9. Warranty

OAKTON warrants this meter to be free from significant deviations in material and workmanship for a period of one year from date of purchase. OAKTON warrants this probe to be free from significant deviations in material and workmanship for a period of six months from date of purchase. If repair or adjustment is necessary and has not been the result of abuse or misuse within the warrantied time period, please return—freight prepaid—and correction will be made without charge. OAKTON alone will determine if the product problem is due to deviations or customer misuse.

Out-of-warranty products will be repaired on a charge basis.

10. Return of items

Authorization must be obtained from your OAKTON distributor before returning items for any reason. When applying for authorization, please include data regarding the reason the items are to be returned. For your protection, items must be carefully packed to prevent damage in shipment and insured against possible damage or loss. We will not be responsible for damage resulting from careless or insufficient packing. A restocking charge will be made on all unauthorized returns.

NOTE: We reserve the right to make improvements in design, construction, and appearance of products without notice.

DISTRIBUTED BY:

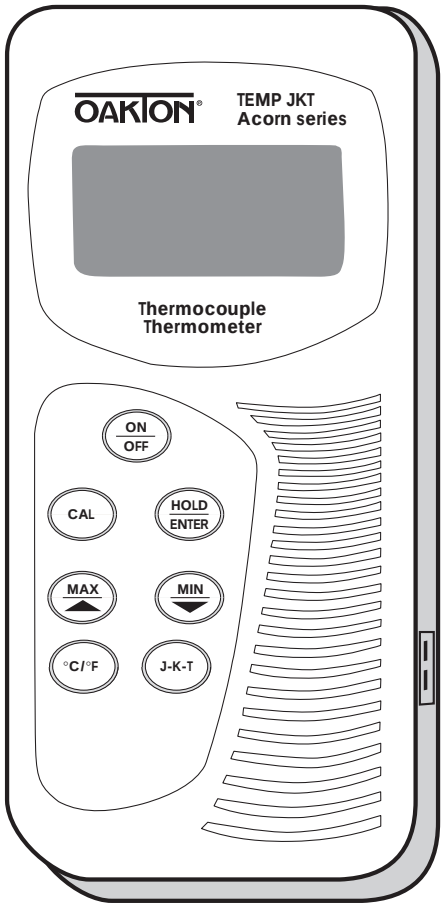
68X243616

OAKTON®

OPERATING INSTRUCTIONS

OAKTON WD-35627-00, -02

TEMP TC
Acorn Series Meters



R1 Printed in the U.S.A. 9/00

OAKTON®

Table of Contents

1. Introduction

Thank you for purchasing an OAKTON® TEMP TC Acorn Meter. These economical, microprocessor-based meters work with type J, type K and type T probes for a wide temperature measurement range:

- **Type J probes** (iron-constantan) offer a wide -200 to 1000°C / -328 to 1832°F range; use in reducing environments
- **Type K probes** (chromel-alumel) offer the widest range: -250 to 1372°C / -418 to 2592°F; use in oxidizing environments
- **Type T probes** (copper-constantan) offer a range of -250 to 400°C / -418 to 752°F; good for ambient and sub-freezing measurements

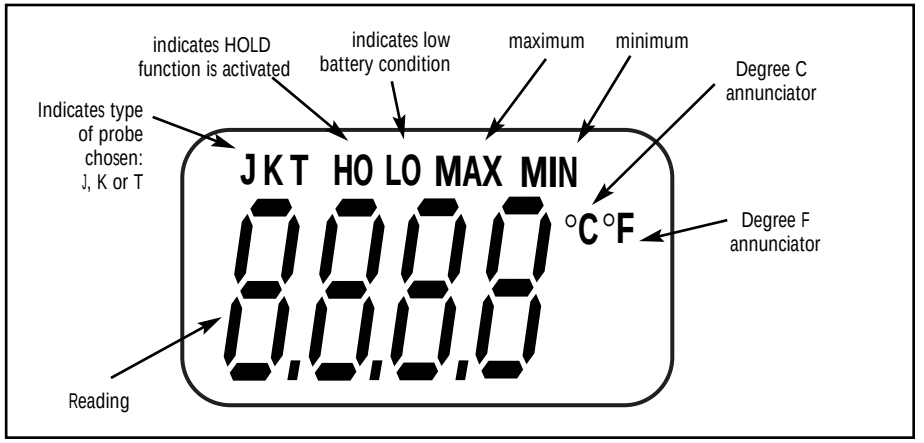
All Acorn TEMP TC meters feature:

- Large LCD for clear and easy reading
- Readings in °C and °F (switchable)
- Minimum and maximum temperature display
- Minimum and maximum hold mode
- Low battery indicator
- Hold function, freezes measured reading
- User calibration, offset adjustment
- Built-in memory backup; calibration and other information remain if battery is disconnected

This instruction manual is organized for easy reference. For basic functions of this meter, read sections 2 through 5. These sections include basic instructions that will get you up and running quickly. The remaining sections of this manual (6 through 11) deal with error messages and troubleshooting. This part of the manual also includes the Specifications, Accessories, Warranty and Return of Items section.

2. Display and Keypad Functions

The Acorn Temp TC meter has a large custom LCD with the following indicators:



The OAKTON Acorn Temp TC meter has seven keys on its splashproof keypad. These keys are ON / OFF, CAL, HOLD / ENTER, MAX / ▲ (UP), MIN / ▼ (DOWN), °C / °F and J-K-T.

ON/OFF: Powers meter on and shuts unit off. Meter directly enters measurement mode when you turn it on.

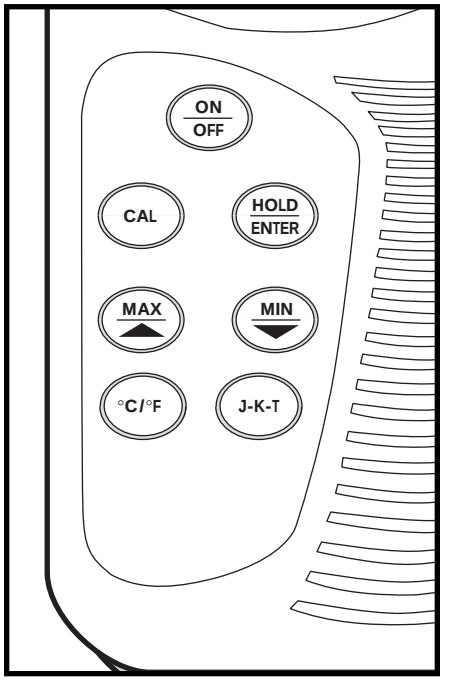
CAL: Allows temperature calibration of the meter.

HOLD/ENTER: Freezes the measured reading; confirms calibration value.

MAX/▲ (UP) and MIN/▼ (DOWN): momentarily displays maximum or minimum temperature; enter maximum or minimum hold mode; scroll up and down in calibration mode.

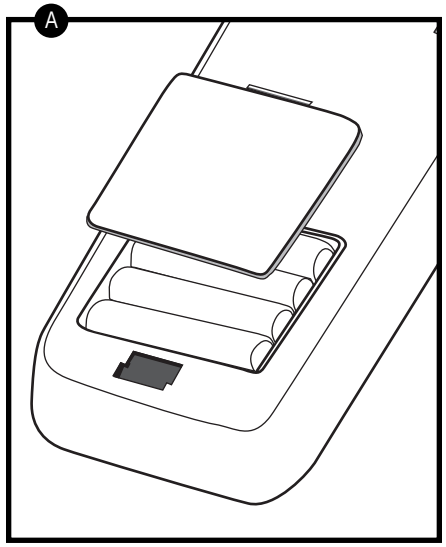
°C/°F: Switches between °C and °F in measurement mode.

J-K-T: Switches between type J, type K and type T readings in measurement mode.



3. Preparation

3.1 Inserting the batteries



The battery compartment is found at the back of the instrument. To open the battery compartment, push the lid up.

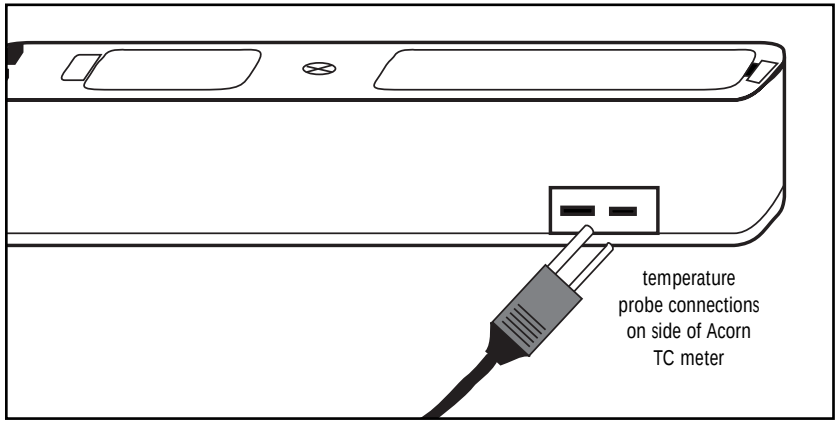
See figure A

Note the polarity of battery before inserting the batteries into position. After replacement, place the cover back into its position and press down until it locks tight.

A "LO" annunciator in the LCD alerts you when battery power is running low. Replace batteries with a fresh set as soon as possible.

3.2 Connecting your Temperature sensor

Insert the mini connector plug of the temperature sensor into the connector on the side of the meter. Note: the negative pin is larger than the positive pin; be sure to properly align the pins. Unplug the sensor when not in use.

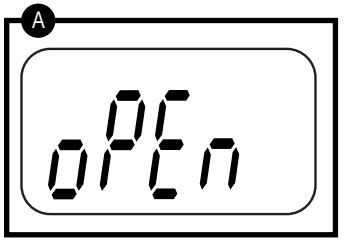


3.3 Switching the meter on

Press the ON / OFF key to power up your meter. All the LCD segments display for a few seconds as the meter goes through a self-diagnostic test. The LCD then switches into measurement mode.

If the LCD then displays "oPEn", the temperature sensor is faulty, or there is an open circuit.

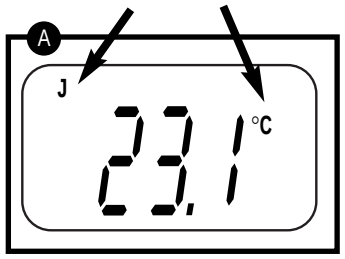
See figure A



See page 11 for more troubleshooting information.

4. Measurement

4.1 Measuring Temperature

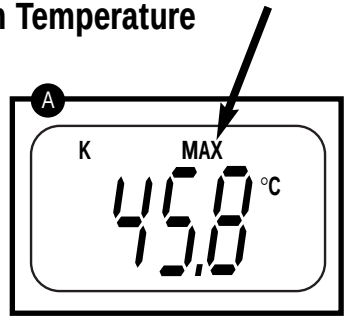


1. Switch on meter. The Acorn TEMP TC meter will automatically enter the temperature measurement mode. The "J", "K" or "T" annunciator will display, depending on what probe type was selected the last time the meter was used. The °C or °F annunciator will display in your LCD to indicate which mode you are taking measurements in.

   See figure A

2. Press the **J-K-T** key to toggle between type J, K or T modes, until mode matches probe type selected. Note reading.
3. Press the **°C/°F** key to switch between °C and °C modes if desired.

4.2 Displaying Minimum and Maximum Temperature

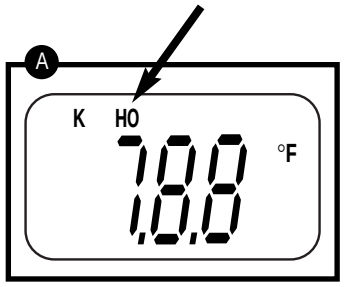


The Acorn TEMP TC meters can momentarily display the minimum and maximum temperature measured since you switched the meter on. Simply press **MAX/▲** or **MIN/▼** key. The MIN or MAX annunciator will display in the LCD, and the minimum or maximum temperature will temporarily display.

See figure A

Meter will then return to measurement mode.

4.3 Hold function



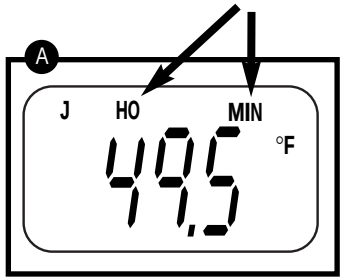
To freeze your reading, press the **HOLD** key once. The LCD show "HO" to indicate the HOLD function is activated

See figure A

Press **HOLD** key again to deactivate the HOLD function and return to measurement mode.

4.4 Minimum and Maximum Hold Mode

With Minimum and Maximum Hold Mode, the Acorn TEMP TC meter can be used as a maximum registering (or minimum registering) thermometer. The meter will display the lowest or highest temperature measured since entering the Maximum or Minimum Hold mode.



1. Switch on meter. The Acorn TEMP meter will automatically enter the temperature measurement mode in the probe mode (J,K or T) that was last used. Press the **J-K-T** key to select the appropriate probe mode. Use **°C/°F** to switch between Celsius and Fahrenheit readings if desired.
2. Press the **HOLD** key. The reading will freeze and the annunciator “HO” will display in the LCD.
3. Press the **MAX/▲** or **MIN/▼** key. Meter enters the Maximum or Minimum Hold mode. “HO” and “MAX” or “MIN” annunciators display in the LCD.

   See figure A

Meter will now continuously display the lowest or highest temperature measured since you entered this mode. It will update the display when new highs or lows are reached.

Press **HOLD** key again to leave MIN / MAX Hold mode and return to standard measurement mode.

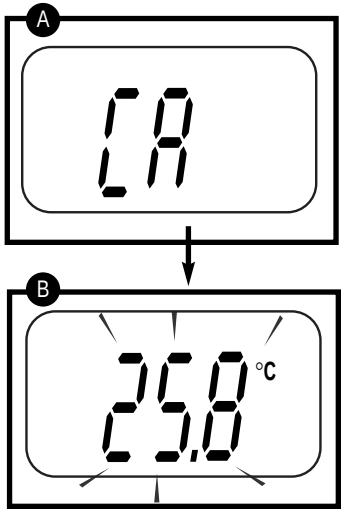
5. Calibration

5.1 Temperature calibration using offset adjustment

The temperature sensor included with your meter is factory calibrated. Over time, the temperature calibration may drift and require recalibration. If you replace the probe you should recalibrate.

1. Connect your temperature probe to the meter. Turn meter on. Meter enters measurement mode.
2. Compare displayed value to a NIST certified thermometer or other thermometer known to be accurate. For best accuracy, place probe and thermometer in a constant temperature bath.
3. Press the **CAL** key to enter calibration mode. The LCD shows "CA" and the reading flashes.

   See figures A B
4. Use the ▲ and ▼ keys to adjust the temperature shown to match the accurate temperature (maximum adjustment is ±10°C / ±18°F from factory default).
5. Press **ENTER** key to confirm calibration. The LCD displays "CO", and the meter then reverts to measurement mode.



6. Troubleshooting

Problem	Cause	Solution
"Ur" or "Or" on LCD	Measurement over (Or) or Under (Ur) range.	—
	Bad temperature probe	Change temperature probe
oPEn annunciator on LCD	Probe not connected	Make sure probe is firmly connected
LO annunciator on LCD	Low battery	Replace batteries with fresh set
Power on but no display	Batteries not in place	Insert batteries
	Batteries not in correct polarity (+ and -)	Re-insert batteries with correct polarity
	Weak batteries	Replace batteries
Unstable reading	Probe not deep enough in sample	Place probe deeper in sample
	Broken probe	Replace probe
	External "noises" or induction caused by by nearby electric motor	Remove or switch off interfering motor
	Dirty probe	Clean probe
Slow response	Dirty probe	Clean probe

7. Specifications

	Type J	Type K	Type T
Range	-200 to 1000°C -328 to 1832°F	-250 to 1372°C -418 to 2502°F	-250 to 400°C 418 to 752°F
Resolution	0.1°C from -99.9°C to 299.9°C / 0.1°F from -99.9°F to 299.9°F; 1°C / °F outside this range		
Accuracy	±0.25% of reading plus 1°C / 2°F for temperatures <–99.9°C / °F; ±0.2% of reading plus 0.5°C / 0.9°F for temperatures > –99.9°C / °F		

Calibration: factory calibrated, push-button offset adjustment

Input connector: standard miniconnector

Display: Single line LCD

Auto shutoff: after 17 minutes

Hold Function indicator: HO

Low battery indication: LO

Operating temperature: 0 to 50°C

Power: 4 x AAA Alkaline batteries (>750 hours)

Dimensions: Meter only: 5.5" x 2.7" x 1.3" (14 x 7 x 3.5 cm);
Boxed: 9.25" x 6.5" x 3" (23.5 x 16.5 x 7.6 cm)

Weight: Meter only: 0.5 lb (210 g); Boxed: 1 lb (420 g)

8. Accessories

Meters

WD-35627-00 Acorn TEMP TC thermocouple thermometer. Probe not included. Shpg wt. 1 lb (460 g).

WD-35627-02 Acorn TEMP TC thermocouple thermometer with protective rubber boot**.** Probe not included. Shpg wt. 1 lb (460 g).

WD-35626-20 Acorn TEMP 6 RTD Thermometer with temperature probe. Shpg wt. 1 lb (460 g).

WD-35606-80 Protective rubber boot, encases meter in sturdy rubber to protect it from drops and dings. Also features meter stand for convenient tabletop use. Shpg wt 0.5 lb (230 g).

Thermocouple Probes

All probes listed below include an integral handle and a 5-ft coiled cable with a miniconnection. General purpose and penetration probes feature a grounded junction for fast response. Shpg wt 0.20 lb (0.09 kg).

Catalog Number	Probe type	Temperature range	Time constant*
General purpose probes.			
WD-08517-55	J	–90 to 760°C / -310 to 1400°F	3 seconds
WD-08516-55	K	-250 to 899°C / -418 to 1500°F	3 seconds
WD-08500-55	T	-250 to 400°C / -418 to 752°F	3 seconds
Penetration probes. Use for penetrating soft or semisoft materials.			
WD-08517-65	J	–90 to 760°C / -310 to 1400°F	5 seconds
WD-08516-65	K	-250 to 899°C / -418 to 1500°F	5 seconds
WD-08500-65	T	-250 to 400°C / -418 to 752°F	5 seconds
Air/gas probes. Feature a perforated shield to minimize error from radiated heat.			
WD-08517-75	J	–90 to 760°C / -310 to 1400°F	45 seconds at 5 m/s airflow
WD-08516-75	K	-250 to 899°C / -418 to 1500°F	45 seconds at 5 m/s airflow
WD-08500-75	T	-250 to 400°C / -418 to 752°F	45 seconds at 5 m/s airflow
Surface probes. Use for surfaces as hot plates, furnaces and molds. Exposed junction is isolated from 316 SS shaft and aluminum housing with ceramic support.			
WD-08517-60	J	–90 to 760°C / -310 to 1400°F	6 seconds
WD-08516-60	K	-250 to 899°C / -418 to 1500°F	6 seconds
WD-08500-60	T	-250 to 400°C / -418 to 752°F	6 seconds

***About Time constants**

Each probe has a characteristic time constant, or response time. Five time constants are needed to reach 99% of the final reading (Time Constant x 5 = Response Time).