



# PLANT GROWTH CHAMBER

## Model: - FIDELS 300

### PRODUCT OVERVIEW

FIDELS chamber has a unique ability to fit various research applications and is flexible in its design. The Basic 300 series can be fitted with various mix and match upgrades kits to suit a variety of applications.

Some of which are Plant Growth, and other many application.

### APPLICATIONS

**Plant Growth:** This chamber is used for soybean, Rice, Tomato, cotton or other height plants.

**Arabidopsis:** This chamber is used for Arabidopsis plants.

**Algae:** This is designed for Algae research.

**Tissue Culture:** This used for Plant Tissue culture

**Incubator (with Light):** This is used for Cyanobacteria, insects and simple low-cost Seed Germination.

**Incubator (without Light):** This is used for nematodes, yeast/ fungi, insects and BOD.

### CONTROLLER

FIDELS has built a reputation of providing reliable customized options for research

**High-definition touch screen controller with android facility Control System, features include**

- Industrial Grade, highly reliable, solid state microcontroller architecture.
- Dual Experiment protection via integrated yet independent temperature limit shutdown.
- Ambient temperature monitoring.
- Power fail event logging.
- Single Board Electronic Solid state design.
- Durable 10-key industrial keypad with VFD display

- **Three Programming styles:** Continuous, Multistep and Diurnal, 24 hour, and non-24 hour (elapsed time)
- Programs can be run in ramping or non-ramping modes.
- Programs are created and run in real time.
- Multiple programs can be linked together to simulate natural conditions.
- RTD temperature sensor inputs.
- Three point temperature calibration.
- Daily light integral programming Mode.
- **Auto-restart in case of power failure.**
- Programs are created and run in real time.
- Multiple programs can be linked together to simulate natural conditions.
- RTD temperature sensor inputs.
- Three point temperature calibration.
- Two calibrations offset per input channel (one for light ON and one for lights OFF)
- **Double Controller in case of touchscreen failure**
- **Controller shut down the chamber and automatically restart when the temperature returns normal.**
- Highly visible alarm display with audible buzzer.
- **Controller can be secured with four –level password protection.**
- Field upgradable I/O expansion modules.
- Firmware updated easily uploaded via included USB thumb drive.
- **Auto restart in case of power failure.**
- Industrial grade membrane key-pad overlay for service.
- Improve troubleshooting with Systems diagnostics menu.
- Scalable analog and digital control outputs.
- **Inbuilt battery.**
- Digital addressable lighting interface (DALI) control allows for light remapping the need for rewiring.

### LIGHTING SYSTEM

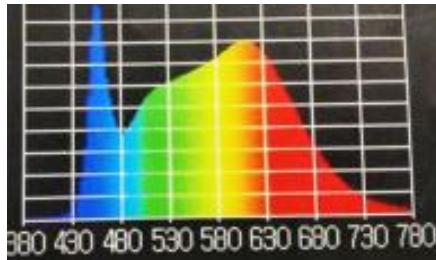
Each Lamp bank shall consist of LED tiles with Photo synthetically active radiation (PAR) spectra.

- **Type:** LED

- **LED Control:** System controlled via open loop dimming as a percentage of total output in 1% increments

- **Programming:** Via realtime Controller.
- **LED output color:** white
- **Intensity:** @ 6" from source, 25°C (ambient)
- **Light Fixture efficacy:** 2.5  $\mu$ moles/J
- **PAR Light Range:** 430-780nm
- Light intensity changing option is there

Maximum Intensity varies according to the chamber model number.



## CABINET CONSTRUCTION

- Interior - Double walled Chamber with Inner of stainless steel 304 grade C.
- Interior Volume: 300/500/800/1100 Liter (Customized)
- Exterior - RCA duly powder coated.
- Overall wall thickness 2" (5.1cm)
- Foamed in place CFC free insulation (refer to insulation section)
- No heater to be used for heating.
- One 1 1/4" diameter access port on right hand wall.
- Chamber floor back equipped with floor drain and hose assembly
- Contains castors, assembly and adjustable leveling legs to compensate for floor unevenness in the lab.

## AIR FLOW/CIRCULATION

Air Circulation inside chamber is from a specifically CFD designed perforated rear plenum (air is drawn at the TOP mounted unit cooler and discharged uniformly across each shelf). Horizontal Air Flow/ Vertical Air flow configurable, as per your research need.

Or plug and play system with one fresh air-port.

## INSULATION

Woodless construction using 2" (5.1cm) thick foamed in place CFC free insulation

## DOOR

- One door opening provides full access to the chamber.
- Width: 93.5cm Height: 146.1cm
- Magnetic Perimeter gasket provides a tight seal to door frame.
- Lock and Key

## FINISH

- Interior and exterior painted with highly reflective, environmentally friendly high temperature baked white powder coating.

## SHELVING

- White epoxy coated steel wire shelving. Each shelf is 45 cm Width x 70 cm Length.
- Shelving is supported by shelf clips allowing 1/2" vertical adjustment.
- Number of shelves and maximum clearance between shelves depends on model number.

## WORK AREA

- 7ft2 per shelf
- Total work area depends on model number and number of shelves.
- For models with multiple shelves shall be removable and adjustable such that the work space can be modified by the owner.

## REFRIGERATION OVERVIEW

- Air cooled condensing unit.
- Continuous running condensing unit with hot gas bypass.
- Ceiling mounted, copper coil, aluminum fin evaporator coil.
- System cycle between heat and cool for precise temperature control around the temperature set point.

- Adjustable expansion valve provided.
- Solenoid valve cycle between hot gas and cooling loops.
- Extended stem-type for long and quiet operation.
- Self contained condensing unit located on top of each chamber for best performance and cleaner operation.
- 1/3 Hp condensing unit.

## TEMPERATURE CONTROL

- **Working Temperature maximum:** +45°C
- **Working Temperature minimum:** 2°C with lights OFF.
- **Setting accuracy:** 0.1°C
- **Temperature stability @ all set temp- (Lights ON/ OFF):** 0.5°C
- **Temperature stability:** ± 0.3°C
- Dual (redundant) adjustable high and low temperature safety controls, audible alarms and visual indicators are provided. The controls shutdown all power to the chamber, activates alarms and automatically controls the temperature at the safety value. When the temperature returns to the normal range, the system will automatically reset.
- Compressor over temp protection
- **Ambient temperature:** 40°C
- Over pressure protection
- Compressor Delay starts (Power ON).
- **Temperature Deviation alarm.**
- **Multiple Day/Night Offset for Temp.**
- **Alarm: Temp. High & low**

## HUMIDITY CONTROL

- The section outlines the H1 PAN type humidity option having Humidifier with Electronic RH sensor.
- The section outlines the H3 PAN type humidity option having Humidifier and Dehumidifier with Electronic RH sensor.
- **Additive humidity control of 30-98% for set temperature between 15-30°C.**
- Extended Humidity ranges available. (See other specification sheet or consult for additional information)
- If a humidity option is selected, a de-mineralized water supply is required which terminates to a 1/2" MPT connector.
- The Performance of Humidity control is dependent upon the laws of thermodynamics.

## ELECTRICAL REQUIREMENT

- 230 V AC, Single Phase, 50Hz.
- Power consumption, Basic unit (without any optional/other load): Less than 1650 watts (all models)
- Power varies according to model and options ordered.

## OPTIONS (MOST POPULAR)

- Glass Door
- Connect with Android based Touch screen controller
- Pan Type Humidifier with Electronic RH sensor
- Ultrasonic Humidifier with Electronic RH sensor
- Ultrasonic Humidifier with Dehumidifier with Electronic RH sensor
- Door with observation Window and cover
- Additional Steel Wire Shelves
- Stainless Steel shelves

(Consult for optional and accessories for any specific need)

## UPGRADE KIT

- Single Tier of 600umole Lamp bank
- Single Tier of 300umole Lamp Bank

Disclaimer: Specification subject to change without notification. Date Issued: May 2020  
Version: FPGC-1500 Trademarks are property of respective owner.

## ACCESSORIES

- One 5 KVA voltage stabilizer.

## SPECIFICATION

Model	Light Intensity 6" from lamps	Temperature Range with all lights on	Interior Space volume	Total Shelving Floor Area	Maximum Growing Height	Exterior Dimensions			Tiers
						width	depth	height	
	µmoles/m <sup>2</sup> /s	°C	m <sup>3</sup>	m <sup>2</sup>	Cm	cm	cm	cm	
<b>Plant Growth</b>									
						41 (in)	33.6 (in)	77.2 (in)	
<b>FIDELS 500</b>	850	2-45±0.5	0.8	0.6	23	80	70	120	2



# FIDELS SCIENCE

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