



# IECEX Certificate of Conformity

## INTERNATIONAL ELECTROTECHNICAL COMMISSION IEC Certification Scheme for Explosive Atmospheres

for rules and details of the IECEx Scheme visit [www.iecex.com](http://www.iecex.com)

Certificate No.: IECEx DEK 15.0028X Issue No: 1 Certificate history:  
Status: **Current** Page 1 of 4 Issue No. 1 (2017-03-21)  
Date of Issue: **2017-03-21** Issue No. 0 (2016-10-19)  
Applicant: **Endress+Hauser GmbH+Co. KG**  
Hauptstraße 1  
79689 Maulburg  
**Germany**  
Equipment: **Liquid Level Switch Liquiphant M Type FTL50(H)-...., Type FTL51(H)-.... and  
Type FTL51C-.... and Liquiphant S Type FTL70-.... and Type FTL71-....**  
*Optional accessory:*  
Type of Protection: **Ex i**  
Marking: Ex ia, Ex ib  
Refer to Annex 1 for detailed marking.

Approved for issue on behalf of the IECEx  
Certification Body:

R. Schuller

Position:

Certification Manager

Signature:  
(for printed version)

Date:

1. This certificate and schedule may only be reproduced in full.
2. This certificate is not transferable and remains the property of the issuing body.
3. The Status and authenticity of this certificate may be verified by visiting the [Official IECEx Website](http://www.iecex.com).

Certificate issued by:

**DEKRA Certification B.V.**  
Meander 1051,  
6825 MJ Arnhem  
The Netherlands





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Certificate No: IECEx DEK 15.0028X

Issue No: 1

Date of Issue: 2017-03-21

Page 2 of 4

Manufacturer: **Endress+Hauser GmbH+Co. KG**  
Hauptstraße 1  
79689 Maulburg  
Germany

Additional Manufacturing location(s):

**refer to Annex 2 for additional manufacturing locations**

This certificate is issued as verification that a sample(s), representative of production, was assessed and tested and found to comply with the IEC Standard list below and that the manufacturer's quality system, relating to the Ex products covered by this certificate, was assessed and found to comply with the IECEx Quality system requirements. This certificate is granted subject to the conditions as set out in IECEx Scheme Rules, IECEx 02 and Operational Documents as amended.

## STANDARDS:

The electrical apparatus and any acceptable variations to it specified in the schedule of this certificate and the identified documents, was found to comply with the following standards:

<b>IEC 60079-0 : 2011</b> Edition:6.0	Explosive atmospheres - Part 0: General requirements
<b>IEC 60079-11 : 2011</b> Edition:6.0	Explosive atmospheres - Part 11: Equipment protection by intrinsic safety "i"
<b>IEC 60079-26 : 2014-10</b> Edition:3.0	Explosive atmospheres – Part 26: Equipment with Equipment Protection Level (EPL) Ga

*This Certificate **does not** indicate compliance with electrical safety and performance requirements other than those expressly included in the Standards listed above.*

## TEST & ASSESSMENT REPORTS:

*A sample(s) of the equipment listed has successfully met the examination and test requirements as recorded in*

Test Report:

[NL/DEK/ExTR15.0036/00](#)

[NL/DEK/ExTR15.0036/01](#)

Quality Assessment Report:

[DE/TUN/QAR06.0003/06](#)



# IECEx Certificate of Conformity

Certificate No: IECEx DEK 15.0028X

Issue No: 1

Date of Issue: 2017-03-21

Page 3 of 4

## Schedule

### EQUIPMENT:

*Equipment and systems covered by this certificate are as follows:*

Liquid Level Switches Liquiphant M Type FTL50 (H)-...., Type FTL51 (H)-.... and Type FTL51 C-.... and Liquid Level Switches Liquiphant S Type FTL70-.... and Type FTL71-...., for use in explosive atmospheres caused by the presence of combustible gases, fluids, vapours or dusts, directly detect a liquid level by means of a symmetrical vibrating fork and convert it into an electrical signal. Depending on the applied electronics insert, the Liquid level Switch provides a 8/16 mA current output signal (electronics insert type FEL55), a NAMUR signal (electronics insert type FEL56 or type FEL58, inverse signal), a digital signal (electronics insert type FEL57) or a connection to a Fieldbus (electronics insert type FEL50A).

The Liquid Level Switches Liquiphant M and Liquiphant S are used for the measurement of the density or concentration of a process fluid, if provided with the electronics insert type FEL50D and connected to the Endress+Hauser Interface type FML621.

The electronics enclosure is made of plastic, aluminium or stainless steel. Depending on the version, the stainless steel sensor is mounted directly to the enclosure (compact versions, type FTL50 (H) and type FTL70) or via an extension tube (type FTL51 (H), type FTL51 C and type FTL71).

The Liquid Level Switches Liquiphant M type FTL 5. (H)-.... and Liquiphant S type FTL7-.... are also available in completely stainless steel versions, electrically identical with the versions with electronics insert type FEL58 (inverted NAMUR output signal).

The process contacting parts of Liquid Level Switch Liquiphant M type FTL51 C-.... are provided with a protective coating.

For model code break down, electrical data and thermal data, refer to Annex 1.

### SPECIFIC CONDITIONS OF USE: YES as shown below:

For Liquid Level Switch Liquiphant M Type FTL50(H)-...., Type FTL51(H)-.... and Type FTL51C-.... with an aluminium enclosure, when used as EPL Ga equipment, shall be installed in such a way that, even in the event of rare incidents, ignition sources due to impact and friction between the enclosure and iron or steel are excluded.

For the Liquid Level Switch Liquiphant M Type FTL51C provided with a protective coating of non-conductive PFA or ECTFE, precautions shall be taken to minimize the risk from electrostatic discharge or propagating brush discharges of the coated sensor surface.



# IECEX Certificate of Conformity

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Certificate No: IECEx DEK 15.0028X

Issue No: 1

Date of Issue: 2017-03-21

Page 4 of 4

**DETAILS OF CERTIFICATE CHANGES (for issues 1 and above):**

Editorial changes in approval codes

**Annex:**

[221566500 - IECEx CoC IECEx DEK 15.0028X iss.1 - Annex 1.pdf](#)

[221566500 - IECEx CoC IECEx DEK 15.0028X iss.1 - Annex 2.pdf](#)

**Annex 1 to Certificate of Conformity IECEx DEK 15.0028X, issue 1,  
to EU-Type Examination Certificate KEMA 99ATEX0523 X, Issue 6 and  
to NL/DEK/ExTR15.0036/01**

**Types:**

**Liquid Level Switch Liquiphant M**

**FTL50 – abbbccdeef+gg  
FTL50H – abbbccdeef+gg  
FTL51 – abbbccdeef+gg  
FTL51H – abbbccdeef+gg  
FTL51C – abbbccdeefg+hh**

**Liquid Level Switch Liquiphant S**

**FTL70 – abbbccdeefg+hh  
FTL71 – abbbccdeefg+hh**

- a = Approval**  
F, G, H, J, 1 or 4 (see marking on page 2)
- bbb = Process connection**  
Triple number of characters, or numbers, which define standardized threaded bosses or flanges, refer to instruction manual for details.
- cc = Probe length**  
Dual number of characters, which defines the probe length, refer to instruction manual for details.  
For FTL51C, where: \*.N = PFA conductive, \*.S = Enamel are non chargeable.  
For FTL51C, where: \*.K = ECTFE, \*.L = Edlon, \*.M = RubyRed are chargeable
- d = Electronic insert**  
A = FEL50A PROFIBUS PA / Fieldbus Foundation FF  
D = FEL50D Density / Concentration  
5 = FEL55 8/16mA-Version, 11...36 VDC  
6 = FEL56 NAMUR-Version (DIN19234)  
7 = FEL57 PFM-Version  
8 = FEL58 NAMUR-Version (EN50227) inverse signal  
9 = Software and hardware modifications, not relevant for Ex i.
- ee = Enclosure**  
\*1 = F27 Stainless steel enclosure  
\*3 = Compact housing /Hygiene version (FEL58 only)  
\*4 = F16 Polyester enclosure (not for a=J)  
\*5 = F17 Aluminium enclosure  
\*6 = F15 Stainless steel enclosure, Hygiene version  
\*7 = T13 Aluminium, with terminal partition  
\*9 = Modification of one of \*1 to \*7 enclosures for Ex i.  
C\* = Cord version (Only \*3 and FEL58)  
D\* = PG11 Plug (Only \*3 and FEL58)  
E\* = NPT 1/2" or NPT 3/4"  
F\* = Thread G 1/2 "  
G\* = Cable gland M20\*1,5  
N\* = M12 Plug
- f = Additional options**  
A = Standard (without options)  
B, C, D, K, L, N, P, R, S = Cleaned for LABS (silicon free) application, Material certificate eg. 3.1 EN10204-3, Calibration Density H<sub>2</sub>O, Ship building certification.
- g = Option in 1 or 2 digits**  
For type FTL50, FTL50H, FTL51, FTL51H:  
any combination of number and/or letter, not relevant for safety  
Process temperature range: -50 °C to +150 °C  
For type FTL51C: Additional options: A = Not selected, B and C = temperature spacer  
Process temperature range: -50 °C to +150 °C  
For type FTL70, FTL71: Process temperature range is:  
L = -60 °C to 230 °C, N = -60 °C to 280 °C and Y = -60 °C to 300 °C
- h = Option in 1 or 2 digits**  
For type FTL51C, FTL70, FTL71:  
any combination of number and/or letter, not relevant for safety

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**Marking**

Level switch Type	ATEX	IECEx/ATEX
<b>FTL50(H) – abbbccdeef+gg; FTL51(H) – abbbccdeef+gg:</b>	For a = F, G: II 1/2 G II 1/2 G II 1/2 D	Ex ia IIC T3...T6 Ga/Gb Ex ib IIC T3...T6 Ga/Gb Ex ia IIIC T80 °C Da/Db
<b>FTL51C – abbbccdeefg+hh:</b>	For a = H, J: II 1 G For a = F: II 1/2 G II 1/2 G II 1/2 D For a = 1: II 1/2 G II 1/2 G For a = 4: II 1/2 G	Ex ia IIC T3...T6 Ga (Only for cc = *N or *S) Ex ia IIC T3...T6 Ga/Gb Ex ib IIC T3...T6 Ga/Gb Ex ia IIIC T80 °C Da/Db (Only for cc = *K or *L or *M) Ex ia IIB T3...T6 Ga/Gb Ex ib IIB T3...T6 Ga/Gb (Only for cc = *K or *L or *M) Ex ia IIC T3...T6 Ga/Gb
<b>FTL70 – abbbccdeefg+hh; FTL71 – abbbccdeefg+hh:</b>	For a = F: II 1/2 G II 1/2 G II 1/2 D	Ex ia IIC T2...T6 Ga/Gb Ex ib IIC T2...T6 Ga/Gb Ex ia IIIC T80 °C Da/Db

**Thermal data**

Ambient temperature range: -50 °C to +70 °C

The max. process temperature is limited according to the following table in dependence to the temperature class or maximum surface temperature:

<b>Maximum process temperature Tp</b>					
<b>T6</b>	<b>T5</b>	<b>T4</b>	<b>T3</b>	<b>T2</b>	<b>T80 °C</b>
≤ 80 °C	≤ 95 °C	≤ 125 °C	≤ 190 °C*	≤ 290 °C	≤ 150 °C*

Note: For temperature class T6 the maximum ambient temperature at the electronics enclosure is 55 °C.

Note: For Level Limit Switches Type FTL51C with PFA/ Enamel, the maximum process temperature is 150 °C, for ECTFE, the process temperature is 120 °C.

The maximum surface temperature of the enclosure T80 °C is based on the maximum ambient temperature of 70 °C with a dust layer up to 5 mm.

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**Electrical data**

The electrical data are depending on the applied electronics insert.

Electronics insert type FEL55

Supply and output circuit (terminals 1 and 2):

in type of protection intrinsic safety Ex ia IIC, only for connection to a certified intrinsically safe circuit, with the following maximum values:

$U_i = 36 \text{ V}$ ;  $I_i = 100 \text{ mA}$ ;  $P_i = 1 \text{ W}$ ;  $C_i = 0 \text{ nF}$ ;  $L_i = 0 \text{ mH}$ .

Electronics insert type FEL56, FEL58 and stainless steel compact versions

Supply and output circuit (terminals 1 and 2, or a connector):

in type of protection intrinsic safety Ex ia IIC, only for connection to a certified intrinsically safe circuit, with the following maximum values:

$U_i = 16 \text{ V}$ ;  $I_i = 52 \text{ mA}$ ;  $P_i = 0.17 \text{ W}$ ;  $C_i = 30 \text{ nF}$ ;  $L_i = 0 \text{ mH}$ .

Electronics insert type FEL57

Supply and output circuit (terminals 1 and 2):

in type of protection intrinsic safety Ex ia IIC, only for connection to a certified intrinsically safe circuit, with the following maximum values:

$U_i = 16.7 \text{ V}$ ;  $I_i = 150 \text{ mA}$ ;  $P_i = 1 \text{ W}$ ;  $C_i = 0 \text{ nF}$ ;  $L_i = 0 \text{ mH}$ .

Electronics insert type FEL50A

Supply and output circuit (terminals 1 and 2):

in type of protection intrinsic safety Ex ia IIC, for connection to a certified intrinsically safe Fieldbus (Profibus PA), in accordance with the FISCO Model, with the following maximum values:

$U_i = 17.5 \text{ V}$ ;  $I_i = 500 \text{ mA}$ ;  $P_i = 5.5 \text{ W}$ ;  $C_i = 2.7 \text{ nF}$ ;  $L_i \leq 10 \text{ }\mu\text{H}$ ;

or for connection to a certified intrinsically safe circuit, with the following maximum values:

$U_i = 24 \text{ V}$ ;  $I_i = 250 \text{ mA}$ ;  $P_i = 1.2 \text{ W}$ ;  $C_i = 2.7 \text{ nF}$ ;  $L_i \leq 10 \text{ }\mu\text{H}$ .

Electronics insert type FEL50D

Supply and output circuit (terminals 1 and 2):

in type of protection intrinsic safety Ex ia IIC, only for connection to the intrinsically safe circuit of Endress + Hauser Interface Type FML621, with the following maximum values:

$U_i = 27.6 \text{ V}$ ;  $I_i = 93 \text{ mA}$ ;  $P_i = 640 \text{ mW}$ ;  $C_i = 2 \text{ nF}$ ;  $L_i = 133 \text{ }\mu\text{H}$ .

The sensor circuit is an internal circuit in type of protection intrinsic safety Ex ia IIC.

The supply and output circuit of the Liquid Level Switch may also be connected to a certified intrinsically safe circuit in type of protection intrinsic safety Ex ib IIC. This does not change the equipment category.

## Annex 2 to Certificate of Conformity IECEx DEK 15.0028X issue 1

### Manufacturing locations

1. Endress+Hauser GmbH+Co. KG  
Hauptstraße 1  
79689 Maulburg  
Germany
2. Endress+Hauser GmbH+Co. KG  
Miramstraße 87  
34123 Kassel  
Germany
3. Endress+Hauser (Suzhou)  
Automation Instrumentation Co. Ltd.  
China – Singapore  
Industrial Park (SIP)  
Su-Hong-Zhong-Lu, No. 491  
Jiangsu Province, 215021 Suzhou  
P.R. China
4. Endress+Hauser (India)  
Automation Instrumentation Pvt. Ltd.  
M-192, Waluj MIDC, Aurangabad – 431 136  
Maharashtra State  
India
5. Endress+Hauser (USA)  
Automation Instrumentation Inc.  
2340 Endress Place  
Greenwood, Indiana 46143  
USA
6. Endress+Hauser (Brasil)  
Instrumentação e Automação Ltda.  
Avenida Antonio Sesti, 600, Itatiba/SP  
Brasil