

CARBONATION TEST CHAMBER



Experiment: To find the effect of Co₂, Relative humidity & Temperature on the sample

Year of Purchase :

Cost :

The Chamber will be fabricated with extremely high standard, high quality of finish, which matches the performance with emphasis on reliability and economy of use. The use of the most up to date Eurotherm 2604 programmable 2 loop PID Controller, aSENSE / Vaisala CO₂ Detector and Controller, shall make it to be currently the best available and with the attractive Corrosion Free MS Powder Coated Exterior to enhance any test facility.

Technical Specification

Internal Volume	: 125 Liter
Size	: 500 mm x 500 mm x 500 mm
Temperature Range	: +5 °C to +60°C
Temperature Measurement Accuracy	: ±0.1 °C
Temperature Control Accuracy	: within ±1 °C after stabilization
Humidity Range (RH)	: 20% to 95% RH, ± 2% in standard temp range. Humidity accuracy at control point during the dwell after stabilization around ±2%RH. Humidity distribution of the empty chamber after stabilization with in ±2% RH.
Access Port	: 1 No. 50 mm dia. with Silicone Closure

Humidifier system	: Air Atomizers for Humidification, Warm water vapor generator, complete with blowing system, heating and over-heat safety system. Rotronics Direct measurement Platinum Resistance type sensors shall used for the measurement and control of the Humidity. Dry Compressed Air at 3-4bar pressure will be required at the site of installation for precise Low humidity Low Temperature control.
CO2 Purging and Control System	: A CO2 purging valve assembly is provided for the purging of CO2 inside the chamber. aSENSE CO2 Transmitter detects the CO2 level in the air (0-10% Concentration) and gives a 4-20mA output to control the opening and closing of the purging valve, to maintain the set concentration level.
Heating System	: Inconel sheathed type evenly spaced in the annular space surrounding the working volume.
Refrigeration Unit	: Single Stage Copeland/Danfoss make Air Cooled Condenser System, complete with Compressor, Condensing unit, and CFC free refrigeration gas will be used.
Finish	: 18SWG MS Powder Coated Exterior Finish and 16SWG SS304 Interior with Full TIG Welding for Vapor Tight Finish.
Door Assembly and Viewing window	: Door System with full front opening type, compensating hinges with locking mechanism. Incorporated in the center is the 400 X 400mm 5 Pane viewing window, with the whole being insulated with non-flammable Rock-wool and with an exterior finish, matching the main cladding. Viewing window will be provided with light. Interlock protection will be provided for opening of door.
Insulation	: Non-flammable 96Kg/m3 Density Rock wool 100 mm thick
Fan system	: High performance externally mounted, flange-mounted motor drives internal fan through extended stainless steel shaft.

Controller system	<p>: The Eurotherm 2604 high performance Multi Loop PID Controller or equivalent shall be used. Over and under temperature indicator shall be of standard make.</p> <p>Main Features of the controller shall be:</p> <ul style="list-style-type: none"> • PC interface – with remote logging inclusive of acquisition and configuration software • High Stability Control & High Precision input • Real time clock. • High accuracy, high stability temperature and process controller • Dual 7-segment display (5 digit) of the process value and set point. • Advanced control algorithm gives stable straight-line control. Automatic tuning simplifies the commissioning procedure by performing a one shot tune to calculate the optimum PID and cutback valves for each loop and further optimize each control loop, gain scheduling can be used to automatically transfer control between up to three sets of PID values. • Incorporates a self-correcting input circuit (INSTANT ACCURACY) to preserve & maximize the accuracy, performance during warm up and change in ambient temperature.
Display	<p>: The Eurotherm Controller will show measured variable and set value in OC, and humidity in %. A separate indicator will be provided for CO2 measurement and display</p>
Safety features	<p>: </p> <ul style="list-style-type: none"> • Door Interlock • Input supply variation >10% • Under & over temperature protection • Circuit breaker • Thermal overload relay for Fans and Compressor Safety alarm for chamber malfunction
Calibration	<p>: Calibration certificate will be issued which has traceability to NABL for the complete system.</p>

Other features	:	<ul style="list-style-type: none"> • Drain for condensate and cleaning water will be provided. • Earth point will be provided . • The power consumption by safety & control devices will be as low as possible. • Energy efficient motors will be used (Siemens/Alstom). • All the electrical items used shall be of std IP 55grade suitable for Humidity chamber (Schneider Electric) • All the switch gears and MCB's used in the construction shall be of high quality reputed brands.(Schneider Electric Telemecanique, Merlin Gerin) • Noise Level of the chamber shall be around 78dBA measured at 1 Mtr distance.
Electrical Supply	:	415 V \pm 10%, 3 Phase, 50 Hz AC
Working Ambient	:	Peak Specifications confines to the working ambient of 35degC, 90% RH.

User Guide

Technical, Operation and Maintenance Manual Will contain technical specifications and operating limits of the system. Installation layout w.r.t. the required electrical & air connections at site, Software programming to load the required test profiles, their interpretation, Calibration procedures, Test data dumping options & Test result printout etc., . blue-prints of assembly & circuit drawings of the equipment, periodic maintenance checks, part nos. of sub-assemblies of the equipment

Commissioning & Operational Training

- a) System will be commissioned by factory-trained engineers at the site.
- b) Training for programming of test profiles, execution, cautions while operating, sequential steps to commence Operations etc, is provided at site during commissioning of the system.

Sense Air aSENSE CO2 Transmitter:

Range : 0-10% Volume
Measurement Accuracy : 1% of the measuring range 5% of the measured value
Principle of detection : NDIR Technology with automatic base line correction
Response time : less than 2 Minutes Output: 4-20mA
Mounting : Space
Electrical Input Supply : 24VDC

Tempsen CO2 Controller :

Size : 96X96mm

Range : 0.00 – 10.00%

Input : 4-20mA 24VDC to power Transmitter

Relay O/P to control the CO2 inlet Valve

Electrical Input Supply: 230VAC