

# Safety Instructions

## Cerabar PMP71B

II 1/2 G Ex ia IIC T6...T1 Ga/Gb

II 2 G Ex db IIC T6...T1 Gb

II 1/2 D Ex ta/tb IIIC T<sub>200</sub> xxx°C Da/Db

**UK  
CA**





# Cerabar PMP71B

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**Associated documentation**

To commission the device, please observe the Operating Instructions pertaining to the device:  
BA02012P, TI01509P

**Supplementary documentation**

Explosion protection brochure: CP00021Z  
The explosion protection brochure is available on the Internet:  
[www.endress.com/Downloads](http://www.endress.com/Downloads)

**General notes:  
Combined approval**

The device is suitable for installation with explosion protection "Intrinsic safety Ex ia" or "Flameproof enclosure Ex db" or "Equipment dust ignition protection by enclosure Ex t".

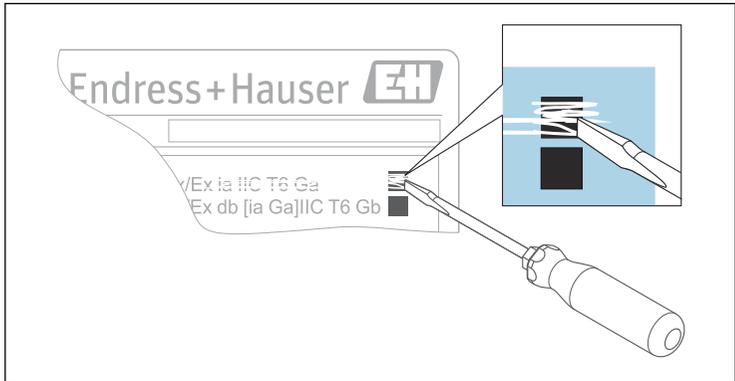
- Before initial commissioning, specify the type of protection.
- It is not permitted to change the type of protection after initial commissioning as this can jeopardize the explosion protection.

For aluminum enclosures:

Void out the explosion protection that is not used on the nameplate.

For stainless steel enclosures:

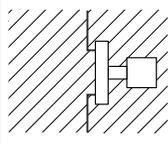
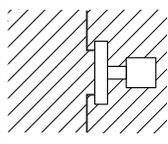
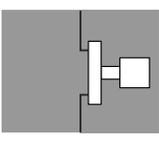
Using a striking tool, mark the explosion protection used, or void out the explosion protection that is not used.



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Depending on the type of protection used: Observe the safety instructions for installation with explosion protection "Intrinsic safety Ex ia", "Flameproof enclosure Ex db" or "Equipment dust ignition protection by enclosure Ex t".

		
Ex ia IIC Zone 0 or Zone 1	Ex db IIC Zone 1	Ex ta/tb IIIC Zone 20 or 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

### UK Declaration of Conformity

Declaration Number:  
UK\_00025 and UK\_00027

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 21UKEX2337X (Ex ia)  
CML 21UKEX2338X (Ex db, Ex ta/tb, Ex tb)

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"



*Basic specifications*

Position 1, 2 (Approval)		
Selected option		Description
PMP71B	UN	UK Ex II 1/2 G Ex ia IIC T6...T1 Ga/Gb UK Ex II 2 G Ex ia IIC T6...T1 Gb UK Ex II 2 G Ex db IIC T6...T1 Gb UK Ex II 1/2 D Ex ta/tb IIIC T <sub>200</sub> xxx°C Da/Db UK Ex II 2 D Ex tb IIIC T <sub>L</sub> xxx°C Db

Position 3, 4 (Output)		
Selected option		Description
PMP71B	BA	2-wire, 4-20 mA HART
	DA	2-wire, PROFIBUS PA
	FA	2-wire, PROFINET, 10Mbit/s (APL)

Position 5 (Display, Operation)		
Selected option		Description
PMP71B	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
PMP71B	B	Single compartment; Alu. coated
	J	Dual compartment; Alu. coated
	K	Dual compartment; 316L

Position 7 (Electrical Connection)		
Selected option		Description
PMP71B	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
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 Nx, Ox (Accessory Mounted)		
Selected option		Description
PMP71B	NA	Overvoltage protection <sup>1)</sup>

1) Only in connection with Position 6 = J, K

ID Px, Rx (Accessory Enclosed)		
Selected option		Description
PMP71B	PA	Weather protection cover, 316L <sup>1)</sup>

1) Only in connection with Position 6 = J, K

### 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.
- 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**

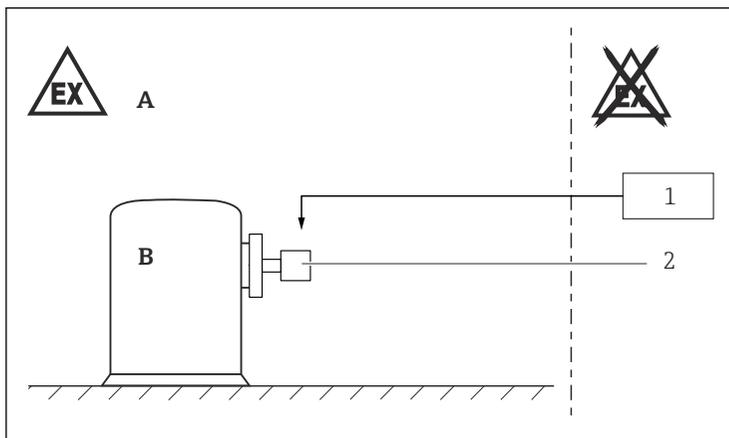
- In the case of process connections made of polymeric material or with polymeric coatings, avoid electrostatic charging of the plastic surfaces.
- For light metal flanges or flange faces (e.g. titanium, zirconium), avoid sparks caused by impact and friction.
- To avoid electrostatic charging: Do not rub surfaces with a dry cloth.
- In the event of additional or alternative special varnishing on the 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 ( $\leq 0.5$  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.

II 1/2 G Ex ia IIC T6...T1 Ga/Gb,  
II 2 G Ex ia IIC T6...T1 Gb

Safety  
instructions:  
Installation



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- A Zone 1, Electronic  
B Zone 0 or Zone 1, Process  
1 Associated intrinsically safe power supply units  
2 PMP71B

- 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.
- 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.

*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.

### 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<sub>rms</sub>.

*Optional specification, ID Nx, Ox = NA*

The intrinsically safe input power circuit of the device is isolated from ground. The dielectric strength is at least 290 V<sub>rms</sub>.

### Potential equalization

Integrate the device into the local potential equalization.

### Temperature tables



- 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.

Temperature class	Process temperature range	Ambient temperature range
T6	$-40\text{ °C} \leq T_p \leq +80\text{ °C}$	$-40\text{ °C} \leq T_a \leq +45\text{ °C}$
	$-40\text{ °C} \leq T_p \leq +70\text{ °C}$	$-40\text{ °C} \leq T_a \leq +50\text{ °C}$
T4...T1	$-40\text{ °C} \leq T_p \leq +125\text{ °C}$	$-40\text{ °C} \leq T_a \leq +45\text{ °C}$
	$-40\text{ °C} \leq T_p \leq +100\text{ °C}$	$-40\text{ °C} \leq T_a \leq +55\text{ °C}$
	$-40\text{ °C} \leq T_p \leq +80\text{ °C}$	$-40\text{ °C} \leq T_a \leq +60\text{ °C}$

*Basic specification, Position 10 = G*

Temperature class	Process temperature range	Ambient temperature range
T6	$-40\text{ °C} \leq T_p \leq +80\text{ °C}$	$-40\text{ °C} \leq T_a \leq +50\text{ °C}$
T4	$-40\text{ °C} \leq T_p \leq +130\text{ °C}$	$-40\text{ °C} \leq T_a \leq +60\text{ °C}$
T3	$-40\text{ °C} \leq T_p \leq +190\text{ °C}$	
T2	$-40\text{ °C} \leq T_p \leq +285\text{ °C}$	$-40\text{ °C} \leq T_a \leq +55\text{ °C}$
T1	$-40\text{ °C} \leq T_p \leq +400\text{ °C}$	

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

Temperature class	Process temperature range	Ambient temperature range
T6	$-40\text{ °C} \leq T_p \leq +80\text{ °C}$	$-40\text{ °C} \leq T_a \leq +60\text{ °C}$
T4	$-40\text{ °C} \leq T_p \leq +130\text{ °C}$	$-40\text{ °C} \leq T_a \leq +65\text{ °C}$
T3	$-40\text{ °C} \leq T_p \leq +190\text{ °C}$	
T2	$-40\text{ °C} \leq T_p \leq +285\text{ °C}$	
T1	$-40\text{ °C} \leq T_p \leq +400\text{ °C}$	

## Connection data

Basic specification, Position 3 = BA

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

Basic specification, Position 3 = DA

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

Basic specification, Position 3 = FA

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

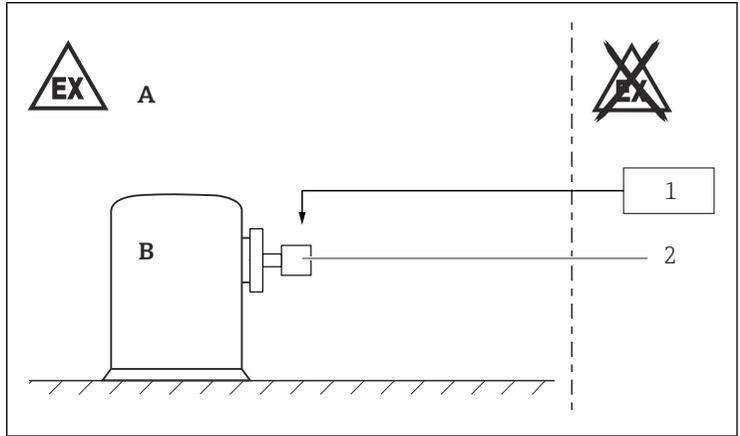
In connection with: *Basic specification, Position 5 = M, N, O*  
 Installation according to the specifications of FHX50B.



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

## II 2 G Ex db IIC T6...T1 Gb

### Safety instructions: Installation



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- A Zone 1, Electronic  
 B Zone 1, Process  
 1 Power supply  
 2 PMP71B

- After aligning (rotating) the enclosure, 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 screw on the cover.
- Connect the device:
  - Using suitable cable and wire entries of protection type "Flameproof Enclosure (Ex db)".
  - Using piping systems of protection type "Flameproof Enclosure (Ex db)".
- When connecting through a conduit entry approved for this purpose, mount the associated sealing unit directly at the enclosure.
- Seal unused entry glands with approved sealing 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.
- Only use certified cable entries or sealing plugs. The metal sealing plugs supplied meet this requirement.
- Only use genuine spare parts from Endress+Hauser which are specified for the device.

*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.

*Basic specification, Position 7 = G*

Flameproof equipment with G threaded holes is not intended for new installations, but only for replacing equipment in existing installations. Use of this equipment shall comply with the local installation requirements.

### Safety instructions: Ex d joints

- Flameproof joints are not intended to be repaired.
- If required or if in doubt: ask manufacturer for specifications.

### Temperature tables



- 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.

Temperature class	Process temperature range	Ambient temperature range
T6	$-40\text{ °C} \leq T_p \leq +80\text{ °C}$	$-40\text{ °C} \leq T_a \leq +60\text{ °C}$
T4...T1	$-40\text{ °C} \leq T_p \leq +100\text{ °C}$	$-40\text{ °C} \leq T_a \leq +60\text{ °C}$
	$-40\text{ °C} \leq T_p \leq +125\text{ °C}$	$-40\text{ °C} \leq T_a \leq +50\text{ °C}$

*Basic specification, Position 10 = G*

Temperature class	Process temperature range	Ambient temperature range
T6	$-40\text{ °C} \leq T_p \leq +80\text{ °C}$	$-40\text{ °C} \leq T_a \leq +65\text{ °C}$
T3	$-40\text{ °C} \leq T_p \leq +190\text{ °C}$	$-40\text{ °C} \leq T_a \leq +60\text{ °C}$
T2	$-40\text{ °C} \leq T_p \leq +290\text{ °C}$	$-40\text{ °C} \leq T_a \leq +55\text{ °C}$
T1	$-40\text{ °C} \leq T_p \leq +400\text{ °C}$	$-40\text{ °C} \leq T_a \leq +50\text{ °C}$

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

Temperature class	Process temperature range	Ambient temperature range
T6	$-40\text{ °C} \leq T_p \leq +80\text{ °C}$	$-40\text{ °C} \leq T_a \leq +70\text{ °C}$
T3	$-40\text{ °C} \leq T_p \leq +190\text{ °C}$	
T2	$-40\text{ °C} \leq T_p \leq +290\text{ °C}$	
T1	$-40\text{ °C} \leq T_p \leq +400\text{ °C}$	

## Connection data

*Basic specification, Position 3 = BA*

Power supply
$U \leq 35\text{ V}_{\text{DC}}$ $P \leq 1\text{ W}$

*Basic specification, Position 3 = DA*

Power supply
$U \leq 32\text{ V}_{\text{DC}}$ $P \leq 0.7\text{ W}$

*Basic specification, Position 3 = FA*

Power supply
$U \leq 15\text{ V}_{\text{DC}}$ $P \leq 0.7\text{ W}$

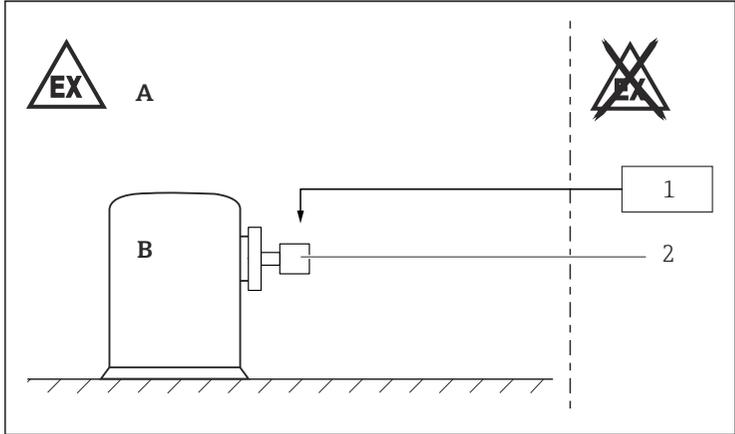
In connection with: *Basic specification, Position 5 = M, N, O*  
 Installation according to the specifications of FHX50B.



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

II 1/2 D Ex ta/tb IIIC T<sub>200</sub> xxx°C Da/Db,  
 II 2 D Ex tb IIIC T<sub>L</sub> xxx°C Db

**Safety  
 instructions:  
 Installation**



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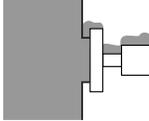
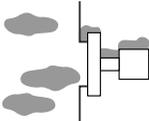
- A Zone 21, Electronic  
 B Zone 20 or Zone 21, Process  
 1 Power supply  
 2 PMP71B

- After aligning (rotating) the enclosure, retighten the fixing screw.
- Do not open in a potentially explosive dust atmosphere.
- Seal unused entry glands with approved sealing 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.
- Seal the cable entry or piping tight (see protection type of enclosure in the "Temperature tables" chapter).
- Before operation:
  - Screw in the cover all the way.
  - Tighten the securing screw on the cover.

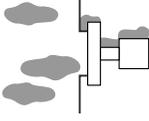
*Basic specification, Position 5 = N*

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***II 1/2 D Ex ta/tb IIIC T<sub>200</sub> 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

**II 2 D Ex tb IIIC T<sub>L</sub> xxx°C Db**

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

**Temperature tables**

- 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.



*Basic specification, Position 6 = K*

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



Protection type of enclosure: IP66/67

II 1/2 D Ex ta/tb IIIC T<sub>200</sub> 125°C Da/Db

II 2 D Ex tb IIIC T<sub>L</sub> 125°C Db

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	$-40\text{ °C} \leq T_p \leq +190\text{ °C}$	$-40\text{ °C} \leq T_a \leq +70\text{ °C}$
	$-40\text{ °C} \leq T_p \leq +290\text{ °C}$	
	$-40\text{ °C} \leq T_p \leq +400\text{ °C}$	

Specific conditions of use:

- The surface temperature is
  - for equipment protection level (EPL) Da: T<sub>200</sub> 125 °C (with 200 mm dust deposit)
  - and equipment protection level (EPL) Db: T<sub>L</sub> 125 °C (with dust accumulation T<sub>L</sub>)
- The surface temperature is for equipment protection level (EPL) Db: T<sub>L</sub> 125 °C (with dust accumulation T<sub>L</sub>)



T<sub>L</sub> marking:

The assigned surface temperature without dust layer is the same.

**Connection data***Basic specification, Position 3 = BA***Power supply**
 $U \leq 35 \text{ V}_{\text{DC}}$   
 $P \leq 1 \text{ W}$ 
*Basic specification, Position 3 = DA***Power supply**
 $U \leq 32 \text{ V}_{\text{DC}}$   
 $P \leq 0.7 \text{ W}$ 
*Basic specification, Position 3 = FA***Power supply**
 $U \leq 15 \text{ V}_{\text{DC}}$   
 $P \leq 0.7 \text{ W}$ 

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!



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