

# EC-TYPE EXAMINATION CERTIFICATE



[1]

[2]

## Equipment or Protective System intended for use in Potentially Explosive Atmospheres Directive 94/9/EC

[3]

EC-Type Examination Certificate Number: **DEMKO 15 ATEX 1634X Rev. 0**

[4]

Equipment or Protective System: **Nanomass Density Meter**

[5]

Manufacturer: **Endress+Hauser Flowtec AG**

[6]

Address: **Kaegenstrasse 7, Reinach BL1, CH-4153 Switzerland**

[7]

This equipment or protective system and any acceptable variation thereto are specified in the schedule to this certificate and the documents therein referred to.

[8]

UL International Demko A/S, notified body number 0539 in accordance with Article 9 of the Council Directive 94/9/EC of 23 March 1994, certifies that this equipment or protective system has been found to comply with the Essential Health and Safety Requirements relating to design and construction of equipment and protective systems intended for use in potentially explosive atmospheres given in Annex II to the Directive.

The examination and test results are recorded in confidential report no. **4787049936-15ATEX1634X**

[9]

Compliance with the Essential Health and Safety Requirements has been assured by compliance with:

**EN 60079-0:2012+A11:2013**

**EN 60079-11:2012**

**EN 60079-26:2007**

[10]

If the sign "X" is placed after the certificate number, it indicates that the equipment or protective system is subject to special conditions for safe use specified in the schedule to this certificate.

[11]

This EC-Type examination certificate relates only to the design, examination and tests of the specified equipment or protective system in accordance to the Directive 94/9/EC. Further requirements of the Directive apply to the manufacturing process and supply of this equipment or protective system. These are not covered by the certificate.

[12]

The marking of the equipment or protective system shall include the following:



**II 1 G**

**Ex ia IIC T4 Ga**

**II 2 G**

**Ex ia IIC T4 Gb**

### Certification Manager

Jan-Erik Storgaard

This is to certify that the sample(s) of the Equipment described herein ("Certified Equipment") has been investigated and found in compliance with the Standard(s) indicated on this Certificate, in accordance with the ATEX Equipment Certification Program Requirements. This certificate and test results obtained apply only to the equipment sample(s) submitted by the Manufacturer. UL did not select the sample(s) or determine whether the sample(s) provided were representative of other manufactured equipment. UL has not established Follow-Up Service or other surveillance of the equipment. The Manufacturer is solely and fully responsible for conformity of all equipment to all applicable Standards, specifications, requirements or Directives. The test results may not be used, in whole or in part, in any other document without UL's prior written approval.

**Date of issue:** 2016-03-10



### Notified Body

UL International Demko A/S, Borupvang 5A, 2750 Ballerup, Denmark  
Tel. +45 44 85 65 65, [info.dk@ul.com](mailto:info.dk@ul.com), [www.ul.com](http://www.ul.com)



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[14]

**Schedule**  
**EC-TYPE EXAMINATION CERTIFICATE No.**  
**DEMKO 15 ATEX 1634X Rev. 0**  
**Report: 4787049936-15ATEX1634X**

[15]

Description of Equipment or protective system

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

Electrical data:

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

Temperature range:

The ambient temperature range is -20 °C to +60 °C.

Installation instructions:

See drawings FES0252A for the RS232 version and FES0253B for the USB version, specific version is identified as item V in the nomenclature above.

Mounting instructions

Refer to "Instructions".

Routine tests

None

[16]

Descriptive Documents

The scheduled drawings are listed in the report no. provided under item no. [ 8 ] on page 1 of this EC-Type Examination Certificate.

[13]

[14]

**Schedule**  
**EC-TYPE EXAMINATION CERTIFICATE No.**  
**DEMKO 15 ATEX 1634X Rev. 0**  
**Report: 4787049936-15ATEX1634X**

[17]

Specific conditions of use:

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 USB and power simultaneously.

[18]

Essential Health and Safety Requirements

Concerning ESRs this Schedule verifies compliance with the Annex III of ATEX directive only. By placing the product on the market, the manufacturer declares compliance with other relevant Directives, and all other safety related requirements including those of Annex II of this Directive.

Additional information

The manufacturer shall inform the notified body concerning all modifications to the technical documentation as described in ANNEX III to Directive 94/9/EC of the European Parliament and the Council of 23 March 1994.



**Non Hazardous Location**

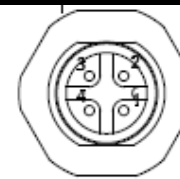
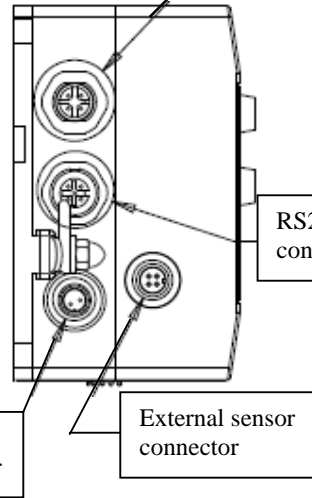
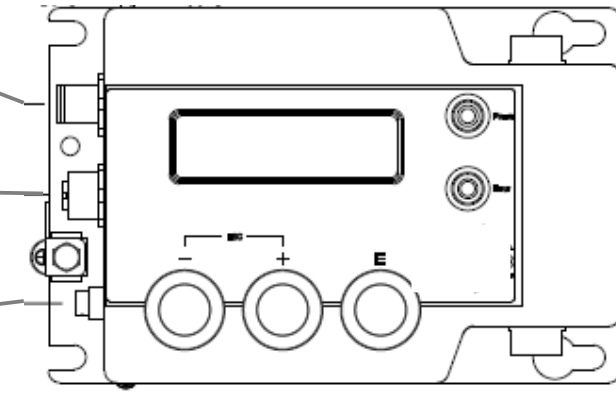
**Hazardous (Classified) Location**

Nanomass: for installation in Zone 0, Zone 1 or Zone 2  
 Type of explosion protection Ex ia IIC T4 Ga  
 $-20\text{ °C} \leq T_a \leq +60\text{ °C}$

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

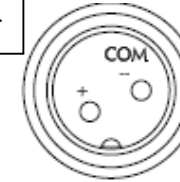


**4-20 mA connector**  
 Channel 1      Channel 2  
 1, 2              3, 4  
 + - or +, polarity insensitive  
 Passive

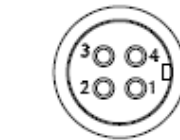


**RS232 connector**      For reference DB9 connector pins

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:  $U_o=5.88\text{ V}$ ,  $I_o=400\text{ mA}$ ,  $P_o=0.6\text{ W}$ ,  $C_o=41000\text{ nF}$ ,  $L_o=20\text{ }\mu\text{H}$   
 $P_o = (I_o * U_o) / 4$

Notes: Intrinsically safe installation for type of explosion protection Ex ia IIC T4.

- 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)
- Use entity certified safety barrier or other associated equipment that satisfies the following conditions:  
 $U_o \leq U_i$  and  $I_o \leq I_i$  and  $P_o \leq P_i$  and  $C_o \geq C_i + C_{cable}$  and  $L_o \geq L_i + L_{cable}$   
 Where  $C_{cable}$  and  $L_{cable}$  are not know the following parameters shall be used:  $C_{cable}=200\text{ pF/m}$ ,  $L_{cable}=1000\text{ nH/m}$
- 4-20 mA circuits should be separated by individually grounded shields.
- No user replacable parts inside
- Associated apparatus output current must be limited by a resistor such that the output voltage-current plot has a linear characteristic.
- 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.
- For additional product information see FES0254.

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**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

**IECEX Installation Drawing  
 Entity Concept Ex ia IIC T4**

**Nanomass, RS232 version**



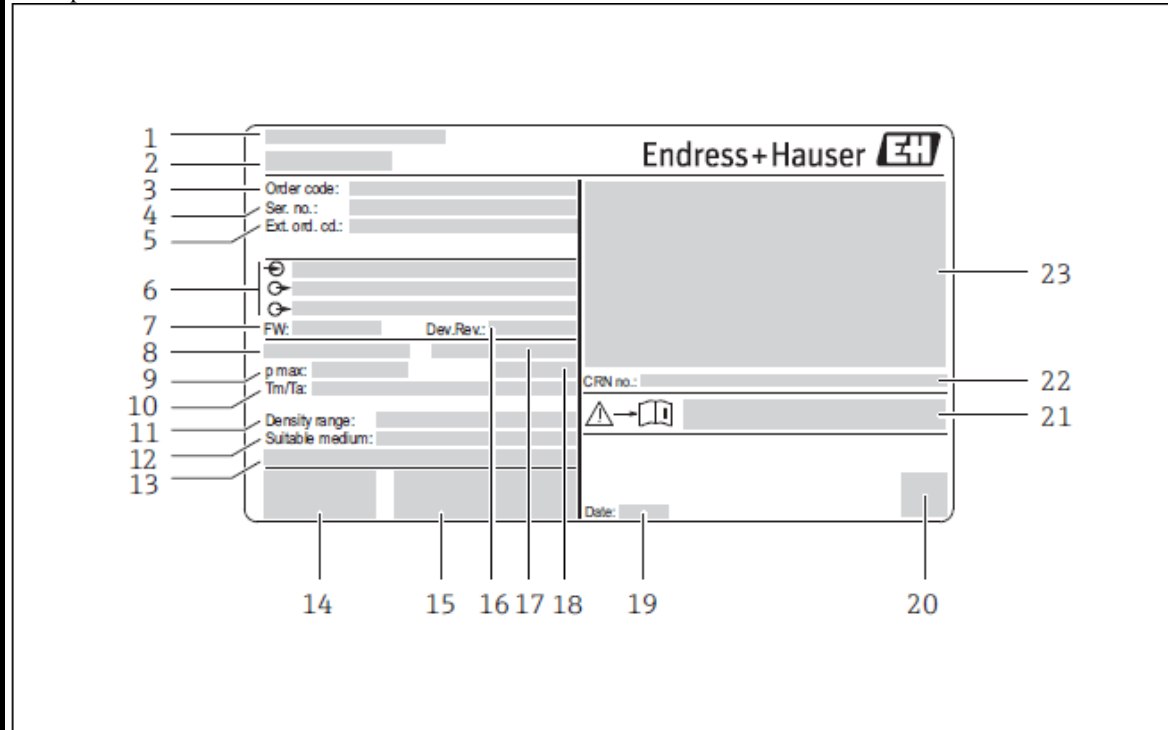
Flowtec AG, Kaegenstrasse 7, CH-4153 Reinach BL1, Postfach

Gezeichnet	20.11.2015	utz
Geprüft		
Ex-geprüft	20.11.2015	utz
Gesehen		

**FES0252A**

Nanomass is suitable for density and/or concentration measurement of fluids (< 30 kg/m<sup>3</sup>)

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

Contact information: [www.addresses.endress.com](http://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 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.

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

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E		K				
<b>Operational manual information</b>				Gezeichnet	20.11.2015	utz
<b>Nanomass</b>				Geprüft		
<b>Endress+Hauser</b> 				Gesehen	20.11.2015	utz
Flowtec AG, Kaegenstrasse 7, CH-4153 Reinach BL1, Postfach				<b>FES0254A</b>		1/1