CONDUCTIVE LEVEL PROBE

The label *Trafag Industrial Components* extends the Trafag brand name to instruments manufactured by qualified partner companies. *Trafag Industrial Components* complement the genuine Trafag product range to offer customers a complete portfolio from one single source.

Conductive probes constitute a valid solution for controlling the level of liquid with minimum value of conductivity of 5µS/cm.
The resistance between two measuring electrodes changes by the presence or absence of a medium. In single-rod probes, the electrically conductive tank wall serves as a counter electrode.

Applications

- Water and waste water treatment
- Machine tools
- Mobile hydraulics
- Food & Beverages
- Chemical & Pharmaceutical

Features

- No calibration required
- Coated electrodes
- Hermetic construction, epoxy resin sealed
- Minimum degree of protection IP65
- No moving parts in the tank

Reference

- EN61010-1

12/2017

Data sheet H20044a

Standard parameters	
Max electrodes length	2000 mm
Electrodes material	Inox 316 SS
Electrodes coating	Kynar, PTFE or Polyolefins
Working pressure	-1 ... 6 bar
Media temperature	100°C max
Degree of protection	IP65

Trafag Italia Srl
Via Cremona 1
20025 Legnano (Mi)
Tel. +39 0331 59 23 97
Fax +39 0331 59 98 15
www.trafagitalia.com
info@trafagitalia.com

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Ordering code

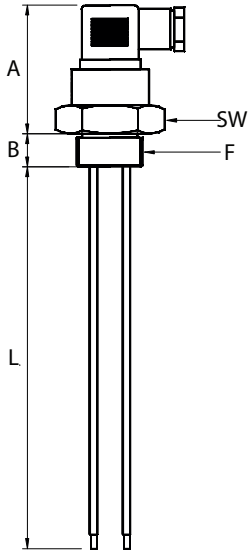
		TCS -	X -	XXX -	X -	XX -	X
1. Process connection material	Polypropylene		P				
	AISI316		S				
2. Process connection[1-2]	G 1/2" m			G15			
	G 1" m			G25			
	G 1 1/2" m			G40			
3. No. electrodes	2				2		
	3				3		
	4				4		
4. Electrodes length (mm)	500					05	
	1000					10	
	1500					15	
	2000					20	
5. Electrodes coating material	Polyolefins						V
	Kynar						K
	PTFE						E

[1] Depend of No. of electrodes
[2] Process connection with NPT on request

Suitable / Not suitable media

Drinking water	✓
Sea water	✓
Milk	✓
Wine and beer	✓
Fruit juices	✓
Acids	✓
Hydraulic oil	✗
Gasoline	✗
Diesel fuel	✗
Distilled water	✗

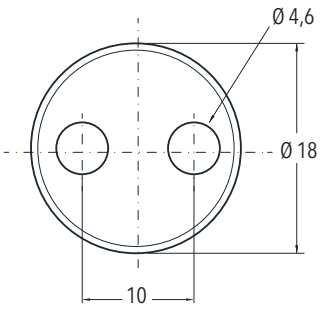
Dimensions - All dimensions are in mm



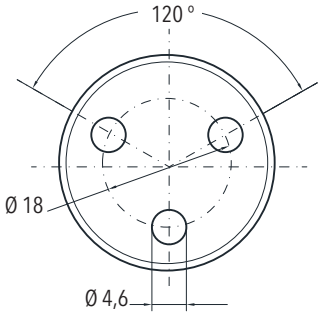
DN	Thread	mm	mm	mm	Electrodes
15	1/2"	32	63	20	2
25	1"	40	68	20	3
40	1-1/2"	55	68	20	4

Note:
For electrodes L=1000 mm the spacers should be positioned at 700 mm from the process connection.
For electrodes > 1000 mm the spacers should be positioned every 500 mm

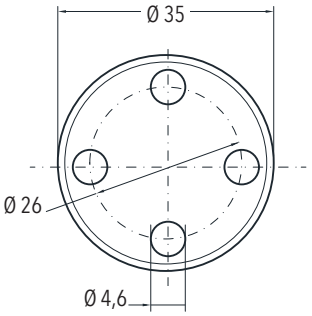
N. 2 Electrodes



N. 3 Electrodes



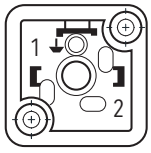
N. 4 Electrodes



Electrical connection

N. 2 Electrodes

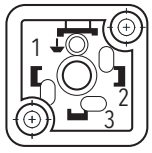
Electrode 1
PIN 1



Electrode 2
PIN 2

N. 3 Electrodes

Electrode 1
PIN 1



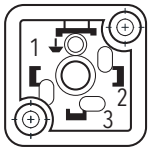
Electrode 2
PIN 2

Electrode 3
PIN 3

N. 4 Electrodes

Electrode 0
PIN 0

Electrode 1
PIN 1



Electrode 2
PIN 2

Electrode 3
PIN 3

Installation

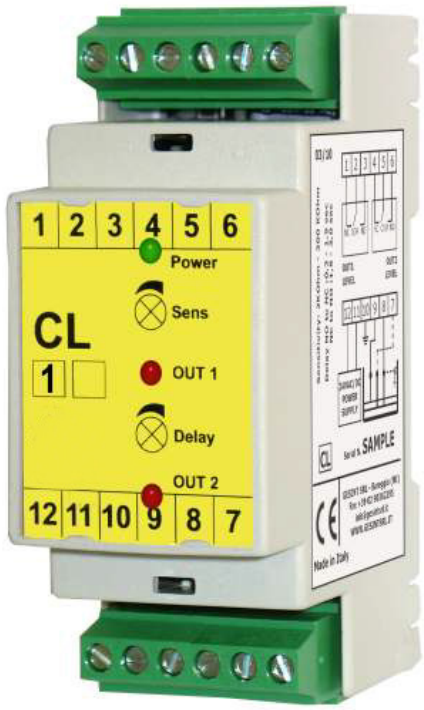
Mounting Location: the rod and rope probes are vertical or lateral mounted in tanks.
Conductive probes are supplied with all electrodes in standard lengths of 500, 1000, 1500 or 2000 mm.
As necessary and depending on the level under control, the electrodes must be shortened, according to the following precautions:
1) The ground electrode must always be the longest and be always immersed in the liquid to be controlled.
2) Once you have shortened the electrodes, remove the coating on the terminal part for about 1 cm. exposing the metal part.

Maintenance

The only recommendation to be observed is: Periodically check the condition of the electrodes and their coating and possibly clean the same with non-aggressive liquids.

ELECTRODE RELAY TYPE CL1 (conductivity level switch) and CL2 (two independent channels conductivity level switch)

CLx sense liquid level detecting conductivity between one or two electrodes (CL2 between two electrodes) installed in a tank to control and a common reference electrode.
When liquid reaches electrodes, a current flows between them causing instrument intervention. The voltage between electrodes is alternate, to avoid electrolysis phenomenal in liquid and electrodes corrosion.

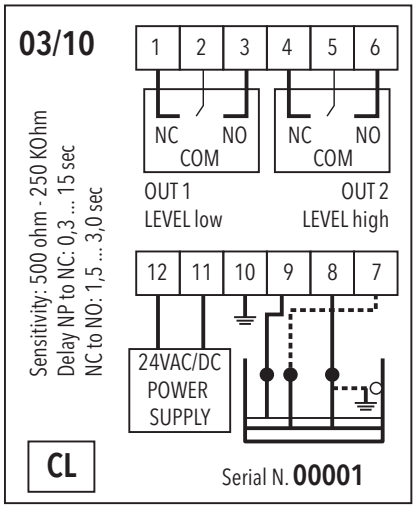


Technical data

Power supply: 24 VAC/DC (CL-1A or CL-2A) or 110-230 VAC (CL-1D or CL2D)
Power consumption: 2VA / 1,8W max
Electrode voltage: 5 VAC max
Electrode current: 0,1 mA max
Sensibility: 0-500Ω / 0-250 KΩ (Sens trimmer)
Minimum conductivity: 4 µS/cm
Storage temperature: from –30 to +80°C
Working temperature: from –20 to +60°C
Output: 2 SPDT relays
Contact rating: 7A @ 250 VAC (resistive load) or 3A @ 230 VAC (single-phase motor)
Relay switching delay: Delay trimmer
Visual signalling: Green LED → Power supply
Red LED → Level threshold
Protection: IP20
Installation: 35 mm DIN rail
Dimensions: 90(H) x 35(L) x 60(P) mm

Electrical connections and applications for CL-1

CL-1 level switch can work with single or double control points.
Used with a single control point it operates as a minimum or maximum level switch, while used as a double control point it can control a pump or valve for maintaining the level between the two control points.
The switch needs two metal electrodes for working, connected at terminal **(8)** and **(9)**, but if tank is metallic it is possible to use only one electrode **(9)** connecting metal structure to terminal **(8)**.
For a double control point operation, three electrodes are needed for working, connected at terminal **(9)** for maximum level, **(7)** for minimum level and **(8)** for common reference. Even in this case, using a metal tank, it is possible to connect at terminal **(8)** the metal structure.



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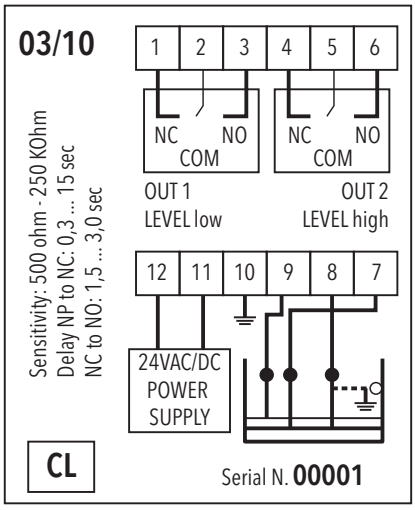
Electrical connections and applications for CL-2

CL-2 level switch is capable of checking conductivity between two distinct electrodes and a common reference electrode. At each electrode is connected an output relay.
The switch needs two metal electrode for level detection, connected at terminal **(7)** and **(9)**.
The common reference electrode, or the tank metal structure, have to be connected at terminal **(8)**.
Output OUT1 is linked at electrode connected at terminal **(7)**, while OUT2 is linked at electrode connected at terminal **(9)**.



Delay adjustment and foam presence

It is possible to adjust switching delay time when fluid level change.
Increasing delay avoid unwanted level change detection due to surface waving or foam presence.
Rotating DELAY trimmer counter-clockwise until you reach lowest point, delay is:
From N.O. to N.C. : 0,3 sec (level increase)
From N.C. to N.O. : 1,5 sec (level decrease)
Rotating DELAY trimmer clockwise until you reach highest point, delay is:
From N.O. to N.C. : 1,5 sec (level increase)
From N.C. to N.O. : 3,0 sec (level decrease)
Intermediate trimmer position change delay time in linear mode between minimum and maximum.

Operation and calibration

When electrode is uncovered, relays are de-energized and so the red LEDs on front are off.
When liquid reaches electrode, relays energize and red LEDs turn on.
To calibrate sensibility, move SENS trimmer counterclockwise to minimum and add liquid until it reach the electrode.
Then slowly turn the trimmer clockwise until liquid is detected. In order to have a sensibility margin, turn again the trimmer clockwise for 10-15% rotation. For a correct installation in the cabinet board, the instrument must be about 1cm far from other instruments.

Additional information			
Documents	Data sheet	H20044	www.trafag.com/H20044
	Instructions	H21044	www.trafag.com/H21044