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71651671
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Safety Instructions
Micropilot FMR60B/62B/63B/66B/67B

II 1/2 G Ex ia IIC T6 Ga/Gb
II 2 G Ex ia IIC T6 Gb
II 1/2 D Ex ia IIIC Txxx°C Da/Db
II 2 D Ex ia IIIC Txxx°C Db

Endress+Hauser
People for Process Automation

Micropilot FMR60B/62B/63B/66B/67B

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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:

HART
- BA02247F (FMR60B)
- BA02248F (FMR62B)
- BA02249F (FMR63B)
- BA02250F (FMR66B)
- BA02251F (FMR67B)

PROFIBUS PA
- BA02261F (FMR60B)
- BA02262F (FMR62B)
- BA02263F (FMR63B)
- BA02264F (FMR66B)
- BA02265F (FMR67B)

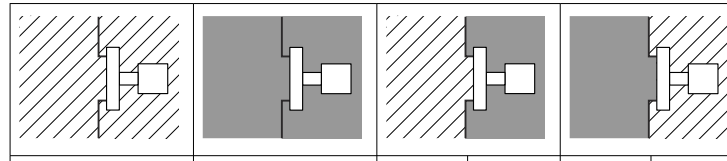
PROFINET
- BA02266F (FMR60B)
- BA02267F (FMR62B)
- BA02268F (FMR63B)
- BA02269F (FMR66B)
- BA02270F (FMR67B)

Supplementary documentation

Explosion protection brochure: CP00021Z

The explosion protection brochure is available on the Internet:
www.endress.com/Downloads

General notes: Combined approval



Ex ia IIC		Ex ia IIIC		Ex ia IIC	Ex ia IIIC	Ex ia IIIC	Ex ia IIC
Zone 0 or Zone 1	Zone 1	Zone 20 or Zone 21	Zone 21	Zone 0 or Zone 1	Zone 21	Zone 20 or Zone 21	Zone 1

The device is designed for operation in explosive gas or explosive dust atmosphere as shown in the sketch above. In the event of potentially explosive gas-air and dust-air mixtures occurring simultaneously: Suitability requires further assessment.

A sequential change between gas and dust explosion protection is only possible if:
- A period with non-explosive atmosphere is realized during the transition or
- Special examinations are done which are not covered by the certificate

Certificates and declarations

UK Declaration of Conformity

Declaration Number:
UK_00019

The UK Declaration of Conformity is available on the Internet:
www.endress.com/Downloads

UKCA type-examination certificate

Certificate number:
CML 22UKEX2610X

List of applied standards: See UK Declaration of Conformity.

Manufacturer address

Endress+Hauser SE+Co. KG
Hauptstraße 1
79689 Maulburg, Germany

Address of the manufacturing plant: See nameplate.

Other standards

Among other things, the following standards shall be observed in their current version for proper installation:

- IEC/EN 60079-14: "Explosive atmospheres - Part 14: Electrical installations design, selection and erection"
- EN 1127-1: "Explosive atmospheres - Explosion prevention and protection - Part 1: Basic concepts and methodology"

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 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

FMR60B, FMR62B, FMR63B, FMR66B, FMR67B

Basic specifications

Position 1, 2 (Approval)		
Selected option		**Description**
FMR6xB	UK	UK Ex II 1/2 G Ex ia IIC T6...T1 Ga/Gb UK Ex II 2 G Ex ia IIC T6...T1 Gb UK Ex II 1/2 D Ex ia IIIC Txxx°C Da/Db UK Ex II 2 D Ex ia IIIC Txxx°C Db UK Ex II 1 G/2 D Ex ia IIC T6...T1 Ga / Ex ia IIIC Txxx°C Db UK Ex II 1 D/2 G Ex ia IIIC Txxx°C Da / Ex ia IIC T6...T1 Gb

Position 3, 4 (Output)		
Selected option		**Description**
FMR6xB	BA	2-wire, 4-20 mA HART
	BB	2-wire, 4-20 mA HART, switch output [1]
	BC	2-wire, 4-20 mA HART + 4 to 20 mA analog [1]
	DA	2-wire, PROFIBUS PA
	FA	PROFINET over Ethernet-APL, 10Mbit/s

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

Position 5 (Display, Operation)		
Selected option		**Description**
FMR6xB	M	Prepared for display FHX50B + Gland M20
	N	Prepared for display FHX50B + Thread NPT1/2
	O	Prepared for display FHX50B + Thread M20

Position 6 (Housing, Material)		
Selected option		**Description**
FMR6xB	B	Single compartment; Alu, coated
	J	Dual compartment; Alu, coated
	K	Dual compartment; 316L
	M	Dual compartment L-shape; Alu, coated
	N	Dual compartment L-shape; 316L, coated

Position 7 (Electrical Connection)		
Selected option		**Description**
FMR6xB	B	Gland M20, brass nickel plated, IP66/68 NEMA Type 4X/6P
	C	Gland M20, 316L, IP66/68 NEMA Type 4X/6P
	F	Thread M20, IP66/68 NEMA Type 4X/6P
	G	Thread G1/2, IP66/68 NEMA Type 4X/6P
	H	Thread NPT1/2, IP66/68 NEMA Type 4X/6P

Position 8 (Application)		
Selected option		**Description**
FMR60B FMR62B FMR63B	B	Process temperature -20...+150°C
	D	Process temperature -20...+200°C
FMR60B FMR66B FMR67B	F	Process temperature -40...+80°C
FMR60B FMR66B	H	Process temperature -40...+130°C
FMR60B FMR62B FMR63B FMR67B	J	Process temperature -40...+150°C
	L	Process temperature -40...+200°C
FMR63B	Q	Process temperature -10...150°C
	S	Process temperature -10...200°C
FMR62B FMR67B	N	Process temperature -40...+280°C
	P	Process temperature -40...+450°C
FMR62B	R	Process temperature -60...+150°C
	T	Process temperature -196...+200°C

Position 8 (Application)		
Selected option		**Description**
FMR62B FMR63B	V	Process temperature -20...+150°C, Steam application
	W	Process temperature -20...+200°C, Steam application

Position 9, 10 (Antenna)		
Selected option		**Description**
FMR60B FMR66B	BS	Encapsulated, PVDF, 40mm/1-1/2"
FMR60B FMR62B FMR66B FMR67B	GA	Drip-off, PTFE 50mm/2"
FMR60B FMR63B	GE	Integrated, PEEK, 20mm/3/4"
FMR60B	GF	Integrated, PEEK, 40mm/1-1/2"
FMR62B FMR63B	GM	Cladded flush mount, PTFE, 50mm/2"
	GN	Cladded flush mount, PTFE, 80mm/3"
FMR67B	GP	Flush mount, PTFE, 80mm/3"
FMR63B	GQ	Cladded, flush mount, PEEK, 20mm/3/4”
	GR	Cladded, flush mount, PEEK, 40mm/1-1/2”
FMR62B FMR67B	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**
FMR60B FMR66B	A	PVDF encapsulated
FMR62B FMR63B	B	PTFE cladded
FMR63B	C	PEEK cladded

Position 16 (Seal)		
Selected option		**Description**
FMR6xB	D	VKM Viton GLT
FMR60B FMR62B	J	HNBR
FMR60B	P	FFKM Kalrez
FMR62B FMR63B	G	EPDM
FMR62B FMR67B	U	Graphite

Position 17 (Air Purge Connection)		
Selected option		**Description**
FMR67B	1	G1/4
	2	NPT1/4
	3	Adapter G1/4
	4	Adapter NPT1/4

Optional specifications

ID Jx, Kx (Test, Certificate, Declaration)		
Selected option		**Description**
FMR62B FMR67B	JL	Ambient temp. transmitter -50°C/-58°F, sensor see specification

ID Nx, Ox (Accessory Mounted)		
Selected option		**Description**
FMR6xB	NA	Overvoltage protection [1]

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

ID Px, Rx (Accessory Enclosed)		
Selected option		**Description**
FMR6xB	PA	Weather protection cover, 316L [1]

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

Safety instructions: General

- The device is intended to be used in explosive atmospheres as defined in the scope of EN 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.
- Devices suitable for zone separation (marked Ga/Gb or Da/Db) are always suitable for installation in the less critical zone (Gb or Db). Due to space limitations the corresponding marking maybe not indicated on the nameplate.
- 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

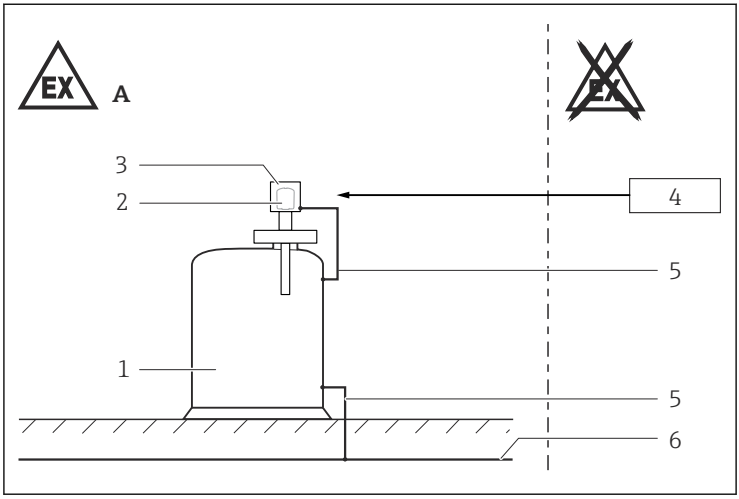
- To avoid electrostatic charging: Do not rub surfaces with a dry cloth.
- In the event of additional or alternative special varnishing on the enclosure or other metal parts or for adhesive plates:
  - Observe the danger of electrostatic charging and discharge.
  - Do not install in the vicinity of processes (≤ 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.
- 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
- In Zone 0, Zone 20, avoid sparks caused by impact and friction.
- Changing the position of the alignment device must be impossible:
  - After the alignment of the antenna via the pivot bracket
  - 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 = 1, 2, 3, 4
- In Zone 0, Zone 20, 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 Zone 1, Zone 21
1 Tank; Zone 0, Zone 1, Zone 20, Zone 21
2 Electronic insert
3 Enclosure
4 Associated intrinsically safe power supply units
5 Potential equalization line
6 Local potential equalization

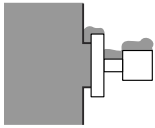
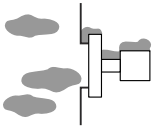
- After aligning (rotating) the enclosure, retighten the fixing screw.
- When the device is connected to certified intrinsically safe circuits of Category Ex ib for Equipment Groups IIC and IIB, the type of protection changes to Ex ib IIC and Ex ib IIB. Do not operate the sensor in Zone 0 if connecting to an intrinsically safe circuit of Category Ex ib.
- When the device is connected to certified intrinsically safe circuits of Category Ex ib for Equipment Groups IIIC and IIIB, the type of protection changes to Ex ib IIIC and Ex ib IIIB. Do not operate the sensor in Zone 20 if connecting to an intrinsically safe circuit of Category Ex ib.
- 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 IP66/67:
  - 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.

Basic specification, Position 5 = N, O

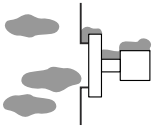
Observe the requirements according to IEC/EN 60079-14 for conduit systems and the wiring- and installation instructions of the suitable Safety Instructions (XA). In addition, observe national regulations and standards for conduit systems.

Permitted ambient conditions

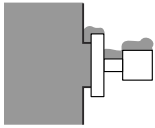
II 1/2 D Ex ia IIIC Txxx°C Da/Db

Process Zone 20		Enclosure Zone 21
Continuous dust submersion		Dust accumulation or temporary explosive dust atmosphere
Continuous explosive dust atmosphere and deposits		Dust accumulation or temporary explosive dust atmosphere

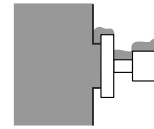
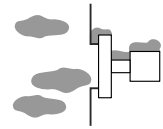
II 2 D Ex ia IIIC Txxx°C Db

Process Zone 21		Enclosure Zone 21
Continuous dust deposits or temporary explosive dust atmosphere		Dust accumulation or temporary explosive dust atmosphere

II 1 G Ex ia IIC T6...T1 Ga / II 2 D Ex ia IIIC Txxx°C Db

Process Zone 0		Enclosure Zone 21
Explosive gas atmosphere		Dust accumulation or temporary explosive dust atmosphere

II 1 D Ex ia IIIC Txxx°C Da / II 2 G Ex ia IIC T6...T1 Gb

Process Zone 20		Enclosure Zone 1
Continuous dust submersion		Temporary explosive gas atmosphere
Continuous explosive dust atmosphere and deposits		Temporary explosive gas atmosphere

Intrinsic safety

- The device is only suitable for connection to certified, intrinsically safe equipment with explosion protection Ex ia / Ex ib.
- The intrinsically safe input power circuit of the device is isolated from ground. The dielectric strength is at least 500 V_{rms}.

Optional specification, ID Nx, Ox = NA
The intrinsically safe input power circuit of the device is isolated from ground. The dielectric strength is at least 290 V_{rms}.

Potential equalization

Integrate the device into the local potential equalization.

Safety instructions: Zone separation Zone 0, Zone 1, Zone 20, Zone 21

Basic specification, Position 9, 10 = BS
- Material specification of the separating element:
  - PVDF plastic: ≥ 1 mm
  - Maximum process temperature T_p: 80 °C (dust) / 130 °C (gas)
  - Maximum Working Pressure (MWP): 3 bar
- The antenna must not be subjected to abrasive or corrosive medium that may adversely affect the partition for the zone separation.

Basic specification, Position 9, 10 = Gx
- The separating element is not directly in contact with the process (process-wetted).
- Material specification of the separating element:
  - Glass feedthrough: ≥ 1 mm
  - Stainless steel weld: ≥ 1 mm

Basic specification, Position 9, 10 in connection with Position 16
The sealing is directly in contact with the process (process-wetted).

Temperature tables

II 1/2 G Ex ia IIC T6...T1 Ga/Gb

- 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.

Basic specification, Position 16 = J, P
Lower limit of the ambient temperature for explosion protection changes to −20 °C.

Optional specification, ID Jx, Kx = JL
Lower limit of the ambient temperature for explosion protection changes to −50 °C.

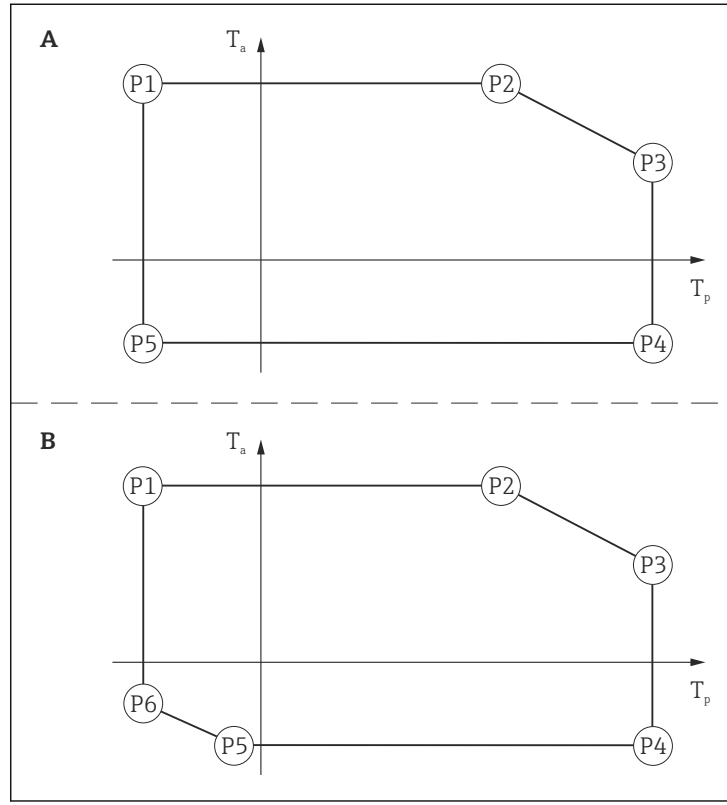
Description notes

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

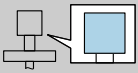
1st column: Temperature classes T6 (85 °C) to T1 (450 °C)

Column P1 to P6: 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



Basic specification, Position 3, 4 = BA, DA, FA (Channel 1)

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

FMR60B, FMR66B

Position 8 (Application)
F, H

Position 9, 10 (Antenna)
BS

	P1		**P2**		**P3**		**P4**		**P5**		**P6**	
	T_p	**T_a**	**T_p**	**T_a**	**T_p**	**T_a**	**T_p**	**T_a**	**T_p**	**T_a**	**T_p**	**T_a**
T6...T1	–40	60	60	60	80	55	80	–40	–40	–40	–	–

FMR60B, FMR62B, FMR63B, FMR66B, FMR67B

Position 8 (Application)
B, F, H, J, Q, V

Position 9, 10 (Antenna)
GA, GE, GF, GM, GN, GP, GQ, GR

Depending on the enclosure, higher temperatures are possible: up to 7 K.

	P1		P2		P3		P4		P5		P6	
	T_p	T_a	T_p	T_a	T_p	T_a	T_p	T_a	T_p	T_a	T_p	T_a
T6	−40 [1) 2)]	60	60	60	80	55	80	−40	−40 [1) 2)]	−40	–	–
T5	−40 [1) 2)]	65	65	65	95 [3)]	59	95 [3)]	−40	−40 [1) 2)]	−40	–	–
T4	−40 [1) 2)]	65	65	65	130 [3)]	53	130 [3)]	−40	−40 [1) 2)]	−40	–	–
T3…T1	−40 [1) 2)]	65	65	65	150 [3) 4)]	44	150 [3) 4)]	−40	−40 [1) 2)]	−40	–	–

1) Position 8 = Q: −10 °C
2) Position 8 = B, V: −20 °C
3) Position 8 = F: 80 °C
4) Position 8 = H: 130 °C

Position 8 (Application)
R

Position 9, 10 (Antenna)
GA, GE, GF, GM, GN, GP, GQ, GR

Depending on the enclosure, higher temperatures are possible: up to 7 K.

	P1		P2		P3		P4		P5		P6	
	T_p	T_a	T_p	T_a	T_p	T_a	T_p	T_a	T_p	T_a	T_p	T_a
T6	−60	60	60	60	80	55	80	−40	−40	−40	−60	−44
T5	−60	65	65	65	95	59	95	−40	−40	−40	−60	−44
T4	−60	65	65	65	130	53	130	−40	−40	−40	−60	−44
T3…T1	−60	65	65	65	150	44	150	−40	−40	−40	−60	−44

FMR60B, FMR62B, FMR63B, FMR67B

Position 8 (Application)
D, L, S, T, W

Position 9, 10 (Antenna)
GA, GE, GF, GM, GN, GP, GQ, GR

Depending on the enclosure, higher temperatures are possible: up to 9 K.

	P1		P2		P3		P4		P5		P6	
	T_p	T_a	T_p	T_a	T_p	T_a	T_p	T_a	T_p	T_a	T_p	T_a
T6	−196 [1) 2) 3)]	60	60	60	80	56	80	−40	−50 [1) 2) 3)]	−40	−196	3
T5	−196 [1) 2) 3)]	65	65	65	95	60	95	−40	−50 [1) 2) 3)]	−40	−196	3
T4	−196 [1) 2) 3)]	65	65	65	130	56	130	−40	−50 [1) 2) 3)]	−40	−196	3
T3	−196 [1) 2) 3)]	65	65	65	195	41	195	−40	−50 [1) 2) 3)]	−40	−196	3
T2...T1	−196 [1) 2) 3)]	65	65	65	200	39	200	−40	−50 [1) 2) 3)]	−40	−196	3

1) Position 8 = S: −10 °C; P6 not relevant
2) Position 8 = D, W: −20 °C; P6 not relevant
3) Position 8 = L: −40 °C; P6 not relevant

FMR62B, FMR67B

Position 8 (Application)
N, T

Position 9, 10 (Antenna)
GT

	P1		P2		P3		P4		P5		P6	
	T_p	T_a	T_p	T_a	T_p	T_a	T_p	T_a	T_p	T_a	T_p	T_a
T6	−196 [1]	60	60	60	80	58	80	−40	−50 [1]	−40	−196	−30
T5	−196 [1]	65	65	65	95	63	95	−40	−50 [1]	−40	−196	−30
T4	−196 [1]	65	65	65	130	61	130	−40	−50 [1]	−40	−196	−30
T3	−196 [1]	65	65	65	195	57	195	−40	−50 [1]	−40	−196	−30
T2...T1	−196 [1]	65	65	65	280 [2]	52	280 [2]	−40	−50 [1]	−40	−196	−30

1) Position 8 = N: −40 °C; P6 not relevant
2) Position 8 = T: 200 °C

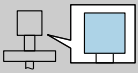
Position 8 (Application)
P

Position 9, 10 (Antenna)
GT

Depending on the enclosure, higher temperatures are possible: up to 6 K.

	P1		P2		P3		P4		P5		P6	
	T_p	T_a	T_p	T_a	T_p	T_a	T_p	T_a	T_p	T_a	T_p	T_a
T6	−40	60	60	60	80	58	80	−40	−40	−40	–	–
T5	−40	65	65	65	95	63	95	−40	−40	−40	–	–
T4	−40	65	65	65	130	61	130	−40	−40	−40	–	–
T3	−40	65	65	65	195	57	195	−40	−40	−40	–	–
T2	−40	65	65	65	290	51	290	−40	−40	−40	–	–
T1	−40	65	65	65	440	33	440	−40	−40	−40	–	–

Basic specification, Position 3, 4 = BB, BC (Channel 2)

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

FMR60B, FMR66B

Position 8 (Application)
F, H

Position 9, 10 (Antenna)
BS

	P1		**P2**		**P3**		**P4**		**P5**		**P6**	
	T_p	**T_a**	**T_p**	**T_a**	**T_p**	**T_a**	**T_p**	**T_a**	**T_p**	**T_a**	**T_p**	**T_a**
T6…T1	–40	58	58	58	80	55	80	–40	–40	–40	–	–

FMR60B, FMR62B, FMR63B, FMR66B, FMR67B

Position 8 (Application)
B, F, H, J, Q, V

Position 9, 10 (Antenna)
GA, GE, GF, GM, GN, GP, GQ, GR

Depending on the enclosure, higher temperatures are possible: up to 4 K.

	P1		P2		P3		P4		P5		P6	
	T_p	T_a	T_p	T_a	T_p	T_a	T_p	T_a	T_p	T_a	T_p	T_a
T6	−40 [1) 2)]	58	58	58	80	54	80	−40	−40 [1) 2)]	−40	–	–
T5	−40 [1) 2)]	63	63	63	95 [3)]	57	95 [3)]	−40	−40 [1) 2)]	−40	–	–
T4	−40 [1) 2)]	63	63	63	130 [3)]	51	130 [3)]	−40	−40 [1) 2)]	−40	–	–
T3…T1	−40 [1) 2)]	63	63	63	150 [3) 4)]	44	150 [3) 4)]	−40	−40 [1) 2)]	−40	–	–

1) Position 8 = Q: −10 °C
2) Position 8 = B, V: −20 °C
3) Position 8 = F: 80 °C
4) Position 8 = H: 130 °C

Position 8 (Application)
R

Position 9, 10 (Antenna)
GA, GE, GF, GM, GN, GP, GQ, GR

Depending on the enclosure, higher temperatures are possible: up to 4 K.

	P1		P2		P3		P4		P5		P6	
	T_p	T_a	T_p	T_a	T_p	T_a	T_p	T_a	T_p	T_a	T_p	T_a
T6	−60	58	58	58	80	54	80	−40	−40	−40	−60	−28
T5	−60	63	63	63	95	57	95	−40	−40	−40	−60	−28
T4	−60	63	63	63	130	51	130	−40	−40	−40	−60	−28
T3…T1	−60	63	63	63	150	44	150	−40	−40	−40	−60	−28

FMR60B, FMR62B, FMR63B, FMR67B

Position 8 (Application)
D, L, S, T, W

Position 9, 10 (Antenna)
GA, GE, GF, GM, GN, GP, GQ, GR

Depending on the enclosure, higher temperatures are possible: up to 10 K.

	P1		P2		P3		P4		P5		P6	
	T_p	T_a	T_p	T_a	T_p	T_a	T_p	T_a	T_p	T_a	T_p	T_a
T6	–196 [1) 2) 3)]	58	58	58	80	55	80	–40	–50 [1) 2) 3)]	–40	–196	17
T5	–196 [1) 2) 3)]	63	63	63	95	58	95	–40	–50 [1) 2) 3)]	–40	–196	17
T4	–196 [1) 2) 3)]	63	63	63	130	53	130	–40	–50 [1) 2) 3)]	–40	–196	17
T3	–196 [1) 2) 3)]	63	63	63	195	41	195	–40	–50 [1) 2) 3)]	–40	–196	17
T2...T1	–196 [1) 2) 3)]	63	63	63	200	39	200	–40	–50 [1) 2) 3)]	–40	–196	17

1) Position 8 = S: –10 °C; P6 not relevant
2) Position 8 = D, W: –20 °C; P6 not relevant
3) Position 8 = L: –40 °C; P6 not relevant

FMR62B, FMR67B

Position 8 (Application)
N, T

Position 9, 10 (Antenna)
GT

Depending on the enclosure, higher temperatures are possible: up to 3 K.

	P1		P2		P3		P4		P5		P6	
	T_p	T_a	T_p	T_a	T_p	T_a	T_p	T_a	T_p	T_a	T_p	T_a
T6	−196 [1]	58	58	58	80	56	80	−40	−50 [1]	−40	−196	−18
T5	−196 [1]	63	63	63	95	61	95	−40	−50 [1]	−40	−196	−18
T4	−196 [1]	63	63	63	130	58	130	−40	−50 [1]	−40	−196	−18
T3	−196 [1]	63	63	63	195	55	195	−40	−50 [1]	−40	−196	−18
T2...T1	−196 [1]	63	63	63	280 [2]	49	280 [2]	−40	−50 [1]	−40	−196	−18

1) Position 8 = N: −40 °C; P6 not relevant
2) Position 8 = T: 200 °C

Position 8 (Application)
P

Position 9, 10 (Antenna)
GT

Depending on the enclosure, higher temperatures are possible: up to 6 K.

	P1		P2		P3		P4		P5		P6	
	T_p	T_a	T_p	T_a	T_p	T_a	T_p	T_a	T_p	T_a	T_p	T_a
T6	–40	58	58	58	80	56	80	–40	–40	–40	–	–
T5	–40	63	63	63	95	61	95	–40	–40	–40	–	–
T4	–40	63	63	63	130	58	130	–40	–40	–40	–	–
T3	–40	63	63	63	195	55	195	–40	–40	–40	–	–
T2	–40	63	63	63	290	49	290	–40	–40	–40	–	–
T1	–40	63	63	63	440	39	440	–40	–40	–40	–	–

II 1/2 D Ex ia IIIC Txxx°C Da/Db

- 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

Basic specification, Position 16 = J, P
Lower limit of the ambient temperature for explosion protection changes to –20 °C.

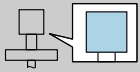
Optional specification, ID Jx, Kx = JL
Lower limit of the ambient temperature for explosion protection changes to –50 °C.

Specific conditions of use:
- The surface temperature is
  - for equipment protection level (EPL) Da: T_{200} xxx °C (with 200 mm dust deposit)
  - and equipment protection level (EPL) Db: T_L xxx °C (with dust accumulation T_L)
- The surface temperature is
  for equipment protection level (EPL) Db: T_L xxx °C (with dust accumulation T_L)

T_L marking:
The assigned surface temperature without dust layer is the same.

Description notes

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

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

FMR60B, FMR66B

Ex ia IIIC T_{200} 80 °C Da/Db
Ex ia IIIC T_L 80 °C Db

Position 8 (Application)
F

Position 9, 10 (Antenna)
BS

Maximum surface temperature	**Process temperature range**	**Ambient temperature range**
T_{200} 80 °C	−20 °C ≤ T_p ≤ +80 °C	−20 °C ≤ T_a ≤ +55 °C

FMR60B, FMR62B, FMR63B, FMR66B, FMR67B

Ex ia IIIC T_{200} 150 °C Da/Db
Ex ia IIIC T_L 150 °C Db

Position 8 (Application)
B, F, H, J, Q, R, V

Position 9, 10 (Antenna)
GA, GE, GF, GM, GN, GP, GQ, GR

Maximum surface temperature	Process temperature range	Ambient temperature range
T_{200} 80 °C	−40 °C [1) 2) 3)] ≤ T_p ≤ +80 °C	−40 °C ≤ T_a ≤ +60 °C
T_{200} 100 °C	−40 °C [1) 2) 3)] ≤ T_p ≤ +100 °C [4)]	−40 °C ≤ T_a ≤ +55 °C
T_{200} 130 °C	−40 °C [1) 2) 3)] ≤ T_p ≤ +130 °C [4)]	−40 °C ≤ T_a ≤ +50 °C
T_{200} 150 °C	−40 °C [1) 2) 3)] ≤ T_p ≤ +150 °C [4) 5)]	−40 °C ≤ T_a ≤ +45 °C

1) Position 8 = Q: −10 °C
2) Position 8 = B, V: −20 °C
3) Position 8 = R: −60 °C
4) Position 8 = F: 80 °C
5) Position 8 = H: 130 °C

FMR60B, FMR62B, FMR63B, FMR67B

Ex ia IIIC T_{200} 200 °C Da/Db
Ex ia IIIC T_L 200 °C Db

Position 8 (Application)
D, L, S, T, W

Position 9, 10 (Antenna)
GA, GE, GF, GM, GN, GP, GQ, GR

Maximum surface temperature	Process temperature range	Ambient temperature range
T_{200} 100 °C	−40 °C [1) 2) 3)] ≤ T_p ≤ +100 °C	−40 °C ≤ T_a ≤ +60 °C
T_{200} 150 °C	−40 °C [1) 2) 3)] ≤ T_p ≤ +150 °C	−40 °C ≤ T_a ≤ +55 °C
T_{200} 200 °C	−40 °C [1) 2) 3)] ≤ T_p ≤ +200 °C	−40 °C ≤ T_a ≤ +50 °C

1) Position 8 = S: −10 °C
2) Position 8 = D, W: −20 °C
3) Position 8 = T: −196 °C

FMR62B, FMR67B

Ex ia IIIC T_{200} 280 °C Da/Db
Ex ia IIIC T_L 280 °C Db

Position 8 (Application)
N, T

Position 9, 10 (Antenna)
GT

Maximum surface temperature	Process temperature range	Ambient temperature range
T_{200} 150 °C	−40 °C [1] ≤ T_p ≤ +150 °C	−40 °C ≤ T_a ≤ +65 °C
T_{200} 200 °C	−40 °C [1] ≤ T_p ≤ +200 °C	−40 °C ≤ T_a ≤ +60 °C
T_{200} 280 °C	−40 °C [1] ≤ T_p ≤ +280 °C [2]	−40 °C ≤ T_a ≤ +55 °C

1) Position 8 = T: −196 °C
2) Position 8 = T: 200 °C

Ex ia IIIC T_{200} 450 °C Da/Db
Ex ia IIIC T_L 450 °C Db

Position 8 (Application)
P

Position 9, 10 (Antenna)
GT

Maximum surface temperature	Process temperature range	Ambient temperature range
T_{200} 150 °C	−40 °C ≤ T_p ≤ +150 °C	−40 °C ≤ T_a ≤ +65 °C
T_{200} 200 °C	−40 °C ≤ T_p ≤ +200 °C	−40 °C ≤ T_a ≤ +60 °C
T_{200} 450 °C	−40 °C ≤ T_p ≤ +450 °C	−40 °C ≤ T_a ≤ +45 °C

Connection data

Basic specification, Position 3, 4 = BA, BB, BC

Power supply	
Channel 1 $U_i \leq 30\ V_{DC}$ $I_i \leq 300$ mA $P_i \leq 1$ W $C_i \leq 10$ nF $L_i = 0$	Channel 2 (only *BB, BC*) $U_i \leq 30\ V_{DC}$ $I_i \leq 300$ mA $P_i \leq 1$ W $C_i \leq 10$ nF $L_i = 0$

Basic specification, Position 3 = DA

Power supply	
FISCO $U_i \leq 17.5\ V_{DC}$ $I_i \leq 380$ mA $P_i \leq 5.32$ W $C_i \leq 5$ nF $L_i = 0$	Entity $U_i \leq 24\ V_{DC}$ $I_i \leq 300$ mA $P_i \leq 1.2$ W $C_i \leq 5$ nF $L_i = 0$

Basic specification, Position 3 = FA

Power supply	
2-WISE $U_i \leq 17.5\ V_{DC}$ $I_i \leq 380$ mA $P_i \leq 5.32$ W $C_i \leq 5$ nF $L_i = 0$	Entity $U_i \leq 17.5\ V_{DC}$ $I_i \leq 300$ mA $P_i \leq 1.2$ W $C_i \leq 5$ nF $L_i = 0$

In connection with: *Basic specification, Position 5 = M, N, O*
Installation according to the specifications of FHX50B.

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

II 1/2 D Ex ia IIIC Txxx°C Da/Db

Cable entry: Connection compartment

Cable gland: *Basic specification, Position 7 = B*

Thread	Clamping range	Material	Sealing insert	O-ring
M20x1,5	ø 8 to 10.5 mm	Ms, nickel-plated	Silicone	EPDM (ø 17x2)

Cable gland: *Basic specification, Position 7 = C*

Thread	Clamping range	Material	Sealing insert	O-ring
M20x1,5	ø 7 to 12 mm	1.4404	NBR	EPDM (ø 17x2)

- The tightening torque refers to cable glands installed by the manufacturer:
  - Recommended: 3.5 Nm
  - Maximum: 10 Nm
- This value may be different depending on the type of cable. However, the maximum value must not be exceeded.

- Only suitable for fixed installation. The operator must pay attention to a suitable strain relief of the cable.
- To maintain the ingress protection of the enclosure: Install the enclosure cover, cable glands and blind plugs correctly.

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