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 SEV 22.0028X**	Page 1 of 7	Certificate history:
Status:	**Current**	Issue No: 1	Issue 0 (2022-08-18)
Date of Issue:	2024-01-29		
Applicant:	**Endress+Hauser SE+Co. KG** Hauptstraße 1 79689 Maulburg **Germany**		
Equipment:	**Microwave units Micropilot, Type: FMR6xB**		
Optional accessory:			
Type of Protection:	**d, e, i, t**		
Marking:	Refer to marking at general product information		

Approved for issue on behalf of the IECEx Certification Body: **Munira Gamma**

Position: **Manager Product Certification**

Signature:
(for printed version)

Date:
(for printed version)

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 www.iecex.com or use of this QR Code.

Certificate issued by:

Eurofins Electric & Electronic Product Testing AG
Luppmenstrasse 3
8320 FEHRALTORF .
Switzerland

IECEx Certificate of Conformity

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

Manufacturing locations:

Endress+Hauser SE+Co. KG
Hauptstraße 1
79689 Maulburg
Germany

Endress+Hauser (Suzhou) Automation Instrumentation Co. Ltd.
China – Singapore Industrial Park (SIP)
Su-Hong-Zhong-Lu, No. 491
Jiangsu Province, 215021 Suzhou
China

Endress+Hauser (India) Automation Instrumentation Pvt. Ltd.
M-192, Waluj MIDC, Industrial Area
Aurangabad - 431 136, Maharashtra State
India

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 Edition:7.0	Explosive atmospheres - Part 1: Equipment protection by flameproof enclosures "d"
IEC 60079-11:2023 Edition:7.0	Explosive atmospheres - Part 11: Equipment protection by intrinsic safety "i"
IEC 60079-26:2021 Edition:4.0	Explosive atmospheres - Part 26: Equipment with Separation Elements or combined Levels of Protection
IEC 60079-31:2022 Edition:3.0	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"
IEC TS 60079-47:2021 Edition:1.0	Explosive atmospheres – Part 47: Equipment protection by 2-wire intrinsically safe Ethernet concept (2-WISE)

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 Reports:

CH/SEV/ExTR19.0044/05 CH/SEV/ExTR22.0030/01 NL/DEK/ExTR23.0022/00

Quality Assessment Report:

DE/TUN/QAR06.0003/09

IECEx Certificate of Conformity

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

Microwave units Micropilot, Type: FMR6xB

The microwave units Micropilot, type series FMR6xB are used for the contactless, continuous level measurement of liquid and solid media in explosion hazardous areas with gas or dust atmosphere.
The Micropilot is a "down-looking" measuring system that works according to the principle of the modulated continuous wave radar (Frequency Modulated Continuous Wave, FMCW). The antenna shines an electromagnetic wave with continuously changing frequency. This wave is reflected by the product and received again by the antenna.
The measured variable is the distance between the reference point R and the product surface. The product can be a liquid or a solid product. The electronic transforms this into an electrical signal which is evaluated and put out as analogue (e.g. 4..20mA) measurement values.

SPECIFIC CONDITIONS OF USE: YES as shown below:
1. For EPL Ga enclosures made of aluminium must be installed protected from impact and friction.
2. To avoid electrostatic charging: Do not rub surfaces with a dry cloth.

IECEx Certificate of Conformity

Equipment (continued):

See Annexe

IECEx Certificate of Conformity

DETAILS OF CERTIFICATE CHANGES (for issues 1 and above)
Addition of PEEK Hygienic probes.
Including Plastic enclosure HP07 for Ex ia IIC.
Including Hygienic enclosure HY07 for Ex ia IIC.
Changing of Sensor electronic and Ex ia temperature tables based on changed Tmax for microwave Chip under fault condition.
Addition of dust application zone 20 with Ex ta IIIC Da and Ex ia IIIC Da.
Implementation of MA13 and MA14 (2 channel versions of HART).
Update to 60079-11 ED7.
Update to 60079-31 ED3.
Correction of Typo errors in Order Code and XA´s.

IECEx Certificate of Conformity

Additional manufacturing locations:

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

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

Endress+Hauser (Brasil) Instrumentação e Aut.Ltda.
Estrada Municipal Antonio Sesti
600 Bairro Recreio Costa Verde
Itatiba, SP - 13254-085
Brazil

IECEx Certificate of Conformity

Additional information:

Annex:

IECEx SEV 22.0028X app i1_1.pdf

Applicant Name: **Endress+Hauser SE+Co. KG**

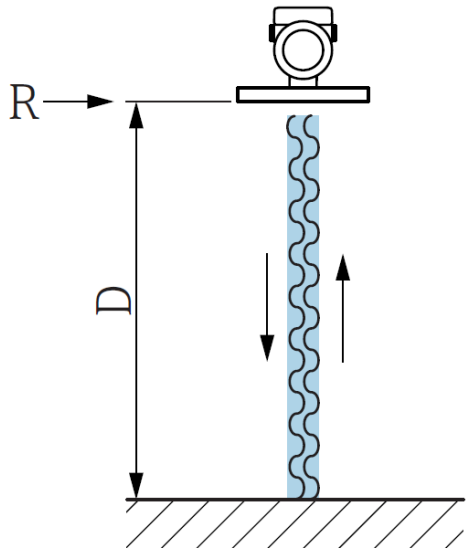
Equipment: **Microwave units Micropilot**

(15) **General product information**

The microwave units Micropilot, type series FMR6xB are used for the contactless, continuous level measurement of liquid and solid media in explosion hazardous areas with gas or dust atmosphere.
The Micropilot is a "down-looking" measuring system that works according to the principle of the modulated continuous wave radar (Frequency Modulated Continuous Wave, FMCW). The antenna shines an electromagnetic wave with continuously changing frequency. This wave is reflected by the product and received again by the antenna.
The measured variable is the distance between the reference point R and the product surface. The product can be a liquid or a solid product.
The electronic transforms this into an electrical signal which is evaluated and put out as analogue (e.g. 4..20mA) measurement values.

Classification of installation and use:	stationary
Ingress protection:	IP66 / IP67 / IP68
Rated ambient temperature range (°C):	Refer to Temperature classification at general product information for details.
Rated ambient temperature range (°C) for Ex Components:	N/A

Measurement principle for Level:



Rating:

For MA10 - 4..20 mA (HART):
Ui ≤ 30 V DC, Ii ≤ 300 mA, Pi ≤ 1 W, Ci ≤ 10 nF, Li = 0 or
Ui ≤ 28 V DC, Ii ≤ 250 mA, Pi ≤ 650 mW, Ci ≤ 10 nF, Li = 0

For MA11 - Profibus PA, Foundation Fieldbus:
FISCO : Ui ≤ 17.5 V DC, Ii ≤ 380 mA, Pi ≤ 5.32 W, Ci ≤ 5 nF, Li = 0
Entity : Ui ≤ 24 V DC, Ii ≤ 300 mA, Pi ≤ 1.2 W, Ci ≤ 5 nF, Li = 0

For MA12 - PROFINET APL:
2-WISE: Ui ≤ 17.5 V DC, Ii ≤ 380 mA, Pi ≤ 5.32 W, Ci ≤ 5 nF, Li = 0
Entity : Ui ≤ 17.5 V DC, Ii ≤ 300 mA, Pi ≤ 1.2 W, Ci ≤ 5 nF, Li = 0

For MA13 - 4-20 mA HART + 4-20 mA analog:
Channel 1, 4..20 mA HART: Ui ≤ 30 V DC, Ii ≤ 300 mA, Pi ≤ 1 W, Ci ≤ 10 nF, Li = 0
Channel 2, 4..20 mA: Ui ≤ 30 V DC, Ii ≤ 300 mA, Pi ≤ 1 W, Ci ≤ 10 nF, Li = 0

For MA14 - 4-20 mA HART, switch output (not for EPL Da):
Channel 1, 4..20 mA HART: Ui ≤ 30 V DC, Ii ≤ 300 mA, Pi ≤ 1 W, Ci ≤ 10 nF, Li = 0
Channel 2, switch output: Ui ≤ 30 V DC, Ii ≤ 300 mA, Pi ≤ 1 W, Ci ≤ 10 nF, Li = 0

Types of protection ec, ta, tb, tc or db:
For MA10: 4..20 mA (HART):
U ≤ 35 V DC, P ≤ 0.8 W

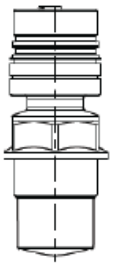
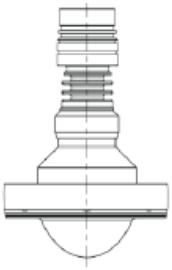
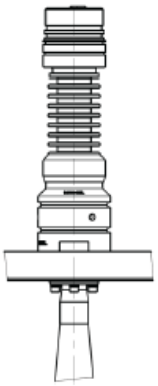
For MA11: Profibus PA, Foundation Fieldbus :
U ≤ 32 V DC P ≤ 0.6 W

For MA12 : Profisafe APL:
U ≤ 15 V DC P ≤ 0.6 W

For MA13 - 4-20 mA HART + 4-20 mA analog:
U ≤ 35 V DC P ≤ 1.6 W

For MA14 - 4-20 mA HART, switch output (not for Da):
U ≤ 35 V DC P ≤ 2.6 W

Temperature classification:

Type 1 Compact dust/gas	Type 2 Stand-ard	Type 3 Standard	Type 4 XT/HT
T_{p_max}			
80°C /130°C	150°C	200°C	280°C/450°C
			

Ex ia IIC T6...T1:					
		Type 1	Type 2	Type 3	Type 4
T-Class	T_{p_range} [1)] [°C]	T_{amb_range} [°C]			
T6	-40...80	-50...58			
T5	-40...95	-50...63			
T4-T1	-40...130	-50...55			
T3	-40...150	-	-50...51		
	-40...195	-	-	-50...57	
T2-T1	-40...200	-	-	-50...46	
	-40...280	-	-	-50...52	
T1	-40...440	-	-	-	-50...39

1) Possible down to -196°C

Ex db IIC T6...T1:					
		Type 1	Type 2	Type 3	Type 4
T-Class	T_{p_range} [1)] [°C]	T_{amb_range} [°C]			
T6	-40...80	-	-60...73		
T5	-40...95	-	-60...78		
T4-T1	-40...130	-	-60...75		
T3	-40...150	-	-60...52		
T2-T1	-40...195	-	-	-60...68	
	-40...200	-	-	-60...46	
	-40...280	-	-	-60...58	
T1	-40...440	-	-	-	-60...39

Ex ec IIC T6...T1:					
		Type 1	Type 2	Type 3	Type 4
T-Class	T_{p_range} [1)] [°C]	T_{amb_range} [°C]			
T6-T1	-40...80	-20...73	-20...73		
T5	-40...95	-	-40...78		
T4-T1	-40...130	-	-40...75		
T3-T1	-40...150	-	-40...52		
	-40...195	-	-	-40...68	
T2-T1	-40...200	-	-	-40...46	
	-40...280	-	-	-40...58	
T1	-40...440	-	-	-	-40...39

Ex ta/tb IIIC Txxx°C Da/Db:					
		Type 1	Type 2	Type 3	Type 4
	T_{p_range} [°C]	T_{amb_range} [°C]			
T_L 80°C	-20...80	-20...65	-40...65	-	-
T_L 100°C	-40...100	-	-40...60	-40...60	-
T_L 130°C	-40...130	-	-40...55	-	-
T_L 150°C	-40...150	-	-40...50	-40...55	-40...65
T_L 200°C	-40...200	-	-	-40...50	-40...60
T_L 280°C	-40...280	-	-	-	-40...55
T_L 450°C	-40...450	-	-	-	-40...45

Ex ta IIIC Txxx°C Da:					
		Type 1	Type 2	Type 3	Type 4
		Output:	$T_{process}$ and T_{amb_range} [°C]		
T_{200} 100 °C		BA	-40 °C ≤ Tp =Ta ≤ 60 °C		
T_{200} 105 °C		BB	-40 °C ≤ Tp =Ta ≤ 45 °C		
T_{200} 110 °C (U_{max}=35V)		BC	-40 °C ≤ Tp =Ta ≤ 40 °C		
T_{200} 100 °C (U_{max}=24V)			-40 °C ≤ Tp =Ta ≤ 55 °C		
T_{200} 95 °C		DA/FA	-40 °C ≤ Tp =Ta ≤ 65 °C		

Ex ia IIIC Txxx°C IIIC Da/Db:					
		Type 1	Type 2	Type 3	Type 4
	T_{p_range} [°C]	T_{amb_range} [°C]			
T_L 80°C	-20...80	-20...55	-40...60	-	-
T_L 100°C	-40...100	-	-40...55	-40...60	-
T_L 130°C	-40...130	-	-40...50	-	-
T_L 150°C	-40...150	-	-40...45	-40...55	-40...65
T_L 200°C	-40...200	-	-	-40...50	-40...60
T_L 280°C	-40...280	-	-	-	-40...55
T_L 450°C	-40...450	-	-	-	-40...45

Ex ia IIIC Txxx°C IIIC Da:					
		Type 1	Type 2	Type 3	Type 4
		T_{p_range} [°C]	T_{amb_range} [°C]		
		Output:	$T_{process}$ and T_{amb_range} [°C]		
T_{200} 90 °C (Pi=1W)		BA	-40 °C ≤ Tp =Ta ≤ 60 °C		
T_{200} 135 °C (Pi=650mW)			-40 °C ≤ Tp =Ta ≤ 65 °C		
T_{200} 100 °C		BC	-40 °C ≤ Tp =Ta ≤ 40 °C		
		DA,FA	-40 °C ≤ Tp =Ta ≤ 65 °C		

Marking:

The following marking strings are possible for all types and in combination with each other.

Ex db IIC T6…T1 Gb

Ex db IIC T6…T1 Ga/Gb

Ex ec IIC T6…T1 Gc

Ex ia IIC T6…T1 Ga

Ex ia IIC T6…T1 Gb

Ex ia IIC T6…T1 Ga/Gb

Ex ia IIIC Txxx °C Da

Ex ia IIIC Txxx °C Db

Ex ia IIIC Txxx °C Da/Db

Ex ta IIIC Txxx °C Da

Ex tb IIIC Txxx °C Db

Ex ta/tb IIIC Txxx °C Da/Db

Ex tc IIIC Txxx °C Dc

For types with MA11 module and FISCO the following text is added to the marking:
FISCO field device
For types with MA12 module and 2-WISE the following text is added to the marking:
2-WISE
2-WISE power load