



Horticultural

Lighting Solutions

LIGHTING
LED



About Us

Our company, PSL Electronic, which is the first Turkish company that applies Fiber Optic lighting systems in Turkey as a manufacturer, was established in Antalya 1991. Our company, which concentrated on "Professional Audio and Light" systems at first, pursued studies on decorative Fiber Optic lighting applications in 1997 and accomplished applications which are highly successful and each of which is a first and trendsetter in its field.

The achieved successful projects have derived our company to concentrate in the field of decorative architectural lighting and our company, gradually pulling away from the field of "audio and light" systems, completely steered towards the field of lighting by creating the "FIBERLI" brand in 2000s.

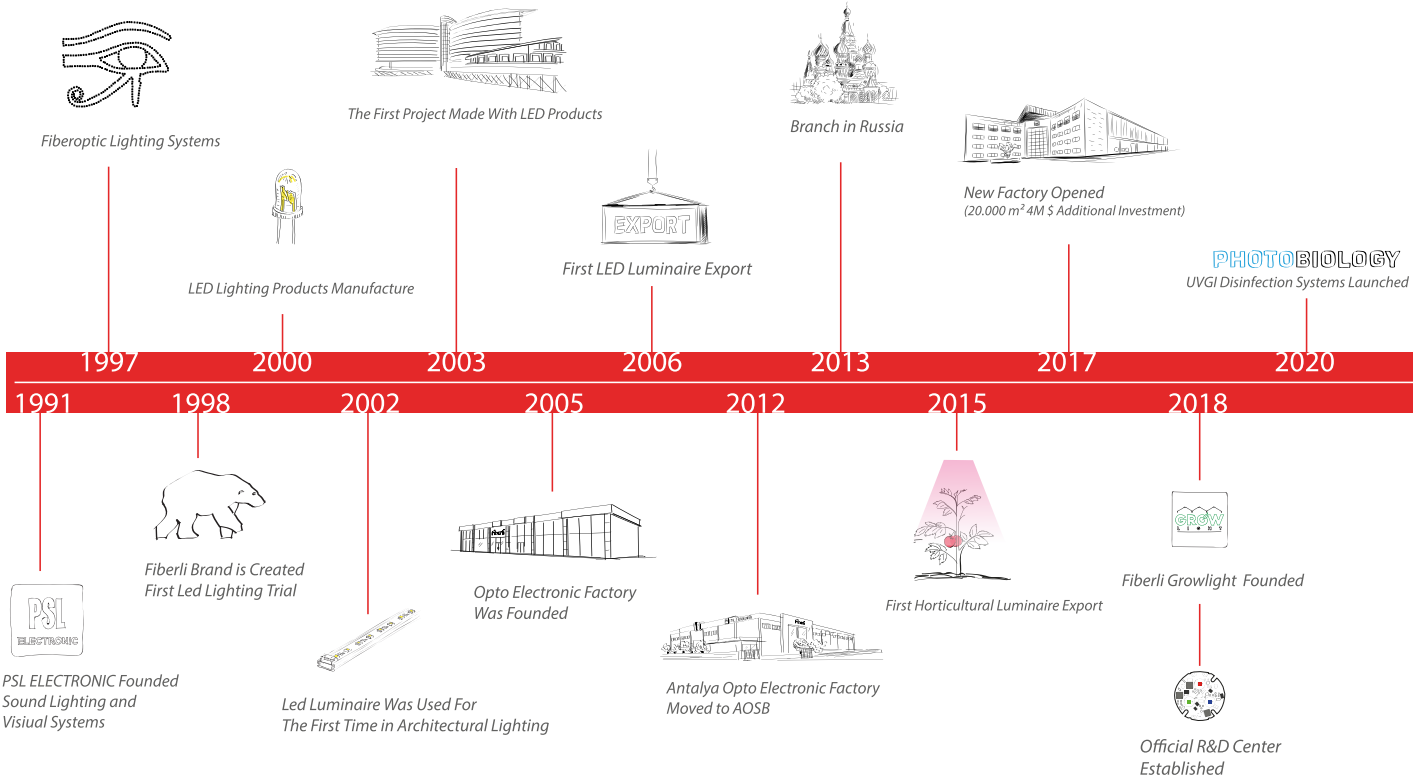
In 2017, for the purpose of providing a service with much higher capacity, pace and quality, we have moved to our new factory established on a 20.000 m² area within the Antalya Organized Industrial Zone and commenced manufacturing. Presently our company, which has accomplished more than 800 large scaled projects up until now;

- Has nearly 300 hundred employees
- Carries out projects and applications customly designed for individuals or businesses,
- Has one of the four R&D center in Turkey's lighting industry
- Has design unit with a team of experts in lighting field.

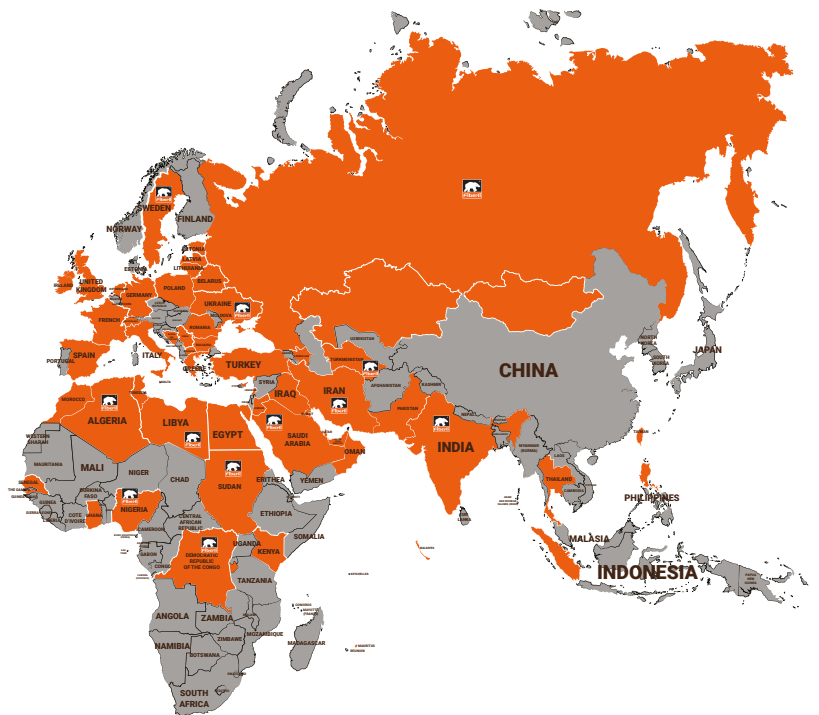
We would like to take this opportunity and once again thank you, our esteemed customers, who have guided us to this day and never refrained their support.

Why Polar Bear?

Polar bears have white, thick fur that protects them from cold since they live in vast areas covered by glaciers. In fact, they have black skin which covered with transparent hairs. The transparent hairs function as fiber optic conductors. The hairs collect ultra-violet light and direct it to the black skin where it is converted into heat. Which means energy saving by heat insulation. Given these facts , we believed a logo design with a "Polar Bear" is the best visual language which describes the perfect harmony of nature and technology for our brand "Fiberli".



Export more than **40** countries



GREEN TECHNOLOGY

Fiberli has adopted the principle of energy efficiency and sustainable environment. Due to respect for nature and life, it is preferred to use completely unleaded materials with ROHS certification in production. The research results have proven that our highly efficient products provide energy conservation and prevent tons of CO₂ emissions.





**T
S
E
B**

SEEDING

BLOOMING

GROWING

CULTIVATING

FRUCTIFICATION

CROP

TIMING

INCOME

PROFIT

ROI RATIO

HORTICULTURAL LED LIGHTING SOLUTIONS

**Fully Optimized & Automated
Processes With The Best
Flexibility & Efficiency**

FIBERLI launched the **Horticultural Lighting** product range with a perfect balance of scientific FIBERLI launched the horticultural lighting product range with a perfect balance of scientific know-how and innovative design. and innovative design.

Seasonal changes, decrease in agricultural areas and nutritional demand of the increasing population are highlighting the importance of productivity in agriculture. The light colors required for photosynthesis in agricultural luminaires are applied in a certain knee, making them an artificial light source. Thanks to the advantages of **LED technology**, conventional lighting fixtures have been transformed to **LED in the agricultural** area as in many other illuminated areas. With the low electricity consumption provided by the LED, new project investments are becoming more attractive.

Criteria*	HPS	LED
Typical Lifetime (h)	6.000-8.000h	30.000-50.000h
Light Spectrum	Static Spectrum (Very few far red and blue, too much yellow most not needed)	Able to provide the light spectrum that plant needs to be able grow.
Efficiency	Critical amount of Energy loss as it gives out unnecessary light spectrum. Also the shape of the lamp and light distribution of the lamp causes light to get lost through reflectors, holders and luminaire body design.	Most efficient umol because of requested spectrum optimization, directed light source as an advantage of LED
Ignition delay, Re-Ignition delay	3-8 minutes delay for the first run, re-ignition may take 10-15 minutes because of cooling down time as a result of energy fail.	No delay in reaching maximum level, also no delay for re-ignition
Automation	No automation chance. Just On-Off with disadvantages of ignition delays	LED is the most flexible light source because of automation compatibility. Adjustable Light Spectrums and Light Levels are possible
Design& Darkshadespots& Homogenous light distribution in greenhouse	Bigger luminaires cause dark spots and non-homogenous light distribution on plants	LED is most flexible light source because of sizes of chips. Lineer Solutions makes no dark spot on daytime with its body design. Thinner design than greenhouse metal structure is mostly possible. Also it makes homogenous continuous light distribution on plants

* Criteria comparison table for renovation of HPS lighting to LED at greenhouses.



Advantage of LED Horticultural Lighting

- ✔ Provides maximum harvest efficiency with limited investment and operating cost.
- ✔ Can be used in all kinds of agricultural facilities due to its durable structure.
- ✔ With the automation system, a self-contained system can be created by sensor and control elements.
- ✔ Higher efficiency can be achieved by adjusting the light levels that plants need at different stages such as sprouting, flowering, and fruiting.
- ✔ Since the luminaires do not overheat, they can be applied in suitable position without damaging the plants.
- ✔ Lower carbon footprint and improve quality by introducing affordable, energy efficient LEDs.

Fiberli Provides

The LED Expertise



Fiberli presents its expertise in LED Lighting and its innovative perspective in the field of agricultural lighting. Our scientists and engineers work closely together with customers to find the best solution that meets the requirements of variety of growing environments.

The Modern Greenhouse Know-How



Turkey is one of the most well known country of all in agriculture. With Turkey's experience with 2000 hectare of modern greenhouse management, it is safe to say that we have the know-how and the technology to help you create the best greenhouse environment.

Project Support



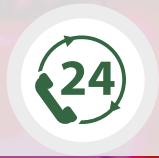
Our experts provide luminaire selection and placement support with precise measurements and evaluations. They come up with solutions to maximize efficiency by considering many variables such as location, plant type and application area.

Production, Delivery and installation



Lighting fixtures are produced and delivered in timely manner and with the Fiberli quality. According to project content, our expert technical team can offer fast and secure installation support without affecting your operation.

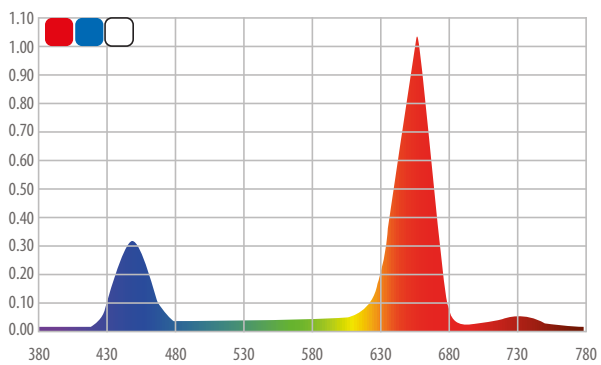
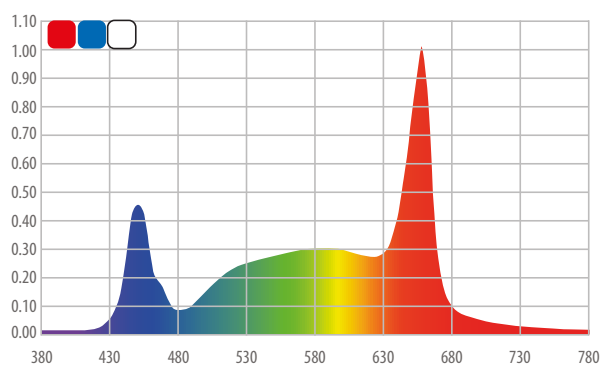
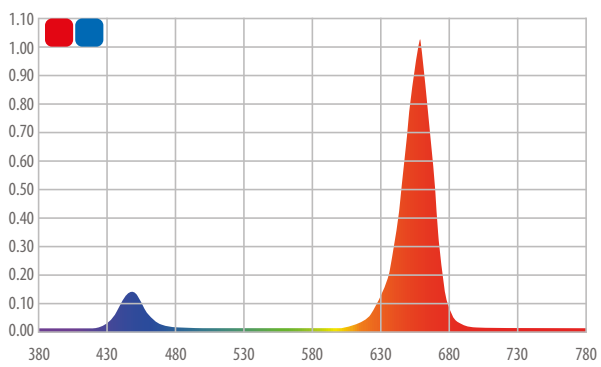
After Sales Support



We do not leave you with our after sales support after the end of the project. Our total quality-oriented technical support and guarantee teams ensure sustainable satisfaction by taking rapid action when necessary. We do not leave you till the end of the project. Our after sales services are always there for you.



Spectrum



PRODUCTS

Greenhouse Solutions



Günay



Sevilay



Hook

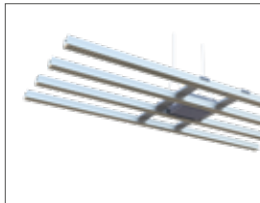


Dual

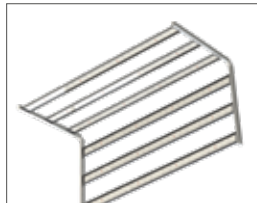
Medical Cannabis Solutions



Groot



Canna Hook



Canna Bars

Vertical Farming Solutions

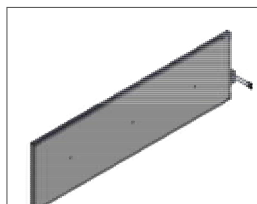


Mono

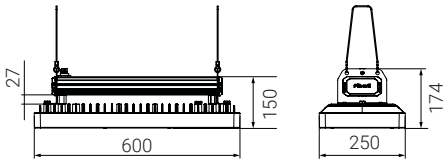
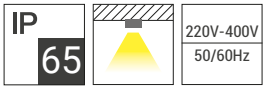


Graft

Tissue Culture Solutions



Grow Panel



Powerful option of Growlight family. TOPLIGHT segment aims general lighting range for greenhouses via ceiling mount. Suits for all greenhouse facilities. Controllable, easy to mount, automation ready, flexible spectrum on request GROWLIGHT solution.

Electromechanic Specifications

- Anodized aluminum extruded profile
- Electrostatic painted aluminum injection body
- Stainless steel mounting clip and hanger part

P Power Options

Code	Power	Light Energy	Efficiency	Dimensions (L)
GÜNAY1000	600-720W	1560-1800 μ mol/s	2.6-3.0 μ mol/J	600mm
GÜNAY1000-DIM	600-720W	1560-1800 μ mol/s	2.6-3.0 μ mol/J	600mm
GÜNAY2000-DIM	900-1000W	2340-3000 μ mol/s	2.6-3.0 μ mol/J	

O Lens Options



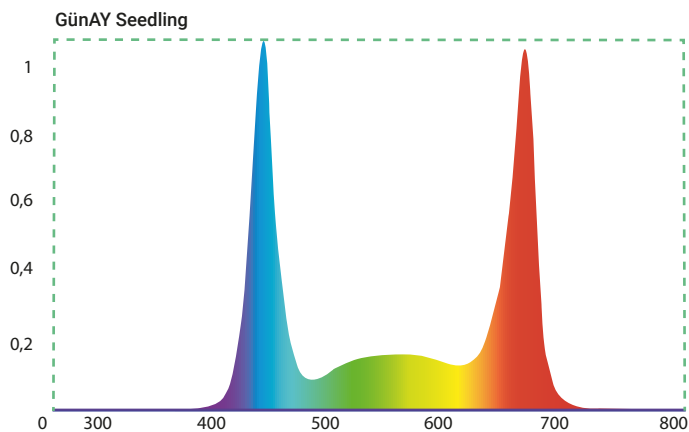
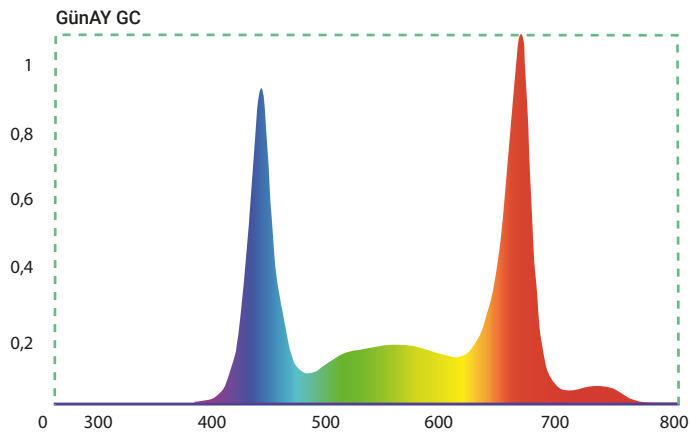
OXW:
120°

J Connection Options



02: IP Socket

Spectrum

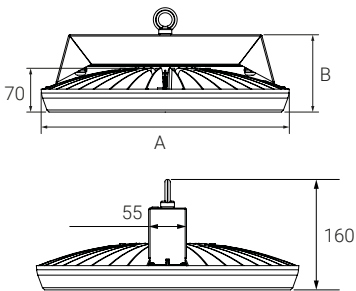


Code Key

P . O . J



IP
65
 IK 08
 IK 10
 220V-240V
 50/60Hz



Design that combines high efficiency and technology. High-performance and long-lasting solution in all conditions with a choice of height-distributing lenses and a wide range of mounting options.

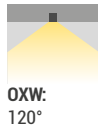
Electromechanic Specifications

- Electrostatic painted aluminum injection body
- High efficiency group lens
- Stainless steel mounting clip and hanger part
- Optional stainless Busbar mounting bracket

P Power Options

Code	Power	Light Energy	Efficiency	PPF Distribution	Dimensions (AxB)
SEVILAY600 300W	300-380W	780-900 μ mol/s	2.6-3.0 μ mol/J	120°	Ø380x113mm
SEVILAY1000 600W-DIM	500-680W	1300-1500 μ mol/s	2.6-3.0 μ mol/J	120°	Ø380x113mm

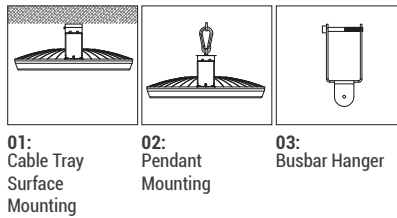
O Lens Options



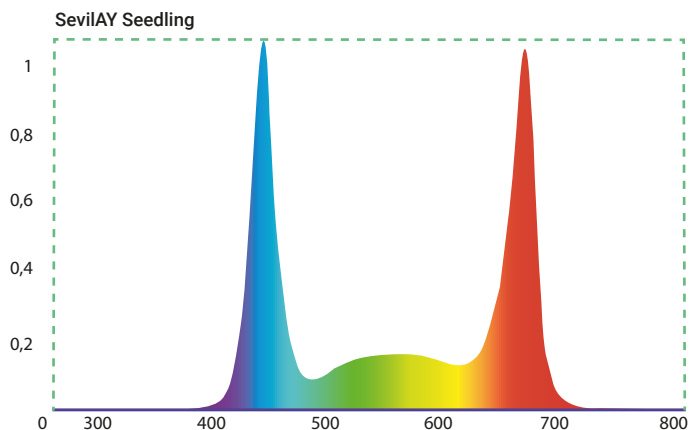
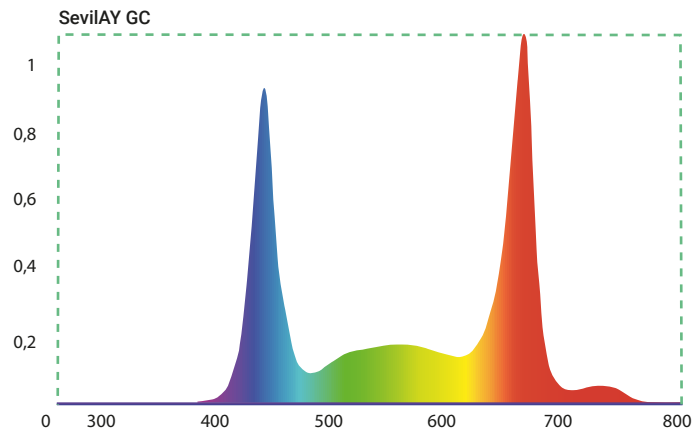
J Connection Options



M Mounting Options

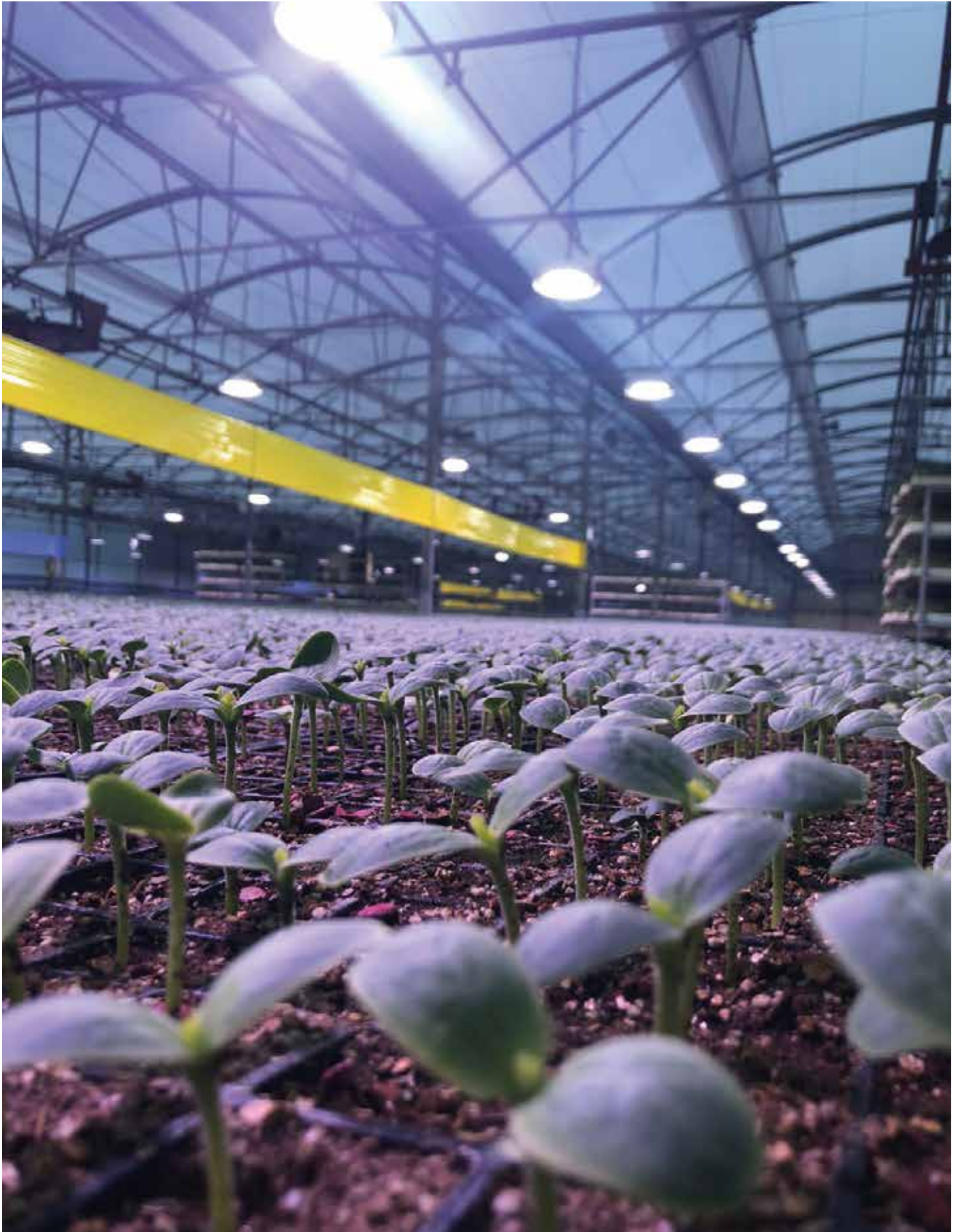


Spectrum



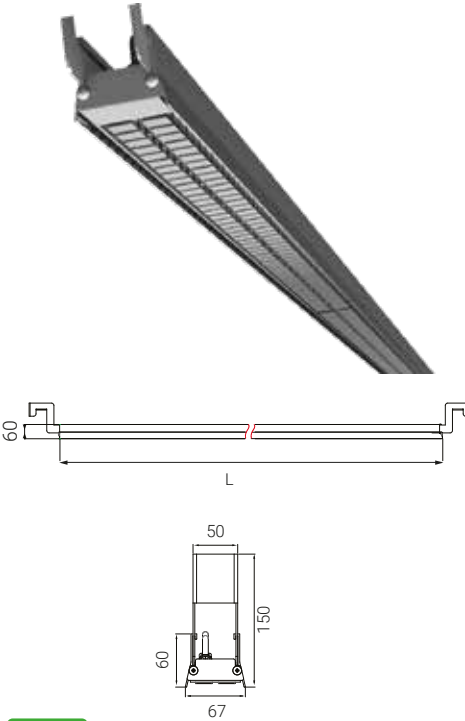
Code Key





IP **66** IK 07

220V-480V
50/60Hz



Hook. The hook system provides easy installation without cable channel. Powerful option of Growlight family. TOPLIGHT segment aims general lighting range for greenhouses via ceiling mount. HOOK also does not crop sunlight. Thanks to its thinner design which fits to all greenhouse construction profiles. Stable, long life solution with high IP&IK levels. Suits for all greenhouse facilities. Controllable, easy to mount, automation ready, flexible spectrum on request GROWLIGHT solution.

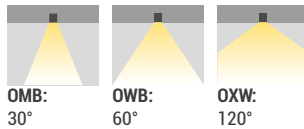
Electromechanic Specifications

- Anodized aluminum extruded profile
- PVC protective covers
- Stainless steel mounting brackets
- Stainless steel hanger springs (for hook/ chain etc.)
- Hidden cable grommet desing
- IP67 electrical connectors
- LED spectrum can be change on request

P Power Options

Code	Power	Light Energy	Efficiency	PPF Distribution	Dimensions (L)
WSHH.500	540-660W	1400-1980µmol/s	2.6-3.0µmol/J	30°, 60°, 120°	5000mm

O Lens Options



J Connection Options



02: IP Socket

M Mounting Options




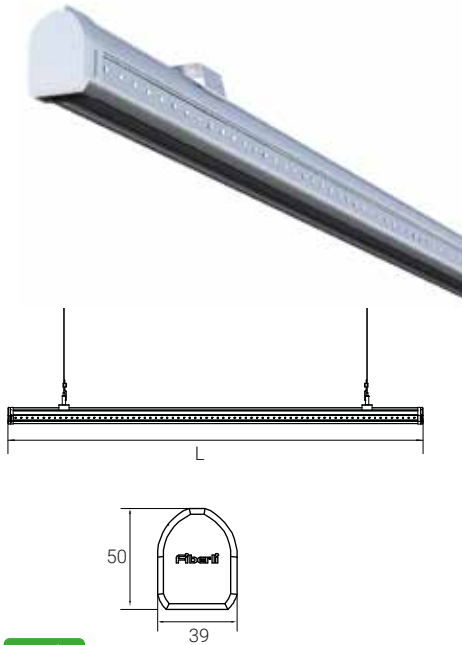
01:
Surface/ Cable Tray/
Pendant Mounting



Code Key

P . O . J . M

IP 66  **IK 10**
 220V-240V
 50/60Hz



Dual. A game changer for agriculture & horticulture. Special designed body goes between the plants to maximize its light energy delivery. INTERLIGHT segment aims closer and high efficient solutions. Hanging options make easy access and flexibility. Suits for all greenhouse facilities. Controllable, easy to mount, automation ready, flexible spectrum on request GROWLIGHT solution. Expanding options with special body design.

Electromechanic Specifications

- Double sided maximum light energy distribution
- Stainless steel mounting brackets
- Stainless steel hanger springs
- Can be placed continuously via optional special hanger part.
- High efficient transparent PMMA diffuser

P Power Options

Code	Power	Light Energy	Efficiency	Dimensions (L)
LLHD.500	150W	405 $\mu\text{mol/s}$	2.7 $\mu\text{mol/J}$	5000mm

O Lens Options



J Connection Options




M Mounting Options



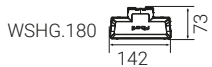
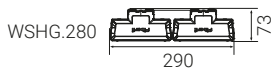
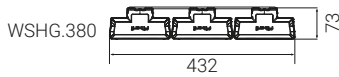
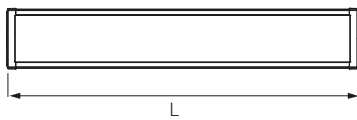
Code Key

P . O . J . M



IP 66  **IK 10**

220V-240V
50/60Hz



Groot. A real superhero member of Growlight family. TOPLIGHT segment aims general lighting range for greenhouses via ceiling mount. Stable, long life solution with high IP&IK levels. Suits for all greenhouse facilities. Controllable, east to mount, automation ready, flexible spectrum on request GROWLIGHT solution. Expanding options with special body design.

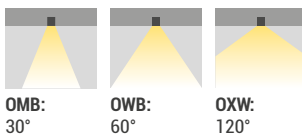
Electromechanic Specifications

- Anodized aluminum extruded profile
- UV protected PVC end caps
- High efficient transparent PMMA diffuser
- Stainless steel mounting brackets
- Stainless steel hanger springs (for hook/ chain etc.)
- Hidden cable grommet desing
- IP67 electrical connectors
- Modular body design with 2x/3x expanding options
- LED spectrum can be change on request
UV module is externally attached.

P Power Options

Code	Power	Light Energy	Efficiency	PPF Distribution	Dimensions (L)
WSHG180	160-210W	410-620µmol/s	2.6-3.0 µmol/J	30°, 60°, 120°	823mm
WSHG280	320-420W	820-1240 µmol/s	2.6-3.0 µmol/J	30°, 60°, 120°	823mm
WSHG380	480-630W	1230-1860 µmol/s	2.6-3.0 µmol/J	30°, 60°, 120°	823mm
WSHG380UV	480-630W	1230-1860 µmol/s	2.6-3.0 µmol/J	30°, 60°, 120°	823mm
WSHG380UV-DIM	480-630W	1230-1860 µmol/s	2.6-3.0 µmol/J	30°, 60°, 120°	823mm
WSHG3x120	870W		2.6-3.0 µmol/J	30°, 60°, 120°	

O Lens Options



OMB:
30°

OWB:
60°

OXW:
120°

J Connection Options



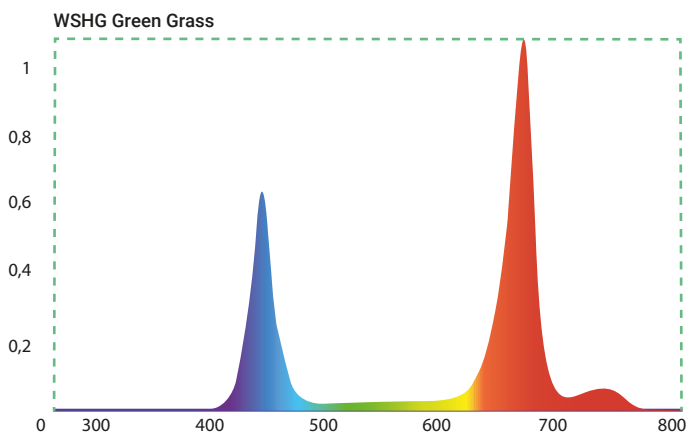
02: IP Socket

M Mounting Options



01:
Surface/ Cable Tray/
Pendant Mounting

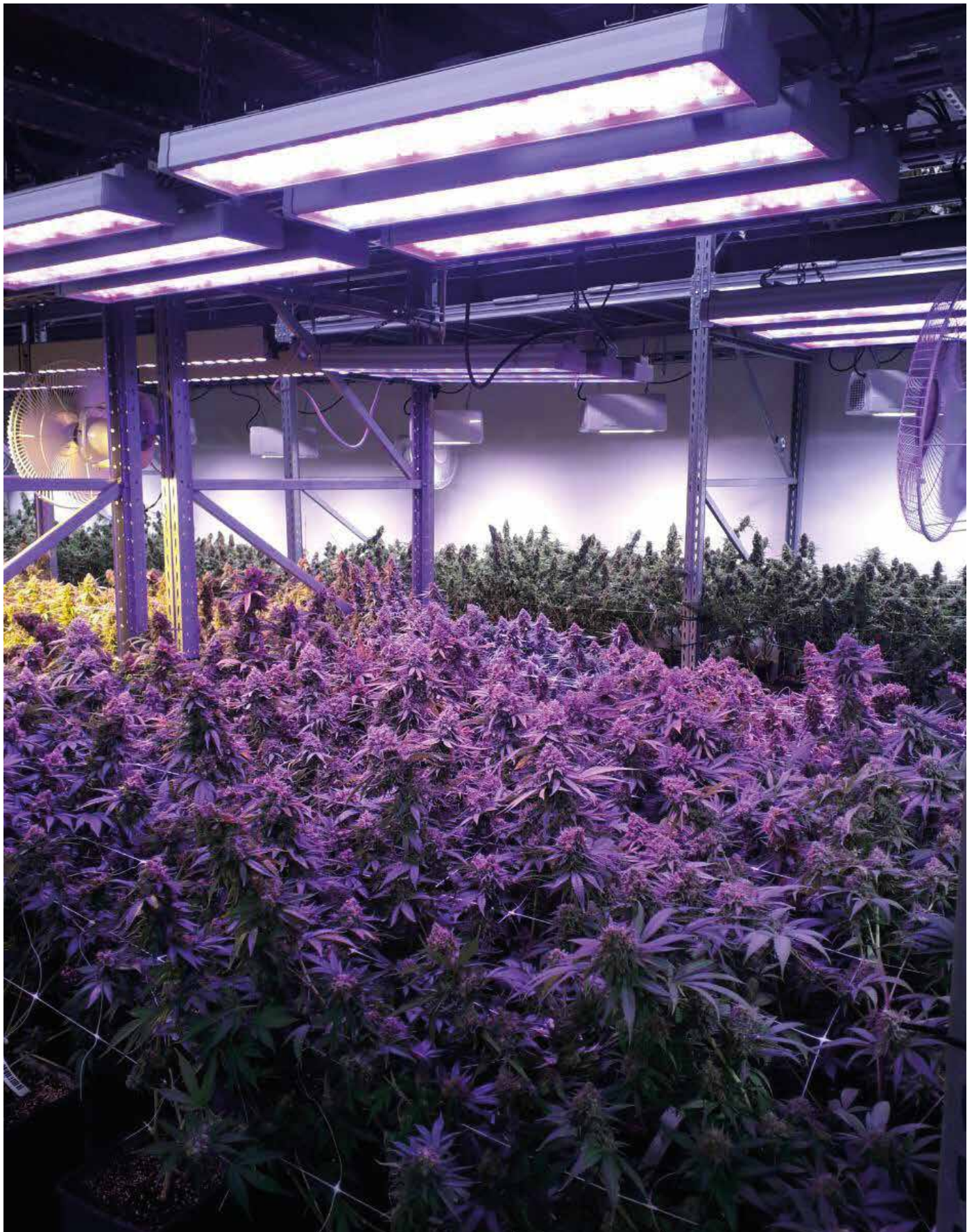
Spectrum



Code Key


P . O . J . M

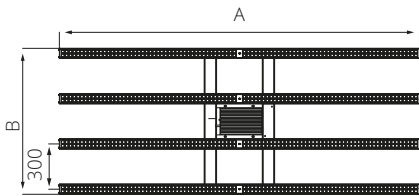
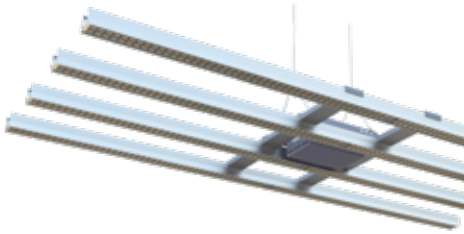




Lighting area capacity: Min. W:120cm L:120cm , Max. W:150cm L:150cm (WSHG380)

IP
66
 220V-480V
 50/60Hz


IK 07



High and powerful ceiling light.

The design that combines the projector feature with GROWLIGHT fields. It provides powerful and long-lasting performance under any circumstances, with lens-appropriate light-dispensing lens options.

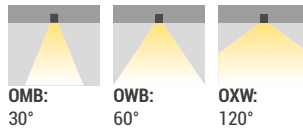
Electromechanic Specifications

- Anodized aluminum extruded profile
 - PVC protective covers
 - Stainless steel mounting brackets
 - Stainless steel hanger springs (for hook/ chain etc.)
 - Hidden cable grommet desing
 - IP67 electrical connectors
 - LED spectrum can be change on request
- UV module is externally attached.*

P Power Options

Code	Power	Light Energy	PPF Distribution	Dimensions (AxB)
WSHH-2x240 DIM	500-600W	1200-1600µmol/s	30°, 60°, 120°	2400x397
WSHH-3x240 DIM	900-1000W	1800-2400µmol/s	30°, 60°, 120°	2400x667
WSHH-4x240 DIM	1200-1350W	2400-3200µmol/s	30°, 60°, 120°	2400x967
WSHH-4x240UV DIM	1200-1350W	2400-3200µmol/s	30°, 60°, 120°	2400x967

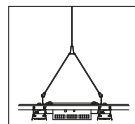
O Lens Options



J Connection Options



M Mounting Options



01:
Surface/ Cable Tray/
Pendant Mounting



Code Key

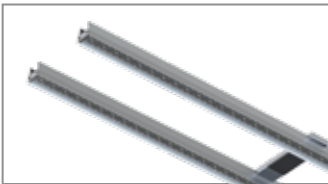
P . O . J . M



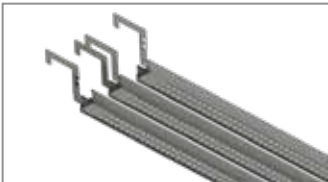


Lighting area capacity: Min. W:240cm L:120cm,
Max. W:300cm L:150cm (WSHH4x240)

Multi Spectrum Canna WSHHM-2X240

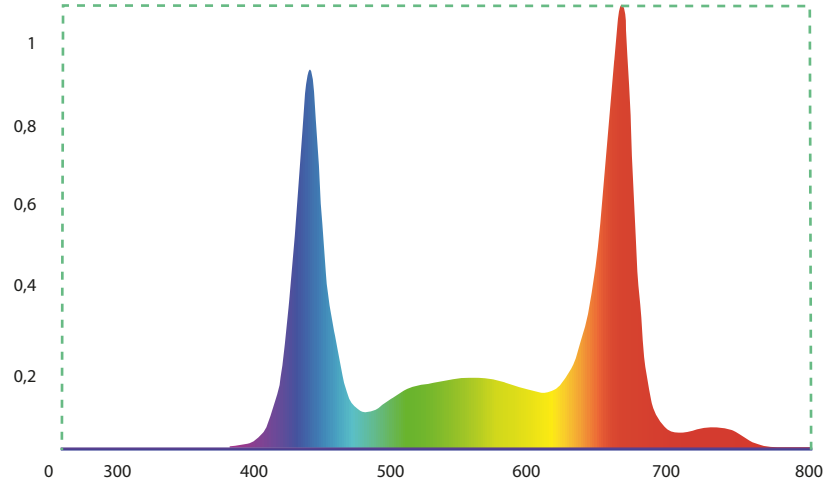


Multi Spectrum Canna WSHHM-3X240

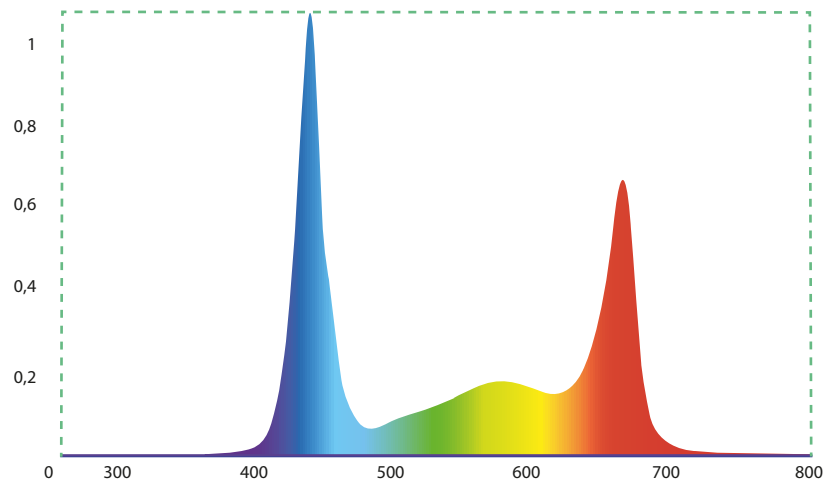


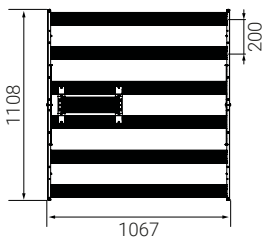
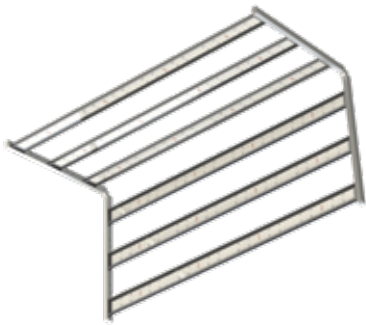
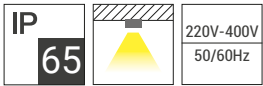
Spectrum

Canna CFT



Canna CS





Powerful option of Growlight family. TOPLIGHT segment aims general lighting range for greenhouses via ceiling mount. Suits for all greenhouse facilities. Controllable, easy to mount, automation ready, flexible spectrum on request GROWLIGHT solution.

Electromechanic Specifications

- Anodized aluminum extruded profile
- Electrostatic painted aluminum injection body
- Stainless steel mounting clip and hanger part

P Power Options

Code	Power (W)	Light Energy	Efficiency	PPF Distribution	Dimensions (L) (mm)	Weight (kg)
Canna Bars	600	1800 μ mol/s	2.7 μ mol/J	120°	1108	12,5

O Lens Options



OXW: 120°

J Connection Options

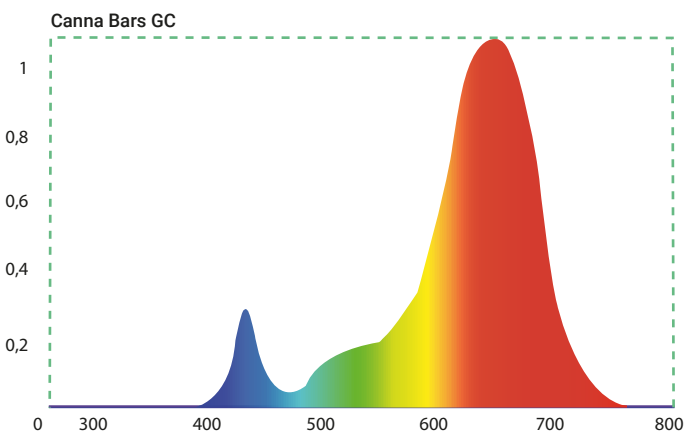


02: IP Socket

S System Options

02 PWM-DIM

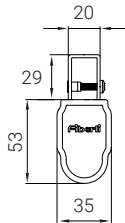
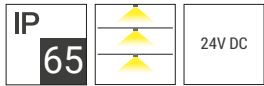
Spectrum



Code Key

P . O . J . S





Mono. Future of farming. Thanks to its slim design and flexibility, MONO is perfectly suitable for climate-controlled cultivation facilities, such as city/vertical farms, propagation and research centers that use multilayer rack systems. Also provides cost effective solution due to its high energy efficiency and long-life structure. Controllable, easy to mount, automation ready, flexible spectrum on request GROWLIGHT solution. Expanding options with special body design.

Electromechanic Specifications

- Anodized aluminum extruded profile
- UV protected PVC end caps
- High efficient PMMA diffuser
- Stainless steel mounting brackets
- LED spectrum can be change on request

P Power Options

Code	Power	Light Energy	Efficiency	Dimensions (L)
LLHM FULL S	36W	90-110 $\mu\text{mol/s}$	2.6-3.0 $\mu\text{mol/J}$	1200mm
LLHM.120.White	36W	80 $\mu\text{mol/s}$	2.2 $\mu\text{mol/J}$	1200mm

O Lens Options



OXW:
Without Lens

J Connection Options



02:
IP Socket

M Mounting Options

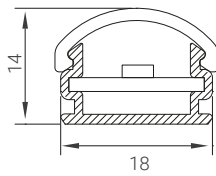
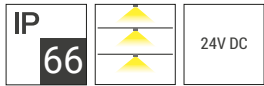


01:
Surface/ Cable Tray/
Pendant Mounting



Code Key





Graft. Future of farming. Designed specifically for use in grafted seedlings. Thanks to its slim design and flexibility, GRAFT is perfectly suitable for climate-controlled cultivation facilities, such as city/vertical farms, propagation and research centers that use multilayer rack systems. Also provides cost effective solution due to its high energy efficiency and long-life structure. Controllable, easy to mount, automation ready, flexible spectrum on request GROWLIGHT solution. Expanding options with special body design.

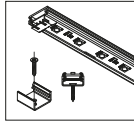
Electromechanic Specifications

- Anodized aluminum profile extrusion
- Stainless fittings
- PVC end caps with UV protection
- Transparent or matte top cover polycarbonate with UV protection
- Suitable for surface mounting

P Power Options

Code	Power	Lumen	Light Energy	Light Color	Dimension (L)
LLK	14,4W	1440lm	50 $\mu\text{mol}/\text{m}^2\text{s}$	4500K-6500K	1000mm

M Mounting Options



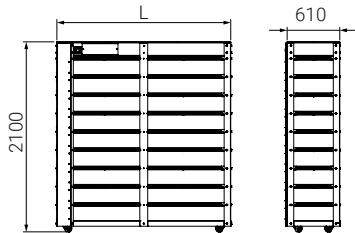
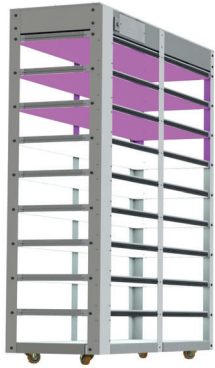
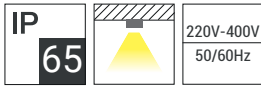
01:
Aluminium Clip



Order Key

P . M





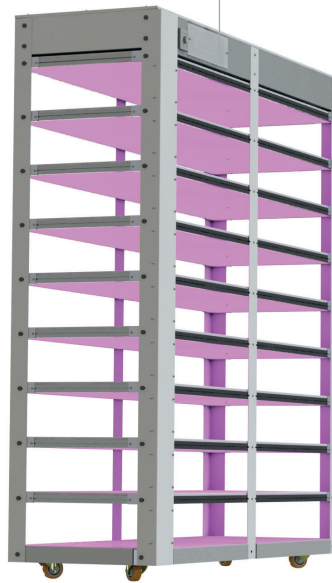
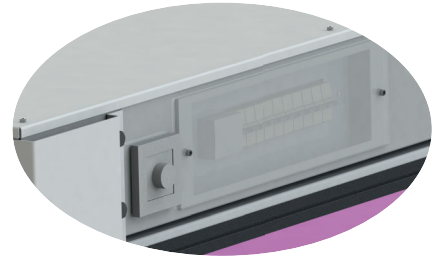
Powerful option of Growlight family. TOPLIGHT segment aims general lighting range for greenhouses via ceiling mount. Suits for all greenhouse facilities. Controllable, easy to mount, automation ready, flexible spectrum on request GROWLIGHT solution.

Electromechanic Specifications

- Anodized aluminum extruded profile
- Electrostatic painted aluminum injection body
- Stainless steel mounting clip and hanger part

P Power Options

Code	Power	Light Color	Efficiency	PPF Distribution	Dimensions (L)
Panel Grow	45W	CW	2.6 μ mol/J	180°	2090mm
Panel Grow	72W	CW	2.6 μ mol/J	180°	2090mm
Panel Grow	165W	PRP	2.8 μ mol/J	180°	2090mm



Code Key








P





Technical Information

International Protection (IP) Classification





Solid Particulate Protection

0		Not protected
1		Any object bigger than 50 mm
2		Any object bigger than 12 mm
3		Any object bigger than 2,5 mm
4		Any object bigger than 1 mm
5		Dust protected
6		Dust Tight

Liquid Particulate Protection

0		Not protected
1		Dripping water
2		Vertically dripping water at an angle up to 15°
3		Water falling as a spray at any angle up to 60°
4		Splashing water
5		Water jets
6		Powerful water jets
7		Immersion up to 15 cm
8		Immersion beyond 1 m

IK- Mechanical Impact Resistance

00		No protection
01		200gr 7,5 cm 0,150 Joule
02		200gr 10 cm 0,200 Joule
03		200gr 17,5 cm 0,350 Joule
04		200gr 25 cm 0,500 Joule
05		200gr 35 cm 0,700 Joule
06		500gr 20 cm 1,00 Joule
07		500gr 40 cm 2,00 Joule
08		1,7kg 29,5 cm 5,00 Joule
09		5kg 20 cm 10,00 Joule
10		5kg 40 cm 20,00 Joule

Electromagnetic Spectrum: The range of frequencies of electromagnetic radiation and their respective wavelengths and photon energies.

HPS: A sodium-vapor lamp is a gas-discharge lamp that uses sodium in an excited state to produce light at a characteristic wavelength near 589 nm.

PAR (Photosynthetically Active Radiation): Wavelengths of light within the visible range of 400-700 nm to drive photosynthesis.

PPF (Photosynthetic Photon Flux): A measurement that determines the total amount of photosynthetically active radiation (PAR) a light gives off.

Efficiency: Converted electrical energy into photons of PAR.

Ta -30°
+45°

Ambient temperature dictates the minimum and maximum temperature at which the luminaires can be operated.

35.000h
L90B50

Rated Average Lifetime describes %50 of luminaires will produce 90% of the initial lumens after 35.000 h



Protection Class I: Items in this class have an earth circuit built in and an earth wire in the plug. Metal parts of the products could potential cause a hazardous voltage if the basic insulation fails. This basically means that all metal parts of the products need to be earthed via the protective conductor.



Toplight: Grow Light LED luminaires designed to illuminate plants from top position. Luminaires are usually mounted or suspended under a cable tray.



Interlight: Grow Light LED luminaires designed to illuminate from sideways and positioned between plants.



Racklight: Grow Light LED luminaires designed to use on rack systems that also known as vertical/city farming.





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