



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 KEM 10.0043X issue No.:4

Status: **Current**

Date of Issue: **2013-11-15** Page 1 of 4

Certificate history:

Issue No. 4 (2013-11-15)
Issue No. 3 (2013-4-15)
Issue No. 2 (2012-3-28)
Issue No. 1 (2011-2-17)
Issue No. 0 (2010-7-22)

Applicant: **Endress+Hauser GmbH+Co. KG**
Hauptstrasse 1
79689 Maulburg
Germany

Electrical Apparatus: **Level Transmitter Levelflex FMP5x**
Optional accessory:

Type of Protection: **Ex i, Ex d, Ex t, Ex n**

Marking:
Ex ia IIC T6 - T1 Ga
Ex ia IIC T6 - T1 Ga/Gb
Ex ic [ia] IIC T6 - T1 Ga/Gb/Gc
Ex nA [ia] IIC T6 - T1 Ga/Gb/Gc
Ex nA IIC T6 - T1 Gc
Ex ic IIC T6 - T1 Gc
Ex d [ia] IIC T6 - T1 Ga/Gb
Ex ta IIIC Txx °C T500 xx °C Da
Ex ia IIIC Txx °C T500 xx °C Da
Ex ta 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:

2013-11-15

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.
Utrechtseweg 310
6812 AR Arnhem
The Netherlands





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

Additional Manufacturing location
(s):

This equipment may be
manufactured at any of the
locations listed in QAR
DE/TUN/QAR06.0003/**

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:

IEC 60079-0 : 2011 Edition: 6.0	Explosive atmospheres - Part 0: General requirements
IEC 60079-1 : 2007-04 Edition: 6	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 60079-15 : 2010 Edition: 4	Explosive atmospheres - Part 15: Equipment protection by type of protection "n"
IEC 60079-26 : 2006 Edition: 2	Explosive atmospheres - Part 26: Equipment with equipment protection level (EPL) Ga
IEC 60079-31 : 2008 Edition: 1	Explosive atmospheres – Part 31: Equipment dust ignition protection by enclosure 't'

*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/KEM/ExTR10.0055/00](#)
[NL/KEM/ExTR10.0055/03](#)

[NL/KEM/ExTR10.0055/01](#)
[NL/KEM/ExTR10.0055/04](#)

[NL/KEM/ExTR10.0055/02](#)

Quality Assessment Report:

[DE/TUN/QAR06.0003/04](#)



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Schedule

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 measurement 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 -40 °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.

CONDITIONS OF CERTIFICATION: YES as shown below:

Depending on the configuration and the application of the equipment, conditions of certification may apply, e.g. regarding electrostatic discharge. For details refer to the equipment specific Safety Instructions.



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

- Addition of centring disk of a new type
- Corrections to 'option B' in the Annex 1 to this ExTR.
- Additional Service connector and External display connector

**Annex 1 to Certificate of Conformity IECEx KEM 10.0043X, issue 4
to EC-Type Examination Certificate KEMA 10ATEX0093X, issue 5
to INMETRO Certificate of Conformity DEKRA 13.0006X, issue 0**

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-aabcdeffgghh**+# and OFMP5x-aabcdeffgghh**+#

x	=	Probe type			
		0, 1, 2, 3, 4, 5, 6 or 7			
aa	=	Approval code			
		IECEx	ATEX	INMETRO	ATEX
		IA	BA	MA	= II 1 G
		IB	BB		= II 1/2 G
		IC	BC	MC	= II 1/2 G
		ID	BD		= II 1/2/3 G
		IG			=
		IH		MH	=
		IL	BL		= II 1/2/3 G
		I2	B2		= II 1/2 G
					= II 1/2 D
		I3	B3		= II 1/2 G
					= II 1/2 D
		I4	B4		= II 1/2 G
		IE	BE	ME	= II 1 D
		IF	BF		= II 1/2 D
		IK	BK		= II 1 D
					IECEx / ATEX / INMETRO
					Ex ia IIC T6 - T1 Ga
					Ex ia IIC T6 - T1 Ga/Gb
					Ex d [ia] IIC T6 - T1 Ga/Gb
					Ex ic [ia] IIC T6 - T1 Ga/Gb/Gc
					Ex nA IIC T6 - T1 Gc ¹⁾
					Ex ic IIC T6 - T1 Gc ¹⁾
					Ex nA [ia] IIC T6 - T1 Ga/Gb/Gc
					Ex ia IIC T6 - T1 Ga/Gb
					Ex ia IIIC Txx °C Da/Db
					Ex d [ia] IIC T6 - T1 Ga/Gb
					Ex ta IIIC Txx °C Da/Db ¹⁾
					Ex ia IIC T6 - T1 Ga/Gb,
					Ex d [ia] IIC T6 - T1 Ga/Gb ²⁾
					Ex ta IIIC T ₅₀₀ xx °C Da ¹⁾
					Ex ta IIIC Txx °C Da/Db ¹⁾
					Ex ia IIIC T ₅₀₀ xx °C Da
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	=	4-wire; 90 - 253 Vac, 4 - 20 mA HART	
		L	=	4-wire; 10.4 - 48 Vdc, 4 - 20 mA HART	
c	=	Display, operation			
		A	=	No display	
		C, E	=	Internal display	
		L, M	=	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			
hhh	=	Process connection			
		any triple numbers or letters			

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**+# = Options + additional options, not relevant for safety
any combination of numbers and letters

Notes to Type Designation table:

NOTE 1:

Marking for versions of transmitters with option c = L or M

approval code aa =	IECEX	ATEX	INMETRO	ATEX	IECEX / ATEX / INMETRO
	IE	BE	ME	II 1 D	Ex ta [ja] IIIC T ₅₀₀ xx °C Da
	IF	BF		II 1/2 D	Ex ta [ja Da] IIIC T ₅₀₀ xx °C Da/Db
	IG				Ex nA IIC T6 - T1 Gc
	IH		MH		Ex ic IIC T6 - T1 Gc
	I3	B3		II 1/2 G	Ex d [ja] IIC T6 Ga/Gb
				II 1/2 D	Ex ta [ja Da] IIIC T ₅₀₀ xx °C Da/Db

NOTE 2:

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

Thermal data

Ambient temperature at the electronics enclosure -40 °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 T₅₀₀ for the different models of Level Transmitters Levelflex FMP5x and OFMP5x is listed in the safety instructions, provided with the equipment.

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.

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, IB, I2, MA	A	4 ... 20 mA HART	Ex ia IIC	U _i = 30 V; I _i = 300 mA; P _i = 1 W; C _i = 12 nF; L _i = 0 mH	---
BK, IK			Ex ia IIIC	U _i = 30 V; I _i = 250 mA; P _i = 0,6 W; C _i = 12 nF; L _i = 0 mH	---
B4, I4			Ex ia IIC/IIIC	U _i = 30 V; I _i = 300 mA; P _i = 1 W; C _i = 5 nF; L _i = 0 mH	---
BD, ID			Ex ic IIC	U _i = 35 V; I _i = N/A ¹⁾ ; P _i = N/A; C _i = 5 nF; L _i = 0 mH	---
IH, MH				U _i = 35 V; I _i = N/A ¹⁾ ; P _i = N/A; C _i = 12 nF; L _i = 0 mH	

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BA, BB, BK, B2, B4, IA, IB, IK, I2, I4, MA	B	4 ... 20 mA HART+ PFS	Ex ia IIC/IIIC	$U_i = 30 \text{ V}; I_i = 300 \text{ mA};$ $P_i = 1 \text{ W}; C_i = 5 \text{ nF};$ $L_i = 0 \text{ mH}$	$U_i = 30 \text{ V}; I_i = 300 \text{ mA};$ $P_i = 0,7 \text{ W}/0,85 \text{ W}/1 \text{ W}^{2)}$ $C_i = 3 \text{ nF}/5,28 \text{ nF}^{3)}$ $L_i = 0 \text{ mH}$
BD, ID, IH, MH			Ex ic IIC	$U_i = 35 \text{ V}; I_i = \text{N/A}^{1)}$; $P_i = \text{N/A}; C_i = 5 \text{ nF};$ $L_i = 0 \text{ mH}$	$U_i = 35 \text{ V}; I_i = \text{N/A}^{1)}$; $P_i = 0,7 \text{ W}/0,85 \text{ W}/1 \text{ W}^{2)}$; $C_i = 3 \text{ nF}/5,28 \text{ nF}^{3)}$; $L_i = 0 \text{ mH}$

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, BK, B2 B4, IA, IB, IK, I2, I4, MA	C	4 ... 20 mA HART + 4 ... 20 mA	Ex ia IIC/IIIC	$U_i = 30 \text{ V}; I_i = 300 \text{ mA};$ $P_i = 1 \text{ W}; C_i = 30 \text{ nF};$ $L_i = 0 \text{ mH}$	$U_i = 30 \text{ V}; I_i = 300 \text{ mA};$ $P_i = 1 \text{ W}; C_i = 30 \text{ nF};$ $L_i = 0 \text{ mH}$
BD, ID, IH, MH			Ex ic	$U_i = 30 \text{ V}; I_i = \text{N/A}^{1)}$; $P_i = \text{N/A}; C_i = 30 \text{ nF};$ $L_i = 0 \text{ mH}$	$U_i = 30 \text{ V}; I_i = \text{N/A}^{1)}$; $P_i = \text{N/A}; C_i = 30 \text{ nF};$ $L_i = 0 \text{ mH}$
BA, BB, BK, B2 B4, IA, IB, IK, I2, I4, MA	G, E	Profibus PA + PFS Foundation Fieldbus + PFS	Ex ia IIC/IIIC	FISCO with $U_i = 17,5 \text{ V};$ $I_i = 550 \text{ mA}; P_i = 5,5 \text{ W};$ $C_i = 5 \text{ nF}; L_i = 10 \mu\text{H}$ or $U_i = 30 \text{ V}; I_i = 300 \text{ mA};$ $P_i = 1,2 \text{ W}; C_i = 5 \text{ nF};$ $L_i = 10 \mu\text{H}$	$U_i = 35 \text{ V}; I_i = 300 \text{ mA};$ $P_i = 1 \text{ W};$ $C_i = 3 \text{ nF}/5,28 \text{ nF}^{3)}$; $L_i = 0 \text{ mH}$
BD, ID, IH, MH			Ex ic IIC	FISCO or $U_i = 32 \text{ V}; I_i = \text{N/A}^{1)}$; $P_i = \text{N/A}; C_i = 5 \text{ nF};$ $L_i = 10 \mu\text{H}$	$U_i = 35 \text{ V}; I_i = 300 \text{ mA};$ $P_i = 0,7 \text{ W}/0,85 \text{ W}/1 \text{ W}^{2)}$; $C_i = 3 \text{ nF}/5,28 \text{ nF}^{3)}$; $L_i = 0 \text{ mH}$

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, I3, I4, MC	A	4 ... 20 mA HART	Ex d IIC	$U_N = 35 \text{ V},$ $I_{\text{max}} = 22 \text{ mA},$ $P_N = 0,7 \text{ W}$ $U_m = 250 \text{ Vac}$	---
BE, BF, B3, IE, IF, I3			Ex ta IIIC		
BL, IG, IL			Ex nA IIC		
BC, B3, B4, IC, I3, I4, MC	B	4 ... 20 mA HART+ PFS	Ex d IIC	$U_N = 35 \text{ V},$ $I_{\text{max}} = 22 \text{ mA},$ $P_N = 0,7 \text{ W}$ $U_m = 250 \text{ Vac}$	$U_N = 35 \text{ V},$ $P_N = 0,7 \text{ W}$ $U_m = 250 \text{ Vac}$
BE, BF, B3, IE, IF, I3			Ex ta IIIC		
BL, IG, IL			Ex nA IIC		
BC, B3, B4, IC, I3, I4, MC	C	4 ... 20 mA HART + 4 ... 20 mA	Ex d IIC	$U_N = 10,4 \dots 30 \text{ V},$ $I_{\text{max}} = 22 \text{ mA},$ $P_N = 0,7 \text{ W}$ $U_m = 250 \text{ Vac}$	$U_N = 10,4 \dots 30 \text{ V},$ $I_{\text{max}} = 22 \text{ mA},$ $P_N = 0,7 \text{ W}$ $U_m = 250 \text{ Vac}$
BE, BF, B3, IE, IF, I3			Ex ta IIIC		
BL, IG, IL			Ex nA IIC		

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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, I3, I4, MC	G, E	Profibus PA + PFS Foundation Fieldbus + PFS	Ex d IIC	$U_N = 9 \dots 32 \text{ Vdc}$ $P_N = 880 \text{ mW}$ $U_m = 250 \text{ Vac}$	$U_N = 10,4 \dots 35 \text{ V}$, $P_N = 0,7 \text{ W}/0,85 \text{ W}/1 \text{ W}$ ²⁾ $U_m = 250 \text{ Vac}$
BE, BF, B3, IE, IF, I3			Ex ta IIIC		
BL, IG, IL			Ex nA IIC		
BC, B3, IC, I3, MC	K	4-wire ac, 4 - 20 mA HART	Ex d IIC	90 ... 253 Vac, 50/60 Hz $U_m = 250 \text{ Vac}$	$U_N = 22 \text{ V}$, $I_{max} = 22 \text{ mA}$ $U_m = 250 \text{ Vac}$
BE, BF, B3, IE, IF, I3			Ex ta IIIC		
BL, IG, IL			Ex nA IIC		
BC, B3, IC, I3, MC	L	4-wire dc, 4 - 20 mA HART	Ex d IIC	10.4 ... 48 Vdc $U_m = 250 \text{ Vac}$	$U_N = 22 \text{ V}$, $I_{max} = 22 \text{ mA}$, $U_m = 250 \text{ Vac}$
BE, BF, B3, IE, IF, I3			Ex ta IIIC		
BL, IG, IL			Ex nA IIC		

- Notes: 1) Current controlled output, $I_N \leq 25 \text{ mA}$
2) Different values of P_i or P_N resulting in different surface temperature values (refer to thermal data)
3) Capacitance between the lines, respectively with respect to ground

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:

$U_o = 7.3 \text{ V}$; $I_o = 100 \text{ mA}$; $P_o = 160 \text{ mW}$; $U_i = 7.3 \text{ V}$; $C_i = 0 \text{ nF}$; $L_i = 0 \text{ mH}$.

If used as non-intrinsically safe interface, $U_N = 6.5 \text{ V}$

External display connector, equivalent to X400 / 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:

$U_o = 7.3 \text{ V}$; $I_o = 157 \text{ mA}$; $P_o = 362 \text{ mW}$; $C_o = 488 \text{ nF}$; $L_o = 149 \text{ }\mu\text{H}$;

maximum allowed cable capacitance $C_c = 125 \text{ nF}$; maximum allowed cable inductance $L_c = 149 \text{ }\mu\text{H}$.

In other cases, if used as interface in type of protection intrinsic safety Ex ia IIC/IIIC, the following maximum values apply:

$U_o = 7.3 \text{ V}$; $I_o = 327 \text{ mA}$; $P_o = 800 \text{ mW}$; $U_i = 7.3 \text{ V}$; $C_i = 0 \text{ nF}$; $L_i = 0 \text{ mH}$.

If used as non-intrinsically safe interface, $U_N = 6.5 \text{ V}$.