

(1) EU-Type-Examination Certificate

- (2) Equipment and protective systems intended for use in potentially explosive atmospheres, **Directive 2014/34/EU**



(3) **Certificate Number** TÜV CY 19 ATEX 0206221 X Issue 02

(4) for the equipment: Bicolor LED Illuminator

Type: LL_RG* ** **

(5) of the manufacturer: **Officine Orobiche S.r.l.**

(6) Address: Via G. Paglia 22 – 24050 Zanica (BG) - Italy

Order number: 0206221

Date of issue: 2023-12-12

(7) The design of this equipment or protective system and any acceptable variation thereto are specified in the schedule to this EU-Type-Examination Certificate and the documents therein referred to.

(8) TÜV CYPRUS Ltd, notified body No. 2261 in accordance with Article 17 of the Council Directive of 2014/34/EU of February 26, 2014, certifies that this equipment or protective system has been found to comply with the Essential Health and Safety Requirements relating to the 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 the confidential report No. 23 0206221.

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

EN IEC 60079-0:2018

EN 60079-1: 2014

EN 60079-11: 2012

EN 60079-25:2010

EN 60079-28:2015 /A1:2017

EN 60079-31: 2014

(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 EU-Type-Examination Certificate relates only to the design, examination and tests of the specified equipment in accordance to the Directive 2014/34/EU. Further requirements of the Directive apply to the manufacturing process and supply of this equipment which are not covered by this certificate.

(12) The marking of the equipment or protective system must include the following:

LED Illuminator
II 2G Ex ia op is IIC T4 Gb
II 2D Ex ia op is IIC T135 °C Db

Power Supply Unit
II 2 G Ex db [ia Ga] IIC T6 Gb
II 2 D Ex tb [ia Da] IIC T85°C Db

TÜV CYPRUS Ltd (TUV NORD Group),

The head of the notified body,

D. Demosthenous

Accredited by CYS-CYSAB
 Certificate No. C 004-2



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(13) SCHEDULE

(14) EU-Type-Examination Certificate No. TÜV CY 19 ATEX 0206221 X Issue 02

(15) Description of equipment

Officine Orobiche LL_RG*_*_* LED illuminator is a special LED bicolor red-green lamp for bicolor glass level gauges used in steam generators.

It is used with Officine Orobiche model "OOBC1 green/red" glass level gauge.

This glass level gauge works on the principle of communicating pipes. The LED illuminator is mounted on the rear side of the gauge body. If there is water in the gauge body, then the light will be refracted in such a way that the green light beam is shown on the front side of the level gauge.

As a result, the "OOBC1 green/red" gauge with the LED Illuminator shows on the front side a green light for the part of the gauge body filled with water and a red light for the part filled with steam.

The equipment main function is not considered as luminarie.

The equipment is composed by the LED Illuminator enclosure and by the Power Supply Unit (PSU).

The LED Illuminator enclosure contains green and red LED modules. Each LED module mounts 3 LED (green or red) connected in series.

The LED Illuminator and cable entries are mechanically protected by a steel enclosure.

The PSU consists of a certified explosion proof enclosure, marked II 2GD Ex db IIC Gb - Ex tb IIIC Db, containing a AC/DC power supply and up to 12 (32 for HT Models) certified intrinsically safe ia EPL Ga associated apparatus.

The PSU enclosures are manufactured by "Officine Meccaniche M.A.M. srl", model types "GUB4 – GUB5A – GUB5B – GUB6", Certificate INERIS 16ATEX0024X.

The model type used depends from the number of LED modules that the Power Supply Unit has to supply.

The associated apparatuses are manufactured by "G.M. International srl", Type "PSD1001" active barriers, Certificate DMT 01ATEXE042X and for HT Models Type "D5040D" active barriers, Certificate BVS14 ATEXE159X.

The connection between the LED Illuminator and the power supply is provided by multipolar cables with n. 8 wires of 0.34 mm². Each cable can supply up to 4 LED modules.

The minimum length of the cables is 3 m and maximum is 50 m.

The equipment as indicated above complies with requirements of EN 60079-25 for Intrinsically safe electrical systems and EN 60079-14 for Electrical installations design, selection and erection.

Degree of ingress protection:

LED Illuminator IP65

Power Supply Unit IP66

The Power Supply Unit and its components are part of this assessment and are separately ATEX certified equipments.

The scope of current Issue 02 is to address the introduction of new models that have extended temperature range identified by the additional type key "HT".

Type key:

LL RG4 Ex	Four LED Modules with round connector
LL RG4 Ex HT	Four Led Modules with round connector with extended temperature
LL RG6 Ex	Six LED Modules with round connector:
LL RG6 Ex HT	Six Led Modules with round connector with extended temperature
LL RG4 CG Ex	Four LED Modules with cable gland
LL RG4 CG Ex HT	Four Led Modules with cable gland with extended temperature
LL RG6 CG Ex	Six LED Modules with cable gland
LL RG6 CG Ex HT	Six Led Modules with cable gland with extended temperature

Technical data:

Power Supply Unit:

Rated Voltage $U_m = 230 \text{ VAC}$

PSU I.S. Barrier Electrical Parameters for each channel:

Model Type LL_RG*_Ex	Model Type LL_RG*_Ex HT
$U_o = 23.6 \text{ V}$	$U_o = 25.2 \text{ V}$
$I_o = 88.2 \text{ mA}$	$I_o = 108 \text{ mA}$
$C_o = 130 \text{ nF}$	$C_o = 107 \text{ nF}$
$L_o = 4.5 \text{ mH}$	$L_o = 3.07 \text{ mH}$
$P_o = 519 \text{ mW}$	$P_o = 676 \text{ mW}$

LED Illuminator, LED module Electrical Parameters:

Model Type LL_RG*_Ex	Model Type LL_RG*_Ex HT
$U_i = 24 \text{ V}$	$U_i = 26 \text{ V}$
$I_i = 90 \text{ mA}$	$I_i = 112 \text{ mA}$
$C_i = 100 \text{ nF}$	$C_i = 82 \text{ nF}$
L_i negligible	L_i negligible
$P_i = 540 \text{ mW}$	$P_i = 728 \text{ mW}$

Cable (EN 60079-25 9.3 and 9.5)

$C_c = 200 \text{ pF/m}$

$L_c = 1 \mu\text{H/m}$

Insulation > 500VAC

Cable Type B

Allowable ambient temperature range:

LED Illuminator: $T_{amb} -40^\circ\text{C} / +70^\circ\text{C}$

Power Supply unit: $T_{amb} -20^\circ\text{C} / +40^\circ\text{C}$

For HT models

Power Supply Unit: $T_{amb} -40^\circ\text{C}$ up to 55°C

Warning Markings:

Warning: See Installation Instruction Document

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Assessment of the intrinsically safe system:

System has been verified in compliance with EN 60079-25 and EN 60079-14.

(16) Test documents are listed in the test report No. 23 0206221 01

(17) Special conditions for safe use

1. LED Illuminator steel cover and cable mechanical protection is part of the certified equipment to ensure mechanical protection.
2. Flameproof joints of power supply unit GUB enclosures have different values from those specified in the tables of EN 60079-1 standard, contact manufacturer for any repair.

(18) Essential Health and Safety Requirements

This certificate covers the Essential Health and Safety Requirements related to the Directive 2104/34/EU.