

# Safety Instructions

## Cerabar M

### PMC51, PMP51, PMP55

4-20 mA HART, PROFIBUS PA,  
FOUNDATION Fieldbus

II 1/2 G Ex ia IIC Ga/Gb  
II 1/2 D Ex ia IIIC Da/Db





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## Table of contents

Associated documentation .....	4
Supplementary documentation .....	4
Manufacturer's certificates .....	4
Manufacturer address .....	4
Other standards .....	5
Extended order code .....	5
Safety instructions: General .....	7
Safety instructions: Special conditions .....	7
Safety instructions: Installation .....	8
Safety instructions: Zone 20, Zone 21 .....	8
Temperature tables .....	9
Connection data .....	11

**Associated documentation**

This document is an integral part of the following Operating Instructions:

HART  
BA00382P/00

PROFIBUS PA  
BA00383P/00

FOUNDATION Fieldbus  
BA00384P/00

**Supplementary documentation**

Explosion-protection brochure: CP00021Z/11

The Explosion-protection brochure is available:

- In the download area of the Endress+Hauser website:  
[www.endress.com](http://www.endress.com) -> Downloads -> Brochures and Catalogs -> Text Search: CP00021Z
- On the CD for devices with CD-based documentation

**Manufacturer's certificates****UK Declaration of Conformity**

Declaration Number:  
UK\_00215

The UK Declaration of Conformity is available:  
In the download area of the Endress+Hauser website:  
[www.endress.com](http://www.endress.com) -> Downloads -> Declaration -> Type: UKCA Declaration -> Product Code: ...

**UKCA type-examination certificate**

Certificate number:  
CML 21UKEX2440X

List of applied standards: See UK Declaration of Conformity.

**Manufacturer address**

Endress+Hauser SE+Co. KG  
Hauptstraße 1  
79689 Maulburg, Germany

Address of the manufacturing plant: See nameplate.

**Other standards**

Among other things, the following standards shall be observed in their current version for proper installation:

- IEC/EN 60079-14: "Explosive atmospheres - Part 14: Electrical installations design, selection and erection"
- EN 1127-1: "Explosive atmospheres - Explosion prevention and protection - Part 1: Basic concepts and methodology"

**Extended order code**

The extended order code is indicated on the nameplate, which is affixed to the device in such a way that it is clearly visible. Additional information about the nameplate is provided in the associated Operating Instructions.

**Structure of the extended order code**

PMC51, PMP5x	-	*****	+	A*B*C*D*E*F*G*..
<i>(Device type)</i>		<i>(Basic specifications)</i>		<i>(Optional specifications)</i>

\* = Placeholder

At this position, an option (number or letter) selected from the specification is displayed instead of the placeholders.

*Basic specifications*

The features that are absolutely essential for the device (mandatory features) are specified in the basic specifications. The number of positions depends on the number of features available.

The selected option of a feature can consist of several positions.

*Optional specifications*

The optional specifications describe additional features for the device (optional features). The number of positions depends on the number of features available. The features have a 2-digit structure to aid identification (e.g. JA). The first digit (ID) stands for the feature group and consists of a number or a letter (e.g. J = Test, Certificate). The second digit constitutes the value that stands for the feature within the group (e.g. A = 3.1 material (wetted parts), inspection certificate).

More detailed information about the device is provided in the following tables. These tables describe the individual positions and IDs in the extended order code which are relevant to hazardous locations.

## Extended order code: Cerabar M



The following specifications reproduce an extract from the product structure and are used to assign:

- This documentation to the device (using the extended order code on the nameplate).
- The device options cited in the document.

### *Device type*

PMC51, PMP51, PMP55

### *Basic specifications*

Position 1, 2 (Approval)		
Selected option		Description
PMC51	U1	UK Ex II 1/2 G Ex ia IIC T6...T4 Ga/Gb UK Ex II 1/2 D Ex ia IIIC T <sub>200</sub> 135°C Da/Db
PMP5x	U1	UK Ex II 1/2 G Ex ia IIC T6...T4 Ga/Gb UK Ex II 1/2 D Ex ia IIIC T <sub>200</sub> 125°C Da/Db

Position 3 (Output)		
Selected option		Description
PMC51	2	4-20 mA HART
PMP5x	3	PROFIBUS PA
	4	FOUNDATION Fieldbus

Position 16 (Diaphragm Seal Connection)		
Selected option		Description
PMP55	B	Temperature isolator
	D	.....m capillary
	E	.....ft capillary

### *Optional specifications*

No options specific to hazardous locations are available.

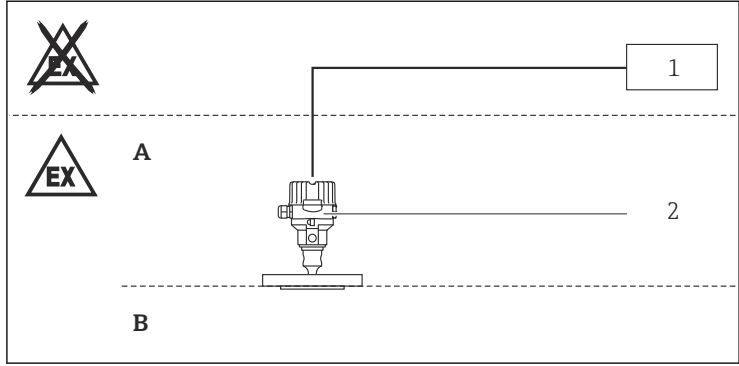
**Safety  
instructions:  
General**

- The device is intended to be used in explosive atmospheres as defined in the scope of EN IEC 60079-0 or equivalent national standards. If no potentially explosive atmospheres are present or if additional protective measures have been taken: The device may be operated according to the manufacturer's specifications.
- Staff must meet the following conditions for mounting, electrical installation, commissioning and maintenance of the device:
  - Be suitably qualified for their role and the tasks they perform
  - Be trained in explosion protection
  - Be familiar with national regulations
- Comply with the installation and safety instructions in the Operating Instructions.
- Install the device according to the manufacturer's instructions and national regulations.
- Only use the device in media to which the wetted materials have sufficient durability.
- Avoid electrostatic charging:
  - Of plastic surfaces (e.g. enclosure, sensor element, special varnishing, attached additional plates, ..)
  - Of isolated capacities (e.g. isolated metallic plates)

**Safety  
instructions:  
Special conditions**

- In the case of process connections made of polymeric material or with polymeric coatings, avoid electrostatic charging of the plastic surfaces.
- For light metal flanges or flange faces (e.g. titanium, zirconium), avoid sparks caused by impact and friction.
- In the event of additional or alternative special varnishing on the enclosure or other metal parts:
  - Observe the danger of electrostatic charging and discharge.
  - Do not rub surfaces with a dry cloth.

**Safety  
instructions:  
Installation**



A0023750

- A *Electronic; Zone 1 or Zone 21*  
 B *Process; Zone 0 or Zone 20*  
 1 *Certified associated apparatus*  
 2 *PMC51, PMP51, PMP55*

The device is designed for operation in Zone 1 or Zone 21 (enclosure) as well as Zone 0 or Zone 20 (process connection). In the event of potentially explosive gas-air and dust-air mixtures occurring simultaneously: Suitability requires further assessment.

**Intrinsic safety**

- When the device is connected to an intrinsically safe circuit Ex ib, the type of protection changes to Ex ib. Do not operate intrinsically safe circuits Ex ib in Zone 0 or Zone 20.
- When the device is connected to an intrinsically safe circuit Ex ic, the type of protection changes to Ex ic. Do not operate intrinsically safe circuits Ex ic in Zone 0, Zone 1 or Zone 20, Zone 21.
- The intrinsically safe input power circuit of the device is isolated from ground. The dielectric strength is at least  $500 V_{rms}$ .

**Safety  
instructions:  
Zone 20, Zone 21**

- Seal the cable entry or piping tight (see protection type of enclosure in the "Temperature tables" chapter).
- Connect the device using suitable cable and wire entries of protection type "Equipment dust ignition protection by enclosure (Ex t)" or "Increased safety (Ex e)" (ingress protection of at least IP65). Lay connecting cable and secure.



## Temperature tables

### Ex ia IIC T6...T4 Ga/Gb



- The specified ambient and process temperature ranges exclusively refer to the explosion protection and must not be exceeded. Operationally permitted ambient temperature ranges can be restricted depending on the version: See Operating Instructions.
- Do not exceed the max. ambient temperature at the enclosure.



*Device type PMC51, PMP51*

The process temperatures refer to the temperature at the separation membrane.

*Device type PMP55*

Higher temperatures are permitted depending on the type of diaphragm seal.

Temperature class	Process temperature $T_p$ (process)	Ambient temperature range
T6	$\leq 80\text{ °C}$	$-40\text{ °C} \leq T_a \leq +40\text{ °C}$
T4	$\leq 125\text{ °C}$	$-40\text{ °C} \leq T_a \leq +70\text{ °C}$

### Ex ia IIIC T<sub>200</sub> 125°C Da/Db



- The specified surface temperature takes into account all direct heat influences from process heat and self-heating at the enclosure.
- Surface temperatures at the process side maybe higher and must be considered by the user (e.g. at high temperature process connections).
- The T-marking is based on the process temperature of the compact designs.
- The specified ambient and process temperature ranges exclusively refer to the explosion protection and must not be exceeded. Operationally permitted ambient temperature ranges can be restricted depending on the version: See Operating Instructions.
- Do not exceed the max. ambient temperature at the enclosure.



*Device type PMC51, PMP51*

The process temperatures refer to the temperature at the separation membrane.

*Device type PMP55*

Higher temperatures are permitted depending on the type of diaphragm seal.

*Device type PMC51*

Maximum surface temperature	Process temperature range	Ambient temperature range
T135 °C	$-40\text{ °C} \leq T_p \leq +80\text{ °C}$	$-40\text{ °C} \leq T_a \leq +55\text{ °C}$
	$-40\text{ °C} \leq T_p \leq +100\text{ °C}$	$-40\text{ °C} \leq T_a \leq +50\text{ °C}$
	$-40\text{ °C} \leq T_p \leq +125\text{ °C}$	$-40\text{ °C} \leq T_a \leq +45\text{ °C}$

Specific conditions of use:

The surface temperature is

- for equipment protection level (EPL) Da:  $T_{200}$  135 °C (with 200 mm dust deposit)
- and equipment protection level (EPL) Db:  $T_L$  135 °C (with dust accumulation  $T_L$ )



$T_L$  marking:

The assigned surface temperature without dust layer is the same.

*Device type PMP51, PMP55*

Maximum surface temperature	Process temperature range	Ambient temperature range
T125 °C	$-40\text{ °C} \leq T_p \leq +80\text{ °C}$	$-40\text{ °C} \leq T_a \leq +55\text{ °C}$
	$-40\text{ °C} \leq T_p \leq +100\text{ °C}$	$-40\text{ °C} \leq T_a \leq +50\text{ °C}$
	$-40\text{ °C} \leq T_p \leq +125\text{ °C}$	$-40\text{ °C} \leq T_a \leq +45\text{ °C}$

*Basic specification, Position 16 = B*

Maximum surface temperature	Process temperature range	Ambient temperature range
T125 °C	$-40\text{ °C} \leq T_p \leq +200\text{ °C}$	$-40\text{ °C} \leq T_a \leq +60\text{ °C}$
	$-40\text{ °C} \leq T_p \leq +300\text{ °C}$	$-40\text{ °C} \leq T_a \leq +55\text{ °C}$
	$-40\text{ °C} \leq T_p \leq +400\text{ °C}$	$-40\text{ °C} \leq T_a \leq +50\text{ °C}$

*Basic specification, Position 16 = D, E*

Maximum surface temperature	Process temperature range	Ambient temperature range
T125 °C	$-40\text{ °C} \leq T_p \leq +400\text{ °C}$	$-40\text{ °C} \leq T_a \leq +60\text{ °C}$

Specific conditions of use:

The surface temperature is

- for equipment protection level (EPL) Da:  $T_{200}$  125 °C (with 200 mm dust deposit)
- and equipment protection level (EPL) Db:  $T_L$  125 °C (with dust accumulation  $T_L$ )



$T_L$  marking:

The assigned surface temperature without dust layer is the same.

## Connection data

*Basic specification, Position 3 = 2*

Power supply
$U_i \leq 30 V_{DC}$ $I_i \leq 300 \text{ mA}$ $P_i \leq 1 \text{ W}$ $C_i \leq 10 \text{ nF}$ $L_i = 0$

*Basic specification, Position 3 = 3, 4*

Power supply	
FISCO $U_i \leq 17.5 V_{DC}$ $I_i \leq 500 \text{ mA}$ $P_i \leq 5.5 \text{ W}$ $C_i \leq 5 \text{ nF}$ $L_i \leq 10 \mu\text{H}$	Entity $U_i \leq 24 V_{DC}$ $I_i \leq 250 \text{ mA}$ $P_i \leq 1.2 \text{ W}$ $C_i \leq 5 \text{ nF}$ $L_i \leq 10 \mu\text{H}$

## Cable entry: Connection compartment

Thread	Clamping range	Material	Sealing insert	O-ring
M20x1,5	$\varnothing 8$ to $10.5 \text{ mm}$ <sup>1)</sup> $\varnothing 6.5$ to $13 \text{ mm}$ <sup>2)</sup>	Ms, nickel-plated	Silicone	EPDM ( $\varnothing 17 \times 2$ )

1) Standard

2) Separate clamping inserts available



- The tightening torque refers to cable glands installed by the manufacturer:
  - Recommended: 3.5 Nm
  - Maximum: 10 Nm
- This value may be different depending on the type of cable. However, the maximum value must not be exceeded.

- Only suitable for fixed installation. The operator must pay attention to a suitable strain relief of the cable.
- To maintain the ingress protection of the enclosure: Install the enclosure cover, cable glands and blind plugs correctly.









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[www.addresses.endress.com](http://www.addresses.endress.com)

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