

# Instructions for Safe Use



Certification N:o VTT 14 ATEX 041X and IECEx VTT 14.0004X

Thank you for choosing **SLAM® Hornet** –portable work light with battery back up for your job site. Purpose of this manual is to provide you all the necessary safety and product information to conduct your job conveniently and without any risks for health and safety.



**SLAM® Hornet EM 1LED**



**SLAM® Hornet EXIT 1LED**

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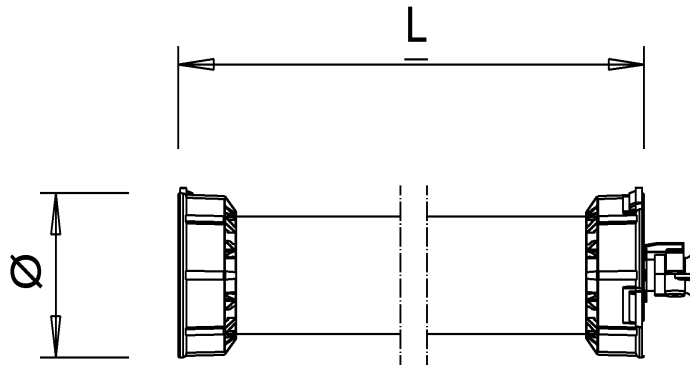
# 1. Introduction to SLAM<sup>®</sup> Hornet

This instruction manual guides you through the process of selecting and adopting SLAM<sup>®</sup> Hornet with battery back up work light at your work site. The manual regards the following SLAM<sup>®</sup> Hornet types:

## 1.1 Technical data

**SLAM<sup>®</sup> Hornet EM 1LED, SLAM<sup>®</sup> Hornet EXIT 1LED (later SHEM)**

Product model	Dimensions / mm	
	L	Ø
SLAM <sup>®</sup> Hornet EM 1LED A SLAM <sup>®</sup> Hornet EXIT 1LED A	708	115
SLAM <sup>®</sup> Hornet EM 1LED C SLAM <sup>®</sup> Hornet EXIT 1LED C	708	115



## 1.2 Certification of equipment

The SLAM<sup>®</sup> Hornet-series has been designed, tested and certified for portable use. There is “X” – mark in the certificate for special conditions of safe use of the equipment. Special conditions of safe use specifies:

- Ambient temperature can be -20°C...+ 40°C without Ex-socket
- With Ex-socket as specified for the used socket but within -20°C...+ 40°C
- “ib”-marking is for internal protection of the switch in the emergency supply circuit. There is NO need for Exi associated apparatus in the supply of the luminaire

The equipment is to be used properly and according to its ratings, documentation and local applicable laws. Local, national certificates of these units may exist outside the region of EU.

The aforementioned SLAM<sup>®</sup> Hornet-types are certified as follows. You may find brief explanation of certificate beneath:

CE<sub>0537</sub>

II 2 G Ex e ib mb op is IIC T4 Gb  
 II 2 D Ex tb op is IIIC T90°C Db  
 IP 66

CE<sub>0537</sub> = Valid production quality system approved and notified by VTT (Finnish Notified Body, listed by EC)



- Ex** = Certified for explosion hazardous areas
- II** = Certified for use in areas excluding mines
- 2** = Equipment category (suitable for Zone 1 & 21 and Zone 2 & 22)
- G** = Certification taking account explosion hazardous GASES
- D** = Certification taking account explosion hazardous DUSTS

#### Explanation of marking for explosion hazardous area due to Gases (Ex e ib mb op is IIC T4 Gb):

- Ex** = Certified for use in explosion hazardous areas
- e** = Explosion protection method increased safety (of certain components)
- ib** = Explosion protection method intrinsic safety (of certain components)
- mb** = Explosion protection method encapsulation (encapsulating ignition sources)
- op is** = Explosion protection method optically inherently safe (visible or infrared radiation that is incapable of producing sufficient energy under normal or specified fault conditions to ignite a specific hazardous atmospheric mixture). This definition is analogous to the term "intrinsically safe" applied to electrical circuits
- IIC** = Equipment group (including explosion hazardous areas of IIA, IIB and IIC gases)
- T4** = Maximum inside temperature of the unit is 135°C (within the ambient temperature range of -20°C...+40°C)
- Gb** = Explosion Protection Level (EPL) marking for "HIGH" level of protection. Equipment for explosive **GAS** atmospheres, which is not a source of ignition in normal operation or during expected malfunctions

#### Explanation of marking for explosion hazardous area due to Dusts (Ex tb op is IIIC T 90°C Db):

- Ex** = Certified for use in explosion hazardous areas
- tb** = Explosion protection method "protection by enclosure"
- IIIC** = Equipment group for all dusts
- T90°C** = Maximum OUTSIDE surface temperature of the unit is 90 °C (within the ambient temperature range of -20°C...+40°C)
- Db** = Explosion Protection Level (EPL) marking for "HIGH" level of protection. Equipment for explosive **DUST** atmospheres, which is not a source of ignition in normal operation or during expected malfunctions

### 1.3 Standard unit construction

The following list familiarizes you with some common unit features important to recognize.

**End parts:** Flexible, plastic-made end parts ensure shock-absorbing and harmless contact to sensitive and hard surface in case the luminaire drops to the ground even from high position. Light construction affects the total weight of the unit itself.

**Transparent PC –tube:** Polycarbonate tube, being durable, flexible and lightweight plastic, brings advantage for use. Unique antistatic treatment allows the use of PC in explosion hazardous areas.

**Aluminium frame:** Nearly all SLAM<sup>®</sup> Hornet units are based on use of solid but flexible aluminium frame. Components are tightened with screws on it, making the unit tough and durable in severe conditions. Moreover, the frame derives excessive heat out from the luminaire thereby extending lifetime of the unit.

**Electronic control gear:** The control gear in controlling the supply of energy to the light source of the luminaire. The control gears are independent from each others. Under failure of one control gear, the other still continues operating. Low-voltage protection (smart-feature) brings reliability and convenience for use, especially when operating with transformers or with long cables.

**Led module (LED):** Light source combining Light Emitting Diodes with convenient and safe light distribution. Led module is explosion protected. Photobiological safety of Led module has been taken into account.

**Cable:** Standard cable of the SLAM<sup>®</sup> Hornet series is H07BQ-F. This cable has polyurethane (PUR) outer sleeve. PUR withstands well chemicals as well mechanical wearing. However, the user has an option to specify cable type in accordance with work site requirements of own.

**Socket:** Optional in-built sockets (receptacles) for linking the SLAM<sup>®</sup> Hornet units in series

**Battery:** The Ex-approved rechargeable Li-Ion battery provides power during the supply power failure. The external battery casing makes the battery more robust and suitable for harsh conditions. The battery temperature is monitored by the advanced control unit.

#### Other common accessories (optional):

- Antistatic protective film for PC tube against chemical splashes and other substances
- SLAM<sup>®</sup> Click'n Fix 80 Magnetic Bracket
- SLAM<sup>®</sup> Click'n Fix 80 Scaffold Bracket
- SLAM<sup>®</sup> Click'n Fix 80 Unistrut Bracket
- SLAM<sup>®</sup> Click'n Fix 80 Single Bracket
- Adjustable hanging straps

To view options on accessories, please visit [www.atexor.com](http://www.atexor.com) for further study or call us directly +358 20 734 3250.

## 1.4 Quality guaranteed

### 1.4.1 General

The SLAM<sup>®</sup> Hornet series is designed, certified, manufactured and tested under ISO 9001:2008 quality system as well as additional requirements of the Directive 94/9/EC (ATEX) or IECEx scheme. The SLAM<sup>®</sup> Hornet series is designed and tested according to the latest directives and standards. The referred directives and standards of the production date in case are stated on the Declaration of Conformity included in the delivery.

### 1.4.2 Individual testing reports

Each SLAM<sup>®</sup> Hornet unit has its own individual serial number and is provided with an original, individual testing report when leaving the factory. The year of manufacture is specified on the type label of the equipment. Following tests have been done for SLAM<sup>®</sup> Hornet units according to standards relating to portable luminaries for explosion hazardous area. The Declaration of Conformity is specifying the relevant standards. The testing report which is included in the delivery specifies the results of the factory tests for that particular unit. The testing report typically specifies the following tests:

#### **PE –resistance test**

The purpose of this test is to measure persistence of earth conductor.  
Vital test for electrical safety as well as explosion safety because of e.g static electricity control.  
The test current is 10 A (current) and the overall resistance should not exceed 0,5  $\Omega$ .

#### **High voltage test (electrical strength)**

The purpose of this test is to measure leakage current through insulation. Vital test for revealing broken components or similar failures which can not be identified visually.  
Testing voltage applied is 2130VDC. Maximum leakage current is 5mA.

#### **Test of expected use of equipment**

The luminary is subjected to shaking and vibration – to see that all the internal wires are properly attached and components are not loose.

#### **Operational test of luminaire and accessories**

The unit is plugged-in and checked that it is working properly after all accomplished tests above.

#### **Visual inspection**

A final check to see everything is fine (screws attached properly, wires connected and required markings attached).

## 2. Prior to use

### 2.1 Selection of right equipment

You need to be sure that the equipment you intend to take into explosion-hazardous area matches up with the zone classification and other safety requirements related. The operator is solely responsible for the correct selection and use of the equipment at his site. At least the following points should be notified prior to use:

### 2.2 Intended purpose of equipment

Please keep in mind what the actual application of equipment is. For example in case the equipment is to be moved when connected to the supply it needs to be designed for that purpose. If the certification is mentioning “portable” it means that the equipment is suitable and tested for portable use. If the certification does not mention portable it means that the equipment shall not be moved when it is in operation (reliable fixing of equipment).

**SLAM® Hornet units are designed and tested for portable use.**

### 2.3 Application of use (Zone XX) in accordance with equipment category

Operator has the best knowledge of area classification at his site. To help the operators' selection of equipment the certification is describing the equipment category. For explosion hazardous areas there are three equipment categories.

- Category 1 product is suitable for use in Zones 0, 1 and 2 / (20, 21 and 22)
- Category 2 product is suitable for use in Zones 1 and 2 / 21 and 22
- Category 3 product is suitable for use in Zones 2 / (22)

**SLAM® Hornet units mentioned in this instruction fall into Category 2 equipment.**

### 2.4 Explosion group (IIA, IIB or IIC) in accordance with Equipment group (IIA, IIB or IIC)

This information is vital because the substances require different amount of energy to be ignited. Safety requirements for equipment are not the same for different substances (e.g. static electricity requirements). Therefore making the selection easier the gases are divided to three different groups (IIA, IIB and IIC). Further information about the substances can be found from EN/IEC 60079-20-1 (Data for flammable gases and vapours, relating to the use of electrical apparatus).

**SLAM® Hornet units mentioned in this instruction are Equipment group IIC.**

## 2.5 Temperature class of the equipment

Please observe the Ignition Temperature (IT) of the substance creating the explosion hazard at your site. Select the equipment based on IT of the substance. The temperature of the equipment must be lower than IT. The highest temperature of the equipment is specified by using Temperature Classes T1 to T6.

Example:

Petroleum ignition temperature is approximately 250°C → Maximum allowed temperature class of the equipment is T3 (< 200° C)

**SLAM® Hornet units mentioned in this instruction are Temperature Class T4 (GASES)**  
**SLAM® Hornet units mentioned in this instruction maximum surface temperature of 90°C (DUSTS)**

## 2.6 Environmental criteria

Please observe the ambient temperature of the application in use because certification is valid for temperatures between -20°C...+40°C. Some SLAM® Hornet luminaries are certified for temperatures between -40°C...+40°C. Please see type label of the product for further data. If the equipment is used in other temperatures than mentioned the safety can not be guaranteed.

**Selection and use of equipment is always under the responsibility of the operator. Please note that all of the aforementioned criteria are to be fulfilled when selecting the equipment.**

**Please do not take any unnecessary risks.**

## 2.7 Special conditions for safe use

As the marking "ib" is for internal protection of NTC, push button and signal LED circuits in the EM control unit, there is no need for Exi-associated apparatus in the supply of the luminaire.



## 3. Operating instructions

### 3.1 Personnel

The use of the equipment is to be controlled and accepted by the operator. The personnel using the unit have to be authorized by the operator or his representative. In case of further training of using the equipment please contact the local supplier of this equipment.

### 3.2 Storage of the SHEM

SHEM units should be stored in normal operating temperatures  $-20^{\circ}\text{C} \dots +40^{\circ}\text{C}$ . To achieve the best lifetime for the battery it is recommended that the unit is stored in ambient temperature  $+5^{\circ}\text{C} \dots +10^{\circ}\text{C}$  and the battery is charged approximately every three months if not used.

### 3.3 Before first use of SHEM

Before first use, connect the unit to mains/transformer for 24 hours to fully charge backup battery. This is necessary to get maximum battery life and capacity. Battery lasts ~600 cycles or 3 - 4 years in normal operation. See also section 4.5.

### 3.4 Visual inspection of SHEM

As for all equipment to be used inside explosion hazardous area it is recommended that before taking the unit into Ex –area, a visual re-inspection on the unit was taken and an analysis made that the unit is not damaged (e.g. any part or wires are loose damaged or disconnected)

In case faults or defects on the unit are noticed, it is prohibited to take such a unit into Ex –area until the corrective actions have been made.

### 3.5 Special attention on 2-pole use (24 V or 42 V)

Certain SHEM units are designed to be used together with step-down transformers. Using SHEM unit with transformers of 2-pole socket outlets (without grounding / bonding) imposes certain extra requirements for the unit itself. All the external metal and aluminium parts of the SHEM are replaced by the manufacturer with plastic parts or equipped with plastic covers in order to avoid electrostatic charging and a consequent risk of explosion. This process can only be done by manufacturer because the certification of the product.

Please inform us about your requirement for 2-pole use when placing the order. Products originally manufactured for 3-pole use can not be modified later for 2-pole use by the operator. Such modifications are only allowed to be carried out by the manufacturer or under supervision of the manufacturer.

Note! Lack of equipotential bonding may cause danger in Ex –area, therefore please pay special attention to all installations of yours involving metallic parts. Static charging is especially noted on standards referring to installations in explosion hazardous areas (e.g. EN/IEC 60079-14).

### 3.6 Connection to the supply

It is recommended that the unit is first connected to the mains / transformer before entering the explosion hazardous area. Potential equalization should be arranged by the operator prior entering explosion hazardous area.

SLAM<sup>®</sup> Hornet units with 2-pole supply (without bonding connection) can be taken to explosion hazardous area without connecting it to the supply first.

#### Requirements for supply (electricity)

The following main requirements should be taken into account:

**Supply voltage:** Variation may be maximum  $\pm 6\%$  from the value stated in the unit type label.

**Current:** Maximum current of the system is 16 A.

**Frequency:** Standard 50 Hz if not otherwise stated in the type label.

**Fuse protection:** The supply has a fuse with a breaking capacity of at least 1500 A.

**Earth Leakage Circuit Breaker (ELCB):** It is recommended to use a supply with 30 mA ELCB.

Please observe the type label for further data. Luminaires for 110 VAC or 230 V supply are to be connected to a supply incorporating protective earth conductor.

### 3.7 Adding accessories to SLAM<sup>®</sup> Hornet

Atexor provides a number of different accessories but in case you afterwards want to add accessories of your own for the SHEM unit, please note the following points:

1. The user is fully responsible for the use of the equipment including service and maintenance
2. In case of adding accessories the following is mandatory
  - a. The construction of the certified unit shall not change
  - b. The IP class of the unit shall not decrease
3. The static electricity is taken account (e.g. electrostatic bonding)

In case you do not want to do your own risk assessment for the accessories please view the whole range of accessories at [www.atexor.com](http://www.atexor.com)

### 3.8 Linking in Series

Certain SLAM<sup>®</sup> Hornet units may be equipped with Ex-certified socket in the factory. Sockets are considered as one option so they are added to the unit upon customer's special request.

In-built sockets are recommended when the illuminated area is notably large, complex or not enough wiring points are available. Linking the units in series save time, amount of cable and provide an opportunity to build a chain of lights to provide enough illumination in the darkness.

When linking SLAM® Hornet units together, please take the following steps:

- 1) Connect the first luminaire to the power supply and power it up.
- 2) Then connect the other luminaries to each other one by one and power them up individually
- 3) The in-built socket is only for chaining SLAM® Hornet units.

**Luminaires should be powered up in series and powering up the whole chain as one need to be avoided.**

Amount of lights which may be connected with each other depends on the supply voltage.

**Competent person of the operator shall control and accept the temporary electrical installation at the site.**

Before connecting SLAM® Hornet luminaries together, please ensure the following points:

1. The total length of the light chain does not exceed 66 meters. Please see additional detail below the chart.
2. The total current of the electrical installation does not exceed 16A.

Here you may see general and theoretical guide-lines for linking SLAM® Hornet luminaires with 5 m 3x1.5mm<sup>2</sup> (or 3x2.5mm<sup>2</sup>) cable:

Supply voltage	Type of luminaire	Number of luminaires in series
230 V	SHEM1LED (30 W)	9
110 V	SHEM1LED (30 W)	9
42 V	SHEM1LED (30 W)	9
24 V	SHEM1LED (30 W)	9

**Please note that even if the voltage drop allows certain amount of luminaries to be linked together, too long chain of luminaries may affect the ability of the fuses in the electrical input to work properly in a fault situation. Therefore it is not recommended to chain luminaries to a longer chain than 66m measured from the protective fuse (when the electrical supply is protected with C-curve fuse). Please refer to local applicable laws and requirements for electrical installations.**

The SHEM control gear protects itself against excessive voltage drops (numerous linking) by switching itself off. If too many units are connected to the chain, some units of the chain will switch off. You may start up by unplugging the last units on the line.

Voltage peaks are more harmful and may damage the ballast permanently when subjected to excessive peaks continuously.

If fluorescent tubes are flickering when the units are chained up, it may be due to excessive linking. This may shorten notably the lifetime of fluorescent tube. Unplug the last unit on the line to ensure proper function of the unit.

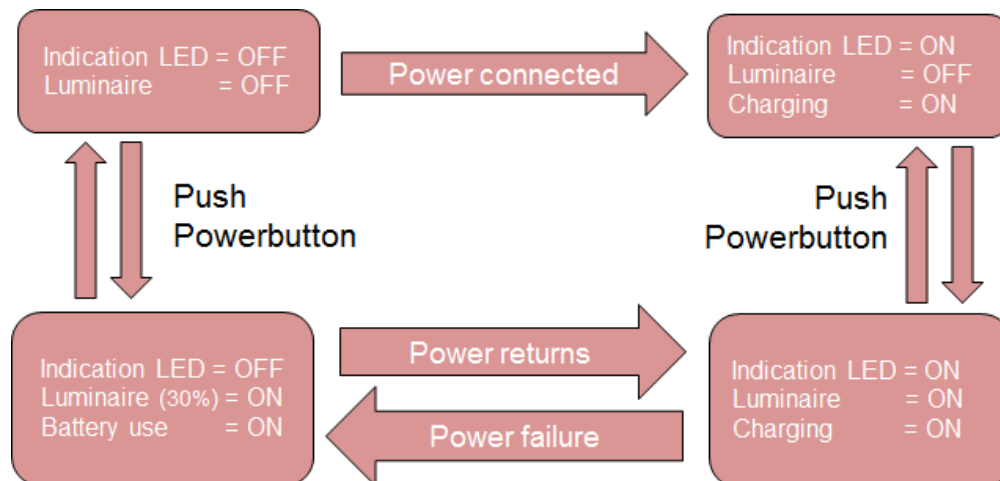
### 3.9 Special operating features of SHEM

Connect luminaire to the mains/transformer. Push the power button on the end part to turn the luminaire on and off. Power button has an integrated standby/power LED to ease finding the button at dark environments and indicating that the luminaire is powered.

All SHEM -units are equipped with Li-Ion battery backup to allow the LED module to illuminate at up to 35% of the normal light output during power failures. When the backup is functioning the LED module blinks shortly every 15 seconds as an indication of the missing power supply. Battery backup function operates up to 90 minutes depending on the condition and charge of the battery (also see 4.5). By using the power button also the operation of battery backup can be controlled on and off.

Battery is charging whenever the luminaire is connected to the mains/transformer and the battery temperature is below +60°C. The temperature of the battery is monitored by the charging circuitry to prevent overtemperature charging. The battery charging in subzero temperatures is not prevented, but it is highly recommended that the charging is done only in ambient temperatures between +0°C...+40°C.

#### Function diagram



#### Indicator Status Chart

Button LED (power)	State
OFF	No power
BLINKING	Powered / Battery charging

LIT	Powered / Battery full
-----	------------------------

## 4. Inspection & Maintenance

### 4.1 After Use

Take the following steps after the SHEM -unit has been taken out from Ex-area:

- 1) Clean the unit with a damp cloth (do not use detergents or solvents)
- 2) Change the anti-static film if only little light comes through it or it is damaged
- 3) Have a visual check on the unit (condition of cable, PC-tube, tightness of parts)
- 4) Let the unit dry in open air

### 4.2 Maintenance

The following procedure should be taken in case the SHEM -unit needs to be repaired:

- 1) Maintenance may be carried out only outside Ex –area
- 2) Person responsible for maintenance should have been trained the basics of explosion-protection as well electricity
- 3) Only original spare parts from the manufacturer should be used. Please note that there are no components in this unit which can be repaired by using glue, silicone or any other similar method.
- 4) The dissipation feature (antistatic) on transparent parts of SLAM® Hornet may be damaged because of external affects like solvents or chemicals or mechanical stress. In case the surface of the PC-tube is damaged in one area greater than 100 cm<sup>2</sup> the part has to be changed. The surface resistance of the transparent parts has to be between 1 MΩ...1 GΩ. Please contact Atexor Oy in case You need a simple measuring device, which is needed for measuring surface resistance of the PC-tube.
- 5) Maintenance instructions with exploded-view diagram and spare parts list are available at your local distributor and the manufacturer. Please, when requesting maintenance instructions with exploded-view diagrams, include the model and serial number of the product.

The device has a Li-Ion battery and electronics inside, please use required actions when disposing of the device or its components.



### 4.3 Testing

Tests are to be done according to EN/IEC 60079-19 until returning the repaired unit back to operation. Below mentioned tests shall be done in addition to the tests specified in EN/IEC 60079-19

- PE –resistance test

- High-voltage test (500 VDC between Phase & Neutral against P/E conductor)
- Operational test
- Test of expected use (vibrations, shaking)

Proper testing ensures safe operation of repaired equipment.

## **4.4 Repair report**

The operator is responsible for keeping up to date record of the condition of his equipment (EN/IEC 60079-14). Ensuring the availability of this important information each repair procedure should be written down in repair report according to EN/IEC 60079-19.

This report should reveal at least:

- Person who conducted the maintenance
- Date of maintenance
- Procedure of maintenance
- Signature of person responsible accepting the maintenance

## **4.5 Periodical testing of SHEM**

Before test, allow battery to be fully charged. Operation of the battery must be checked 4 times a year by cutting off the input voltage. Operation time in battery mode should be over 45 minutes. If not, luminary is to be serviced.

## **4.6 More information about the use of Electrical Apparatus for Explosive Gas Atmospheres**

Please observe the requirements of the valid standards of the day. Please study at least the following standards:

EN/IEC 60079-14 (Electrical installations in hazardous areas)

EN/IEC 60079-10 (Classification of hazardous areas)

EN/IEC 60079-17 (Inspection and maintenance of electrical installations in hazardous areas)

EN/IEC 60079-19 (Repair and overhaul for apparatus used in potentially explosive atmospheres)



## Helpdesk

Under any doubt or question, please contact your local distributor or the manufacturer.

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