

Safety Instructions

Micropilot FMR43

Ex ia IIC T4...T1 Ga

Ex ia IIIB T₂₀₀135 °C Da



Micropilot FMR43

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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:

BA02310F

Supplementary documentation

Explosion protection brochure: CP00021Z

The explosion protection brochure is available on the Internet:

www.endress.com/Downloads

Certificates and declarations**NEPSI Declaration of Conformity**

Certificate number:

GYJ25.1428X

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

- GB/T 3836.1-2021
- GB/T 3836.4-2021

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

FMR43	-	*****	+	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: 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

FMR43

Basic specifications

Position 1, 2 (Approval)		
Selected option	Description	
FMR43	NI	NEPSI Ex ia IIC T4...T1 Ga NEPSI Ex ia IIIB T ₂₀₀ 135 °C Da

Position 3, 4 (Output)		
Selected option	Description	
FMR43	BA	2-wire, 4-20 mA HART

Position 10-12 (Process Connection)		
Selected option	Description	
FMR43	VGJ	MNPT1/2, 316L, flush mount
	VHJ	MNPT3/4, 316L, flush mount
	VLJ	MNPT1-1/2, 316L, flush mount
	WJJ	G1/2, 316L, flush mount
	WKJ	G3/4, 316L, flush mount
	WLJ	G1, 316L, flush mount
	WNJ	G1-1/2, 316L, flush mount
	X2J	M24, 316L, install > accessory, process adapter
	3CK	Tri-Clamp ISO2852 DN38 (1-1/2"), PTFE>316L, NA-CONNECT compatible
	3EK	Tri-Clamp ISO2852 DN51 (2"), PTFE>316L, NA-CONNECT compatible
	5DK	NEUMO BioControl D50 PN16, PEEK>316L
	9YY (VJJ)	MNPT1, 316L, flush mount
	(3FK)	Tri-Clamp ISO2852 DN76.1 (3"), PTFE>316L, NA-CONNECT compatible
	(3HK)	Tri-Clamp ISO2852 DN101.6 (4"), PTFE>316L, NA-CONNECT compatible
	(5AK)	NEUMO BioControl D25 PN16, PEEK>316L
(5FK)	NEUMO BioControl D80 PN16, PEEK>316L	

Optional specifications

No options specific to hazardous locations are available.

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.
- 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 device for explosion atmospheres and fire hazard electrical equipment installation engineering".
 - GB/T 3836.13-2021: "Explosive atmospheres, Part 13: Equipment repair, overhaul, reclamation and modification".
 - GB 3836.15-2024: "Explosive atmospheres, Part 15: Specification of electrical installations design, selection and erection".
 - GB 3836.16-2024: "Explosive atmospheres, Part 16: Specification of electrical installations inspection and maintenance".
 - GB/T 3836.18-2024: "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

- 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).
- 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.

Device group III, Application in dust

Ambient and process temperature range: -40 to $+70$ °C.

Electrostatics

Ex ia IIC

Sensor

Basic specification, Position 10-12 = 3CK, 5AK

- When used in gas applications, the sensor must be used in conjunction with a metallic frame provided by the user. This can be a metal tank wall, a metal nozzle or a pipe.
- If there is no risk of dangerous electrostatic charging of the plastic surfaces, the sensor can be used without restrictions.

Basic specification, Position 10-12 = 3EK, 3FK, 3HK, 5DK, 5FK

- The sensor must not be used in applications with explosive gases.
- If there is no risk of dangerous electrostatic charging of the plastic surfaces, the sensor can be used without restrictions.

Ex ia IIIB

Electronics enclosure with display (LCD or LED)

Do not use in areas with a moving dust atmosphere.

Sensor

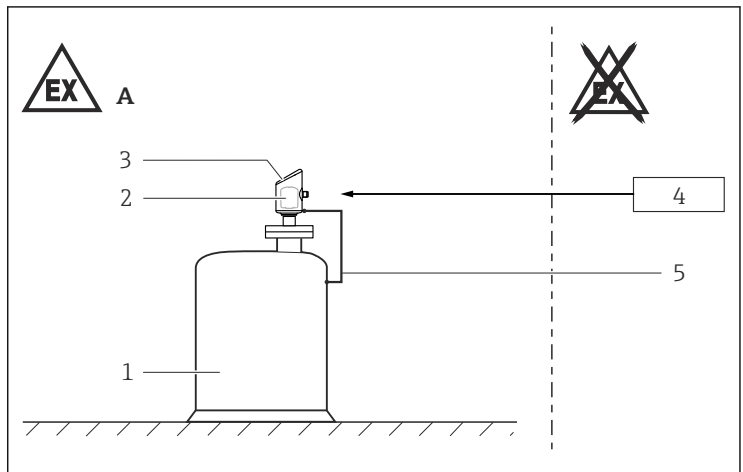
Basic specification, Position 10-12 = 3CK, 3EK, 5xK

- The sensor may only be used in dust applications if it is mounted in a metal tube or nozzle.
- If there is no risk of dangerous electrostatic charging of the plastic surfaces, the sensor can be used without restrictions.

Basic specification, Position 10-12 = 3FK, 3HK

- The sensor must not be used in applications with explosive dusts.
- If there is no risk of dangerous electrostatic charging of the plastic surfaces, the sensor can be used without restrictions.

Safety instructions: Installation



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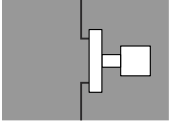
- A Zone 0, Zone 1, Zone 20, Zone 21
 1 Tank; Zone 0, Zone 20
 2 Electronic insert
 3 Enclosure
 4 Associated intrinsically safe power supply units
 5 Local earthing

- 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.
- Perform the following to achieve the degree of protection IP66/68:
 - 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.

Permitted ambient conditions

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Process Zone 20	Enclosure Zone 20
Continuous dust submersion	Continuous dust submersion
	

Intrinsic safety

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.
- If not earthed directly via the process connection, provide separate earthing.

Temperature tables

Ex ia IIC T4...T1 Ga

- i
 - 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.

Description notes



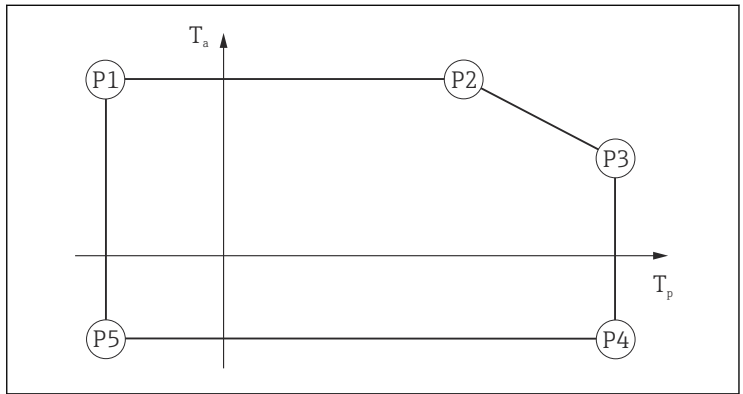
Unless otherwise indicated, the positions always refer to the basic specification.

1st column: Temperature classes T4 (135 °C) to T1 (450 °C)

Column P1 to P5: Position (temperature value) on the axes of the derating

- T_a : Ambient temperature in °C
- T_p : Process temperature in °C

Example diagrams of possible deratings



A0033052

Basic specification, Position 10-12 = VGJ, WJJ, X2J, 3xK, 5DK, 5FK

	P1		P2		P3		P4		P5	
	T_p	T_a	T_p	T_a	T_p	T_a	T_p	T_a	T_p	T_a
T4	-40	70	70	70	135	47	135	-40	-40	-40
T3...T1	-40	70	70	70	150	40	150	-40	-40	-40

Basic specification, Position 10-12 = VHJ, VJJ, VLJ, WKJ, WLJ, WNJ, 5AK

	P1		P2		P3		P4		P5	
	T_p	T_a	T_p	T_a	T_p	T_a	T_p	T_a	T_p	T_a
T4...T1	-40	70	70	70	130	40	130	-40	-40	-40

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- 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: IP66/68

Maximum surface temperature	Process temperature range	Ambient temperature range
T ₁₃₅ °C	-40 °C ≤ T _p ≤ +70 °C	-40 °C ≤ T _a ≤ +70 °C

Connection data**Ex ia IIC**

Entity parameter
$U_i \leq 30 \text{ V}_{DC}$ $I_i \leq 100 \text{ mA}$ $P_i \leq 700 \text{ mW}$ $C_i = 15 \text{ nF}$ $L_i = 0.69 \text{ mH}$

Ex ia IIIB

Entity parameter
$U_i \leq 30 \text{ V}_{DC}$ $I_i \leq 100 \text{ mA}$ $P_i \leq 650 \text{ mW}$ $C_i = 15 \text{ nF}$ $L_i = 0.69 \text{ mH}$



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