Instruction Manual

Temp-100 and Temp-300

Dual-Input Thermocouple Datalogging Thermometer

OAKTON®

ISO 9001 SUPPLIER CERTIFIED

Part of Thermo Fisher Scientific 68X518203 R1 Jan 2010

TABLE OF CONTENTS

1. INTRODUCTION

This versatile hand-held instrument provides highly accurate temperature measurements. The instrument is designed for easy operation and includes the following features:

- Menu driven setup and operation
- Datalogging for up to 1000 points on Temp-100, 2000 on Temp-300
- USB output (Temp-300 only)
- Differential temperature measurements
- Operator selection of Celsius or Fahrenheit scale
- Resolution of 0.1° C/F from -199.9 to 999.9°
- Large backlit LCD with two lines of four-digit display
- Hold feature for temporarily retain a reading
- Displays min and max readings
- Field calibration capability
- Disabling of Auto-Off function
- Low battery warning
- Two blade female ANSI mini-connector input
- Operates with a wide selection of probes

2. SAFETY PRECAUTIONS

WARNING:

1. This instrument is designed to accept low level signals supplied by standard Thermocouples. Under NO circumstances should the input voltage exceed the specified 50V RMS.
2. To prevent ignition of a hazardous atmosphere, batteries must only be changed in an area known to be non-hazardous.

CAUTION:

1. Do not use or store this instrument in microwave ovens or any abnormally hot or cold areas.
2. Weak batteries should not be left in the instrument. Dead batteries can leak and cause damage to unit.

DANGER:

1. Voltages present at the Thermocouple may also be present at the battery terminals. Always disconnect the Thermocouple when changing batteries.

3. SPECIFICATIONS

Thermocouple Thermometers

Type	Temperature range
Type J	–210°C to 1200°C
	(–346°F to 2192°F)
Type K	–250°C to 1372°C
	(–418°F to 2501°F)
Type T	–250°C to 400°C
	(–418°F to 752°F)
Type E	-250°C to 1000°C
	(-418°F to1832°)
Type R (300 only)	0°C to 1768°C
	(32°F to 3214°F)
Type S (300 only)	0°C to 1768°C
	(32°F to 3214°F)
Type N (300 only)	-250°C to 1300°C
	(-418°F to 2372°F)
Type B (300 only)	200°C to 1800°C
	(392°F to 3272°F)

Out of range display: - - - -

Resolution
0.1°/1° auto-ranging,
0.1° C/F from -199.9 to 999.9°,
1° outside this range

Accuracy
J,K,T,E & N
Below -150 °C (-238 °F):
±0.25% of reading ±1 °C (±0.25% ±0.7 °F)
Above -150 °C (-238 °F):
±0.1% of reading ±0.4 °C (±1% ±0.7 °F)

R,S & B
±0.1% of reading ±1 °C (±0.1% ±2 °F)

Display
Backlit Dot-matrix 50mm X 37.2mm

Data Logging
Temp-100 : 1000 points
Temp-300 : 2000 points

Logging Interval
1 sec to 60 min

Min/Max/Avg Function
Yes

Auto Off (adjustable time)
Enable/Disable option available

Stability Criteria
Yes, upon stability of 5 seconds

Display update rate
0.6 sec per update.

Input
Two thermocouple with ANSI connector.

Input Protection
50V rms

Storage
–40°C to 65°C (–40°F to 149°F)

Humidity
10% to 90% (non-condensing)

Battery Life
Size: Three AA, 1.5V; Alkaline
Life: 400 hours continuous, typical, (without backlighting)

Dimensions
Without Armor:
175mm (L) X 97mm (W) X 42mm (H)
With Armor:
180mm (L) X 102mm (W) X 52mm (H)

Weight with batteries
Without Armor: 267g
With Armor: 362g

Ingress protection:
Meets IEC-529 IP-54 for dust and water resistant enclosures (probe attached)

CE Compliance
EN61326-1/A1: 1998 (EU EMC Directive)

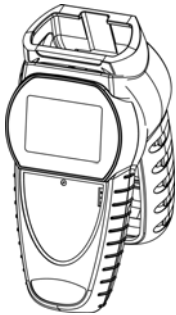
4. BATTERY INSTALLATION

The total battery life without backlighting and alarm is about 400 hours. The battery bar annunciator represents the battery strength. An empty battery annunciator indicates low battery strength; a blinking battery annunciator indicates that the batteries should be replaced immediately.

Selected settings are stored in memory and will remain in memory even after power is turned off, or while batteries are being replaced.

1. Before changing battery, turn instrument off and disconnect thermocouple.
2. Loosen screw and lift battery cover off back of case.
3. Remove the three AA batteries.
4. Insert three new batteries observing polarity.
5. Install cover and tighten screw.

5. OPTIONAL RUBBER ARMOUR

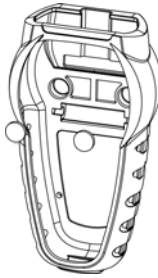


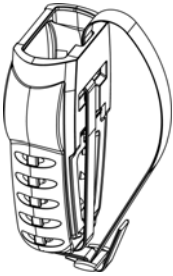
1. To insert thermometer into the optional rubber armor, slide in from the top of meter before pushing the bottom edges of meter down to set it into position. Lift up the stand at the back of meter for bench top applications if necessary.

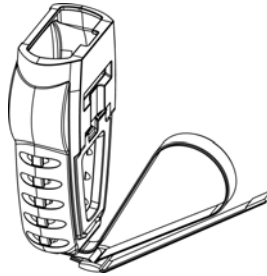
2. To remove thermometer from armor, push out from the bottom edges of meter until it is completely out of boot.

6. OPTIONAL HANDSFREE KIT

You can use the optional magnets and strap in the Hands-free Kit accessories for hands free operations.





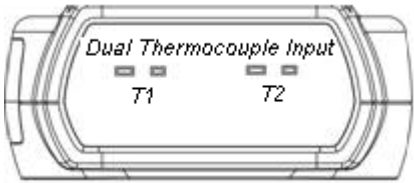


7. CONNECTING A THERMOCOUPLE

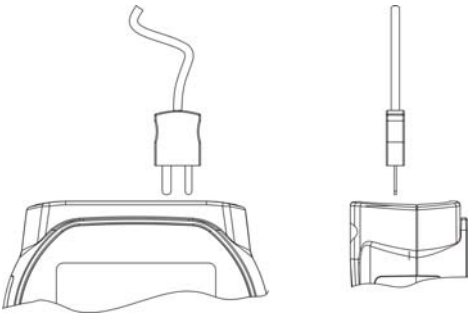
Use the correct thermocouple type for your instrument setting. Using an incorrect thermocouple type will result in erroneous readings. Thermocouples are colour coded by type using the North American ANSI Colour Code as follows:

TYPE	COLOR
J	Black
K	Yellow
T	Blue
E	Purple

Thermocouple connectors have one wide blade and one narrow blade. Do not force connector in backwards. Connect thermocouples to receptacles at top of instrument as shown in the following illustration.



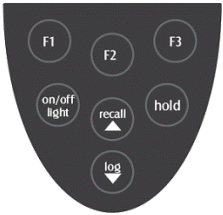
Thermocouple wiring polarity must be correct. If readings decrease as the temperature increases, the thermocouple wires may be reversed. The red wire is negative for thermocouple wires manufactured in North America.



If no probe is connected the display will read “open”.

Thermocouples are sensitive at the tip or measuring junction. When taking measurements, allow time for the reading to stabilize. Multiplying the time constant of the probe by 5 will give you the approximate time required.

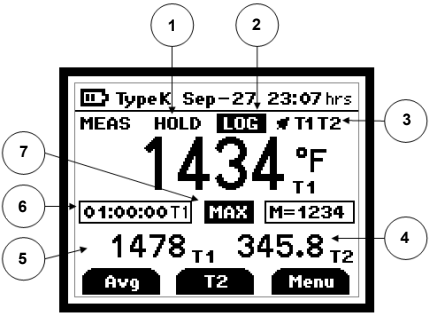
8. KEY FUNCTIONS



F1	Step through Min, Max and Avg readings.
F2	Choose probe T1, T2 or T1-T2
F3	Toggle between menu and measure mode
hold	Freeze display
on/off light	Turns meter on and off (press and hold for 3 seconds to turn off) Press momentarily to turn on backlight
recall▲	Recalls and steps through stored readings
log▼	Stores current measured value to memory

Note: Function keys change in setup mode to provide advanced operation flexibility. Text above key will indicate function.

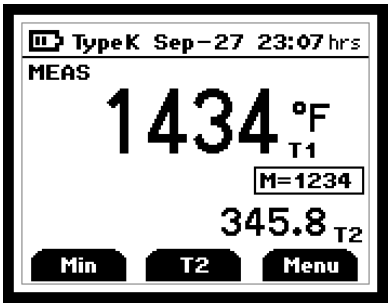
9. DISPLAY OVERVIEW



The dot matrix display features a large primary display, smaller secondary displays for channel info or min/max/ave, and helpful annuciators for added measurement data

1	HOLD - Active
2	Data Logging is Active
3	Alarm Enabled – channel in alarm indicated: T1 or T2 or T1&T2
4	MAX/MIN/AVG of Secondary channel if MIN/MAX/AVG activated
5	MAX/MIN/AVG of Primary channel if MIN/MAX/AVG activated
6	Min/Max hit time since Min/Max activated. For Avg, it is continually increments since activated
7	Current active Mode – Min/Max/Avg

10. MEASUREMENT MODE



On initial start-up the meter will display the measured value for input one in the primary display and for input two in the secondary display.

Pressing the **F2** key will toggle primary display through input one (T1), input two, and the delta (T1 – T2) values.

Pressing the **F1** key initiates and toggles through Minimum, Maximum, and Average reading modes.

Pressing **F3** enter accesses Setup mode.

11. HOLD FUNCTON

Press the hold key to retain the reading on the display. Press the hold key again for normal operation.

12. MIN, MAX, and AVE FUNCTION

Press the F1 key to toggle between the minimum, maximum, and average readings. The minimum and maximum reading function is ideal for monitoring unattended operations while continually displaying every temperature change that occurs. The minimum and maximum values are sensed and automatically stored.

To exit and clear this function, press the F3 to access the Menu functions.
See the Clear Reset menu section for more details.

13. DATA LOGGING

Press the **log** ▼ key to store the current reading to memory. The memory indicator M = 1234 shows the memory location for the next stored reading.

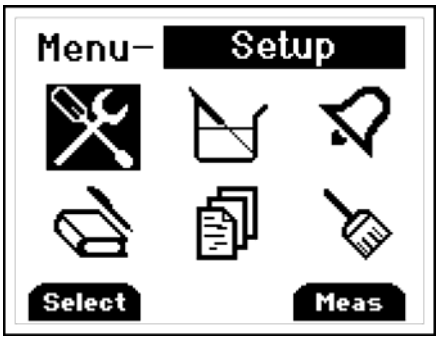
Press the **recall** ▲ key to review stored readings.

See section on Data Logging for timed logging, and logging to a computer (300 model only).

See section on Clear/Reset for information on clearing stored readings.

14. SETUP MODE

To access the setup mode from measurement mode press the ***F3*** key (Menu).



Press ▲▼ keys on the meter key pad to scroll through options.

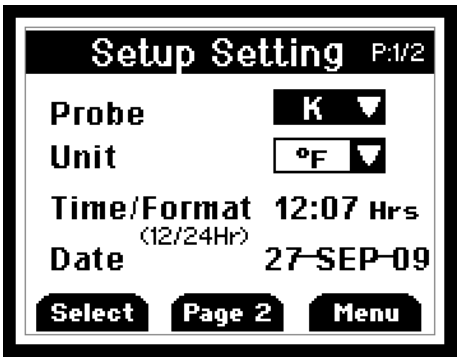
To enter a setup screen press Select ***F1*** key.

To return to measurement mode press Meas ***F3*** key. Following menu options are listed

1. General Setup
2. User field calibration
3. Alarm settings
4. Data logging settings
5. View user calibration report
6. Clear/Reset options

15. GENERAL SETUP SCREEN

The first page of the General Setup screens let you set probe type, measurement units, time, and date.

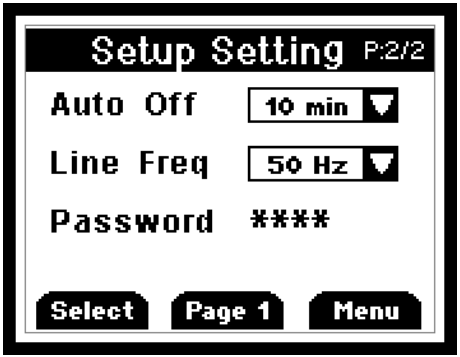


Press ***F1*** to indicate you want to change the setting of the current parameter or recall▲ or log▼ to move to the next parameter.

Press recall▲ or log▼ to change the options.

Press F2 to choose the next setting. Whenever set the options, press F1 for accepting the choice.

On the second page you can set auto-off time, line frequency, and password.



This screen below is used to reset/change password. In the event if uses forget his/her password, 5586 can be used to reset to a new value

16. CALIBRATION SCREEN

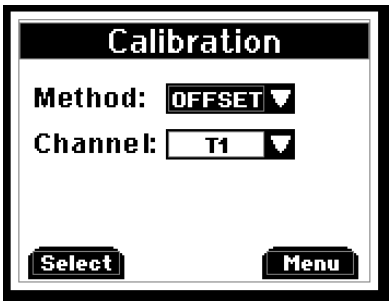
The thermometer is factory calibrated and does not require calibration before use. The Calibration function allows single point calibration of the thermometer, at 0°C (32°F) to compensate for thermocouple off-set error. It is NOT necessary to perform a field calibration to obtain specified meter accuracy. Use the field calibration feature to improve thermometer/probe accuracy or to compensate for thermocouple drift...

Before go into the calibration mode, must enter the password. Press F2 to change to the next digit. (Default Password is 9900)

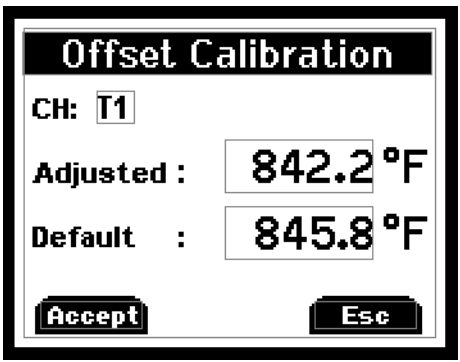
There are three calibration options:

Offset – adjusts at a single point
Slope – adjusts at two points
Match – adjusts readings on T1 to match those on T2. Or adjusts T2 to match T1.

Select calibration method by pressing F1 and the▲ or ▼ keys. Then select the channel you with to calibrate the▲ or ▼ keys.

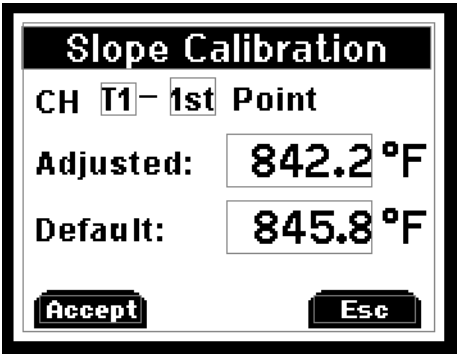


Offset Calibration



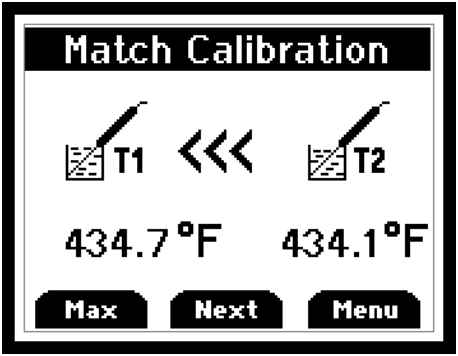
Use the ▲ or ▼ keys to adjust the value to match known temperature standard. Press ***F1*** to accept.

Slope Calibration



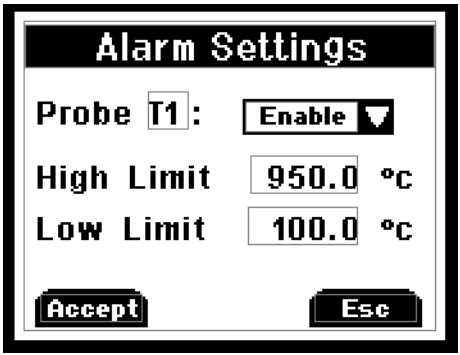
Use the ▲ or ▼ keys to adjust the value to match known temperature standard. .
Press ***F1*** to accept. Then move to second temperature point using the ▲ or ▼ keys and repeat.

Match Calibration



Use the ▲ or ▼ keys to adjust the value to match T1 readings and T2 readings.

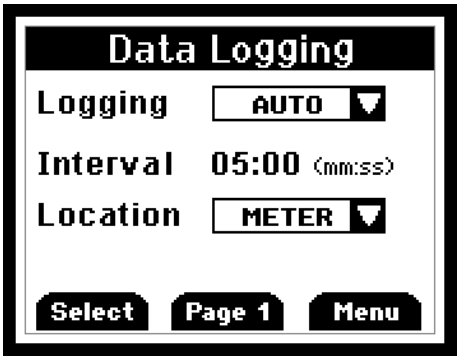
17. ALARMS SCREEN



Disable or enable the alarm for individual probe by pressing recall▲ or log▼and F1 to accept. Increase or decrease individual limit by pressing recall▲ or log▼.

18. DATA LOGGING SCREEN

Data Transfer from Meter to Computer (Temp-300 only)

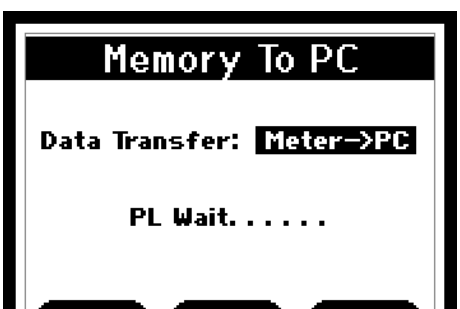


Press recall▲ or log▼to choose the logging methods as auto or manual. If it is auto logging, using recall▲ or log▼to set time interval. Its range is from 0min to 60min.

Button “Page1” will appear only in Temp-300.

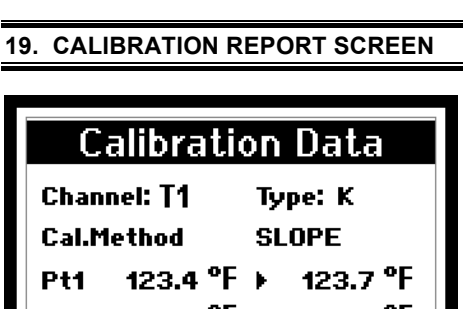
Please refer to softcopy of the driver manual in the CD for installation and datalogging instructions.

*****NOTE: METER MUST BE TURNED ON PRIOR TO CONNECTING USB CABLE OR COMPUTER MAY NOT RECOGNIZE THE INSTRUMENT*****



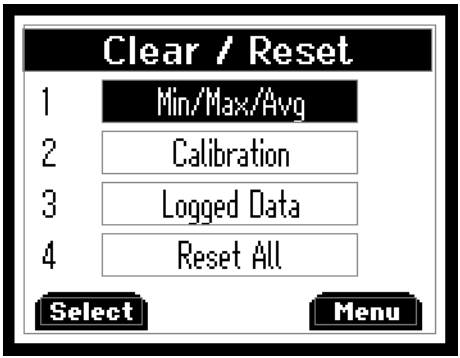
Once the USB connection is establish with PC, press the Start button to download data from Meter to PC using HyperTerminal.

19. CALIBRATION REPORT SCREEN



The Calibration report will show the time and date along with results of the last user calibration.

20. CLEAR / RESET SCREEN



Press ***F1*** to choose which data you want to clear or reset. For calibration, logged data and reset all, you will have to enter the password to proceed. (Default Password is 9900)

21. MAINTENANCE

Properly used, the thermometer should maintain calibration indefinitely and not require service other than occasional cleaning of the housing and changing of the batteries.

22. CLEANING

WARNING:
TO PREVENT IGNITION OF A HAZARDOUS ATMOSPHERE BY ELECTROSTATIC DISCHARGE, CLEAN WITH DAMP CLOTH.

Do not clean with abrasives or solvents. Use mild detergents, never immerse nor use excessive fluid.

23. BATTERIES

If there is no display when the thermometer is turned on, check condition of the three AA batteries. Also check that the battery terminals are clean and batteries are properly installed. If replacement is necessary, refer to the BATTERY INSTALLATION AND REPLACEMENT section for replacement procedure.

24. TROUBLE SHOOTING

The following chart lists the most probable faults. There are no internal adjustments or user-replaceable parts.

FAULT	ACTION
NO Display	Check condition of batteries. Check that batteries are inserted properly.
Display shows - - - -	Out of range indication
Display Shows OPEN	No thermocouple connected in the Connector
Display Shows Err	If display shows this message other than during the field calibration mode, please return the instrument for servicing
Can not connect to PC (Temp-300 only)	Ensure that the meter is powered on and measuring prior to connecting to USB port. Before and after the driver is installed, your PC may not recognize the Temp-300 if the Temp-300 is not powered on prior to connecting the USB to the computer.

25. ACCESSORIES

Replacement Meters and Meter Accessories

Item	Part Number
Temp-100 thermometer	91427-40
Temp-300 thermometer	91427-50 35427-50
Rubber Armour with Stand	35427-80
Hands free Kit (Two Magnets and Strap)	35427-85
USB cable (Temp-300 only)	35427-86
General purpose probe, type K	08516-55
Penetration probe, type K	08516-65
Surface probe, type K	08516-60
Clip-on probe, type K	08469-02
General purpose probe, type J	08517-55
Penetration probe, type J	08517-65
Surface probe, type J	08517-60
Clip-on probe, type J	08469-00

26. WARRANTY

The Manufacturer warrants this product to be free from significant deviations from published specifications for a period of **three** years. If repair or adjustment is necessary within the warranty period, the problem will be corrected at no charge if it is not due to misuse or abuse on your part as determined by the Manufacturer. Repair costs outside the warranty period, or those resulting from product misuse or abuse, may be invoiced to you.

27. PRODUCT RETURN

To limit charges and delays, contact the seller or Manufacturer for authorization and shipping instructions before returning the product, either within or outside of the warranty period. When returning the product, please state the reason for the return. For your protection, pack the carefully and insure it against possible damage or loss. The Manufacturer will not be responsible for damage resulting from careless or insufficient packing.

28. INNOCAL® CALIBRATION AND REPAIR SERVICES

Optimum performance of your temperature-measuring instrument is not a timeless condition. To ensure quality measurements, have your instrument calibrated regularly. Trust InnoCal® to satisfy your calibration and equipment repair needs. With over a decade of service, we've helped thousands of customers meet ISO, FDA, EPA, GLPs/cGMPs and other quality standards.

Conformity*
ISO/IEC 17025:2005 accredited
NIST Handbook 150, 2000 Edition
ANSI/NCSL Z540-2-1997
NIST Technical Note 1297
ISO 9000:2000

Fast Service
Our substantial inventory of replacement parts ensures a fast turnaround and prevents costly downtime. Most instruments serviced in five business days!

Excellent Value
Get quality at a fair price. Our InnoCal® NIST-traceable certificates offer extensive test data on a broad range of measurement parameters without breaking the bank!

Reliable Support

Trust in our free diagnostic support and troubleshooting advice. Our factory-trained metrologists and technicians are armed with years of experience and extensive technical data.

Convenient Reminders
It's so easy to keep your instruments functioning properly. Based on your requirements, InnoCal will send you a reminder when it's time to re-certify or service your instrument.

We provide you with the documentation you need to meet your most stringent quality requirements for the control of inspection, measuring, and test equipment.

Certification includes certificate of calibration with test data, including:
● description and identification of the item certified
● condition of the item
● issue date
● identification of calibration procedure
● calibration date
● as found/as left test data (where applicable)
● signature of technician
● statement of estimated uncertainty
● list of equipment used to perform calibration (including their calibration dates)

With today's high quality standards such as ISO 9000, certification is becoming

increasingly important. Traceability is not a timeless condition. It must be verified and maintained over the life of the calibration to ensure the highest accuracy possible. When you have your calibration done by InnoCal, we will send you an automatic reminder when it is time to recalibrate your instrument.

Are your calibration certificates good enough?
InnoCal surpasses the competition by providing the most complete certificates as required by NIST. All of our certificates include measured data and point-by-point measurement uncertainty, and by request, we'll provide test accuracy and test uncertainty ratios at no extra cost. Call us today and see why InnoCal is The Choice of Quality.

*See our Scope of Accreditation for any limitations.

Calibration against NIST-traceable standards
Four test points across range of instrument.
Meters: –270 to 2316°C (–454 to 4200°F)
Probes & Systems: –80 to 1000°C (–112 to 1832°F)
**Actual range is dependent on type of probe

Meter only	Probe only	System (meter + probe)**
17000-10	17001-10	17002-10

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www.InnoCalSolutions.com

TECHNICAL ASSISTANCE

If you have any questions about the use of this product, contact the Manufacturer or authorized seller.

For more information on OAKTON Instruments products, please contact your nearest distributor or visit our web site listed below:

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