

Microprocessor Based Temperature / Humidity Controller for Stability Chamber

(Product Code: 14.2.1 to 14.2.2)



Model Wise Description:

Sr. No	Model	Product Description
14.2.1	HTC-3003	Microprocessor based Temperature & %RH PID-On/Off controller (2 inputs and 3 or 4 outputs) with RTC, Printer port, RS-485/RS-232 Serial port and Extra 128KB memory bank. (Simultaneous Display of T and RH)
14.2.2	HTC-3000	Microprocessor based Temperature & %RH PID-On/Off controller (2 inputs and 3 or 4 outputs) with RTC, Printer port, RS-485/RS-232 Serial port and Extra 128KB memory bank. (Scan Display for T and RH)

Description:

Libratherm offers Microprocessor based Humidity and Temperature Controller Model HTC-3003 and HTC-3000 with input and output suitable for measuring and controlling the T and RH of stability or environmental test chambers. These chambers are mainly used in Pharma, Petroleum, Chemical and Food Industries to test the sample under the desired simulated levels of temperature and humidity.

The controller accepts input from the standard T + RH sensors consisting of (Pt-100) temperature sensor and the capacitive type RH sensor or from T + RH transmitter. (The suitable sensors or transmitters of international brands can also be supplied along with this controller).

In model HTC-3003, the process values and set values are displayed simultaneously in the range of 0.0 to 99.9 °C and 0.0 – 99.90% RH respectively on 4 independent 3 digit 7-segment Red / Green LED displays. The real time is displayed on 4 digit display.

In model HTC-3000, the process values and set values are displayed on the same 4 digit display with 2 digit display for the respective unit. The display will scan at the programmed rate and indicates T and RH alternately. HTC-3000 has only advantage of HTC-3003 is that of temperature can be indicated up to 200.0 °C. The real time is displayed on 6 digit display. Otherwise both the models are similar.

Since these controllers are basically designed for the stability chambers, the accurate control of temperature and humidity is achieved by operating the air heater (for Dry heat) and the boiler heater (for Moisture) in the PID control action. And the compressor (for low temperature) is operated in ON/OFF action with time delay facility. Since the compressors are not required to be kept ON above certain level of temperature, the user selectable mode is provided to program the compressor operation in AUTO, Continuous ON or Continuous OFF mode. To de-humidify the system, an extra ON/OFF output can also be optionally provided. The control outputs are in the form of SSR drivers of (0 – 10) VDC pulse to control the Air heater, boiler heater and compressor and dehumidifier.

In addition, these controllers have many other useful features such as, in-built real time data storage facility, which can be retrieved on demand or can be down loaded on to a computer or on a printer for hard copy via the built in printer port. The storage capacity depends on the logging time. Maximum 480 records can be stored which can be printed in OFF line mode. For larger storage, additional memory card increases the capacity up to 3000 records.

These models also accepts 2 nos. of external potential free contacts to detect the water level of the boiler used for generating the steam or moisture and to monitor the status of the front door of the chamber – through limit switch contacts. The Door operating command can be issued externally from the PC .

The controllers are ready with the serial communication port RS 232 or RS 485 in ASCII modbus format for interfacing to the computer for data logging and storage.

Specially designed window based **E-Chamber Software** (as per our standard or as per CFR compliance) does the on line data logging and plot the online / offline graph on the PC and also allows user to enter the set points and control parameters through PC and the controller. (i.e. bi-directional communication).

Features:

- ❖ Microprocessor based design.
- ❖ Easy front panel keyboard programmable.
- ❖ Independent 4 control outputs for Temperature/%RH control.
- ❖ Digital input for water level, door switch etc..
- ❖ PID or ON/OFF control action for Air heater, Boiler heater and ON/OFF control action for Compressor with programmable time delay.
- ❖ Direct dot matrix parallel / Centronics printer output for EPSON printer model LX-300+ or Equivalent.
- ❖ RS-485 or RS-232 PC computer interface.
- ❖ Standard software or CFR complaint software.

Application:

- Stability / Environmental Test Chambers
- Walk In Chambers
- BOD Incubator etc

Sensors for (T + Rh) Measurement:

Libratherm controllers are designed to accept the T+RH probe or the Transmitter from various models of Rotronic – Swiss. User has the choice to select suitable probe or the transmitter based on the application and the range of measurement. Standard OEM products from Rotronic are available from us to be used with T+RH controller model HTC-3003. A detail of the same is given below in Table 1.

Technical Specifications:

No. of Input	2 (one each for Temperature (T) and % Relative Humidity (%RH)).
Input	T + RH sensor probe or Transmitter Refer Table 1.
Range	-40.0 to 60.0 °C or 0.0 to 60.0 °C , 0.0 to 200.0oC and 0.0 to 99.9 %RH.
Resolution	0.1 °C / %
Accuracy	Better than ± 0.1% for temperature and ± 2% for RH. (Taking into account the sensor accuracy).
Display (HTC-3003)	3 digit 0.5" Red 7-segment LED display for Process Temperature. 3 digit 0.5" Red 7-segment LED display for Process Humidity. 3 digit 0.5" Green 7-segment LED display for Set Temperature. 3 digit 0.5" Green 7-segment LED display for Set Humidity. 4 digit 0.5" Red 7-segment LED display for RTC.
Display (HTC-3000)	4 digit 0.5" Red 7-segment LED display for Process Temperature and RH 4 digit 0.5" Red 7-segment LED display for Set Temperature and RH 2 digit 0.5" Red 7-segment LED display for unit (°C or RH) . 6 digit 0.3" Red 7-segment LED display for RTC.
Tuning	Manual tuning of PID values.
Control Action	PID or On/Off as required.
Open Sensor Indication	Display shows Fault messages and control outputs will be turned OFF.
Settings	Using front panel membrane keyboard to set the various values.
Memory Backup	Retention of PID and set values in the non-volatile memory in the event of power failure.
Control Action	PID for Air Heater and Boiler heater. On-Off with programmable hysteresis for Compressor and Dehumidifier.
Control Output	For Air Heater, Boiler Heater, Compressor and Dehumidifier in the form of DC pulses 0 to 12 VDC to drive external SSRs.
Event Outputs	2 Extra Relay outputs can be used as High/Low or Day/Night effect.
External Input	Potential free contact input for water level & door switch.

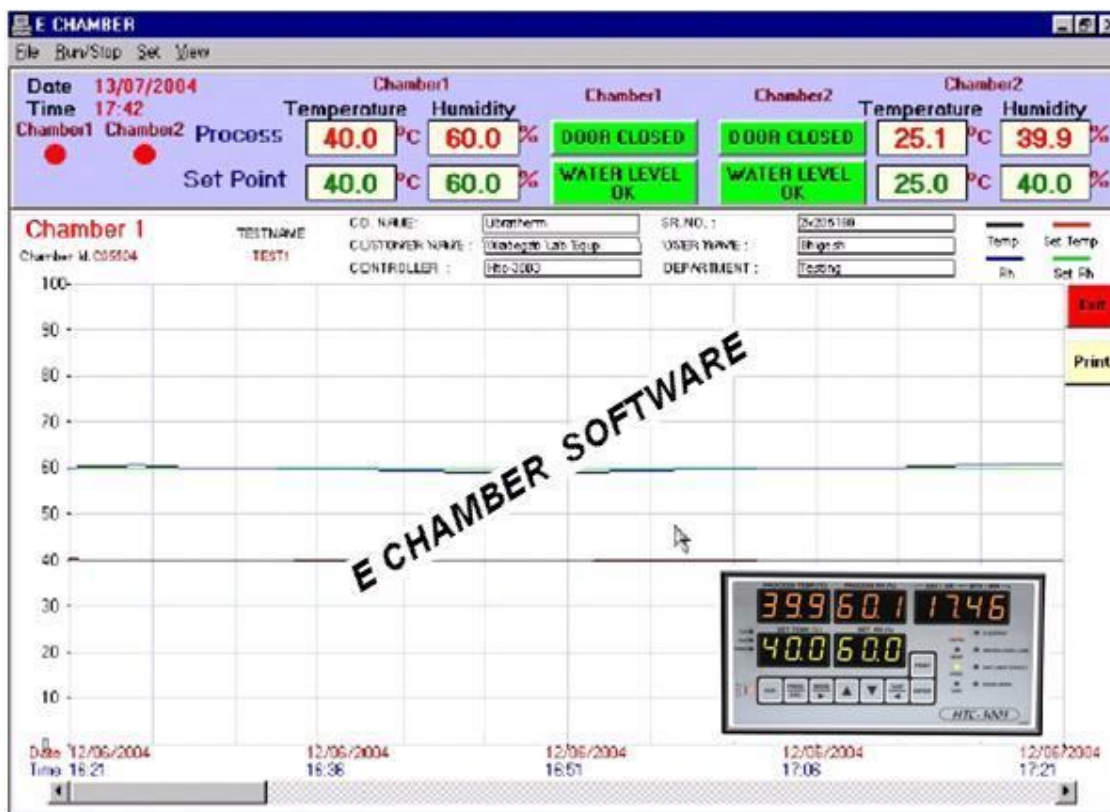
	Water level switch is interlocked with control outputs.
Data Logging	Real Time with programmable log time and storage time.
Data Storage	2K memory bank – sufficient to store 480 records. For more storage memory can be expanded up to 128KB.
Serial / Parallel Interface	Parallel Centronics port (25 pin D connector) fo 80 column dot-matrix printer (EPSON or Equivalent). Serial port (RS232- 4 wire or RS485 - 2 wire) on modbus ASCII protocol. USB interface can also be optionally provided.
Supply	230VAC or 110 VAC \pm 10% (10VA), 50/60Hz.
Size	192 x 96 x 200 mm
Panel cut out	186 x 92 mm +/- 0.5 mm.
Enclosure	Metal Powder coated with ABS front bazel and polycarbonate graphics.

Input Sensor / Transmitter and Range Selection Table:

(Which can be used with above controllers)

Sensor / Transmitter	A1 (Sensor)	A2 (Transmitter)	A3 (Transmitter)
Model	HYGRO CLIP –CP	HYGROTX-3000	H290
Type	Sensor	Transmitter	Transmitter
Make	Rotronic – Swiss make	Libratherm	Rotronic
Temp. Sensor	In-built	Hygroclip-CP	In-built
Supply	(5-24) VDC	18-24VDC	(5-24) VDC
%Rh O/P	0 TO 1 VDC	4-20mA	(4-20) mA DC
% Rh Range	0 to 100%RH	0 to 100%	0 to 100%
Accuracy	+/- 1.5 %RH @23°C	+/-1.5% @ 23°C	+/- 1% RH
Temp. O/P	0 to 1 VDC	4-20mA	(4-20) mA DC
Temperature	-40 to 60°C	-40 to 60°C	-40 to 150°C.
Accuracy	+/- 0.5%	+/- 0.5%	+/- 0.5%
Std. Cable Length	2 meter	1 meter with sensor	2 meter
Transmitter Enclosure	--	ABS IP 65	ABS-IP65
Transmitter Size	--	85 x 85 x 55 mm.	120 x 85 x 55 mm
Sensor Size	15 x 140 mm	15 x 140 mm	15 x 200 mm
			

ECHAMBER Standard Software – designed to interface with our controller **HTC-3003, HTC-3000** to control temperature and humidity of the stability chambers. The software allows user to monitor the temp. and humidity values on the screen, user can feed the PID, Set Point and Program values through the computer keyboard, one can view the real time values in graphical format which can be zoomed or scaled as per the requirement. Database can be searched with date and time or other user defined fields. Software can be customized to monitor more than one stability chamber on a single screen, selection options are provided to the user. Software can also be supplied to comply with 21 CFR PART 11 requirements.



Ordering Information:

Model	A- Input Type	B- Logic Input	C- Output 1 For T	D- Output 2 For RH	E- Output 3 For Cool	F- Output 4 For Dehumid	G- Output 5 For Beeper	H- Parallel Interface	I- Serial Interface
HTC-3003 HTC-3000	A1 -(HYGROCLIP)	B1- (Water Level Input)	C1- (DC pulse)	D1- (DC pulse)	E1- (DC pulse)	F1- (DC pulse)	G1- (DC pulse)	H1- (Yes)	I1-(RS232)
	A2 -(HYGROTX)	B2 -(Door switch Input)				00-(None)	00- (None)	00-(None)	I2-(RS485)
	A3 -(H290)	B3 -(Both Input)							00-(None)
		00 -(None)					G1 is for Buzzer output		

Examples:

Model	A- Input Type	B- Logic Input	C- Output 1 For T	D- Output 2 For RH	E- Output 3 For Cool	F- Output 4 For Dehumid	G- Output 5 For Beeper	H- Parallel Interface	I- Serial Interface
HTC-3003	A1	B1	C1	D1	E1	00	G1	00	I2
HTC-3003	A2	B3	C1	D1	E1	F1	G1	H1	I1
HTC-3000	A3	00	C1	D1	E1	F1	00	00	I2

Example	Ordering Code	Description
1	HTC-3003-A1-B1-C1-D1-E1-00-G1-00-I2	This is T + RH controller with Hygroclip sensor as the input, water level switch as extra input with 3 dc pulse outputs for control, extra output for Buzzer and RS 485 serial interface..
2	HTC-3003-A2-B3-C1-D1-E1-F1-G1-H1-I1	This is T + RH controller with transmitter input, water level and door switch as the extra inputs and 4 dc pulse outputs for control, , extra output for Buzzer, parallel printer port and RS-232 serial port.
3	HTC-3000-A3-00-C1-D1-E1-F1-00-00-I1	This is T + RH controller with transmitter input, 4 dc pulse outputs for control, and RS-485 serial port.

REMARK :