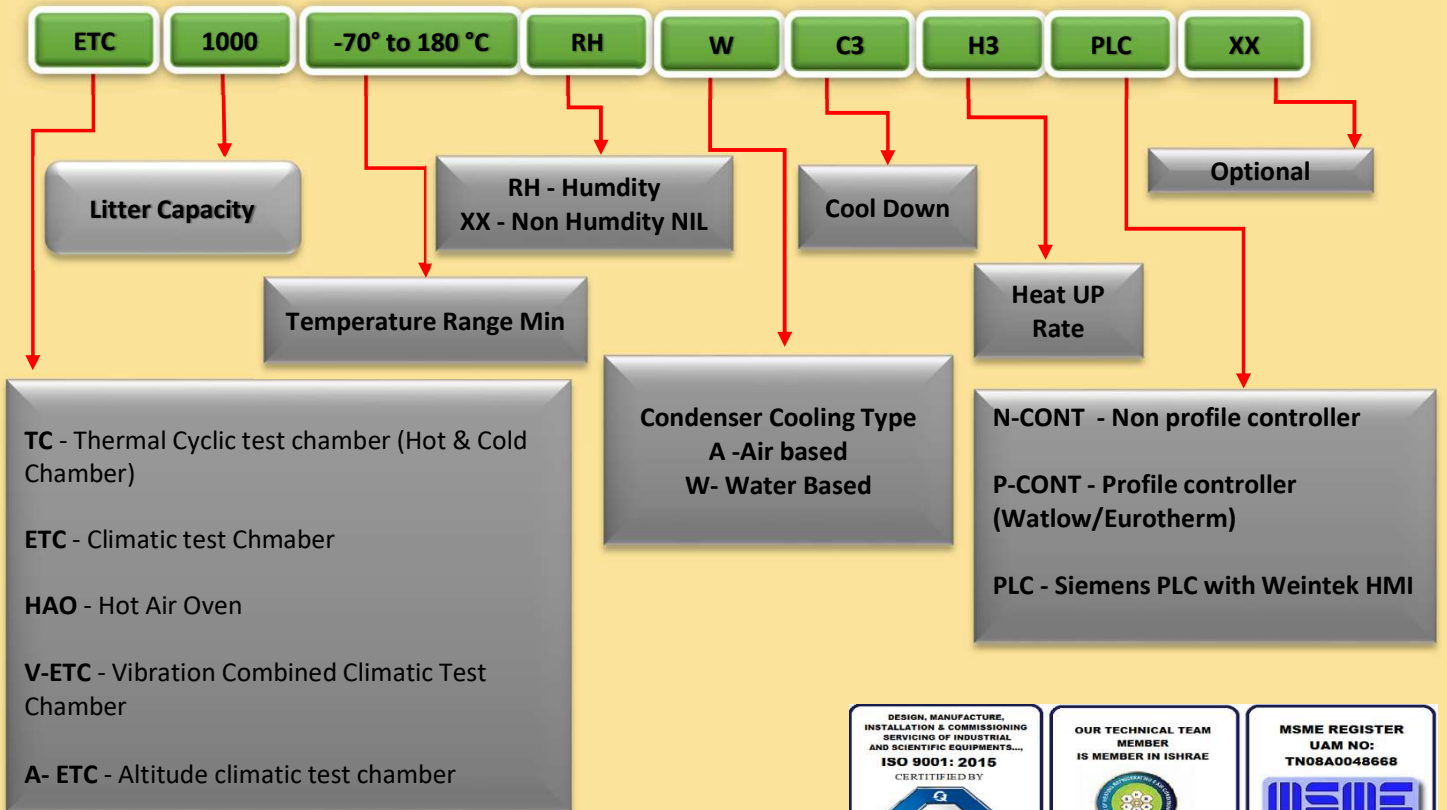


**CLIMATIC TEST CHAMBER / THERMAL CYCLIC TEST CHAMBER**



**Chamber Model Selection**



**According to IEC 60068-3-5 and IEC 60068-3-6**

a) \_\_\_\_ °C /min (empty chamber) as per IEC 60068-3-5. Averaged between chamber Maximum Range temp \_\_\_\_ °C to chamber minimum range temp \_\_\_\_ °C with sensor in discharge of air of blower.

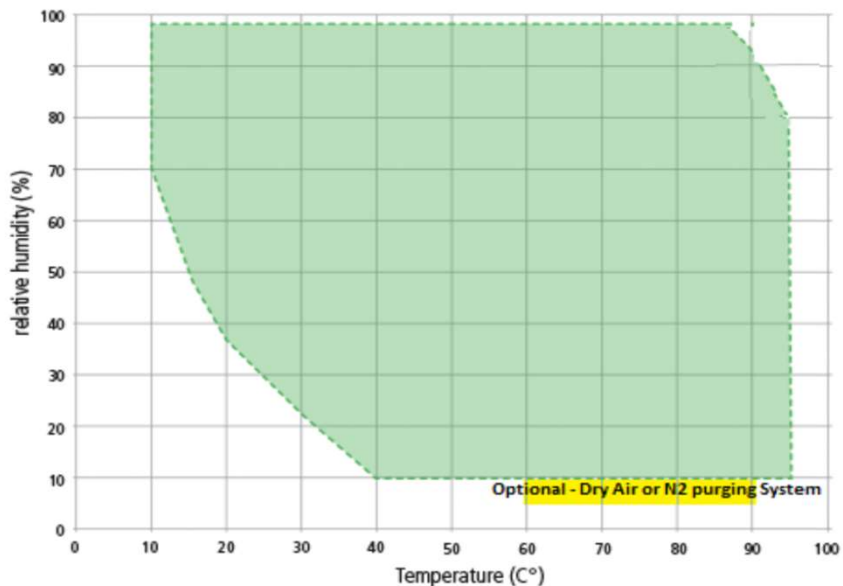
b) \_\_\_\_ °C /min (empty chamber) as per IEC 60068-3-5. Averaged between chamber Minimum Range temp \_\_\_\_ °C to chamber Maximum range temp \_\_\_\_ °C with sensor in discharge of air of blower

Work Space (Inner size )	50 Litter	100 Litter	180 Litter	250 Litter	340 Litter
Internal dimensions approx. (mm)	400mm W x 300mm D x 500mm H	500mm W x 400mm D x 600mm H	580 mm W x 450mm D x 750mm H	600mm W x 600mm D x 750mm H	580mm W x 765mm D x 750mm H
Temperature Range different model	Ultra -70 °C to 180 °C / ± 1 °C				
	Medium -50 °C to 180 °C / ± 1 °C				
	Basic -35 °C to 180 °C / ± 1 °C				
Humidity range (%) (τ=10/+85°C) <sup>2</sup>	10 to 98% / ± 3% (P Basic Model only RH 40 to 95%)				
Temperature range for climatic test (°C)	10.....85 deg c (PH Basic Model only temp 10 to 60 deg c)				
Deviation in temperature with respect to space	± 1 °C to 2° C				
Display resolution	0.1 ° C for temperature / 0.1% for RH				
Temperature accuracy	± 1 ° C				
Temperature changing rate Cooling <sup>4+5</sup>	Based on customer request				
Temperature changing rate Heating <sup>4+5</sup>	Based on customer request				
Controller	N-CONT = Non profile controller PPI make single set point only				
	P-CONT = Profile controller Make Watlow or Eurotherm (20 profiles)				
	PLC = Siemens PLC with 7" Weintek 7" HMI (In HMI 20 profiles/ In PC multiple profile)				
Optional Fan Motor Drive	Based on customer request				
Construction Features	Interior SS 304 Sheet thickness - 1.2/ 1.5 mm Stainless Steel arc welded				
Exterior	Exterior Sheet thickness 1.5 mm CRCA sheet with powder coated				
Tray	1 Number - Adjustable horizontal SS grill racks				
Side Cable Access port	75 mm Diameter - 1 no				
Chamber inspection lamp will be provided	20 w			60 w	
Insulation	125 mm thick Glass wool insulation				
Door	Full front opening door, double walled insulated and interior stainless steel				
	Optional -View glass window				
	100 mm x 200 mm Front Inspection glass window in door		300 mm x 400 mm Front Inspection glass window in door		
Gasket	Silicon Double gasket, one on the chamber and one on the door.				
Hinges & Latches	Heavy duty door hinges with toggle type locking arrangement.				
Mounting	Floor Mounting Type		Wheel mounting type.		
Power Supply	230 VAC +/-5% + N+G, single Phase, 50 Hz, A.C.		415 VAC +/-5% + N+G, Three Phase, 50 Hz, A.C.		
Noise level	75 DB		82 DB		

Work Space (Inner size )	380 Litter	550 Litter	600 Litter	800 Litter	1000 Litter
Internal dimensions approx. (mm)	600 mm W x 800 mm D x 800 mm H	850mm W x 730mm D x 900mm H	800mm W x 800mm D x 950mm H	1100mm W x 800mm D x 950 mm H	1000mm W x 1000mm D x 1000mm H
Temperature Range different model	Ultra -70 °C to 180 °C / ± 1 °C				
	Medium -50 °C to 180 °C / ± 1 °C				
	Basic -35 °C to 180 °C / ± 1 °C				
Humidity range (%) (10-85°C) <sup>2</sup>	10 to 98% ± 3% (PH Basic Model only RH 40 to 95%)				
Temperature range for climatic test (°C)	10-85 deg c (PH Basic Model only temp 10 to 60 deg c)				
Deviation in temperature with respect to space	: ± 1 °C to 2 °C				
Display resolution	: 0.1 °C for temperature / 0.1% for RH				
Temperature accuracy	: ± 1 °C				
Temperature changing rate Cooling <sup>4-5</sup>	Based on customer request				
Temperature changing rate Heating <sup>4-5</sup>	Based on customer request				
Controller	N-CONT = Non profile controller PPI make single set point only				
	P-CONT = Profile controller Make Watlow or Eurotherm (20 profiles)				
	PLC = Siemens PLC with 7" Veintek 7" HMI (In HMI 20 profiles/ In PC multiple profile)				
Optional Fan Motor Drive	Based on customer request				
Construction Features	Interior SS 304 Sheet thickness - 1.2/ 1.5 mm Stainless Steel arc welded				
Exterior	Exterior Sheet thickness 1.5 mm CRCA sheet with powder coated				
Tray	1 Number - Adjustable horizontal SS grill racks				
Side Cable Access port	75 mm Diameter - 1 no				
Chamber inspection lamp will be provided	60 w		60 w x 2		
Insulation	125 mm thick Glass wool insulation				
Door	Full front opening door, double walled insulated and interior stainless steel				
	Optional -View glass window				
	300 mm x 400 mm Front Inspection glass window in door				
Gasket	Silicon Double gasket, one on the chamber and one on the door.				
Hinges & Latches	Heavy duty door hinges with toggle type locking arrangement.				
Mounting	Wheel mounting type.				
Power Supply	415 VAC +/-5% - N-G, Three Phase, 50 Hz, A.C.				
Noise level	: 82 DB				

Note: **XXX\*\***

1	<p>a) For Hot and cold test chamber (Model TC) Single loop control system – Temperature controller will be provided with PT 100 as temperature sensor for indication and control of Temperature direct display.</p> <p>b) For Climatic chamber (Model ETC) Dual loop control system Temperature / Humidity controller will be provided with PT 100 as temperature sensor for indication and control of Temperature/Humidity with direct display</p>
2	$T = +4^{\circ}\text{C}/+90^{\circ}\text{C}$ for continuous test
3	measured at 1 m distance in front of the unit in 1,6 m height, free field measurement
4	<p>According to IEC 60068-3-5 and IEC 60068-3-6</p> <p>a) ___ °C / min (empty chamber) as per IEC 60068-3-5. Averaged between chamber Maximum Range temp ___ °C to chamber minimum range temp ___ °C with sensor in discharge of air of blower.</p> <p>b) ___ °C / min (empty chamber) as per IEC 60068-3-5. Averaged between chamber Minimum Range temp ___ °C to chamber Maximum range temp ___ °C with sensor in discharge of air of blower</p>
5	The performance data refer to +22°C ambient temperature, 410V nominal voltage, without specimen
6	Ramp rate available Heating and cooling for 0.5 deg c / min to 20 deg c / min
7	Ramp rate available Heating and cooling with LN2 Injection for 0.5 deg c / min to 100 deg c / min



Temperature-humidity working range CTC

## DESCRIPTION

- **Chamber Construction:** The chamber is with double walled insulated construction with argon arc welded thickness of the sheet 1.2/1-5 mm. SS 304 interior / outer sheet thickness 1.5 mm. with Powder coated. The chamber is of vertical trolley mounting configuration. Full front opening double walled insulated door is provided with silicone rubber gasket with hinges and toggle type locking arrangement.
- **Air Circulation:** Fan/blower will be provided with continuous duty rated motor for air circulation. Conditioning space will be provided in the main chamber, which is baffled, and the heaters and cooling coil etc. will be located in the conditioning space. Conditioned air will be admitted in the main chamber to maintain uniform temperature in the chamber workspace and Air circulation Internal Fan with synchronized door lock system.
- **Heating system:** Low surface loading sealed tube heaters will be provided to add heat in the chamber to maintain uniform temperature. The heat input will be controlled by solid-state relays through microprocessor programmer. The heaters will be located in the conditioning space and there will not be any direct radiation of heat on the item under test.
- **Humidity system:** Low-pressure moisture generator will be provided to generate moisture and add humidity in the chamber for uniform humidity conditions. The humidity system will be provided with moisture generator with water level controller. You will provide DM water 50 liters Overhead tank or online water connection with 2 bar pressure and connect the same to the chamber. It is recommended to use soft water for the moisture generator.

- **Refrigeration System** Based on model selected:

Single stages Air or water cooled refrigeration system will be provided with Hermetic / semi Hermetic Bitzer / Dorin/Emerson make compressor working on environmental friendly refrigerant R404A. The refrigeration system will be provided with HP/LP cut off switch, air inlet condenser / Temperature Protector, back up fuse protection, expansion valve etc. and the system will be designed for continuous and trouble free operation.

Double stages cascade Air or water cooled refrigeration system will be provided with semi Hermetic Bitzer / Dorin/Emerson make compressor working on environmental friendly refrigerant R404A/R23. The refrigeration system will be provided with HP/LP cut off switch, air inlet condenser / Temperature Protector, back up fuse protection, expansion valve etc. and the system will be designed for continuous and trouble free operation.

- **Condenser: Water** cooled condenser (chiller customer scope)

- **Optional Instrumentation:**

For Hot and cold test chamber (Model TC) Single loop control system – Temperature controller will be provided with PT 100 as temperature sensor for indication and control of Temperature direct display.

For Climatic chamber (Model ETC) Dual loop control system Temperature / Humidity controller will be provided with PT 100 as

### **Option 1 - Non profile controller**

#### **HumiTherm-cS Advanced Temperature + Humidity**

#### **Highlights**

Universal Inputs (RTD/mA/V for Temperature & %RH) with Selection for Dry/Wet Configuration  
Independent Self Tune PID or On-Off Control Loops for Temperature & %RH  
Compressor Control Output with Time Delay  
Programmable Alarms & Retransmission Outputs for Temperature & %RH

#### **Features**

24V or 12V or 5V DC Excitation Voltage for Transmitters  
Relay or SSR Drive Outputs for Heating, Humidification & Compressor Control  
Relay Output for Alarm  
DC Volts / Current Retransmission Outputs  
Standby Mode for Use as Indicator with Alarms  
Optional RS485 MODBUS/RTU Serial Communication Port  
Universal Supply Voltage : 85~264 VAC, 50/60 Hz  
DIN Standard Dimensions (mm) : 96(H) X 96(W) X 100(D)



### **Option 2 - Profile controller** **(Watlow F4 or Eurotherm 2604)**



The SERIES F4 1/4 DIN industrial ramping temperature controller meets the requirements of the most demanding ramp soak controller processing applications. Easy to set up and operate, the ramp soak controller's programming features and proven performance capabilities are ideally suited for environmental chamber or furnace and oven applications. Single and dual channel versions are available.

Competitively-priced, the SERIES F4 ramping temperature controller features a four line, high-definition LCD interface display for quick and easy profile programming and controller configuration. Its 16-bit microprocessor ensures accuracy and delivers performance advantages you can count on from a Watlow controller

#### **Features**

Guided 256 step, 40 profile ramp and soak programmable memory supports a wide range of processing applications  
High-definition, four line LCD controller interface display simplifies setup and operation

## Option 3 - PLC with HMI control system

### PID

Temperature PID parameters will take care our control system Siemens based PLC. Each of these PID's shall be set by using the auto tune feature or manually entered values.



### Power Resumption

Various power resumption modes shall be provided in case of a power failure. The break mode shall stop the program on resumption of power. The hot mode shall resume the program from the point of break and complete the program. The cold mode shall restart the program from the point of break and ensure the program has run without any break

### Process Mimic

A graphical representation of the working of the chamber shall be provided in the form of a process mimic screen. The live status of all major components are displayed. The components include heaters, valves etc.

### Ethernet

A 10 Base T/100 Base-TX Ethernet connection shall be able to connect to an unlimited number of devices via ten protocols simultaneously. The Ethernet port is accessible through the controller by using a RJ45 port. The IP settings can be set in dynamic or static modes for access through LAN/WAN or the internet.

### Touch Screen

The chamber shall be operated using a 7-inch TFT active matrix resistive analog touch screen. The screen shall have a 256 color, with a screen resolution of 320 x 240 pixel. The screen is mounted on the operating panel of the chamber.



Ultra-slim form factor and new color design

PCB corrosion prevention and built-in isolated RS-485.

## **SRI EASWARI SCIENTIFIC SOLUTION PVT LTD.,**

Door No.2/298, ANE Garden Permul Kovil Street, Srinivasapuram  
Paraniputhur Post, Iyyappanthangal, Chennai - 600 122, Tamilnadu, India.



**13.8**  
SEC  
Booting  
speed

**5.6**  
/s  
100 Words  
Speed of  
PLC Data

**0.4**  
/s  
2MB/10Page  
JPEG file  
display speed

### Equipped with powerful Cortex A8 600MHz CPU

Fast change a window which contains many complex objects. Furthermore, high speed of communication improves the efficiency of database operations.

### PCB Coating Protection

Enhance the strength of the damp-proof, dust-proof and corrosion resistance in any harsh environments.

### Programs

The chamber shall have a program mode in the controller which shall have 20 independent programs and through PC software unlimited programs. These programs can be stored with a name and number. Each of these programs shall have 50 segments where different modes such as salt spray, dwell, dry cycle, high humidity cycle, and air inlet can be set

### Diagnostics

An event viewer shall display a log of all errors and actions with a date and time stamp. These events are also logged in a csv file which can be accessed using the USB or Ethernet ports available in the controller. The PLC's digital inputs and outputs statuses shall be indicated to analyse the working of all the electrical components in the chamber. A csv file of every test program shall be created and stored in the internal memory of the controller. The values that are logged, temperature, humidity, will be recorded.

### Delay Start

A delay start of program shall be provided based on time, where the start of the program is scheduled. The delay schedule can be set for a maximum of 24h

### Trend Graph

A real time trend shall be provided to view the test program in a graphical view. The parameters that shall be provided are include test space temperature process value, test space temperature set value, saturator temperature process value, saturator temperature set value humidity process value, humidity set value .

## SRI EASWARI SCIENTIFIC SOLUTION PVT LTD.,

Door No.2/298, ANE Garden Permul Kovil Street, Srinivasapuram  
Paraniputhur Post, Iyyappanthangal, Chennai - 600 122, Tamilnadu, India.







### Remote viewer


A built-in web server shall be provided which allows remote view or control from any LAN, WAN or internet connected PC, tablet or smart phone. Any standard web browser shall allow access to the controller screens using the pre-configured IP address. The screens on the web browser and the touch screen shall be duplicated to offer the same user interface / experience on PC or touchscreen.

### And Optional for


EasyAccess 2.0, access your remote HMI from anywhere in the world

You must have used instant messaging software such as Skype, Whatsapp, Line, or Wechat to instantly communicate with your friends wherever they are on-line without asking for their IP addresses. Now, Weintek offers a remote access service, EasyAccess 2.0 which enables you to access remote HMIs from anywhere in the world. EasyAccess 2.0 is just as easy to use as instant messaging software is. There is no need to memorize the HMI's IP address or spend time on router setup, complicated port mapping configuration, and detailed network layer investigation when encountering abnormal connections.


EasyAccess 2.0 solves all the problems above and provides complete solutions to help you easily – Access & Manage each remote HMI.



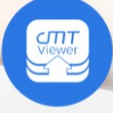
HMI Manage



PassThrough



VNC



cMT Viewer

### Memory

Flash Memory 128MB and Ram memory 128MB capacity. The memory shall store test program data and diagnostic data in csv format. This memory shall be accessed using the USB and Ethernet ports.

• **Control Panel & Wiring:** Separate control panel attached to the main chamber will be provided which will house the programmer, on/off switches, fuses, contactors, indicating lamps etc. Channel type wiring will be done with suitable current rated copper wires with marking ferrules, crimped dowel terminals, elmex connectors etc.

### • Safety protection:

1. Back up fuse protection for mains and individual circuit.
2. Over temperature safety cut off thermostat with audiovisual alarm.
3. Overload protector for motor.
4. MCB for heaters.
5. Water level controller for level in boiler.

## SRI EASWARI SCIENTIFIC SOLUTION PVT LTD.,

Door No.2/298, ANE Garden Permul Kovil Street, Srinivasapuram  
Paraniputhur Post, Iyyappanthangal, Chennai - 600 122, Tamilnadu, India.

