(1) EU-TYPE EXAMINATION CERTIFICATE

(2) Equipment and Protective Systems intended for use in Potentially Explosive Atmosphere - **Directive 2014/34/EU**

(3) EU-Type Examination Certificate Number

TÜV 11 ATEX 7031 X

Issue: 04

(4) Equipment: **Measurement System type OTS3-a-b-c-d, type OTS3S-a-b-c-d, type LHD3-a-b-c-d, and type LHD3S-a-b-c-d**

(5) Manufacturer: **NKT Photonics GmbH**

(6) Address: **Schanzenstrasse 39, Gebäude D9-D13, 51063 Cologne, Germany**

(7) This product and any acceptable variation thereto are specified in the schedule to this certificate and the documents therein referred to.

(8) The certification body for explosion protection of TÜV Rheinland Industrie Service GmbH, Notified Body No. 0035 in accordance with Article 21 of the Council Directive 2014/34/EU of 26th February 2014, certifies this product which 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 atmosphere, given in Annex II to the Directive.

The examination and test results are recorded in the confidential report 557 / Ex 7031.05 / 11.

(9) Compliance with the Essential Health and Safety Requirements, with the exception of those listed in the schedule of this certificate, has been assessed by reference to:

EN 60079-0:2018 **EN 60079-28:2015** **EN 50495:2010**
EN 50303:2000

(10) If the sign "X" is placed after the certificate number, it indicates that the equipment 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 and specification for construction of the equipment or protective system. It does not cover the process for actual manufacture or supply of the equipment or protective system, for which further requirements of the directive are applicable.

II (1)G [Ex op is T3 Ga] IIA or II (1)G [Ex op is T4 Ga] IIC
II (1)D [Ex op is Da] IIIC
I (M1) [Ex op is Ma]

TÜV Rheinland certification body for explosion protection

Cologne, 2019-02-04

Dipl.-Ing. Andreas Maschke

This EU-Type Examination Certificate without signature and stamp shall not be valid.
This EU-Type Examination Certificate may be circulated only without alteration. Extracts or alterations are subject to approval by the TÜV Rheinland Industrie Service GmbH TÜV Rheinland Group Am Grauen Stein 51105 Cologne.
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(13) Annex

(14) # EU-Type Examination Certificate

TÜV 11 ATEX 7031 X Issue: 04

(15) Description of equipment

15.1 Equipment and type:

Measurement System
type OTS3-a-b-c-d, type OTS3S-a-b-c-d,
type LHD3-a-b-c-d, and type LHD3S-a-b-c-d

15.2 Details of Change

The 4th update of TÜV 11 ATEX 7031 X comprises the following changes:

- The company name changed from LIOS Technology GmbH to NKT Photonics GmbH.
- Standard update of EN 60079-0: 2018
- Standard update of EN 60079-28: 2015

15.3 Technical Data

Power supply:
12 – 48 VDC
100 – 240 VAC

Optical output:
* 3 * -EX T3 *:
Optical power Popt: < 150mW

* 3 * -EX T4 *:
Optical power Popt: < 35mW

Ambient temperature:
-10 °C ≤ Ta ≤ 60 °C

(16) Test report no. 557 / Ex 7031.05 / 11

(17) Special conditions for safe use

The retest for the limitation units has to be done by the manufacturer at least after 10 years.

(18) Basic Safety and Health Requirements

Covered by afore mentioned standards.

TÜV Rheinland certification body for explosion protection — Cologne, 2019-02-04

Dipl.-Ing. Andreas Maschke

(1) EU-TYPE EXAMINATION CERTIFICATE

(2) Equipment and Protective Systems intended for use in Potentially Explosive Atmosphere - **Directive 2014/34/EU**

(3) EU-Type Examination Certificate Number

TÜV 11 ATEX 7031 X

Issue: 03

(4) Equipment: **Measurement System type OTS3-a-b-c-d, type OTS3S-a-b-c-d, type LHD3-a-b-c-d, and type LHD3S-a-b-c-d**

(5) Manufacturer: **LIOS Technology GmbH**

(6) Address: **Schanzenstrasse 39, Gebäude D9-D13, 51063 Cologne, Germany**

(7) This product and any acceptable variation thereto are specified in the schedule to this certificate and the documents therein referred to.

(8) The certification body for explosion protection of TÜV Rheinland Industrie Service GmbH, Notified Body No. 0035 in accordance with Article 21 of the Council Directive 2014/34/EU of 26th February 2014, certifies this product which 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 atmosphere, given in Annex II to the Directive.

The examination and test results are recorded in the confidential report 557 / Ex 7031.04 / 11.

(9) Compliance with the Essential Health and Safety Requirements, with the exception of those listed in the schedule of this certificate, has been assessed by reference to:

EN 60079-0:2012+A11:2013 **EN 60079-28:2007** **EN 50495:2010**
EN 50303:2000

(10) If the sign "X" is placed after the certificate number, it indicates that the equipment 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 and specification for construction of the equipment or protective system. It does not cover the process for actual manufacture or supply of the equipment or protective system, for which further requirements of the directive are applicable.

II (1)G [Ex op is T3 Ga] IIA or II (1)G [Ex op is T4 Ga] IIC
II (1)D [Ex op is Da] IIIC
I (M1) [Ex op is Ma] I

TÜV Rheinland certification body for explosion protection

Cologne, 2016-11-15

Dipl.-Ing. Geoffrey Stenzel

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(13) Annex

(14) # EU-Type Examination Certificate

TÜV 11 ATEX 7031 X Issue: 03

(15) Description of equipment

15.1 Equipment and type:

Measurement System
type OTS3-a-b-c-d, type OTS3S-a-b-c-d,
type LHD3-a-b-c-d, and type LHD3S-a-b-c-d

15.2 Details of Change

1. Change of transmitter board 3.4.2a to revision r3.4.3
2. Change of Ex intrinsic board r3.5.2 to revision r3.5.3
3. The overcurrent limitation changed back from switch off to limitation. The limitation was originally assessed within issue 0 of this certificate.
4. Details of notification of change 557 / Ex 7031.03 / 11.

15.3 Technical Data

Unchanged

(16) Test report no. 557 / Ex 7031.04 / 11

(17) Special conditions for safe use

The retest for the limitation units has to be done by the manufacturer at least after 10 years.

(18) Basic Safety and Health Requirements

Covered by afore mentioned standards.

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TÜV Rheinland certification body for explosion protection

Cologne, 2016-11-15

Dipl.-Ing. Geoffrey Stenzel

This EU-Type Examination Certificate without signature and official stamp shall not be valid.
This certificate may be circulated without alteration. Extracts or alterations are subject to approval by:
Certification body of TÜV Rheinland Industrie Service GmbH

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D-PL-11052-02-00

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Änderungsmitteilung

Notification of change

Nr. 557 / Ex 7031.03 / 11

zu / to

EG-Baumusterprüfung für Geräte und Komponenten zur Verwendung in explosionsgefährdeten Bereichen (Richtlinie 94/9/EG, Anhang III)

EC-Type Examination for Equipment and Components Intended for Use in Potentially Explosive Atmospheres (Directive 94/9/EC, annex III)

Gegenstand: Gerät / Komponente / Typ Subject: Equipment / Component / type	**Measurement System** **OTS3-a-b-c-d, OTS3S-a-b-c-d** **LHD3-a-b-c-d, LHD3S-a-b-c-d**
Hergestellt und zur Prüfung vorgelegt Manufactured and submitted for examination	**LIOS Technology GmbH**
Anschrift Address	**Schanzenstrasse 39, Gebäude D9-D13** **51063 Köln**
Verwendete Normen Standard basis	**EN 60079-0:2012, EN 60079-28:2007** **EN 50495:2010, EN 50303:2000**
Prüfgrundlage für Sicherheits- und Gesundheits-Anforderungen, die nicht von den verwendeten Normen abgedeckt werden. Basis for those health and safety requirements Not covered by the standard basis	Entfällt Not relevant
Schutzartenkennzeichen Code for type of protection	**II (1) G [Ex op is T3 Ga] IIA oder** **II (1) G [Ex op is T4 Ga] IIC** **und** **II (1) D [Ex op is Da] IIIC** **und** **I (M1) [Ex op is Ma] I**
Angebotsnummer Offer number	-
Auftragsnummer der Prüfstelle Testing station order number	124749515
Prüfberichts-Nr. Test and Assessment Report N°	**557 / Ex 7031.03 / 11**

1. Beschreibung der Änderungen / Description of changes

The assessment of the origin certificate TÜV 11 ATEX 7031 X covers the Ex intrinsic board rev. 3.5.2 with transmitter board rev. 3.4.1 and laser diode specified in the listed documents below.
The 1st supplement covers Ex intrinsic board rev. 3.7.0 with transmitter board rev. 3.4.2a and another laser diode specified in the listed documents below as well.
In future projects it is intended to assemble the Ex intrinsic board rev. 3.5.2 in conjunction with transmitter board rev. 3.4.2a and the second laser diode also.

2. Dokumentation des Herstellers / Manufacturer's documents

Register-Nr./ Register no.	Bezeichnung / Designation	Seiten/ Pages	Revision/ Rev.	Datum/Date
1.	Änderungsinformation	2	-	05.10.2015

Tabelle 1

3. Bewertung und Stellungnahme / Assessment and statement

The Ex protection is not affected.

TÜV Rheinland Industrie Service GmbH
Prüflaboratorium für Ex-Schutz
Moltkeplatz 1
D – 45138 Essen

Essen, den 06.10.2015

Erstellt von / Compiled by

Dr.-Ing. Angela Lilienthal

Geprüft von / Reviewed by

Dipl.-Ing. Geoffrey Stenzel

2nd Supplement

to

EC - Type Examination Certificate

TÜV 11 ATEX 7031X

Device: **Measurement System**
OTS3-a-b-c-d, OTS3S-a-b-c-d
LHD3-a-b-c-d, LHD3S-a-b-c-d

Manufacturer: **LIOS Technology GmbH**
Address: **Schanzenstrasse 39, Gebäude D9-D13**
51063 Köln

Description of supplements and modifications:

(15) **The following modifications are valid for this 2nd Supplement**

Standard basis:

EN 60079-0:2012, EN 60079-28:2007; EN 50495:2010, EN 50303:2000

Code for type of protection

II (1) G [Ex op is T3 Ga] IIA or
II (1) G [Ex op is T4 Ga] IIC
and
II (1) D [Ex op is Da] IIIC
and
I (M1) [Ex op is Ma] I

15.1 Equipment and Type

Assessment as electrical equipment of Group I, which is intended for use in mines susceptible to firedamp.

15.2 Description

General product information

The general product information remains unchanged.

15.3 Technical Data

Unchanged

(16) **Test Report No.** 557 / Ex 031.02 / 11

Parts of the device, which already fullfill the requirements for the category, were not approved and assessed by TÜV Rheinland Industrie Service.

The applicability and assembly of mechanical and electrical parts and components were assessed and approved by TÜV Rheinland Industrie Service with respect to the requirements of explosion protection.

(17) **Special conditions for safe use**

The original certificate and the 1st supplement has to be observed.

(18) **Basic Safety and Health Requirements**

Covered by mentioned standards in the original certificate.

TÜV Rheinland ExNB for explosion protected equipment — Cologne, 2015-07-13

Dipl.-Ing. Klauspeter Graffi

1st Supplement

to

EC - Type Examination Certificate

TÜV 11 ATEX 7031X

Device: **Measurement System**
OTS3-a-b-c-d, OTS3S-a-b-c-d
LHD3-a-b-c-d, LHD3S-a-b-c-d

Manufacturer: **LIOS Technology GmbH**
Address: **Schanzenstrasse 39, Gebäude D9-D13, 51063 Köln**

Description of supplements and modifications:

(15) **The following modifications are valid for this 1st Supplement**

Standard basis:

EN 60079- 0: 2012, EN 60079- 28: 2007, EN 50495: 2010

Code for type of protection

II (1) G [Ex op is T3 Ga] IIA or

II (1) G [Ex op is T4 Ga] IIC and
II (1) D [Ex op is Da] IIIC

15.1 Equipment and Type

1. Both overcurrent limitations of the Ex protection circuit changed from limitation to switch off.
2. Additional minor changes of the Ex protection board.
3. Standard update according EN 60079-0: 2012

15.2 Description

General product information
Unchanged

15.3 Technical Data

Unchanged

(16) **Test Report No.** 557 / Ex 031.01 / 11

Parts of the device, which already fullfill the requirements for the category, were not approved and assessed by TÜV Rheinland Industrie Service.

The applicability and assembly of mechanical and electrical parts and components were assessed and approved by TÜV Rheinland Industrie Service with respect to the requirements of explosion protection.

(17) **Special conditions for safe use**

The original certificate has to be observed.

(18) **Basic Safety and Health Requirements**

Covered by mentioned standards in the original certificate.

TÜV Rheinland ExNB for explosion protected equipment

Cologne, 2015-01-08

Dipl.-Ing. Klauspeter Graffi

(1) # EG-Baumusterprüfbescheinigung

(2) Geräte und Schutzsysteme zur bestimmungsgemäßen Verwendung in explosionsgefährdeten Bereichen - **Richtlinie 94/9/EG**

(3) EG-Baumusterprüfbescheinigungsnummer

TÜV 11 ATEX 7031 X

(4) Gerät: **Messsystem** **Type: * 3 * - EX T3 *** **bzw. * 3 * - EX T4 ***

(5) Hersteller: **LIOS Technology GmbH**

(6) Anschrift: **Schanzenstrasse 39** **51063 Köln**

(7) Die Bauart dieses Gerätes sowie die verschiedenen zulässigen Ausführungen sind in der Anlage zu dieser EG - Baumusterprüfbescheinigung festgelegt.

(8) Die TÜV Zertifizierungsstelle für Ex-Schutz-Produkte der TÜV Rheinland Industrie Service GmbH, bescheinigt als benannte Stelle Nr. 0035 nach Artikel 9 der Richtlinie des Rates der Europäischen Gemeinschaften vom 23. März 1994 (94/9/EG) die Erfüllung der grundlegenden Sicherheits- und Gesundheitsanforderungen für die Konzeption und den Bau von Geräten und Schutzsystemen zur bestimmungsgemäßen Verwendung in explosionsgefährdeten Bereichen gemäß Anhang II der Richtlinie.

Die Ergebnisse der Prüfung sind in dem vertraulichen Prüfbericht Nr. 557/Ex 031.00/11 festgelegt.

(9) Die grundlegenden Sicherheits- und Gesundheitsanforderungen werden erfüllt durch Übereinstimmung mit

EN 60079-0: 2009 **EN 60079-28: 2007** **EN 50495: 2010**

(10) Falls das Zeichen „X" hinter der Bescheinigungsnummer steht, wird auf besondere Bedingungen für die sichere Anwendung des Gerätes in der Anlage zu dieser Bescheinigung hingewiesen.

(11) Diese EG-Baumusterprüfbescheinigung bezieht sich nur auf Konzeption und Bau des festgelegten Gerätes gemäß Richtlinie 94/9/EG. Weitere Anforderungen dieser Richtlinie gelten für die Herstellung und das Inverkehrbringen dieses Gerätes. Diese Anforderungen werden durch diese Bescheinigung nicht abgedeckt.

(12) Die Kennzeichnung des Gerätes muß die folgenden Angaben enthalten:

II(1)G [Ex op is T3 Ga] IIA **bzw.** **II(1)G [Ex op is T4 Ga] IIC**

II(1)D [Ex op is Da] IIIC

TÜV Zertifizierungsstelle für Explosionsschutz Köln, den 14.09.2011

Dipl.-Ing. Heinz Farke

Diese EG-Baumusterprüfbescheinigung hat ohne Unterschrift und Stempel keine Gültigkeit.
Diese EG-Baumusterprüfbescheinigung darf nur unverändert verbreitet werden.
Auszüge und Änderungen bedürfen der Genehmigung der TÜV Zertifizierungsstelle für Ex-Schutz-Produkte

TÜV Rheinland Industrie Service GmbH, Am Grauen Stein, 51105 Köln
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(13) Anlage zur

(14) # EG-Baumusterprüfbescheinigung
TÜV 11 ATEX 7031 X

(15) **Beschreibung des Gerätes**

15.1 Gegenstand

Die Gerätereihe benutzt ein einheitliches Nummerierungsschema für EX und Nicht EX Ausführungen. Die EX-Ausführungen erhalten eine zusätzliche Typenkennzeichnung wie oben dargestellt. Die * in der Typenbezeichnung können durch verschiedene Ziffern und Buchstabenkombinationen ersetzt werden Diese stellen aus explosionstechnischer Sicht keine unterschiedlichen Varianten dar.

Die folgenden Varianten sind geeignet zur Verwendung mit explosionsgefährdeter Atmosphäre:

-EX T3	II (1) G [Ex op is T3 Ga] IIA
-EX T4	II (1) G [Ex op is T4 Ga] IIC
	II (1) D [Ex op is Da] IIIC

15.2 Technische Daten

Anschlusswerte

Nennspannung	U_N	12 - 48 VDC 100 – 240 VAC

Optische Ausgangswerte

* 3 * -EX T3 *

Optische Leistung	P_{opt}	< 150	mW
Wellenlänge		1550	nm

* 3 * -EX T4 *

Optische Leistung	P_{opt}	< 35	mW
Wellenlänge		1550	nm

Umgebungstemperaturbereich

$-10\ °C \leq Ta \leq 60\ °C$

(16) Prüfbericht-Nr. 557 / Ex 031.00 / 11

(17) Besondere Bedingungen

Die Begrenzungsschaltung ist spätestens nach 10 Jahren einer Wiederholungsprüfung durch den Hersteller zu unterziehen.
Die Wiederholungsprüfung muss in einer Prüftiefe erfolgen so das für die Begrenzerschaltungen ein „wie neu" Zustand erreicht wird.

(18) Grundlegende Sicherheits- und Gesundheitsanforderungen

Erfüllt.

TÜV Rheinland Zertifizierungsstelle

Köln, 14. September 2011

Dipl.-Ing. Heinz Farke

TÜVRheinland® 0035 Notified Body

(1) EC TYPE-EXAMINATION CERTIFICATE

(2) Equipment and Protective Systems intended for use in Potentially Explosive Atmosphere - **Directive 94/9/EC**

(3) EC Type-Examination Certificate Number

TÜV 11 ATEX 7031 X

(4) **Equipment:** Measuring system **Type: * 3 * - EX T3 * and * 3 * - EX T4 ***

(5) **Manufacturer:** **LIOS Technology GmbH**
(6) **Address:** **Schanzenstrasse 39**
51063 Cologne / Germany

(7) This equipment and any acceptable variation thereto are specified in the schedule to this certificate and the documents therein referred to.

(8) The TÜV Rheinland Zertifizierungsstelle for ex-protected products of TÜV Rheinland Industrie Service GmbH, Notified Body No. 0035 in accordance with Article 9 of the Council Directive 94/9/EC of 23 March 1994, certifies this equipment 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 atmosphere, given in Annex II to the Directive.

The examination and test results are recorded in the confidential report 557/Ex 031.00/11

(9) Compliance with the Essential Health and Safety Requirements, with the exception of those listed in the schedule of this certificate, has been assessed by reference to:

EN 60079-0: 2009 EN 60079-28: 2007 EN 50495: 2010

except the requirements, which are listed under item (18).

(10) If the sign "X" is placed after the certificate number, it indicates that the equipment is subject to special conditions for safe use specified in the schedule to this certificate.

(11) This EC-Type-Examination Certificate relates only to the design and specification for construction of the equipment or protective system. It does not cover the process for actual manufacture or supply of the equipment or protective system, for which further requirements of the directive are applicable.

(12) The marking of the equipment shall include the following:

II(1)G [Ex op is T3 Ga] IIA or II(1)G [Ex op is T4 Ga] IIC

II(1)D [Ex op is Da] IIIC

TÜV Rheinland ExNB for explosion protected equipment

Cologne, 2011-09-14

Dipl.-Ing. Klauspeter Graffi

This EC-Type-Examination Certificate without signature and stamp shall not be valid.
This EC-Type-Examination Certificate may be circulated only without alteration. Extracts or alterations are subject to approval by the TÜV Rheinland Notified Body of TÜV Rheinland Industrie Service GmbH, Am Grauen Stein 51105 Köln
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(13) Annex to

(14) # EC-Type Examination Certificate
TÜV 11 ATEX 7031 X

(15) **Description of equipment**

15.1 Equipment:

The device series uses a standardized numbering scheme for explosion-proof and non-explosion proof versions. The explosion-proof versions receive an additional type designation as shown above. The * in the type designation can be replaced by different number and letter combinations. These do not represent any different variants with regard to explosion protection.

The following variants are suitable for use with explosive atmospheres:

-EX T3	II (1) G [Ex op is T3 Ga] IIA
-EX T4	II (1) G [Ex op is T4 Ga] IIC
	II (1) D [Ex op is Da] IIIC

15.2 Technical Data

Connected load

Nominal voltage	U_N	12 – 48 VDC 100 – 240VAC

Optical output values

* 3 * -EX T3 *

Optical power	P_{opt}	< 150 mW
Wavelength		1550 nm

* 3 * -EX T4 *

Optical power	P_{opt}	< 35 mW
Wavelength		1550 nm

Ambient temperature range

-10 °C ≤ Ta ≤ 60 °C

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(16) **Test-Report No.** 557/Ex031.00/11

(17) **Special Conditions for safe use**

The current limiting circuit has to undergo a repeat test by the manufacturer after 10 years at the latest.
The repeat test has to be carried out in a test depth which ensures that an "as new" condition is achieved for the limiting circuits.

(18) **Basic Safety and Health Requirements**

Covered by afore mentioned standard

TÜV Rheinland ExNB für explosion protected equipment — Cologne, 2011-09-14

Dipl.-Ing. Klauspeter Graffi