

## FAULTY OPERATION AND ITS POSSIBLE DIAGNOSIS

### LED indicator does not light up

AC power failure.

### LED indicator is red, the luminaire does not operate (AT or MT version, e.g. in SA / M mode)

Battery pack is damaged or disconnected, damaged light source or electronic circuit.

### Red LED indicator lights up or blinks (AT version)

The luminaire performs testing or damage of any part of the luminaire possible. Please, refer to the "TESTING" section.

### The luminaire does not operate in emergency mode the required time for a selected model

It is possible that the battery requires a full charge cycle (48h). If after 48 hours of charging the luminaire still does not keep a predefined autonomy, it is possible that the battery is run-down or damaged, e.g. due to possible incorrect formatting and needs to be replaced.

## RECOMMENDED PERIODICAL MAINTENANCE

The luminaire should be tested on regular basis in accordance with valid laws and regulations. The results of the tests should be recorded and stored for the use of a fire safety inspector.

### Once a day

It is suggested to check visually if the LED indicator in the luminaire lights up in green.

### Once a month

It is necessary to perform a function test (e.g. by disconnecting the AC power supply) and checking whether the luminaire is operating in emergency mode - the green LED indicator should turn off, and LED light source light up.

### Once a year

In order to make an autonomy test (e.g. by disconnect the AC power supply) and check if the luminaire operates in emergency mode for a specified time. If the autonomy time of emergency operation is not sufficient, the battery needs to be fully recharged and the test is to be carried out again. If the result of the test continues to be negative, the battery needs to be replaced.

### CAUTION!

All damage that might occur as an effect of the device being used not in accordance to this instruction will result in loss of guarantee.

Used or damaged lamps including batteries, are subject to be recycled. They should be delivered to the point of collection of electrical and battery waste or to the manufacturer.



The light source contained in this luminaire shall only be replaced by the manufacturer or his service agent or a similar qualified person.

## Handling of obsolete equipment



Pursuant to the Act of 29 July 2005 on waste electrical and electronic equipment and the Act of 24 April 2009 on batteries and accumulators, the presented device, after use, due to hazardous substances contained in it, is subject to collection of waste electrical and electronic equipment. Detailed information on WEEE collection can be obtained from municipal authorities.



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## STARLET EXTERNAL LED EMERGENCY LUMINAIRE

Installation and maintenance instructions



Version:

STARLET EXTERNAL LED SO

STARLET EXTERNAL LED SC

TECHNICAL SPECIFICATIONS:	
Light source* (non-replaceable):	White LED: 3W or 5W
Operating modes*:	SA (M) - mains and emergency operation or A (NM) - emergency operation
Test versions*:	MT – manual test or AT – auto test or CT – central test
Emergency autonomy*:	1 or 3 hours
Battery* (non-replaceable):	Ni-Cd: 1300-2500 lub Ni-MH: 2000-4200 mAh / 3,6V
Battery charging duration:	24h
Power supply*:	MT, AT and CT: 220-240V AC 50Hz CB (central battery): 220V AC/DC
Max. power*:	3W-9W
Luminous flux*:	3W: 120-200 lm; 5W: 250-300 lm
Module:	Starlet External
Enclosure IP rating:	IP41
Ambient temperature:	10-55°C

\*- depending on model



## INTRODUCTION

1. The lamp should be installed when power supply is off. Safety rules, construction and electrical installation standards should be followed all the time.
2. The luminaire should not be powered with circuits connected to inductive power-receiving devices at the same time. This type of solution may cause damage to the electronic module of the luminaire.
3. The luminaire should be used indoors.

## INSTALLATION

- Before installation one has to make sure that the luminaire will be connected to 220-240VAC power supply by the use of minimum a 1,5mm<sup>2</sup> wire.
- In order to install the luminaire on a ceiling, first one need to open the luminaire housing by pressing with a screwdriver on one of the latches on the side of the housing, which fix the luminaire cover to its base. After releasing all the three latches and decomposing the housing, one need to fix the luminaires' base containing electronics and a battery pack to the ceiling using two mounting holes designed for this purpose. A large hole with a grommet is designed to conduct the power cables, one need to cut a right size hole in the grommet to ensure proper sealing.
- Prepare power cable and connect all the wires to the appropriate terminal block entries.
- The description of luminaire terminals:  
**L** - phase wire - brown or black insulation colour; power source for Maintained operation and battery charging, presence signaled by signal LED lighting up in green  
**L1** – used for SA / M mode jumper (Note: the jumper is being delivered already connected to **L1** and **L**)  
**N** - neutral wire - blue insulation colour  
**PE** - earth wire - yellow and green insulation colour
- EMERGENCY OPERATION (A, NM).** To enable emergency operation of the luminaire the AC mains power has to be connected to appropriate terminals: **L** (phase) and **N** (neutral). Always remember about connecting the protection earth wire (**PE**). Additionally, one need to remove the jumper which connects the **L** and **L1** terminals, **L1** terminal should remain not connected. The luminaire should be constantly supplied by power - voltage drop on **L** will result in emergency mode activation.
- MAINS AND EMERGENCY OPERATION (SA, M).** For the mains and emergency mode of the luminaire, the AC mains supply needs to be connected to appropriate terminals: **L** (phase) and **N** (neutral). Always remember about connecting the protection earth wire (**PE**). In addition, the pre-installed between **L** and **L1** terminals jumper must remain in place (if there is no jumper, it must be installed). Phase loss on **L** will cause automatic activation of the emergency mode.
- Before connecting the luminaire to the mains network, insert the white battery plug into the socket on the PCB.
- Please remember to indicate the date of installation on the label attached to the battery pack.
- In order to finish the installation, one need to click the housing cover into the luminaire's body.
- For quick operation testing – switch on the AC power supply. The green LED indicator should light up, signaling the mains connection and battery charging. After battery is charged, the LED indicator should still light up in green, what means readiness for emergency operation. By pressing the test button, one can check if the luminaire enters the emergency operation when the power supply is off. The way how to press the test button and how to read the luminaire's behaviour depends on its version. You can find detailed information in the "TESTING" section.
- First-time charge of the luminaire battery pack should be carried out continuously for 48 hours. This will allow appropriate formatting of the battery pack. During the first-time charge, no testing should be carried out and power supply should not be disconnected for any other purpose. Power supply should be disconnected after 48 hours for the first time. The luminaire should complete a full emergency operation cycle, after which it should be connected to power supply for another 36 hours. This sequence shall complete the formatting cycle.

## OPERATION

### Emergency operation mode

In this mode (A, NM) the luminaire does not light when powered by AC supply voltage. Correct operation of the device is confirmed by LED indicator lighting up in green. The battery is being continuously trickle charged for the purpose of a possible emergency operation. When AC power supply is off (no voltage on **L**), the luminaire automatically starts operating in emergency mode and the source of light is activated for the period specific for a particular model. During emergency operation, the LED indicator is off.

### Mains and emergency operation mode

In this mode (SA, M) the luminaire lights up when powered by AC supply voltage. Correct operation of the device is also confirmed by LED indicator lighting up in green. The battery is being continuously trickle charged for the purpose of possible emergency operation. When AC power supply is off (no voltage on **L**), the luminaire automatically starts operating in emergency mode and the source of light is activated for the period specific for a particular model. During emergency operation, the LED indicator is off.

### Information on lamp operation

The luminaire operates correctly and charging circuit works if the LED indicator lights up in green. If the indicator does not light up, the lamp is not operating with AC power supply on or any luminaire's element (e.g. the battery) has been damaged. See more info about signaling in "TESTING" section.

### Battery pack

The luminaire is equipped with a rechargeable Ni-Cd or Ni-MH battery pack. Please remember to carry out the correct first-time charge cycle (see "INSTALLATION", p.11). After such a formatting cycle it achieves its capacity and is prepared to perform a possible full time emergency operation. It is suggested to discharge and then to re-charge the battery every three months, even if it hasn't been used, in order to extend its performance. It is recommended to replace the battery once every four years of operation or in a case of poor test results. Obsolete batteries, similarly to packaging, fluorescent lamps or electronics, are recyclable products that should be disposed to a recyclable waste collection point.

## TESTING

STARLET EXTERNAL LED luminaire is equipped with a TEST button, which is being used both for MT – manual test versions and AT – auto test versions. It enables to test emergency operation of the luminaire.

### AT auto test function

If a luminaire version has an auto test functionality, the TEST button is being used to initiate and break either function or autonomy tests. When the luminaire is connected to mains network and there is no voltage drop, pressing and holding the test button, depending on time of pressing, will result in activation of any of the two. Pressing the button for more than 2s and not longer than 5s (2s<t<5s) initiate the function test, for more than 5s and not longer than 10s (5s<t<10s) – initiate the autonomy test, while for t>10s – breaks any currently running test. For a convenient counting of nr. of seconds – when a test button is pressed and hold – after every second the luminaire confirms the passing time by a quick flash of a red indication LED.

In a standard luminaire operation, both functional and autonomy tests are being initialised automatically, function test every 28 days and autonomy test every 336 days. There is no possibility to break any automatically planned test. There is also no possibility to erase any test results, this means that any signalled failures can be cancelled only after making the luminaire repaired and further re-testing it with a positive result.

All the possible luminaire working states and LED indications are gathered in the table below.

LUMINAIRE WORKING STATE OR ACTION	GREEN LED INDICATION	RED LED INDICATION	COMMENTS
<b>BASIC STATES</b>			
MAINS SUPPLY ON, BATTERY BEING CHARGED	ON	OFF	
MAINS SUPPLY FAILURE, EMERGENCY OPERATION	OFF	OFF	
<b>FUNCTIONAL TEST STATES</b>			
FUNCTIONAL TEST (PART 1: CHARGING CIRCUIT) BEING INITIATED	ON	FLASHING (2/T)	DURATION: 10s
FUNCTIONAL TEST (PART 2: LIGHT SOURCE AND ELECTRONICS) IN PROGRESS	OFF	FLASHING (1/T2)	DURATION: 60s
CHARGING, ELECTRONIC CIRCUIT, LIGHT SOURCE OR BATTERY FAILURE	ON	ON	
LUMINAIRE (ELECTRONICS, BATTERY, LIGHT SOURCE) – OK	ON	OFF	
<b>AUTONOMY TEST STATES</b>			
AUTONOMY TEST (PART 1: CHARGING CIRCUIT) BEING INITIATED	ON	FLASHING (2/T)	DURATION: 10s
AUTONOMY TEST (PART 2: LIGHT, ELECTRONICS, AUTONOMY) IN PROGRESS	OFF	FLASHING (2/T2)	DURATION: 1h or 3h (*)
CHARGING, ELECTRONICS, LIGHT SOURCE, BATTERY OR AUTONOMY FAILURE	ON	ON	
LUMINAIRE (ELECTRONICS, BATTERY, AUTONOMY, LIGHT SOURCE) – OK	ON	OFF	
<b>MANUAL TEST BUTTON FUNCTIONS</b>			
INITIATION OF A FUNCTIONAL TEST – PRESSING A BUTTON FOR A 2s<t<5s	ON	FLASHING (1/T)	FLASHING ENABLES TIME (t) COUNTING
INITIATION OF AN AUTONOMY TEST – PRESSING A BUTTON FOR A 5s<t<10s	ON	FLASHING (1/T)	

Legend:

T – 1s period; T2 – 10s period; t – time of pressing the test button

FLASHING: (1/T) / (2/T) – 1 flash / 2 flashes every 1s period

FLASHING: (1/T2) / (2/T2) – 1 flash / 2 flashes every 10s period

(\*): test duration is same as an autonomy time declared for a given luminaire

### MT manual test function

When the emergency luminaire is connected to mains and there is no voltage drop, pressing and holding TEST button will result in activation of the "voltage drop" mode, the signal LED will go off and the luminaire should light up. When the button is released - the luminaire will switch back into its standard operation mode.

The above action means that in a case of emergency mode version the luminaire will go from unlit to illuminated. In a case of mains and emergency mode the luminaire will change a power source, from mains to a battery supply, the switch-over moment should be visible as a quick blink – during a very short while the light source will be off.

CAUTION! In a case of SA (M) luminaire version, but wired as A (NM) one, the lamp behaves according to A (NM) typical behaviour.

### CT (central test) and CB (central battery) versions

Note – CB version may be equipped in manual test button, however it is inactive in this luminaire's version. Pressing the button will not result in any luminaire's reaction.

CT version is being programmed individually according to a particular model of a central controller, depending on customer's requirements and installation needs. Communication is being carried through RS485 port.

CB version is being monitored directly by a central battery controller, depending on functionalities and settings of a particular system.