IECEx Certificate of Conformity

INTERNATIONAL ELECTROTECHNICAL COMMISSION
IEC Certification System for Explosive Atmospheres

for rules and details of the IECEx Scheme visit www.iecex.com

Certificate No.:	**IECEx KEM 10.0043X**	Page 1 of 5	Certificate history:
Status:	**Current**	Issue No: 10	Issue 9 (2020-10-16) Issue 8 (2019-05-21) Issue 7 (2018-01-24) Issue 6 (2017-08-17) Issue 5 (2015-10-30) Issue 4 (2013-11-15) Issue 3 (2013-04-15) Issue 2 (2012-03-28) Issue 1 (2011-02-17) Issue 0 (2010-07-22)
Date of Issue:	2022-02-16		
Applicant:	**Endress+Hauser SE+Co. KG** Hauptstrasse 1 79689 Maulburg **Germany**		
Equipment:	**Level Transmitter Levelflex FMP5x**		
Optional accessory:			
Type of Protection:	**Ex d, Ex e, Ex i, Ex t**		
Marking:	Ex ec IIC T6...T1 Gc Ex ia IIC T6...T1 Ga Ex ia IIC T6...T1 Ga/Gb Ex ia/db [ia Ga] IIC T6...T1 Ga/Gb Ex ia/ec [ia Ga] IIC T6...T1 Ga/Gb/Gc Ex ia/ic [ia Ga] IIC T6...T1 Ga/Gb/Gc Ex ic IIC T6...T1 Gc Ex ic [ia Ga] IIC T6...T1 Gc Ex ta IIIC Txx °C T_{200} xx °C Da Ex ia IIIC Txx °C T_{200} xx °C Da Ex ta/tb IIIC Txx °C Da/Db Ex ia IIIC Txx °C Da/Db		

Approved for issue on behalf of the IECEx Certification Body:	**R. Schuller**
Position:	**Certification Manager**
Signature: (for printed version)	
Date: (for printed version)	2022-02-16

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Certificate issued by:

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

IECEx Certificate of Conformity

Certificate No.: **IECEx KEM 10.0043X**

Date of issue: 2022-02-16

Issue No: 10

Manufacturer: **Endress+Hauser SE+Co. KG**
Hauptstrasse 1
79689 Maulburg
Germany

Manufacturing locations:

See following pages for more 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 equipment 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 60079-0:2017 Edition:7.0	Explosive atmospheres - Part 0: Equipment - General requirements
IEC 60079-1:2014-06 Edition:7.0	Explosive atmospheres - Part 1: Equipment protection by flameproof enclosures "d"
IEC 60079-11:2011 Edition:6.0	Explosive atmospheres - Part 11: Equipment protection by intrinsic safety "i"
IEC 60079-26:2014-10 Edition:3.0	Explosive atmospheres – Part 26: Equipment with Equipment Protection Level (EPL) Ga
IEC 60079-31:2013 Edition:2	Explosive atmospheres - Part 31: Equipment dust ignition protection by enclosure "t"
IEC 60079-7:2017 Edition:5.1	Explosive atmospheres - Part 7: Equipment protection by increased safety "e"

This Certificate **does not** indicate compliance with 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/KEM/ExTR10.0055/11

Quality Assessment Report:

DE/TUN/QAR06.0003/09

EQUIPMENT:
Equipment and systems covered by this Certificate are as follows:

Description

Level Transmitters Levelflex Type FMP50, Type OFMP50, Type FMP51, Type OFMP51, Type FMP52, Type OFMP52, Type FMP53, Type OFMP53, Type FMP54, Type OFMP54, Type FMP55, Type OFMP55, Type FMP56, Type OFMP56, Type FMP57 and Type OFMP57 are used for the measurment of the level of liquid or solid materials on basis of the Time of Flight (ToF) method.
Level Transmitters Levelflex FMP55 and OFMP55 additionally measure the interlayer between two different liquids by additionally using the capacitance of the probe.

The transmitter consists of an electronics enclosure and an integral rope or rod probe.

Depending on the applied interface, the sensor measurement signal is converted into an electrical output signal. See Annex 1 for detailed information on all possible variations and options and the electrical data.

Ambient temperature range -50 °C to +80 °C.

See Annex 1 for detailed information on the relation between ambient temperature and process temperature and temperature class and maximum surface temperature.

SPECIFIC CONDITIONS OF USE: YES as shown below:
Depending on the configuration and the application of the equipment, conditions of certification may apply, e.g. regarding electrostatic discharge or external protective devices. For details refer to the equipment specific Safety Instructions.

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DETAILS OF CERTIFICATE CHANGES (for issues 1 and above)

1. Assessed per IEC 60079-7 Ed. 5.1
2. Versions with Approval Codes “BK, IK, *K” removed from scope
3. Editorial changes

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Additional manufacturing locations:

Endress+Hauser (USA) Automation Instrumentation Inc.
2340 Endress Place
Greenwood , Indiana 46143
United States of America

Endress+Hauser (Suzhou) Automation Instrumentation Co. Ltd.
Suzhou Industrial Park
491 Su Hong Zhong Road No.
Jiangsu Province
Suzhou 215021
China

Endress+Hauser (India) Automation Instrumentation Pvt. Ltd.
M-192, Waluj MIDC
Maharashtra State
Aurangabad 431136
India

Endress+Hauser Yamanashi Co. Ltd.
862-1 Mitsukunugi
Sakaigawa-cho
Fuefuki-shi
Yamanashi 406-0846
Japan

Endress+Hauser (Brasil) Instrumentação e Automação Ltda.
Avenida Antonio Sesti
600, Itatiba/SP
Brazil

Annex:

226279800-Annex1 to ExTR10.0055.11.pdf

Annex 1 to Certificate of Conformity IECEx KEM 10.0043X
to EU-Type Examination Certificate KEMA 10ATEX0093X, issue 11
to IECEx Test Report NL/KEM/ExTR10.0055/11

Equipment
Guided Radar Level Transmitters Levelflex FMP5x and OFMP5x, for the measurement of the level of liquid or solid materials on basis of the Time of Flight (ToF) method.

Type designation
Levelflex, code FMP5x-aabcdeffgghhh**+# and OFMP5x-aabcdeffgghhh**+#

x = Probe type
0, 1, 2, 3, 4, 5, 6 or 7

aa = Approval code

IECEx	ATEX		ATEX	IECEx / ATEX
IA, KA, *A	BA	=	II 1 G	Ex ia IIC T6...T1 Ga
8B	8B	=	II 1 G	Ex ia IIC T6...T1 Ga
IB, KB, *B	BB	=	II 1/2 G	Ex ia IIC T6...T1 Ga/Gb
8C	8C	=	II 1/2 G	Ex ia IIC T6...T1 Ga/Gb
IC, KC, *C	BC	=	II 1/2 G	Ex ia/db [ia Ga] IIC T6...T1 Ga/Gb
ID, KD, *D	BD	=	II 1/2/3 G	Ex ia/ic [ia Ga] IIC T6...T1 Ga/Gb/Gc
IG, KG, *G		=		Ex ec IIC T6...T1 Gc [1)]
IH, KH, *H		=		Ex ic IIC T6...T1 Gc [1)]
IL, KL, *L	BL	=	II 1/2/3 G	Ex ia/ec [ia Ga] IIC T6...T1 Ga/Gb/Gc
I2, K2, *2	B2	=	II 1/2 G	Ex ia IIC T6...T1 Ga/Gb
			II 1/2 D	Ex ia IIIC Txx °C Da/Db
I3, K3, *3	B3	=	II 1/2 G	Ex ia/db [ia Ga] IIC T6...T1 Ga/Gb
			II 1/2 D	Ex ta/tb IIIC Txx °C Da/Db [1)]
I4, K4, *4	B4	=	II 1/2 G	Ex ia IIC T6...T1 Ga/Gb,
				Ex ia/db [ia Ga] IIC T6...T1 Ga/Gb [2)]
IE, KE, *E	BE	=	II 1 D	Ex ta IIIC T_{200} xx °C Da [1)]
IF, KF, *F	BF	=	II 1/2 D	Ex ta/tb IIIC Txx °C Da/Db [1)]

b = I/O - interface

A	=	2-wire; 4 - 20 mA HART
B	=	2-wire; 4 - 20 mA HART + PFS (status output)
C	=	2-wire; 4 - 20 mA HART + 4 - 20 mA
E	=	2-wire; Foundation fieldbus, PFS (status output)
G	=	2-wire; Profibus PA, PFS (status output)
K[3)]	=	4-wire; 90 - 253 Vac, 4 - 20 mA HART
L[3)]	=	4-wire; 10.4 - 48 Vdc, 4 - 20 mA HART
Y	=	Special version, not safety relevant

c = Display, operation

A	=	No display
C, E	=	Internal display
L, M, N	=	Provision for connection of external display
Y	=	Special version, not safety relevant

d = Enclosure
any single number or letter

e = Cable gland
any single number or letter

ff = Probe specification
any double numbers or letters.

gg = Seal
any double numbers or letters

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hhh	=	Process connection any triple numbers or letters
**+#	=	Options + additional options, not relevant for safety any combination of numbers and letters, except JN and/or NF, as listed below: Test, Certificate
	JN	Ambient temperature transmitter -50 °C
		Accessory Mounted
	NF	Bluetooth

Notes to Type Designation table:
NOTE 1:
Marking for versions of transmitters with option c = L or M or N

approval code aa =	IECEx	ATEX	ATEX	IECEx / ATEX
	IE, KE, *E	BE	II 1 D	Ex ta [ia Da] IIIC T_{200} xx °C Da
	IF, KF, *F	BF	II 1/2 D	Ex ta/tb [ia Da] IIIC Txx °C Da/Db
	IG, KG, *G			Ex ec [ia Ga] IIC T6...T1 Gc [a)]
	IH, KH, *H			Ex ic [ia Ga] IIC T6...T1 Gc [b)]
	I3, K3, *3	B3	II 1/2 G	Ex ia/db [ia Ga] IIC T6 Ga/Gb
			II 1/2 D	Ex ta/tb [ia Da] IIIC Txx °C Da/Db

a) only with option b = B, C, E, G, K or L
b) only with option b = B, C, E or G

NOTE 2:
Multiple marking; type of protection selected at first installation must be indicated and may not be changed.

NOTE 3:
Pos 3 (I/O - interface) options L and K are excluded for approval code IE and BE.

NOTE 4:
Properties described in the documentation on IECEx approval codes apply to the same extent to the corresponding K* approval code.

Thermal data
Ambient temperature at the electronics enclosure -50 °C to +80 °C.

The process temperature range, depending on the probe specifications and the relation between ambient temperature, process temperature and temperature class and maximum surface temperature T respectively T_{200} for the different models of Level Transmitters Levelflex FMP5x and OFMP5x is listed in the safety instructions, provided with the equipment.

Where EPL Da is involved but no dust layer depth (e.g. T_{200}) is indicated, this is to be understood that only the probe which has no electrical connections, may be installed in an area requiring EPL Da.
That part may be installed in any dust layer depth because no significant heating can occur here.

Electrical data

I/O Interface

The codes of the type(s) of protection in the following table only relate to the electrical data of the I/O Interface and may differ from the codes as listed for the approval code in the Type Designation table.

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Intrinsically safe versions

Approval Code	I/O Interface		Type of protection	Electrical data/maximum values	
	Code	Mode (functional)		Supply/output (terminals 1 and 2)	Supply/output (terminals 3 and 4)
BA, BB, B2, IA, *A, IB, *B, I2, *2, 8B, 8C	A	4 ... 20 mA HART	Ex ia IIC/IIIC	U_i = 30 V; I_i = 300 mA; P_i = 1 W; C_i = 12 nF; L_i = 0 mH	non-existent
IH, *H			Ex ic IIC	U_i = 35 V; I_i = N/A [1]; P_i = N/A; C_i = 12 nF; L_i = 0 mH	non-existent
For application / certificates which need IO-module with galvanic separation and use of 4...20mA HART in 1 channel mode (switch terminals closed) :					
B4, I4, *4	A	4 ... 20 mA HART	Ex ia IIC	U_i = 30 V; I_i = 300 mA; P_i = 1 W; C_i = 5 nF; L_i = 0 mH	Not used
BD, ID, *D IH, *H			Ex ic IIC	U_i = 35 V; I_i = N/A [1]; P_i = N/A; C_i = 5 nF; L_i = 0 mH	Not used
BA, BB, BK, B2, B4, IA, *A, IB, *B, IK, I2,*2, I4, *4, 8B, 8C	B	4 ... 20 mA HART+ PFS	Ex ia IIC/IIIC	U_i = 30 V; I_i = 300 mA; P_i = 1 W; C_i = 5 nF; L_i = 0 mH	U_i = 30 V; I_i = 300 mA; P_i = 0.7 W/0.85 W/1 W [2] C_i = 6 nF; L_i = 0 mH
BD, ID, *D, IH, *H			Ex ic IIC	U_i = 35 V; I_i = N/A [1]; P_i = N/A; C_i = 5 nF; L_i = 0 mH	U_i = 35 V; I_i = N/A [1]; P_i = 0.7 W/0.85 W/1 W [2]; C_i = 6 nF; L_i = 0 mH
BA, BB, B2 B4, IA, *A, IB, *B, I2, *2, I4, *4, 8B, 8C	C	4 ... 20 mA HART + 4 ... 20 mA	Ex ia IIC/IIIC	U_i = 30 V; I_i = 300 mA; P_i = 1 W; C_i = 30 nF; L_i = 0 mH	U_i = 30 V; I_i = 300 mA; P_i = 1 W; C_i = 30 nF; L_i = 0 mH
BD, ID, *D, IH, *H			Ex ic IIC	U_i = 30 V; I_i = N/A [1]; P_i = N/A; C_i = 30 nF; L_i = 0 mH	U_i = 30 V; I_i = N/A [1]; P_i = N/A; C_i = 30 nF; L_i = 0 mH
BA, BB, B2 B4, IA, *A, IB, *B, I2, *2, I4, *4	G, E	Profibus PA + PFS Foundation Fieldbus + PFS	Ex ia IIC/IIIC	FISCO with U_i = 17,5 V; I_i = 550 mA; P_i = 5,5 W; C_i = 5 nF; L_i = 10 µH or U_i = 30 V; I_i = 300 mA; P_i = 1.2 W; C_i = 5 nF; L_i = 10 µH	U_i = 30 V; I_i = 300 mA; P_i = 1 W; C_i = 6 nF; L_i = 0 mH
BD, ID, *D, IH, *H		Profibus PA + PFS Foundation Fieldbus + PFS	Ex ic IIC	FISCO with U_i = 17,5 V; I_i = N/A [1]; P_i = N/A; C_i = 5 nF; L_i = 10 µH or U_i = 32 V; I_i = N/A [1]; P_i = N/A; C_i = 5 nF; L_i = 10 µH	U_i = 35 V; I_i = 300 mA; P_i = 0.7 W/0.85 W/1 W [2]; C_i = 6 nF; L_i = 0 mH

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Non-intrinsically safe versions

Approval Code	I/O Interface		Type of protection	Electrical data/maximum values	
	Code	Mode (functional)		Supply/output (terminals 1 and 2)	Supply/output (terminals 3 and 4)
BC, B3, B4, IC, *C, I3, *3, I4, *4	A	4 ... 20 mA HART	Ex db IIC	U_N = 35 V 4) I_{max} = 22 mA P_N = 0.7 W U_m = 250 Vac	---
BE, IE, *E			Ex ta IIIC 3)		
BF, B3, IF, *F, I3, *3			Ex tb IIIC 3)		
BL, IG, *G, IL, *L			Ex ec IIC		
BC, B3, B4, IC, *C, I3, *3, I4, *4	B	4 ... 20 mA HART+ PFS	Ex db IIC	U_N = 35 V 4) I_{max} = 22 mA P_N = 0.7 W U_m = 250 Vac	U_N = 35 V 4) P_N = 0.7 W U_m = 250 Vac
BE, IE, *E			Ex ta IIIC 3)		
BF, B3, IF, *F, I3, *3			Ex tb IIIC 3)		
BL, IG, *G, IL, *L			Ex ec IIC		
BC, B3, B4, IC, *C, I3, *3, I4, *4	C	4 ... 20 mA HART + 4 ... 20 mA	Ex db IIC	U_N = 10.4 ... 30 V 4) I_{max} = 22 mA P_N = 0.7 W U_m = 250 Vac	U_N = 10.4 ... 30 V 4) I_{max} = 22 mA P_N = 0.7 W U_m = 250 Vac
BE, IE, *E			Ex ta IIIC 3)		
BF, B3, IF, *F, I3, *3			Ex tb IIIC 3)		
BL, IG, *G, IL, *L			Ex ec IIC		
BC, B3, B4, IC, *C, I3, *3, I4, *4	G, E	Profibus PA + PFS Foundation Fieldbus + PFS	Ex db IIC	U_N = 9 ... 32 Vdc 4) P_N = 880 mW U_m = 250 Vac	U_N = 10.4 ... 35 V 4) P_N = 0.7 W/0.85 W/1 W 2) U_m = 250 Vac
BE, IE, *E			Ex ta IIIC 3)		
BF, B3, IF, *F, I3, *3			Ex tb IIIC 3)		
BL, IG, *G, IL, *L			Ex ec IIC		
BC, B3, IC, *C, I3, *3	K	4-wire ac, 4 - 20 mA HART	Ex db IIC	90 ... 253 Vac 4) 50/60 Hz U_m = 250 Vac I_{max} = 160 mA; P_N = 1540 mW	U_N = 22 V 4) I_{max} = 22 mA U_m = 250 Vac
BF, B3, IF, *F, I3, *3			Ex tb IIIC 3)		
IG, *G			Ex ec IIC		
BC, B3, IC, *C, I3, *3	L	4-wire dc, 4 - 20 mA HART	Ex db IIC	10.4 ... 48 Vdc 4) U_m = 250 Vac I_{max} = 300 mA; P_N = 1328 mW	U_N = 22 V 4) I_{max} = 22 mA U_m = 250 Vac
BF, B3, IF, *F, I3, *3			Ex tb IIIC 3)		
IG, *G			Ex ec IIC		

Notes: 1) Current controlled output, $I_N \leq$ 25 mA
2) Different values of P_i or P_N resulting in different surface temperature values (refer to thermal data)
3) if used as replacement for devices certified according to EN/IEC60079-31 ed. 1 or preceding standards the values stated applies for Ex ta, also.
4) specifies maximum value, which includes 10% safety margin for typical power line variations

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Service connector, equivalent to connector X500 / service interface (CDI)

The type of protection of the service connector, which is intended for connection to Endress+Hauser Service Interface FXA291 or any other interface, depends on the Approval code of the equipment.
If used as interface in type of protection intrinsic safety Ex ia IIC/IIIC, the following maximum values apply:
U_o = 7.3 V; I_o = 100 mA; P_o = 160 mW; U_i = 7.3 V; C_i = 0 nF; L_i = 0 mH.
If used as non-intrinsically safe interface, U_N = 6.5 V

External display connector, equivalent to X900/X901 / interface for display

The type of protection of the external display connector depends on the Approval code of the equipment.

For transmitters prepared for connection of the external display of Endress+Hauser, Type FHX50, or any other suitable display in type of protection intrinsic safety Ex ia IIC/IIIC, the following maximum values apply:
U_o = 7.3 V; I_o = 157 mA; P_o = 362 mW; C_o = 388 nF; L_o = 149 µH;
maximum allowed cable capacitance C_c = 125 nF; maximum allowed cable inductance L_c = 149 µH.

In other cases, if used as interface in type of protection intrinsic safety Ex ia IIC/IIIC, the following maximum values apply:
U_o = 7.3 V; I_o = 327 mA; P_o = 800 mW; U_i = 7.3 V; C_i = 0 nF; L_i = 0 mH.
If used as non-intrinsically safe interface, U_N = 6.5 V.

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