

# Safety Instructions

## Liquiline CM42B

Two-wire transmitter

IS Cl. I Div. 1 GP A-D T6/T4

IS Cl. I Zone 0 AEx/Ex ia IIC T6/T4 Ga

NI Cl. I Div. 2 GP A-D T6/T4



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# Liquiline CM42B

Two-wire transmitter

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**Associated documentation** This document is an integral part of the Liquiline CM42B Operating instructions BA02380C and BA02381C.

**Additional documentation**

 Competence Brochure CP00021Z

- Explosion Protection: Guidelines and General Principles
- [www.endress.com](http://www.endress.com)

**Certificates and approvals**

**Certificate number**  
CSA 24CA80229832X

#### Ex marking

CM42B
IS Cl. I Div. 1 GP A-D T6/T4
IS Cl. I Zone 0 AEx/Ex ia IIC T6/T4 Ga
NI Cl. I Div. 2 GP A-D T6/T4

#### Applied standards

Applied standards are listed in the certificates and manufacturer declarations.

#### Identification

The following information on the device can be found on the nameplate:

- Manufacturer identification
- Product designation
- Serial number
- Ambient conditions
- Input and output values
- Safety information and warnings
- Ex markings
- Certification information
- Warnings

► Compare the information on the nameplate with the order.

#### Type code

C/US

Type	Version						
CM42B	CB	**	**	**	**	**	+
	IS Cl. I Div. 1 GP A-D T6/T4 IS Cl. I Zone 0 AEx/Ex ia IIC T6/T4 Ga NI Cl. I Div. 2 GP A-D T6/T4	No Ex relevance					

#### Technical data

Voltage input	nom. 24 V DC max. 30 V DC min. 17 V DC ELV
Current	4...20 mA loop max. 23 mA
Ambient temperature range $T_a$	T6: $-20^{\circ}\text{C} \leq T_a \leq +50^{\circ}\text{C}$ ( $-4^{\circ}\text{F} \leq T_a \leq +122^{\circ}\text{F}$ ) T4: $-20^{\circ}\text{C} \leq T_a \leq +60^{\circ}\text{C}$ ( $-4^{\circ}\text{F} \leq T_a \leq +140^{\circ}\text{F}$ )

**Connection values***Current outputs SA1 and SA2 (terminals 33 and 34)*

Intrinsically safe power supply and signal circuits	
Max. input voltage $U_i$	30 V
Max. input current $I_i$	100 mA
Max. input power $P_i$	750 mW
Max. internal inductance $L_i$	30 $\mu$ H
Max. internal capacitance $C_i$	Current output 1: 15.2 nF Current output 2: 7.9 nF

*Digital sensor interface (Memosens) (terminals 87, 88, 97, 98)*

Max. output voltage $U_o$	5 V
Max. output current $I_o$	100 mA
Max. output power $P_o$	120 mW
Max. internal inductance $L_i$	Negligible
Max. internal capacitance $C_i$	15.6 $\mu$ F
Max. external inductance $L_o$	3.5 mH
Max. external capacitance $C_o$	100 $\mu$ F

Only approved devices shall be connected to the digital Memosens sensor input:

- Memosens cable xYK10, xYK20  
The connection of the CM42B and the Memosens cable xYK10 and xYK20 with a maximum length of 100 m is certified as a system via spark ignition test, separate proof of intrinsic safety is not necessary.
- Digital Memosens sensors / other Memosens devices  
Digital Memosens sensors and other devices that match the stated electrical parameters of the Liquiline CM42B.  
Digital Memosens sensors/devices other than xLS50D are connected via an inductive interface to the Memosens cables xYK10 and xYK20.

The devices stated in the following certificates and additional devices that match the stated entity parameter may be connected to the Liquiline CM42B:

CSA C/US

- xYK10 and xYK20 according to CSA certificate no. 80021719
- xLS50D according to CSA certificate no. 80021719

*Analog input conductivity, measured inductively (terminals 11, 12, 13, 15, 16, 17, 18, 20)*

Max. output voltage $U_o$	7.6 V
Max. output current $I_o$	95 mA
Max. output power $P_o$	100 mW
Max. internal inductance $L_i$	Negligible
Max. external inductance $L_o$	3.5 mH
Max. internal capacitance $C_i$	480 nF
Max. external capacitance $C_o$	10.4 $\mu$ F

*Analog input conductivity, measured conductively (terminals 11, 12, 13, 19, 20)*

Max. output voltage $U_o$	8.2 V
Max. output current $I_o$	30 mA
Max. output power $P_o$	38 mW
Max. internal inductance $L_i$	Negligible
Max. external inductance $L_o$	30 mH
Max. internal capacitance $C_i$	0 nF
Max. external capacitance $C_o$	7.6 $\mu$ F

*Analog input pH/ORP (terminals 11, 12, 13, 14, 16, 17, 18, 20, 21, 22)*

Max. output voltage $U_o$	5 V
Max. output current $I_o$	30 mA
Max. output power $P_o$	37.5 mW
Max. internal inductance $L_i$	Negligible
Max. external inductance $L_o$	30 mH
Max. internal capacitance $C_i$	1 $\mu$ F
Max. external capacitance $C_o$	100 $\mu$ F

In addition to the three tables above, it is allowed to connect analogue sensors as certified in the CSA certificates 1718339 and 80219586 and FM certificate FM16US0145X to the VSPH1, VSLI1, or VSLC1 sensor input.

$L_o$  and  $C_o$  are based on maximum output voltage and current values. These values are applicable when used independently but not in combination of both  $L_o$  and  $C_o$ . The values for each parameter must be compensated for  $L_i$  and  $C_i$  accordingly.

### Galvanic separation

The device electronic is fully isolated from earthed metal parts up to a test voltage of 500 VAC rms.

Analog sensor interface:

- The analog sensor interface is galvanically isolated from current output 1 & 2 up to a test voltage of 500 VAC rms.
- The galvanic isolation ensures that the intrinsically safe current output circuits in the sense of IEC 60079-14 can be considered isolated from earth, even if the intrinsically safe sensor circuit has a functional earthing.

Digital Memosens sensor interface:

- The digital sensor output of the device is not galvanically isolated from current output 1.
- If the sensor connection cable runs through areas of Zone 0 or Div.1 or the sensor is installed in Zone 0 or Div. 1, the use of a galvanically isolated power supply is recommended.

Galvanic isolation between current output 1 and current output 2:

The two current outputs of the CM42B are isolated from each other up to a test voltage of 500 VAC rms.

## Cable specification

*Qualified cable glands (only field device)*

Cable gland	Clamping area, permitted cable diameter
M20x1.5	6 mm to 12 mm (0.24" to 0.47") 5 mm to 9 mm (0.2" to 0.35")
NPT1/2 Via M20x1.5 adapter on NPT1/2	6 mm to 12 mm (0.24" to 0.47") 5 mm to 9 mm (0.2" to 0.35")
G1/2 Via M20x1.5 adapter on G1/2	7 mm to 12 mm (0.28" to 0.47") 4 mm to 9 mm (0.16" to 0.35")

## Cable cross-section

Terminal connector is suitable for strands and ferrules.

Cable cross-section: 0.25 mm<sup>2</sup> (≈23 AWG) to 2.5 mm<sup>2</sup> (≈12 AWG)

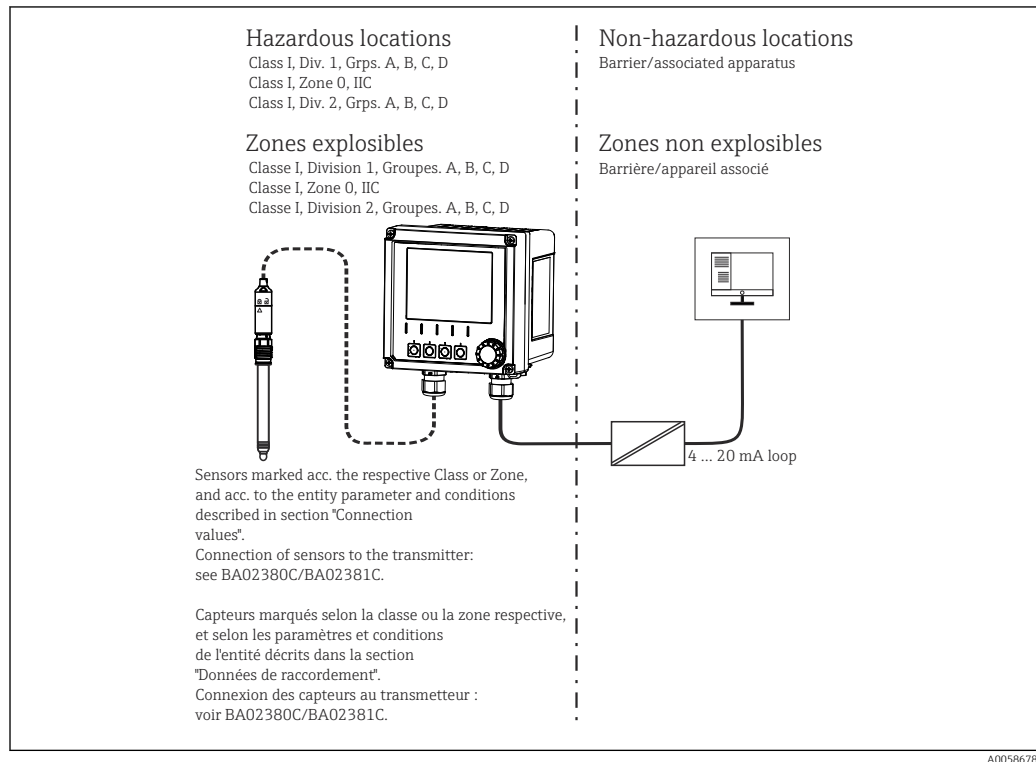
## Safety instructions for electrical apparatus for explosion-hazardous areas

The transmitter is suitable for use in hazardous areas. Installation in Canada shall be per Canadian Electrical Code, Part I, in the USA per National Electrical Code (NFPA70) and ANSI/ISA RP12.06.01.

- The transmitter is an intrinsically safe electrical apparatus for use in hazardous areas, spec. classified as Zone 0 or Class I Division 1.
- The transmitter provides Equipment Protection Level Ga.
- The transmitter may only be connected to a suitable power supply with protection level "ia". Associated apparatus with galvanic isolation from other circuits is preferred, such as e.g. active barrier.
- The output protection level is "ia", therefore approved intrinsically safe sensors can be connected, which may be located in Zone 0 or Cl. I Div. 1.
- The transmitter may as well be used in hazardous areas classified as Class I Div. 2 with NI wiring when followed the maximum input parameters. In this case, the sensor must be located in Class I Div. 2 only.
- When operated in Div. 2 and connected to non-incendive associated apparatus, the parameters Ui, Ci and Li must be observed (normal operation is current controlled).
- Only sensors, intended for use in hazardous areas must be connected.
- The rated values of input and output circuits must be followed, particularly the intrinsic safety parameter.
- Metal enclosures must be connected to the local equipotential bonding system at the point of installation.
- Only genuine spare parts may be used for maintenance and repair work on the device. This work may only be carried out by service staff or specially trained and authorized personnel.
- Installation, connection to the electricity supply, commissioning, inspection, maintenance, and repair of the devices must be carried out by qualified personnel according to applicable national codes of practice and according to the Operating Instructions.
- Compliance with all of the technical data of the device is mandatory.
- The device shall be installed in a way to minimize the risk of electrostatic discharge. For ESD safety reasons the transmitter is marked with a warning label. Following content is stated on the label: "Beware of electrostatic charging. Device must be cleaned using a wetted cloth."
- In case of repair work, when the module cover shielding has been dismantled, attention shall be applied to fix the screw to the earthing bolt when reassembling.
- The battery may only be replaced in controlled area. If the battery for the clock shall be replaced, the following types must be used only:
  - Maxell CR2032
  - Panasonic BR2032
- Make sure that the cable glands are secured to prevent from working loose.
- The cables must be installed such that they are fixed in place. Adequate strain relief must be ensured.
- When the transmitter shall be mounted with the adaptors for conduit, the adaptors must be supported by the metal guide (accessory in the package with the adaptors).

- The rail mount version of the device is intended to be used within another enclosure, e.g. control box.
- The connector marked "Display" is not for external use, but for connection of the display which is part of the device only.
- The connector marked "Service" is not for external use, but for manufacturer purposes only.

#### Location of CM42B, sensors and associated equipment





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