

Safety Instructions

Liquiphant FTL62

Control Drawing IS



Liquiphant FTL62

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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

Manufacturer's certificates**CSA C/US certificate**

Certificate number:
CSA19CA80022351

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*..
<i>(Device type)</i>		<i>(Basic specifications)</i>		<i>(Optional specifications)</i>

* = 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

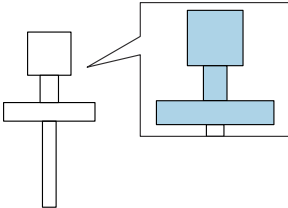
Position 1, 2 (Approval)		
Selected option		Description
FTL62	CB ¹⁾	CSA C/US IS Cl. I, II, III, Div. 1, Gr. A-G; Cl. I, Zn. 0, AEx/Ex ia IIC T6 Ga

1) Class II and III, Div. 1: Only in connection with Position 6 = B, C, M

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:




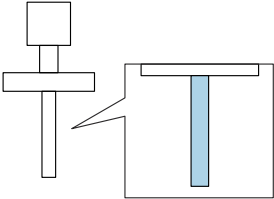
Position 7 (Electrical Connection)		
Selected option		Description
FTL62	A	Gland M20, plastic, IP66/68 NEMA Type 4X/6P
	B ¹⁾	Gland M20, brass nickel plated, IP66/68 NEMA Type 4X/6P
	C ²⁾	Gland M20, 316L, IP66/68 NEMA Type 4X/6P
	F	Thread M20, IP66/68 NEMA Type 4X/6P
	H ³⁾	Thread NPT1/2, IP66/68 NEMA Type 4X/6P
	I ⁴⁾	Thread NPT3/4, IP66/68 NEMA Type 4X/6P
	M	Plug M12, IP66/67 NEMA Type 4X

- 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
<p> Shown in the temperature tables exemplary as follows:</p> 		

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, I

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

- 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:
 $-40\text{ °C} \leq T_a \leq +70\text{ °C}$

- 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: →  12, "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.

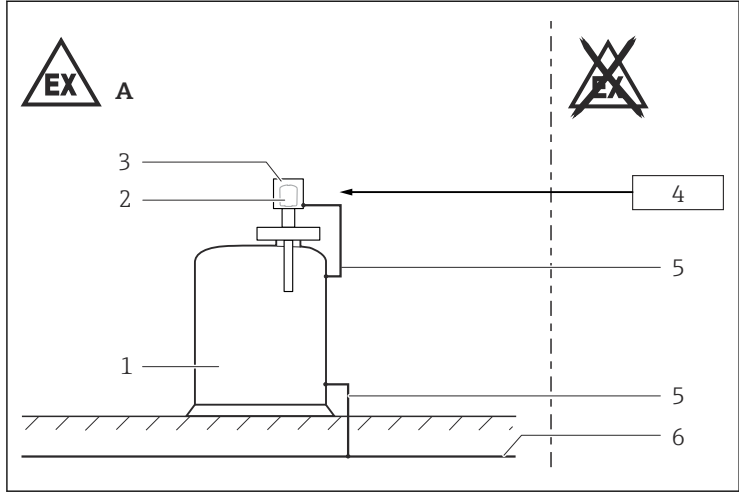
*For hazardous location Group A, B and C / Device group IIC/IIB**Basic specification, Position 9 = N, P, Q*

- Probes can be used in gases of Group A and B / 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 C / Group IIB.

Basic specification, Position 9 = R, T

- Due to the surface resistance $1\text{ G}\Omega$ ([R] PFA-conductive) or the enamel (glass) surface [T], these coatings are suitable without restrictions.
- Prevent damage to the conductive surface layer (e.g. by abrasion).

Safety instructions: Installation



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- A Zone 0 or Zone 1; Class I, II, III, Div. 1, Groups A-G
 1 Tank; Zone 0 or Zone 1; Class I, II, III, Div. 1, Groups A-G
 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

- Continuous service temperature of the connecting cable / cable gland / cable entry: $\geq T_a + 20 \text{ K}$.
- Perform the following to achieve the degree of protection IP66/68:
 - Screw the cover tight.
 - Mount the cable entry correctly.
- 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.

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

- Observe the general notes of the Special Documentation SD02389F.
- After installing the Bluetooth® module: Pay attention to the correct installation of the device.

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.

Only use one of the following battery types:

Manufacturer	Battery type
Saft	LS14500
Tadiran	SL-360/S
Varta	ER-AA / 7106
XENO ENERGY	ER14505 / XL-060F

Intrinsic safety

Intrinsically safe, Class I, Div. 1, Groups A, B, C, D;

Class II, Div. 1, Groups E, F, G, Class III;

Class I, Zone 0 or Zone 1, AEx ia IIC/Ex ia IIC Ga

Entity installation


- Use an intrinsic safety barrier or other associated equipment that is approved for the country in use and satisfies the following conditions:
 $U_o (V_{oc}) \leq U_i (V_{max}), I_o (I_{sc}) \leq I_i (I_{max}), C_o (C_a) \geq C_i + C_{cable},$
 $L_o (L_a) \geq L_i + L_{cable}$ and $P_o \leq P_i$.
- For transmitter parameters: See "Connection data" section.
- 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.
- Control room equipment may not use or generate over 250 V_{rms}.
- Install per National Electrical Code (NFPA70) or Canadian Electrical Code, Part I (C22.1), as applicable.

- 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 intrinsically safe input power circuit of the device is isolated from ground. The dielectric strength is at least $500 V_{\text{rms}}$.

Process seals

The device is rated as a Single Seal device and does not require the use of an external secondary process seal.


Temperature tables

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


Optional specification, ID Jx, Kx = JN
Lower limit of the ambient temperature for explosion protection changes to $-52\text{ }^{\circ}\text{C}$.

General notes


Zone 0, Zone 1; Class I, Div. 1

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

Class II, III, Div. 1

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

Description notes

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

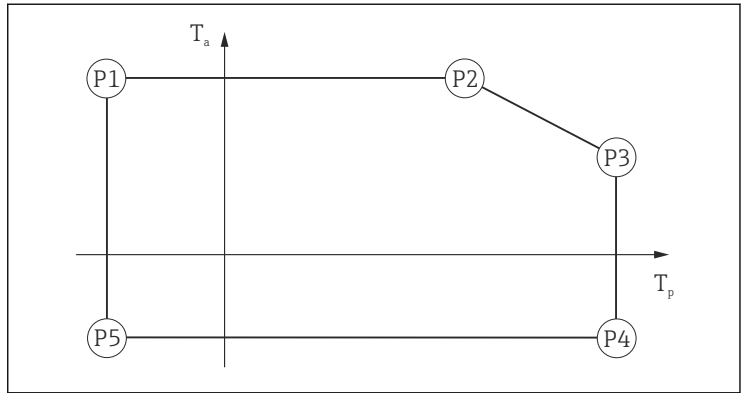
Zone 0, Zone 1; Class I, Div. 1

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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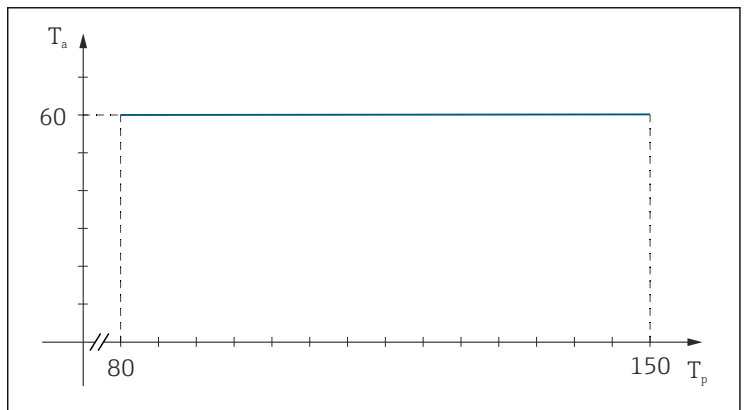
Class II, III, Div. 1

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

2nd column: Process temperature range in °C

3rd column: Ambient temperature range in °C

4th column: Maximum surface temperature in °C



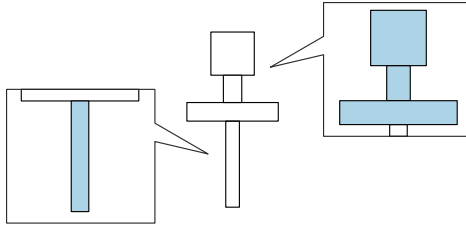
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T_a Ambient temperature in °C

T_p Process temperature in °C

Zone 0, Zone 1; Class I, Div. 1

Zone 0 or Zone 1;
Class I, Div. 1

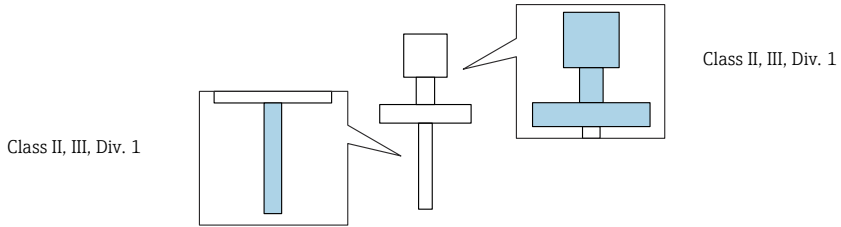


Zone 0 or Zone 1;
Class I, Div. 1

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 ¹⁾	-50	67 65 ²⁾	67	67 65 ²⁾	75	60	75	0 ³⁾ -40 -50 ⁴⁾ -52 ⁵⁾	-50	0 ³⁾ -40 -50 ⁴⁾ -52 ⁵⁾
	T5 ¹⁾	-50	70 65 ²⁾	70	70 65 ²⁾	90	60	90		-50	
	T4	-50	70 65 ²⁾	70	70 65 ²⁾	125 120 ⁶⁾	60	125 120 ⁶⁾		-50	
	T3	-50	70 65 ²⁾	70	70 65 ²⁾	150 120 ⁶⁾	60	150 120 ⁶⁾		-50	

- 1) In connection with Position 3, 4 = A8 and Optional specification, ID Nx, Ox = NG: The temperature classes change to T4
- 2) Only in connection with Position 3, 4 = A8 and Optional specification, ID Nx, Ox = NG
- 3) Only in connection with Position 6 = A: Standard ambient temperature range = 0 to +70 °C
- 4) Only in connection with Optional specification, ID Jx, Kx = JL
- 5) Only in connection with Optional specification, ID Jx, Kx = JN
- 6) 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	-50	70	70	70	75	60	75	-40	-50	-40

Class II, III, Div. 1

<i>N, P, T</i>			
	$-50 \leq T_p \leq +150$ $-50 \leq T_p \leq +120$ ¹⁾	$-40 \leq T_a \leq +60$ $-50 \leq T_a \leq +60$ ²⁾ $-52 \leq T_a \leq +60$ ³⁾	T155 ($T = T_p + 5 K$)

- 1) Only in connection with Position 9 = N
- 2) Only in connection with Optional specification, ID Jx, Kx = JL
- 3) Only in connection with Optional specification, ID Jx, Kx = JN

<i>C</i>			
	$-50 \leq T_p \leq +80$	$-40 \leq T_a \leq +60$	T85 ($T = T_p + 5 K$)

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

<i>Basic specification, Position 3, 4</i>	Power supply circuit
A7	U_i (or V_{max}) = 14.6 V I_i (or I_{max}) = 100 mA P_i = 633 mW L_i = 0 C_i = 3 nF
A8	U_i (or V_{max}) = 16 V I_i (or I_{max}) = 52 mA P_i = 170 mW L_i = 0 C_i = 30 nF

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

<i>Basic specification, Position 3, 4</i>	Power supply circuit
GA	U_i (or V_{max}) = 27.6 V I_i (or I_{max}) = 93 mA P_i = 640 mW L_i = 3 μ H C_i = 3 nF



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