

This manual applies to : KT8P0/KT8P2/KT8P3/KT856

The KT800/802/803/809 is the previous series of Dickson 8" Temperature Chart Recorders. All references made to these products can be substituted as information on the KT8P series.

## Default Recorder Settings

- 7-day chart rotation
- 0 to 100F (KT800/802/803/809/856)
- 0 to 1000F (KT804)

## Quick Start

1. Remove the protective pen caps
2. Connect Probes
  - KT8P0/2/3: Make sure the KTC is connected firmly to the Replaceable Sensor and that the Replaceable Sensor is plugged in firmly to the chart recorder.
  - KT856: Make sure both the KTC probes are plugged in firmly to the chart recorder.
3. Insert batteries and if applicable, plug in AC adapter (see Figure 3). KT8P0: 4 AA batteries required; KT8P2/3 & KT856: 4 AA batteries backup power only. The unit will power on.
4. The instrument will move pen(s) to the appropriate readings.
5. Install the chart that matches the Dip Switch settings.
  - Press the pen home key to move the pens to the outside of the chart. The pen is automatically raised off the chart.

Remove the old chart, place the new chart on the chart hub being certain that the edge of the chart slides under the chart guide. Clips located at the outside of the chart.

6. **Set the appropriate time.** There are two ways to adjust the chart and set the appropriate time:
  - a. Set the chart time manually by inserting a coin into the groove in the chart hub and turning clockwise until the correct hour(and day if applicable) on the chart is referenced to the timing arrow (just to the right of the pen tip on the dial). **Press Pen Home** to move the pen(s) back onto the chart.

*The following feature should be used for fine adjustments only.*

- b. To adjust the chart time, press and hold **Adjust-Up** and **Adjust-Down** buttons located on the back of the unit next to the dip switch (see Figure 3).

The green LED will blink rapidly for about five seconds, then the LED will remain solid green. While in this state the **Adjust-Up** button will move the chart backward (counter clockwise) and the **Adjust-Down** button will move the chart forward (clockwise).

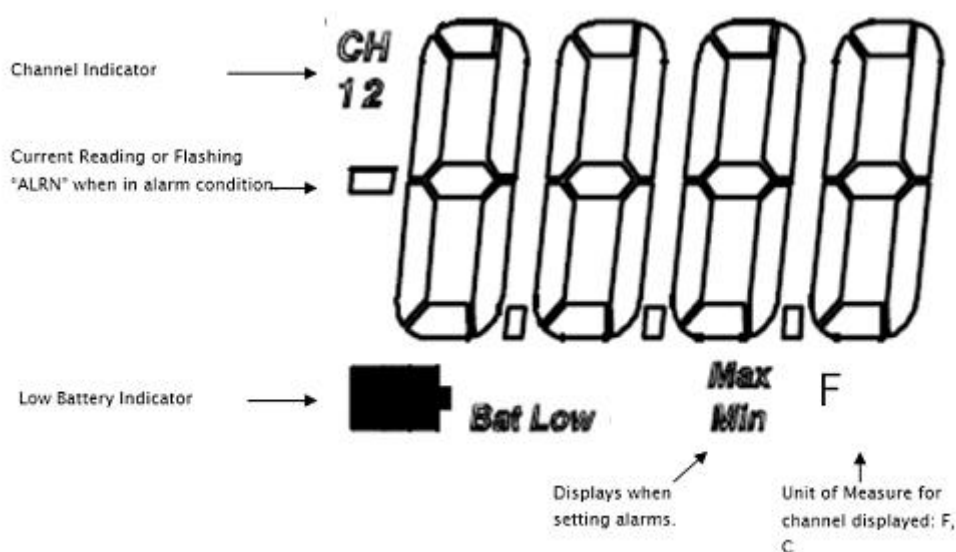
Rotate the chart until the correct our (and day if applicable) on the chart is reference to the timing arrow. Once you have set your chart, press the **Pen Home** button to exit Chart Adjust Mode. The unit will take one minute to exit the Chart Adjust Mode once **Pen Home** is pressed.

Press **Pen Home** to move the pens back onto the chart.

7. Place the KT8 recorder on a flat vibration-free surface. Be sure it is in a vertical position and level. For best performance and longevity, the location should be a clean environment, free from dust and corrosive fumes. Do not exceed temperature specifications.

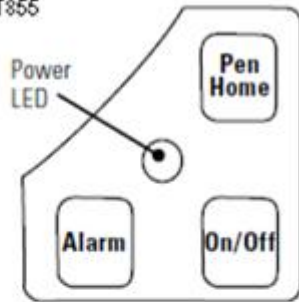
**Wall Mount** Keyhole slots are provided on the KT8 Recorder for wall mounting.

## Display Symbols

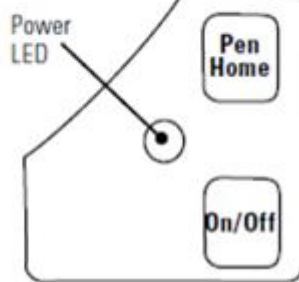


## Button Operations

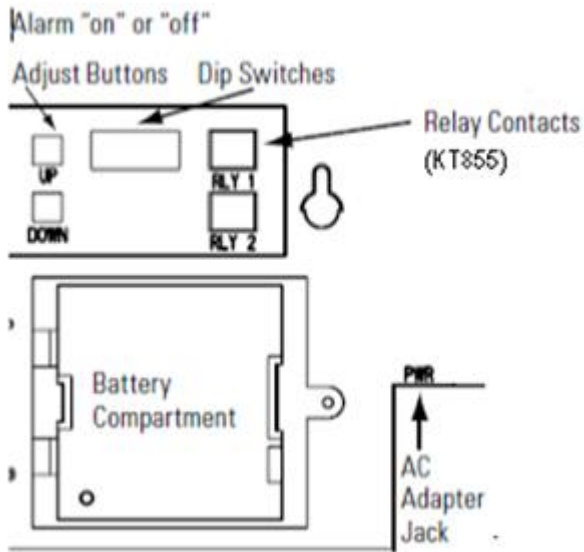
**Figure 2**  
KT8P3/KT855



KT8P0/2



**Figure 3**



**On/Off**

The On/Off button turns the unit on and off.

### **Pen Home (Down Arrow)**

If the pens are located on the outside edge of the chart, press the Pen Home to move pen(s) to recording position. If the pens are located on the chart, press the Pen Home key to move the pen(s) to the outside edge of the chart.

### **Alarm (optional)**

**Pen1:** Red Pen

**Pen2:** Blue Pen

1. To set the alarm, make sure the unit is on and press and hold the Alarm button. The LED will blink red rapidly for about five seconds, then the LED will turn solid green. Release the Alarm button and the LED will turn solid red. At this point the display will show "on" or "off." Pressing either the Adjust-Up or Adjust-Down buttons, located on the back of the unit next to the dip switch, will toggle the alarm on or off.
2. Pressing Pen Home will scroll to the next alarm options:
  - a. Alarm "on" or "off"
  - b. Pen 1 alarm minimum
  - c. Pen 1 alarm maximum

If it is a two pen unit, the additional options are:

- d. Pen 2 alarm minimum
- e. Pen 2 alarm maximum

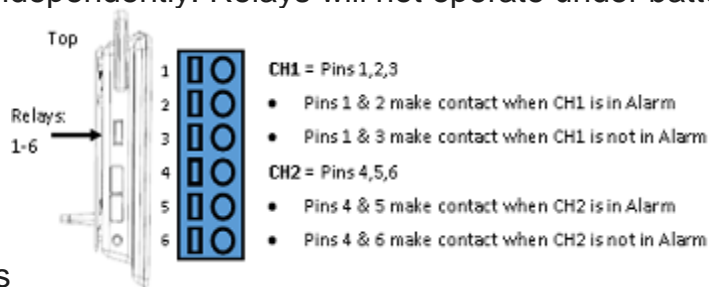
3. In order to set pen alarm minimums and maximums, pressing Adjust-up will increase the alarm value, and pressing Adjust-Down will decrease the alarm value. The numbers will scroll faster if you hold the Adjust-up button.

Repetitively pressing the Pen Home button will scroll through the five options until the alarm button is pressed to exit from alarm adjust. Each press of the Pen Home or Alarm button will store the new settings. The unit will take one minute to exit Alarm Set Mode once the Alarm button is pressed.

4. If the alarm is triggered, the LED will show as solid red and the alarm will sound. Press the Alarm button to silence the audible alarm.

## Alarm Relays

The SPST 24V 500mA relay contacts are normally open and will close on alarm conditions when the alarms are enabled. Relay contacts are always functional when the alarm is enabled. The relay will close only during minimum and maximum alarm conditions. Two pen models have 2 sets of relay contacts which operate independently. Relays will not operate under battery only power

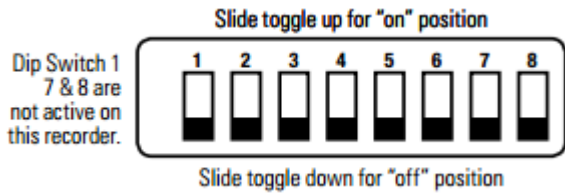


conditions

## Dip Switch Setup

To set up the KT8 recorder for your specific application, you might need to change some of the "Dip Switches". The Dip Switches are located on the back of the unit.

Use a pen or small screw driver to flip the switches. Remember to install the correct chart to match the corresponding Dip Switch setting.



KT8 Dip Switch Setting Up=On Down=Off						
Switches 1-6	For Model	1	2	3	4	5 6
7-Day		D	D			
24-Hour		D	U			
31-Day	Not For KT8P0	U	U			
Fahrenheit				D		
Celsius				U		
-50 to 50° F/C					D	D U
-20 to 20°F/C					U	U U
0 to 100°F/C					D	D D
0 to 150°F/C					D	U D
0 to 250° F/C					D	U U
0 to 500° F/C					U	D D
0 to 1000° F/C	A203 High Temp				U	D U
0 to 2000° F	Probe Required				U	U D

Remember to install the correct chart to match corresponding switch setting

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## Recording Time

All the KT8 recorders feature user selectable recording times.

\*The KT8P0 does not feature a 31-day recording time.

24-hour all models	#1 down
	#2 up
7-day all models	#1 down
	#2 down
31-day KT802/03/56	#1 up
	#2 up

## °F/C

You can record in °F or°C with the KT8 by using dip switch #3.

**Note:** Remember to install the correct chart to match corresponding switch setting.

°F	#3 down
°C	#3 up

## Temperature Ranges

0 to +100°F	#4 down
	#5 down
	#6 down
-50 to +50°F/C	#4 down
	#5 down
	#6 up
0 to +250°F/C	#4 down
	#5 up
	#6 up
0 to +500°F/C KT802/03/56	#4 up
	#5 down
	#6 down
0 to +150°F/C	#4 down
	#5 up
	#6 down

## KT804 Dip Switches for Ranges

-20 to +20°F/C	#4 down
	#5 up
	#6 down
+20 to +100°F/C	#4 down
	#5 up
	#6 up
+50 to +150°F/C	#4 up
	#5 down
	#6 down
0 to +1000°F/C	#4 down
	#5 down
	#6 down
0 to +2000°F (°F only)	#4 down
	#5 down
	#6 up

## Power

The KT8 operates on AC power with an optional 4 AA battery backup. Depending on chart rotation selected and model; battery backup will last

### KT8P2/3 &KT856

24 Hour Chart Rotation = 1 Day Backup

7 Day Chart Rotation = 2 Day Backup

31 Day Chart Rotation = 1 Week Backup

**Note:** Alarm and relays will not operate under battery only power.

## KT8P0

*At 70°F*

24-Hour Chart Rotation = 1 Month

7-Day Chart Rotation = 6 Months

*At 32°F*

24-Hour Chart Rotation = 3 Weeks

7-Day Chart Rotation = 4 Months

**Note:** Unit should not be placed in an environment below 32°F

### LED Indicators

- AC Power with battery backup – Solid green
- AC Power with low battery or no battery – Blinks red
- Battery only – Blinks green
- Battery only (Low battery) – Solid red

**Note:** KT8P0 operates on battery only and will blink one time every minute to conserve battery life.

## Calibration

Your instrument was carefully tested and calibrated before being shipped from the factory. For greatest accuracy, we recommend factory re-calibration every 6 – 12 months. Call customer service at (630) 543-3747. If you wish to do calibration yourself, follow these procedures:

1. To activate Calibration Mode, turn the unit on and press and hold both the **On/Off** button and the **Adjust-Down** button (making sure to press the **Adjust-Down** button first so the unit will not turn off). The LED will blink in amber rapidly for about five seconds, and turn solid green. Release the **On/Off** button and the **Adjust-Down** button. The LED will then blink amber at which point only the pen being adjusted will show on the display.
2. To raise the unit of measurement, press the **Adjust-Down** button. To lower the unit of measurement, press the **Adjust-Up** button. Pen home switches between the red and blue pens on a two-pen unit and stores the current adjustment value.
3. When calibration is complete, press the **On/Off** button. Calibration is stored in memory even after you turn the unit off. User calibration information will not be lost if AC power fails.

**Note:** After two hours, if no buttons are pressed, the unit will time out of user

calibration and resume normal operation. The user calibration is stored separately from the factory calibration. If you wish to cancel out your user calibration, simply enter Calibration Mode and toggle through the steps without adjusting displayed readings. Exit by pressing the **On/Off** button. You have now restored factory calibration.

**Note:** It is recommended that you use a controlled chamber when calibrating temperature and humidity. Calibrating in an open room is not recommended as humidity can vary greatly within a very small area.

## Replaceable Sensor Certificate of Validation

Dickson ensures that the Replaceable Sensors / Instruments listed below were developed, tested and validated together.

Replaceable Sensor / Instrument:

- R400 / KT8P0/KT8P2/KT8P3

The Instruments and Replaceable Sensor models listed above were specifically designed to work together. No other sensors will work with the Instrument models listed. No other Instrument will work with the Replaceable Sensors listed. The Replaceable Sensor must be connected to the Instrument for the Instrument to operate properly.

### Calibration

## Need to Know

### KT809 Water Resistant Enclosure

The KT809 features an IP66 enclosure. In order to maintain the IP66 rating the battery/switch cover, on the back of the unit, must be screwed down tightly at all points. The door must be closed tightly using the two side latches. The K-TC probe must be connected using the external connector and the connector/jack connection must be completely sealed using waterproof tape.

It is strongly recommended that the case door gasket be greased occasionally using a standard silicone rubber grease. The more the door is opened and closed, the more frequently grease should be applied. The Door and Battery Cover gaskets should maintain the IP66 rating for 1 year under normal use. To replace gaskets, contact Dickson Customer Service.

### KT8P0 Pen Movement

The pen movement for the KT800/09 is slower than on the AC powered models in order to conserve battery power. In 24-hour mode, the pen will move every 1



minute and 30 seconds. In 7-day mode, the pen will move every 8 minutes and 30 seconds.

The recorder takes temperature readings every 50 seconds. An average of the readings taken between pen movements is what is drawn on the chart.

## Pen adjust

Pen adjust may be needed if the pen(s) and display do not match.

While the unit is on, press and hold both the **Pen Home** button and the **On/Off** button (making sure to press the **Pen Home** button first so the unit will not turn off). The led will blink rapidly between amber and green for about five seconds. The LED will then turn green. Release the **Pen Home** and **On/Off** buttons. The LED will flash amber and green for one second and the LED will turn off.

### One-Pen Models:

The red pen will move to the outer edge of the chart and is ready to be adjusted. Use the **Adjust-Up** and **Adjust-Down** buttons to move the pen to the maximum temperature line on the chart. Once the pen is set, the Pen Home button will move the pen to reaffirm the new pen position. Press the **On/Off** button to exit Pen Home Adjust.

### Two-Pen Models:

Both pens will move to the outer edge of the chart, and then the shorter red pen will move to the current position. Use the **Adjust-Up** and **Adjust-Down** buttons to move the pen to the maximum temperature line on the chart. Once the shorter red pen is set, the Pen Home button will move the shorter red pen to the outer edge of the chart and the longer blue pen will move to its current position. The **Adjust-Up** and **Adjust-Down** buttons will adjust the longer blue pen position. Once the pen is set, the **Pen Home** button will move the longer blue pen to the outer edge of the chart and the shorter red pen will move to its new position. Each time pen home is pressed the two pens will switch positions (moving the most recently adjusted position) until the **On/Off** button is pressed to exit pen adjust mode.

**Note:** Pressing the **On/Off** button will exit the adjustment and return the unit to normal operation. Each time the **Pen Home** or **On/Off** button is pressed, the adjustment currently in progress will be stored. The unit will take one minute to exit Pen Adjust Mode once the **On/Off** button is pressed.

## Troubleshooting

### Why isn't the chart keeping time or running slow?

- The chart may be “hung up” or restricted, possibly caused by a rip on the outer edge of the chart or the chart hub, or the chart may be caught between the arm and pen arm platform.
- Incorrect chart installed for the selected chart speed

## Why did the chart stop turning?

- Chart hung up or restricted, (ripped chart)
- Unit may be “locked up”?

This can be confirmed by pressing any of the buttons on the keypad. If the unit is locked up there will be no response to button presses and the Chart Recorder may appear to be working, but the readings won't change. Also, the chart will not rotate. Remove power and battery, and then re-power.

## Why don't the display and chart match?

- Dip switches are set for a specific range, but using chart for another range, or vice versa.
- Pen(s) not inserted on pen arm(s) all the way

To adjust pen to match chart see *Pen Adjust* in the Need to Know section of this manual.

**Note:** KT800 does not have a display.

## Why does the display read PROB?

- Check the K-TC probe. Make sure it is properly plugged into the back of unit.
- Is the unit “locked up”?

This can be confirmed by pressing any of the buttons on the keypad, if the unit is “locked up” there will be no response to button presses and the unit may appear to be working, but the readings won't change. Also, the chart will not rotate. Remove power and battery, and then re-power.

## Why does calibration seem to be off?

- 
- What is the tolerance of the unit it's being compared to?
- It's ok if the unit is within the sum of the two tolerances.

- Has an outside calibration house attempted calibration? It may not have been adjusted properly.
- Walk through calibration adjustment, found in the manual

## Why won't the battery backup work?

- Are there good batteries in the Chart Recorder?

Keep in mind that battery backup varies significantly depending on temperature, pen movement and chart rotation speed.

- If there was a momentary power outage (brown out), the unit may not have had enough time to recognize this and switch to Battery Mode. (The Chart Recorder may lock up or shut off in this situation) This situation may also occur if the unit is plugged into an outlet that shares the circuit with other machinery that has phase motors or compressors that cycle periodically. As these other machines cycle, they momentarily have a high current draw, therefore drawing from the unit.

**Note:** KT800 does not have a battery backup.

## Why won't the chart recorder respond to changes?

Is the unit "locked up"?

This can be confirmed by pressing any of the buttons on the keypad. If the unit is locked up there will be no response to button presses and the unit may appear to be working, but the readings won't change. Also, the chart will not rotate. Remove power and battery, and then re-power.

## Why won't the unit power up?

Remove the batteries and power adapter for a minute or two, this will reset the unit. The unit should respond when the adapter is plugged in.

## Water is getting inside the case.

- Check the battery cover to make sure it is screwed down tightly at all 5 points.
- Check the case door and make sure it is securely fastened at both latches.
- Try greasing the door and battery cover gaskets with a silicone rubber grease.

If the unit is over a year old and/or the door and cover are frequently opened and closed, we recommend replacing the door and battery cover gaskets. Contact Customer Service for a Return Authorization Number.

## Warranty

Dickson warrants that this line of instruments will be free from defects in material and workmanship under normal use and service for a period of twelve months after delivery.

This warranty does not cover routine calibration and battery replacement. For Specifications and Technical Support go to [www.DicksonData.com](http://www.DicksonData.com)

## Factory Service & Returns

Contact Customer Service **630.543.3747** for a Return Authorization Number (RA) before returning any instrument. Please have the model number, serial number and a PO ready before calling.

Dickson ensures that the Replaceable Sensors / Instruments listed below were developed, tested and validated together.

Replaceable Sensor / Instrument:

- R200 / ENH20
- R300 / ENT20
- R500 / ENT21
- R800 / ENT22
- R400 / ENT23
- R600 / ENT25

## Operation

Only the Replaceable Sensor is calibrated. The sensor, and all calibration defaults and adjustments are stored on the Replaceable Sensor. Accuracy is strictly controlled by the sensor – no adjustments are made by the Instrument. Readings are sent from the Replaceable Sensor to the Instrument for storage purposes only. Certificates of Calibration / NISTs are only supplied for the Replaceable Sensor for this reason.

## Recalibration

When a Replaceable Sensor is due for recalibration the existing Replaceable Sensor can be replaced with a new Replaceable Sensor thus eliminating the need to return the entire instrument for recalibration. Replaceable Sensors can be returned for recalibration as well.