

Safety Instructions

Liquiphant FTL62

Control Drawing
Class I, Div. 2, Groups A-D



Liquiphant FTL62

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Associated documentation

All documentation is available on the Internet:
www.endress.com/Deviceviewer
 (enter the serial number from the nameplate).

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

BA02036F

Certificates and declarations**CSA C/US certificate**

Certificate number:
 CSA19CA80022351

Certificate holder

Endress+Hauser SE+Co. KG
 Hauptstraße 1
 79689 Maulburg, Germany
 Address of the manufacturing plant: See nameplate.

Extended order code

The extended order code is indicated on the nameplate, which is affixed to the device in such a way that it is clearly visible. Additional information about the nameplate is provided in the associated Operating Instructions.

Structure of the extended order code

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

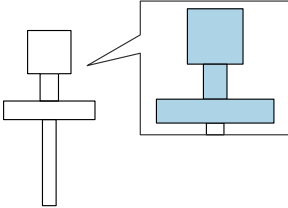
Basic specifications

Position 1, 2 (Approval)		
Selected option		Description
FTL62	CC	CSA C/US Cl. I, Div. 2, Gr. A-D

Position 3, 4 (Output)		
Selected option		Description
FTL62	A1	FEL61, 2-wire 19-253VAC + test button
	A2	FEL62, 3-wire PNP 10-55VDC + test button
	A3	FEL64DC, relay DPDT 9-20VDC contact 253V/2A + test button
	A4	FEL64, relay DPDT 19-253VAC/19-55VDC contact 253V/2A + test button
	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	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:




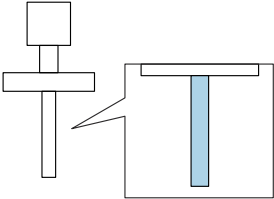
Position 7 (Electrical Connection)		
Selected option	Description	
FTL62	B ¹⁾	Gland M20, brass nickel plated, IP66/68 NEMA Type 4X/6P
	C ²⁾	Gland M20, 316L, IP66/68 NEMA Type 4X/6P
	F	Thread M20, IP66/68 NEMA Type 4X/6P
	I	Thread NPT3/4, IP66/68 NEMA Type 4X/6P

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

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 = A1-A4, 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 Mx (Sensor Design)		
Selected option		Description
FTL62	MR	Temperature separator
	MS	Pressure tight feed through (Second line of defence)

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 = A1-A4, A7, Position 6 = B, M
 2) Only in connection with Position 3, 4 = A8, Position 6 = 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 = A1-A4, A8

Safety instructions: General

- The device is intended to be used in hazardous locations as defined in the Canadian Electrical Code, Part I or the National Electrical Code (NFPA70). 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.
- 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.
- Avoid electrostatic charging:
 - Of plastic surfaces (e.g. enclosure, sensor element, special varnishing, attached additional plates, ...)
 - Of isolated capacities (e.g. isolated metallic plates)
- Alterations to the device can affect the explosion protection and must be carried out by staff authorized to perform such work by Endress+Hauser.
- If the degree of protection IP66/67 or IP66/68 is ensured, the device may be installed in an environment of pollution degree 4.

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: →  12, "Temperature tables".
- In the case of process connections made of polymeric material or with polymeric coatings, avoid electrostatic charging of the plastic surfaces.
- 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 = 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

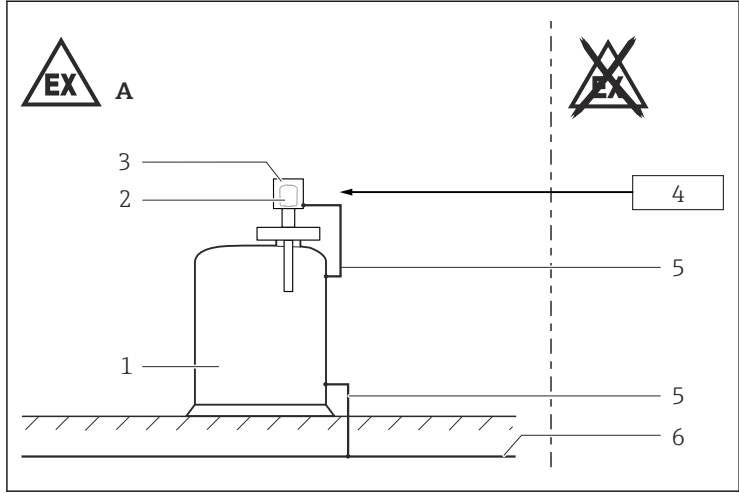
Basic specification, Position 9 = N, P, Q

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

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 Class I, Div. 2, Groups A-D
- 1 Tank; Class I, Div. 2, Groups A-D
- 2 Electronic insert
- 3 Enclosure
- 4 Supply unit
- 5 Potential equalization line
- 6 Local potential equalization

- Before operation:
 - Screw in the cover all the way.
 - Tighten the securing clamp on the cover.
- In potentially explosive atmospheres:
 - Do not disconnect the electrical connection of the power supply circuit when energized.
 - Do not open the connection compartment cover and the electronics compartment cover.
- Continuous service temperature of the connecting cable / cable gland / cable entry:
 - Basic specification, Position 3, 4 = GA, A7, A8: $\geq T_a + 20 \text{ K}$
 - Basic specification, Position 3, 4 = A2: $\geq T_a + 35 \text{ K}$
 - Basic specification, Position 3, 4 = A3, A4: $\geq T_a + 45 \text{ K}$
 - Basic specification, Position 3, 4 = A2 in connection with
Optional specification, ID Mx = MR, MS: $\geq T_a + 20 \text{ K}$
 - Basic specification, Position 3, 4 = A3, A4 in connection with
Optional specification, ID Mx = MR, MS: $\geq T_a + 25 \text{ K}$
- 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.

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

- High cover with inspection window is required.
- 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 = 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

Class I, Div. 2, Groups A-D

- Install per National Electrical Code (NFPA70) or Canadian Electrical Code, Part I (C22.1), as applicable.
- Use wiring methods appropriate for the location.
- Associated apparatus not required.
- For the maximum supply voltage: See "Connection data" section.
- **WARNINGS:** Substitution of components may impair suitability for hazardous locations. Do not disconnect equipment unless power has been switched off or the area is known to be non-hazardous.

Process seals

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

Temperature tables**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.

Class I, Div. 2

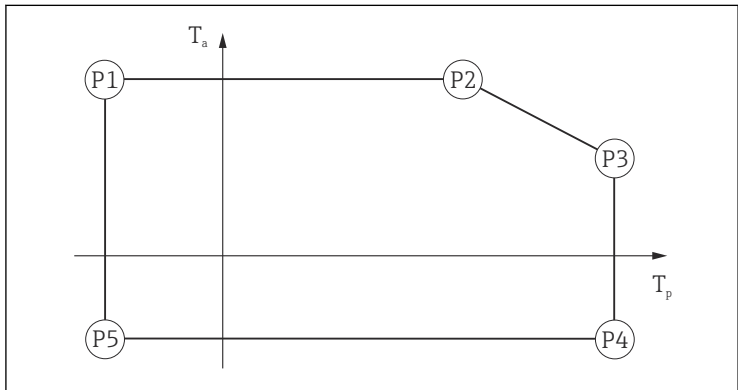
1st column: Position $\theta = A, B, \dots$

2nd column: Maximum load current

3rd column: Temperature classes T6 (85 °C) to T1 (450 °C)

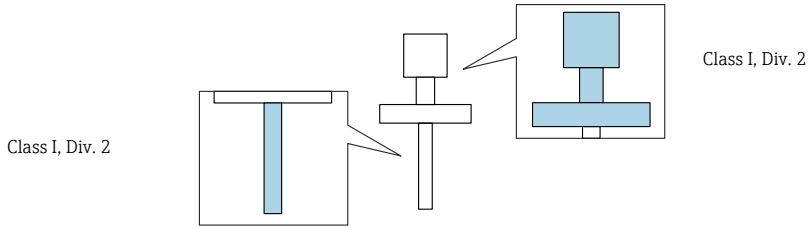
Column P1 to P5: Position (temperature value) on the axes of the derating

- T_a : Ambient temperature in °C
- T_p : Process temperature in °C



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Class I, Div. 2



Position 3, 4 = A1 and Position 6 = B, C

Without Optional specification, ID Mx = MR, MS

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
	180 mA											
		T6	-50	60	60	60	80	50	80	-40	-50	-40
		T5	-50	70	70	70	90	70	90	-40	-50	-40
		T4	-50	70	70	70	130 120 ¹⁾	70	130 120 ¹⁾	-40	-50	-40
		T3	-50	70	70	70	150 120 ¹⁾	70	150 120 ¹⁾	-40	-50	-40

1) Only in connection with Position 9 = N

With Optional specification, ID Mx = MR, MS

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
	180 mA											
		T6	-50	60	60	60	80	50	80	-40	-50	-40
		T5	-50	70	70	70	95	70	95	-40	-50	-40
		T4	-50	70	70	70	130 120 ¹⁾	70	130 120 ¹⁾	-40	-50	-40
		T3	-50	70	70	70	150 120 ¹⁾	70	150 120 ¹⁾	-40	-50	-40
	350 mA											
		T4	-50	70	70	70	130 120 ¹⁾	70	130 120 ¹⁾	-40	-50	-40
		T3	-50	70	70	70	150 120 ¹⁾	70	150 120 ¹⁾	-40	-50	-40

1) Only in connection with Position 9 = N

Position 3, 4 = A1 and Position 6 = M

Without Optional specification, ID Mx = MR, MS

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
	180 mA											
		T6	-50	60	60	60	80	50	80	-40	-50	-40
		T5	-50	70	70	70	95	70	95	-40	-50	-40
		T4	-50	70	70	70	130 120 ¹⁾	70	130 120 ¹⁾	-40	-50	-40
		T3	-50	70	70	70	150 120 ¹⁾	70	150 120 ¹⁾	-40	-50	-40

1) Only in connection with Position 9 = N

With Optional specification, ID Mx = MR, MS

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	
	180 mA												
		T6	-50	60	60	60	80	60	80	-40	-50	-40	
		T5	-50	70	70	70	95	70	95	-40	-50	-40	
		T4	-50	70	70	70	130 120 ¹⁾	70	130 120 ¹⁾	-40	-50	-40	
		T3	-50	70	70	70	150 120 ¹⁾	70	150 120 ¹⁾	-40	-50	-40	
	350 mA												
		T4	-50	70	70	70	130 120 ¹⁾	70	130 120 ¹⁾	-40	-50	-40	
		T3	-50	70	70	70	150 120 ¹⁾	70	150 120 ¹⁾	-40	-50	-40	

1) Only in connection with Position 9 = N

Position 3, 4 = A2 and Position 6 = B, C, M

Without Optional specification, ID Mx = MR, MS

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
	350 mA											
		T6	-50	52	54	52	80	40	80	-40	-50	-40
		T5	-50	67	69	67	95	55	95	-40	-50	-40
		T4	-50	67	69	67	130 120 ¹⁾	32	130 120 ¹⁾	-40	-50	-40
		T3	-50	67	69	67	150 120 ¹⁾	18	150 120 ¹⁾	-40	-50	-40

1) Only in connection with Position 9 = N

With Optional specification, ID Mx = MR, MS

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
	350 mA											
		T6	-50	52	61	52	80	50	80	-40	-50	-40
		T5	-50	67	76	67	95	65	95	-40	-50	-40
		T4	-50	67	77	67	130 120 ¹⁾	62	130 120 ¹⁾	-40	-50	-40
		T3	-50	67	77	67	150 120 ¹⁾	60	150 120 ¹⁾	-40	-50	-40

1) Only in connection with Position 9 = N

Position 3, 4 = A3, A4 and Position 6 = B, C

Without Optional specification, ID Mx = MR, MS

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
	2 A											
		T6	-50	52	53	52	80	40	80	-40	-50	-40
		T5	-50	67	68	67	95	55	95	-40	-50	-40
		T4	-50	70	78	70	130 120 ¹⁾	47	130 120 ¹⁾	-40	-50	-40
		T3	-50	70	78	70	150 120 ¹⁾	38	150 120 ¹⁾	-40	-50	-40

1) Only in connection with Position 9 = N

With Optional specification, ID Mx = MR, MS

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
	2 A											
		T6	-50	52	58	52	80	50	80	-40	-50	-40
		T5	-50	67	73	67	95	65	95	-40	-50	-40
		T4	-50	70	104	70	130 120 ¹⁾	67	130 120 ¹⁾	-40	-50	-40
		T3	-50	70	104	70	150 120 ¹⁾	65	150 120 ¹⁾	-40	-50	-40

1) Only in connection with Position 9 = N

Position 3, 4 = A3, A4 and Position 6 = M

Without Optional specification, ID Mx = MR, MS

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
	2 A											
		T6	-50	55	56	55	80	50	80	-40	-50	-40
		T5	-50	70	71	70	95	65	95	-40	-50	-40
		T4	-50	70	94	70	130 120 ¹⁾	61	130 120 ¹⁾	-40	-50	-40
		T3	-50	70	94	70	150 120 ¹⁾	57	150 120 ¹⁾	-40	-50	-40

1) Only in connection with Position 9 = N

With Optional specification, ID Mx = MR, MS

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
	2 A											
		T6	-50	55	59	55	80	53	80	-40	-50	-40
		T5	-50	70	74	70	95	68	95	-40	-50	-40
		T4	-50	70	130 120 ¹⁾	70	130 120 ¹⁾	70	130 120 ¹⁾	-40	-50	-40
		T3	-50	70	148 120 ¹⁾	70	150 120 ¹⁾	69 70 ¹⁾	150 120 ¹⁾	-40	-50	-40

1) Only in connection with Position 9 = N

Position 3, 4 = A7, A8 and Position = B, C, M

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	70	80	70	80	70	80	-40	-50	-40
		T5	-50	70	95	70	95	70	95	-40	-50	-40
		T4	-50	70	130 120 ¹⁾	70	130 120 ¹⁾	70	130 120 ¹⁾	-40	-50	-40
		T3	-50	70	150 120 ¹⁾	70	150 120 ¹⁾	67 70 ¹⁾	150 120 ¹⁾	-40	-50	-40

1) Only in connection with Position 9 = N

Position 3, 4 = GA and Position = B, C, M

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

Connection data*Optional specification, ID Nx, Ox = NF, NG*

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

<i>Basic specification, Position 3, 4</i>	Power supply circuit	Output
A1	U = 19 to 253 V _{AC} , 50/60 Hz; P _{max} < 2 VA	I _{max} = 180 mA I _{max} = 350 mA ¹⁾
A2	U = 10 to 55 V _{DC} ; P _{max} < 0.5 W	I _{max} = 350 mA
A3	U = 9 to 20 V _{DC} ; P _{max} < 1 W	2 potential free change-over contacts; 2 A
A4	U = 19 to 253 V _{AC} , 50/60 Hz or 19 to 55 V _{DC} ; P _{max} < 25 VA or < 1.3 W	
A7	U = 9.5 to 12.5 V _{DC} ; PFM; I _{max} = 12 mA Connection only to power supply unit FTL325P or FTL375P from Endress+Hauser.	
A8	U = 4 to 8.2 V _{DC}	NAMUR; I _{max} = 3.8 mA
GA	U = 21 to 26 V _{DC} ; I _{max} = 16 mA Connection only to power supply unit FML621 from Endress+Hauser.	

- 1) Only in connection with Position 8 = A, B, Optional Specification ID Mx = MR, MS



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