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Safety Instructions
Cerabar PMC71B

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

Endress+Hauser
People for Process Automation

Cerabar PMC71B

Table of contents

About this document

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

Associated documentation

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

BA02010P, TI01507P

Supplementary documentation

Explosion protection brochure: CP00021Z

The Explosion-protection brochure is available:
- In the download area of the Endress+Hauser website: www.endress.com -> Downloads -> Brochures and Catalogs -> Text Search: CP00021Z
- On the CD for devices with CD-based documentation

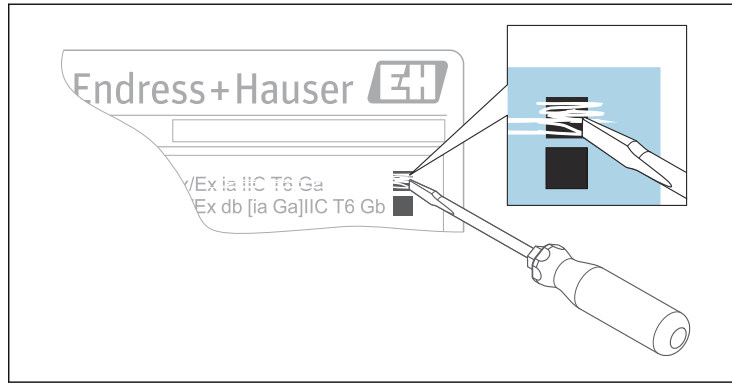
General notes: Combined approval

The device is suitable for installation with explosion protection "Intrinsic safety Ex ia" or "Flameproof enclosure Ex db".

- 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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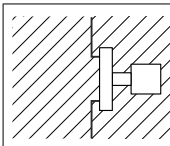
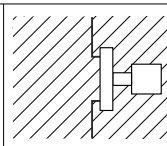
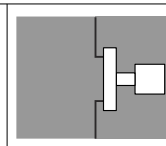
Depending on the type of protection used: Observe the safety instructions for installation with explosion protection "Intrinsic safety Ex ia" or "Flameproof enclosure Ex db".

					
Ex ia IIC		Ex db ia IIC		Ex ia IIIC	
Zone 0 or Zone 1	Zone 1	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

NEPSI Declaration of Conformity

Certificate number:
GYJ21.1015X (Ex db)
GYJ21.1017X (Ex ia)

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

- GB/T 3836.1-2021
- GB/T 3836.2-2021
- GB/T 3836.4-2021
- IEC 60079-26 : 2021

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

PMC71B	–	**********	+	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

Basic specifications

Position 1, 2 (Approval)		
Selected option		**Description**
PMC71B	NO	NEPSI Ex ia IIC T6...T1 Ga/Gb NEPSI Ex ia IIC T6...T1 Gb NEPSI Ex db ia IIC T6...T1 Gb NEPSI Ex ia IIIC T_{200} xxx°C Da/Db NEPSI Ex ia IIIC T_L xxx°C Db

Position 3, 4 (Output)		
Selected option		**Description**
PMC71B	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**
PMC71B	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**
PMC71B	B	Single compartment; Alu, coated
	J	Dual compartment; Alu, coated
	K	Dual compartment; 316L

Position 7 (Electrical Connection)		
Selected option		**Description**
PMC71B	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

Optional specifications

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

ID Nx, Ox (Accessory Mounted)		
Selected option		**Description**
PMC71B	NA	Overvoltage protection [1)]

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

ID Px, Rx (Accessory Enclosed)		
Selected option		**Description**
PMC71B	PA	Weather protection cover, 316L [1)]

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 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
- For installation, use and maintenance of the device, users must also observe the requirements stated in the Operating Instructions and the standards:
  - GB 50257-2014: "Code for construction and acceptance of electric equipment on fire and explosion hazard electrical equipment installation engineering".
  - GB/T 3836.13-2021: "Explosive atmospheres, Part 13: Equipment repair, overhaul, reclamation and modification".
  - GB/T 3836.15-2017: "Explosive atmospheres, Part 15: Electrical installations design, selection and erection".
  - GB/T 3836.16-2022: "Explosive atmospheres, Part 16: Electrical installations inspection and maintenance".
  - GB/T 3836.18-2017: "Explosive atmospheres, Part 18: Intrinsically safe electrical systems".
  - GB 15577-2018: "Safety regulations for dust explosive prevention and protection". (Only if installed in dust hazardous area.)
- 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 (≤ 0.5 m) generating strong electrostatic charges.
- Avoid sparks caused by impact and friction.

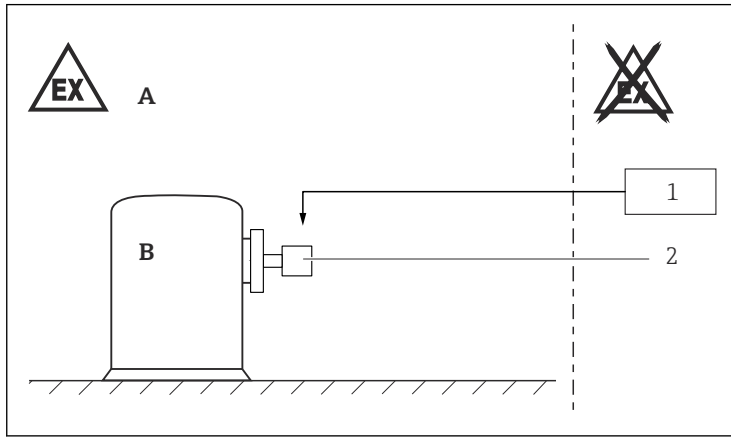
Optional specification, ID Px, Rx = PA
Connect the weather protection cover to the local potential equalization.

Ex db ia IIC

Internal Ex i circuit:
- Not accessible from the outside
- Not relevant during installation

Ex ia IIC T6...T1 Ga/Gb, Ex ia IIC T6...T1 Gb

Safety instructions: Installation



A Zone 1, Electronic
B Zone 0 or Zone 1, Process
1 Associated intrinsically safe power supply units
2 PMC71B

- 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_{rms}.

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_{rms}.

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	$-40\,°C \le T_p \le +80\,°C$	$-40\,°C \le T_a \le +45\,°C$
	$-40\,°C \le T_p \le +60\,°C$	$-40\,°C \le T_a \le +50\,°C$
T4	$-40\,°C \le T_p \le +100\,°C$	$-40\,°C \le T_a \le +50\,°C$
T4...T1	$-40\,°C \le T_p \le +125\,°C$	$-40\,°C \le T_a \le +45\,°C$

Optional specification, ID Ex = EC

Temperature class	Process temperature range	Ambient temperature range
T6	$-40\,°C \le T_p \le +80\,°C$	$-40\,°C \le T_a \le +50\,°C$
T4	$-40\,°C \le T_p \le +100\,°C$	$-40\,°C \le T_a \le +60\,°C$
T4	$-40\,°C \le T_p \le +125\,°C$	$-40\,°C \le T_a \le +55\,°C$
T3...T1	$-40\,°C \le T_p \le +150\,°C$	$-40\,°C \le T_a \le +50\,°C$

Connection data

Basic specification, Position 3 = BA

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

Basic specification, Position 3 = 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 = FA

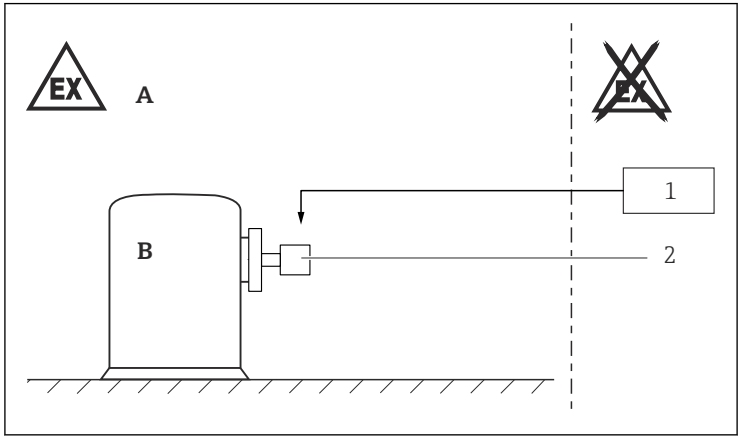
Power supply	
2-WISE $U_i \leq 17.5\ V_{DC}$ $I_i \leq 380\ mA$ $P_i \leq 5.32\ W$ $C_i \leq 5\ nF$ $L_i = 0$	Entity $U_i \leq 17.5\ V_{DC}$ $I_i \leq 300\ mA$ $P_i \leq 1.2\ W$ $C_i \leq 5\ nF$ $L_i = 0$

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 db ia IIC T6...T1 Gb

Safety instructions: Installation



A Zone 1, Electronic
B Zone 1, Process
1 Power supply
2 PMC71B

- 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 °C ≤ T_p ≤ +80 °C	−40 °C ≤ T_a ≤ +55 °C
T4	−40 °C ≤ T_p ≤ +100 °C	−40 °C ≤ T_a ≤ +50 °C
T4...T1	−40 °C ≤ T_p ≤ +125 °C	−40 °C ≤ T_a ≤ +40 °C

Optional specification, ID Ex = EC

Temperature class	Process temperature range	Ambient temperature range
T6	−40 °C ≤ T_p ≤ +80 °C	−40 °C ≤ T_a ≤ +55 °C
T4	−40 °C ≤ T_p ≤ +125 °C	−40 °C ≤ T_a ≤ +50 °C
T3...T1	−40 °C ≤ T_p ≤ +150 °C	−40 °C ≤ T_a ≤ +40 °C

Connection data

Basic specification, Position 3 = BA

Power supply
$U \leq 35\ V_{DC}$ $U_m = 250\ V_{AC}$ $P \leq 1\ W$

Basic specification, Position 3 = DA

Power supply
$U \leq 32\ V_{DC}$ $U_m = 250\ V_{AC}$ $P \leq 0.7\ W$

Basic specification, Position 3 = FA

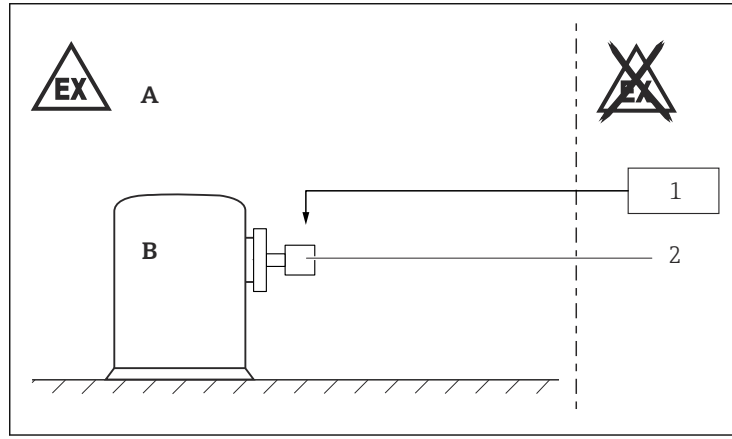
Power supply
$U \leq 15\ V_{DC}$ $U_m = 250\ V_{AC}$ $P \leq 0.7\ W$

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!

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

Safety instructions: Installation



A Zone 21, Electronic
B Zone 20 or Zone 21, Process
1 Associated intrinsically safe power supply units
2 PMC71B

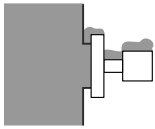
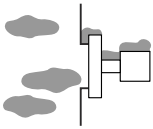
- After aligning (rotating) the enclosure, retighten the fixing screw.
- Continuous service temperature of the connecting cable: ≥ T_a+20 K.
- Perform the following to achieve the degree of protection IP66/67:
  - Screw the cover tight.
  - Mount the cable entry correctly.
- Seal unused entry glands with suitable sealing plugs that correspond to the type of protection.
- Supplied 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.
- 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

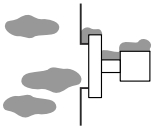
Safety Instructions (XA). In addition, observe national regulations and standards for conduit systems.

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}.

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_{rms}.

Potential equalization

Integrate the device into the local potential equalization.

Temperature tables

- The specified surface temperature takes into account all direct heat influences from process heat and self-heating at the enclosure.
- 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

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

Maximum surface temperature	Process temperature range	Ambient temperature range
T135 °C	−40 °C ≤ T_p ≤ +80 °C	−40 °C ≤ T_a ≤ +55 °C
	−40 °C ≤ T_p ≤ +100 °C	−40 °C ≤ T_a ≤ +50 °C
	−40 °C ≤ T_p ≤ +125 °C	−40 °C ≤ T_a ≤ +45 °C

Ex ia IIIC T_{200} 150°C Da/Db
Ex ia IIIC T_L 150°C Db

Optional specification, ID Ex = EC

Maximum surface temperature	Process temperature range	Ambient temperature range
T150 °C	−40 °C ≤ T_p ≤ +125 °C	−40 °C ≤ T_a ≤ +55 °C
	−40 °C ≤ T_p ≤ +150 °C	−40 °C ≤ T_a ≤ +50 °C

Specific conditions of use:
- The surface temperature is
  - for equipment protection level (EPL) Da: T_{200} 135 °C / 150 °C (with 200 mm dust deposit)
  - and equipment protection level (EPL) Db: T_L 135 °C / 150 °C (with dust accumulation T_L)
- The surface temperature is
  for equipment protection level (EPL) Db: T_L 135 °C / 150 °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 = BA

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

Basic specification, Position 3 = 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 = 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!

www.addresses.endress.com

Endress+Hauser

People for Process Automation