



# 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](http://www.iecex.com)

Certificate No.: IECEx PRE 17.0001X

Issue No: 0

Certificate history:

[Issue No. 0 \(2017-05-04\)](#)

Status: **Current**

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Date of Issue: **2017-05-04**

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 e ia ib mb pxb IIC T4 Gb  
 $0^{\circ}\text{C} \leq \text{Ta} \leq 55^{\circ}\text{C}$

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

Asle Kaastad

*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 the [Official IECEx Website](#).

Certificate issued by:

**DNV GL Nemko Presafe AS**  
Veritasveien 3  
1363 Høvik  
Norway





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

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** Explosive atmospheres - Part 0: General requirements  
Edition:6.0

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

*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:

[NO/PRE/ExTR17.0001/00](#)

Quality Assessment Report:

[NO/NEM/QAR13.0006/02](#)



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## Schedule

### 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 quartz 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 quartz tube and the end cap area is purged with inert gas, Nitrogen (N<sub>2</sub>). 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.

### Annex:

[ANNEX TO IECEx PRE170001X.pdf](#)

**ANNEX to IECEx Certificate of Conformity**  
PRE 17.0001 X/00

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**ANNEX to Certificate of Conformity.**

**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:**  $0^{\circ}\text{C} \leq T_a \leq 55^{\circ}\text{C}$

**Water temperature:**  $-2^{\circ}\text{C} \geq T_w \geq 37^{\circ}\text{C}$

**Minimum water flow:**  $20\text{m}^3/\text{h}$  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, $\text{N}_2$
Minimum quantity of protective gas purge volume:	$60\text{ dm}^3$
Minimum purge flow:	$24\text{ dm}^3/\text{min}$
Minimum purge time:	150 sec
Minimum pressure:	200 Pa
Normal operation pressure.	1000 Pa
Maximum operation pressure:	2700 Pa
Supply pressure:	0.2 -0.4 MPa
Maximum allowed leakage rate of gas according to specified test procedure.	

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PRE 17.0001 X/00

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**Certified Parts**

Description	Type	Manufacture	Ex code	Certificate	Standards
Ex p controller	FS850S.6.4.1	Grönheimer	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 valve	SVP.2-A60	Bürkert.	II 2 G/D Ex em II T4	IECEX PTB 09.0064X	IEC 60079-0:2011 IEC 60079-18:2014 IEC 60079-7: 2006
UV sensor	SUV20.2Y2C	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/M205	Tranberg	II 2 G Ex eb IIC	IECEX NEM 13.0021X	IEC 60079-0:2011 IEC 60079-7: 2006