Protecta X (LED Emergency Linear Luminaire)

ATEX ,IECEx and UKEX

INSTALLATION, OPERATION AND MAINTENANCE INSTRUCTIONS

Important: Please read these instructions carefully before installing or maintaining this equipment.
Good electrical practices should always be followed, and this data should be used as a guide only.

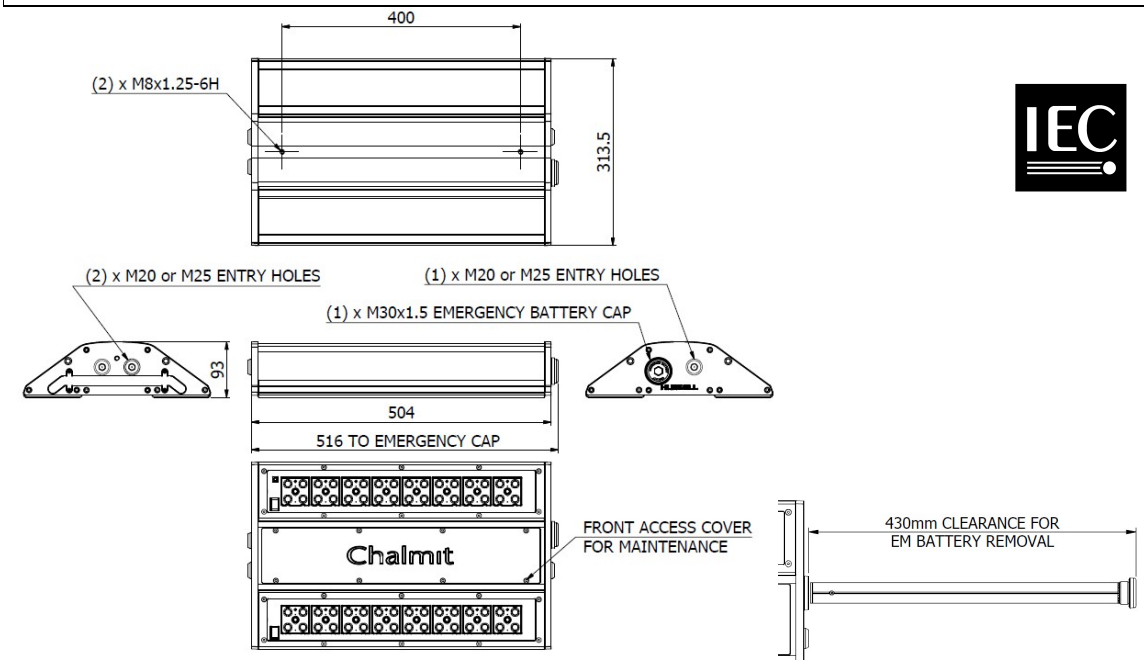

Fig. 1

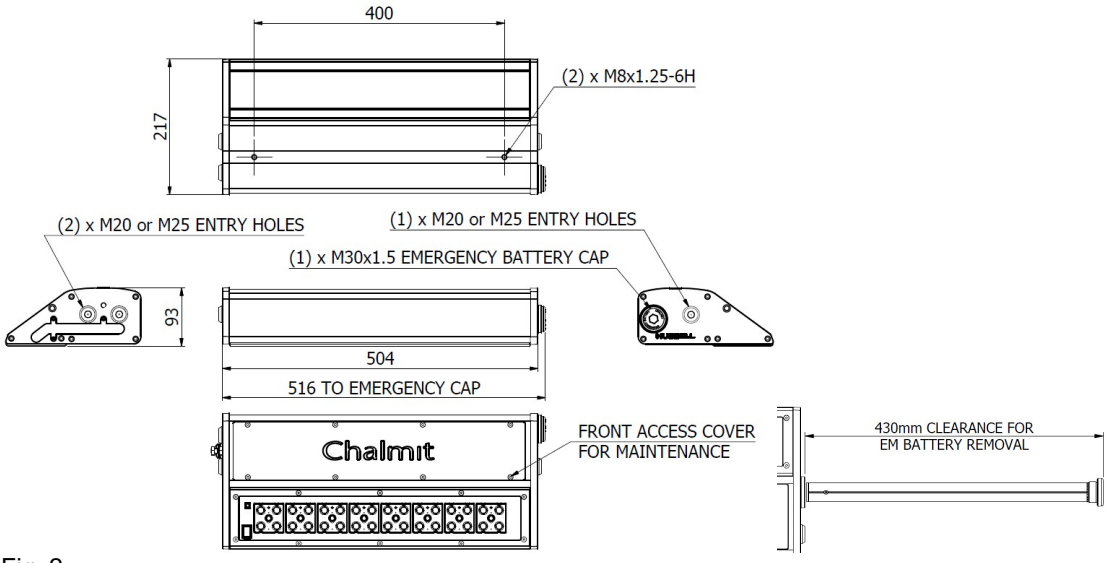

Fig. 2

Specification

Type of Protection	Ex d Driver ((flameproof and increased safety), Ex eb Housing (Increased safety), Ex mb LED Engine (Encapsulation), Ex tb Housing (Dust)
Protection Standards	EN/IEC 60079-0, EN/IEC 60079-1, EN/IEC 60079-7, EN/IEC 60079-18, EN/IEC 60079-31.
Area Classification	Zone 1 and Zone 2 areas to (IEC) EN60079-10-1 Zone 21 and Zone 22 areas to (IEC) EN60079-10-2
Installation	(IEC) EN 60079-14
Certificate	IECEx Certificate of Conformity IECEx CML 18.0167X EU Type Examination Certificate CML 18ATEX3358X UK Type Examination Certificate CML 21UKEX1506X
Equipment Coding	Ex db eb IIB+H2 T5 Gb Ex tb IIIC T**°C Db -25°C ≤ Ta ≤ 55°C/ 60°C
ATEX /UKEX Coding	II 2 GD
Ingress Protection	IP66/67
Photobiological safety of Lamps and Lamp Systems	Risk Group 2 LED product to IEC 62471. Avoid looking at exposed LEDs in operation especially with optical instruments. Eye injury can result.
WARNING! DO NOT OPEN WHEN AN EXPLOSIVE ATMOSPHERE IS PRESENT	
CE UK CA	The CE marking of this product applies to "The Electrical Equipment (Safety) Directive", The Electromagnetic Compatibility Directive", the "Waste Electrical and Electronic Equipment Directive" and the "Equipment and Protective Systems intended for use in Explosive Atmospheres Directive". [2014/35/EU, 2014/30/EU, 2012/19/EU and 2014/34/EU respectively]. The UKCA marking of this product applies to "The Electrical Equipment (Safety) Regulations 2016", "The Electromagnetic Compatibility Regulations 2016", the "Waste Electrical and Electronic Equipment Regulations 2012" and the "Equipment and Protective Systems intended for use in Explosive Atmospheres Regulations 2016 The Equipment is declared to meet the provisions of the ATEX directive (2014/34/EU) by reason of the Type Examination/EU Type Examination and meets the UK statutory requirements SI 2016 No.1107 and compliance with the Essential Health and Safety Requirements.  A Reid Technical Manager

SPECIAL CONDITIONS FOR SAFE USE
The battery powered emergency versions,

Flameproof joints of battery stick connector and driver modules are not intended to be repaired.

Before and after removal of battery stick assembly or battery stick entry stopping plug, ensure no dust or debris can enter the entry.

When the battery stick assembly is removed from the Protecta X, a replacement assembly shall be inserted immediately or a suitably approved stopping plug shall be put in its place in order to maintain the IP rating of the enclosure.

Under certain extreme circumstances, the non-metallic parts incorporated in the enclosure of this equipment may generate an ignition-capable level of electrostatic charge. Therefore, the equipment shall not be installed in a location where the external conditions are conducive to the build-up of electrostatic charge on such surfaces (e.g. steam generation, windblown dust, etc). In addition, the equipment shall only be cleaned with a damp cloth.

The presence of certain chemicals in the explosive atmosphere may cause a chemical reaction with non-metallic materials such as the polycarbonate diffuser and silicone/EPDM gaskets that could have detrimental effect on their performance. Chemical compatibility is highly dependent on concentration, temperature, humidity and other environmental conditions. The end user will assume responsibility for evaluation of gaseous or direct contact compatibility at their site prior to product installation. If in doubt please contact Chalmit sales.

1.0 Introduction – Protecta X

The Protecta X Luminaire operates from mains voltage.
This installation leaflet covers the range of ATEX and IECEx Protecta X Luminaire models. These luminaires are mainly used in harsh environments and are constructed using Non-corrosive materials. Refer to the current catalogue for information on product references. The luminaires are available in 02L,05L and 07L Lumen outputs.

2.0 Electrical Supplies

Table 1 MODEL VARIATIONS

Voltage range AC ==> 110-277V
Voltage range DC ==> 127-250V
Frequency range Hz ==> 50-60Hz

Product	Ambient	Voltage AC	Watts	Amps	Tamb Range
PRXB/02L/LE/EM/**	Ta25°C	110 - 277V	19	0.18 – 0.07A	-40°C to +60°C
PRXB/05L/LE/EM/**	Ta25°C	110 - 277V	38	0.38 – 0.15A	-40°C to +60°C
PRXB/07L/LE/EM/**	Ta25°C	110 - 277V	53	0.48 – 0.22A	-40°C to +55°C

The safety limit for surface temperature (T rating) is +/-10% on the rated voltage. The maximum nominal variation from rated voltages stated above is +/- 6%. For the full range of Product Technical data please contact Chalmit technical department.

Power Factor @ 230V >0.90 Power is constant over voltage range.

Over Voltage **4**00V ac for 1 min and EN 61000-4-5 > 4kV

Through Wiring The through current rating is 16A. 4mm² terminals are standard (As option /SC 6mm² wiring can be used in the terminals in accordance with the luminaire certificate).

Fuse and MCB Ratings It is recommended that for selection of MCBs users should consult the MCB manufacturer as this unit contains electronic control gear. The electronic control gear has nominal values of inrush current as follows;
07L 46.7A for 33µs on 230V @ Ta25°C.
05L 20.2A for 38µs on 230V @ Ta25°C.
02L 17.9A for 16µs on 230V @ Ta25°C.

3.0 Storage

Luminaires are to be stored in cool dry conditions preventing ingress of moisture and condensation. Storage temperature range to be -40°C to +80°C. Battery packs in storage should be cycled charged/discharged/charged every 6 months, as per instructions below. Section 4.1.3 to 4.1.5

If it is expected that the Luminaire will be left without power for a period greater than 6 months, consideration should be given to the /BNI (Batteries not Included) option of the Protecta X range.

Always disconnect battery plug and socket for storage.

Any specific instructions concerning emergency luminaires must be complied with.
(Warning: Battery packs not cycled and stored for a year may not be recoverable)

4.0 Installation and Safety

4.1 General

These instructions should be read fully and carefully before attempting to install the luminaire. For details of servicing operations, opening etc. see section 5.0

Copies of these instructions should be held in a safe place for future reference. It is the responsibility of the installer to ensure that the apparatus selected is fit for its intended purpose and that the installation, operation and maintenance of the apparatus complies with applicable regulations, standards or codes of practice. Installation should be carried out in accordance with (IEC) *EN 60079-14* or with a local hazardous area code of practice, whichever is appropriate.

Any specific installation instructions must be referred to. In the UK the requirements of the *Health and Safety at Work Act* must be met and electrical work associated with this product must be in accordance with the *"Manual Handling Operations Regulations"* and "*Electricity at Works Regulations 1989".* Disposal instructions should be complied with. The luminaires should be considered Class 1 to EN 60598 and effectively earthed. Certification details on the rating plate must be verified against the application requirements before installation. The information in this leaflet is correct at the time of publication. The company reserves the right to make specification changes as required without notice.

4.1.1 Use in Combustible Dust Atmospheres

Where the equipment is used in ignitable dust atmospheres reference must be made to the selection and installation standards in order that the equipment is used correctly. In particular this applies to the de-rating of surface temperature for use where dust clouds may be present. Dust layers should not be allowed to accumulate on the fitting surface and good housekeeping is required for safe operation. Dust in layers has the potential to form ignitable clouds and to burn at lower temperatures. Refer to EN/IEC 60079-10-2 & EN/IEC 60079-14 for additional details of selection and installation.

4.1.2 Hybrid Mixtures – Gas plus Dust.

Where Hybrid mixtures exist as defined in EN1127 as a potentially explosive atmosphere, consideration should be given to verifying that the maximum surface temperature of the luminaire is below the ignition temperature of the hybrid mixture.

Emergency Operation

4.1.3 Emergency Duration

The luminaire is supplied as standard set for 90 minutes emergency duration, the Emergency Self test is also set as standard. Options of 180 minutes and Non self test are available on request.

Light Output range as follows;

Type	Emergency duration	Lumen percentage	Ambient temperature
02L	90Mins	50%	+60°C
02L	3Hrs (180Mins)	25%	+60°C
05L	90Mins	25%	+60°C
05L	3Hrs (180Mins)	12.5%	+60°C
07L	90Mins	20%	+55°C
07L	3Hrs (180Mins)	10%	+55°C

4.1.4 General description of operation

The luminaire will go seamlessly into emergency mode at not less than 60% rated supply voltage and will remain in mains mode up to 85% of rated supply voltage.

The charging function is monitored continuously, there is a check for over charging and no charging.

After a complete battery discharge, the unit will switch over to a low discharge current mode, until power restored.

4.1.5 Emergency Commissioning

The Protecta X is programmed to commence a self-test programmed test upon battery connection & energisation of mains power supply.

The self-test programme is as stated below:-

Mains power will operate for an hour, at this point the system will switch the operation of the LEDs to battery power, until the LED's goes out. – This checks the battery pack is accepting charge (battery connected).

Mains power will then operate the fitting for 24 hours, at this point the system will switch the operation of the LEDs to battery power. The duration should be 90 or 180 minutes minimum depending on what was specified.
After the discharge for the emergency duration period, the fitting will switch back to mains power operation completing the Self-test programme.
This self-test programme of 27 hours duration approximately, should not be interrupted.
Prior to manual discharge test Chalmit recommend that the fitting is charged for a further 24hours or a full solid Green LED indicator is present.

When there is a planned power outage for 5 days or more continuously, the battery stick should be dis-engaged from the Luminaire. When the battery stick assembly is removed a suitably approved stopping plug must be put in its place in order to maintain the IP rating of the enclosure.

If a battery is left connected to the luminaire during an extended power outage for longer than 3 months and is allowed to completely discharge, the battery may require a short, external boost charge before the luminaire takes over the battery management process.

Please see section 3.0 for battery storage instructions.

4.1.6 Optical performance

In addition to the Wide and Medium beam optics, the Protecta X utilises specialised asymmetric optics (ASL or ASW) to maximise the spacing between adjacent luminaires along walkways, aisles, corridors and escape routes. If using the ASL or ASW optics in the 05L and 07L model, it is recommended that the luminaire is mounted at a minimum height of 2.5m to achieve the optimum spacing and lighting distribution.
Please also note that the duration in Emergency conditions for the ASL and ASW optics are restricted to 3hr only

4.1.7 Automatic Self Testing

A manual test of emergency duration can only be made by manually de-energising the luminaire and timing the discharge. The LED must be constant green to show that charging has been completed before commencing this test. The LED indication will show if the emergency battery duration is too low. The electronic control gear continuously monitors all charging functions. The unit will perform a complete battery discharge every 102 days and will check for minimum emergency duration as stated above. The start of the first complete battery discharge is at a random point between 0 and 102 days after applying mains voltage. The test will be repeated at fixed 102 day intervals. If the self-test detects a failure it is indicated as per the table below by the LED. After a complete battery discharge, the unit will switch over to a low battery discharge mode which maintains the memory and monitoring function. The control contains dedicated features which prevent any unsafe condition arising if the micro-processor were to malfunction.

4.1.8 Emergency Integrated (EMI) version.

This type of product is NOT hot swappable and during any replacement **The battery assembly must be protected from damage and water ingress then removed from any potentially hazardous area as soon as practical.**

LED display

Table 1 Monitoring function indication

GREEN	RED	MODE	REMARKS
Continuous - Steady		Fully Charged / During Self Test	
Flashing Green		Charging	
	Flashing Red	Battery Fault Detected	Consider full re-commissioning cycle, If Flashing Red continues
	Continuous - Steady	Self-test failure	
None	None	Mains off, Battery Discharged, or Total unit defective	Luminaire off
Continuous - Steady		Unit in Emergency Mode	Luminaire with reduced light output. (LEDs illuminated)

4.2 Tools

6mm A/F socket keys (For Blanking Plugs) / 12mm A/F socket keys (For Emergency Plugs)
4mm flat blade Screw Driver (For Terminal Connection)
Pozi Screw Driver (For Front Cover Access)
Suitable Spanners for Installing Cable Glands
Pliers, Knife, Wire Strippers / Cutters

4.3 Mounting

Luminaires should be installed where access for maintenance is practical and in accordance with lighting design information. Refer to the note in 4.1.1 concerning electrostatic charge.
The standard suspension is via two M8 x 12mm deep blind tapped holes in the top of the body, the recommended torque for the fixing bolts is 10-15Nm. Various adaptors, pole clamps and suspension brackets are available to order.

4.4 Electrical Supplies

A maximum voltage variation of +6%/-6% on the nominal is expected. The safety limit for T rating is +10%.

4.5 Light Source

The luminaire is fitted with LEDS that can last >200,000 hours depending on ambient temperatures. Therefore depending on the functionality of the fitting replacement of LED's will be rare / unnecessary.

4.6 Cabling and Cable Glands

4.6.1 Cable Glands

The installer and user must take responsibility for the selection of cables, cable glands and seals.
The product is certified for ATEX, IECEx and UKEX and to comply with the certification for installation cable glands and sealing plugs must be ATEX, IECEx or UKEX certified depending on site requirements.
Cable glands for entry into Ex e enclosures when fitted with any gland to body sealing method and the supply cable must reliably maintain the IP rating of the enclosure IP66/67.
The cable gland must withstand an impact value of 7Nm where the risk of mechanical damage is high or 4Nm where the risk of mechanical damage is low.
Sealing plugs must be similarly rated and a tool must be used for their removal. Where the cable is not reliably clamped externally to the apparatus, the cable gland must clamp the cable against a pull in Newtons of 20x the cable OD in mm for non-armoured cable and 80x the cable OD for armoured cable. Where brass cable glands are used in a corrosive environment cadmium or nickel plating should be used. Three tapped cable entries are provided, two with a plug and seal suitable for permanent use on Non-EM side, The EM swappable side has one travelling plug M20 x 1.5 pitch entries are standard, other sizes are available on request up to M25 x 1.5 pitch

4.6.2 Cable

The temperature conditions at the supply cable entry point are such that 70°C (ordinary PVC) cable can be used.

4.6.3 Cable Connection

The cable connections are made by removing the main front access cover (Fig.1). The screws are retained and should be re-greased as required. The conductors should be bared back so that they make full contact in the terminals, but the bare conductor should not be more than 1mm beyond the terminal. Unused terminal screws should be tightened. The core must be identified by polarity and connected in accordance with the terminal markings. Before re-fitting the cover, a final check on the correctness of connections should be made. Front access cover screw torque 3.5 Nm.

4.7 Electrical Connections and Testing

If any work is to be done on any luminaire already connected to the electrical system, the luminaire must be isolated from the system. The access front cover (Fig.1) is swung down. To access the mains terminals loosen the 8 fixing screws. Screw type or screw-less "cage clamp" terminals are fitted in the range of luminaires.
Mains terminal blocks are marked Lc Ls N Earth.
The maximum amount of insulation allowed beyond the throat of the terminal is 1mm. The normal method of insulation testing is to connect Live and Neutral together and test between this point and Earth to prevent the risk of damage to the electronic control gear.
However, if this is not possible luminaires can be tested with an insulation tester that complies with IEC 364 or BS 7671 with a maximum output current of 1mA and output voltage of 500V dc. (Units damaged by incorrect insulation testing can be detected). Before completing the wiring, ensure that all the connections are correctly introduced into place before reassembling the luminaire.

5.0 Inspection, Maintenance and Servicing

Safe servicing on the gear tray requires the mains supply to be isolated.
Individual organisations will have their own procedures for inspection and maintenance. What follows are guidelines based on *EN/IEC 60079-17* and on our experience. Maintenance work and fault finding must be performed by competent personnel

under an appropriate permit to work and with the apparatus isolated. Frequency of maintenance will depend on experience and the operating conditions.

Luminaire should not be opened when an explosive atmosphere is present.

1 Check if any LED's have failed.
2 The LEDs are mounted on boards, if there is 3 or more LED's not working on one board the light output will have dropped to a level where the LED board may need replaced.
3 Check the front access cover screws for tightness.
4 Check the cable gland for tightness and re-tighten if necessary.
5 Check any external earthing.
6 Examine the LED diffuser for any signs of damage and for any signs of sealant damage, cracking or discoloration.
7 Check all End Cover bolts for tightness, Torque 4Nm. Front Cover screws Torque 3.5Nm
8 Check for signs of corrosion between the LED Light Engine and the main housing. Evaluation of this will be a matter for judgement gained by experience, as there may be little evidence on the outside. A damaged or non-resilient gasket must be replaced (supplied by Chalmit).
The cover should be re-fitted with all screws fully tightened. Any replacement screws must be identical to the original. Replacement fasteners should be stainless steel marine grade of ISO262 Grade A4-70 minimum.
9 The front access cover should be opened periodically and checked for moisture and dirt ingress. The cable connections should be checked for tightness. The gasket should be checked for cracks or lack of elasticity, and if necessary, replaced. (It may well be practical to also replace the gasket on each occasion if this is at a 3-year interval). (supplied by Chalmit).
10 If painting operations have taken place around the luminaire, ensure that coatings have not entered or been deposited on the LED Diffuser. If they have, clean carefully.
11 Check that mountings are secure.
12 Clean the LED Diffuser.
13 If there is suspicion that the luminaire has suffered mechanical damage, a stringent workshop check should be made

Important: *Where spares are needed, these must be replaced with manufacturer parts. No modifications should be made without the knowledge and approval of the manufacturer.*

6.1 Electrical Fault Finding and Replacement

Any fault finding must be done by a competent electrician with the luminaire isolated and if carried out with the luminaire in place, under a permit to work. Fault finding is by substitution with known good components.

6.2 Checking of Battery separately

If the battery is to be checked separately, it should be fully discharged before charging. Charge using a constant current charger at 200/400mA for 30/15 hours for a 3.3Ah min. Discharge measurement is not easy as the current is proportional to the voltage for resistance loads, so it has to be averaged. Discharge the battery at 1 to 2A and multiply current by time. Do not discharge below 1 volt per cell, which is 5V. The capacity should be 75% or more of normal.

7.0 Disposal of Material

The unit is mostly made from incombustible materials. The control gear contains electronic components and synthetic resin. All these may give off noxious fumes if incinerated. Care must be taken to render these fumes harmless and avoid inhalation. Any local regulations concerning disposal must be complied with. Any disposal must satisfy the requirements of the WEEE directive [2012/19/EU and Regulations 2012] and therefore must not be treated as commercial waste.

To comply with the Waste Electrical and Electronic Equipment directive 2012/19/EU and Regulations 2012 the apparatus cannot be classified as commercial waste and as such must be disposed of or recycled in such a manner as to reduce the environmental impact.

Chalmit Lighting is a leading supplier of Hazardous Area lighting products

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Note: Chalmit Lighting reserves the right to amend characteristics of our products and all data is for guidance only.

EU/UK-Declaration of conformity
UE-Déclaration de conformité
EU-Konformitätserklärung

Manufacturer	Chalmit	Address	388 Hillington Road, Glasgow. G52 4BL Scotland UK
Product	Protecta X (LED Emergency Linear Luminaire)		
Notified Body	CML B.V. 2776		
EU Type Examination Certificate	CML 18ATEX3358X		
Approved Body	Eurofins CML 2503		
UK Type Examination Certificate	CML 21UKEX1506X		
ATEX/UKEX Coding	Ex II 2 GD		
ATEX/UKEX Classification	Group II Category 2 GD		
Equipment Coding	Ex db eb IIB+H2 T5 Gb -25°C ≤ Ta ≤ 55°C /60°C Ex tb IIIC T**°C Db IP6*		
Ingress Protection	IP66/67		

The technical basis, with respect to equivalence of
La base technique, en ce qui concerne l'équivalence de
Die technische Grundlage hinsichtlich der Normen
Protection Standards EN 60079-0, EN 60079-1, EN 60079-7, EN 60079-18, EN 60079-31
Area Classification EN 60079-10-1 and EN 60079-10-2

of compliance with the EHSRs is valid as there are no changes which materially affect the state of technological progress of the product.
en conformité avec les EESS est valide puisqu'il n'y a aucun changement qui affecte matériellement l'état de l'évolution technologique du produit.
zur Erfüllung der GSGA ist gegeben, da keine Änderungen erfolgt sind, die einen Einfluss auf den technischen Stand des Produkts haben.

Terms of the directive: Prescription de la directive: Bestimmungen der Richtlinie:		Standard & Date Certified to Standard & date certifiée à Standard & Datum Zertifiziert nach	Standards Date Declared to Normes date Déclaré Standards Datum erklärt
2014/34/EU SI 2016 No.1107	Equipment and protective systems intended for use in potentially explosive atmospheres.	EN 60079-0: 2012 A11:2013 EN 60079-1 : 2014	
2014/34/UE	Appareils et les systèmes de protection destinés à être utilisés en atmosphères potentiellement explosibles.	EN 60079-7 : 2015 EN 60079-18 : 2015 EN 60079-31: 2014	
2014/34/EU	Geräte und Schutzsysteme zur bestimmungs-gemäßen Verwendung in explosionsfähigen Bereichen.		
2014/30/EU Regulations 2016	Electromagnetic compatibility	EN 55015 : 2019	

2014/30/UE	Compatibilité électromagnétique	EN 61547 : 2009	
2014/30/EU	Elektromagnetische Verträglichkeit	EN 61000-3-2 : 2019	
2014/35/EU Regulations 2016	Low voltage equipment	EN 60598-1 : 2015	
2014/35/UE	Équipements électriques à bas voltage	EN 60598-2-22:2014	
2014/35/EU	Niederspannungsgeräte / -systeme	EN 60529 : 1992+A2:2013	
2012/19/EU Regulations 2012	Waste of electrical and electronic equipment		
2012/19/UE	Déchets d'équipements électriques et électroniques		
2012/19/EU	Entsorgung der elektrischen und elektronischen Geräte / Systeme		
2011/65/EU Regulations 2012	RoHS II Directive		
Additional information:	The luminaire is capable of withstanding over voltage levels of up to 400V AC for 1 minute and impulse voltage surges of 4kV.		
Informations complémentaires:	Le luminaire peut supporter des niveaux de tensions juqu'à 400V CA pendant 1 minute et des tensions de choc de 4kV.		
Zusatzinformation :	Dieser Strahler widersteht Überspannungen bis 400V AC 1 Minute lang sowie Stoßspannungen von 4kV		

On behalf of the Chalmit, I declare that, on the date the equipment accompanied by this declaration is placed on the market, the equipment conforms to all technical and regulatory requirements of the above listed directives.

En tant que représentant du fabricant Chalmit, je déclare qu'à la date où les équipements accompagnant cette déclaration sont mis sur le marché, ceux-ci sont conformes à toutes les dispositions réglementaires et techniques des directives énumérées ci-dessus.

Hiermit bestätige ich, im Namen von Chalmit, dass am Tag der Lieferung des Produkts/der Produkte zusammen mit dieser Erklärung das Gerät/die Geräte alle technischen und regulativen Anforderungen der oben aufgeführten Direktiven erfüllt.

Name and Date Nom et Date Name und Datum	Andy Reid	05/04/2023	Technical Manager Directeur technique Technischer Leiter

Quality Assurance Notification by: Notification d'assurance qualité par: Qualitätssicherungsnotifikation durch:	**SGS Fimko OY** **0598**	Quality Management System Acreditation: Système de Management Qualité Accréditation: Qualitätsmanagementsystem Akkreditierung:	**ISO 9001**
		Environmental Management System. Système de gestion de l'environnement. Umwelt kontroll system.	**ISO 14001** by/par/durch **Loyd's Register**
UKCA Quality Assurance Notification by:	SGS Fimko OY 0598	**Certificate No./Certificat N°/Zertifikat Nr.**	**LRQ 4005876**