

## PV module testing chambers ETSP-WTH series

**ETSP-WTH** series are designed for testing all types of photovoltaic modules including Mono/multi-crystalline silicon, thin film PV modules such as amorphous silicon (single double and triple tandem), micro crystalline silicon, CIS, CdTe, Thin silicon film, organic(OPV) and dye sensitized photovoltaic modules. With different combination of temperature and humidity condition, temperature cycling, damp heat and humidity freeze test can be achieved required by IEC 61215/ 61646, IEC62108, IEC61730-2, UL1703, JIS C-8917, JIS C-8938, JIS C-8990&JIS C-8991, ASTM E 1171 for PV module testing . With user friendly LCD touch screen controller, you can set the program easily. Data can be download to PC through RS232C interface or RS485.



**ETSP-WTH series**

### General Features

- Temperature shock cycling testing, humidity freeze testing, Damp heat testing, temperature testing, temperature and humidity cyclic testing
- Effects of extreme ambient temperature and humidity conditions.
- All types of PV modules testing is possible.
- Optional UV lamps or solar lamps inside chamber.
- Friendly, flexible, up-to date control and management systems.
- Allows easy servicing and upgrades.

### Technical Features

- Temperature range: -50 ~120 °C (Changeable according to user's demand.)
- Temperature accuracy: Less than  $\pm 0.3$  °C
- Temperature heat up rate; More than 3.0 °C/min.
- Temperature pull down rate: More than 2.0 °C/min.
- Humidity range: 20~98%RH
- Humidity accuracy: Less than  $\pm 1.5$  %RH
- Microprocessor controller including self-diagnostics warning message function .



**ETSP Co., Ltd.**

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# PV module testing chamber ETSP-WTH series

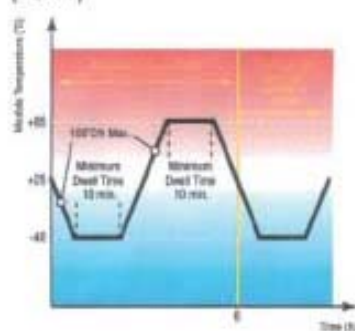
## Technical Specification

Model	Internal dimensions	Eternational dimensions	Useful capacity
WTH 1625C	1,300 X 1,200 X 1,000 (W X D X H) mm	1,800 X 2,200 X 1,550 (W X D X H) mm	1,625 liters
WTH 3143C	1,300 x 1,300 x 2,500 (W X D X H) mm	1,600 x 2,400 x 2,965 ( W X D X H) mm	3,143 liters
WTH 4163C	1,300 x 2,040 x 1,570 (W X D X H) mm	1,600 x 3,390 x 1,955 ( W X D X H) mm	4,163 liters
WTH 12500C	2,500 x 2,500 x 2,000 (W X D X H) mm	2,800 X 3,500 X 2,500 (W X D X H) mm	12,500 liters

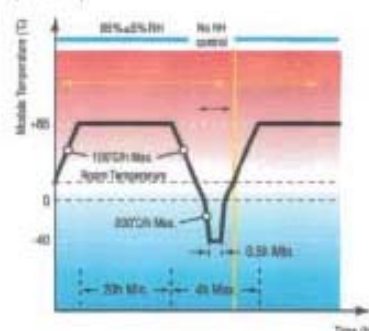
**Note: Different size of chambers are available on user's demand.**

**Chamber dimensions are subject to change due to final design and specification.**

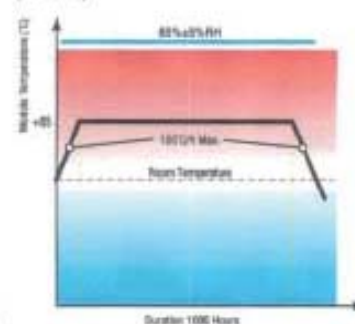
**Temperature Shock Cycling Test (10.11)**



**Humidity Freezing Test (10.12)**



**Damp Heat Test (10.13)**



Light testing with UV irradiation and solar simulation is also described in these standards.

### Solar Simulation on PV Modules

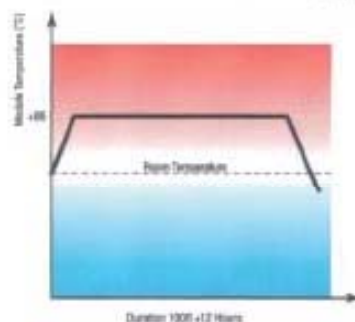
- Determination of the maximum output
- Determination of the temperature coefficients
- Measurement of the nominal operating cell temperature
- Performance under standard testing conditions
- Performance at nominal operating cell temperature
- Hot spot endurance test
- UV Test - Pre-treatment of the PV module with ultraviolet (UV) radiation before the thermal shock load and the humidity freezing testing.

#### Required source of radiation:

- UV radiation source within the range of 280 to 385 nm and at max. 250 W/m<sup>2</sup>

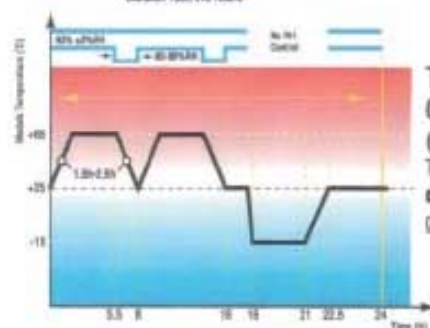
#### Required source of radiation:

- Solar simulator with 800 to 1000 W/m<sup>2</sup>



**Temperature Test (IEC 60068-2-2)**

To evaluate the ability of the module for use/ storage under high temperature



**Temperature and Humidity Cyclic Test (IEC 60068-2-38)**

Testing procedure of **power conditioner** for small PV power generating systems