

Safety Instructions

Liquiphant FTL64

4-20 mA HART

2Ex ec IIC T6...T1 Gc X

Ex tc III C T**°C Dc X



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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

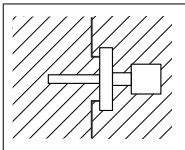
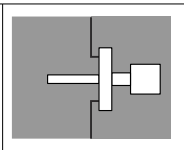
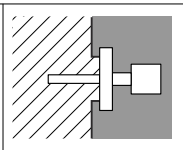
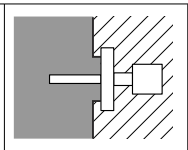
This document is an integral part of the following Operating Instructions:
BA02215F

Supplementary documentation


Explosion protection brochure: CP00021Z
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

General notes:
Combined approval

			
Ex ec IIC Zone 2	Ex tc IIIC Zone 22	Ex ec IIC Zone 2	Ex tc IIIC Zone 22

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

Manufacturer's certificates

Certificate of Conformity TP TC 012/2011

Inspection authority:
LLC NANIO CCVE (ООО «НАНИО ЦСВЭ»)

Certificate number:
EAЭС RU C-DE.AA87.B.00772/21

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

- GOST 31610.0-2014 (IEC 60079-0:2011)
- GOST 31610.7-2017 (IEC 60079-7:2015)
- GOST IEC 60079-31-2013

**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

FTL64	–	*****	+	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
FTL64

Basic specifications

Position 1, 2 (Approval)		
Selected option		Description
FTL64	GL	EAC 2Ex ec IIC T6...T1 Gc X EAC Ex tc IIIC T**C Dc X

Position 3, 4 (Output)		
Selected option		Description
FTL64	BA	FEL60H, 2-wire 4...20 mA HART+test button

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 100bar
	E	Process max 230°C/446°F, max 100bar
	R	Process max 230°C/446°F, max 40bar (PFA)
	9	Special version: Process max 300°C/572°F, max 100bar

Position 9 (Surface Refinement)		
Selected option		Description
FTL64	A	Standard Ra<3,2um/126uin
	R	Coating PFA (conductive)

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:
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: →  11, "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 ($\leq 0.5\text{ m}$) 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

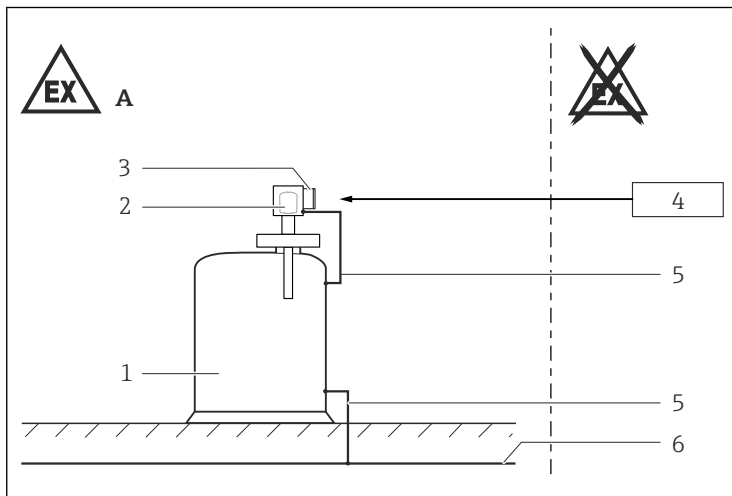
Avoid electrostatic charging of the weather protection cover (e.g. friction, cleaning, maintenance, strong medium flow).

Device group IIC and Device group III

Basic specification, Position 9 = R

- Due to the surface resistance 1 GΩ ($|R|$ PFA-conductive), this coating is suitable without restrictions.
- Prevent damage to the conductive surface layer (e.g. by abrasion).

Safety instructions: Installation



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- A Zone 2, Zone 22
- 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 entries suitable for the application. Observe national regulations and standards.
- When operating the transmitter enclosure at an ambient temperature under $-20\text{ }^{\circ}\text{C}$, 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

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°C .

Optional specification, ID Px, Rx = PB

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

2Ex 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.

Basic specification, Position 8 = E, R


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

Basic specification, Position 8 = D, 9

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

1) Only in connection with Position 8 = 9

Ex tc IIIC T**°C Dc

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- 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.

Ex tc IIIC T230 °C Dc

Basic specification, 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

Ex tc IIIC T280 °C / 300 °C Dc

Basic specification, 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**Power supply**

$U \leq 35 \text{ V}_{\text{DC}}$
 $P \leq 1 \text{ W}$

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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