

# Safety Instructions

## **CLS50D, CLS50, CLS54, CLS15D, CLS16D, CLS21D, CLS82D**

Supplement to: BA00182C, BA01591C, BA01147C,  
BA01326C

Safety instructions for electrical apparatus in explosion-  
hazardous areas

UK II 1G Ex ia IIC T3/T4/T6 Ga



---

# CLS50D, CLS50, CLS54, CLS15D, CLS16D, CLS21D, CLS82D

Supplement to: BA00182C, BA01591C, BA01147C, BA01326C

## Table of contents

Associated documentation .....	4
Supplementary documentation .....	4
Certificate .....	4
Identification .....	4
Safety instructions .....	6
Temperature tables .....	7
Connection .....	7
Installation conditions .....	8

**Associated documentation**

This document is an integral part of



Operating Instructions for Indumax CLS50D/CLS50, BA00182C



Operating Instructions for Condumax CLS15D/CLS16D/CLS21D, BA01147C



Operating Instructions for Indumax CLS54, BA01591C



Operating Instructions for Memosens CLS82D, BA01326C

**Supplementary documentation**

Competence Brochure CP00021Z

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

**Certificate****CLS50D**

UK Type Examination Certificate CML 21UKEX2885X

**CLS50**

UK Type Examination Certificate CML 21UKEX2884X

**CLS54**

UK Type Examination Certificate CML 22UKEX2006X

**CLS15D, CLS16D, CLS21D, CLS82D**

UK Type Examination Certificate CML 21UKEX2902X

**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					
CLS50D	-	UA	a <sup>1)</sup>	b <sup>2)</sup>	c <sup>3)</sup>	+d ... d <sup>4)</sup>

- 1) Process connection (no ex-relevance)
- 2) Shaft material: B = PEEK; VITON; PEEK, C = PEEK; Chemraz; PEEK, D = PFA; CHEMRAZ; 1.4571
- 3) Cable length up to 50 m (no ex-relevance)
- 4) Optional = one or more characters determining optional features (no ex-relevance), e.g. test or other certificates or declarations

Type	Version				
CLS50	-	U	a <sup>1)</sup>	b <sup>2)</sup>	c <sup>3)</sup>

- 1) Process connection (no ex-relevance)
- 2) Shaft material: A = PFA; CHEMRAZ; 1.4571, B = PEEK; VITON; PEEK, C = PEEK; Chemraz; PEEK
- 3) Cable length up to 55 m (no ex-relevance)

Type	Version					
CLS54-	U	a <sup>1)</sup>	b <sup>2)</sup>	c <sup>3)</sup>	2 <sup>4)</sup>	+ d <sup>5)</sup>

- 1) Process connection (not Ex-relevant)
- 2) Additional option (not Ex-relevant)
- 3) Cable connection (not Ex-relevant), 1: fixed cable 5 m, 2: fixed cable 10 m, 3: fixed cable 20 m, 4: fixed cable 5 ... 50 m
- 4) Temperature sensor Pt1000
- 5) Tagging (not Ex-relevant)

Type	Version		
CLS15D	-	a <sup>1)</sup>	b <sup>2)</sup> U

- 1) Measuring range (no ex-relevance)
- 2) Process connection (no ex-relevance)

Type	Version		
CLS16D	-	a <sup>1)</sup>	b <sup>2)</sup> U

- 1) Process connection (no ex-relevance)
- 2) Additional equipment (no ex-relevance)

Type	Version		
CLS21D	-	a <sup>1)</sup>	b <sup>2)</sup> U

- 1) Measuring range (no ex-relevance)
- 2) Process connection (no ex-relevance)

Type	Version			
CLS82D	-	UA	a <sup>1)</sup>	b <sup>2)</sup> +d ... d <sup>3)</sup>

- 1) Process connection (no ex-relevance)
- 2) Sensor material: A = ceramics; platinum; stainless steel
- 3) Optional = one or more characters determining optional features (no ex-relevance), e.g. test or other certificates or declarations

## Certificates and approvals

### UK Declaration of Conformity

With this declaration of conformity, the manufacturer guarantees that the product conforms to UK statutory requirements:

- The Electromagnetic Compatibility Regulations SI 2016 No. 1091
- The Equipment and Protective Systems Intended for use in Potentially Explosive Atmosphere Regulations SI 2016 No. 1107
- The Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment Regulations SI 2012 No. 3032

Compliance is verified by adherence to the standards listed in the Declaration of Conformity.

### Hazardous area approvals

UK II 1G Ex ia IIC T3/T4/T6 Ga

### Approved Body

Eurofins E&E CML Limited (UK)

## Safety instructions

### All sensor types

This device was developed and manufactured in accordance with SI 2016 No. 1107 dated 2016 and also complies with the following standards:

- EN IEC 60079-0 :2018 Electrical apparatus for explosive gas atmospheres
- EN 60079-11:2012 Explosive atmospheres. Equipment protection by intrinsic safety "i"
- The regulations for electrical installation in hazardous areas (EN 60079-14) are to be observed for the use of the instrument and sensors.
- The sensor must be connected and operated in accordance with its associated Operating Instructions and the Operating Instructions of the connected transmitter.
- All operating data of the sensor must be observed.
- Adherence to the specified ambient and medium temperature ranges is a prerequisite for safe operation of the equipment.

### CLS50D

- The maximum permitted ambient temperature range may not exceed -20 °C ... 60 °C for all temperature classes mentioned above.
- The operator must ensure above temperature values are not exceeded by suitable means at the place of installation.
- Proper installation is required in order to maintain the protection type (IP68): use original seal, install cable gland properly.
- The product may only be used in liquid media with a conductivity of least 10 nS/cm.
- Metallic process connection parts have to be mounted at the mounting location electrostatically conductive (< 1 MΩ).
- Non-metallic process connectors must be protected from electrostatic charging (even when applied in Ex-Zone 1 (2G)).
- The measurement cable must be protected from electrostatic charging when applied in Ex-Zone 0 (1G).
- The maximum permissible measurement cable length must not exceed 100 m.

### CLS50, CLS54

- The sensor may be operated in Zone 0 (1G) classified areas.
- Proper installation is required in order to maintain the protection type (IP67): use original seal, install cable gland properly.
- The product may only be used in liquid media with a conductivity of least 10 nS/cm.
- Metallic process connection parts have to be mounted at the mounting location electrostatically conductive (< 1 MΩ).
- Non-metallic process connectors must be protected from electrostatic charging (even when applied in Ex-Zone 1 (2G)).
- The measurement cable must be protected from electrostatic charging when applied in Ex-Zone 0 (1G).
- The maximum permissible measurement cable length must not exceed 55 m (CLS50) resp. 50 m (CLS54).

### CLS15D, CLS16D and CLS21D

- Ex-protected digital sensors with Memosens technology are identified by an orange-red ring on the terminal head.
- The maximum permissible measurement cable length must not exceed 100 m.
- The measurement cable must be protected from electrostatic charging when applied in Ex-Zone 0 (1G).
- Metallic process connection parts have to be mounted at the mounting location electrostatically conductive (< 1 MΩ).

### CLS21D

The sensor may only be used in liquid media with a conductivity of at least 10 nS/cm.

### CLS15D with thread process connection (CLS15D-\*1AU and CLS15D-\*1MU):

- The sensor may not be operated under such kind of process conditions where electrostatic charging of the sensor and in particular of the electrically separated outer electrode, could be expected to occur.
- The sensor may only be used in liquid media with a conductivity of at least 10 nS/cm.

### CLS82D

- Ensure proper installation to maintain ingress protection class (IP68). Use original seal, install cable entry properly.
- Metallic process connection parts have to be mounted at the mounting location electrostatically conductive (< 1 MΩ).
- The sensor may not be operated in electrostatically critical processing conditions. Intense vapour or dust flows directly impacting on the connection system must be avoided.
- The maximum permissible measurement cable length must not exceed 100 m.

Temperature tables

Sensor	Temperature class	
	T4	T6
CLS50D-UA*D/E**+*	-20 °C ≤ T <sub>a</sub> ≤ 110 °C	-20 °C ≤ T <sub>a</sub> ≤ 70 °C
CLS50D-UA*B/C**+*	-20 °C ≤ T <sub>a</sub> ≤ 120 °C	-20 °C ≤ T <sub>a</sub> ≤ 70 °C
CLS50-U***	-20 °C ≤ T <sub>a</sub> ≤ 125 °C	-20 °C ≤ T <sub>a</sub> ≤ 75 °C

Sensor	Temperature class		
	T3	T4	T6
CLS54-U*****	-10 °C ≤ T <sub>a</sub> ≤ 125 °C <sup>1)</sup>	-10 °C ≤ T <sub>a</sub> ≤ 105 °C	-10 °C ≤ T <sub>a</sub> ≤ 55 °C

1) 150 °C for max. 60 min.

The temperature table above applies only under the installation conditions, which are described in the Operating Instructions BA00182C. If the installation conditions cannot be met, the maximum process temperature T<sub>p</sub> must not exceed the maximum ambient temperature T<sub>a</sub>.

Sensor	Temperature class		
	T3	T4	T6
CLS15D-A**U	-20 °C ≤ T <sub>a</sub> ≤ 135 °C	-15 °C ≤ T <sub>a</sub> ≤ 120 °C	-15 °C ≤ T <sub>a</sub> ≤ 70 °C
CLS15D-B/L**U	-20 °C ≤ T <sub>a</sub> ≤ 135 °C	-15 °C ≤ T <sub>a</sub> ≤ 100 °C	-15 °C ≤ T <sub>a</sub> ≤ 50 °C
CLS16D-***U	-5 °C ≤ T <sub>a</sub> ≤ 135 °C	-5 °C ≤ T <sub>a</sub> ≤ 115 °C	-5 °C ≤ T <sub>a</sub> ≤ 65 °C
CLS21D-***U	-20 °C ≤ T <sub>a</sub> ≤ 135 °C	-15 °C ≤ T <sub>a</sub> ≤ 115 °C	-15 °C ≤ T <sub>a</sub> ≤ 65 °C
CLS82D-UA*****+*	-20 °C ≤ T <sub>a</sub> ≤ 140 °C	-20 °C ≤ T <sub>a</sub> ≤ 120 °C	-20 °C ≤ T <sub>a</sub> ≤ 70 °C

The temperature table above applies only under the installation conditions, which are described in the Operating Instructions BA01147C (CLS15D/16D/21D) or BA01326C (CLS82D). If the installation conditions cannot be met, the maximum process temperature T<sub>p</sub> must not exceed the maximum ambient temperature T<sub>a</sub>.

Connection

CLS50D

The sensor provides the following entity parameters:

Parameter	Value
U <sub>i</sub>	5.1 V DC
I <sub>i</sub>	130 mA
P <sub>i</sub>	166 mW
C <sub>i</sub>	18 µF
L <sub>i</sub>	72.6 µH

The sensor may be connected to the approved intrinsic safe sensor output of transmitters, only and furthermore to the ones listed below:

- The intrinsically safe Memosens sensor output module FSDG1 of Liquiline M CM42
- The communication module 2DS Ex-I of the field measuring device Liquiline CM44

CLS50, CLS54

The sensor may be connected to the approved intrinsic safe sensor output of transmitters, only: Transmitter type Liquiline M CM42  
 Connected via sensor module FSLI1, Terminals 111-113, 215-218

**CLS15D, CLS16D, CLS21D, CLS82D**

The approved sensor may be connected via measuring cable CYK10, CYK20 or a structurally identical and in hardware and function identical Memosens measuring cable to the approved intrinsic safe digital Memosens sensor circuit of transmitter:

- Liquiline M CM42 sensor module FSDG1 or
- Liquiline CM44 communication module 2DS-Exi

Alternatively, the sensor may be connected to an approved, intrinsic safe Memosens sensor output providing the following maximum values as described below. In particular the effective inner inductivity and capacity of the approved, intrinsic safe sensor output may not exceed the values given below.

	Entity parameter set 1	Entity parameter set 2
$U_i$	5.1 V DC	5.04 V DC
$I_i$	130 mA	80 mA
$P_i$	166 mW (linear output characteristic)	112 mW (trapezoide output characteristic)
$C_i$	15 $\mu$ F	14.1 $\mu$ F
$L_i$	95 $\mu$ H	237.2 $\mu$ H

**Installation conditions**

Operating Instructions for Indumax CLS50D/CLS50, BA00182C



Operating Instructions for Condumax CLS15D/CLS16D/CLS21D, BA01147C



Operating Instructions for Memosens CLS82D, BA01326C



Operating Instructions for Indumax CLS54, BA01591C



---



---



71553120