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GHMGROUP
Specialists by Competence.

Product information

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
- Ex applications

Device overview

Functional principle

	Seite
Float - horizontal installation	3
Float - vertical installation	4
Capacitive	4
Calorimetric	4
Ultrasound	5
Pressure	5
Sight glass	5
Options	5
Accessories	5

Float - horizontal installation

Device	Display	Switching	Measuring	Switch / sensor	Pressure resistance in bar	Medium temperature	Material	Medium: Water	Medium: Oil	Medium: Aggressive	Page
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 Ex		●		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.

Device overview

Float - vertical installation

Device	Display	Switching	Measuring	Switch	Length mm	Pressure resistance in bar	Medium temperature	Material	Medium: Water	Medium: Oil	Medium: Aggressive	Page
NM-007HP		●		Reed switch	40	PN 5	-20..+60 °C	PP / PA	●	●		18
NM1-004HK		●		Reed switch	50	PN 30	-20..+105 °C	Brass	●	●	●	19
NM-008HK		●		Reed switch	80	PN 40	-20..+105 °C	Stainless steel	●	●	●	20
NMS-004HM040		●		Reed switch	40	PN 20	-20..+105 °C	Brass	●	●		21
NMS-004HM047		●		Reed switch	47	PN 12	-20..+105 °C	Brass	●	●		22
NMS-004HM077		●		Reed switch	77	PN 12	-20..+105 °C	Brass	●	●		23
SB				Reed switch	100..500	PN 20	-20..+105 °C	Brass	●	●		24
NR		●		Reed switch	250..1000	PN 5	-5..+100 °C	Stainless steel / aluminium	●	●		25
NR-000		●		Switching unit for device range NR			-5..+100 °C	PA	●	●		26
LC		●		Reed switch chain	250..2000	PN 20..40	-20..+105 °C	Brass / stainless steel	●	●	●	27
FLEX-LC		●	●	Reed switch chain	250..2000	PN 20..40	-20..+105 °C	Brass / stainless steel	●	●	●	29
OMNI-LC	●	●	●	Reed switch chain	250..2000	PN 20..40	-20..+105 °C	Brass / stainless steel	●	●	●	33

Errors and technical modifications reserved.

Capacitive

Device	Display	Switching	Measuring	Metering range	Pressure resistance	Medium temperature	Material	Medium: Water	Medium: Oil	Medium: Aggressive	Page
LCC1		●	●	30	PN 5	-20..+85 °C	Brass / epoxy		●		36
LCC2		●		200, 400, 600 mm (other on request)	PN5	-20..+85 °C	-		●		39
UNION-CL	●	●	●	0..3000 mm	PN 16	-10..+50°C	PTFE / stainless steel	●	●	●	43

Errors and technical modifications reserved.

Calorimetric

Device	Display	Switching	Measuring	Pressure resistance in bar	Medium temperature	Material	Medium: Water	Medium: Oil	Medium: Aggressive	Page
LABO LK012		●	●	PN 6..40	-20..+70 °C	Stainless steel	●	●	●	45

Errors and technical modifications reserved.

Device overview

Ultraschall

Device	Display	Switching	Measuring	Metering range	Temperature	Seite
LS20		•	•	30..8000 mm	-25..+70 °C	47
EL		•	•	100..2500 mm	-20..+70 °C	48
OMNI-L	•	•	•	200..2500 mm	-20..+80 °C	49

Errors and technical modifications reserved.

Druck

Device	Display	Switching	Measuring	Metering range	Temperature	Material	Medium			Page
							Water	Oil	Aggressive	
LS10		•	•	0,1..10 bar	-10..+60 °C	Stainless steel	•	•	•	53
IL10 Ex		•	•	0,1..25 bar	-10..+60 °C	Stainless steel	•	•	•	54
LK10		•	•	0,16..16 bar	0..50 °C	PVC	•	•	•	55

Errors and technical modifications reserved.

Schauglas

Device	Length mm	Pressure resistance	Medium temperature	Medium			Page
				Water	Oil	Aggressive	
NA	40..300	-20..+80 °C	Brass	•	•		56
NB	40..300	--20..+80 °C	Brass	•	•		57

Errors and technical modifications reserved.

Options

Device		Page
Gooseneck **Special connections** **Plug DIN 43650-A / ISO 4400 with diodese**	- for FLEX-LC, OMNI-LC - customer-specific connections are available. - Diode red, red/green	58

Errors and technical modifications reserved.

Accessories

Device		Page
Panel meter OMNI-TA **Round plug connector 4 / 5-pin**	External converter Plug connector	59
ECI-1	If required, all parameters can be set at any time on the sensor, using the ECI-1 device configurator.	60

Errors and technical modifications reserved.

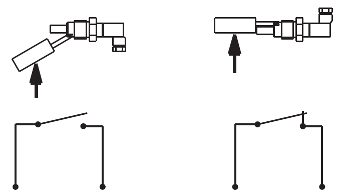
Level Switch RW-015HKS

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

Characteristics

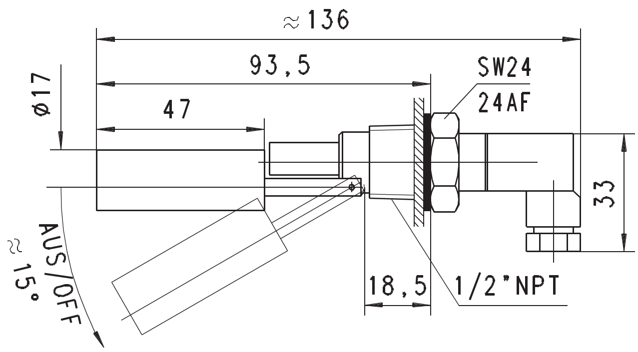
Mechanical level monitor for fluid media, with contact-free triggering of a reed contact.

Technical data

Switch	reed switch
Process connection	male thread ½"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

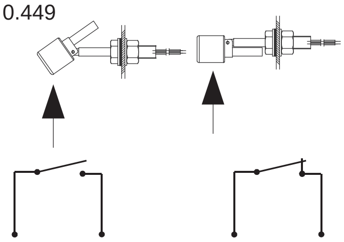
Level Switch RW-015HKL

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

Characteristics

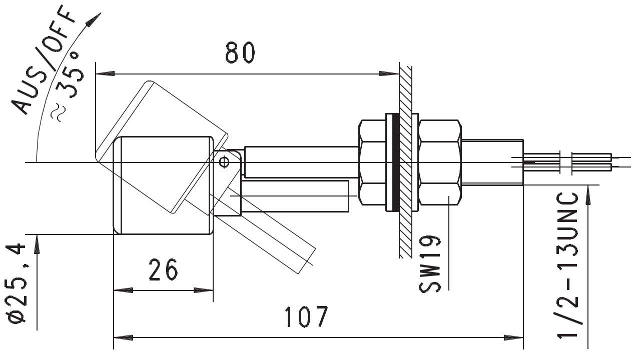
Mechanical level monitor for fluid media, with contact-free triggering of a reed contact.

Technical data

Switch	reed switch
Process connection	male thread $^{1}/_{2}$ -13 THD
Density of medium	³ 0.7 g/cm³
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

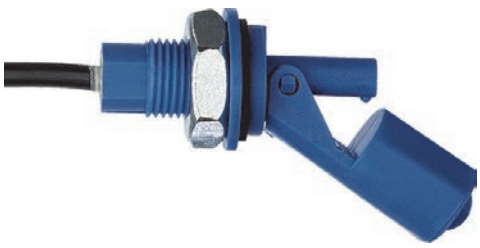
- It must be ensured that the values given for voltage, current, and power are not exceeded.
- When switched on, a load must be connected in series.
- The electrical details apply to ohmic loads. Capacitive, inductive and lamp loads must be operated using a protective circuit.
- Not suitable for use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

Ordering code

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

Level Switch RWI

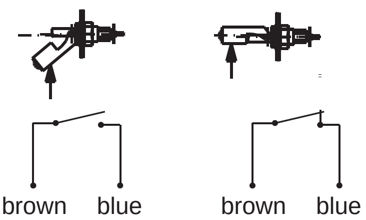


- **Installation from inside or outside**
- **Highly reproducible**
- **Normally open or normally closed contact**

Characteristics

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

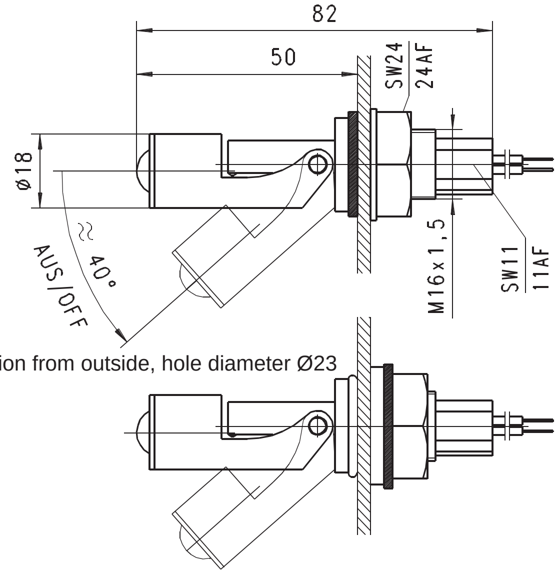
Technical data

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 (optinal IP 00)	
Electrical connection	cable 0.5 m	
Materials medium-contact	*PP model:* PP, FKM	*PVDF model:* 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

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

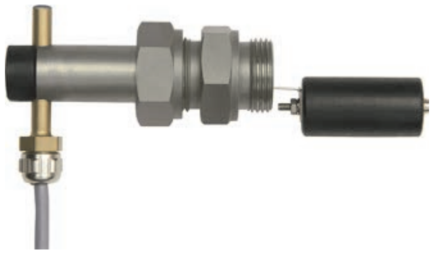
❍=Option

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

Level Switch NW1

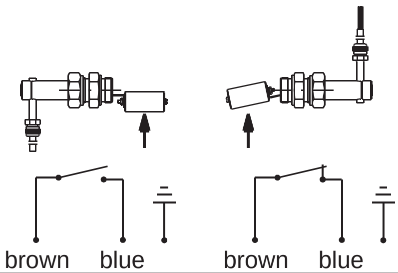


- **Highly reproducible**
- **Normally open or normally closed contact**

Characteristics

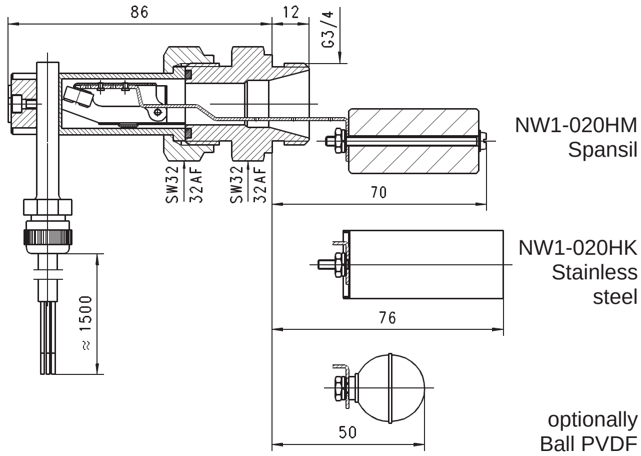
Mechanical level monitor for fluid media, with contact-free triggering of a reed contact.

Technical data

Switch	reed switch	
Process connection	male thread G $^3/_4$ A	
Density of medium	Spansil float Stainless steel float	^{3} 0.7 g/cm^3 ^{3} 0.9 g/cm^3
Pressure resistance	Spansil float Stainless steel float PVDF float	PN 25 bar PN 10 bar PN 25 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:* 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	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

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

❍=Option

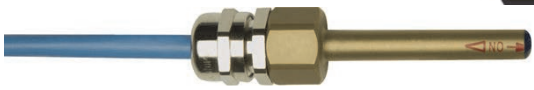
1.	**Connection size**	
	020	threaded connection G $^3/_4$ A
2.	**Process connection**	
	H	screw-in thread
3.	**Connection material**	
	M	brass
	K	stainless steel
4.	**Switching unit option**	
	A ❍	for switching unit ATEX A-U1-2 The switching unit must be ordered in addition.

Options

- Float ball PVDF
- Float cylinder stainless steel

Switching Head A-U1-1

For device UR1

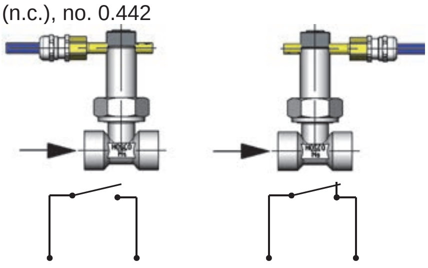


- **I M1 Ex ia I Ma**
- **II 1G Ex ia IIC T4 Ga**
- **II 1D Ex IIIC T135°C Da**

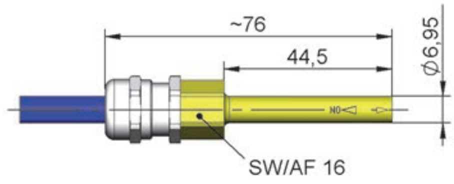
Characteristics

Intrinsically safe switching unit with reed switch and ATEX approval, for the UR1 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 open (n.o.) or normally closed (n.c.), no. 0.442 
Switching voltage	max. 30 V
Switching current	max. 1 A
Switching capacity	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



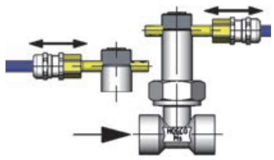
Handling and operation

Note

- 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.

Adjustment

Loosen bolt(s), push the switching current tube into the desired position. Retighten the bolt(s). Normally closed (n.c.) or normally opened (n.o.) as per table "Technical data"



Ordering code

The base device is ordered, e.g. UR1-015GMA with switching head A-U1-1.

1.
A-U1 - 1

1.	**Device series**	
	1	for UR1

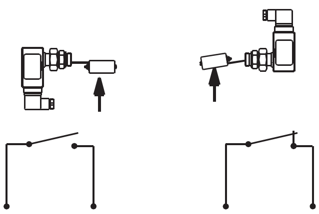
Level Switch NW3

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

Characteristics

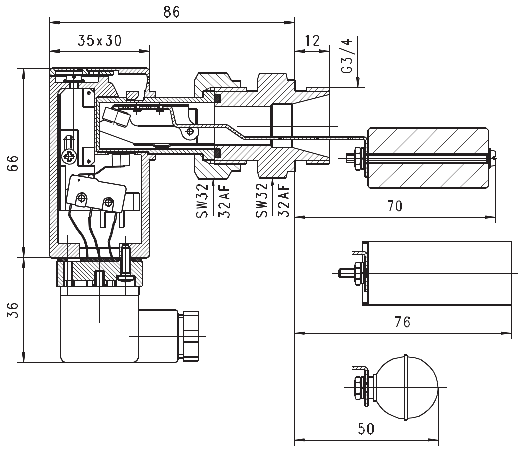
Mechanical level monitor for fluid media, with contact-free triggering of a reed contact.

Technical data

Switch	reed switch	
Process connection	male thread G $^3/_4$ A	
Density of medium	Spansil float Stainless steel float	^{3} 0.7 g/cm^3 ^{3} 0.9 g/cm^3
Pressure resistance	Spansil float Stainless steel float	PN 25 bar 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  brown blue brown blue	
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



NW3-020HM
Spansil

NW3-020HK
Stainless steel

optionally
Ball PVDF

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, 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.
NW3	-	**020**	**H**	

1.	**Connection size**	
	020	threaded connection G $^3/_4$ 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

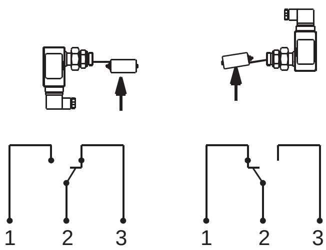
Level Switch MW3

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

Characteristics

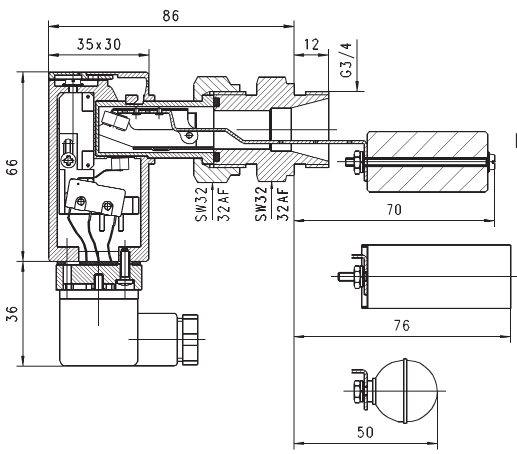
Mechanical level monitor for fluid media, with contact-free triggering of a micro switch.

Technical data

Switch	micro switch	
Process connection	male thread G $^{3}/_{4}$ A	
Density of medium	Spansil float Stainless steel float	^{3} 0.7 g/cm^{3} ^{3} 0.9 g/cm^{3}
Pressure resistance	Spansil float Stainless steel float	PN 25 bar 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	*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



MW3-020HM
Spansil

MW3-020HK
stainless
steel

optionally
Ball PVDF

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

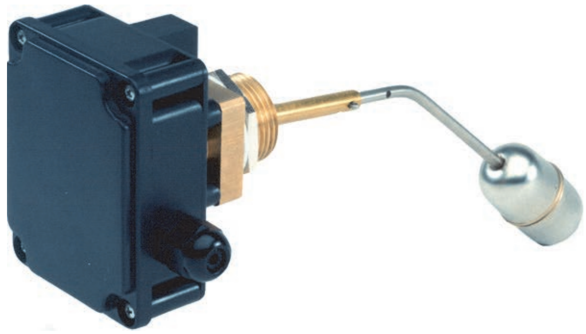
		1.	2.	3.
MW3	**-**	**020**	**H**	

1.	**Connection size**	
	020	threaded connection G $^{3}/_{4}$ 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

Level Switch MWI

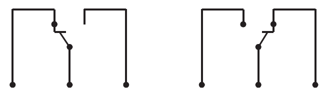


- **Temperature up to 180 °C**
- **High switching current**
- **Transformer**

Characteristics

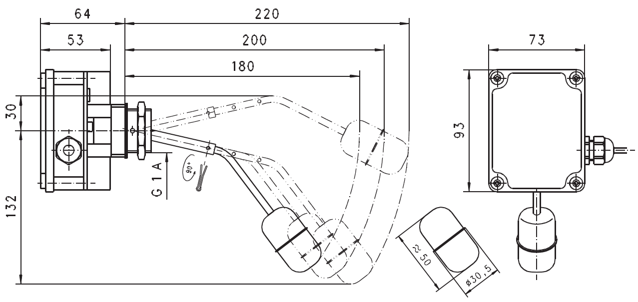
Mechanical level monitor for fluid media, with contact-free triggering of a micro switch.

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.

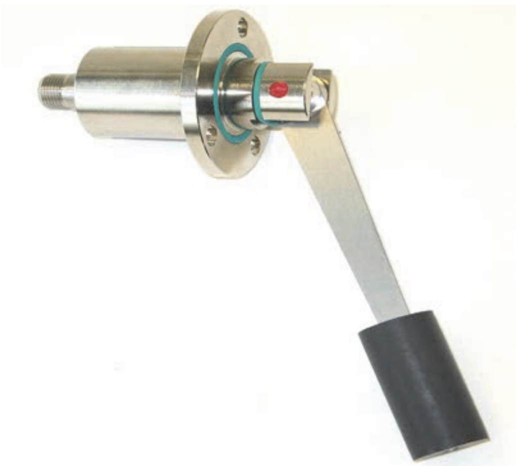
Ordering code

		1.	2.	3.
MWI	**-**	**025**	**H**	

❍=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

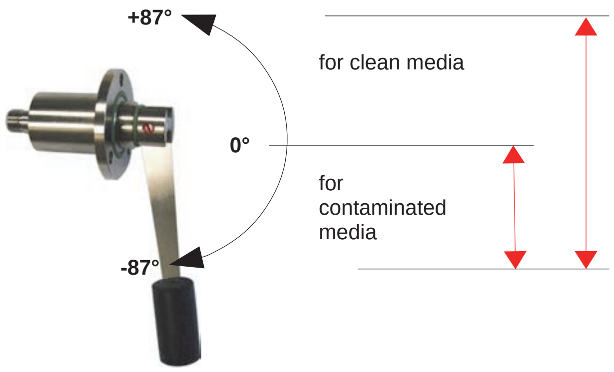
Level Transmitter / Switch VECTIS



- **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.

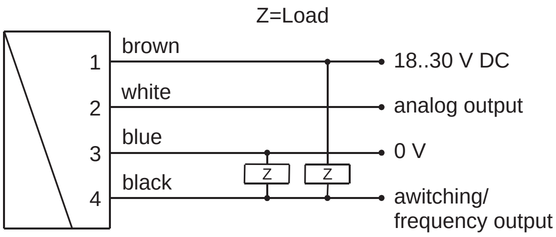
The high temperature model is equipped with only one output (analog output, switching output, or frequency output). Programming is not carried out using a magnetic clip; instead a voltage pulse of 0.5 to 2 seconds is applied to pin 2 of the connector. This model therefore has a different connection mode.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

Technical data

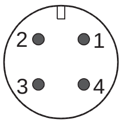
Sensor	analog hall sensor
Process connection	3-hole flange (asymmetric)
Metering range	-87 °..+87 ° or parts of this Level height up to 1 m, depending on length of lever arm.
Measurement accuracy	typically ±0.5 °
Pressure resistance	max. 3 bar
Medium temperature	-20..+85 °C (high temperature model max. 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)

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 Float Arm O-rings	CW614N spansil stainless steel 1.4310 FKM, optional NBR, EPDM
Weight	approx. 0.2 kg	
Conformity	CE	

Wiring

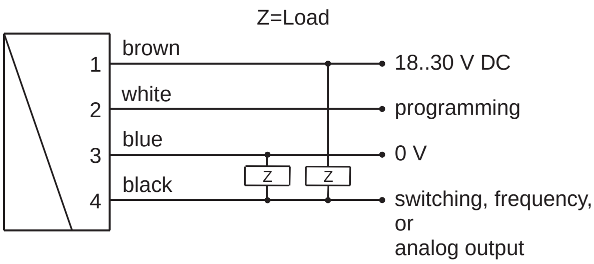


Connection example: PNP NPN



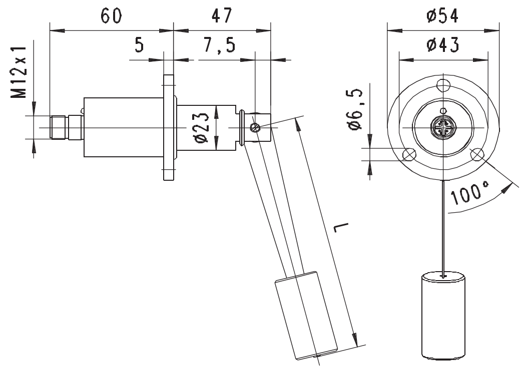
Before connecting the supply voltage, it must be ensured that this corresponds with the data sheet.
The use of shielded cabling is recommended.

High temperature model

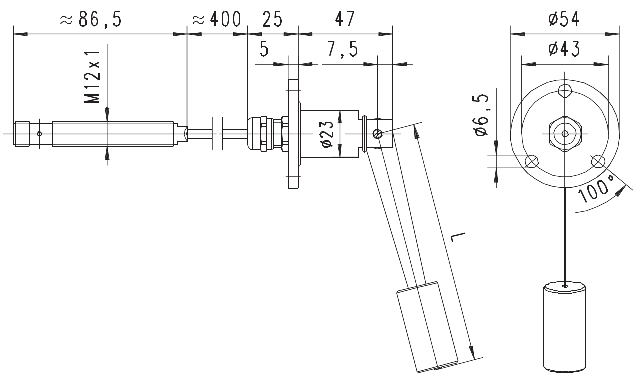


Connection example: PNP NPN

Dimensions



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.

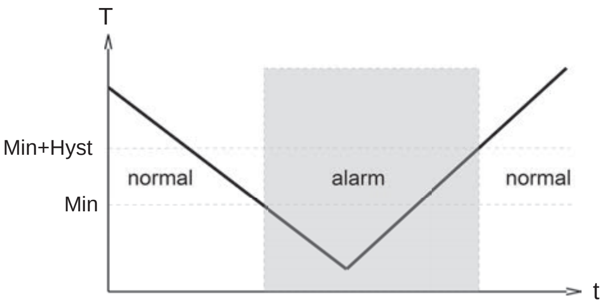
Programming

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.

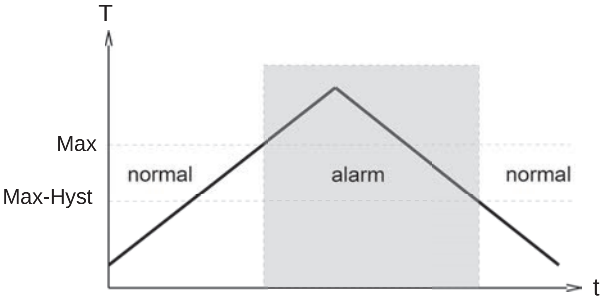
If the contact time is longer or shorter than this, no programming takes place (protection against external magnetic fields). Immediately after programming, the switching output goes into the normal state (see below).

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.

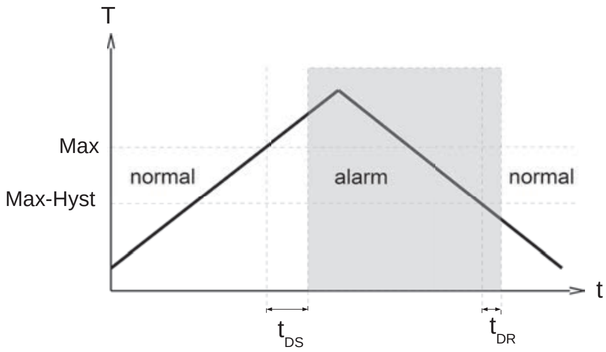
Example: The switching value is to be set to +50 °, because at this flow rate a critical process status is to be notified. However, only +40 ° can be achieved without danger. In this case, the device would be ordered with a "teach-offset" of +10 °. At +40 ° in the process, a switching value of +50 ° 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.



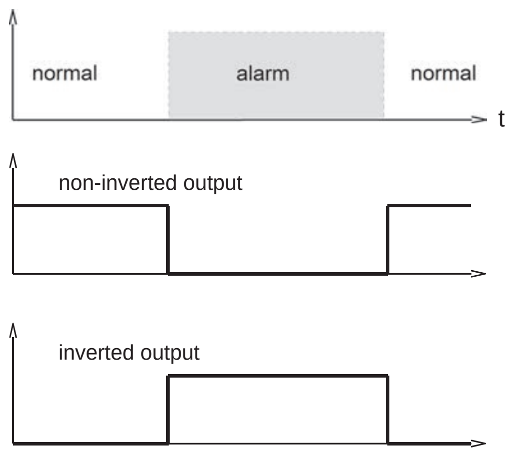
With a maximum-switch, exceeding the limit value causes a switchover to the alarm state. Return to the normal state occurs when the measured value once more falls below the limit value minus the set hysteresis.



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.

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

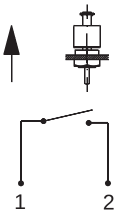
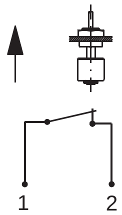
Level Switch NM-007HP

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

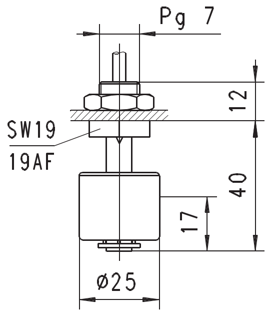
Characteristics

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 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. 230 V AC
Switching current	max. 0.5 A
Switching capacity	max. 10 VA
Protection class	2 - safety insulation
Ingress protection	IP 65
Electrical connection	cable 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 density1 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	-	007	H	P

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

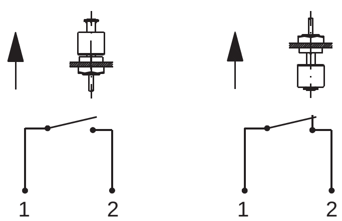
Level Switch NM-004HK

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

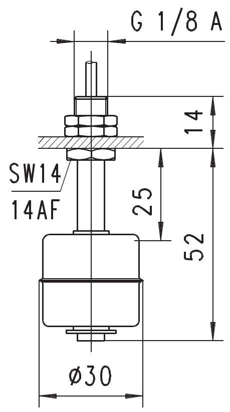
Characteristics

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	-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. 250 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	1.4571
Non-medium-contact materials	PVC
Weight	0.06 kg
Installation location	vertical installation position

Dimensions



Details of float location 25 mm for density1 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	-	004	H	K

1.	**Connection size**	
	004	threaded connection G $^{1}/_{8}$ A
2.	**Process connection**	
	H	screw-in thread
3.	**Connection material**	
	K	stainless steel

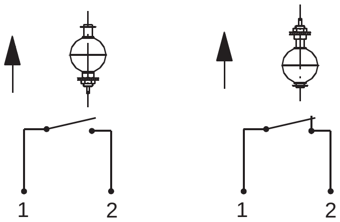
Level Switch NM-008HK

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

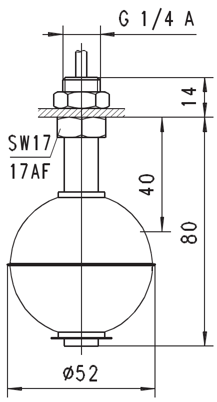
Characteristics

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 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	cable 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 density1 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

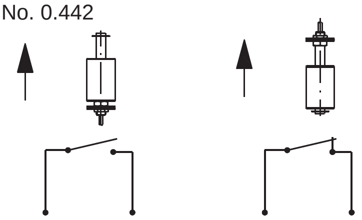
Level Switch NMS-004HM40

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

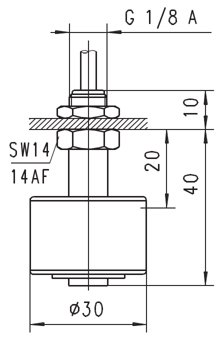
Characteristics

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  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	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 density1 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.	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

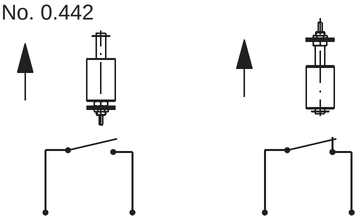
Level Switch NMS-004HM47

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

Characteristics

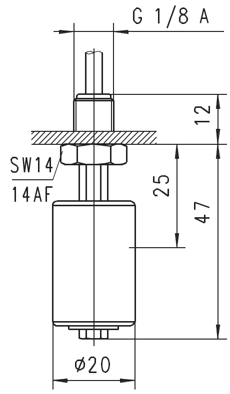
Mechanical level monitor for fluid media, with contact-free triggering of a reed contact.

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	cable 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 density1 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.	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

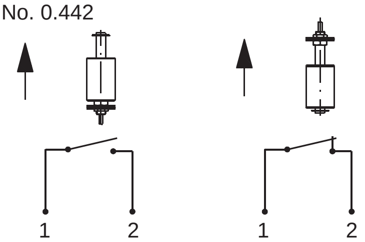
Level Switch NMS-004HM77

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

Characteristics

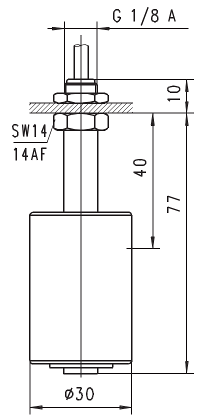
Mechanical level monitor for fluid media, with contact-free triggering of a reed contact.

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	cable 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 density1 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.	4.
NMS	**-**	**004**	**H**	**M**	**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

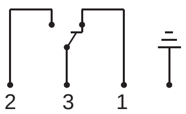
Level Switch SB

- **Mounted in the cover**
- **Changeover contact**

Characteristics

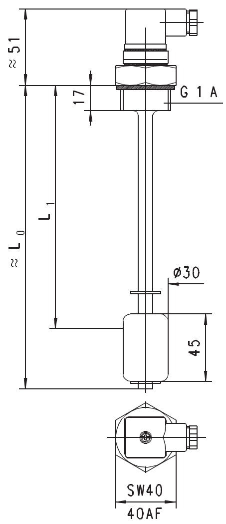
Mechanical level monitor for fluid media with contact-free actuation of a reed contact.

Technical data

Switch	reed switch
Process connection	male thread G 1 A
Density of medium	³ 0.35 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 L_1 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.	4.
SB	**-**	**025**	**H**	**M**	

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

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/cm^{3}	
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-AlSi12, 1.4571
	threaded type	1.4571
Non-medium-contact materials	GD-AlSi 12, NBR, PA	
Weight	see table "Dimensions and weights"	
Installation location	vertical installation position	

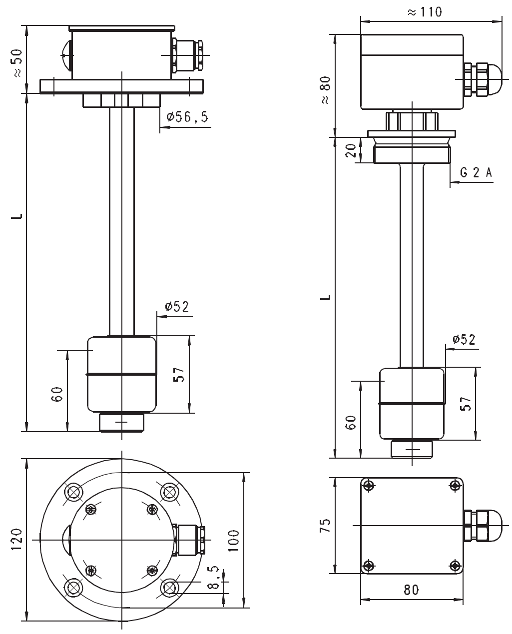
Dimensions and weights

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 density1 g/cm^{3}.
The device is delivered without a seal.

Handling and Operation

Note

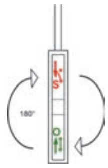
- It must be ensured that the values given for voltage, current, and power are not exceeded.
- When switched on, a load must be connected in series.
- The electrical details apply to ohmic loads. Capacitive, inductive and lamp loads must be operated using a protective circuit.
- Not suitable for use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

Commissioning

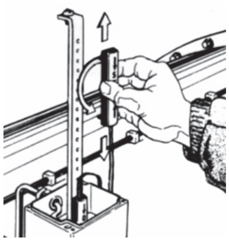
- Number of possible switching contacts:

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

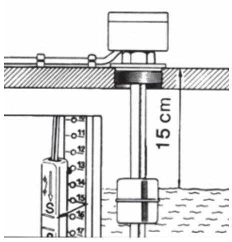
- The switching contacts must be activated before commissioning. By turning the switching module through 180 °, the switching function is changed from 'normally open' to 'normally closed'. Minimum contact separation 80 mm.



- 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.



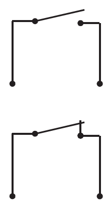
Ordering code

NR - [1.] [2.]

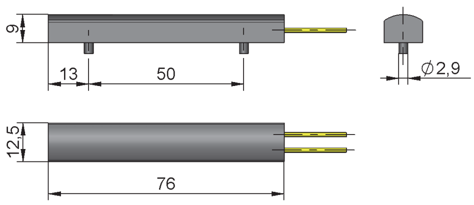
1.	**Connection size / material**	
	120EA	flange Ø120 aluminium
	050HK	male thread G 2 A stainless steel
2.	**Length**	
	0250	250 mm
	0500	500 mm
	0750	750 mm
	1000	1000 mm

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 transmitter 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.

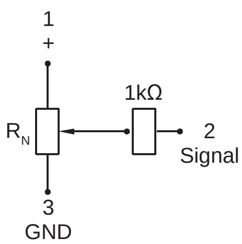
Technical data

Switch	reed switch chain with float fitted with magnet	
Mechanical Connection	LC-S45 LC-S44 LC-K52	G 1 A G $1^1/_2$ A G2A
For metering ranges, lengths and divisions	see "Ranges, dimensions and weights"	
Length tolerance	±5 mm	
Pressure resistance	LC-S45 LC-S44 LC-K52	PN 20 bar PN 20 bar PN 40 bar
Medium temperature	-20..+105 °C	
Ambient temperature	-20..+70 °C	
Storage temperature	-20..+80 °C	
Density of medium	LC-S45 LC-S44 LC-K52	^{3} 0.34 g/cm^3 ^{3} 0.44 g/cm^3 ^{3} 0.66 g/cm^3

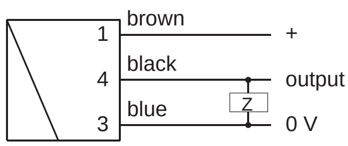
Output	resistor chain (radiometric), 4..20 mA or 0..10 V DC	
Electrical connection	plug DIN 43650-A / ISO 4400 or for round plug connector M12x1, 4-pole (only for electronic output)	
Ingress protection	IP 65 IP 67 for round plug connector	
Materials medium-contact	LC-S45 LC-S44 LC-K52	CW614N and Spansil CW614N and Spansil Stainless steel 1.4404
Materials Electronics housing	stainless steel 1.4305	
Weights	see table "Ranges, dimensions and weights"	
Conformity	CE	

Wiring

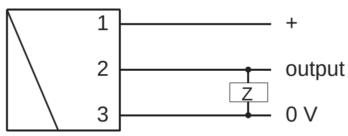
Reed switch chain Typ WB
with plug DIN 43650-A / ISO 4400



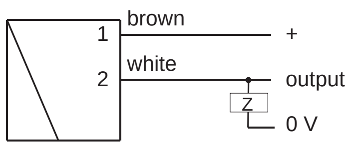
3 wire electronics Typ TS / VS
for round plug connector M12x1, 4-pole



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

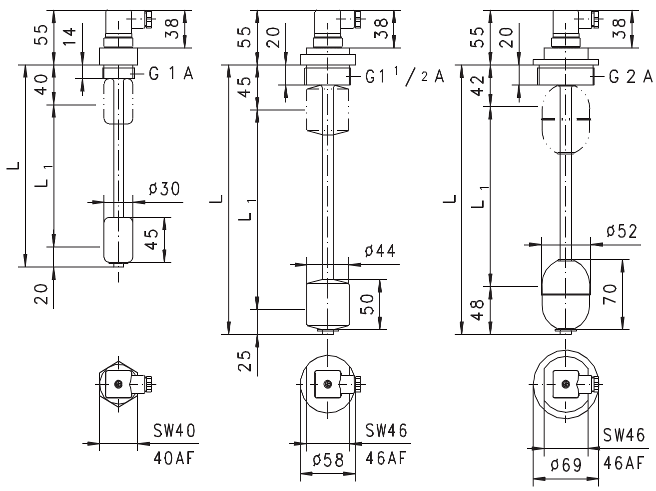


2 wire electronics Typ ZB / ZS



Ranges, dimensions and weights

LC-S45HM LC-S44HM LC-K52HK



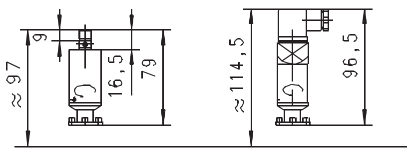
Types LC-	L	L1	Division mm	Resistance * R_N / Ohm	Tolerance Ohm	Weight kg
S45HM0250	250	190		1800	±136	0.5
S45HM0500	500	440	10	4300	±186	0.6
S45HM0750	750	690		1503	± 52	0.6
S45HM1000	1000	940		2055	± 64	0.7
S44HM1000	1000	930		2295	± 95	0.7
S44HM1500	1500	1430	20	3543	±121	0.8
S44HM2000	2000	1930		4790	±146	0.8
K52HK0250	250	160	10	1500	±130	1.0
K52HK0500	500	410		4000	±280	1.0
K52HK0750	750	660		1647	± 83	1.0
K52HK1000	1000	910	20	2246	± 94	1.1
K52HK1500	1500	1410		3493	±120	1.1
K52HK2000	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

	1.	2.	3.	4.
LC -				

❍=Option

1.	**Version**						
	S45HM	screw-in fitting G 1 A brass - float Spansil					
	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
- Temperature120 °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

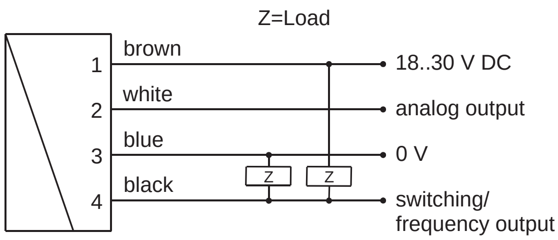
A float fitted with a magnet affects a Reed chain within the guide tube; the chain is connected as a potentiometer with resistances. The resolution is 10..20 mm and is highly reproducible. The FLEX sensor electronics use a microcontroller to convert the potentiometer values into standardised outputs, 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

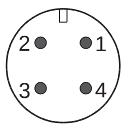
Switch	reed switch chain with float fitted with magnet	
Mechanical Connection	FLEX-LC45M	G 1 A
	FLEX-LC44M	G $1^1/_2$ A
	FLEX-LC52K	G 2 A
For metering ranges, lengths and divisions	see "Ranges, dimensions and weights"	

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 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



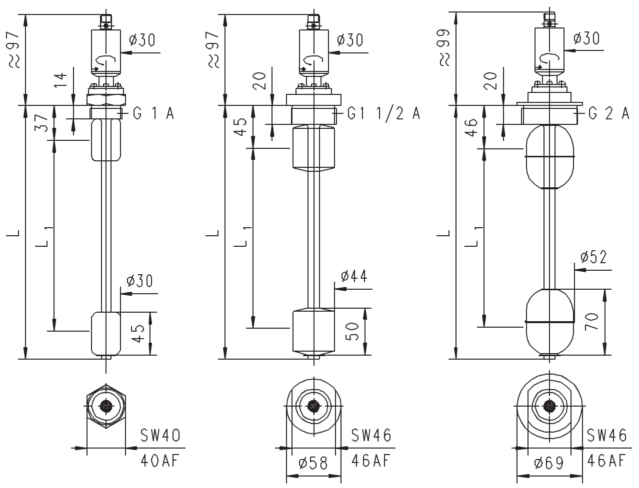
Connection example: PNP NPN



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

Ranges, dimensions and weights

FLEX-LC45M FLEX-LC44M FLEX-LC52K



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	10	250	160	1.1
LC52K0500	20	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).

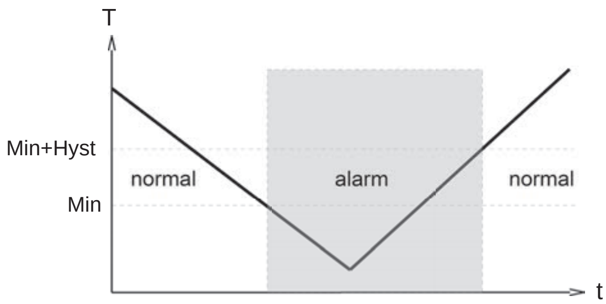
After the programming ("teaching"), the clip can either be left on the device, or removed to protect data.
The device has a yellow LED which flashes during the programming pulse. During operation, the LED serves as a status display for the switching output.
In order to avoid the need to transit to an 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".

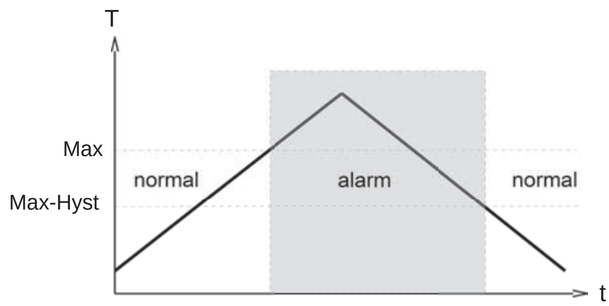
Normally, programming is used to set the limit switch. However, if desired, other parameters such as the end value of the analog or frequency output may also be set.

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

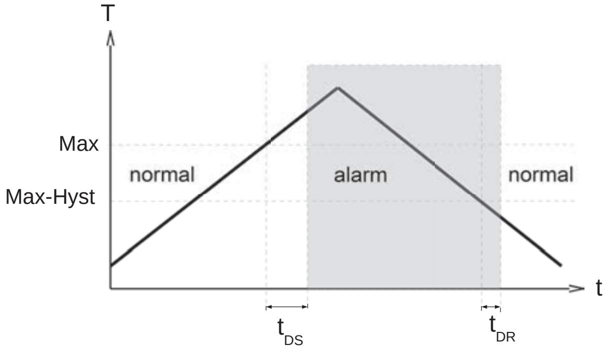
With a minimum-switch, falling below the limit value causes a switchover to the alarm state. Return to the normal state occurs when the limit value plus the set hysteresis is again exceeded.



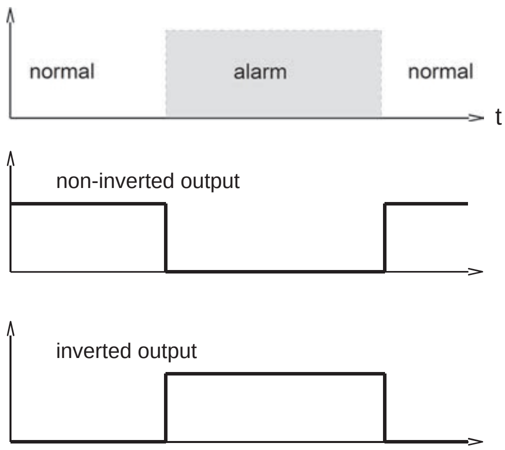
With a maximum-switch, exceeding the limit value causes a switchover to the alarm state. Return to the normal state occurs when the measured value once more falls below the limit value minus the set hysteresis.



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.



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 $1^1/_2$ 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			

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) (time after power on, during which the outputs are not actuated)		s
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 (KB...) see additional information “Accessories”
- Device configurator ECI-1

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.

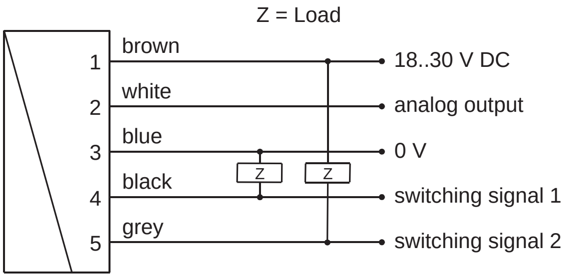
Because the complete upper part of the housing can be turned, it is possible to simply and infinitely adjust the display and the cable outlet.

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.

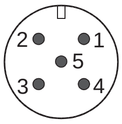
Technical data

Sensor	reed switch chain with float fitted with magnet	
Mechanical Connection	OMNI-LC-S45HM OMNI-LC-S44HM OMNI-LC-K52HK	G 1 A G 1$^1/_2$ A G 2 A
For metering ranges, lengths and divisions	see "Ranges, dimensions and weights"	
Pressure resistance	OMNI-LC-S45HM OMNI-LC-S44HM OMNI-LC-K52HK	PN 20 bar PN 20 bar 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-S45HM OMNI-LC-S44HM OMNI-LC-K52HK	^{3} 0.34 g/cm^3 ^{3} 0.44 g/cm^3 ^{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_{out} = 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-S45HM OMNI-LC-S44HM OMNI-LC-K52HK	CW614N and Spansil CW614N and Spansil stainless steel 1.4404
Materials, non-medium-contact	Housing Glass Magnet	stainless steel 1.4305 mineral glass, hardened samarium-Cobalt
Weights	see "Ranges, dimensions and weights"	
Conformity	CE	

Wiring



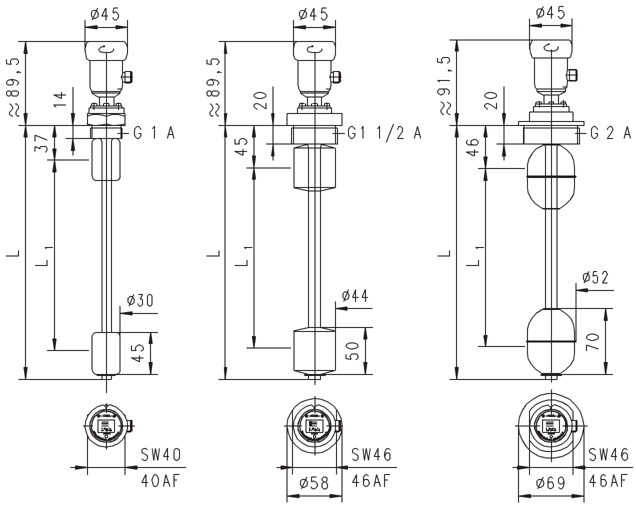
Connection example: PNP NPN



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

OMNI-LC45M OMNI-LC44M OMNI-LC52K



Types OMNI-LC-	Division mm	L mm	L1 mm	Weight 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	20	500	410	1.1
K52HK0750		750	660	1.1
K52HK1000		1000	910	1.2
K52HK1500		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)

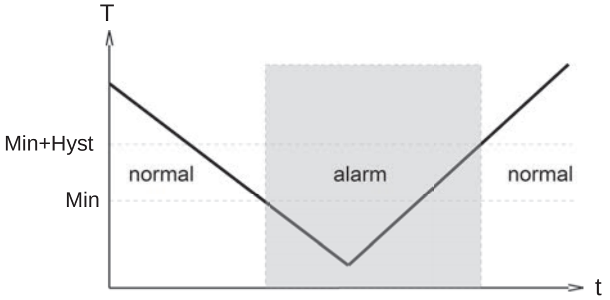
Edit, using position 2

If the currently visible parameter is to be modified:

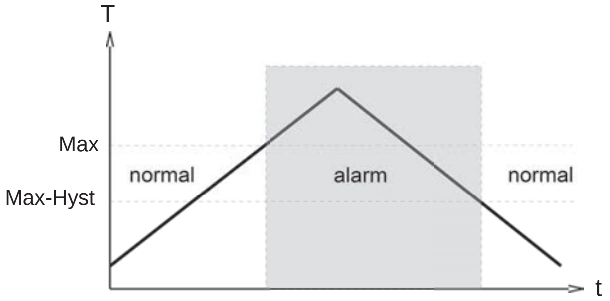
- Turn the annular gap to position 2, so that a flashing cursor appears which displays the position which can be modified.
- By repeatedly turning to position 2, values are increased; by turning to position 1, the next digit is reached.
- Leave the parameter by turning to position 1 (until the cursor 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 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 is 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

	1.	2.	3.
OMNI-LC -			

❍=Option

1.	**Version**					
	S45HM	screw-in fitting G 1 A brass - float spansil				
	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.	**Optional**					
	H ❍	model with gooseneck				

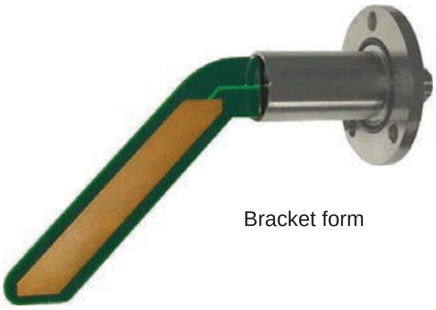
Options

- 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) <u>and</u> analog output (4..20 mA or 0..10 V)**

Straight form

- **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.

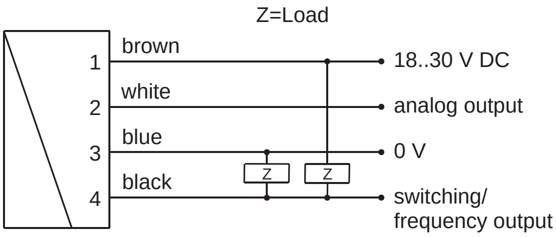
Technical data

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	

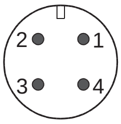
Wiring

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

It is recommended to use shielded cable.

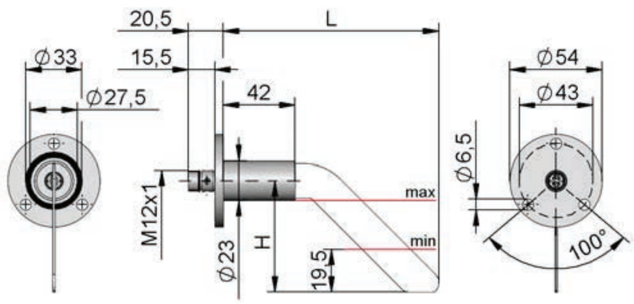


Connection example: PNP NPN



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.

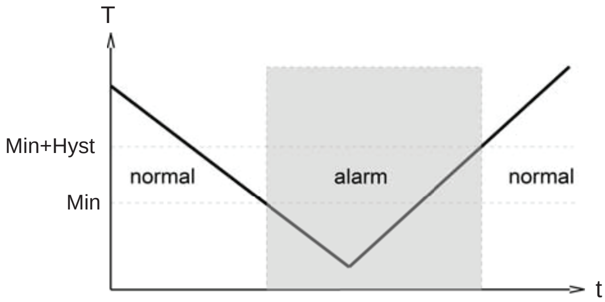
A magnet clip is used for programming the switching point - if this is desired - or for programming an offset to the start or full scales. Equally, the analog full scale may alternatively be programmed with the clip. The clip can be inserted onto the plug connection or can be removed as a key.

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

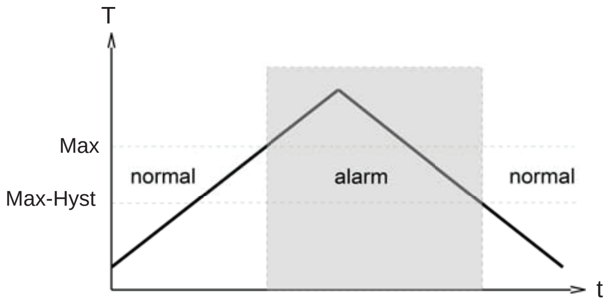
If the programmable switching point is desired:

- 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.

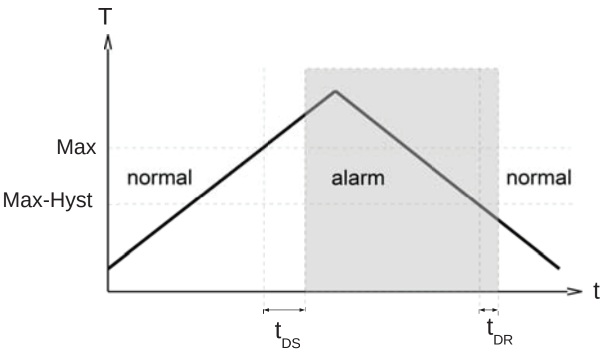
With a minimum-switch, falling below the limit value causes a switchover to the alarm state. Return to the normal state occurs when the limit value plus the set hysteresis is once more exceeded.



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.

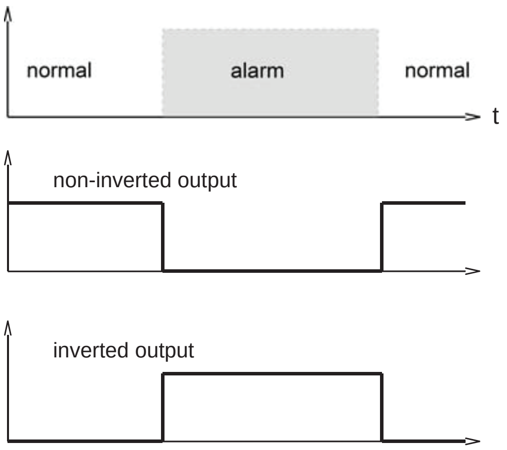


A changeover delay time (t_{DS}) can be applied to the switch in the alarm state. Equally, one switch-back delay time (t_{DR}) of several can be applied to switching back to the normal state.



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

	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.
LCC1 -		**A**			**V**					

❍=Option

1.	**Form**	
	A	Bracket form (side mounting)
	B	straight shape (installation from above)
2.	**Connection**	
	A	flange
3.	**Installation length**	
	126	126 mm (only with installation hight 65)
	200	200 mm (only with installation hight 00)
	xxx	Weitere auf Anfrage
4.	**Installation lheight**	
	65	65 mm (Form A)
	00	00 mm (Form B)
	xx	ohters on request
5.	**Seal**	
	V	FKM
6.	**Output signal**	
	I	current ouput 4..20 mA
	U	voltage output 0..10 V
7.	**Switching function**	
	L	minimum-switch
	H	maximum-switch
8.	**Programming**	
	N	cannot be programmed (no teaching)
	P ❍	programmable (teaching possible)
9.	**Switching output level**	
	O	standard
	I	inverted
10.	**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) <u>and</u> 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.

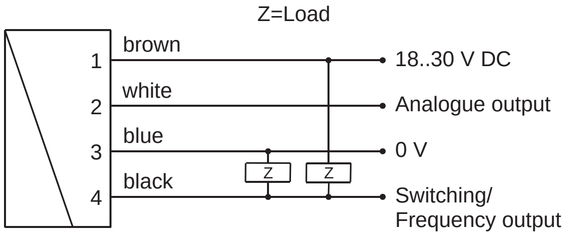
The electronics belong to the class of intelligent sensors from HONSBERG, and thus enable the use of the ECI-1 interface (configurator). The USB-compatible interface enables the adjustment of numerous parameters for adaptation to the application.

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

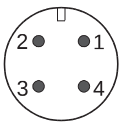
Technical data

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 + fibreglass), 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 RoHS COMPLIANT	

Wiring



Connection example: PNP NPN

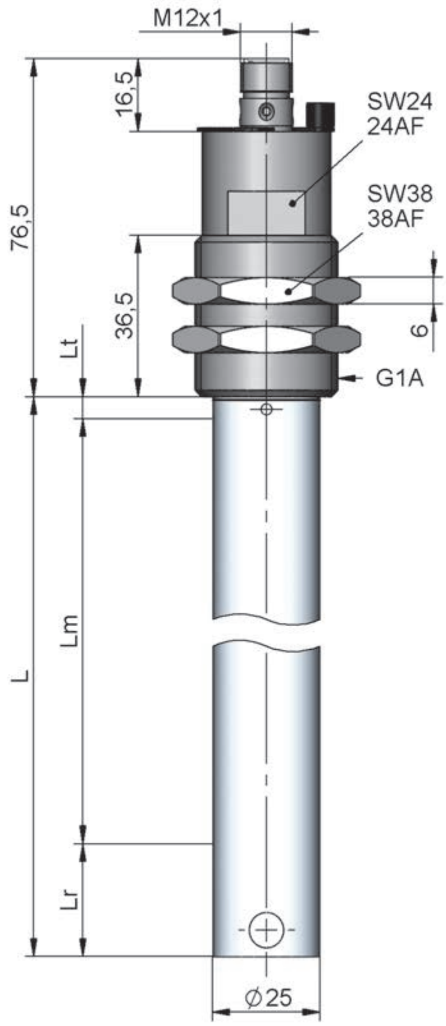


Before the electrical installation, it must be ensured that the supply voltage corresponds to the data sheet.

It is recommended to use shielded wiring.

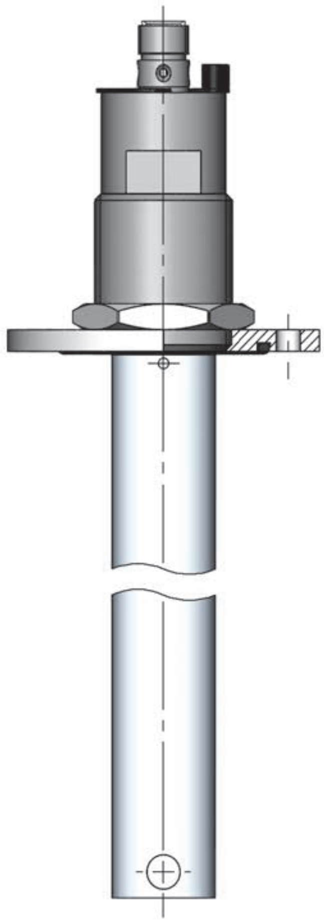
The push-pull output of the frequency or pulse output version can as desired be switched as a PNP or an NPN output.

Dimensions

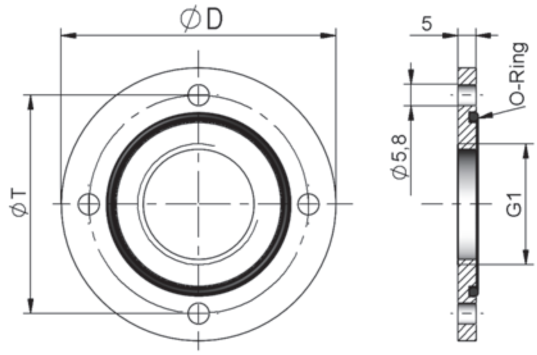


L= installation length (see ordering code),
L_m = metering range ($L-L_T-L_R$) Standard 0 – 100%
Lt = Dead zone 10 mm
L_r = Reference zone 26 mm
(always in the same medium as the measuring zone)
L_{min} = 10

LCC2 with flange



Standard flange dimensions



D= 75
T= 60
C1= Tank hole 34 – 40 mm

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.

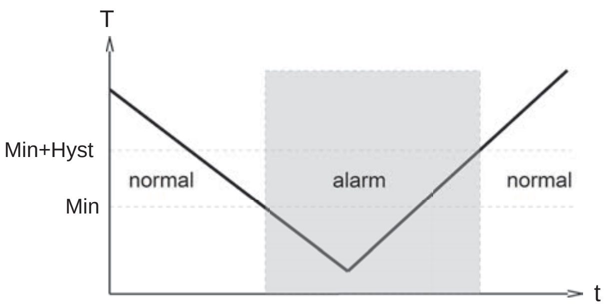
A magnet clip is used for programming the switching point - if this is desired - or for programming an offset to the start or full scales. Equally, the analog full scale may alternatively be programmed with the clip.
The clip can be inserted onto the plug connection or can be removed as a key.

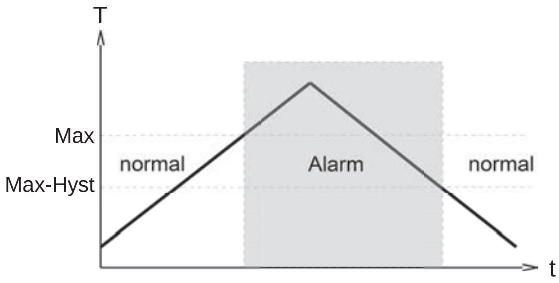
The location to which to apply the clip for one second is marked on the label.

If the programmable switching point is desired:

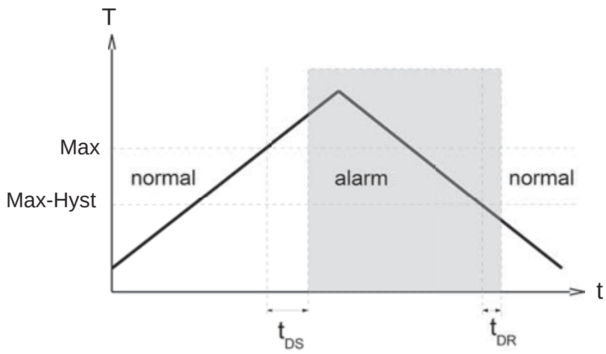
- Set the level to the switching value or to the value from which the offset was desired.
- Hold the magnet against the marking.
- LED flickers
- Remove the magnet from the marking. Two LED pulses acknowledge successful programming.

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.



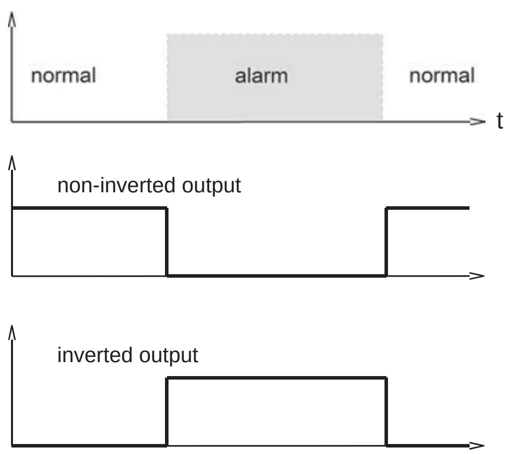


With a maximum-switch, exceeding the limit value causes a switchover to the alarm state. Return to the normal state occurs when the measured value once more falls below the limit value minus the set hysteresis.
A changeover delay time (t_{DS}) can be applied to switching to the alarm state. One switch-back 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.



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

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

❍=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 ___ °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.

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

Capacitive Level Gauge UNICON®-CL

Mounting type 04

Mounting type 01

Characteristics

- Microprocessor controlled measurement with LCD Display
- Measuring unit programmable
- Tara function (level 0)
- No moving parts in the medium
- For conductive liquids, acids or lye's
- Not for adherent media
- Temperature compensation with Pt100 sensor
- Outputs 4..20 mA 2-wire for level and temperature, measuring range programmable
- 2 alarm outputs transistor voltage free
  min or max function
- Programmable set points
- Simulation mode (manual mode) for level and temperature
- Level correction of the indicating range
- 2-point calibration to adapt the geometric of the tank
- Horizontal or vertical mounting of the electronic

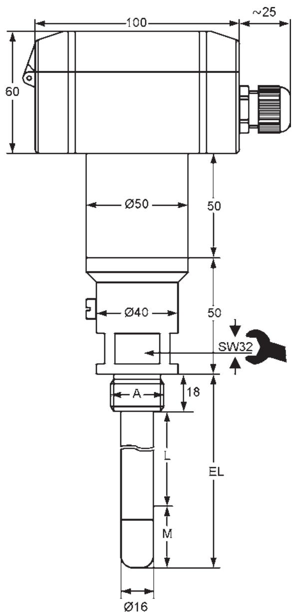
Technical data

Power supply	
Supply voltage	: 14..30 V DC, 2-wire
CE-conformity	: EN 61326-1:2013
Ambient conditions	
Ambient temperature	: -10..+50°C
Climatic class	: EN 60068-2-38
Protection class	: IP65
Vibration class	: EN 60068-2-6, GL test2
Input	
Measuring range	: 0..100 mm up to max. 3000 mm
Repeatability	: ±2 mm
Accuracy	: 0.5 % of the measuring value
Refresh time	: 1 s
Electrical connection	: screw terminal with pressure plate 2.5mm² IP20 acc. to German BGV A3
Isolation	: sensor/supply/outputs
Outputs	
Level	: 4..20 mA, 2-wire
Temperature	: 4..20 mA -40..+160 °C, 2-wire Pt100 sensor class B acc. DIN60751
Alarm	: transistor 14..30V max. 60 mA
Case	
Material	: Polyamide PA6-GF/GK 15/15 Front foil Polyester
Protection class	: IP65
Sensor	
Mounting direction	: $ only vertical
Radiated frequency	: 400 kHz
Conductivity medium	: >50 µS
Viscosity medium	: <2000 mm²/s (cSt)
Process temperature	: 0..60 / -10..+120 °C, 140 °C < 1h CIP-/SIP-capable
Process pressure	: 0..16 bar
Process material	: PTFE with aluminum core, sealing FDA conform stainless steel 1.4404
Process connection	: G ¾ A
Stud torque	: 10 Nm max.

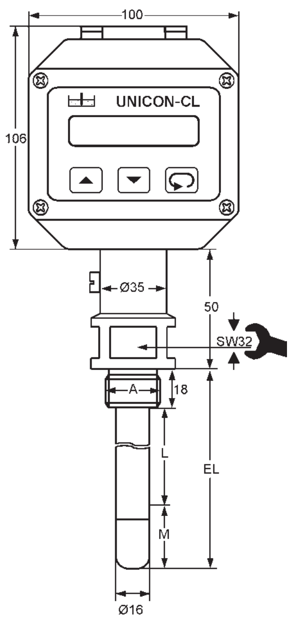
Mistakes reserved, technical specifications subject to change without notice.

Continue next page

Dimensions

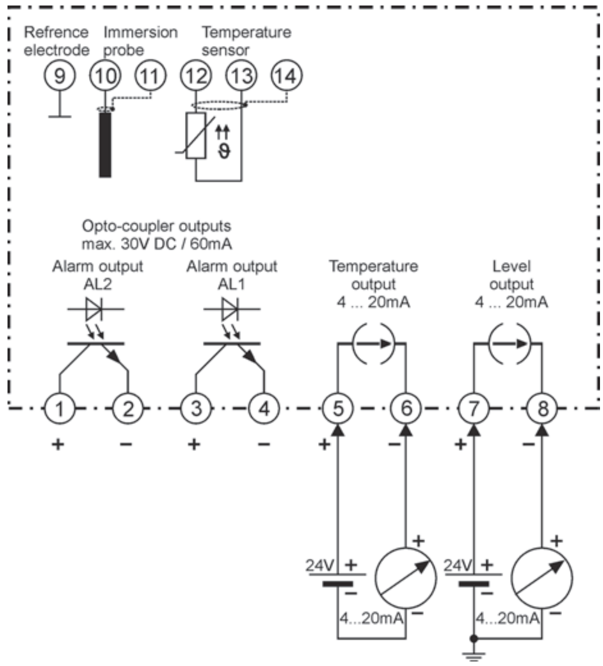


Head mounting horizontal; mounting type 01



Head mounting vertical; mounting type 04

Connection diagram



Ordering code

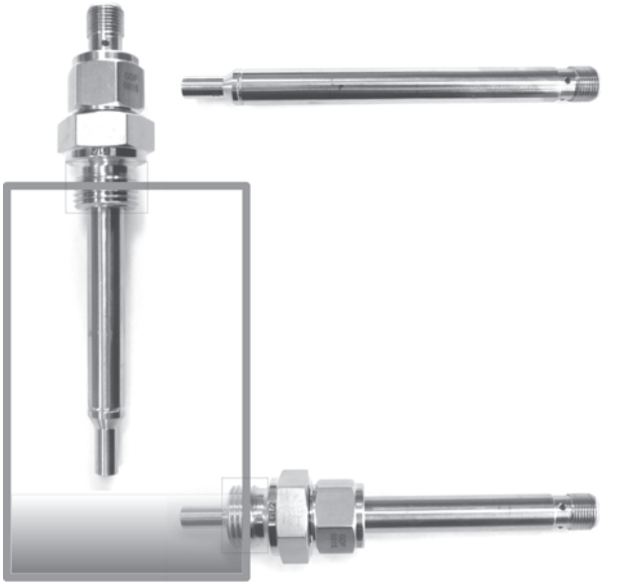
	1.		2.		3.		4.		5.		6.		7.
UNICON-CL -		-		-		-		-		-		-	

1.	**Model**	
	1	output 4..20 mA, for level, 2 electronic alarm outputs
	2	as 1, but additional temperature measurement, for temperature compensation of the probe output 4..20 mA for temperature
2.	**Mounting type**	
	01	case horizontal
	04	case vertical, cable glands at the backside
3.	**Sensor** (M = minimal immersion depth)	
	1	Single sensor for metal tanks min. 20 mm (M)
	2	Single sensor for plastic tanks min. 60 mm (M)
	4	as 2, but reference electrode Hastelloy, for acids and lye's
4.	**Medium temperature**	
	1	0..60 °C
	2	-10..+120 °C (steam sterilization 140 °C)
5.	**Process connection**	
	G ¾ A	
6.	**Mounting length EL (please state in mm)**	
	Standard 500, 800, 1000, 1500, 2000, 2500 mm	
7.	**Options**	
	00	without option
	11	2nd cable gland M20x1.5

Following information's are needed by order:

1. type of medium
2. medium temperature

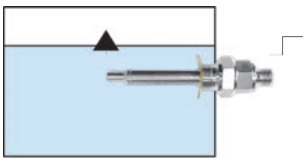
Level Switch or Drip Sensor LABO-LK012

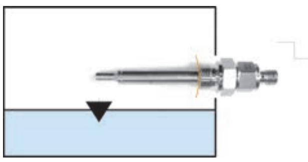


- Complete electronic level switch in 12 mm housing
- Independent of conductivity, colour, ...
- Suitable for fluids and finer granulates
- Programmable hysteresis
- Suitable for very variable fluids
- Programmable power-on/power-off delays
- Very simple to use

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...).





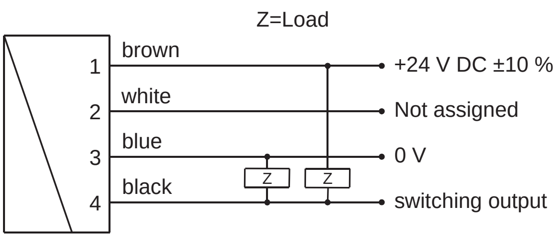
When set in sensitive mode, the LABO-LK012 sensor can be used as a drip sensor. Here, drops which hit the tip of the sensor create an output signal, and thereby indicate the presence of leaks.

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

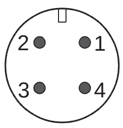
Technical data

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

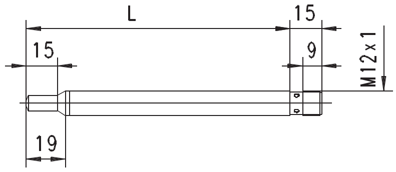


Connection example: PNP NPN

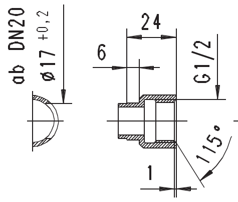


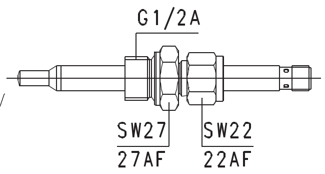
Before the electrical installation, it must be ensured that the supply voltage corresponds to the data sheet. It is recommended to use shielded wiring.

Dimensions



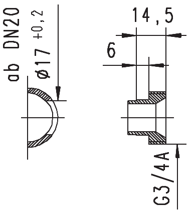
Optional accessories

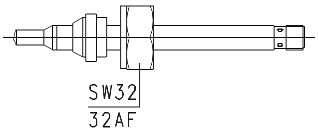




weld-on adapter

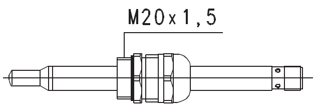
crimp screw joint
stainless steel





weld-on adapter

conical screw connection
plastic

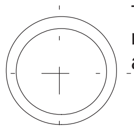


crimp screw joint
plastic

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

X 

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

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

❍=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 [ ][ ].[ ] 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)
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

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.
Applicable with drinking-, used-water, diesel-,heating- or rape-oil and carbon dioxide.

Technical data

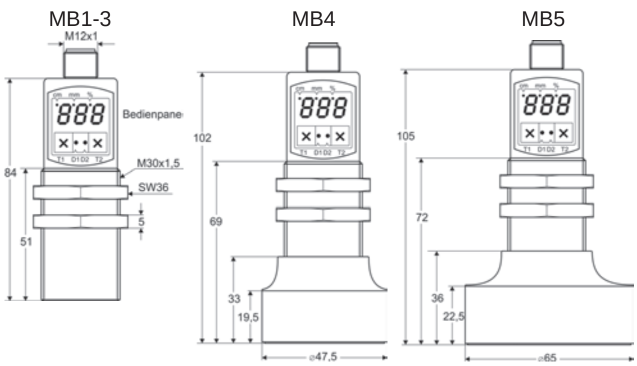
Power supply

Supply voltage U_B	: 9..30 V DC, reverse polarity protection
Voltage ripple	: ±10 %
No-load supply current	: ≤ 80 mA
Operating temperature	: -25..70 °C
CE-conformity	: EN 61000-6-3:2007 + A1:2011; EN 60947-5-2:2007 + A1:2012; EN 60947-5-7:2003

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

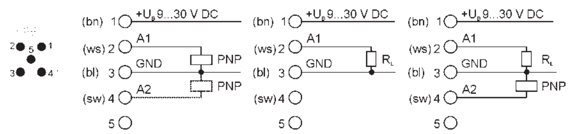
Display	: LED red, 7,6 mm
Indicating range	: 0..999 Digit
LED´s	: output indicators, 3-colors
Output	
Switched output PNP	: U_S=U_B-2 V; Imax 200 mA, short circuit proof, NO orNC programmable
-Switching hysteresis	: programmable
-Switching frequency	: max. 11 Hz
-Response time	: min. 50 ms
-Start-up delay	: <300 ms
Current output	: 4..20 mA, RL ≤100 Ω at 9 V ≤UB≤20 V RL ≤500 Ω at UB>20 V
Voltage output	: 0..10 V RL ≥100 kΩ at UB>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

Output 04(44) Output 50 Output 54



Ordering code

LS20 - 1. [ ] - 2. [ ] - 3. [ ]

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

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.

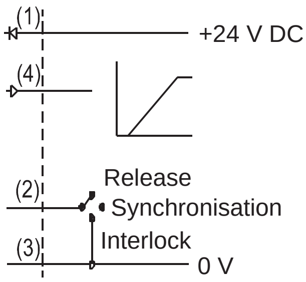
Technical data

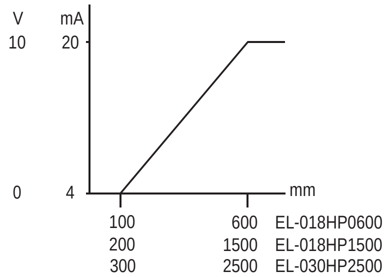
Types	EL-018HP0600	EL-018HP1500	EL-030HP2500
Connection	M18x1	M18x1	M30x1.5
Metering range	100..600 mm	200..1500 mm	300..2500 mm
Response time (at 90 %EW)	< 50 ms	< 90 ms	< 150 ms
Weight	0.05 kg	0.05 kg	0.15 kg

Combined data:

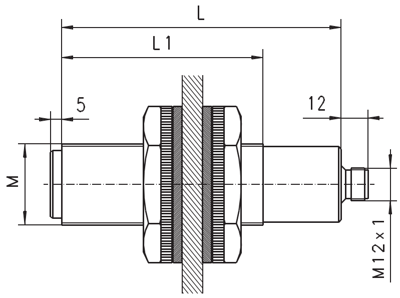
Sensor	piezoceramic ultrasound transducer
Sound beam	8 °
Linearity error	< 0.3 %
Repeatability	±2 mm
Temperature range	-20..+70 °C
Operating voltage	18..30 V DC
Output	0..10 V or 4..20 mA
Medium temperature	max. 90 °C
Construction material	PET 30 % glass fibre
Ingress protection	IP 67
Electrical connection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

	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

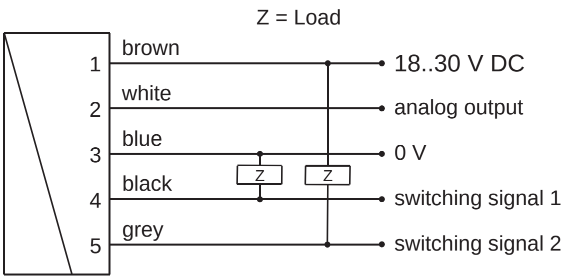
The level sensor consists of the primary sensor (an ultrasound sensor) which, contact-free, determines the separations of media of different types (fluids, transported goods, solids). The ultrasound sensor works on the principle of end-to-end measurement. Emitted ultrasound impulses are reflected at 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.

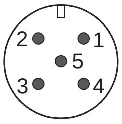
Technical data

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 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	

Wiring

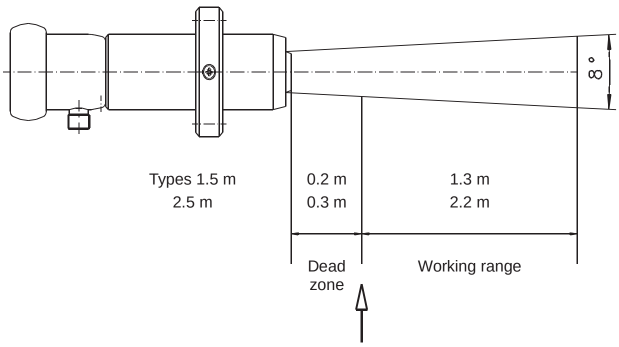


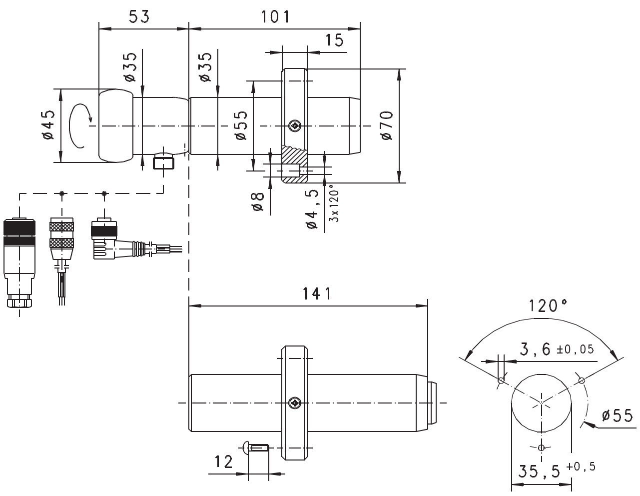
Connection example: PNP NPN



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





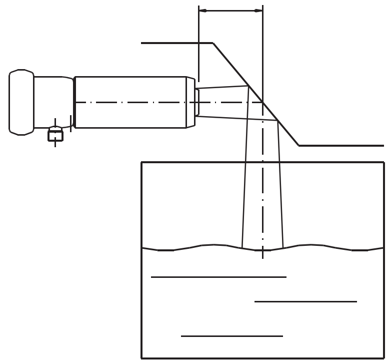
A gooseneck (optional) between the electronics head and the primary sensor provides freedom in the orientation and reading direction of the sensor.

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.

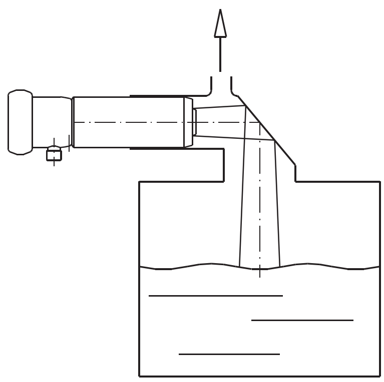
Dead zone



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.

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

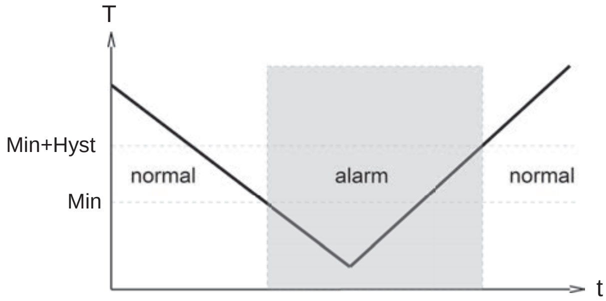
- Switching value S1 (switching point 1 in the selected unit)
- Switching characteristic of S1
- (MIN = monitoring of minimum value, hysteresis greater than switching value,
- MAX = monitoring of maximum value, hysteresis less than switching value)
- Hysteresis 1 (hysteresis value of S 1 in the set unit)
- 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

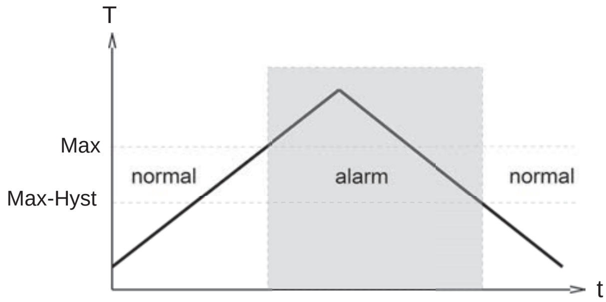
If the currently visible parameter is to be modified:

- 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 is 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 (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

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.
Applicable with drinking-, used-water, diesel-,heating- or rape-oil and carbon dioxide.

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	: EN61326-1:2013, EN61326-2-3:2013

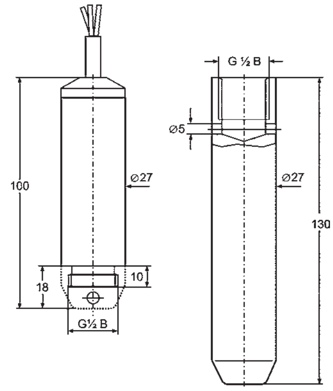
Output

Current	: 4..20 mA, 2-wire
Max. burden R_A	: ≤(U+ -10 V) ÷ 0,02 A-(0.14 Ωx cable length[m])
Accuracy	: 0.5 % optional 0.25 %

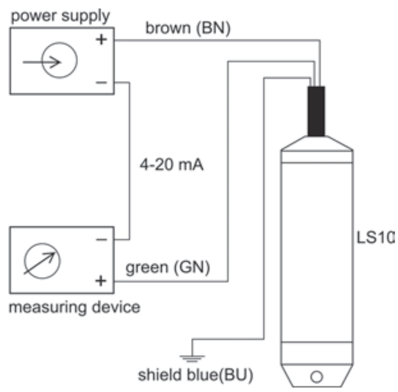
Material

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

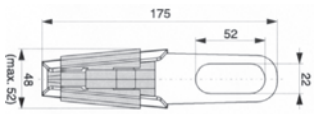


Ordering code

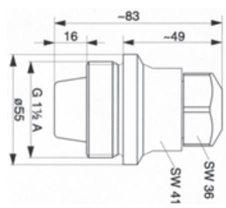
LS10 - 1. [ ] - 2. [ ] - 3. [ ]

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

ASK(-E)



ASV-E



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	:	2014/30/EU, EN61326-1:2013; 61326-2-3:2013; Emissions (group 1 class B) and interference resistance (industrial area)
Ex-directive	:	ATEX 2014/34/EU

Output

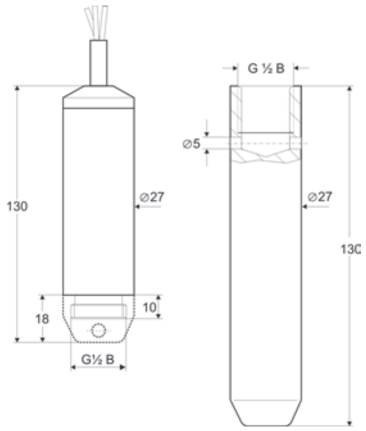
Current	:	4..20 mA, 2-wire
Max. burden R_A	:	≤(U+ -10 V)÷0.02 A-(0.14Ω x cable length[m])
Accuracy	:	0.5 %

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

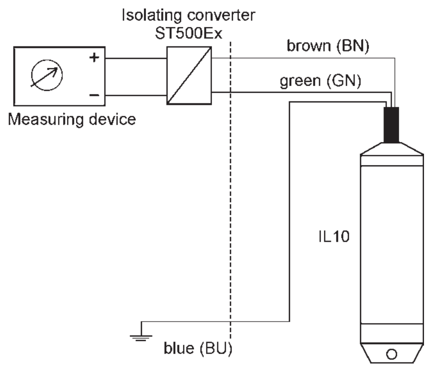
Dimensions

IL10 additional weight G10



Connection diagram

non Ex-area Ex-area

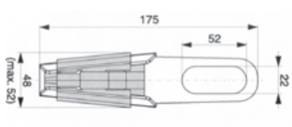


Ordering code

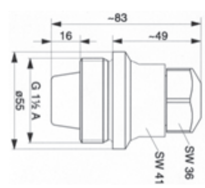
IL10 - [1.] - [2.] - [3.]

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

ASK(-E)



ASV-E



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)

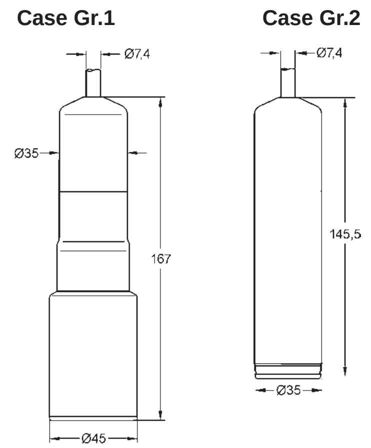
Environmental technology:
sewage treatment, water supply, aggressive media.

Technical data

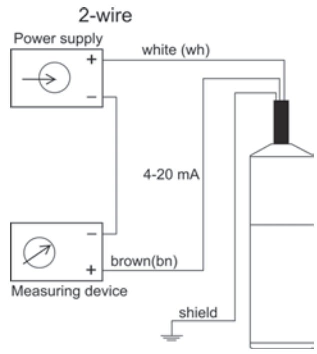
Power supply	
Supply voltage	: 12..36 V DC (U+)
Medium temperature	: 0..50 °C
CE-conformity	: EN 61326-1:2013
Measuring range	: 0..0.16 bar bis 0..16 bar relative
Output	
Current	: 4..20 mA, 2-wire
Max. burden R_A	: ≤((U+ -12V)/0.02A-(0.14ΩxCable length [m]) short circuit protection
Accuracy	: 0.35 %
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

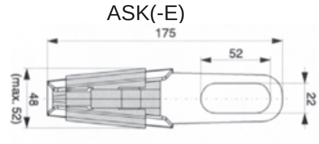


Ordering code

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	

ASK(-E)



Level Indicator NA

- **Wall mounting**
- **No moving parts**

Characteristics

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

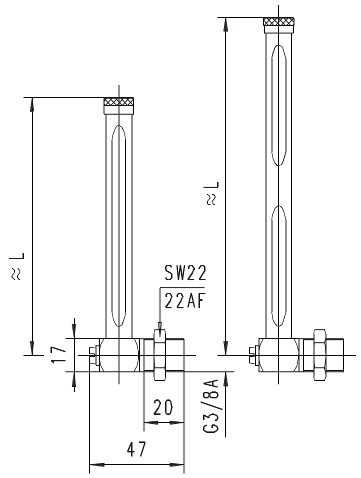
Technical data

Switch	without
Process connection	male thread G $^3/_8$ 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	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		0.12
	NA-010HM200	200		0.14
	NA-010HM250	250	2	0.15
	NA-010HM300	300		0.16

Length 40..200 Length 250..300



Vent drilling in cover.

Ordering code

	1.	2.	3.	4.
NA -		**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

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.

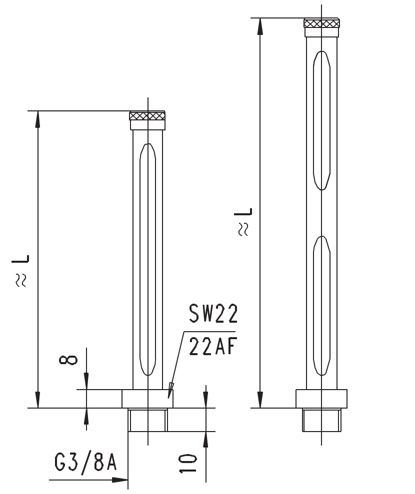
Technical data

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		
	NB-010HM200	200		0.10
	NB-010HM250	250	2	0.11
	NB-010HM300	300		0.12

Length 40..200 Length 250..300



Vent drilling in cover

Ordering code

	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

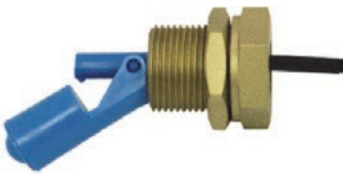
Options

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

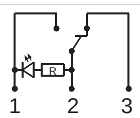


Example RWI

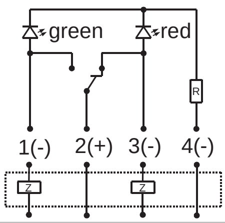
Customer-specific connections are available.

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)

GHMGROUP
Specialists by Competence.

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

4-pin		5-pin	
1	brown	1	brown
2	white	2	white
3	blue	3	blue
4	black	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

Gerätekonfigurator ECI-1

- **Vor Ort verwendbar für:**
  - **- Parameteränderung**
  - **- Firmware-Update**
  - **- Justierung der Ein- und Ausgänge**
- **Anschließbar über USB**

Merkmale

Der Gerätekonfigurator ECI-1 ist ein Interface, das den Anschluss von mikrocontrollergesteuerten HONSBERG-Sensoren an den USB-Port eines Computers gestattet.
In Verbindung mit der Windows-Software "HONSBERG Device Configurator" ermöglicht er

- die Änderung aller Konfigurationseinstellungen des Sensors
- das Auslesen von Messwerten
- die Justage der Ein- und Ausgänge
- Firmware-Updates

Technische Daten

Hilfsspannung	12..30 V DC (abhängig vom angeschlossenen Sensor) und über USB
Leistungs-aufnahme	< 1 W
Anschluss	
Sensor	Kabelbuchse M12x1, 5-polig, gerade Länge ca. 50 cm
Zuleitung	Gerätestecker M12x1, 5-polig
USB	USB-Buchse Typ B
Betriebs-temperatur	0..+50 °C
Lagertemperatur	-20..+80 °C
Gehäuse-abmessungen	98 mm (L) x 64 mm (B) x 38 mm (H)
Gehäusewerkstoff	ABS
Schutzart	IP 40

Handhabung und Betrieb

Anschluss

Der Gerätekonfigurator ist für den vorübergehenden Anschluss in der Applikation bestimmt. Er wird zwischen die vorhandene Zuleitung des Sensors und den Sensor geschaltet. Die Versorgung erfolgt über die Sensorversorgung und den USB-Port des Computers. Im inaktiven Zustand (ohne Kommunikation) verhält sich der Konfigurator völlig neutral, alle Signale des Sensors stehen der Applikation weiterhin zur Verfügung. Bei Kommunikation zwischen Computer und Sensor werden die Signalleitungen im Konfigurator aufgetrennt, so dass in diesem Zustand die Ausgangssignale des Sensors nicht zur Verfügung stehen.

Zum Anschluss 4-poliger Zuleitungen ohne Mittelbohrung an den eingebauten 5-poligen Gerätestecker wird der Adapter K04-05 mitgeliefert. 4-polige Zuleitungen mit Mittelbohrung können ohne Adapter verwendet werden.

Bestellschlüssel

Gerätekonfigurator (Lieferumfang siehe Abbildung unten)	**ECI-1**

Lieferumfang:

1. Gerätekonfigurator ECI-1
2. USB-Kabel
3. Adapter K04-05
4. Stecker KB05G
5. Kabel K05PU-02SG
6. Tragekoffer

(Software und Steckernetzteil sind nicht im Lieferumfang enthalten)

Zubehör:

Software 'Device Configurator 1.00' Beschreibung der Software siehe Datenblatt „EDC"	**EDC 1.00**
Steckernetzteil 24 V DC (mit montiertem Rundsteck-verbinder, 5-polig) 	**EPWR24-1**

Ersatzteile:

M12x1-Adapter 4- / 5-polig	**K04-05**
PUR-Kabel, 5-polig, abgeschirmt mit Rundsteckverbinder M12x1	**K05PU-02SG**
Rundsteckverbinder M12x1, 5-polig (ohne Kabel)	**KB05G**

GHMGROUP
Specialists by Competence.

Headquarter

GHM Messtechnik GmbH
GHM GROUP CORPORATE
Schloßstraße 6
88453 Erolzheim | GERMANY
Phone +49 7354 937233-0
info@ghm-group.de
www.ghm-group.de

Centers of Competences

GHM Messtechnik GmbH
GHM GROUP – Greisinger
Hans-Sachs-Straße 26
93128 Regenstauf | GERMANY
Phone +49 9402 9383-0
info@greisinger.de | www.greisinger.de

GHM Messtechnik GmbH
GHM GROUP – Honsberg
Tenter Weg 2-8
42897 Remscheid | GERMANY

GHM Messtechnik GmbH
GHM GROUP – Martens
Kiebitzhörn 18
22885 Barsbüttel | GERMANY

GHM Messtechnik GmbH
GHM GROUP – Imtron
Carl-Benz-Straße 11
88696 Owingen | GERMANY

Delta OHM S.r.l. a socio unico
GHM GROUP – Delta OHM
Via Marconi 5
35030 Caselle di Selvazzano
Padova (PD) | ITALY
Phone +39 049 8977150
info@deltaohm.com
www.deltaohm.com

Valco srl
GHM GROUP – VAL.CO
Via Rovereto 9/11
20014 S. Ilario di Nerviano
Milano (MI) | ITALY
Phone +39 0331 53 59 20
valco@valco.it
www.valco.it

GHM GROUP International

Austria
GHM Messtechnik GmbH
Office Austria
Breitenseer Str. 76/1/36
1140 Vienna | AUSTRIA
Phone +43 660 7335603
a.froestl@ghm-messtechnik.de

Brazil & Latin America
GHM Messtechnik do Brasil Ltda
Av. José de Souza Campos, 1073, cj 06
Campinas, SP
13025 320 | BRAZIL
Phone +55 19 3304 3408
info@grupoghm.com.br

Czech Republic / Slovakia
GHM Greisinger s.r.o.
Ovci hajek 2 / 2153
158 00 Prague 5
Nove Butovice | CZECH REPUPLIC
Phone +420 251 613828
Fax +420 251 612607
info@greisinger.cz | www.greisinger.cz

Denmark
GHM Maaleteknik ApS
Maarslet Byvej 2
8320 Maarslet | DENMARK
Phone +45 646492-00
Fax +45 646492-01
info@ghm.dk | www.ghm.dk

France
GHM GROUP France SAS
Parc des Pivolles
9 Rue de Catalogne
69150 Décines-Charpieu (Lyon) | FRANCE
Phone +33 4 72 37 45 30
a.jouanilou@ghm-group.fr

India
GHM Messtechnik India Pvt Ldt.
209 | Udyog Bhavan | Sonowala Road
Gregaon (E) | Mumbai - 400 063
INDIA
Phone +91 22 40236235
info@ghmgroup.in | www.ghmgroup.in

Italy for Greisinger & Delta OHM
GHM GROUP – Delta OHM
Via Marconi 5
35030 Caselle di Selvazzano
Padova (PD) | ITALY
Phone +39 049 8977150
a.casati@ghm-messtechnik.de

Italy for Honsberg, Martens, Val.co
GHM GROUP – Val.co
Via Rovereto 9/11
20014 S. Ilario di Nerviano
Milano (MI) | ITALY
Phone +39 0331 53 59 20
alessandro.perego@valco.it

Netherlands
GHM Meettechniek BV
Zeeltweg 30
3755 KA Eemnes | NETHERLANDS
Phone +31 35 53805-40
Fax +31 35 53805-41
info@ghm-nl.com | www.ghm-nl.com

South Africa
GHM Messtechnik SA (Pty) Ltd
16 Olivier Street
Verwoerdpark, Alberton 1453
SOUTH AFRICA
Phone +27 74 4590040
j.grobler@ghm-sa.co.za

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