

Safety Instructions

Cerabar PMC71B, PMP71B

4-20 mA HART

Control Drawing XP, DIP



Cerabar PMC71B, PMP71B

4-20 mA HART

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About this document

This document has been translated into several languages. Legally determined is solely the English source text.

Associated documentation

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

PMC71B
BA02010P/00, TI01507P/00
PMP71B
BA02012P/00, TI01509P/00

Manufacturer's certificates**CSA C/US certificate**

Certificate number:
CSA21CA80066208

Manufacturer address

Endress+Hauser SE+Co. KG
Hauptstraße 1
79689 Maulburg, Germany
Address of the manufacturing plant: See nameplate.

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

PMx71B - ***** + A*B*C*D*E*F*G*..
(Device type) *(Basic specifications)* *(Optional specifications)*

* = 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



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

PMC71B, PMP71B

Basic specifications

Position 1, 2 (Approval)		
Selected option		Description
PMC71B	CD	CSA C/US XP Cl. I, II, III, Div. 1, Gp. A-G; Cl. I, Div. 2, Gp. A-D; Class I, Zone 1, AEx/Ex db ia IIC Gb
	CG	CSA C/US DIP Cl. II, III, Div. 1, Gp. E-G
PMP71B	CD	CSA C/US XP Cl. I, II, III, Div. 1, Gp. B-G; Cl. I, Div. 2, Gp. A-D; Class I, Zone 1, AEx/Ex db IIC Gb
	CG	CSA C/US DIP Cl. II, III, Div. 1, Gp. E-G

Position 6 (Housing, Material)		
Selected option		Description
PMC71B	B	Single compartment; Alu, coated
PMP71B	J	Dual compartment; Alu, coated
	K	Dual compartment; 316L

Position 10 (Diaphragm Seal Type)		
Selected option		Description
PMP71B	G	Temperature isolator
	M m capillary, 316L
	N m capillary, PVC>316L
	O m capillary, PTFE>316L
	R ft capillary, 316L
	S ft capillary, PVC>316L
	T ft capillary, PTFE>316L

Optional specifications

ID Ex (Application Package)		
Selected option		Description
PMC71B	EC	High temperature version, 150°C/302°F process

ID Jx, Kx (Test, Certificate, Declaration)		
Selected option		Description
PMP71B	JL	Ambient temp. transmitter -50°C/-58°F, sensor see specification
	JT	Ambient temp. transmitter -60°C/-76°F, sensor see specification

Safety instructions: General

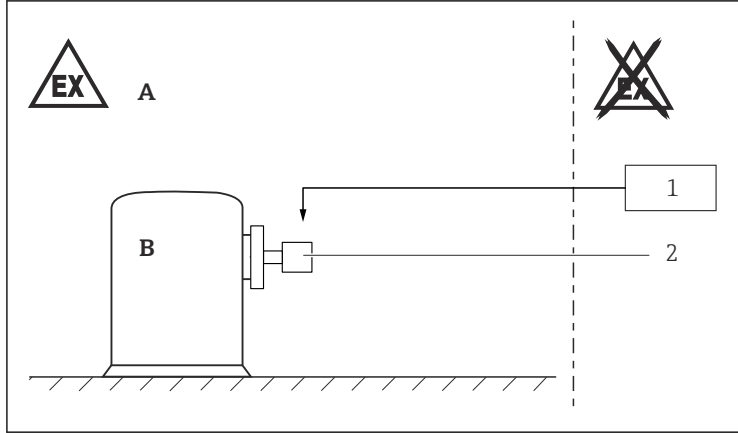
- Comply with the installation and safety instructions in the Operating Instructions.
- Staff must meet the following conditions for mounting, electrical installation, commissioning and maintenance of the device:
 - Be suitably qualified for their role and the tasks they perform
 - Be trained in explosion protection
 - Be familiar with national regulations
- Install the device according to the manufacturer's instructions and national regulations.
- Do not operate the device outside the specified electrical, thermal and mechanical parameters.

- Only use the device in media to which the wetted materials have sufficient durability.
- Avoid electrostatic charging:
 - Of plastic surfaces (e.g. housing, sensor element, special varnishing, attached additional plates, ..)
 - Of isolated capacities (e.g. isolated metallic plates)
- Modifications to the device can affect the explosion protection and must be carried out by staff authorized to perform such work by Endress+Hauser.

**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.
- To avoid electrostatic charging: Do not rub surfaces with a dry cloth.
- In the event of additional or alternative special varnishing on the housing or other metal parts or for adhesive plates:
 - Observe the danger of electrostatic charging and discharge.
 - Do not install in the vicinity of processes (≤ 0.5 m) generating strong electrostatic charges.
- Avoid sparks caused by impact and friction.
- Flameproof joints are not intended to be repaired.

Safety instructions: Installation



A0041997

- A Device type *PMC71B*
 Zone 1 or 2; Class I, II, III, Div. 1, Groups A-G or Class I, Div. 2, Groups A-D
 Device type *PMP71B*
 Zone 1 or 2; Class I, II, III, Div. 1, Groups B-G or Class I, Div. 2, Groups A-D
- B Process;
 Device type *PMC71B*
 Zone 1 or 2; Class I, II, III, Div. 1, Groups A-G or Class I, Div. 2, Groups A-D
 Device type *PMP71B*
 Zone 1 or 2; Class I, II, III, Div. 1, Groups B-G or Class I, Div. 2, Groups A-D
- 1 Power supply
 2 *PMC71B, PMP71B*

- After aligning (rotating) the housing, retighten the fixing screw.
- In potentially explosive atmospheres: Do not open the connection compartment cover and the electronics compartment cover when energized.
- Before operation:
 - Screw in the cover all the way.
 - Tighten the securing clamp on the cover.
- Continuous service temperature of the connecting cable: $\geq T_a + 20 \text{ K}$.
- Observe the maximum process conditions according to the manufacturer's Operating Instructions.
- Install the device to exclude any mechanical damage or friction during the application. Pay particular attention to flow conditions and tank fittings.

**Explosionproof /
Flameproof***Device type PMC71B*

Class I, Div. 1, Groups A, B, C, D; Class I, Zone 1, AEx/Ex db ia IIC Gb

Device type PMP71B

Class I, Div. 1, Groups B, C, D; Class I, Zone 1, AEx/Ex db IIC Gb

- Install per National Electrical Code (NFPA70) or Canadian Electrical Code, Part I (C22.1), as applicable.
- XP conduit seal required within 450 mm (18 in) of the enclosure.
- For the maximum supply voltage: See "Connection data" section.
- Seal unused entries with approved plugs that correspond to the type of protection. The plastic transport sealing plug does not meet this requirement and must therefore be replaced during installation. The metal sealing plugs supplied meet this requirement.
- The transmitter housing is to be connected to ground via internal or external ground terminals.
- **WARNINGS:** Keep covers tight when explosive atmosphere is present.

Only Device type PMC71B

- The transmitter housing is to be installed as an explosionproof/flameproof device. It provides an intrinsically safe circuit to the integral or remote mounted sensor housing.
- Use wiring and sealing methods for the power supply wiring as appropriate for the location.

Only Device type PMP71B

Use wiring and sealing methods appropriate for the location.

**Class II, III, Div. 1,
Groups E, F, G**

- Install per National Electrical Code (NFPA70) or Canadian Electrical Code, Part I (C22.1), as applicable.
- Use wiring and sealing methods appropriate for the location.
- Use a dust-tight seal for wiring at the conduit/cable entry.
- Seal unused entries with approved plugs that correspond to the type of protection. The plastic transport sealing plug does not meet this requirement and must therefore be replaced during installation. The metal sealing plugs supplied meet this requirement.
- **WARNINGS:** Keep covers tight when explosive atmosphere is present.

**Class I, Div. 2,
Groups A, B, C, D**

- Install per National Electrical Code (NFPA70) or Canadian Electrical Code, Part I (C22.1), as applicable.
- Use wiring and sealing methods appropriate for the location.
- Enclosure is not required to be explosionproof/flameproof.
- **WARNINGS:** Substitution of components may impair suitability for hazardous locations. Do not disconnect equipment unless power has been switched off or the area is known to be non-hazardous.

Process seals

Device Type PMC71B

- The device is rated Single Seal in accordance with UL122701 and does not require the use of an external secondary process seal.
- The Single Seal rating is valid for a maximum pressure of up to 40 bar and a maximum process temperature (T_p) up to 150 °C.

Device Type PMP71B

- The device is rated Single Seal in accordance with UL122701 and does not require the use of an external secondary process seal.
- The Single Seal rating is valid for a maximum working pressure (MWP) of up to 400 bar and a maximum process temperature (T_p) up to 400 °C.
- Single Seal rating does not apply to devices with Basic specification, Position 11, 12 = 3X (700 bar).



- Limitation of the maximum working pressure (MWP) for each device is marked on the nameplate and must not be exceeded! This value may be less than the Single Seal rating.
- Limitation of the maximum process temperature (T_p) with regards to the device options, temperature code rating and maximum ambient temperature as specified in the "Temperature tables" section of this document must be considered!
- Verify the chemical compatibility of the process fluid with the process seal material (see field "Mat." on the nameplate)!

Temperature tables

Class I, Div. 1 and 2 / Zone 1 and Zone 2



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



Optional specification, ID Jx, Kx = JL

Lower limit of the ambient temperature for explosion protection changes to -50 °C.

Optional specification, ID Jx, Kx = JT

Lower limit of the ambient temperature for explosion protection changes to -60 °C.

Device Type PMC71B

Temperature class	Process temperature range	Ambient temperature range	
		Class I, Div. 1/Zone 1	Class I, Div. 2/Zone 2
T6	$-40\text{ °C} \leq T_p \leq +80\text{ °C}$	$-40\text{ °C} \leq T_a \leq +55\text{ °C}$	$-40\text{ °C} \leq T_a \leq +55\text{ °C}$
T4	$-40\text{ °C} \leq T_p \leq +55\text{ °C}$	-	$-40\text{ °C} \leq T_a \leq +65\text{ °C}$
	$-40\text{ °C} \leq T_p \leq +100\text{ °C}$	$-40\text{ °C} \leq T_a \leq +50\text{ °C}$	$-40\text{ °C} \leq T_a \leq +60\text{ °C}$
	$-40\text{ °C} \leq T_p \leq +125\text{ °C}$	$-40\text{ °C} \leq T_a \leq +40\text{ °C}$	$-40\text{ °C} \leq T_a \leq +50\text{ °C}$

Optional specification, ID Ex = EC

Temperature class	Process temperature range	Ambient temperature range	
		Class I, Div. 1/Zone 1	Class I, Div. 2/Zone 2
T6	$-40\text{ °C} \leq T_p \leq +80\text{ °C}$	$-40\text{ °C} \leq T_a \leq +55\text{ °C}$	$-40\text{ °C} \leq T_a \leq +65\text{ °C}$
T4	$-40\text{ °C} \leq T_p \leq +125\text{ °C}$	$-40\text{ °C} \leq T_a \leq +50\text{ °C}$	$-40\text{ °C} \leq T_a \leq +60\text{ °C}$
T3	$-40\text{ °C} \leq T_p \leq +150\text{ °C}$	$-40\text{ °C} \leq T_a \leq +40\text{ °C}$	$-40\text{ °C} \leq T_a \leq +50\text{ °C}$

Device Type PMP71B

Temperature class	Process temperature range	Ambient temperature range	
		Class I, Div. 1/Zone 1	Class I, Div. 2/Zone 2
T6	$-40\text{ °C} \leq T_p \leq +80\text{ °C}$	$-40\text{ °C} \leq T_a \leq +60\text{ °C}$	$-40\text{ °C} \leq T_a \leq +60\text{ °C}$
	$-40\text{ °C} \leq T_p \leq +70\text{ °C}$	-	$-40\text{ °C} \leq T_a \leq +65\text{ °C}$
T4	$-40\text{ °C} \leq T_p \leq +100\text{ °C}$	$-40\text{ °C} \leq T_a \leq +60\text{ °C}$	$-40\text{ °C} \leq T_a \leq +60\text{ °C}$
	$-40\text{ °C} \leq T_p \leq +125\text{ °C}$	$-40\text{ °C} \leq T_a \leq +50\text{ °C}$	$-40\text{ °C} \leq T_a \leq +50\text{ °C}$

Basic specification, Position 10 = G

Temperature class	Process temperature range	Ambient temperature range	
		Class I, Div. 1/Zone 1	Class I, Div. 2/Zone 2
T6	$-40\text{ °C} \leq T_p \leq +80\text{ °C}$	$-40\text{ °C} \leq T_a \leq +65\text{ °C}$	$-40\text{ °C} \leq T_a \leq +65\text{ °C}$
T4	$-40\text{ °C} \leq T_p \leq +125\text{ °C}$	$-40\text{ °C} \leq T_a \leq +70\text{ °C}$	-
	$-40\text{ °C} \leq T_p \leq +130\text{ °C}$	-	$-40\text{ °C} \leq T_a \leq +70\text{ °C}$
T3	$-40\text{ °C} \leq T_p \leq +190\text{ °C}$	$-40\text{ °C} \leq T_a \leq +60\text{ °C}$	$-40\text{ °C} \leq T_a \leq +65\text{ °C}$
T2	$-40\text{ °C} \leq T_p \leq +290\text{ °C}$	$-40\text{ °C} \leq T_a \leq +55\text{ °C}$	$-40\text{ °C} \leq T_a \leq +60\text{ °C}$
T1	$-40\text{ °C} \leq T_p \leq +400\text{ °C}$	$-40\text{ °C} \leq T_a \leq +50\text{ °C}$	$-40\text{ °C} \leq T_a \leq +55\text{ °C}$

Basic specification, Position 10 = M, N, O, R, S, T

Temperature class	Process temperature range	Ambient temperature range	
		Class I, Div. 1/Zone 1	Class I, Div. 2/Zone 2
T6	$-40\text{ °C} \leq T_p \leq +80\text{ °C}$	$-40\text{ °C} \leq T_a \leq +70\text{ °C}$	$-40\text{ °C} \leq T_a \leq +65\text{ °C}$
T4	$-40\text{ °C} \leq T_p \leq +125\text{ °C}$	$-40\text{ °C} \leq T_a \leq +70\text{ °C}$	-
	$-40\text{ °C} \leq T_p \leq +130\text{ °C}$	$-40\text{ °C} \leq T_a \leq +70\text{ °C}$	$-40\text{ °C} \leq T_a \leq +70\text{ °C}$
T3	$-40\text{ °C} \leq T_p \leq +190\text{ °C}$	$-40\text{ °C} \leq T_a \leq +70\text{ °C}$	$-40\text{ °C} \leq T_a \leq +70\text{ °C}$
T2	$-40\text{ °C} \leq T_p \leq +290\text{ °C}$	$-40\text{ °C} \leq T_a \leq +70\text{ °C}$	$-40\text{ °C} \leq T_a \leq +70\text{ °C}$
T1	$-40\text{ °C} \leq T_p \leq +400\text{ °C}$	$-40\text{ °C} \leq T_a \leq +70\text{ °C}$	$-40\text{ °C} \leq T_a \leq +70\text{ °C}$

Class II, III, Div. 1



- The specified surface temperature takes into account all direct heat influences from process heat and self-heating at the housing.
- 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 housing.
- The process temperatures refer to the temperature at the separation membrane.



Basic specification, Position 6 = K

When using the stainless steel housing: Reduce the admissible ambient temperature by 5 K.

Device Type PMC71B

Maximum surface temperature	Process temperature range	Ambient temperature range
T125 °C	$-40\text{ °C} \leq T_p \leq +70\text{ °C}$	$-40\text{ °C} \leq T_a \leq +65\text{ °C}$
	$-40\text{ °C} \leq T_p \leq +100\text{ °C}$	$-40\text{ °C} \leq T_a \leq +60\text{ °C}$
	$-40\text{ °C} \leq T_p \leq +125\text{ °C}$	$-40\text{ °C} \leq T_a \leq +55\text{ °C}$

Optional specification, ID Ex = EC

Maximum surface temperature	Process temperature range	Ambient temperature range
T150 °C	$-40\text{ °C} \leq T_p \leq +125\text{ °C}$	$-40\text{ °C} \leq T_a \leq +60\text{ °C}$
	$-40\text{ °C} \leq T_p \leq +150\text{ °C}$	$-40\text{ °C} \leq T_a \leq +55\text{ °C}$

Device Type PMP71B

Maximum surface temperature	Process temperature range	Ambient temperature range
T125 °C	$-40\text{ °C} \leq T_p \leq +80\text{ °C}$	$-40\text{ °C} \leq T_a \leq +65\text{ °C}$
	$-40\text{ °C} \leq T_p \leq +100\text{ °C}$	$-40\text{ °C} \leq T_a \leq +60\text{ °C}$
	$-40\text{ °C} \leq T_p \leq +125\text{ °C}$	$-40\text{ °C} \leq T_a \leq +50\text{ °C}$

Basic specification, Position 10 = G

Maximum surface temperature	Process temperature range	Ambient temperature range
T125 °C	$-40\text{ °C} \leq T_p \leq +190\text{ °C}$	$-40\text{ °C} \leq T_a \leq +60\text{ °C}$
	$-40\text{ °C} \leq T_p \leq +290\text{ °C}$	$-40\text{ °C} \leq T_a \leq +55\text{ °C}$
	$-40\text{ °C} \leq T_p \leq +400\text{ °C}$	$-40\text{ °C} \leq T_a \leq +50\text{ °C}$

Basic specification, Position 10 = M, N, O, R, S, T

Maximum surface temperature	Process temperature range	Ambient temperature range
T125 °C	$-40\text{ °C} \leq T_p \leq +190\text{ °C}$	$-40\text{ °C} \leq T_a \leq +70\text{ °C}$
	$-40\text{ °C} \leq T_p \leq +290\text{ °C}$	$-40\text{ °C} \leq T_a \leq +70\text{ °C}$
	$-40\text{ °C} \leq T_p \leq +400\text{ °C}$	$-40\text{ °C} \leq T_a \leq +70\text{ °C}$

Connection data

Power supply
$U \leq 35\text{ V}_{DC}$ $I = 4\text{ to }20\text{ mA}$ $P \leq 1\text{ W}$



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