



RusAutomation

FOR LIQUIDS

NIVOCAP

CAPACITIVE LEVEL TRANSMITTERS



3 YEARS WARRANTY @ NIVELCO – WHERE ELSE?

NIVELCO

LEVEL TRANSMITTERS

GENERAL DESCRIPTION

NIVOCAP 2-wire capacitive level transmitters provide an ideal solution for level measurement of conductive or non-conductive liquids. The probe of the instrument and the reference probe (which can be either the metal wall of the tank or installed separately) operate as opposing plates of a capacitor. Between the plates of this capacitor the air is replaced by a medium with greater dielectric constant than the air during filling the tank, therefore the capacitance is changing directly proportional to the level. The incorporated electronic circuitry measures the capacitance difference and converts it to an output signal proportional to level.

MAIN FEATURES

- Maximum 20 m measurement range
- Vertical mounting
- Rod or cable probe versions
- -30 °C ...+200 °C medium temperature
- Max. 40 bar medium pressure
- 32 point linearization table
- Indirect assignment of 0% and 100%
- 4 – 20 mA + HART® output
- Ex version
- IP67 protection

APPLICATIONS

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

CERTIFICATIONS

- ATEX (Ex ia)



CHR-200

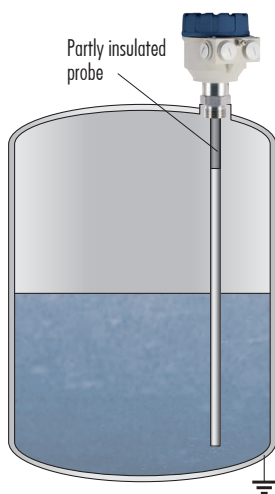
CAF-110

CFR-100

CTR-300

CTK-200

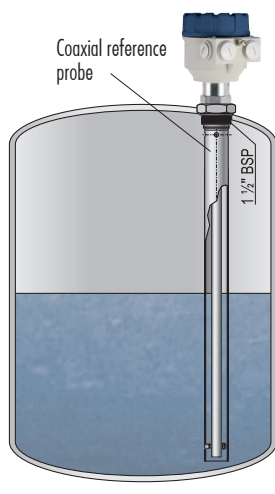
MEASUREMENT ARRANGEMENTS



Rod probe

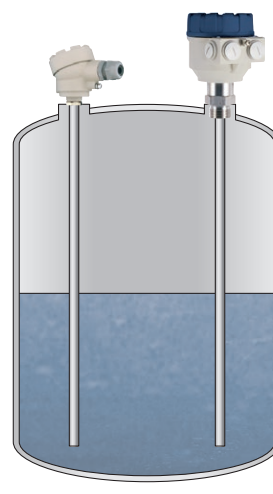
Metal tank and non-conductive medium.

The rod probe is insulated partly at the process connection.



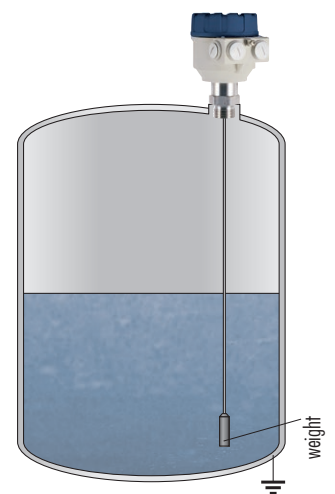
Rod probe

With coaxial tube reference probe



Rod probe

With reference rod probe



Cable probe with weight

Metal tank

TECHNICAL DATA

Version		Rod probe	High temperature rod probe	Cable probe
Measurement range (Ln)		0.2 – 3 m		1 – 20 m
Capacitance range		0 pF – 5 nF		
Min. capacitance change		Max. (I _{out}) SPAN: 10 pF or 10% FS		
Saturation capacitance of the insulated probe		~600 pF/m		~200 pF/m
Relative dielectric constant		ϵ_r , min. 1.5		
Process connection		As per order codes		
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), paint coated aluminium or stainless steel		
Medium temperature		-30 °C ... +130 °C	-30 °C ... +200 °C	-30 °C ... +130 °C
Ambient temperature		-25 °C ... +70 °C		
Medium pressure		Max. 4 MPa (40 bar)		Max. 1.6 MPa (16 bar)
Power supply / consumption		12 – 36 V DC / max. 800 mW, overvoltage protection against transients		
Output data	Output signals	Analogue: 4 – 20 mA (3.9 – 20.5 mA) $R_{max} = U_f - 1.4 V / 0.02A$ Error indication: 3.8 mA or 22 mA		
		Digital communication: 4 – 20 mA + HART®		
		Display module: SAP-202, 6 digit LCD, dimensions, bargraph		
	Damping time	0, 3, 6 – 300 sec selectable		
	Linearity error	±0.3% FS		
Temperature error	±0.02% /°C FS			
Electrical connection		2x M20x1.5 cable glands + internal thread for 2x 1/2" NPT cable protective pipe, cable outer diameter: Ø7 – Ø13 mm, wire cross section: max. 1.5 mm²		
Electrical protection		Class III		
Ingress protection		IP67		
Mass		~2.5 kg with 0.5 m probe	~3 kg with 0.5 m probe	~2 kg with 3 m probe

SPECIAL DATA FOR Ex CERTIFIED MODELS

Type	C□□-2□□-□ Ex / C□□-3□□-□ Ex	
Protection type	Intrinsically safe	
Ex marking	Ⓔ II 1 G Ex ia IIB T6...T3 Ga	
Intrinsically safe data	C _i ≤ 15 nF, L _i ≤ 200 µH, U _i ≤ 30 V, I _i ≤ 140 mA, P _i ≤ 1.0 W	
Temperature classification	T6...T4 temperature class	T _{ambient} : -25 °C ... +70 °C; T _{medium} max. 80 °C ... 120 °C
	T3 temperature class	T _{ambient} : -25 °C ... +45 °C; T _{medium} max. 190 °C

PROBE SELECTION

Consequences of the capacitive operation principle: Relative dielectric constant of the medium should be taken into consideration. Measurement will be accurate only in case of suitable probe and reference probe selection.

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