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Safety Instructions
Liquiphant FTL43, FTL60

II 1/2 G Ex ia IIC T4 Ga/Gb
II 2 G Ex ia IIC T4 Gb
II 1/2 D Ex ia IIIB T135 °C Da/Db
II 2 D Ex ia IIIB T135 °C Db

Endress+Hauser
People for Process Automation

Liquiphant FTL43, FTL60

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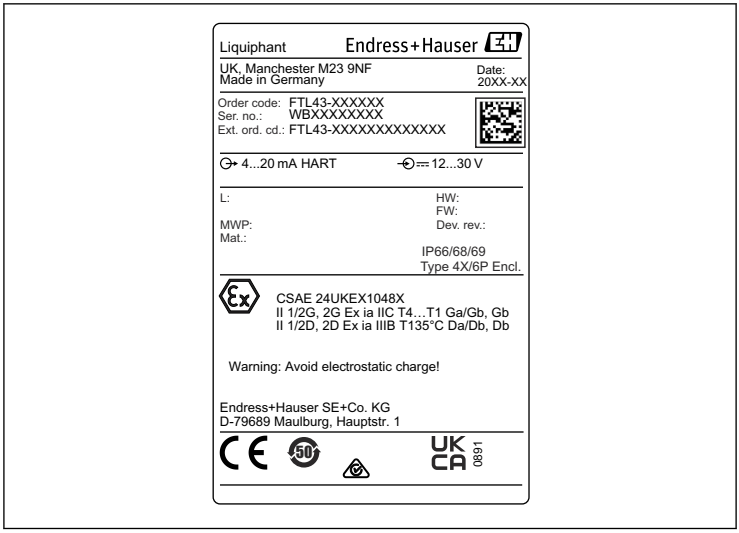
About this document

The document number of these Safety Instructions (XA) must match the information on the nameplate.



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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:

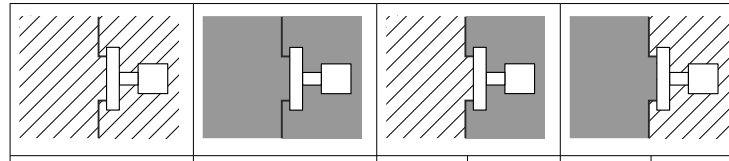
- FTL43: BA02308F
- FTL60: BA02355F

Supplementary documentation

Explosion protection brochure: CP00021Z

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

General notes: Combined approval



Ex ia IIC		Ex ia IIIB		Ex ia IIC	Ex ia IIIB	Ex ia IIIB	Ex ia IIC
Zone 0 or Zone 1	Zone 1	Zone 20 or Zone 21	Zone 21	Zone 0 or Zone 1	Zone 21	Zone 20 or Zone 21	Zone 1

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

UK Declaration of Conformity

Declaration Number:

UK_00599

The UK Declaration of Conformity is available:
In the download area of the Endress+Hauser website:
www.endress.com -> Downloads -> Declaration ->
Type: UKCA Declaration -> Product Code: ...

UKCA type-examination certificate

Certificate number:

CSAE 24UKEX1048X

List of applied standards: See UK Declaration of Conformity.

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

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	UK	UK II 1/2 G Ex ia IIC T4...T1 Ga/Gb UK II 2 G Ex ia IIC T4...T1 Gb UK II 1/2 D Ex ia IIIB T135 °C Da/Db UK II 2 D Ex ia IIIB T135 °C Db

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

Position 9 (Surface Refinement)		
Selected option		**Description**
FTL43	A [1]	Standard Ra <1.5 µm (59 µin)
	B [2]	Hygienic Ra <0.76 µm (30 µin)
	D	Hygienic Ra <0.3 µm (12 µin) mech. polished
	E	Hygienic Ra <0.38 µm (15 µin) electro-polished
FTL60	A [1]	Standard Ra <3.2 µm (126 µin)

1) Also suitable for zone separation for equipment protection level (EPL) Da/Gb or Ga/Db.
2) Not suitable for zone separation.

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 EN 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.
- 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
- 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.

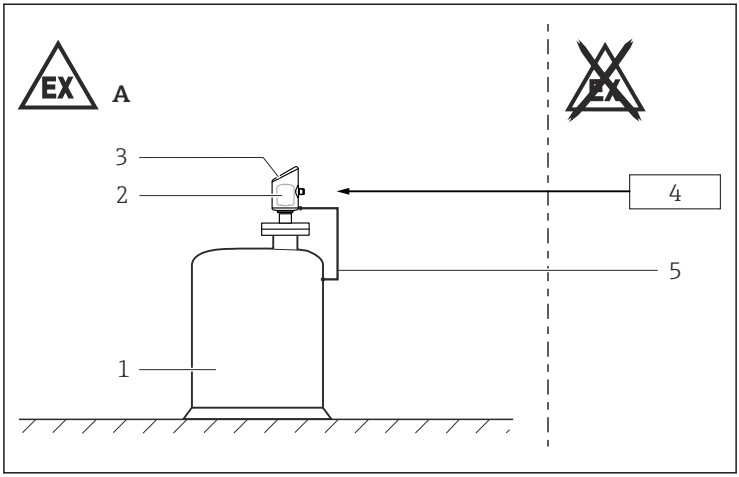
Device group III, Application in dust

In case of very strongly abrasive or corrosive media: Additionally protect the wetted surface of the sensor in order to avoid abrasion of the zone separation wall.

Electronics enclosure with display (LCD or LED)

Do not use in areas with a moving dust atmosphere.

Safety instructions: Installation



A Zone 1, Zone 21
1 Tank; Zone 0, Zone 1, Zone 20, Zone 21
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.

Safety instructions: Zone separation Zone 0, Zone 1, Zone 20, Zone 21

Device type FTL43, FTL60 with Basic specification, Position 9 = A
The zone separation wall of the device is made of stainless steel or high corrosion-resistant alloy of thickness ≥ 1 mm.

Device type FTL43 with Basic specification, Position 9 = D, E
- The zone partition wall of the device is made of stainless steel or a highly corrosion-resistant alloy of thickness from 0.2 to 1 mm.
- The probe must not be subjected to abrasive or corrosive medium that may adversely affect the partition for the zone separation.

Temperature tables

Ex ia IIC

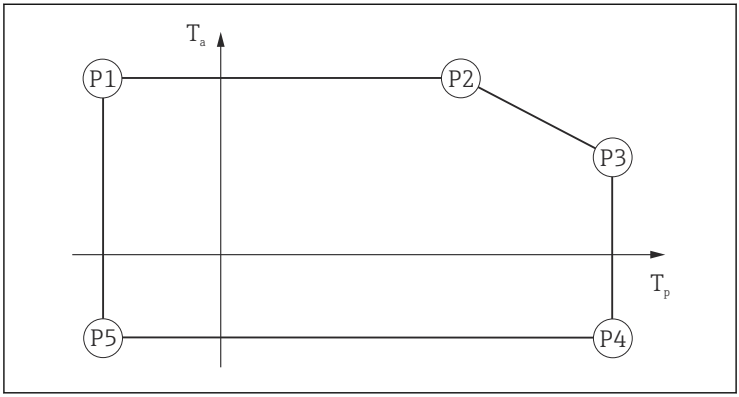
- The specified ambient and process temperature ranges exclusively refer to the explosion protection and must not be exceeded. Operationally permitted ambient temperature ranges can be restricted depending on the version: See Operating Instructions.
- Do not exceed the max. ambient temperature at the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



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.

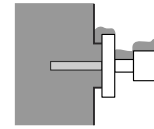
For detailed information see Technical Information.

Protection type of enclosure: IP66/68

II 1/2 D Ex ia IIIB T135 °C Da/Db

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

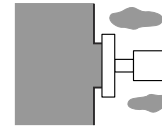
Permitted ambient conditions

Process Zone 20		Enclosure Zone 21
Continuous dust submersion		Dust accumulation or temporary explosive dust atmosphere

With Optional specification, ID Mx = MR, MS

Maximum surface temperature	Process temperature range	Ambient temperature range
T135 °C	−40 °C ≤ T_p ≤ +100 °C	−40 °C ≤ T_a ≤ +45 °C
	−40 °C ≤ T_p ≤ +70 °C	−40 °C ≤ T_a ≤ +70 °C

Permitted ambient conditions

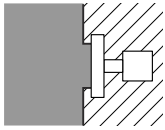
Process Zone 20		Enclosure Zone 21
Continuous dust submersion		Temporary explosive dust atmosphere

II 1 D Ex ia IIIB T135 °C Da/II 2 G Ex ia IIC T4...T1 Gb

Only in connection with *Basic specification, Position 9 = A*

Maximum surface temperature	Process temperature range	Ambient temperature range
EPL Ga: T4 EPL Db: T135 °C	−40 °C ≤ T_p ≤ +100 °C	−40 °C ≤ T_a ≤ +60 °C

Permitted ambient conditions

Process Zone 20		Enclosure Zone 1
Continuous dust submersion		Explosive gas atmosphere

II 1 G Ex ia IIC T4...T1 Ga/II 2 D Ex ia IIIB T135 °C Db

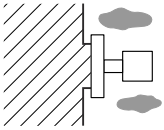
Only in connection with *Basic specification, Position 9 = A*

Maximum surface temperature	Process temperature range	Ambient temperature range
EPL Ga: T4 EPL Db: T135 °C	−40 °C ≤ T_p ≤ +70 °C	−40 °C ≤ T_a ≤ +70 °C

With Optional specification, ID Mx = MR, MS

Maximum surface temperature	Process temperature range	Ambient temperature range
EPL Ga: T4 EPL Db: T135 °C	−40 °C ≤ T_p ≤ +125 °C	−40 °C ≤ T_a ≤ +40 °C
	−40 °C ≤ T_p ≤ +70 °C	−40 °C ≤ T_a ≤ +70 °C

Permitted ambient conditions

Process Zone 0		Enclosure Zone 21
Explosive gas atmosphere		Temporary explosive dust atmosphere

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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