

Safety Instructions

Gammapilot FMG50

4-20 mA HART

Control Drawing IS / Div. 2



Document: XA02087F-A
Safety instructions for electrical apparatus for explosion-
hazardous areas →  3

Gammapilot FMG50

4-20 mA HART

Table of contents

Associated documentation	4
Manufacturer's certificates	4
Manufacturer address	4
Extended order code	4
Safety instructions: General	6
Safety instructions: Special conditions	6
Safety instructions: Installation	7
Intrinsic safety	8
Class I, Div. 2, Groups A-D	9
Temperature tables	9
Connection data	9

Associated documentation

This document is an integral part of the following Operating Instructions:
BA01966F/00

Manufacturer's certificates

CSA C/US certificate
Certificate number:
CSA20CA80047505

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

FMG50 - ***** + 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: Gammapilot



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

FMG50

Basic specifications

Position 1, 2 (Approval)		
Selected option		Description
FMG50	CB	CSA C/US IS Cl. I, II, III, Div. 1, Gr. A-G; Cl. I, Zn. 1, AEx/Ex db ia IIC T6 Gb; Cl. I, Div. 2, Gp. A, B, C, D

Position 8 (Application)		
Selected option		Description
FMG50	A	Ambient temperature -40...60°C/ -40...140°F (PVT)
	B	Ambient temperature -20...80°C/ -4...176°F (PVT HT) ¹⁾
	C	Ambient temperature -40...80°C/ -40...176°F (NaI) ¹⁾

1) For IS and Div. 2 applications: Limited to 70 °C

Position 9 (Sensor Length, Material)		
Selected option		Description
FMG50	A, B, C mm; NaI crystal
	G, H, I, J, K, L, M, N mm; PVT

Optional specifications

ID Nx (Accessory Mounted)		
Selected option		Description
FMG50	NA	Overvoltage protection

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.
- Avoid electrostatic charging:
 - Of plastic surfaces (e.g. housing, sensor element, special varnishing, attached additional plates, ..)
 - Of isolated capacities (e.g. isolated metallic plates)

Safety instructions:
Special conditions

- To avoid electrostatic charging: Do not rub surfaces with a dry cloth.
- In the event of additional or alternative special varnishing on the housing 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.

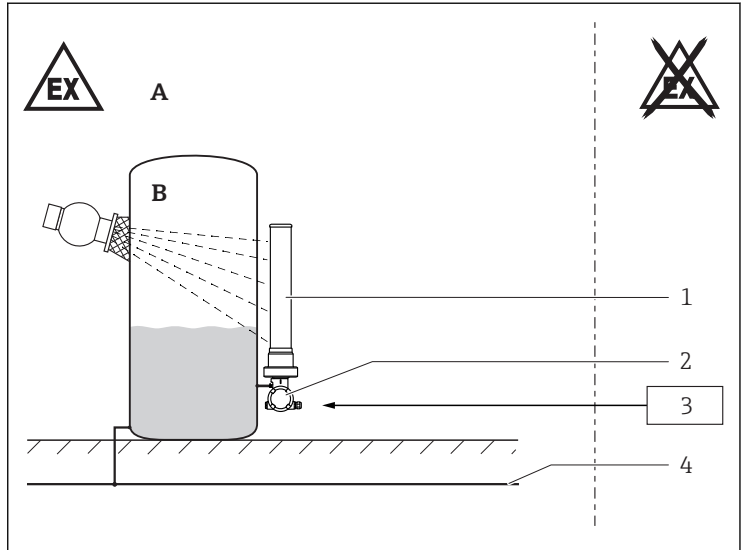
Designation AEx/Ex db ia IIC Gb

- Type of protection Ex ia refers to the protection method for field wiring connections and transmitter housing electronics.
- Type of protection Ex db refers to the protection method for sensor housing.

Detector pipe (Ex d)

Flameproof joints are not intended to be repaired.

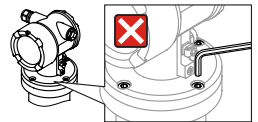
Safety instructions: Installation



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- A Zone 1; Class I, II, III, Div. 1, Groups A-G or Class I, Div. 2, Group A-D
 B Zone 0 or 1 or 2; Class I, Div. 1 or Div. 2
 1 Detector pipe (XP / Ex d)
 2 Housing
 3 Certified associated apparatus
 4 Local potential equalization

- After aligning (rotating) the housing, retighten the fixing screw.
- The safety screws at the pipe housing must not be loosened:



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Potential equalization

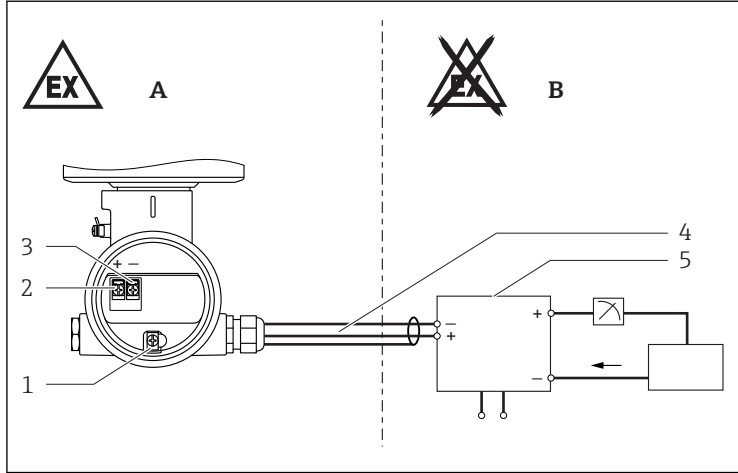
Integrate the device into the local potential equalization.

Overvoltage protection

Optional specification, ID Nx (Accessory Mounted) = NA

The intrinsically safe input power circuit of the device is isolated from ground. The dielectric strength is at least $290 V_{\text{rms}}$.

Intrinsic safety



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- A Hazardous Location: Cl. I, II, III, Div. 1, Gp A-G; Cl. I, Zn 1, IIC Gb
 B Non-hazardous (unclassified) location
 1 Internal ground terminal (for cable shield)
 2 Positive terminal
 3 Negative terminal
 4 Intrinsically safe wiring
 5 Barrier / Associated equipment

Entity installation

- 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:
 $U_o (V_{OC}) \leq U_i (V_{max}), I_o (I_{sc}) \leq I_i (I_{max}), C_o (C_a) \geq C_i + C_{cable},$
 $L_o (L_a) \geq L_i + L_{cable}$ 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.
- 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.
- 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**

- 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.
- Associated apparatus not required.
- For the maximum supply voltage: See "Connection data" section.
- **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

Basic specification, Position 8 (Application) = A

Temperature class	Ambient temperature T_a (ambient)	
	Intrinsic safety	Division 2
T6	$-40\text{ °C} \leq T_a \leq +60\text{ °C}$	$-40\text{ °C} \leq T_a \leq +60\text{ °C}$

Basic specification, Position 8 (Application) = B

Temperature class	Ambient temperature T_a (ambient)	
	Intrinsic safety	Division 2
T6	$-20\text{ °C} \leq T_a \leq +60\text{ °C}$	$-20\text{ °C} \leq T_a \leq +70\text{ °C}$
T4	$-20\text{ °C} \leq T_a \leq +70\text{ °C}$	-

Basic specification, Position 8 (Application) = C

Temperature class	Ambient temperature T_a (ambient)	
	Intrinsic safety	Division 2
T6	$-40\text{ °C} \leq T_a \leq +60\text{ °C}$	$-40\text{ °C} \leq T_a \leq +70\text{ °C}$
T4	$-40\text{ °C} \leq T_a \leq +70\text{ °C}$	-

Connection data

Power supply circuit	
Intrinsic safety	Division 2
U_i (or V_{max}) = 30 V I_i (or I_{max}) = 300 mA $P_1 = 1\text{ W}$ $C_i \leq 10\text{ nF}$ $L_i = 0$	U_n (V_{in}) $\leq 35\text{ V}_{DC}$ ¹⁾ $P \leq 1\text{ W}$

1) Supplied by Class 2 or limited energy source in accordance with CSA/UL 61010-1-12



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