CRTH2 MANUAL

Elite Series recorders limited warranty

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CR-TH2 Recorder Features:

The CR-TH2 is a precision temperature, relative humidity and dewpoint recorder with a digital display. The recorder was designed with the user in mind. No special knowledge is required to operate the CR-TH2. The menu driven setup is logically simple and user friendly. All parameters are shown on a two line alphanumeric LCD display. The backlighting of the display enhances visibility under marginal lighting conditions.
The CR-TH2 uses two independent pens and records information on a six inch circular chart.

Each pen is uniquely colored to maximize chart readability. The rotation of the chart may be set to single turn or continuous.
In addition, a full function alarm feature is provided. The alarm of the CR-TH2 can be set to sound an audible signal when the temperature and/or humidity has exceeded an upper or lower limit. Each limit is individually set from the front panel. A delay time before the alarm is activated may be set by the user to prevent nuisance alarms. Low power, normally open relay contacts are provided to allow activation of a remote alarm, phone dialer or annunciator.

Power is supplied through a 120 VAC 50/60 Hz plug-in adapter. External power may be supplied from any 12 VDC source such as automotive, marine, or other battery. Battery backup for 48 hours is featured to provide operation during temporary power loss.

All functions of the CR-TH2 are accessed through five pushbuttons located on the front panel. Selectable functions are retained in a memory to avoid re-entering settings in the event of a power failure.

Quick Start

1. Connect power supply to CR-TH2 through jack on right side of unit.
2. Plug power supply into 120 VAC outlet.
3. Press ON button.
4. Pens will move to the "Home" position. (The outermost part of the chart.)
5. Pens will then go to a position on the chart according to the display reading. This is called the RUN
Mode. (Unit is always in the ON or RUN Mode when display is showing temperature, humidity and dew point readings.

Menu or Run?

The CR-TH2 has two basic modes of operation:
MENU mode. To review or change settings.
RUN mode. To display present conditions and record them.

If MENU mode is selected the user can:
Set Chart Speed/Range.
Set Red Pen to record Temperature or Dewpoint.
Set Single or Continuous Chart Rotation.
Set Alarm Status:
Alarm Disabled
Alarm Delay = 0
Alarm Delay = 10 Min.
Alarm Delay = 20 Min.
Alarm Delay = 1 Hour

Alarm Delay = 2 Hours
Set Blue Pen position
Set Red Pen position

If Alarm is Enabled:
Set Temperature High Limit.
Set Temperature Low Limit.
Set Humidity High Limit.
Set Humidity Low Limit.

After MENU setting unit will automaticly go into the RUN Mode after 30 seconds.
If RUN Mode is selected:
The display shows temperature, humidity, and dewpoint.

While in RUN mode, the user can:
Home the Pens by pressing the HOME switch.
Advance the chart by pressing the ADV button.

How to Change the Chart.

1. Press the HOME button to move the pens to the outer edge of the chart.
2. Lift the pens with the lever (just enough to lift the pens from the chart).
3. Remove the old chart.
4. Install the new chart on to the spindle.
5. Rotate the chart to the starting point with the ADV button.
6. Lower the pens.
7. Press the HOME button again. This will put Recorder in the RUN Mode.
8. If the pen(s) position need adjustment, see Pen Adjustment section below.

Chart speed and range

The CR-TH2 offers 18 combinations of Chart ranges and Chart speeds to match a wide variety of applications. All functions of Chart Speed and Chart Range have been combined in one menu to make the necessary selections as easy and as fast as possible.
As a further aid to the user the Supco chart number is shown on the display for any combination of Chart Range and Chart Speed.

Chart Speed is the term used to describe the time it takes for the recording chart to make one complete revolution. Different applications will require different chart speeds. For example, the 7 day chart would generally be used where long term monitoring is required and frequent changing of the charts would be undesirable. The main disadvantage of this is that short term variations in temperature or humidity will record as a single line or step on the chart. In applications that have wide short term temperature or humidity variations the user may prefer a faster chart speed for more accurate analysis.
The fastest chart speed is one revolution in 1 1/2 hours. This allows the user to record short term variations in temperature and humidity in great detail. An example of this would be to test the

defrost cycle in a frost free freezer or to observe the settling time of a temperature control system.

Chart Range can be selected by the user for degrees F or degrees C. Recorder will retain this information even when the power is disconnected or the unit turned off.

If the measured temperature is out of range (for the chart selection), the display will read the actual temperature, but the pen will not go beyond limit of the chart.

How to Set the Chart Speed and Range.

1. While in the Run mode, press the MENU button. This will show the present setting for speed and
   range.
2. To change the chart speed, press the A button. Each time the A button is pressed, the speed will
   change. Whatever speed is on the display will become the chart speed
   7 Day
   24 Hr.
   12 Hr.
   6 Hr.
   3 Hr.
   1.5 Hr.
3. To change chart range, press the B button. Each time the B button is pressed, the range will change.
   Whatever range is on the display will become the chart range
   -20/+120 F
   -20/+50 F
   +40/+110 F
   +5/+45 C
   -30/+10 C
   -30/+50 C
4. Chart Number will be displayed automatically.
5. Press MENU to proceed in MENU Mode.
   If no button is pressed for 30 seconds, the recorder will automatically return to the Run mode.

Red Pen Mode.

The red pen may be used to record Temperature or Dewpoint. The blue pen always records Relative Humidity.

How to Select Red Pen to Record Temperature or Dewpoint

1. Press MENU until “Red Pen = ...” message appears.
2. Press:
   A to toggle between Temperature and Dewpoint
   B to go to RUN
   MENU to continue in MENU Mode.

How to set Single Turn or Continuous Rotation

The recorder can be set to rotate chart continuously or stop after one revolution.

1. Press MENU until “Single Turn or Continuous” message appears.
2. Press A to toggle between Single and Continuous.
3. Press B to go to RUN Mode.
4. Press MENU to continue in MENU Mode.

Alarm and Delay

When temperature, humidity or both measurements pass above or below the thresholds set in the menu function, the CR-TH2 will execute a preset operation. This operation is described as an Alarm condition or a Delay condition and is referred to simply as Alarm or Delay.
Alarm indicates that one or both measurements are above or below the preset thresholds. The CR-TH2 is sounding the audible alarm and has closed the relay contacts. The display will also be flashing the parameter which has caused the Alarm condition.

Delay is a condition in which one or both thresholds have been passed, but the audible alarm and relay contacts are not activated for a preset delay time. Delay is used to prevent nuisance and false alarms.

For Example:
In the normal operation of a frost free freezer an automatic defrost cycle takes place periodically. Without the Delay function this would cause a false alarm indicating a freezer failure when in fact no failure has occurred. The Delay can also be used to prevent nuisance alarms on coolers or similar devices which have frequent door openings. Without the Delay function an alarm would be started as a result of a short term increase in temperature caused by the door being opened and again no failure of the system has occurred.
The CR-TH2 allows the user to select one of five Delay times, Zero Delay, 10 minutes, 20 minutes, 1 hour or 2 hours. The delay time selected will depend on the application and will vary from installation to installation. It is up to the judgment of the user to determine the best Delay time for a given application.
When a Delay time of zero is selected the Delay function is disabled. When a temperature or humidity threshold is passed the audible alarm and relay contacts will close immediately.
When a Delay Time other than zero is selected the audible alarm and relay contacts will not activate until one or both temperature and humidity thresholds have been exceeded continuously for the

period of the Delay Time. The display will flash the parameter which has caused the Delay condition to alert the user that one or more thresholds have been passed. At the end of the Delay time the audible alarm will sound and the relay contacts will close.

How To silence the Alarm: (Relay contacts remain closed.)

1. Press MENU... display will show "Disable Alarm " message.
2. Press A to turn off alarm (only sound will be turned off, relay will be closed.)
3. Press B to turn alarm (sound) on.
4. Press MENU to continue in Menu Mode.

In RUN Mode:
If a temperature limit caused alarm, the temperature reading will blink until the condition returns to normal.

If a humidity limit caused the alarm, the humidity reading will blink until the condition returns to normal.

When condition that caused alarm is no longer present, the alarm and relay will be reset and the blinking will stop and the alarm sound will be enabled. To disable the relay contacts and the blinking parameter(s), the alarm must be disabled. See How to Set Alarm and Delay below.

How to Set the Alarm & Delay

1. Press MENU button until alarm status message appears.
2. Press button A to scroll through options:
   - Alarm Disabled
   - Zero Delay
   - 10 Min. Delay
   - 20 Min. Delay
   - 1 Hour Delay
   - 2 Hour

3. Press:
   - B to go to RUN Mode.
   - MENU to continue in MENU Mode.

Temperature and Humidity Limits

The Temperature and Humidity Upper and Lower Limits allow the user to customize the alarm settings of the CR-TH2 to provide the greatest degree of protection while at the same time preventing unnecessary alarms. Since each application is unique careful selection of the temperature and humidity thresholds are required to provide the maximum degree of protection. Both Temperature and Humidity high and low limits may be set.
If the Alarm is enabled, and any of these limits are exceeded, the display will blink the reading

that went out of limit. An audible alarm (Beeper) will sound and the relay contacts will close after the set delay time. This delay time can be set as follows:

0 Delay
10 Min. Delay
20 Min. Delay
1 Hr. Delay
2 Hr. Delay

If the Alarm is not disabled, any of the four limits could trip the alarm, therefore all upper and lower limits must be set.

Setting the Limits.

How to Set the Temperature High Limit

1. Press MENU until “Temp. High Limit” appears.
2. Press:
   A to increase limit
   B to decrease limit
   MENU to go to TEMPERATURE LOW LIMIT.

How to Set the Temperature Low Limit

1. Press MENU until “Temp. Low Limit” appears.
2. Press:
   A to increase limit
   B to decrease limit
   MENU to go to SET HUMIDITY HIGH LIMIT.

How to Set the Humidity High Limit

1. Press MENU until “Humidity High Limit” appears.
2. Press:
   A to increase limit
   B to decrease limit
   MENU to go to SET HUMIDITY LOW LIMIT.

How to Set the Humidity Low Limit

1. Press MENU until “Humidity Low Limit” appears.
2. Press:
   A to increase limit
   B to decrease limit

MENU to continue in MENU Mode.

Temperature and Humidity Pen Position Adjustment

NOTE: The blue pen has a longer arm to allow it to move under the red pen. Therefore one pen will record at real time and the other will lag or lead by 3/16 “.

In the normal course of operation charts and eventually, pens will have to be changed on the CR-TH2. When this occurs it may be necessary to adjust the pen position to match the pen position with the reading of the display.

How to Adjust the Blue Pen Position on the chart (Humidity).

1. Press the MENU button until the display reads “Adjust Blue Pen”.
2. Press button A to move pen out (toward outer edge).
3. Press button B to move pen in (toward hub).
4. Press MENU to continue in Menu Mode.

How to Adjust the Red Pen Position on the chart (Temperature or Dewpoint).

1. Press the MENU button until the display reads “Adjust Red Pen”.
2. Press button A to move pen out (toward outer edge).
3. Press button B to move pen in (toward hub).
4. Press MENU to continue in Menu Mode.

Temperature / Humidity Probe

The Temperature / Humidity probe contains the sensors to convert temperature and relative humidity to electrical signals that the recorder uses to record and display.
The probe will measure Temperature from -20° F to +120° F. (-30 to +49° C)
The probe will measure Relative Humidity from 0 to 100%.
The Dewpoint is calculated from these two measurements, and will range from 32° F to 120° F (0° C to +49° C). Any readings of Dewpoint outside of these limits will be invalid.

The probe must not be immersed in any liquid, and must not be subjected to temperatures outside the -20° to +120° F range.
Each probe is matched with its recorder, and can not be switched between recorders without going through a calibrating process. This same process must be done if the probe is replaced.

Calibration by Supco to NIST traceable standards is available as an option. The CR-TH2 only requires calibration when the probe is replaced. Calibration procedure for the probe is available, for details, contact the factory.

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Battery Backup Operation

Battery backup allows the CR-TH2 to continue operation in the event of a power loss. Actual operating time on battery will depend upon the condition of the batteries. With fresh alkaline batteries the typical operating time will be 48 hours (when operating on battery only) . Alkaline batteries are essential for this type of application.
When the main power is lost the CR-TH2 will sense this and immediately turn off the backlight on the LCD Display in order to save batteries energy. An asterisk (*) will be present after each reading on the display to advise the operator the CR-TH2 is operating on battery power. No other indication will be visible. The temperature and chart recording will continue until the batteries have been exhausted or the AC power is restored.
The CR-TH2 will monitor the battery power and when the batteries are almost exhausted, a "Low Battery" message will appear on the display. The batteries should be replaced as soon as possible to avoid erroneous readings. This prevents possible damage due to battery leakage and also assures that the CT-TH2 will remain in operation in the event of another power failure.
The suggested battery backup consists of eight AA cells, however, a standard nine volt battery could be used to provide approximately one hour of backup.
The following chart shows the life expectancy of various types of batteries.

1. Eight Alkaline AA cells 48 Hours

2. Eight Rechargeable NiCad AA cells 24 Hours

3. Standard 9 Volt Alkaline Battery 1 Hour

The life expectancy of the batteries is based only on the time when the CR-TH2 is being operated on batteries only. A small "Trickle Charge" is featured to maintain normal operation of rechargeable batteries.

It is good practice to replace batteries every year.

Do not keep batteries in CR-TH2 when not in use.

CR-TH2 Specifications

Operating ambient temperature range	32 to 120°F (0 to 49°C)
Storage temperature	0 to 120°F (-18 to 65°C)

Primary power	115 VAC, 50/60 Hz. (220-240 VAC, 50/60 Hz. optional)
Backup power batteries (not supplied)	8 AA alkaline(approx. 48 Hrs.) or rechargeable
Alternative power adapter	12 Volt vehicle operation with optional
Temperature Accuracy	+/- 1.8°F (+/- 1°C)
Relative Humidity Range	0 - 100%
Relative Humidity Accuracy	+/- 2%
Dewpoint Range	32 to 120°F (0 to 49°C)
Probe	Supco Part # THP5. Combined Temperature/humidity with 6" cable (extended cable length is available)
Chart	6" Circular chart (see following table)
Chart Rotation Speeds	User Selectable: 7 Days, 24 Hours, 12 Hours, 6 Hours, 3 Hours and 1.5 Hours
Chart Rotation Mode	User Selectable Single Turn or Continuous
Chart Speed Accuracy	+/- 1%
Display	Alphanumeric Backlit LCD 16 Characters 2 Lines
Temperature Alarm Range	-20 to +120°F (-30 to +50°C)
Alarm Delay Range	User Selectable: No Delay, 10 Min., 30 Min., 1 Hr. or 2 Hr.
Remote Alarm Connection	Normally Open Contacts 48 VAC/DC , 0.1 Amp.
Mounting	Vertical or Horizontal Free Standing or Wall Mounted
Dimensions	9.25" x 7.25" x 2.75"
Weight	2.5 lb.

Power Consumption	3.5 Watts Max.

Chart Temperature Ranges

Chart #	Chart Speed Range
E20120F12	12 Hours -20 to +120 F
E20120F24	24 Hours 20 to +120 F
E20120F7	7 Days -20 to +120 F
E2050F12	12 Hours -20 to +50 F
E2050F24	24 Hours -20 to +50 F
E2050F7	7 Days

-20 to +50 F

E40110F12

12 Hours

+40 to +110 F

E40110F24
24 Hours

+40 to +110 F

E40110F7

7 Days

+40 to +110 F

E3050C12

12 Hours
-30 to +50 C

E3050C24
24 Hours

-30 to +50 C

E3050C7
7 Days
-30 to +50 C

E3010C12

12 Hours

-30 to +10 C

E3010C24

24 Hours
-30 to +10 C

E3010C7

7 Days

-30 to +10 C

E545C12

12 Hours

+5 to +45 C

E545C24
24 Hours
+5 to +45 C

E545C7

7 Days

+5 to +45 C