

- For level detection of electrically conductive and non-conductive fluids
- Compact miniature performance
- Easy setting by means of magnetic pen
- Direct mounting to vessels, tanks, sumps, tubes
- High temperature performance available
- 2-wire connection directly to relay circuit (current switch)
- LED state indication



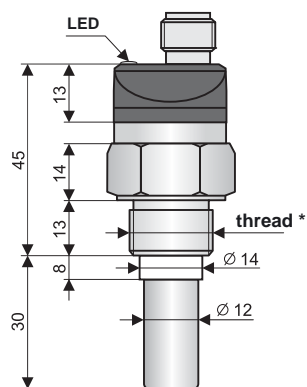
**Capacitive level sensors (switches) CLS-23** are designed for limit level detection of electrically conductive and non-conductive fluids in vessels, reservoirs, sumps, pipes, tanks, etc. The sensitivity of the sensor can be easily set by placing magnetic pen on a sensitive spot. The connection is done by means of two wires directly into a circuit with a relay or to binary input of a control system.

### SENSOR VARIANTS

- **CLS-23N-10**      **Uncoated short bar electrode**, for sensing of electrically non-conductive liquids (mineral and plant oils, resins, etc.). Mounting in horizontal position. Electrode length 30 mm.
- **CLS-23N-11**      **Insulated (coated) short bar electrode**, for non-aggressive electrically conductive liquid sensing (water, water solutions). The insulation is made from polypropylene (PP). Electrode length 30 mm.
- **CLS-23N-12**      **Insulated (coated) short bar electrode**, for moderately aggressive electrically conductive liquid sensing (chemicals, water, moderately aggressive water solutions). Higher temperature resistance than variant "11". The insulation is made from FEP. Electrode length 30 mm.
- **CLS-23N-20**      **Partly insulated rod electrode**, for level detection of conductive and non-conductive liquids, partially resistant to vapours (water) condensation in the sensing area. The insulation is made from FEP. Vertical mounting; horizontal mounting (from the side) is possible for shorter electrodes (up to 200 mm). Electrode length from 50 mm to 1 m.
- **CLS-23N-21**      **Fully insulated rod electrode**, for universal use, for level detection of conductive liquids (water, water solutions). Resistant to vapours (water) condensation in the sensing area and partially resistant to medium spraying. The insulation is made from FEP. Vertical mounting; horizontal mounting (from the side) is possible for shorter electrodes (up to 200 mm). Electrode length from 50 mm to 1 m.
- **CLS-23N-30**      **Uncoated removable rod electrode**, for level detection of conductive and non-conductive liquids. Vertical mounting; horizontal mounting (from the side) is possible for shorter electrodes (up to 200 mm). Electrode length from 50 mm to 1 m.

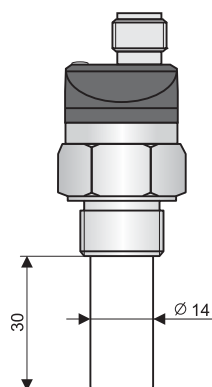
## DIMENSIONS DRAWINGS

CLS-23N-10

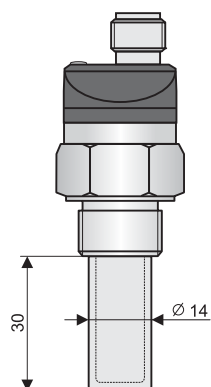


\* threads:  
G 3/8"  
M18x1,5  
M20x1,5  
1/2-14 NPT

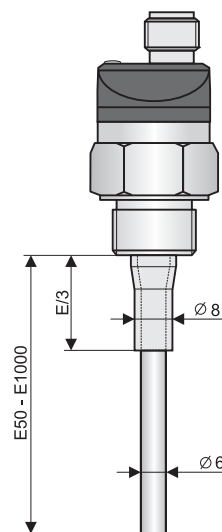
CLS-23N-11



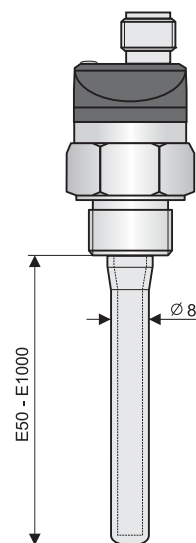
CLS-23N-12



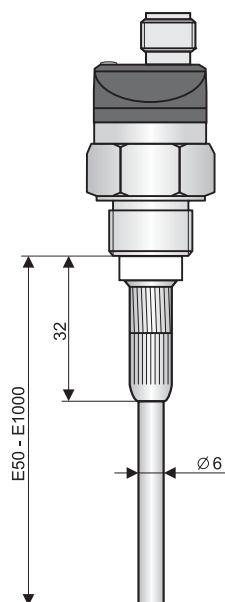
CLS-23N-20



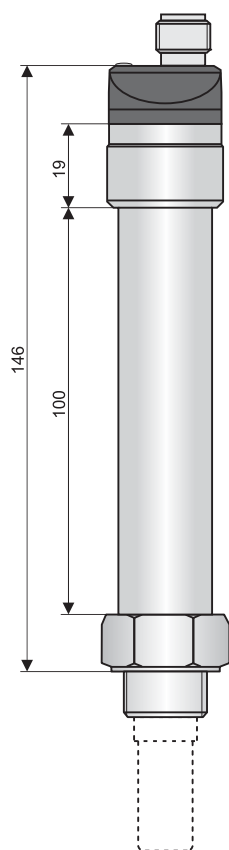
CLS-23N-21



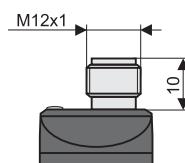
CLS-23N-30



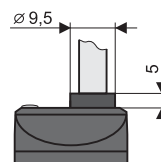
High temperatures variants  
(CLS-23NT-10; 12; 20; 21; 30)



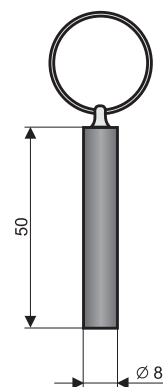
Variants "C" with  
connector



Variants "A" with  
cable outlets



Magnetic pen  
MP-8



## TECHNICAL SPECIFICATIONS

Supply voltage	6 ... 30 VDC
Supply current - OFF state	max. 0.6 mA
Switched current (min / max)	3.3 / 40 mA
Remanent voltage – ON state	max. 6 V
Output time delay	0.1 s
Ambient temperature range (around the housing with electronics)	-20 ... +80°C
Ingress protection	IP68 (0.1 MPa)
Cable ("B" performance with cable gland)	PVC 2x 0.34 mm

## AREA CLASSIFICATION

CLS-23N	Normal performance for non-explosive areas
CLS-23NT	High temperature performance for non-explosive areas

## PROCESS CONNECTION

Type	Size	Marking
Metric thread	M18x1.5	M18
Metric thread	M20x1.5	M20
Pipe thread (BSP)	G 3/8"	G
Sealing thread	1/2–14	NPT

## TEMPERATURE AND PRESSURE RESISTANCE

Variant / Performance	Temperature in process connection place	Medium operating temperature	Max. operating pressure in process connection place			
			up to +30°C	up to +80°C	up to +130°C	up to +150°C
CLS-23N-10, 12	-25°C ... +85°C	-25°C ... +85°C	7 MPa	5 MPa	–	–
CLS-23N-11	-10°C ... +85°C	-10°C ... +85°C	6 MPa	4 MPa	–	–
CLS-23N-30 *	-20°C ... +80°C	-30°C ... +150°C	7 MPa	5 MPa	–	–
CLS-23N-20 *, 21 *	-20°C ... +80°C	-30°C ... +150°C	3 MPa	2.5 MPa	–	–
CLS-23NT-10, 12, 30	-30°C ... +150°C	-30°C ... +150°C	7 MPa	5 MPa	4 MPa	3 MPa
CLS-23NT-20, 21	-30°C ... +150°C	-30°C ... +150°C	3 MPa	2.5 MPa	2 MPa	1 MPa

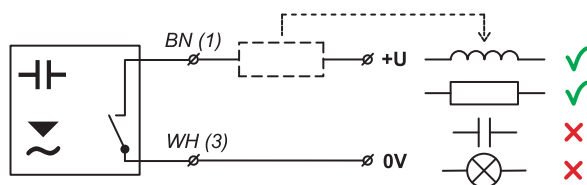
\* Valid for top mounting (in vertical position)

## MATERIAL PERFORMANCE

Sensor part	Variant	Material
Housing	All variants	Plastic material PP
Process coupling	All variants	Stainless steel W.Nr. 1.4305 (AISI 303)
Electrode	All variants	Stainless steel W.Nr. 1.4305 (AISI 303)
Electrode insulation	CLS-23N-11	Plastic material PP
Electrode insulation	CLS-23_-12, 20, 21	Plastic material FEP

## ELECTRICAL CONNECTION

Positive pole (+ U) of power supply is connected through a load (relay) to brown wire, negative pole (0V) is connected to white wire. The sensor output is protected against short circuits. Capacity loads and loads with low sleep resistance (bulb) evaluate the sensor as a short circuit. In the case of connection to evaluation unit or to binary input of the PLC the load is not applied.

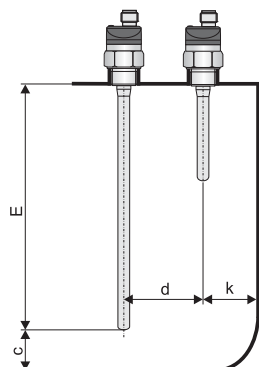


Note: In case of high ambient electromagnetic interference, parallel conductors with power lines, or lines at distances greater than 30 m, we recommend to use shielded cable.

Legend: (1), (3) – Terminals number for variants with connector  
BN – Brown  
WH – White

## INSTALLATION AND RECOMMENDATIONS

For **top mounting** (vertical position) it is necessary to keep the distances from walls and from other sensors.



$$c \geq 10 + \frac{E}{50}$$

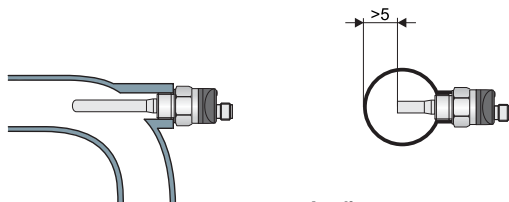
$$d \geq 40 + \frac{E}{40}$$

$$k \geq 20 + \frac{E}{20}$$

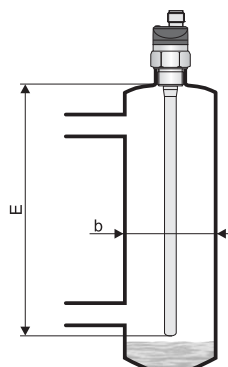
*E* – Electrode length in mm

**Applies to:**  
All types variants

When installing the sensor into the pipe it is necessary to choose properly internal diameter of the tube to ensure the inner walls distances from the electrode to min. 5 mm. In some cases (sticky liquids, liquids with low dielectric constant) is suitable to **mount the sensor** in the knee tube.



**Applies to:**  
CLS–23\_–10, 11, 12, 20, 21

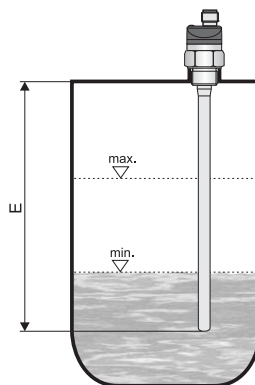


Installation into the **auxiliary gauging (calming) tube**. We recommend to keep the tube diameter.

$$b \geq 40 + \frac{E}{20}$$

*E* – Electrode length in mm

**Applies to:**  
CLS–23\_–20, 21, 30



When installing the sensor in vertical position it can be used for **2-state (LO-HI) level control** between the min. and max. level. The position of the minimum and maximum level can be changed by setting the sensor. Fluid changes require new settings of the sensor

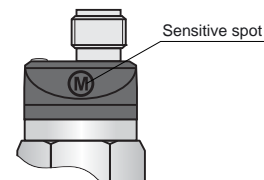
For more information, see the instructions.

*E* – Electrode length in mm

**Applies to:**  
CLS–23\_–20, 30 (only for electrically non-conductive liquids)  
CLS–23\_–21 (for electrically conductive liquids)

## SENSOR SETTINGS

Setting is done by placing a magnetic pen MP – 8 (included in a delivery) to a sensitive spot (M) located next to the connector. Brief attaching (max. 2 sec.) of the magnetic pen causes open state, long attaching (at least 4 sec.) defines closed state of the sensor. In this way, the sensitivity of the measured media and modes of SO (normally open) or SC (normally closed) is set. When you change the fluid it is necessary to make the new settings. More details are given in the instructions.





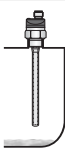



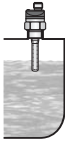

### FACTORY DEFAULT SETTINGS:

Types CLS–23\_–10; –20; –30 are set to detect mineral oil, CLS–23\_–11; –12; –21 to detect water.

## STATUS SIGNALIZATION

Indicator	Function
Orange LED	<b>Continuous light</b> – Sensor is closed (switched ON)
	<b>Dark</b> – Sensor is open (switched OFF)
	<b>Rapid flashing (period 0.2 sec.)*</b> – Unrecognized upper and lower limits or setting mistake
	<b>Slow flashing (period 0.8 sec.)</b> – Short circuit at sensor output

\* Sensor for each flash of the LED switches its output on for approx. 3 ms. This period is sufficiently short to avoid unwanted switching of relay contacts. For binary inputs, we recommend to set the filter so as not to respond to pulses shorter than 3 ms.

	Level state	Mode	Output state	LED Indicator
Minimum level sensing		SO	CLOSED	 (Shine)
		SO	OPEN	 (Dark)
Maximum level sensing		SC	CLOSED	 (Shine)
		SC	OPEN	 (Dark)

For **security reasons**, we recommend to set the **mode SO** (normally open, sensor closes when immersed) for **minimum level detection**. Any failure of the sensor or wiring is equally apparent as the emergency level state. Analogously – for the **maximum level detection** is recommended to set the **mode SC** (normally closed, sensor opens when immersed).

## AREAS OF APPLICATIONS

Detection of various types of liquids - water, oils, coolants, water solutions, etc. Suitable for metal vessels, containers, tanks, sumps, tanks, pipes. Suitability for non-metallic containers (glass, plastic containers, etc.) please consult with the manufacturer.

## ORDER CODE

CLS-23   -  -  -  -  E  Cable  — Length of cable in meters (variant "A")

Length of electrode in mm

Process connection: **G** – Pipe thread G 3/8"  
**M18** – Metric thread M 18x1,5  
**M20** – Metric thread M 20x1,5  
**NPT** – Sealing thread 1/2–14 NPT

Type of output: **S** – 2-wire electronic switch

Electric connection: **A** – Cable outlet (+ Spec. the length of the cable)  
**C** – Connector (+ Spec. type of the socket)

Performance:

**N** – Normal (for non-explosive areas)  
**NT** – High temperature performance (without type "11")

Type and electrode performance:

**10** – Uncoated short bar, length 30 mm  
**11** – Insulated (coated) short bar (PP), length 30 mm (only normal performance "N")  
**12** – Insulated (coated) short bar (FEP), length 30 mm  
**20** – Partly insulated rod (FEP), length 50... 1000 mm  
**21** – Fully insulated rod (FEP), length 50... 1000 mm  
**30** – Uncoated removable rod, length 50... 1000 mm

## CORRECT SPECIFICATION EXAMPLES

CLS-23N-10-A-S-G Cable 8 m  
CLS-23N-30-C-S-M20 E450

CLS-23N-11-C-S-NPT  
CLS-23NT-20-A-S-M18 E320 Cable 4 m

## ACCESSORIES

### *Standard – included in the level sensors price*

- 1x Magnetic pen MP-8

### *Optional – for extra charge*

- Extra cables (over the standard length 2 m)
- Non-rewirable connector plug M12
- Rewirable connector plug M12
- Steel welding flange ON-18x1,5 or ON-G3/8"
- Stainless steel welding flange NN-18x1,5 or NN-G3/8"

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## SAFETY, PROTECTIONS AND COMPATIBILITY

The level sensor is equipped with a protection against electric shock on electrode, polarity, overvoltage and short-term current overload on the output.

Electromagnetic compatibility is provided by conformity with standards EN 55011/B, EN 61326-1, EN 61000-4-2 (8 kV), -4-3 (10 V/m), -4-4 (2 kV), -4-5 (1 kV) and -4-6 (10 V).