CERTIFICATE OF CONFORMITY

1. **HAZARDOUS (CLASSIFIED) LOCATION ELECTRICAL EQUIPMENT PER US REQUIREMENTS**
2. **Certificate No:** **FM17US0187X**
3. **Equipment:** **Micropilot FMR60, FMR62, & FMR67 Level Detectors**
   (Type Reference and Name)
4. **Name of Listing Company:** **Endress+Hauser GmbH+Co KG**
5. **Address of Listing Company:** **Haupstrasse 1**
   Postfach 1261
   Maulburg
   D79689
   Germany
6. The examination and test results are recorded in confidential report number:

   3062340 dated 14th September 2017
7. FM Approvals LLC, certifies that the equipment described has been found to comply with the following Approval standards and other documents:

   FM Class 3600:2011, FM Class 3610:2015, FM Class 3611:2016, FM Class 3615:2006, FM Class 3616:2011, FM Class 3810:2005, ANSI/ISA 61010-1:2012, ANSI/ISA 60079-0:2013, ANSI/UL 60079-1:2015, ANSI/ISA 60079-11:2014, ANSI/ISA 60079-26:2017, UL 50E:2015, ANSI/IEC 60529:2004, ANSI/ISA 12.27.01:2011
8. If the sign 'X' is placed after the certificate number, it indicates that the equipment is subject to specific conditions of use specified in the schedule to this certificate.
9. This certificate relates to the design, examination and testing of the products specified herein. The FM Approvals surveillance audit program has further determined that the manufacturing processes and quality control procedures in place are satisfactory to manufacture the product as examined, tested and Approved.

Certificate issued by:

J.E. Marquedant
VP, Manager, Electrical Systems

14 September 2017
Date

To verify the availability of the Approved product, please refer to www.approvalguide.com

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10. Equipment Ratings:

Intrinsically Safe for Class I, II, III Division 1, Groups A, B, C, D, E, F, and G hazardous (classified) locations in accordance with drawing XA01615F, Intrinsically Safe for Class I, Zone 0, AEx ia IIC hazardous (classified) locations in accordance with drawing XA01615F

Explosionproof with Intrinsically Safe Probe for Class I, Division 1, Groups A, B, C, and D hazardous (classified) locations in accordance with drawing XA01616F, Dust-ignitionproof with Intrinsically Safe Probe for Class II, III, Division 1, Groups E, F, and G hazardous (classified) locations

Nonincendive for Class I, Division 2, Groups A, B, C, and D hazardous (classified) locations NIFW in accordance with drawing XA01615F

Associated Intrinsically Safe Outputs for Class I, II, III Division 1, Groups A, B, C, D, E, F, and G hazardous (classified) locations in accordance with drawing XA01615F and XA01616F

Flameproof with Intrinsically Safe Outputs for Class I, Zone 0/1, AEx ia/db [ia Ga] IIC T* Ga/Gb hazardous (classified) locations in accordance with drawing XA01616F.

Indoors and outdoors (Type 4X / 6P, IP66/68) with an ambient temperature rating of -40°C to +80°C. Single Seal or Dual Seal per 12.27.01.

11. The marking of the equipment shall include:

IS CLI, II, III, DIV 1, GP A, B, C, D, E, F, G; T* Ta = -40°C to +80°C; Entity XA01615F~~EN~~; Type 4X/6P, IP66/68

CL I, Zn 0, AEx ia IIC, T* Ta = -40°C to +80°C; Entity XA01615F; Type 4X/6P, IP66/68

XP- IS, CL I, DIV 1, GP A, B, C, D; T* Ta = -40°C to +80°C; Entity XA01616F; Type 4X/6P, IP66/68

DIP-IS, CL II, III, DIV 1, GP E, F, G; T* Ta = -40°C to +80°C; Entity XA01616F; Type 4X/6P, IP66/68

AIS, CL I, II, III DIV 1, GP A, B, C, D, E, F, G; T* Ta = -40°C to +80°C; Entity XA01615F/XA01616F; Type 4X/6P, IP66/68

DIP CL II, III, DIV 1, GP E, F, G; T* Ta = -40°C to +80°C; Type 4X/6P, IP66/68

CL I, Zn 0/1, AEx ia/db [ia Ga] IIC T* Ga/Gb Ta = -40°C to +80°C; Entity XA01616F; Type 4X/6P, IP66/68

NI CL I, DIV 2, GP A, B, C, D; T* Ta = -40°C to +80°C; NIFW XA01615F; Type 4X/6P, IP66/68

Single or Dual Seal per 12.27.01

12. **Description of Equipment:**

General - The Models Micropilot FMR60, FMR62, and FMR67 are microwave based level detectors used for contactless continuous measurement of liquid and solid media in explosion hazardous areas. Short microwave pulses are radiated from the antenna, reflected by the medium surface and picked up again by the antenna. The time delay between emission and reception of the microwave radiation is measured and converted into a signal to calculate the level. The microwave units Micropilot consist of various types of housings, electronic modules with optional surge protection adapted to the supply and evaluating circuits, different RF modules with associated antennas. The electronic versions provide different power and output signals (voltage values,

voltage forms, protocols). The FMR6x can be installed as Explosion-proof, Intrinsically Safe, or Nonincendive. In all cases the probe is always intrinsically Safe, the FMR6x includes Intrinsically Safe Outputs to be used with an Endress+Hauser service tool.

Construction - The Models Micropilot FMR60, FMR62, and FMR67 level detectors come in three different housings: 1) GT19 which is a plastic dual compartment, 2) GT18 stainless steel 316L dual compartment, and 3) GT20 Aluminum coated dual compartment enclosure. The enclosures come with various gland, threaded, and plug type openings.

Ratings - Models Micropilot FMR60, FMR62, and FMR67 ratings are as follows:

Electrical data						
I/O Interface						
Approval Code (010)	**Power supply / Output (I/O Interface)**			**Type of protection**	**Electrical data/maximum values**	
	Code (020)	**Mode (functional)**	**Module Transmis-sion Code (TRC)**		**Supply/output (terminals 1 and 2)**	**Supply/output (terminals 3 and 4)**
FA,FF	**A**	4..20mA HART (IO210_3)	31	I.S. Cl. I Div. 1	U_i = 30 V [4] I_i = 300 mA P_i = 1 W L_i = 0 µH C_i = 12 nF	non-existent
FB				I.S. Cl. I, II, III Div. 1		
FB,FF				NIFW Cl. I Div. 2 [Ex ia]	U_i = 35 V [8] I_i = N/A [5] P_i = N/A L_i = 0 µH C_i = 12 nF	non-existent
FA,FF	**A**	4..20mA HART (IO211/3) [3]	02	I.S. Cl. I Div. 1	U_i = 30 V [4] I_i = 300 mA P_i = 1 W L_i = 0 µH C_i = 5 nF	not used
FB				I.S. Cl. I, II, III Div. 1		
FB,FF				NIFW Cl. I Div. 2 [Ex ia]	U_i = 35 V [4] I_i = N/A [5] P_i = N/A L_i = 0 µH C_i = 5 nF	not used
FC,FD	**A**	4..20mA HART (IO212/3) [3]	03	XP-AIS Cl. I Div.1 [Ex ia]	U_N = 35 V DC [2] U_m = 250 V I_{nom} = 4 ... 20 mA I_{max} = 22 mA P_{nom} = 0,7 W	not used
FD				DIP Cl. II, III Div. 1, Ex ia/db encl. NI Cl. I Div. 2 [Ex ia]		
FE				DIP Cl. II, III Div. 1		
FA,FF	**B**	4..20mA HART+ switch (IO211/3)	02	I.S. Cl. I Div. 1	U_i = 30 V [4] I_i = 300 mA P_i = 1 W L_i = 0 µH C_i = 5 nF	U_i = 30 V [4] I_i = 300 mA P_i = 1W L_i = 0 µH C_i = 6 nF
FB,8A [1]				I.S. Cl. I, II, III Div.1		
FB,FF				NIFW Cl. I Div. 2 [Ex ia]	U_i = 35 V [4] I_i = N/A [5] P_i = N/A L_i = 0 µH C_i = 5 nF	U_i = 35 V [4] I_i = N/A [5] P_i = 1W L_i = 0 µH C_i = 6 nF
FC,FD,8A [1]	**B**	4..20mA	03	XP-AIS Cl. I Div.1 [Ex ia]	U_N = 35 V DC [2]	U_N = 35 V DC [2]

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FD,8A [1]		HART+ switch (IO212/3)		DIP Cl. II, III Div. 1, Ex ia/db encl.	U_m = 250 V I_{nom} = 4 ... 20 mA I_{max} = 22 mA P_{nom} = 0,7 W	U_m = 250 V P_{nom} = 0,7 W
FD				NI Cl. I Div. 2 [Ex ia]		
FE				DIP Cl. II, III Div. 1		
FA,FF	C	4..20mA HART+ 4..20mA (IO214_2)	24	I.S. Cl. I Div. 1	U_i = 30 V [4] I_i = 300 mA P_i = 1 W L_i = 0 µH C_i = 30 nF	U_i = 30 V [4] I_i = 300 mA P_i = 1 W L_i = 0 µH C_i = 30 nF
FB,8A [1]				I.S. Cl. I, II, III Div.1		
FB,FF				NIFW Cl. I Div. 2 [Ex ia]	U_i = 30 V [6] I_i = N/A [5] P_i = N/A L_i = 0 µH C_i = 30 nF	U_i = 30 V [6] I_i = N/A [5] P_i = N/A L_i = 0 µH C_i = 30 nF
FC,FD,8A [1]	C	4..20mA HART+ 4..20mA (IO215_2)	25	XP-AIS Cl. I Div.1 [Ex ia]	U_N = 30 V DC [2] U_m = 250 V I_N = 4 ... 20 mA I_{max} = 22 mA P_N = 0,7 W	U_N =30 V DC [2] U_m = 250 V I_N = 4 ... 20 mA I_{max} = 22 mA P_N = 0,7 W
FD,8A [1]				DIP Cl. II, III Div. 1, Ex ia/db encl.		
FD				NI Cl. I Div. 2 [Ex ia]		
FE				DIP Cl. II, III Div. 1		
FA,FF	E,G	Fieldbus + switch (IO220_2)	28	I.S. Cl. I Div. 1	U_i = 17.5 V [7] I_i = 550 mA P_i = 5.5 W L_i = 10 µH C_i = 5 nF or U_i = 30 V [4] I_i = 300 mA P_i = 1.2 W L_i = 10 µH C_i = 5 nF	passive: U_i = 30 V [4] I_i = 300 mA P_i = 1.0 W L_i = 0 µH C_i = 6 nF U_o = negligible low I_o = negligible low P_o = negligible low
FB,8A [1]				I.S. Cl. I, II, III Div.1		
FB,FF				NIFW Cl. I Div. 2 [Ex ia]	U_i = 17.5 V [7] I_i = N/A [5] P_i = N/A L_i = 10 µH C_i = 5 nF or U_i = 32 V [4] I_i = N/A [5] P_i = N/A L_i = 10 µH C_i = 5 nF	passive: U_i = 35 V [4] I_i = 300 mA P_i = 1.0 W L_i = 0 µH C_i = 6 nF U_o = negligible low I_o = negligible low P_o = negligible low
FC,FD,8A [1]	E,G	Fieldbus + switch (IO221_2)	29	XP-AIS Cl. I Div.1 [Ex ia]	U_N = 9-32 V DC [2] U_m = 250 V AC P_N ≤ 880 mW Fieldbus	U_N = 10.4-35 V DC [2] U_m = 250 V AC P_N = 1.0 W
FD,8A [1]				DIP Cl. II, III Div. 1, Ex ia/db encl.		
FD				NI Cl. I Div. 2 [Ex ia]		
FE				DIP Cl. II, III Div. 1		
FC,FD,8A [1]	L	4-wire DC + 4..20mA HART (IO410_2)	08	XP-AIS Cl. I Div.1 [Ex ia]	U_N = 10.4-48 V DC [2] U_m = 250 V I_N = 112 mA I_{max} = 300 mA P_N = 1328 mW	Active current output U_N = 22 V DC [2] U_m = 250 V I_N = 4 … 20 mA I_{max} = 22 mA P_N = 0.5 W
FD,8A [1]				DIP Cl. II, III Div. 1, Ex ia/db encl.		
FD				NI Cl. I Div. 2 [Ex ia]		
FE				DIP Cl. II, III Div. 1		

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FC,FD,8A [1]	K	4-wire AC + 4..20mA HART (IO411_2)	09	XP-AIS Cl. I Div.1 [Ex ia]	U_N = 90-253 V AC [2] 50/60 Hz; U_m = 250 V I_N = 25 mA I_{max} = 160 mA P_N = 1540 mW	Active current output U_N = 22 V DC [2] U_m = 250 V I_N = 4 … 20 mA I_{max} = 22 mA P_N = 0.5 W
FD,8A [1]				DIP Cl. II, III Div. 1, Ex ia/db encl.		
FD				NI Cl. I Div. 2 [Ex ia]		
FE				DIP Cl. II, III Div. 1		

Micropilot FMR60-aabcdeffgghhhi + (options)

aa	**Approval:** FA FM C/US IS Cl. I Div. 1 Gr. A-D FB FM C/US IS Cl.I,II,III Div.1 Gr.A-G, NI Cl.1 Div.2, AEx ia FC FM C/US XP-IS Cl.I Div.1 Gr.A-D, AIS Cl.I Div.1 Gr.A-D FD FM C/US XP-IS Cl.I Div.1 Gr.A-D, DIP-IS Cl.II,III Div. 1 Gr.E-G, NI Cl.1 Div.2, Ex/AEx ia/db [ia], AIS Cl.I,II,III Div.1 Gr.A-G FE FM C/US DIP Cl.II,III Div.1 Gr.E-G, AIS Cl.II,III Div.1 Gr.E-G FF FM C/US IS Cl.I Div.1 Gr.A-D, NI Cl.1 Div.2, AEx ia 8A FM/CSA IS+XP-IS Cl.I Div.1 Gr.A-D, DIP-IS Cl.II,III, Div1 Gr. E-G AIS Cl.I,II,III Div.1 Gr.A-G
b	**Power Supply; Output:** A 2-wire; 4-20mA HART B 2-wire; 4-20mA HART, switch output C 2-wire; 4-20mA HART, 4-20mA E 2-wire; FOUNDATION Fieldbus, switch output G 2-wire; 4-20mA PROFIBUS PA, switch output K 4-wire 90-253VAC, 4-20mA HART L 4-wire 10,4-48VDC, 4-20mA HART
c	**Display, Operation:** A W/o LCD, via communication C LCD SD02, push button + data backup function E LCD SD03, touch control + data backup function L Prepared for display FHX50 + M12 connection M Prepared for display FHX50 + custom connection N Prepared for display FHX50 + NPT½ thread, custom connection
d	**Housing:** A GT19 dual compartment, Plastics PBT B GT18 dual compartment, 316L C GT20 dual compartment, Alu coated
e	**Electrical Connection:** A Gland M20, IP66/68 Type 4X/6P Encl. B Thread M20, IP66/68 Type 4X/6P Encl. D Thread NPT½, IP66/68 Type 4X/6P Encl. I Plug M12, IP66/68 Type 4X/6P Encl. M Plug 7/8", IP66/68 Type 4X/6P Encl.
ff	**Antenna:** GA Drip-off, PTFE DN50
gg	**seal:** A3 Viton GLT, -40…80°C / -40…176°F A4 Viton GLT, -40…130°C / -40…266°F
hhh	**Process Connection:**

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	G** Threads acc. ISO Standards R** Threads acc. ANSI Standards XJ* Uni Flange XK* Uni Flange XL* Uni Flange
i	**Air Purge Connection:** not available
(options)	Not relevant for safety

Micropilot FMR62-aabcdeffgghhhi + (options)

aa	**Approval:** FA FM C/US IS Cl. I Div. 1 Gr. A-D FB FM C/US IS Cl.I,II,III Div.1 Gr.A-G, NI Cl.1 Div.2, AEx ia FC FM C/US XP-IS Cl.I Div.1 Gr.A-D, AIS Cl.I Div.1 Gr.A-D FD FM C/US XP-IS Cl.I Div.1 Gr.A-D, DIP-IS Cl.II,III Div. 1 Gr.E-G, NI Cl.1 Div.2, Ex/AEx ia/db [ia], AIS Cl.I,II,III Div.1 Gr.A-G FE FM C/US DIP Cl.II,III Div.1 Gr.E-G, AIS Cl.II,III Div.1 Gr.E-G FF FM C/US IS Cl.I Div.1 Gr.A-D, NI Cl.1 Div.2, AEx ia 8A FM/CSA IS+XP-IS Cl.I Div.1 Gr.A-D, DIP-IS Cl.II,III, Div1 Gr. E-G AIS Cl.I,II,III Div.1 Gr.A-G
b	**Power Supply; Output:** A 2-wire; 4-20mA HART B 2-wire; 4-20mA HART, switch output C 2-wire; 4-20mA HART, 4-20mA E 2-wire; FOUNDATION Fieldbus, switch output G 2-wire; 4-20mA PROFIBUS PA, switch output K 4-wire 90-253VAC, 4-20mA HART L 4-wire 10,4-48VDC, 4-20mA HART
c	**Display, Operation:** A W/o LCD, via communication C LCD SD02, push button + data backup function E LCD SD03, touch control + data backup function L Prepared for display FHX50 + M12 connection M Prepared for display FHX50 + custom connection N Prepared for display FHX50 + NPT½ thread, custom connection
d	**Housing:** A GT19 dual compartment, Plastics PBT B GT18 dual compartment, 316L C GT20 dual compartment, Alu coated
e	**Electrical Connection:** A Gland M20, IP66/68 Type 4X/6P Encl. B Thread M20, IP66/68 Type 4X/6P Encl. D Thread NPT½, IP66/68 Type 4X/6P Encl. I Plug M12, IP66/68 Type 4X/6P Encl. M Plug 7/8", IP66/68 Type 4X/6P Encl.
ff	**Antenna:** GE integrated, PEEK, ¾” GF integrated, PEEK, 1½” GM PTFE cladded flush mount DN50

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	GN PTFE cladded flush mount DN80
gg	**seal:** A5 Vitron GLT, -40…150°C / -40…302°F A6 Vitron GLT, -40…200°C / -40…392°F C1 Kalrez, -20…150°C / -4… 302°F C2 Kalrez, -20…200°C / -4… 392°F F5 PTFE cladded, -40…150°C / -40…302°F F6 PTFE cladded, -40…200°C / -40…392°F
hhh	**Process Connection:** A** Flanges acc. ANSI Standards, PTFE>316/316L C** Flanges acc. EN Standards, PTFE>316/316L G** Threads acc. ISO Standards K** Flanges acc. JIS Standards, PTFE>316/316L M** Flanges acc. DIN Standards, PTFE>316/316L R** Threads acc. ANSI Standards
i	**Air Purge Connection:** not available
(options)	Not relevant for safety

Micropilot FMR67-aabcdeffgghhhi + (options)

aa	**Approval:** FA FM C/US IS Cl. I Div. 1 Gr. A-D FB FM C/US IS Cl.I,II,III Div.1 Gr.A-G, NI Cl.1 Div.2, AEx ia FC FM C/US XP-IS Cl.I Div.1 Gr.A-D, AIS Cl.I Div.1 Gr.A-D FD FM C/US XP-IS Cl.I Div.1 Gr.A-D, DIP-IS Cl.II,III Div. 1 Gr.E-G, NI Cl.1 Div.2, Ex/AEx ia/db [ia], AIS Cl.I,II,III Div.1 Gr.A-G FE FM C/US DIP Cl.II,III Div.1 Gr.E-G, AIS Cl.II,III Div.1 Gr.E-G FF FM C/US IS Cl.I Div.1 Gr.A-D, NI Cl.1 Div.2, AEx ia 8A FM/CSA IS+XP-IS Cl.I Div.1 Gr.A-D, DIP-IS Cl.II,III, Div1 Gr. E-G AIS Cl.I,II,III Div.1 Gr.A-G
b	**Power Supply; Output:** A 2-wire; 4-20mA HART B 2-wire; 4-20mA HART, switch output C 2-wire; 4-20mA HART, 4-20mA E 2-wire; FOUNDATION Fieldbus, switch output G 2-wire; 4-20mA PROFIBUS PA, switch output K 4-wire 90-253VAC, 4-20mA HART L 4-wire 10,4-48VDC, 4-20mA HART
c	**Display, Operation:** A W/o LCD, via communication C LCD SD02, push button + data backup function E LCD SD03, touch control + data backup function L Prepared for display FHX50 + M12 connection M Prepared for display FHX50 + custom connection N Prepared for display FHX50 + NPT½ thread, custom connection
d	**Housing:** A GT19 dual compartment, Plastics PBT B GT18 dual compartment, 316L C GT20 dual compartment, Alu coated

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e	**Electrical Connection:** A Gland M20, IP66/68 Type 4X/6P Encl. B Thread M20, IP66/68 Type 4X/6P Encl. D Thread NPT½, IP66/68 Type 4X/6P Encl. I Plug M12, IP66/68 Type 4X/6P Encl. M Plug 7/8", IP66/68 Type 4X/6P Encl.
ff	GA Drip-off, PTFE DN50 GP PTFE flush mount DN80
gg	A3 Viton GLT, -40…80°C / -40...176°F A5 Viton GLT, -40…150°C / -40…302°F A6 Viton GLT, -40…200°C / -40…392°F
hhh	A** Flanges acc. ANSI Standards C** Flanges acc. EN Standards G** Thread acc. ISO Standards K** Flanges acc. JIS Standards R** Thread acc. ANSI Standards XC* Align. device, Alu UNI flange XD* Align. device, Alu UNI flange XE* Align. device, Alu UNI flange XF* Align. device, Alu UNI flange XJ* UNI Flange XK* UNI Flange XL* UNI Flange X3* UNI Flange X5* UNI Flange
i	A W/O 1 G1/4 2 NPT1/4 3 Adapter G1/4 4 Adapter NPT1/4
(options)	Not relevant for safety

13. **Specific Conditions of Use:**

1. The flamepaths of the equipment are not intended to be repaired. Consult the manufacturer if repair of the flamepath joints is necessary.
2. Refer to the manufacturer's instructions to reduce the potential of an electrostatic charging hazard on the equipment enclosure.
3. For enclosures made of Aluminum avoid impacts that can cause sparking. Refer to applicable control drawing for Instructions.
4. For Division 2 installations do not disconnect equipment unless power has been switched off.
5. Factory Sealed, Explosionproof Seals not required. Refer to applicable control drawing for Instructions.
6. Refer to XA01615F or XA01616F for temperature class related information.

14. **Test and Assessment Procedure and Conditions:**

This Certificate has been issued in accordance with FM Approvals US Certification Requirements.

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15. **Schedule Drawings**

A copy of the technical documentation has been kept by FM Approvals.

16. **Certificate History**

Details of the supplements to this certificate are described below:

Date	Description
14th September 2017	Original Issue.