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Safety Instructions
Micropilot FMR30B

Control Drawing IS
Class I, II, III, Div. 1, Groups A-D, F, G
AEx/Ex ia IIC Ga, AEx/Ex ia IIIB Da
Class I, Div. 2, Groups A-D

FM APPROVED

Endress+Hauser
People for Process Automation

Micropilot FMR30B

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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:

BA02373F

Certificates and declarations

FM C/US certificate

Certificate number:

- FM 25US0123X
- FM 25CA0058X

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

FMR30B	–	**********	+	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: Micropilot

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

FMR30B

Basic specifications

Position 1, 2 (Approval)		
Selected option		**Description**
FMR30B	FC	FM C/US IS Cl. I, Div. 1, Gr. A-D, T4 AEx/Ex ia IIC T4 Ga
	FD	FM C/US IS Cl. II, III, Div. 1, Gr. F, G, T135 °C AEx/Ex ia IIIB T135 °C Da
	FE	FM C/US Cl. I, Div. 2, Gr. A-D, T4 (NIFW)

Position 3, 4 (Output)		
Selected option		**Description**
FMR30B	BA	2-wire, 4-20 mA HART

Optional specifications

No options specific to hazardous locations are available.

Safety instructions: General

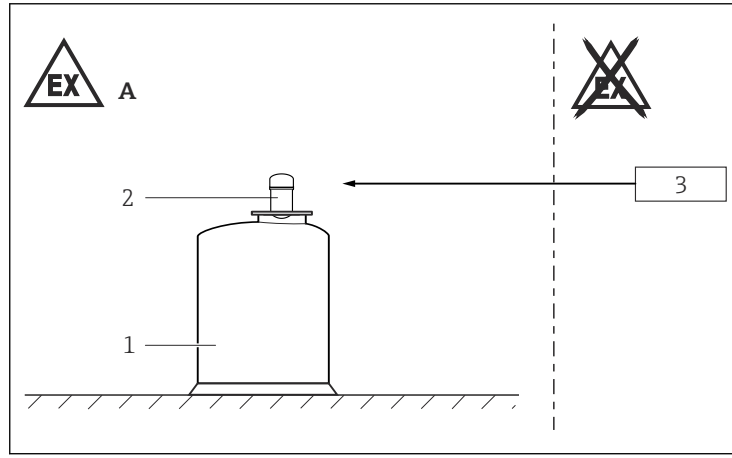
- The device is intended to be used in hazardous locations as defined in the Canadian Electrical Code, Part I or the National Electrical Code (NFPA70). If no potentially explosive atmospheres are present or if additional protective measures have been taken: The device may be operated according to the 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.
- The process connection of the device must be installed in such a way that guarantees a sufficiently tight joint (IP66/67).
- Applications in which the process temperature exceeds the maximum surface temperature limits of the required maximum surface temperature: The ignition hazard posed by hot surfaces on the process connecting parts of the device must be taken into account.

- It is essential for the device to use a power supply that is galvanically isolated from earth.
- When using an intrinsically safe barrier, the barrier must be connected to the same earth as the device.
- Refer to the temperature tables for various ambient and process temperature ranges.

Safety instructions: Installation



A See Basic specifications, Position 1, 2 = FC, FD, FE
1 Tank; see Basic specifications, Position 1, 2 = FC, FD, FE
2 Micropilot FMR30B
3 Associated intrinsically safe power supply units

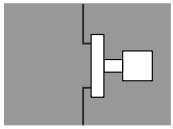
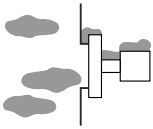
- Observe the pertinent guidelines when interconnecting intrinsically safe circuits.
- Observe the maximum process conditions according to the manufacturer's Operating Instructions.
- Install the device to exclude any mechanical damage or friction during the application. Pay particular attention to flow conditions and tank fittings.
- Plugs must meet the IP66/67 protection rating.
- Perform the following to achieve the degree of protection IP66/67:
  - Select a suitable cable / connector.
  - Mount the cable / connector correctly.
- Supplied cables / connectors comply with the requirements of the type of protection marked on the nameplate.

Application in gas
Continuous service temperature of the connecting cable:
$\geq T_a+10$ K

Application in dust
Continuous service temperature of the connecting cable:
$\geq T_a$+25 K

Permitted ambient conditions

Class II, III, Div. 1, Groups F, G

Process Zone 20		Enclosure Zone 20
Continuous dust submersion		Continuous dust submersion
Continuous explosive dust atmosphere and deposits		Continuous explosive dust atmosphere and deposits

Class I, Div. 1, Groups A-D

Intrinsic safety

- Install per National Electrical Code (NFPA70) or Canadian Electrical Code, Part I (C22.1), as applicable.
- Use an intrinsic safety barrier or other associated equipment that is approved for the country in use and satisfies the following conditions: $U_o \leq U_i$, $I_o \leq I_i$, $C_o \geq C_i + C_{cable}$, $L_o \geq L_i + L_{cable}$ and $P_o \leq P_i$.
- For transmitter parameters: See "Connection data" section.
- Associated devices with galvanic isolation between the intrinsically safe and non-intrinsically safe circuits are preferred.
- Control room equipment may not use or generate over 250 V_{rms}.
- Always follow the installation instructions provided by the intrinsic safety barrier manufacturer when installing this equipment.
- WARNINGS: Substitution of components may impair intrinsic safety.
- The intrinsically safe input power circuit of the device is isolated from ground. The dielectric strength is at least 500 V_{rms}.

Class I, Div. 2, Groups A-D

Nonincendive Field Wiring (NIFW) installation

- The Nonincendive Field Wiring circuit concept allows interconnection of nonincendive field wiring apparatus with associated nonincendive field wiring apparatus or associated apparatus not specifically examined in combination as a system using any of the wiring methods permitted for unclassified locations, when the following conditions are met: $U_o \leq U_i$, $I_o \leq I_i$, $C_o \geq C_i + C_{cable}$, $L_o \geq L_i + L_{cable}$.
- For detailed parameters: See "Connection data" section.
- Control room equipment may not use or generate over 250 V_{rms}.
- Install per National Electrical Code (NFPA70) or Canadian Electrical Code, Part I (C22.1), as applicable.
- WARNINGS: Substitution of components may impair suitability for Class I, Div. 2.
- Always follow the installation drawing provided by the associated apparatus manufacturer. The configuration of the associated apparatus must be approved for the country in use.

Standard Wiring installation

- Install per National Electrical Code (NFPA70) or Canadian Electrical Code, Part I (C22.1), as applicable.
- Use wiring methods appropriate for the location.
- Associated apparatus not required.
- For the maximum supply voltage: See "Connection data" section.
- WARNINGS: Explosion hazard - Do not disconnect equipment unless power has been switched off or the area is known to be non-hazardous.
- WARNINGS: Substitution of components may impair suitability for Class I, Div. 2.

Temperature tables

Class I, Groups A-D

- 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.

Ambient and process temperature range
$-40\ °C \leq T_p \leq +70\ °C$

Class II, III, Groups F, G

- 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.

For detailed information see Technical Information.

Protection type of enclosure: IP66/67

Maximum surface temperature
135 °C

Input parameters			Maximum permitted ambient or process temperature
650 mW	28.9 V	22.5 mA	–40 to 48 °C
594 mW	26.4 V	22.5 mA	–40 to 52 °C
540 mW	24.0 V	22.5 mA	–40 to 55 °C

Connection data

Class I, Div. 1, Groups A-D

Entity parameter
$U_i \leq 30\ V_{DC}$ $I_i \leq 100$ mA $P_i \leq 700$ mW $C_i = 18$ nF $L_i = 0$ Cable capacitance $C_c = 200$ pF Cable inductance $L_c = 1$ µH/m

Class I, Div. 2, Groups A-D

Nonincendive Field Wiring (NIFW) installation

Entity parameter
$U_i \leq 30\ V_{DC}$ $I_i \leq 100$ mA $P_i \leq 700$ mW $C_i = 18$ nF $L_i = 0$ Cable capacitance $C_c = 200$ pF Cable inductance $L_c = 1$ µH/m

Standard Wiring installation

Entity parameter
$U_i = 30$ V $I_i = 22.5$ mA Cable capacitance $C_c = 200$ pF Cable inductance $L_c = 1$ µH/m

Class II, III, Groups F, G

Entity parameter
$U_i \leq 30\ V_{DC}$ $I_i \leq 100$ mA $P_i \leq 650$ mW $C_i = 18$ nF $L_i = 0$ Cable capacitance $C_c = 200$ pF Cable inductance $L_c = 1$ µH/m

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