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Safety Instructions
Liquiphant FTL62

Ex ia IIC T6...T1 Ga/Gb

Endress+Hauser
People for Process Automation

Liquiphant FTL62

Table of contents

About this document

This document has been translated into several languages. Legally determined is solely the English source text.

Associated documentation

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

BA02036F/00

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 -> Downloads -> Brochures and Catalogs -> Text Search: CP00021Z
- On the CD for devices with CD-based documentation

Manufacturer's certificates

KC Declaration of Conformity

Certificate number:

Output = A7
21-KA4BO-0932X

Output = A8
21-KA4BO-0933X

Output = GA
21-KA4BO-0934X

IEC Declaration of Conformity

Certificate number:
IECEx KIWA 19.0010X

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

- IEC 60079-0:2017
- IEC 60079-11:2011
- IEC 60079-26:2014

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

FTL62	–	**********	+	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

FTL62

Basic specifications

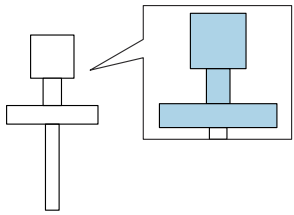
Position 1, 2 (Approval)		
Selected option		**Description**
FTL62	KB [1]	KC Ex ia IIC T6...T1 Ga/Gb

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**
FTL62	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**
FTL62	A	Single compartment; plastic
	B	Single compartment; Alu, coated
	C	Single compartment; 316L, cast
	M	Dual compartment L-shape; Alu, coated

Shown in the temperature tables exemplary as follows:



Position 7 (Electrical Connection)		
Selected option		**Description**
FTL62	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
	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

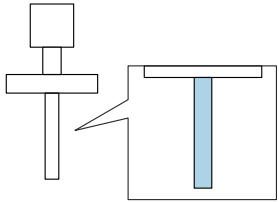
Position 8 (Application)		
Selected option		**Description**
FTL62	C [1]	Process max 80°C/176°F, max 25bar
	N [2]	Process max 120°C/248°F, max 40bar (ECTFE)
	P [2]	Process max 150°C/302°F, max 40bar (PFA)
	T [2]	Process max 150°C/302°F, max 25bar (Enamel)

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

Position 9 (Surface Refinement)		
Selected option		**Description**
FTL62	N	Coating ECTFE
	P	Coating PFA (Edlon)
	Q	Coating PFA (RubyRed)
	R	Coating PFA (conductive)
	T	Coating Enamel

Position 10 (Type of Probe)		
Selected option		**Description**
FTL62	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**
FTL62	JL [1]	Ambient temperature -50°C/-58°F
	JN [1]	Ambient temperature -52°C/-62°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 Nx, Ox (Accessory Mounted)		
Selected option		**Description**
FTL62	NF [1]	Bluetooth VU121, Labeling: VA13-02
	NG [2]	Prepared for Heartbeat Verification + Monitoring + Bluetooth VU121, Labeling: VA13-01

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**
FTL62	PA [1]	Weather protection cover, 316L
	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

- Devices suitable for zone separation (marked Ga/Gb or Da/Db) are always suitable for installation in the less critical zone (Gb or Db). Due to space limitations the corresponding marking maybe not indicated on the nameplate.
- 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.
- 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 enclosure:
$-40\ °C \leq T_a \leq +70\ °C$

- 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: → 13, "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 (≤ 0.5 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).

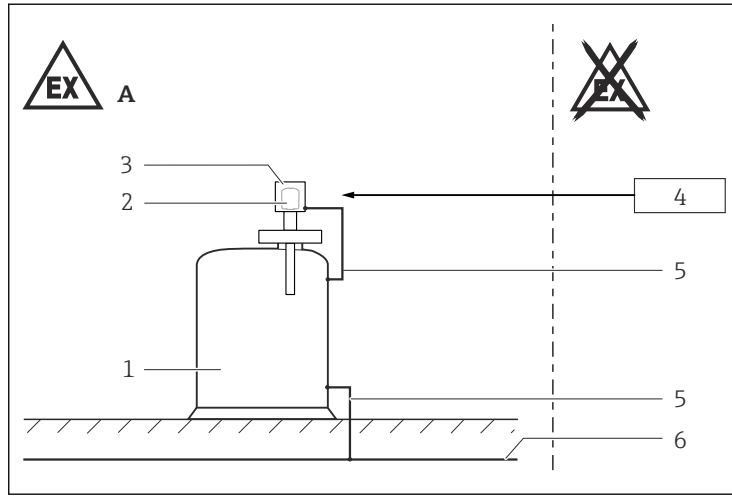
Optional specification, ID Px, Rx = R6
Suitable for use in explosion hazardous areas.

Device group IIC/IIB

Basic specification, Position 9 = N, P, Q
- Probes can be used in gases of Group IIC if avoiding electrostatic charging (e.g. through friction, cleaning, maintenance, strong medium flow). These probes are marked by the warning sign "Avoid Electrostatic Charge".
- If electrostatic charging cannot be avoided: Probe can be used in gases of Group IIB.

Basic specification, Position 9 = R, T
Due to the surface resistance 1 GΩ ([R] PFA-conductive) or the enamel (glass) surface [T], these coatings are suitable without restrictions.

Safety instructions: Installation



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A Zone 1
1 Tank; Zone 0, Zone 1
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

- When the device is connected to certified intrinsically safe circuits of Category Ex ib for Equipment Groups IIC and IIB, the type of protection changes to Ex ib IIC and Ex ib IIB.
- 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.
- 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.

Intrinsic safety

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

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.
- Observe the information in the Safety Instructions (XA) included with the Bluetooth® module.

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.
- Only use the device in media to which the wetted materials have sufficient durability (e.g. process connection seal).
- When using under non-atmospheric pressures and non-atmospheric temperatures: The sensor part of the device approved for Zone 0 does not cause any ignition hazards.

Temperature tables

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

Optional specification, ID Jx, Kx = JN
Lower limit of the ambient temperature for explosion protection changes to −52 °C.

General notes

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

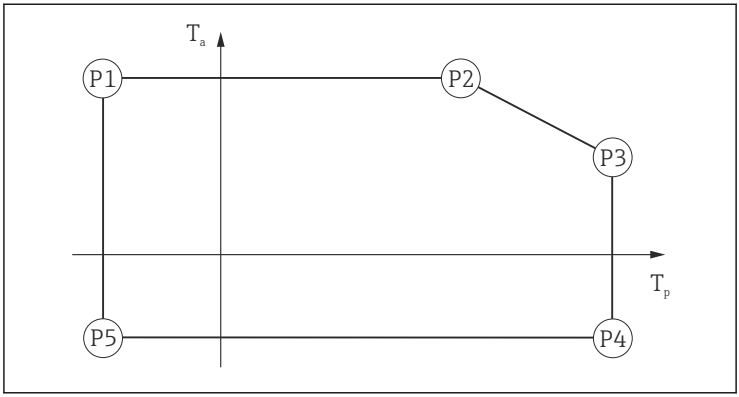
Description notes

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

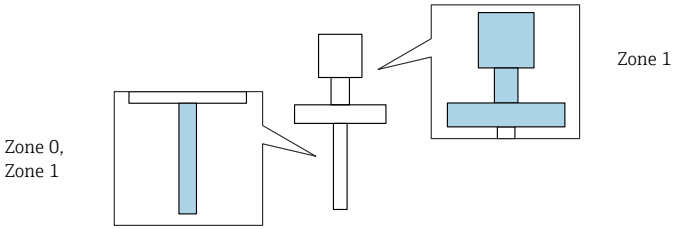
1st column: Position 8 = A, B, ...

2nd 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



Zone 0, Zone 1



N, P, T		**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	67 65 [1)]	67	67 65 [1)]	75	60	75	−40 −50 [2)] −52 [3)]	−50	−40 −50 [2)] −52 [3)]
	T5	−50	70 65 [1)]	70	70 65 [1)]	90	60	90		−50	
	T4 [4)]	−50	70 65 [1)]	70	70 65 [1)]	125 120 [5)]	60	125 120 [5)]		−50	
	T3…T1 [4)]	−50	70 65 [1)]	70	70 65 [1)]	150 120 [5)]	60	150 120 [5)]		−50	

1) Only in connection with Position 3, 4 = A8 and Optional specification, ID Nx, Ox = NG
2) Only in connection with Optional specification, ID Jx, Kx = JL
3) Only in connection with Optional specification, ID Jx, Kx = JN
4) In connection with Position 3, 4 = A8 and Optional specification, ID Nx, Ox = NG: The temperature classes change to T4…T1
5) Only in connection with Position 9 = N

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	67	67	67	75	60	75	–40	–50	–40
	T5…T1	–50	70	70	70	75	60	75	–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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