

Safety Instructions

Liquiphant FTL51B, FTL63

Ex ia IIC T6...T1 Ga



Liquiphant FTL51B, FTL63

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About this document

The document number of these Safety Instructions (XA) must match the information on the nameplate.

Associated documentation

All documentation is available on the Internet:

www.endress.com/Deviceviewer

(enter the serial number from the nameplate).

To commission the device, please observe the Operating Instructions pertaining to the device:

- BA01894F (FTL51B)
- BA02286F (FTL63)

Supplementary documentation

Explosion protection brochure: CP00021Z

The explosion protection brochure is available on the Internet:

www.endress.com/Downloads

Certificates and declarations**Certificate of Conformity**

Certificate number:

CML 24JPN1308X

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

- JNIO SH-TR-46-1 : 2020
- JNIO SH-TR-46-6 : 2015
- IEC 60079-26 : 2021

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

FTL51B, FTL63	–	*****	+	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: Liquiphant



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

FTL51B, FTL63

Basic specifications

Position 1, 2 (Approval)		
Selected option		Description
FTL51B	JA ¹⁾	JPN Ex ia IIC T6...T1 Ga
FTL63		

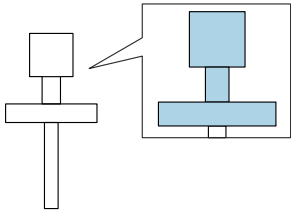
- 1) In connection with Position 3, 4 = A8 and Optional specification, ID Nx, Ox = NG:
The temperature classes change to T4...T1

Position 3, 4 (Output)		
Selected option		Description
FTL51B FTL63	A7	FEL67, 2-wire PFM + test button
	A8	FEL68, 2-wire NAMUR + test button
	GA	FEL60D, density/concentration

Position 6 (Housing, Material)		
Selected option		Description
FTL51B FTL63	A	Single compartment; plastic
	B	Single compartment; Alu, coated
	C	Single compartment; 316L, cast
	D	Single compartment; 316L, hygiene
	M	Dual compartment L-shape; Alu, coated



Shown in the temperature tables
exemplary as follows:

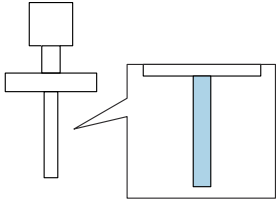


Position 7 (Electrical Connection)		
Selected option		Description
FTL51B FTL63	A	Gland M20, plastic, IP66/68 NEMA Type 4X/6P
	B ¹⁾	Gland M20, brass nickel plated, IP66/68 NEMA Type 4X/6P
	C ²⁾	Gland M20, 316L, IP66/68 NEMA Type 4X/6P
	F	Thread M20, IP66/68 NEMA Type 4X/6P
	G	Thread G1/2, IP66/68 NEMA Type 4X/6P
	H ³⁾	Thread NPT1/2, IP66/68 NEMA Type 4X/6P
	I ⁴⁾	Thread NPT3/4, IP66/68 NEMA Type 4X/6P
	J	Gland M20, plastic blue, IP66/68 NEMA Type 4X/6P
	M ⁴⁾	Plug M12, IP66/67 NEMA Type 4X
	Y	Special version: Thread NPT1/2, IP66/68 NEMA Type 4X/6P

- 1) Only in connection with Position 6 = B, M
 2) Only in connection with Position 6 = B, C
 3) Only in connection with Position 6 = A
 4) Only in connection with Position 6 = B, C, M

Position 8 (Application)		
Selected option		Description
FTL51B FTL63	A ¹⁾	Process max 150°C/302°F, max 64bar
	B ¹⁾	Process max 150°C/302°F, max 100bar
	C ²⁾	Process max 80°C/176°F, max 25bar

- 1) Only in connection with Position 3, 4 = A7, A8
 2) Only in connection with Position 3, 4 = GA

Position 10 (Type of Probe)		
Selected option		Description
FTL51B FTL63	1	Compact version
	2	Extension tube
	3	Short tube version
 Shown in the temperature tables exemplary as follows: 		

Optional specifications

ID Jx, Kx (Test, Certificate, Declaration)		
Selected option		Description
FTL51B FTL63	JL ¹⁾	Ambient temperature -50°C/-58°F

- 1) Only in connection with Position 3, 4 = A7, A8, Position 6 = B, C, M, Position 7 = B, C, F, G, I, Y

ID Mx (Sensor Design)		
Selected option		Description
FTL51B FTL63	MA	Sensor remote, cable TPR, 2m/80in + mounting bracket, wall/ pipe, 316L
	MB	Sensor remote, cable TPR, 5m/200in + mounting bracket, wall/ pipe, 316L
	MC	Sensor remote, cable TPR, 10m/400in + mounting bracket, wall/ pipe, 316L
	MD	Sensor remote, cable TPR, 20m/800in + mounting bracket, wall/ pipe, 316L
	ME	Sensor remote, cable TPR, 30m/1200in + mounting bracket, wall/ pipe, 316L
	MR	Temperature separator
	MS	Pressure tight feed through (Second line of defence)

ID Nx, Ox (Accessory Mounted)		
Selected option		Description
FTL51B	NF ¹⁾	Bluetooth
FTL63	NG ²⁾	Bluetooth for NAMUR output
	NJ	Cover with sight glass, glass
	NK	Cover with sight glass, plastic

- 1) Only in connection with Position 3, 4 = A7, Position 6 = A, B, M
 2) Only in connection with Position 3, 4 = A8, Position 6 = A, B, M

ID Px, Rx (Accessory Enclosed)		
Selected option		Description
FTL51B	PA ¹⁾	Weather protection cover, 316L
FTL63	PB ²⁾	Weather protection cover, plastic
	R6 ³⁾	Test magnet

- 1) Only in connection with Position 6 = M
 2) Only in connection with Position 6 = B, C
 3) Only in connection with Position 3, 4 = A8

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.
- 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)
- 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.
- 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**

Permitted ambient temperature range at the electronics enclosure:
 $-40\text{ °C} \leq T_a \leq +70\text{ °C}$

- Limitations of the maximum ambient temperature at the electronics enclosure may be required dependent on device configuration, process temperatures and temperature classification.
- Details of limitations: →  14, "Temperature tables".
- 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 ($\leq 0.5\text{ m}$) generating strong electrostatic charges.

Basic specification, Position 6 = A

Avoid electrostatic charging of the enclosure (e.g. friction, cleaning, maintenance, strong medium flow).

Basic specification, Position 6 = B, M

Avoid sparks caused by impact and friction.

Optional specification, ID Px, Rx = PA

Connect the weather protection cover to the local potential equalization.

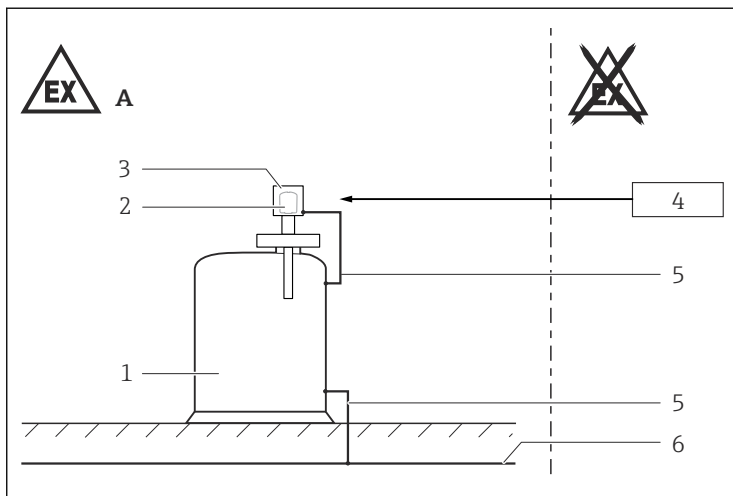
Optional specification, ID Px, Rx = PB

Avoid electrostatic charging of the weather protection cover (e.g. friction, cleaning, maintenance, strong medium flow).

Optional specification, ID Px, Rx = R6

Suitable for use in explosion hazardous areas.

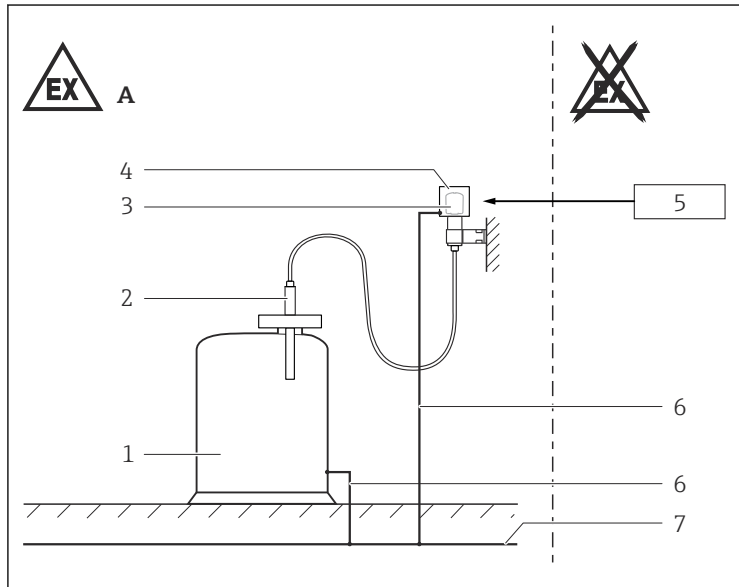
Safety instructions: Installation



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- A Zone 0
- 1 Tank; Zone 0
- 2 Electronic insert
- 3 Enclosure
- 4 Basic specification, Position 3, 4 = A7, A8:
Associated intrinsically safe power supply units
Basic specification, Position 3, 4 = GA:
Only associated intrinsically safe power supply unit FML621 from
Endress+Hauser
- 5 Potential equalization line
- 6 Local potential equalization

Optional specification, ID Mx = MA - ME



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- A Zone 0
 1 Tank; Zone 0
 2 Sensor enclosure
 3 Electronic insert
 4 Electronics enclosure
 5 Basic specification, Position 3, 4 = A7, A8:
 Associated intrinsically safe power supply units
 Basic specification, Position 3, 4 = GA:
 Only associated intrinsically safe power supply unit FML621 from
 Endress+Hauser
 6 Potential equalization line
 7 Local potential equalization

- Continuous service temperature of the connecting cable: $\geq T_a + 20 \text{ K}$.
- Observe the pertinent guidelines when interconnecting intrinsically safe circuits.
- Observe the maximum process conditions according to the manufacturer's Operating Instructions.
- At high medium temperatures, note flange pressure load capacity as a factor of temperature.

- Install the device to exclude any mechanical damage or friction during the application. Pay particular attention to flow conditions and tank fittings.
- Support extension tube of the device if a dynamic load is expected.
- The device can be equipped with the Bluetooth® module: refer to the Operating Instructions and specifications in the "Bluetooth® module" chapter.

Accessory: Sliding sleeve

The sliding sleeve can be used for a continuous setting of the switch point (see Operating Instructions).

Intrinsic safety

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

Potential equalization

Integrate the device into the local potential equalization.

Optional specification, ID Px, Rx = PA

Connect the weather protection cover to the local potential equalization.

Bluetooth® module

Basic specification, Position 3, 4 = A7

If the device is equipped with the Bluetooth® module, no battery is required or allowed.

Basic specification, Position 3, 4 = A8

- If the device is equipped with the Bluetooth® module, a battery is required.
- Removal or replacement of the battery is only permitted in non-hazardous areas.
- Connection or disconnection of the Bluetooth® module is permitted in hazardous areas.

Only use one of the following battery types:

Manufacturer	Battery type
Tadiran	SL-360/S
XENO ENERGY	ER14505 / XL-060F

Safety instructions:
Zone 0

Only use the device in media to which the silicone rubber and Probimer 62 potting compound of the electronic insert and the enclosure made of PBT, aluminum or 316L have sufficient durability.

Temperature tables

i *Optional specification, ID Jx, Kx = JL*
Lower limit of the ambient temperature for explosion protection changes to $-50\text{ }^{\circ}\text{C}$.

General notes

i *Optional specification, ID Px, Rx = PB*
When using the weather protection cover: Reduce the values T_a of P1, P2, P3 by 16 K.

Description notes

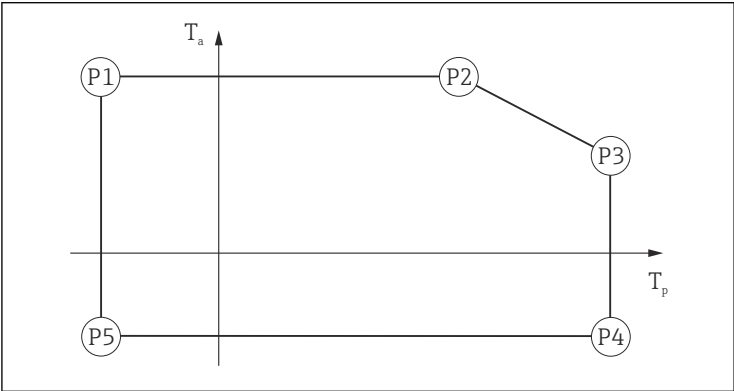
i Unless otherwise indicated, the positions always refer to the basic specification.

1st column: Position 8 = A, B, ...

2nd column: Temperature classes T6 ($85\text{ }^{\circ}\text{C}$) to T1 ($450\text{ }^{\circ}\text{C}$)

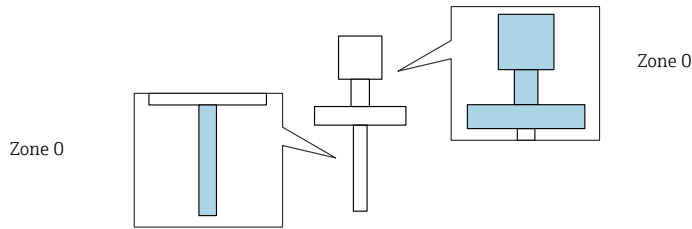
Column P1 to P5: Position (temperature value) on the axes of the derating

- T_a : Ambient temperature in $^{\circ}\text{C}$
- T_p : Process temperature in $^{\circ}\text{C}$



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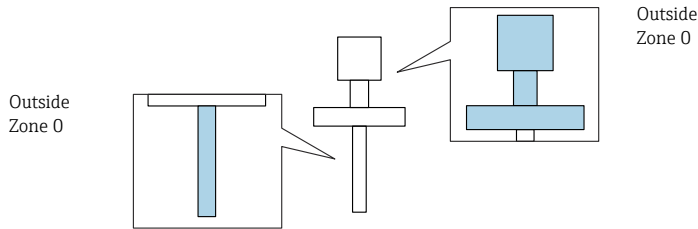
Zone 0



A, B, C		P1		P2		P3		P4		P5	
		T _p	T _a	T _p	T _a	T _p	T _a	T _p	T _a	T _p	T _a
	T6...T1 ¹⁾	-20	60	60	60	60	60	60	-20	-20	-20

1) In connection with Position 3, 4 = A8 and Optional specification, ID Nx, Ox = NG: The temperature classes change to T4...T1

Outside Zone 0



Position 3, 4 = A7

Without Optional specification, ID Mx = MR, MS

A, B		P1		P2		P3		P4		P5	
		T _p	T _a	T _p	T _a	T _p	T _a	T _p	T _a	T _p	T _a
	T6	-50	70	73	70 65 ¹⁾	80 70 ¹⁾	67	80 70 ¹⁾	-40 -50 ²⁾	-50	-40 -50 ²⁾
	T5	-50	70	94	70 62 ¹⁾	95 94 ¹⁾	70 62 ¹⁾	95 94 ¹⁾		-50	
	T4	-50	70	94	70 62 ¹⁾	130 125 ¹⁾	55 50 ¹⁾	130 125 ¹⁾		-50	
	T3...T1	-50	70	94	70 62 ¹⁾	150 140 ¹⁾	47 40 ¹⁾	150 140 ¹⁾		-50	

- 1) Only in connection with Position 6 = D
- 2) Only in connection with Optional specification, ID Jx, Kx = JL

With Optional specification, ID Mx = MR, MS

A, B		P1		P2		P3		P4		P5	
		T _p	T _a	T _p	T _a	T _p	T _a	T _p	T _a	T _p	T _a
	T6	-50	70	80 79 ¹⁾	70 65 ¹⁾	80 79 ¹⁾	70 65 ¹⁾	80 79 ¹⁾	-40 -50 ²⁾	-50	-40 -50 ²⁾
	T5	-50	70	95 94 ¹⁾	70	95 94 ¹⁾	70	95		-50	
	T4	-50	70	130 94 ¹⁾	70	130	70 65 ¹⁾	130		-50	
	T3...T1	-50	70	150 94 ¹⁾	70	150	70 62 ¹⁾	150		-50	

- 1) Only in connection with Position 6 = D
- 2) Only in connection with Optional specification, ID Jx, Kx = JL

Position 3, 4 = A8

Without Optional specification, ID Mx = MR, MS

A, B		P1		P2		P3		P4		P5	
		T _p	T _a	T _p	T _a	T _p	T _a	T _p	T _a	T _p	T _a
	T6 ¹⁾	-50	70	80	70	80	70	80	-40 -50 ²⁾	-50	-40
	T5 ¹⁾	-50	70	95	70	95	70	95		-50	-50 ²⁾
	T4	-50	70	115 70 ¹⁾	70	130 120 ¹⁾ 125 ³⁾	62 50 ¹⁾ 59 ^{1) + 3)}	130		-50	
	T3...T1	-50	70	115 70 ¹⁾	70	150 120 ¹⁾ 142 ³⁾	54 50 ¹⁾ 59 ^{1) + 3)}	150		-50	

- 1) Only in connection with Optional specification, ID Nx, Ox = NG: Temperature classes only valid for T4...T1
 2) Only in connection with Optional specification, ID Jx, Kx = JL
 3) Only in connection with Position 6 = D

With Optional specification, ID Mx = MR, MS

A, B		P1		P2		P3		P4		P5	
		T _p	T _a	T _p	T _a	T _p	T _a	T _p	T _a	T _p	T _a
	T6 ¹⁾	-50	70	80	70	80	70	80	-40 -50 ²⁾	-50	-40
	T5 ¹⁾	-50	70	95	70	95	70	95		-50	-50 ²⁾
	T4	-50	70 65 ¹⁾	130	70 65 ¹⁾	130	70 65 ¹⁾	130		-50	
	T3...T1	-50	70 63 ¹⁾	150	70 63 ¹⁾	150	70 63 ¹⁾	150		-50	

- 1) Only in connection with Optional specification, ID Nx, Ox = NG: Temperature classes only valid for T4...T1
 2) Only in connection with Optional specification, ID Jx, Kx = JL

Position 3, 4 = GA

Without Optional specification, ID Mx = MR, MS

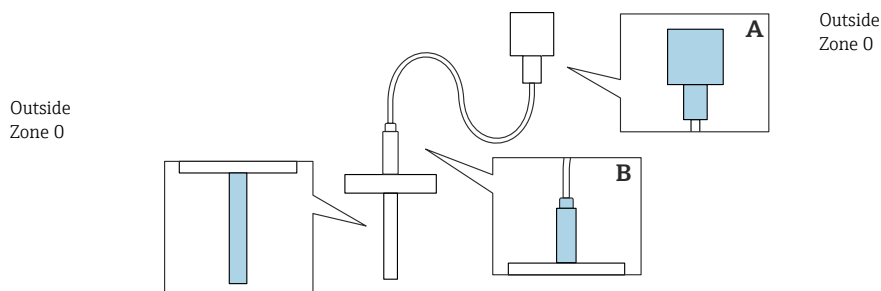
C		P1		P2		P3		P4		P5	
		T _p	T _a	T _p	T _a	T _p	T _a	T _p	T _a	T _p	T _a
	T6	-50	69 62 ¹⁾	80	69 62 ¹⁾	80	69 62 ¹⁾	80	-40	-50	-40
	T5...T1	-50	70	80	70	80	70	80	-40	-50	-40

1) Only in connection with Position 6 = D

With Optional specification, ID Mx = MR, MS

C		P1		P2		P3		P4		P5	
		T _p	T _a	T _p	T _a	T _p	T _a	T _p	T _a	T _p	T _a
	T6	-50	70 66 ¹⁾	80	70 66 ¹⁾	80	70 66 ¹⁾	80	-40	-50	-40
	T5...T1	-50	70	80	70	80	70	80	-40	-50	-40

1) Only in connection with Position 6 = D



Position 3, 4 = A7

Optional specification, ID Mx = MA - ME without Optional specification, ID Mx = MR, MS

A, B		P1			P2			P3			P4		P5	
		T_p	$T_a^{1)}$	$T_a^{2)}$	T_p	$T_a^{1)}$	$T_a^{2)}$	T_p	$T_a^{1)}$	$T_a^{2)}$	T_p	T_a	T_p	T_a
	T6	-50	70	70	80	70 68 ³⁾	70	80	70 68 ³⁾	70	80	-40 -50 ⁴⁾	-50	-40 -50 ⁴⁾
	T5	-50	70	90	95	70	90	95	70	90	95		-50	
	T4	-50	70	90	130	70	90	130	70	90	130		-50	
	T3...T1	-50	70	75	150	70	75	150	70	75	150		-50	

- 1) Electronics enclosure (A)
- 2) Sensor enclosure (B)
- 3) Only in connection with Position 6 = D
- 4) Only in connection with Optional specification, ID Ix, Kx = JL

Optional specification, ID Mx = MA - ME with Optional specification, ID Mx = MR, MS

A, B		P1			P2			P3			P4		P5	
		T_p	$T_a^{(1)}$	$T_a^{(2)}$	T_p	$T_a^{(1)}$	$T_a^{(2)}$	T_p	$T_a^{(1)}$	$T_a^{(2)}$	T_p	T_a	T_p	T_a
	T6	-50	70	70	80	70 68 ³⁾	70	80	70 68 ³⁾	70	80	-40 -50 ⁴⁾	-50	-40 -50 ⁴⁾
	T5	-50	70	90	95	70	90	95	70	90	95		-50	
	T4	-50	70	90	130	70	90	130	70	90	130		-50	
	T3...T1	-50	70	90	150	70	90	150	70	90	150		-50	

- 1) Electronics enclosure (A)
- 2) Sensor enclosure (B)
- 3) Only in connection with Position 6 = D
- 4) Only in connection with Optional specification, ID Jx, Kx = JL

Position 3, 4 = A8

Optional specification, ID Mx = MA - ME without Optional specification, ID Mx = MR, MS

A, B		P1			P2			P3			P4		P5	
		T _p	T _a ¹⁾	T _a ²⁾	T _p	T _a ¹⁾	T _a ²⁾	T _p	T _a ¹⁾	T _a ²⁾	T _p	T _a	T _p	T _a
	T6 ³⁾	-50	70	70	80	70	70	80	70	70	80	-40 -50 ⁴⁾	-50	-40
	T5 ³⁾	-50	70	90	95	70	90	95	70	90	95		-50	-50 ⁴⁾
	T4	-50	70 69 ³⁾	90	130	70 69 ³⁾	90	130	70 69 ³⁾	90	130		-50	
	T3...T1	-50	70 69 ³⁾	75	150	70 69 ³⁾	75	150	70 69 ³⁾	75	150		-50	

- 1) Electronics enclosure (A)
- 2) Sensor enclosure (B)
- 3) Only in connection with Optional specification, ID Nx, Ox = NG: Temperature classes only valid for T4...T1
- 4) Only in connection with Optional specification, ID Jx, Kx = JL

Optional specification, ID Mx = MA - ME with Optional specification, ID Mx = MR, MS

A, B		P1			P2			P3			P4		P5	
		T _p	T _a ¹⁾	T _a ²⁾	T _p	T _a ¹⁾	T _a ²⁾	T _p	T _a ¹⁾	T _a ²⁾	T _p	T _a	T _p	T _a
	T6 ³⁾	-50	70	70	80	70	70	80	70	70	80	-40 -50 ⁴⁾	-50	-40
	T5 ³⁾	-50	70	90	95	70	90	95	70	90	95		-50	-50 ⁴⁾
	T4	-50	70 69 ³⁾	90	130	70 69 ³⁾	90	130	70 69 ³⁾	90	130		-50	
	T3...T1	-50	70 69 ³⁾	90	150	70 69 ³⁾	90	150	70 69 ³⁾	90	150		-50	

- 1) Electronics enclosure (A)
- 2) Sensor enclosure (B)
- 3) Only in connection with Optional specification, ID Nx, Ox = NG: Temperature classes only valid for T4...T1
- 4) Only in connection with Optional specification, ID Jx, Kx = JL

Position 3, 4 = GA

With Optional specification, ID Mx = MA - ME

C		P1		P2		P3		P4		P5	
		T _p	T _a	T _p	T _a	T _p	T _a	T _p	T _a	T _p	T _a
	T6	-50	70	80	70	80	70	80	-40	-50	-40
	T5...T1	-50	70	80	70	80	70	80	-40	-50	-40

Connection data

Optional specification, ID Nx, Ox = NF, NG

When using the Bluetooth® module: No changes to the connection values.

Associated intrinsically safe power supply unit with max. electrical specifications below the characteristic values of the electronic inserts

Basic specification, Position 3, 4	Power supply circuit
A7	U _i = 14.6 V I _i = 100 mA P _i = 633 mW L _i = 0 C _i = 3 nF
A8	U _i = 16 V I _i = 52 mA P _i = 170 mW L _i = 0 C _i = 30 nF

Only associated intrinsically safe power supply unit FML621 from Endress+Hauser

Basic specification, Position 3, 4	Power supply circuit
GA	U _i = 27.6 V I _i = 93 mA P _i = 640 mW L _i = 3 µH C _i = 3 nF



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