

Accelerated Aging Chamber Model: FIDELS/36 F2

About the Accelerated Aging Chamber

The Accelerated Aging Chamber by FIDELS SCIENCE is designed to simulate environmental aging under controlled temperature, humidity, and lighting conditions. It provides a stable and uniform test environment for research and evaluation purposes, ensuring consistent and repeatable results for laboratory applications.

Key Features

- Controlled environmental simulation for accelerated aging studies
- Ambient temperature monitoring with deviation alarms
- Automatic ultrasonic humidification system with high-accuracy sensor
- Full-spectrum PAR LED lighting
- Adjustable light intensity with programmable photoperiod control
- Independently controlled lighting for each tier in two-tier configuration
- Provision of two UV lamps with programmable operation
- Flexible airflow system with horizontal and vertical circulation options
- Air-cooled refrigeration system with hot gas bypass for continuous operation
- Option for future CO₂ sensor upgradation
- Microprocessor-based PID controller with touchscreen interface
- Real-time clock programming with multi-phase cycling and hold functions
- Password-protected controller with experiment safety features
- Auto-restart function in case of power failure
- USB/SD card-based data logging with optional 30-day storage
- Removable and adjustable shelving for workspace customization
- Safety features including over-temperature protection and audio-visual alarms

CO₂ Control

Provision available for future upgradation with a CO₂ sensor, allowing system readiness for controlled CO₂ monitoring and integration based on evolving testing requirements.

Technical Specifications

Temperature Range

The chamber operates from +2°C to +60°C with lights OFF and +7°C to +60°C with lights ON. Temperature is controlled with an accuracy of ±0.5°C at the control point and includes ambient temperature monitoring.

Temperature Control

Equipped with compressor delay start during power ON to protect the refrigeration system, temperature deviation alarms for continuous monitoring, and optional three-point temperature calibration to ensure improved control accuracy and long-term measurement reliability.

Volume

Designed with a growth capacity of 800 liters, suitable for short to medium height plants. The external dimensions are maintained within 85.1 × 85.4 × 196.1 cm for efficient space utilization.

Shelving

- Two tiers of white epoxy coated steel wire shelving (each shelf is 28.8"W x 27"D (73 cm x 68.6 cm)
- Each shelf is supported by shelf clips allowing ½" vertical adjustments
- Maximum growing height is 22.6" (57.5 cm)

Lighting System

Features full-spectrum PAR LED lighting delivering 680 µmol/m²/s at canopy level. The lighting system offers an efficacy of 2.5 µmoles/J and is mounted on a horizontal light shelf for uniform light distribution. In two-tier configuration, lighting is independently available for each tier, enabling flexible and controlled illumination for different test requirements.

Light Control

Two mandatory UV lamps with programmable photoperiod and adjustable light intensity.

Major Features

Two-tier configuration providing a growing height of 50–60 cm per tier with a total shelving area of one square meter. Shelves are removable and height-adjustable to allow flexible workspace arrangement and easy accommodation of samples with varying heights and layouts.

Insulation

Insulated with high-density PUF insulation of 80 mm thickness, ensuring reliable thermal performance, reduced heat loss, and stable operating conditions during continuous operation.

Door

Single door design with magnetic perimeter gasket to ensure an airtight seal.

Lift-off hinge design allows for simple removal of door

Airflow Circulation

The chamber is designed with a controlled airflow system that provides horizontal air circulation for multi-tier configurations and vertical airflow for single-tier operation. This airflow design ensures uniform distribution of conditioned air throughout the chamber, minimizing environmental gradients and maintaining consistent conditions across all growth levels.

Construction & Utility Specifications

Interior / Exterior Material

Constructed with corrosion-resistant SS-304 stainless steel and 26-gauge galvanized steel for durability and long service life. The interior floor is made of 24-gauge polished stainless steel, providing ease of cleaning and resistance to wear.

Mobility

Mounted on heavy-duty caster wheels with locking mechanism for easy movement, stable placement, and secure positioning during operation.

Electrical Requirement

Operates on 220–240 V AC, single phase, 50 Hz power supply.

Humidity Range

Provides precise humidity regulation within a range of 75% to 95% RH.

Humidity Control

Integrated automatic ultrasonic humidification system with a high-accuracy sensor, providing precise and responsive humidity control. Boiler-based humidity generation is not used, ensuring clean operation and reduced maintenance requirements.

Refrigeration Type

Fitted with an air-cooled condensing unit designed for continuous operation using hot gas bypass technology, ensuring stable cooling performance and reliable temperature control during extended operating cycles.

Safety Features

Includes over-temperature protection, audio-visual alarms with buzzer, door locking system, emergency shut-off, and an inbuilt diagnostics menu for troubleshooting, ensuring enhanced operator safety, quick fault identification, and reliable protection of the system and samples during operation.

Controller Type and Display Control Features

- Microprocessor-based PID controller with digital display for temperature, relative humidity, and timer
- High-resolution touchscreen interface
- User-defined high and low temperature settings
- High and low temperature deviation alarms
- Experiment safety through temperature limit shutdown with automatic restart upon normalization
- Automatic restart after power failure with inbuilt battery backup & automatic system shutdown with audio-visual alarms during abnormal temperature conditions.
- Highly flexible architecture facilitates configuration, expansion and customization
- Preferable four-level password-protected access
- Real-time clock-based programming for temperature, humidity, and lighting with multi-phase cycling, countdown, and hold functions



Options

- Additive CO₂ control
- CO₂ removal system
- Self-contained water-cooled condensing unit
- Dry alarm contacts
- USB/SD card-based data logging facility for storing and downloading operational data, with storage capacity up to 30 days
- Closed loop dimmable lighting with PAR light sensor
- Open loop dimmable lighting per tier
- Extended temperature ranges available
- Convenience receptacles
- Additional tier with lighting system

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Internal Chamber

The inner chamber is manufactured from high-quality SS-304 stainless steel with a smooth, corrosion-resistant finish. The interior design supports durability, easy maintenance, and stable operation under controlled temperature and humidity conditions.

External Cabinet

The outer cabinet is fabricated using 26-gauge galvanized steel, providing structural strength, protection, and long service life suitable for laboratory environments.

Insulation

High-density PUF insulation of 80 mm thickness is used throughout the chamber walls to ensure excellent thermal efficiency and reliable environmental stability during operation.

Door Assembly

The chamber is fitted with a single front-opening door equipped with a magnetic perimeter gasket to ensure an airtight seal and maintain internal conditions effectively.

Airflow & Cooling System

The system is designed with configurable airflow, providing horizontal circulation in multi-tier configuration and vertical circulation in single-tier configuration. Cooling is achieved through an air-cooled condensing unit with hot gas bypass for continuous and stable performance.

Humidity System

Humidity control is achieved using an automatic ultrasonic humidification system integrated with a high-accuracy sensor. Boiler-based humidity generation is not used, ensuring precise and clean humidity control.

Lighting System

The chamber is equipped with full-spectrum PAR LED lighting mounted on horizontally fitted light shelves. Lighting is independently available for each tier in two-tier configuration, with integrated UV lamps for controlled light exposure.

Control & Electronics

Operation is managed through a microprocessor-based PID controller with a high-resolution touchscreen display. The controller supports programmable temperature, humidity, and lighting functions, safety alarms, password-protected access, and automatic restart features.

Mobility & Utilities

The unit is mounted on heavy-duty caster wheels with locking mechanism for easy movement and stable placement. The system operates on standard single-phase laboratory power supply.

Specification Table

Parameter	Specification
Temperature Range (with all lights on)	7-60 ±0.5 °C
Interior Space Volume	29.7 ft ³ / 0.8 m ³
Total Shelving Floor Area	10.8 ft ² / 1 m ²
Maximum Growing Height	22.6 inch / 57.5 cm
Exterior Dimensions (W × D × H)	33.5 × 33.6 × 77.2 inch / 85.1 × 85.4 × 196.1 cm
Light Intensity (6" from lamps)	680 µmoles/m ² /s
Number of Tiers	2

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