EU-Type Examination Certificate

[2] EQUIPMENT OR PROTECTIVE SYSTEM INTENDED FOR USE IN POTENTIALLY EXPLOSIVE ATMOSPHERES DIRECTIVE 2014/34/EU

[3] **EU-Type Examination Certificate Number:** **Presafe 16ATEX8281X** **Issue 1**

[4] **Product:** **Ballast Water UV-System UV-WT-Ex**

[5] **Manufacturer:** **Optimarin AS**

[6] **Address:** **Sjøveien 34**
4315 Sandnes
Norway

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

[8] **DNV Nemko Presafe AS, notified body number 2460, 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 reports listed in section 16.

[9] **Compliance with the Essential Health and Safety Requirements has been assured by compliance with: EN 60079-0: 2012+A11:2013, EN 60079-2: 2015, EN 60079-7 : 2007, EN 60079-11: 2012, EN 60079-18: 2009**

[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:**

II 2G Ex e ia ib mb pxb IIC T4 Gb 0°C ≤ Ta ≤ 55°C

Date of issue: 2017-07-28

Asle Kaastad
For DNV Nemko Presafe AS
Information on electronic signature www.presafe.com

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EU-Type Examination Certificate

[13] **Schedule**

[14] **EU-TYPE EXAMINATION CERTIFICATE No.:** **Presafe 16 ATEX 8281X** Issue 1

[15] **Description of Product**

UV-WT-Ex, UV Ballast Water Treatment System. The UV system is designed with UV chambers installed in parallel on inlet and outlet manifold. Number of installed UV chambers in one assembly is from one to three.
An UV lamp, with permanently connected cables, is installed in a quarts tube in the center of each UV chamber. At each end, an end cap containing gland for electric cable and connection for purge and pressurization tubing. The quarts tube and the end cap area is purged with inert gas, Nitrogen (N_2).The up to three UV Chambers are connected in series with tubing for protective gas.
The purging is controlled and monitored by an Ex px controller and regulated with a proportional valve.
Separately certified parts with the system are Purge and pressurizing controller, solenoid valve, cable glands, protective tubing for high voltage electrical supply cables to the tubes

Maximum Ratings.

Operation voltage:	2200 VAC
Start-up peak voltage:	4000 VAC
Operation current:	30 A
Frequency:	170 kHz
Power consumption:	1-3 tubes. Max 35 kW

Ambient temperature: 0°C ≤ Ta ≤ 55°C

Water temperature: -2°C ≥ Tw ≥ 37°C

Minimum water flow: 20m^3/h each chamber.

Intrinsically safe sensors.

The intrinsically safe sensors for UV and temperature have to be connected to intrinsically safe circuits with data according to the certificates and manufacturer's instructions.

Purging and Pressurization

Protective gas:	Nitrogen, N_2
Minimum quantity of protective gas purge volume:	60dm^3
Minimum purge flow:	24 dm^3/min
Minimum purge time:	150 sec
Minimum pressure:	2 mbar
Normal operation pressure.	10 mbar
Maximum operation pressure:	27 mbar
Supply pressure:	2 -4 bar

Maximum allowed leakage rate of gas according to specified test procedure.

[16] Report No.: D0001764

[17] Specific Conditions of Use

1. The internal temperature of the UV-tube exceeds the temperature class T4 (135°C) and a delay cooling period of a minimum 15minutes is required before an opening operation of the unit is commenced, unless the atmosphere is known to be non-explosive.
2. Replacements of gaskets according to the manufacturers instructions at lamp replacement.
3. Maximum allowed leakage of enclosure comparable with a test of the maximum allowed pressure drop from 10mbar to 1mbar during minimum 5 minutes.
4. The ballast water surrounding the energized UV-tubes shall be free from air pockets.

[18] Essential Health and Safety Requirements

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

[19] Drawings and documents

Number	Title	Rev.	Date
900000	Technical Description Ex p system for UV lamps, UV-WT-Ex. Optimatin ballast system, Ex version for hazardous area zone 1	09	10.04.2017
146604	Cable protection hose kit Ex	1	29.03.2017
145130	UV lamp 2150V V 3m Cable type ETA	1	08.08.2016
142158	Cable protection hose kit Ex Type TRA	1	09.08.2016
142145	UV lamp 1260 V 3m Cable type UL	2	16.11.2013
142003	UV Chamber With Signs	4	06.04.2017
138318	UV-WT-EX EX P SYSTEM SIGN	7	08.02.2017
132647	UV lamp 1260 V 2m Cable type UVT	4	15.12.2014
132616	UV-Unit 3 chamber DN250 System Ex	10	06.04.2017
117019	Quartz Glas OD41 L1600 Type UVT	6	21.05.2015

[20] Certificate History

Issue	Description	Issue date	Report no.
0	Nemko 12ATEX1138X Primary Certificate	2013-07-23	156996
1	Nemko 12ATEX1138X Issue 1	2014-03-06	156996 01
0	Presafe 16ATEX8281X . Change to group IIC and class T4 . Update to EN 60079-0:2012/A11 2013	2016-06-07	D0001764
1	Update to EN 60079-2: 2015, optional UV tubes , docs. Editorial corrections Editorial corrections of certificate dated 2017-07-28	2017-05-03	D0001764-01

END OF CERTIFICATE