

# Safety Instructions

## **Liquiline CM42B**

Two-wire transmitter

EAC 0Ex ia IIC T6/T4 Ga X



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# Liquiline CM42B

Two-wire transmitter

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**Related documentation**

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

**Supplementary documentation**

Competence Brochure CP00021Z

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

**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**

*EAC Ex*

| Model | Version               |                 |    |    |    |    |    |
|-------|-----------------------|-----------------|----|----|----|----|----|
| CM42B | GA                    | **              | ** | ** | ** | ** | +* |
|       | OEx ia IIC T6/T4 Ga X | No Ex relevance |    |    |    |    |    |

**Certificates and declarations**

*Hazardous area approvals*

Сертификат

ЕАЭС KZ 7500525.01.01.02343

Изделие сертифицировано в соответствии с техническим регламентом ТР ТС 012/2011, действующим на территории Евразийского экономического союза (ЕАЭС). На изделие наносится единый знак обращения продукции на рынке государств-членов Евразийского экономического союза.

*Certification body*

Орган по сертификации ТОО/ЖШС "Т-Стандарт"

*Standards applied*

Applied standards are listed in the certificates and manufacturer declarations.

**Technical data**

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

**Safety instructions**

The Liquiline CM42B transmitter is suitable for use in explosion-hazardous areas.

- The transmitter is an intrinsically safe electrical device for use in Zone 0, 1 or 2.
- The transmitter meets equipment protection level Ga.
- The output's type of protection is intrinsic safety (ia) and therefore intrinsically safe sensors can be connected and may be located in Zone 0 depending on the sensor's Ex marking.
- Only sensors suitable for use in explosion-hazardous areas may be connected.
- The nominal values of the input and output circuits must be observed, especially the intrinsic safety parameters.
- The transmitter may only be connected to a suitable power supply with ia protection. The power supply must be safely isolated from other circuits, e.g. by using an active barrier.
- Metal housings must be connected to the installation location's potential equalization system.
- Repair work may only be carried out by the manufacturer's service personnel. Only original spare parts may be used in this context.
- Installation, electrical connection, commissioning, inspection, maintenance and repair may only be performed by qualified specialists trained to work on explosion protected devices in accordance with the applicable standards, e.g. IEC 60079-14, -17, -19. Comply with the instructions in the Operating Instructions.
- All technical specifications for the device must be followed.
- To avoid electrostatic charge, the device is fitted with a warning label bearing the following information: "Protect against electrostatic charge. Clean the device with a damp cloth only."
- If the cable management module has been disassembled during repair work, ensure that the grounding bolt screw is properly reattached after reassembly.
- Only the following battery types may be used to replace the clock battery:
  - Maxell CR2032
  - Panasonic BR2032
- Ensure that the cables are strain-relieved and securely connected.
- Secure the cable glands against loosening.
- The device for DIN rail mounting must be operated in an additional enclosure, e.g. in a control cabinet.
- The terminal connection labeled "Display" is only to be used for connecting the display, which is part of the device.
- The terminal connection labeled "Service" is intended for manufacturer use only.

**Connection****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<br>Current output 2: 7.9 nF |

*Memosens input (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 may be connected to the digital Memosens input:

■ Memosens cable xYK10, xYK20

Connecting the Liquiline CM42B to the Memosens cable xYK10 and xYK20 with a maximum length of 100 m is certified as a system via spark ignition testing; no separate proof of intrinsic safety is required.

■ 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.

Devices named in the certificates listed below may be connected to the Liquiline CM42B, as well as other devices that comply with the specified entity parameters:

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EA9C KZ 7500525.01.01.02089

$L_o$  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.

*Analog input conductivity, inductive measurement (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, conductive measurement (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 |

$L_o$  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 isolation

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 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")<br>5 mm to 9 mm (0.2" to 0.35")  |
| NPT1/2<br>Via M20x1.5 adapter on NPT1/2 | 6 mm to 12 mm (0.24" to 0.47")<br>5 mm to 9 mm (0.2" to 0.35")  |
| G1/2<br>Via M20x1.5 adapter on G1/2     | 7 mm to 12 mm (0.28" to 0.47")<br>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)



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