

NIVOCAP 2-wire capacitive level transmitters are an ideal solution for level measurement of conductive and non-conductive liquids. The instrument's probe and the reference probe (which can be either the metal wall of the tank or a separate probe) operate as opposing plates of a capacitor. Between the plates of this capacitor, the air is replaced by a medium with a higher dielectric constant, changing the capacitance proportionally to the material's level. The incorporated electronic circuitry measures the capacitance difference and converts it to an output signal.

## FEATURES

- Maximum 20 m measuring range
- Vertical mounting
- Rod or cable probe versions
- $-30...+200\text{ }^{\circ}\text{C}$  medium temperature
- Up to 40 bar medium pressure
- 32-point linearization table
- Indirect assignment of 0% and 100%
- $4...20\text{ mA} + \text{HART}^{\circ}$  output
- Ex version
- IP67

## APPLICATIONS

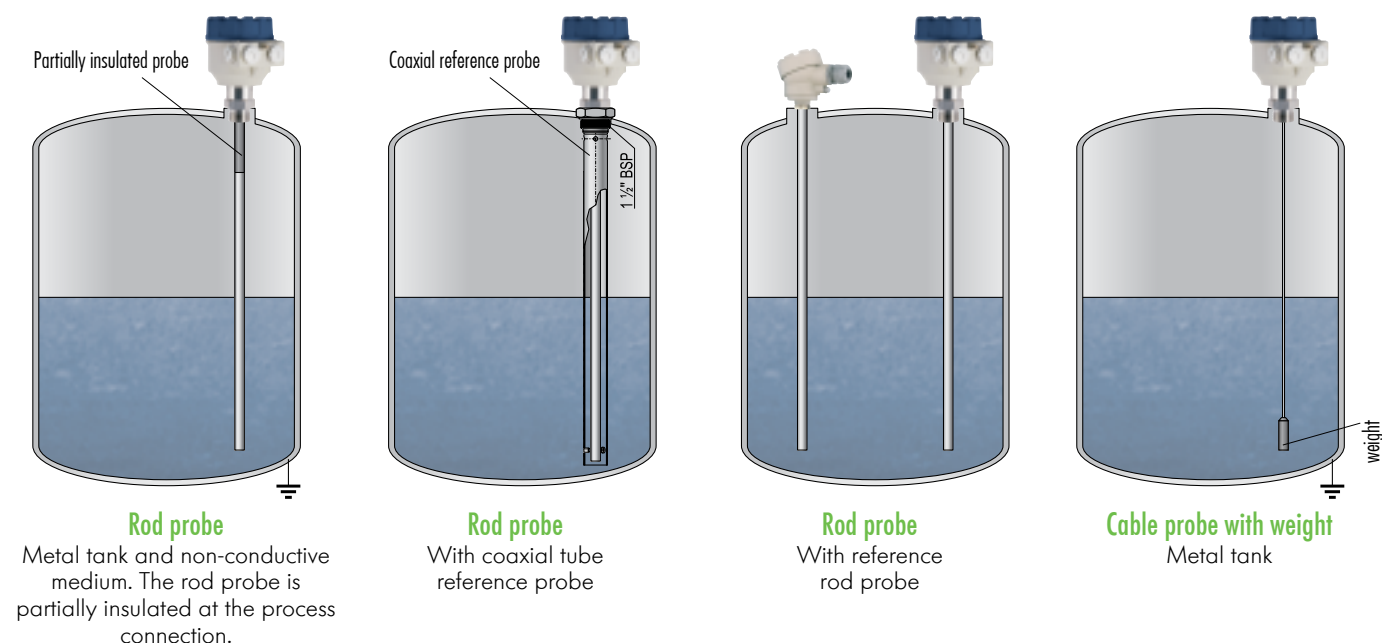
- Level and volume measurement
- Level measurement of conductive and non-conductive materials
- Level measurement of liquids
- For high pressures and high-temperature mediums

## CERTIFICATES

- ATEX (Ex ia G)



## ARRANGEMENTS



## TECHNICAL DATA

		Version	Rod probe	High-temperature rod probe	Cable probe
Measuring range (Ln)			0.2...3 m		1...20 m
Capacitance range			0 pF...5 nF		
Min. capacitance change			Max. (I <sub>out</sub> ) SPAN: 10 pF or 10% FS		
Saturation capacitance of the insulated probe			~600 pF/m		~200 pF/m
Relative dielectric constant			$\epsilon_r$ min. 1.5		
Process connection			As per order code		
Material of wetted parts	Threaded part		1.4571 Stainless steel		
	Probe		Fully or partially PFA-coated 1.4301 stainless steel		Fully or partially FEP-coated steel cable
Housing material			Plastic (PBT), powder-coated aluminum or stainless steel		
Medium temperature			-30...+130 °C	-30...+200 °C	-30...+130 °C
Ambient temperature			-25...+70 °C		
Medium pressure			Maximum 40 bar (4 MPa)		Maximum 16 bar (1.6 MPa)
Power supply / consumption			12...36 V DC / maximum 800 mW, transient overvoltage protection		
Output properties	Output signals		Analog: 4...20 mA (3.9...20.5 mA) $R_{max} = (U_t - 11.4 \text{ V})/0.02 \text{ A}$ Error indication: 3.8 mA or 22 mA		
			Digital communication: HART®		
			Display module: SAP-202, 6-digit LCD, dimensions, bargraph		
			Current loop test: 10 mV / 1 mA via resistor in series		
	Damping time		0, 3, 6...300 sec selectable		
	Linearity error		±0.3% FS		
		Temperature error	±0.02% / °C FS		
Electrical connection			2x M20×1.5 cable glands + Two internally threaded ½" NPT connection for protective pipes, cable outer diameter: Ø7...Ø13 mm, wire cross section: maximum 1.5 mm²		
Electrical protection			Class III		
Ingress protection			IP67		
Weight			~2.5 kg with 0.5 m probe	~3 kg with 0.5 m probe	~2 kg with 3 m probe

## Ex INFORMATION

C□□-2□□-□Ex / C□□-3□□-□Ex		
Protection		Intrinsic safety
Ex marking		Ⓔ II 1 G Ex ia IIB T6...T3 Ga
Intrinsic safety data		$C_i \leq 15 \text{ nF}$ , $L_i \leq 200 \text{ } \mu\text{H}$ , $U_i \leq 30 \text{ V}$ , $I_i \leq 140 \text{ mA}$ , $P_i \leq 1.0 \text{ W}$
Temperature classification	T6...T4 temperature class	$T_{ambient}: -25...+70 \text{ }^\circ\text{C}$ ; $T_{medium}: \text{maximum } +80...+120 \text{ }^\circ\text{C}$
	T3 temperature class	$T_{ambient}: -25...+45 \text{ }^\circ\text{C}$ ; $T_{medium}: \text{maximum } +190 \text{ }^\circ\text{C}$

## SELECTING THE APPROPRIATE PROBE

The device uses the capacitive operating principle; therefore, if the dielectric constant of the measured material changes or it is too low, or the wrong probes are selected for the job, measurement accuracy will suffer.

	Material				Reference probe		
	Conductive	Non-conductive			Rod	Tube	Tank wall
		$\epsilon_r > 2$	$2 > \epsilon_r > 1.5$				
Insulated probe, reference probe	■	■	–	Conductive tank	■	■	■
Partially insulated probe, reference probe	–	■	■	Non-conductive tank	■	■	–

## NIVOCAP C-200/C-300 with rod probe

5 years

2-wire compact capacitive level transmitter for conductive and non-conductive liquids with partially or fully plastic-coated stainless steel rod probe

### Version / Max. temperature

C ☐ ☐ ☐ - ☐ ☐ ☐ - ☐

T	Transmitter / +130 °C
B	Transmitter with local LCD display / +130 °C
H	Transmitter / +200 °C
P	Transmitter with local LCD display / +200 °C

### Process connection size / Insulation

C ☐ ☐ ☐ - ☐ ☐ ☐ - ☐

M	¾" BSP / Fully PFA-insulated stainless steel
Z	¾" NPT / Fully PFA-insulated stainless steel
R	1" BSP / Fully PFA-insulated stainless steel
P	1" BSP / Partially PFA-insulated stainless steel
A	1" NPT / Fully PFA-insulated stainless steel
C	1" NPT / Partially PFA-insulated stainless steel
S	1½" BSP / Fully PFA-insulated stainless steel
T	1½" BSP / Partially PFA-insulated stainless steel
B	1½" NPT / Fully PFA-insulated stainless steel
D	1½" NPT / Partially PFA-insulated stainless steel

### Housing

C ☐ ☐ ☐ - ☐ ☐ ☐ - ☐

2	Aluminum (powder-coated)
3	Plastic, PBT, fiberglass-reinforced
4	* Stainless steel

\* Ex version under approval

### Probe length

C ☐ ☐ ☐ - ☐ ☐ ☐ - ☐

Fully PFA-insulated

0 2	0.2 m
n n	0.3...3 m; sold by the 100 mm

Partially PFA insulated

0 2	0.2 m
n n	0.3...3 m; sold by the 100 mm

nn = 03...30 : 0.3...3 m

### Output / Certificates

C ☐ ☐ ☐ - ☐ ☐ ☐ - ☐

2	4...20 mA
4	4...20 mA + HART®
6	4...20 mA / Ex ia G
8	4...20 mA+ HART® / Ex ia G

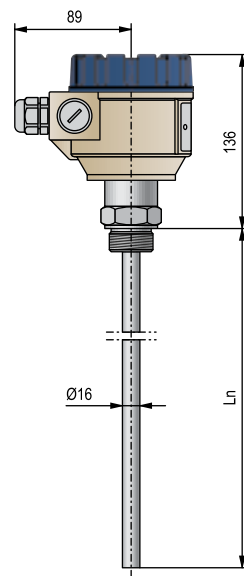
Available on request: special process connections (should be given in the text of the order)

X07	1½" TriClamp (ISO 2852)
X07	2" TriClamp (ISO 2852)
X12	DN40 Pipe coupling (DIN 11851)
X12	DN50 Pipe coupling (DIN 11851)

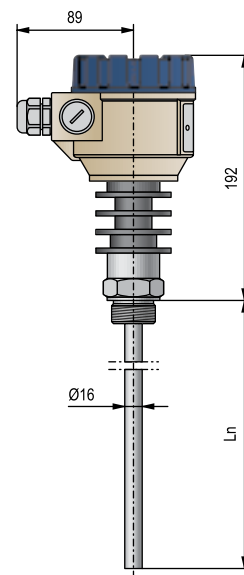
Accessories sold separately; see relevant page for details

CBR-205-2M-900-01	Adapter 1" BSP / ¾" NPT (1.4571)
CBR-205-2M-900-02	Adapter 1" BSP / 2" BSP (1.4571)

S A P - 2 0 2 - 0	Plug-in display module
S A T - 3 0 4 - 0	HART®-USB modem
S A T - 5 0 4 - <input type="checkbox"/>	HART®-USB/Bluetooth® modem
S A K - 3 0 5 - 2	HART®-USB/RS485 modem
S A K - 3 0 5 - 6	HART®-USB/RS485 modem / [Ex ia G]



CTR-200/300



CHR-200/300

### NIVOCAP C coaxial reference probe

5 years

For use with NIVOCAP rod probe capacitive level transmitters

Internal process connection for NIVOCAP: 1" BSP, process connection: 1½" BSP/NPT

#### Connection type

C ☐ F - 1 ☐ ☐ - 0

A BSP

D NPT

#### Probe length

C ☐ F - 1 ☐ ☐ - 0

0 2 0.2 m

n n 0.3...3 m; sold by the 0.1 m

nn = 03...30 : 0.3...3 m

### NIVOCAP C reference rod probe

5 years

Reference rod probes for NIVOCAP rod probe type capacitance level transmitters

Process connection 1" BSP/NPT

#### Connection type

C ☐ ☐ - 1 ☐ ☐ - 0

F BSP thread

E NPT thread

#### Connection size / Insulation

C ☐ ☐ - 1 ☐ ☐ - 0

R 1" / Fully PFA-insulated stainless steel

P 1" / Partially-PFA insulated stainless steel

#### Probe length

C ☐ ☐ - 1 ☐ ☐ - 0

Fully PFA-insulated

0 2 0.2 m

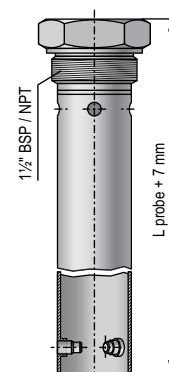
n n 0.3...3 m; sold by the 100 mm

Partially PFA-insulated

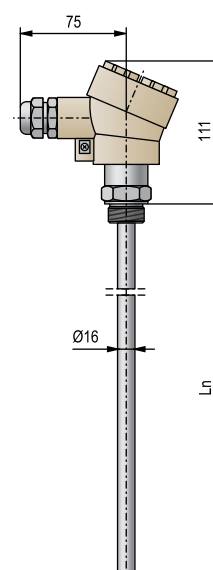
0 2 0.2 m

n n 0.3...3 m; sold by the 100 mm

nn = 03...30 : 0.3...3 m



CAF-100



CFR-100

