Philips Essential LED tube T8
Essential LEDtube T8 is a reliable value-for-money LED lamp out of Philips lighting portfolio, incorporated with frontier LED chips and other advanced technologies. The product helps customers to achieve over 50% energy saving and significant maintenance cost reduction by comparing to fluorescent lamps. It also helps generate natural and comfortable lighting effect, and to build up green and environment friendly image for our customers.
Product Features

Maintain high performance
• Reliable operation between -20 °C to 45 °C ambient temperature
• Trustable claimed lifetime
• 50,000 switching cycles

Easy to experience
• CRI 80
• Instant on, no flicker or buzz
• Advanced optical design ensures a uniform light output and superior optical efficiency

Energy Efficient
• Energy savings over 50%*

Safe and forget
• Protection circuit inside ensuring people’s safety in case of mis-use, complying with IEC safety requirements
• Pass 4KV high-pot test, insulation & safety guaranteed
• Pass 1KV surge test (vs. IEC standard 500V), avoiding the damage caused by input voltage fluctuation and lightning strike
• 100% comply with IEC requirement on T8 dimension, fitting into fluorescent luminaire perfectly

Environmental Friendly
• No mercury and glass
• No breakage and pollution risk

Compatibility
• Compatible with electromagnetic ballasts by replace the fluorescent starter with Philips starter, eliminating the need for rewiring and allows fixture to maintain original CE compliance

* Based on comparison between 20W Essential LEDtube standard and Philips TLD standard or super 80 36W (40-44W system power when working with Electro Magnetic Ballasts)

Application

Retail
Industry
Schools
Hospitals
Offices
Parking Lots
Warehouses
Public Areas
Light may be precisely characterized by giving the power of the light at each wavelength in the visible spectrum. The resulting spectral power distribution (SPD) shows that the ESSENTIAL LEDtube contains the visible light only. No harm from UV and IR.

Photometric Diagrams

The Photometric diagram depicting the top down mounted lighting fixtures in a specific area and a numerical grid of the maintained lighting levels that the fixture will produce in that specific area. Pictures below show the photometric diagrams of a typical Philips Essential LEDtube’s application.

<table>
<thead>
<tr>
<th>1 x TLED 10W 4000K/6500K</th>
<th>1 x 800 lm</th>
</tr>
</thead>
</table>

| 1 x TLED 20W 4000K/6500K | 1 x 1600 lm |
**Lifetime and Lumen Maintenance**

PHILIPS ESSENTIAL LEDtube has a lifetime of 30,000 hours, defined as the number of hours when 50% of a large group of identical lamps below 70% of its initial lumens.

**Temperature**

Essential LEDtube’s excellent thermal design ensures low temperature during operating, which brings reliable and stable product performance throughout life time.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>TC position</th>
<th>53</th>
<th>58</th>
<th>63</th>
<th>68</th>
<th>73</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lumen maintenance</td>
<td>TC point is at the middle of bottom</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Operating temperature</td>
<td>Tc</td>
<td>100%</td>
<td>99%</td>
<td>98%</td>
<td>97%</td>
<td>96%</td>
</tr>
<tr>
<td>Storage temperature</td>
<td>Tc</td>
<td>93%</td>
<td>94%</td>
<td>95%</td>
<td>96%</td>
<td>98%</td>
</tr>
<tr>
<td>Maximum surface temperature</td>
<td>Tc</td>
<td>95%</td>
<td>96%</td>
<td>97%</td>
<td>98%</td>
<td>100%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Tc point is at the middle of bottom</th>
</tr>
</thead>
</table>

**Table:**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>TC position</th>
<th>Min Tc</th>
<th>Max Tc</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating temperature</td>
<td>Tc</td>
<td>-20°C</td>
<td>+45°C</td>
</tr>
<tr>
<td>Storage temperature</td>
<td>Tc</td>
<td>-40°C</td>
<td>+65°C</td>
</tr>
<tr>
<td>Maximum surface temperature</td>
<td>Tc</td>
<td>+53°C</td>
<td></td>
</tr>
</tbody>
</table>

**Graphs:**

- Lumen maintenance over time
- Lumen maintenance vs. TC temperature
**Approbation & Certificates**

Philips LEDtube is designed by strictly following applicable legislation and international standard. The product complies with **CE, KEMA, TISI, RCM, RoHS and REACH**.

![CE, KEMA, RoHS](image)

**Technical specification**

<table>
<thead>
<tr>
<th>Product Description</th>
<th>Wattage (W)</th>
<th>Voltage (V)</th>
<th>Cap</th>
<th>Length (mm)</th>
<th>Beam Angle</th>
<th>Lifetime (hrs)</th>
<th>Lumen output (lm)</th>
<th>CCT (K)</th>
<th>CRI *</th>
<th>Pcs per BOX</th>
<th>Lamp Weight (g)</th>
<th>Model Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>ESSENTIAL LEDtube 1200mm 20W 840 T8</td>
<td>20</td>
<td>220-240</td>
<td>G13</td>
<td>1200</td>
<td>150</td>
<td>30,000</td>
<td>1600</td>
<td>4000</td>
<td>80</td>
<td>10</td>
<td>320</td>
<td>9290002966</td>
</tr>
<tr>
<td>ESSENTIAL LEDtube 1200mm 20W 865 T8</td>
<td>20</td>
<td>220-240</td>
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<td>1200</td>
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<td>30,000</td>
<td>1600</td>
<td>6500</td>
<td>80</td>
<td>10</td>
<td>320</td>
<td>9290002967</td>
</tr>
<tr>
<td>ESSENTIAL LEDtube 600mm 10W 840 T8</td>
<td>10</td>
<td>220-240</td>
<td>G13</td>
<td>600</td>
<td>150</td>
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<td>4000</td>
<td>80</td>
<td>10</td>
<td>170</td>
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</tr>
<tr>
<td>ESSENTIAL LEDtube 600mm 10W 865 T8</td>
<td>10</td>
<td>220-240</td>
<td>G13</td>
<td>600</td>
<td>150</td>
<td>30,000</td>
<td>800</td>
<td>6500</td>
<td>80</td>
<td>10</td>
<td>170</td>
<td>9290002969</td>
</tr>
</tbody>
</table>

* minimum is 77

**Quick Installation Guide**

Please take the time to read this quick installation guide. Philips Lighting does not accept liability for any damages for installations not performed according to this guide or not performed by a professional electrician.

**Installation Warning**

- Check whether the system is an EM (Electro Magnetic) ballast based system or an HF (High Frequency electronic) ballast based system, and follow the appropriate instructions accordingly. For new built luminaries follow section “New built luminaries”.
- Product is not dimmable
- Always switch off the power supply before commencing work
- Do not change the structure or any components of the product
Application Notes

- Operation temperature range is between -20°C and +45°C ambience.
- Only to apply in dry indoor usage and environments.
- Not intended for use with emergency light fixtures or exit light.
- For use in fixtures which consist of IEC compliant G13 bi-pin lamp holders which can support 500 gram.

Installation Guide

- EM ballast based system

1. Mains Off
2. Install EMP starter replacement only
3. Remove all existing FLUORESCENT TUBES from luminaire
4. Install the LED tube
5. Remove all existing STARTERS from luminaire
6. Install EMP starter replacement only
7. Turn on mains

For EM ballast installations please check if a Power Factor Correcting Capacitor is installed in the existing circuit. If yes, please follow the instructions below:
- Please simply remove the capacitor if it is in parallel with the EM Ballast
- Please short circuit the capacitor if it is in series with the EM Ballast
- In case of 2ft/600mm lamps, if there is only one starter in the luminaire for 2 lamps, or 2 starters for 4 lamps, then rewire according to the SAFE rewiring instructions in next section
• HF ballast based system

1. Mains Off
2. Remove all existing FLUORESCENT TUBES from luminaire
3. By pass HF

- For 3 lamps use diagram A & B
- For 4 lamps use diagram B & B

Bypass existing HF BALLAST and rewire according to the following diagrams.
Please check the L/N markings on the lamp end and insert the lamp with AC mains supplied to the corresponding end.
To install the lamp in the wrong direction will lead to malfunction.

- Warning sticker

The supplied warning sticker must be placed on the luminaire and must be visible during lamp replacement.

- Turn on mains

• New built luminaires

<table>
<thead>
<tr>
<th>Number of tube</th>
<th>Wire according to diagram</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>C</td>
</tr>
<tr>
<td>2</td>
<td>D</td>
</tr>
<tr>
<td>3</td>
<td>C+D</td>
</tr>
<tr>
<td>4</td>
<td>D+D</td>
</tr>
</tbody>
</table>

Please check the L/N markings on the lamp end and insert the lamp with AC mains supplied to the corresponding end.
To install the lamp in the wrong direction will lead to malfunction.

- Diagram C

- Diagram D
OEM Guideline

Failure rate vs. Lifetime @ Ta 25 °C

Lumen Maintenance vs. Lifetime

Failure Rate vs. Lifetime vs. Tcase

Lifetime vs. Tcase

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