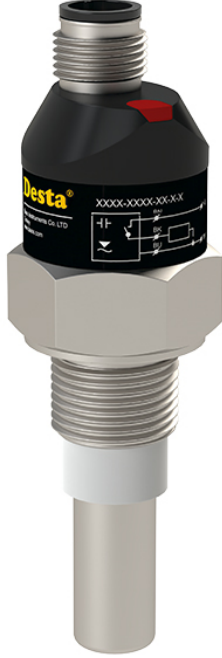
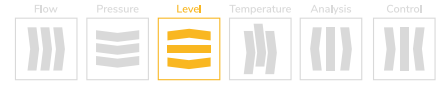


CLS

Capacitive Level Sensor



OVERVIEW

Operation

Capacitive level sensors (switches) CLS are designed for limit level detection of electrically conductive and non-conductive liquids. The sensitivity of the sensor can be easily set by placing magnetic pen on sensitive spot. The process coupling at the housing can be with metric thread (M18x1,5; M20x1,5) pipe thread (G3/8" ; G1/2") or sealing thread (NPT 1/2-14). Output performances-transistor output with open collector (PNP) two wire electronic switch (S) and NAMUR output for intrinsically safe connection.

Application

- Water, oils, coolants, water solution
- Metal vessels, containers, sumps, pipes
- Tanks
- For level detection of electrically conductive and non-conductive liquids

Features

- Compact miniature performance for direct mounting to vessels, tanks etc.
- Easy setting by means of magnetic pen
- High temperature performance available
- LED state indication
- Output types S, PNP, NAMUR



OPERATING DATA

Ambient Temperature

-20...+75°C

Connection Temperature

-25...+105°C Standard
-30...+150°C for High temperature

Operating Pressure

80 Bar max.

Enclosure

IP68

Recommended Cable

PVC 2x0,34 mm²(3x0,34 mm²)

Safety Integrity Level

SIL 1

MEASURING RANGES

Electrode Length

30 mm for sensor types 10,11,12
50-1000 mm for s. types 20,21,30

MATERIALS

Housing

PP

Process Coupling

AISI 303

Electrode

AISI 303

Electrode Insulation

PP/FEP

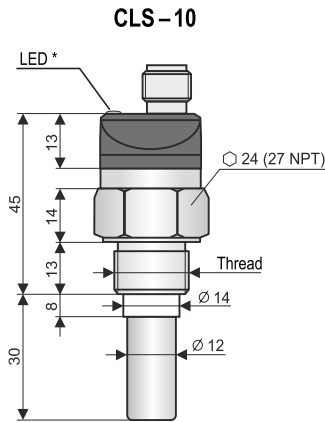
CONNECTION

Thread

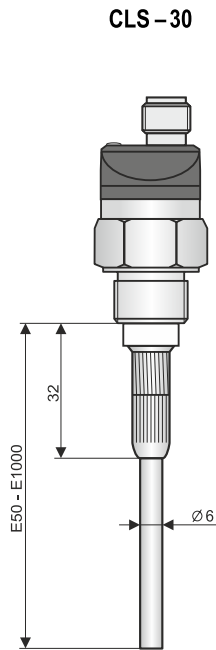
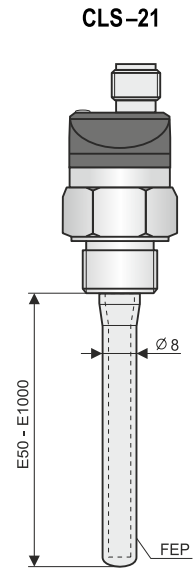
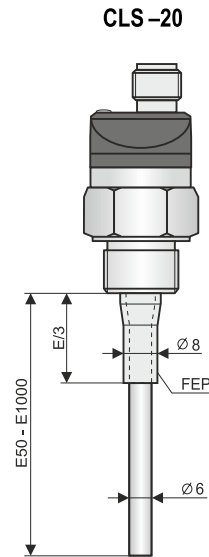
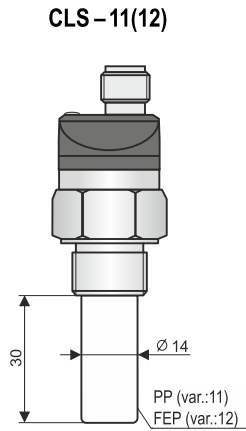
1/2" NPT /G 3/8" / G 1/2"
M18x1,5 / M20x1,5



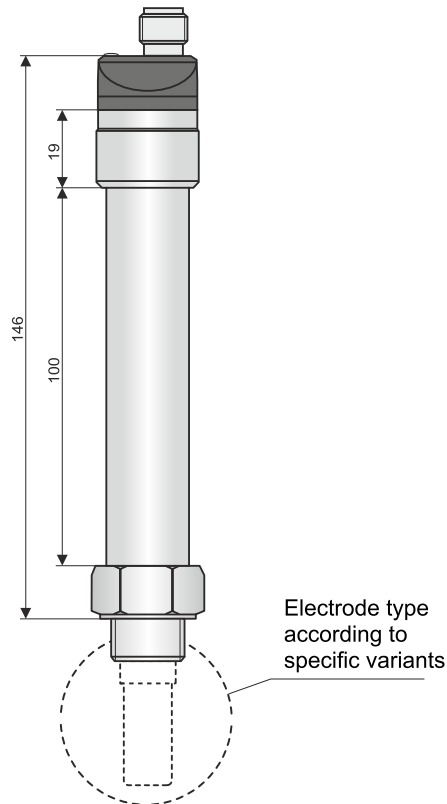
TECHNICAL DRAWINGS AND DIMENSIONS



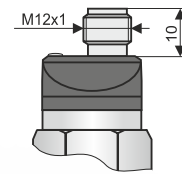
Types of threads:
G 3/8"
M18x1,5
M20x1,5
1/2-14 NPT



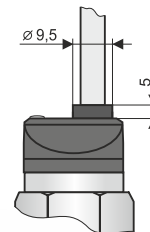
High temperature variants



Variant „C“ with connector (outside CLS-E*)



Variant „A“ with cable outlet



* Variant „E“ without LED state indicator



ELECTRICAL DATA

Power Supply

6...30 V DC
8...9 V DC for Ex proof

Current Supply (state OFF/ON)

≤ 1 mA / ≥ 2.2 mA for Ex proof, 0.6/7 mA for type P

Max. Switching Current (NPN, PNP)

100 mA for type P, 3.3 mA/40 mA for type S

Limit Parameters

$U_i = 12$ V DC; $I_i = 15$ mA; $P_i = 45$ mW; $C_i = 15$ nF;
 $L_i = 10$ μ h

Reference Value LC

Typ. C < 150 pF/m, Typ. L < 0.8 μ H/m

Delay

0.1 s

Couple Capacity

44 nF / 250 V AC for Ex proof

TEMPERATURE AND PRESSURE RESISTIVITY

Exproof Variants

Variant (Performance)	Temperature t_p	Temperature t_m	Temperature t_a	Max. operating pressure for temperature t_p				
				to 30°C	to 85°C	to 105°C	to 130°C	to 150°C
CLS-Xi-10	-25°C ... +105°C	-25°C ... +105°C	-20°C ... +75°C	8 MPa	6 MPa	5 MPa	–	–
CLS-XiT-10	-30°C ... +150°C	-30°C ... +150°C	-20°C ... +75°C	8 MPa	6 MPa	5 MPa	4 MPa	3 MPa
CLS-Xi-11	-10°C ... +105°C	-10°C ... +105°C	-10°C ... +75°C	7 MPa	5 MPa	4 MPa	–	–
CLS-Xi-12	-25°C ... +105°C	-25°C ... +105°C	-20°C ... +75°C	8 MPa	6 MPa	5 MPa	–	–
CLS-XiT-12	-30°C ... +150°C	-30°C ... +150°C	-20°C ... +75°C	8 MPa	6 MPa	5 MPa	4 MPa	3 MPa
CLS-Xi-20	-25°C ... +105°C	-30°C ... +150°C*	-20°C ... +75°C	3 MPa	2,5 MPa	2 MPa	–	–
CLS-XiT-20	-30°C ... +150°C	-30°C ... +150°C	-20°C ... +75°C	3 MPa	2,5 MPa	2 MPa	1,5 MPa	1 MPa
CLS-Xi-21	-25°C ... +105°C	-30°C ... +150°C*	-20°C ... +75°C	3 MPa	2,5 MPa	2 MPa	–	–
CLS-XiT-21	-30°C ... +150°C	-30°C ... +150°C	-20°C ... +75°C	3 MPa	2,5 MPa	2 MPa	1,5 MPa	1 MPa
CLS-Xi-30	-25°C ... +105°C	-30°C ... +150°C*	-20°C ... +75°C	8 MPa	6 MPa	5 MPa	–	–
CLS-XiT-30	-30°C ... +150°C	-30°C ... +150°C	-20°C ... +75°C	8 MPa	6 MPa	5 MPa	4 MPa	3 MPa

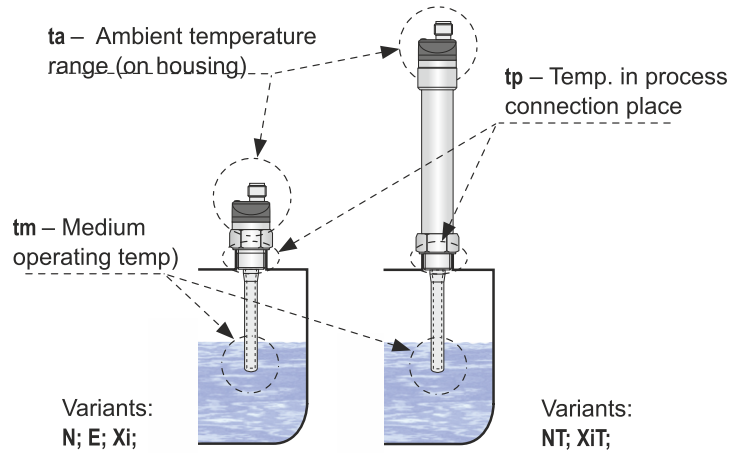
* Valid for top mounting (in vertical position)



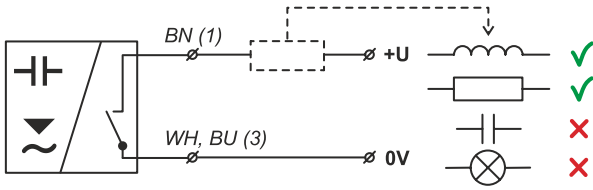
Standard Variants

Variant (Performance)	Temperature t_p	Temperature t_m	Temperature t_a	Max. operating pressure for temperature t_p				
				to 30°C	to 85°C	to 105°C	to 130°C	to 150°C
CLS-N-10	-25°C ... +105°C	-25°C ... +105°C	-20°C ... +80°C	8 MPa	6 MPa	5 MPa	–	–
CLS-E-10	-25°C ... +120°C	-25°C ... +120°C	-25°C ... +105°C	8 MPa	6 MPa	5 MPa	–	–
CLS-NT-10	-30°C ... +150°C	-30°C ... +150°C	-20°C ... +80°C	8 MPa	6 MPa	5 MPa	4 MPa	3 MPa
CLS-N-11	-10°C ... +105°C	-10°C ... +105°C	-10°C ... +80°C	7 MPa	5 MPa	4 MPa	–	–
CLS-E-11	-10°C ... +105°C	-10°C ... +105°C	-10°C ... +105°C	7 MPa	5 MPa	4 MPa	–	–
CLS-N-12	-25°C ... +105°C	-25°C ... +105°C	-20°C ... +80°C	8 MPa	6 MPa	5 MPa	–	–
CLS-E-12	-25°C ... +120°C	-25°C ... +120°C	-25°C ... +105°C	8 MPa	6 MPa	5 MPa	–	–
CLS-NT-12	-30°C ... +150°C	-30°C ... +150°C	-20°C ... +80°C	8 MPa	6 MPa	5 MPa	4 MPa	3 MPa
CLS-N-20	-25°C ... +105°C	-30°C ... +150°C*	-20°C ... +80°C	3 MPa	2,5 MPa	2 MPa	–	–
CLS-E-20	-25°C ... +120°C	-30°C ... +150°C*	-25°C ... +105°C	3 MPa	2,5 MPa	2 MPa	–	–
CLS-NT-20	-30°C ... +150°C	-30°C ... +150°C	-20°C ... +80°C	3 MPa	2,5 MPa	2 MPa	1,5 MPa	1 MPa
CLS-N-21	-25°C ... +105°C	-30°C ... +150°C*	-20°C ... +80°C	3 MPa	2,5 MPa	2 MPa	–	–
CLS-E-21	-25°C ... +120°C	-30°C ... +150°C*	-25°C ... +105°C	3 MPa	2,5 MPa	2 MPa	–	–
CLS-NT-21	-30°C ... +150°C	-30°C ... +150°C	-20°C ... +80°C	3 MPa	2,5 MPa	2 MPa	1,5 MPa	1 MPa
CLS-N-30	-25°C ... +105°C	-30°C ... +150°C*	-20°C ... +80°C	8 MPa	6 MPa	5 MPa	–	–
CLS-E-30	-25°C ... +120°C	-30°C ... +150°C*	-25°C ... +105°C	8 MPa	6 MPa	5 MPa	–	–
CLS-NT-30	-30°C ... +150°C	-30°C ... +150°C	-20°C ... +80°C	8 MPa	6 MPa	5 MPa	4 MPa	3 MPa

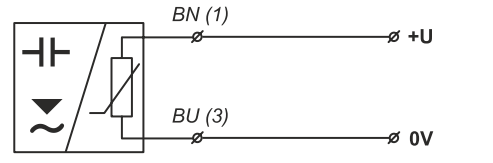
* Valid for top mounting (in vertical position)



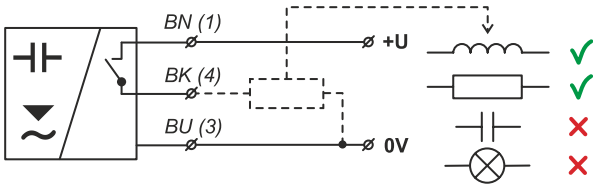
WIRING



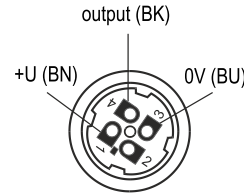
"S" type sensors connection
(2 - wire electronic switch)



"R" (NAMUR) type sensors connection



"P" (PNP) type sensors connection



Inside of the connector socket

Legend:

- (1...4) – terminals number for variants with connector
 BN – brown
 WH – white
 BK – black
 BU – blue



ORDERING

Model	
CLS	Capacitive Level Sensor

Model	
N	Non-explosive areas
E	Extended temperature range (without LED)
NT	High temperature
Xi	Ex-proof explosion environments
XiT	Ex-proof high temperature explosive environments

Sensor	
10	Uncoated short bar, length 30 mm
11	Insulated (coated) short bar (PP), length 30 mm (only for N and Xi)
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

Electrical Connection	
A	Cable outlet
C	Connector (Extep E version)

Output	
P	PNP
S	2-wire electronic switch
R	NAMUR

Connection	
1	G 3/8 thread
2	G 1/2 thread
3	M18 thread
4	M20 thread
5	1/2" NPT

Electrode Length	
XX	Please specify in order as unit is mm

Cable Length	
XX	Please specify in order as unit is m

