

ULTRA THERMO

Walk in Steam Curing Chamber for Concrete Application

Detailed Working Specifications

The Chamber with extremely high fabrication 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 Profile Programmable Controller and Rotronics direct humidity measurement probe makes it to be currently the best available and with the attractive exterior to enhance any test facility.



Inner Dimensions : 3Mtr X 2Mtr X 2.1Mtr(H)

Steam Fill Time : with in 90min

Concrete Loading : Max 2 Tons (Spread Load)

Concrete Product : Cubes, Cylinders, Beam, Column

Chamber Construction : with Rockwool Insulated and Fully TIG Welded 16SWG SS304 Panels, for Vapor Tight Finish

Temperature Range : 25°C to 80°C

Humidity Range : 40% to 95% (Low Temp Low humidity with Dry Air Purging)

Rampdown : 65°C to 25°C in 2hrs with 1 Ton Load

Turn Around Time :

80degC,95%RH in around 2hrs.

50degC,95%RH in around 1hr

Steam Water Bath capacity : 75Ltrs

Inconel type heaters with capacity: 12-16KW/Phase

Dimensions : Internal Dimensions :3 Mtr(L) X 2Mtr(B) X 2.1Mtr (H), 13000 Ltrs.

Temperature Range : 25 °C to +80°C, ± 1 °C uniformity across the gradient and 1°C Control Accuracy, after stabilization.

Humidity Range : 40% RH to 95% RH in the temperature range of 25degC to 80degC RH Accuracy will be with in 2% RH after stabilization.

Structure : 16SWG MS Powder Coated Exterior and 16SWG SS304 Fully TIG Welded Inner, mountable on MS Top and Bottom Frame. Self standing floor mounted mechanical structure with Vibration Mounts. All rotating parts and critical components of the test chamber is provided with guards.

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Heating System	: Inconel sheathed type evenly spaced in the annular space surrounding the working volume.
Refrigeration Unit	: Emerson Copeland Air Cooled Refrigeration system complete with all other refrigeration accessories & with CFC free refrigeration gas.
Finish	: 18SWG MS Powder Coated Exterior and 18SWG SS304 Interior with 100mm thick 96Kg/m ³ density Rockwool Insulation. Inner Chamber will be fully TIG Welded to ensure vapor tight finish.
Humidifier, DeHumidifier system	: Adequate Air Atomizers (4nos) for equalized and consistent Humidification of the entire chamber volume, Warm water vapor generator (75Ltrs capacity) with 12-16KW/Phase heating system, over-heat safety system, Vapour Storage Tank complete with blowing system will be used in the chamber. Fill Time : with in 1.5 hours Turn Around time for 80degC,95%RH will be around 120min. 50degC,95%RH will be around 60min Rotronics Direct measurement Platinum Resistance type sensors shall used for the measurement and control of the Humidity Automatic DM Water refill in the vapor generator if connected to the DM Water Line. Compressed Dry air (4-5bar) will be required for De-humidification at the site of installation. (Must for Low Humidity Low Temperature application)
Fan system	: 4 Nos. High performance externally mounted, flange-mounted motor will drive the internal fans through extended steel shaft.
Insulation and Chamber Floor	: 100mm, 96Kg/m ³ Density Rockwool Insulation will be done between the 16SWG MS Powder Coated Exterior and 16SWG SS304 TIG Welded Interior. The interior floor surface shall be heavy gauge galvanized steel with Marine wooden plank, rockwool insulation material and covered with non-skid Aluminium checkered plates.

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Door Assembly and Viewing window	<p>Door System 1Mtr Wide and 1.8Mtr Height, full front opening type, compensating Chromium Plated Heavy Duty Hinges, Silicone Gasket and Locking mechanism.</p> <p>Incorporated in the centre is the 5 Pane, 400mm X 400mm viewing window, with the whole being insulated with Rockwool Insulation, with an exterior finish, matching the main cladding. 2 Nos., 5 Pane, 400X400mm viewing window will also be provided on either of the side walls for clear viewing of the samples under test.</p> <p>Interlock protection in case of opening of the door.</p>
Controller system	<p>: The Eurotherm 2604 high performance Multi Loop PID Controller shall be used. Over and under temperature indicator shall be of standard make.</p> <ul style="list-style-type: none">➤ PC interface – with remote logging inclusive of acquisition and configuration software➤ High Stability Control & High Precision input➤ Gain scheduling, Auto tune➤ High accuracy, high stability temperature and process controller➤ Dual 7-segment display (5 digit) of the process value and setpoint with an LCD panel for display of alarm messages, programmer and loop status information. User defined messages in the LCD panel simplify operation.➤ Advanced control algorithm gives stable straight line control. Auto tune simplifies the commissioning procedure.➤ Incorporates a self-correcting input circuit (INSTANT ACCURACY) to preserve & maximise the accuracy, performance during warm up and change in ambient temperature.
Display	<p>: The programmer will show both measured variable and set value in °C, and humidity in %.</p>
Working Ambient	<p>: 5degC to 45degC, 90% RH</p>

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Safety features	: ➤ Visual Alarm for Chamber Malfunction and Emergency ➤ Door Interlock ➤ Input supply variation >10% ➤ Under & over temperature protection ➤ MCB's for heater, compressor and fan motor ➤ Thermal overload relay for Fans and Compressor. ➤ Temperature Guard ➤ Emergency Stop ➤ Single phase preventer
Calibration	: Calibration certificate will issued which has traceability to NABL for the complete system.
Electrical Supply	: 415 VAC \pm 10%, 3 Phase, 50 Hz + N + E
Other features	: ● Earth point will be provided ● SSR Based Electrical Control System ● The power consumption by safety & control devices will be as low as possible. ● Energy efficient motors will be used. ● All the switch gears and MCB's used in the construction shall be of MerlinGerin/Schneider Electric.
Technical, Operational and Maintenance Manual	Will contain technical specifications and operating limits of the system. Installation layout w.r.t. the required electrical & air connections, operational instructions, Software programming, Calibration procedures, blue-prints of assembly & circuit drawings, periodic maintenance checks, part nos. of sub-assemblies of the equipment will be provided.

Commissioning & Operational Training

System will be Commissioned by factory trained engineers.



Humidity Measurement Sensor Type : Rotronics Hygromer
Temperature Measurement : PT 100 RTD
Humidity Measuring Range : 0 to 100% RH
Accuracy : +/- 1% RH
Temperature Measuring Range : -100degC to +200degC
Operating Limits at Electronics : -40degC to +85degC
Probe cable length : more than 2 mtrs.
Manufacturer : Rotronics Instrument Corporation, USA

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Danfos Refrigeration Accessories Programmable PID Controller Schneider Elec. Accessories



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