

XENON LAMP WEATHERING TEST CHAMBER



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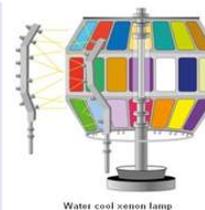
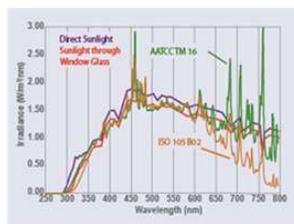
Xenon is one of the noble gases and is a major component of arc lamps and flash lamp and it also has its importance in general anesthetics. One of the major applications of xenon lamp is that it can be used in research applications to simulate the sunlight.

Hapten **Xenon Lamp Test Chamber** uses Xenon Lamp to simulate the whole sunlight spectrum that can produce many destructive effects on the products. This simulation environment provided in the chamber is used to test the resistance of various manufactured products towards these destructive conditions. Our **Xenon Lamp Weather Resistance Test Chamber** is used for quality control, product development and scientific researches and many more. With a variety of models and options, you can customize your chamber to fit your testing needs. With walk in option you have a facility to test your product in bulk quantity and even for the products which are larger in size. This chamber also known as **UV Test Chamber** and **UV Weathering Test Chamber**.

Our Xenon Test Chambers are easy to install, easy to program and easy to operate. Specimen mounting and evaluations are simplified with specially designed specimen holders. **All models are completely automated and can operate continuously, 24 hours per day, 7 days per week, without supervision.** The testers are smart enough to alert you to problems they may encounter during testing.

SALIENT FEATURES:

- **Full Spectrum Xenon Lamps** Xenon arc lamps give the ultimate correlation to the full spectrum of natural sunlight including UV, visible light and infrared radiation. Water-cooling makes them economical, efficient and low maintenance. Lamps last for 2000hours.



- **Optical Filters** A choice of optical filters is available to simulate a variety of service environments including direct sunlight and sunlight through window glass. Filter performance does not decline with age; therefore, filters do not need to be replaced unless the glass is broken.

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Three categories of optical filters are available to simulate variety of service environments.

- **Daylight Filters**

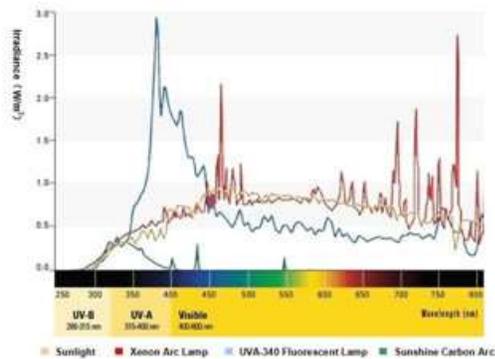
Daylight filters are used to simulate direct sunlight. They provide the best correlation to natural outdoor exposures for most applications. Materials that are typically used outdoors like roofing or exterior coatings should be tested using daylight filters.

- **Window Glass Filters**

Window glass filters produce spectra equivalent to sunlight coming through window glass. This spectrum can also simulate other indoor lighting such as the harsh lighting found in a typical commercial or office environment. Window glass filters are used for indoor materials such as printing materials or textiles

- **Extended UV Filters**

Extended UV filters allow excess UV, below the normal cut-on of natural sunlight. They are used to produce faster or more severe test results. Extended UV filters are specified in some automotive test methods and are sometimes used for aerospace applications



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- **Precision Temperature Control through Black Panel**

All Q-Sun models control specimen temperature with a Black Panel or a Black Standard sensor. Due to its black coating it absorbs all wavelength uniformly, it provides an estimate of the maximum temperature of the specimen inside the chamber.

The black panel temperature can be set anywhere between 25°C and 12°C depending upon the irradiance level, lamp age, ambient room temperature, black panel sensor and specific tester model. Chamber Air Temperature can also be controlled simultaneously with Black Panel Temperature to give the ultimate control of specimen temperature.



- **Water Spray**

Outdoor moisture attack is simulated via a pure water spray. Two nozzles are located in the top of the chamber. Spray can be programmed to operate during either the dark or light cycle.

In addition to oxygenation, spray can be useful for creating thermal shock and/or mechanical erosion.



- **Solar Eye Irradiance Control**

The Solar Eye system constantly monitors and controls lamp output to assure precise light exposure and to maximize repeatability and reproducibility of test results. Irradiance control is available at 340 nm, 420 nm or TUV.

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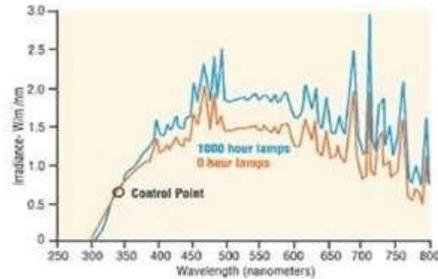


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OPERATING PRINCIPLE:

- Select the desired irradiance level.
- The built in solar eye irradiance sensor measures the light intensity and transmits it to the controller.
- The solar eye irradiance controller compares the actual measurement irradiance to the set irradiance point.
- The solar eye controller adjusts the power to the lamp to maintain self-point irradiance.
- **Relative Humidity Control** Available with precise control of relative humidity. These may be useful for testing interior materials like textiles, papers and inks.
- **Microprocessor based controls.**
- **Colour touch panel.**



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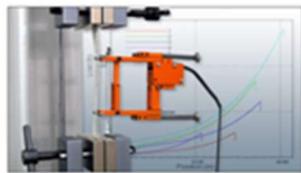
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- HMI+PLC in one unit
- Door open and Door close alarm system.
- Inbuilt calibration system.
- Separate Inbuilt printer for printing graphs (optional).



- **CFC FREE REFRIGERATION UNIT.**
- **Less use of Electrical and Mechanical Components on the Top and Bottom of Chamber** - Provides easy maintenance of chamber, increases durability because of proper air circulation; cooling systems kept at bottom of the chamber to provide proper environment for compressor.
- **Heated Viewing Window** - Heated viewing window allows viewing fog generated and proper viewing of the test sample.

Circulation Fan with Variable Speed -

- **Electrical efficiency**-Variable speed motor saves money by reducing energy bills, as it consumes less electricity than conventional motor.
- **Cooling Efficiency**-Variable speed enables gaining air conditioning efficiency or SEER.
- **Air Quality**-Variable speed motor helps clean the air efficiently. When the fan is in constant operation (indicated by the "Fan" setting on thermostat), the motor continues to slowly circulate air, allowing filters to capture more contaminants.
- **Humidity Control**-Variable speed motor combined with a Thermostat allows controlling the amount of humidity.
- **Quieter Operation**-Variable speed blower motor are significantly quieter than its single-speed counterpart.

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- **Air Cooled Refrigerated System** - Air cooled refrigeration system offer various benefits like:
 - low fan power consumption
 - resistant to corrosion and freezing conditions
 - requires very low maintenance
 - Guaranteed long life operation
- **PCRC sheet body** - Powder coated steel body assures corrosion resistant chamber and allows working of chamber at high temperature applications.
- **Digital Output** – Target and Performance Output of the chamber operations are in digital format(digits) giving precise reading.
- **Pre - Attached Data Logger with Data Analysis Software** - Primary benefits of using data loggers is to automatically collect data 24-hour basis. Graph and table format of results can be produced automatically by the data logging software.
- **Self - Calibration System** - Hapten incorporate a self-calibration system, in each chamber, that is completely automatic to prevent errors that could result from failure to calibrate. The system continuously monitors the environment, sensing changes that could affect analysis, and re-calibrates accordingly using a built-in long-life calibrator The process takes just a few seconds, without operator intervention or additional supplies, quickly optimizing system parameters for the current conditions.
- **Open and Close Updates Through Mobile Network** - Mobile technology has the potential to make services more flexible and keep informed, information anywhere at any time from mobile device, and can set alert system to know whether or not the chamber is being used.
- **Reliable** – Construction, performance mechanism, controls and information system integration makes the equipment reliable.
- **Precise Control of Environmental Parameters** - The set/ programmable parameters of the chamber are precise or have less deviation from original value, thus ensuring correct measurement.
- **Micro - Processor Based Controller** – Microprocessor based controller enables precise control of temperature, humidity, pressure and other values and Benefits:

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- Processing speed is high
 - Provides flexibility to alter the system by changing software.
 - Compact in size.
 - Operation and maintenance easier.
 - Maintain precise values
- **Aesthetically designed** - Designed according to the standards and principles underlining industry's aesthetic values.
 - **Corrosion Resistant Interior and Exteriors** - Corrosion resistant coatings like epoxy coatings are applied inside and outside the chamber to prevent against degradation due to moisture, salt spray, oxidation or exposure to a variety of environmental or industrial chemicals/ corrosive agents.
 - **Energy Efficient** – Our chamber uses less energy to provide the same level of performance, comfort and convenience, thus making it energy conserving chamber.
 - **CFC- Free Cooling** - The air cooled refrigerator use CFC (chlorofluorocarbon)-free refrigerants those are ozone friendly and eco-friendly.
 - **Sturdy Construction** - Hapten chambers are built with robustness to withstand stress and strain, giving the chamber long life and ability to perform in extreme stress environments
 - **Low Maintenance** - Hapten systems benefit in retaining proper functionality over long period of time.
 - **Light Weight:** Compact and superior materials ensure the chamber be light weight.

CONSTRUCTION DETAILS :

HMI+ PLC IN ONE UNIT:



Hapten provides better automatic controls for the chamber by integrating HMI and PLC together. This special feature is compelling alternative to traditional methods and provides a simplified, reduced cost control system architecture. It works by following operating steps:

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- Sensors measure the physical quantity like temperature and convert them to electrical signal
- The actuation device acts upon that electrical signal
- At HMI interface between operator and chamber occurs.
- The machine operates with the logic design controls controlled by software.
- This signal is sent to the chamber by logic control devices and the chamber operates.

Basic features of HMI+PLC:

- **Processor of 1.6 GHz:** High clock speed processing PLC that enables speed up processing to the functions. With 1.6GHz processing speed, the PLC system is capable of multitasking, processing of large data volume, and high performance.
- **Audio Output Alarm:** Audio alarm alert in case of failures in any of the component controlling functions.
- **256 MB of RAM:** PLC of 256 Mega Byte memory for running programs offers high memory space for installing of more programs
- **COM Port:** Com port provided for attaching RS 235/RS 485 cable.



- **USB Ports:** A USB port provided for transferring data through communication between HMI and PLC. Various peripherals can be connected via USB hub.



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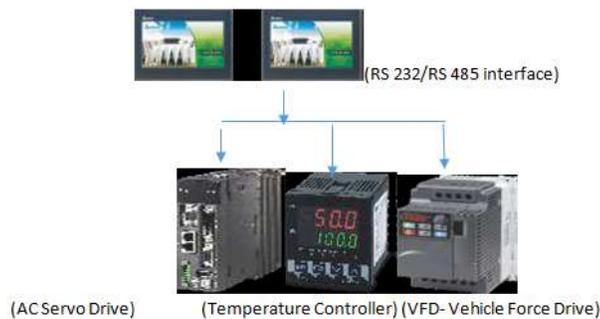


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- **Coloured Touch Panel:** We provide coloured touch panel screen available in 2 sizes -7 inches and 10inches, displaying all the control features, digital clock, sensor layouts, data and values, graphics and pictures, navigations etc.
- **RS232 or RS485 Interface:** Serial interface provided to get connectivity with internet, mobile and other data transmission. Single device to device interface and a communication bus that is used to form simple networks of multiple devices are available through RS485 interface. RS485 interface supports transmission speed of 2400, 4800, 9600, 19200, 38400 bits per second.

Through Ethernet communication module, AC Drives, temperature controller and other industrial automation products can be connected quickly.



- **Touch Screen Size of 7 Inches and 10 Inches:** HMI screen available in 2 sizes- 7inches and 10inches, as per user's requirement. Screen displays the control features, images, data values and other programs.
- **Expandable Memory with a SD Card:** SD card plugged in appropriate slot for more memory requirement that will be read and used as part of device; for long storage requirements SD card may be added and store data with expanded memory.



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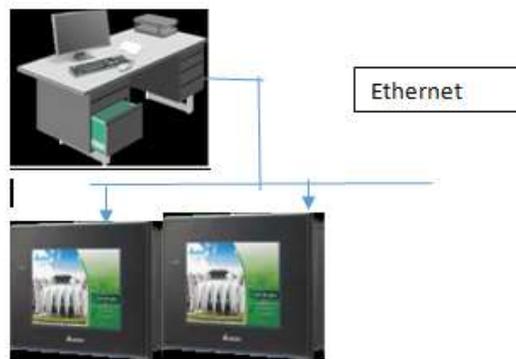
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- **High Resolution Brilliant TFT Displays, 64k Colours:** HMI screen displays 64000 different colours with good resolution, allowing large number of distinguished colours, easy to establish and work with. It shows entire new 2D drawing technique, the screen resolution enhanced for more realistic images and more colourful and vivid displays.



- **Software Supports All Six IEC 61131 Programming Languages:** Software supports all the six programming languages under international standard IEC 61131: Function Block Diagram, Ladder Diagram, Structured Text, Sequential Function Chart, Instruction List, and Continuous Function Chart.
- **E-remote Control Software:** E-remote enables viewing the monitor and same screen shown on HMI at the production site, and control the manufacturing process via Ethernet.



- **A set of Trouble Shooting Tools:** 3 troubleshooting tools provided with in the software
- Simulation- Imitation of a situation as real situation
- Debugging- Finding and reducing number of defects.
- Online changes- Like change of IP address can be made online. Manual to operate the programs on request.

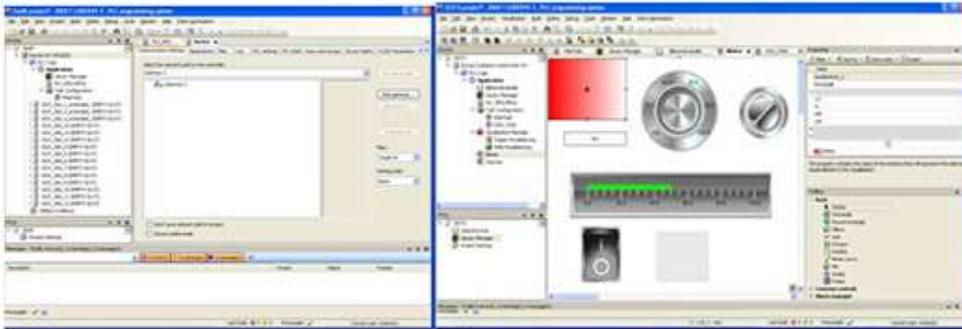
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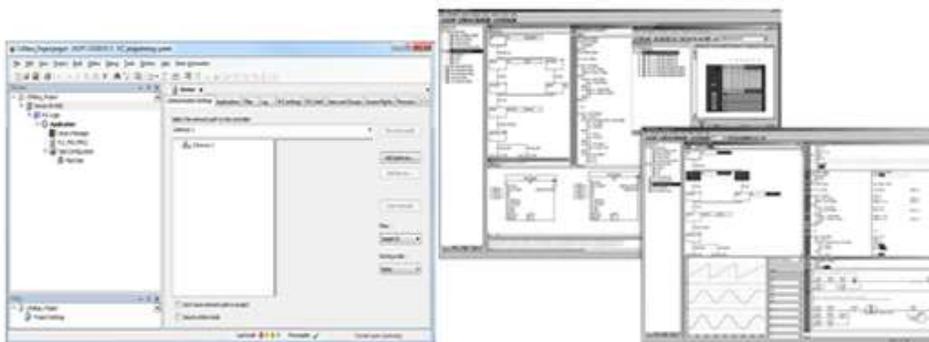
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- **Increased Numbers of On - Board I/O peripherals (10-50):** Maximum number of 50 I/O peripherals provided on request, to attach input and output devices to the HMI and PLC. Increased number of input and output peripherals allows adding of devices like printers, recorders, etc., as per the need.
- **Data Logging and Free Programming Software:** Attached data logger with input program software provided. Through data logging software, HMI and PLC collect data through sensors, analyze the data and save and output the results of the collection and analysis. Examples of the types of information a data logging system can collect include temperatures, sound frequencies, vibrations, times, light intensities, electrical currents, pressure and changes in states of matter.

CoDeSys (Controller Development System) software technology



Software Screen Shot



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Chamber Body: Double walled cabinet with inner chamber made up of Stainless steel of grade SS 304 and outer wall of heavy gauge Mild steel sheet that is degreased and pretreated with primers for rust proofing.

Insulation: It's a process of retardation or the reduction of heat loss or heat gain for energy conservation. Hapten xenon Chamber provides cellular insulation that is through polyurethane foam.

Cellular Insulation: Composed of air or some other gas contained within foam of stable small bubbles and formed into boards, blankets, or hollow cylinders.

Heating: Desired positive temperature is provided through stainless steel sheathed air heaters, these heaters do not affect the test specimen directly as they are placed in conditioning plenum proving indirect heat.

Air Circulation: Air circulation efficient motor fans are provided, ensuring uniform temperature throughout the chamber.

Cooling: Negative temperature is maintained through ultra-low temperature application compressor and non CFC ecofriendly R 404a refrigerant used.

DETAILED DESCRIPTION ALONG WITH SALIENT FEATURES ARE AS UNDER FOR REFRIGERATION MACHINE

CONDENSING UNIT

AIR-COOLED CONDENSOR

Air-cooled condenser is internally grooved finned copper tubes used for high heat transfer area, which not only reduce power consumption, but also bring down the condensation faster. This unit is designed. &verdigris& reduces the resistance, saves energy consumption and ensure good heat exchange.

COMPRESSOR:

- **HERMETIC COMPRESSOR-** Single stage Reciprocating Compressor. Give the High Efficiency compared to sealed compressors, Less Power Consumption , Accessible for repairing, low noise level, Less Vibrations, Wide Voltage Range, Designed for Extremely High Ambient ,Full warranty etc.
- **COOLING SYSTEM-** The compressor is mounted perfectly to ensure recommended level of sound and vibration.

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REFRIGERATION CONTROL

- **Low and High Pressure switch of RANCO/Danfoss-** Which ensures the compressor and refrigeration system when low pressure will occurs it trip off the compressor. This is the only operator friendly switch can easily reset.
- **Hand Shut off Valve-** Is the only Condensing Unit, which is equipped with it. This valve is used for pump down the total gas in to the condenser & receiver in the faulty condition.
- **Liquid Dryer of Danfoss make-** Which is equipped in the liquid line for ministration of moisture in the liquid. It will collect all the moisture in side the refrigeration line as well as gas.
- **Moisture Indicator of Danfoss make-** The sight glass area in the Moisture Indicator shows at a glance the condition of the refrigerant system. The moisture indicator element changes colour and indicate if the system is safely dry, or dangerously wet.
-
- **Solenoid Valve of Castle make** - In most refrigeration applications, in order to automatically control the flow of fluids in a system, it is necessary to be able to start or stop the flow in the refrigerant circuit. An electrically operated solenoid valve is usually used for this purpose. Its basic function is the same as a manually operated shutoff valve, but it can be positioned in remote locations, and may be conveniently controlled by simple electrical switches.
- **Oil Separator of Stainless Steel 304-**The oil separator intercepts the oil mixed with compressed gas and returns it into the crankcase of the compressor, thus assuring an efficient lubrication of its moving parts. Also, it improves the overall efficiency in the system.
- **Suction Accumulator-**Maximum Efficiency of the relief device (expansion valve) because it is supplied with sub cooled Liquid.
- **Liquid Receiver-** As per ASME Section VIII Division I for storage of refrigerant.

Xenon Arc Lamp:

Xenon arc lamps are to simulate full sunlight spectrum. To reproduce the presence of different environments destructive waves, it can provide the appropriate environment for simulation of scientific research, product development and quality control and acceleration tests.

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TECHNICAL SPECIFICATIONS:

MODEL	HB-XLWC01	HB-XLWC03
Test Space Dimension (W X D X H)	2 x 2 x 3 feet	3 x 3 x 4 feet
Temperature Range	+10°C to +70°C	
Temperature Controller	HMI+PLC	
Temperature Uniformity	±3°C	
Humidity Range	Up to 95% RH, +/-5%	
Light Source	Water Cooled Xenon Lamp/ Air cooled xenon lamp	
Light Intensity on specimen surface	500 – 1200 W/m ²	
UV wavelength	290nm-400nm, UV-A, UV-B	
Spectrum wavelength	280nm-800nm	
Light Uniformity	Within +/- 5%	
Rising Wave Length	320 nm	
Light Intensity Control	300 to 400 nm	
Specimen Rotating Frame (Optional)	2 RPM	
Distance between test product and lamp surface	50 ± 2mm	
Temperature Control	The temperature is efficiently controlled by PLC based HMI (human machine interface) interactive control panel	
Power Requirements	220/230V, 50/60Hz	

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