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

Certificate No.: IECEx DEK 15.0060

Issue No: 1

Certificate history:
Issue No. 1 (2018-09-24)
Issue No. 0 (2016-10-19)

Status: **Current**

Date of Issue: **2018-09-24**

Applicant: **Endress+Hauser SE+Co. KG**
Hauptstraße 1
79689 Maulburg
Germany

Equipment: **Liquid Level Switches Liquiphant**

Optional accessory:

Type of Protection: **Ex d e**

Marking:
Ex db eb

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.

Certificate issued by:

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

IECEx Certificate of Conformity

Certificate No: IECEx DEK 15.0060 Issue No: 1

Date of Issue: **2018-09-24** Page 2 of 4

Manufacturer: **Endress+Hauser SE+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 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:

IEC 60079-0 : 2011 Edition:6.0	Explosive atmospheres - Part 0: General requirements
IEC 60079-1 : 2014-06 Edition:7.0	Explosive atmospheres - Part 1: Equipment protection by flameproof enclosures "d"
IEC 60079-26 : 2014-10 Edition:3.0	Explosive atmospheres – Part 26: Equipment with Equipment Protection Level (EPL) Ga
IEC 60079-7 : 2006-07 Edition:4	Explosive atmospheres - Part 7: Equipment protection by increased safety "e"

*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/ExTR15.0080/01

Quality Assessment Report:

DE/TUN/QAR06.0003/07

IECEx Certificate of Conformity

Certificate No:	IECEx DEK 15.0060	Issue No: 1
Date of Issue:	2018-09-24	Page 3 of 4

Schedule

EQUIPMENT:

Equipment and systems covered by this certificate are as follows:

Liquid Level Switches Liquiphant M type FTL50-…, type FTL50H-…, type FTL51-…, type FTL51H-… and type FTL51C-… and Liquid Level Switches Liquiphant S type FTL70-… and type FTL71-… for use in explosive atmospheres caused by the presence of combustible gases, fluids or vapours. The Liquid Level Switch consists of a sensor which directly detect a liquid level by means of a symmetrical vibrating fork. The different electronic inserts in the transmitter enclosure, converts the fork frequency into an electrical signal.

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.

Depending on the version, the sensor is mounted directly to the enclosure (compact versions, type FTL50, type FTL50H and type FTL70) or via a temperature spacer and / or extension tube (type FTL51, type FLT51H, type FTL51C and type FTL71).

The process contacting parts of Liquid Level Switch Liquiphant M type FTL51C are provided with a protective coating.

For type designation, marking and technical data refer to Annex 1 to this certificate.

SPECIFIC CONDITIONS OF USE: NO

IECEx Certificate of Conformity

Certificate No: IECEx DEK 15.0060 Issue No: 1

Date of Issue: **2018-09-24** Page 4 of 4

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

- Minor changes of the construction
- Name change of the manufacturer.

Annex:

222702300-Annex 1.pdf

222702300-Annex 2.pdf

Annex 1 to Test Report NL/DEK/ExTR15.0080/01
Annex 1 to Certificate of Conformity IECEx DEK15.0060
Annex 1 to EU Type Examination Certificate DEKRA 15ATEX0088, issue 1

Description

Note: in this document [.] is used as decimal separator.

Type designation

Type Liquiphant M type FTL50-…, type FTL50H-…, type FTL51-…, type FTL51H-…

FTL50	**H**	**-**	**E**	****2**	**AA**	**A**	**E1**	**-**	**+**	**-**
I	II		III	IV	V	VI	VII	VIII		IX

Pos.	Explanation	Value	Explanation
I.	Design	50 51	Compact Pipe extension up to 6 000 mm / 235 in
II.	Line	- H	Standard Hygiene Line
III.	Approval	E I K L	II 1/2G Ex db eb IIC T6..T3 Ga/Gb (ATEX) II 1/2G Ex db eb IIC T6..T3 Ga/Gb (ATEX + IECEx) II 1/2G Ex db IIC T6..T3 Ga/Gb (ATEX + IECEx) II 1/2G Ex db IIC T6..T3 Ga/Gb (ATEX)
IV.	Process Connection	** **2 **6	Type of process connection (not relevant for Ex certification) Material Stainless Steel type 316L Material Hastelloy type C22
V.	Probe length and type	A* I* Q* or B*,C*,D* J*, K*,L* R*,S*,T* *A, *B, *E, *C, *F YY	Compact (no pipe extension) Compact, with Temperature Spacer Compact, with Temp. Spacer, Pressure Tight or Extended till 6 meter Extended till 6 meter with Temperature Spacer Extended till 6 meter with Temperature Spacer Pressure Tight Ra external roughness of probe (not relevant for Ex certification) Special version, e.g. Longer Temperature Spacer
VI.	Electronic insert	A D 1 2 4 5 6 7 8 9	FEL50A PROFIBUS PA / Fieldbus Foundation FF FEL50D Density / Concentration FEL51 AC-Version, 19...253 Vac FEL52 DC-Version, PNP, 10...55 Vdc FEL54 Relay-Version, 19...253 Vac/ 19...55 Vdc, DPDT FEL55 8/16mA-Version, 11...36 Vdc FEL56 NAMUR-Version (DIN19234) FEL57 PFM-Version FEL58 NAMUR-Version (EN50227) inverse signal FEL5x Modifications to software and hardware, not relevant for Ex certification.

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Annex 1 to Report NL/DEK/ExTR15.0080/01
Annex 1 to Certificate of Conformity IECEx DEK15.0060
Annex 1 to EU Type Examination Certificate DEKRA 15ATEX0088, issue 1

Pos.	Explanation	Value	Explanation
VII.	Enclosure and Cable Entry	*1 *5 *7 E* F* G* Y9	F27 Stainless steel 316L enclosure F13 Aluminium enclosure T13 Aluminium, with terminal partition Thread NPT 1/2" or NPT 3/4" Thread G ½ [1)] Thread M20x1,5 Modification of one of *1 to *7 enclosures for Ex d Two modifications possible, 1: reduction M20x1,5 to NPT 1/2” in the cable entry assembled, 2: cover with glass window.
VIII till IX	Additional option (cleaning / material certificate, test certificate)	custom	Not relevant for Ex certification
Note	1) Flameproof equipment with G threaded entry holes is not intended for new installations but only for replacement of equipment in existing installations.		

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Annex 1 to Certificate of Conformity IECEx DEK15.0060
Annex 1 to EU Type Examination Certificate DEKRA 15ATEX0088, issue 1

Type Liquiphant M FTL type FTL51C-…

FTL51	**C**	**-**	**E**	****N**	**BK**	**A**	**E1**	**-**	**-**	**+**	**-**
I	II		III	IV	V	VI	VII	VIII	IX		X

Pos.	Explanation	Value	Explanation
I.	Design	51	Pipe extension up to 6 000 mm
II.	Line	C	Coated version
III.	Approval	E L 2 3 5 6	II 1/2G Ex db eb IIC T6..T3 Ga/Gb (Pos. V = *N or *S) II 1/2G Ex db IIC T6..T3 Ga/Gb (Pos. V = *N or *S) II 1/2G Ex db IIB T6..T3 Ga/Gb (Pos. V = *K, *L or *M) II 1/2G Ex db eb IIB T6..T3 Ga/Gb (Pos. V = *K, *L or *M) II 1/2G Ex db IIC T6..T3 Ga/Gb (Pos. V = *K, *L or *M) (1) II 1/2G Ex db eb IIC T6..T3 Ga/Gb (Pos. V = *K, *L or *M) (1) (all are ATEX + IECEx)
IV.	Process Connection	** **N,K,L,M **S	Type of process connection (not relevant for Ex certification) Material Stainless Steel type 316L Material Hastelloy type C22
V.	Probe length and type	B*,C*,D*, E*,F*,G*, H*,K* *K *L *M *N *S YY	Probe length up to 6 000 mm / 235 in ECTFE (chargeable, suitable for IIB. For IIC see note(1)) PFA Edlon© (chargeable, suitable for IIB. For IIC see note(1)) PFA RubyRed© (chargeable, suitable for IIB. For IIC see note(1)) PFA (conductive) (non-chargeable, suitable for IIC) Enamel (non-chargeable, suitable for IIC) Special version, eg. Longer Temp. Spacer
VI.	Electronic insert	A D 1 2 4 5 6 7 8 9	FEL50A PROFIBUS PA / Fieldbus Foundation FF FEL50D Density / Concentration FEL51 AC-Version, 19...253 Vac FEL52 DC-Version, PNP, 10...55 Vdc FEL54 Relay-Version, 19...253 Vac/ 19...55 Vdc, DPDT FEL55 8/16mA-Version, 11...36 Vdc FEL56 NAMUR-Version (DIN19234) FEL57 PFM-Version FEL58 NAMUR-Version (EN50227) inverse signal FEL5x Modifications to software and hardware, not relevant for Ex certification.
VII.	Enclosure and Cable Entry	*1 *5 *7 E* F* G* Y9	F27 Stainless steel enclosure F13 Aluminium enclosure T13 Aluminium, with terminal partition Thread NPT 1/2" or NPT 3/4" Thread G½ 2) Thread M20x1,5 Modification of one of *1 to *7 enclosures for Ex d Two modifications possible, 1: reduction M20x1,5 to NPT 1/2” in the cable entry assembled, 2: cover with glass window.

Annex 1 to Report NL/DEK/ExTR15.0080/01
Annex 1 to Certificate of Conformity IECEx DEK15.0060
Annex 1 to EU Type Examination Certificate DEKRA 15ATEX0088, issue 1

Pos.	Explanation	Value	Explanation
VIII till X	Additional option (cleaning / material certificate, test certificate)	custom	Not relevant for Ex certification

Notes:
1. The 'conditions' as mentioned in the manufacturer safety instructions are applicable.
2. Flameproof equipment with G threaded entry holes is not intended for new installations but only for replacement of equipment in existing installations.

Annex 1 to Report NL/DEK/ExTR15.0080/01
Annex 1 to Certificate of Conformity IECEx DEK15.0060
Annex 1 to EU Type Examination Certificate DEKRA 15ATEX0088, issue 1

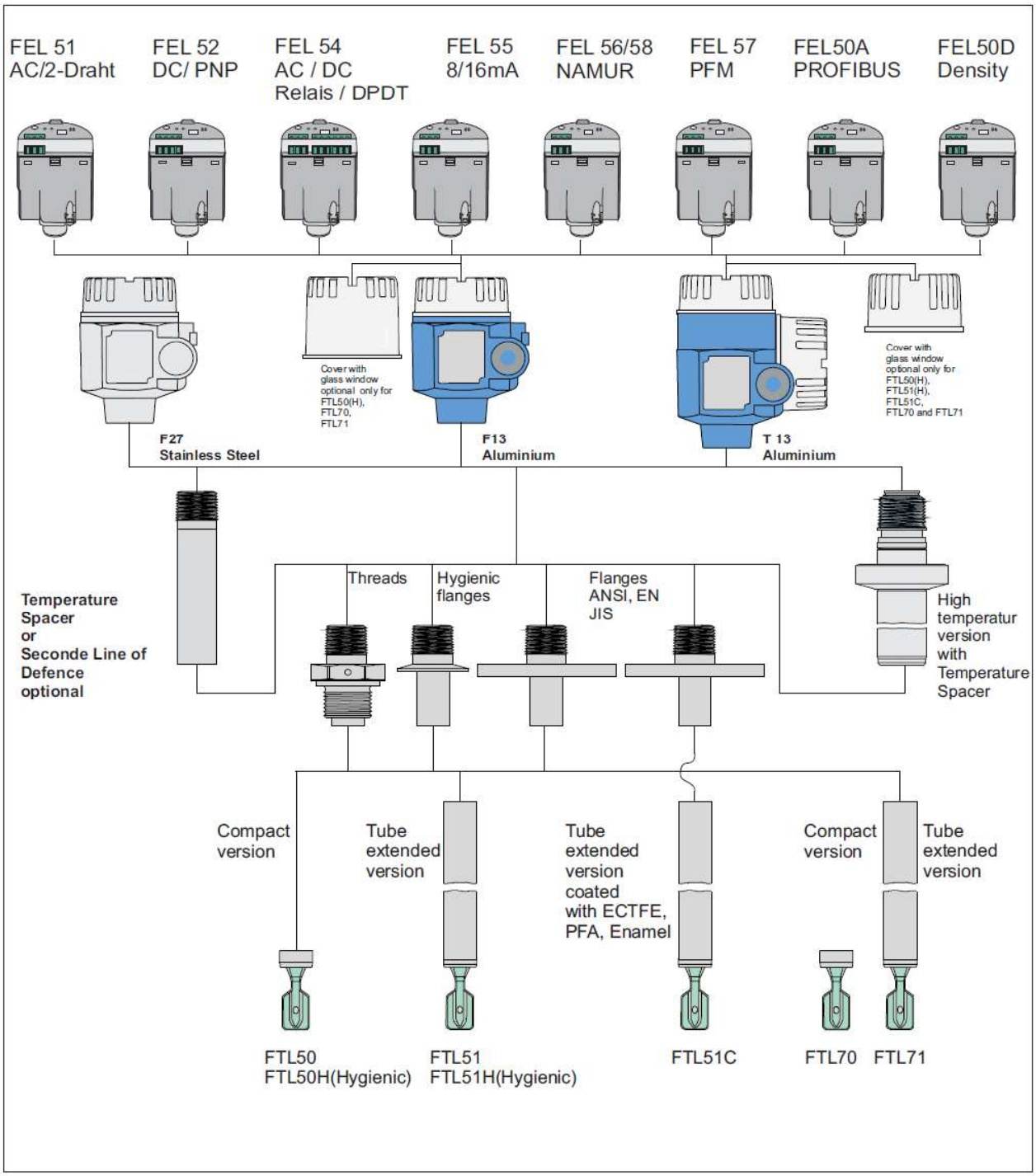
Type Liquiphant S type FTL70-…, type FTL71-…,

FTL70	**-**	**E**	****2**	**AB**	**A**	**E1**	**-**	**-**	**+**	**-**
I		II	III	IV	V	VI	VII	VIII		IX

Pos.	Explanation	Value	Explanation
I.	Design	70 71	Compact Pipe extension up to 6 000 mm / 235 in
II.	Approval	E L	II 1/2G Ex db eb IIC T6...T1 Ga/Gb (ATEX + IECEx) II 1/2G Ex db IIC T6...T1 Ga/Gb (ATEX + IECEx)
III.	Process Connection	** **2 **6	type of process connection (not relevant for Ex certification) Material Stainless Steel type 316L Material Hastelloy type C22
IV.	Probe length and type	A* B*,C* *B, *E YY	Compact (no pipe extension), Temp. Spacer, Gas tightPipe Extended till 6 meter / 235 in, Temp. Spacer, Gas tight Ra external roughness of probe (not relevant for Ex certification) Special version, e.g. Longer Temp. Spacer
V.	Electronic insert	A D 1 2 4 5 6 7 8 9	FEL50A PROFIBUS PA / Fieldbus Foundation FF FEL50D Density / Concentration FEL51 AC-Version, 19...253 Vac FEL52 DC-Version, PNP, 10...55 Vdc FEL54 Relay-Version, 19...253 Vac/ 19...55 Vdc, DPDT FEL55 8/16mA-Version, 11...36 Vdc FEL56 NAMUR-Version (DIN19234) FEL57 PFM-Version FEL58 NAMUR-Version (EN50227) inverse signal FEL5x Modifications to software and hardware, not relevant for Ex certification.
VI.	Enclosure and Cable Entry	*1 *5 *7 E* F* G* Y9	F27 Stainless steel enclosure F13 Aluminium enclosure T13 Aluminium, with terminal partition Thread NPT 1/2" or NPT 3/4" Thread G ½ 1) Thread M20x1,5 Modification of one of *1 to *7 enclosures for Ex d Two modifications possible, 1: reduction M20x1,5 to NPT 1/2” in the cable entry assembled, 2: cover with glass window.
VII.	Additional option (cleaning / material certificate)	custom	Not relevant for Ex certification
VIII.	Application	custom	gas-tight feed through for process temperatures up to 300 °C
IX.	Test certificate	custom	Not relevant for Ex certification
Note	1) Flameproof equipment with G threaded entry holes is not intended for new installations but only for replacement of equipment in existing installations.		

Overview of Liquiphant M and Liquiphant S modular system

Annex 1 to Report NL/DEK/ExTR15.0080/01
Annex 1 to Certificate of Conformity IECEx DEK15.0060
Annex 1 to EU Type Examination Certificate DEKRA 15ATEX0088, issue 1



Annex 1 to Report NL/DEK/ExTR15.0080/01
Annex 1 to Certificate of Conformity IECEx DEK15.0060
Annex 1 to EU Type Examination Certificate DEKRA 15ATEX0088, issue 1

Thermal data

The relation between types of Liquid Level Switches, ambient temperature and process temperature is given in the table below:

Types of Liquid Level Switches	Ambient temperature range	Process temperature range
Liquiphant M with type of protection 'Ex d e'	-50 ºC to +70 ºC	-50 °C to +150 °C
Liquiphant M with type of protection 'Ex d' and enclosure with glass window cover		
Liquiphant M with type of protection 'Ex d' and enclosure with blind cover	-60 ºC to +70 ºC	
Liquiphant S with type of protection 'Ex d e'	-50 ºC to +70 ºC	-60 °C to +300 °C
Liquiphant S with type of protection 'Ex d' and enclosure with glass window cover		
Liquiphant S with type of protection 'Ex d' and enclosure with blind cover	-60 ºC to +70 ºC	

The relation between types of Liquid Level Switches, ambient temperature, process temperature and temperature class is given in the table below:

Types of Liquid Level Switches	Maximum ambient temperature	Maximum process temperature	Temperature class
All types, except for types with electronic insert type 'FEL54'.	+70 ºC	+75 °C	T6
All types and electronic insert type 'FEL54', limited to 4 A relays current.	+55 ºC		
All types and electronic insert type 'FEL54', limited to 4 A relays current.	+70 ºC with Temperature Spacer +50 °C without Temperature Spacer or Temperature Spacer isolated. See derating diagrams in Safety manual.	+90 °C	T5
All types, except for FTL51C with type of probe ECTFE		+125 °C	T4
FTL51C with type of probe ECTFE		+120 °C	T4
FTL50, FTL50H, FTL51, FTL51H, FTL51C with type of probe PFA or Enamel		+150 °C	T3
Liquiphant S (FTL70, FTL71)		+190 °C	T3
Liquiphant S (FTL70, FTL71)		+285 °C	T2
Liquiphant S (FTL70, FTL71)		+300 °C	T1

Technical data

Degree of protection: IP66
Process pressure: Vacuum and up to 100 bar depending on type

Annex 1 to Report NL/DEK/ExTR15.0080/01
Annex 1 to Certificate of Conformity IECEx DEK15.0060
Annex 1 to EU Type Examination Certificate DEKRA 15ATEX0088, issue 1

Electrical data

The relation between electronic insert, circuit and rating is given in the table below:

Electronic insert	Circuit	Rating
FEL51	Supply circuit:	U = 19…253 Vac, 50/60Hz; P_{max} = 0.96 VA
	Output:	I_{max} = 350 mA
FEL52	Supply circuit:	U = 10..55 V_{DC}, P_{max} = 0.83 W
	Output:	PNP transistor, I_{max} = 350 mA
FEL54	Supply circuit:	U = 19…253 Vac, 50/60Hz or U = 19…55 Vdc; P_{max} = 1,3 W
	Output:	2 potential free change-over contacts, rated 4 A Ex e / 6 A Ex d
FEL55	Supply circuit:	U = 11...36 Vdc, P_{max} = 0.6 W
	Output:	I_{max} = 22 mA
FEL56	Supply circuit:	U = 4...12.5 Vdc; P_{max} = 0.23 W
	Output:	NAMUR I_{max} = 3.5 mA
FEL57	Supply circuit:	U_{max} = 16.7 Vdc; P_{max} = 0.15 W
	Output:	PFM: I_{max}= 12 mA
FEL58	Supply circuit:	U = 4...12.5 Vdc; P_{max}= 0.23 W
	Output:	NAMUR I_{max} = 3.5 mA
FEL50A	Supply circuit:	For connection to a Fieldbus
	Output:	Profibus PA or Foundation Fieldbus (FF)
FEL50D	Supply circuit / Output	Only for connection to Endress+Hauser Interface Type FML621