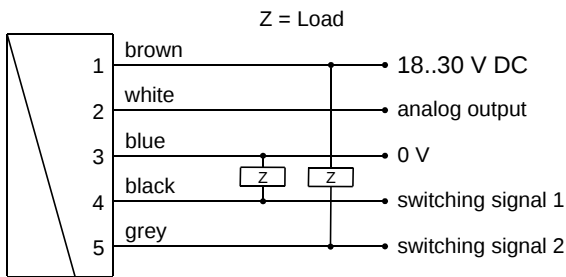


Technical data

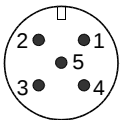
Sensor	ultrasound transmitter / receiver	
Mechanical Connection	3-hole flange	
Metering ranges	1.5 m or 2.5 m	
Sound beam	8 degrees	
Measurement accuracy	±0.2 % FS	
Linearity error	< 0.3 % FS	
Temperature error	0.03 %/°C	
Working temperature	0..70 °C	
Storage temperature	-20..+80 °C	
Supply voltage	18..30 V DC	
Power consumption	< 3 W	
Analog output	0/4..20 mA (0/2..10 V available on request)	
Switching output	transistor output "push-pull" (resistant to short circuits and polarity reversal) $I_{out} = 100 \text{ mA max.}$	
Hysteresis	adjustable, position of the hysteresis depends on minimum or maximum	
Display	backlit graphical LCD-Display (transreflective), extended temperature range -20..+70 °C, 32 x 16 pixels, background illumination, displays value and unit, flashing LED signal lamp with simultaneous message on the display.	
Electrical connection	for round plug connector M12x1, 5-pole	
Materials medium-contact	PET 30 % fibreglass, epoxy resin, POM	
Materials, non-medium-contact	housing	stainless steel 1.4305
	glass	mineral glass, hardened
	magnet	samarium-Cobalt
	ring	POM
Ingress protection	IP 67	
Weight	approx. 0.3 kg	
Conformity	CE	

Product Information

Wiring

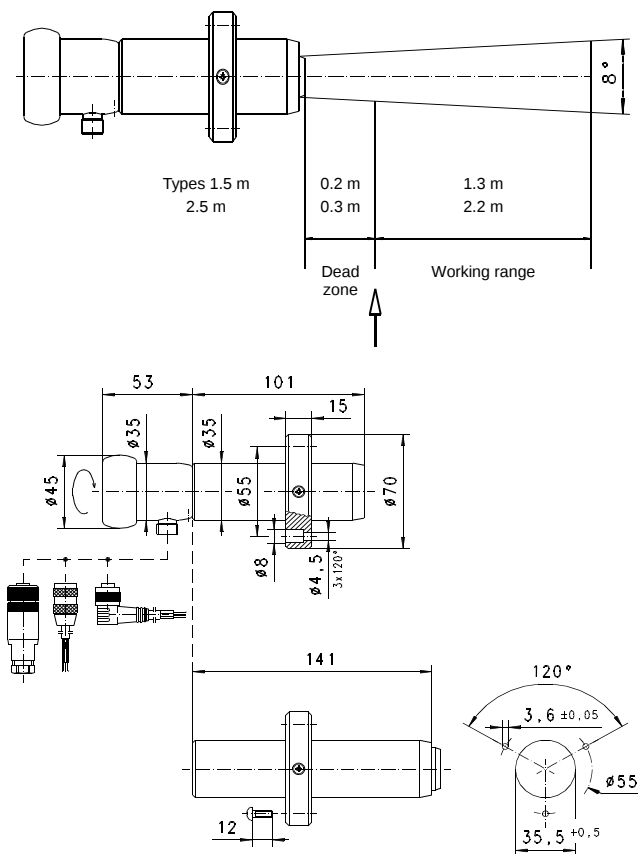


Connection example: PNP NPN



The switching outputs are self-configuring, depending on whether they are connected as PNP or NPN switches (push-pull). It is recommended to use shielded wiring.

Dimensions



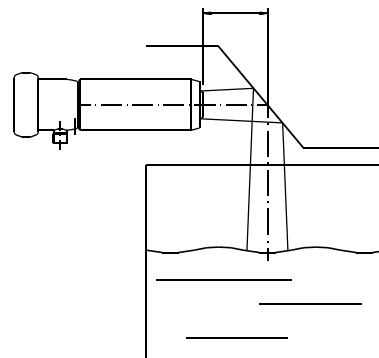
A gooseneck (optional) between the electronics head and the primary sensor provides freedom in the orientation and reading direction of the sensor.

Handling and operation

Installation

A Ø35.5 hole and fixing drillings (see "Dimensions") must be broken through for the supplied stainless steel bolts (self-cutting). The separation from the container's outer wall must be taken into account (reflection!) The ultrasound cone must normally opened vertically with the surface of the material being measured. The sensor's dead zone must be taken into account (see also example for fixing). Variations in measured values (e.g. due to movement from agitators) may be masked by the use of filter times on the device.

Dead zone

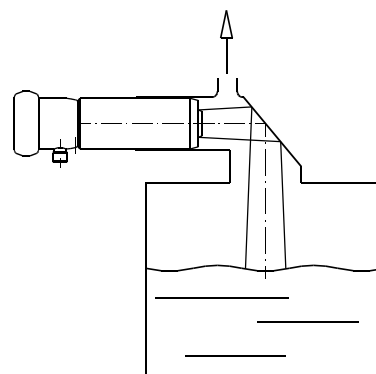


Possible arrangement of the sensors

It should be noted that the sensor has a limited working range (dead zone). This may mean that in some circumstances the sensor must be mounted relatively high in order to ensure the minimum separation from the measured material, and to avoid incorrect measurements. One possibility of reducing the installation height is the diversion of the ultrasound signal to a reflection surface in front of the sensor (see diagram).

Wave slap, and surfaces which are too steep to the surface of the level to be measured should be avoided. Temperatures > 60 °C at the measured surface may result in deviations in accuracy (here, a ventilated or aspirated submersion tube can help).

Aspiration



High dust levels reduce the ultrasound signal and produce incorrect measurements. Depending on density, foams may or may not be recognised.

Product Information

Sensors and Instrumentation

Programming

The annular gap of the programming ring can be turned to positions 1 and 2. The following actions are possible:



Set to 1 = continue (STEP)
Set to 2 = modify (EDIT)

Neutral position between 1 and 2

The ring can be removed to act as a key, or turned through 180 ° and replaced to create a programming protector. Operation is by dialog with the display messages, which makes its use very simple. Starting from the normal display (currently measured value with unit), if 1 (STEP) is repeatedly selected, then the display shows the following information in this order:

Display of the parameters, using position 1

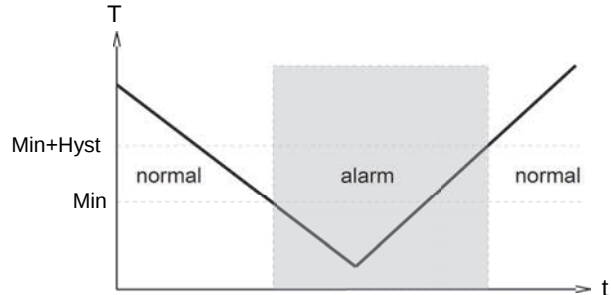
- Switching value S1 (switching point 1 in the selected unit)
- Switching characteristic of S1
- (MIN = monitoring of minimum value, hysteresis greater than switching value,
- MAX = monitoring of maximum value, hysteresis less than switching value)
- Hysteresis 1 (hysteresis value of S 1 in the set unit)
- Switching value S2
- Switching characteristic of S2
- Hysteresis 2
- Code:
After entering the code 111, further parameters can be defined:
- Filter (settling time of the display and output)
- Units: e.g. l/min or m³/h
- Output: 0..20 mA or 4..20 mA
- 0/4 mA (flow rate corresponding to 0/4 mA)
- 20 mA (flow rate corresponding to 20 mA)

Edit, using position 2

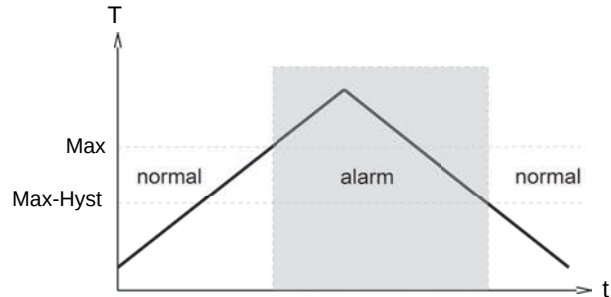
If the currently visible parameter is to be modified:

- Turn the annular gap to position 2, so that a flashing cursor appears which displays the position which can be modified.
- By repeatedly turning to position 2, values are increased; by turning to position 1, the next digit is reached.
- Leave the parameter by turning to position 1 (until the cursor leaves the row); this accepts the modification.
- If there is no action within 30 seconds, the device returns to the normal display range without accepting the modification.

The limit switches S1 and S2 can be used to monitor minimal or maximal. With a minimum-switch, falling below the limit value causes a switchover to the alarm state. Return to the normal state occurs when the limit value plus the set hysteresis is once more exceeded.



With a maximum-switch, exceeding the limit value causes a switchover to the alarm state. Return to the normal state occurs when the measured value once more falls below the limit value minus the set hysteresis.



The change to the alarm state is indicated by the integrated red LED and a cleartext in the display.

While in the normal state the switching outputs are at the level of the supply voltage; in the alarm state they are at 0 V, so that a wire break would also display as an alarm state at the signal receiver. Overload of the switching output is detected, indicated on the display ("Check S1 / S2"), and the switching output is switched off.

Simulation mode

To simplify commissioning, the sensor supports a simulation mode for the analog output. It is possible to create a programmable value in the range 0..26 mA at the output (without modifying the process variable). This allows the wiring run between the sensor and the downstream electronics to be tested during commissioning. This mode is accessed by means of code 311.

Overload display

Overload of the switching output is detected, indicated on the display, and the switching output is set to high impedance.

Product Information

Sensors and Instrumentation

Default setting

After setting the configuration parameters, they can be reset to factory values at any time, by means of code 989.

Starting from the normal display (current total and unit), if 1 (STEP) is selected repeatedly, then the display shows the following information:

Display of the parameters, using position 1

- Switching values S 1 and S 2: Switching values in the selected unit.
- Hysteresis direction of S 1 and S 2:
Max = Hysteresis less than S 1 or S 2
- Max = Hysteresis greater than S 1 or S 2
- Hystereses Hyst 1 and Hyst 2:
- Hysteresis values of the switching values in the set unit
- After entering code 111, further parameters can be defined (this should take place only if necessary)
- Filter: Selectable filter constants in seconds (affects display and output)
- Unit: e.g. bar or psi ...
- Output: 0..20 mA or 4..20 mA
- 0/4 mA: Displayed value for 0/4 mA
- 20 mA: Displayed value for 20 mA

Edit, using position 2

- If the visible parameter is to be modified:
- Turn the annular gap to position 2, so that a flashing cursor appears which displays the position which can be modified. By repeatedly turning to position 2, values are increased; by turning to position 1, the next digit is reached. In this way, every digit can be modified. If there is no action within 5 seconds, the device returns to the normal display range without accepting the modification.

Saving the changes using position 1

- After leaving the last value, turn once to position 1; this accepts the modification.

Ordering code

1. 2. 3. 4.
OMNI-L S

○=Option

1. Range	
15	200..1500 mm
25	300..2500 mm
2. Output signal	
I	current output 0/4..20 mA
U	○ voltage output 0/2..10 V (available on request)
3. Optional	
S	for round plug connector M12x1, 5-pole
4. Optional	
H	○ model with gooseneck

Accessories

- Cable/round plug connector (KB...) see additional information "Accessories"
- Device configurator ECI-1

Product Information

Level Sensor LS10



- Measuring range from 100 mbar..10 bar relative
- Output 4..20 mA
- Process temperature -10..+60 °C
- Protection class IP68, depth of immersion max. 100 m

Characteristics

The LS10 liquid level transmitter is designed for economical and reliable performance in a wide variety of level measurement applications. The LS10 provides a signal output of 4-20mA and an accuracy of 0.25% of span. Standard stocked pressure ranges are assembled with any length cable for fast delivery.

Compensation for atmospheric pressure changes is accomplished through a vent tube in the cable.

Technical data

Power supply

Supply voltage : 10..30 V DC (U+)
Medium temp. : -10..+50 °C (compensated range 0..50 °C)
Ambient temp. : -20..+80 °C
CE-conformity : EN 50081-1:03-2009, EN 50081-2:03-94,
EN 50082-2:03-95

Output

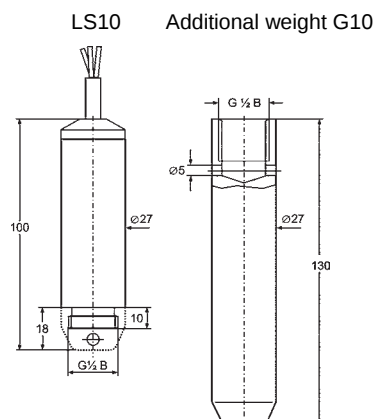
Current : 4..20 mA, 2-wire
Max. burden R_A : $\leq (U+ - 10 \text{ V}) \div 0,02 \text{ A} (0.14 \Omega \times \text{cable length [m]})$

Accuracy : 0.5 % optional 0.25 %

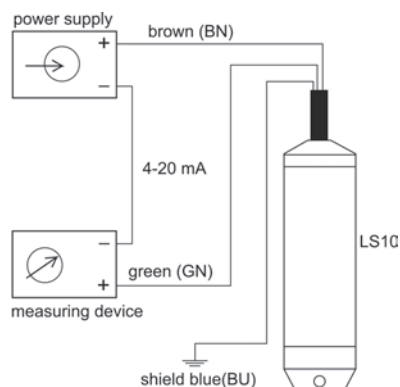
Material

Process conn. : stainless steel [Hastelloy®]
Case : stainless steel [Hastelloy®]
Membrane : stainless steel [Hastelloy®]
Protection cap : PA
Electrical connection : PUR cable vented
Protection class : IP68 (immersion depth max. 100 m)
Weight : approximately 0.2 kg

Dimensions



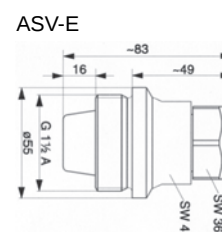
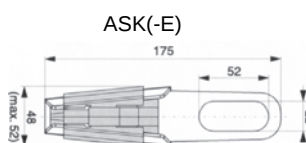
Connection diagram



Ordering code

LS10 - 1. - 2. - 3.

1.	Output	
2		4..20 mA
2.	Measuring range [bar]	
		0.1/ 0.16/ 0.25/ 0.4/ 0.6/ 1/ 1.6/ 2.5/ 4/ 6/ 10
3.	Cable length [m]	
		Please insert
	Accessories	
	G10	additional weight 0.5 kg
	ASK	anchor clamp steel zinc plate
	ASK-E	anchor clamp stainless steel 1.4571
	ASV-E	anchor gland stainless steel 1.4301



Product Information

Level Sensor IL10



- Intrinsic safety ATEX applicable for Zone 0, 1, 2 also 20, 21 and 22
- Measuring ranges from 100 mbar..25 bar rel.
- Output 4..20 mA
- Process temperature -10..+60 °C
- Protection class IP68, max. immersion depth 300 m

Characteristics

The IL10 intrinsically safe level transmitter is designed for use in a wide variety of level measurement applications. The IL-10 has FM, ATEX and CSA approvals for installation in hazardous areas when used with the appropriate intrinsically safe zener barrier or isolating converter ST500Ex. Compensation for changes in barometric pressure is accomplished through a vent tube in the cable.

Technical data

Power supply

Supply voltage	: 10..30 V DC (U+)
Medium temp.	: -10..+60 °C (compensated range 0..50 °C)
Ambient temp.	: -10..+60 °C
CE-conformity	: 2004/108/EG, EN61326 Emission (group 1 class B) and immunity (industrial locations)
Ex-directive	: ATEX94/9/EC, Data acc. to DMT 00 ATEX E 045X

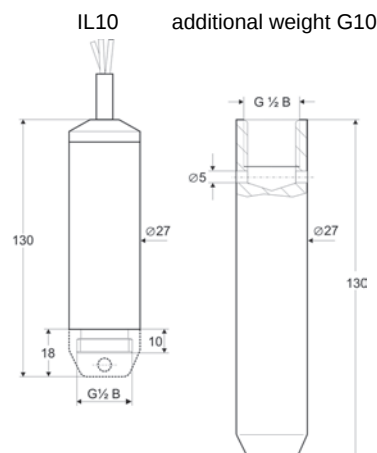
Output

Current	: 4..20 mA, 2-wire
Max. burden R _A	: $\leq (U+ - 10 V) \div 0.02 A - (0.14 \Omega \times \text{cable length [m]})$
Accuracy	: 0.5 %

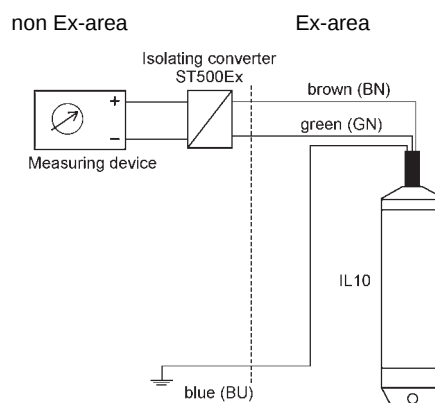
Material

Process connection	: stainless steel [Hastelloy®]
Case	: stainless steel [Hastelloy®]
Membrane	: stainless steel [Hastelloy®]
Protection cap	: stainless steel [Hastelloy®]
Electrical connection	: PUR vented cable
Protection class	: IP68 (immersion depth up to 300 m)
Weight	: approx. 0.2 kg

Dimensions



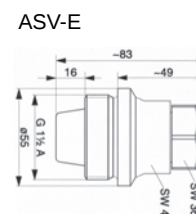
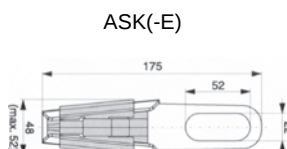
Connection diagram



Ordering code

IL10 - 1. - 2. - 3.

1. Output	2 4..20 mA
2. Measuring range [bar]	0.1/ 0.16/ 0.25/ 0.4/ 0.6/ 1/ 1.6/ 2.5/ 4/ 6/ 10/ 16/ 25
3. Cable length [m]	Please insert
Accessories	
G10	additional weight 0.5 kg
ASK	anchor clamp steel zinc plate
ASK-E	anchor clamp stainless steel 1.4571
ASV-E	anchor gland stainless steel 1.4301



Product Information

Level Sensor LK10



- Measuring ranges from 0,16..16 bar
- Output 4..20 mA, 2-wire
- Process temperature 0..50 °C
- Protection class IP68, aggressive liquids

Characteristics

Types LK10 have been designed as cost-effective level transmitters for continuous level measurement especially in contaminated and aggressive liquids. Because of the flush ceramic diaphragm both transmitters are well suited for applications in water supply and sewage treatment. They are suited also for level measurement in aggressive media where stainless steel transmitters have their limits. When dirt or sediments set on the transmitter the ceramic diaphragm makes cleaning easier.

Cables made of different materials can be chosen to adapt the LK10 to the specific operating conditions.

PUR cable: diesel oil, fuel oil, rape oil, carbonic acid

FEP cable: chem. aggressive liquids, acid, caustic solution, heavy loaded waste water, sewage technology (ferric-III-chloride)

Environmental technology:

sewage treatment, water supply, aggressive media.

Technical data

Power supply

Supply voltage : 12..36 V DC (U+)

Medium temperature : 0..50 °C

CE-conformity : EN 61000-4-5 , EN 50082-2, EN 61326

Measuring range : 0..0.16 bar bis 0..16 bar relative

Output

Current : 4..20 mA, 2-wire

Max. burden R_A : $\leq ((U+ - 12V)/0.02A - (0.14\Omega \times \text{Cable length [m]}))$
 short circuit protection

Accuracy : 0.35 %

Material

Process material : PVC; seal FKM, EPDM

Flush diaphragm : ceramic with parylen

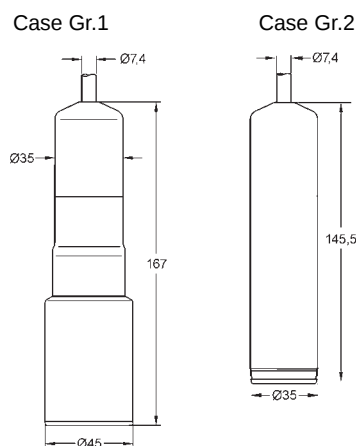
Electrical conn. : PUR cable or FEP cable, vented

Protection class : IP68, sea water resistant

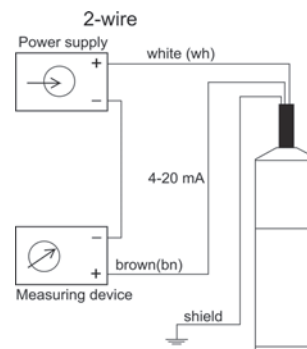
Weight : appr. 0.2 kg

Dimension

Measuring ranges



Connection diagram



Ordering code

LK10 - 1. - 2. - 3. - 4.

1. Output	
2	4..20 mA
2. Measuring range [bar] please insert	
0.16/ 0.25/ 0.4/ 0.6	Case Gr. 1
1/ 1.6/ 2.5/ 4/ 6/ 10/ 16	Case Gr. 2
3. Cable type	
1	PUR (standard)
2	FEP
4. Cable length [m] please insert	
Accessories	
ASK	anchor clamp steel zinc plated
ASK-E	anchor clamp stainless steel 1.4571



... professional Instruments "MADE IN GERMANY"

Product Information

Level Indicator NA



- Wall mounting
- No moving parts

Characteristics

Mechanical flow indicator for fluid media: The level is displayed directly in a sight glass.

Technical data

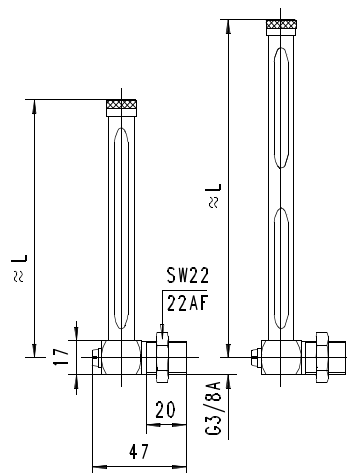
Switch	without
Process connection	male thread G $\frac{3}{8}$ A, optional G $\frac{1}{2}$ A
Density of medium	$\geq 0.01 \text{ g/cm}^3$
Pressure resistance	-
Medium temperature	-20...+80 °C
Ambient temperature	-20...+70 °C
Media	water, oils
Electrical data	none
Materials medium-contact	CW614N, natural glass
Non-medium-contact materials	CW614N, natural glass
Weight	see table "Dimensions and weights"
Installation location	vertical installation position

Dimensions and weights

G	Types	L	Number of sight glasses	Weight kg
G $\frac{3}{8}$ A	NA-010HM040	40	1	0.09
	NA-010HM060	60		
	NA-010HM080	80		0.10
	NA-010HM100	100		
	NA-010HM125	125		0.11
	NA-010HM150	150	2	0.12
	NA-010HM200	200		0.14
	NA-010HM250	250		0.15
	NA-010HM300	300		0.16

Length 40..200

Length 250..300



Vent drilling in cover.

Ordering code

NA - 1. 2. 3. 4.
NA - H M

○=Option

1. Connection size	
010	threaded connection G $\frac{3}{8}$ A
015 ○	threaded connection G $\frac{1}{2}$ A
2. Process connection	
H	screw-in thread
3. Connection material	
M	brass
4. Length	
040	40 mm
060	60 mm
080	80 mm
100	100 mm
125	125 mm
150	150 mm
200	200 mm
250	250 mm
300	300 mm

Product Information

Level Indicator NB



- Mounted in the cover
- No moving parts

Characteristics

Mechanical flow indicator for fluid media: The level is displayed directly in a sight glass.

Technical data

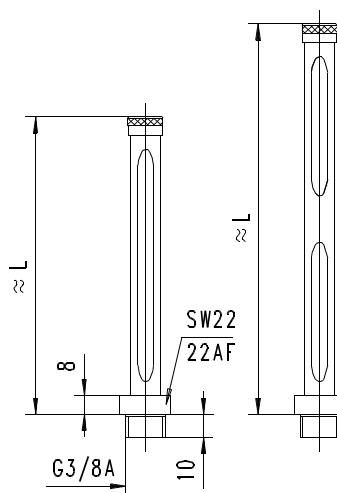
Switch	without
Process connection	male thread G 3/8 A, optional G 1/2 A
Density of medium	³ 0.01 g/cm ³
Pressure resistance	-
Medium temperature	-20...+80 °C
Ambient temperature	-20...+70 °C
Media	water, oils
Electrical data	none
Materials medium-contact	CW614N, natural glass
Non-medium-contact materials	CW614N, natural glass
Weight	see table "Dimensions and weights"
Installation location	vertical installation position

Dimensions and weights

G	Types	L	Number of sight glasses	Weight kg
G 3/8 A	NB-010HM040	40	1	0.06
	NB-010HM060	60		
	NB-010HM080	80		0.07
	NB-010HM100	100		
	NB-010HM125	125		0.08
	NB-010HM150	150	2	0.10
	NB-010HM200	200		0.11
	NB-010HM250	250		0.12
	NB-010HM300	300		

Length 40..200

Length 250..300



Vent drilling in cover

Ordering code

NB - 1. 2. 3. 4.
NB - H M

○=Option

1. Connection size	
010	threaded connection G 3/8 A
015	○ threaded connection G 1/2 A
2. Process connection	
H	screw-in thread
3. Connection material	
M	brass
4. Length	
040	40 mm
060	60 mm
080	80 mm
100	100 mm
125	125 mm
150	150 mm
200	200 mm
250	250 mm
300	300 mm

Options

Gooseneck

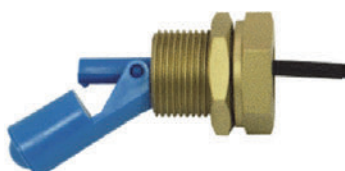
FLEX-LC, OMNI-LC



A gooseneck between the electronics head and the primary sensor provides freedom in the orientation of the sensor. This option simultaneously provides thermal decoupling between the two units. The length of the gooseneck is 140 mm.

Special connections

Customer-specific connections are available.

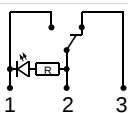


Example RWI

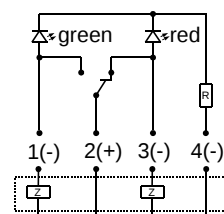
Plug DIN 43650-A / ISO 4400 with diodes



Diode red

Wiring	changeover with diode No. 0.208	
Switching voltage	max. 12 V AC, 24 V AC, 48 V AC, 115 V DC or 230 V DC (when ordering please state)	

Red / green diode

Wiring	changeover with diode No. 0.347	
Switching voltage	max. 12 V AC, 24 V AC, 48 V AC, 115 V DC or 230 V DC (when ordering please state)	

Accessories

Panel meter OMNI-TA

Primary Sensors
 0..10 V
 4..20 mA
 Frequency



Converter with the same data as the OMNI in situ electronics; but as an external panel-mounting variant with IP 67 housing.

Round plug connector 4 / 5-pin



1 → brown
 2 → white
 3 → blue
 4 → black

1 → brown
 2 → white
 3 → blue
 4 → black
 5 → grey

Ordering code

Self-assembly

1. 2.
 KB

1. Number of pins	
04	4-pin
05	5-pin
2. Connector output	
G	straight
W	elbow 90 °

Packaged

1. 2. 3. 4. 5. 6.
 PU -

1. Number of pins	
K	4-pin
K05	5-pin
2. Cable material	
PU	PUR
3. Cable length	
02	2 m
05	5 m
10	10 m
4. Shielding	
N	shielding not applied to coupling
S	shielding applied to coupling
5. Connector output	
G	straight
W	elbow 90 °
6. Shielding	
A	shielded

Product Information

Device Configurator ECI-1



- Can be used on site for:
 - parameter modification
 - firmware update
 - adjustment of inputs and outputs
- Can be connected via USB

Characteristics

The device configurator ECI-1 is an interface which allows the connection of microcontroller-managed HONSBERG sensors to the USB port of a computer. Together with the Windows software "HONSBERG Device Configurator" it enables

- the modification of all the sensor's configuration settings
- the reading of measured values
- the adjustment of inputs and outputs
- firmware updates

Technical data

Supply voltage	12..30 V DC (depending on the connected sensor) and via USB
Power consumption	< 1 W
Connection	
Sensor	cable bushing M12x1, 5-pole, straight length approx. 50 cm
Lead	device connector M12x1, 5-pole
USB	USB bushing type B
Operating temperature	0..50 °C
Storage temperature	-20..+80 °C
Dimensions of housing	98 mm (L) x 64 mm (W) x 38 mm (H)
Housing material	ABS
Ingress protection	IP 40

Handling and operation

Connection



The device configurator is intended for temporary connection to the application. It is connected between the the existing sensor lead and the sensor. Power supply is via the supply to the sensor and the computer's USB port. When inactive (no communication), the configurator behaves completely neutrally; all signals from the sensor remain available to the application. During communication between computer and sensor, the signal wirings are separated in the configurator, so that in this state the sensor's output signals are not available.

To connect 4-pole leads without a middle hole to the installed 5-pole device connector, adapter K04-05 is included. 4-pole leads with a middle hole can be used without an adapter.

Ordering code

Device configurator (for scope of delivery, see the diagram below)	ECI-1
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Scope of delivery

1. Device configurator ECI-1
2. USB cable
3. Adapter K04-05
4. Plug KB05G
5. Cable K05PU-02SG
6. Carrying case



Incl. software

Accessories:

Mains connector 24 V DC (with fitted round plug connector, 5-pole, incl. international plug set)	EPWR24-1
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Replacement parts:

M12x1 adapter 4- / 5-pole	K04-05
PUR cable, 5-pole, shielded with round plug connector M12x1	K05PU-02SG
Round plug connector M12x1, 5-pole (without cable)	KB05G

Product Information

Product Overview

„Industrial Sensors and Instrumentation“

Temperature
 Flow
 Level / Filling Height
 Analysis
 Humidity
 Pressure
 Weighing Instruments



„Process Instrumentation “Hygienic Design“

GHMadapt
 Temperature
 Flow
 Level / Filling Height
 Analysis



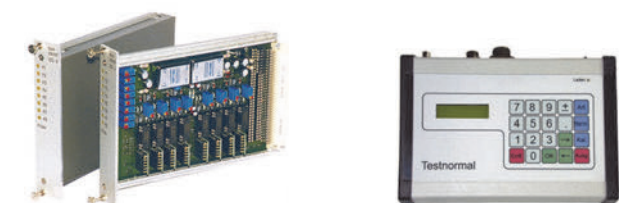
Sensors and Instrumentation

“Laboratory Instrumentation“



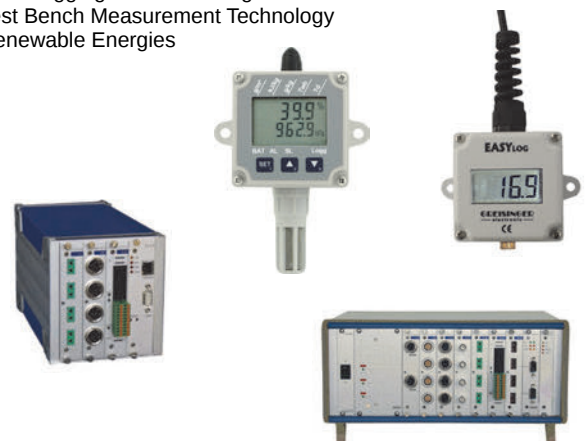
„Industrial Electronics“

Displays / Controller
 Transmitter / Signal conditioning
 Isolating converters
 Safety and Monitoring Devices
 Power Electronics
 Calibration and Testing



“Measuring Data Acquisition“

Data Logging and Monitoring
 Test Bench Measurement Technology
 Renewable Energies



... professional Instruments “MADE IN GERMANY”