

Safety Instructions

Micropilot

FMR50/51/52/53/54/56/57

PROFIBUS PA, FOUNDATION Fieldbus

Ex d [ia] IIC T6-T1



Document: XA01048F-A

Safety instructions for electrical apparatus for explosion-hazardous areas

Micropilot FMR50/51/52/53/54/56/57

PROFIBUS PA, FOUNDATION Fieldbus

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Associated documentation

This document is an integral part of the following Operating Instructions:

- PROFIBUS PA:
BA01124F/00 (FMR50), BA01125F/00 (FMR51/52), BA01126F/00 (FMR53/54),
BA01127F/00 (FMR56/57)
- FOUNDATION Fieldbus:
BA01120F/00 (FMR50), BA01121F/00 (FMR51/52), BA01122F/00 (FMR53/54),
BA01123F/00 (FMR56/57)

The Operating Instructions pertaining to the device apply.

Supplementary documentation

Explosion-protection brochure:
CP00021Z/11

The Explosion-protection brochure is available:

- In the download area of the Endress+Hauser website: www.endress.com → Download → Advanced → Documentation Code: CP00021Z
- On the CD for devices with CD-based documentation

Manufacturer's certificates

KC Declaration of Conformity

Certificate number:
13-KB4BO-0380

Affixing the certificate number certifies conformity with the standards under www.IECEx.com (depending on the device version).

- IEC 60079-0 :2011
- IEC 60079-1 :2007
- IEC 60079-11:2011
- IEC 60079-26:2006

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

FMR5x	-	*****	+	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.

Device type: FMR50, FMR51, FMR52, FMR53, FMR54, FMR56, FMR57

Basic specifications

Position		Selected option		Description
1, 2	Approval	FMR5x	KC	Ex d [ia] IIC T6-T1
3	Power Supply; Output	FMR5x	E G	2-wire, FOUNDATION Fieldbus, switch output (PFS) 2-wire, PROFIBUS PA, switch output (PFS)
4	Display; Operation	FMR5x	A C E L M	Without, via communication SD02 4-line, push buttons + data backup function SD03 4-line, illum., touch control + data backup function Prepared for display FHX50 + M12 connection Prepared for display FHX50 + custom connection
5	Housing	FMR5x, except FMR50/56	B	Dual compartment, 316L (GT18)
		FMR5x	C	Dual compartment, Alu coated (GT20)
7, 8	Antenna	FMR50	BM BN BR	Horn 40 mm/1½", PVDF encapsulated, -40...130 °C Horn 80 mm/3", PP cladded, -40...80 °C Horn 100 mm/4", PP cladded, -40...80 °C
		FMR51	Bx	Horn (different sizes)
		FMR52	BO BP	Horn 50 mm/2", -40...200 °C, flush mount Horn 80 mm/3", -40...200 °C, flush mount
		FMR53	Cx	Rod (different sizes)
		FMR54	Ax Bx Dx	Without Horn Horn (different sizes) Planar (different sizes)
		FMR56	BN BR	Horn 80 mm/3", PP cladded, -40...80 °C Horn 100 mm/4", PP cladded, -40...80 °C
		FMR57	Bx Fx	Horn (different sizes) Parabolic (different sizes)
9, 10	Seal	FMR51	A5 C1 D2 D3	Viton GLT, -40...150 °C Kalrez, -20...150 °C Graphite, -196...450 °C (HT) Graphite, -40...250 °C (XT)
		FMR54	A7 A8 B4 C2 D1 D2	Viton, -20...150 °C (Planar) Viton, -40...200 °C EPDM, -40...150 °C Kalrez, -20...200 °C, conductive media max. 150 °C Graphite, -196...280 °C (XT) Graphite, -196...400 °C (HT)
		FMR57	A6 D4	Viton GLT, -40...200 °C Graphite, -40...400 °C (HT)
11-13	Process Connection	FMR5x, except FMR50/56	Axx, Cxx, Kxx	Flange (different sizes)
		FMR50	GGF, RGF	Thread, PVDF
		FMR51	Pxx Rxx Txx	Flange (different sizes) Thread, 316L and PVDF Tri-Clamp
		FMR52	Mxx Txx	Slotted-nut Tri-Clamp
		FMR53	Rxj RxF	Thread, 316L Thread, PVDF

Position	Selected option	Description
11-13 Process Connection	FMR50/56 UAE XR0 XxG	Mounting bracket Connection, without flange/mounting bracket Slip on flange (different sizes)
	FMR57 RxJ XxJ	Thread, 316L Align. device (different sizes)

Optional specifications

ID	Selected option	Description
Ox Accessory Mounted	FMR51, FMR57 OW	Horn protection, PTFE, no airpurge possible

**Safety instructions:
General**

- 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. housing, sensor element, special varnishing, attached additional plates, ..)
 - Of isolated capacities (e.g. isolated metallic plates)
- Refer to the temperature tables for the relationship between the permitted ambient temperature for the sensor and/or transmitter, depending on the range of application, and the temperature class.
- Modifications 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**

Permitted ambient temperature range at the electronics housing: $-40\text{ °C} \leq T_a \leq +80\text{ °C}$.
Observe the information in the temperature tables.

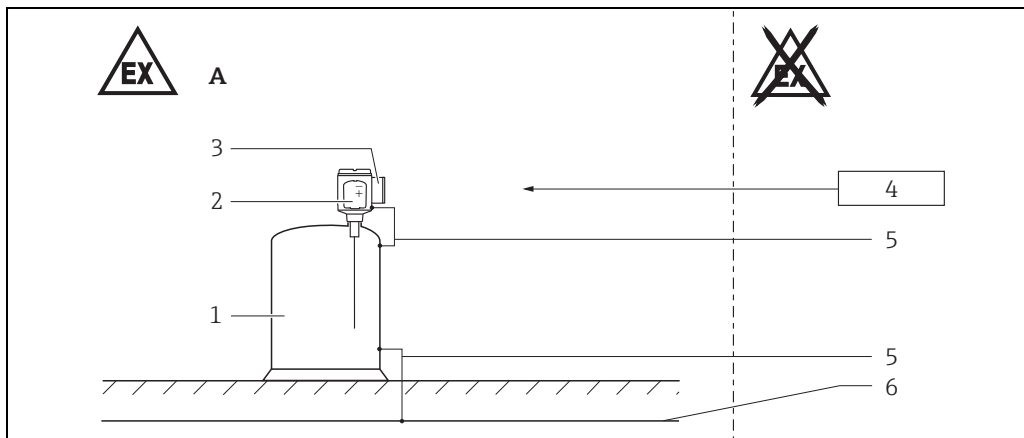
Device type FMR50, FMR52, FMR53, FMR54 (planar, enamel), FMR56

- An antenna coated with non-conductive material can be used if avoiding electrostatic charging (e.g. through friction, cleaning, maintenance, strong medium flow).

Device type FMR51, FMR57 and Optional specification, ID Ox (Accessory Mounted) = OW

- An antenna coated with non-conductive material can be used if avoiding electrostatic charging (e.g. through friction, cleaning, maintenance, strong medium flow).
- In the case of process connections made of polymeric material or with polymeric coatings, avoid electrostatic charging of the plastic surfaces.
- In the event of additional or alternative special varnishing on the housing or other metal parts:
 - Observe the danger of electrostatic charging and discharge.
 - Do not rub surfaces with a dry cloth.

Safety instructions: Installation



FMP5x_02



A Zone 1

- 1 Tank; Zone 0, Zone 1
- 2 Electronics compartment Ex ia; Electronic insert
- 3 Connection compartment Ex d
- 4 Power supply
- 5 Potential equalization line
- 6 Potential equalization

- After aligning (rotating) the housing, retighten the fixing screw (see Operating Instructions).
- When mounting the device:
 - Exclude any mechanical damage or friction during the application.
 - Pay particular attention to flow conditions and tank fittings.
- Continuous service temperature of the connecting cable: -40 to $\geq +85$ °C; in accordance with the range of service temperature taking into account additional influences of the process conditions ($T_{a,min}$), ($T_{a,max} + 20$ K).
- Only use certified cable entries suitable for the application. Observe national regulations and standards. Accordingly, the connection terminal does not include any ignition sources.
- When operating the transmitter housing at an ambient temperature under -20 °C, use appropriate cables and cable entries permitted for this application.
- When connecting through a conduit entry approved for this purpose, mount the associated sealing unit directly at the housing.
- 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.
- Before operation:
 - Screw in the cover all the way.
 - Tighten the securing clamp on the cover.
- In potentially explosive atmospheres:
 - Do not open the electrical connection of the power supply circuit when energized.
 - Do not open the connection compartment cover.

Intrinsic safety

- The device can be connected to the Endress+Hauser FXA291 service tool: refer to the Operating Instructions.

Potential equalization

- Integrate the device into the local potential equalization.

**Safety instructions:
Zone 0**

- In the event of potentially explosive vapor/air mixtures, only operate the device under atmospheric conditions.
 - Temperature: –20 to +60 °C
 - Pressure: 80 to 110 kPa (0.8 to 1.1 bar)
 - Air with normal oxygen content, usually 21 % (V/V)
- If no potentially explosive mixtures are present, or if additional protective measures have been taken, the device may also be operated under non-atmospheric conditions in accordance with the manufacturer's specifications.

Temperature tables→  11**Connection data**

The power consumption of I/O modules with passive PFS output can be limited for certain applications.

- Recommended: Power consumption = 1 W.
This is obtained for a supply voltage at the terminals of 27 V DC.
- For higher supply voltages (U_{max}): Insert a serial resistance (R_V) in order to limit the power consumption → table below.

Table for the PFS serial resistance (R_V):

Power consumption	1.0 W
Total power consumption	1.88 W
Internal resistance R_I	760 Ω

U_{max} [V]	R_V min
35	205 Ω
34	177 Ω
33	150 Ω
32	122 Ω
31	95 Ω
30	67 Ω
29	39 Ω
28	12 Ω
27	0 Ω

**Note!**

For values associated with a higher or lower internal power consumption please contact Endress+Hauser.

Connection compartment Ex d

Basic specification, Position 3 (Power Supply; Output) = E, G (TRC [27])

Terminal 1 (+), 2 (-)	Terminal 3 (+), 4 (-)
Power supply: U_N = 32 V DC U_m = 250 V	Switch output (PFS): U_N = 35 V DC U_m = 250 V

Electronics compartment Ex ia**Service interface (CDI)**

Taking the following values into consideration, the device can be connected to the certified Endress+Hauser FXA291 service tool or a similar interface:

Service interface													
$U_i = 7.3 \text{ V}$													
effective inner inductance $L_i = \text{negligible}$													
effective inner capacitance $C_i = \text{negligible}$													
$U_o = 7.3 \text{ V}$													
$I_o = 100 \text{ mA}$													
$P_o = 160 \text{ mW}$													
$L_o \text{ (mH)} =$	5.00	2.00	1.00	0.50	0.20	0.10	0.05	0.02	0.01	0.005	0.002	0.001	
$C_o \text{ (}\mu\text{F)} =$	0.73	1.20	1.60	2.00	2.60	3.20	4.00	5.50	7.30	10.00	12.70	12.70	

Temperature tables

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Antenna: Zone 0, Electronics housing: Zone 1	
FMR5x	25

General notes



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

Note!

Observe the permitted temperature range at the antenna.

*1 = Functional

Max. permissible process temperature

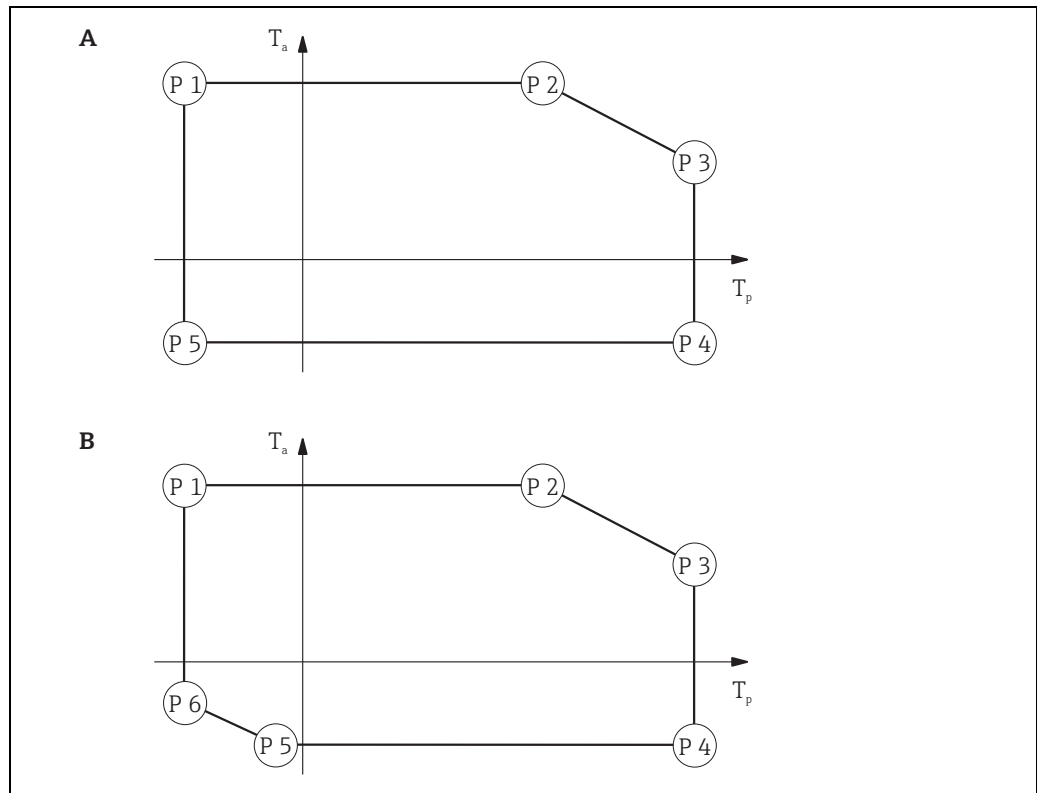
Selection table

Position 1, 2 (Approval)		Position 5 (Housing)	
KC	Ex d [ia] IIC T6-T1	B	GT18 dual compartment, 316L
		C	GT20 dual compartment, Alu coated

Position 3 (Power Supply; Output)		Transmission code of the terminal module	Channels
E	2-wire, FOUNDATION Fieldbus, switch output (PFS)	TRC [27]	1 or 2 channels used
G	2-wire, PROFIBUS PA, switch output (PFS)		

Diagram

Example diagrams to the temperature tables



A Version 1

B Version 2

T_a Ambient temperature

T_p Process temperature

Antenna and electronics housing: Zone 1

FMR50, Position 7, 8 (Antenna) = BM

Position 5 (Housing) = C													
Power Supply; Output	Temperature class	P 1		P 2		P 3		P 4		P 5		P 6	
		T _p	T _a	T _p	T _a	T _p	T _a	T _p	T _a	T _p	T _a	T _p	T _a
1 channel used	T6 (85 °C)	-40 °C	60 °C	60 °C	60 °C	80 °C	58 °C	80 °C	-40 °C	-40 °C	-40 °C	-	-
2 channels used	T6 (85 °C)	-40 °C	60 °C	60 °C	60 °C	80 °C	58 °C	80 °C	-40 °C	-40 °C	-40 °C	-	-

FMR50, Position 7, 8 (Antenna) = BN, BR

Position 5 (Housing) = C													
Power Supply; Output	Temperature class	P 1		P 2		P 3		P 4		P 5		P 6	
		T _p	T _a	T _p	T _a	T _p	T _a	T _p	T _a	T _p	T _a	T _p	T _a
1 channel used	T6 (85 °C)	-40 °C	60 °C	60 °C	60 °C	80 °C	58 °C	80 °C	-40 °C	-40 °C	-40 °C	-	-
2 channels used	T6 (85 °C)	-40 °C	60 °C	60 °C	60 °C	80 °C	58 °C	80 °C	-40 °C	-40 °C	-40 °C	-	-

FMR51

Position 5 (Housing) = B													
Power Supply; Output	Temperature class	P 1		P 2		P 3		P 4		P 5		P 6	
		T _p	T _a	T _p	T _a	T _p	T _a	T _p	T _a	T _p	T _a	T _p	T _a
1 channel used	T6 (85 °C)	-40 °C	60 °C	60 °C	60 °C	85 °C	54 °C	85 °C	-40 °C	-40 °C	-40 °C	-	-
	T5 (100 °C)	-40 °C	75 °C	75 °C	75 °C	100 °C	69 °C	100 °C	-40 °C	-40 °C	-40 °C	-	-
	T4 (135 °C)	-40 °C	80 °C	81 °C	80 °C	135 °C	69 °C	135 °C	-40 °C	-40 °C	-40 °C	-	-
	T3 (200 °C)	-40 °C	80 °C	81 °C	80 °C	150 °C	66 °C	150 °C	-40 °C	-40 °C	-40 °C	-	-
2 channels used	T6 (85 °C)	-40 °C	60 °C	60 °C	60 °C	85 °C	54 °C	85 °C	-40 °C	-40 °C	-40 °C	-	-
	T5 (100 °C)	-40 °C	75 °C	75 °C	75 °C	100 °C	69 °C	100 °C	-40 °C	-40 °C	-40 °C	-	-
	T4 (135 °C)	-40 °C	76 °C	76 °C	76 °C	135 °C	63 °C	135 °C	-40 °C	-40 °C	-40 °C	-	-
	T3 (200 °C)	-40 °C	76 °C	76 °C	76 °C	150 °C	60 °C	150 °C	-40 °C	-40 °C	-40 °C	-	-

Position 5 (Housing) = C													
Power Supply; Output	Temperature class	P 1		P 2		P 3		P 4		P 5		P 6	
		T _p	T _a	T _p	T _a	T _p	T _a	T _p	T _a	T _p	T _a	T _p	T _a
1 channel used	T6 (85 °C)	-40 °C	60 °C	60 °C	60 °C	85 °C	55 °C	85 °C	-40 °C	-40 °C	-40 °C	-	-
	T5 (100 °C)	-40 °C	75 °C	75 °C	75 °C	100 °C	70 °C	100 °C	-40 °C	-40 °C	-40 °C	-	-
	T4 (135 °C)	-40 °C	80 °C	81 °C	80 °C	135 °C	71 °C	135 °C	-40 °C	-40 °C	-40 °C	-	-
	T3 (200 °C)	-40 °C	80 °C	81 °C	80 °C	150 °C	68 °C	150 °C	-40 °C	-40 °C	-40 °C	-	-
2 channels used	T6 (85 °C)	-40 °C	60 °C	60 °C	60 °C	85 °C	55 °C	85 °C	-40 °C	-40 °C	-40 °C	-	-
	T5 (100 °C)	-40 °C	75 °C	75 °C	75 °C	100 °C	70 °C	100 °C	-40 °C	-40 °C	-40 °C	-	-
	T4 (135 °C)	-40 °C	76 °C	76 °C	76 °C	135 °C	65 °C	135 °C	-40 °C	-40 °C	-40 °C	-	-
	T3 (200 °C)	-40 °C	76 °C	76 °C	76 °C	150 °C	63 °C	150 °C	-40 °C	-40 °C	-40 °C	-	-

Antenna and electronics housing: Zone 1

FMR51, Position 9, 10 (Seal) = D3

Position 5 (Housing) = B													
Power Supply; Output	Temperature class	P 1		P 2		P 3		P 4		P 5		P 6	
		T _p	T _a	T _p	T _a	T _p	T _a	T _p	T _a	T _p	T _a	T _p	T _a
1 channel used	T6 (85 °C)	-40 °C	60 °C	60 °C	60 °C	85 °C	57 °C	85 °C	-40 °C	-40 °C	-40 °C	-	-
	T5 (100 °C)	-40 °C	75 °C	75 °C	75 °C	100 °C	72 °C	100 °C	-40 °C	-40 °C	-40 °C	-	-
	T4 (135 °C)	-40 °C	80 °C	81 °C	80 °C	135 °C	75 °C	135 °C	-40 °C	-40 °C	-40 °C	-	-
	T3 (200 °C)	-40 °C	80 °C	81 °C	80 °C	200 °C	68 °C	200 °C	-40 °C	-40 °C	-40 °C	-	-
	T2 (300 °C)	-40 °C	80 °C	81 °C	80 °C	250 °C	63 °C	250 °C	-40 °C	-40 °C	-40 °C	-	-
2 channels used	T6 (85 °C)	-40 °C	60 °C	60 °C	60 °C	85 °C	57 °C	85 °C	-40 °C	-40 °C	-40 °C	-	-
	T5 (100 °C)	-40 °C	75 °C	75 °C	75 °C	100 °C	72 °C	100 °C	-40 °C	-40 °C	-40 °C	-	-
	T4 (135 °C)	-40 °C	76 °C	76 °C	76 °C	135 °C	69 °C	135 °C	-40 °C	-40 °C	-40 °C	-	-
	T3 (200 °C)	-40 °C	76 °C	76 °C	76 °C	200 °C	62 °C	200 °C	-40 °C	-40 °C	-40 °C	-	-
	T2 (300 °C)	-40 °C	76 °C	76 °C	76 °C	250 °C	57 °C	250 °C	-40 °C	-40 °C	-40 °C	-	-

Position 5 (Housing) = C													
Power Supply; Output	Temperature class	P 1		P 2		P 3		P 4		P 5		P 6	
		T _p	T _a	T _p	T _a	T _p	T _a	T _p	T _a	T _p	T _a	T _p	T _a
1 channel used	T6 (85 °C)	-40 °C	60 °C	60 °C	60 °C	85 °C	58 °C	85 °C	-40 °C	-40 °C	-40 °C	-	-
	T5 (100 °C)	-40 °C	75 °C	75 °C	75 °C	100 °C	73 °C	100 °C	-40 °C	-40 °C	-40 °C	-	-
	T4 (135 °C)	-40 °C	80 °C	81 °C	80 °C	135 °C	76 °C	135 °C	-40 °C	-40 °C	-40 °C	-	-
	T3 (200 °C)	-40 °C	80 °C	81 °C	80 °C	200 °C	71 °C	200 °C	-40 °C	-40 °C	-40 °C	-	-
	T2 (300 °C)	-40 °C	80 °C	81 °C	80 °C	250 °C	67 °C	250 °C	-40 °C	-40 °C	-40 °C	-	-
2 channels used	T6 (85 °C)	-40 °C	60 °C	60 °C	60 °C	85 °C	58 °C	85 °C	-40 °C	-40 °C	-40 °C	-	-
	T5 (100 °C)	-40 °C	75 °C	75 °C	75 °C	100 °C	73 °C	100 °C	-40 °C	-40 °C	-40 °C	-	-
	T4 (135 °C)	-40 °C	76 °C	76 °C	76 °C	135 °C	71 °C	135 °C	-40 °C	-40 °C	-40 °C	-	-
	T3 (200 °C)	-40 °C	76 °C	76 °C	76 °C	200 °C	65 °C	200 °C	-40 °C	-40 °C	-40 °C	-	-
	T2 (300 °C)	-40 °C	76 °C	76 °C	76 °C	250 °C	61 °C	250 °C	-40 °C	-40 °C	-40 °C	-	-

Antenna and electronics housing: Zone 1

FMR51, Position 9, 10 (Seal) = D2

Position 5 (Housing) = B													
Power Supply; Output	Temperature class	P 1		P 2		P 3		P 4		P 5		P 6	
		T _p	T _a	T _p	T _a	T _p	T _a	T _p	T _a	T _p	T _a	T _p	T _a
1 channel used	T6 (85 °C)	-196 °C	60 °C	60 °C	60 °C	85 °C	56 °C	85 °C	-40 °C	-40 °C	-40 °C	-196 °C	-15 °C
	T5 (100 °C)	-196 °C	75 °C	75 °C	75 °C	100 °C	71 °C	100 °C	-40 °C	-40 °C	-40 °C	-196 °C	-15 °C
	T4 (135 °C)	-196 °C	80 °C	81 °C	80 °C	135 °C	73 °C	135 °C	-40 °C	-40 °C	-40 °C	-196 °C	-15 °C
	T3 (200 °C)	-196 °C	80 °C	81 °C	80 °C	200 °C	64 °C	200 °C	-40 °C	-40 °C	-40 °C	-196 °C	-15 °C
	T2 (300 °C)	-196 °C	80 °C	81 °C	80 °C	300 °C	50 °C	300 °C	-40 °C	-40 °C	-40 °C	-196 °C	-15 °C
2 channels used	T6 (85 °C)	-196 °C	60 °C	60 °C	60 °C	85 °C	56 °C	85 °C	-40 °C	-40 °C	-40 °C	-196 °C	-15 °C
	T5 (100 °C)	-196 °C	75 °C	75 °C	75 °C	100 °C	71 °C	100 °C	-40 °C	-40 °C	-40 °C	-196 °C	-15 °C
	T4 (135 °C)	-196 °C	76 °C	76 °C	76 °C	135 °C	67 °C	135 °C	-40 °C	-40 °C	-40 °C	-196 °C	-15 °C
	T3 (200 °C)	-196 °C	76 °C	76 °C	76 °C	200 °C	59 °C	200 °C	-40 °C	-40 °C	-40 °C	-196 °C	-15 °C
	T2 (300 °C)	-196 °C	76 °C	76 °C	76 °C	300 °C	45 °C	300 °C	-40 °C	-40 °C	-40 °C	-196 °C	-15 °C

Position 5 (Housing) = C													
Power Supply; Output	Temperature class	P 1		P 2		P 3		P 4		P 5		P 6	
		T _p	T _a	T _p	T _a	T _p	T _a	T _p	T _a	T _p	T _a	T _p	T _a
1 channel used	T6 (85 °C)	-196 °C	60 °C	60 °C	60 °C	85 °C	57 °C	85 °C	-40 °C	-40 °C	-40 °C	-196 °C	-20 °C
	T5 (100 °C)	-196 °C	75 °C	75 °C	75 °C	100 °C	72 °C	100 °C	-40 °C	-40 °C	-40 °C	-196 °C	-20 °C
	T4 (135 °C)	-196 °C	80 °C	81 °C	80 °C	135 °C	75 °C	135 °C	-40 °C	-40 °C	-40 °C	-196 °C	-20 °C
	T3 (200 °C)	-196 °C	80 °C	81 °C	80 °C	200 °C	68 °C	200 °C	-40 °C	-40 °C	-40 °C	-196 °C	-20 °C
	T2 (300 °C)	-196 °C	80 °C	81 °C	80 °C	300 °C	57 °C	300 °C	-40 °C	-40 °C	-40 °C	-196 °C	-20 °C
	T1 (450 °C) *1	-196 °C	80 °C	81 °C	80 °C	450 °C	39 °C	450 °C	-40 °C	-40 °C	-40 °C	-196 °C	-20 °C
2 channels used	T6 (85 °C)	-196 °C	60 °C	60 °C	60 °C	85 °C	57 °C	85 °C	-40 °C	-40 °C	-40 °C	-196 °C	-20 °C
	T5 (100 °C)	-196 °C	75 °C	75 °C	75 °C	100 °C	72 °C	100 °C	-40 °C	-40 °C	-40 °C	-196 °C	-20 °C
	T4 (135 °C)	-196 °C	76 °C	76 °C	76 °C	135 °C	69 °C	135 °C	-40 °C	-40 °C	-40 °C	-196 °C	-20 °C
	T3 (200 °C)	-196 °C	76 °C	76 °C	76 °C	200 °C	62 °C	200 °C	-40 °C	-40 °C	-40 °C	-196 °C	-20 °C
	T2 (300 °C)	-196 °C	76 °C	76 °C	76 °C	300 °C	51 °C	300 °C	-40 °C	-40 °C	-40 °C	-196 °C	-20 °C
	T1 (450 °C) *1	-196 °C	76 °C	76 °C	76 °C	450 °C	35 °C	450 °C	-40 °C	-40 °C	-40 °C	-196 °C	-20 °C

Antenna and electronics housing: Zone 1

FMR52, Position 7, 8 (Antenna) = B0

Position 5 (Housing) = B													
Power Supply; Output	Temperature class	P 1		P 2		P 3		P 4		P 5		P 6	
		T _p	T _a	T _p	T _a	T _p	T _a	T _p	T _a	T _p	T _a	T _p	T _a
1 channel used	T6 (85 °C)	-40 °C	60 °C	60 °C	60 °C	85 °C	55 °C	85 °C	-40 °C	-40 °C	-40 °C	-	-
	T5 (100 °C)	-40 °C	75 °C	75 °C	75 °C	100 °C	70 °C	100 °C	-40 °C	-40 °C	-40 °C	-	-
	T4 (135 °C)	-40 °C	80 °C	81 °C	80 °C	135 °C	71 °C	135 °C	-40 °C	-40 °C	-40 °C	-	-
	T3 (200 °C)	-40 °C	80 °C	81 °C	80 °C	200 °C	60 °C	200 °C	-40 °C	-40 °C	-40 °C	-	-
2 channels used	T6 (85 °C)	-40 °C	60 °C	60 °C	60 °C	85 °C	55 °C	85 °C	-40 °C	-40 °C	-40 °C	-	-
	T5 (100 °C)	-40 °C	75 °C	75 °C	75 °C	100 °C	70 °C	100 °C	-40 °C	-40 °C	-40 °C	-	-
	T4 (135 °C)	-40 °C	76 °C	76 °C	76 °C	135 °C	65 °C	135 °C	-40 °C	-40 °C	-40 °C	-	-
	T3 (200 °C)	-40 °C	76 °C	76 °C	76 °C	200 °C	54 °C	200 °C	-40 °C	-40 °C	-40 °C	-	-

Position 5 (Housing) = C													
Power Supply; Output	Temperature class	P 1		P 2		P 3		P 4		P 5		P 6	
		T _p	T _a	T _p	T _a	T _p	T _a	T _p	T _a	T _p	T _a	T _p	T _a
1 channel used	T6 (85 °C)	-40 °C	60 °C	60 °C	60 °C	85 °C	56 °C	85 °C	-40 °C	-40 °C	-40 °C	-	-
	T5 (100 °C)	-40 °C	75 °C	75 °C	75 °C	100 °C	71 °C	100 °C	-40 °C	-40 °C	-40 °C	-	-
	T4 (135 °C)	-40 °C	80 °C	81 °C	80 °C	135 °C	73 °C	135 °C	-40 °C	-40 °C	-40 °C	-	-
	T3 (200 °C)	-40 °C	80 °C	81 °C	80 °C	200 °C	64 °C	200 °C	-40 °C	-40 °C	-40 °C	-	-
2 channels used	T6 (85 °C)	-40 °C	60 °C	60 °C	60 °C	85 °C	56 °C	85 °C	-40 °C	-40 °C	-40 °C	-	-
	T5 (100 °C)	-40 °C	75 °C	75 °C	75 °C	100 °C	71 °C	100 °C	-40 °C	-40 °C	-40 °C	-	-
	T4 (135 °C)	-40 °C	76 °C	76 °C	76 °C	135 °C	67 °C	135 °C	-40 °C	-40 °C	-40 °C	-	-
	T3 (200 °C)	-40 °C	76 °C	76 °C	76 °C	200 °C	58 °C	200 °C	-40 °C	-40 °C	-40 °C	-	-

Antenna and electronics housing: Zone 1

FMR52, Position 7, 8 (Antenna) = BP

Position 5 (Housing) = B													
Power Supply; Output	Temperature class	P 1		P 2		P 3		P 4		P 5		P 6	
		T _p	T _a	T _p	T _a	T _p	T _a	T _p	T _a	T _p	T _a	T _p	T _a
1 channel used	T6 (85 °C)	-40 °C	60 °C	60 °C	60 °C	85 °C	54 °C	85 °C	-40 °C	-40 °C	-40 °C	-	-
	T5 (100 °C)	-40 °C	75 °C	75 °C	75 °C	100 °C	69 °C	100 °C	-40 °C	-40 °C	-40 °C	-	-
	T4 (135 °C)	-40 °C	80 °C	81 °C	80 °C	135 °C	69 °C	135 °C	-40 °C	-40 °C	-40 °C	-	-
	T3 (200 °C)	-40 °C	80 °C	81 °C	80 °C	200 °C	56 °C	200 °C	-40 °C	-40 °C	-40 °C	-	-
2 channels used	T6 (85 °C)	-40 °C	60 °C	60 °C	60 °C	85 °C	54 °C	85 °C	-40 °C	-40 °C	-40 °C	-	-
	T5 (100 °C)	-40 °C	75 °C	75 °C	75 °C	100 °C	69 °C	100 °C	-40 °C	-40 °C	-40 °C	-	-
	T4 (135 °C)	-40 °C	76 °C	76 °C	76 °C	135 °C	63 °C	135 °C	-40 °C	-40 °C	-40 °C	-	-
	T3 (200 °C)	-40 °C	76 °C	76 °C	76 °C	200 °C	50 °C	200 °C	-40 °C	-40 °C	-40 °C	-	-

Position 5 (Housing) = C													
Power Supply; Output	Temperature class	P 1		P 2		P 3		P 4		P 5		P 6	
		T _p	T _a	T _p	T _a	T _p	T _a	T _p	T _a	T _p	T _a	T _p	T _a
1 channel used	T6 (85 °C)	-40 °C	60 °C	60 °C	60 °C	85 °C	55 °C	85 °C	-40 °C	-40 °C	-40 °C	-	-
	T5 (100 °C)	-40 °C	75 °C	75 °C	75 °C	100 °C	70 °C	100 °C	-40 °C	-40 °C	-40 °C	-	-
	T4 (135 °C)	-40 °C	80 °C	81 °C	80 °C	135 °C	72 °C	135 °C	-40 °C	-40 °C	-40 °C	-	-
	T3 (200 °C)	-40 °C	80 °C	81 °C	80 °C	200 °C	61 °C	200 °C	-40 °C	-40 °C	-40 °C	-	-
2 channels used	T6 (85 °C)	-40 °C	60 °C	60 °C	60 °C	85 °C	55 °C	85 °C	-40 °C	-40 °C	-40 °C	-	-
	T5 (100 °C)	-40 °C	75 °C	75 °C	75 °C	100 °C	70 °C	100 °C	-40 °C	-40 °C	-40 °C	-	-
	T4 (135 °C)	-40 °C	76 °C	76 °C	76 °C	135 °C	66 °C	135 °C	-40 °C	-40 °C	-40 °C	-	-
	T3 (200 °C)	-40 °C	76 °C	76 °C	76 °C	200 °C	55 °C	200 °C	-40 °C	-40 °C	-40 °C	-	-

FMR53, Position 11, 12, 13 (Process Connection) = RxF

Position 5 (Housing) = B													
Power Supply; Output	Temperature class	P 1		P 2		P 3		P 4		P 5		P 6	
		T _p	T _a	T _p	T _a	T _p	T _a	T _p	T _a	T _p	T _a	T _p	T _a
1 channel used	T6 (85 °C)	-40 °C	60 °C	60 °C	60 °C	80 °C	58 °C	80 °C	-40 °C	-40 °C	-40 °C	-	-
2 channels used	T6 (85 °C)	-40 °C	60 °C	60 °C	60 °C	80 °C	58 °C	80 °C	-40 °C	-40 °C	-40 °C	-	-

Position 5 (Housing) = C													
Power Supply; Output	Temperature class	P 1		P 2		P 3		P 4		P 5		P 6	
		T _p	T _a	T _p	T _a	T _p	T _a	T _p	T _a	T _p	T _a	T _p	T _a
1 channel used	T6 (85 °C)	-40 °C	60 °C	60 °C	60 °C	80 °C	58 °C	80 °C	-40 °C	-40 °C	-40 °C	-	-
2 channels used	T6 (85 °C)	-40 °C	60 °C	60 °C	60 °C	80 °C	58 °C	80 °C	-40 °C	-40 °C	-40 °C	-	-

Antenna and electronics housing: Zone 1

FMR53

Position 5 (Housing) = B													
Power Supply; Output	Temperature class	P 1		P 2		P 3		P 4		P 5		P 6	
		T _p	T _a	T _p	T _a	T _p	T _a	T _p	T _a	T _p	T _a	T _p	T _a
1 channel used	T6 (85 °C)	-40 °C	60 °C	60 °C	60 °C	85 °C	53 °C	85 °C	-40 °C	-40 °C	-40 °C	-	-
	T5 (100 °C)	-40 °C	75 °C	75 °C	75 °C	100 °C	68 °C	100 °C	-40 °C	-40 °C	-40 °C	-	-
	T4 (135 °C)	-40 °C	80 °C	81 °C	80 °C	135 °C	68 °C	135 °C	-40 °C	-40 °C	-40 °C	-	-
	T3 (200 °C)	-40 °C	80 °C	81 °C	80 °C	150 °C	65 °C	150 °C	-40 °C	-40 °C	-40 °C	-	-
2 channels used	T6 (85 °C)	-40 °C	60 °C	60 °C	60 °C	85 °C	53 °C	85 °C	-40 °C	-40 °C	-40 °C	-	-
	T5 (100 °C)	-40 °C	75 °C	75 °C	75 °C	100 °C	68 °C	100 °C	-40 °C	-40 °C	-40 °C	-	-
	T4 (135 °C)	-40 °C	76 °C	76 °C	76 °C	135 °C	62 °C	135 °C	-40 °C	-40 °C	-40 °C	-	-
	T3 (200 °C)	-40 °C	76 °C	76 °C	76 °C	150 °C	58 °C	150 °C	-40 °C	-40 °C	-40 °C	-	-

Position 5 (Housing) = C													
Power Supply; Output	Temperature class	P 1		P 2		P 3		P 4		P 5		P 6	
		T _p	T _a	T _p	T _a	T _p	T _a	T _p	T _a	T _p	T _a	T _p	T _a
1 channel used	T6 (85 °C)	-40 °C	60 °C	60 °C	60 °C	85 °C	54 °C	85 °C	-40 °C	-40 °C	-40 °C	-	-
	T5 (100 °C)	-40 °C	75 °C	75 °C	75 °C	100 °C	69 °C	100 °C	-40 °C	-40 °C	-40 °C	-	-
	T4 (135 °C)	-40 °C	80 °C	81 °C	80 °C	135 °C	70 °C	135 °C	-40 °C	-40 °C	-40 °C	-	-
	T3 (200 °C)	-40 °C	80 °C	81 °C	80 °C	150 °C	67 °C	150 °C	-40 °C	-40 °C	-40 °C	-	-
2 channels used	T6 (85 °C)	-40 °C	60 °C	60 °C	60 °C	85 °C	54 °C	85 °C	-40 °C	-40 °C	-40 °C	-	-
	T5 (100 °C)	-40 °C	75 °C	75 °C	75 °C	100 °C	69 °C	100 °C	-40 °C	-40 °C	-40 °C	-	-
	T4 (135 °C)	-40 °C	76 °C	76 °C	76 °C	135 °C	64 °C	135 °C	-40 °C	-40 °C	-40 °C	-	-
	T3 (200 °C)	-40 °C	76 °C	76 °C	76 °C	150 °C	62 °C	150 °C	-40 °C	-40 °C	-40 °C	-	-

Antenna and electronics housing: Zone 1

FMR54

Position 5 (Housing) = B													
Power Supply; Output	Temperature class	P 1		P 2		P 3		P 4		P 5		P 6	
		T _p	T _a	T _p	T _a	T _p	T _a	T _p	T _a	T _p	T _a	T _p	T _a
1 channel used	T6 (85 °C)	-40 °C	60 °C	60 °C	60 °C	85 °C	53 °C	85 °C	-40 °C	-40 °C	-40 °C	-	-
	T5 (100 °C)	-40 °C	75 °C	75 °C	75 °C	100 °C	68 °C	100 °C	-40 °C	-40 °C	-40 °C	-	-
	T4 (135 °C)	-40 °C	80 °C	81 °C	80 °C	135 °C	67 °C	135 °C	-40 °C	-40 °C	-40 °C	-	-
	T3 (200 °C)	-40 °C	80 °C	81 °C	80 °C	200 °C	52 °C	200 °C	-40 °C	-40 °C	-40 °C	-	-
2 channels used	T6 (85 °C)	-40 °C	60 °C	60 °C	60 °C	85 °C	53 °C	85 °C	-40 °C	-40 °C	-40 °C	-	-
	T5 (100 °C)	-40 °C	75 °C	75 °C	75 °C	100 °C	68 °C	100 °C	-40 °C	-40 °C	-40 °C	-	-
	T4 (135 °C)	-40 °C	76 °C	76 °C	76 °C	135 °C	61 °C	135 °C	-40 °C	-40 °C	-40 °C	-	-
	T3 (200 °C)	-40 °C	76 °C	76 °C	76 °C	200 °C	45 °C	200 °C	-40 °C	-40 °C	-40 °C	-	-

Position 5 (Housing) = C													
Power Supply; Output	Temperature class	P 1		P 2		P 3		P 4		P 5		P 6	
		T _p	T _a	T _p	T _a	T _p	T _a	T _p	T _a	T _p	T _a	T _p	T _a
1 channel used	T6 (85 °C)	-40 °C	60 °C	60 °C	60 °C	85 °C	54 °C	85 °C	-40 °C	-40 °C	-40 °C	-	-
	T5 (100 °C)	-40 °C	75 °C	75 °C	75 °C	100 °C	69 °C	100 °C	-40 °C	-40 °C	-40 °C	-	-
	T4 (135 °C)	-40 °C	80 °C	81 °C	80 °C	135 °C	70 °C	135 °C	-40 °C	-40 °C	-40 °C	-	-
	T3 (200 °C)	-40 °C	80 °C	81 °C	80 °C	200 °C	57 °C	200 °C	-40 °C	-40 °C	-40 °C	-	-
2 channels used	T6 (85 °C)	-40 °C	60 °C	60 °C	60 °C	85 °C	54 °C	85 °C	-40 °C	-40 °C	-40 °C	-	-
	T5 (100 °C)	-40 °C	75 °C	75 °C	75 °C	100 °C	69 °C	100 °C	-40 °C	-40 °C	-40 °C	-	-
	T4 (135 °C)	-40 °C	76 °C	76 °C	76 °C	135 °C	64 °C	135 °C	-40 °C	-40 °C	-40 °C	-	-
	T3 (200 °C)	-40 °C	76 °C	76 °C	76 °C	200 °C	51 °C	200 °C	-40 °C	-40 °C	-40 °C	-	-

Antenna and electronics housing: Zone 1

FMR54, Position 9, 10 (Seal) = D1

Position 5 (Housing) = B													
Power Supply; Output	Temperature class	P 1		P 2		P 3		P 4		P 5		P 6	
		T _p	T _a	T _p	T _a	T _p	T _a	T _p	T _a	T _p	T _a	T _p	T _a
1 channel used	T6 (85 °C)	-196 °C	60 °C	60 °C	60 °C	85 °C	55 °C	85 °C	-40 °C	-40 °C	-40 °C	-196 °C	-9 °C
	T5 (100 °C)	-196 °C	75 °C	75 °C	75 °C	100 °C	70 °C	100 °C	-40 °C	-40 °C	-40 °C	-196 °C	-9 °C
	T4 (135 °C)	-196 °C	80 °C	81 °C	80 °C	135 °C	71 °C	135 °C	-40 °C	-40 °C	-40 °C	-196 °C	-9 °C
	T3 (200 °C)	-196 °C	80 °C	81 °C	80 °C	200 °C	60 °C	200 °C	-40 °C	-40 °C	-40 °C	-196 °C	-9 °C
	T2 (300 °C)	-196 °C	80 °C	81 °C	80 °C	280 °C	46 °C	280 °C	-40 °C	-40 °C	-40 °C	-196 °C	-9 °C
2 channels used	T6 (85 °C)	-196 °C	60 °C	60 °C	60 °C	85 °C	55 °C	85 °C	-40 °C	-40 °C	-40 °C	-196 °C	-9 °C
	T5 (100 °C)	-196 °C	75 °C	75 °C	75 °C	100 °C	70 °C	100 °C	-40 °C	-40 °C	-40 °C	-196 °C	-9 °C
	T4 (135 °C)	-196 °C	76 °C	76 °C	76 °C	135 °C	65 °C	135 °C	-40 °C	-40 °C	-40 °C	-196 °C	-9 °C
	T3 (200 °C)	-196 °C	76 °C	76 °C	76 °C	200 °C	54 °C	200 °C	-40 °C	-40 °C	-40 °C	-196 °C	-9 °C
	T2 (300 °C)	-196 °C	76 °C	76 °C	76 °C	280 °C	41 °C	280 °C	-40 °C	-40 °C	-40 °C	-196 °C	-9 °C

Position 5 (Housing) = C													
Power Supply; Output	Temperature class	P 1		P 2		P 3		P 4		P 5		P 6	
		T _p	T _a	T _p	T _a	T _p	T _a	T _p	T _a	T _p	T _a	T _p	T _a
1 channel used	T6 (85 °C)	-196 °C	60 °C	60 °C	60 °C	85 °C	56 °C	85 °C	-40 °C	-40 °C	-40 °C	-196 °C	-15 °C
	T5 (100 °C)	-196 °C	75 °C	75 °C	75 °C	100 °C	71 °C	100 °C	-40 °C	-40 °C	-40 °C	-196 °C	-15 °C
	T4 (135 °C)	-196 °C	80 °C	81 °C	80 °C	135 °C	73 °C	135 °C	-40 °C	-40 °C	-40 °C	-196 °C	-15 °C
	T3 (200 °C)	-196 °C	80 °C	81 °C	80 °C	200 °C	64 °C	200 °C	-40 °C	-40 °C	-40 °C	-196 °C	-15 °C
	T2 (300 °C)	-196 °C	80 °C	81 °C	80 °C	280 °C	53 °C	280 °C	-40 °C	-40 °C	-40 °C	-196 °C	-15 °C
2 channels used	T6 (85 °C)	-196 °C	60 °C	60 °C	60 °C	85 °C	56 °C	85 °C	-40 °C	-40 °C	-40 °C	-196 °C	-15 °C
	T5 (100 °C)	-196 °C	75 °C	75 °C	75 °C	100 °C	71 °C	100 °C	-40 °C	-40 °C	-40 °C	-196 °C	-15 °C
	T4 (135 °C)	-196 °C	76 °C	76 °C	76 °C	135 °C	67 °C	135 °C	-40 °C	-40 °C	-40 °C	-196 °C	-15 °C
	T3 (200 °C)	-196 °C	76 °C	76 °C	76 °C	200 °C	59 °C	200 °C	-40 °C	-40 °C	-40 °C	-196 °C	-15 °C
	T2 (300 °C)	-196 °C	76 °C	76 °C	76 °C	280 °C	48 °C	280 °C	-40 °C	-40 °C	-40 °C	-196 °C	-15 °C

Antenna and electronics housing: Zone 1

FMR54, Position 9, 10 (Seal) = D2

Position 5 (Housing) = B													
Power Supply; Output	Temperature class	P 1		P 2		P 3		P 4		P 5		P 6	
		T _p	T _a	T _p	T _a	T _p	T _a	T _p	T _a	T _p	T _a	T _p	T _a
1 channel used	T6 (85 °C)	-196 °C	60 °C	60 °C	60 °C	85 °C	56 °C	85 °C	-40 °C	-40 °C	-40 °C	-196 °C	-13 °C
	T5 (100 °C)	-196 °C	75 °C	75 °C	75 °C	100 °C	71 °C	100 °C	-40 °C	-40 °C	-40 °C	-196 °C	-13 °C
	T4 (135 °C)	-196 °C	80 °C	81 °C	80 °C	135 °C	73 °C	135 °C	-40 °C	-40 °C	-40 °C	-196 °C	-13 °C
	T3 (200 °C)	-196 °C	80 °C	81 °C	80 °C	200 °C	63 °C	200 °C	-40 °C	-40 °C	-40 °C	-196 °C	-13 °C
	T2 (300 °C)	-196 °C	80 °C	81 °C	80 °C	300 °C	48 °C	300 °C	-40 °C	-40 °C	-40 °C	-196 °C	-13 °C
	T1 (450 °C) *1	-196 °C	80 °C	81 °C	80 °C	400 °C	31 °C	400 °C	-40 °C	-40 °C	-40 °C	-196 °C	-13 °C
2 channels used	T6 (85 °C)	-196 °C	60 °C	60 °C	60 °C	85 °C	56 °C	85 °C	-40 °C	-40 °C	-40 °C	-196 °C	-13 °C
	T5 (100 °C)	-196 °C	75 °C	75 °C	75 °C	100 °C	71 °C	100 °C	-40 °C	-40 °C	-40 °C	-196 °C	-13 °C
	T4 (135 °C)	-196 °C	76 °C	76 °C	76 °C	135 °C	67 °C	135 °C	-40 °C	-40 °C	-40 °C	-196 °C	-13 °C
	T3 (200 °C)	-196 °C	76 °C	76 °C	76 °C	200 °C	57 °C	200 °C	-40 °C	-40 °C	-40 °C	-196 °C	-13 °C
	T2 (300 °C)	-196 °C	76 °C	76 °C	76 °C	300 °C	43 °C	300 °C	-40 °C	-40 °C	-40 °C	-196 °C	-13 °C

Position 5 (Housing) = C													
Power Supply; Output	Temperature class	P 1		P 2		P 3		P 4		P 5		P 6	
		T _p	T _a	T _p	T _a	T _p	T _a	T _p	T _a	T _p	T _a	T _p	T _a
1 channel used	T6 (85 °C)	-196 °C	60 °C	60 °C	60 °C	85 °C	57 °C	85 °C	-40 °C	-40 °C	-40 °C	-196 °C	-19 °C
	T5 (100 °C)	-196 °C	75 °C	75 °C	75 °C	100 °C	72 °C	100 °C	-40 °C	-40 °C	-40 °C	-196 °C	-19 °C
	T4 (135 °C)	-196 °C	80 °C	81 °C	80 °C	135 °C	74 °C	135 °C	-40 °C	-40 °C	-40 °C	-196 °C	-19 °C
	T3 (200 °C)	-196 °C	80 °C	81 °C	80 °C	200 °C	67 °C	200 °C	-40 °C	-40 °C	-40 °C	-196 °C	-19 °C
	T2 (300 °C)	-196 °C	80 °C	81 °C	80 °C	300 °C	55 °C	300 °C	-40 °C	-40 °C	-40 °C	-196 °C	-19 °C
	T1 (450 °C) *1	-196 °C	80 °C	81 °C	80 °C	400 °C	42 °C	400 °C	-40 °C	-40 °C	-40 °C	-196 °C	-19 °C
2 channels used	T6 (85 °C)	-196 °C	60 °C	60 °C	60 °C	85 °C	57 °C	85 °C	-40 °C	-40 °C	-40 °C	-196 °C	-19 °C
	T5 (100 °C)	-196 °C	75 °C	75 °C	75 °C	100 °C	72 °C	100 °C	-40 °C	-40 °C	-40 °C	-196 °C	-19 °C
	T4 (135 °C)	-196 °C	76 °C	76 °C	76 °C	135 °C	69 °C	135 °C	-40 °C	-40 °C	-40 °C	-196 °C	-19 °C
	T3 (200 °C)	-196 °C	76 °C	76 °C	76 °C	200 °C	61 °C	200 °C	-40 °C	-40 °C	-40 °C	-196 °C	-19 °C
	T2 (300 °C)	-196 °C	76 °C	76 °C	76 °C	300 °C	49 °C	300 °C	-40 °C	-40 °C	-40 °C	-196 °C	-19 °C
	T1 (450 °C) *1	-196 °C	76 °C	76 °C	76 °C	400 °C	38 °C	400 °C	-40 °C	-40 °C	-40 °C	-196 °C	-19 °C

Antenna and electronics housing: Zone 1

FMR54, Position 7, 8 (Antenna) = Dx

Position 5 (Housing) = B													
Power Supply; Output	Temperature class	P 1		P 2		P 3		P 4		P 5		P 6	
		T _p	T _a	T _p	T _a	T _p	T _a	T _p	T _a	T _p	T _a	T _p	T _a
1 channel used	T6 (85 °C)	-40 °C	60 °C	60 °C	60 °C	85 °C	55 °C	85 °C	-40 °C	-40 °C	-40 °C	-	-
	T5 (100 °C)	-40 °C	75 °C	75 °C	75 °C	100 °C	70 °C	100 °C	-40 °C	-40 °C	-40 °C	-	-
	T4 (135 °C)	-40 °C	80 °C	81 °C	80 °C	135 °C	71 °C	135 °C	-40 °C	-40 °C	-40 °C	-	-
	T3 (200 °C)	-40 °C	80 °C	81 °C	80 °C	150 °C	68 °C	150 °C	-40 °C	-40 °C	-40 °C	-	-
2 channels used	T6 (85 °C)	-40 °C	60 °C	60 °C	60 °C	85 °C	55 °C	85 °C	-40 °C	-40 °C	-40 °C	-	-
	T5 (100 °C)	-40 °C	75 °C	75 °C	75 °C	100 °C	70 °C	100 °C	-40 °C	-40 °C	-40 °C	-	-
	T4 (135 °C)	-40 °C	76 °C	76 °C	76 °C	135 °C	65 °C	135 °C	-40 °C	-40 °C	-40 °C	-	-
	T3 (200 °C)	-40 °C	76 °C	76 °C	76 °C	150 °C	62 °C	150 °C	-40 °C	-40 °C	-40 °C	-	-

Position 5 (Housing) = C													
Power Supply; Output	Temperature class	P 1		P 2		P 3		P 4		P 5		P 6	
		T _p	T _a	T _p	T _a	T _p	T _a	T _p	T _a	T _p	T _a	T _p	T _a
1 channel used	T6 (85 °C)	-40 °C	60 °C	60 °C	60 °C	85 °C	56 °C	85 °C	-40 °C	-40 °C	-40 °C	-	-
	T5 (100 °C)	-40 °C	75 °C	75 °C	75 °C	100 °C	71 °C	100 °C	-40 °C	-40 °C	-40 °C	-	-
	T4 (135 °C)	-40 °C	80 °C	81 °C	80 °C	135 °C	73 °C	135 °C	-40 °C	-40 °C	-40 °C	-	-
	T3 (200 °C)	-40 °C	80 °C	81 °C	80 °C	150 °C	71 °C	150 °C	-40 °C	-40 °C	-40 °C	-	-
2 channels used	T6 (85 °C)	-40 °C	60 °C	60 °C	60 °C	85 °C	56 °C	85 °C	-40 °C	-40 °C	-40 °C	-	-
	T5 (100 °C)	-40 °C	75 °C	75 °C	75 °C	100 °C	71 °C	100 °C	-40 °C	-40 °C	-40 °C	-	-
	T4 (135 °C)	-40 °C	76 °C	76 °C	76 °C	135 °C	67 °C	135 °C	-40 °C	-40 °C	-40 °C	-	-
	T3 (200 °C)	-40 °C	76 °C	76 °C	76 °C	150 °C	65 °C	150 °C	-40 °C	-40 °C	-40 °C	-	-

Antenna and electronics housing: Zone 1

FMR56, Position 7, 8 (Antenna) = BN, BR

Position 5 (Housing) = C													
Power Supply; Output	Temperature class	P 1		P 2		P 3		P 4		P 5		P 6	
		T _p	T _a	T _p	T _a	T _p	T _a	T _p	T _a	T _p	T _a	T _p	T _a
1 channel used	T6 (85 °C)	-40 °C	60 °C	60 °C	60 °C	80 °C	58 °C	80 °C	-40 °C	-40 °C	-40 °C	-	-
2 channels used	T6 (85 °C)	-40 °C	60 °C	60 °C	60 °C	80 °C	58 °C	80 °C	-40 °C	-40 °C	-40 °C	-	-

FMR57

Position 5 (Housing) = B													
Power Supply; Output	Temperature class	P 1		P 2		P 3		P 4		P 5		P 6	
		T _p	T _a	T _p	T _a	T _p	T _a	T _p	T _a	T _p	T _a	T _p	T _a
1 channel used	T6 (85 °C)	-40 °C	60 °C	60 °C	60 °C	85 °C	56 °C	85 °C	-40 °C	-40 °C	-40 °C	-	-
	T5 (100 °C)	-40 °C	75 °C	75 °C	75 °C	100 °C	71 °C	100 °C	-40 °C	-40 °C	-40 °C	-	-
	T4 (135 °C)	-40 °C	80 °C	81 °C	80 °C	135 °C	74 °C	135 °C	-40 °C	-40 °C	-40 °C	-	-
	T3 (200 °C)	-40 °C	80 °C	81 °C	80 °C	200 °C	66 °C	200 °C	-40 °C	-40 °C	-40 °C	-	-
2 channels used	T6 (85 °C)	-40 °C	60 °C	60 °C	60 °C	85 °C	56 °C	85 °C	-40 °C	-40 °C	-40 °C	-	-
	T5 (100 °C)	-40 °C	75 °C	75 °C	75 °C	100 °C	71 °C	100 °C	-40 °C	-40 °C	-40 °C	-	-
	T4 (135 °C)	-40 °C	76 °C	76 °C	76 °C	135 °C	68 °C	135 °C	-40 °C	-40 °C	-40 °C	-	-
	T3 (200 °C)	-40 °C	76 °C	76 °C	76 °C	200 °C	61 °C	200 °C	-40 °C	-40 °C	-40 °C	-	-

Position 5 (Housing) = C													
Power Supply; Output	Temperature class	P 1		P 2		P 3		P 4		P 5		P 6	
		T _p	T _a	T _p	T _a	T _p	T _a	T _p	T _a	T _p	T _a	T _p	T _a
1 channel used	T6 (85 °C)	-40 °C	60 °C	60 °C	60 °C	85 °C	57 °C	85 °C	-40 °C	-40 °C	-40 °C	-	-
	T5 (100 °C)	-40 °C	75 °C	75 °C	75 °C	100 °C	72 °C	100 °C	-40 °C	-40 °C	-40 °C	-	-
	T4 (135 °C)	-40 °C	80 °C	81 °C	80 °C	135 °C	75 °C	135 °C	-40 °C	-40 °C	-40 °C	-	-
	T3 (200 °C)	-40 °C	80 °C	81 °C	80 °C	200 °C	69 °C	200 °C	-40 °C	-40 °C	-40 °C	-	-
2 channels used	T6 (85 °C)	-40 °C	60 °C	60 °C	60 °C	85 °C	57 °C	85 °C	-40 °C	-40 °C	-40 °C	-	-
	T5 (100 °C)	-40 °C	75 °C	75 °C	75 °C	100 °C	72 °C	100 °C	-40 °C	-40 °C	-40 °C	-	-
	T4 (135 °C)	-40 °C	76 °C	76 °C	76 °C	135 °C	70 °C	135 °C	-40 °C	-40 °C	-40 °C	-	-
	T3 (200 °C)	-40 °C	76 °C	76 °C	76 °C	200 °C	64 °C	200 °C	-40 °C	-40 °C	-40 °C	-	-

Antenna and electronics housing: Zone 1

FMR57, Position 9, 10 (Seal) = D4

Position 5 (Housing) = B													
Power Supply; Output	Temperature class	P 1		P 2		P 3		P 4		P 5		P 6	
		T _p	T _a	T _p	T _a	T _p	T _a	T _p	T _a	T _p	T _a	T _p	T _a
1 channel used	T6 (85 °C)	-40 °C	60 °C	60 °C	60 °C	85 °C	57 °C	85 °C	-40 °C	-40 °C	-40 °C	-	-
	T5 (100 °C)	-40 °C	75 °C	75 °C	75 °C	100 °C	72 °C	100 °C	-40 °C	-40 °C	-40 °C	-	-
	T4 (135 °C)	-40 °C	80 °C	81 °C	80 °C	135 °C	76 °C	135 °C	-40 °C	-40 °C	-40 °C	-	-
	T3 (200 °C)	-40 °C	80 °C	81 °C	80 °C	200 °C	70 °C	200 °C	-40 °C	-40 °C	-40 °C	-	-
	T2 (300 °C)	-40 °C	80 °C	81 °C	80 °C	300 °C	61 °C	300 °C	-40 °C	-40 °C	-40 °C	-	-
	T1 (450 °C) *1	-40 °C	80 °C	81 °C	80 °C	400 °C	51 °C	400 °C	-40 °C	-40 °C	-40 °C	-	-
2 channels used	T6 (85 °C)	-40 °C	60 °C	60 °C	60 °C	85 °C	57 °C	85 °C	-40 °C	-40 °C	-40 °C	-	-
	T5 (100 °C)	-40 °C	75 °C	75 °C	75 °C	100 °C	72 °C	100 °C	-40 °C	-40 °C	-40 °C	-	-
	T4 (135 °C)	-40 °C	76 °C	76 °C	76 °C	135 °C	70 °C	135 °C	-40 °C	-40 °C	-40 °C	-	-
	T3 (200 °C)	-40 °C	76 °C	76 °C	76 °C	200 °C	64 °C	200 °C	-40 °C	-40 °C	-40 °C	-	-
	T2 (300 °C)	-40 °C	76 °C	76 °C	76 °C	300 °C	55 °C	300 °C	-40 °C	-40 °C	-40 °C	-	-
	T1 (450 °C) *1	-40 °C	76 °C	76 °C	76 °C	400 °C	46 °C	400 °C	-40 °C	-40 °C	-40 °C	-	-

Position 5 (Housing) = C													
Power Supply; Output	Temperature class	P 1		P 2		P 3		P 4		P 5		P 6	
		T _p	T _a	T _p	T _a	T _p	T _a	T _p	T _a	T _p	T _a	T _p	T _a
1 channel used	T6 (85 °C)	-40 °C	60 °C	60 °C	60 °C	85 °C	58 °C	85 °C	-40 °C	-40 °C	-40 °C	-	-
	T5 (100 °C)	-40 °C	75 °C	75 °C	75 °C	100 °C	73 °C	100 °C	-40 °C	-40 °C	-40 °C	-	-
	T4 (135 °C)	-40 °C	80 °C	81 °C	80 °C	135 °C	77 °C	135 °C	-40 °C	-40 °C	-40 °C	-	-
	T3 (200 °C)	-40 °C	80 °C	81 °C	80 °C	200 °C	72 °C	200 °C	-40 °C	-40 °C	-40 °C	-	-
	T2 (300 °C)	-40 °C	80 °C	81 °C	80 °C	300 °C	65 °C	300 °C	-40 °C	-40 °C	-40 °C	-	-
	T1 (450 °C) *1	-40 °C	80 °C	81 °C	80 °C	400 °C	58 °C	400 °C	-40 °C	-40 °C	-40 °C	-	-
2 channels used	T6 (85 °C)	-40 °C	60 °C	60 °C	60 °C	85 °C	58 °C	85 °C	-40 °C	-40 °C	-40 °C	-	-
	T5 (100 °C)	-40 °C	75 °C	75 °C	75 °C	100 °C	73 °C	100 °C	-40 °C	-40 °C	-40 °C	-	-
	T4 (135 °C)	-40 °C	76 °C	76 °C	76 °C	135 °C	71 °C	135 °C	-40 °C	-40 °C	-40 °C	-	-
	T3 (200 °C)	-40 °C	76 °C	76 °C	76 °C	200 °C	67 °C	200 °C	-40 °C	-40 °C	-40 °C	-	-
	T2 (300 °C)	-40 °C	76 °C	76 °C	76 °C	300 °C	60 °C	300 °C	-40 °C	-40 °C	-40 °C	-	-
	T1 (450 °C) *1	-40 °C	76 °C	76 °C	76 °C	400 °C	52 °C	400 °C	-40 °C	-40 °C	-40 °C	-	-

Antenna: Zone 0, Electronics housing: Zone 1

FMR5x

Position 5 (Housing) = B, C													
Power Supply; Output	Temperature class	P 1		P 2		P 3		P 4		P 5		P 6	
		T _p	T _a	T _p	T _a	T _p	T _a	T _p	T _a	T _p	T _a	T _p	T _a
1 channel used	T6 (85 °C)	-20 °C	60 °C	60 °C	60 °C	60 °C	60 °C	60 °C	-40 °C	-20 °C	-40 °C	-	-
	T5 (100 °C)	-20 °C	75 °C	60 °C	75 °C	60 °C	75 °C	60 °C	-40 °C	-20 °C	-40 °C	-	-
	T4 (135 °C)	-20 °C	80 °C	60 °C	80 °C	60 °C	80 °C	60 °C	-40 °C	-20 °C	-40 °C	-	-
2 channels used	T6 (85 °C)	-20 °C	60 °C	60 °C	60 °C	60 °C	60 °C	60 °C	-40 °C	-20 °C	-40 °C	-	-
	T5 (100 °C)	-20 °C	75 °C	60 °C	75 °C	60 °C	75 °C	60 °C	-40 °C	-20 °C	-40 °C	-	-
	T4 (135 °C)	-20 °C	76 °C	60 °C	76 °C	60 °C	76 °C	60 °C	-40 °C	-20 °C	-40 °C	-	-



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