

CERTIFICATE

(1) EU-Type Examination

(2) **Equipment or protective systems intended for use in potentially explosive atmospheres - Directive 2014/34/EU**

(3) EU-Type Examination Certificate Number: **DEKRA 15ATEX0088** Issue Number: **1**

(4) Product: **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-...**

(5) Manufacturer: **Endress+Hauser SE+Co. KG**

(6) Address: **Hauptstraße 1, 79689 Maulburg, Germany**

(7) This product and any acceptable variation thereto is specified in the schedule to this certificate and the documents therein referred to.

(8) DEKRA Certification B.V., Notified Body number 0344 in accordance with Article 17 of Directive 2014/34/EU of the European Parliament and of the Council, dated 26 February 2014, certifies that this product has been found to comply with the Essential Health and Safety Requirements relating to the design and construction of products intended for use in potentially explosive atmospheres given in Annex II to the Directive.

The examination and test results are recorded in confidential test report number NL/DEK/ExTR15.0080/01.

(9) Compliance with the Essential Health and Safety Requirements has been assured by compliance with:

EN 60079-0 : 2012 + A11 : 2013
EN 60079-7 : 2007

EN 60079-1 : 2014
EN 60079-26 : 2015

except in respect of those requirements listed at item 18 of the Schedule.

(10) If the sign "X" is placed after the certificate number, it indicates that the product is subject to the Specific Conditions of Use specified in the schedule to this certificate.

(11) This EU-Type Examination Certificate relates only to the design and construction of the specified product. Further requirements of the Directive apply to the manufacturing process and supply of this product. These are not covered by this certificate.

(12) The marking of the product shall include the following:



Refer to Annex 1 to this certificate for Type designation and Equipment marking.

Date of certification: 24 September 2018

DEKRA Certification B.V.

R. Schuller
Certification Manager



(13) **SCHEDULE**

(14) **to EU-Type Examination Certificate DEKRA 15ATEX0088**

Issue No. 1

(15) **Description**

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.

Installation instructions

The instructions provided with the product shall be followed in detail to assure safe operation.

(16) **Report Number**

No. NL/DEK/ExTR15.0080/01.

(17) **Specific conditions of use**

None.

(18) **Essential Health and Safety Requirements**

Covered by the standards listed at item (9).

(19) **Test documentation**

As listed in Report No. NL/DEK/ExTR15.0080/01.

(20) **Certificate history**

Issue 0 - 218554700 initial certificate.

Issue 1 - 222702300 Name change of the manufacturer, minor changes of the construction

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.

Annex 1 to Report NL/DEK/ExTR15.0080/01

Annex 1 to Certificate of Conformity IECEx DEK15.0060

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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 1/2 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.		

Annex 1 to Report NL/DEK/ExTR15.0080/01
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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.

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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.

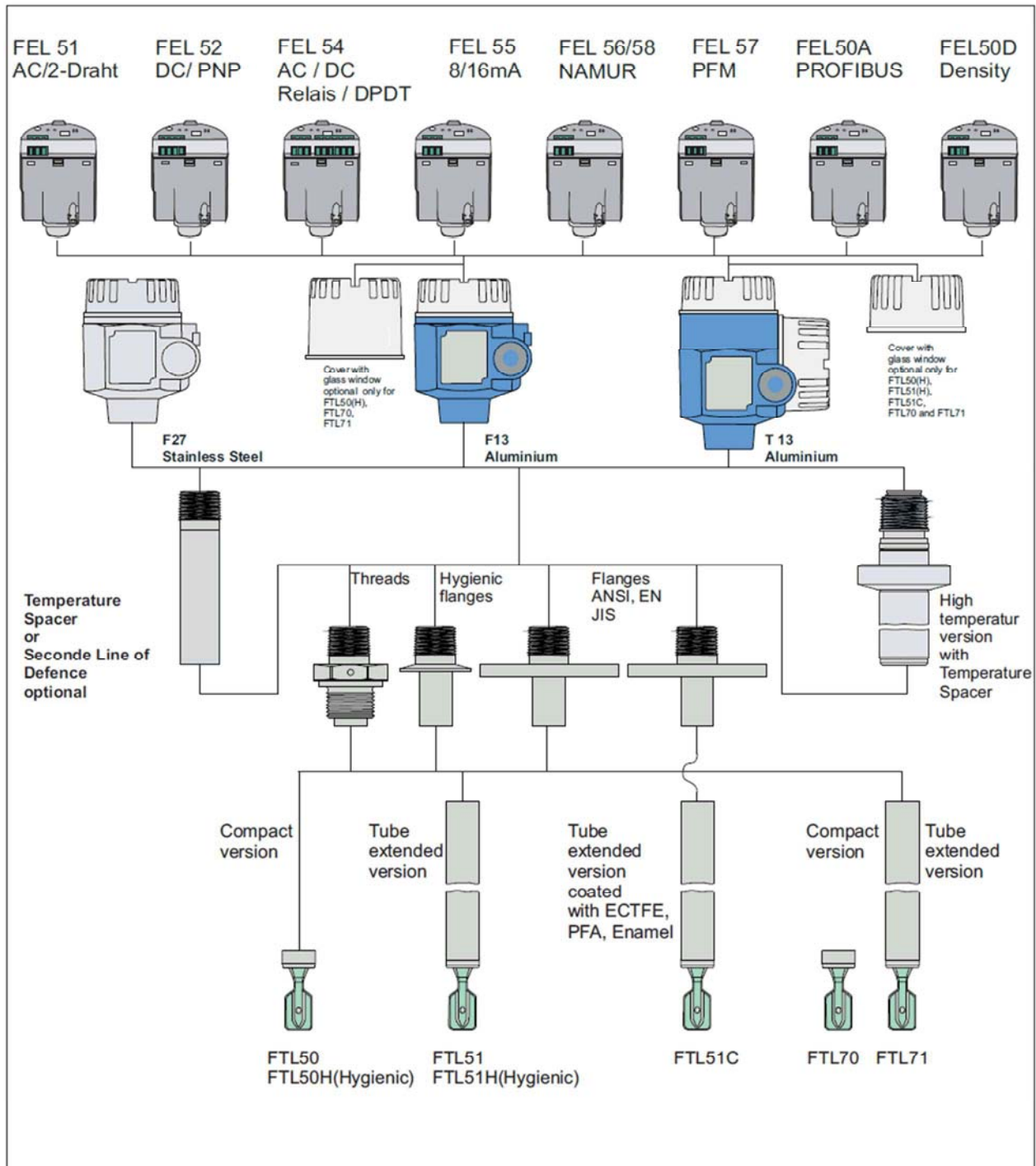
Annex 1 to Report NL/DEK/ExTR15.0080/01
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Type Liquiphant S type FTL70-..., type FTL71-...,

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 tight 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 1/2 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
<p>Note 1) Flameproof equipment with G threaded entry holes is not intended for new installations but only for replacement of equipment in existing installations.</p>			

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
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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 °C to +70 °C	-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 °C to +70 °C	
Liquiphant S with type of protection 'Ex d e'	-50 °C to +70 °C	-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 °C to +70 °C	

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 °C	+75 °C	T6
All types and electronic insert type 'FEL54', limited to 4 A relays current.	+55 °C		
All types and electronic insert type 'FEL54', limited to 4 A relays current.	+70 °C 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

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Electrical data

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

Electronic insert	Circuit	Rating
FEL51	Supply circuit:	$U = 19 \dots 253 \text{ Vac}$, 50/60Hz; $P_{\max} = 0.96 \text{ VA}$
	Output:	$I_{\max} = 350 \text{ mA}$
FEL52	Supply circuit:	$U = 10 \dots 55 \text{ V}_{\text{DC}}$, $P_{\max} = 0.83 \text{ W}$
	Output:	PNP transistor, $I_{\max} = 350 \text{ mA}$
FEL54	Supply circuit:	$U = 19 \dots 253 \text{ Vac}$, 50/60Hz or $U = 19 \dots 55 \text{ Vdc}$; $P_{\max} = 1,3 \text{ W}$
	Output:	2 potential free change-over contacts, rated 4 A Ex e / 6 A Ex d
FEL55	Supply circuit:	$U = 11 \dots 36 \text{ Vdc}$, $P_{\max} = 0.6 \text{ W}$
	Output:	$I_{\max} = 22 \text{ mA}$
FEL56	Supply circuit:	$U = 4 \dots 12.5 \text{ Vdc}$; $P_{\max} = 0.23 \text{ W}$
	Output:	NAMUR $I_{\max} = 3.5 \text{ mA}$
FEL57	Supply circuit:	$U_{\max} = 16.7 \text{ Vdc}$; $P_{\max} = 0.15 \text{ W}$
	Output:	PFM: $I_{\max} = 12 \text{ mA}$
FEL58	Supply circuit:	$U = 4 \dots 12.5 \text{ Vdc}$; $P_{\max} = 0.23 \text{ W}$
	Output:	NAMUR $I_{\max} = 3.5 \text{ mA}$
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