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

Control Drawing IS
Class I, II, III, Div. 1, Groups A-G
Class I, Div. 2, Groups A-D

Endress+Hauser
People for Process Automation

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

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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)

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 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	C2	CSA C/US IS Cl. I, II, III, Div. 1, Gr. A-G, Cl. I, Zone 0, AEx/Ex ia IIC T6 Ga Cl. I, Div. 2, Gr. A-D

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	N	Prepared for display FHX50B + Thread NPT1/2

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	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

Position 8 (Application)		
Selected option		**Description**
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
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
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
FMR6xB	D	VKM Viton GLT
	G	EPDM
FMR60B FMR62B FMR63B FMR67B	J	HNBR
	P	FFKM Kalrez
FMR62B FMR67B	U	Graphite

Position 17 (Air Purge Connection)		
Selected option		**Description**
FMR67B	2	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

- 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).

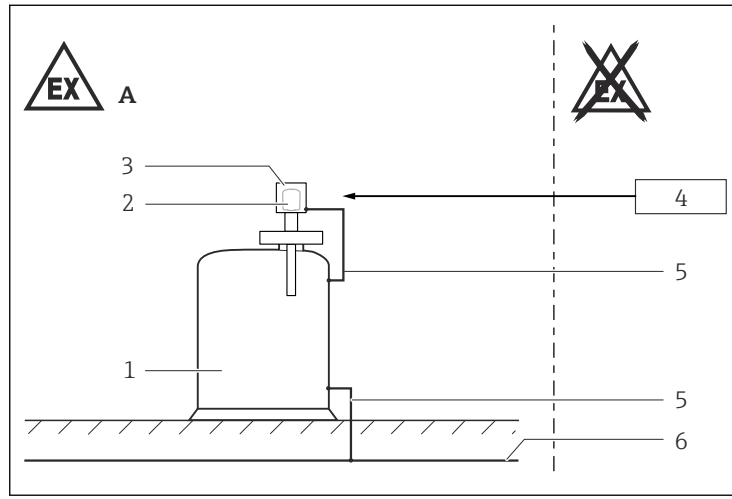
Optional specification, ID Px, Rx = PA
Connect the weather protection cover to the local potential equalization.

Device type FMR67B and Basic specification, Position 11, 12 = JD
- Avoid sparks caused by impact and friction.
- 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 = 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.

IS; Class I, II, III, Div. 1, Groups A-G

Safety instructions: Installation



A Zone 0; Class I, II, III, Div. 1, Groups A-G
1 Tank; Zone 0; Class I, II, III, Div. 1, Groups A-G
2 Electronic insert
3 Enclosure
4 Associated intrinsically safe power supply units
5 Potential equalization line
6 Local potential equalization

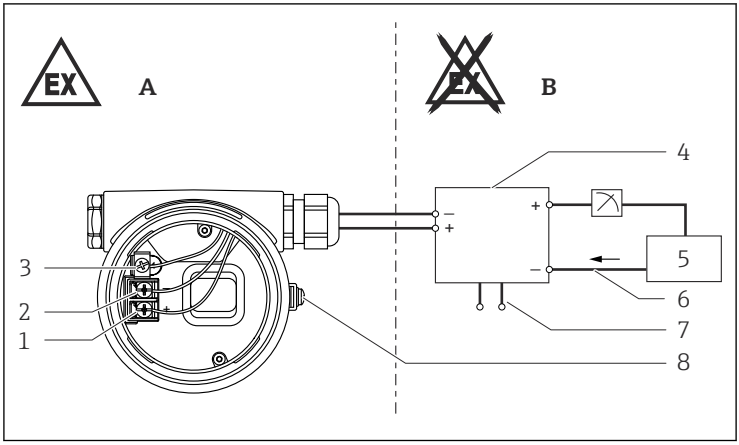
- After aligning (rotating) the enclosure, retighten the fixing screw.
- Continuous service temperature of the connecting cable: ≥ T_a+20 K.
- Observe the pertinent guidelines when interconnecting intrinsically safe circuits.
- Observe the maximum process conditions according to the manufacturer's Operating 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.

Potential equalization

Integrate the device into the local potential equalization.

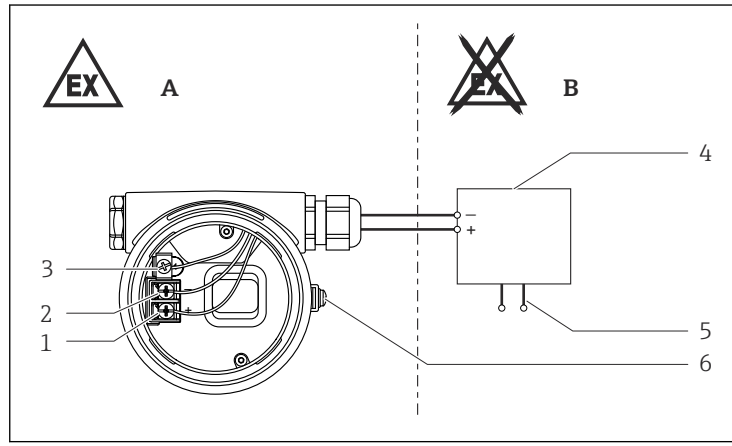
Intrinsic safety

Basic specification, Position 3, 4 = BA



A Hazardous Location:
Class I, Div. 1, Groups A-D; Class II, Div. 1, Groups E-G; Class III;
Class I, Zone 0, AEx/Ex ia IIC T6 Ga
B Non-hazardous location
1 Positive terminal
2 Negative terminal
3 Internal ground terminal
4 Barrier / Associated equipment
5 External load
6 4 to 20 mA loop
7 Supply
8 External ground terminal

Basic specification, Position 3, 4 = DA, FA



A Hazardous Location:
Class I, Div. 1, Groups A-D; Class II, Div. 1, Groups E-G; Class III;
Class I, Zone 0, AEx/Ex ia IIC T6 Ga
B Non-hazardous location
1 Positive terminal
2 Negative terminal
3 Internal ground terminal
4 PROFIBUS PA, FISCO / Associated equipment or
2-WISE Port / Associated equipment (PROFINET APL)
5 Supply
6 External ground terminal

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}) ≤ U_i (V_{max}), I_o (I_{sc}) ≤ I_i (I_{max}), C_o (C_a) ≥ C_i + C_{cable}, L_o (L_a) ≥ L_i + L_{cable} and P_o ≤ 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.
- 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 transmitter enclosure is to be connected to ground via internal or external ground terminals.
- 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}.

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

Class I, Div. 1 / Zone 0

- 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.

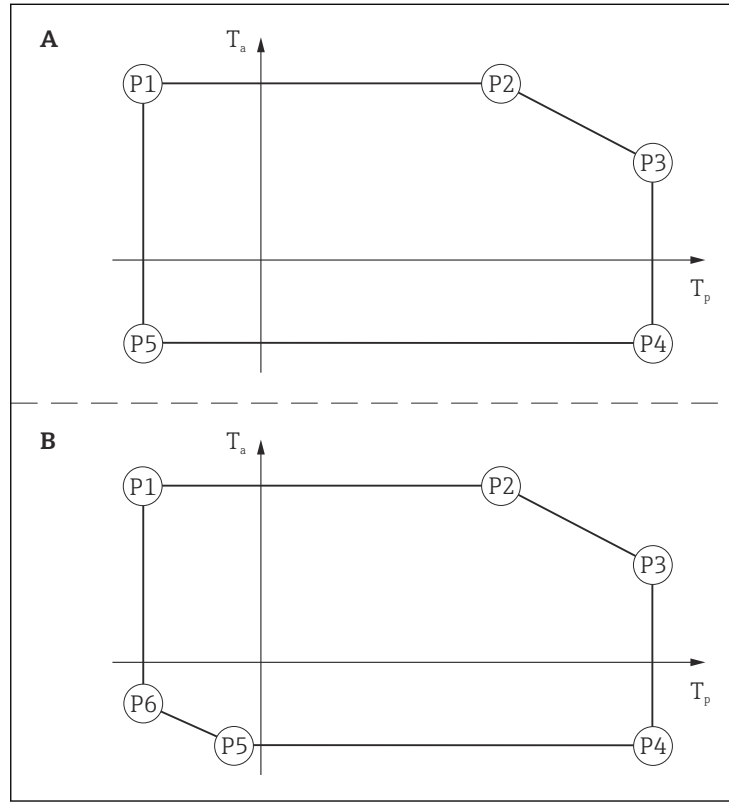
Description notes

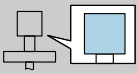
Unless otherwise indicated, the positions always refer to the basic specification.

1st column: Temperature classes T6 (85 °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



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

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	–40	46	46	46	80	28	80	–40	–40	–40	–	–
T5	–40	61	61	61	80	51	80	–40	–40	–40	–	–

FMR60B, FMR62B, FMR63B, FMR66B, FMR67B

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

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

	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) 3)]	46	46	46	80	32	80	–40 [4)]	–40 [1) 2) 3)]	–40 [4)]	–	–
T5	–40 [1) 2) 3)]	61	61	61	95	47	95	–40 [4)]	–40 [1) 2) 3)]	–40 [4)]	–	–
T4	–40 [1) 2) 3)]	65	65	65	130	54	130	–40 [4)]	–40 [1) 2) 3)]	–40 [4)]	–	–
T3	–40 [1) 2) 3)]	65	65	65	150	51	150	–40 [4)]	–40 [1) 2) 3)]	–40 [4)]	–	–

1) Position 8 = B, V: –20 °C
2) Position 8 = R: –60 °C
3) Position 16 = J, P: –20 °C
4) Optional specification, ID Jx, Kx = JL: –50 °C

FMR60B, FMR62B, FMR63B, FMR67B

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

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

	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)]	46	46	46	80	37	80	−40 [4)]	−50 [1) 2) 3)]	−40 [4)]	−196 [1) 2) 3)]	−6
T5	−196 [1) 2) 3)]	61	61	61	95	52	95	−40 [4)]	−50 [1) 2) 3)]	−40 [4)]	−196 [1) 2) 3)]	−6
T4	−196 [1) 2) 3)]	65	65	65	130	56	130	−40 [4)]	−50 [1) 2) 3)]	−40 [4)]	−196 [1) 2) 3)]	−6
T3	−196 [1) 2) 3)]	65	65	65	195	47	195	−40 [4)]	−50 [1) 2) 3)]	−40 [4)]	−196 [1) 2) 3)]	−6
T2	−196 [1) 2) 3)]	65	65	65	200	46	200	−40 [4)]	−50 [1) 2) 3)]	−40 [4)]	−196 [1) 2) 3)]	−6

1) Position 8 = D, W: −20 °C; P6 not relevant
2) Position 8 = L: −40 °C; P6 not relevant
3) Position 16 = J, P: −20 °C
4) Optional specification, ID Jx, Kx = JL: −50 °C

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]	46	46	46	80	43	80	−40 [2]	−50 [1]	−40 [2]	−196 [1]	−32
T5	−196 [1]	61	61	61	95	58	95	−40 [2]	−50 [1]	−40 [2]	−196 [1]	−32
T4	−196 [1]	65	65	65	130	61	130	−40 [2]	−50 [1]	−40 [2]	−196 [1]	−32
T3	−196 [1]	65	65	65	195	57	195	−40 [2]	−50 [1]	−40 [2]	−196 [1]	−32
T2	−196 [1]	65	65	65	280 [3]	52	280 [3]	−40 [2]	−50 [1]	−40 [2]	−196 [1]	−32

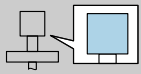
1) Position 8 = N: −40 °C; P6 not relevant
2) Optional specification, ID Jx, Kx = JL: −50 °C
3) Position 8 = T: 200 °C

Position 8 (Application)
P

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	−40	46	46	46	80	43	80	−40 [1]	−40	−40 [1]	–	–
T5	−40	61	61	61	95	58	95	−40 [1]	−40	−40 [1]	–	–
T4	−40	65	65	65	130	61	130	−40 [1]	−40	−40 [1]	–	–
T3	−40	65	65	65	195	57	195	−40 [1]	−40	−40 [1]	–	–
T2	−40	65	65	65	290	51	290	−40 [1]	−40	−40 [1]	–	–
T1	−40	65	65	65	440	39	440	−40 [1]	−40	−40 [1]	–	–

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

	**Position 6 (Housing, Material)**
	K, 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	−40	46	46	46	80	29	80	−40	−40	−40	–	–
T5	−40	61	61	61	80	51	80	−40	−40	−40	–	–

FMR60B, FMR62B, FMR63B, FMR66B, FMR67B

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

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

	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) 3)]	46	46	46	80	28	80	−40 [4)]	−40 [1) 2) 3)]	−40 [4)]	–	–
T5	−40 [1) 2) 3)]	61	61	61	95	43	95	−40 [4)]	−40 [1) 2) 3)]	−40 [4)]	–	–
T4	−40 [1) 2) 3)]	65	65	65	130	53	130	−40 [4)]	−40 [1) 2) 3)]	−40 [4)]	–	–
T3	−40 [1) 2) 3)]	65	65	65	150	42	150	−40 [4)]	−40 [1) 2) 3)]	−40 [4)]	–	–

1) Position 8 = B, V: −20 °C
2) Position 8 = R: −60 °C
3) Position 16 = J, P: −20 °C
4) Optional specification, ID Jx, Kx = JL: −50 °C

FMR60B, FMR62B, FMR63B, FMR67B

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

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

	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)]	46	46	46	80	34	80	−40 [4)]	−50 [1) 2) 3)]	−40 [4)]	−196 [1) 2) 3)]	−2
T5	−196 [1) 2) 3)]	61	61	61	95	49	95	−40 [4)]	−50 [1) 2) 3)]	−40 [4)]	−196 [1) 2) 3)]	−2
T4	−196 [1) 2) 3)]	65	65	65	130	56	130	−40 [4)]	−50 [1) 2) 3)]	−40 [4)]	−196 [1) 2) 3)]	−2
T3	−196 [1) 2) 3)]	65	65	65	195	39	195	−40 [4)]	−50 [1) 2) 3)]	−40 [4)]	−196 [1) 2) 3)]	−2
T2	−196 [1) 2) 3)]	65	65	65	200	37	200	−40 [4)]	−50 [1) 2) 3)]	−40 [4)]	−196 [1) 2) 3)]	−2

1) Position 8 = D, W: −20 °C; P6 not relevant
2) Position 8 = L: −40 °C; P6 not relevant
3) Position 16 = J, P: −20 °C
4) Optional specification, ID Jx, Kx = JL: −50 °C

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]	46	46	46	80	42	80	−40 [2]	−50 [1]	−40 [2]	−196 [1]	−30
T5	−196 [1]	61	61	61	95	57	95	−40 [2]	−50 [1]	−40 [2]	−196 [1]	−30
T4	−196 [1]	65	65	65	130	61	130	−40 [2]	−50 [1]	−40 [2]	−196 [1]	−30
T3	−196 [1]	65	65	65	195	57	195	−40 [2]	−50 [1]	−40 [2]	−196 [1]	−30
T2	−196 [1]	65	65	65	280 [3]	52	280 [3]	−40 [2]	−50 [1]	−40 [2]	−196 [1]	−30

1) Position 8 = N: −40 °C; P6 not relevant
2) Optional specification, ID Jx, Kx = JL: −50 °C
3) Position 8 = T: 200 °C

Position 8 (Application)
P

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	−40	46	46	46	80	42	80	−40 [1]	−40	−40 [1]	–	–
T5	−40	61	61	61	95	57	95	−40 [1]	−40	−40 [1]	–	–
T4	−40	65	65	65	130	61	130	−40 [1]	−40	−40 [1]	–	–
T3	−40	65	65	65	195	57	195	−40 [1]	−40	−40 [1]	–	–
T2	−40	65	65	65	290	51	290	−40 [1]	−40	−40 [1]	–	–
T1	−40	65	65	65	440	32	440	−40 [1]	−40	−40 [1]	–	–

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

Class II, III, Div. 1

- 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.

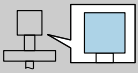
For detailed information see Technical Information.

Protection type of enclosure: IP66/67

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

FMR60B, FMR66B, FMR67B

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 ≤ +55 °C

FMR60B, FMR62B, FMR63B, FMR66B, FMR67B

Position 8 (Application)
B, H, J, 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 [4)] ≤ T_a ≤ +60 °C
T 100 °C	−40 °C [1) 2) 3)] ≤ T_p ≤ +100 °C	−40 °C [4)] ≤ T_a ≤ +55 °C
T 130 °C	−40 °C [1) 2) 3)] ≤ T_p ≤ +130 °C	−40 °C [4)] ≤ T_a ≤ +50 °C
T 150 °C	−40 °C [1) 2) 3)] ≤ T_p ≤ +150 °C [5)]	−40 °C [4)] ≤ T_a ≤ +45 °C

1) Position 8 = B, V: −20 °C
2) Position 8 = R: −60 °C
3) Position 16 = J, P: −20 °C
4) Optional specification, ID Jx, Kx = JL: −50 °C
5) Position 8 = H: 130 °C

FMR60B, FMR62B, FMR63B, FMR67B

Position 8 (Application)
D, L, 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 [4)] ≤ T_a ≤ +60 °C
T 150 °C	−40 °C [1) 2) 3)] ≤ T_p ≤ +150 °C	−40 °C [4)] ≤ T_a ≤ +55 °C
T 200 °C	−40 °C [1) 2) 3)] ≤ T_p ≤ +200 °C	−40 °C [4)] ≤ T_a ≤ +50 °C

1) Position 8 = D, W: −20 °C
2) Position 8 = T: −196 °C
3) Position 16 = J, P: −20 °C
4) Optional specification, ID Jx, Kx = JL: −50 °C

FMR62B, FMR67B

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 [2] ≤ T_a ≤ +65 °C
T 200 °C	−40 °C [1] ≤ T_p ≤ +200 °C	−40 °C [2] ≤ T_a ≤ +60 °C
T 280 °C	−40 °C [1] ≤ T_p ≤ +280 °C [3]	−40 °C [2] ≤ T_a ≤ +50 °C

1) Position 8 = T: −196 °C
2) Optional specification, ID Jx, Kx = JL: −50 °C
3) Position 8 = T: 200 °C

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 [1] ≤ T_a ≤ +65 °C
T 200 °C	−40 °C ≤ T_p ≤ +200 °C	−40 °C [1] ≤ T_a ≤ +60 °C
T 450 °C	−40 °C ≤ T_p ≤ +450 °C	−40 °C [1] ≤ T_a ≤ +30 °C

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

Connection data

Basic specification, Position 3 = BA

Power supply
$U_i \leq 30\ V_{DC}$ $I_i \leq 300\ mA$ $P_i \leq 1\ W$ $C_i \leq 10\ nF$ $L_i = 0$

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

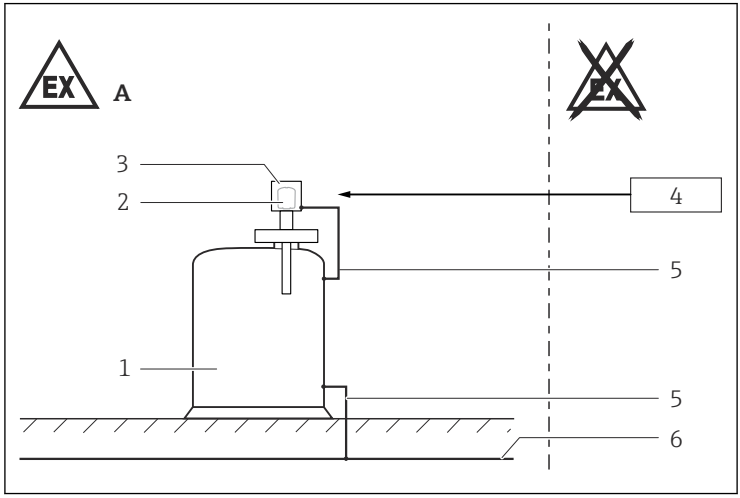
Power supply	
2-WISE $U_i \leq 17.5\ V_{DC}$ $I_i \leq 380\ mA$ $P_i \leq 5.32\ W$ $C_i \leq 5\ nF$ $L_i = 0$	Entity $U_i \leq 17.5\ V_{DC}$ $I_i \leq 300\ mA$ $P_i \leq 1.2\ W$ $C_i \leq 5\ nF$ $L_i = 0$

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

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

Class I, Div. 2, Groups A-D

Safety instructions: Installation



A Class I, Div. 2, Groups A-D
1 Tank; Class I, Div. 2, Groups A-D
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.
- In potentially explosive atmospheres: Do not open the connection compartment cover and the electronics compartment cover when energized.
- Before operation:
  - Screw in the cover all the way.
  - Tighten the securing screw on the cover.
- Continuous service temperature of the connecting cable: $\geq T_a+20$ 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.
- When connecting through a conduit entry approved for this purpose, mount the associated sealing unit directly at the enclosure.

- 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.
- Only use certified cable entries or sealing plugs. The metal sealing plugs supplied meet this requirement.
- Only use genuine spare parts from Endress+Hauser which are specified for the device.

Class I, Div. 2, Groups A, B, C, 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.
- Enclosure is not required to be explosionproof/flameproof.
- 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.

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

Class I, Div. 2

- 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.

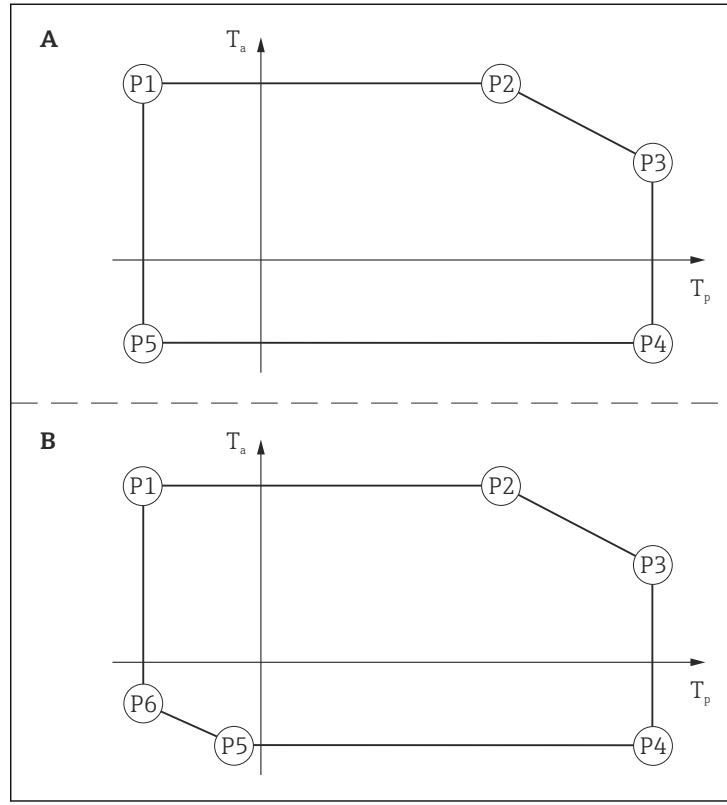
Description notes

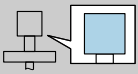
Unless otherwise indicated, the positions always refer to the basic specification.

1st column: Temperature classes T6 (85 °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



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

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

FMR60B, FMR62B, FMR63B, FMR66B, FMR67B

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

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

	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) 3)]	74	74	74	80	73	80	–40 [4)]	–40 [1) 2) 3)]	–40 [4)]	–	–
T5	–40 [1) 2) 3)]	79	79	79	95	76	95	–40 [4)]	–40 [1) 2) 3)]	–40 [4)]	–	–
T4	–40 [1) 2) 3)]	79	79	79	130	61	130	–40 [4)]	–40 [1) 2) 3)]	–40 [4)]	–	–
T3	–40 [1) 2) 3)]	79	79	79	150	52	150	–40 [4)]	–40 [1) 2) 3)]	–40 [4)]	–	–

1) Position 8 = B, V: –20 °C
2) Position 8 = R: –60 °C
3) Position 16 = J, P: –20 °C
4) Optional specification, ID Jx, Kx = JL: –50 °C

FMR60B, FMR62B, FMR63B, FMR67B

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

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

	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)]	74	74	74	80	73	80	−40 [4)]	−50 [1) 2) 3)]	−40 [4)]	−196 [1) 2) 3)]	−19
T5	−196 [1) 2) 3)]	79	79	79	95	76	95	−40 [4)]	−50 [1) 2) 3)]	−40 [4)]	−196 [1) 2) 3)]	−19
T4	−196 [1) 2) 3)]	79	79	79	130	67	130	−40 [4)]	−50 [1) 2) 3)]	−40 [4)]	−196 [1) 2) 3)]	−19
T3	−196 [1) 2) 3)]	79	79	79	195	48	195	−40 [4)]	−50 [1) 2) 3)]	−40 [4)]	−196 [1) 2) 3)]	−19
T2	−196 [1) 2) 3)]	79	79	79	200	46	200	−40 [4)]	−50 [1) 2) 3)]	−40 [4)]	−196 [1) 2) 3)]	−19

1) Position 8 = D, W: −20 °C; P6 not relevant
2) Position 8 = L: −40 °C; P6 not relevant
3) Position 16 = J, P: −20 °C
4) Optional specification, ID Jx, Kx = JL: −50 °C

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]	74	74	74	80	73	80	−40 [2]	−50 [1]	−40 [2]	−196 [1]	−43
T5	−196 [1]	79	79	79	95	78	95	−40 [2]	−50 [1]	−40 [2]	−196 [1]	−43
T4	−196 [1]	79	79	79	130	75	130	−40 [2]	−50 [1]	−40 [2]	−196 [1]	−43
T3	−196 [1]	79	79	79	195	68	195	−40 [2]	−50 [1]	−40 [2]	−196 [1]	−43
T2	−196 [1]	79	79	79	280 [3]	58	280 [3]	−40 [2]	−50 [1]	−40 [2]	−196 [1]	−43

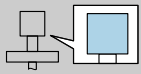
1) Position 8 = N: −40 °C; P6 not relevant
2) Optional specification, ID Jx, Kx = JL: −50 °C
3) Position 8 = T: 200 °C

Position 8 (Application)
P

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	−40	74	74	74	80	73	80	−40 [1]	−40	−40 [1]	–	–
T5	−40	79	79	79	95	78	95	−40 [1]	−40	−40 [1]	–	–
T4	−40	79	79	79	130	75	130	−40 [1]	−40	−40 [1]	–	–
T3	−40	79	79	79	195	68	195	−40 [1]	−40	−40 [1]	–	–
T2	−40	79	79	79	290	57	290	−40 [1]	−40	−40 [1]	–	–
T1	−40	79	79	79	440	39	440	−40 [1]	−40	−40 [1]	–	–

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

	**Position 6 (Housing, Material)**
	K, 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	–20	74	74	74	80	73	80	–20	–20	–20	–	–

FMR60B, FMR62B, FMR63B, FMR66B, FMR67B

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

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

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

1) Position 8 = B, V: –20 °C
2) Position 8 = R: –60 °C
3) Position 16 = J, P: –20 °C
4) Optional specification, ID Jx, Kx = JL: –50 °C

FMR60B, FMR62B, FMR63B, FMR67B

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

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

	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 [4)]	−50 [1) 2) 3)]	−40 [4)]	−196 [1) 2) 3)]	−10
T5	−196 [1) 2) 3)]	77	77	77	95	74	95	−40 [4)]	−50 [1) 2) 3)]	−40 [4)]	−196 [1) 2) 3)]	−10
T4	−196 [1) 2) 3)]	77	77	77	130	63	130	−40 [4)]	−50 [1) 2) 3)]	−40 [4)]	−196 [1) 2) 3)]	−10
T3	−196 [1) 2) 3)]	77	77	77	195	39	195	−40 [4)]	−50 [1) 2) 3)]	−40 [4)]	−196 [1) 2) 3)]	−10
T2	−196 [1) 2) 3)]	77	77	77	200	37	200	−40 [4)]	−50 [1) 2) 3)]	−40 [4)]	−196 [1) 2) 3)]	−10

1) Position 8 = D, W: −20 °C; P6 not relevant
2) Position 8 = L: −40 °C; P6 not relevant
3) Position 16 = J, P: −20 °C
4) Optional specification, ID Jx, Kx = JL: −50 °C

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]	72	72	72	80	71	80	−40 [2]	−50 [1]	−40 [2]	−196 [1]	−41
T5	−196 [1]	77	77	77	95	75	95	−40 [2]	−50 [1]	−40 [2]	−196 [1]	−41
T4	−196 [1]	77	77	77	130	73	130	−40 [2]	−50 [1]	−40 [2]	−196 [1]	−41
T3	−196 [1]	77	77	77	195	65	195	−40 [2]	−50 [1]	−40 [2]	−196 [1]	−41
T2	−196 [1]	77	77	77	280 [3]	54	280 [3]	−40 [2]	−50 [1]	−40 [2]	−196 [1]	−41

1) Position 8 = N: −40 °C; P6 not relevant
2) Optional specification, ID Jx, Kx = JL: −50 °C
3) Position 8 = T: 200 °C

Position 8 (Application)
P

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	−40	72	72	72	80	71	80	−40 [1]	−40	−40 [1]	–	–
T5	−40	77	77	77	95	75	95	−40 [1]	−40	−40 [1]	–	–
T4	−40	77	77	77	130	73	130	−40 [1]	−40	−40 [1]	–	–
T3	−40	77	77	77	195	65	195	−40 [1]	−40	−40 [1]	–	–
T2	−40	77	77	77	290	52	290	−40 [1]	−40	−40 [1]	–	–
T1	−40	77	77	77	440	32	440	−40 [1]	−40	−40 [1]	–	–

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

Connection data

Basic specification, Position 3 = BA

Power supply
$U \leq 35\ V_{DC}$

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 = N*
Installation according to the specifications of FHX50B.

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

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