Digi -Sense ®

Instruction Manual
Type K
Thermocouple Thermometer

OAKTON ®

CE

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Preface

This manual serves to explain the use of the `Digi-Sense`® Type K thermocouple thermometer.

This manual functions in two ways: first, as a step by step guide to help you operate the meter; second, it serves as a handy reference guide.

This manual is written to cover as many anticipated applications of the Type K meter as possible. If there are doubts in the use of the Type K meter, do not hesitate to contact the nearest Eutech Instruments/ Oakton Instruments Authorized Distributor.

Eutech Instruments/ Oakton Instruments will not accept any responsibility for damage or malfunction to the meter caused by improper use of the instrument.

The information presented in this manual is subjected to change without notice as improvements are made, and does not represent a commitment on the part of Eutech Instruments Pte Ltd/ Oakton Instruments.

Table of Contents

1. INTRODUCTION

Thank you for purchasing the Digi-Sense Type K thermocouple thermometer. This economical microprocessor-based handheld meter works with any type K probe with color-coded yellow ANSI miniconnectors.

Type K probes (chromel-alumel) offer a wide temperature range from –250 to 1372 °C / –418 to 2502 °F; suitable for use in oxidizing environments

The meter features:

- Large LCD for clear and easy reading
- Readings in $^{\circ}$C and $^{\circ}$F (selectable)
- Low battery indicator
- Hold function, freezes measured reading
- User calibration - offset adjustment
- Built-in non volatile memory to ensure that calibration and other information are not erased if battery is disconnected

This instruction manual is organized for quick reference with step-by-step procedures that give you thorough review of the various features and meter operations.

Included with your meter are 4 alkaline "AAA" batteries and an instruction manual. To order Type K thermocouple probes, please refer to Section on Accessories for more information.

2. GETTING STARTED

2.1 Description of Keypad Functions

The meter has three keys on its splash-proof keypad. These keys include ON / OFF, HOLD, and °C/°F keys.

|		
ON/OFF	Powers meter on and shuts the unit off. Meter directly enters measurement mode when you turn it on.	
°C/°F	Switches between °C and °F measurement mode	
	Activates the calibration mode when used with the ON/OFF key.	
	Decrease the calibration value during the calibration mode.	
HOLD/ENTER	Freezes the measured reading.	
	Confirm calibration value	
	Increase the calibration value during the calibration mode.	
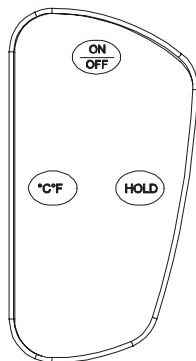
Figure 1: Keypad

2.2 Description of LCD Annunciators

The Digi-Sense Type K meter has a large custom LCD that consists of 4-digit segments and operation annunciators for °C and °F. Other indicators include "HO" (when the HOLD function is activated), "LO" (low battery condition) and "K" (Type K thermocouple thermometer).

Figure 2: LCD Segment

2.3   Inserting & Removing the Rubber Boot / Stand (Optional Purchase)

1. To remove meter from rubber boot, push out from the bottom edges of meter until it is completely out of boot. Ensure that the connector of temperature sensor is not connected.

2. To insert meter into rubber boot, 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.

Figure 3: Inserting meter into the rubber boot

2.4   Inserting New Batteries

The battery compartment is found at the back of instrument. To open the battery compartment, push in the direction of arrow and lift up the cover. Note the polarity of battery before inserting into position. After replacement, place cover back and press down until it locks tight.
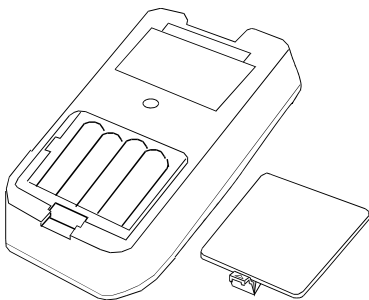
Figure 4: Battery compartment at the back of the meter

2.5   Battery Replacement

A "**LO**" annunciator in the LCD alerts you when battery power is running low. Replace with the same type as recommended by the manufacturer.

Figure 5: Low battery indicator

Caution: Power off the meter when changing battery.

2.6   Connecting the Temperature Sensor

Insert the yellow 2-pin mini connector plug of the temperature sensor into the connector socket on the side of the meter.

NOTE: The negative pin is larger than the positive pin, be sure to properly align the pins. Remove sensor from meter for long periods of non use.
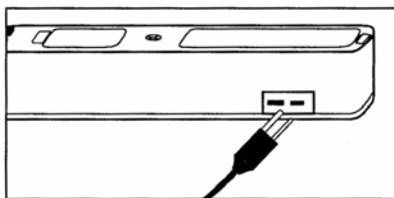
Figure 6: Connecting the temperature sensor

2.7   Switching the Meter On

1. Press **ON/OFF** key to power up your meter. The meter will momentarily display its revision number and the whole LCD segments before switching to the measurement mode.

Figure 7: "Open" annunciator

2. The LCD displays "**oPEn**" if the temperature sensor is faulty, or there is an open circuit, i.e. no sensor is attached. Please refer to section on Troubleshooting if in doubt.

3.   CALIBRATION

3.1   Temperature Calibration

Your meter is factory calibrated. The meter allows you to enter a 1-point calibration as fine adjustment by changing its offset value. This is useful when using a new probe for the first time.

1.   Connect the temperature probe and switch on the meter.

2.   Dip the probe in a constant temperature bath, or in liquid whose temperature can be checked against another accurate thermometer. For best accuracy, place your thermocouple probe and the reference thermometer in a constant temperature bath.

3.   Note the reading. Power off the meter once the reading has stabilized.

4.   With the meter powered off, hold down **°C/°F** key and press **ON/OFF** key to power up the meter.

5.   Continue to hold down **°C/°F** key until display shows "CA" momentarily. This is followed by a blinking value which is with respect to the factory default calibration.

6.   To adjust the display until it matches the correct temperature:

   -   Press °C/°F key to decrease

   -   Press HOLD key to increase

With meter off, Hold down °C/°F key and press ON/OFF to power on the meter. Continue hold down °C/°F until display shows CA momentarily.
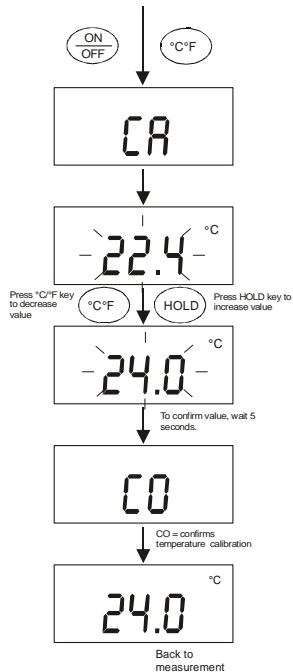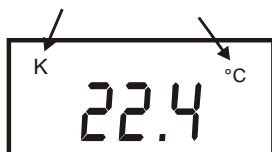

Figure 9: Calibration Sequence

7. To confirm value, wait for 5 seconds without any key press. The "CO" display appears signifying conformation and meter goes back to the measurement mode.

8. To abort calibration, press ON/OFF key to power off the meter.

   NOTE: The offset adjustment window is ±10°C (±18°F) of the factory default value.

4.   MEASUREMENT

4.1 Taking Measurements

K 22.4 $^{\circ}C$

1. The meter automatically enters Temperature mode when powered on. The "K" annunciator will be displayed.

2. The $^{\circ}C$ or $^{\circ}F$ annunciator displayed in your LCD indicates which mode you are taking measurements in.

3. Press the **°C/°F** key to toggle between temperature units.

4.2 Holding a Reading

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

K   HO 73.8 $^{\circ}F$

4.3 Releasing a Held Reading

Press **HOLD** key again to deactivate HOLD function or to release your frozen reading. The meter returns to measurement mode, and the "**HO**" annunciator disappears from the LCD.

5.   PROBE CARE AND MAINTENANCE

For best results, maintain the thermocouple probe as per the manufacturers instructions.

To remove the probe, simply hold firmly onto the plastic yellow mini-connector and pull out of the meter's socket. Store both the probe and meter into its original packaging when not in use.

6.   TROUBLESHOOTING

Problem	Cause	Solution
No display when turned on.	a) Batteries not in place.	a) Re-insert batteries in correct polarity.
"oPEn" display on LCD	a) Probe not connected	a) Make sure probe is firmly connected or is not damaged.
"Ur" or "Or" display on LCD	a) Measurement over (Or) or Under (Ur) range	a) Ensure temperature taken is within meter's specification.
"LO" annunciator in the LCD	a) Low battery	a) Replace batteries with fresh ones.
Inaccurate readings	a) Wrong thermocouple probe type used b) Reading has not stabilized c) Temperature calibration not correct or new probe used	a) Verify that Type K probe is used. b) Check time constant of probe & wait for reading to stabilize c) Recalibrate
Unstable reading	a) Electrode not deep enough in sample b) Dirty connector c) Broken probe d) External "noises" or induction caused by nearby electrical motor	a) Place probe deeper in sample. b) Clean probe connector. c) Replace electrode. d) Remove or switch off interfering motor.
Slow response	a) Dirty probe	a) Clean probe

7. SPECIFICATIONS

Temperature Range	
Type K	-250 to 1372 °C (-418 to 2501 °F)
Resolution	
t<-99.0 °C	1 °C (1 °F)
-99.9 °C<t<299.9 °C	0.1 °C (0.1 °F)
t>299.9 °C	1 °C (1 °F)
Accuracy	
t<-99.9 °C	± 0.25% of reading + 1 °C (2 °F)
t>-99.9 °C	±0.25% of reading + 0.5 °C (0.9 °F)
Offset Adjustment Window	±10 °C (±18 °F)
Auto Power-Off	17 minutes after last key-press
Hold Function	Yes
Display	Custom LCD
Low Battery Indicator	Yes
Input	2-pin ANSI mini connector
Power Requirement	4 'AAA' Batteries
Battery Life	>400 hours continuous operation
Operating Temperature	0 to +50 °C (32 to 122 °F)
Dimension / Weight	Meter: 14 x 7 x 3.5 cm / 200 g
	Boxed: 24 x 17 x 8 cm / 550 g

8.   ACCESSORIES

Item Description	Eutech Instruments Ordering Code	Oakton Instruments Ordering Code
Digi-Sense Type K Thermocouple Thermometer	93000-00	93000-00
Type K general purpose probe (immersion into liquids), 5-ft coiled cable.	EC-TPGLPK-01M	08516-55
Type K penetration probe (meat, semi-soft materials), 5-ft coiled cable.	EC-TPPENK-01M	08516-65
Type K surface probe (direct contact on hot surface, no liquids), 5-ft coiled cable.	EC-TPSURK-01M	08516-60
Type K alligator clip-on surface probe, 2", (electronics, tubing, no liquids), 5-ft coiled cable.	EC-TPCLPK-01M	08469-02
Rubber Boot / Stand	EC-RUBBERBOOTTC	35627-80
Replacement AAA Batteries	60X023200	09376-00

9.   WARRANTY

This meter is supplied with a warranty against significant deviations in material and workmanship for a period of **THREE** years from date of purchase.

If repair or adjustment is necessary and has not been the result of abuse or misuse within the designated period, please return – freight pre-paid – and correction will be made without charge. Eutech Instruments/ Oakton Instruments will determine if the product problem is due to deviations or customer misuse.

Out of warranty products will be repaired on a charged basis.

Exclusions

The warranty on your instrument shall not apply to defects resulting from:

- Improper or inadequate maintenance by customer
- Unauthorized modification or misuse
- Operation outside of the environment specifications of the product

10. RETURN OF ITEMS

Authorization must be obtained from our Customer Service Department or authorized distributor before returning items for any reason. A "Return Goods Authorization" (RGA) form is available through our authorized distributor. 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. Eutech Instruments/ Oakton Instruments will not be responsible for damage resulting from careless or insufficient packing. A restocking charge will be made on all unauthorized returns.

NOTE: Eutech Instruments Pte Ltd/ Oakton Instruments reserves the right to make improvements in design, construction, and appearance of products without notice.

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