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71590642
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Safety Instructions
Micropilot FMR60B/62B/63B/66B/67B

2Ex ec IIC T6 Gc
Ex tc IIIC Txxx°C Dc

Endress+Hauser
People for Process Automation

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

Table of contents

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).

If not yet available, a translation into EU languages can be ordered.

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)

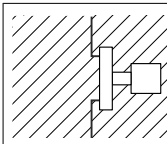
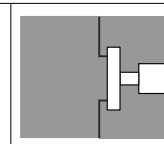
Supplementary documentation

Explosion protection brochure: CP00021Z

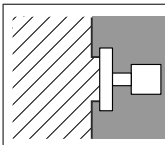
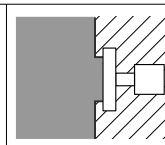
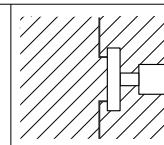
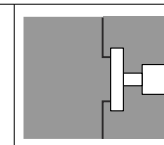
The explosion protection brochure is available on the Internet:
www.endress.com/Downloads

General notes: Combined approval

Without *Optional specification, ID Nx, Ox = NC*

	
Ex ec IIC Zone 2	Ex tc IIIC Zone 22

With *Optional specification, ID Nx, Ox = NC*

					
Ex ec IIC Zone 2	Ex tc IIIC Zone 22	Ex tc IIIC Zone 22	Ex ec IIC Zone 2	Ex ec IIC Zone 2	Ex tc IIIC Zone 22

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

Certificate of Conformity TP TC 012/2011

Inspection authority:
LLP "T-Standard" (ТОО/ЖШС "Т-Стандарт")

Certificate number:
ЕАЭС KZ 7500525.01.01.01690

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

- GOST 31610.0-2019 (IEC 60079-0:2017)
- GOST 31610.7-2017 (IEC 60079-7:2015)
- GOST 31610.26-2016 (IEC 60079-26:2014)
- GOST IEC 60079-31-2013

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

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	GL	EAC 2Ex ec IIC T6...T1 Gc EAC Ex tc IIIC Txxx°C Dc EAC 2Ex ec IIC T6...T1 Gc / Ex tc IIIC Txxx°C Dc EAC Ex tc IIIC Txxx°C Dc / 2Ex ec IIC T6...T1 Gc

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 FMR62B FMR63B	P	FFKM Kalrez
	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 Nx, Ox (Accessory Mounted)		
Selected option		**Description**
FMR6xB	NC	Gas-tight feed through

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 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
- 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.
- 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.

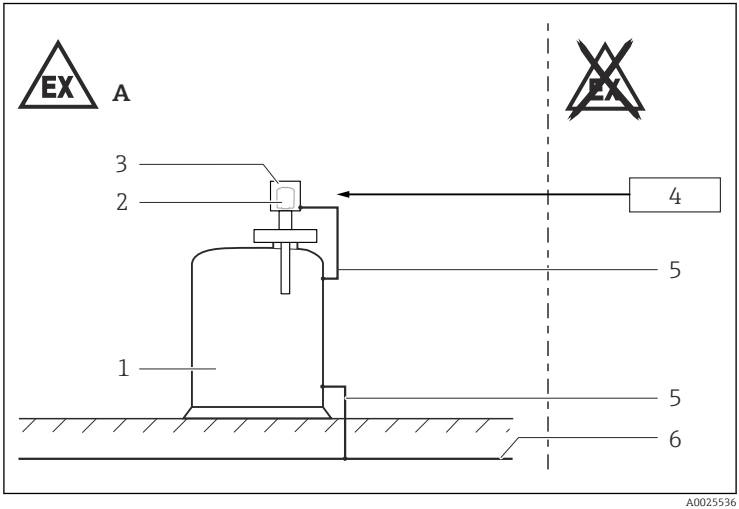
Device type FMR67B and Basic specification, Position 11, 12 = JD

- 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

- 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 2, Zone 22
1 Tank; Zone 2, Zone 22
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.
- Perform the following to achieve the degree of protection IP66/67:
  - Screw the cover tight.
  - Mount the cable entry correctly.
- In potentially explosive atmospheres:
  - Do not disconnect the electrical connection of the power supply circuit when energized.
  - Do not open the connection compartment cover and the electronics compartment cover when energized.
- Continuous service temperature of the connecting cable: ≥ T_a+20 K.
- 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.
- Seal unused entry glands with approved sealing 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.
- Supplied cable glands and metallic sealing plugs comply with the requirements of type of protection marked on the nameplate.
- Before operation:
  - Screw in the cover all the way.
  - Tighten the securing screw on the cover.

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.

Basic specification, Position 7 = G
Devices under the protection type “Equipment dust ignition protection by enclosure (Ex t)" with G threaded holes are not intended for new installations, but only for replacing equipment in existing installations. Use of this equipment shall comply with the local installation requirements.

Potential equalization

Integrate the device into the local potential equalization.

Temperature tables

2Ex ec IIC T6...T1 Gc

- 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.

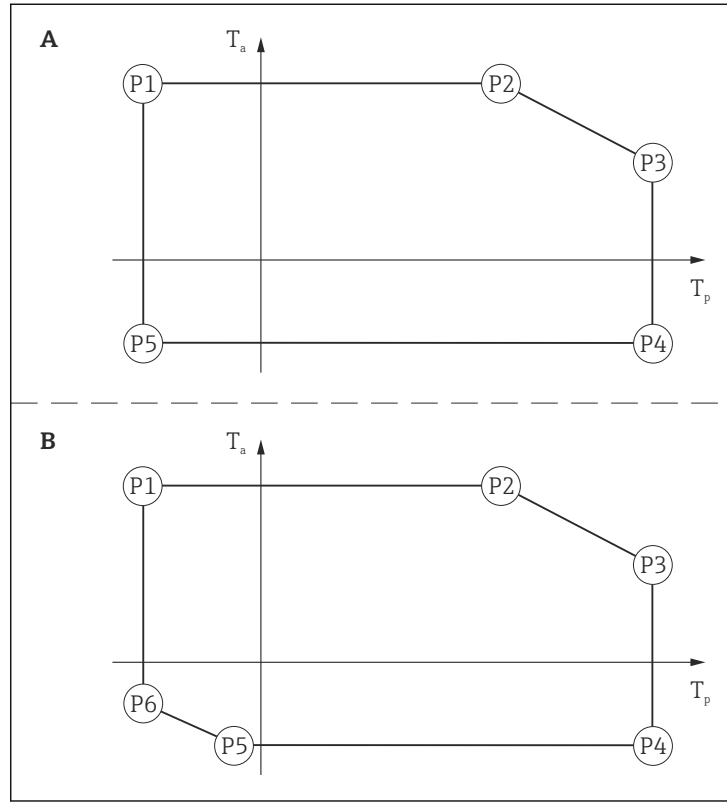
Description notes

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

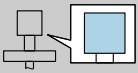
1st column: Temperature classes T6 (85 °C) to T1 (450 °C)

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

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	–20	74	74	74	80	73	80	–20	–20	–20	–	–

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 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	−40 [1) 2)]	72	72	72	80	70	80	−40	−40 [1) 2)]	−40	–	–
T5	−40 [1) 2)]	77	77	77	95 [3)]	73	95 [3)]	−40	−40 [1) 2)]	−40	–	–
T4	−40 [1) 2)]	77	77	77	130 [3)]	53	130 [3)]	−40	−40 [1) 2)]	−40	–	–
T3…T1	−40 [1) 2)]	77	77	77	150 [3) 4)]	42	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 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	−60	72	72	72	80	70	80	−40	−60	−40	–	–
T5	−60	77	77	77	95	73	95	−40	−60	−40	–	–
T4	−60	77	77	77	130	53	130	−40	−60	−40	–	–
T3…T1	−60	77	77	77	150	42	150	−40	−60	−40	–	–

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)]	72	72	72	80	70	80	−40	−50 [1) 2) 3)]	−40	−196	−10
T5	−196 [1) 2) 3)]	77	77	77	95	74	95	−40	−50 [1) 2) 3)]	−40	−196	−10
T4	−196 [1) 2) 3)]	77	77	77	130	63	130	−40	−50 [1) 2) 3)]	−40	−196	−10
T3	−196 [1) 2) 3)]	77	77	77	195	39	195	−40	−50 [1) 2) 3)]	−40	−196	−10
T2...T1	−196 [1) 2) 3)]	77	77	77	200	37	200	−40	−50 [1) 2) 3)]	−40	−196	−10

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 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	−196 [1]	72	72	72	80	71	80	−40	−50 [1]	−40	−196	−10
T5	−196 [1]	77	77	77	95	75	95	−40	−50 [1]	−40	−196	−10
T4	−196 [1]	77	77	77	130	73	130	−40	−50 [1]	−40	−196	−10
T3	−196 [1]	77	77	77	195	65	195	−40	−50 [1]	−40	−196	−10
T2...T1	−196 [1]	77	77	77	280 [2]	54	280 [2]	−40	−50 [1]	−40	−196	−10

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

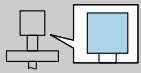
Position 8 (Application)
P

Position 9, 10 (Antenna)
GT

Depending on the enclosure, higher temperatures are possible: up to 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	72	72	72	80	71	80	–40	–40	–40	–	–
T5	–40	77	77	77	95	75	95	–40	–40	–40	–	–
T4	–40	77	77	77	130	73	130	–40	–40	–40	–	–
T3	–40	77	77	77	195	65	195	–40	–40	–40	–	–
T2	–40	77	77	77	290	52	290	–40	–40	–40	–	–
T1	–40	77	77	77	440	32	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

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	–20	59	59	59	80	58	80	–20	–20	–20	–	–

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 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 [1) 2)]	59	59	59	80	55	80	−40	−40 [1) 2)]	−40	–	–
T5	−40 [1) 2)]	64	64	64	95 [3)]	59	95 [3)]	−40	−40 [1) 2)]	−40	–	–
T4	−40 [1) 2)]	64	64	64	130 [3)]	53	130 [3)]	−40	−40 [1) 2)]	−40	–	–
T3…T1	−40 [1) 2)]	64	64	64	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 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	−60	59	59	59	80	55	80	−40	−40	−40	−60	−28
T5	−60	64	64	64	95	59	95	−40	−40	−40	−60	−28
T4	−60	64	64	64	130	53	130	−40	−40	−40	−60	−28
T3…T1	−60	64	64	64	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)]	59	59	59	80	56	80	−40	−50 [1) 2) 3)]	−40	−196	17
T5	−196 [1) 2) 3)]	64	64	64	95	60	95	−40	−50 [1) 2) 3)]	−40	−196	17
T4	−196 [1) 2) 3)]	64	64	64	130	55	130	−40	−50 [1) 2) 3)]	−40	−196	17
T3	−196 [1) 2) 3)]	64	64	64	195	41	195	−40	−50 [1) 2) 3)]	−40	−196	17
T2...T1	−196 [1) 2) 3)]	64	64	64	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]	59	59	59	80	58	80	−40	−50 [1]	−40	−196	−18
T5	−196 [1]	64	64	64	95	62	95	−40	−50 [1]	−40	−196	−18
T4	−196 [1]	64	64	64	130	60	130	−40	−50 [1]	−40	−196	−18
T3	−196 [1]	64	64	64	195	56	195	−40	−50 [1]	−40	−196	−18
T2...T1	−196 [1]	64	64	64	280 [2]	51	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	59	59	59	80	58	80	–40	–40	–40	–	–
T5	–40	64	64	64	95	62	95	–40	–40	–40	–	–
T4	–40	64	64	64	130	60	130	–40	–40	–40	–	–
T3	–40	64	64	64	195	56	195	–40	–40	–40	–	–
T2	–40	64	64	64	290	51	290	–40	–40	–40	–	–
T1	–40	64	64	64	440	33	440	–40	–40	–40	–	–

Ex tc IIIC Txxx°C Dc

- 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.

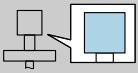
For detailed information see Technical Information.

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.

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 tc IIIC T 80 °C Dc

Position 8 (Application)
F

Position 9, 10 (Antenna)
BS

Maximum surface temperature	**Process temperature range**	**Ambient temperature range**
T 80 °C	−20 °C ≤ T_p ≤ +80 °C	−20 °C ≤ T_a ≤ +65 °C

FMR60B, FMR62B, FMR63B, FMR66B, FMR67B

Ex tc IIIC T 150 °C Dc

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 80 °C	−40 °C [1) 2) 3)] ≤ T_p ≤ +80 °C	−40 °C ≤ T_a ≤ +65 °C
T 100 °C	−40 °C [1) 2) 3)] ≤ T_p ≤ +100 °C [4)]	−40 °C ≤ T_a ≤ +60 °C
T 130 °C	−40 °C [1) 2) 3)] ≤ T_p ≤ +130 °C [4)]	−40 °C ≤ T_a ≤ +55 °C
T 150 °C	−40 °C [1) 2) 3)] ≤ T_p ≤ +150 °C [4) 5)]	−40 °C ≤ T_a ≤ +50 °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 tc IIIC T 200 °C Dc

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 100 °C	−40 °C [1) 2) 3)] ≤ T_p ≤ +100 °C	−40 °C ≤ T_a ≤ +60 °C
T 150 °C	−40 °C [1) 2) 3)] ≤ T_p ≤ +150 °C	−40 °C ≤ T_a ≤ +55 °C
T 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 tc IIIC T 280 °C Dc

Position 8 (Application)
N, T

Position 9, 10 (Antenna)
GT

Maximum surface temperature	Process temperature range	Ambient temperature range
T 150 °C	−40 °C [1] ≤ T_p ≤ +150 °C	−40 °C ≤ T_a ≤ +65 °C
T 200 °C	−40 °C [1] ≤ T_p ≤ +200 °C	−40 °C ≤ T_a ≤ +60 °C
T 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 tc IIIC T 450 °C Dc

Position 8 (Application)
P

Position 9, 10 (Antenna)
GT

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

Connection data

Basic specification, Position 3 = BA, BB, BC

Power supply	
Channel 1 U ≤ 35 V_{DC}	Channel 2 (only *BB*, *BC*) U ≤ 35 V_{DC}

Basic specification, Position 3 = DA

Power supply
$U \leq 32\ V_{DC}$

Basic specification, Position 3 = FA

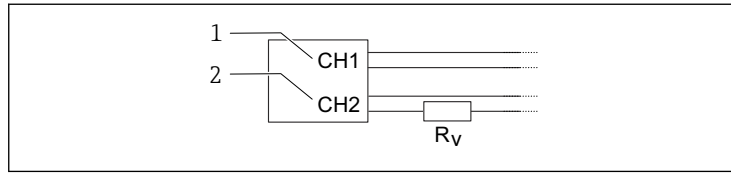
Power supply
$U \leq 15\ V_{DC}$

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!

Serial resistance (R_V)

Basic specification, Position 3, 4 = BB (only channel 2)



1 4 to 20 mA
2 Switch output

The power consumption have to be limited for certain applications.

- Recommended: Power consumption ≤ 1 W. This is obtained for a supply voltage up to 27 V_{DC}.
- For higher supply voltages (U_{max}): Insert a serial resistance (R_V) in order to limit the power consumption, see table below.

U_{max} [V]	R_V min
35	199 Ω
34	171 Ω
33	143 Ω
32	115 Ω
31	88 Ω
30	60 Ω
29	32 Ω
28	4 Ω
27	0 Ω

Cable entry parameters

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.
- The cable glands are suitable for a low risk of mechanical danger (4 Joule) and must be mounted in a protected position if larger impact energy levels are expected.
- To maintain the ingress protection of the enclosure: Install the enclosure cover, cable glands and blind plugs correctly.

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