



# Application guide

## Philips GreenPower LED toplighting module - limited edition

A unique way to apply grow light above your plants, based on state-of-the-art LED technology designed together with growers for growers



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# PHILIPS



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# 1. Introduction

Thank you for choosing the Philips GreenPower LED toplighting module. This guide tells you all about this unique LED module. If you require any further information or support please contact your local Philips office or visit: [www.philips.com/horti](http://www.philips.com/horti)

## 1.1 Description

Featuring state-of-the-art LED technology, the GreenPower LED toplighting module is specially designed for greenhouse applications to provide grow / assimilation light above the plants.

Nowadays greenhouses have to be as efficient as possible, i.e. filled with the maximum number of plants.

With current technology it is now possible to build a highly efficient lighting solution. Here at Philips we can advise you, as and when necessary, on the ideal light levels for your crop. We have a light recipe database for many different crops.

Unlike conventional lighting the LEDs do not radiate heat. The light level (photon flux) of this product has been determined by means of extensive testing in the field with various growers in cooperation with companies who can give crop advice. This enables us to deliver the best possible lighting solution that will improve both quality and yield.

## 1.2 Application areas

- Greenhouse applications
- All types of greenhouse crops that need assimilation light
- A typical additional grow light produces between 50 and 300  $\mu\text{mol/s/m}^2$

## 1.3 GreenPower LED toplighting module

This module operates on 400 V mains via an inter-connection (head-to-tail) made by means of Wieland connectors and a pre-assembled 3-pole cable. It offers an Ingress Protection of IP66, making it suitable for use in high-humidity environments.

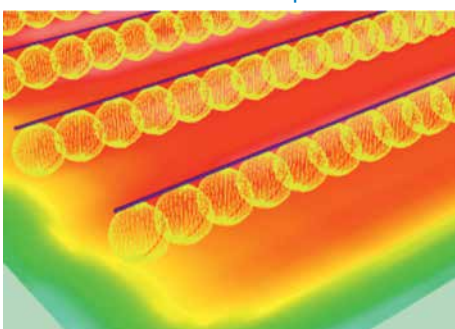
## 2. How to design your application

A dedicated crop-specific recipe is available to ensure you get the best possible results from your crop. Philips has a crop-specific recipe database which will give you a head start. This “GreenPower Recipe D-base” has been created in recent years on the basis of field tests performed together with growers and universities all over the world.

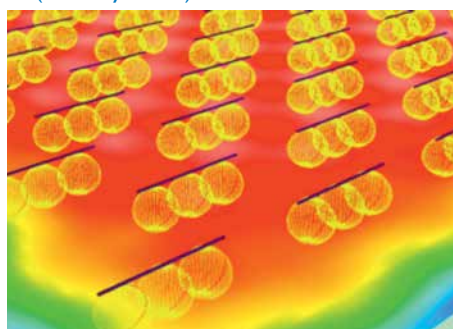
The GreenPower LED toplighting module must be installed in a horizontal position above the plant and is mounted on a standard C-profile of 40x40 mm. Depending on the required intensity and the installation height, it can be mounted in one of three formations: continuous line, short line/checkerboard or a checkerboard formation. Your local sales representative can advise you on the best formation.

The GreenPower LED toplighting module is based on LEDs that have been developed especially for horticultural applications. This means you only use energy for the spectrum required by the crop and you also benefit from the long useful lifetimes associated with LED technology. The GreenPower LED toplighting module enables you to install additional lighting above the plants without adding IR radiation to your crop or, if you want to increase the light level in your greenhouse without increasing heat radiation, it is possible to apply the GreenPower LED toplighting in between your existing lighting fixtures. The light beam (>120 degrees) will ensure that the light is distributed equally over the growing area.

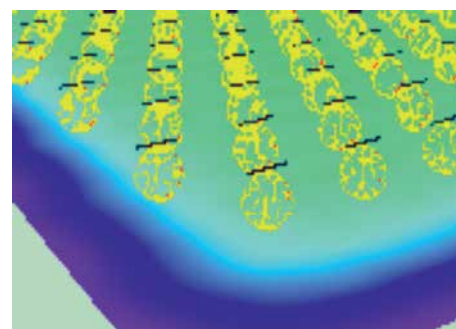
A number of formation examples are shown below (bird's-eye view)



**Figure 1:** Line formation



**Figure 2:** Short line/checkerboard formation



**Figure 3:** Checkerboard formation



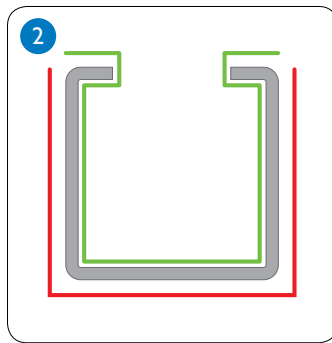
### 3. Mounting into the greenhouse

The module can be fixed to the greenhouse structure using the existing technology that is used for greenhouse installations. The GreenPower LED toplighting module can be fitted very easily without the need for any tools and has been designed together with installers and growers to deliver optimum results.

The 40x40 mm C-profile is integrated into the module. This way less light will be blocked by the LED modules cabling and suspension structure. Thanks to the head-to-tail inter-connection and the stainless steel clips, it is virtually a plug-and-play module.



1 Connect the Mains power cable to the power grid.

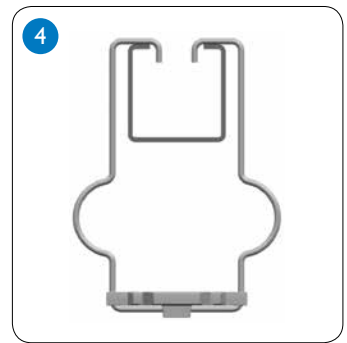


2 Mount 40x40 mm C-profiles to the green house structure on the desired height. During assembly use a fixation that only uses the inside of the C-profile (green area) (see drawing).

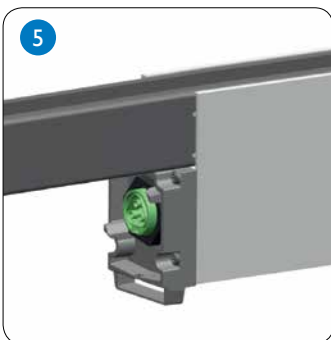
**Do not use hooks that are mounted around the profile (red area) (see drawing)!**



3 Click the plastic part with the snap fingers on the stainless steel clips (see drawing).



4 Hook on 2 stainless steel clips onto the C-profile at 1,3 m pitch (see drawing).



5 Put the LED module over the C-profile.



6 Take the clip and slide and press the locking plate into the module at both sides.



7 Hook on one stainless steel clip onto the C-profile at 1,3 m distance.



8 Put the second module over the C-profile.



Click the second module on the clip of the first module.



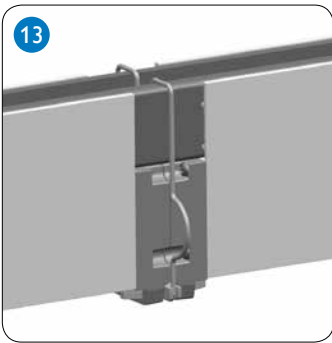
Slide the clip on the back in the second module. Check if the locking plate snaps into the module.



Hook on one stainless steel clip onto the C-profile at 1.3 m distance.



Put the third module over the C-profile.



Click the third module on the clip of the second module.



Slide the clip back in the third module. Check if the locking plate snaps into the module. You can continue like this for the rest of the modules.

**Max 15 pcs per phase!**



**IMPORTANT:**

Put the connector stop on the end of a through wire line to make the line IP66.



**IMPORTANT NOTE:**

The maximum amount of GreenPower LED top lighting modules is **15 pcs per phase on a 16 A C-type circuit breaker**. Not allowed to use >16 A circuit breakers and increasing the module amounts per phase due to internal wire dimensions and higher current!

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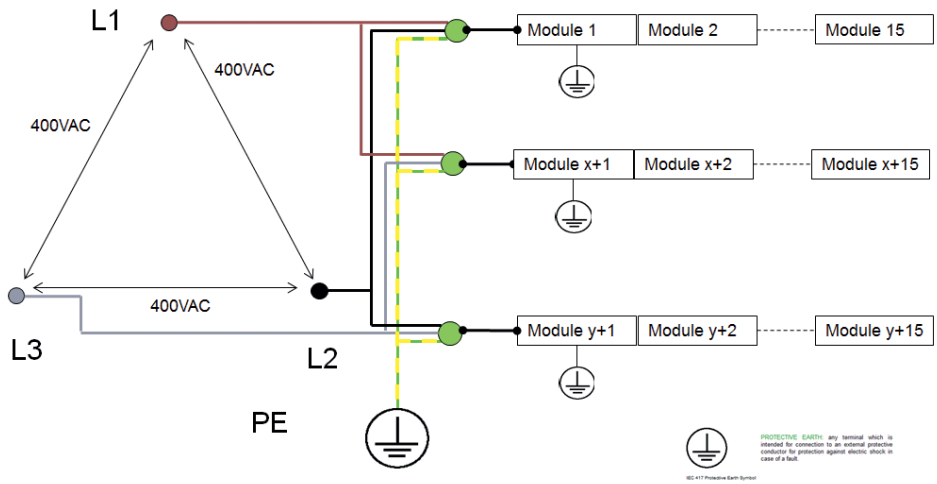
**⚠ RISK GROUP 2**

**CAUTION:** Possibly hazardous optical radiation emitted from this product. Do not stare at operating lamp. May be harmful to the eyes.

# 4. Connection to 400 V on a 400 V grid

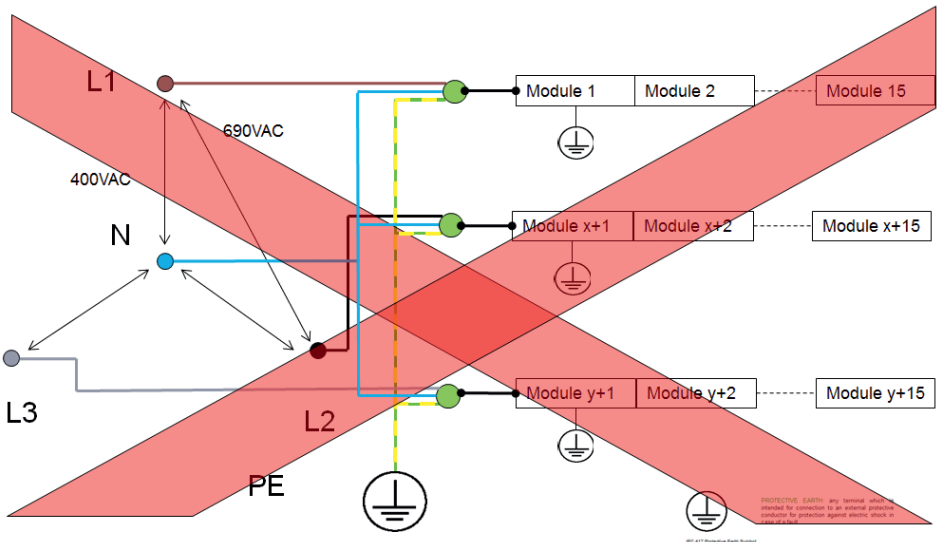
## 4.1 Connecting the GreenPower LED top lighting module to a 400 V (3-phase) power grid

Always connect protected earth.



## 4.2 Connection to 400V on a 690 V grid is PROHIBITED on safety grounds

400 VAC between neutral and Phase in 690 VAC grid is not permitted.



**⚠ WARNING**  
Use of the LED interlight modules in 690 VAC systems is prohibited because the safety isolation is not designed for these high voltages!



## 5. Specifications for the GreenPower LED toplighting module

Product	Photon flux micromol/s	Power W
GreenPower LED toplighting module DR/B LB 400V	440	190
GreenPower LED toplighting module DR/B MB 400V	440	195
GreenPower LED toplighting module DR/B HB 400V	440	200
GreenPower LED toplighting module DR/W LB 400V	440	190
GreenPower LED toplighting module DR/W MB 400V	440	195

### 5.1 Technical specification

System Efficacy	: 2.3 umol/l
Input Voltage	: 400 VAC
Power factor @400 VAC	: >0.95
Ingress protection rating	: IP66 including connection after assembly
Lifetime	: 25,000 hr Photon flux maintenance of 90% at Tambient 25 °C
Warranty	: According to general warranty conditions (3 year)
Module length	: 1250 mm
Module height	: 100 mm
Module width	: 50 mm
Weight	: 3.65 kg
Connection	: Maximum 15 modules may be mounted head to tail. The maximum amperage of the through wiring is 16 A
Certificate	: CE, IEC 60598, EMC CISPR-15, RoHS

### 5.2 Accessories (determined per situation)

Mains power cable	: 1 meter, 3 conductors, one-sided, pre-stripped 2.5 mm <sup>2</sup> conductors, one-sided Wieland female connector
Jumper cable	: 1.5 meters, 3 x 2.5 mm <sup>2</sup> conductors, 2-sided "male / female connector" to bridge max. 1.5 m per cable
Mounting clips	: Stainless steel ø2.0 mm wire clip including "locking plate" to fix the modules in an axial direction to prevent the modules working loose as a result of vibrations
Connector stop	: To ensure IP66 on last module in the line!

## 6. Ordering information

This unique GreenPower LED toplighting product is on the market in limited supply. It has been fully released in accordance with all safety regulations and has been tested against IEC 60598 by a certified approbation body (Dekra).

Philips has designed several types according to a best practice recipe. This is the outcome of a number of tests and studies we have carried in recent years in conjunction with universities and growers.

### Important!

Due to limited availability, please always check with your local sales representative what the possibilities are for your specific application.

Product name	Ordering code 12NC
GreenPower LED toplighting module DR/B LB 400V	9290 008 82206
GreenPower LED toplighting module DR/B MB 400V	9290 008 82106
GreenPower LED toplighting module DR/B HB 400V	9290 008 82006
GreenPower LED toplighting module DR/W LB 400V	9290 008 81906
GreenPower LED toplighting module DR/W MB 400V	9290 008 85106

The accessories will be determined per project. This is due to the fact that it depends on the lighting design required for your crop whether you need a “Line formation” or “Checkerboard formation”.

The local Philips sales representative will be able to advise you on this.

### Contact details

Please contact your local sales office or mail us via [www.philips.com/horti](http://www.philips.com/horti) if you have any further questions or problems.

Additional information can also be obtained at [www.philips.com/horti](http://www.philips.com/horti)



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