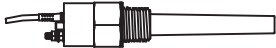


## Table of contents

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	Page
Specifications/ Application	2
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CN 7100 	3
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Options	4
Accessories	4
Detailed Ex-markings	4
Dimensions	5
Electrical installation	6

Subject to change.

All dimensions in mm (inches).

All prices in Euro (€) or USD (\$),  
 excluding VAT.

All EURO prices are EXW Betzigau,  
 all USD prices are EXW Memphis,  
 excluding packaging costs.

Valid: From 01.04.2021 until 31.03.2022, unless otherwise agreed.

By publishing this selection list all other lists become invalid.

We assume no liability for typing errors.

Different variations to those specified are possible.  
 Please contact our technical consultants.

## Specifications

- Level limit detection in liquids, slurries, foam, interfaces and solids
- Compact unit
- Wide range of applications
- No maintenance
- Full-, demand-, empty detector
- Integral cable version or Enclosure version
- Corrosion resistant construction
- Capacitive technology
- Sensitivity: dielectric constant  $\geq 1.5$
- 2-wire 4/ 20 mA switch
- Non-polarized, solid-state switch or relay output
- FSL/ FSH selectable
- 2011/65/EU RoHS conform

Approvals	CE/ FM/ CSA/ TR-CU	Ordinary Locations (General purpose)
	ATEX/ INMETRO/ TR-CU	Zone 0, 0/1, 20, 20/21 Intrinsically safe
	FM/ CSA	Class I, II, III, Div. 1, Gr. A-G Intrinsically Safe
	Lloyds	Categories ENV1, ENV2, ENV3 and ENV5
	WHG	Overfill protection

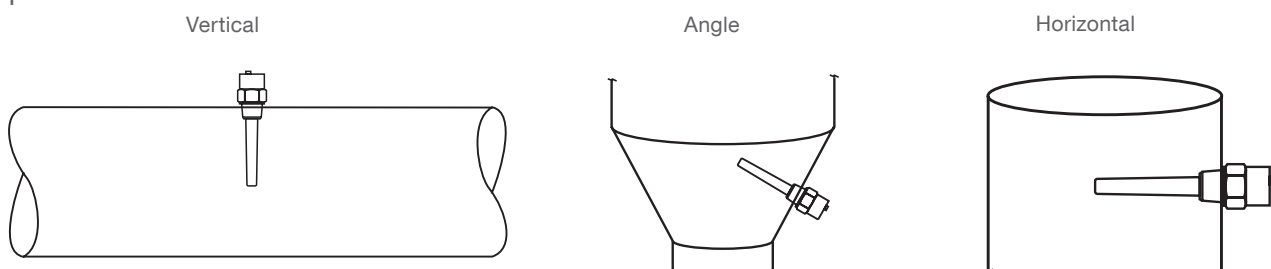
Electronics	Power supply	12 - 33 V DC <sup>(1)</sup>
	Output	4/ 20 mA or 20/ 4 mA, 2-wire current loop detection Solid-state switch 30 V DC max, Relay 60 V DC or 30 V AC max <sup>(1)</sup>

(1) Reduces values present for intrinsically safe version and for wet locations

		Integral cable version	Enclosure version
Mechanics and Process	Housing/ lid	316L stainless steel	VALOX® (thermoplastic polyester)/ PC (polycarbonate) transparent
	Ingress protection	Type 4/ NEMA 4/ IP65	Type 4/ NEMA 4/ IP68 <sup>(2)</sup>
	Length of extension	120 mm (4.7")	120 mm (4.7")
	Ambient temperature	-30 .. +85°C (-22 .. +185°F)	-10 .. +85°C (+14 .. +185°F) with PPS process connection -30 .. +85°C (-22 .. +185°F) with SS process connection
	Process temperature	-30 .. +100°C (-22 .. +212°F) With ATEX, INMETRO, TR-CU approval: -30 .. +85°C (-22 .. +185°F)	With PPS process connection: -10 .. +100°C (+14 .. +212°F) With stainless steel process connection: -30 .. +100°C (-22 .. +212°F) With ATEX, INMETRO, TR-CU approval: -30 .. +85°C (-22 .. +185°F)
	Process pressure	-1 .. 10 bar (146 psi) gauge, nominal	-1 .. 10 bar (146 psi) gauge, nominal
	Process connection	Stainless steel 1.4404 (316L): $\frac{3}{4}$ " NPT or R 1" (BSPT) or G 1" (BSPP)	Stainless steel 1.4404 (316L): $\frac{3}{4}$ " NPT or R 1" (BSPT) or G 1" (BSPP) PPS (Fully synthetic): $\frac{3}{4}$ " NPT or R 1" (BSPT)
	Material of sensor	PPS or PVDF	PPS or PVDF
	Material of seal (probe)	FKM or FFKM	FKM or FFKM
	Connecting cable	1 m (3.3 ft) of 4 conductor, 22 AWG, shielded, polyester jacket	-

(2) For version with plug the type of protection can be lower (see page 4).

## Applications



## CN 7100



Integral cable version



Enclosure version

**Dimensions:** see page 5  
**Cable entries:** M20 x 1.5 (1x cable gland, attached) for Process connection R and G  
 NPT 1/2" (1x open conduit) for Process connection NPT  
 Options see page 4

### Basic type

**CN 7100** ..... •

pos.2 **Certificate** (detailed Ex-markings: see page 4)

	Gas	Dust	Protection method
0 CE <sup>(2)</sup>	-	-	General purpose
Q CE/ FM/ CSA <sup>(1,2)</sup>	-	-	General purpose
Y ATEX/ FM/ CSA <sup>(2,3)</sup>	Zone 0 and 0/1, Cl. I Div.1	Zone 20 and 20/21, Cl. II, III, Div.1	Intrinsically Safe
B INMETRO <sup>(3)</sup>	Zone 0 and 0/1	Zone 21 and 20/21	Intrinsically Safe
V TR-CU <sup>(3)</sup>	Zone 0 and 0/1	Zone 21 and 20/21	Intrinsically Safe

pos.3 **Device version**

- 1 Integral cable ..... •
- 2 Enclosure ..... •

pos.4 **Electronic module**

- A 2-wire 4/ 20 mA, solid state or relay switch<sup>(4)</sup> ..... •

pos.5 **Material of sensor**

- A PPS ..... •
- B PVDF ..... •

pos.6 **Process connection**

- A Thread 3/4" NPT ..... •
- E Thread R 1" ..... •
- J Thread G 1" ..... •

pos.7 **Material of process connection**

- 1 PPS ..... ↑
- 2 Stainless steel 1.4404 (316L) ..... ↑

**Further options:** see page 4

(1) Included is: TR-CU (Ordinary Locations).  
 (2) Included is: Lloyds.  
 (3) Intrinsically safe barrier required.  
 (4) Implemented is relay switch with PPS (pos.7 1), solid state switch with stainless steel (pos.7 2).

**CN 7100 A A** ← **Order code**

Position 1 2 3 4 5 6 7

All positions are available with special design (use code "Z").

## Options / Accessories

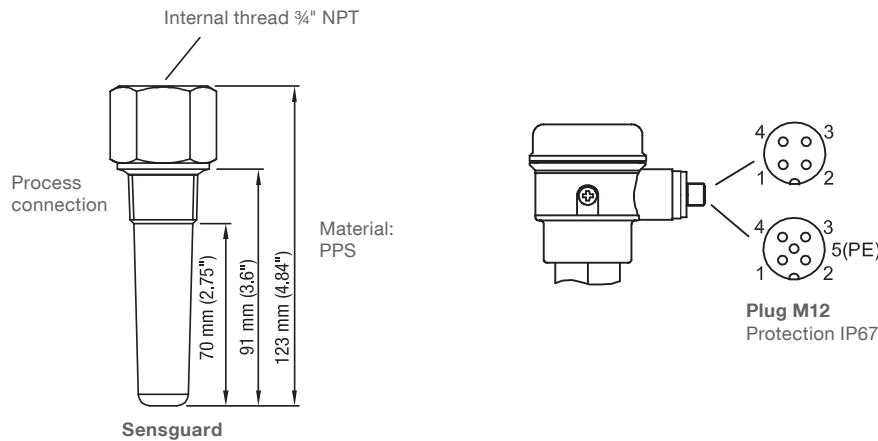
### Options

- pos.11 x **Guarantee extension to 5 years** ..... •
- pos.17 x **FFKM wetted seals** <sup>(1)</sup> ..... •
- pos.23 x **WHG approval** ..... •
- Cable entry** <sup>(2)</sup>  
 Selection of the following options only necessary, if a deviation from the default cable entry is required:
- pos.33 x M20 x 1.5 (1x cable gland, attached) ..... •
- pos.33 a NPT ½" tapered ANSI B1.20.1 (1x open conduit) ..... •
- Declaration, Certificate, Testreport** <sup>(6)</sup>
- CA Declaration of compliance with the order, EN 10204 clause 2.1 ..... •
- CC Inspection certificate, EN 10204 clause 3.1, material wetted parts ..... •
- Marking**
- DA Stainless steel tag (Measuring point number / identification, max. 27 char.) ..... •

### Accessories

Minimum order value for separate orders of spare parts or accessories is 75 €.

- cl440102 Sensguard (PPS) Process connection ¼" NPT <sup>(3)</sup> ..... •
- cl440103 Sensguard (PPS) Process connection 1" BSPT <sup>(3)</sup> ..... •
- em440318 Plug M12 (without mating plug), 4-pole, max. 25 V <sup>(4,5)</sup> ..... •
- em440319 Plug M12 (without mating plug), 5-pole (incl. PE), max. 60 V <sup>(4,5)</sup> ..... •



(1) Not available with PPS process connection (pos.7 1). Ambient- and process temperature limited to -20°C (-4°F).  
 (2) Available with Device version Enclosure (pos.3 2).  
 (3) Requires unit with process connection ¼" NPT (pos.6 A).  
 (4) Available for CE (pos.2 0). Connection of plug wires to internal terminals by customer.  
 (5) Not available with certificate Lloyds.  
 (6) The documents are enclosed with the delivered goods.

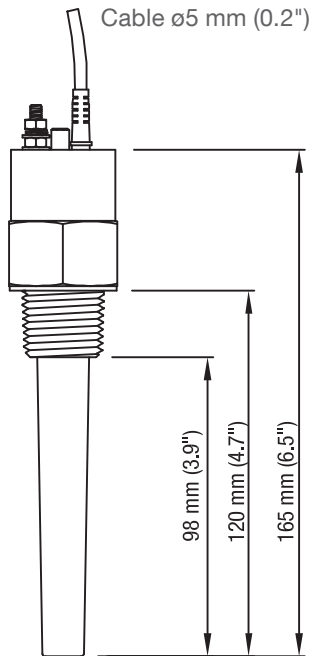
### Detailed Ex-markings

#### Certificate

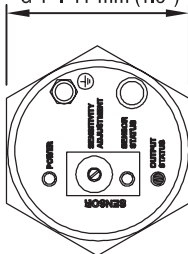
pos.2	Y	ATEX II 1 G Ex ia IIC T <sub>△</sub> Ga ATEX II 1/2 G Ex ia IIC T <sub>△</sub> Ga/Gb ATEX II 1 D Ex ia IIIC T <sub>△</sub> Da ATEX II 1/2 D Ex ia IIIC T <sub>△</sub> Da/Db FM IS Cl. I, II, III Div.1 Gr. A-G CSA Cl. I, II, III Div.1 Gr. A-G Intrinsic safe
pos.2	B	INMETRO Ex ia IIC T <sub>6</sub> /T <sub>4</sub> Ga INMETRO Ex ia IIC T <sub>6</sub> /T <sub>4</sub> Ga/Gb INMETRO Ex ia IIIC T <sub>200</sub> 95°C/T <sub>200</sub> 135°C Da INMETRO Ex ia IIIC T <sub>200</sub> 95°C/T <sub>200</sub> 135°C Da/Db
pos.2	V	TR-CU 0Ex ia IIC T <sub>6</sub> /T <sub>4</sub> Ga X TR-CU Ga/Gb Ex ia IIC T <sub>6</sub> /T <sub>4</sub> X TR-CU Ex ia IIIC T <sub>200</sub> 95°C/T <sub>200</sub> 135°C Da X TR-CU Ex ia IIIC T <sub>200</sub> 95°C/T <sub>200</sub> 135°C Da/Db X

## Dimensions

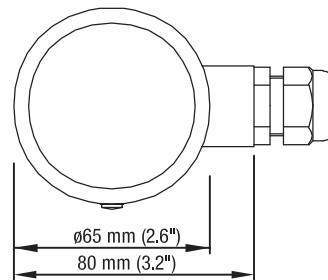
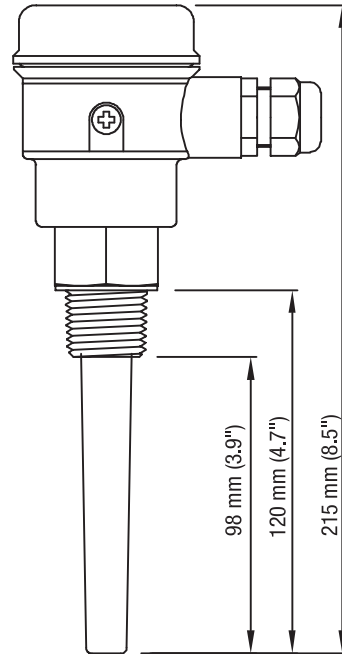
### Integral Cable version



3/4" NPT: 36 mm (1.4")  
 R 1": 36 mm (1.4")  
 G 1": 41 mm (1.6")

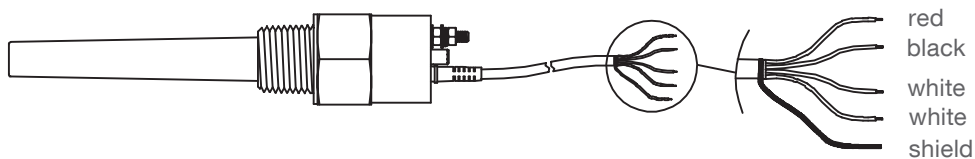


### Enclosure version

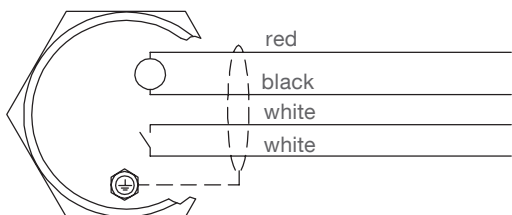


## Electrical installation

### Integral Cable Version



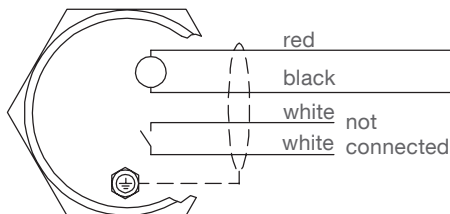
### Operation with solid state switch/ relay



Shield is internal connected to ground.  
 It is recommended to use a shielded cable for stable measurement.

red/ black	white/ white
<b>Supply:</b> 12 - 33 V DC 10 - 30 V DC intrinsic safe*	<b>Output:</b> <b>Solid state switch*</b> Observe protection (see below). Max. 30 V DC/ 30 V AC, 82 mA Limited to 30 V DC/ 16 V AC, 82 mA in wet locations.
Polarity determines output logic, see table below	
* For intrinsic safe operation an intrinsic safety barrier is required. Ratings $U_i$ $I_i$ $P_i$ $C_i$ $L_i$ see instruction manual.	

### Operation with 4/ 20 mA loop



Shield is internal connected to ground.  
 It is recommended to use a shielded cable for stable measurement.

<b>Supply:</b> 12 - 33V DC 10 - 30V DC intrinsic safe* Polarity determines output logic, see table below
*For intrinsic safe operation an intrinsic safety barrier is required. Ratings $U_i$ $I_i$ $P_i$ $C_i$ $L_i$ see instruction manual.

$$R_{\max} = (V_{\text{supply}} - 12 \text{ V}) / 20 \text{ mA}$$

Example: 24 V supply allows  $R_{\max}$  of 600 Ohms

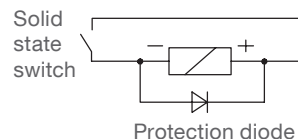
### Output logic

	Low liquid level		High liquid level	
	FSL	FSH	FSL	FSH
Yellow LED	○	☀	☀	○
Status	FSL	FSH	FSL	FSH
Supply polarity (cable colour)	red + black -	red - black +	red + black -	red - black +
Red LED	○	☀	☀	○
Solid state switch	— / —	— / —	— / —	— / —
4/ 20 mA loop	4 mA	20 mA	20 mA	4 mA

FSL = Fail safe low FSH = Fail safe high

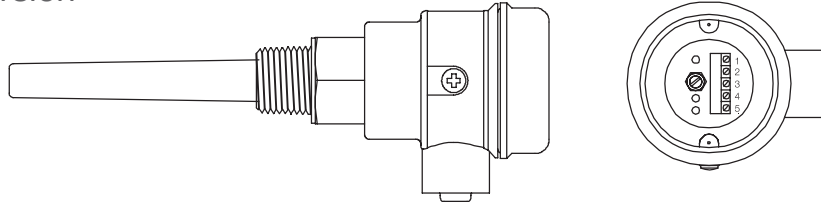
### Protection of Solid State Switch

Observe a Protection diode in case of connecting an external relay to the Solid state switch

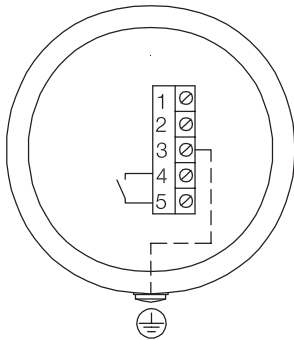


## Electrical installation

### Enclosure Version



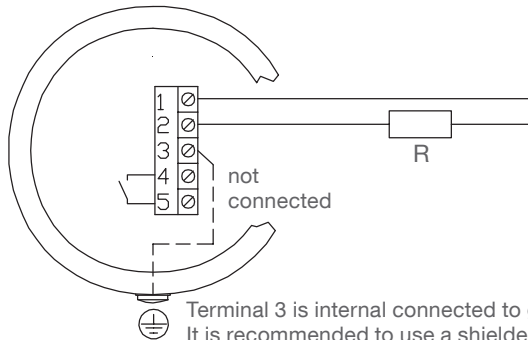
### Operation with solid state switch/ relay



Terminal 3 is internal connected to ground. It is recommended to use a shielded cable for stable measurement.

Terminal 1, 2	Terminal 3	Terminal 4, 5
<b>Supply:</b> 12 - 33 V DC 10 - 30 V DC intrinsic safe*  Polarity determines output logic, see table below	cable shield connection  connect to ground	<b>Output:</b>  <b>Solid state switch*</b> Present with stainless steel process connection. Observe protection (see below). Max. 30 V DC/30 V AC, 82 mA, limited to 30 V DC/ 16 V AC, 82 mA in wet locations  <b>Relay</b> Present with PPS process connection. Intrinsic Safety operation not available. Max. 60 V DC or 30 V AC; limited to 30 V DC/ 16 V AC in wet locations, Max. 1 A, 60 W
* For intrinsic safe operation an intrinsic safety barrier is required. Ratings $U_i$ $I_i$ $P_i$ $C_i$ $L_i$ see instruction manual.		

### Operation with 4/20 mA loop



Terminal 3 is internal connected to ground. It is recommended to use a shielded cable for stable measurement.

$$R_{\max} = (V_{\text{supply}} - 12 \text{ V}) / 20 \text{ mA}$$

Example: 24 V supply allows  $R_{\max}$  of 600 Ohms

<b>Supply:</b> 12 - 33V DC 10 - 30V DC intrinsic safe* Polarity determines output logic, see table below  * For intrinsic safe operation an intrinsic safety barrier is required. Ratings $U_i$ $I_i$ $P_i$ $C_i$ $L_i$ see instruction manual.
---

### Output logic

Yellow LED				
Status	FSL	FSH	FSL	FSH
Supply polarity (Terminal)	1 + 2 -	1 - 2 +	1 + 2 -	1 - 2 +
Red LED				
Solid state switch				
4/ 20 mA loop	4 mA	20 mA	20 mA	4 mA

FSL = Fail safe low FSH = Fail safe high

### Protection of Solid State Switch

Observe a Protection diode in case of connecting an external relay to the Solid state switch

