



ALTITUDE TEST CHAMBER

AN ISO 9001 : 2015 / 14001 : 2015 / WHO-GMP CERTIFIED CO. & CE MARK PRODUCT

Model No : SRL / ATC - 01



Construction :

Double walled in construction inner made of SS 304 & outer made of CRCA powder coated with PUF & ceramic wool Insulation in between two walls.

- (i) Door with silicon gasket sealing, metallic with PUF insulation.
- (ii) The unit will be made of double walled leak proof metal door with lock.
- (iii) Forced air circulation for uniform temperature.
- (iv) Lockable & Movable PU wheels for easy movement.

Insulation of Walls, ceiling and floor: 100-120mm thick puff plus ceramic wool Insulation with puff in-place density of minimum of 1kg per cubic foot or its equivalent. Insulation with expanded polystyrene or any equivalent material having R factor of minimum 34. Insulation material shall maintain its dimensional stability in an operating temperature range of Insulation puff.

Door : Flush type doors of metal surfaces (as per above specification of metal) with proper puff insulation of above mentioned standard or its equivalent. Doors shall have magnetic snap-in perimeter gasket or its equivalent, self-closing cam lift gravity hinges or its equivalent, a posi-seal door closure or its equivalent. Door shall have key lockable latch handle. Doorjamb shall be made fiberglass reinforced plastic or any other suitable material compatible with constructed door.

Viewing Window : Suitable doors with together glass window with organ gas Coating to Prevent Coalesced on glass with its appropriate shutter.

Application :

These equipments are used for climatic & durability tests of electrical & electronic components, corrosion test on mechanical assemblies, materials for simulated tropical & extreme tropical conditions.

Sensor :

Sensors : Rotronic Make Hygroclip non condensing type sensor for RH and PT-100 'A' class for temp. calibrated from ERTL / NABL accredited labs.

Ecoentric System :

Chamber runs on the basis of Dewpoint control. Less deviations during short-term door opening & power failure. Less utility area Increased storage area. Low operating cost. Minimum power & water consumption. Reduced deviations. Less breakdowns due to standby refrigeration & humidification system. Due to PLC HMI & controlling through microprocessor based PID Temp. & RH operations the on time of both Temp. & RH system is reduced & efficiency of this system is increased with reduced energy consumption.

Refrigeration system : (Air Cooled)

Bitzer / Danfoss / Tecumseh: make compressors, 2 stage cooling system with Cascade system for ULTRA LOW TEMP. Range & Single stage system for Humidity Control. All accessories such as HPCO/LPCO, Oil Separators, Dryers, Relays, OLP etc. of **Danfoss/Tecumseh** Emerson Make. CFC free refrigerant to be used to comply with the New Environmental Regulation. Will have suitable tonnage compressor for maintain temperature with lights on. Will have hermetically sealed condensing unit compressor coupled with Evaporation coil and condenser, safe guarded by time delay circuit. Cabinet shall be supplied with air-cooled condensing unit with extended compressor life and close temperature control. Cooling system will be split type to place condenser unit in a ventilated area to avoid hot air in growth chamber. Cooled air shall be delivered in such a way to reduce or eliminate condensation within media dishes and to provide maximum uniformity In different research vessels. This may be through silent and durable fan motors or through any kind of advanced air diffusers. Air Cooled Condenser with solenoid & LP to pass hot gas to the chamber for uniformity & long life of compressor for continuous usage. Phenolic coating for cooling & condensing coils (All weather proof).

Salient Features : [Optional]

First time in **India** developed by **SR Lab Instruments**. Standby Refrigeration, Standby Humidification & Standby safety controller with auto changeover, In case of failure of the main system, To run the system for a longer with uninterrupted operation.

Also USFDA approved 21 CFR compliance software, where in case of temp. & RH fluctuation, SMS & Email alert shall be sent to registered user nos and minute details of operation of the chamber can be downloaded weekly, Monthly or Quarterly.

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Controller : [PLC with HMI TFT screen]

PID Action : Provides Precise Temperature, Maintain Uniform And Accurate Growth Environment, Timer, Alarm, Auto-Tuning And Auto Start Stop Function. Technical Design and Construction Silent Fan Motor to Maintain Uniform Temperature Over Temperature and Current Protection Capability Ensure User Safety, Adjustable Sliding Rack, Alert Unexpected Interruption Of Electrical Power Or Unauthorized Change.

PLC-HMI Control system with touch screen display & HMI for data Storage, Stepwise Programmable Controller with 50 or more programs Provides Automatic Operation of Variable Temperature, Humidity Value, 100 Or More Cycles with Minimum 100 Sections in Each Cycle. Data logger with RS 485/232 port for logging & transfer of data. Auto restart, power failure event logging, memory protection S.M.A.R.T/ SELF diagnostics system. Control system shall have audio/audiovisual warning/alarm when set temperature/RH is below or above the set values. Ethernet communication port. Ambient temp. Monitoring. Over Temperature and Current Protection Capability Ensure User Safety, Adjustable Sliding Rack, Water Level Sensor Alert Control System. Total no of output: 23 channels. Alert Unexpected Interruption of Electrical Power or Unauthorized Change. 4 digit Password lock.

Heating / Humidification & Dehumidification :

Imported Encolite heaters up to 3 K.W. Air Heaters are provided for heating above ambient temperatures.

Humidity is controlled by steam injection method. The boiler tank is used for steam generation, Electro-magnetic switch is used for sensing the Water Level. Thus eliminating the humidity interruption. De-humidification coils are installed below the cooling coils for lower humidity.

Certification :

- MSME AWARD FOR BEST MANUFACTURING PRACTICES - 2023
- ISO/IEC 17025: 2017 / Electrical Safety IEC 61010.
- ISO 45001:2018 / ISO 14001:2015 & WHO-GMP.
- ISO 9001:2015 certified Co. & CE marked product.
- RoHS 2002/95/EC / UL (QAMS Certification).
- US FDA Certification.
- NSIC & MSME registered.
- D&B registered (Financial Certification).

Safety Features :

2 minute compressor "on" delay timer to safeguard the compressor. Compressors overload relay protector. Electronic low water level cut off device to cut off the supply to boiler heater in case of low water level. Safety Temp. Controller. MCB for mains.

- Unit will be provided with safety devices for temperature and humidity overshoot in case of malfunction.
- Built-in temp. Deviation, audio/visual alarms. Safety thermostat for over shooting of temp. Safety circuit to cut off the whole system.
- OLP (Overload Protector) & Time delay Circuit for safety of compressors.
- HRC fuses for compressors, Heaters & Mains.

Air Circulation : [Laminar Type]

The chamber is provided with best air circulation to give better temperature uniformity this is achieved by using one set of motor & blower in baffle wall Compartment to push treated air in working chamber. This system gives better than 1 deg c. temp. uniformity in working chamber.

Uniform forced air circulate across the shelf via air diffusers on the top wall. Uniform horizontal or vertical airflow shall be provided for maintaining uniform temperature and RH in the room. System for adjustable forced air exchange shall be provided with up to 20 air exchanges per hour of fresh air to the room or its equivalent and an option to shut it down when not required. No direct radiation on the specimen.

Temp. & Humidity Range :

-85°C to +180°C **Resolution** : 0.1°C

Temperature Fluctuation : $\pm 0.5^{\circ}\text{C}$, **Temp. Uniformity** : $\pm 2^{\circ}\text{C}$

Humidity Range : 10% to 98% RH, **Resolution** : 0.1%

Accuracy : $\pm 2\%$ R.H, **Uniformity** : $\sim \pm 5\%$

Heating / Cooling Rate : 3°C per/min.

Altitude : 30 km. Oil sealed rotary vacuum pump (make : J.B. Sawant)

Pressure : 10 Milibar

Vibration Level: The chamber shall withstand 100 Hz dynamic load due to its robust construction & angular structure to withstand the vibration level of 100 Hz.

Power Supply :

Single Phase 230V AC, 50Hz / Three Phase 440V AC, 50Hz

Shelves & Trays :

Stainless Steel 304 quality bar type shelves will be fitted inside the chamber adjustable up to 0.5 inches Increment/Decrement. [Qty: 02 Nos]

Illumination : water & moisture proof lights.

Documentation :

To comply with the documentation requirements, we provide IQ, OQ & PQ protocols to be executed before taking the chamber in to for regular use, and support the supply with the following documents with the detail operational and service manual.

Standard Operating Procedure (SOP)
Operational Manual for Controller
IQ, PQ, OQ protocols certificate.
Calibration certificate of all controlling modules with traceable to NABL / ERTL accredited labs.
Certificate of MOC.
Test Report of chamber prior to supply with mapping certificate.
wiring diagram for ease of service maintenance.