



EU-TYPE EXAMINATION CERTIFICATE

2 Equipment intended for use in Potentially Explosive Atmospheres Directive 2014/34/EU

3 Certificate Number: CSANe 24ATEX1167X Issue: 0

4 Equipment: Compact Line Vibronic sensor models Liquiphant FTL43 and FTL60

5 Applicant: Endress+Hauser SE+Co. KG 6 Address: Hauptstrasse 1, Maulburg, Baden-

Württemberg 79689, Germany

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

8 CSA Group Netherlands B.V., notified body number 2813 in accordance with Articles 17 and 21 of Directive 2014/34/EU of the European Parliament and of the Council, dated 26 February 2014, certifies that this equipment has been found to comply with the Essential Health and Safety Requirements relating to the design and construction of equipment intended for use in potentially explosive atmospheres given in Annex II to the Directive.

The examination and test results are recorded in the confidential reports listed in Section 14.2.

9 Compliance with the Essential Health and Safety Requirements, with the exception of those listed in the schedule to this certificate, has been assured by compliance with the following documents:

EN IEC 60079-0:2018

EN 60079-11:2012

EN 60079-26:2015

- If the sign 'X' is placed after the certificate number, it indicates that the equipment is subject to Specific Conditions of Use identified in the schedule to this certificate.
- This EU-Type Examination Certificate relates only to the design and construction of the specified equipment. If applicable, further requirements of this Directive apply to the manufacture and supply of this equipment.
- 12 The marking of the equipment shall include the following:



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

Ex ia IIC T4 Ga/ Ex ia IIIB T135°C Db

Signed:

M Halliwell

Title: Senior Director of Operations







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13 DESCRIPTION OF EQUIPMENT

The Liquiphant Compact Line devices FTL43 and FTL60 are point level switches for liquids and can be used for:

Maximum Working Pressure (MWP) up to 100 bar Process temperatures up to 150°C.

The main differences for the FTL43 and the FTL60 is the application in where they are intended to be used:

- -FTL43 is used for hygienic industrial applications with a maximum working pressure (MWP) up to 64bar and e.g., with a smaller surface roughness as the standard version of the Liquiphant Compact Line sensor.
- -FTL60 is used for process industrial applications, with a maximum working pressure (MWP) up to 100bar and e.g., with the standard surface roughness of the Liquiphant Compact Line sensor.

To reduce the influence of the process temperature, it is possible that the sensor is available with a temperature spacer which is outside of the process (vessel). The sensor length (inside the process / vessel) can vary between a compact, short or an extended sensor length up to 1.5m for the standard device and up to 6m for a customer specific length (depend on the switching point of the sensor required by the customer).

Measuring Principle:

For point level detection in liquids a sensor in form of a tuning fork is excited at its resonant frequency. The drive works piezoelectrically. The oscillating frequency changes as the fork enters the medium. The change is analyzed and translated into a switching signal.

The Compact Line Liquiphant devices FTL43 / FTL60 uses Ex component of the Compact Platform Electronics (device enclosure, visual unit, terminal unit, main unit (e.g. MA20: HART) certified under IECEx CSA 24.0035U and Ex sensor specific component (e.g. sensor electronic EA22-01A, Liquiphant piezo sensor SV20-XXX and different process connections) certified under IECEx CSAE 24.0046U.

The FTL43 and FTL60 enclosure [HY20-03A] consists of the following parts:

- Metallic Cover with plastic window unit part, which covers the LED module (VA22-01A)
- Metallic Housing unit part with M12 connector for the input power, which contains:
 - Terminal Electronic (2-wire) [TA20-01A] with its Terminal housing for Ex-ia HART
 - Electronic plastic box which contains the Main electronics 2 wire [MA20-01A] and sensor electronics [EA22-01] under potting
- Metallic Housing adapter for the SV20-XXX sensor
- Metallic Sensor SV20-XXX which could be of three types:
 - Compact sensor
 - Sensor with tube extension
 - Compact sensor with temperature spacer with/without pressure tight feed through

The metallic cover with the housing and with the adapter and with the sensor parts are full welded together and form a fully enclosed enclosure and evaluated entirely as intrinsically safe Ex ia IIC with entity parameters and also evaluated for different zones separations and as Single seal device as per listed standards.

The entity parameters at the M12 connector, in type of protection Ex ia IIC or Ex ic IIC:





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In type of protection Ex ia IIIB or Ex ic IIIB:

Ui = 30 V Ii = 100 mA Pi = 650 mW Ci = 15nF Li = 0

Li = 0.69 mH

Ordering Codes

	FTL	43	60	-aa bb c d e f g h ii jj kkk + ll mm nn oo pp qq rr γγ
aa=10				Approval:
	BA	Χ	X	ATEX/IEC II 1G Ex ia IIC T4 Ga
BB		Χ	X	ATEX/IEC II 1/2G, 2G Ex ia IIC T4 Ga/Gb
	BH	Χ	X	ATEX/IEC II 1D Ex ia IIIB Da
	BI	Χ	X	ATEX/IEC II 1G Ex ia IIC T4 Ga, II 1D Ex ia IIIB Da
	BK	Χ	Х	ATEX/IEC II 1/2G, 2G Ex ia IIC T4 Ga/Gb, II 1/2D, 2D Ex ia IIIB Da/Db
bb=20				Output:
	BA	Х	X	2-wire 4-20mA (8/16mA) HART
c=30				Display; Operation:
	В	Х	X	LED
	С	Χ	X	LED with control button
	D	Χ	X	LED with control button + Bluetooth
	Υ	X	X	Modification of the above named option in (e.g. colour of LED). Not relevant for
	<u>'</u>	^		explosion protection.
			_	
d=40				Housing; Material:
	F	Х	X	Compact; 316L
e=50				Electrical Connection:
0-30	N	Х	Х	Plug M12, IP66/68/69 NEMA Type 4X/6P
	Y	X	X	Modification of the above mentioned option. Not relevant for explosion protection.
	<u>'</u>	, A	\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	indunication of the above mentioned option. Not relevant for explosion protection.
				Application
f=60	Α	Х	Х	Process max 150oC/302oF, max 64bar
	В		Х	Process max 150oC/302oF, max 100bar
	Υ	Х	Х	Modification of the above mentioned option. Not relevant for explosion protection.
g=80				Surface Refinement:
	Α	Х		Standard Ra<1.5µm/59uin
	Α		X	Standard Ra<3.2µm/126µin
	В	Χ		Hygienic Ra<0.76 μm/30 μin
	D	Х		Hygienic Ra<0.3µm/12uin mech. polished
	E	Χ		Hygienic Ra<0.38µm/15uin electropolished
	Υ	Х	X	Modification of the above mentioned option (e.g. different Ra). Not relevant for
	T	^	_^	explosion protection.
h=85				Type of Probe:
	1	Х	X	Compact version
	2	Х	X	Tube extension
	3	Χ	Х	Short tube version

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	FTL	43	60	-aa bb c d e f g h ii jj kkk + ll mm nn oo pp qq rr γγ
				Modification of the above mentioned option (e.g. shorter than standard version, probe
	9	Χ	X	angled).
				Not relevant for explosion protection.
ii=90				Sensor Length: Material:
	AC		Х	Compact version; AlloyC22
	AJ	Х	Х	Compact version; 316L
	BC		X	Short tube version; AlloyC22
	BJ	Х	X	Short tube version; 316L
	BL	X		153 mm L, Ra<1.5µm/59µin; 316L
	BS	X		253 mm L, Ra<1.5µm/59µin; 316L
	BL		Х	153 mm L, Ra<3.2µm/126µin; 316L
	BS		X	253 mm L, Ra<3.2µm/126µin; 316L
	CC		X	mm L, Ra<3.2µm/126µin; AlloyC22
	CT		X	mm L, Ra<3.2µm/126µin; 316L
	C1	Х		mm L, Ra<1.5µm/59µin; 316L
	DC	^	Х	
	DJ		X	inch L, Ra<3.2µm/126µin; AlloyC22 inch L, Ra<3.2µm/126µin; 316L
		V		
	FJ	X		mm L, Ra<0.3µm/12µin; 316L
	GJ	X		mm L, Ra<0.38µm/15µin electro polished; 316L
	KJ	X		inch L; Ra<1.5µm/59µin; 316L
	MJ	X	-	inch L; Ra<0.3µm/12µin; 316L
	NJ	Χ		inch L; Ra<0.38µm/15µin electro-polished; 316L
	YY	Х	Х	Modification of one of the above mentioned options (max. L=6m, e.g. material Duplex steel, different Alloy-C-version). Not relevant for explosion protection.
jj=105				Process connection, Sealing Surface:
				Standard industrial process connection: threaded, flange (e.g. Varivent, Clamp/Tri-
	##	X	X	Clamp, Thread EN10226 (R), Thread ISO228 (G),)
				Modification of one of the above mentioned options (customer specific connections).
	99	X	X	Not relevant for explosion protection.
kkk=110				Process Connection:
	###	Х	Х	Standard industrial process connection: flanges, threaded, flush mount diaphragm seal, 316L, Alloy C22
	9YY	Х	Х	Modification of one of the above mentioned options (customer specific connections).
	711	^		Not relevant for explosion protection.
II_E4O				> Application Dackago
II=540	FII	V	V	>>Application Package:
	EH	Х	X	Heartbeat Verification + Monitoring
	E9	Х	Х	Modification of one of the above mentioned options (customer specific variant). Not relevant for explosion protection.
mm=570				>>Service:
111111-370				Representing different services like cleaned from oli + fat, cleaned for Oxygen
				applications, settings to the device different from delivery standard or product
	##	# v	X	documentation on paper, etc
	X		" X X	Not relevant for explosion protection.
				Special version (only modification by firmware) not given in the standard order code.
	19	X	Х	Examples: Switch Point, Switch Time or Switch Density, Foam Detection.





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nn=580	,,			Not relevant for explosion protection.		
	,,					
	,,					
	,,			>>Test, Certificate, Declaration:		
##	#	Material certificates wetted metallic parts, pressure test, leakage		Material certificates wetted metallic parts, pressure test, leakage test, PMI-test. Not relevant for explosion protection.		
К9	9	Х	Χ	Modification of one of the above mentioned options: Customer specific variant. Not relevant for explosion protection.		
00=590				>>Additional Approval:		
##	#	Х	Χ	Additional approvals, no influence to explosion protection; e.g.: SIL, WHG, Ship building, drinking water, CRN. Not relevant for explosion protection.		
L9)	Х	Χ	Modification of one of the above mentioned options: Further approvals. Not relevant for explosion protection.		
pp=600				>Sensor Design:		
MR	R	Χ	Χ	Temperature spacer		
MS	S	Χ	Χ	Temperature spacer + Pressure tight feed through (Second line of defence)		
M9	9	х	Х	Modification of one of the above mentioned options or special sensor version not given in the standard order code: Shorter, Longer or Angled version of the sensor tube. Not relevant for explosion protection.		
qq=620				>>Accessory Enclosed:		
##	#	Х	Х	Not part of the approval, because only enclosed parts. Example: Accessory can be a weld-in adapter, plug connector M12 with/without cable. M12 made in plastic or metal with different		
rr=850				>Firmware Version		
##	#	Х	Χ	Representing different firmware versions. Not relevant for explosion protection.		
γγ=895				>>Marking:		
Zx	(Х	Х	Tagging acc. customer order. Not relevant for explosion protection.		

14 DESCRIPTIVE DOCUMENTS

14.1 Drawings

Refer to Certificate Annexe.

14.2 Associated Reports and Certificate History

Issue	Date	Report number	Comment
0	20 May 2025	R80191569A	The release of the prime certificate.

- 15 SPECIFIC CONDITIONS OF USE (denoted by X after the certificate number)
- 15.1 In applications where the process temperature exceeds the temperature class, the hot surface ignition at the process connecting parts of the device shall be monitored.
- To avoid electrostatic charging in explosive atmospheres, avoid rubbing of the non-metallic surfaces using electrostatic generating materials. Do not use the device in applications with moving dust atmosphere causing electrostatic charging.





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- 15.3 It is essential for the device to use a power supply that is galvanically isolated from earth.
- 15.4 When using an intrinsically safe barrier, the barrier must be connected to the same earth as the device.
- 15.5 Maximum working pressure (MWP) for model FTL 43 is 64 bar and for FTL 60 is 100 bar.
- 15.6 Pipe/tube extension version is max. 6m and was included in the intrinsically safe evaluation.
- Only the surface roughness with the order code g (080) = A for FTL43 and FTL60 can be used for EPL Da/Gb and EPL Ga/Db applications.
- 15.8 The FTL 43/60 models with surface roughness with the order code g (080) = D, E shall not be exposed to environmental, chemical or physical factors that could affect the partition.
- 15.9 The process connection including sealing should maintain a tight joint as IP66 or IP67 according to IEC 60529 under the max process pressure conditions.
- 15.10 The FTL 43/60 devise has to be installed within a maximum range of the ambient -40°C ≤ Tamb ≤ +70°C and a maximum process temperature of 150°C but there is an ambient and process temperature derating depending on the Zones and the EPL of installation as shown below:

Marking: Ex ia IIC T4 Ga or Ex ia IIC T4 Ga/Gb or Ex ic IIC T4...T1 Gc Entity parameters: Ui = 30 V, Ii = 100 mA, Pi = 700 mW Tp -Process temperature (EPL Ga) Ta-Ambient temperature ((EPL Ga or EPL Gb) Device + Sensor P2 P3 P4 Unit configuration $T_{\underline{a}}$ T_a T_p T_a T_p T_p T_a Tp T_a T_p T4 -40 70 80 70 125 50 125 -40 -40 -40 °C. T3...T1 140 40 70 -40 70 80 150 -40 -40 -40 150 30 T_{spacer} Device + Р3 Unit + Sensor T_a T_p T_a T_p Tp T_{a} Tp T_a T_p T_a configuration T4 70 70 °C -40 80 125 60 125 -40 -40 -40 T3...T1 70 -40 70 80 150 60 150 -40 -40 -40

Marking: Ex ia IIIE	Marking: Ex ia IIIB T135°C Da							
Entity parameters:	Entity parameters: Ui = 30 V, Ii = 100 mA, Pi = 650 mW							
Device + sensor with/without temperature spacer (T _{spacer}).	Process temperature (T _p) [°C]	EPL Da Ambient temperature (T _a) [°C]	Marking surface temperature (device + sensor)	Remark				
	-40 ≤ T _p ≤ 70	-40 ≤ T _a ≤ 70	T135°C	For EPL Da in Zone 20 a dust immersion or dust layer is permitted acc. IEC 60079-11:2021 cl. 5.4.5				





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Marking: Ex ia IIIB T135°C Da/Db Entity parameters: Ui = 30 V, Ii = 100 mA, Pi = 650 mW							
Device + Sensor configuration	EPL Da Process temperature (Tp) [°C]	EPL Db (Dc) Ambient temperature (T _a) [°C]	Marking surface temperature (device + sensor)	Remark			
	-40 ≤ T _p ≤ 70	-40 ≤ T _a ≤ 70	T135°C	Da/Db → Same as for a EPL Da.			

	Marking: Ex ia IIIB T135°C Da/Db Entity parameters for the device input: Ui = 30 V, Ii = 100 mA, Pi = 650 mW						
Device + T _{spacer} + Sensor configuration	EPL Da Process temperature (Tp) [°C]	EPL Db (Dc) Ambient temperature (T _a) [°C]	Marking surface temperature (device + sensor)	Remark			
	-40 ≤ T _p ≤ 100	-40 ≤ T _a ≤ 45	T135°C	Zone 20: For EPL Da in Zone 20 a dust immersion or dust layer is permitted acc. IEC 60079-11:2021 cl. 5.4.5 Zone 21: For the EPL Db in Zone 21 (EPL Db assumed as Da) only a dust cloud, but no dust layer is permitted The enclosure is rated as IP 66/68 acc. IEC 60529.			
	-40 ≤ T _p ≤ 70	-40 ≤ T _a ≤ 70		Zone 20: For EPL Da (EPL Db assumed as Da) in Zone 20 (Zone 21) a dust immersion or dust layer is permitted acc. IEC 60079- 11:2021 cl. 5.4.5. Same as for EPL Da			





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Marking: Ex ia IIIB T135°C Da / Ex ia IIC T4 Gb Entity parameters: Ui = 30 V, Ii = 100 mA, Pi = 700 mW								
Device + Sensor configuration with/without T _{spacer}	EPL Da Process temperature (Tp) [°C]	EPL Gb Ambient temperature (T _a) [°C]	Marking max. Surface temperature and T-class	Remark				
	-40 ≤ T _p ≤ 100	-40 ≤ T _a ≤ 60	EPL Da (Zone 20): T135°C EPL Gb (Zone 1): T4	For EPL Da in Zone 20 a dust immersion or dust layer is permitted acc to IEC 60079-11:2021 Cl.5.4.5 For EPL Gb the limit is T4 which is fulfilled with the Tp and Ta				

Marking: Ex ia IIC T4 Ga / Ex ia T135°C IIIB Db Entity parameters: Ui = 30 V, Ii = 100 mA, Pi = 650 mW							
Device + Sensor configuration	EPL Ga Process temperature (Tp) [°C]	EPL Db Ambient temperature (T _a) [°C]	Marking max. Surface temperature and T-class	Remark			
	-40 ≤ T _p ≤ 70	-40 ≤ T _a ≤ 70	EPL Ga (Zone 0): T4 EPL Db (Zone 21): T135°C	Zone 21: For the EPL Db no dust layer is permitted, only a dust cloud The enclosure is rated as IP 66/68 acc. IEC 60529.			
Device + T _{spacer} + Sensor configuration	EPL Ga Process temperature (T _p) [°C]	EPL Db Ambient temperature (T _a) [°C]	Marking max. Surface temperature and T-class	Remark			
	$-40 \le T_p \le 125$ (125°C is the limit for T4) $-40 \le T_p \le 70$	$-40 \le T_a \le 40$ $-40 \le T_a \le 70$	EPL Ga (Zone 0): T4 EPL Db (Zone 21,22): T135°C	Zone 21: For the EPL Db no dust layer is permitted, only a dust cloud The enclosure is rated as IP 66/68 acc. IEC 60529.			





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16 ESSENTIAL HEALTH AND SAFETY REQUIREMENTS OF ANNEX II (EHSRs)

The relevant EHSRs that are not addressed by the standards listed in this certificate have been identified and individually assessed in the reports listed in Section 14.2.

17 CONDITIONS OF MANUFACTURE

- 17.1 The use of this certificate is subject to the Regulations Applicable to Holders of CSA Group Netherlands B.V. certificates.
- 17.2 Holders of EU-Type Examination Certificates are required to comply with the conformity to type requirements defined in Article 13 of Directive 2014/34/EU.
- 17.3 Routine test for the encapsulant for the complete device has to be conducted as per E+H procedure to comply with IEC 60079-11 Ed. 7 Cl 10.4.
- 17.4 The products covered by this certificate incorporate previously certified devices as shown below in the table, it is therefore the responsibility of the manufacturer to continually monitor the status of the certification associated with these devices, and the manufacturer shall inform CSA Group of any modifications of the devices that may impinge upon the explosion safety design of their products.

Component	Model	Certificate or Report	Standards
Enclosure	HY20-** & HY21-** Series	CSA report number 80184761, dated March 07, 2024	CSA C22.2 No. 94.2:20 Third Edition & ANSI/UL 50E Third Edition, October 15, 2020
Platform Electronics	Compact Platform, consisting of modules TA20-01A, MA20-01A, VA20-02A and VA22-01A	CSANe 24ATEX1149U issue 0	EN IEC 60079-0:2018 IEC 60079-11, edition 7.0
Liquiphant Sensor Component.	EA22-01A+SV20-xxx	CSANe 24ATEX1179U issue 0	EN IEC 60079-0:2018 EN 60079-11:2012 EN 60079-26:2015

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Certificate Annexe

Certificate Number: CSANe 24ATEX1167X



Equipment: Compact Line Vibronic sensor models Liquiphant FTL43 and FTL60

Applicant: Endress+Hauser SE+Co. KG

Issue 0

Drawing	Sheets	Rev.	Date (Stamp)	Title	
961007181	1 of 1	Α	30 Apr 25	Overview FTL43/FTL60 Process connection	
961007185	1 of 1	Α	30 Apr 25	Assembly CL FTL43/FTL60	
961007339	1 of 1	Α	30 Apr 25	Overview Housing Compact Line	
961007338	1 of 1	Α	30 Apr 25	Overview potting	
961007432	1 to 3	Α	30 Apr 25	Order code FTL43 FTL60 ATEX,UKEx (Cat.1+2) and IECEx (Cat.	
				1+2+3). Based on 961007433.	
961007745	1 to 3	Α	30 Apr 25	Nameplate ATEX/IECEx/UKEx CL FTL43/FTL60	
961006634	1 to 8	Α	30 Apr 25	Addendum IECEx/ATEX/UKEx AIC MA20-01A	
961006637	1 to 6	Α	30 Apr 25	Addendum IECEx/ATEX/UKEx AIC VA22-01A	
961006638	1 to 6	Α	30 Apr 25	Addendum IECEx/ATEX/UKEx AIC TA20-01A	
961007746	1 to 8	Α	30 Apr 25	Addendum IECEx/ATEX/UKEx/CSA EA22-01A + SV20-XXX	
			-	Liquiphant Sensor Component	
961007629	1 of 1	Α	30 Apr 25	PCB Interface CL electronics	
				(mechanical dimensions between the PCBs)	
961008210	1 of 1	Α	30 Apr 25	FTL Electronic Box Compact Line HY20-03A	
961005642	1 of 1	Α	30 Apr 25	Coating Plan A TA20-01 2W-420mA (work around)	
961005643	1 of 1	Α	30 Apr 25	Coating Plan B TA20-01 2W-420mA (work around)	
961008261	1 of 1	Α	30 Apr 25	Printed Circuit Board TA20-01A Encapsulation M12	
XA03341F	1 to 12	Α	30 Apr 25	Safety Instruction ATEX/IECEx Order code: 010=BA,BU;Ex ia	
				IIC T4 Ga; Ex ic IIC T4 Gc	
XA03342F	1 to 12	Α	30 Apr 25	Safety Instruction ATEX/IECEx Order code: 010=BB;	
				Ex ia IIC T4 Ga/Gb; Ex ia IIC T4 Gb	
XA03343F	1 to 12	Α	30 Apr 25	Safety Instruction ATEX/IECEx Order code: 010=BH,BT;	
				Ex ia IIIB T135°C Da; Ex ic IIIC T135°C Dc	
XA03344F	1 to 16	Α	30 Apr 25	Safety Instruction ATEX/IECEx Order code: 010=BI;	
				Ex ia IIC T4 Ga; Ex ia IIIB Txxx°C Da	
XA03345F	1 to 16	Α	30 Apr 25	Safety Instruction ATEX/IECEx Order code: 010=BK;	
				Ex ia IIC T4 Gb/Gb; Ex ia IIC T4 Gb;	
				Ex ia IIIC T135°C Da/Db; Ex ia IIIC T135°C Db	
961008135	1 of 1	Α	30 Apr 25	Connection Diagram FTL 43/60	
961008287	1 of 1	Α	30 Apr 25	PCB holder display CX2022A Compact Hygeine	
C-225252-E	1 of 1	Α	30 Apr 25	M12 Circular Connector male Angled A Cod 4p THR Rear Mount	