

PLANT GROWTH CHAMBER

Growing Life, One Plant at a Time



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Introduction

Our Plant Growth Chamber is engineered for precise control of temperature, humidity, and lighting—ideal for plant science research and controlled environment agriculture. It ensures uniform conditions essential for reliable and repeatable results.



Hot Gas Bypass System

Integrated Hot Gas Bypass System allows fine temperature control by bypassing excess cooling load:

- Improves accuracy
- Prevents compressor cycling
- Reduces energy use
- Stabilizes internal environment

Typical Applications:

- Tissue Culture Growth
 - Seed Germination & Storage
 - Photoperiodic Studies
 - Abiotic Stress Tolerance Research (heat, cold, drought)
 - Genetic & Mutation Studies (requiring tightly controlled environments for accurate phenotypic expression)
- Optional Add-ons: CO₂ module, remote alarms, data logging, custom shelf/rack system

PLANT GROWTH CHAMBER (PGC) WITH HOT GAS BYPASS SYSTEM (RARE IN INDIA)

Our **Plant Growth Chamber** is engineered for precise control of temperature, humidity, and lighting—ideal for **plant science research** and **controlled environment agriculture**. It ensures uniform conditions essential for reliable and repeatable results.



The slide features a light green background with a subtle bokeh effect. Four green leaves are positioned at the corners: top-left, top-right, bottom-left, and bottom-right.

Key Features:

- Temperature Range: 10°C to 40°C ($\pm 0.5^\circ\text{C}$)
- Humidity Control
- Lighting: Horizontal LED lighting (Red, Blue, White – programmable intensity & cycle)
- Control: Digital PID controller with programmable day/night cycles
- Airflow: Uniform horizontal air circulation
- Build: PUF-insulated MS/SS body with corrosion resistance

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	PGH/PGC			
INNER VOLUME .+.+.	500 Ltr	1000 Lts	1400 Ltrs	2000 Ltrs
Lights in micromole measured 6inch heights from lampbank (spectrum as per your application) by default warm white	250-500	250-500	250-600	250-600
Cooling Mode	Hot gas by pass /Condensing Principles continuous compressor ON			
Standard Dimension WDH in mm Standard Dimension for 3 feet door	850*850*700 800*650*1000	850*850*1400 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 m sq. 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			

Key Features

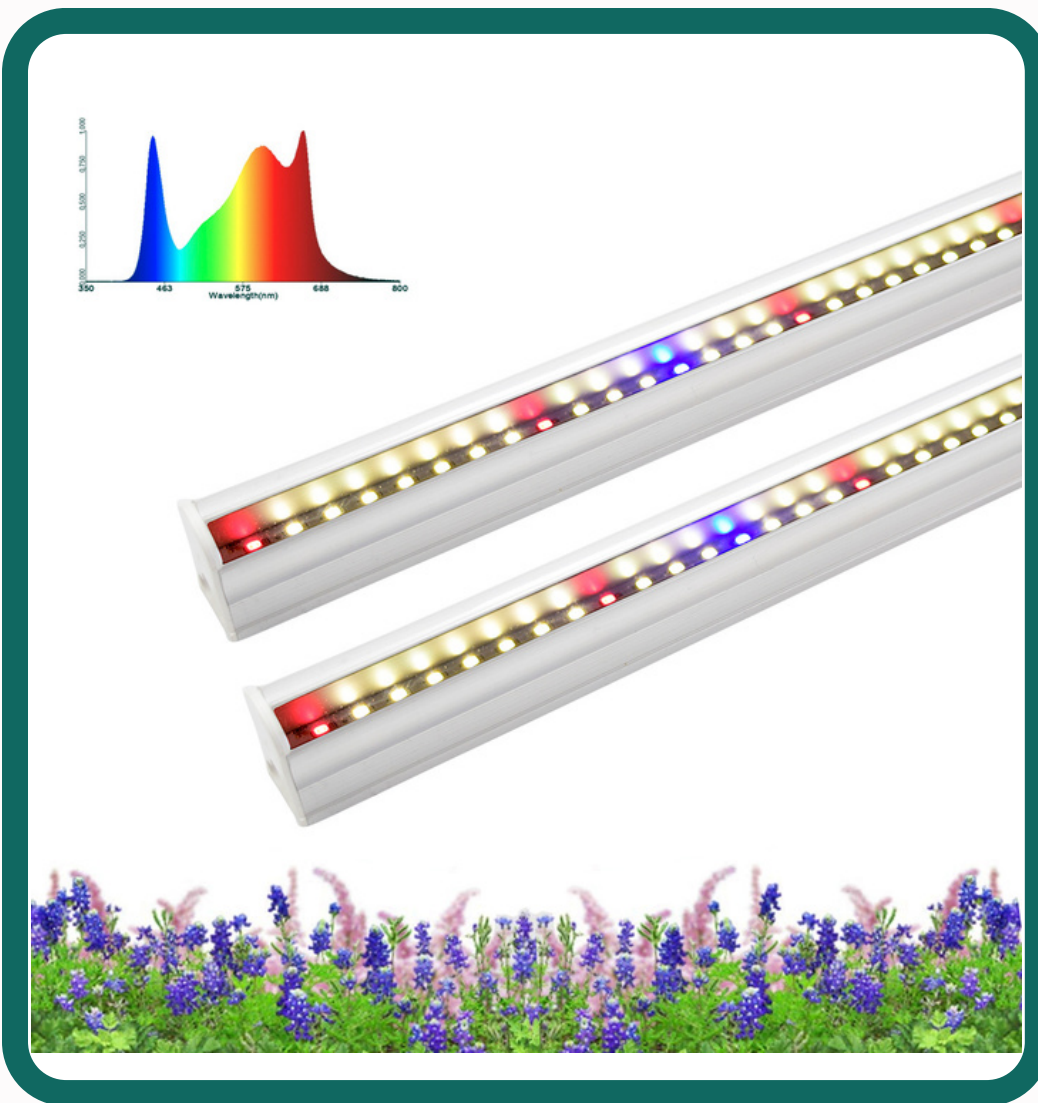
-  Sunlight-Mimicking Full Spectrum: A strategic combination of white + red + blue + far-red + UV for optimal plant performance.
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-  Dimmable Control: Each channel is adjustable for customized light recipes.
(OPTIONAL)
-
-  Energy Efficient: High PAR 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

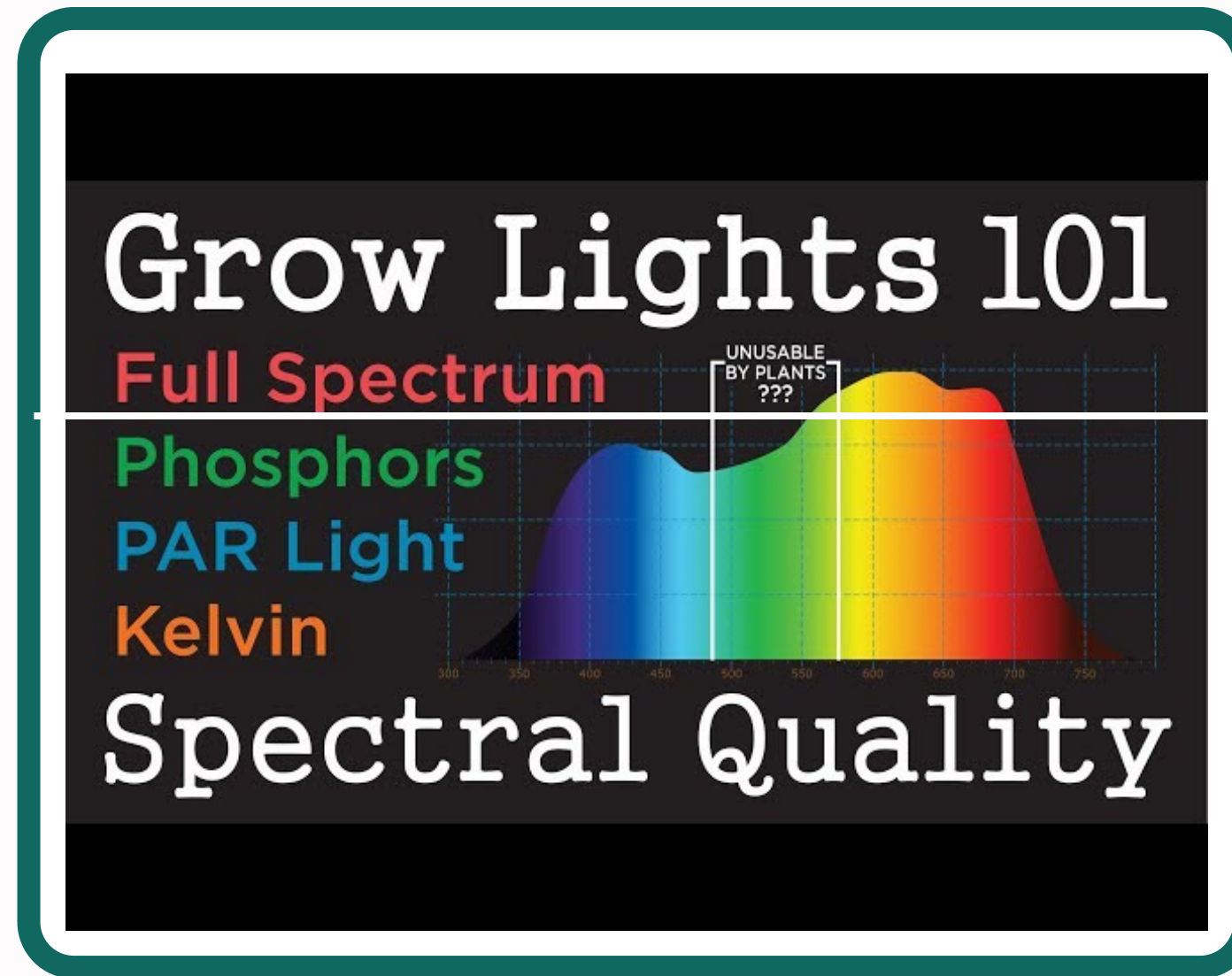
Spectrum Range Chart

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

GROWTH LIGHT



LED Growth Tube



Customized Spectrum



Customized LED Panel

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

. 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

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)

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)

. CO₂ Control

- GAS01 Additive CO₂ Control with 2000 ppm Sensor
- GAS02 Additive CO₂ Control with 5000 ppm Sensor
- GAS03 Additive CO₂ Control with 10% Sensor
- GAS04 CO₂ 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

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



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THANK YOU

For watching this presentation



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