



## **Plant Growth Chamber**

**Model: FIDELS/30 FS**



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## Applications

The chamber is suitable for applications involving maintenance of *C. elegans*, nematodes, yeast and fungi, insects, bacteria, as well as for conducting BOD studies. In addition, it can be used for a wide range of other biological and environmental research applications. Users are advised to evaluate their specific experimental requirements in relation to the specifications provided.

## Key Features

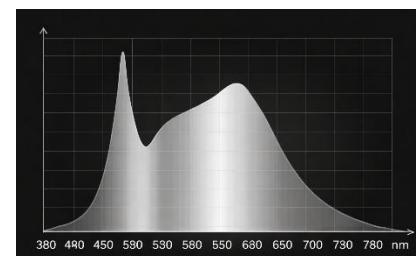
- Single-board controller with manual and programmable temperature control, including diurnal operation.
- Programmable linear LED lighting system.
- Adjustable shelving.
- Air-cooled refrigeration system.
- hot-gas bypass without heater heating.
- Uniform cooling.
- Rear-mounted evaporator coil with circulation fan.
- Temperature safety system with alarms, automatic shutdown.
- Multi step program for temperature.
- dual independent protection.
- Large access door with magnetic gasket.

## Controller

- The chamber is controlled by an integrated microprocessor-based single-board controller employing PID control logic, designed to deliver stable and dependable performance with operational flexibility.
- The controller supports both manual operation and programmable temperature control, allowing users to configure multi-step temperature profiles based on application requirements. Diurnal temperature programming is supported, with program steps executed sequentially according to elapsed time, ensuring consistent, repeatable, and well-controlled thermal conditions during operation.

## Lighting System

The chamber is equipped with linear LED light modules arranged in horizontal pairs above each shelf to provide uniform illumination across the workspace. Light intensity is fully programmable up to 125  $\mu$ moles/m<sup>2</sup>/s, with irradiance values referenced at a distance of 6 inches from the LED source. All lighting functions, including programming and real-time intensity control, are managed through the integrated controller. The system allows continuous dimming across a range of 5% to 100% output, enabling precise adjustment based on application requirements.



*intensity varies according to Model No.*

## Humidity Control

The plant growth chamber incorporates an integrated electronic humidity control system with a pan-type humidification arrangement for precise environmental regulation. The system is designed to operate over a relative humidity range of 40% to 80% RH, depending on operating and ambient conditions. Uniform humidity distribution is maintained throughout the chamber to support consistent and reliable plant growth.

## Finish

Both the internal and external surfaces are finished with a white powder-coated layer applied through a high-temperature baking process. This coating provides a durable, reflective surface and is designed to be environmentally safe for long-term use.

## Refrigeration System

The unit is designed with a self-contained, air-cooled condensing system incorporating hot-gas bypass technology to enable continuous compressor operation and ensure long service life, without the use of any separate electrical heater for heating. Ice build-up is prevented by controlled circulation of refrigerant and hot gas through the cooling coil. Extended-stem solenoid valves are provided for quiet and reliable operation. Uniform cooling is achieved through a rear-mounted evaporator coil with an integrated circulation fan, while total heat rejection to ambient is approximately 1,221 BTU/hr.

## Temperature Range

The chamber is designed to deliver precise temperature control across a broad operating range. When the internal lighting is switched OFF, the system supports temperature operation from 2°C to 50°C with an accuracy of  $\pm 0.5^\circ\text{C}$ . With the lighting system ON, the achievable operating temperature range is 5°C to 50°C, maintaining the same control accuracy.

## Temperature Safety Limit Controls

- The system is provided with adjustable high and low temperature safety limits supported by audible and visual alarms to safeguard ongoing experiments. In the event of a temperature deviation beyond the set limits, chamber power is automatically disconnected and normal operation is restored once conditions return to the acceptable range.
- The design incorporates dual experiment protection through an integrated yet independent temperature limit shutdown system, ensuring enhanced operational safety.

## Insulation

The chamber features a wood-free construction incorporating CFC-free insulation materials. An overall wall thickness of approximately 2 inches (5.1 cm) is provided to support consistent thermal performance and maintain uniform temperature conditions within the chamber.

## Door

- The chamber is provided with a single large access door measuring approximately 68 x 76 cm.
- The door is fitted with a magnetic gasket to ensure a tight, airtight seal during operation.

## Cabinet Construction

- The chamber is of a fully self-contained design and is suitable for stacked installation. The outer cabinet is manufactured from 18-gauge electro-zinc-plated steel, while the inner chamber is formed using 22-gauge electro-zinc-plated steel.
- All joints and seams are fully welded to ensure long-term structural integrity.
- The inner liner is supported on non-compressible, non-thermally conductive blocks to avoid direct metal-to-metal contact.
- The cabinet construction provides an overall wall thickness of 2 inches (5.1 cm).

## Shelving

The chamber is fitted with three tiers of white epoxy-coated steel wire shelves. Each shelf provides an approximate usable area of 41 cm (D) × 67 cm (W). The shelves are mounted on adjustable support clips, permitting vertical repositioning in 1.27 cm increments. When all shelves are installed, a maximum vertical clearance of approximately 23.4 cm is maintained between adjacent shelves.

## Electrical Requirements

220 V single phase 50Hz

## Options / Accessories

- Door with fresh air ports
- Door with observation window
- CO<sub>2</sub> enrichment package
- Humidifier with electronic RH sensor
- Combined humidifier and dehumidifier system
- Phenolic-coated coils (recommended for *Drosophila* research)
- Self-contained water-cooled condensing unit
- Android-based touchscreen controller
- Convenience electrical receptacles
- Integrated LED working light
- Extended temperature range configurations
- Access port with protective cover

*Additional accessories and configurations are available upon request.*

Parameter	Specification
Temperature Range	2°-50°C (±0.5°C) lights off and 5°-50°C (±0.5°C) lights on
Volume	300 L
Number of Tiers	3
Maximum Growing Height	23.4 cm
Exterior Dimensions (W × D × H)	79 × 60.5 × 117 cm
Light Intensity (6" from lamps)	125 µmoles/m <sup>2</sup> /s
Total Shelving Floor Area	0.8 m <sup>2</sup>