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 PRE 17.0001X**

Certificate history:
Issue 1 (2020-04-03)
Issue 0 (2017-05-04)

Status: **Current**

Issue No: 2

Date of Issue: 2020-07-15

Applicant: **Optimarin AS**
Sjøveien 34
4315 Sandnes
Norway

Equipment: **Ballast Water UV-System UV-WT-Ex**

Optional accessory:

Type of Protection: **Purged and pressurized**

Marking: Ex eb ia ib mb pxb IIC T4 Gb
0°C ≤ Ta ≤ 55°C

Approved for issue on behalf of the IECEx Certification Body: **Bjørn Spongsveen**

Position: **Certification Manager**

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

Certificate issued by:

DNV GL Presafe AS
Veritasveien 3
1363 Høvik
Norway

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Certificate No.: **IECEx PRE 17.0001X**

Date of issue: 2020-07-15 Issue No: 2

Manufacturer: **Optimarin AS**
Sjøveien 34
4315 Sandnes
Norway

Additional manufacturing 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 60079-0:2011 Explosive atmospheres - Part 0: General requirements
Edition:6.0

IEC 60079-11:2011 Explosive atmospheres - Part 11: Equipment protection by intrinsic safety "i"
Edition:6.0

IEC 60079-18:2014 Explosive atmospheres – Part 18: Equipment protection by encapsulation “m”
Edition:4.0

IEC 60079-2:2014-07 Explosive atmospheres - Part 2: Equipment protection by pressurized enclosure "p"
Edition:6

IEC 60079-7:2017 Explosive atmospheres - Part 7: Equipment protection by increased safety "e"
Edition:5.1

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:

NO/PRE/ExTR17.0001/00 NO/PRE/ExTR17.0001/01 NO/PRE/ExTR17.0001/02

Quality Assessment Report:

NO/NEM/QAR13.0006/03

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

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 (N2).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.

Data and Ratings: See Attachment

SPECIFIC CONDITIONS OF USE: YES as shown below:
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.

Replacements of gaskets according to the manufacturers instructions at lamp replacement.

Maximum allowed leakage of enclosure comparable with a test of the maximum allowed pressure drop from 10mbar to 1mbar during minimum 5 minutes.

The ballast water surrounding the energized UV-tubes shall be free from air pockets.

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DETAILS OF CERTIFICATE CHANGES (for issues 1 and above)
00 Initial Issue
01 Assessment new gasket for leakage test & new purging criteria
02 Corrected type error & assessment for plastic cover protection for cables

Annex:

ANNEX to IECEx Certificate of Conformity.pdf

ANNEX IECEx PRE 17.0001X/02

Maximum Ratings.

Operation voltage:	2200 VAC
Start-up peak voltage:	4000 VAC
Operation current:	30 A/UV Lamp
Frequency:	170 kHz
Power consumption:	35 kW/UV lamp, max 3 UV lamps

Ambient temperature: 0°C ≤ Ta ≤ 55°C

Water temperature: -2°C ≥ Tw ≥ 37°C

Minimum water flow: 20m³/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, N2
Minimum quantity of protective gas purge volume:	60 dm³
Minimum purge flow:	24 dm³/min
Maximum purge flow:	120 dm³/min
Minimum purge time@ 24 dm³/min	150 sec
Minimum purge time@ 120 dm³/min	30 sec
Minimum pressure:	2mbar
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.

Certified Parts

Description	Type	Manufacture	Ex code	Certificate	Standards
Ex p controller	FS850S. 6.4.1	Grönnheimer	II 2 G Ex e mb [ib] [px] IIC T4	IECEx BVS 12.0033	IEC 60079-0:2011 IEC 60079-11:2011 IEC 60079-18:2014 IEC 60079-2:2007 IEC 60079-7: 2015
Solenoid	Solenoid 0641	Bürkert.	II 2 G Ex mb IIC T4	IECEx EPS 16.0053X	IEC 60079-0:2011 IEC 60079-18:2014
UV sensor	SUV20.2 Y2C	Metronic	II 2G Ex ib IIC T4 Gb	IECEx IBE 14.0027	IEC 60079-0:2011 IEC 60079-11:2011
Transmitter	TR34-B-TT	WIKA	II 2G Ex ia IIC T4 Gb	IECEx BVS 14.0101X	IEC 60079-0:2011 IEC 60079-11:2011
Cable Gland	501-421	Hawke	II 2 G Ex eb IIC Gb	IECEx BAS 06.0013X	IEC 60079-0:2011 IEC 60079-1: 2014 IEC 60079-7: 2006 IEC 60079-15: 2010
Cable Gland	E204/M2 05	Tranberg	II 2 G Ex eb IIC	IECEx NEM 13.0021X	IEC 60079-0:2011 IEC 60079-7: 2006
Corrugated Conduit	XESX...	ABB Schweiz AG, PMA Cable Protection	II 2 G Ex eb IIC Gb	IECEx SEV 15.0009X	IEC 60079-0:2011 IEC 60079-7:2015