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 UL 15.0112X	Issue No: 1	Certificate history:
			Issue No. 1 (2016-03-10)
Status:	**Current**	Page 1 of 4	Issue No. 0 (2015-12-15)
Date of Issue:	**2016-03-10**		
Applicant:	**Endress+Hauser Flowtec AG** Kaegenstrasse 7, Reinach BL1, CH-4153 **Switzerland**		
Electrical Apparatus:	**Nanomass Density Meter**		
Optional accessory:			
Type of Protection:	**Intrinsic Safety "ia"**		
Marking:	Ex ia IIC T4 Ga Ex ia IIC T4 Gb -20°C ≤ Ta ≤ +60°C		

Approved for issue on behalf of the IECEx Certification Body: Lucy Frieders

Position: Staff Engineer

Signature:
(for printed version)

Date:

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:

UL LLC
333 Pfingsten Road
Northbrook IL 60062-2096
United States of America

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Date of Issue:	**2016-03-10**	Page 2 of 4
Manufacturer:	**Endress+Hauser Flowtec AG** Kaegenstrasse 7, Reinach BL1, CH-4153 **Switzerland**	
Additional Manufacturing location(s):		

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 60079-11 : 2011 Edition:6.0	Explosive atmospheres - Part 11: Equipment protection by intrinsic safety "i"
IEC 60079-26 : 2006 Edition:2	Explosive atmospheres - Part 26: Equipment with equipment protection level (EPL) Ga

*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:

US/UL/ExTR15.0128/01

Quality Assessment Report:

DE/TUN/QAR06.0004/05

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Schedule

EQUIPMENT:

Equipment and systems covered by this certificate are as follows:

The apparatus is intended to measure the density of liquids and gases

See Annex for additional information.

CONDITIONS OF CERTIFICATION: YES as shown below:

For Zone 0:

The apparatus enclosure contains aluminium. Care must be taken to avoid ignition hazards due to impact or friction.

For Zone 0 and Zone 1:

Disconnect power before servicing.

Do not connect to USB and Power simultaneously.

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

Issue 1: Update to latest Edition of IEC 60079-11. Revision to construction and documentation not affecting safety.

Annex:

Annex to IECEx UL 15.0112X Issue 1.pdf

Annex to IECEx UL 15.0112X Issue No.: 1
Applicant: Endress+Hauser Flowtec AG

The model nomenclature is as follows:

Nanomass abcdefghijklmnopqr, where

a	b	c	d	e	f	g	h	i	j	k	l	m	n	o	p	q	r
I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	XIII	XIV	XV	XVI	XVII	XVIII

I. *a = Root; DCDB for Liquid Density, DCEB for Gas Density*
II. b = Nominal diameter manifold; alphanumeric characters.
III. c = Approval; AA = Non-hazardous area, BA = ATEX+IEC II1G Ex ia IIC T4, BB = ATEX+IEC II2G Ex ia IIC T4, 8A = ATEX+IEC II1G Ex ia IIC T4 + UL C/US Class I, Groups A, B, C, D, T4, Class I Zone 0 AEx/Ex ia IIC T4
IV. d = Power supply, alphanumeric characters.
V. e = Output, input; A = 2 x 4-20 mA, passive, USB Interface, cable, B = 2 x 4-20 mA, passive. RS 232 plug, C = 2 x 4-20 mA, passive, RS 232, cable, D = 2 x 4-20 mA, passive, RS 232 plug, cable,
VI. f = Display; alphanumeric characters.
VII. g = Housing, alphanumeric characters
VIII. h = Cable; alphanumeric characters.
IX. i = Electrical connection; alphanumeric characters.
X. j = Reserved for fluid applications; alphanumeric characters.
XI. k = Reserved for process connections; alphanumeric characters
XII. l = Factory calibration density; alphanumeric characters.
XIII. m = Customized parameters; alphanumeric characters.
XIV. n = Reserved for functional applications; alphanumeric characters.
XV. o = Reserved for Test, certificate; alphanumeric characters.
XVI. p = Additional approval; alphanumeric characters.
XVII. q= Accessories enclosed; alphanumeric characters.
XVIII. r= Reserved for customer marking; alphanumeric characters.

The following entity parameters are declared by the manufacturer for the Power input:

Ui = 30V, Ii = 300 mA, Pi = 1.10W, Ci = 55nF, Li = 220µH.

The following entity parameters are declared by the manufacturer for the RS-232 input:

Ui = 15V, Ii = 90mA, Pi = 1.10W, Ci = 700nF, Li = 1000µH.

The following entity parameters are declared by the manufacturer for the 4-20mA circuits:

Ui = 30V, Ii = 320 mA, Pi = 1.1W, Ci = 48nF, Li = 150µH.

The apparatus has following output entity parameters:

Uo = 5.88V, Io = 400 mA, Po = 0.6W, Co = 41000nF, Lo = 20µH

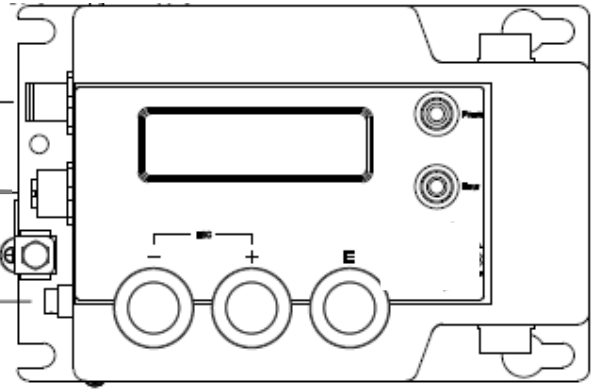
Non Hazardous Location

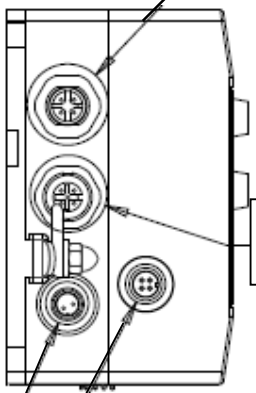
Hazardous (Classified) Location
Nanomass: for installation in Zone 0, Zone 1 or Zone 2
Type of explosion protection Ex ia IIC T4 Ga
-20 °C ≤ Ta ≤ +60 °C

Appropriate Third Party certified IECEx Barrier or Associated Apparatus

Appropriate Third Party certified IECEx Barrier or Associated Apparatus

Appropriate Third Party certified IECEx Barrier or Associated Apparatus



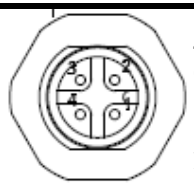


4-20 mA connector

RS232 connector

Power connector

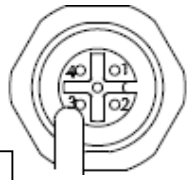
External sensor connector



4-20 mA connector

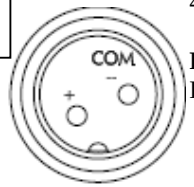
Channel 1	Channel 2
1, 2	3.4

\+ - or - +, polarity insensitive
Passive



RS232 connector

		For reference DB9 connector pins
1	Common	5
2	Txout	2
3	Rxin	3
4	Shield	Shield



Power connector
DC 8 – 30 V

External sensor connector

Pins	Pressure	Temperature
1	+ 5VDCout power	Iout
2	V+ (0-4.5 VDC) signal in	V+
3	V- (0 VDC) signal in	V-
4	Ground	Ireturn

Connect simple apparatus
- Or Endress+Hauser UC2 – T3C sensor - cable length max. 30.5 m
- Or Entity parameters: Uo=5.88 V, Io=400 mA, Po=0.6 W, Co=41000 nF, Lo=20 µH
  Po = (Io * Uo) / 4

Notes: Intrinsically safe installation for type of explosion protection Ex ia IIC T4.
1. Associated apparatus must be installed in accordance with the manufacturer's operation manual and the appropriate national or international standard (e.g. IEC 60079-14)
2. Use entity certified safety barrier or other associated equipment that satisfies the following conditions:
   $U_o \le U_i$ and $I_o \le I_i$ and $P_o \le P_i$ and $C_o \ge C_i + C_{cable}$ and $L_o \ge L_i + L_{cable}$
   Where C_{cable} and L_{cable} are not know the following parameters shall be used: C_{cable}=200 pF/m, L_{cable}=1000 nH/m
3. 4-20 mA circuits should be separated by individually grounded shields.
4. No user replacable parts inside
5. Associated apparatus output current must be limited by a resistor such that the output voltage-current plot has a linear characteristic.
6. Warning: Disconnect power before servicing.
   Zone 0 Warning: Apparatus enclosure contains aluminium. Care must be taken to avoid ignition hazards due to impact or friction.
7. For additional product information see FES0254.

Entity Parameters

	V_{max}, U_i	I_{max}, I_i	P_i	C_i	L_i
Power	30 V	300 mA	1.1 W	55 nF	0.22 mH
RS 232	15 V	90 mA	1.1 W	700 nF	1 mH
4–20 mA	30 V	320 mA	1.1 W	48 nF	0.15 mH

Aenderungen:					Mat. No.
	A	20.11.2015 / utz	F		
	B		G		Ersteller: FES / utz
	C		H		
	D		J		FILE: M:\ZEICHNG\FES0237\A\FES0252A.doc
	E		K		

IECEx Installation Drawing
Entity Concept Ex ia IIC T4

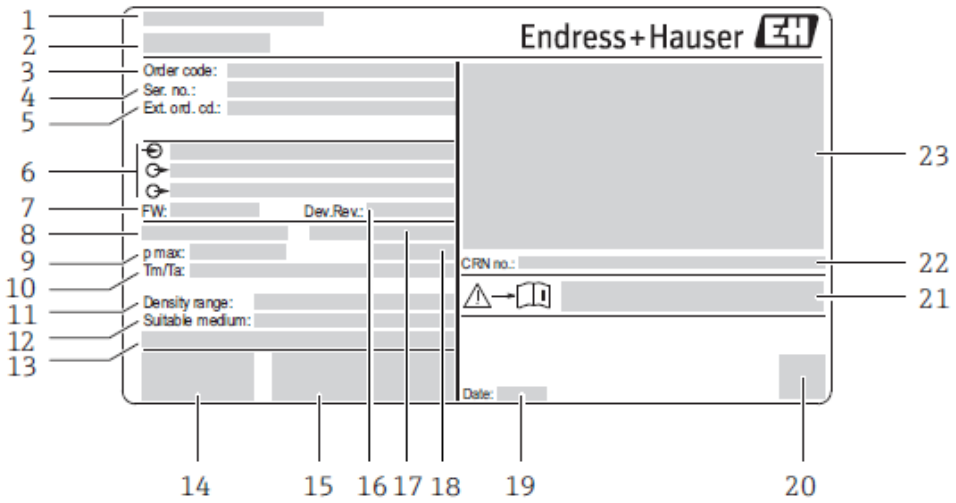
Nanomass, RS232 version

Gezeichnet	20.11.2015	utz
Geprüft		
Ex-geprüft	20.11.2015	utz
Gesehen		

Endress+Hauser
Flowtec AG, Kaegenstrasse 7, CH-4153 Reinach BL1, Postfach

FES0252A 1/1

Nanomass is suitable for density and/or concentration measurement of fluids (< 30 kg/m^3)
Nameplate:



1 Owner of certificate
2 Product name
3 Order code
4 Serial number
5 Extended order code
6 Electrical ratings: e.g. available I/Os, supply voltage
7 Firmware-Version
8 Diameter of micro channel
9 Maximum nominal system pressure
10 Allowed ambient temperature and fluid temperature
11 Allowed fluid density range
12 Allowed fluids
13 Additional information for special product design
14 CE-mark, C-Tick
15 Additional information on version: certificates, approvals
16 Device revision level
17 Diameter of process connection
18 IP, type of ingress protection
19 Manufacturing date: year – month
20 2-D-matrix code
21 Number of safety relevant document
22 Certification information on CRN
23 Certificate information for type of explosion protection

By affixing the certification number IECEx UL 15.0112X compliance with the following standards is confirmed:
IEC 60079-0: 2011, IEC 60079-11: 2006 , IEC 60079-26: 2006

Contact information: www.addresses.endress.com

Ambient temperature range: -20 … + 60 °C
Allowed maximum process pressure: 20 bar (290 psi)

Installation shall be done by qualified personnel.
National installation standards shall be observed.
For installation at wall or on solid support, use installation holes and M6 screws. For installation at pole use use pole mounting set.
Normally, the measuring instrument is installed in a bypass.
Mounting in the measuring tube is realized by means of tube fitting.

Maintenance:
Do not clean with high-pressure steam.
External: clean with mild soap solution or similar products.
Internal: clean with isopropanol or similar products.
For repair or alteration follow Endress+Hauser instructions or contact the Endress+Hauser organization. Use only original spare parts.

A	20.11.2015 / utz	u		Mat. No.
B		G		
C		H		Ersteller: FES / utz
D		J		
E		K		FILE: M:\ZEICHNG\FES0238\A\FES0254A.doc

Operational manual information

Nanomass

Gezeichnet	20.11.2015	utz
Geprüft		
Gesehen	20.11.2015	utz

Endress+Hauser
Flowtec AG, Kaegenstrasse 7, CH-4153 Reinach BL1, Postfach

FES0254A 1/1