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Safety Instructions
Cerabar PMC51B, PMP51B

0/1Ex ia IIC T6...T1 Ga/Gb
Ex ia IIIC T_{200} xxx°C Da/Db

Endress+Hauser
People for Process Automation

Cerabar PMC51B, PMP51B

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About this document

The document number of these Safety Instructions (XA) must match the information on the nameplate.

Associated documentation

All documentation is available on the Internet:
www.endress.com/Deviceviewer
(enter the serial number from the nameplate).

To commission the device, please observe the Operating Instructions pertaining to the device:

PMC51B
BA02009P, TI01506P

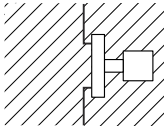
PMP51B
BA02011P, TI01508P

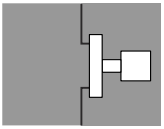
Supplementary documentation

Explosion protection brochure: CP00021Z

The explosion protection brochure is available on the Internet:
www.endress.com/Downloads

General notes: Combined approval





Ex ia IIC		Ex ia IIIC	
Zone 0 or Zone 1	Zone 1	Zone 20 or Zone 21	Zone 21

The device is designed for operation in explosive gas or explosive dust atmosphere as shown in the sketch above. In the event of potentially explosive gas-air and dust-air mixtures occurring simultaneously: Suitability requires further assessment.

Certificates and declarations

Certificate of Conformity TP TC 012/2011

Inspection authority:
LLP "T-Standard" (ТОО/ЖШС "Т-Стандарт")

Certificate number:
ЕАЭС KZ 7500525.01.01.01734

Affixing the certificate number certifies conformity with the following standards (depending on the device version):

- GOST 31610.0-2019 (IEC 60079-0:2017)
- GOST 31610.11-2014 (IEC 60079-11:2011)
- GOST 31610.26-2016 (IEC 60079-26:2014)

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

PMx51B	–	**********	+	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

PMC51B, PMP51B

Basic specifications

Position 1, 2 (Approval)		
Selected option		**Description**
PMC51B PMP51B	GK	EAC 0/1Ex ia IIC T6...T1 Ga/Gb EAC 1Ex ia IIC T6...T1 Gb EAC Ex ia IIIC T_{200} xxx°C Da/Db EAC Ex ia IIIC T_L xxx°C Db

Position 3, 4 (Output)		
Selected option		**Description**
PMC51B PMP51B	BA	2-wire, 4-20 mA HART
	BB	2-wire, 4-20 mA HART, switch output [1]
	BC	2-wire, 4-20 mA HART + 4 to 20 mA analog [1]
	DA	2-wire, PROFIBUS PA
	FA	PROFINET over Ethernet-APL, 10Mbit/s

1) Only in connection with Position 6 = J

Position 5 (Display, Operation)		
Selected option		**Description**
PMC51B PMP51B	M	Prepared for display FHX50B + Gland M20
	N	Prepared for display FHX50B + Thread NPT1/2
	O	Prepared for display FHX50B + Thread M20

Position 6 (Housing, Material)		
Selected option		**Description**
PMC51B PMP51B	B	Single compartment; Alu, coated
	J	Dual compartment; Alu, coated

Position 7 (Electrical Connection)		
Selected option		**Description**
PMC51B PMP51B	B	Gland M20, brass nickel plated, IP66/68 NEMA Type 4X/6P
	C	Gland M20, 316L, IP66/68 NEMA Type 4X/6P
	F	Thread M20, IP66/68 NEMA Type 4X/6P
	G	Thread G1/2, IP66/68 NEMA Type 4X/6P
	H	Thread NPT1/2, IP66/68 NEMA Type 4X/6P

Position 10 (Diaphragm Seal Type)		
Selected option		**Description**
PMP51B	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 Px, Rx (Accessory Enclosed)		
Selected option		**Description**
PMC51B PMP51B	PA	Weather protection cover, 316L [1]

1) Only in connection with Position 6 = J

Safety instructions: General

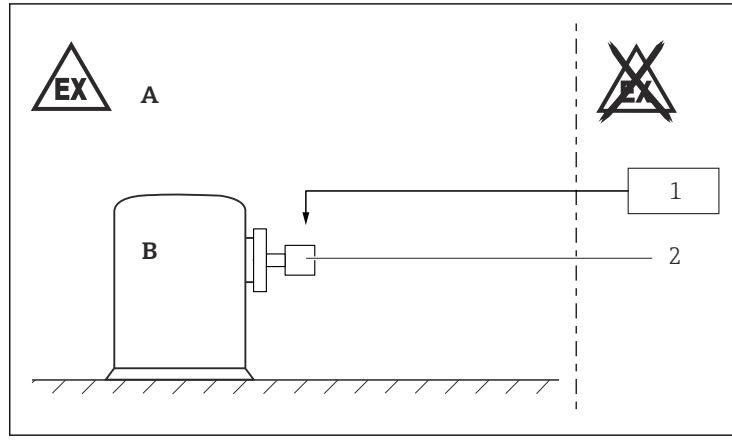
- The device is intended to be used in explosive atmospheres as defined in the scope of IEC 60079-0 or equivalent national standards. If no potentially explosive atmospheres are present or if additional protective measures have been taken: The device may be operated according to the manufacturer's specifications.
- Devices suitable for zone separation (marked Ga/Gb or Da/Db) are always suitable for installation in the less critical zone (Gb or Db). Due to space limitations the corresponding marking maybe not indicated on the nameplate.
- 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. enclosure, sensor element, special varnishing, attached additional plates, ...)
  - Of isolated capacities (e.g. isolated metallic plates)
- Alterations 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: Specific conditions of use

- To avoid electrostatic charging: Do not rub surfaces with a dry cloth.
- In the event of additional or alternative special varnishing on the enclosure 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.

Optional specification, ID Px, Rx = PA
Connect the weather protection cover to the local potential equalization.

Safety instructions: Installation



A Zone 1 or Zone 21, Electronic
B Zone 0, Zone 1 or Zone 20, Zone 21, Process
1 Associated intrinsically safe power supply units
2 PMC51B, PMP51B

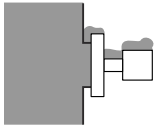
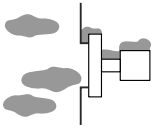
- After aligning (rotating) the enclosure, retighten the fixing screw.
- When the device is connected to certified intrinsically safe circuits of Category Ex ib for Equipment Groups IIC and IIB, the type of protection changes to Ex ib IIC and Ex ib IIB. Do not operate the sensor in Zone 0 if connecting to an intrinsically safe circuit of Category Ex ib.
- When the device is connected to certified intrinsically safe circuits of Category Ex ib for Equipment Groups IIIC and IIIB, the type of protection changes to Ex ib IIIC and Ex ib IIIB. Do not operate the sensor in Zone 20 if connecting to an intrinsically safe circuit of Category Ex ib.
- Continuous service temperature of the connecting cable: $\geq T_a$+20 K.
- Observe the pertinent guidelines when interconnecting intrinsically safe circuits.
- 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.
- Perform the following to achieve the degree of protection IP66/67:
  - Screw the cover tight.
  - Mount the cable entry correctly.

- Seal unused entry glands with suitable sealing plugs that correspond to the type of protection.
- Supplied cable glands and metallic sealing plugs comply with the requirements of type of protection marked on the nameplate.
- The plastic sealing plug is used only as transport protection.

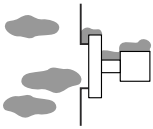
Basic specification, Position 5 = N
Observe the requirements according to IEC/EN 60079-14 for conduit systems and the wiring and installation instructions of the suitable Safety Instructions (XA). In addition, observe national regulations and standards for conduit systems.

Permitted ambient conditions

Ex ia IIIC T_{200} xxx°C Da/Db

Process Zone 20		Enclosure Zone 21
Continuous dust submersion		Dust accumulation or temporary explosive dust atmosphere
Continuous explosive dust atmosphere and deposits		Dust accumulation or temporary explosive dust atmosphere

Ex ia IIIC T_L xxx°C Db

Process Zone 21		Enclosure Zone 21
Continuous dust deposits or temporary explosive dust atmosphere		Dust accumulation or temporary explosive dust atmosphere

Intrinsic safety

- The device is only suitable for connection to certified, intrinsically safe equipment with explosion protection Ex ia / Ex ib.
- The intrinsically safe input power circuit of the device is isolated from ground. The dielectric strength is at least 500 V_{rms}.

Potential equalization

Integrate the device into the local potential equalization.

Overvoltage protection

Only device type PMC51B
For installations which require overvoltage protection to comply with national regulations or standards, install the device with suitable external overvoltage protection.

Temperature tables

0/1Ex ia IIC T6...T1 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.
- The process temperatures refer to the temperature at the separation membrane.

Device Type PMC51B

Temperature class	Process temperature T_p (process)	Ambient temperature T_a (ambient)	
		Basic specification, Position 3, 4 =	
		BA, DA, FA	*BB, BC*
		Basic specification, Position 6 =	
		B, J	*J*
T6	+40 °C	–40 to +50 °C	–40 to +45 °C
	+80 °C	–40 to +45 °C	–40 to +40 °C
T4...T1	+60 °C	–40 to +60 °C	–40 to +55 °C
	+80 °C	–40 to +60 °C	–40 to +50 °C
	+100 °C	–40 to +55 °C	–40 to +50 °C
	+125 °C	–40 to +50 °C	–40 to +40 °C

Device Type PMP51B

Temperature class	Process temperature T_p (process)	Ambient temperature T_a (ambient)	
		Basic specification, Position 3, 4 =	
		BA, DA, FA	*BB, BC*
		Basic specification, Position 6 =	
		B, J	*J*
T6	+60 °C	−40 to +50 °C	−40 to +45 °C
	+70 °C	−40 to +50 °C	−40 to +45 °C
	+80 °C	−40 to +45 °C	−40 to +40 °C
T4...T1	+70 °C	−40 to +65 °C	−40 to +55 °C
	+80 °C	−40 to +60 °C	−40 to +55 °C
	+100 °C	−40 to +55 °C	−40 to +50 °C
	+125 °C	−40 to +50 °C	−40 to +45 °C

Basic specification, Position 10 = G

Temperature class	Process temperature T_p (process)	Ambient temperature T_a (ambient)	
		Basic specification, Position 3, 4 =	
		BA, DA, FA	*BB, BC*
		Basic specification, Position 6 =	
		B, J	*J*
T6	+80 °C	−40 to +60 °C	−40 to +55 °C
T4	+130 °C	−40 to +70 °C	−40 to +60 °C
T3	+190 °C	−40 to +60 °C	−40 to +60 °C
T2	+290 °C	−40 to +60 °C	−40 to +55 °C
T1	+300 °C	−40 to +60 °C	−40 to +55 °C
	+400 °C	−40 to +55 °C	−40 to +50 °C

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

Temperature class	Process temperature T_p (process)	Ambient temperature T_a (ambient)	
		Basic specification, Position 3, 4 =	
		BA, DA, FA	*BB, BC*
		Basic specification, Position 6 =	
		B, J	*J*
T6	+80 °C	–40 to +60 °C	–40 to +55 °C
T4	+130 °C	–40 to +70 °C	–40 to +60 °C
T3	+190 °C	–40 to +70 °C	–40 to +60 °C
T2	+290 °C	–40 to +70 °C	–40 to +60 °C
T1	+400 °C	–40 to +70 °C	–40 to +60 °C

Ex ia IIIC T_{200} xxx°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.
- The process temperatures refer to the temperature at the separation membrane.

For detailed information see Technical Information.

Protection type of enclosure: IP66/67

Device Type PMC51B

Ex ia IIIC T_{200} 135 °C Da/Db
Ex ia IIIC T_L 135 °C Db

Temperature class	Process temperature T_p (process)	Ambient temperature T_a (ambient)	
		Basic specification, Position 3, 4 =	
		BA, DA, FA	*BB, BC*
		Basic specification, Position 6 =	
		B, J	*J*
T135 °C	+60 °C	–40 to +60 °C	–40 to +55 °C
	+80 °C	–40 to +60 °C	–40 to +55 °C
	+100 °C	–40 to +55 °C	–40 to +50 °C
	+125 °C	–40 to +50 °C	–40 to +45 °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)
- The surface temperature is
  for 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 PMP51B

Ex ia IIIC T_{200} 125 °C Da/Db
Ex ia IIIC T_L 125 °C Db

Temperature class	Process temperature T_p (process)	Ambient temperature T_a (ambient)	
		Basic specification, Position 3, 4 =	
		BA, DA, FA	*BB, BC*
		Basic specification, Position 6 =	
		B, J	*J*
T125 °C	+70 °C	−40 to +65 °C	−40 to +55 °C
	+80 °C	−40 to +60 °C	−40 to +55 °C
	+100 °C	−40 to +55 °C	−40 to +50 °C
	+125 °C	−40 to +50 °C	−40 to +45 °C

Basic specification, Position 10 = G

Temperature class	Process temperature T_p (process)	Ambient temperature T_a (ambient)	
		Basic specification, Position 3, 4 =	
		BA, DA, FA	*BB, BC*
		Basic specification, Position 6 =	
		B, J	*J*
T125 °C	+130 °C	−40 to +70 °C	−40 to +60 °C
	+190 °C	−40 to +60 °C	−40 to +60 °C
	+290 °C	−40 to +60 °C	−40 to +55 °C
	+300 °C	−40 to +60 °C	−40 to +55 °C
	+400 °C	−40 to +55 °C	−40 to +50 °C

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

Temperature class	Process temperature T_p (process)	Ambient temperature T_a (ambient)	
		Basic specification, Position 3, 4 =	
		BA, DA, FA	*BB, BC*
		Basic specification, Position 6 =	
		B, J	*J*
T125 °C	+130 °C	−40 to +70 °C	−40 to +70 °C
	+190 °C	−40 to +70 °C	−40 to +70 °C
	+290 °C	−40 to +70 °C	−40 to +70 °C
	+300 °C	−40 to +70 °C	−40 to +70 °C
	+400 °C	−40 to +70 °C	−40 to +70 °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)
- The surface temperature is
  for 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, 4 = BA, BB, BC

Power supply	
Channel 1	Channel 2 (only *BB, BC*)
$U_i \leq 30\ V_{DC}$ $I_i \leq 300$ mA $P_i \leq 1$ W $C_i \leq 10$ nF $L_i = 0$	$U_i \leq 30\ V_{DC}$ $I_i \leq 300$ mA $P_i \leq 1$ W $C_i \leq 10$ nF $L_i = 0$

Basic specification, Position 3, 4 = DA

Power supply	
FISCO $U_i \leq 17.5\ V_{DC}$ $I_i \leq 380\ mA$ $P_i \leq 5.32\ W$ $C_i \leq 5\ nF$ $L_i = 0$	Entity $U_i \leq 24\ V_{DC}$ $I_i \leq 300\ mA$ $P_i \leq 1.2\ W$ $C_i \leq 5\ nF$ $L_i = 0$

Basic specification, Position 3, 4 = FA

Power supply	
2-WISE $U_i \leq 17.5\ V_{DC}$ $I_i \leq 380\ mA$ $P_i \leq 5.32\ W$ $C_i \leq 5\ nF$ $L_i = 0$	Entity $U_i \leq 17.5\ V_{DC}$ $I_i \leq 300\ mA$ $P_i \leq 1.2\ W$ $C_i \leq 5\ nF$ $L_i = 0$

In connection with: *Basic specification, Position 5 = M, N, O*
Installation according to the specifications of FHX50B.

Only the type of protection suitable for the device shall be connected!

Ex ia IIIC T_{200} xxx°C Da/Db

Cable entry: Connection compartment

Cable gland: *Basic specification, Position 7 = B*

Thread	Clamping range	Material	Sealing insert	O-ring
M20x1,5	ø 8 to 10.5 mm	Ms, nickel-plated	Silicone	EPDM (ø 17x2)

Cable gland: *Basic specification, Position 7 = C*

Thread	Clamping range	Material	Sealing insert	O-ring
M20x1,5	ø 7 to 12 mm	1.4404	NBR	EPDM (ø 17x2)

- 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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