CAUTION!
Inappropriate installation may cause injury to persons and damage to the lamp.
BEFORE YOU BEGIN

1. Please read this manual thoroughly before use, and retain it for future reference.
2. Due to our continuous program of product development, data is subject to change without notice.
3. Unauthorized product tampering invalidates warranty & is a safety risk.
4. All electrical work must be carried out by qualified persons.
5. Always follow appropriate electrical codes.
6. Disconnect mains power before product installation, connection, or disconnection.
7. Products are fixed luminaires for indoor use (i.e. Install out of reach / Only movable using tools).
8. LED-modules are non-replaceable light sources.
9. Do not use luminaires without LED Drivers (power units) connected (BX-, C-Series).
10. Connect LED drivers to electrical branch circuits (ensure suitable strain relief is fitted).
11. Products with an earth connection must be earthed for safety.
12. Installation of additional electrical circuit protection devices is strongly advised:
   a. Type C MCB’s (Miniature Circuit Breakers).
   b. RCD (Residual Current Device).
   c. ICL (Inrush Current Limiter).
   d. SPD (Surge Protection Device).
13. Do not high voltage test.
14. Install LED drivers against a flat surface to ensure optimal heat dissipation and lifetime (BX-, C-Series).
15. Do not connect products installed on different mains phases to the same dimming device (dimmable products only).
17. Product surface temperature may become hot to the touch during use.
18. Do not stare directly at any bright light source.
19. As a precaution, use suitable eye protection if working for long periods under high intensity lighting.
20. Dispose of all waste in accordance with local regulations.
21. The external flexible cable of the luminaire is only replaceable by Valoya.
22. For luminaries supplied with open-end supply cables:
   a. Cables should not be concealed or extended through parts of the building structure.
   b. Cables should not be located above a suspended/dropped ceiling, or permanently fixed to the building structure.
   c. Cables must be visible over their full length, not strained, and protected from physical damage.
   d. Cables must be used within their electrical ratings at the maximum temperature of the installed environment.

IMPORTANT
Installation must be carried out by qualified persons, and according to the electrical safety rules & regulations applicable in your country!
DELIVERY CHECK

• Please inspect the goods upon receipt to ensure that your delivery is complete.
• If you detect any damage to the packaging, please notify the carrier immediately and ask them to note that “the delivery was not delivered in good condition”.
• If the packaging shows no damage but the goods inside are either missing, defective, or show other signs of damage, please contact us.
• In all cases please take pictures as evidence and contact us as soon as possible by phone or e-mail.

Check package
Check content
Check operation
If problems, contact us
A Luminaire - option A
B Luminaire - option B
C ELG Driver, optional order for option A
D HVGC Driver, optional order for option A
E TLD Driver, optional order for option A
F BLD Driver, optional order for option A
G Mains input connector, field installable - For D, E drivers
H Mains input connector, field installable - For C, F drivers
I Dimmer connector with pigtail cable - For all drivers
J Standard hanger (included)
K Optional hanger for luminaire option A (order separately)
## Technical Specifications

<table>
<thead>
<tr>
<th>SPECIFICATIONS (TYPICAL)</th>
<th>BX120 Solray™</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Electrical &amp; Physical Luminaire &amp; LED Driver</strong></td>
<td></td>
</tr>
<tr>
<td>Total Power (W)</td>
<td>135</td>
</tr>
<tr>
<td>Input voltage, nominal by driver</td>
<td>ELG</td>
</tr>
<tr>
<td></td>
<td>100, 200-305</td>
</tr>
<tr>
<td>Input current (A)</td>
<td>0.8 A @230 VAC</td>
</tr>
<tr>
<td>Frequency (Hz)</td>
<td>50 / 60</td>
</tr>
<tr>
<td>Power Factor</td>
<td>&gt; 0.93</td>
</tr>
<tr>
<td>Dimmable (IEC 60929 Annex E)</td>
<td>Yes (0-10V / PWM): LED driver is a current source device</td>
</tr>
<tr>
<td>AC mains plug fitted</td>
<td>Yes</td>
</tr>
<tr>
<td>Luminaire Insulation class</td>
<td>Class I: For Fixed Installations (protective earth required)</td>
</tr>
<tr>
<td>16A Type-C MCB load (max @230 VAC.)</td>
<td>6</td>
</tr>
<tr>
<td>Luminaire weight (kg/lb)</td>
<td>2.6 / 5.7</td>
</tr>
<tr>
<td>LED Driver weight (kg/lb)</td>
<td>1.5 / 3.3</td>
</tr>
<tr>
<td>Minimum cable bending radius</td>
<td>5x cable diameter</td>
</tr>
<tr>
<td><strong>Optical</strong></td>
<td></td>
</tr>
<tr>
<td>Efficiency, 380-820nm (PPF)</td>
<td>Up to 2.4 µmol/W (Spectrum dependent)</td>
</tr>
<tr>
<td>Light output (µmol/s), Spectrum dependent</td>
<td>320</td>
</tr>
<tr>
<td>Light intensity decay, Q90 / L90 (hours)</td>
<td>36000</td>
</tr>
<tr>
<td>Typical use life, Q90 / L70 (hours)</td>
<td>50000</td>
</tr>
<tr>
<td><strong>Environmental Luminaire only</strong></td>
<td></td>
</tr>
<tr>
<td>Operational ambient temperature range (°C/°F)</td>
<td>0...+40 / +32...+104</td>
</tr>
<tr>
<td>Max. allowed luminaire housing (tc) temperature (°C/°F)</td>
<td>75 / 167</td>
</tr>
<tr>
<td>Maximum Relative Humidity (%)</td>
<td>90 (non-condensing)</td>
</tr>
<tr>
<td>Storage temperature (°C/°F)</td>
<td>-20...+40 / -4...+104</td>
</tr>
<tr>
<td>Ingress Protection (IP) rating</td>
<td>IP 67</td>
</tr>
<tr>
<td>Cooling method</td>
<td>Passive cooled</td>
</tr>
<tr>
<td><strong>Regulations &amp; Approvals</strong></td>
<td></td>
</tr>
<tr>
<td>CE marked</td>
<td>X</td>
</tr>
<tr>
<td>RoHS compliant</td>
<td>X</td>
</tr>
<tr>
<td>EMC directive compliant</td>
<td>X</td>
</tr>
<tr>
<td>Low Voltage Directive compliant</td>
<td>X</td>
</tr>
<tr>
<td>Eco-design (EuP) directive compliant</td>
<td>X</td>
</tr>
<tr>
<td>Certified to UL &amp; CSA standards</td>
<td>X</td>
</tr>
<tr>
<td><strong>Packaging</strong></td>
<td></td>
</tr>
<tr>
<td>Pieces per box (luminaire / PSU)</td>
<td>2 / 2</td>
</tr>
<tr>
<td>Box length (mm/in)</td>
<td>1450 / 57</td>
</tr>
<tr>
<td>Box width (mm/in)</td>
<td>260 / 10.2</td>
</tr>
<tr>
<td>Box height (mm/in)</td>
<td>75 / 3</td>
</tr>
<tr>
<td>Box weight (kg/lb)</td>
<td>10.3 / 22.7</td>
</tr>
</tbody>
</table>

**Notes:**

- Electrical values are typical nominal figures (variations may occur due to spectrum, component & production tolerances).
- Due to our continuous program of product development, specifications are subject to change without notice in order to improve spectra, function, performance & reliability.
- Due to manufacturing tolerances, slight variations are possible in cable lengths, weights & package dimensions.
**PRODUCT DIMENSIONS**

### LUMINAIRE DIMENSION

<table>
<thead>
<tr>
<th></th>
<th>OPTION A</th>
<th>OPTION B</th>
</tr>
</thead>
<tbody>
<tr>
<td>A Length (mm/in)</td>
<td>1176 mm / 46.3 in</td>
<td></td>
</tr>
<tr>
<td>B Height (mm/in)</td>
<td>58 mm / 2.3 in</td>
<td>93 mm / 3.7&quot;</td>
</tr>
<tr>
<td>C Width (mm/in)</td>
<td>73.5 mm / 2.9 in</td>
<td></td>
</tr>
</tbody>
</table>

### LED DRIVER (POWER UNIT)

<table>
<thead>
<tr>
<th></th>
<th>ELG</th>
<th>HVGC</th>
<th>TLD</th>
<th>BLD</th>
</tr>
</thead>
<tbody>
<tr>
<td>A Length (mm/in)</td>
<td>219 mm / 8.6 in</td>
<td>245 mm / 9.6 in</td>
<td>251 mm / 9.8 in</td>
<td>188 mm / 7.4 in</td>
</tr>
<tr>
<td>B Width (mm/in)</td>
<td>63 mm / 2.5 in</td>
<td>68 mm / 2.7 in</td>
<td>68 mm / 2.7 in</td>
<td>68 mm / 2.7 in</td>
</tr>
<tr>
<td>C Height (mm/in)</td>
<td>35 mm / 1.4 in</td>
<td>38.8 mm / 1.5 in</td>
<td>38.5 mm / 1.5 in</td>
<td>33.5 mm / 1.3 in</td>
</tr>
<tr>
<td>D Screw holes distance (mm/in)</td>
<td>208 mm / 8.2 in</td>
<td>225.8 mm / 8.9 in</td>
<td>225.8 mm / 8.9 in</td>
<td>176 mm / 6.9 in</td>
</tr>
<tr>
<td>E Screw holes distance (mm/in)</td>
<td>45.8 mm / 1.8 in</td>
<td>34.2 mm / 1.3 in</td>
<td>34.2 mm / 1.3 in</td>
<td>34.2 mm / 1.3 in</td>
</tr>
<tr>
<td>F Screw hole (mm/in) (x4)</td>
<td>Ž4.5 mm / 0.2 in</td>
<td>Ž4.2 mm / 0.2 in</td>
<td>Ž4.2 mm / 0.2 in</td>
<td>Ž4.2 mm / 0.2 in</td>
</tr>
</tbody>
</table>
PRODUCT DIMENSIONS

<table>
<thead>
<tr>
<th></th>
<th>STANDARD HANGER (2X)</th>
<th>OPTIONAL HANGER (2X)</th>
</tr>
</thead>
<tbody>
<tr>
<td>A Length (mm/in)</td>
<td>70 mm / 2.8 in</td>
<td>76 mm / 3 in</td>
</tr>
<tr>
<td>B Width (mm/in)</td>
<td>14 mm / 0.6 in</td>
<td>20 mm / 0.8 in</td>
</tr>
<tr>
<td>C Height (mm/in)</td>
<td>3 mm / 0.1 in</td>
<td>70 mm / 2.8 in</td>
</tr>
<tr>
<td>D Screw hole</td>
<td>M5 thread</td>
<td>Hole diameter (mm/in)</td>
</tr>
<tr>
<td>E Hanger height (mm/in)</td>
<td>35 mm / 1.4 in</td>
<td>C Height (mm/in)</td>
</tr>
</tbody>
</table>

Notes:
- Optional hangers are not suitable for luminaire option B where the driver is placed on top of the luminaire!

CABLES

<table>
<thead>
<tr>
<th></th>
<th>OPTION A</th>
<th>OPTION B</th>
</tr>
</thead>
<tbody>
<tr>
<td>A Mains cable (mm/in)</td>
<td>300 mm / 11.8 in</td>
<td>300 mm / 11.8 in</td>
</tr>
<tr>
<td>B DC cable LED Driver (mm/in)</td>
<td>300 mm / 11.8 in</td>
<td>300 mm / 11.8 in</td>
</tr>
<tr>
<td>C Dimming cable (mm/in)</td>
<td>300 mm / 11.8 in</td>
<td>300 mm / 11.8 in</td>
</tr>
<tr>
<td>D DC cable luminaire (mm/in)</td>
<td>1000 mm / 40 in</td>
<td>1000 mm / 40 in</td>
</tr>
<tr>
<td>E Dimming cable (mm/in)</td>
<td>1800 mm / 72 in</td>
<td>1800 mm / 72 in</td>
</tr>
</tbody>
</table>

OPTION A

OPTION B
LUMINAIRE INSTALLATION - OPTION A

METHOD A (STANDARD HANGER)

1. 
2. 
3. 
4. [Image with note: Screws not included in the package]

METHOD B (STANDARD HANGER)

1. 
2. 
3. 

METHOD C (OPTIONAL HANGER)

1. 
2. 
3. [Image with note: Screws not included in the package]
4.
LUMINAIRE INSTALLATION - OPTION B

1. 
2. 
3. 

LUMINAIRE ORIENTATION
LED DRIVER INSTALLATION

1. Install LED drivers against a flat surface to ensure optimal heat dissipation and operational lifetime.
2. The mounting surface must be made of non-combustible / non-flammable material.

NOTES

LED DRIVER PLACEMENT EXAMPLES

LED drivers installed outside a growth chamber
LED driver installed next to the luminaire
ELECTRICAL CONNECTION PROCEDURE

Luminaire connection - Option A
1) Connect luminaire to LED driver
2) Connect a compatible dimming controller (if used) to the LED Driver’s “DIM+” and “DIM-” connection. Electrically isolate wires if no controller is connected.
3) Connect LED Driver to mains supply (Live, Neutral, Earth).

Luminaire connection - Option B
1) Connect a compatible dimming controller (if used) to the LED Driver’s “DIM+” and “DIM-” connection. Electrically isolate wires if no controller is connected.
2) Connect LED Driver to mains supply (Live, Neutral, Earth).

WARNING: Do not remove a driver that is factory installed on top of the luminaire. Doing so will disrupt the earth connection.
ELECTRICAL CONNECTION PROCEDURE

Wieland mains input connector connection (with drivers HVGC and TLD)

Connect your incoming mains cable to the Wieland RST female connector (ZHPF8144) as shown below.

Amphenol mains input connector connection (with drivers ELG and BLD)

Connect incoming mains cable to the Amphenol female connector (ZHPF8235) as shown below.
**INRUSH CURRENT**

This is the initial current surge drawn during product start-up. Total inrush current rises as the circuit load increases and is one factor that can contribute to nuisance tripping of circuit breakers (MCB’s). Practical performance will be affected by the MCB load, MCB tripping characteristics, site wiring impedance, and the angle of the AC mainscycle at the specific moment power is applied.

Nuisance tripping issues may be improved by:
- Reducing the quantity of LED drivers connected to a single MCB.
- Re-distributing the load over multiple mains phases.
- Using an MCB with Type C (EN 60898) tripping characteristics.
- Installing additional inrush current limiting devices.
- Installing a zero crossing relay for powering up the LED drivers.

**MCBS (MINIATURE CIRCUIT BREAKERS)**

Valoya only recommend using MCB’s with “Type C” trip characteristics according to EN 60898.

The maximum quantity of Valoya products recommended for a 16A Type C MCB is stated on the product’s technical specifications datasheet (e.g installation guide). This quantity is used as the 100% reference in the table below. The table is provided as a tool to enable calculation of the approximate maximum load for different MCB types and ratings. Installation wiring rating, impedances and mains switch-on angle variations may also influence the actual practical limit.

**20A branch circuit is the maximum allowed per UL certification according to LED Drivers UL Conditions of Acceptability.**

<table>
<thead>
<tr>
<th>MCB TYPE</th>
<th>Rating (A)</th>
<th>Relative quantity (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>B</td>
<td>10</td>
<td>37</td>
</tr>
<tr>
<td></td>
<td>16</td>
<td>60</td>
</tr>
<tr>
<td></td>
<td>20</td>
<td>75</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>MCB TYPE</th>
<th>Rating (A)</th>
<th>Relative quantity (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>C</td>
<td>10</td>
<td>62</td>
</tr>
<tr>
<td></td>
<td>16</td>
<td>100 (Ref.)</td>
</tr>
<tr>
<td></td>
<td>20</td>
<td>125</td>
</tr>
</tbody>
</table>

**ICL (INRUSH CURRENT LIMITER)**

An ICL can help avoid nuisance MCB tripping and can be installed between the MCB and the load. It also enables an increase the luminaire quantity up to the maximum RMS current limit of the Inrush Current Limiter.
RCDS (RESIDUAL CURRENT DEVICES)

An RCD is a protective safety device used to automatically disconnect the electrical supply when an imbalance is detected between live conductors. Requirements for use, and the needed RCD rating, will vary depending on the type of installation. Valoya luminaires are designed to be installed in fixed electrical installations where no plug is permitted for connecting the luminaire to the mains supply.

SURGE PROTECTORS

Valoya LED drivers have built-in surge protection. However, to protect against surge peaks above 4KV (e.g. due to a lightning strike) we recommend the installation of transient voltage surge suppression.

3-PHASE SUPPLIES

- Do not apply power without the Neutral connected.
- Ensure the supply is off before disconnecting the Neutral.
- To avoid erratic dimming or possible product damage, do not connect the same dimmer or controller to luminaires supplied by different mains phases.

INSULATION RESISTANCE/ ELECTRIC STRENGTH TESTING

- Valoya products have been fully tested during manufacture. There is no need to test again.
- If the electrical site wiring must be tested, test with the luminaires and LED drivers disconnected from the mains supply.
- If luminaires and LED drivers are connected to the mains supply during the test, all Live phases and Neutral must be connected together before the test is carried out (Remember to check correct reconnection before reapplying the mains supply).
**DIMMING METHODS**

Differences in dimming methods exist depending on the LED driver (power unit) used by the Valoya luminaire.

- **1-10V:** Minimum dimmed light output is approximately 10% (Spectra dependent). The mains supply to the driver must be switched in order to turn the light on & off.
- **0-10V:** Minimum dimmed light output is approximately 6% (Spectra dependent). Below this the light output is off without the need for mains switching.

---

**DIMMING POSSIBILITIES BY PRODUCT RANGE**

<table>
<thead>
<tr>
<th>BX-Series</th>
<th>BL-Series</th>
<th>L-Series</th>
<th>C-Series</th>
<th>RX-Series</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-10V</td>
<td>-</td>
<td>-</td>
<td>0-10V</td>
<td>0-10V</td>
</tr>
</tbody>
</table>
**DIMMING CONTROL COMPATIBILITY**

**Important considerations when choosing a controller**

- Please check with your controller provider regarding the specification of the device.
- The number of luminaires possible to connect to a single control device will depend on its specification, specifically:
  - The dimming method (1-10V or 0-10V).
  - The control circuit current sink capability.
  - Mains switch inrush current capacity.
- Dimming controls should only be connected to LED drivers on the same mains phase. Cross phase connection may lead to differing control circuitry electrical potentials, reduced dimming performance, or permanent damage to LED drivers.

Due to variations in specifications, terminology and connections between different control device manufacturers, it is impossible to list all possible alternatives. The controller manufacturer will be able to verify that their product is a current sink device compatible with LED drivers designed according to IEC60929 Annex E.

**Examples of manufacturers of compatible control products/systems (some example products indicated).**

<table>
<thead>
<tr>
<th>MANUFACTURERS</th>
<th>WEBSITE</th>
<th>EXAMPLE PRODUCT</th>
</tr>
</thead>
<tbody>
<tr>
<td>ABB</td>
<td><a href="http://www.abb.com">www.abb.com</a></td>
<td>1-10 V 2112UJ-214-510</td>
</tr>
<tr>
<td>Argus</td>
<td><a href="http://www.arguscontrols.com">www.arguscontrols.com</a></td>
<td>P1A</td>
</tr>
<tr>
<td>Dinuy</td>
<td><a href="http://www.dinuy.com">www.dinuy.com</a></td>
<td>RE EL5 002</td>
</tr>
<tr>
<td>Ever Shining Optotech Co., Ltd</td>
<td><a href="http://www.esop-power.com">www.esop-power.com</a></td>
<td>EC011</td>
</tr>
<tr>
<td>Helvar</td>
<td><a href="http://www.helvar.com">www.helvar.com</a></td>
<td>140 (TK4)</td>
</tr>
<tr>
<td>Honeywell Peha</td>
<td><a href="http://www.peha.de">www.peha.de</a></td>
<td>D 430</td>
</tr>
<tr>
<td>Jung</td>
<td><a href="http://www.lutron.com">www.lutron.com</a></td>
<td>Electronic potentiometer, 1-10 V</td>
</tr>
<tr>
<td>Lutron</td>
<td><a href="http://www.jung.de">www.jung.de</a></td>
<td></td>
</tr>
<tr>
<td>Osram</td>
<td><a href="http://www.osram.com">www.osram.com</a></td>
<td>Dim MCU 1-10V</td>
</tr>
<tr>
<td>Philips</td>
<td><a href="http://www.lighting.philips.com">www.lighting.philips.com</a></td>
<td>UID8600/00 1-10V Dimmer</td>
</tr>
<tr>
<td>Priva</td>
<td><a href="http://www.priva.com">www.priva.com</a></td>
<td></td>
</tr>
<tr>
<td>RAM</td>
<td><a href="http://www.ram-group.com">www.ram-group.com</a></td>
<td></td>
</tr>
<tr>
<td>Siemens</td>
<td><a href="http://www.siemens.com">www.siemens.com</a></td>
<td>5TC8424</td>
</tr>
</tbody>
</table>
DIMMING CONNECTION EXAMPLES

Using a simple potentiometer (1-10V / 0-10V)

One LED driver can be connected to a standard 100KOhm potentiometer. Note that connection of multiple LED drivers to one 100KOhm potentiometer is not recommended due to possibilities for erratic dimming performance.

Using a compatible current sink 1-10V dimmer

Using a compatible current sink 0-10V dimmer
BASIC FAULT FINDING

Lighting faults can be due to a rare product defect, connection error, or other external issue. Faults are unlikely to affect both luminaire and the LED driver (power unit) together. If possible, please check if the issue is luminaire or LED driver related. This will speed problem resolution and minimize unnecessary shipping costs.

- Switch off the mains supply.
- Disconnect the luminaire from its LED driver.
- Connect the luminaire to an unpowered, working LED driver (if available).
- Connect the mains supply to the working LED driver.
- If the problem remains, then the luminaire may be damaged.
- If the luminaire now works, then the original LED driver, or mains supply to it may be at fault.
- Note details of the problem (product type, quantity, problem description...) and contact Valoya for further assistance.

If a problem reoccurs or affects many products at the same time, please contact Valoya (www.valoya.com/support) for further advice and assistance.

CLEANING

Switch the supply OFF  Allow to cool  Do not use detergent

Switch the supply OFF
Allow to cool
Do not use detergent

Clean with a soft brush  Wipe with soft clothes  IP67 rated products. Suitable for spray cleaning with water

Clean with a soft brush
Wipe with soft clothes
IP67 rated products. Suitable for spray cleaning with water

Switch the supply OFF  Allow to cool  Do not use detergent

Switch the supply OFF
Allow to cool
Do not use detergent

Clean with a soft brush  Wipe with soft clothes  IP67 rated products. Suitable for spray cleaning with water

Clean with a soft brush
Wipe with soft clothes
IP67 rated products. Suitable for spray cleaning with water
WARRANTY

Products are covered by a limited warranty. Warranty starts from date of installation, but latest 3 months from the delivery date.

The warranty offered is “Return-to-Base", meaning suspected faulty items shall be returned to Valoya for fault and warranty validation before any repair or replacement can be agreed.

Valoya warrants that each Product will be free from defects in material and workmanship for the duration of the warranty period as long as the products are installed and used in accordance with our published specifications and recommendations.

Warranty shall be void in the event any repairs or alterations not duly authorized by Valoya in writing are made to the Product by any person.

CLAIMS

Before returning a suspected faulty item, please contact Valoya (www.valoya.com/support) to give details of the issue and obtain a Return Material Authorization (RMA) reference number. Please be prepared to provide the following information about the issue:

- Product model information (e.g. B200 NS1).
- Product serial number plus YF or XF code.
- Quantity showing problems.
- Detailed problem description.
- Photograph or video showing the issue (if possible).
- Installation / invoice date (if known).

After receiving an RMA number, Products should be suitably packed and the package or shipping paperwork clearly marked with the RMA number. Returns received without an RMA reference number may be rejected.

Valoya will inspect the returned items to validate fault and warranty validity. If Valoya determines to its satisfaction that warranty is valid, Valoya will repair or replace the Product with one of similar age. Where a warranty claim is justified, Valoya will pay for the return freight expenses for repaired or replaced items. Valoya reserve the right to invoice for returning Products that are not found to be defective, or do not comply with the terms of this warranty, together with associated freight, testing and handling costs.

* Above is a summary of our warranty and claim policy. For full details please see: www.valoya.com/warranty.
Standards applied (where applicable):

EUROPE

EN60598-1: Luminaires. General requirements and tests.
EN62031: LED modules for general lighting. Safety specifications.
EN 62493: Assessment of lighting equipment related to human exposure to electromagnetic fields.
EN55015: Limits and methods of measurement of radio disturbance characteristics of electrical lighting and similar equipment.
EN61547: Equipment for general lighting purposes. EMC immunity requirements.
EN61000-3-2: Electromagnetic compatibility - Limits - Limits for harmonic current emissions.
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IEC EN 61000-4-4: Electromagnetic compatibility (EMC) - Part 4-4: Testing and measurement techniques - Electrical fast transient/burst immunity test.
IEC EN 61000-4-5: Electromagnetic compatibility (EMC) - Part 4-5: Testing and measurement techniques - Surge immunity test.
IEC EN 61000-4-6: Electromagnetic compatibility (EMC) - Part 4-6: Testing and measurement techniques - Immunity to conducted disturbances, induced by radio-frequency fields.
IEC EN 61000-4-8: Electromagnetic compatibility (EMC) - Part 4-8: Testing and measurement techniques - Power frequency magnetic field immunity test.
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IEC 62384: DC or AC supplied electronic control gear for LED modules. Performance requirements.
EN62471: Photobiological safety of lamps and lamp systems.
EN62560: Self-ballasted LED-lamps for general lighting services by voltage >50V - Safety specifications.
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UL1598: Luminare safety.
UL8750: Light Emitting Diode (LED) equipment for use In lighting products.
UL2108: Standard for Low Voltage Lighting Systems.
UL 8800: Outline of Investigation for Horticultural Lighting Equipment
CSA C22.2: #9.0: General Requirements for Luminaires.
CSA C22.2: #250.0.8: Safety for Light emitting diode (LED) equipment for lighting applications.
CSA C22.2 No. 250.13-14: Light Emitting Diode (LED) equipment for use in lighting products.

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