Safety Instructions Micropilot FMR66B/67B

Control Drawing Class II, III, Div. 1, Groups E-G







Micropilot FMR66B/67B

Table of contents

Associated documentation 4
Certificates and declarations
Certificate holder
Extended order code 4
Safety instructions: General 8
Safety instructions: Special conditions 8
Safety instructions: Installation
Class II, III, Div. 1, Groups E, F, G 10
Process seals 10
Temperature tables 10
Connection data 14

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: HART • BA02250F (FMR66B) • BA02251F (FMR67B)
	PROFIBUS PA • BA02264F (FMR66B) • BA02265F (FMR67B) PROFINET • BA02269F (FMR66B) • BA02270F (FMR67B)
Certificates and declarations	CSA C/US certificate Certificate number: CSA23CA80159823
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
	FMR6xB - ********* + A*B*C*D*E*F*G*
	(Device (Basic (Optional type) specifications) 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 FMR66B, FMR67B

Basic specifications

Position 1, 2 (Approval)			
Selected option		Description	
FMR6xB	CG	CSA C/US Cl. II, III, Div. 1, Gr. E-G	

Position 3, 4 (Output)		
Selected option		Description
FMR6xB	BA	2-wire, 4-20 mA HART
	DA	2-wire, PROFIBUS PA
	FA	2-wire, PROFINET, 10Mbit/s (APL)

Position 5 (Display, Operation)		
Selected option		Description
FMR6xB	Ν	Prepared for display FHX50B + Thread NPT1/2

Position 6 (Housing, Material)		
Selected option		Description
FMR6xB	В	Single compartment; Alu, coated
	J	Dual compartment; Alu, coated
	К	Dual compartment; 316L
	М	Dual compartment L-shape; Alu, coated
	N	Dual compartment L-shape; 316L, coated

Position 7 (Electrical Connection)		
Selected option		Description
FMR6xB	Н	Thread NPT1/2, IP66/68 NEMA Type 4X/6P

Position 8 (Application)		
Selected opt	ion	Description
FMR6xB	F	Process temperature -40+80°C
FMR66B	Н	Process temperature -20+200°C
FMR67B	J	Process temperature -40+150°C
	L	Process temperature -40+200°C
	N	Process temperature -40+280°C
	Р	Process temperature -40+450°C

Position 9, 10 (Antenna)		
Selected option		Description
FMR66B	BS	Encapsulated, PVDF, 40mm/1-1/2"
FMR6xB	GA	Drip-off, PTFE 50mm/2"
FMR67B	GP	Flush mount, PTFE, 80mm/3"
	GT	Horn, 316L, 65mm/2.6"

Position 11, 12 (Process Connection, Sealing Surface)			
Selected option		Description	
FMR67B	JD	Alignment device, UNI flange	

Position 16 (Seal)		
Selected option		Description
FMR66B	А	PVDF encapsulated
FMR6xB	D	VKM Viton GLT
	G	EPDM
FMR67B	J	HNBR
	Р	FFKM Kalrez
	U	Graphite

Position 17 (Air Purge Connection)		
Selected opti	ion	Description
FMR67B	2	NPT1/4

Optional specifications

ID Jx, Kx (Test, Certificate, Declaration)		
Selected option		Description
FMR67B	JL	Ambient temp. transmitter -50°C/-58°F, sensor see specification

ID Nx, Ox (Accessory Mounted)			
Selected option		Description	
FMR6xB	NA	Overvoltage protection	

ID Px, Rx (Accessory Enclosed)		
Selected opti	ion	Description
FMR6xB	PA	Weather protection cover, 316L ¹⁾

1) Only in connection with Position 6 = J, K, M, N

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: 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 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). Optional specification, ID Px, Rx = PA Connect the weather protection cover to the local potential equalization. Device type FMR67B and Basic specification, Position 11, 12 = JD Avoid sparks caused by impact and friction.

- After tightening of the clamping flange
 After setting the damping ring (torque 10 to 11 Nm)
 Degree of protection IP67 must be fulfilled.

Device type FMR67B and Basic specification, Position 17 = 2

- Avoid sparks caused by impact and friction.
- After removing the air purge connection: Lock the opening with a suitable plug.
- Torque: 6-7 Nm
- Degree of protection IP67 must be fulfilled.

Safety instructions: Installation



- A Class II, III, Div. 1, Groups E-G
- 1 Tank; Class II, III, Div. 1, Groups E-G
- 2 Electronic insert
- 3 Enclosure
- 4 Power supply
- 5 Potential equalization line
- 6 Local potential equalization
- After aligning (rotating) the enclosure, retighten the fixing screw.
- 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.

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.
Process seals	 Basic specification, Position 9, 10 = BS The device is not rated as Single Seal in accordance with UL122701 and requires the use of an external secondary process seal. The sensor is rated for a Maximum Working Pressure (MWP) of up to 3 bar and a maximum process temperature (T_p) up to 80 °C.
	 Basic specification, Position 9, 10 = Gx The device is rated Single Seal in accordance with UL122701 and does not require the use of an external secondary process seal. The sensor is rated for a Maximum Working Pressure (MWP) of up to 100 bar and a maximum process temperature (T_p) up to 450 °C, depending on the antenna.
	 Limitation of the Maximum Working Pressure (MWP) for each device is marked on the nameplate and must not be exceeded! This value may be less than the Single Seal rating. Limitation of the maximum process temperature (T_p) with regards to the device options, temperature code rating and maximum ambient temperature as specified in the "Temperature tables" section of this document must be considered! Verify the chemical compatibility of the process fluid with the process seal material (see field "Mat." on the nameplate)!
Temperature tables	 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.
	Optional specification, ID Jx, $Kx = JL$ Lower limit of the ambient temperature for explosion protection changes to -50 °C.

Description notes



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

Position 6 (Housing, Material)
B, J, K, M, N

FMR66B

Position 8 (Application)	
F	

Position 9, 10 (Antenna)	
BS	

Maximum surface temperature	Process temperature range	Ambient temperature range
T 80 °C	$-20 \ ^\circ\text{C} \le T_p \le +80 \ ^\circ\text{C}$	$-20 \ ^\circ C \le T_a \le +65 \ ^\circ C$

FMR66B, FMR67B

Position 8 (Application)	
F, H, J	

Position 9, 10 (Antenna)	
GA, GP	

Maximum surface temperature	Process temperature range	Ambient temperature range
T 80 °C	$-40 \ ^\circ C^{1)} \le T_p \le +80 \ ^\circ C$	$-40 {}^{\circ}\!\mathrm{C}^{2)} \le T_a \le +65 {}^{\circ}\!\mathrm{C}$
T 100 °C	$-40~^\circ\text{C}~^{1)} \le T_p \le +100~^\circ\text{C}$	$-40 \ ^{\circ}C^{2)} \le T_a \le +60 \ ^{\circ}C$
T 130 °C	$-40 \ ^\circ C^{1)} \le T_p \le +130 \ ^\circ C$	$-40 ^{\circ}\text{C}^{2)} \le T_a \le +55 ^{\circ}\text{C}$
T 150 °C	$-40 \ ^{\circ}C^{1)} \le T_p \le +150 \ ^{\circ}C^{3)}$	$-40 \ ^{\circ}C^{2)} \le T_a \le +50 \ ^{\circ}C$

1) Position 16 = J, P: -20 °C

2) Optional specification, ID Jx, $Kx = JL: -50 \degree C$

3) Position 8 = H: 130 °C

Position 8 (Application)
L

Position 9, 10 (Antenna)

GA, GP

Maximum surface temperature	Process temperature range	Ambient temperature range
T 100 °C	$-40~^\circ\!C^{1)} \le T_p \le +100~^\circ\!C$	$-40 ^{\circ}\text{C}^{2)} \le T_a \le +65 ^{\circ}\text{C}$
T 150 °C	$-40 \ ^\circ C^{1)} \le T_p \le +150 \ ^\circ C$	$-40 ^{\circ}\text{C}^{2)} \le T_a \le +60 ^{\circ}\text{C}$
T 200 °C	$-40\ ^\circ C^{1)} \leq T_p \leq +200\ ^\circ C$	$-40 ^{\circ}\text{C}^{2)} \le T_a \le +55 ^{\circ}\text{C}$

1) Position 16 = J, P: -20 °C

2) Optional specification, ID Jx, Kx = JL: -50 °C

FMR67B

Position 8 (Application)	
N	

Position 9, 10 (Antenna)	

GT

Maximum surface temperature	Process temperature range	Ambient temperature range
T 150 ℃	$-40 \ ^\circ\text{C} \le T_p \le +150 \ ^\circ\text{C}$	$-40 ^{\circ}C^{1)} \le T_a \le +70 ^{\circ}C$
T 200 °C	$-40 \ ^\circ\text{C} \le T_p \le +200 \ ^\circ\text{C}$	$-40 ^{\circ}C^{1)} \le T_a \le +65 ^{\circ}C$
T 280 °C	$-40 \ ^\circ\text{C} \le T_p \le +280 \ ^\circ\text{C}$	$-40 ^{\circ}C^{1)} \le T_a \le +55 ^{\circ}C$

1) Optional specification, ID Jx, Kx = JL: -50 °C

Position 8 (Application)	

Position 9, 10 (Antenna)	
GT	

Maximum surface temperature	Process temperature range	Ambient temperature range
T 150 ℃	$-40 \ ^\circ C \le T_p \le +150 \ ^\circ C$	-40 °C $^{1)} \le T_a \le +70$ °C
T 200 ℃	$-40 \ ^\circ C \le T_p \le +200 \ ^\circ C$	$-40 \ ^\circ C^{1)} \le T_a \le +65 \ ^\circ C$
T 450 ℃	$-40~^\circ\text{C} \le T_p \le +450~^\circ\text{C}$	-40 °C $^{1)} \le T_a \le +30$ °C

1) Optional specification, ID Jx, Kx = JL: -50 °C

Basic specification, Position 3 = BA **Connection data**

Power supply

 $U \le 35 V_{DC}$

Basic specification, Position 3 = DA

Power supply

 $U \le 32 V_{DC}$

Basic specification, Position 3 = FA

Power supply

 $U \le 15 V_{DC}$

In connection with: *Basic specification, Position* 5 = NInstallation according to the specifications of FHX50B.



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



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