



福建省中科生物股份有限公司  
FUJIAN SANAN SINO-SCIENCE PHOTOBIOTECH CO., LTD.

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2018 Product Catalog



**SANANBIO**



Company Profiles

Fujian Sanan Sino-Science Photobiotech Co.,Ltd was founded in 2015, as a joint venture by the Institute of Botany under the Chinese Academy of Sciences and Fujian SAN 'an Group Co., LTD. An industry leader in optoelectronics and optical communication technology, Fujian San' an Group is a new entrant in to the field of photobiology. The company is investing 7 billion yuan across multiple business units, including the planned construction of a 200-acre plant research institute and a completed industrialized plant factory covering 300-acres. Fujian San' an Group is committed to the industrialization of plant factories and food production coupled with cutting-edge scientific research in to plant compounds and the potential medical breakthroughs that may lie within. The company' s research and development achievements in the field of botany combined with the deep industry expertise in the field of photoelectric technology using LED light spectrums applied to plant science gives Fujian San' an Group a unique market advantage in photobiology. Fujian San' an Group' s ability to demonstrate industrialized indoor food production using innovative LED lighting technology combined with being at the forefront of plant science research and development make the company an international leader in photobiology now and in to the future.



(1) Hutou industrialization base is located in the photoelectric production park in Hutou, Anxi county, Quanzhou city, Fujian province. The industrial park covers an area of 200,000 m2, with a building area of 700,000 m2. The first 10,000 m2 plant factory was put into operation in June 2016, with the goal of mainly producing high-quality and safe vegetables and intermediate materials for health care products.

The company has passed the food safety management system ISO22000 certification and quality management system ISO9001 certification. The vegetables that passed GAP grade best in-class certification have been sold in more than 300 large commercial supermarkets, 5-star hotels and high-end restaurants in Fujian province. The first jewel orchid production line has been put into operation and obtained the organic conversion certificate.

(2) Jinzhai industrialization base is located in the modern industrial park in Jinzhai county, Liu" an city, Anhui province. It covers a floor area of 420,000 m2 and a building area of 436,000m2. The site was established in the scientific and technological industrial park with Dabie Mountain Institute of Traditional Chinese Medicine to carry out seedling, cultivation and processing research with the aim of extracting medicinal properties out of rare Chinese medicinal materials. Once rare Chinese medicinal derivatives have been isolated, we will begin to produce and sell healthcare products that contain rare Chinese

medicinal properties.

(3) Industrial base in North America: Located in Las Vegas, Nevada, USA, the first phase 5000 m2 plant factory is already built with plans to expand the original plant factory to 20,000 m2. The factory was officially put into production in May 2018.

Equipment field:

Including integrated plant factory solution; container plant factory; plant factory module production equipment; plant growth lighting. Our company is relying on the headquarters to accelerate the industrialization of LED plant growth lighting, biologicals and plant factory automation equipment. At the same time to expand investment in the upstream and downstream of the industrial chain and actively provide the plant factory equipment and technical services which possessing the own proprietary intellectual property rights to foreign countries.

Research base:

The plant factory research institute include two branches institutes in Fujian and Beijing and engineering technology in the United States and Xiamen. The center is mainly engaged in applied research of photobiotech , providing technical support for industrialization.

Research team

Combining the institutional academic knowledge of Kuang Tingyun and Fang Jingyun, two of the most distinguished academics in the field of biology from the Chinese Academy of Sciences with Fujian San'an Groups global leading photoelectric technology gives us an unprecedented market advantage when it comes to technology innovation in high-tech agriculture and biological medicine. Closely combining scientific research and the industrialization of indoor food/plant production gives us the ability to create a world-class research institute where over 20 world-renowned scientists and consultants can conduct cutting-edge research as it relates to photobiology.

Three research centers and an open laboratory of photobiology are set up under the institute, which brings together a research and development team of 130 people, including 12 full-time doctors stationed in plants at the Chinese Academy of Sciences. It is mainly engaged in the research and development of the integration and demonstration of plant lighting, intelligent cultivation equipment, agricultural science, biological medicine, and large-scale energy-saving plant factory systems.



Technology R&D center

The Technology R&D center includes crop variety screening, nutrient solution formulation, plant cultivation techniques, plant light formula development with independent and intellectual property lighting, and medicinal plant testing. Indoor culture technology has been widely used in industrialization production, providing the strong technical support for the photobiology industrial development.



Innovation Drug R&D center

The raw material was made from special medicinal plants to study innovative drugs that fight against major diseases such as cancer.



Equipment R&D center

The equipment R&D center includes plant factory series cultivation equipment, plant illumination lighting, and intelligent environmental control system development. The center possess a multitude of intelligent plant factory equipment that includes invention and utility model patents that can satisfy different types and sizes of plant factory construction requirements.

Open laboratory of photobiology

The multi-faceted laboratory of photobiology fully simulates factory production conditions by including a plant cultivation and analysis laboratory, an equipment development laboratory, and an artificial microclimate simulation laboratory, providing an open collaboration platform for the domestic and foreign photobiology researchers.



# Vertical Farming — Total solution



**Total solution**

**Vertical Farming System Construction Program**  
The vertical farming system (RADIX) provides an energy and space saving design solution with multi-level cultivation modules and built-in environmental and lighting control equipment to support the closed-loop production process.

**Proprietary Cultivation Techniques**  
Our proprietary cultivation techniques allow us maximize the growth potential of crops, shorten growth cycles, increase nutrient density, and improve yield.


**Special Nutrient Solution and Control System**  
Supporting a series of nutrient solution configurations and nutrient solution regulation technology.

**Custom Plant Lighting Technology**  
Based on the study of light requirements for different crops, the lighting environment required by different crops in different growing periods was developed to provide the best light formula.


**Intelligent Environmental Control Management Technology**  
Provide various plant demand environmental parameters that support monitoring and control programs.

**Production Management Technology**  
Provide excellent production management techniques and standards to ensure efficient and stable operation of the factory.


**Training and Technical Support**  
Provide on-site or remote technical service for factory operation anomaly diagnosis and technical improvement.



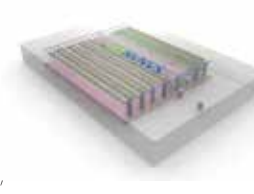
**01**  
**Business operation mode**  
Size of factory space 500-5000m<sup>2</sup>  
Modular construction, applicable to a wide range of regions



**03**  
**Commercial dream farm**  
Size of factory space 50-200m<sup>2</sup>  
Supporting high-end restaurants, communities, shopping malls



**02**  
**For research and display**  
Size of factory space 200-500m<sup>2</sup>  
Publicity display, popular science education, scientific research and development



**04**  
**High automatic plant factory**  
Size of factory space 5000-20000m<sup>2</sup>  
Automation, intelligence, high - density production



SANANBIO





M Series — Planting modular equipment



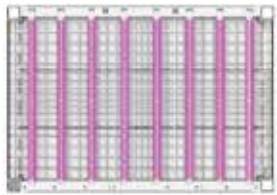
Configuration guide:

Product model	M11 Propagation module	Vegetative module
Full size	1346*942*2449mm	1346*942*2929mm
Number of layers (customizable)	6	6
Growing space (customizable)	200mm	280mm
Raft size	600*900mm	600*900mm
Raft number	12 PCS	12 PCS
Power	540W	648W
PPFD	200	250
Color	white	white

▼ Landscape orientation lighting diagrams



▼ Vertical orientation lighting diagrams



Specifications:

Type	Parameter
Dimensions (mm)	1346*942 (Length * width, height can be customized)
Raft size (mm / tray)	600*900
Vegetative raft (two tray / layer)	Hole number 54 / tray
Propagation raft (two tray / layer)	Hole number 180 / tray
Number of layers (layers)	Standard 6 layers, 4-10 layers can be customized
Vegetative module story height (mm / layer)	Standard 280, height can be customized
Propagation module story height (mm / layer)	Standard 200, height can be customized
Nutrient solution supply mode	NFT/DFT
Vegetative module LED power (W / layer)	108
Propagation module LED power (W / layer)	90
Number of LED lights (PCS / layer)	6
Material	Food grade PP
Color	White
Voltage (V)	100-277

Module product features

- 01

**Multilayer vertical farming design**  
with high quality LED light source and spectrum tuning technology that is designed for optimal and efficient plant growth.
- 02

**All new modularized industrial design**  
Concise and elegant appearance of multilayer modular structure.  
The design structure of hydro-power integration, combining 3 standard interfaces, which are water supply, drainage and electricity supply.  
Flexible DIY customization of different height and layers of single set of equipment.
- 03

**Environmentally-Friendly, Durable Material**  
The main components of the equipment are food-grade, non-metallic material that is moisture proof, anti-corrosive, compressive, no deformation, anti-ultraviolet.  
Adopt IP65 protection class luminaries, aviation water-proof joints, ensure safety.
- 04

**Rapid assembly of equipment**  
There are no specific tools required for installation. The modules are stackable and require two people for installation in 30 minutes.



# Container type — vertical farming



The container type vertical farm is based on the LED plant light source technology and is designed according to the production concept of saving energy and clean environment protection.

The intelligent plant production system for the annual planning and stable production of high-quality leafy vegetables and fruits is realized by using the container as the closed enclosure structure and the high-precision environmental control technology in the facility.

It is applicable to a wide range of areas and is not affected by the environment.

It can be deployed in cold, island, dry and remote areas.

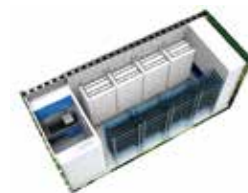
Photovoltaic  
Energy

Water-saving  
system

Seawater  
desalination

Healthy&  
Eco-friendly

## Production type / Sightseeing type



### 01 20-foot container production type

Daily production of green vegetables is 3-5kg  
Meet the daily needs of 6-10 peoples



### 03 20-foot container sightseeing type

Demonstration of vertical farming technology  
Science popularization education and scientific research and development



### 02 40-foot container production type

Daily production of green vegetables is 5-10kg  
Meet the daily needs of 15-20 peoples



### 04 40-foot container sightseeing type

Leisure and entertainment tourism integration





LED Growth Lighting — Multilayer Cultivation



Product Feature

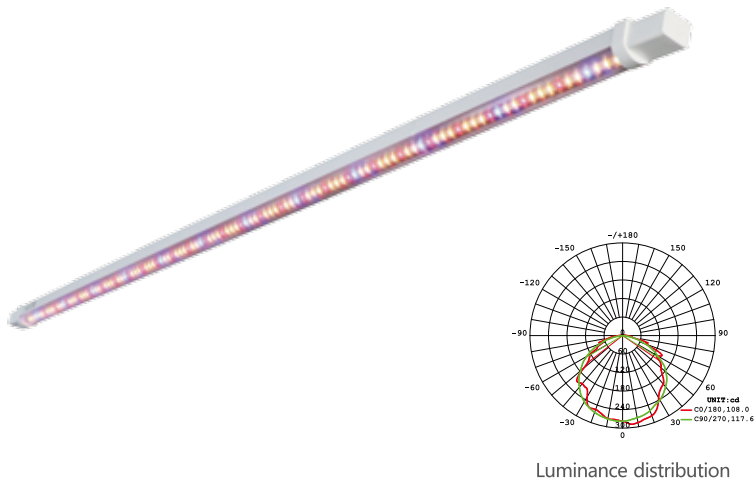
Designed for multi-layer planting to meet the needs of multi-layer crops for cold light sources for close-range illumination. The surface temperature of the lamp body is low to avoid scalding the crop; a reasonable lighting scheme ensures uniform illumination and uniform color mixing in each band, and avoids large individual differences in crops in the same planting area. Customized light formulations for crop varieties to achieve optimal growth solutions for different crops.

The Skylark series can be installed with our module free accessories, and can also be used to meet the installation requirements of different types of growth frames, which is flexible, convenient and fast.

The Skylark + Series is available in either a sling or ceiling mount installation and can be used in combination with single or dual lights.



Skylark Series——apply to height ≤40CM	
Input voltage(V)	220-240/100-277
Power(W)	10-18
Power factor	0.95
Dimensions (mm)	1264*33*29/900*38*35
PPF(μmol/s)	22-38
Efficacy(μmol/J)	2.1
LifeTime(H)	36000
IP	IP65
Application	Lettuce, Asparagus, Pakchoi, Herb, Arabidopsis, tissue culture, Jewel Orchid, SHMI, Seeding etc.



Seeding



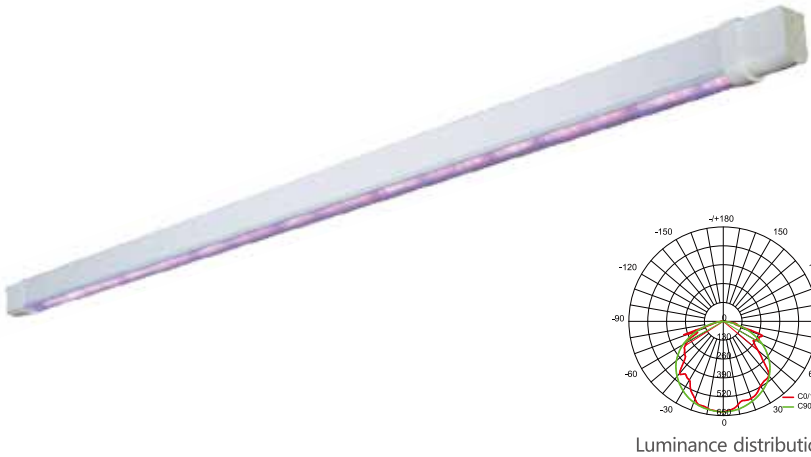
Vegetable



Jewel Orchid



Arabidopsis



Skylark Series——apply to height ≥30CM	
Input voltage(V)	100-240/100-277
Power(W)	30
Power factor	0.95
Dimensions (mm)	1220*35*41
PPF(μmol/s)	62
Efficacy(μmol/J)	2.1
LifeTime(H)	36000
IP	IP65
Application	lettuce, tomato, aromatic plants, strawberry, pepper



Tomato



Pepper



Strawberry



Aromatic plants





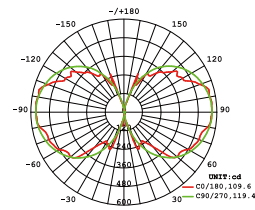
LED Growth Lighting — Lighting for crop space

Product Feature

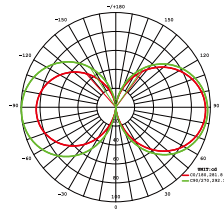
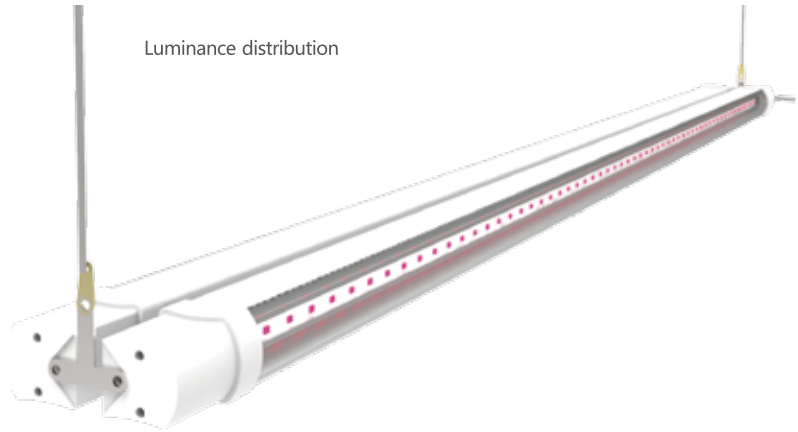
Designed for high plant crops to address low light in the lower half of high plant crops. Near 360° full-circumference, combined with flexible suspension, provides the whole side of crops with uniform fill light. Used in combination with top fill light, the planting effect is better. Tailored fill spectrum, in line with crop light absorption characteristics, with optimal illumination mode, which can be harvested in advance and increase crop yield and quality.



SkyLark Plus Series — Adjustable Angle Flexible Connection	
Input voltage(V)	100-240/100-277
Power(W)	30
Power factor	0.95
Dimensions (mm)	1220*35*41
PPF(μmol/s)	62
Efficacy(μmol/J)	2.1
LifeTime(H)	36000
IP	IP65
Application	Cucumber,tomato and other vine plants



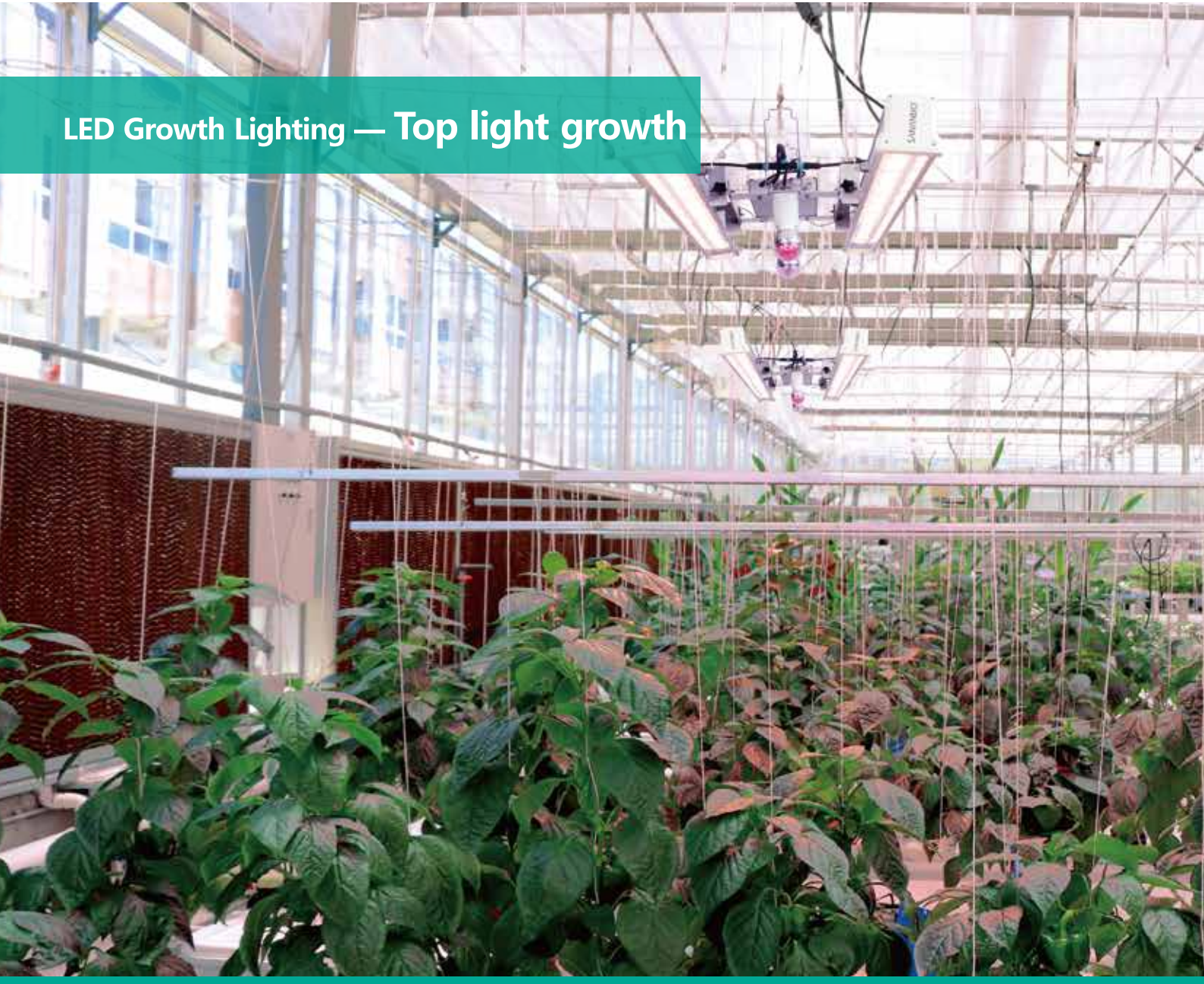
Luminance distribution



Luminance distribution

Flamingo — Double suspension direction, uperlarge irradiation range		
Active Radiation	440/460nm 660nm+730nm	440/460nm 660nm
Input voltage(V)	100-240/100-277	100-240/100-277
Power(W)	40+3 (Two-channel)	40
Power factor	0.95	0.95
Dimensions (mm)	1145*45*63	1145*45*63
PPF(μmol/s)	85+6 (Two-channel)	85
Efficacy(μmol/J)	2.1	2.1
LifeTime(H)	36000	36000
IP	IP65	IP65
Application	Cucumber,tomato and other vine plants	Cucumber,tomato and other vine plants






LED Growth Lighting — Top light growth

Product Feature


The new series of industrial design meets the needs of indoor single or double layer high light intensity crops, and can be widely used in the top of the greenhouse. The unique vertical grille heat dissipation design effectively guarantees the life and stability of the lamp; the combination of high-quality aluminum alloy casing and coated optical glass effectively enhances product durability; reflective optical design enables more uniform illumination distribution and improves the light utilization rate by 20%-30%; and custom light formula for different crops, high efficiency, energy savings and high yield.





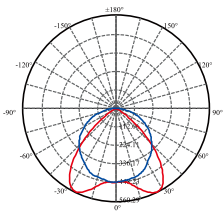
**HAWK-DUO**

Installation distance is above 0.5m, the two lighting angle is adjustable




**HAWK-SOLO**

Installation distance is above 0.5m, single lighting directed illumination




Luminance distribution



**HAWK-SQUAD**

Can be orbit type installed with close installation distance 0.15m, the density of led lamp is adjustable



**HAWK-MINI**

Medium power output, flexible application

	HAWK-DUO	HAWK-SOLO	HAWK-SQUAD	HAWK-MINI
Input voltage(V)	100-277/249-528	100-277/249-528	100-277/249-528	100-277/249-528
Power(W)	600	300	600	100
Power factor	0.95	0.95	0.95	0.95
Dimensions (mm)	1200*500*110	1200*98*178	1200*1200*142	1200*71*115
PPF(μmol/s)	1380	690	1380	230
Efficacy(μmol/J)	2.3	2.3	2.3	2.3
LifeTime(H)	36000	36000	36000	36000
IP	IP65	IP65	IP65	IP65
Application	Horticultural crops of greenhouses , full artificial light of high-light needs cultivation vegetables, fruit trees, flowers, corn, rice, tobacco, medicinal plants, etc			





LED Growth Lighting — The Power of Spectrum-tuning

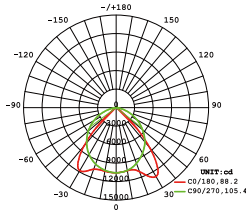


Product Feature

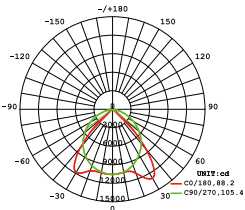
Designed for photobiological research and special medicinal plants, it integrates a variety of single-band and white LEDs, and achieves intelligent control of light quality, light intensity and photoperiod through APP. Scientific or crop stage lighting requirements. Precise optical design for a more even illumination distribution and a significant increase in light utilization. Can be used in single lamp or networking; The water control system of the water-cooled lamp can take away nearly 70% of the heat of the lamp, greatly reducing the demand for indoor air-conditioning, and reducing the overall operating energy consumption by 40%-60%.



Toucan Air Cooling Series	Air cooling Single lamp use
Input voltage(V)	100-240/100-277
Power(W)	600
Power factor	0.95
Dimensions (mm)	504*295*184
PPF(μmol/s)	960
Efficacy(μmol/J)	1.6
LifeTime(H)	36000
IP	IP65
Application	Photobiology research Special medicinal plants

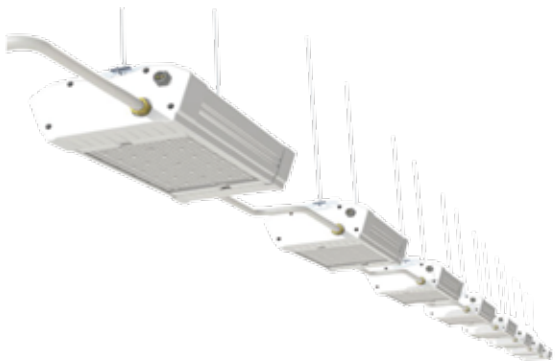


Luminance distribution

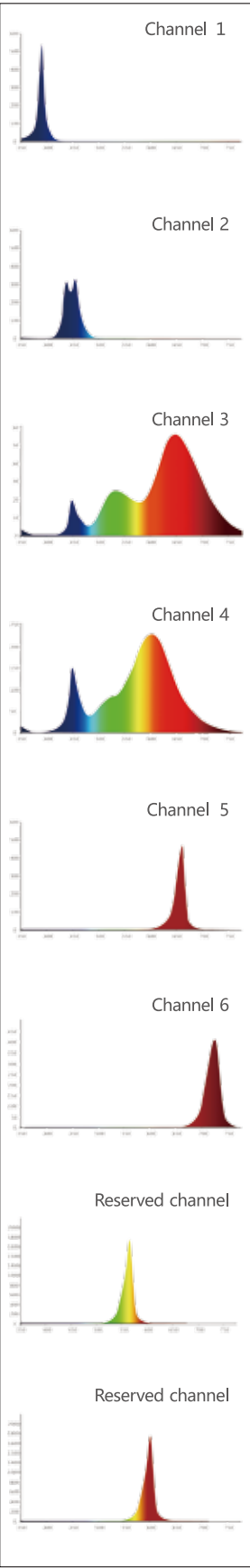


Luminance distribution

Toucan Water Cooling Series	Water cooling Network using
Input voltage(V)	100-240/100-277
Power(W)	600
Power factor	0.95
Dimensions (mm)	515*273*111
PPF(μmol/s)	960
Efficacy(μmol/J)	1.6
LifeTime(H)	36000
IP	IP65
Application	Photobiology research Special medicinal plants



Connection mode





Intellectual property

Enterprise qualification



SANANBIO

Letters patent

86 patents  
Including 4 PCT patents distributed in the European Union, the far-east, APAC, and other international regions

