

Environmental Chambers for Materials Testing Applications ETC Series

We offer an extensive range of Environmental Chambers for testing at non-ambient temperatures.

The ETC Series environmental chambers are compatible with both static and dynamic test systems and available with temperature ranges between -150°C to 600°C.

Standardised designs are available to suit both single column or twin column table-top frames or floor standing twin or four column test systems.

This Series use liquid Nitrogen cooling (CO2 cooling on request) and utilise forced air recirculation.



Construction

The inner chamber is constructed from 316 stainless steel and insulated by high efficiency insulation. This durable stainless steel interior eliminates the risk of high temperature oxidation. A forced air skin heating/cooling system is incorporated to minimise skin temperatures when testing at high temperature. The outer case is constructed from mild steel with a durable grey finish.

Principle of Operation

The ETC Series of environmental chambers use forced air recirculation to promote optimum temperature uniformity with reduced thermal gradients in the region of the test specimen. Using a fan system that circulate hot or cold air around the specimen, grips and grip extensions to provide programmable heating & cooling rates and good thermal stability. The air is forced (forced convection) over a set of heating elements and enters the insulated test enclosure at top and bottom. This heated air is drawn back into the centre of the fan through a 'baffle plate' and is recirculated. The temperature of the heating elements is controlled via a type K thermocouple mounted in the centre of the baffle plate. For sub ambient operation, or where controlled cooling is required, liquid Nitrogen is injected into the recirculated air stream via a rear mounted solenoid valve controlled by a second channel on the temperature control instrument. A secondary impellor forces air between the inner insulation and the outer skin to minimise case temperatures when testing above ambient and minimise frosting when testing below ambient.

Safe Door

Hinged to the left (optional to right side). A safety interlock switch operated by the door hinge cuts power to the heating elements and the fan if the door is opened during operation. A door mounted microswitch isolates power to the heater, recirculating fan and liquid Nitrogen solenoid valve when the door is opened ensuring that the operator is protected from potential hazards

Window

Fitted centrally within the door. The window is heated during low temperature testing to help prevent frosting of the panes. Durable stainless steel interior eliminates the risk of high temperature oxidation, whilst inset internal illumination aids observation without impinging on available test space.

Ports

The chamber having top and bottom ports which varies with machine and chamber. An instrumentation port is also included on the top of the chamber complete with a plug.

Removable Top/Bottom Wedges

Removable wedge option enables the chamber to be withdrawn from the test area without removing the load string. This reduces test setup times and improves usability. Instrumentation ports are typically top mounted, but can be side mounted if required

Control

The control system is based on a Eurotherm self-tuning digital (PID) controller, enabling heating and cooling rates to be set. Smaller (table model) environmental chambers are supplied with a discrete control console suited to bench mounting. Larger chambers are more commonly supplied with integrated control instrumentation mounted to the rear lefthand or rear righthand side of the unit. Eurotherm instrumentation is typically fitted, but the precise model of controller may be changed to meet specific user requirements with respect to programmability and communication protocols. It is usual for the primary control instrument to also be used for overtemperature protection, although additional discrete instruments can be fitted if desired. The control interface features individual controls for <Fan>, <Light>, <Cool>, <Heat> and <Enable>, fan speed adjustment for sensitive specimens being incorporated on the rear of the unit on larger chambers with integrated electronics (optionally available on models with discrete control systems). A range of communications protocols can be supported, RS232/485, Ethernet, Modbus or ElBysync, appropriate connections being provided on either the rear of the chamber or discrete console.

With interface to our PCS8000 Control System

The ETC environmental chambers features direct data communication with the testing machine controller. The interface allows to read up to 10 temperatures for data acquisition through PCS8000 / DION7 as well as set the environmental chambers heating or cooling rates, dwell times and end temperatures direct from the test software DION7.

Accessories

The principle accessories offered with environmental chambers are roller mounting systems and split insulating plugs, designed to fill the radial gap between <pullrods> and the internal diameter of the chamber's upper/lower ports. Roller mounting systems are typically custom configured to suit specific installation requirements and may either be bolted to the test frame's lower platen/base or alternatively can be fully mobile, using a trolley configuration. Also available are doors with additional opening for manual insertion of specimens through a small port in the door as well as specimen magazines.



Technical Data for Chambers with temperature range up to +350°C

Model		ETC 550.EC-2001	ETC 550.EC-2094	ETC 550.EC-2007C	ETC 550.EC-2007E	ETC 550.EC-2089
Max. Temperature	°C	+350	+350	+350	+350	+350
Minimum Temperature (LN2)	°C	-150	-100	-100	-100	-100
Internal Dimensions						
Height	mm	300	350	560	560	560
Width	mm	300	240	240	240	310
Depth	mm	300	230	230	230	400
External Dimension						
Height	mm	400	500	710	710	710
Width	mm	475	350	350	350	460
Depth	mm	600	642	643	642	938
Window Dimension	mm	200x125	200x125	350x125	350x125	350x125
Cooling Time to min. Temperature*	minutes	100	90	90	90	90
Heating Time to max. Temperature*	minutes	70	70	70	70	70
Temperature Stability*	°C	± 2°C	± 2°C	± 2°C	± 2°C	± 2°C
Power Supply	V	230	230	230	230	400V 3 Ph/N/PE
Power	kW A	2 kW (32 Ampere)	4 kW (32 Ampere)	4 kW (32 Ampere)	4 kW (32 Ampere)	4.5 kW
Controller		Integrated	External	External	External	External

* with empty chamber

Technical Data for Chambers with temperature range up to +350°C

Model		ETC 550.EC-2057A	ETC 550.EC-2279	ETC 550.EC-2170	ETC 550.EC-2298	ETC 550.EC-2198
Max. Temperature	°C	+350	+350	+350	+350	+350
Minimum Temperature (LN2)	°C	-100	-100	-150	-70	-100
Internal Dimensions						
Height	mm	560	720	560	760	850
Width	mm	400	400	400	400	400
Depth	mm	400	400	1000	400	400
External Dimension						
Height	mm	710	870	710	910	1000
Width	mm	550	550	550	550	550
Depth	mm	948	948	1548	940	938
Window Dimension	mm	350x125	350x125	350x125	350x125	350x125
Cooling Time to min. Temperature*	minutes	90	90	100	90	100
Heating Time to max. Temperature*	minutes	70	70	70	70	70
Temperature Stability*	°C	± 2°C	± 2°C	± 2°C	± 2°C	± 2°C
Power Supply	V	400V 3 Ph/N/PE	400V 3 Ph/N/PE	400V 3 Ph/N/PE	400V 3 Ph/N/PE	400V 3 Ph/N/PE
Power	kW	4.5 kW	4.5 kW	8.25 kW	8.25 kW	8.25 kW
Controller		Integrated	Integrated	Integrated	Integrated	Integrated

* with empty chamber

Technical Data for Chambers with temperature range up to +600°C

Model		ETC 600. EC-2094	ETC 600. EC-2007B	ETC 600. EC-2007E	ETC 600. EC-2089A	ETC 600. EC-2057B	ETC 600. EC-2211	ETC 600. EC-2198S	ETC 600. EC-2169
Max. Temperature	°C	+600	+600	+600	+600	+600	+600	+600	+600
Minimum Temperature (LN2)	°C	-150	-150	-100	-170	-150	-150	-150	-150
Internal Dimensions									
Height	mm	350	560	560	560	560	850	850	1000
Width	mm	230	240	240	310	400	310	400	400
Depth	mm	240	230	230	400	400	400	400	400
External Dimension									
Height	mm	500	710	710	710	710	1000	1000	1150
Width	mm	350	350	350	460	550	460	550	550
Depth	mm	642	642	642	938	938	938	938	938
Window Dimension	mm	200x125	350x125	350x125	350x125	350x125	350x125	350x125	350x125
Cooling Time to min. Temperature*	minutes	100	100	90	110	100	100	100	100
Heating Time to max. Temperature*	minutes	90	90	90	90	90	90	90	90
Temperature Stability*	°C	± 2°C	± 2°C	± 2°C	± 2°C	± 2°C	± 2°C	± 2°C	± 2°C
Power Supply	V	230	230	230	400V 3 Ph/N/PE	400V 3 Ph/N/PE	400V 3 Ph/N/PE	400V 3 Ph/N/PE	400V 3 Ph/N/PE
Power	kW A	2 kW (32 Ampere)	2 kW (32 Ampere)	4 kW (32 Ampere)	6 kW	8.25 kW	6 kW	6 kW	6 kW
Controller		External	External	External	External	Internal	Internal	Internal	Internal

* with empty chamber