

# Safety Instructions

## Remote display FHX50B

Control Drawing IS, XP  
for devices with combined approval





# Remote display FHX50B

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**General notes:** The device is suitable for installation as intrinsically safe, explosionproof/flameproof, suitable for Class II, III, Div. 1 or suitable for Class I, Div. 2.

**Combined approval**

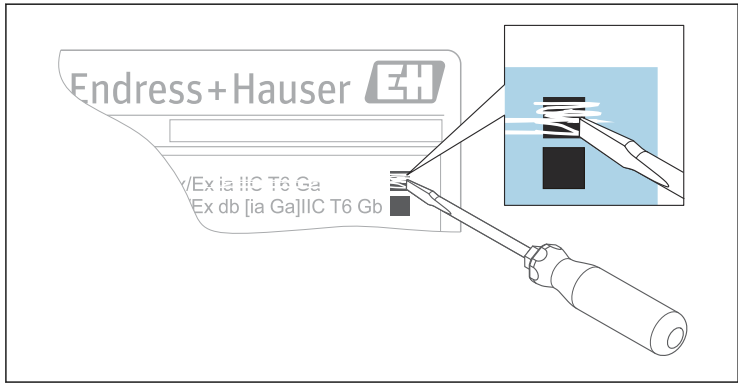
- Before initial commissioning, specify the type of protection.
- It is not permitted to change the type of protection after initial commissioning as this can jeopardize the explosion protection.

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 appropriate safety instructions included in this document.

**Associated documentation**

All documentation is available on the Internet:

[www.endress.com/Deviceviewer](http://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

**Certificates and declarations**

**CSA C/US certificate**

Certificate number:

80192690

**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**

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	C1	CSA C/US XP Cl. I, Div. 1, Gr. A-D, Cl. I, Zone 1, AEx/Ex db IIC T6 Gb, Cl. II, III, Div. 1, Gr. E-G IS Cl. I, II, III, Div. 1, Gr. A-G, Cl. I, Zone 0, AEx/Ex ia IIC T6 Ga, Cl. I, Div. 2, Gr. A-D

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

Position 5 (Electrical Connection, Cable)		
Selected option		Description
FHX50B	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

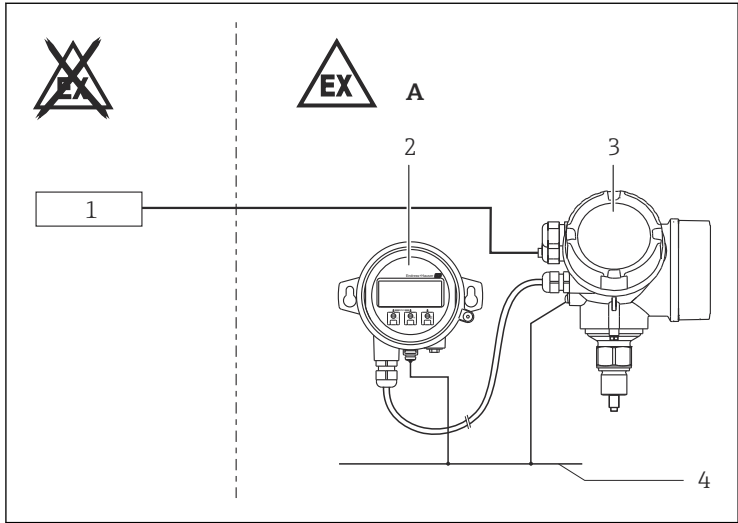
**Safety instructions:  
General**

- 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 ( $\leq 0.5$  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.

## IS; Class I, II, III, Div. 1, Groups A-G

Safety  
instructions:  
Installation

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- A Zone 0; Class I, II, III, Div. 1, Groups A-G  
 1 Associated intrinsically safe power supply units  
 2 FHX50B  
 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:  $\geq T_a + 20 \text{ K}$ .
- 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.



## Potential equalization



Integrate the device into the local potential equalization.

## Intrinsic safety

- **WARNINGS:** Substitution of components may impair intrinsic safety.
- The display enclosure must be connected to ground via internal or external ground terminals.
- The intrinsically safe input power circuit of the device is isolated from ground. The dielectric strength is at least  $500 V_{\text{rms}}$ .


## Temperature tables

### Class I, Div. 1 / Zone 0


-  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  $-50\text{ }^{\circ}\text{C}$ .


Temperature class	Ambient temperature range
T6	$-40\text{ }^{\circ}\text{C} \leq T_a \leq +60\text{ }^{\circ}\text{C}$

### Class II, III, Div. 1

-  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.

For detailed information see Technical Information.

-  Protection type of enclosure: IP66/67

-  *Optional specification, ID Jx, Kx = JL*  
Lower limit of the ambient temperature for explosion protection changes to  $-50\text{ }^{\circ}\text{C}$ .

Max. surface temperature	Ambient temperature range
$T_L\ 80\text{ }^{\circ}\text{C}$	$-40\text{ }^{\circ}\text{C} \leq T_a \leq +60\text{ }^{\circ}\text{C}$

## Connection data **FHX50B**

Power supply
$V_{\max} = U_i \leq 6 \text{ V}$ $I_{\max} = I_i \leq 53 \text{ mA}$ $P_{\max} = P_i \leq 200 \text{ mW}$ $C_i \leq 15.5 \text{ }\mu\text{F}$ $L_i = 0$

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:

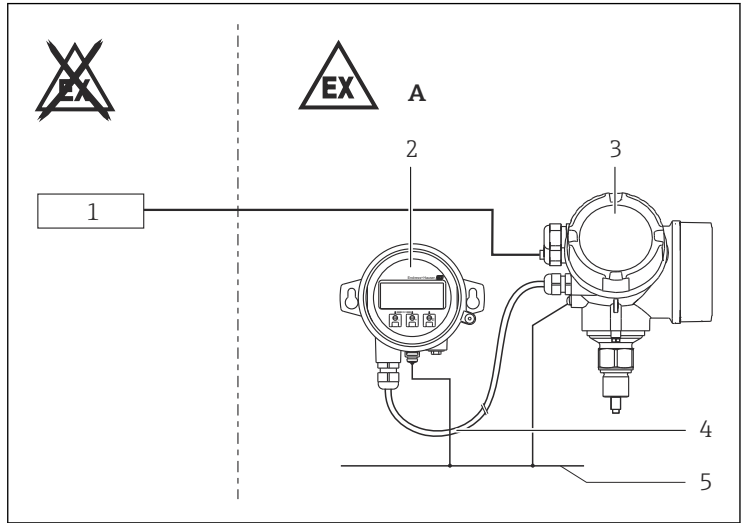
Power supply
$V_{oc} = U_o \leq 6 \text{ V}$ $I_{sc} = I_o \leq 53 \text{ mA}$ $P_{\max} = P_o \leq 200 \text{ mW}$ $C_i \leq 11 \text{ }\mu\text{F}$ $L_i = 0$

### 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)

## Class I, Div. 2, Groups A-D

### Safety instructions: Installation



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- A *Class I, Div. 2, Groups A-D*
- 1 *Power supply*
- 2 *FHX50B*
- 3 *Endress+Hauser measuring device*
- 4 *Remote display FHX50B connection to measuring device is non-incendive field wiring*
- 5 *Potential equalization*

- 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.
- Continuous service temperature of the connecting cable:  $\geq T_a + 20\text{ K}$ .
- Install the device to exclude any mechanical damage or friction during the application. Pay particular attention to flow conditions and tank fittings.
- 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.


### 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.
- The FHX50B remote display is connected to the measuring device via non-incendive field wiring.

### Temperature tables

#### Class I, Div. 2

-  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  $-50\text{ }^{\circ}\text{C}$ .

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

### Connection data

#### FHX50B

Power supply
$U \leq 3.2\text{ V}_{\text{DC}}$ $P \leq 40\text{ mW}$

Only for connection to Endress+Hauser devices.

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

### Connectable transmitters

In order to be connected to an Endress+Hauser measuring device, the device must specifically show the information "Prepared for display FHX50B".

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

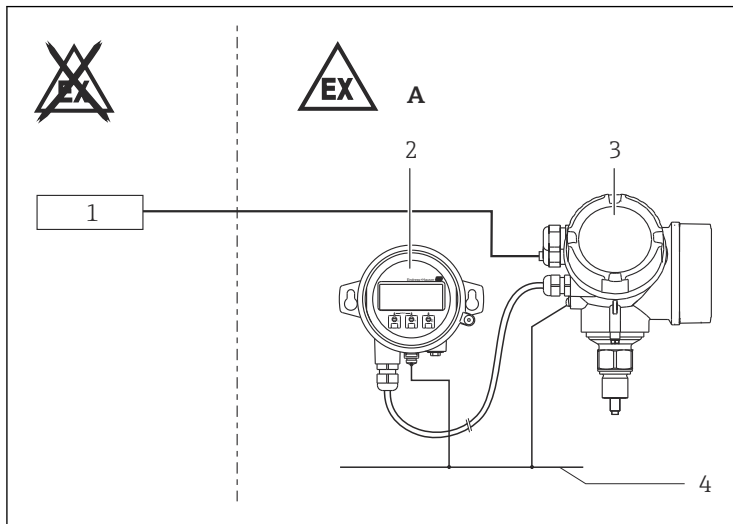
Power supply
$U \leq 6 \text{ V}_{\text{DC}}$

### Connectable cables

- Maximum cable length: 60 m.
- A customer's cable can be used.

XP; Class I, II, III, Div. 1, Groups A-G; Class I, Div. 2, Groups A-D

Safety  
instructions:  
Installation



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- A Zone 1; Class I, II, III, Div. 1, Groups A-G; Class I, Div. 2, Groups A-D  
Zone 0 or Zone 1; Class I, II, III, Div. 1, Groups A-G
- 1 Power supply  
2 FHX50B  
3 Endress+Hauser measuring device  
4 Potential equalization

- After aligning (rotating) the enclosure, retighten the fixing screw.
- Continuous service temperature of the connecting cable:  $\geq T_a + 20 \text{ K}$ .
- 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.
- 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.
- When connecting through a conduit entry approved for this purpose, mount the associated sealing unit directly at the enclosure.

- Seal the cable entry or piping tight (see protection type of enclosure in the "Temperature tables" chapter).
- 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.

**Safety  
instructions: Ex d  
joints**

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

**Explosionproof /  
Flameproof**

**Class I, Div. 1, Groups A, B, C, D;  
Class I, Zone 0/1, AEx/Ex db IIC T6 Ga/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 display enclosure must be connected to ground via internal or external ground terminals.
- WARNINGS: Keep covers tight when explosive atmosphere is present.

**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.
- 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.



## Temperature tables

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

-  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  $-50\text{ }^{\circ}\text{C}$ .

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

### Class II, III, Div. 1

-  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  $-50\text{ }^{\circ}\text{C}$ .

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

## Connection data

### FHX50B

Power supply
$U \leq 6\text{ }V_{DC}$

Only for connection to Endress+Hauser devices.

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



### Connectable transmitters

In order to be connected to an Endress+Hauser measuring device, the device must specifically show the information "Prepared for display FHX50B".

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

Power supply
$U \leq 6 \text{ V}_{\text{DC}}$

### Connectable cables

- Maximum cable length: 60 m.
- A customer's cable can be used.







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