LED GROW LIGHTS
FOR CANNABIS

LNLED®

SIINCE 1996

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LNLED®

LED horticulture lighting specialist
Trusted brand for more than 25 years

LNLED® | Company profile

LNLED was established in 1996. Its main products are LED and LED fixture. Innovation creates value and technology guides horticulture. We have been committed to LED plant light since 2015. In the past 6 years, we have developed and produced series of LED plant growing light which Widely Used in modern agriculture such as greenhouses, indoor / vertical farming etc.

six years since our beginning, LNLED continues to grow and offer the industry's leading smart horticultural lighting solutions. Empowering Growth Through Connectivity is our mission, to create a connected lighting environment for plants and people to thrive.

LNLED® | Certification

CERTIFICATE OF COMPLIANCE

Certificate Number UL-US-2015878-0
Report Reference E517549-20210205
Date 11-Feb-2021

Issued to: GUANGZHOU LINONG LIGHTING TECHNOLOGY CO LTD
Keying Rd
Guangzhou Sci-Tech Lndustry Park
Taihe Town Balyun District Guangzhou , Guangdong, China 510540

This is to certify that representative samples of IFAU - Horticultural Luminaires
See Addendum Page for Product Designation(s).

Have been investigated by UL in accordance with the Standard(s) indicated on this Certificate.

Standard(s) for Safety: ANSI/CAN/UL8800:2019 , 1st Ed., Issue Date: 2019-08-30

Additional Information: See the UL Online Certifications Directory at https://iq.ulprospector.com for additional information

This Certificate of Compliance does not provide authorization to apply the UL Mark. Only the UL Follow-Up Services Procedure provides authorization to apply the UL Mark.

Only those products bearing the UL Mark should be considered as being UL Certified and covered under UL's Follow-Up Services.

Look for the UL Certification Mark on the product.

Bruce Mahrenholz, Director North American Certification Program
UL LLC

Any information and documentation involving UL Mark services are provided on behalf of UL LLC (UL) or any authorized licensee of UL. For questions, please contact a local UL Customer Service Representative at http://ul.com/aboutul/locations/

Photometric Test Report

Relevant Standards

- IES LM-79-2008
- ANSI C82.77-10-2014
- UL1598-2008

Prepared For

Guangzhou lnled Lighting Technology Co., Ltd
No.2 keying Road, private science park, Taihe Town, Baiyun District,Guangzhou510540 , China
Jack Huang, 18620910717, jack.huang@lnled.com

Test Laboratory: UL Verification Services (Guangzhou) Co., Ltd.
Test Laboratory Address: 1-3F & Room 501, Building 2 (R&D Center A1), No. 25, South Huanshi Avenue, Nansha District, Guangzhou 511458, China
Telephone: +86 20 22639500

Catalog Number
LNGL-640W-6Z

Project Number
4789617598
Report Number
4789617598_1a
Test Date
2/25/2021
Issue Date

Revision Date
N/A

Prepared By	Approved By
Susie Shao	Dendi Lin

The results contained in this report pertain only to the tested sample.
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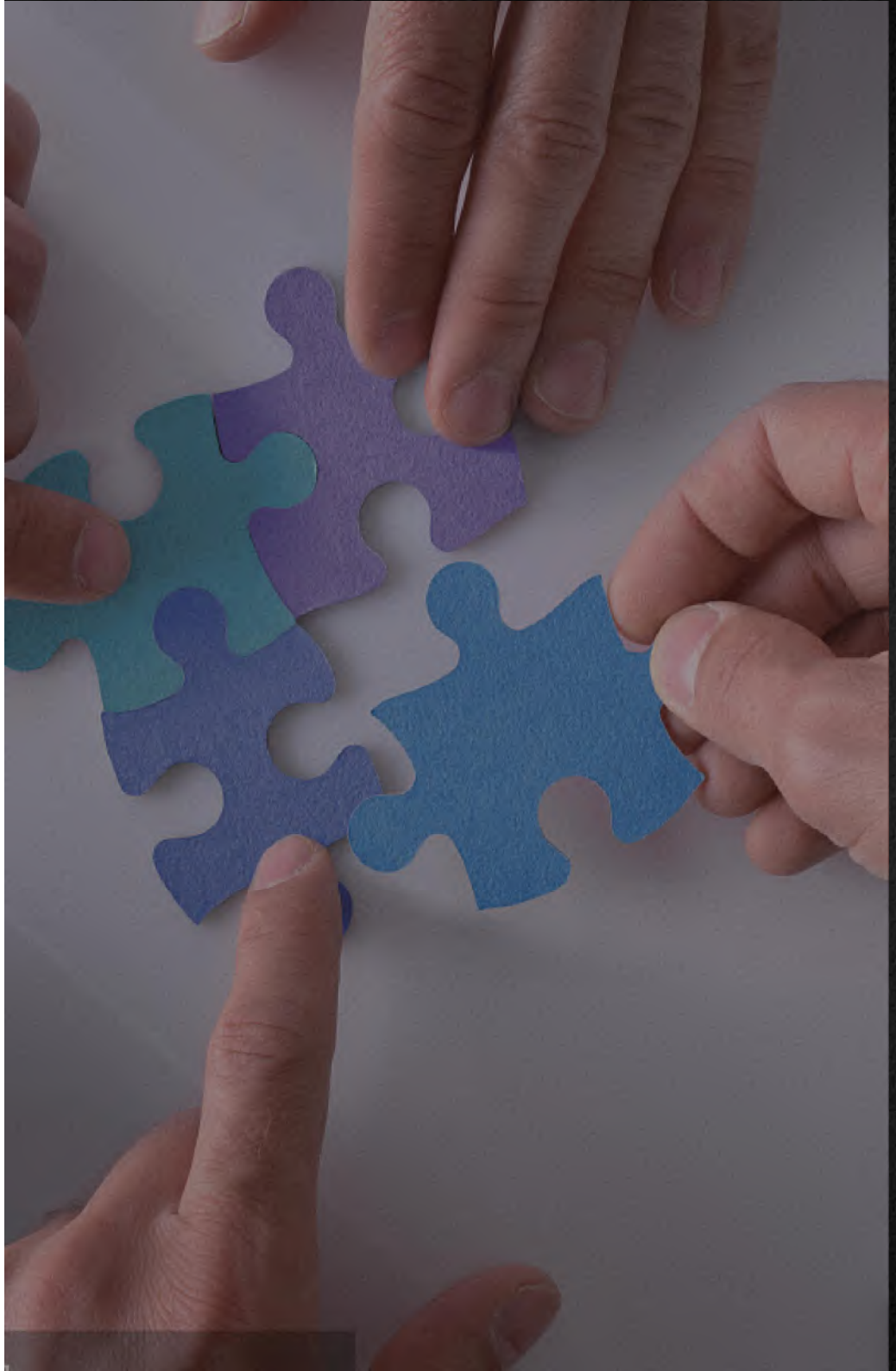
The laboratory is not responsible for the information which provided by customer, its authenticity can affect the validity of the result in the test report.



WHY CHOOSE US

Order directly from the manufacturer and get the best price

ONE-STOP SHOP

We provide an entire range of indoor gardening and hydroponic lighting products

PROFESSIONAL

Professional manufacturer in china over 20years , OEM+ODM experience

QUALITY

Our extremely strict quality control standards guarantee top quality products

CUSTOMIZATION

Customize product appearance, functions and packaging to fit different needs for customers

CUSTOMER SERVICE

Competitive product warranty with our USA warehouses to promise reliable, consistent and timely service

LED GROW LIGHTS

GENERAL STANDARD SERIES

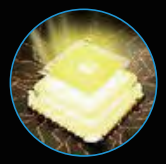
c UL us
E517549

DLC QPL LISTED

640W LNGL-GEN640

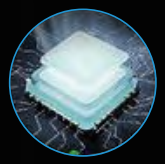
SUITABLE FOR
The full cannabis growth cycle

GENERAL STANDARD SERIES



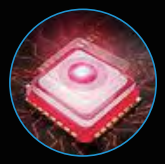
3000K

High red ratio promotes growth



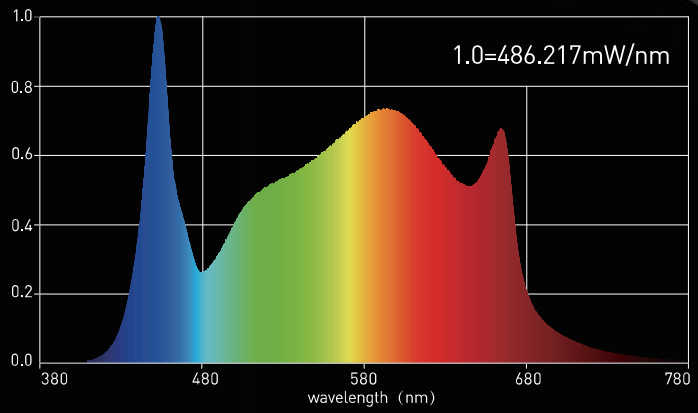
5000K

High blue ratio promotes root development



660nm

Pure red light promotes yields



SUPERIOR FULL SPECTRUM

High energy efficency to achieve greater yield at harvest

OPTIMAL PERFORMANCE

LED GROW LIGHTS

640W LNGL-GEN640

5 YEAR WARRANTY

Real Heat Sink

100% Flexible Dimmer

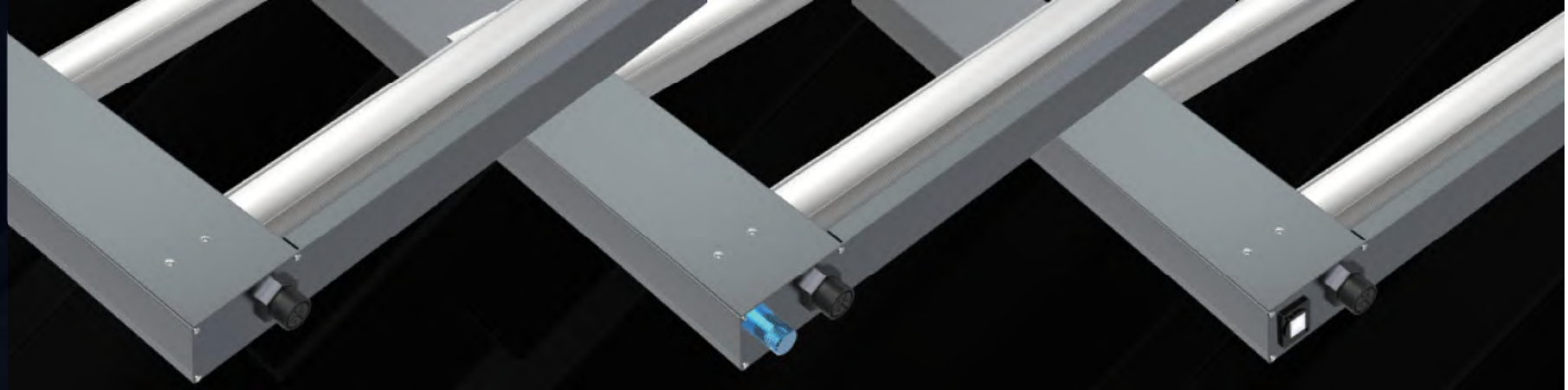
2.7µmol/J

NEW SMD LEDs

1730µmol/s

HIGH PPF,UNIFORM OUTPUT

GENERAL STANDARD SERIES



LNGL-GEN640

MEAN WELL
Driver

APT ELECTRONICS
LEDs

No DIMMING

LNGL-GEN640-DIM

MEAN WELL
Driver

APT ELECTRONICS
LEDs

KNOB DIMMING
0-10V

LNGL-GEN640-NET

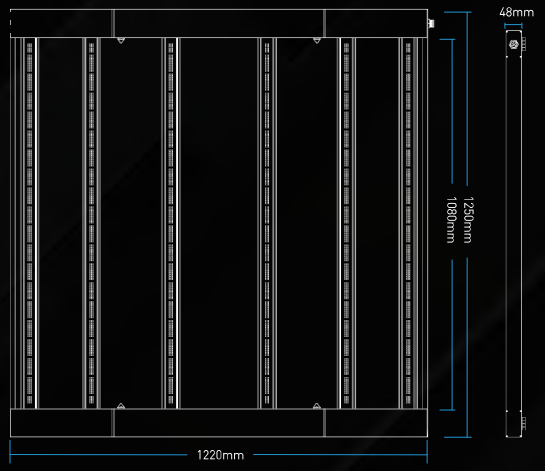
MEAN WELL
Driver

APT ELECTRONICS
LEDs

APP DIMMING
Network Control

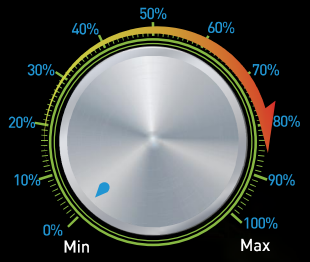
SPECIFICATIONS

AC Input	AC100-240V / 277V	Light Source	3000K+5000K+Red(660nm)
Frequency	50/60Hz	Procut Dimensions	122x 125x 4.8cm
Actual Power	640W ± 5%	Product Carton size	130 x 11.5x 68.5cm
PPF	1730±50μmol/s	Item Weight	12.5Kg(NW) / 14.8Kg(GW)
QE Rate	2.7μmol/J	HID Replacement	1000W HPS/MH
Use for	All growth stages	Light Distribution	120°
Luminous Flux	115200Lm	Amperage	6.4A / 110V 2.67A/ 240V



ADJUSTABLE BRIGHTNESS,MORE FLEXIBLE

640W GENERAL STANDARD SERIES



KNOB DIMMING
0-10V

APP DIMMING
Network Control

Digital Dimming

10V — 0V

100% Brightness	75% Brightness	50% Brightness	25% Brightness	0% Brightness
1730µmol/s	**1295**µmol/s	**865**µmol/s	**430**µmol/s	**Power off**

Customize light intensity at various growing phase, great choice for beginners and indoor growers.

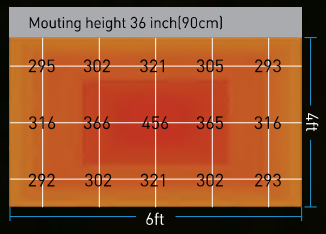
LIGHTING REQUIREMENTS SUGGESTION **FOR CANNABIS GROWTH**

Cutting Propagation

150-200μmol/m²/s

Photoperiod hours of light

18h or more — **14 Days**



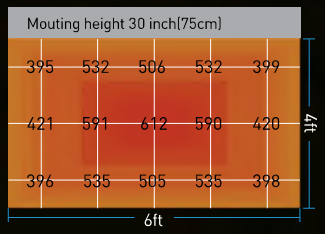
Average PPFD: 326μmol/m²/s
Middle PPFD: 456μmol/m²/s

Vegetative Growth

420-550μmol/m²/s

Photoperiod hours of light

18h or more — **21+ Days**



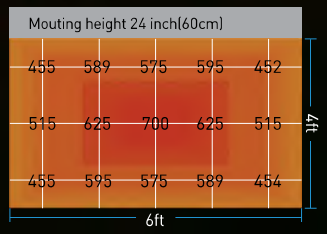
Average PPFD: 413μmol/m²/s
Middle PPFD: 612μmol/m²/s

Veg-to-Flower

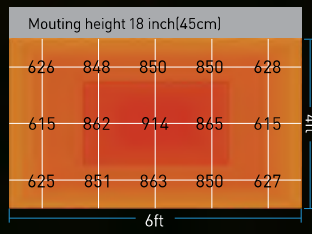
500-700μmol/m²/s

Photoperiod hours of light

12h — 3 to 7 Days



Average PPFD: 464μmol/m²/s
Middle PPFD: 700μmol/m²/s



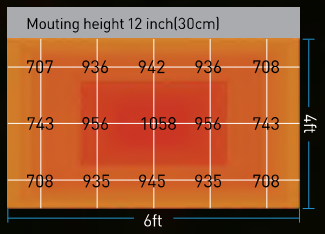
Average PPFD: 522μmol/m²/s
Middle PPFD: 797μmol/m²/s

Flowering

700-800μmol/m²/s

Photoperiod hours of light

12h — 8 to 10 Weeks



Average PPFD: 616μmol/m²/s
Middle PPFD: 1058μmol/m²/s

LED GROW LIGHTS

GENERAL STANDARD SERIES

c UL us
E517549

DLC QPL LISTED

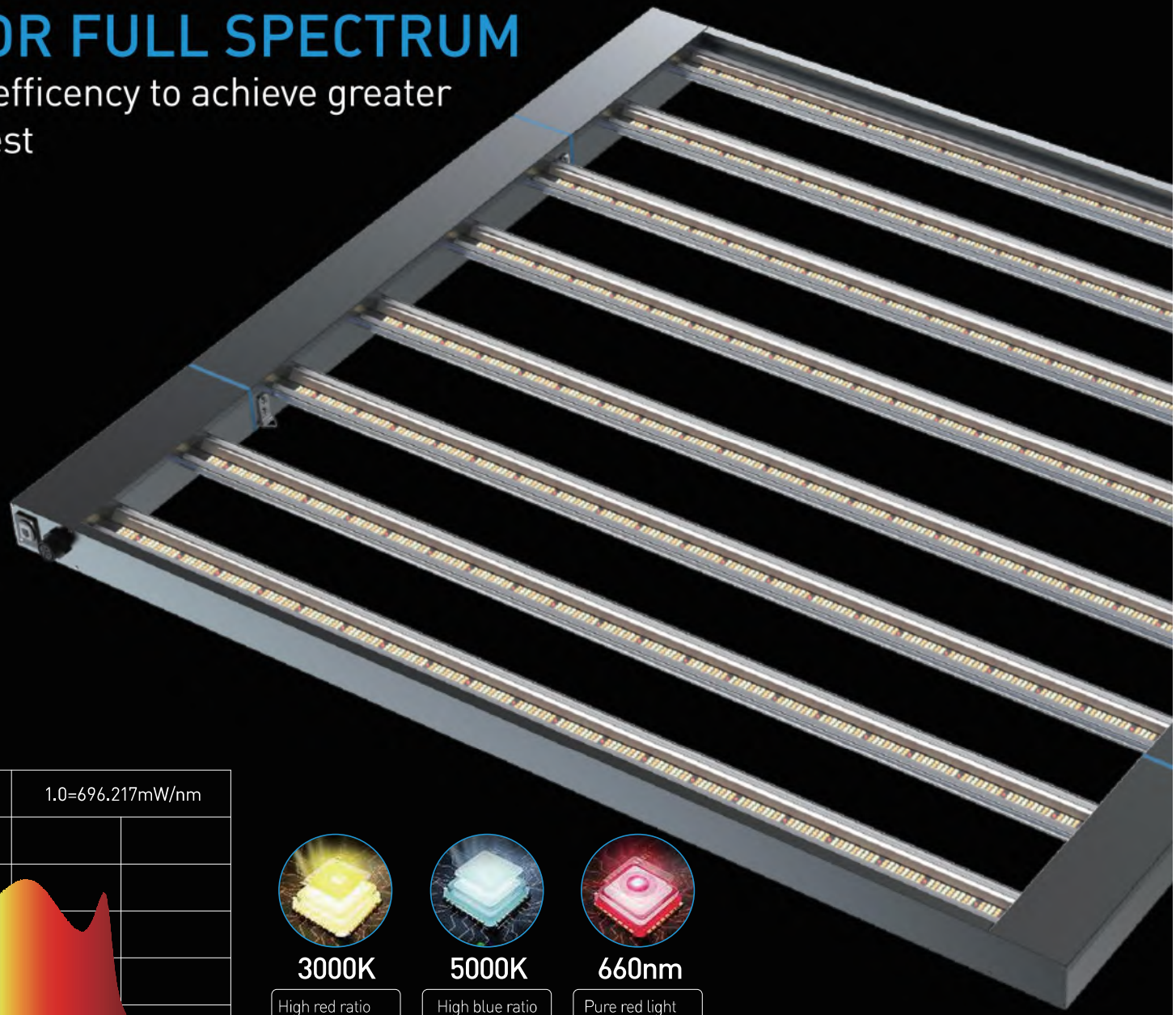
850W LNGL-GEN850

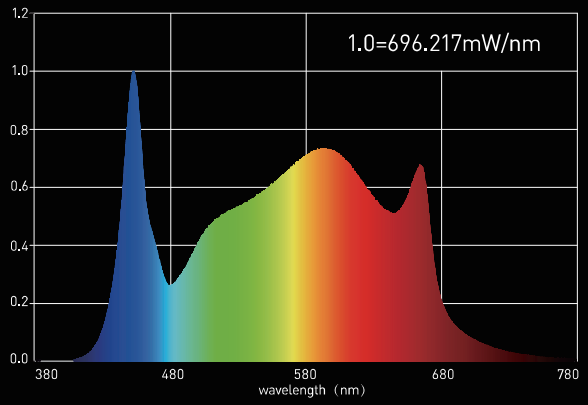
SUITABLE FOR

The full cannabis growth cycle
Higher light intensity

SUPERIOR FULL SPECTRUM

High energy efficency to achieve greater yield at harvest





3000K

High red ratio promotes growth

5000K

High blue ratio promotes root development

660nm

Pure red light promotes yields

OPTIMAL PERFORMANCE

LED GROW LIGHTS

850W LNGL-GEN850

5 YEAR WARRANTY

Real Heat Sink

100% Flexible Dimmer

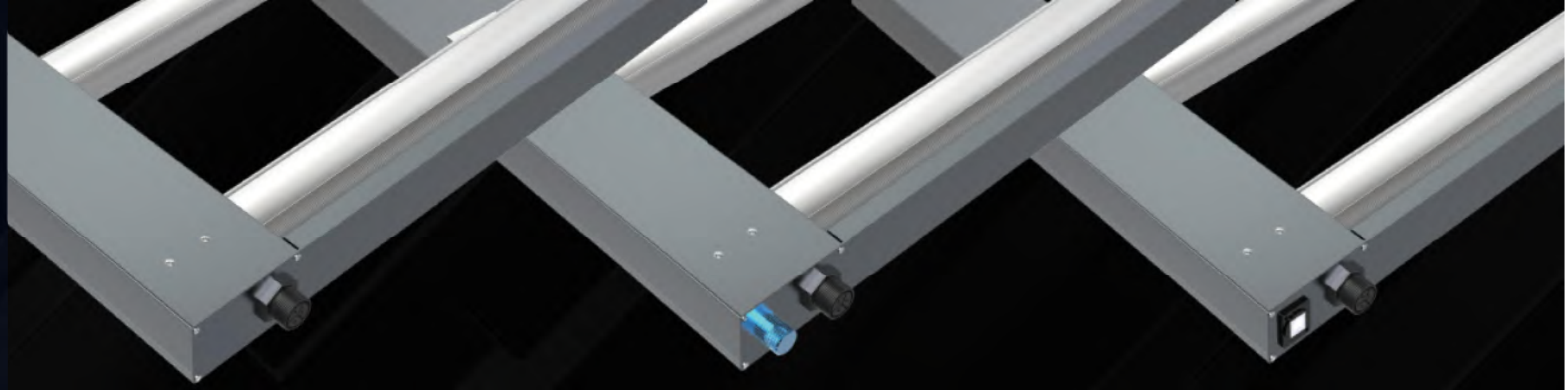
2.7µmol/J

NEW SMD LEDs

2300µmol/s

HIGH PPF,UNIFORM OUTPUT

GENERAL STANDARD SERIES



LNGL-GEN850

MEAN WELL Driver

APT ELECTRONICS LEDs

No DIMMING

LNGL-GEN850-DIM

MEAN WELL Driver

APT ELECTRONICS LEDs

KNOB DIMMING 0-10V

LNGL-GEN850-NET

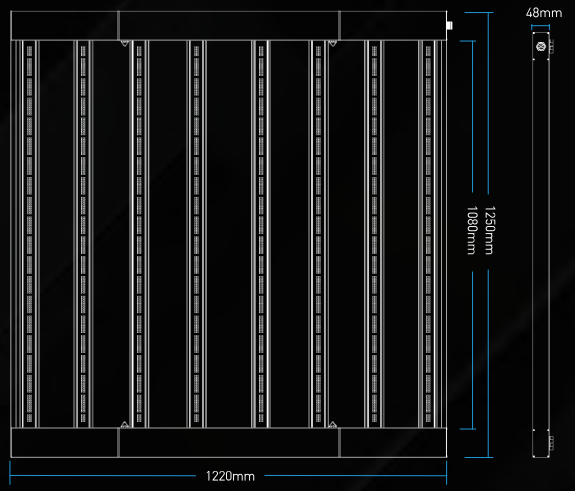
MEAN WELL Driver

APT ELECTRONICS LEDs

APP DIMMING Network Control

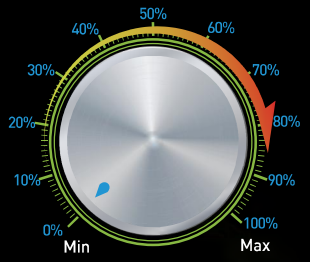
SPECIFICATIONS

AC Input	AC100-240V / 277V	Light Source	3000K+5000K+Red(660nm)
Frequency	50/60Hz	Procut Dimensions	122x 125x 4.8cm
Actual Power	850W ± 5%	Product Carton size	130 x 11.5x 68.5cm
PPF	2300±50μmol/s	Item Weight	15.5Kg(NW) / 18.5Kg(GW)
QE Rate	2.7μmol/J	HID Replacement	1300W HPS/MH
Use for	All growth stages	Light Distribution	120°
Luminous Flux	153000Lm	Amperage	8.5A / 110V 3.54A/ 240V



ADJUSTABLE BRIGHTNESS,MORE FLEXIBLE

850W GENERAL STANDARD SERIES



KNOB DIMMING
0-10V

APP DIMMING
Network Control

Digital Dimming

10V — 0V

100% Brightness	75% Brightness	50% Brightness	25% Brightness	0% Brightness
2300µmol/s	**1725**µmol/s	**1150**µmol/s	**575**µmol/s	**Power off**

Customize light intensity at various growing phase, great choice for beginners and indoor growers.

LIGHTING REQUIREMENTS SUGGESTION **FOR CANNABIS GROWTH**

Cutting Propagation

150-200μmol/m²/s

Photoperiod hours of light

18h or more — **14 Days**

Vegetative Growth

420-550μmol/m²/s

Photoperiod hours of light

18h or more — **21+ Days**

Veg-to-Flower

500-700μmol/m²/s

Photoperiod hours of light

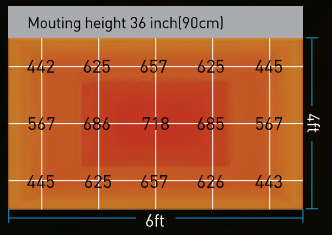
12h — **3 to 7 Days**

Flowering

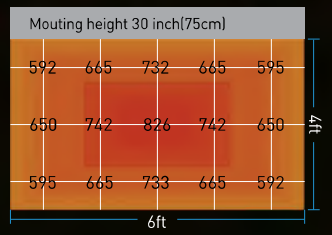
700-800μmol/m²/s

Photoperiod hours of light

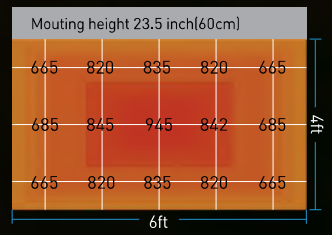
12h — **8 to 10 Weeks**



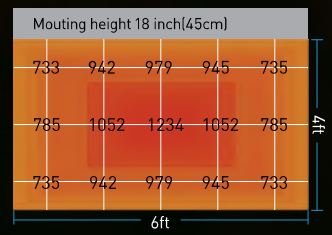
Average PPFD: 499μmol/m²/s
Middle PPFD: 718μmol/m²/s



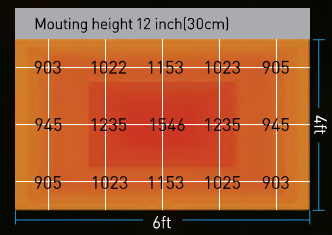
Average PPFD: 557μmol/m²/s
Middle PPFD: 826μmol/m²/s



Average PPFD: 626μmol/m²/s
Middle PPFD: 945μmol/m²/s



Average PPFD: 791μmol/m²/s
Middle PPFD: 1234μmol/m²/s



Average PPFD: 982μmol/m²/s
Middle PPFD: 1546μmol/m²/s

LED GROW LIGHTS

GENERAL STANDARD SERIES

c UL us
E517549

DLC QPL LISTED

400W LNGL-GEN400

SUITABLE FOR the full cannabis growth cycle
MATCHED WITH LNGL-GEN640 or GEN850,
if the installation area is not enough or in
the corner, you can choice this one

SUPERIOR FULL SPECTRUM

High energy efficency to achieve greater yield at harvest

3000K

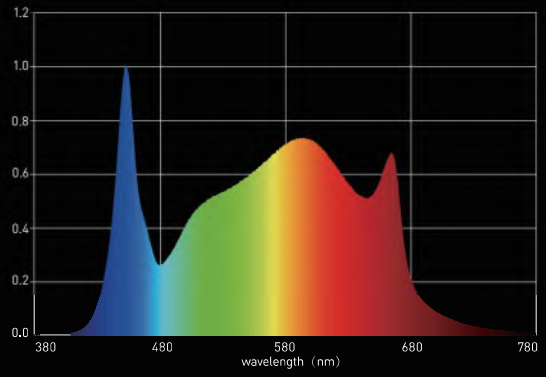
High red ratio promotes growth

5000K

High blue ratio promotes root development

660nm

Pure red light promotes yields



OPTIMAL PERFORMANCE

LED GROW LIGHTS

400W LNGL-GEN400

5 YEAR WARRANTY

Real Heat Sink

100% Flexible Dimmer

2.7µmol/J

NEW SMD LEDs

1080µmol/s

HIGH PPF,UNIFORM OUTPUT

GENERAL STANDARD SERIES

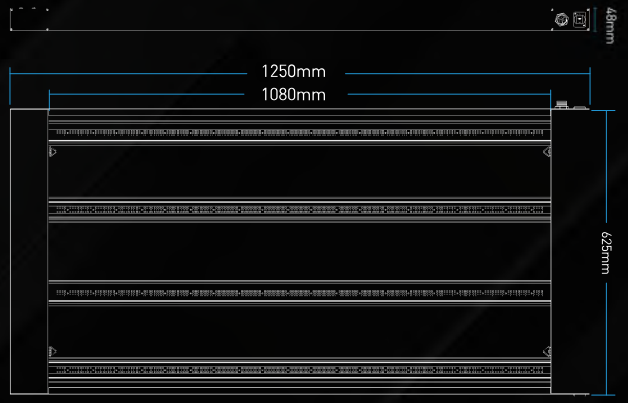
MEAN WELL
Driver

APT ELECTRONICS
LEDs

APP DIMMING
Network Control

SPECIFICATIONS (LNGL-GEN400)

AC Input	AC100-240V / 277V	Light Source	3000K+5000K+Red(660nm)
Frequency	50/60Hz	Procut Dimensions	62.5x 125x 4.8cm
Actual Power	400W ± 5%	Product Carton size	130 x 6.5x 68.5cm
PPF	1080±50μmol/s	Item Weight	7.8Kg(NW) / 10.5Kg(GW)
QE Rate	2.7μmol/J	HID Replacement	650W HPS/MH
Use for	All growth stages	Light Distribution	120°
Luminous Flux	72000Lm	Amperage	4.0A / 110V 1.67A/ 240V



ADJUSTABLE BRIGHTNESS, MORE FLEXIBLE

400W GENERAL STANDARD SERIES

APP DIMMING
Network Control

100% Brightness	75% Brightness	50% Brightness	25% Brightness	0% Brightness
1080μmol/s	**810**μmol/s	**540**μmol/s	**270**μmol/s	**Power off**

Customize light intensity at various growing phase, great choice for beginners and indoor growers.

LIGHTING REQUIREMENTS SUGGESTION **FOR CANNABIS GROWTH**

Cutting Propagation

150-200μmol/m²/s

Photoperiod hours of light

18h or more — **14 Days**

Vegetative Growth

420-550μmol/m²/s

Photoperiod hours of light

18h or more — **21+ Days**

Veg-to-Flower

500-700μmol/m²/s

Photoperiod hours of light

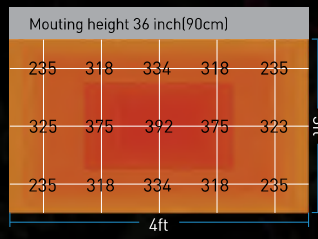
12h — **3 to 7 Days**

Flowering

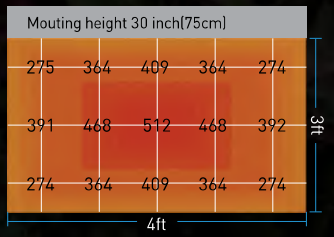
700-800μmol/m²/s

Photoperiod hours of light

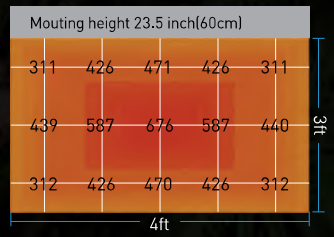
12h — **8 to 10 Weeks**



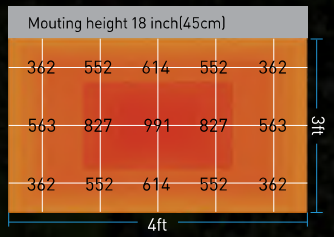
Average PPFD: 305μmol/m²/s
Middle PPFD: 392μmol/m²/s



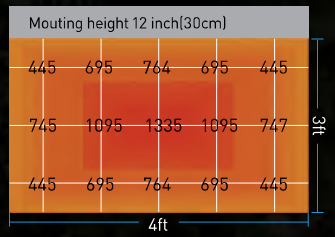
Average PPFD: 378μmol/m²/s
Middle PPFD: 512μmol/m²/s



Average PPFD: 475μmol/m²/s
Middle PPFD: 676μmol/m²/s



Average PPFD: 632μmol/m²/s
Middle PPFD: 991μmol/m²/s



Average PPFD: 803μmol/m²/s
Middle PPFD: 1335μmol/m²/s

LED GROW LIGHTS

PROFESSIONAL SERIES

c UL us
E517549

DLC OPL LISTED

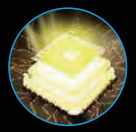
640W LNGL-PRO640

Professional upgrade model **special for vegetative growth phase**, 210W fixed spectrum, 420W adjustable, supporting smart controller adjust spectra and light intensity automatically.

PROFESSIONAL SERIES

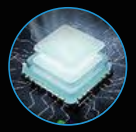
SUPERIOR FULL SPECTRUM

High energy efficency to achieve greater yield at harvest



High red ratio promotes growth

3000K

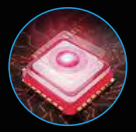


High blue ratio promotes root development

5000K

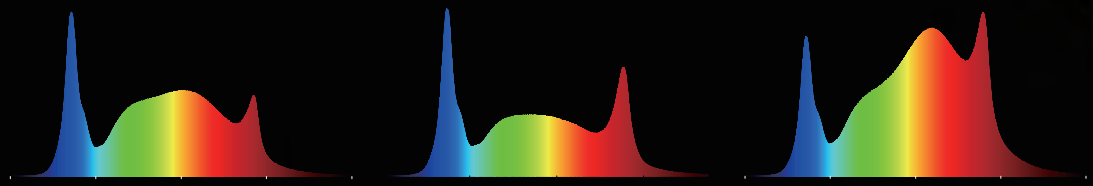
Pure red light promotes yields **SMD3535**

660nm



Pure red light promotes yields **SMD3030**

665nm



OPTIMAL PERFORMANCE

LED GROW LIGHTS

640W LNGL-PRO640

5 YEAR WARRANTY

Real Heat Sink

100% Flexible Dimmer

2.7µmol/J

NEW SMD LEDs

1730µmol/s

HIGH PPF,UNIFORM OUTPUT

PROFESSIONAL SERIES

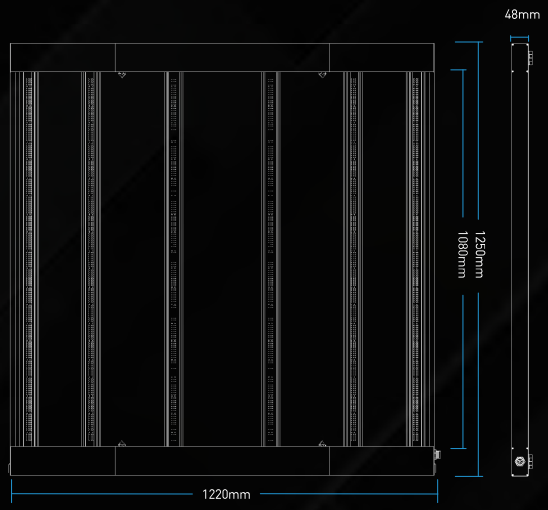
MEAN WELL
Driver

APT ELECTRONICS
LEDs

APP DIMMING
Network Control

SPECIFICATIONS (LNGL-PRO640)

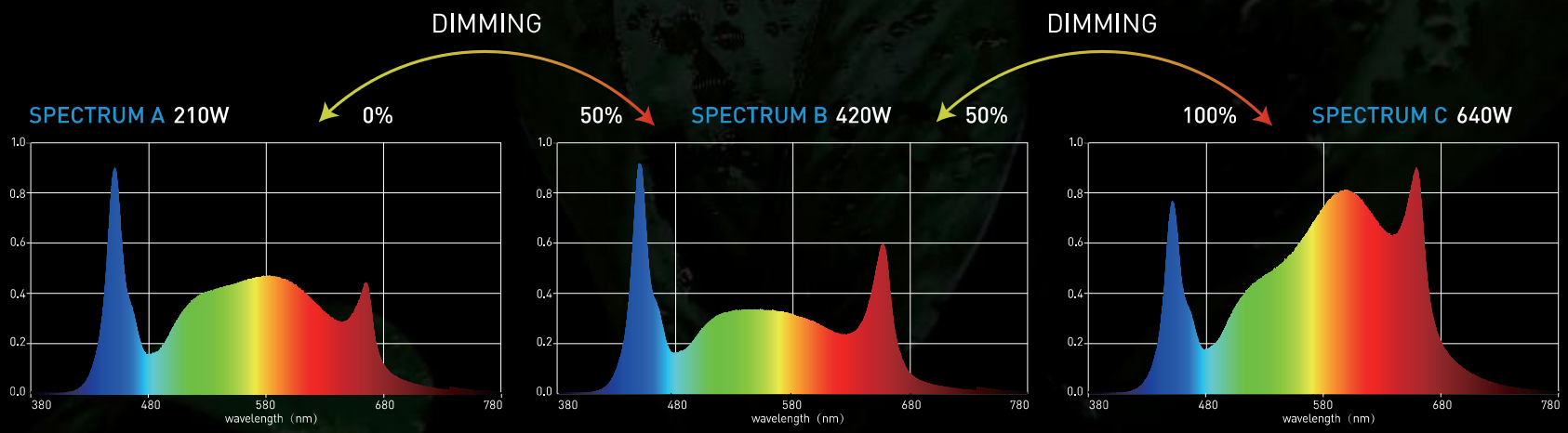
AC Input	AC100-240V / 277V	Light Source	3000K+5000K+Red(660nm)
Frequency	50/60Hz	Procut Dimensions	122x 125x 4.8cm
Actual Power	640W ± 5%	Product Carton size	130 x 11.5x 68.5cm
PPF	1730±50umol/s	Item Weight	12.5Kg(NW) / 14.8Kg(GW)
QE Rate	2.7 umol/J	HID Replacement	1000W HPS/MH
Better use for vegetative growth		Light Distribution	120°
Luminous Flux	116800Lm	Amperage	6.4A / 110V 2.67A/ 240V



ADJUSTABLE BRIGHTNESS,MORE FLEXIBLE

640W PROFESSIONAL SERIES

APP DIMMING
Network Control



Customize intensity at various growing stages, great choice for beginners and indoor growers.

LIGHTING REQUIREMENTS SUGGESTION **FOR CANNABIS VEGETATIVE GROWTH**

First week

200-350μmol/m²/s

Photoperiod hours of light

18h or more —**SPECTRUM A**

Second week

350-500μmol/m²/s

Photoperiod hours of light

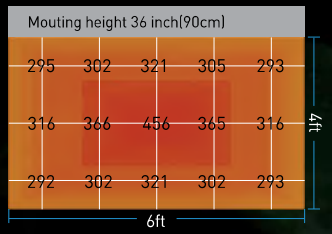
18h or more —**SPECTRUM B**

The last 14-28day

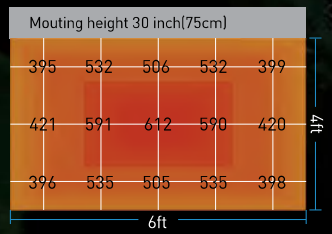
500-550μmol/m²/s

Photoperiod hours of light

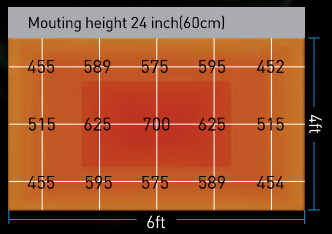
18h or more —**SPECTRUM C**



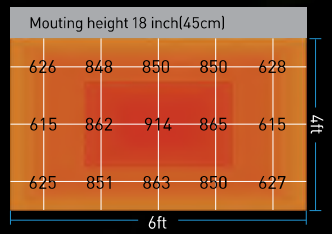
Average PPFD: 326μmol/m²/s
Middle PPFD: 456μmol/m²/s



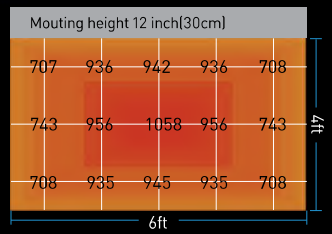
Average PPFD: 413μmol/m²/s
Middle PPFD: 612μmol/m²/s



Average PPFD: 464μmol/m²/s
Middle PPFD: 700μmol/m²/s



Average PPFD: 522μmol/m²/s
Middle PPFD: 797μmol/m²/s



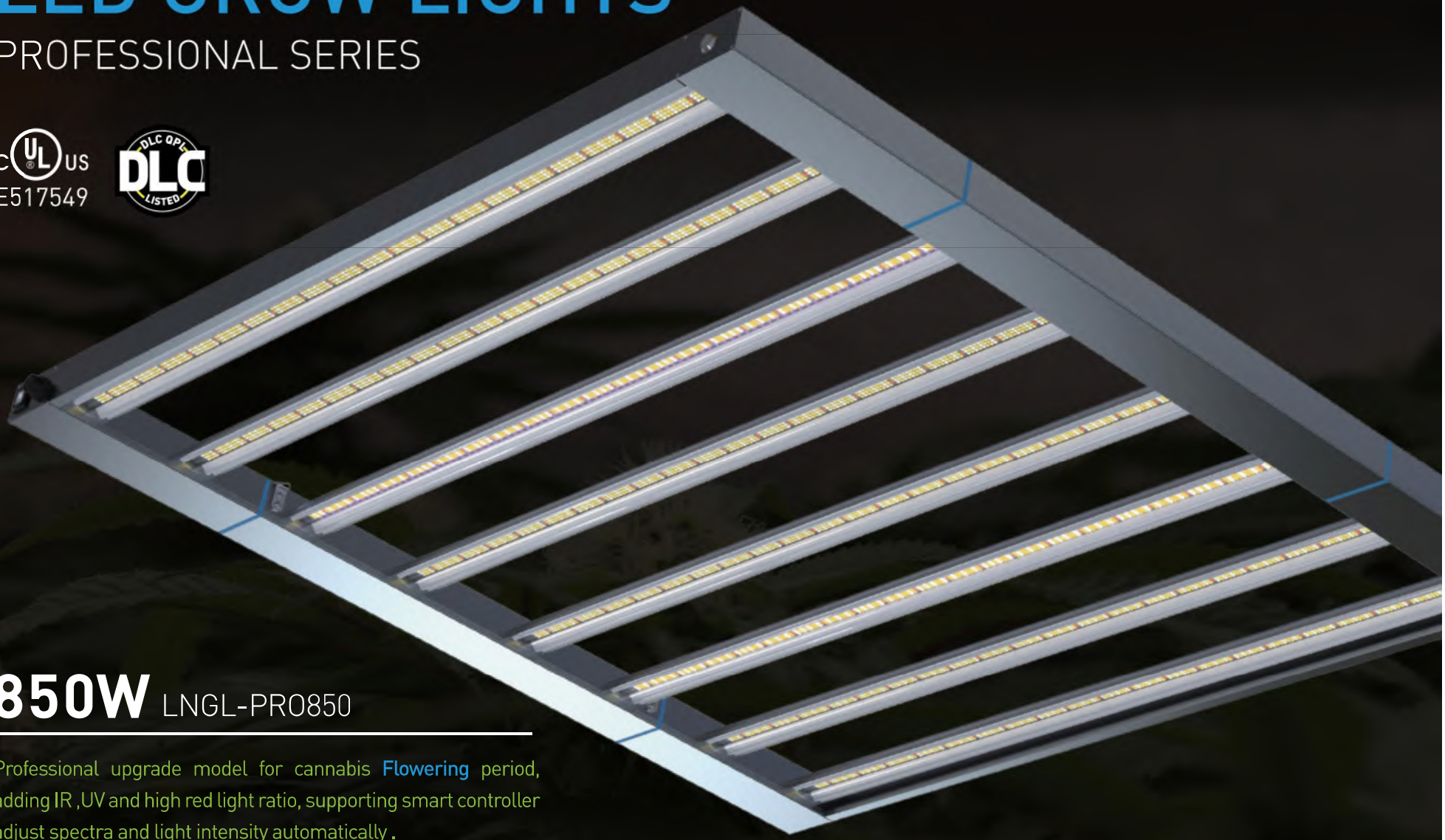
Average PPFD: 616μmol/m²/s
Middle PPFD: 1058μmol/m²/s

LED GROW LIGHTS

PROFESSIONAL SERIES

c UL us
E517549

DLC QPL LISTED



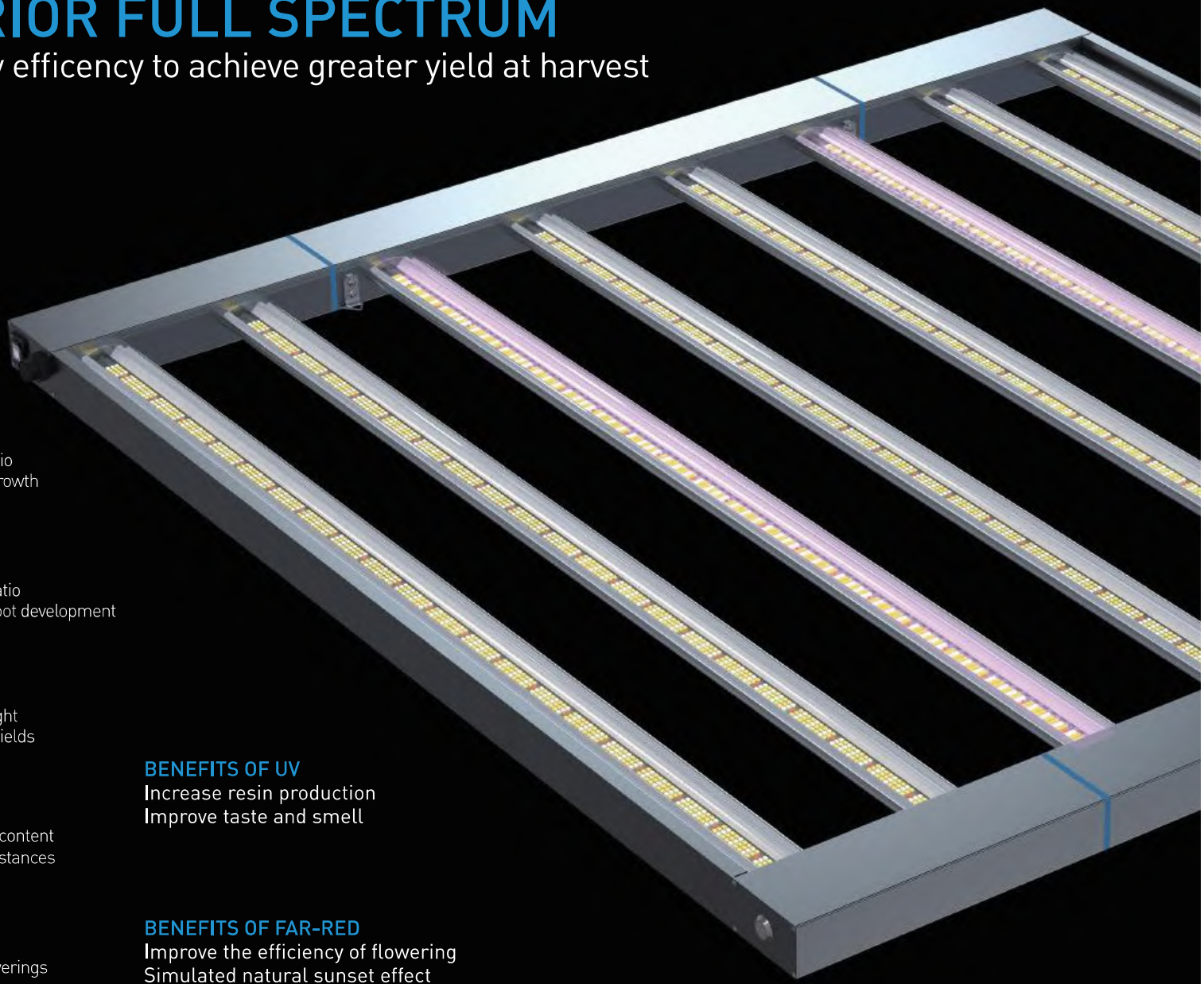
850W LNGL-PRO850

Professional upgrade model for cannabis Flowering period, adding IR ,UV and high red light ratio, supporting smart controller adjust spectra and light intensity automatically .

PROFESSIONAL SERIES

SUPERIOR FULL SPECTRUM

High energy efficency to achieve greater yield at harvest



3000K
High red ratio promotes growth

5000K
High blue ratio promotes root development

660nm
Pure red light promotes yields

395nm
Improve the content of active substances

735nm
Improve flowerings efficiency

BENEFITS OF UV

Increase resin production
Improve taste and smell

BENEFITS OF FAR-RED

Improve the efficiency of flowering
Simulated natural sunset effect
Promote plant extension and flowering

OPTIMAL PERFORMANCE

LED GROW LIGHTS

850W LNGL-PRO850

5 YEAR WARRANTY

Real Heat Sink

100% Flexible Dimmer

2.7µmol/J

NEW SMD LEDs

2300µmol/s

HIGH PPF,UNIFORM OUTPUT

PROFESSIONAL SERIES

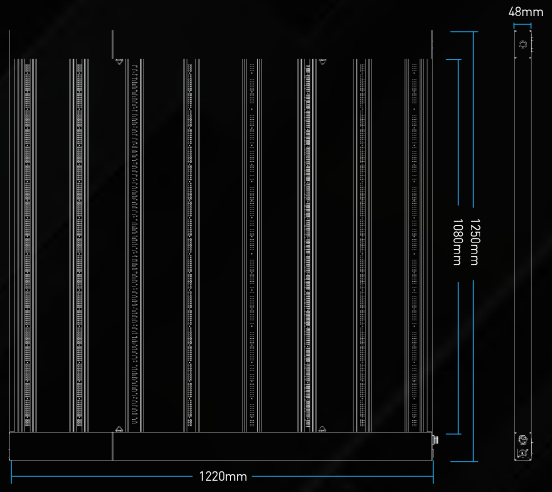
MEAN WELL
Driver

APT ELECTRONICS
LEDs

APP DIMMING
Network Control

SPECIFICATIONS (LNGL-PRO850)

AC Input	AC100-240V / 277V	Light Source	3000K+5000K+Red+IR+UV
Frequency	50/60Hz	Procut Dimensions	122x 125x 4.8cm
Actual Power	850W ± 5%	Product Carton size	130 x 11.5x 68.5cm
PPF	2300±50μmol/s	Item Weight	15.5Kg(NW) / 18.5Kg(GW)
QE Rate	2.7μmol/J	HID Replacement	1300W HPS/MH
Better use for flowering period		Light Distribution	120°
Luminous Flux	158000Lm	Amperage	8.5A / 110V 3.54A/ 240V



ADJUSTABLE BRIGHTNESS,MORE FLEXIBLE

850W PROFESSIONAL SERIES

100% Brightness
2300µmol/s

75% Brightness
1725µmol/s

50% Brightness
1150µmol/s

25% Brightness
575µmol/s

0% Brightness
Power off

10V

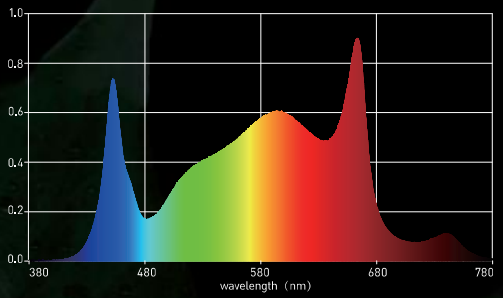
0V

Digital Dimming

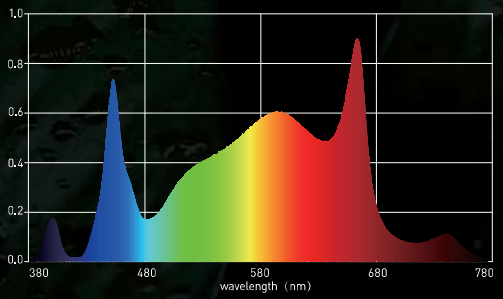
Switch

+ UV

SPECTRUM A Early stage



SPECTRUM B The last week



Customize light intensity at various growing phase, great choice for beginners and indoor growers.

LIGHTING REQUIREMENTS SUGGESTION **FOR CANNABIS FLOWERING PERIOD**

First Week

500-700μmol/m²/s

Photoperiod hours of light

12h — SPECTRUM A

2th-7th Weeks

700-800μmol/m²/s

Photoperiod hours of light

12h — SPECTRUM A

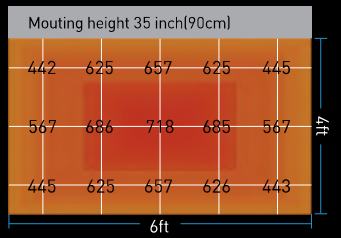
Last week before harvest

700-800μmol/m²/s

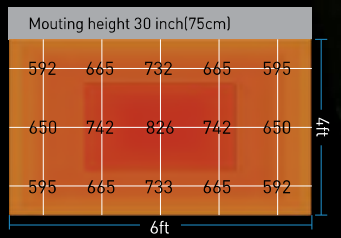
Photoperiod hours of light

12h — SPECTRUM A

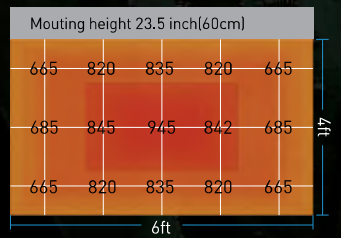
Turn the uv swicth on



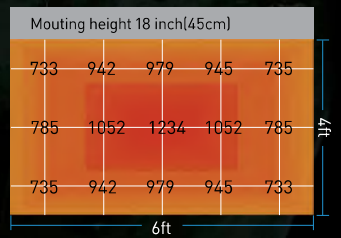
Average PPFD: 499μmol/m²/s
Middle PPFD: 718μmol/m²/s



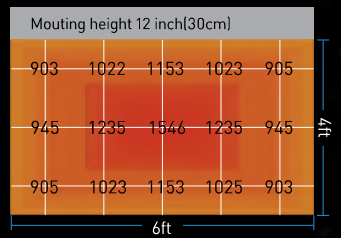
Average PPFD: 557μmol/m²/s
Middle PPFD: 826μmol/m²/s



Average PPFD: 626μmol/m²/s
Middle PPFD: 945μmol/m²/s



Average PPFD: 791μmol/m²/s
Middle PPFD: 1234μmol/m²/s



Average PPFD: 982μmol/m²/s
Middle PPFD: 1546μmol/m²/s

LED GROW LIGHTS

ECONOMICAL SERIES

c UL us
E517549

640W LNGL-ECO640

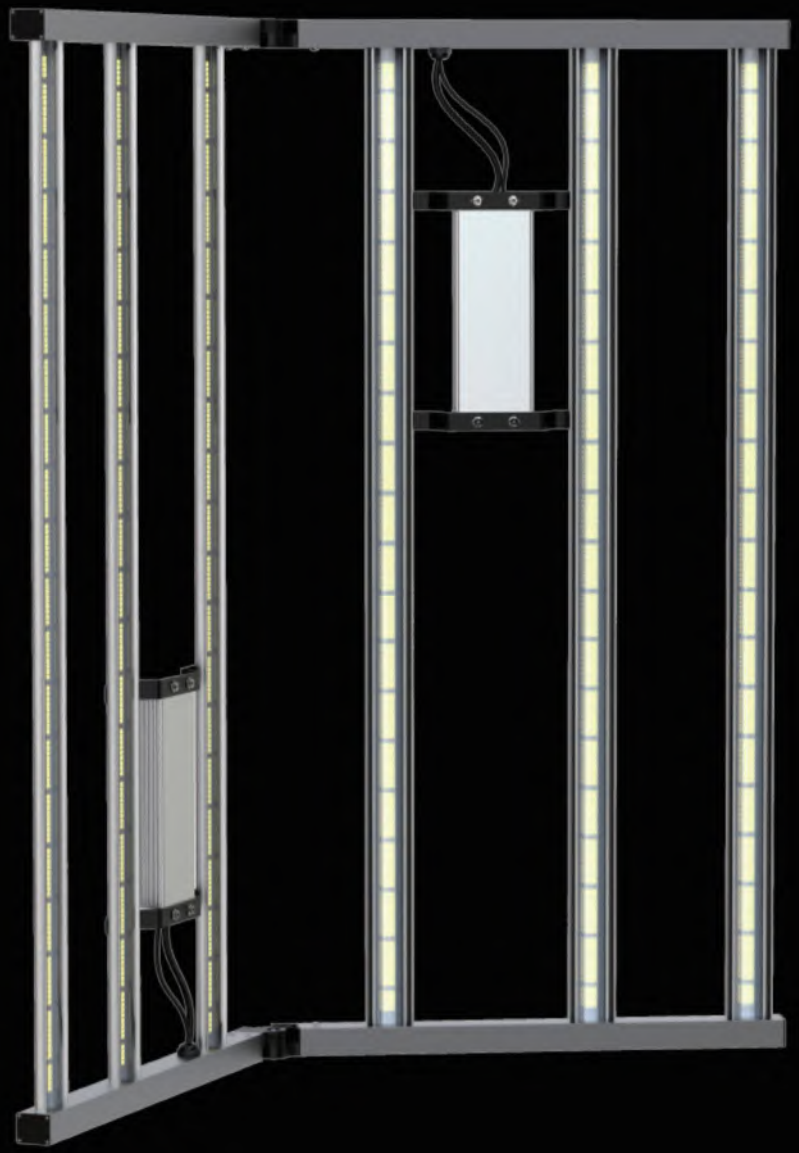
SUITABLE FOR

The full cannabis growth cycle
Cost-effective

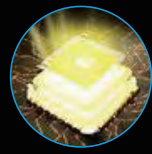
ECONOMICAL SERIES

SUPERIOR FULL SPECTRUM

High energy efficency to achieve greater yield at harvest

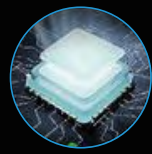


High red ratio
promotes growth



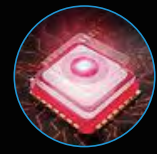
3000K

High blue ratio
promotes root development



5000K

Pure red light
promotes yields



660nm

LED GROW LIGHTS

OPTIMAL PERFORMANCE

640W LNGL-ECO640

5 YEAR WARRANT

Real Heat Sink

100% Flexible Dimmer

2.5μmol/J

NEW SMD LEDs

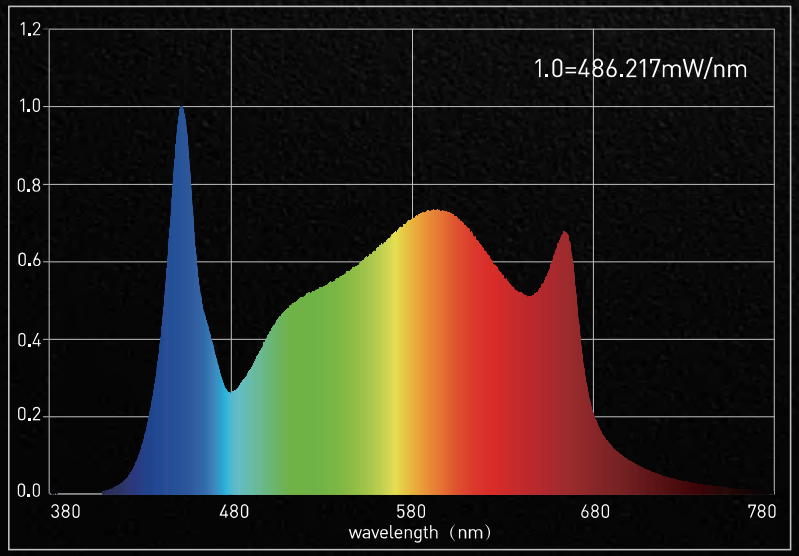
1650μmol/s

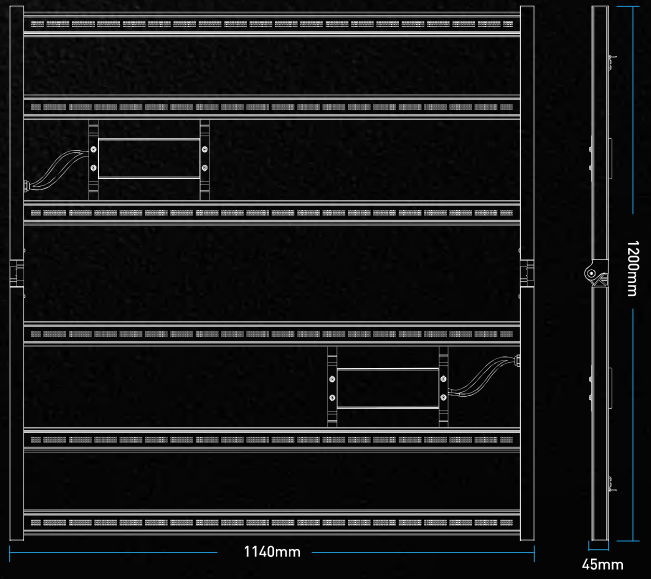
HIGH PPF,UNIFORM OUTPUT

ECONOMICAL SERIES

SPECIFICATIONS (LNGL-ECO640)

AC Input	AC100-240V / 277V	Light Source	3000K+5000K+Red(660nm)
Frequency	50/60Hz	Procut Dimensions	120x 114x 4.5cm
Actual Power	640W ± 5%	Product Carton size	120 x 13x 65.5cm
PPF	1650±50umol/s	Item Weight	11.4Kg(NW) / 12.5Kg(GW)
QE Rate	2.5 umol/J	HID Replacement	1000W HPS/MH
Use for	All growth stages	Light Distribution	120°
Luminous Flux	114500Lm	Amperage	6.4A / 110V 2.93A/ 240V





LIGHTING REQUIREMENTS SUGGESTION **FOR CANNABIS GROWTH**

Cutting Propagation

150-200μmol/m²/s

Photoperiod hours of light
18h or more — **14 Days**

Vegetative Growth

420-550μmol/m²/s

Photoperiod hours of light
18h or more — **21+ Days**

Veg-to-Flower

500-700μmol/m²/s

Photoperiod hours of light
12h — **3 to 7 Days**

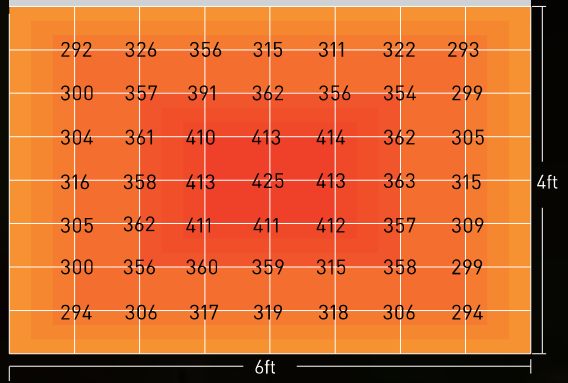
Flowering

700-800μmol/m²/s

Photoperiod hours of light
12h — **8 to 10 Weeks**

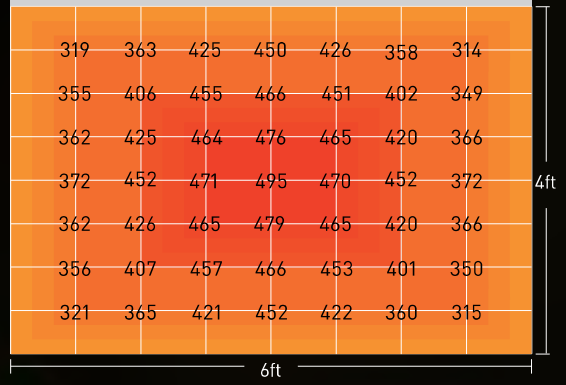
SINGLE LIGHT PPFD MAP

Mouting height 36 inch(90cm)



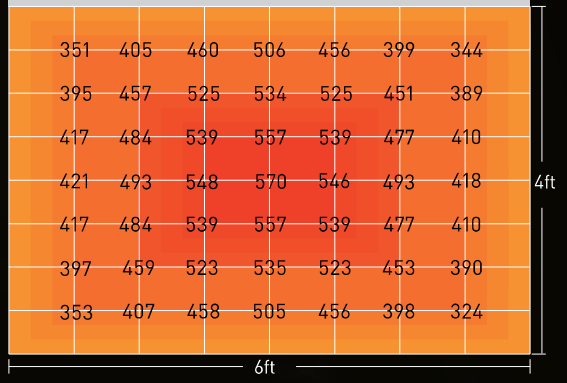
Average PPFD: 304μmol/m²/s
Middle PPFD: 425μmol/m²/s

Mouting height 31.5 inch(80cm)



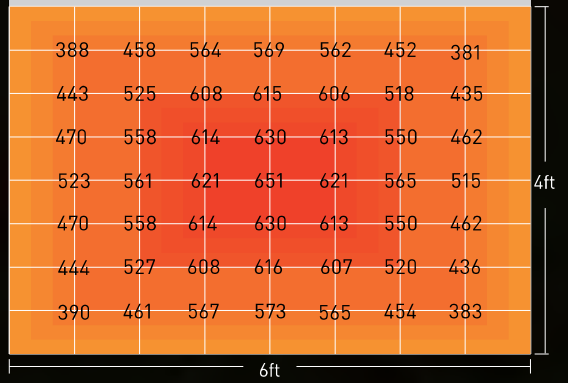
Average PPFD: 345μmol/m²/s
Middle PPFD: 495μmol/m²/s

Mouting height 30 inch(75cm)



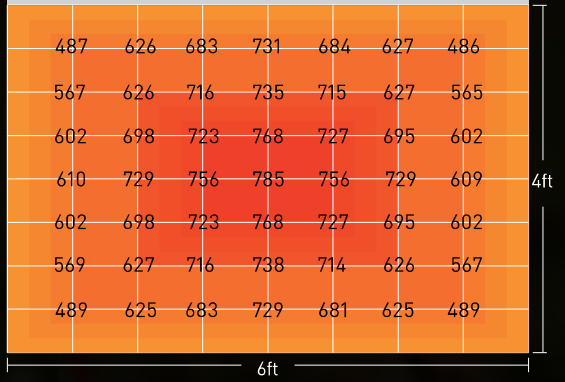
Average PPFD: 385μmol/m²/s
Middle PPFD: 570μmol/m²/s

Mouting height 24 inch(60cm)



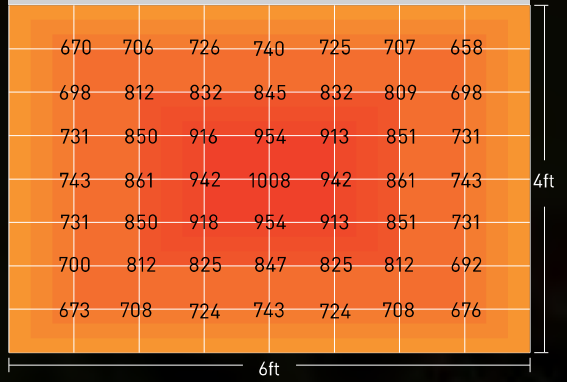
Average PPFD: 435μmol/m²/s
Middle PPFD: 651μmol/m²/s

Mouting height 18 inch(40cm)



Average PPFD: 495μmol/m²/s
Middle PPFD: 785μmol/m²/s

Mouting height 12 inch(30cm)



Average PPFD: 576μmol/m²/s
Middle PPFD: 1008μmol/m²/s

LED GROW LIGHTS

EXCLUSIVE SERIES

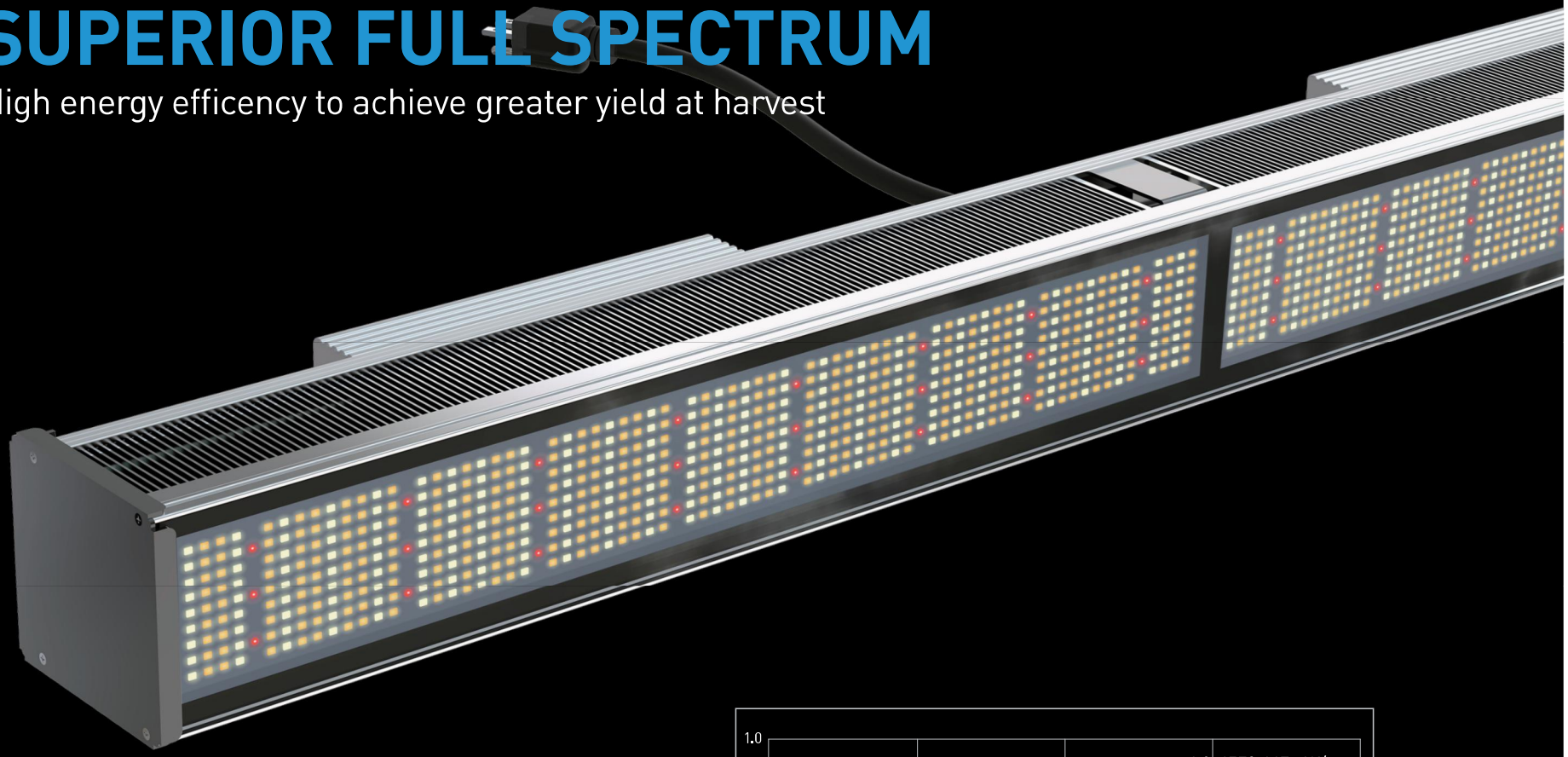
c UL us
E517549

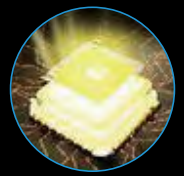
600W LNGL-EX600

EXCLUSIVE series is an advanced solution for greenhouse supplemental lighting, patented linear design can avoid blocking the natural light, no shadow to plant.

SUPERIOR FULL SPECTRUM

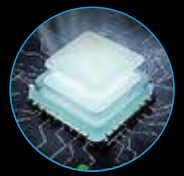
High energy efficency to achieve greater yield at harvest





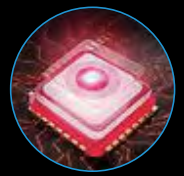
3000K

High red ratio promotes growth



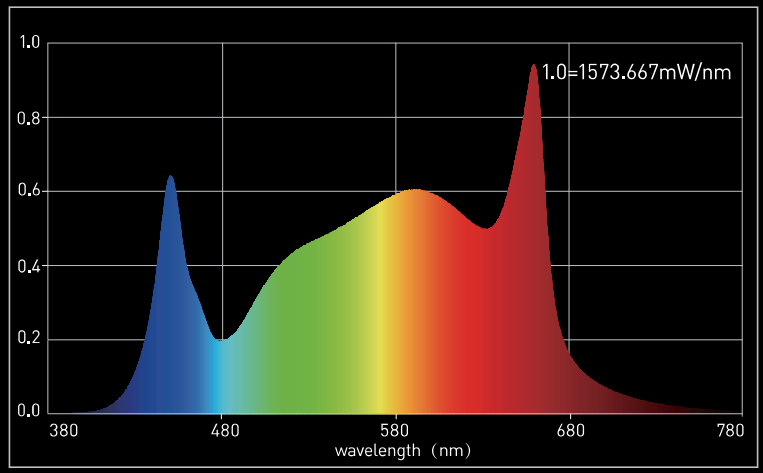
5000K

High blue ratio promotes root development



660nm

Pure red light promotes yields



LED GROW LIGHTS

OPTIMAL PERFORMANCE

2.4µmol/J

NEW SMD LEDs

1450µmol/s

HIGH PPF,UNIFORM OUTPUT

600W LNGL-EX600

5 YEAR WARRANTY

Real Heat Sink

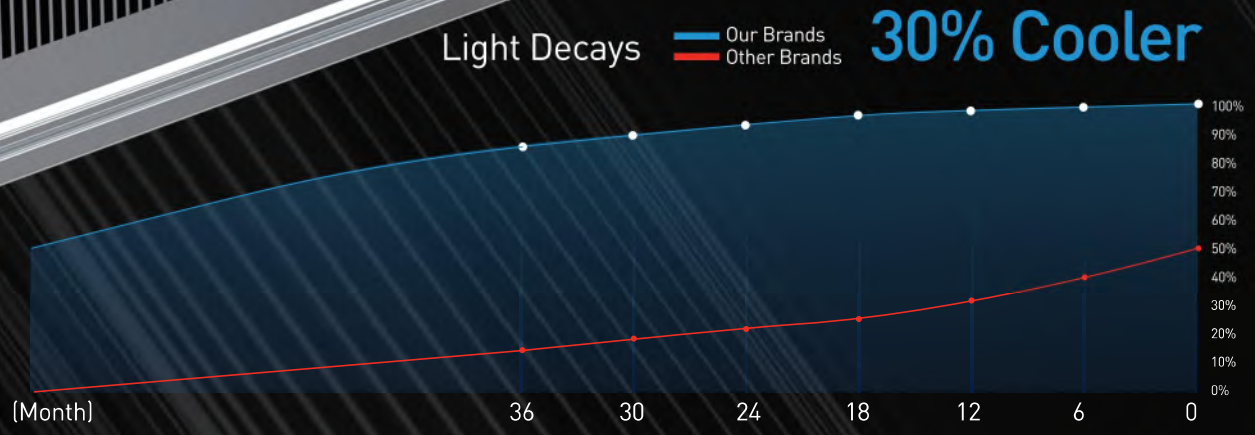
THICK REAL HEAT SINK

The higher temperature,faster the light decays.
The faster light decays,lower the yield produces.

MEAN WELL
Driver

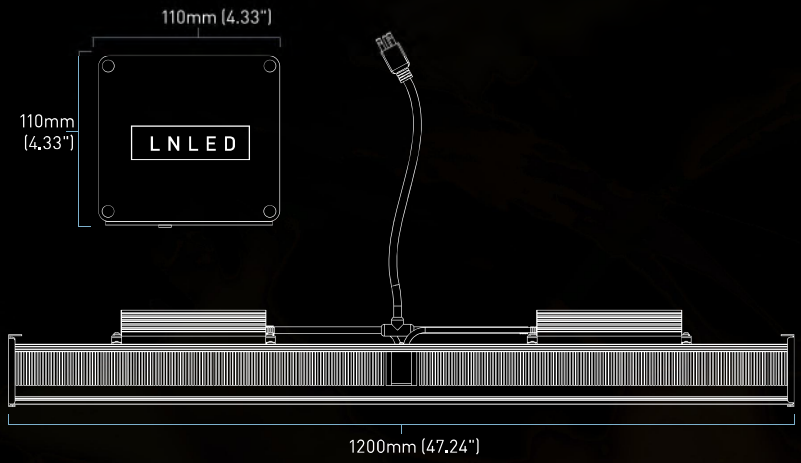
APT ELECTRONICS
LEDs

DIMMING



SPECIFICATIONS (LNGL-EX600)

AC Input	AC100-240V / 277V	Light Source	3000K+5000K+Red(660nm)
Frequency	50/60Hz	Procut Dimensions	120x 11.5x 11.5cm
Actual Power	600W ± 5%	Product Carton size	126 x 17 x 15cm
PPF	1450±50μmol/s	Item Weight	9.9Kg(NW) / 11.5Kg(GW)
QE Rate	2.4 μmol/J	HID Replacement	800W HPS/MH
Use for	All growth stages	Light Distribution	120°
Luminous Flux	96000Lm	Amperage	6.0A / 110V 2.5A/ 240V



LIGHTING REQUIREMENTS SUGGESTION **FOR CANNABIS GROWTH**

Cutting Propagation

150-200μmol/m²/s

Photoperiod hours of light

18h or more — **14 Days**

Vegetative Growth

420-550μmol/m²/s

Photoperiod hours of light

18h or more — **21+ Days**

Veg-to-Flower

500-700μmol/m²/s

Photoperiod hours of light

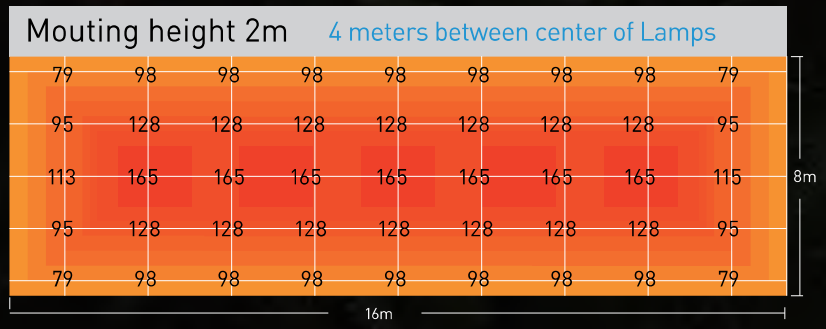
12h — 3 to 7 Days

Flowering

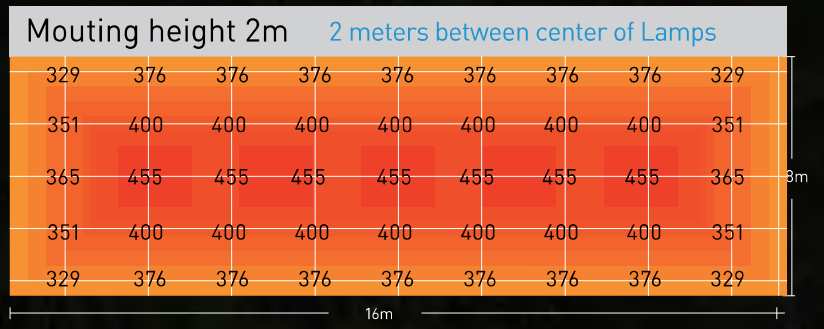
700-800μmol/m²/s

Photoperiod hours of light

12h — 8 to 10 Weeks



Average PPFD: 108μmol/m²/s Middle PPFD: 165μmol/m²/s

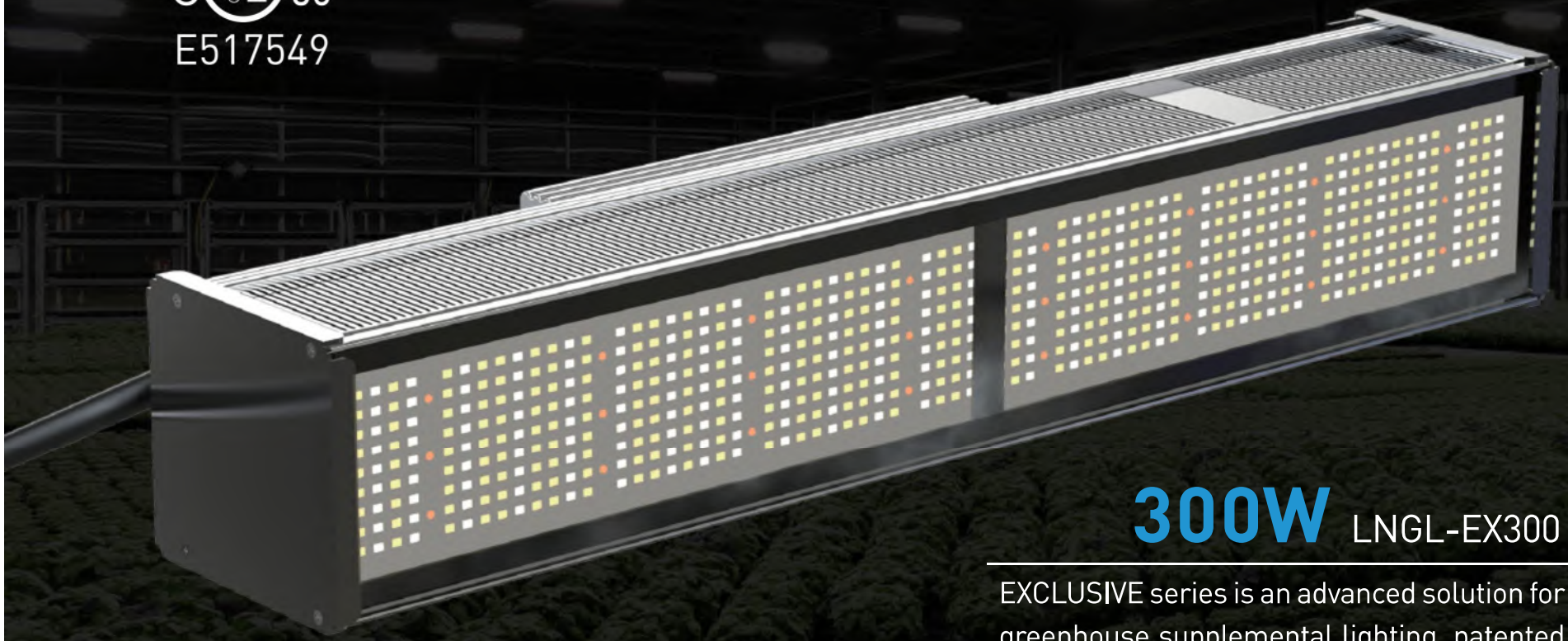


Average PPFD: 375μmol/m²/s Middle PPFD: 455μmol/m²/s

LED GROW LIGHTS

EXCLUSIVE SERIES

c UL us
E517549

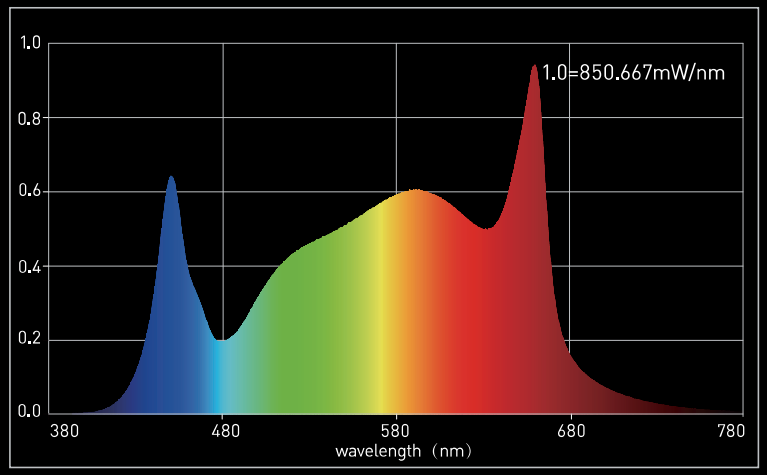


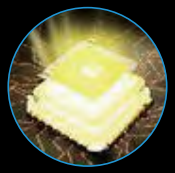
300W LNGL-EX300

EXCLUSIVE series is an advanced solution for greenhouse supplemental lighting, patented linear design can avoid blocking the natural light, no shadow to plant.

SUPERIOR FULL SPECTRUM

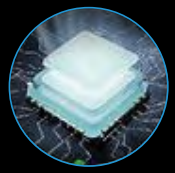
High energy efficency to achieve greater yield at harvest





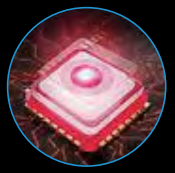
3000K

High red ratio promotes growth



5000K

High blue ratio promotes root development



660nm

Pure red light promotes yields

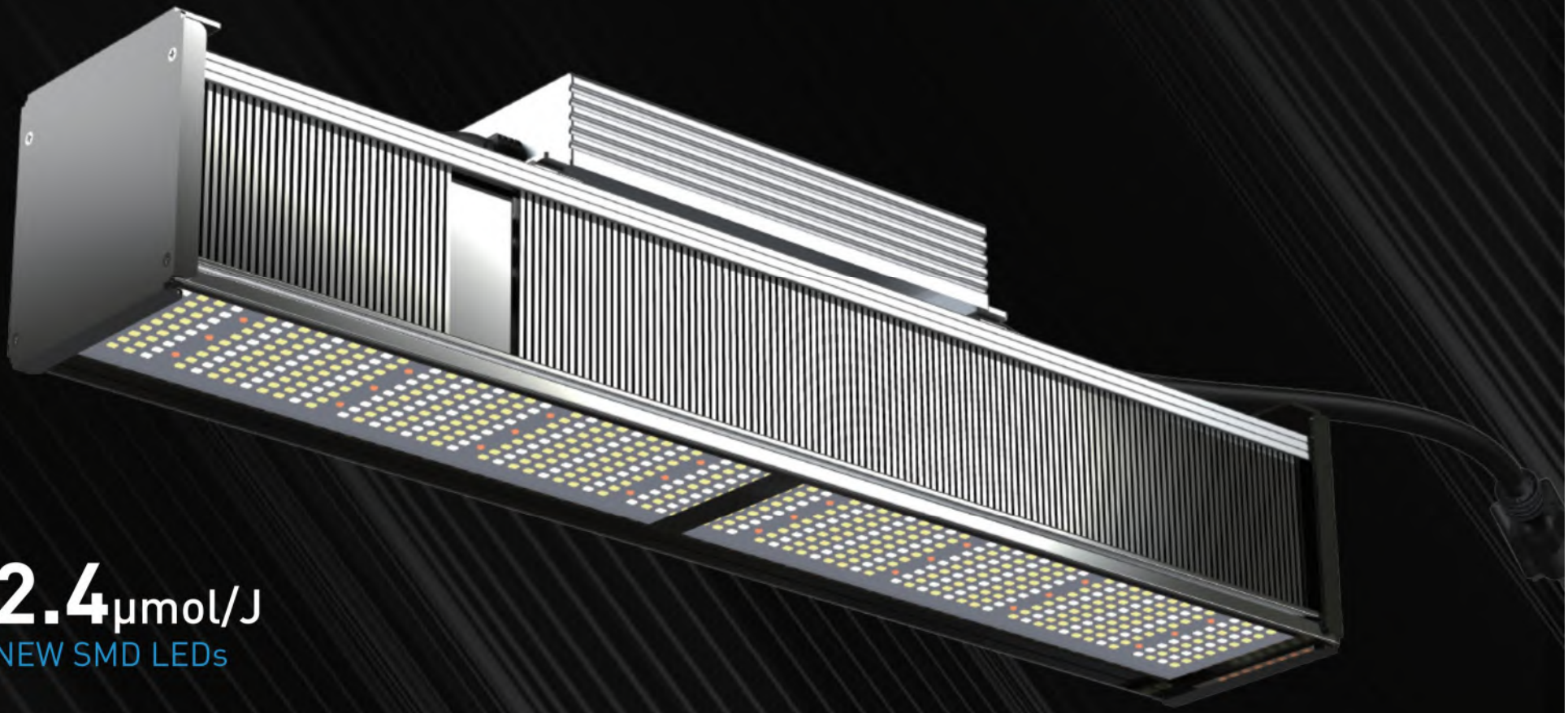
LED GROW LIGHTS

OPTIMAL PERFORMANCE

300W LNGL-EX300

5 YEAR WARRANTY

Real Heat Sink



2.4μmol/J

NEW SMD LEDs

750μmol/s

HIGH PPF,UNIFORM OUTPUT

THICK REAL HEAT SINK

The higher temperature, faster the light decays.
The faster light decays, lower the yield produces.

MEAN WELL
Driver

APT ELECTRONICS
LEDs

30% Cooler

SPECIFICATIONS (LNGL-EX300)

AC Input	AC100-240V / 277V	Light Source	3000K+5000K+Red(660nm)
Frequency	50/60Hz	Procut Dimensions	60x 11.5x 11.5cm
Actual Power	300W ± 5%	Product Carton size	66 x 17 x 15cm
PPF	750±50μmol/s	Item Weight	5.5Kg(NW) / 6.8Kg(GW)
QE Rate	2.4 μmol/J	HID Replacement	400W HPS/MH
Use for	All growth stages	Light Distribution	120°
Luminous Flux	48000Lm	Amperage 3.0A / 110V	1.25A/ 240V

LIGHTING REQUIREMENTS SUGGESTION **FOR CANNABIS GROWTH**

Cutting Propagation

150-200μmol/m²/s

Photoperiod hours of light

18h or more — **14 Days**

Vegetative Growth

420-550μmol/m²/s

Photoperiod hours of light

18h or more — **21+ Days**

Veg-to-Flower

500-700μmol/m²/s

Photoperiod hours of light

12h — **3 to 7 Days**

Flowering

700-800μmol/m²/s

Photoperiod hours of light

12h — **8 to 10 Weeks**

Mouting height 2m — 4 meters between center of Lamps

45	52	52	52	52	52	52	52	45
57	92	92	92	92	92	92	92	57
63	105	105	105	165	165	165	165	65
57	92	92	92	92	92	92	92	57
45	52	52	52	52	52	52	52	45

8m

16m

Average PPFD: 62μmol/m²/s Middle PPFD: 105μmol/m²/s

Mouting height 2m — 2 meters between center of Lamps

162	187	187	187	187	187	187	187	162
176	203	203	203	203	203	203	203	176
195	245	245	245	245	245	245	245	195
176	203	203	203	203	203	203	203	176
162	187	187	187	187	187	187	187	162

8m

16m

Average PPFD: 195μmol/m²/s Middle PPFD: 245μmol/m²/s

OPTIMAL PERFORMANCE
LED GROW LIGHTS

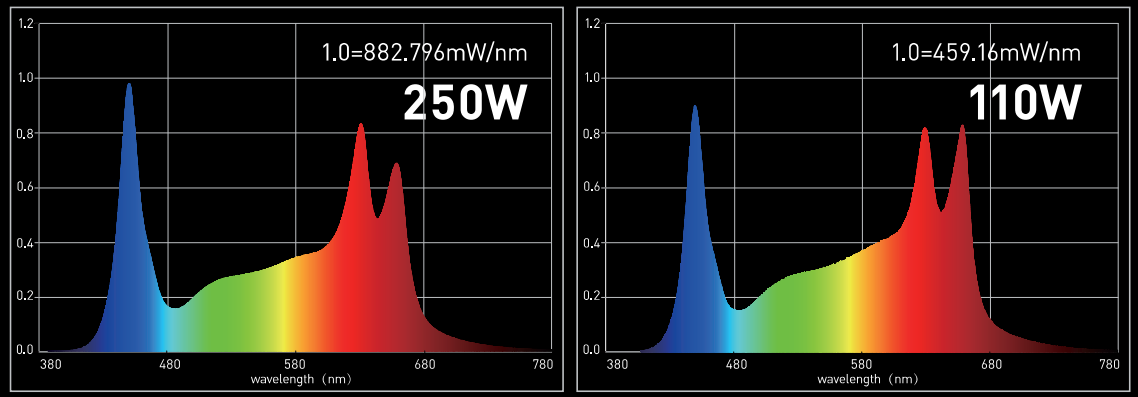
250W
SWITCH
110W

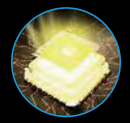
250W LNGL-UFO250

UFO series is a high-performance top-lighting solution for commercial horticulture cultivation.

SUPERIOR FULL SPECTRUM

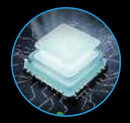
High energy efficency to achieve greater yield at harvest





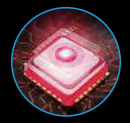
3000K

High red ratio
promotes growth



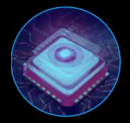
4000K

High blue ratio
promotes root development



660nm

Pure red light
promotes yields



450nm

Pure blue light
promotes boost yields

LED GROW LIGHTS

OPTIMAL PERFORMANCE

2.4µmol/J

NEW SMD LEDs

600µmol/s

HIGH PPF,UNIFORM OUTPUT

5 YEAR WARRANTY

Real Heat Sink

LED GROW LIGHTS

OPTIMAL PERFORMANCE

SPECIFICATIONS (LNGL-UFO250)

AC Input	AC100-240V / 277V	Light Source	3000K+4000K+R(660nm)+B(450nm)
Frequency	50/60Hz	Procut Dimensions	φ60 x 12.5cm
Actual Power	250W / 110W	Product Carton size	70 x 22 x 72cm
PPF	750±50μmol/s	Item Weight	6.1Kg(NW) / 7.5Kg(GW)
QE Rate	2.4 μmol/J	HID Replacement	400W HPS/MH
Use for	All growth stages	Light Distribution	140°
Luminous Flux	30800Lm	Amperage	2.5A / 110V 1.04A/ 240V

LIGHTING REQUIREMENTS SUGGESTION FOR CANNABIS GROWTH

Cutting Propagation

150-200μmol/m²/s

Photoperiod hours of light

18h or more — **14 Days**

Half open/110W

Vegetative Growth

420-550μmol/m²/s

Photoperiod hours of light

18h or more — **21+ Days**

Half open 1-7 Days

Full open 7-21+ Days

Veg-to-Flower

500-700μmol/m²/s

Photoperiod hours of light

12h — 3 to 7 Days

Full open/250W

Flowering

700-800μmol/m²/s

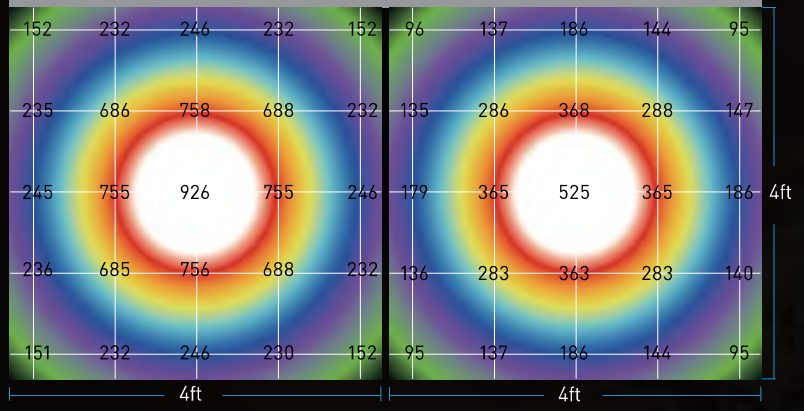
Photoperiod hours of light

12h — 8 to 10 Weeks

Full open/250W

SINGLE LIGHT PPFD MAP

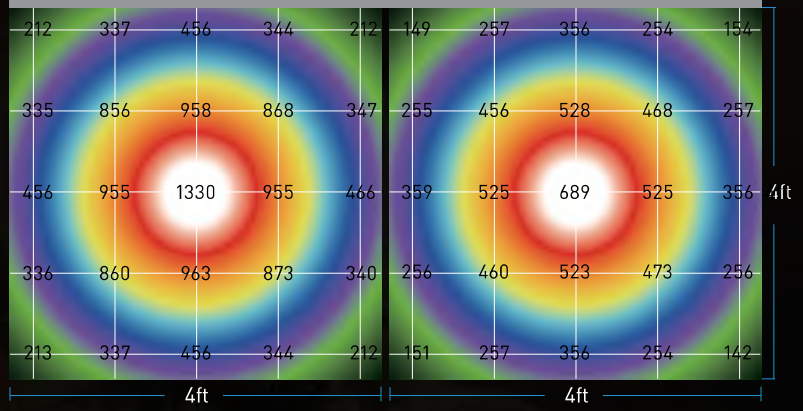
Light was positioned at 12" height(μmol/



Full open/250W
Average PPFD: 406μmol/m²/s
Middle PPFD: 926μmol/m²/s

Half open/110W
Average PPFD: 278μmol/m²/s
Middle PPFD: 525μmol/m²/s

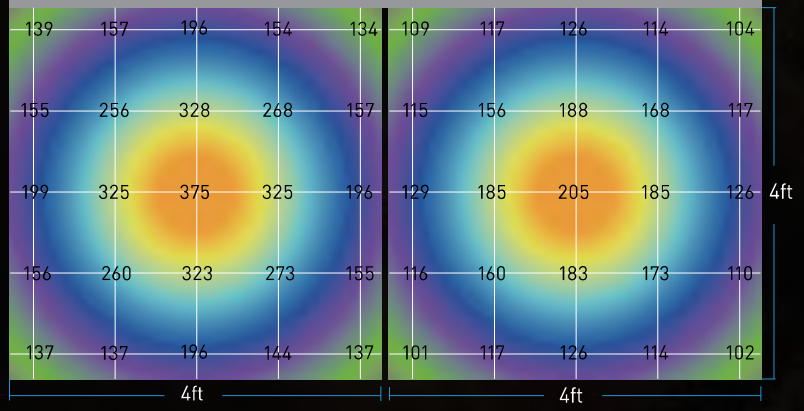
Light was positioned at 6" height(μmol/



Full open/250W
Average PPFD: 659μmol/m²/s
Middle PPFD: 1330μmol/m²/s

Half open/110W
Average PPFD: 365μmol/m²/s
Middle PPFD: 689μmol/m²/s

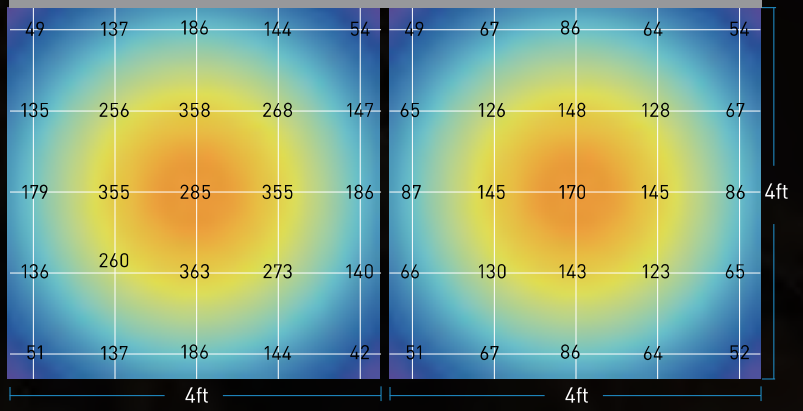
Light was positioned at 18" height(μmol/



Full open/250W
Average PPFD: 236μmol/m²/s
Middle PPFD: 375μmol/m²/s

Half open/110W
Average PPFD: 148μmol/m²/s
Middle PPFD: 205μmol/m²/s

Light was positioned at 24" height(μmol/



Full open/250W
Average PPFD: 169μmol/m²/s
Middle PPFD: 285μmol/m²/s

Half open/110W
Average PPFD: 95μmol/m²/s
Middle PPFD: 170μmol/m²/s

OPTIMAL PERFORMANCE
LED GROW LIGHTS

c UL us
E517549

220W

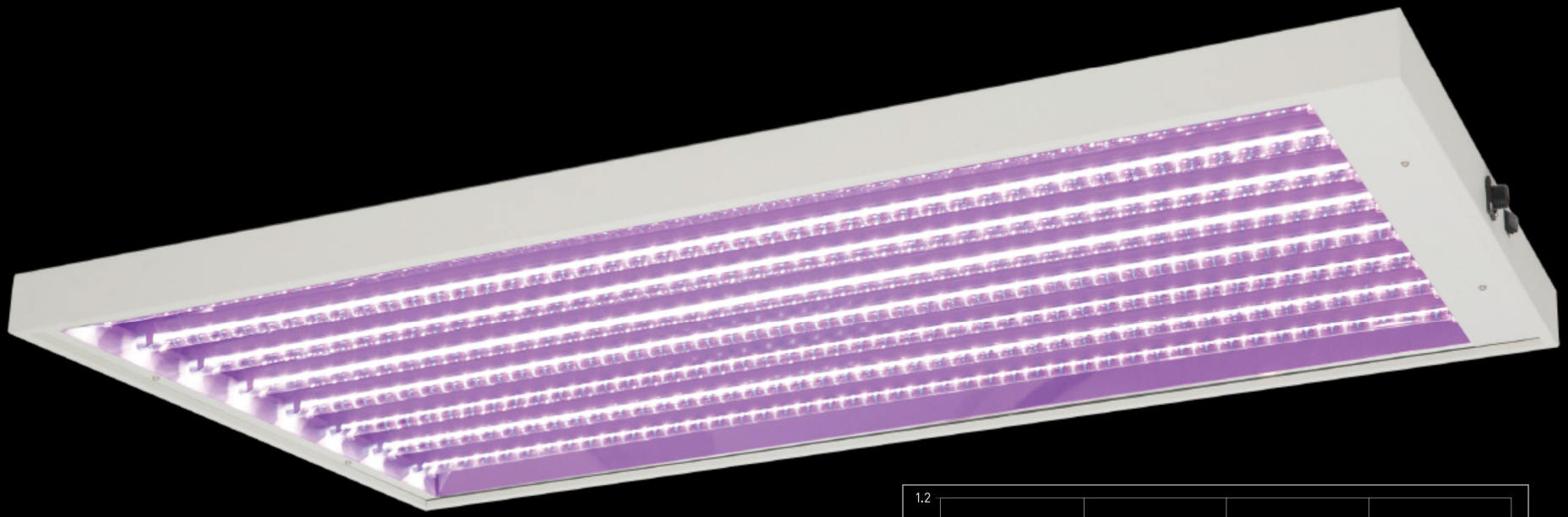
LNGL-220S-8Z

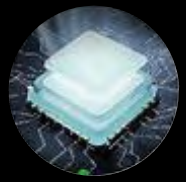
DESIGNED FOR SEEDLING

5 YEAR WARRANTY

SUPERIOR FULL SPECTRUM

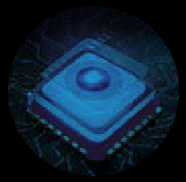
High energy efficency to achieve greater yield at harvest





5000K

High blue ratio promotes root development

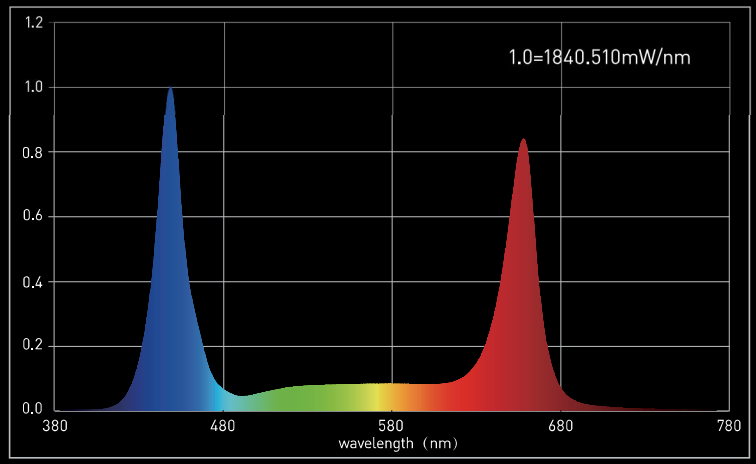


450nm

Pure blue light promotes boost yields

660nm

Pure red light promotes yields



LED GROW LIGHTS

OPTIMAL PERFORMANCE

2.2μmol/J

NEW SMD LEDs

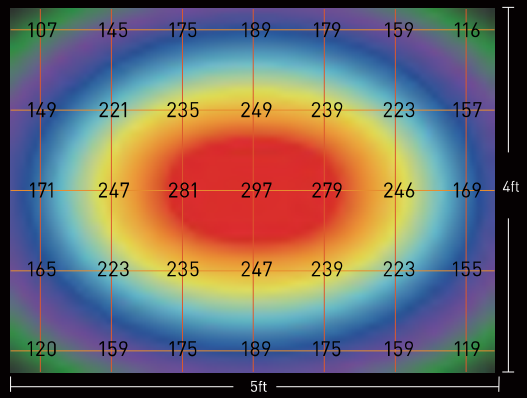
450μmol/s

HIGH PPF,UNIFORM OUTPUT

AC Input	AC100-240V / 277V	Light Source	5000K+Blue(450nm)+Red(660nm)
Frequency	50/60Hz	Procut Dimensions	125x 68x 5.1cm
Actual Power	220W ± 5%	Product Carton size	133 x 18.5 x 76cm(2pcs)
PPF	450±50umol/s	Item Weight	4.2KGS(NW)
QE Rate	2.2 umol/J	HID Replacement	300W HPS/MH
Use for	SEEDLING	Light Distribution	120°
Luminous Flux	28000Lm	Amperage	2.2A / 110V 0.92A/ 240V

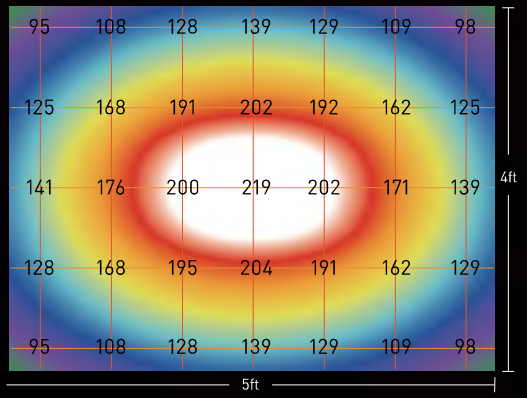
SINGLE LIGHT PPFD MAP

Light was positioned at 15" height(μmol/m²/s)



Coverage Area: 5mx4m for Seedling stage
Average PPFD: 5mx4m = 189μmol/m²/s
Middle PPFD: 299μmol/m²/s

Light was positioned at 20" height(μmol/m²/s)

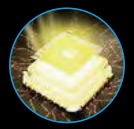


Coverage Area: 5mx4m for Seedling stage
Average PPFD: 5mx4m = 145μmol/m²/s
Middle PPFD: 219μmol/m²/s

OPTIMAL PERFORMANCE
LED GROW TUBE

SUPERIOR FULL SPECTRUM

High energy efficency Achieve greater yield at harvest



High red ratio
promotes growth

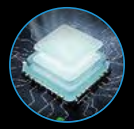
3000K

Pure red light
promotes yields

660nm

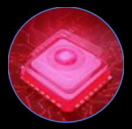
UV, improve the content
of active substances

395nm



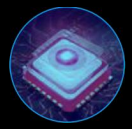
High blue ratio
promotes root development

5000K



IR, improve flowerings
efficiency

735nm



Pure blue light
promotes boost yields

450nm

LED GROW LIGHTS

OPTIMAL PERFORMANCE

SPECIFICATIONS(0.6m)

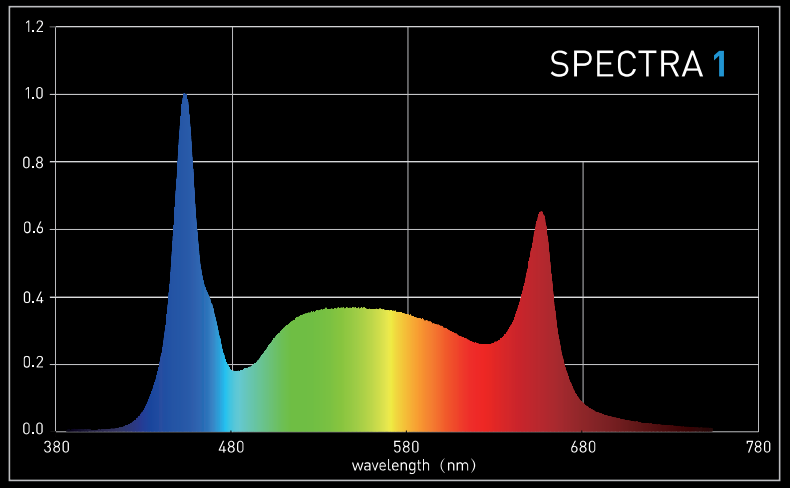
AC Input	DC24V or AC100-277V	Use for	Shelf
Frequency	50/60Hz(AC)	Procut Dimensions	φ28x600mm
Actual Power	12W ± 5%	Item Weight	0.15KGS
PPF	25μmol/s	HID Replacement	50W Fluorescent lamp
QE Rate	2.2μmol/J	Total Harmonic Distortion	< 15%
Efficacy	140Lm/W	Light Distribution	120°

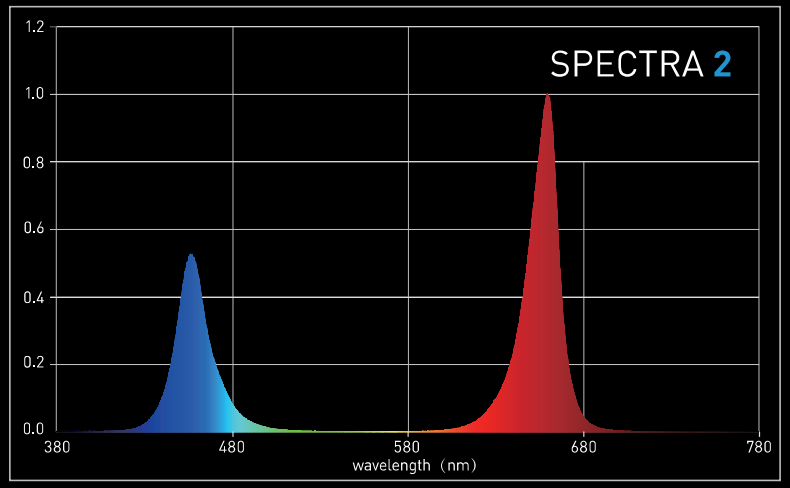
SPECIFICATIONS(1.2m)

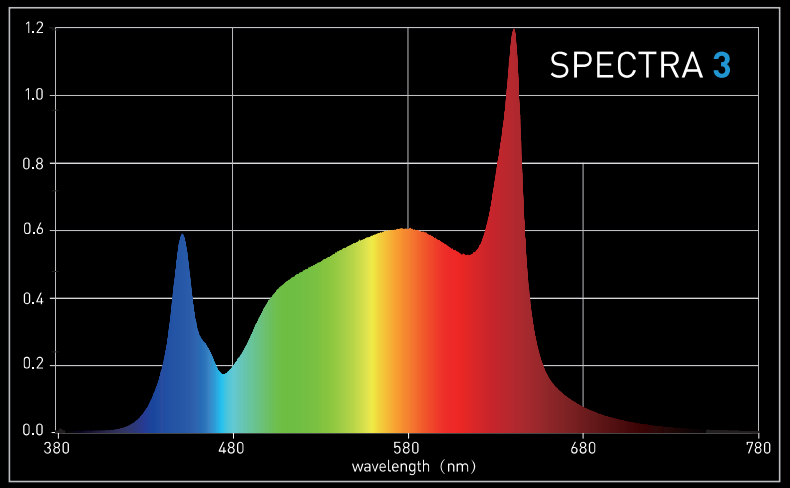
AC Input	DC24V or AC100-277V	Use for	Shelf
Frequency	50/60Hz(AC)	Procut Dimensions	φ28x1200mm
Actual Power	25W ± 5%	Item Weight	0.22KGS
PPF	50μmol/s	HID Replacement	100W Fluorescent lamp
QE Rate	2.0μmol/J	Total Harmonic Distortion	< 15%
Efficacy	140Lm/W	Light Distribution	120°

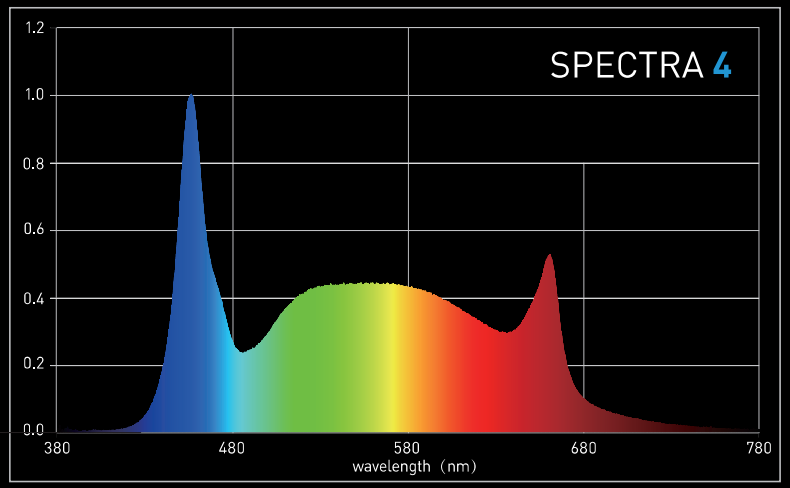
MULTIPLE SPECTRA

Different spectra for different purposes









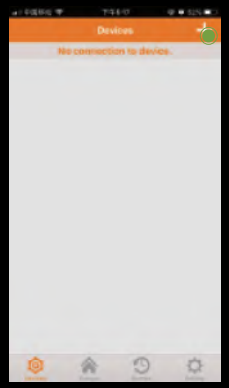
CONTROLLER INTRODUCTION

Product features

- No need for a switchboa.
- Easy and safe installation (low voltage device).
- Protected against short circuit.
- Double temperature safety feature.
- Control up to 100 lamps.
- Show output as W or %.
- Auto shutdown at temperature setting.
- APP Smart control of lamps.

Connect mobile phone with controller

1.Download"SmartMesh" from App store or Google Play.

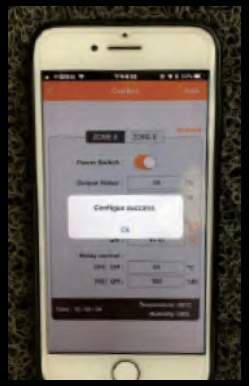


On setting ID page, there is ID's QR code to scan.(See page 5)

2.Turn on Bluetooth on Phone,click"+"and scan QR code on the back of Master Controller.Then click "Next".

3.Click "PL Controller".

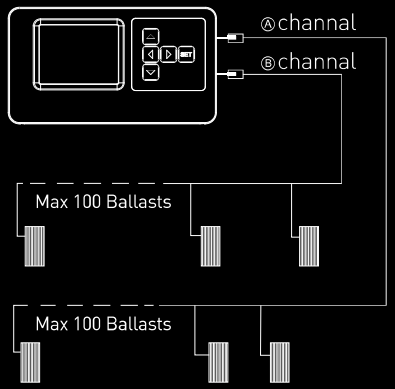
4. After the mobile phone successfully connects to the controller, the "no connect to device" prompt on the top will disappear.



5. Setting Done, then click "SAVE".

6.Done.

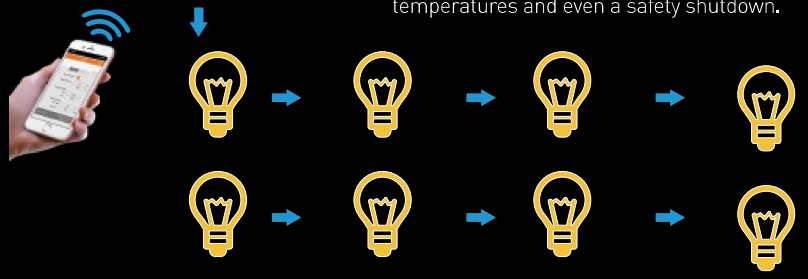
Introduction to product connection

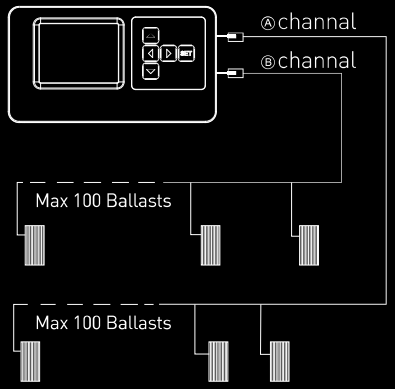


Connecting the controller to complete ballasts	
1	Switch the rotary knob on all ballasts to"EXT".
2	Plug the RJ14 end of the provided controller cable into the RJ14 main port of the controller
3	Plug the RJ14 end of the controller cable(s) into the input of a RJ14 splitter.Use an Interconnect cable to connect one output of the RJ14 splitter to the RJ14 port the ballasts
4	Use an interconnect cable to connect one output of the RJ14 splitter to the input of the following RJ14 splitter
5	Repeat this process to connect up to 100 pcs ballasts

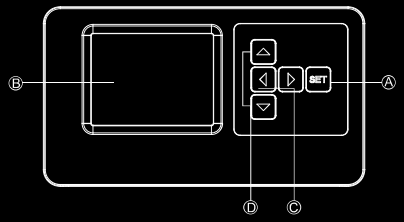
- Set output level from 0% to 115%.
- Sunrise/Sunset Timing Setup.
- Temperature and Humidity Sensors with solid cable connection.
- APP Operation on the Phone to Master Controller via BlueTooth.

- These fixture can be controlled centrally by our Smart controller.
- This replaces the often cumbersome installation with contactors and clocks， adds safety features such as automatic dimming of your lights at high temperatures and even a safety shutdown.

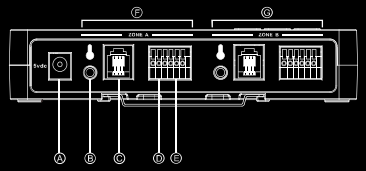




Connecting the controller to complete ballasts	
1	Switch the rotary knob on all ballasts to"EXT".
2	Plug the RJ14 end of the provided controller cable into the RJ14 main port of the controller
3	Plug the RJ14 end of the controller cable(s) into one of the two RJ14 ports of the first ballast
4	Interconnect the remote ballast to the next ballast in line using an interconnect cable with RJ14 plugs Up to 100 pcs ballasts may be daisy chained this way



CONTROLLERS		
A	key	Function
B	Set	To get cursor(long press)/Confirm (short press)
C	Display	Display status and controllermenu
D	Right/Left	Move cursor
E	Up/Down	Changer the Value



连 接	
A	5V DC input
B	3.5mm Jack aux temperature sensor
C	RJ14 aux port for controlling up to 100 pcs ballasts
D	Relay switch controlled by temperature senor
E	Relay switch controlled by humidity
F	Zone A
G	Zone B，same functions as Zone A

(1) Click Setting Icon on the Lower Right Conner .

★ Menu

★ 0-10V.PWN exchange

★ Sunrise/sunset settings:

1. Group A corresponds to Zone A, Group B corresponds to Zone B.
2. Click the "Active" button to start the sunrise/ sunset function of the group, Click the "Disable" button to stop the sunrise/ sunset function of the group.
3. The gradient time can be set from 0 to 60 minutes.

★ (2) Return back to home page, it is set successfully.

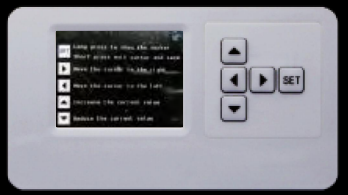
400
600
630
800
1000
315

The Default Power

User Custom Power

★ Notes : Above is the power setting or order, User Custom Power comes last,users can choose the corresponding power according to the needs.

★ On setting ID page,there is ID's QR code to scan



★ Help Page

Android

IOS

Custom power : Custom power can be selected in the power settings on the main page.

Percentage (Min): Set the minimum percentage of main page power.

Percentage(Max): Set the maximum percentage of the main page power.

OUR LABORATORY

OUR ENGINEERING CASE

Los Angeles, USA

Los Angeles, USA

Amsterdam

Munich, Germany

Vancouver, Canada

Lighting Requirements for Cannabis

	Propagation & Cutting 14 Days	Vegetative Growth 21+ Days Depending on strategy	Veg-to-Flower Transition 3-7 Days	Flower 8-10 Weeks Including transition and depending on cultivar	Stock Plants (mothers) Slow Growth	Stock Plants (mothers) Rapid Growth
Avg. Light Intensity Measured in µmol $m^{-2}s^{-1}$	150-200	200 Increasing gradually to 450-550 over 21 days	450-550 Increasing to 700-800	700 - 800	350-450	500-600
Photoperiod Hours of light	18	18	12	12	18	18
Ambient Room Temp. (Day) F° | C°	70-72 °F 21-23 °C	80-85 °F 26-29 °C	80-85 °F 26-29 °C	80-85 °F 26-29 °C	70-75 °F 21-24 °C	80-85 °F 26-29 °C
Ambient Room Temp. (Night) F° | C°	60-70 °F 16-21 °C	70-75 °F 21-24 °C	70-75 °F 21-24 °C	70-75 °F 21-24 °C	65-70 °F 18-21 °C	70-75 °F 21-24 °C
Ambient Relative Humidity (Day) (RH)	100% until root-ed within 4-7 days, then vent to 80%	75-80% (early) 55-67% (mid/late veg)	55-67%	55-67% (early) 50-62% (mid/late flower)	50-60%	55-67%
Ambient Relative Humidity (Night) (RH)	Same as daytime,see "Propagation"section below for more information	75-80% (early) 55-67% (mid/late veg)	55-67%	55-67% (early) 42-57% (mid/late flower)	50-60%	55-67%
Vapor Pressure Deficit (Day) (Measured in kPA)	0	0.67-1.00 (early) 1.11-1.80 (late)	1.11-1.80	1.11-1.80 (early) 1.28-2.00 (late)	1.00-1.49	1.11-1.80
Vapor Pressure Deficit (Night) (Measured in kPA)	0	0.50-0.75 (day) 0.82-1.34 (night)	0.82-1.34	0.50-0.75 (day) 0.82-1.34 (night)	0.83-1.24	0.82-1.34
CO_2 Enrichment (Measured in ppm)	-	1200-1500	1200-1500	1200-1500	0	1200-1500

What is grow light and how is it used?

※**Supplemental Lighting**
To supplement natural daylight and raise grow light levels in order to enhance photosynthesis and thereby improve growth and quality of plants in greenhouses.

※**Photoperiodic Lighting**
To control the light period by extending the natural day length with artificial light.

※**Cultivation without daylight**
To totally replace daylight with artificial light for ultimate climate control.

How does grow light affect the plant growth?

※ **Light quantity**
The amount of light affects the photosynthesis process in the plant. This process is a photochemical reaction within the chloroplasts of the plant cells in which CO2 is converted into carbohydrate under the influence of the light energy.

※ **Light quality regarding spectral composition of the light**
The spectral composition of the different wavelength regions (blue, green, yellow, red, far red or invisible e.g. UV or IR) is important for the grows, shape, development and flowering (photomorphogenesis) of the plant. For the photosynthesis, the blue and red regions are most important.

※ **Light duration**
The timing / light duration which is also called photoperiod is mainly affecting the flowering of the plants. The flowering time can be influenced by controlling the photoperiod.

Photon: Discrete bundle (quantum) of electromagnetic radiation (light). Can be considered to be a particle (although it displays properties of waves as well). The energy of a photon depends upon its wavelength. Conversely, if the energy & wavelength are known, the number of photons can be calculated

Photosynthetically Active Radiation (PAR): Radiation between 400 nm and 700 nm. Spectral region most useful to plants for photosynthesis

Photosynthetic Photon Flux Density (PPFD): Radiation between 400 nm and 700 nm. Radiation hitting a surface
Photosynthesis: A process used by plants and other organisms to convert light energy into chemical energy that can be later released to fuel the organisms' activities. This chemical energy is stored in carbohydrate molecules, such as sugars, which are synthesized from carbon dioxide and water.

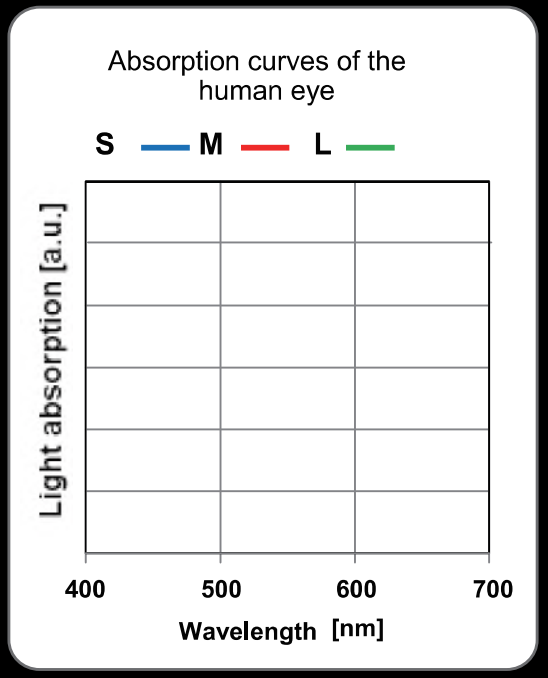
Germination: Germination is the process by which a plant grows from a seed. It is also known as sprouting of a seedling from a seed.

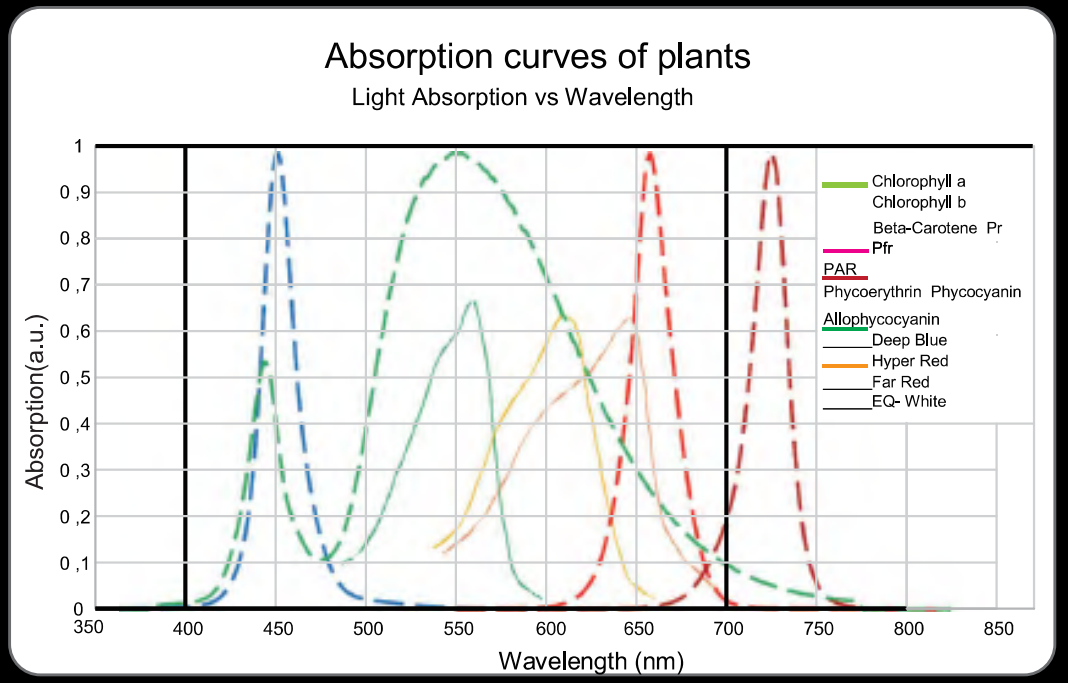
Vegetative Growth: Vegetative Growth is the period between germination and flowering. It is also known as vegetative phase of the plant development. During this phase the plants are performing photosysthesis and accumulating resources which will be used for the flowering and reproduction in the later stage.

Photomorphogenesis: Because light is the energy source for plant growth, plants have evolved highly sensitive mechanisms for perceiving light and using that information for regulating development changes to help maximize light utilization for photosynthesis. The process by which plant development is controlled by light is called photomorphogenesis. Typically, photomorphogenic responses are most obvious in germinating seedlings but light affects plant development in many ways throughout all stages of development.

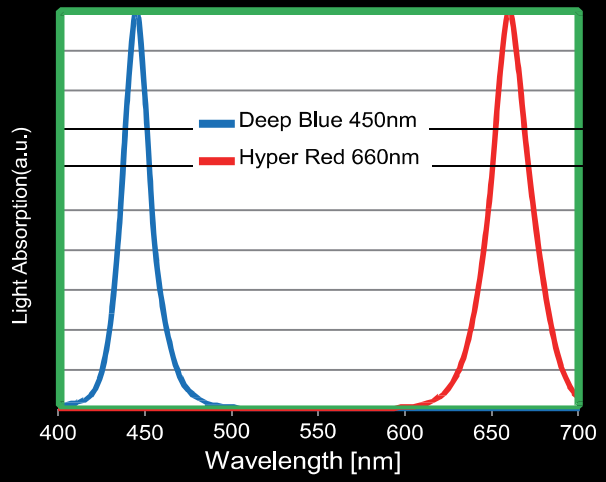
Difference in absorption curves for photochemical reactions between the human eye and plants

Light is generating a photochemical reaction.
In our eye it is reacting with the photo receptor in different versions S, M and L.
In plants, the light is reacting with Chlorophyll a and b.





Grow Lights 450nm and 660nm provide the energy for the plant



The 450nm and the 660nm are providing the energy for the plant to life and grow. The amount of light is not measured in lumen but in amount of photons. The common unit in horticulture lighting is µmol/s in the range of 400-700 (photosynthetically active region)

PAR 400 – 700nm

Usually the customer will request for a certain photon flux level in µmol/s.
The values can be put in our horticulture calculator to derive the number of LEDs

Horticulture System Calculator

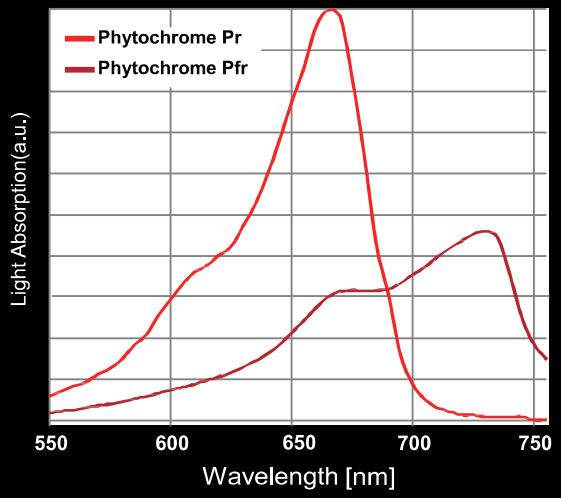
Photomorphogenic effects are mainly influenced by the phytochromes Pr and Pfr

Phytochrome Pr and Pfr

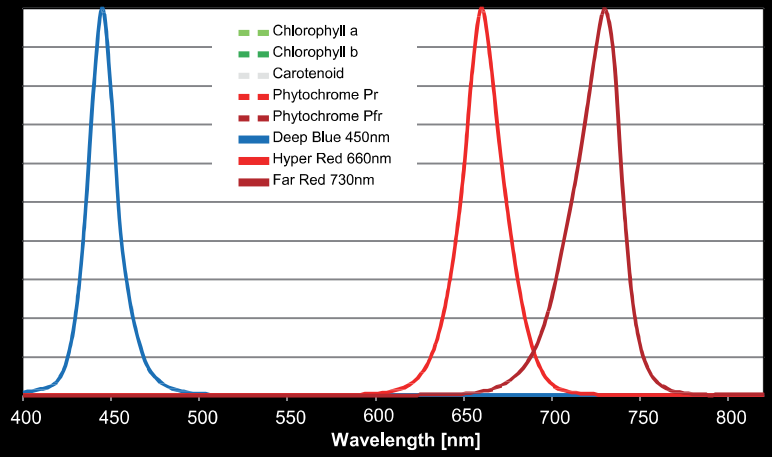
The Phytochromes pr (red) and pfr (far red) are mainly influencing the germination, plant growth, leave building and flowering.

Phytomorphogenic effects

The phytomorphogenic effects are controlled by applying a spectrum with a certain mix of 660nm and 730nm in order to stimulate the pr and pfr phytochromes.



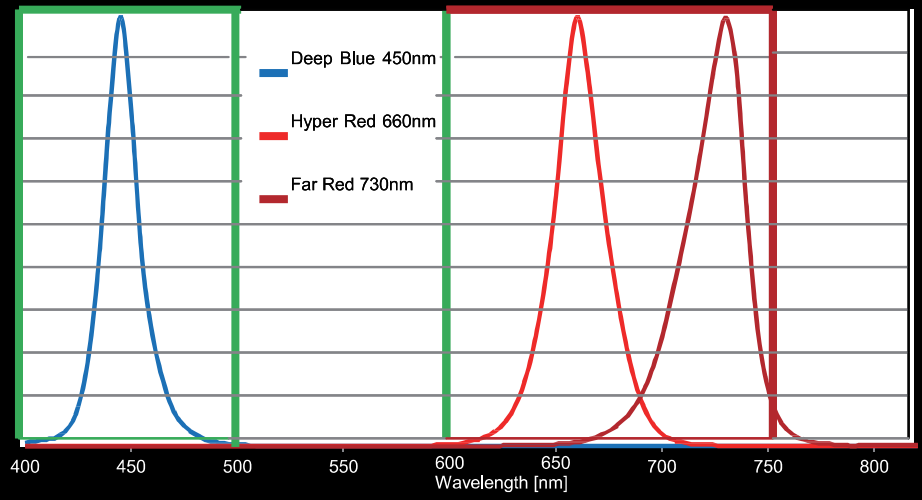
Therefore we are focusing in horticulture lighting on the 450nm, 660nm and 730nm LEDs



All three important wavelength are available in the same LED package:

Grow Lighting - What are the LEDs and colors used for horticulture lighting?

The typical wavelength used for horticulture lighting are 450nm and 660nm. For the control of the plants 730nm are used



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