

Safety Instructions

Condumax CLS12, CLS13, CLS15, CLS16B, CLS21

Conductivity sensors with conductive measurement of conductivity

CSA C/US IS Cl. I Div. 1 GP A-D T3/T4/T6 + CSA C/US IS
Cl. I Zone 0 AEx ia IIC T3/T4/T6



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Related documentation

The technical documentation for the device is available on the Internet:

www.endress.com

- Enter the serial number from the nameplate into the search screen (magnifying glass).



Operating Instructions for Condumax CLS12/CLS13, BA01641C



Operating instructions for Condumax CLS16B, BA02334C



Operating instructions for Condumax CLS15/CLS21/(CLS16), BA01148C

Supplemental documentation

Competence Brochure CP00021Z

- Explosion Protection: Guidelines and General Principles
- www.endress.com

Certifications

CSA C/US certificate, certificate number: CSA24CA80219586

Identification

The nameplate provides you with the following information on your device:

- Manufacturer identification
- Extended order code
- Serial number
- Safety information and warnings
- Ex marking on hazardous area versions

- Compare the information on the nameplate with the order.

Type code

Type	Version					
CLS12	A/B ¹⁾	** 3)	* 5)	A ⁶⁾		
CLS13	A/B ¹⁾	** 3)	* 5)	A ⁶⁾		
CLS15	A/B/L ¹⁾	** 3)	* 5)	A ⁶⁾		
CLS16B-	C ²⁾	** 3)	** 4)	* 5)	A/B ⁶⁾	+ (optional) ⁷⁾
CLS21	C/L ¹⁾	** 3)	*	A/D ⁶⁾		

- 1) Measuring range, cell constant (not Ex-relevant), A: k = 0.01/cm, B: k = 0.1/cm, C: k = 1/cm, L: PWIS-free version of B (CLS15) or C (CLS21)
- 2) CSA C/US IS Cl. I Div. 1 GP A-D T3/T4/T6 + CSA C/US IS Cl. I Zone 0 AEx ia IIC T3/T4/T6
- 3) Process connection (not Ex-relevant)
- 4) Material (not Ex-relevant)
- 5) Cable connection (not Ex-relevant)
- 6) Temperature sensor, A: Pt100, B: Pt1000
- 7) Optional features (not Ex-relevant)

Certificates and approvals

IS Class I, Division 1 Groups ABCD T3/T4/T6; Ex ia IIC T3/T4/T6 Ga ; Class I, Zone 0 AEx ia IIC T3/T4/T6 Ga

Ex approval

- The product meets the requirements of:
 - CLASS 2258 04 - PROCESS CONTROL EQUIPMENT - Intrinsically Safe Entity - For Hazardous Locations
 - CLASS 2258 84 - PROCESS CONTROL EQUIPMENT - Intrinsically Safe Entity - For Hazardous Locations - Certified to US Standards
- This is verified by compliance with the following standards:
 - CAN/CSA-C22.2 No. 60079-0:19
 - CAN/CSA-C22.2 No. 60079-11:14
 - ANSI/UL 60079-0-2020
 - ANSI/UL 60079-11:2013
 - CAN/CSA C22.2 No. 61010-1-12 + UPD1:2015, UPD2:2016, AMD 1 – 18 (R2022), UPD3:2023
 - UL Std. No. 61010-1 (3rd Edition)

Safety instructions

- ▶ The mentioned conductivity sensors are suitable for use in explosion-hazardous areas according to the mentioned certificate.
- ▶ The sensor must be connected and operated in accordance with the Operating Instructions of the sensor and of the transmitter to be connected. All sensor operating data must be observed.
- ▶ The sensors may only be operated on suitable intrinsically safe circuits. Make sure that the maximum permissible sensor input characteristic values, the maximum permissible inductance L_i and capacitance values C_i in these circuits and the ambient temperature ranges indicated are not exceeded.
- ▶ The maximum permissible cable length is limited by the maximum permissible characteristic values of the transmitter. The total of the maximum permissible inductance L_i and capacitance values C_i for the sensor and measuring cable may not exceed the maximum permissible inductance L_o and capacitance values C_o for the transmitter.
- ▶ When connected to the Liquiline M CM42 or CM42B transmitter, the maximum permissible length of measuring cables CYK71 or CYK71-Ex is 50 m.
- ▶ The CLS21 sensor may only be used for measurement in liquids with a minimum conductivity $> 10 \text{ nS/cm}$.
- ▶ Pay attention to the regulations for electrical installations in explosive atmospheres (e.g. EN/IEC 60079-14) when using the devices and sensors.
- ▶ Install the device according to the National Electrical Code (NFPA70) or the Canadian Electrical Code, Part 1 (C22.1), where applicable.
- ▶ Do not operate type CLS15 sensors with non-metallic process connections and type CLS21 sensors under process conditions in which electrostatic charging of the sensor, particularly of the electrically insulated outer electrode, is likely to occur.
- ▶ The sensor heads of types CLS12 and CLS13 have to be protectively installed against impacts and friction.
- ▶ The ambient temperature range of the sensor head is $-20^\circ\text{C} \leq T_a \leq 60^\circ\text{C}$.
- ▶ Also follow the instructions of the XA of the associated transmitter.
- ▶ To ensure that the explosion protection of the device is maintained, the operator must not change the configuration. Any modification may affect safety.

Temperature tables

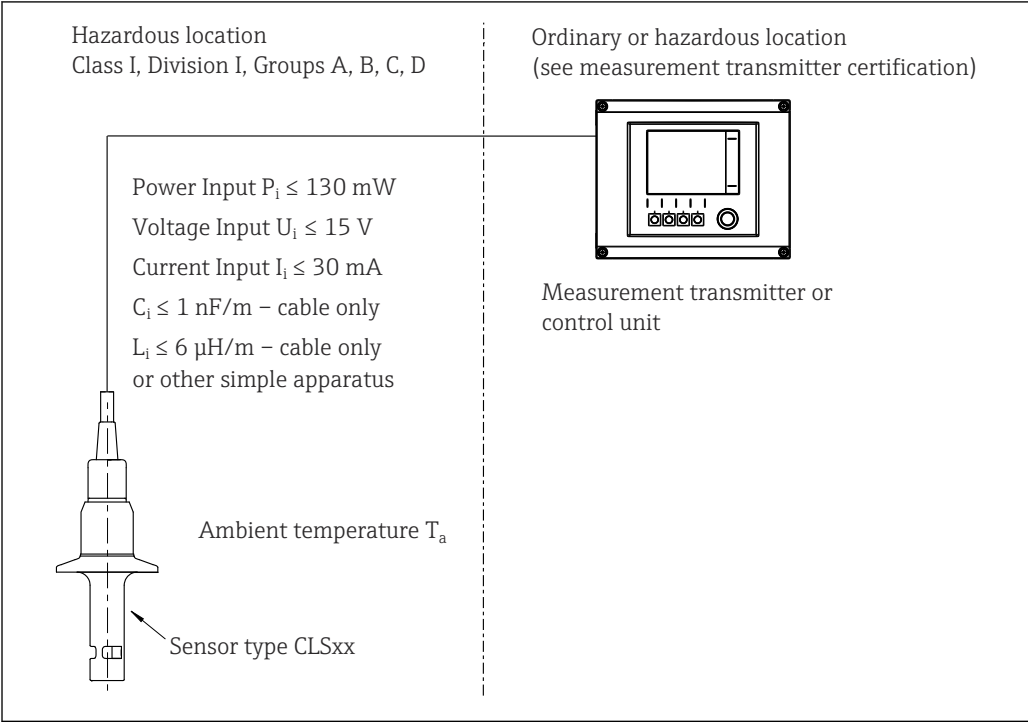
Type	Temperature class			
	T2	T3	T4	T6
CLS12	- ¹⁾	$-20^\circ\text{C} \leq T_a \leq 160^\circ\text{C}$	$-20^\circ\text{C} \leq T_a \leq 125^\circ\text{C}$	$-20^\circ\text{C} \leq T_a \leq 75^\circ\text{C}$
CLS13	$-20^\circ\text{C} \leq T_a \leq +250^\circ\text{C}$	$-20^\circ\text{C} \leq T_a \leq 190^\circ\text{C}$	$-20^\circ\text{C} \leq T_a \leq 125^\circ\text{C}$	$-20^\circ\text{C} \leq T_a \leq 75^\circ\text{C}$
CLS15	- ¹⁾	$-20^\circ\text{C} \leq T_a \leq 140^\circ\text{C}$	$-20^\circ\text{C} \leq T_a \leq 115^\circ\text{C}$	$-20^\circ\text{C} \leq T_a \leq 65^\circ\text{C}$
CLS16B	- ¹⁾	$-5^\circ\text{C} \leq T_a \leq 150^\circ\text{C}$	$-5^\circ\text{C} \leq T_a \leq 115^\circ\text{C}$	$-5^\circ\text{C} \leq T_a \leq 65^\circ\text{C}$
CLS21-****A	- ¹⁾	$-20^\circ\text{C} \leq T_a \leq 135^\circ\text{C}$	$-20^\circ\text{C} \leq T_a \leq 115^\circ\text{C}$	$-20^\circ\text{C} \leq T_a \leq 65^\circ\text{C}$
CLS21-****D	- ¹⁾	$-20^\circ\text{C} \leq T_a \leq 135^\circ\text{C}$	$-20^\circ\text{C} \leq T_a \leq 130^\circ\text{C}$	$-20^\circ\text{C} \leq T_a \leq 80^\circ\text{C}$

1) not applicable

The temperature tables apply only under the installation conditions described in the following graphic . If the installation conditions cannot be met, the maximum process temperature T_p must not exceed the maximum ambient temperature T_a .

- For functional reasons, the CLS15 sensors may only be operated up to 120 °C (248 °F) during continuous operation/and up to 140 °C (284 °F) for short periods.
- For functional reasons, the CLS16B sensors may only be operated up to 120 °C (248 °F) during continuous operation/and up to 150 °C (302 °F) for short periods.

Installation conditions



Additional equipment ratings

Pollution degree	4
Installation category	N/A DC supplied (supplied from secondary non-hazardous live)
Ingress protection	IP68
Altitude	N/A (not relevant for limited energy devices without insulation requirements)
Max. humidity	95 %
Max. process pressure	CLS12 Without flow assembly Up to 100 °C: 1 to 41 bar, absolute Up to 160 °C: 1 to 7 bar, absolute In flow assembly 1 to 13 bar, absolute CLS13 1 to 41 bar, absolute CLS15 13 bar absolute, at 20 °C 2 bar absolute, at 120 °C CLS16B 13 bar absolute, at 20 °C 9 bar absolute, at 120 °C CLS21 17 bar absolute, at 20 °C

Indoor use (wet location)

Connection

Ex specification

The following connection data refer to safety-related limit values which must not be exceeded.

Associated transmitter

Characteristic	Connection data
Power supply circuit	Intrinsically safe
Maximum output voltage U_o	15 V
Maximum output current I_o	30 mA
Maximum output power P_o	130 mW

Sensor

Characteristic	Connection data
Maximum internal capacitance C_i	Negligible
Maximum internal inductance L_i	Negligible

Cables

Characteristic	Connection data
Maximum internal capacitance C_i	1 nF/m
Maximum internal inductance L_i	6 μ H/m

