

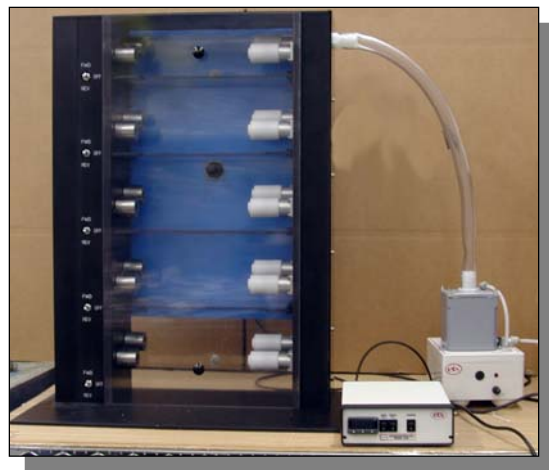
# CUSTOM ENCLOSURE MODIFICATIONS

## Series 5501-8000

Existing enclosures from any manufacturer can be upgraded with ETS Systems and Controllers to maintain desired humidity or humidity and temperature levels. Virtually any contained environment such as uncontrolled sealed working, mixing, storage and display enclosures can be retrofitted for use in storing, conditioning, assembly, testing etc of raw material, product, artifacts, electronic, electrostatic, biomedical, pharmaceutical, military, R&D plus other applications.

### Features:

- Modify to customer specifications
- Adaptable to most sealed enclosures
- Microprocessor RH & temperature control
- Maintain humidity from <5 – 98% RH
- Maintain temperature from 50-135°F (10-55°C)
- HEPA filters available
- Glove port or bare hand iris access available



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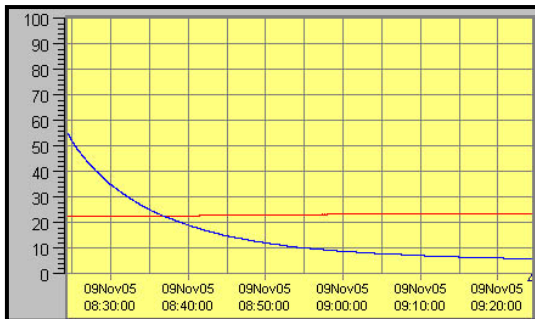
## General Description:

Existing enclosures, either those already installed or standard units offered by other manufacturers can be retrofitted with ETS microprocessor Humidity/Temperature Controllers and Operating Systems to adapt these enclosures to controlled humidity or humidity/temperature environments.

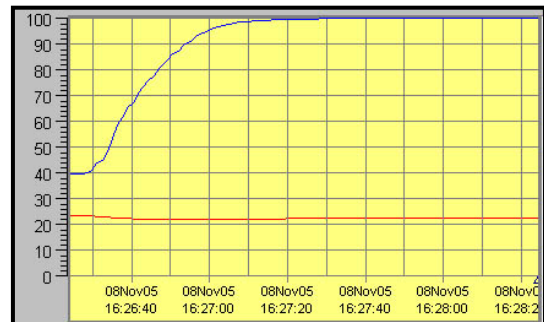
Examples include cabinets designed to store electronic components that have a controlled nitrogen purge to maintain low RH within the cabinet. A 55 Gallon (213 l) drum fireproof storage cabinet modified with a controlled nitrogen purge to maintain a constant low humidity environment for storing the contents of the drum. An enclosed manufacturing process with a controlled temperature system added to maintain constant temperature. Another manufacturing process with an ultrasonic humidity control system incorporated to control a curing process.

## Performance Characteristics:

The ability of an enclosure to maintain and hold a given humidity level is a function of cabinet design (size, shelves and doors), frequency of access, and operating systems and controllers used. The following charts show the time typically required to decrease and increase humidity in a 13ft<sup>3</sup> (370 l) enclosure (Blue = %RH, Red = T°C) using an ETS humidity control system with CALCOMMS software.



Rate of humidity decrease



Rate of humidity increase

## Standard Humidity/Temp. Operating Systems & Accessories:

Modified enclosures can be configured using the following operating systems and accessories:

### Dehumidification:

- 1.0 lb Desiccant/Pump @ 0.6 cfm
- 2.5 lb Desiccant/Pump @ 1.2 cfm
- Self-regenerating molecular sieve
- Dry Gas

### Humidification:

- Ultrasonic, ½ Gal tank
- Hi flow, 1 & 3 transducer systems
- from house water source or 5 gal tank

### Cooling:

- Liquid CO<sub>2</sub> or N<sub>2</sub> to Gas
- Thermoelectric: 100, 150, 200, 300, 400W

### Heating:

- Electric: 250, 400, 500, & 800W

### Accessories:

- Antechamber
- 5 lb jar of desiccant
- HEPA Filters
- Hypalon Gloves
- Iris Ports (12 overlapping silicone layers)
- Static dissipative acrylic (ESD protective)
- Access door without ports
- Shelves
- Vibration-free configuration (external pumps)
- Cart
- 3<sup>rd</sup> Parameter Monitoring**
- Requires linear sensor output
- O<sub>2</sub>, CO<sub>2</sub>, Pressure, ph etc.

# Custom Chamber Design Form:

Use the following form to create a custom chamber specification. Provide a sketch if necessary.  
**Note:** Gloves, access ports, fans, doors, power outlets and operating systems may utilize a portion of the workspace.

All custom modifications that ETS incorporates will be assigned a Drawing **5501-8xxx** Number. Drawings must be approved prior to modification.

## Chamber:

Construction: Metal \_\_\_\_\_ Plastic \_\_\_\_\_ Other \_\_\_\_\_

External Dimensions: Length \_\_\_\_\_ Width \_\_\_\_\_ Height \_\_\_\_\_

Add: No Glove Ports \_\_\_\_\_ 8" Glove Ports \_\_\_\_\_ 6" Glove Ports \_\_\_\_\_ (For small chambers only)

Port Options: Accordion Sleeves w/Replaceable Hands\_\_ Hypalon\_\_ Iris Port (8" only, >20%RH) \_\_ Other \_\_\_\_\_

Add: Door(s)\* Qty \_\_\_\_\_ Size of Opening \_\_\_\_\_ Location(s) \_\_\_\_\_

Add shelves \_\_ \_\_ Spacing \_\_ Type: Acrylic\_\_ Wire \_\_ Stackable wire frame, 18"W x 6"D x 2.5"H) Qty: \_\_\_\_

Chamber support: Floor \_\_\_\_\_ Table \_\_\_\_\_ Cart \_\_\_\_\_ Cart required? \_\_\_\_\_

\*2" of material normally required around door openings for support. Access door should be at least 2" larger than opening for gasket and latch. Alternatives to doors include removable side panels.

## Control Systems:

Humidity Control Only:\_\_\_\_ Temperature Control Only:\_\_\_\_ Both Hum & Temp:\_\_\_\_

Other Controlled Parameter (O<sub>2</sub>, Pressure, etc.): \_\_\_\_\_

Operational Range: Humidity: \_\_\_\_%; Temperature: \_\_\_\_ °F (°C)

List the highest Humidity/Temp combination needed: \_\_\_\_\_

List the lowest Humidity/Temp combination needed: \_\_\_\_\_

(Examples: 10-95% RH @ 100°F, 50% RH @ 72°F, 80% RH @ 50°C, 20% RH @ 5-50°C).

## Operating Systems (Check all that are required):

Humidification: \_\_\_\_\_ Dehumidification: \_\_\_\_\_ Heating: \_\_\_\_\_ Cooling: \_\_\_\_\_

NOTE: Several choices are available for dehumidification (dry gas, desiccant, molecular sieve, house air) and cooling (liquefied gas, refrigeration, thermoelectric). These vary greatly in cost. ETS will quote the most appropriate system based on customer input. Heating (resistive) and humidification (ultrasonic) do not require selection by the end user.

## Computer Interface (Includes software, communication boards, cables and interface):

Required: \_\_\_\_\_ Not Required: \_\_\_\_\_

## Misc:

Fluorescent Lighting: \_\_\_\_\_ AC Outlet: \_\_\_\_\_ Cable Pass-through: \_\_\_\_\_ Drain: \_\_\_\_\_

Availability of: Dry Nitrogen: \_\_\_\_ Liquid Nitrogen: \_\_\_\_ Dry House Air: \_\_\_\_ Liquid CO<sub>2</sub>: \_\_\_\_\_

**Warranty:** All ETS installed systems and accessories carry the standard ETS One (1) year warranty