

Safety Instructions

Remote display FHX50B

Ex ia IIC T6 Gb

Ex db IIC T6 Gb

Ex tb IIIC T85 °C T_L 85°C Db



Remote display FHX50B

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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:

SD02991F

Supplementary documentation

Explosion protection brochure: CP00021Z

The explosion protection brochure is available on the Internet:
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".

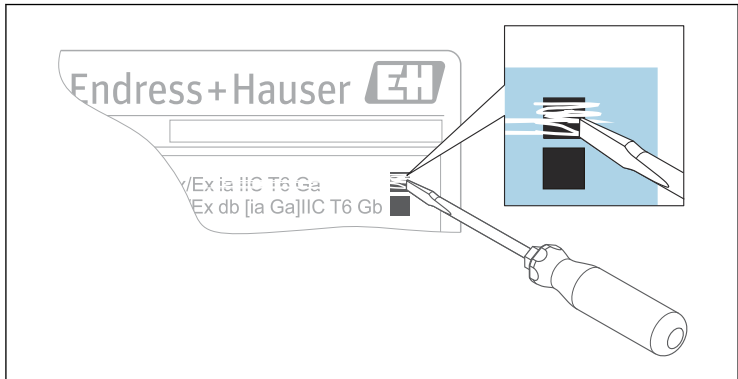
- Before initial commissioning, specify the type of protection.
- It is not permitted to change the type of protection after initial commissioning as this can jeopardize the explosion protection.

For aluminum enclosures:

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

For stainless steel enclosures:

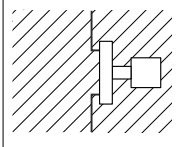
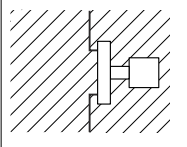
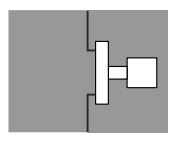
Using a striking tool, mark the explosion protection used, or void out the explosion protection that is not used.



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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 1	Ex db IIC Zone 1	Ex tb IIIC 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

KC Declaration of Conformity

Certificate number:

Ex ia IIC

23-KA4BO-0793X, 23-KA4BO-0800X

Ex db IIC

23-KA4BO-0791X, 23-KA4BO-0798X

Ex tb IIIC

23-KA4BO-0796X, 23-KA4BO-0803X

IEC Declaration of Conformity

Certificate number:

IECEX SEV 23.0002X

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

- IEC 60079-0 : 2017
- IEC 60079-1 : 2014
- IEC 60079-11 : 2011
- IEC 60079-31 : 2013
- Protection Device Safety Certification Notification No. 2021-22

Certificate holder

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

FHX50B	–	*****	+	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: Remote display



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

FHX50B

Basic specifications

Position 1, 2 (Approval)		
Selected option		Description
FHX50B	KN	KC Ex ia IIC T6 Gb KC Ex db IIC T6 Gb KC Ex tb IIIC T85 °C T _L 85 °C Db

Position 4 (Housing, Material)		
Selected option		Description
FHX50B	B	Single compartment; Alu, coated

Position 5 (Electrical Connection, Cable)		
Selected option		Description
FHX50B	5	Thread M20; w/o
	6	Thread G1/2; w/o
	7	Thread NPT1/2; w/o

Optional specifications

ID Jx, Kx (Test, Certificate, Declaration)		
Selected option		Description
FHX50B	JL	Ambient temperature -50°C/-58°F

Safety instructions:
General



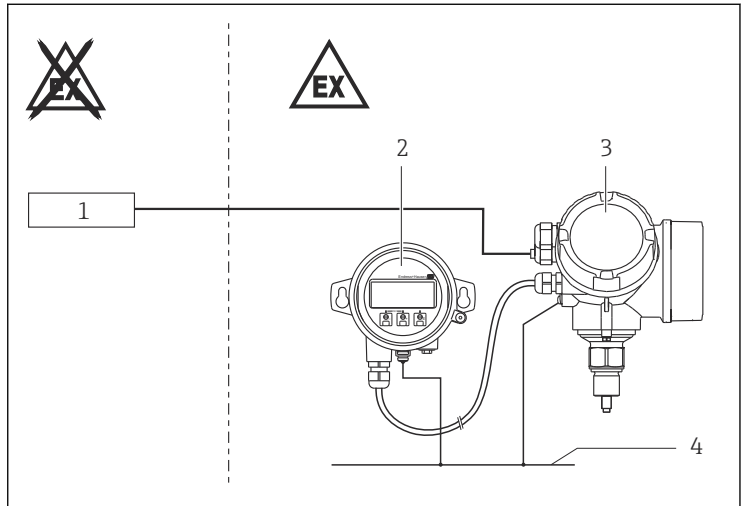
The FHX50B remote display can only be operated with compatible Endress+Hauser measuring devices.

- 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.
- 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.
- 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.
- Avoid electrostatic charging of the sensor (e.g. do not rub dry and install outside the filling flow).

Ex ia IIC T6 Gb**Safety
instructions:
Installation**

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- 1 Power supply or certified associated apparatus (dependent on Endress+Hauser measuring device)
- 2 FHX50B in Zone 1
- 3 Endress+Hauser measuring device
- 4 Local potential equalization

- After aligning (rotating) the enclosure, retighten the fixing screw.
- Continuous service temperature of the connecting cable: $-40\text{ }^{\circ}\text{C}$ to $\geq +85\text{ }^{\circ}\text{C}$.
- 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 = 7

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.

Optional specification, ID Jx, Kx = JL

Continuous service temperature of the connecting cable: $-50\text{ }^{\circ}\text{C}$ to $\geq +85\text{ }^{\circ}\text{C}$; in accordance with the range of service temperature

taking into account additional influences of the process conditions ($T_{a,\min}$), ($T_{a,\max} + 20$ K).

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.

Temperature tables



- The specified ambient 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.



Optional specification, ID Jx, Kx = JL

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

Temperature class	Ambient temperature range
T6	-40 °C $\leq T_a \leq +60$ °C

Connection data

Power supply
$U_i \leq 6$ V $I_i \leq 53$ mA $P_i \leq 200$ mW $C_i \leq 15.5$ μ F $L_i = 0$

For connection to Endress+Hauser devices with intrinsically safe display only.

Connectable transmitters

The device must meet the following conditions to be connected to an Endress+Hauser measuring device:

- The device has an intrinsically safe display circuit
- The device is specifically defined as "Prepared for display FHX50B"

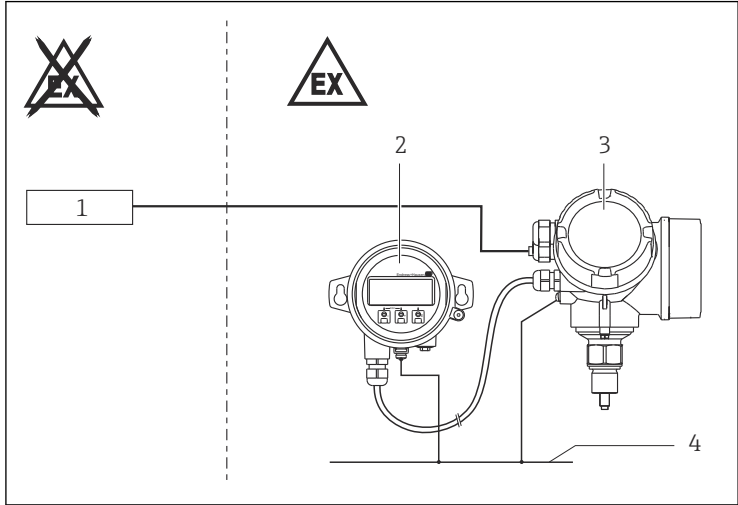
The measuring device that has already been prepared for the FHX50B has an intrinsically safe display circuit with the following characteristic values:

Power supply
$U_i \leq 6 \text{ V}$ $I_i \leq 53 \text{ mA}$ $P_i \leq 200 \text{ mW}$ $C_i \leq 11 \text{ }\mu\text{F}$ $L_i = 0$

Connectable cables

- Cables which are optionally available from Endress+Hauser: can be ordered up to a total length of 30 m.
- Maximum cable length: 60 m.
- A customer's cable can be used provided the effective capacitance of the cable does not exceed the following value:
Total capacitance of cable $C_c \leq 1.6 \text{ }\mu\text{F}$ (wire to wire)

Ex db IIC T6 Gb

Safety
instructions:
Installation

A0032629

- 1 Power supply or certified associated apparatus (dependent on Endress+Hauser measuring device)
- 2 FHX50B in Zone 1
- 3 Endress+Hauser measuring device
- 4 Local potential equalization

- After aligning (rotating) the enclosure, retighten the fixing screw.
- Continuous service temperature of the connecting cable: $-40\text{ }^{\circ}\text{C}$ to $\geq +85\text{ }^{\circ}\text{C}$.
- 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 = 6

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.

Basic specification, Position 5 = 7

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.

Optional specification, ID Jx, Kx = JL

Continuous service temperature of the connecting cable:
 -50 °C to $\geq +85\text{ °C}$; in accordance with the range of service temperature taking into account additional influences of the process conditions ($T_{a,\min}$), ($T_{a,\max} + 20\text{ K}$).

Potential equalization

Integrate the device into the local potential equalization.

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 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.



Optional specification, ID Jx, Kx = JL

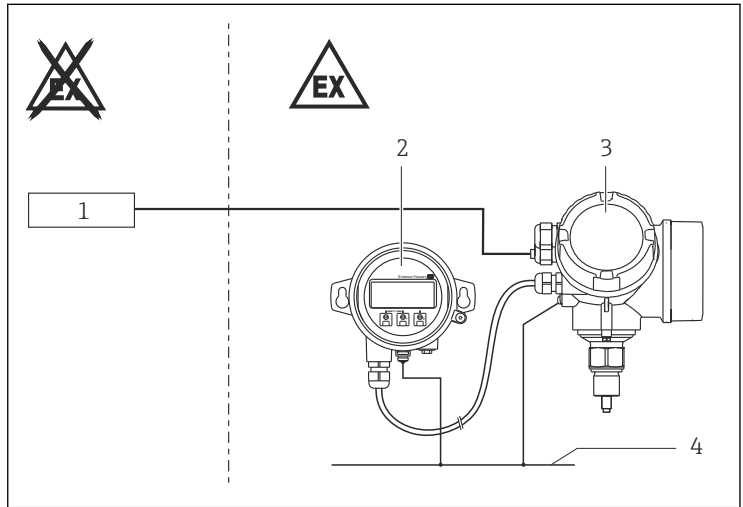
Lower limit of the ambient temperature for explosion protection changes to -50 °C .

Temperature class	Ambient temperature range
T6	$-40\text{ °C} \leq T_a \leq +70\text{ °C}$

Connection data**Power supply** $U \leq 3.2 \text{ V}_{\text{DC}}$
 $P \leq 0.04 \text{ W}$

Ex tb IIIC T85 °C T_L 85 °C Db

**Safety
instructions:
Installation**



A0032629

- 1 Power supply or certified associated apparatus (dependent on Endress+Hauser measuring device)
- 2 FHX50B in Zone 21
- 3 Endress+Hauser measuring device
- 4 Local potential equalization

- After aligning (rotating) the enclosure, retighten the fixing screw.
- Continuous service temperature of the connecting cable: -40 °C to ≥ +85 °C.
- Do not open in a potentially explosive dust atmosphere.
- 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 = 6

Devices under the protection type "Equipment dust ignition protection by enclosure (Ex t)" with G threaded holes are not intended for new installations, but only for replacing equipment in existing installations. Use of this equipment shall comply with the local installation requirements.

Basic specification, Position 5 = 7

Observe the requirements according to IEC/EN 60079-14 for conduit systems and the wiring and installation instructions of the suitable

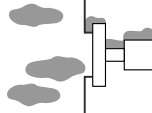
Safety Instructions (XA). In addition, observe national regulations and standards for conduit systems.

Optional specification, ID Jx, Kx = JL

Continuous service temperature of the connecting cable:
 -50 °C to $\geq +85\text{ °C}$; in accordance with the range of service temperature taking into account additional influences of the process conditions ($T_{a,\min}$), ($T_{a,\max} + 20\text{ K}$).

Permitted ambient conditions

Ex tb III C T85 °C T_L 85 °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 the ambient temperature and from self-heating at the enclosure.
- The specified ambient 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.



Optional specification, ID Jx, Kx = JL

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

Specific conditions of use:

The surface temperature for equipment protection level (EPL) Db is:
 $T_L\text{ xxx °C}$ (with dust accumulation T_L)



T_L marking:

The assigned surface temperature without dust layer is the same.

Max. surface temperature	Ambient temperature range
$T_L\ 85\text{ °C}$	$-40\text{ °C} \leq T_a \leq +80\text{ °C}$

Connection data

Power supply
$U \leq 3.2\text{ V}_{DC}$ $P \leq 0.04\text{ W}$



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