

Safety Instructions

Liquiphant FTL64

Digital

ATEX, IECEx: Ex db ia IIC T6 Ga/Gb
Ex db ia IIC T6 Gb



Liquiphant FTL64

Digital

Table of contents

About this document 4

Associated documentation 4

Supplementary documentation 4

Certificates and declarations 4

Manufacturer address 5

Other standards 5

Extended order code 5

Safety instructions: General 8

Safety instructions: Specific conditions of use 9

Safety instructions: Installation 10

Safety instructions: Zone 0 11

Safety instructions: Zone separation Zone 0, Zone 1 11

Explosion protection with heat insulation 12

Temperature tables 12

Connection data 15

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

Certificates and declarations**EU Declaration of Conformity**

Declaration Number:

EU_00970

The EU Declaration of Conformity is available on the Internet:

www.endress.com/Downloads

EU type-examination certificate

Certificate number:

DEKRA 22ATEX0008 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 60079-1 : 2014
- IEC 60079-11 : 2023
- IEC 60079-26 : 2021

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	BB	ATEX II 1/2 G Ex db ia IIC T6...T1 Ga/Gb
		ATEX II 2 G Ex db ia IIC T6...T1 Gb
		IECEX Ex db ia IIC T6...T1 Ga/Gb
		IECEX Ex db ia IIC T6...T1 Gb

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
	L	Prepared for display FHX50B + M12 connection
	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 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 Nx, Ox (Accessory Mounted)		
Selected option		Description
FTL64	NA ¹⁾	Overvoltage protection

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

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.
- 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
- 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.

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".
- 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.
- 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).

Device group IIC/IIB

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.

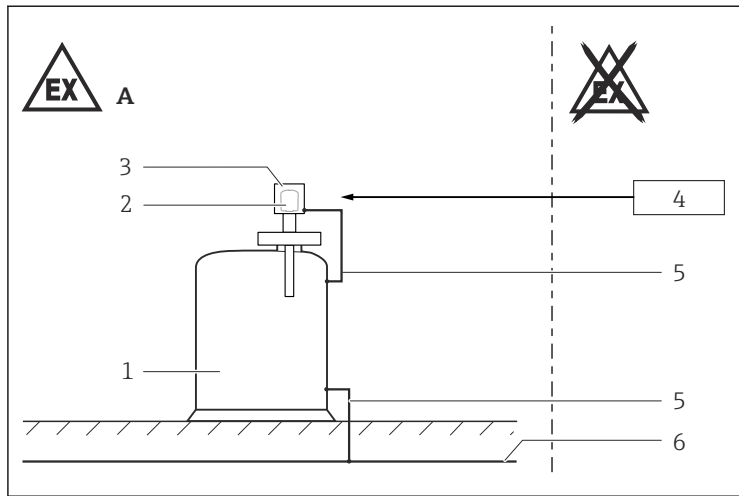
Basic specification, Position 9 = Y (ECTFE, PFA (Edlon, RubyRed))

- 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.

Type of protection Ex db

- The high-temperature part of the device (fork/pipe/process connection/temperature spacer) is designed in type of protection Ex db and has an Ex ia connection to the electronics insert. The installation on the terminals of the device must always be carried out in type of protection Ex i.
- Flameproof joints of the Ex db parts of the device are not intended to be repaired.

Safety instructions: Installation



A0025536

1

- A Zone 1
 1 Tank; Zone 0, Zone 1
 2 Electronic insert
 3 Enclosure
 4 Associated intrinsically safe power supply units
 5 Potential equalization line
 6 Local potential equalization

- After aligning (rotating) the enclosure, retighten the fixing screw.
- 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: $\geq T_a + 20\text{ K}$.
- 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.
- Only use genuine spare parts from Endress+Hauser which are specified for the device.

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.

Accessory high pressure sliding sleeve

The high pressure sliding sleeve can be used for a continuous setting of the switch point and is suited for zone separation if mounted properly (see Operating Instructions).

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}.

Optional specification, ID Nx, Ox = NA

The intrinsically safe input power circuit of the device is isolated from ground. The dielectric strength is at least 290 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.

**Safety instructions:
Zone 0**

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.

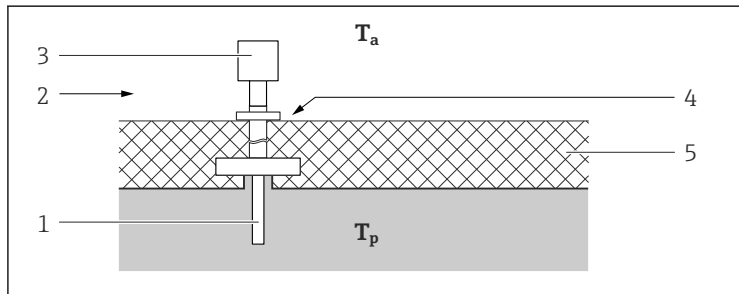
**Safety instructions:
Zone separation
Zone 0, Zone 1**

The zone separation wall of the device is made of stainless steel or high corrosion-resistant alloy of thickness ≥ 1 mm.

Explosion protection with heat insulation

Basic specification, Position 8 = D, E, R, 9

- While observing the "temperature derating", the device is suitable for process temperatures up to 300 °C.
- When operating, ensure that you rule out contact between hot component surfaces and potentially explosive atmospheres beyond the limits of the corresponding temperature class. Suitable measures: e.g. thermal insulation at container and/or pipes.
- The temperature of 85 °C specified at the reference point may not be exceeded.
- To protect the electronics, observe the specified ambient temperature at the electronics enclosure.



A0025541

2

T_a Ambient temperature

T_p Process temperature

1 Sensor

2 Temperature class, e.g. T6

3 Enclosure

4 Reference point: max. +85 °C

5 E.g. thermal insulation

Temperature tables



- 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.



Optional specification, ID Jx, Kx = JL

Lower limit of the ambient temperature for explosion protection changes to -50 °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.

Position 5 = A, L, M, N, O

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

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

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

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

1) Only in connection with Position 8 = 9

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

Temperature class	Process temperature range	Ambient temperature range
T6	$-60\text{ °C} \leq T_p \leq +80\text{ °C}$	$-40\text{ °C} \leq T_a \leq +60\text{ °C}$
T5	$-60\text{ °C} \leq T_p \leq +95\text{ °C}$	$-40\text{ °C} \leq T_a \leq +65\text{ °C}$
T4	$-60\text{ °C} \leq T_p \leq +130\text{ °C}$	$-40\text{ °C} \leq T_a \leq +60\text{ °C}$
T3	$-60\text{ °C} \leq T_p \leq +195\text{ °C}$	$-40\text{ °C} \leq T_a \leq +55\text{ °C}$
T2...T1	$-60\text{ °C} \leq T_p \leq +230\text{ °C}$	$-40\text{ °C} \leq T_a \leq +55\text{ °C}$

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

Temperature class	Process temperature range	Ambient temperature range
T6	$-60\text{ °C} \leq T_p \leq +80\text{ °C}$	$-40\text{ °C} \leq T_a \leq +60\text{ °C}$
T5	$-60\text{ °C} \leq T_p \leq +95\text{ °C}$	$-40\text{ °C} \leq T_a \leq +65\text{ °C}$
T4	$-60\text{ °C} \leq T_p \leq +130\text{ °C}$	$-40\text{ °C} \leq T_a \leq +60\text{ °C}$
T3	$-60\text{ °C} \leq T_p \leq +195\text{ °C}$	$-40\text{ °C} \leq T_a \leq +60\text{ °C}$
T2	$-60\text{ °C} \leq T_p \leq +280\text{ °C}$ $-60\text{ °C} \leq T_p \leq +290\text{ °C}^{1)}$	$-40\text{ °C} \leq T_a \leq +55\text{ °C}$
T1	$-60\text{ °C} \leq T_p \leq +300\text{ °C}^{1)}$	$-40\text{ °C} \leq T_a \leq +55\text{ °C}$

1) Only in connection with Position 8 = 9

Position 5 = E, F

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

Temperature class	Process temperature range	Ambient temperature range
T6	$-60\text{ °C} \leq T_p \leq +80\text{ °C}$	$-40\text{ °C} \leq T_a \leq +55\text{ °C}$
T5	$-60\text{ °C} \leq T_p \leq +95\text{ °C}$	$-40\text{ °C} \leq T_a \leq +60\text{ °C}$
T4	$-60\text{ °C} \leq T_p \leq +130\text{ °C}$	$-40\text{ °C} \leq T_a \leq +60\text{ °C}$
T3	$-60\text{ °C} \leq T_p \leq +195\text{ °C}$	$-40\text{ °C} \leq T_a \leq +55\text{ °C}$
T2...T1	$-60\text{ °C} \leq T_p \leq +230\text{ °C}$	$-40\text{ °C} \leq T_a \leq +55\text{ °C}$

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

Temperature class	Process temperature range	Ambient temperature range
T6	$-60\text{ °C} \leq T_p \leq +80\text{ °C}$	$-40\text{ °C} \leq T_a \leq +55\text{ °C}$
T5	$-60\text{ °C} \leq T_p \leq +95\text{ °C}$	$-40\text{ °C} \leq T_a \leq +60\text{ °C}$
T4	$-60\text{ °C} \leq T_p \leq +130\text{ °C}$	$-40\text{ °C} \leq T_a \leq +60\text{ °C}$
T3	$-60\text{ °C} \leq T_p \leq +195\text{ °C}$	$-40\text{ °C} \leq T_a \leq +55\text{ °C}$
T2	$-60\text{ °C} \leq T_p \leq +280\text{ °C}$ $-60\text{ °C} \leq T_p \leq +290\text{ °C}^{1)}$	$-40\text{ °C} \leq T_a \leq +55\text{ °C}$
T1	$-60\text{ °C} \leq T_p \leq +300\text{ °C}^{1)}$	$-40\text{ °C} \leq T_a \leq +55\text{ °C}$

1) Only in connection with Position 8 = 9

Connection data

Basic specification, Position 3, 4 = BA

Power supply	
$U_i \leq 30\text{ V}_{DC}$ $I_i \leq 300\text{ mA}$ $P_i \leq 1\text{ W}$ $C_i \leq 10\text{ nF}$ $L_i = 0$	

Basic specification, Position 3, 4 = DA

Power supply	
FISCO	Entity
$U_i \leq 17.5\text{ V}_{DC}$ $I_i \leq 380\text{ mA}$ $P_i \leq 5.32\text{ W}$ $C_i \leq 5\text{ nF}$ $L_i = 0$	$U_i \leq 24\text{ V}_{DC}$ $I_i \leq 300\text{ mA}$ $P_i \leq 1.2\text{ W}$ $C_i \leq 5\text{ nF}$ $L_i = 0$

Basic specification, Position 3, 4 = FA

Power supply	
2-WISE	Entity
$U_i \leq 17.5\text{ V}_{DC}$ $I_i \leq 380\text{ mA}$ $P_i \leq 5.32\text{ W}$ $C_i \leq 5\text{ nF}$ $L_i = 0$	$U_i \leq 17.5\text{ V}_{DC}$ $I_i \leq 300\text{ mA}$ $P_i \leq 1.2\text{ W}$ $C_i \leq 5\text{ nF}$ $L_i = 0$

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



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



71671087

www.addresses.endress.com
