[1] EU-TYPE EXAMINATION CERTIFICATE

[2] Equipment or Protected System Intended for use in Potentially explosive atmospheres Directive 2014/34/EU

[3] EU-Type Examination Certificate Number: Nemko 07ATEX1160X Issue 7

[4] Product: Flare Gas Meter FGM 160
(incl. FGM 160 TFS ultrasonic sensor)

[5] Manufacturer: Fluenta AS

[6] Address: Haraldsgate 90
N-5501 Haugesund
Norway

[7] This product and any acceptable variation thereto is specified in the schedule to this certificate and the documents therein referred to.

[8] Nemko AS, notified body number 0470, in accordance with Article 17 of Directive 2014/34/EU of the European Parliament and of the Council, dated 26 February 2014, certifies that this product has been found to comply with the Essential Health and Safety Requirements relating to the design and construction of products 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. D0001024-01

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

EN 60079-0:2012/A11:2013, EN 60079-1:2007, EN 60079-7:2007, EN 60079-11:2012, EN 60079-26:2007

[10] If the sign "X" is placed after the certificate number, it indicates that the product is subject to the Specific Conditions of Use specified in the schedule to this certificate.

[11] This EU - TYPE EXAMINATION CERTIFICATE relates only to the design and construction of the specified product. Further requirements of the Directive apply to the manufacturing process and supply of this product. These are not covered by this certificate

[12] The marking of the product shall include the following:

Field Computer:	II 2 (1) G	Ex d e [ia Ga] IIC T6 Gb	Ta: -40°C to +60°C
Ultrasonic Sensors:	II 1 G	Ex ia IIC T* Ga	T6: Ta: -70°C to +60°C T5: Ta: -70°C to +85°C T4: Ta: -70°C to +120°C

Oslo, 2017-06-28

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[13] Schedule

[14] EU-TYPE EXAMINATION CERTIFICATE No Nemko 14ATEX1160X Issue 7

[15] Description of Product

This certificate covers Fluenta Flare Gas Meter FGM 160 (including FGM 160 TFS ultrasonic sensor) which is designed to measure the velocity of gases in a flare pipe. The Fluenta Flare Gas Meter consists of a Field Computer and Ultrasonic Sensors. The Field Computer is composed of an Increased safety "e" enclosure with terminal blocks and a Flameproof "d" enclosure containing the electronics. The output to the Ultrasonic sensors is supplied through intrinsic safe barriers ("ia"). The standard configuration allows up to 20m Draka RFOU 250V S2/S6 4pair 0.75mm2 or Draka FlexFlame RFOU(i) 150/250(300V) S1/S5 1Pair 0.75mm2 Instr. Cable to the Ultrasonic Sensor. As an option cable length up to 50m can be used by adding a current limiting resistor: 5.6ohm series resistor. FGM 160 also includes outputs to external Ex devices, intrinsically safe when connected according to the below electrical safety data (safety parameters).

Type Designations
FGM 160
FGM 160 TFS Ultrasonic Sensor

Electrical Safety Data

Input: Um= 250VAC, external fuse: max 1.25A, min breaking capacity 1500A.

Output terminals Tmp1, Tmp2, Prs1 and Prs2:
Uo= 27.3V, Io= 90mA, Po= 0.62W, Co= 0.088uF, Lo= 3.5mH, Lo/Ro= 58uH/Ω

Output to ultrasonic sensors:
Uo=11.7V, Io=1.46A, Po=1.76W, Co=1.54µF, Lo=0.01µH, Lo/Ro= 8.3uH/Ω
These output parameters may be used for entity evaluation when the FGM 160 is connected to an alternative ultrasonic sensor which is covered by a separate Ex certificate

Degrees of protection (IP Code)
IP66 in accordance with IEC 60529

Ambient temperature:

Field Computer	Ta: -40°C to +60°C
Sensors	T6: Ta: -70°C to +60°C
	T5: Ta: -70°C to +85°C
	T4: Ta: -70°C to +120°C

Routine tests

Dielectric test according to clause 7.1 in EN 60079-7.

Routine tests for infallible transformer T811 according to clause 11.2 in EN 60079-11.

[16] Report No. D0001024-01

Descriptive Documents

Number	Title	Rev	Date
62.120.106	FGM 160 Production and Assembly of IS Barrier Module	A	2009.01.08
63.120.301	FGM 160 IS Barrier – PCB Layout – Gerber Files	B	2008-10-03
63.120.303	FGM 160 Sensor Electronics – PCB Layout – Gerber Files	B	2008-12-05
63.120.313	FGM 160 RTC Backup Battery – PCB Layout – Gerber Files	A	2008-09-12
74.120.002	FGM 160 Parts List – Ex Related Components	K	2017.06.23
74.120.100	FGM 160 IS Barrier Module – Parts and Check List	D	2012.02.17
74.120.102	FGM 160 Sensor Electronics – Parts and Check List	F	2015.05.15
74.120.113	FGM 160 RTC Backup Battery Module – Parts and Check List	D	2012.02.17
77.120.362	FGM 160 GA Sensor Unit – TFS With Lemo	D	2014.08.07
77.120.801	FGM 160 IS Barrier – Assembly Drawing	B	2008.10.03
77.120.802	FGM 160 IS Barrier – PCB Layout All Layers	B	2008.10.03
77.120.805	FGM 160 Sensor Electronics – PCB Layout All Layers	B	2008.12.05
77.120.807	FGM 160 Sensor Electronics – Assembly Drawing w/Cable	B	2008.12.05
77.120.850	FGM 160 RTC Backup Battery Module - Ex-Certification Drawing	C	2009.01.05
62.120.108	FGM 160 Production and Assembly of Surge Protection Module	B	2010.11.01
63.120.305	FGM 160 Surge Protection – PCB Layout – Gerber Files	C	2010-12-15
74.120.104	FGM 160 Surge Protection – Parts and Check List	G	2014.06.25
77.120.179	FGM 160 Ex-e Box for Field Computer	C	2013.07.29
77.120.189	FGM 160 Prod Drawing Ex-d Enclosure	F	2017.05.10
77.120.207	FGM 160 IECEx, ATEX and CSA Label (Fluenta enclosure)	I	2015.05.27
77.120.212	FGM 160 Prod Drawing – Ultrasonic sensor tag plate	F	2015.05.27
77.120.364	FGM 160 New Ex-d enclosure Detailed Mounting Arrangement	D	2017.05.10
77.120.509	FGM 160 Field Wiring Fluenta Enclosure	G	2017.06.26
77.120.510	FGM 160 Ex d electrical feed through principal drawing	A	2010.11.11
77.120.511	FGM 160 Ex e electrical connection principal drawing	A	2010.11.11
77.120.514	FGM 160 Ex d bushing production control drawing	A	2011.07.20
77.120.808	FGM 160 Surge Protection – Assembly Drawing	C	2010.11.01
77.120.809	FGM 160 Surge Protection – PCB Layout All Layers	C	2010.11.11
77.120.854	FGM 160 Ex Certification Schematics with enclosure	D	2015.03.13
77.120.856	FGM 160 Ex Certification Schematics Fieldbus option	C	2015.03.13
77.120.847	FGM 160 IS-Barrier Module PCB coating	B	2015.04.15

Certificate History and Associated Test Reports

Issue	Date	Report	Description
0	2007-12-13	95416	Prime Certificate released
1	2009-04-15	124323	The certificate is extended to include new design of IS-Barrier. The certificate is updated to include accordance with the following standards: EN 60079-0:2006, EN 60079-11:2007, EN 60079-26:2004
2	2011-04-15	147895	The certificate is updated to include new Ex d and Ex e enclosure.
3	2011-06-31	177209	Descriptive documents list corrected.
4	2011-10-19	186837	The certificate includes the descriptive documents for the Technor enclosure. Waived routine overpressure testing of the Fluenta Ex d enclosure, withstand type test made at a static pressure equal to four times the reference pressure and the assembly procedure is sufficiently documented in 77.120.514. Included Fieldbus option as an alternative to the IO-module in the Fluenta enclosure. Included the option to connect the Transducer through a suitable Ex e cable gland specified in 77.120.508 and 77.120.509, as an alternative to the LEMO connector. Changed safety parameters for external transmitter.
5	2012-03-21	191800	Included the option to use cable length between 20m and 50m to the Ultrasonic Sensor, according to 77.120.508 and 77.120.509. Duplicate marking label on Ultrasonic sensor added. Added alternative DC/DC converter on schematics 77.120.852, 77.120.854, and 77.120.856.
6	2015-06-03	D0001024	Changed address and certificate updated to latest standards. X-marked due to Ultrasonic sensor head is made of titanium, avoid impact or friction. Included 1Pair Draka cable instead of 4 pair.
7	2017-06-28	D0001024-01	- Alternative glass material. - Listing of the intrinsic safe output parameters to ultrasonic sensors. Uo=11.7V, Io=1.46A, Po=1.76W, Co=1.54µF, Lo=0.01µH, Lo/Ro= 8.3uH/Ω

[17] Specific Conditions of Use

The Ultrasonic sensor head is made of titanium, avoid impact or friction.

[18] Essential Health and Safety Requirements

Essential Health and Safety Requirements (EHSRs) are covered by the standards listed at item 9