

USER GUIDE

IP67 control gear for outdoor applications for LED modules



0...10V



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1. INTRODUCTION

Thank you for choosing control gear for LED modules designed and manufactured by ELT (Especialidades Luminotécnicas S.A.U.). This user guide will help you learn about the family of IP67 control gear for outdoor applications as well as how to correctly integrated into your luminaire.

We advise you to check the latest available version of this document on the ELT website, www.elt.es/en.

1.1. IP protection

The control gear IP ingress protection index refers to the protection provided by its casing against the ingress of foreign bodies as defined by international standard IEC 60529 with particular requirements for lighting fixtures as contained in international standard IEC 60598-1. The first figure refers to the protection against solid objects and the second figure against the ingress of liquids.

Control gear from ELT for outdoor applications offers an IP67 protection level:

- First figure “6”: completely dust-tight.
- Second figure “7”: protected against the effects of immersion (*).

This protection level is considered to be a standard for drivers that are going to be installed without the protection of an additional casing.

(*) As defined by the standard, this level does not guarantee permanent operation underwater.

1.2. Applications

ELT control gear with IP67 protection level is the perfect option for any street lighting application as well as for roads, monuments, sports and industrial facilities in which greater protection must be guaranteed due to the fact the drivers will be installed in aggressive environments, outdoors with greater exposure to atmospheric agents. It is also the ideal solution where the lighting system requires a higher level of resilience to the outdoor environment.

1.3. Classification and symbols

The nomenclature of the ELT control gear for outdoor applications with IP67 protection level is described as follows:

i LC PRO 40 / 200...1050 - XT - IP67 - DALI-1...10V STE
(1) (2) (3) (4) (5) (6) (7) (8)

(1) Driver family according to its dimming and configuration features:

- No indicator: non-programmable and non-configurable ON/OFF drivers.
- D: programmable, non-configurable drivers.
- i: programmable and configurable drivers with eSMART technology.

(2) Driver for LED modules with constant output current.

(3) Configuration level and dimming methods of iLC drivers:

- No indicator: some configurable features available and some dimming methods of the eSMART technology.
- PRO: all programmable features and dimming methods of the eSMART technology available.

(4) Maximum power load of the driver.

(5) Driver output current:

- XXXX: fixed output current.
- XXXX...YYYY: configurable output voltage range.

(6) Format:

- XR: compact reduced format.
- XT: compact format.

(7) Protection index IP67.

(8) Regulation methods available from eSMART technology in DLC drivers and iLC (not PRO) drivers:

- DALI: DALI dimming.
- 1...10V: dimming 1...10V.
- 0...10V: dimming 0...10V.
- ActiDIM: pre-configured stand-alone dimming profile.
- MainsDIM: head-end dimming by varying the mains voltage.
- NTC: module temperature protection.
- STE: STE: driver compatible with the STELARIA remote street lighting management system.

NOTE:

All the information relating to eSMART technology can be viewed in the corresponding user guide available on the ELT website at www.elt.es/en

1.4. General features of the drivers

The main features of the ELT control gear with IP67 for outdoor applications are:

- Independent drivers, Class II.
- Suitable for installation in demanding environments with no additional casing and in luminaires with low IPs, both Class I and Class II.
- Wide range of input voltages.
- High power factor.
- Low harmonic distortion.
- Low standby power consumption.
- Low output ripple current.
- High quality light without flickering.
- Programmable by modulating output current size in configurable models.
- Wide range of output current regulation in configurable models.

- Configurable functionalities for an optimal lighting system design:
 - Adjustable output current (AOC).
 - LED module thermal protection (MTP).
 - LED module constant lumen output (CLO).
 - LED module end-of-life alarm (EOL).
 - Programmable start-up time (PST).
 - Monitoring parameters and events.
- Different regulation methods available depending on the model:
 - DALI.
 - 1-10V / 0-10V.
 - ActiDIM: stand-alone and dynamic dimming system that adapts to night hours.
 - Parking mode: light regulation via presence detectors.
 - ActiDIM Parking: combines stand-alone dimming with presence detectors.
 - LineSwitch: lineswitch dimming.
 - MainsDIM: head-end dimming by varying the mains voltage.
 - ON/OFF: no regulation.
- Versions compatible with the STELARIA™ remote street lighting management system.
- Short circuit, overload and open circuit protection.
- Control gear thermal protection.
- Protection against grid variations and power surges.
- Excellent thermal performance and extensive working temperature ranges.
- Up to 100,000h lifetime.

1.5. Portfolio

Ref nº	Model
9916169	iLC PRO 25/200...1050-XR-IP67
9916170	iLC PRO 40/200...1050-XR-IP67
9916171	iLC PRO 75/200...1400-XR-IP67
9916157	iLC PRO 40/200...1050-XT-IP67
9916156	iLC PRO 75/200...1400-XT-IP67
9916168	iLC PRO 110/200...1050-XT-IP67
9916174	iLC PRO 150/200...1050-XT-IP67

The iLC PRO models in the above table incorporate all the functionalities and dimming methods of the eSMART technology which are accessible via five connecting hoses (grid, DALI, 0-10V/1-10V, NTC, LED module).

On request, when not all the functionalities and dimming methods are required, other control gear hose configurations can be provided (NTC, 0-10V/1-10V and DALI) in order to adapt the features of the driver to its end application, thereby avoiding the need to insulate and install unnecessary connections.

Similarly, there are configurations compatible with the STELARIA™ remote street lighting management system. Please contact our sales offices to define the required configuration.

NOTE: All the information relating to eSMART technology can be viewed in the corresponding user guide available on the ELT website at www.elt.es/en

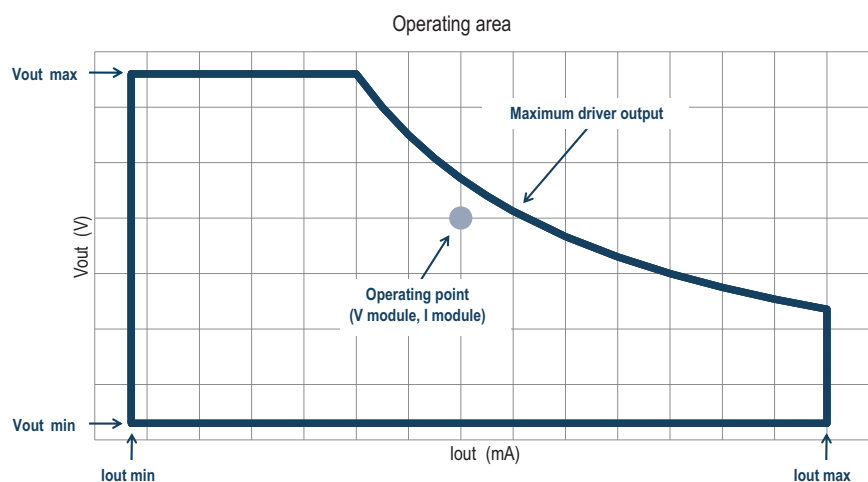
2. ELECTRICAL FEATURES

2.1. Electrical parameters

The ELT control gear with IP67 protection for outdoor applications offers an extensive operating area, perfectly adjusting the operating point required in the design of each luminaire and each lighting system. The result is full flexibility, easily adapting to the continuous and fast evolution being experienced by LED technology lighting.

The operating area of the drivers is defined by the maximum and minimum load voltage that can be connected, by the maximum and minimum output current that can be programmed and by the maximum working power.

The operating point is defined by the maximum voltage of the LED module to be connected and the current which it is going to supply. This operating point must be within the operating area of the selected driver.



In the ELT drivers, the operating area of one model partially overlaps with that of the higher output model, ensuring a continuity that effectively responds to every operating point. When the defined operating point falls within the operating area of several drivers, selecting the device with the lowest assigned power will provide it with the best electrical output values in terms of THD, power factor and efficiency; while selecting the device with the highest assigned power will provide a lower working temperature and as such, a longer service life. Generally, if the luminaire has a good thermal design, the first option is usually the recommended selection.

The IP67 control gear for outdoor applications from ELT permits a wide range of the supply voltage that, in addition to becoming a solution suited to a host of installations, guarantee stable and reliable operation in the face of fluctuations in the values of the mains grid voltage.

In terms of efficiency, the power factor, THD and dimming range of the ELT drivers are positioned in the high performance segment of the lighting sector.

NOTE:

The technical specifications of each model and their corresponding data sheets can be viewed and are available for download via the ELT website at www.elt.es/en

2.2. Electrical insulation

The IP67 control gear for outdoor applications from ELT has been designed in accordance with the EN 61347-1 and EN 61347-2-13 safety standards for double or reinforced insulation against electric shocks resulting from contact with accessible parts. In addition, these drivers are suitable for “independent” use and are thus classified as Class II drivers.



The insulation between the primary and secondary circuits, as well as between every circuit and the functional earth, is set out in the following table:

	Functional earth	Input voltage	DALI	0-10V	LED module/external NTC / STELARIA
Functional earth	X	Double	Double	Double	Double
Input voltage	Double	X	Main	Main	Double
DALI	Double	Main	X	Main	Double
0-10V	Double	Main	Main	X	Double
LED module/external NTC / STELARIA	Double	Double	Double	Double	X

NOTE:

When the devices are built into luminaires, the cabling between the different components must observe the insulation class for which these lighting fixtures have been designed, as well as comply with the EN 60598 standard.

3. THERMAL CHARACTERISTICS AND LIFETIME

The thermal operating conditions of the control gear are a critical factor for its lifetime and for the LED street lighting system into which it is integrated. This is why an understanding of the factors and parameters relating to this aspect is essential.

The IP67 control gear for outdoor applications from ELT has been designed to offer maximum performance with the best thermal efficiency.

Once the drivers have been integrated into the lighting system, the thermal efficiency and lifetime depend on factors such as the connected load, luminaire design, its capacity to dissipate the heat generated inside the unit and the relative position of each of its components.

3.1. Temperature inside the casing (tc)

The parameter to control in order to ensure correct operation and life expectancy is the temperature inside the casing at a point called tc. The tc is a point of reference that represents the conditions under which the driver's internal components are working. Particular care must be taken to ensure that the maximum limits specified for each model are not exceeded.

The simplest way to measure the temperature at this point is by means of a thermocouple attached at the place indicated on the casing of each driver once thermal stability has been achieved.

NOTE:

The eSMART drivers from the PRO range incorporate a diagnostic mode that indicates the internal temperature value of the driver. This is for guidance purposes only as it does not necessarily coincide with the tc value.

3.2. Ambient temperature (ta)

The IP67 control gear for outdoor applications from ELT has been designed to be able to operate within a very wide ambient temperature range.

The maximum ambient temperature limit depends on the operating point, the value of the connected load and, largely, to the design of the luminaire itself and its ability to dissipate heat outwards. The maximum permitted ambient temperature for control gear can serve as a guideline or an indicator of the conditions under which that device is able to work, however must not be used as the control parameter to guarantee its estimated lifetime.

With the aim of ensuring reliable ignition in ambient temperatures of less than -25°C, the drivers power up gradually, applying a start-up process that lasts for a maximum of 10 seconds. Gradual start-up takes place irrespectively of the driver configuration.

3.3. Lifetime

The IP67 control gear for outdoor applications from ELT can achieve up to a 100,000 hour lifetime depending on the working temperature at point tc.

NOTE:

Thermal data and the lifetime of each model can be viewed on their corresponding data sheets, available for download via the ELT website at www.elt.es/en

4. PROTECTION

The IP67 control gear for outdoor applications from ELT is equipped with internal protection to ensure that the drivers and every component of the luminaire in which they are installed operate correctly.

4.1. Short circuit protection

In the case of a short circuit in the load terminals, the driver disconnects the power and goes into protection mode, in which it remains as long as the fault continues. This protection automatically resets so that when the short circuit is resolved, the driver comes out of protection mode and reconnects to the power supply.

4.2. Overload and open circuit protection

In the event of an overload or open circuit, the driver disconnects the power and goes into protection mode.

When occasional situations of overload or open circuit are identified in the output terminals, the protection mode automatically resets. This means that once the fault is resolved, the driver comes out of protection mode and reconnects to the power supply.

Should overloads or open circuit events repeat over time with a high level of frequency, or if such events persist, protection mode will not automatically reset and it will be necessary to disconnect the mains power for at least a few seconds.

If the driver is connected at a load lower than that permitted for the operating area, it will flicker as long as it remains connected.

4.3. Thermal protection

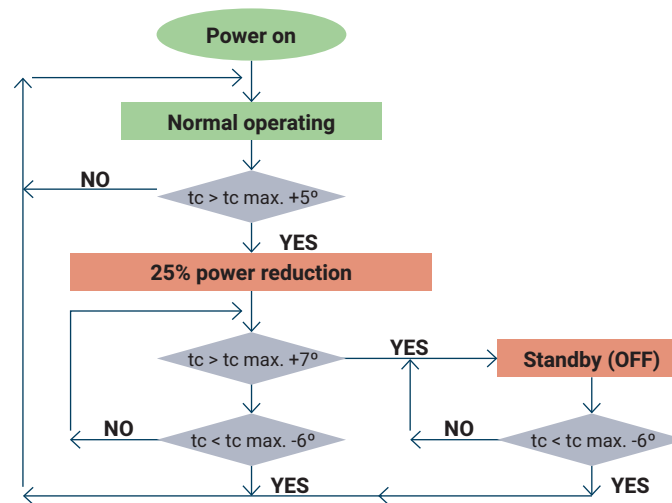
The IP67 control gear for outdoor applications from ELT benefits from thermal protection, meaning that when a temperature excess is detected, the power supplied is reduced or even switched off.

If, under normal operating conditions, the temperature at t_c exceeds its maximum permitted value by 5°C , the driver will reduce the power supplied to the load by 25%.

If, during power reduction mode, the temperature at t_c continues to rise until it exceeds its maximum permitted value by 7°C , the driver disconnects the power.

While in thermal protection mode, having reduced or cut off the power, if the temperature at the t_c reduces to 6°C or lower than its maximum permitted value, the driver will return to its initial normal operating mode.

This process is illustrated in the following flowchart:



4.4. Out-of-range mains voltage protection

The IP67 control gear for outdoor applications from ELT is designed to withstand temporary fluctuations in the mains voltage that are outside the permitted range.

In the event of a low mains voltage value that is between the permitted minimum and the brownout value, the driver will remain on. If this situation continues over time resulting in over-heating, the driver will reduce the power supplied to the load and even disconnect it in extreme cases.

In the event that a mains voltage value is less than the brownout value, the driver switches itself off for protection.

In the event that a mains voltage is above the maximum permitted value, the driver will remain on, generating stress on its internal components and potentially affecting its lifetime. Possible adverse effects are increased the greater the value and the longer the time that the power surge continues.

Even though the drivers are able to withstand power surges of 380Vac for 2 hours, extreme care must be taken to avoid this type of situation.

4.5. Shock wave protection

The IP67 control gear for outdoor applications from ELT is designed to offer improved protection of the supply terminals against shock waves such as those caused by radio storms. It benefits from levels of protection, in both differential and common modes, that are higher than the minimums defined by the immunity requirements for lighting equipment under EN 61547.

- Protection in differential mode (L - N): 6kV / 3kA
- Protection in common mode (L - Earth / N - Earth): 8kV

If higher levels of protection are required, external devices can be added to the luminaire or to another point in the street lighting installation.

NOTE:

Fault conditions and the response of each model can be viewed on their corresponding data sheets, available for download via the ELT website at www.elt.es/en

5. INSTALLATION

5.1. General observations

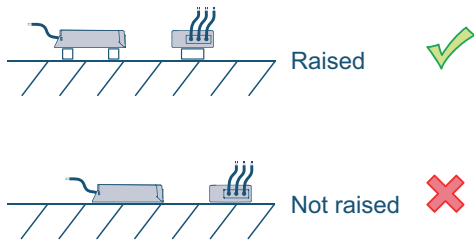
The constant current power supply drivers for LED modules use sensitive electronic components. They have to be handled and manipulated with care, as with any other electronic equipment.

The installation, maintenance and replacement of the drivers must be carried out by qualified personnel, strictly in line with the given instructions for the product and current regulations, in order to achieve the correct level of durability and operation for both the driver and the LED module it supplies.

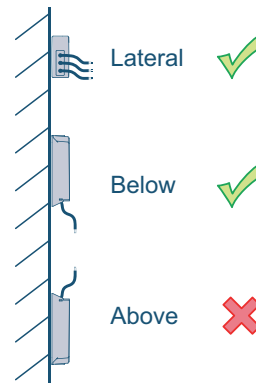
To guarantee protection against electric shocks during any intervention involving the driver, the power supply must be disconnected

5.2. Installation in luminaires

The ELT control gear for outdoor applications with an IP67 protection index is classified as an independent device and is suitable for installation with no additional casing in conditions exposed to water, snow and ice or in luminaires with a low IP level, always provided the manufacturer's instructions are followed. However it must not permanently immersed or used in highly aggressive salty or chemical environments without additional protection.



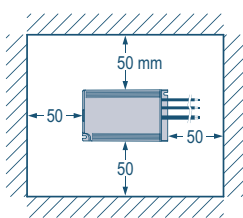
Mounted horizontally to exposure to water
(installed on the support surface)



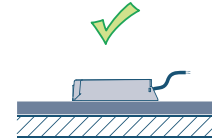
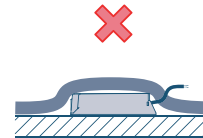
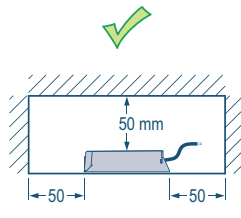
Mounted vertically to exposure to water
(direction of the hose output)

The lighting system must be designed to provide adequate protection against electric shocks. The IP67 drivers for outdoor applications from ELT are classified as Class II and as such are suitable for use in Class I and Class II installations, thereby facilitating their design.

The drivers must be attached in such a way that mechanical vibrations are reduced while favouring heat dissipation, positioning them, insofar as is possible, away from heat sources. In closed housings, ELT recommends that minimum distances are respected as well as ensuring that they are not covered when mounted in false ceilings or similar.



Distances to be respected in closed housings



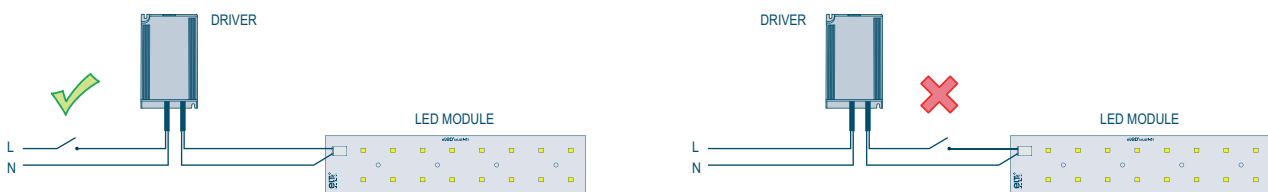
Do not cover when assembling in false ceilings

5.3. Connecting the drivers

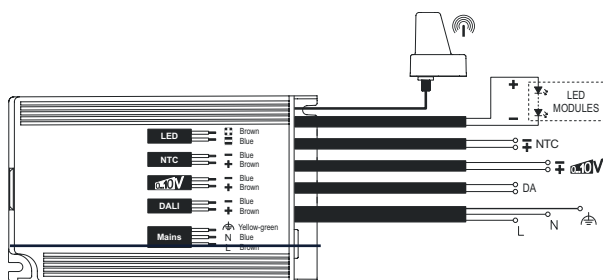
To ensure that the IP67 drivers for outdoor applications are connected and operate correctly, the following instructions must be taken into account:

- Do not exceed the permitted ranges for the electrical input and output values for the different connection terminals of the drivers.
- The polarity indicated on the labelling must be observed at all times.
- DC operation is only allowed for equipment that has been specifically designed for the purpose.
- In three-phase 400V installations, ensure that the neutral is always connected. If this connection is broken, the 400V could reach the equipment, with the consequent risk of a breakdown. During installation, the distribution of loads between phases must be balanced out as much as possible.
- In IP67 drivers for outdoor applications, the connection takes place by means of hoses.
- As humidity and water can be absorbed by the ends of the control gear connection hoses, these must be protected using connectors or junction boxes that guarantee a minimum protection level of IP65, whether connected or not.
- The end of every unconnected control gear hose must be electrically insulated to guarantee the minimum insulation required by the installation.
- To avoid the deterioration of the insulating materials and to prolong their useful life, do not apply too much mechanical stress to the hoses, respecting a radius with a minimum curvature of 22 mm. They must also be protected from extended exposure to UV rays and aggressively salty and chemical environments.
- The maximum length of the cabling of the input terminals is limited by the brownout that takes place in it, so that it complies with current regulations and standards. As such, it depends on the cable sections used and the current circulating through them, which is established by the number of devices connected. Specifically, where DALI communication is used, it must never exceed 300 metres without using repeaters or signal amplifiers.
- As regards the output, ELT recommends installing the equipment as close as possible to the LED module. In the event that external NTC connection terminals are used to protect the module via the MTP functionality, the maximum recommended length is 60 cm to avoid problems of interference and to achieve a more accurate measurement. In any event, for correct operation, the maximum accepted distance between the driver and the LED module is 2 metres.
- The connection cables must be appropriately insulated for the working voltage and comply with the level of protection against electric shocks provided by the street lighting system.

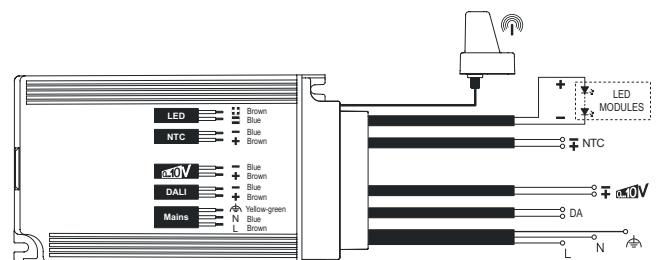
- Ensure that the chassis and other internal metal parts, such as assembly plates, supports or dissipaters, are always connected or electrically isolated. Make a reliable electrical connection between them by using serrated washers and sufficiently tightened screws, ensuring that the connecting cables are as short as possible to minimise inductances and thereby maximise their efficacy.
- In Class I luminaires, the protective earth conductor is strictly compulsory. Connect the protective earth to the chassis and to the internal metal parts.
- In Class II luminaires, ELT recommends installing an equipotential connection or a star configuration functional earth conductor between the chassis and every inaccessible conductive element of the lighting fixture, to avoid issues with electromagnetic compatibility, to reduce residual brightness in the LED modules in standby mode and to provide protection against shock waves.
- The installation of a switch at the driver output is not allowed as this could damage the LED modules as well as the driver itself.



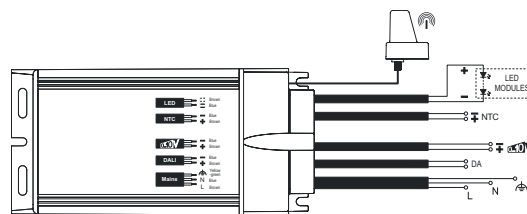
iLC PRO connection diagrams



Format -XT-IP67: 40-75W



Format -XT-IP67: 110-150W



Format -XR-IP67: 25-40-75W

NOTE:

Other hose connection configurations can be provided on request. Similarly, configurations that are compatible with the STELARIA™ remote street lighting management system are available. Please contact our sales network to define the required configuration.

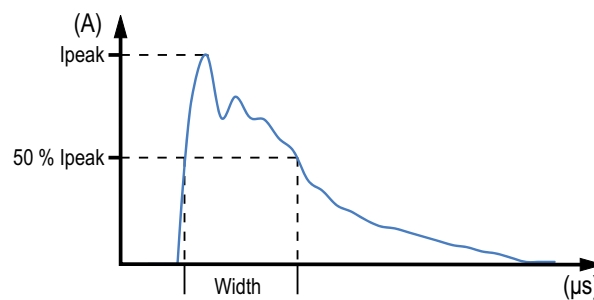
5.4. Protective switches

Each group of drivers has to be protected by an automatic circuit breaker and, in Class I installations, by a single-circuit trip switch.

The IP67 drivers for outdoor applications from ELT are resistant to temporary power surges as specified in the regulations and must be installed in independent circuits separated from other inductive loads such as inductive ballasts, motors, etc.

Automatic circuit breaker

The moment the control gear is connected, the driver's condensers create a high pulse of current that lasts for a very short period. This is called the inrush current.



The simultaneous ignition of several drivers can activate the protective automatic circuit breakers, which is why depending on the type and features of each, ELT recommends the installation of a maximum number of drivers.

The inrush current values and the maximum number of drivers that can be connected to each automatic circuit breaker can vary depending on the nominal voltage and impedance of the grid to which they are going to be installed.

These values, which can be viewed on the specific data sheets for each reference, have been empirically obtained using the set-up and measurement method proposed under the draft standard IEC 63129, for a 277V AC reference power grid as defined under NEMA standard 410 with a line impedance of $450m\Omega$ and $100\mu H$.

The inrush current values of the control gear will reduce, thereby increasing the number of drivers to be connected to each circuit breaker; the lower the voltage, the greater the impedance of the power grid (and vice versa). As such ELT recommends that it is checked for each installation.

Steps can be taken to reduce the effects of the inrush current, such as the use of external devices to limit it; carrying out a sequential ignition of the control gear; dividing the installation into different circuits; or selecting automatic circuit breakers with a less sensitive response curve.

NOTES:

- The maximum number of drivers that can be connected to an automatic circuit breaker will be the most restrictive value that is obtained from the evaluation of the inrush current and the maximum connected load.
- Configuring a gradual power-on via the PST functionality does not reduce the peak and width values of the inrush current.

Single-circuit trip switch

The interference suppression filters of the LED control gear is designed to earth interferences in the form of leakage current, whose typical value is less than 0.5mA in IP67 drivers for outdoor applications from ELT.

The total leakage current of the luminaire can be greater because of the current introduced by elements such as the LED module or the cabling.

This leakage current has to be taken into account in Class I installations so that the protective single-circuit trip switches can be appropriately sized.

In three-phase modules, leakage currents are compensated by balancing the distribution of the luminaires' connection between the three phases, while for single-phase networks, the maximum number of luminaires that can be connected to each switch has to be calculated.

NOTES:

- Typically a maximum of 35 luminaires can be connected in a 30mA residential single-circuit trip switch. As this maximum number can vary depending on the installation, ELT recommends that this is checked.
- The functional earth terminal may not be disconnected from the driver to reduce the leakage current value.

6. ELECTROMAGNETIC COMPATIBILITY

The IP67 control gear for outdoor applications from ELT is designed in accordance with the EN 55015 standard on Electromagnetic Compatibility.

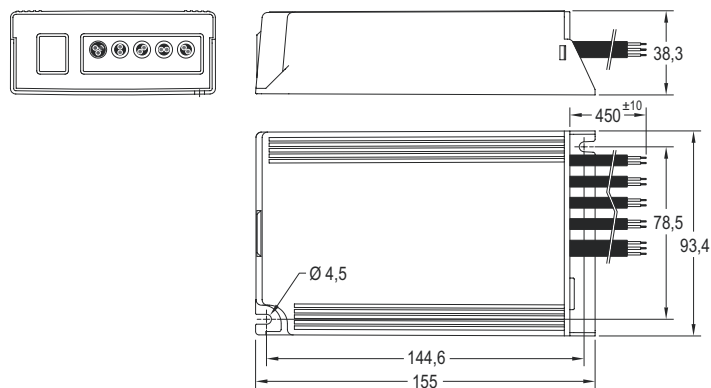
To guarantee compliance with this regulation, the following recommendations should be followed:

- Adjust the length of the cables between the LED module and the control gear to the minimum distance possible between connections.
- The connection wires to the LED module must run together, avoiding the creation of loops.
- The power cables, control cables and the connection to the LED module must be physically separated and never crossed.
- Running a cable over or sticking it to the control gear is not recommended
- ELT recommends that the functional earth of every metallic component of the luminaire is connected to the protective earth in Class I luminaires, even though this connection is not designed to protect from electric shocks.

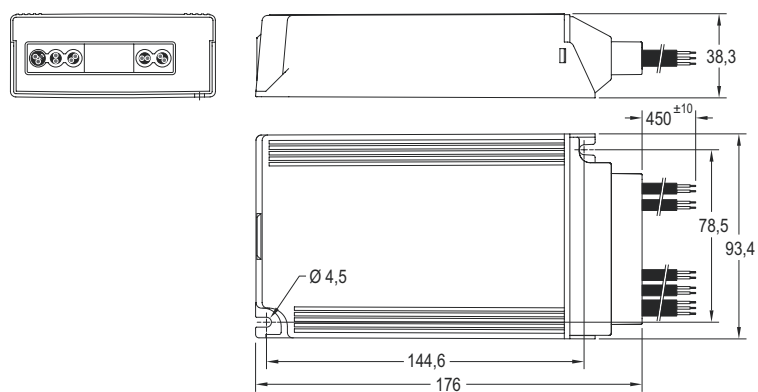
Testing corresponding to standard EN 55015 has taken place on a benchmark set-up using the driver, the LED module and the dissipater fixed to a metal mounting plate. Respecting this benchmark assembly, the above-described recommendations and the indications contained in standard EN 55015, ELT guarantees test compliance.

7. MECHANICAL FEATURES

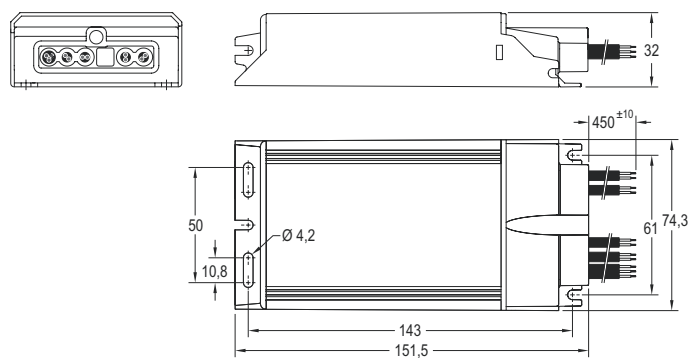
Format -XT-IP67: 40-75W



Format -XT-IP67: 110-150W



Format -XR-IP67: 25-40-75W



8. MARKINGS AND INDICATIONS

	Indicates devices equipped with eSMART technology.
	Indicates drivers compatible with the STELARIA™ remote street lighting management system.
	Marking that confirms product compliance with European directives.
	Certification mark conferred by an official organism that accredits compliance with international safety and operating standards.
	Class II indicator. Device protected against electric shocks by a basic insulation and by an additional or reinforced insulation. No protective earth measures are incorporated however it may include a functional earth connection.
	Independent auxiliary apparatus that can be assembled on a stand-alone basis to the outside of a lighting fixture with no additional casing.
	Lamp control gear with double or reinforced insulation between the primary and secondary circuits, resistant to short circuits.
	Lamp control gear with double or reinforced insulation between the primary and secondary circuits, resistant to short circuits and with Safety Extra-Low Voltage (SELV).
SELV ⁽¹⁾	Device with Safety Extra-Low Voltage (SELV).
	Device with over-temperature protection. The number indicated inside the triangle shows the maximum temperature at any point of the surface of the casing in the event of driver failure.
	Indicates conformity of the drivers with the IEC 62386 standard referring to the Digital Addressable Lighting Interface (DALI).
	Marking for drivers programmable by means of an analogue signal ranging from 0V to 10V that can enter into standby mode.
	Marking for drivers programmable by means of an analogue signal ranging from 0V to 10V that cannot enter into standby mode.
	Percentage of output ripple current, given as ±% over the nominal rms value.
	Device that incorporates protection against shock waves and power surges.
	Marking for drivers programmable via mains grid voltage variation.
	Indicates drivers that incorporate stand-alone and dynamic dimming that adapts to night hours.
	Indicates systems that regulate the light level by means of presence detectors.
	Marking for stand-alone dimming combined with presence detectors.

⁽¹⁾ Models with a maximum output voltage lower than 120V

9. APPLICABLE STANDARDS

The IP67 drivers manufactured by ELT, ENEC tested and certified, have been designed in accordance with the following international standards:

EN 60598-1	Luminaires. Part 1: General requirements and tests.
EN 61347-1	Lamp control gear. Part 1: General and safety requirements.
EN 61347-2-13	Lamp control gear. Part 2-13: Particular requirements for DC or AC supplied electronic control devices for LED modules.
EN 62384	DC or AC supplied electronic control devices for LED modules. Operational requirements.
EN 62493	Assessment of lighting equipment related to human exposure to electromagnetic fields.
EN 61000-3-2	Electromagnetic compatibility (EMC). Part 3-2: Limits. Limits for harmonic current emissions (equipment input current ≤ 16 A per phase).
EN 61000-3-3	Electromagnetic compatibility (EMC). Part 3-3: Limits. Limitation of voltage changes, voltage fluctuations and flicker in public low-voltage supply systems for equipment with rated current ≤ 16 A per phase and not subject to conditional connection.
EN 55015	Limits and methods of measurement of radio disturbance characteristics of electrical lighting and similar.
EN 61547	Equipment for general lighting purposes. EMC immunity requirements.
EN 62386-101	Digital addressable lighting interface. Part 101: General requirements. System components.
EN 62386-102	Digital addressable lighting interface. Part 102: General requirements. Control gear.
EN 62386-207	Digital addressable lighting interface. Part 207: Particular requirements for control gear. LED modules (device type 6).

NOTE:

To view editions of the abovementioned standards, under which the certifications have been issued, please contact us by email at elt@elt.es, or by telephone on +34 976 573 660 or via our sales network.

10. PRODUCT WARRANTY

The drivers with eSMART technology are manufactured under the most demanding quality criteria, based on the ISO-9001 and ISO-14001 management standards, among others. This ensures a high level of durability, accompanied by a 5-year warranty for every product in this range.

Warranty conditions:

- The warranty period starts as from the date of delivery of the product.
- The warranty covers the replacement of the product and its corresponding labour costs. ELT accepts no liability for any other indirect costs that may arise. (As a reference to establish the replacement cost, please refer to the indications in the following document: "Application and maintenance recommendation for the use of electronic ballasts in view of the directive 99/44/EC" from CELMA which establishes that: "It is understood that professionally installed ballasts and lighting are replaceable within a maximum of 10 minutes").
- ELT reserves the right to request the return of the affected product to its premises in Zaragoza (Spain) to verify and subsequently validate the warranty claim.
- The warranty exclusively covers material defects and manufacturing faults in the components made and supplied by ELT.

The application of the warranty is subject to compliance with the following paragraphs:

- Operation of the lighting system in line with current IEC and/or EN international standards and the particular specifications provided by ELT in this user guide.
- Correct usage, handling and storage of the product to guarantee the absence of third party damage.

This warranty excludes claims under which ELT is not liable for defects or faults and, specifically, those **which fall within any of the following cases:**

- Incorrect handling, abusive use or any type of failure attributable to the customer or a third party, particularly in the case of non-compliance with the installation and usage conditions as defined by ELT contained in our catalogues, product sheets and technical documentation.
- Faults or fluctuations in the power supply
- Anomalous operating conditions.
- Force majeure, such as: fire, flood, acts of war, violence or vandalism or similar situations.
- Faults in any accessory or other component (even in the event they were manufactured or supplied by ELT) that do not form part of the components covered by this warranty.
- Attempts to change or maintain the component by any individual other than an authorised installer
- Where the component's batch number is damaged, changed or deleted.

The statutory warranty rights applicable to ELT's products do not vary as a result of this warranty and continue to have independent validity.

ELT reserves the right to take the final decision regarding any claim under the warranty and undertakes to quickly, fully, reliably and honestly process any claim submitted.

ELT reserves the right to modify these terms and conditions, without prior notice.

11. DISCLAIMER

This user guide for IP67 control gear for outdoor applications from ELT cancels and replaces all previous versions.

ELT reserves the right, without prior notice, to make changes to the data and information contained in this user guide, to the features of the product itself to which the guide refers and/or to cease manufacturing and/or commercialising the said product. ELT accepts no liability for any damage arising from the use of this guide or the use of the product to which it refers, beyond that explicitly established in the contract.

ELT has taken the utmost care in the drafting of this user guide and the information and data contained herein has been revised with all due diligence. Nevertheless, the appearance of editorial errors may not be ruled out, in respect of which ELT shall in no event be held liable. The reader is kindly requested to notify ELT of any error identified in this user guide.

ELT has provided all the information and data contained in this user guide to the best of its knowledge and understanding, however this information and data shall in no event constitute a guarantee, beyond that established by law. ELT expressly disclaims any commitment or liability based on the data and information contained in the user guide and the individuals responsible for the end product may not consider themselves released from the requirement to undertake their own tests and verifications.

The recommendations included in the user guide are based on the experience of ELT, but this does not signify that they are the best-known technical or commercial options. ELT accepts no claim based on any damage arising from the application of the above recommendations.

The data contained in this user guide that refers to technical features and product testing is for information purposes only and is not considered to be an official certification that supports the release of the end product into which the product the object of this guide is to be assembled. The manufacturer of the end product is responsible for testing the product in an accredited laboratory with a view to demonstrating compliance with the legal standards required by the end product in its place of installation, as well as the necessary requirements for every marking displayed on the end product (such as CE, ENEC, etc).

The product the object of this user guide is classified as “independent lamp control gear” and has been designed so that it can be installed separately outside the luminaire and with a protection level corresponding to that of its marking and with no need for a supplementary casing. The remaining data and features indicated in this user guide may be affected by the end product to which it is connected. ELT accepts no liability for damage arising from the adverse effects that the configuration of the end product may cause to the data and features of the product mentioned in this user guide.

ELT accepts no liability for possible unforeseen and adverse effects that may occur because of the interaction of the product the object of this user guide with any other product that forms part of the assembly of the end product, whether manufactured or not by ELT.

ELT kindly requests the user of this guide to ensure they are using the most up-to-date documentation and review its content when placing orders or using the product covered by this guide. The most recent approved version of our product guides can be found on the ELT website www.elt.es/en.



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