

Safety Instructions

Liquiphant FTL64

Digital

ATEX, IECEx: Ex ec IIC T6 Gc
Ex tc III C Txxx°C Dc



Liquiphant FTL64

Digital

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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).

 If not yet available, a translation into EU languages can be ordered.

To commission the device, please observe the Operating Instructions pertaining to the device:
BA02215F

Supplementary documentation

Explosion protection brochure: CP00021Z

The explosion protection brochure is available on the Internet:
www.endress.com/Downloads

General notes:
Combined approval

					
Ex ec IIC Zone 2	Ex tc IIIC Zone 2	Ex ec IIC Zone 2	Ex tc IIIC Zone 2	Ex tc IIIC Zone 2	Ex ec IIC Zone 2

The device is designed for operation in explosive gas or explosive dust atmosphere as shown in the sketch above. In the event of potentially explosive gas-air and dust-air mixtures occurring simultaneously: Suitability requires further assessment.

 A sequential change between gas and dust explosion protection is only possible if:

- A period with non-explosive atmosphere is realized during the transition or
- Special examinations are done which are not covered by the certificate

Certificates and declarations

EU Declaration of Conformity

Declaration Number:
EU_00971

The EU Declaration of Conformity is available on the Internet:
www.endress.com/Downloads

EU type-examination certificate

Certificate number:

EU 00971 X

List of applied standards: See EU Declaration of Conformity.

IEC Declaration of Conformity

Certificate number:

IECEX DEK 22.0008X

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

- IEC 60079-0 : 2017
- IEC 60079-7 : 2017
- IEC 60079-31 : 2022

Manufacturer address

Endress+Hauser SE+Co. KG

Hauptstraße 1

79689 Maulburg, Germany

Address of the manufacturing plant: See nameplate.

Other standards

Among other things, the following standards shall be observed in their current version for proper installation:

- IEC/EN 60079-14: "Explosive atmospheres - Part 14: Electrical installations design, selection and erection"
- EN 1127-1: "Explosive atmospheres - Explosion prevention and protection - Part 1: Basic concepts and methodology"

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

FTL64	-	*****	+	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

FTL64

Basic specifications

Position 1, 2 (Approval)		
Selected option		Description
FTL64	BL	ATEX II 3 G Ex ec IIC T6...T1 Gc
		ATEX II 3 D Ex tc IIIC Txxx°C Dc
		IECEX Ex ec IIC T6...T1 Gc
		IECEX Ex tc IIIC Txxx°C Dc

Position 3, 4 (Output)		
Selected option		Description
FTL64	BA	FEL60H, 2-wire 8/16 mA HART + test button
	DA	FEL60A, 2-wire, PROFIBUS PA
	FA	FEL60P, 2-wire, PROFINET over Ethernet-APL, 10 Mbit/s

Position 5 (Display, Operation)		
Selected option		Description
FTL64	A	W/o; switch
	E	Graphic display with touch control
	F	Graphic display with touch control + Bluetooth
	M	Prepared for display FHX50B + Gland M20
	N	Prepared for display FHX50B + Thread NPT1/2
	O	Prepared for display FHX50B + Thread M20

Position 6 (Housing, Material)		
Selected option		Description
FTL64	B	Single compartment; Alu, coated
	M	Dual compartment L-shape; Alu, coated
	N	Dual compartment L-shape; 316L

Position 7 (Electrical Connection)		
Selected option		Description
FTL64	B	Gland M20, brass nickel plated, IP66/68 NEMA Type 4X/6P
	C	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	Thread NPT1/2, IP66/68 NEMA Type 4X/6P

Position 8 (Application)		
Selected option		Description
FTL64	D	Process max 280 °C (536 °F), max 100 bar
	E	Process max 230 °C (446 °F), max 100 bar
	R	Process max 230 °C (446 °F), max 40 bar (PFA)
	9	Special version: Process max 300 °C (572 °F), max 100 bar

Position 9 (Surface Refinement)		
Selected option		Description
FTL64	A	Standard Ra<3.2 µm (126 µin)
	R	Coating PFA (conductive)
	Y	Special version: Coating ECTFE, PFA (Edlon, RubyRed), Enamel

Optional specifications

ID Jx, Kx (Test, Certificate, Declaration)		
Selected option		Description
FTL64	JL	Ambient temperature -50 °C (-58 °F)

ID Px, Rx (Accessory Enclosed)		
Selected option		Description
FTL64	PA ¹⁾	Weather protection cover, 316L
	PB ²⁾	Weather protection cover, plastic

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

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
- Comply with the installation and safety instructions in the Operating Instructions.
- 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.
- 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: → 13, "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.
- Avoid sparks caused by impact and friction.
- The device shall only be used in an area of pollution degree 2 or better.

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).

Device group IIC/IIB and Device group III

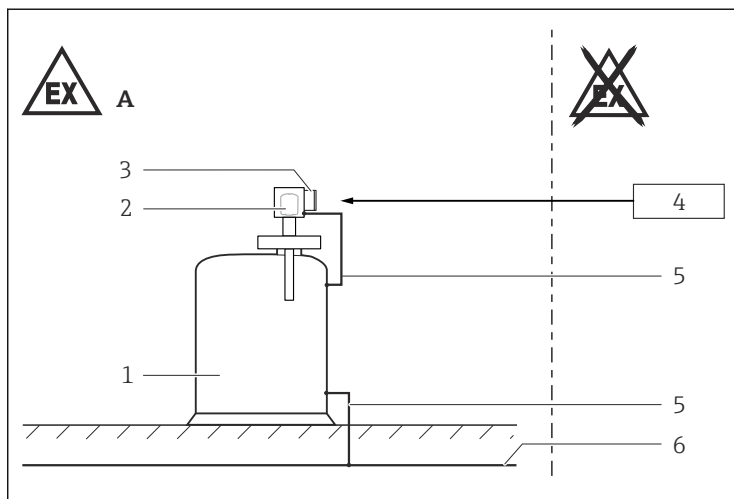
Basic specification, Position 9 = R, Y (Enamel)

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

Basic specification, Position 9 = Y (ECTFE, PFA (Edlon, RubyRed))

- 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.

Safety instructions: Installation



A0025537



- 1 Tank; Zone 2, Zone 22
 2 Electronic insert; Electronics compartment
 3 Connection compartment Ex ec
 (only Basic specification, Position 6 = M, N)
 4 Power supply unit
 5 Potential equalization line
 6 Potential equalization

- After aligning (rotating) the enclosure, retighten the fixing screw.
- Perform the following to achieve the degree of protection IP66/67 or IP66/68:
 - Screw the cover tight.
 - Mount the cable entry correctly.
- 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 when energized.
- Continuous service temperature of the connecting cable / cable gland / cable entry: $\geq T_a + 20 \text{ K}$.
- 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.
- Only use genuine spare parts from Endress+Hauser which are specified for the device.
- Only use certified cable glands suitable for the application. Observe national regulations and standards.
- When operating the transmitter enclosure at an ambient temperature under -20 °C, use appropriate cables and cable entries permitted for this application.
- Supplied cable glands and metallic sealing plugs comply with the requirements of type of protection marked on the nameplate.
- 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 screw on the cover.

Cross section connecting wire	Tightening torque of terminal screw	Stripped insulation
0.2 to 2.5 mm ²	0.5 to 0.6 Nm	8 mm

Basic specification, Position 5 = N

Observe the requirements according to IEC/EN 60079-14 for conduit systems and the wiring and installation instructions of the suitable Safety Instructions (XA). In addition, observe national regulations and standards for conduit systems.

Device group III, Application in dust

- To ensure the ingress protection IP66/67: Only use the unit-mounted cable entries, sealing plugs and O-rings.
- Supplied cable glands and metallic sealing plugs comply with the requirements of type of protection marked on the nameplate.

Accessory: Sliding sleeve

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

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.

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 Px, Rx = PB

When using the weather protection cover: Reduce the admissible ambient temperature by 10 K.

Description notes



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

Ex ec IIC T6...T1 Gc



- The specified ambient and process temperature ranges exclusively refer to the explosion protection and must not be exceeded. Operationally permitted ambient temperature ranges can be restricted depending on the version: See Operating Instructions.
- Do not exceed the max. ambient temperature at the enclosure.

Position 3, 4 = BA, DA, FA with Position 8 = E, R

Temperature class	Process temperature range	Ambient temperature range
T6	$-60\text{ }^{\circ}\text{C} \leq T_p \leq +80\text{ }^{\circ}\text{C}$	$-40\text{ }^{\circ}\text{C} \leq T_a \leq +70\text{ }^{\circ}\text{C}$
T5	$-60\text{ }^{\circ}\text{C} \leq T_p \leq +95\text{ }^{\circ}\text{C}$	$-40\text{ }^{\circ}\text{C} \leq T_a \leq +70\text{ }^{\circ}\text{C}$
T4	$-60\text{ }^{\circ}\text{C} \leq T_p \leq +130\text{ }^{\circ}\text{C}$	$-40\text{ }^{\circ}\text{C} \leq T_a \leq +70\text{ }^{\circ}\text{C}$
T3	$-60\text{ }^{\circ}\text{C} \leq T_p \leq +195\text{ }^{\circ}\text{C}$	$-40\text{ }^{\circ}\text{C} \leq T_a \leq +65\text{ }^{\circ}\text{C}$
T2...T1	$-60\text{ }^{\circ}\text{C} \leq T_p \leq +230\text{ }^{\circ}\text{C}$	$-40\text{ }^{\circ}\text{C} \leq T_a \leq +65\text{ }^{\circ}\text{C}$

Position 3, 4 = BA, DA, FA with Position 8 = D, 9

Temperature class	Process temperature range	Ambient temperature range
T6	$-60\text{ }^{\circ}\text{C} \leq T_p \leq +80\text{ }^{\circ}\text{C}$	$-40\text{ }^{\circ}\text{C} \leq T_a \leq +70\text{ }^{\circ}\text{C}$
T5	$-60\text{ }^{\circ}\text{C} \leq T_p \leq +95\text{ }^{\circ}\text{C}$	$-40\text{ }^{\circ}\text{C} \leq T_a \leq +70\text{ }^{\circ}\text{C}$
T4	$-60\text{ }^{\circ}\text{C} \leq T_p \leq +130\text{ }^{\circ}\text{C}$	$-40\text{ }^{\circ}\text{C} \leq T_a \leq +70\text{ }^{\circ}\text{C}$
T3	$-60\text{ }^{\circ}\text{C} \leq T_p \leq +195\text{ }^{\circ}\text{C}$	$-40\text{ }^{\circ}\text{C} \leq T_a \leq +70\text{ }^{\circ}\text{C}$
T2	$-60\text{ }^{\circ}\text{C} \leq T_p \leq +280\text{ }^{\circ}\text{C}$ $-60\text{ }^{\circ}\text{C} \leq T_p \leq +290\text{ }^{\circ}\text{C}^{1)}$	$-40\text{ }^{\circ}\text{C} \leq T_a \leq +65\text{ }^{\circ}\text{C}$
T1	$-60\text{ }^{\circ}\text{C} \leq T_p \leq +300\text{ }^{\circ}\text{C}^{1)}$	$-40\text{ }^{\circ}\text{C} \leq T_a \leq +65\text{ }^{\circ}\text{C}$

1) Only in connection with Position 8 = 9

Ex tc IIIC Txxx°C Dc

- 
- The specified surface temperature takes into account all direct heat influences from process heat and self-heating at the enclosure.
 - Surface temperatures at the process side maybe higher and must be considered by the user (e.g. at high temperature process connections).
 - The specified ambient and process temperature ranges exclusively refer to the explosion protection and must not be exceeded. Operationally permitted ambient temperature ranges can be restricted depending on the version: See Operating Instructions.
 - Do not exceed the max. ambient temperature at the enclosure.

For detailed information see Technical Information.

Position 3, 4 = BA, DA, FA with Position 8 = E, R

Maximum surface temperature	Process temperature range	Ambient temperature range
T230 °C	-60 °C ≤ T _p ≤ +80 °C	-40 °C ≤ T _a ≤ +70 °C
	-60 °C ≤ T _p ≤ +130 °C	-40 °C ≤ T _a ≤ +70 °C
	-60 °C ≤ T _p ≤ +195 °C	-40 °C ≤ T _a ≤ +70 °C
	-60 °C ≤ T _p ≤ +230 °C	-40 °C ≤ T _a ≤ +70 °C

Position 3, 4 = BA, DA, FA with Position 8 = D, 9

Maximum surface temperature	Process temperature range	Ambient temperature range
T280 °C	-60 °C ≤ T _p ≤ +80 °C	-40 °C ≤ T _a ≤ +70 °C
	-60 °C ≤ T _p ≤ +130 °C	-40 °C ≤ T _a ≤ +70 °C
	-60 °C ≤ T _p ≤ +195 °C	-40 °C ≤ T _a ≤ +70 °C
	-60 °C ≤ T _p ≤ +280 °C	-40 °C ≤ T _a ≤ +70 °C
T300 °C	-60 °C ≤ T _p ≤ +300 °C ¹⁾	-40 °C ≤ T _a ≤ +70 °C

1) Only in connection with Position 8 = 9

Connection data

Basic specification, Position 3 = BA

Power supply
U ≤ 35 V _{DC} P ≤ 1 W

Basic specification, Position 3 = DA

Power supply
$U \leq 32 \text{ V}_{\text{DC}}$ $P \leq 0.7 \text{ W}$

Basic specification, Position 3 = FA

Power supply
$U \leq 15 \text{ V}_{\text{DC}}$ $P \leq 0.7 \text{ W}$

In connection with: *Basic specification, Position 5 = M, N, O*
 Installation according to the specifications of FHX50B.



Only the type of protection suitable for the device shall be connected!

Cable entry parameters

Cable gland: *Basic specification, Position 7 = B*

mandatory for Position 6 = B, M

Thread	Clamping range	Material	Sealing insert	O-ring
M20x1,5	ø 8 to 10.5 mm	Ms, nickel-plated	Silicone	EPDM (ø 17x2)

Cable gland: *Basic specification, Position 7 = C*

preferably for Position 6 = N and possible for Position 6 = B, M

Thread	Clamping range	Material	Sealing insert	O-ring
M20x1,5	ø 7 to 12 mm	1.4404	NBR	EPDM (ø 17x2)



- The tightening torque refers to cable glands installed by the manufacturer:
 - Recommended torque to connect the cable gland into the enclosure: 3.75 Nm
 - Recommended torque to tighten the cable into the cable gland: 3.5 Nm
 - Maximum torque to tighten the cable into the cable gland: 10 Nm
- This value may be different depending on the type of cable. However, the maximum value must not be exceeded.

- Only suitable for fixed installation. The operator must pay attention to a suitable strain relief of the cable.
- To maintain the ingress protection of the enclosure: Install the enclosure cover, cable glands and blind plugs correctly.
- The cable glands are suitable for a low risk of mechanical danger (4 Joule) and must be mounted in a protected position if larger impact energy levels are expected.



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