



INSTRUCTION MANUAL

Models: H240
Type K & J Four Channel Thermometer
with Pt 100 ohm inputs

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To see all available accessories and downloadable software, please visit
www.anaheimscientific.com

1. Product Introduction

1-1 Features

- Measures temperature from up to four probes
- 0.1 Resolution
- Fast response time
- High level of accuracy
- Large LCD display
- Two year warranty

1-2 Applications

- Science Experiments
- HVAC
- Plant Maintenance
- Manufacturing
- Agriculture
- Quality Control

2. Safety Information

Read the following safety information carefully before attempting to operate or service the meter. Only qualified personnel should perform repairs or servicing not covered in this manual.

2-1 Cautions!

- **DO NOT** submerge the products mentioned in this manual in water or any other types of liquids.
- This product is not designed for use in medical applications. The product can only be used to measure body temperature simply for reference.

2-2 Safety Symbols



Dangerous, refer to this manual before using the meter.



Conforms to requirements of European Union and European Free Trade Association (EFTA).



Battery level is low.



Don't dispose this product as unsorted municipal waste.

This instrument conforms to the following standards:

EN61326: Electrical equipment for measurement, control and laboratory use.

IEC61000-4-2: Electrostatic discharge immunity test.

IEC61000-4-3: Radiated, radio-frequency, electromagnetic field immunity test.

IEC61000-4-8: Power frequency magnetic field immunity test.

3. Specifications

Unit of Measurement	°C or °F
Temperature Compensation	Automatic for cold junction on K & J type
Types	K, J & Pt 100ohm (inline with a 0.00385 alpha coefficient, DIN IEC751)

Thermocouple Type	Resolution	Range	Accuracy*
Type K	1°C	1000 to 1370°C	$\pm(0.5\% + 1^{\circ}\text{C})$
	0.1°C	-199.9 to 999.9°C	
	1°F	1000 to 2498°F	$\pm(0.5\% + 1.8^{\circ}\text{F})$
	0.1°F	-199.9 to 999.9°F	
Type J	1°C	1000 to 1210°C	$\pm(0.5\% + 1^{\circ}\text{C})$
	0.1°C	-199.9 to 999.9°C	
	1°F	1000 to 2210°F	$\pm(0.5\% + 1.8^{\circ}\text{F})$
	0.1°F	-199.9 to 999.9°F	
Pt 100 ohm	0.1°C	-199.9 to 850°C	$\pm(0.4\% + 1.2^{\circ}\text{C})$
	0.1°F	-199.9 to 999.9°F	-
	1°F	-200 to 327°F	$\pm(0.4\% + 2^{\circ}\text{F})$
	1°F	1000 to 999.9°F	-

Sampling Time of Data Logger	Manual	Pushing the data logger button once will save data one time
	Auto	1sec. to 59min. and 59sec.
Data Logger Memory	Max. 16,000 points	
	K or J with 4 channels, sample will occupy 4 data points	
	Pt 100 ohm with 2 channels, sample will occupy 2 data points	
Data Hold	Display freeze	
Memory	Saves MAX. or MIN values with recall	
Sampling Time	Approximately 1 second	
Over Range Indicator	" - - - - "	
Data Output	RS-232 Serial data output	
Operating Environment	32° to 122°F (0° to 50°C), <80% R.H.	
Power Supply	6 Pieces of DC 1.5V Batteries (UM4, AAA or equivalent)	
Weight (approx.)	0.68lbs. (310g)	
Dimensions (approx.)	6.9 x 2.7 x 1.7" (174 x 68 x 42mm)	
Included Accessories	Instruction manual, battery, carrying case, 4pcs. K-Type Probes	

* = Note: Accuracy applicable in environments with RFI <3V/M with Hz <30MHz, and temperatures between 20°C to 26°C and only applies to the meter itself, not the probe.

Specifications and information are subject to change without notice

Please visit www.anaheimscientific.com for the most current product information.

4. Operating Instructions

4-1 Unit Diagram

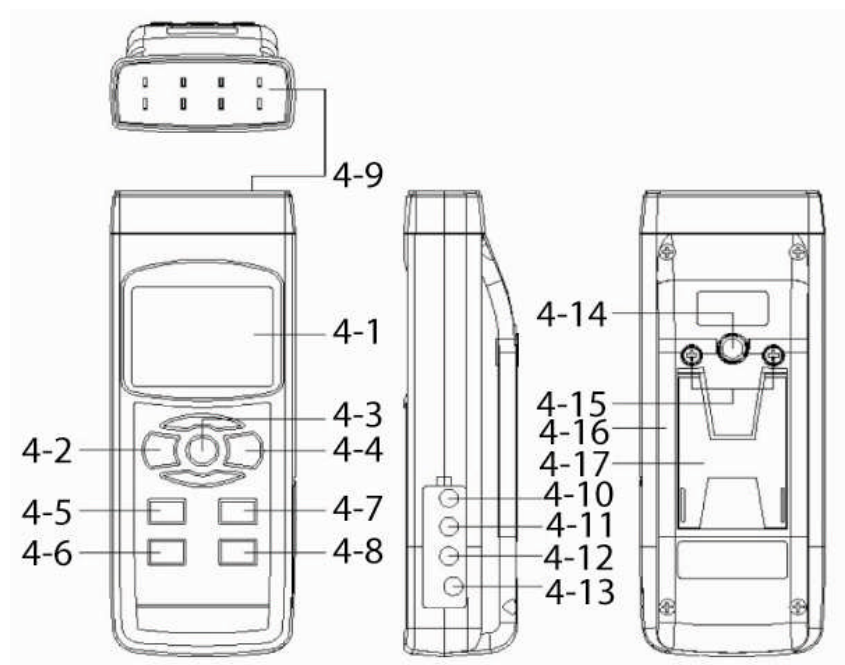


Fig. 1

- | | |
|--|--------------------------------------|
| 4-1 Display | 4-10 Pt1 Input Socket (Pt 100ohm) |
| 4-2 Power Button | 4-11 Pt2 Input Socket (Pt 100ohm) |
| 4-3 Hold Button | 4-12 RS232 Socket |
| 4-4 REC (MAX/MIN) Button | 4-13 DC 9V Adapter Socket (center +) |
| 4-5 Function (L & ▲) Button | 4-14 Tripod Screw Mount |
| 4-6 C°/F° (send/clear) Button | 4-15 Battery Cover Screw |
| 4-7 T1-T2 (R & ▼) Button | 4-16 Battery Compartment |
| 4-8 Logger (sample time/offset) button | 4-17 Stand |
| 4-9 Thermocouple Input Socket | |

4-2 Measuring Procedure

4-3 Type K Measurements

1. Power on the meter by pressing the “Power Button” (4-3, Fig.1). Note: to turn the power off, press and hold the “Power Button” (4-3, Fig.1) for about 2 seconds.
2. The meters default type is K. You will not see any notification on the display. Anytime there is no indicator on the display then the meter is set for K.
3. Select the unit of measure, either °C or °F by pressing the “°C/°F Button” (4-6, Fig. 1). The LCD will display the unit of measure. For convenience the meter will retain the unit of measure when it is turned off.
4. Insert the Type K probes into the “Thermocouple Input Socket” (4-9, Fig. 1).

4-4 Type J Measurements

1. Power on the meter by pressing the “Power Button” (4-3, Fig.1). Note: to turn the power off, press and hold the “Power Button” (4-3, Fig.1) for about 2 seconds.
2. Press “Function Button” (4-5, Fig. 1) once. You will see a letter J on the top of the LCD.
3. Select the unit of measure, either °C or °F by pressing the “°C/°F Button” (4-6, Fig. 1). The LCD will display the unit of measure. For convenience the meter will retain the unit of measure when it is turned off.
4. Insert the Type J probes into the “Thermocouple Input Socket” (4-9, Fig. 1).

4-5 Pt 100 ohm Measurements

1. Power on the meter by pressing the “Power Button” (4-3, Fig.1). Note: to turn the power off, press and hold the “Power Button” (4-3, Fig.1) for about 2 seconds.
2. Press “Function Button” (4-5, Fig. 1) twice. You will see the letters Pt on the bottom right of the LCD.
3. Select the unit of measure, either °C or °F by pressing the “°C/°F Button” (4-6, Fig. 1). The LCD will display the unit of measure. For convenience the meter will retain the unit of measure when it is turned off.
4. Insert the Pt1 probe into the “Pt1 Input Socket” (4-10, Fig. 1) and/or insert the Pt2 probe into the “Pt2 Input Socket” (4-11, Fig. 1).

4-6 T1-T2 Measurements

1. With the probes already inserted and the meter already setup for either K, J or Pt functions, press the “T1-T2 Button” (4-7, Fig.1).
2. The LCD display will show the two measured values on the left side. On the right you will see the difference of the two measured values.

4-7 Data Hold

While taking measurements you can freeze the displayed value by pressing the “Hold Button” (4-3, Fig. 1) once. The HOLD symbol will be displayed along with the held measured value on the LCD. By pressing the “Hold Button” (4-3, Fig. 1) a second time will release the displayed value and turn off the data hold function.

4-8 Data Record (MAX/MIN)

1. To record the maximum and minimum readings, press the “REC Button” (4-4, Fig. 1). The REC symbol will be displayed on the LCD. By pressing the “REC Button” (4-4, Fig. 1) you can toggle through the Max and Min values.

2. To delete the recorded values press and hold the "Hold Button" (4-3, Fig. 1) for about 3 seconds.
3. To stop using the REC function, press and hold the "REC Button" (4-4, Fig. 1) for at least 3 seconds.

4-9 Auto Data Logger

Setup process will be described first because the Auto Data Logger function will not work if the sampling seconds is set to 0. If you do not need to setup your meter, skip to step 7.

1. Press and hold the "Sample Time Button" (4-8, Fig. 1) for about 3 seconds. The bottom of the LCD will display "oFS" and "SP-t". To leave the setting menu press the "ESC Button" (4-3, Fig.1).
2. Press the "R Button" (4-7, Fig. 1). The LCD display will now show "SP-t" on the top of the LCD, a "00" on the bottom left and a flashing "00" on the bottom right.
3. The bottom left "00" is for minutes adjust and the bottom right "00" is for seconds adjust. To toggle between the seconds and minutes press the "Sample Time Button" (4-8, Fig. 1). The value flashing is the value that will be adjusted.
4. To change the sampling seconds time, use the "▲ Button" (4-5, Fig.1) and/or the "▼ Button" (4-7, Fig.1).
5. Press the "Enter Button" (4-4, Fig. 1) to save settings. Both the seconds and minutes values will flash four times and the unit will then go in to standard measurement mode.
6. If you wish to cancel the settings during the four seconds of display flashing, press the "ESC Button" (Fig. 1).
7. Press the "REC Button" (4-4, Fig.1) momentarily to start the data log function. The REC symbol will be displayed on the LCD. The data logger function can save up to 1000 values of measure (either Humidity & Temp. or Dew Point & Temp).
8. Press the "Logger Button" (4-8, Fig.1) and the meter will start logging. You will see the A flashing on the top of the LCD every time a logging event has occurred. The A flashing will match the number of seconds you set in the setup of the data logger function.
9. If the A in the top of the LCD and the lower display are flashing then, it indicates that the memory is full. Please view the "Clears the existing saving data from the memory" section in the "Advanced Measuring Procedures" section.

4-10 Manual Data Logger (set sample time to 0 seconds)

1. Press the "REC Button" (4-4, Fig.1) momentarily to start the data log function. The REC symbol will be displayed on the LCD. The data logger function can save up to 1000 values of measure (either Humidity & Temp. or Dew Point & Temp).
2. Press the "Logger Button" (4-8, Fig.1) every time you would like the meter to record a value. You will see an A flash in the top of the LCD. The meter will not record another measurement until you press the "Logger Button" (4-6, Fig.1) again.
3. If the A in the top of the LCD and the lower display are flashing then, it indicates that the memory is full. Please view the "Clears the existing saving data from the memory" section in the "Advanced Measuring Procedures" section.

5. Advanced Measuring Procedures

5-1 Changing the Data Logger Sampling Time

Note: Cancel any Hold or Record functions before trying to perform an advanced measuring procedure.

1. Press and hold the "Sample Time Button" (4-8, Fig. 1) for about 3 seconds. The bottom of the LCD will display "oFS" and "SP-t". To leave the setting menu press the "ESC Button" (4-3, Fig.1).
2. Press the "R Button" (4-7, Fig. 1). The LCD display will now show "SP-t" on the top of the LCD, a "00" on the bottom left and a flashing "00" on the bottom right.
3. The bottom left "00" is for minutes adjust and the bottom right "00" is for seconds adjust. To toggle between the seconds and minutes press the "Sample Time Button" (4-8, Fig. 1). The value flashing is the value that will be adjusted.
4. To change the sampling seconds time, use the "▲ Button"(4-5, Fig.1) and/or the "▼ Button"(4-7, Fig.1).
5. Press the "Enter Button" (4-4, Fig. 1) to save settings. Both the seconds and minutes values will flash four times and the unit will then go in to standard measurement mode.
6. If you wish to cancel the settings during the four seconds of display flashing, press the "ESC Button" (Fig. 1).

5-2 Clear the Existing Saved Data from Memory

1. Pressing the "CLR Button" (4-6, Fig. 1) for about 3 seconds the LCD will display on the bottom "Send" and "CLr".
2. Press the "R Button" (4-7, Fig. 1) and the LCD will display the number of data points stored in to memory and to enter the clear memory function.
3. Use the "▲ Button"(4-5, Fig.1) and/or the "▼ Button"(4-7, Fig.1) to change the "n" and "Y" in the bottom right of the LCD. The "n" and "Y" are displayed to allow you to tell the meter either "n" NO do not clear memory or "Y" YES clear the memory.
4. Once you have set your answer to either "n" or "Y", press the "Enter Button" (4-4, Fig. 1). The stored data number will flash for about four times and then the meter will go to the normal measuring mode. To cancel your selection of "n" or "Y" after you pressed the "Enter Button" (4-4, Fig. 1), press the "ESC Button" (Fig. 1). You will then be able to change your answer and repeat step 4.

6. Send Saved Data Out the RS232 Port

Note: Cancel any Hold or Record functions before trying to send data.

1. Pressing the "Send Button" (4-6, Fig. 1) for about 3 seconds the LCD will display on the bottom "Send" and "CLr".
2. Press the "L Button" (4-5, Fig. 1) and the LCD will display the number of saved data points on the top of the LCD and the memory balance in the lower LCD.
3. Press the "Send Button" (4-6, Fig. 1) once will send the data out and the LCD will show the data points being send from zero to the number of stored data.
4. During the sending of data by pressing the "Send Button" (4-6, Fig. 1) once will momentarily stop the data transfer, pressing the "Send Button" (4-6, Fig. 1) once again will continue sending the data.
5. After the data send process is completed, press the "ESC Button" (Fig. 1) to return to the normal measurement screen.

7. Offset Adjustment

7-1 Type K and J Adjustment

1. After setting the meter for either Type K or J and inserting the probes in to the input socket T1.

2. Press the "Offset Button" (4-8, Fig. 1) for about 2 seconds. The LCD will display "oFS" on the bottom left and "SP-t" on the bottom right.
 3. Press the "L Button" (4-5, Fig. 1) and the LCD will display on the bottom left the measured value, and the adjust value on the bottom right (if probe was not inserted into T1 the LCD will display "Err").
 4. Use "▲ Button" (4-5, Fig.1) and/or the "▼ Button" (4-7, Fig.1) to change the adjust value on the bottom right of the LCD.
 5. Once you have entered in the amount of offset you require, press the Enter Button" (4-4, Fig. 1) and the both values on the bottom of the display will flash about four times and then return you to the normal measurement screen.
- Note: The T1 offset is applied to all input channels.

7-2 Pt 100 ohm Adjustment

1. After setting the meter for Pt 100 ohm operation and inserting the probes in to the input socket PT1 or PT2.
2. Press the "Offset Button" (4-8, Fig. 1) for about 2 seconds. The LCD will display "P t1" on the bottom left and "Pt 2" on the bottom right.
3. If you wish to offset the Pt 1 value, press the "L Button" (4-5, Fig. 1). If you wish to offset the Pt 2 value, press the "R Button" (4-7, Fig. 1).
4. The LCD will display on the bottom left the measured value, and the adjust value on the bottom right (if probe was not inserted into the correct input socket the LCD will display "Err").
5. Use "▲ Button" (4-5, Fig.1) and/or the "▼ Button" (4-7, Fig.1) to change the adjust value on the bottom right of the LCD.
5. Once you have entered in the amount of offset you require, press the Enter Button" (4-4, Fig. 1) and the both values on the bottom of the display will flash about four times and then return you to the normal measurement screen.

8. Auto Power Off Disable

This instrument has a "Auto Power Off " function that can prolong battery life. The meter will shut off automatically if none of the buttons are pressed in approx. 10 min.

To disable this function, select the memory record function during a measurement by pressing the " REC. Button" (4-4, Fig. 1).

9. RS232 PC Serial Interface Information

This instrument has RS232 PC serial interface via a 3.5 mm terminal (4-12, Fig. 1).

The data output is a 16 digit stream which can be utilized for user's specific application.

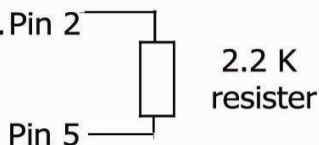
A RS232 lead with the following connection will be required to link the instrument with the PC serial port.

Visit www.anaheimscientific.com to see any available downloadable software for your instrument.

Meter

PC
(9W 'D' Connector)

Center Pin.....Pin 4
(3.5 mm jack plug)
Ground/shield.....Pin 2



The 16 digit data stream will be displayed in the following format:

D15 D14 D13 D12 D11 D10 D9 D8 D7 D6 D5 D4 D3 D2 D1D0

Each digit indicates the following status:

D15	Start Word
D14	4
D13	Function: T1, T2, T3, T4 When sending T1 value, D13 = 1 When sending T2 value, D13 = 2 When sending T3 value, D13 = 3 When sending T4 value, D13 = 4 Function: T1, T2, T1-T2 When sending T1 value, D13 = 1 When sending T2 value, D13 = 2 When sending T1-T2 value, D13 = 3
D12 & D11	Indicator for Display °C = 01 °F = 02
D10	Polarity: 0 = Positive / 1 = Negative
D9	Decimal Point (DP), position from right to left 0 = No DP, 1 = 1 DP, 2 = 2 DP, 3 = 3 DP
D8 to D1	Display reading, D1 = LSD, D8 = MSD Example: If the display reading is 1234, then D8 to D1 is: 00001234
D0	End Word

RS232 Setting

Baud Rate	9600
Parity	No Parity
Data bit #	8 Data bits
Stop bit	1 Stop bit

10. Battery Replacement

1. When the LCD display shows the  low battery symbol, It is necessary to replace the battery. The specifications listed for this instrument do not apply when the low battery symbol is displayed.
2. Open the "Battery Compartment" (4-16, Fig. 1) by first loosening the "Battery Cover Screws" (4-15, Fig. 1).
3. Replace the batteries with "good" batteries noting the correct polarity. Replace "Battery Compartment" (4-16, Fig. 1) and "Battery Cover Screws" (4-15, Fig. 1). Ensure the cover is securely fastened.

11. Service Information

Warranty Service: Please return the product in the original packaging with proof of purchase to the address below. Clearly state in writing the performance problem and return any leads, probes, connectors and accessories that you are using with the device.

Non-Warranty Service: Return the product in the original packaging to the address below. Clearly state in writing the performance problem and return any leads, probes, connectors and accessories that you are using with the device. Customers not on open account must include payment in the form of a money order or credit card. For the most current repair charges please visit www.anaheimscientific.com and click on "service/repair".

Return all merchandise to Anaheim Scientific with pre-paid shipping. The flat-rate repair charge for Non-Warranty Service **does not** include return shipping. Return shipping to locations in North American is included for Warranty Service only. For overnight shipments and non-North American shipping fees please contact Anaheim Scientific.

Anaheim Scientific
22820 Savi Ranch Parkway
Yorba Linda, CA 92887
www.anaheimscientific.com
714-921-9095

Include with the returned instrument your complete return shipping address, contact name, phone number and description of problem.

12. Limited Two-Year Warranty

Anaheim Scientific warrants to the original purchaser that its products and the component parts thereof, will be free from defects in workmanship and materials for a period of two years from date of purchase from an authorized Anaheim Scientific distributor.

Anaheim Scientific will, without charge, repair or replace, at its option, defective product or component parts. Returned product must be accompanied by proof of the purchase date in the form of a sales receipt.

To obtain warranty coverage in the U.S.A., this product must be registered by completing the warranty registration form on www.anaheimscientific.com within fifteen (15) days of purchase.

Exclusions: This warranty does not apply in the event of misuse or abuse of the product or as a result of unauthorized alterations or repairs. The warranty is void if the serial number is altered, defaced or removed.

Anaheim Scientific shall not be liable for any consequential damages, including without limitation damages resulting from loss of use. Some states do not allow limitations of incidental or consequential damages. So the above limitation or exclusion may not apply to you.

This warranty gives you specific rights and you may have other rights, which vary from state-to-state.

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Printed in Taiwan / Ver. 1.1/0408
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