

Borcelle



**ALGAE  
CHAMBER**

# INTRODUCTION

## Understanding the Balance of Nature

An Algae Growth Chamber is a controlled environment system specially designed for the cultivation of various microalgae species under specific temperature, humidity, CO<sub>2</sub>, and light conditions. These chambers are used in research, biotechnology, pharmaceuticals, biofuel production, and aquaculture industries.



## LIGHT APPLICATION

Light is the most critical factor in algae cultivation as algae perform photosynthesis. Our chambers simulate natural sunlight with programmable LED lighting tailored to different algae types

Spectrum Control: Blue and red dominant wavelengths (450 nm & 660 nm) to maximize photosynthetic efficiency.

Light Intensity: Adjustable up to 250–350  $\mu\text{mol}/\text{m}^2/\text{s}$  to match specific growth phases. Dimming Control from 0 to 100 Percent

LigPhotoperiod Control: Day-night simulation with programmable light cycles (e.g., 16:8 or 12:12 hours).  
Uniformity: Diffused lighting ensures even exposure across all cultures.

MicAlgae biofuel development  
roalgae research (Chlorella,  
Spirulina, Dunaliella, etc.)

Algae biofuel development

Carbon capture studies

Wastewater treatment studies

Optional:

UV lighting for sterilization

Shaking platforms for continuous  
culture mixing(due to that growth  
height will be decreased upto 200  
rpm)

CO2 additional if required



# THE ROLE OF ALGAE

The refrigeration operates through a **hot gas bypass system**, offering enhanced stability and efficiency, particularly suited for the demanding climate conditions of **India**. This technology ensures smooth temperature regulation even in high ambient temperatures, extending the lifespan and performance of the equipment. **Build:** PUF-insulated MS/SS body with corrosion resistance. Compressor will run for 24\*7 without disturbing the environment condition .

# ADVANCED REFRIGERATION SYSTEM

Note:

- 1.All technical data are valid in an empty chamber (without samples on trays) for the ambient temperature of 22 °C and the supply voltage of 230 V  $\pm$  10 %. \*)
- 2.The trays can be filled up to approx. 50% of the area, if possible in such a way as to allow an even flow of air inside the chamber space. \*\*)
- 3.All incubators should be kept in a 15- 30 degree C environment.
4. Additional environment temperature sensors will be customized for outside environment as optional .

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# TECHNICAL SPECIFICATION

| MODEL                                                                                                            | ALH/ALC CUSTOMIZATION DIMENSION(OPTIONAL)                       |                               |                |               |
|------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------|-------------------------------|----------------|---------------|
| INNER VOLUME .+.*.                                                                                               | 500 Ltr                                                         | 1000 Lts                      | 1400 Ltrs      | 2000 Ltrs     |
| Lights in micromole (spectrum as per your application) by default red 30 percent 70 percent warm white light     | 250-450                                                         | 250-450                       | 250-450        | 250-450       |
| Cooling Mode                                                                                                     | Hot gas by pass /Condensing Principles continuous compressor ON |                               |                |               |
| Standard Dimension WDH in mm<br>Standard Dimension for 3 feet door                                               | 850*850*700<br>800*650*1000                                     | 850*850*1400<br>1200*650*1300 | 1200*850*1500  | 1600*850*1500 |
| DOOR (GLASS DOOR OPTIONAL)                                                                                       | SINGLE DOOR                                                     |                               | DOUBLE DOOR    |               |
| STANDARD TRAY                                                                                                    | 2                                                               | 2                             | 2              | 02*02         |
| OPTIONAL TRAY OR SHELVES AS PER YOUR REQUIREMENT                                                                 |                                                                 |                               |                |               |
| OPERATING TEMPERATURE                                                                                            | 10 TO 40 DEGREE C (CUSTOMIZATION)                               |                               |                |               |
| Light Shelves (optional Custom)                                                                                  | 2                                                               | 2                             | 4              | 4             |
| Growth Height in mm/per tier area in metre S<br>Note-Accordingly to shelf height will be increased and decreased | 300/0.72                                                        | 650/0.72                      | 700/0.51       | 700/0.68      |
| Degree of protection /HMI                                                                                        | IP21/7INCH (Data Logging Optional)                              |                               |                |               |
| POWER SUPPLY                                                                                                     | SINGLE PHASE 50HZ ,220 VOLT                                     |                               | SINGLE/3 PHASE | 3 PHASE       |
| HUMIDITY(OPTIONAL)                                                                                               | AMBIENT +10-65%( OPTIONAL UPTO 95 PERCENT AS PER DESIGN)        |                               |                |               |
| Humidity type (optional)                                                                                         | 1. Boiler B. Pan C Ultrasonic                                   |                               |                |               |

# CUSTOMIZED OPTION

## Temperature Control

**TMP01 Self-contained, Air-cooled Condensing Unit**

**TMP02 Remote, Outdoor, Air-cooled Condensing Unit (All-Weather Housing)**

**TMP03 Extended Temperature: -10°C (non-lighted units)**

**TMP04 Extended Temp: -10°C (lights off) / 0°C (lights on)**

**TMP05 Extended Temp: +60°C (no refrigeration above 40°C)**

**TMP06 Extended Temp: +60°C (continuous running condenser)**

**TMP90 Extended Temperature Range up to +90°C — For ultra-high-temperature applications.**

## **. Refrigeration**

**STND      Standby Refrigeration**

**AL      Aluminium coil Condenser coil for insect**

## **Doors & Access Options**

**DR01 Observation Window with Cover (12" x 12") on Door**

**DR02 Door Lock**

**DR03 Full Size Glass Door**

**DR04 LED Working Light (energized when door opens)**

**DR05 Left-Hand Door Swing**

**DR06 Heavy Duty Door Handle with Latch**

**DR07 Locking Door, Power Switch, Dry Contacts (one door)**

**DR08 Locking Door, Power Switch, Dry Contacts (two doors)**

**DR09 Customization Dimension**

## **. Control Systems & Interfaces**

**CTL03      Android-based Touchscreen**

**CTLO4      ( 5-15R 1A Convenience Receptacle (Programmable)**

**CTL05      Dry Contact for Remote Alarm**

# CUSTOMIZED OPTION

## Humidity Control

- HMD01 Pan-type Humidifier + Electronic RH Sensor (0–1 VDC)
- HMD02 Pan-type Humidifier/Dehumidifier + RH Sensor (0–1 VDC)
- HMD03 Pan-type Humidifier/Dehumidifier + Advanced RH Sensor (0–5 VDC)
- HMD04 Ultrasonic Humidifier + Advanced RH Sensor (0–5 VDC)
- HMD05 Ultrasonic Humidifier/Dehumidifier + Advanced RH Sensor (0–5 VDC)
- HMD06 Ultrasonic Humidifier + Electronic RH Sensor (0–1 VDC)
- HMD07 Ultrasonic Humidifier/Dehumidifier + RH Sensor (0–1 VDC)

## . CO<sub>2</sub> Control

- GAS01 Additive CO<sub>2</sub> Control with 2000 ppm Sensor
- GAS02 Additive CO<sub>2</sub> Control with 5000 ppm Sensor
- GAS03 Additive CO<sub>2</sub> Control with 10% Sensor
- GAS04 CO<sub>2</sub> Removal System (requires GAS01/GAS02/GAS03)

## Data Logging & Instrumentation

- TRA-DATA Temperature & RH Recorder with Data Logging — Records environmental data for compliance.
- P47 PAR Sensor (400–650 nm) — Measures photosynthetically active radiation.
- S47 Spectroradiometer (400–1100 nm) — Captures a broad light spectrum for precision lighting analysis.
- EMCB MCB & Temp/RH Safety Controller — Provides electrical and environmental safety control.

## Lighting Systems

- LGT01 Closed Loop Dimmable Lighting + PAR Light Sensor
- LGT02 Open Loop Dimmable Lighting (independent shelf dimming)

# CUSTOMIZED OPTION

## **. Shelving & Structural Hardware**

**SHF01 Additional Epoxy Wire Shelf**

**SHF02 Stainless Steel Wire Shelf**

**STR01 Caster Assembly with Levelers (30 Series)**

**STR02 Stacking Hardware for 30 Series**

**STR03 External Drip Pan**

**STR04 Additional Access Ports (1", 2", 3", or 4")**

**DON Unstandard dimension**

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## **Filters, Coils, Accessories**

**FLT01 Air Filter Assembly (insect screen)**

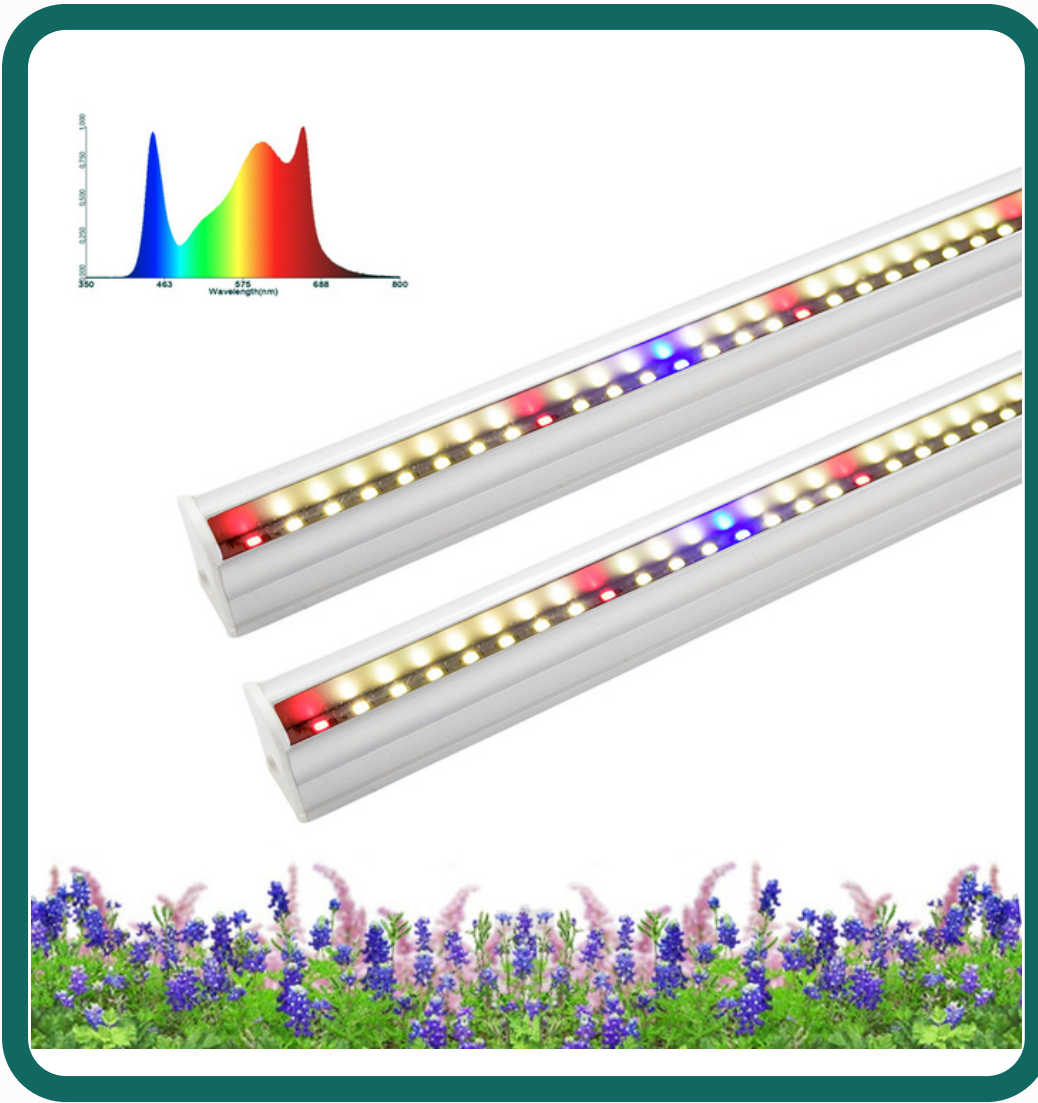
**FLT02 Phenolic Coated Coils (for Drosophila research)**

**FLT03 Cover for WAC4 Unit**

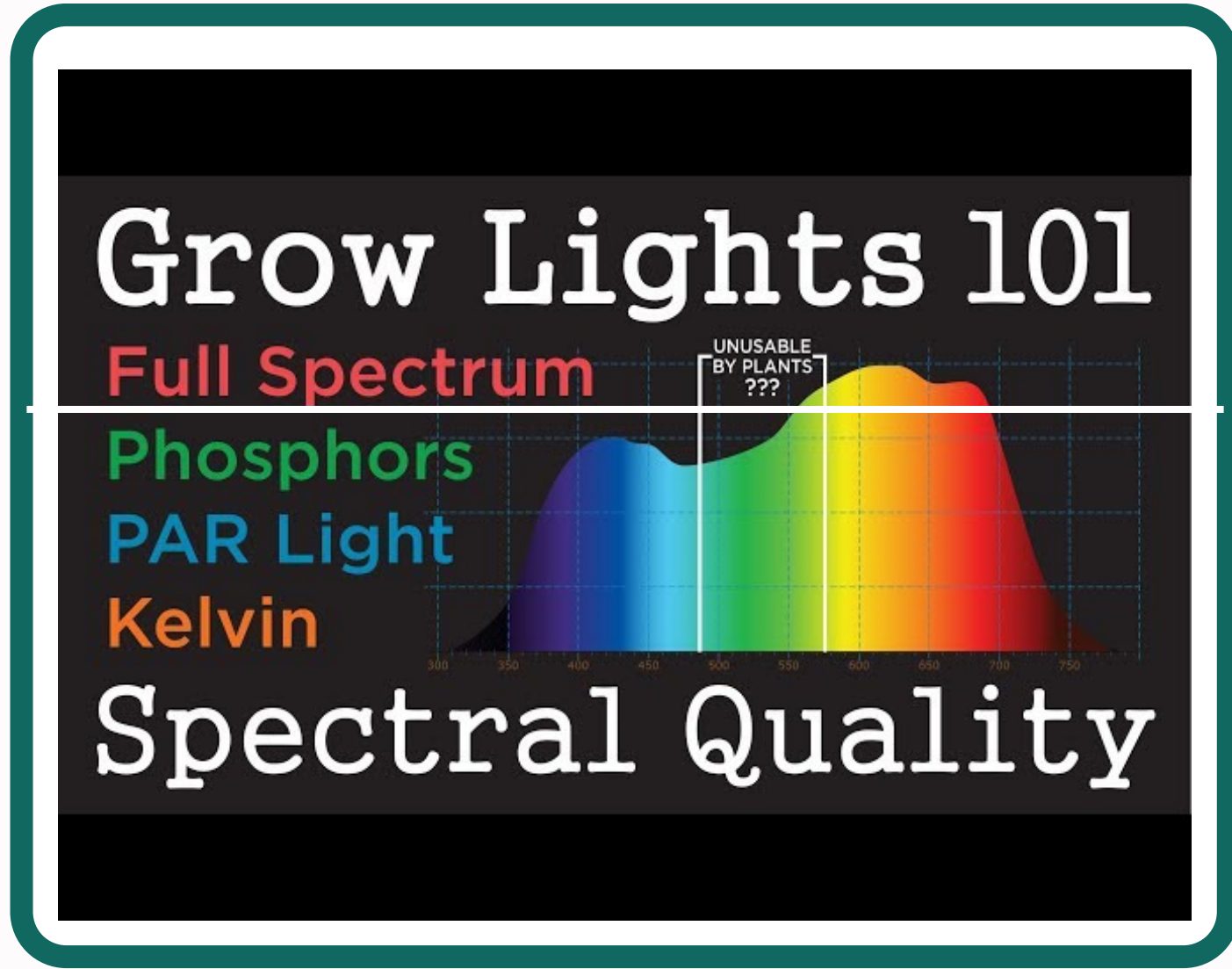
## **. Warranty**

**WR01 Extended Warranty (1, 2, or 3 Years)**

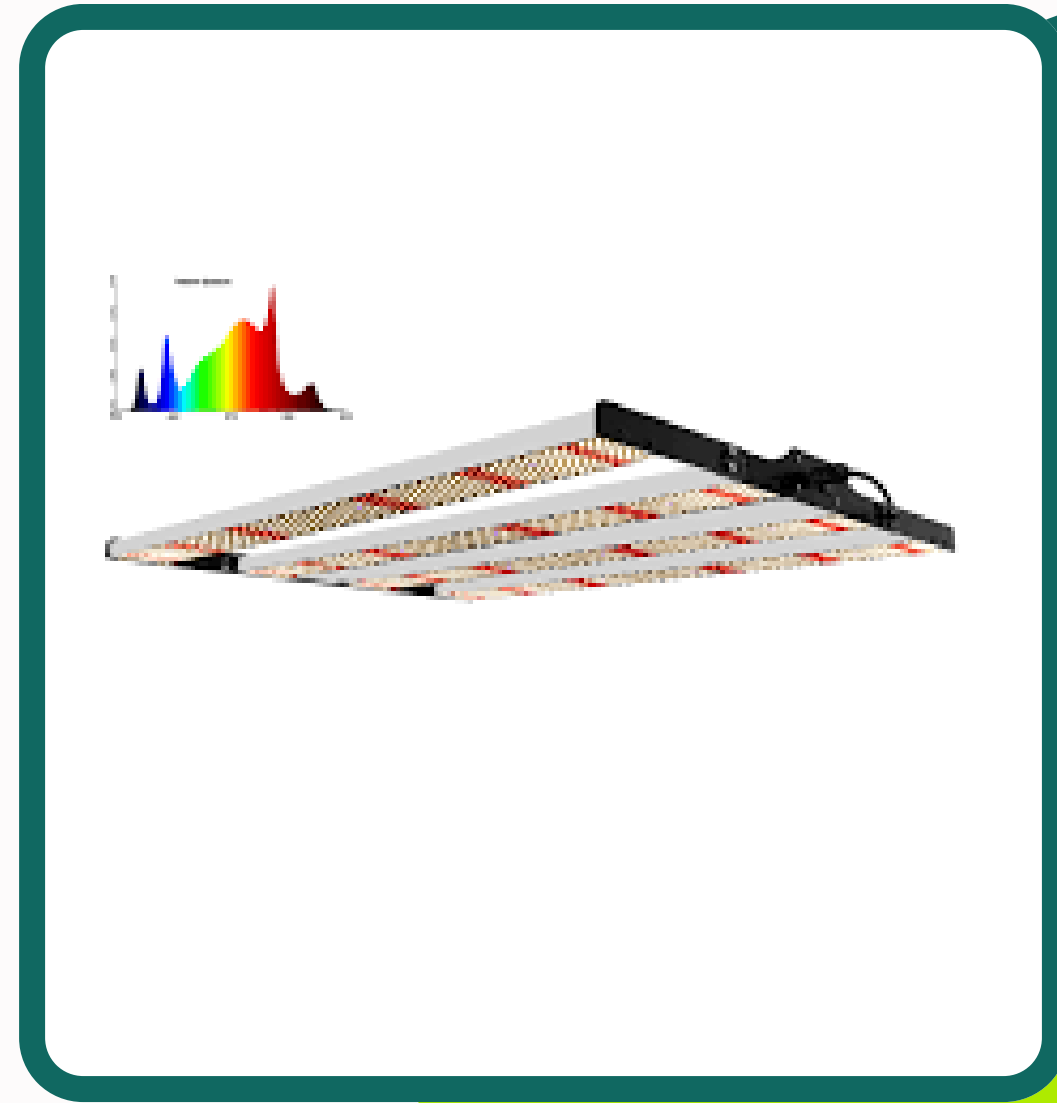
# GROWTH LIGHT



LED Growth Tube



Customized Spectrum



Customized LED Panel

# Spectrum Range Chart

| Color Spectrum | Wavelength (nm) | Functionality                                              |
|----------------|-----------------|------------------------------------------------------------|
| Cool White     | 6500K           | Full-spectrum light for general plant growth across stages |
| Warm White     | 3500K           | Enhanced red-yellow spectrum to aid flowering and biomass  |
| Red            | 650–670 nm      | Promotes photosynthesis, flowering, and fruiting           |
| Far-Red        | 720–740 nm      | Stimulates elongation and flowering trigger responses      |
| Blue           | 451 nm          | Boosts chlorophyll formation and compact vegetative growth |
| Green          | 510–550 nm      | Penetrates deep into the canopy; balances foliage growth   |
| Violet         | 430 nm          | Encourages pigmentation and secondary metabolites          |
| UV-A           | 390 nm          | Enhances plant resilience and defense response             |
| UV-B           | 310 nm          | Influences plant morphology and biochemical composition    |

# Key Features

-  Sunlight-Mimicking Full Spectrum: A strategic combination of white + red + blue + far-red + UV for optimal plant performance.
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-  Dimmable Control: Each channel is adjustable for customized light recipes.  
(OPTIONAL)
- 
-  Energy Efficient: High PAR output with low heat emission.
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-  Modular Configuration: Suitable for tissue culture, vertical farming, phenotyping, and research environments.
- 
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NOTE:- CHOOSE YOUR OWN SPECTRUM



**SHOOLINLAB**

# THANK YOU

For watching this presentation



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