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Safety Instructions
Liquiphant FTL43, FTL60

Ex ia IIC T4...T1 Ga
Ex ia IIIB T_{200}135 °C Da

Endress+Hauser
People for Process Automation

Liquiphant FTL43, FTL60

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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).

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

- FTL43: BA02308F
- FTL60: BA02355F

Supplementary documentation

Explosion protection brochure: CP00021Z

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

Certificates and declarations

NEPSI Declaration of Conformity

Certificate number:
GYJ25.1427X

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

- GB/T 3836.1-2021
- GB/T 3836.4-2021

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

FTL43, FTL60	–	**********	+	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

FTL43, FTL60

Basic specifications

Position 1, 2 (Approval)		
Selected option		**Description**
FTL43 FTL60	NI	NEPSI Ex ia IIC T4...T1 Ga NEPSI Ex ia IIIB T_{200}135 °C Da

Position 3, 4 (Output)		
Selected option		**Description**
FTL43 FTL60	BA	2-wire, 8/16 mA HART

Optional specifications

ID Mx (Sensor Design)		
Selected option		**Description**
FTL43 FTL60	MR	Temperature separator
	MS	Pressure tight feed through (Second line of defence)

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.
- Comply with the installation and safety instructions in the Operating Instructions.
- 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

- For installation, use and maintenance of the device, users must also observe the requirements stated in the Operating Instructions and the standards:
  - GB 50257-2014: "Code for construction and acceptance of electric device for explosion atmospheres and fire hazard electrical equipment installation engineering".
  - GB/T 3836.13-2021: "Explosive atmospheres, Part 13: Equipment repair, overhaul, reclamation and modification".
  - GB 3836.15-2024: "Explosive atmospheres, Part 15: Specification of electrical installations design, selection and erection".
  - GB 3836.16-2024: "Explosive atmospheres, Part 16: Specification of electrical installations inspection and maintenance".
  - GB/T 3836.18-2024: "Explosive atmospheres, Part 18: Intrinsically safe electrical systems".
  - GB 15577-2018: "Safety regulations for dust explosive prevention and protection". (Only if installed in dust hazardous area.)
- 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)
- Alterations to the device can affect the explosion protection and must be carried out by staff authorized to perform such work by Endress+Hauser.

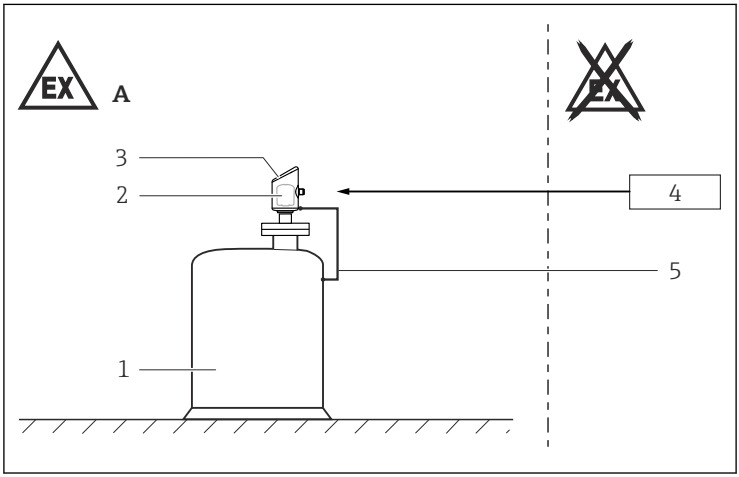
Safety instructions: Specific conditions of use

- 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.
- In the case of process connections made of polymeric material or with polymeric coatings, avoid electrostatic charging of the plastic surfaces.
- The process connection of the device must be installed in such a way that guarantees a sufficiently tight joint (IP66/67).
- Applications in which the process temperature exceeds the maximum surface temperature limits of the required maximum surface temperature: The ignition hazard posed by hot surfaces on the process connecting parts of the device must be taken into account.

- It is essential for the device to use a power supply that is galvanically isolated from earth.
- When using an intrinsically safe barrier, the barrier must be connected to the same earth as the device.
- Refer to the temperature tables for various ambient and process temperature ranges.

Electronics enclosure with display (LCD or LED)
Do not use in areas with a moving dust atmosphere.

Safety instructions: Installation



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A Zone 0, Zone 20
1 Tank; Zone 0, Zone 20
2 Electronic insert
3 Enclosure
4 Associated intrinsically safe power supply units
5 Local earthing

- Continuous service temperature of the connecting cable: ≥ T_a+20 K.
- Observe the pertinent guidelines when interconnecting intrinsically safe circuits.
- Observe the maximum process conditions according to the manufacturer's Operating Instructions.
- Install the device to exclude any mechanical damage or friction during the application. Pay particular attention to flow conditions and tank fittings.

- Perform the following to achieve the degree of protection IP66/68:
  - Select a suitable cable / connector.
  - Mount the cable / connector correctly.
- Supplied cables / connectors comply with the requirements of the type of protection marked on the nameplate.
- Support extension tube of the device if a dynamic load is expected.

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

Potential equalization

- Integrate the device into the local potential equalization.
- If not earthed directly via the process connection, provide separate earthing.

Temperature tables

Ex ia IIC

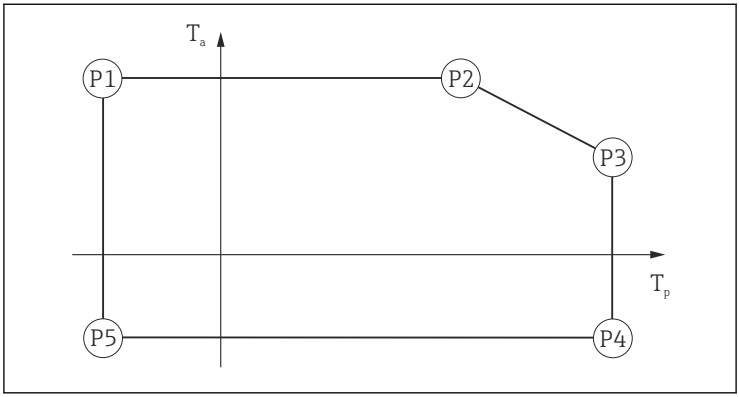
- The specified ambient and process temperature ranges exclusively refer to the explosion protection and must not be exceeded. Operationally permitted ambient temperature ranges can be restricted depending on the version: See Operating Instructions.
- Do not exceed the max. ambient temperature at the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

Description notes

1st column: Temperature classes T4 (135 °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

Example diagrams of possible deratings



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Without Optional specification, ID Mx = MR, MS

	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
T4	–40	70	80	70	125	50	125	–40	–40	–40
T3...T1	–40	70	80	70	140	40	150	–40	–40	–40
	–40	70	80	70	150	30	150	–40	–40	–40

With Optional specification, ID Mx = MR, MS

	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
T4	–40	70	80	70	125	60	125	–40	–40	–40
T3...T1	–40	70	80	70	150	60	150	–40	–40	–40

Ex ia IIIB

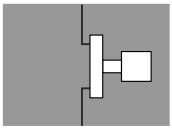
- The specified surface temperature takes into account all direct heat influences from process heat and self-heating at the enclosure.
- The specified ambient and process temperature ranges exclusively refer to the explosion protection and must not be exceeded. Operationally permitted ambient temperature 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.

Protection type of enclosure: IP66/68

Maximum surface temperature	Process temperature range	Ambient temperature range
T135 °C	−40 °C ≤ T_p ≤ +70 °C	−40 °C ≤ T_a ≤ +70 °C

Permitted ambient conditions

Process Zone 20		Enclosure Zone 20
Continuous dust submersion		Continuous dust submersion

Connection data

Ex ia IIC

Entity parameter
U_i = 30 V I_i = 100 mA P_i = 700 mW C_i = 15 nF L_i = 0.69 mH

Ex ia IIIB

Entity parameter
U_i = 30 V I_i = 100 mA P_i = 650 mW C_i = 15 nF L_i = 0.69 mH

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