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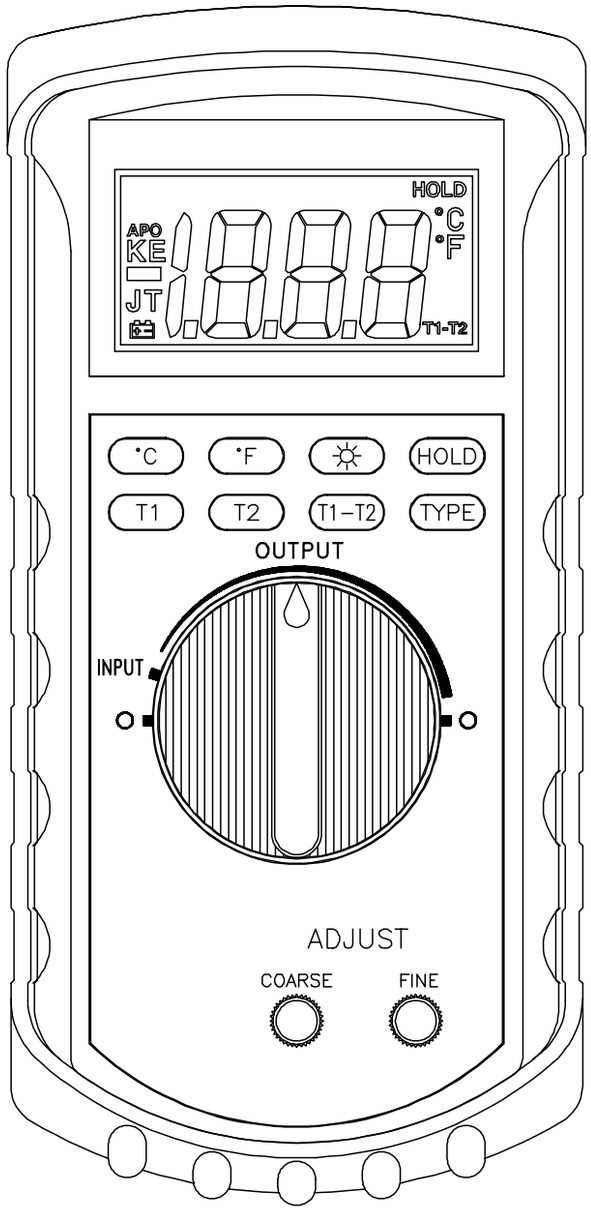

User's Guide

OMEGA®
An OMEGA Technologies Company

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CL3512A

Digital Thermometer & Calibrator

omega.com™

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1.0 Introduction

The OMEGA® CL3512A calibrator/thermometer is two meters in one. The CL3512A simulates type J/K/T/E thermocouple signals. Each signal is adjustable by using the coarse and fine dials. The CL3512A can also be used as a dual type J/K/T/E thermocouple input thermometer. Features include a large 3½ digit display with backlighting and display selections of HOLD, °C/°F, and 0.1/1°.

The source mode of the CL3512A simulates the thermocouple output to check the operation of a thermocouple meter and make rough calibration adjustments. A more accurate calibrator would be required for calibration of thermocouple meters to specify tolerances.

1.1 Safety Information

It is recommended that you read the safety and operation instructions before using the thermometer.

WARNING

To avoid electrical shock, do not use this instrument when working voltages at the measurement surface over 24V AC or DC.

WARNING

To avoid damage or burns, do not make temperature measurement in microwave ovens.

CAUTION

Repeated sharp flexing can break the thermocouple leads. To prolong lead life, avoid sharp bends in the leads, especially near the connector.

1.2 Unpacking

Remove the packing list and verify that all equipment has been received. If there are any questions about the shipment, please call the OMEGA Customer Service Department.

Upon receipt of shipment, inspect the container and equipment for any signs of damage. Immediately report any damage to the shipping agent.

NOTE

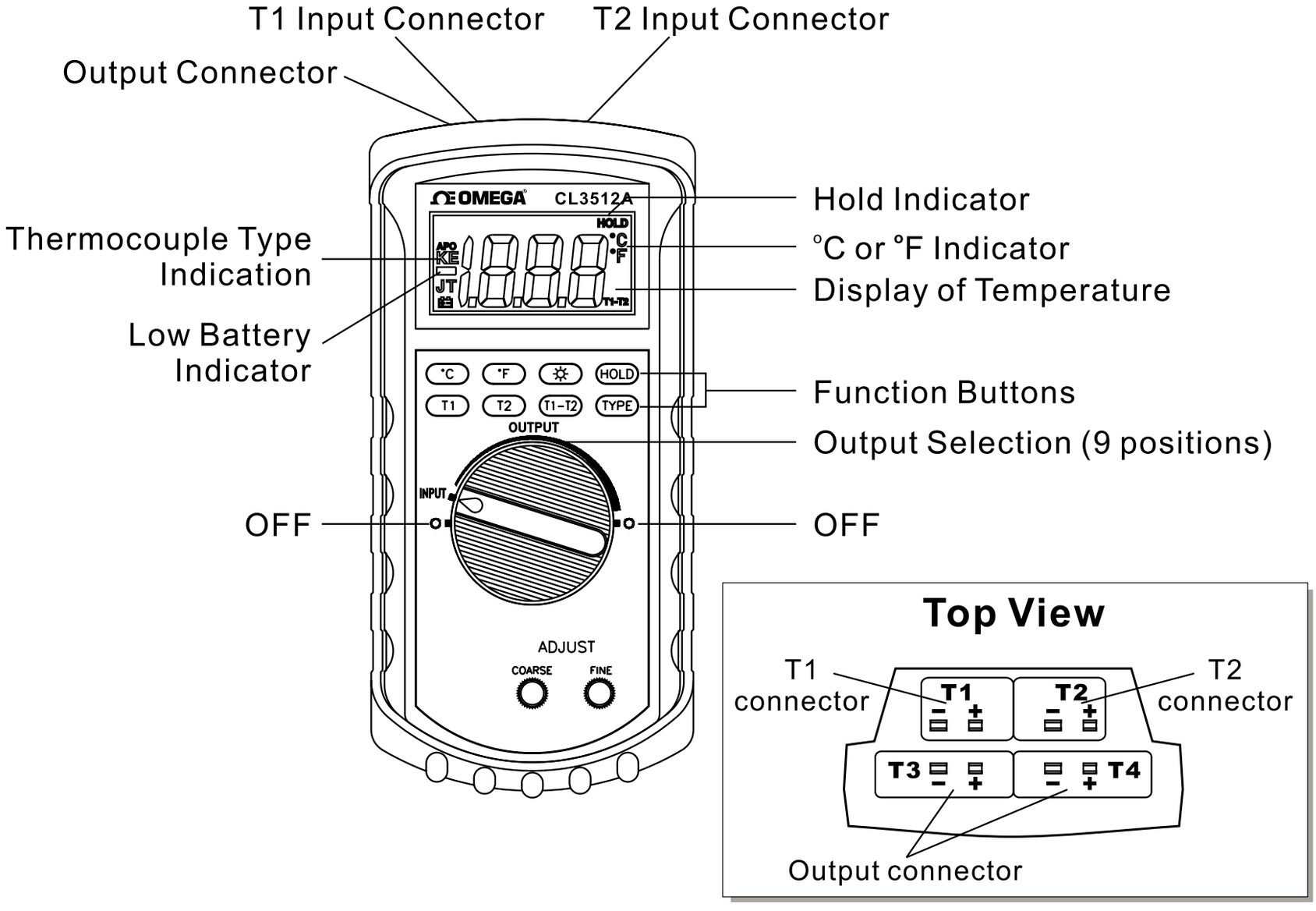
The carrier will not honor any claims unless all shipping material is saved for their examination. After examining and removing contents, save the packing material and carton in the event reshipment is necessary.

The following is supplied in the box:

- CL3512A
- Rubber boot
- 2 K beaded wire thermocouples
- K calibration cable
- 9 volt battery
- Operator's manual

2.0 Operation Proceedure

2.1 Drawing of Unit



Actual Dimensions: 195mm(H) x 92mm(W) x 53mm(D)

2.2 Descriptions of Buttons and Switches

°C/°F Buttons

Temperature is displayed in either degrees Celsius(°C) or degrees Fahrenheit(°F). When the thermometer is turned on, it is set to the temperature scale that was in use when the thermometer was last turned off. To change the temperature scale, press the °C or °F key.

☼ Button

Press "☼" button to toggle the on and off backlight. The backlight will switch-off automatically after 30 seconds.

HOLD Button (HOLD Mode)

Press the HOLD key to enter the Data Hold mode, the "HOLD" annunciator is displayed. When HOLD mode is selected, the thermometer will hold the present reading and stop all further measurements.
Pressing the HOLD key again will cancel HOLD mode causing the thermometer to resume taking measurements.

TYPE Button (K/J/T/E Input Thermocouple Type Selection)

The TYPE key allows for selection of J, K, E or T thermocouple types as either the input or simulated output. To select thermocouple type press type key once. Unit will briefly show 1888 and beep and then the type of thermocouple selected will be indicated on the left hand side of the display. Continue pressing the type key to step through the thermocouple types until desired type is indicated.

T1 / T2 / T1-T2 Input Selections

The input selection indicates which input is selected; T1 thermocouple, T2 thermocouple or the difference between the two thermocouples (T1-T2).When the thermometer is turned on, it is set to the temperature input that was in use when the thermometer was last turned off.

Selector Switch

The circular selector switch is used to turn the unit off (○) or to select Reading Mode (Input) or Simulation Mode (Output). There are nine selector switch positions under output which provide rough adjustment of the simulated output.

Adjust

Course and fine adjustment Dials are used in Simulation Mode to allow a particular simulated temperature to be selected once the output has been adjusted close to the desired temperature using the selector switch.

2.3 Read Mode Proceedure

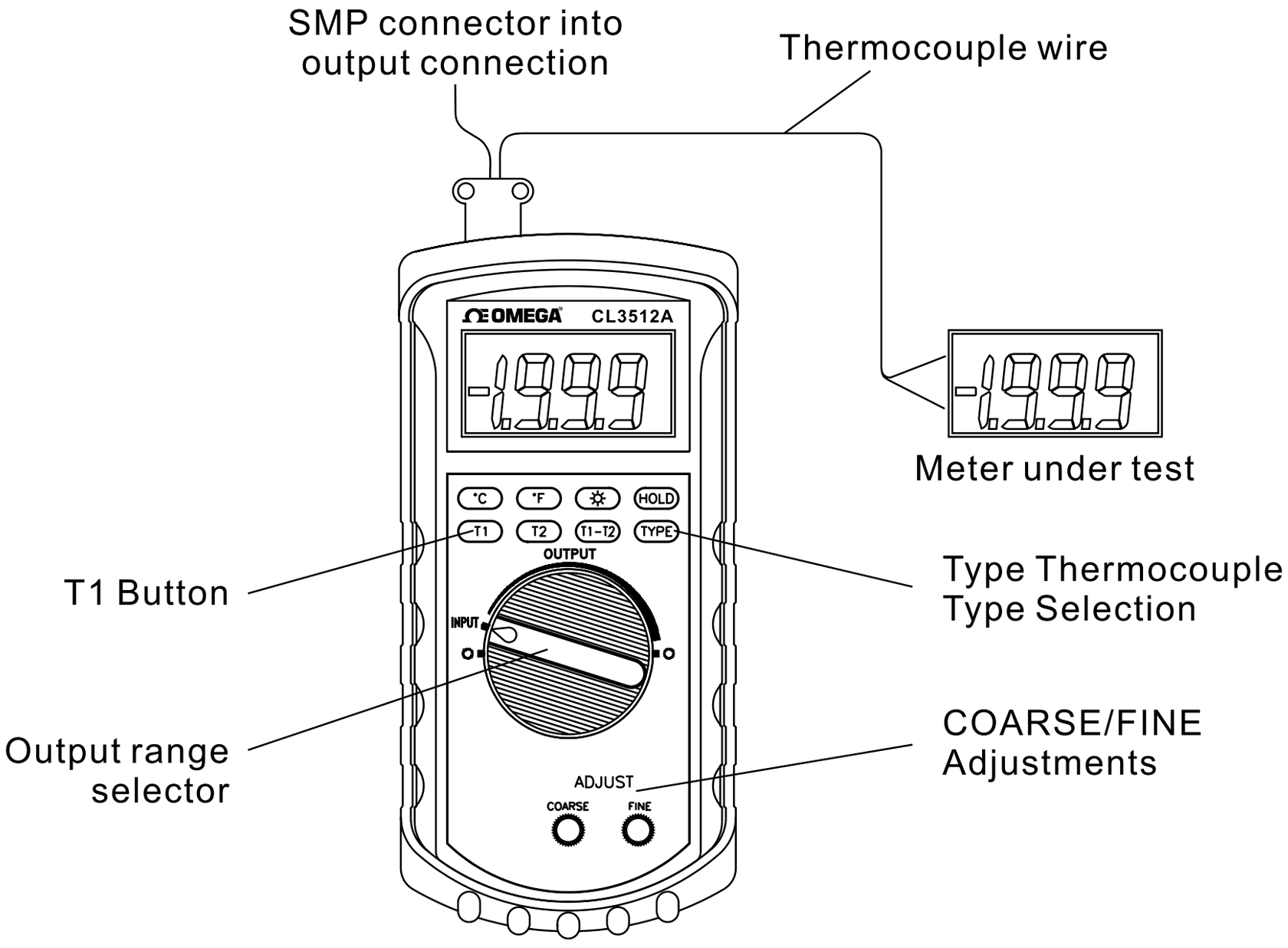
1. Plug Thermocouple Sensor into input T1 and/or T2.
2. Turn selector switch to Input.
3. Select proper thermocouple type (J, K, T or E) using type button.
4. Press T1 button to read thermocouple connected to input T1.
   Press T2 button to read thermocouple connected to input T2.
   Press T1-T2 if difference between T1 and T2 is to be read.
5. To Hold reading press HOLD button. To resume making measurements press HOLD again.
   Note: Unit will display -OL if input is out of range or thermocouple is broken or not connected to proper input.

To save battery life, CL3512A will turn off automatically if no is key is pressed for 70 minutes.

2.4 Source Mode Procedure (Calibration Simulation)

1. Turn CL3512A on by turning selector switch to any one of the output selector positions.
2. Press T1 button.
3. Select thermocouple type (J, K, T or E) using type button.
   Select °C or °F using °C or °F buttons.
4. Plug proper type of thermocouple wire into either one of the two output connectors. (SMP male connector required)
5. Attach the other end of the thermocouple wire to the instrument being tested/calibrated.
6. Move the output range switch to the temperature value close to the desired simulated value.
   Note: There are 9 temperature range switch positions arranged from left to right representing low to high temperatures.
   The display will read -OL if the output voltage for the meter is higher than the maximum voltage for that particular thermocouple type. For type T this will be in the highest 4 positions, type K in the highest 3 positions, type J in the highest 2 positions, and type E in the highest position only.
7. Adjust course and/or fine adjustment dial until desired temperature is displayed on CL3512A.
8. Instrument under test should read same temperature as CL3512A. If not adjust instrument under test or have recalibrated.
9. Repeat steps 6-8 at different temperatures as needed.

Source Mode Diagram



3.0 Operator Maintenance

WARNING

To avoid possible electrical shock, disconnect the thermocouple connectors from the thermometer before removing the cover.

Battery Replacement

Power is supplied by a 9 volt "transistor" battery. The "  " appears on the LCD display when replacement is needed. To replace the battery, remove the two screws from the back of the meter and lift off the battery cover. Remove the battery from battery contacts.

4.0 Specifications

ELECTRICAL

Temperature Scale: Celsius or Fahrenheit user-selectable

Measurement Range:

Thermocouple	Range
K-TYPE(0.1°C)	-200°C to 1372°C , -328°F to 1999°F
J-TYPE(0.1°C)	-210°C to 1200°C , -346°F to 1999°F
T-TYPE(0.1°C)	-200°C to 400°C , -328°F to 752°F
E-TYPE(0.1°C)	-220°C to 1000°C , -364°F to 1832°F

Calibration Range:

-210°C to 1372°C, (-364°F to 1999°F)

Auto range: 0.1°C/1°C , 0.1°F/1°F

Accuracy: Accuracy is specified for operating temperatures over the range of 18°C to 28°C (64°F to 82°F), for 1 year, not including thermocouple error. (Read mode)

±(0.1%rdg + 1°C) range -60°C to 1372°C

±(0.1%rdg + 2°C) range -60°C to -220°C

±(0.1%rdg + 2°F) range -76°F to 1999°F

±(0.1%rdg + 4°F) range -76°F to -364°F

Simulation Accuracy: Measurement accuracy plus 1°C

ENVIRONMENTAL

Ambient Operating Ranges: 0°C to 50°C (32°F to 122°F) <80% R.H.

Storage Temperature: -20°C to 60°C (-4°F to 140°F) <70% R.H.

GENERAL

Display: 3½ digit liquid crystal display (LCD) with a maximum reading of 1999.

Polarity: Automatic,positive implied,negative polarity indication.

Overrange: -OL is displayed.

Zero: Automatic.

Low battery indication: the"  "is displayed when the battery voltage drops below the operating level.

Measurement rate: 1 times/second.

Accuracy: Stated accuracy at 23°C±5°C,<75% relative humidity.

Dimensions: 195mm(H) x 92mm(W) x 53mm(D).

Weight: approx. 9 oz. (250g) including battery.

Input Connector: Accepts standard miniature thermocouple connectors (flat blades spaced 7.9mm, center to center SMP type).

Battery Life: 100 hours typical with carbon zinc battery

Auto power off: The meter key switch inactive for more than 70 minutes.

Temperature Coefficient: 0.1 times the applicable accuracy specification per °C from 0°C to 18°C and 28°C to 50°C (32°F to 64°F and 82°F to 122°F).

Input Protection: 24V dc or 24V ac rms maximum input voltage on any combination of input pins.

Maximum Differential Common Mode Voltage (Maximum Voltage between T1 and T2 during measurement): 1volt.

5.0 CL3152A Calibration Procedure

Note: The following calibration procedure should be performed only by qualified technicians who have access to the items as following items:

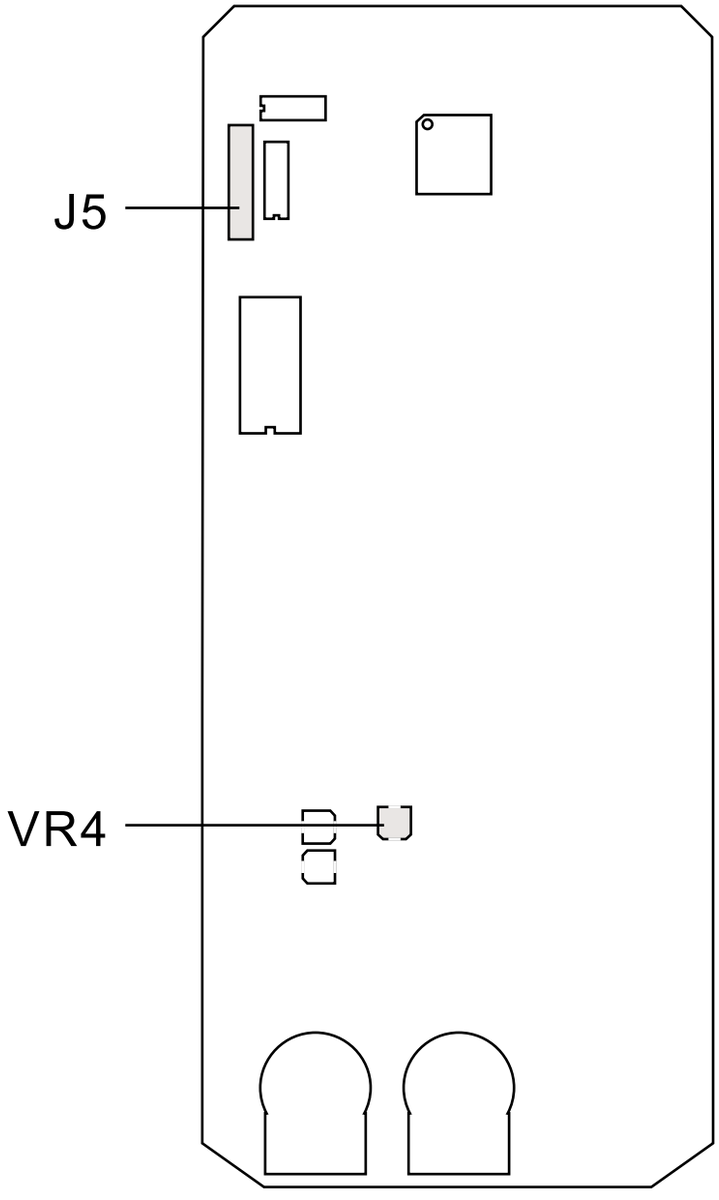
Equipment: 1) A very accurate millivolt source.
2) A TRC III ICE Point Reference or ice bath with type K thermocouple.

Input Funtion "Calibration"

1. Before turning on the meter, turn the RANGE knob to position "INPUT" and then move the jumper to the upper two pins of J5 which is at the left upper of the PCB.
2. Input DCV 25.60mV to the T1. After the display is stabilized, then press ☼ key and "0.1" is displayed.
3. Input DCV 74.00mV. After the display has stabilized, then press ☼ key and "OL" is displayed.
4. Input 0°C (K-type, use a K thermocouple on an ice bath, or thermocouple calibrator). After the display has stabilized then press ☼ key.
5. Do Not press any key. The meter will turn off automatically after 10 seconds. Move the jumper to the lower two pins of J5.
6. Turn the meter back on then input 0°C (K-type). The meter will be calibrated if the display reading reads 0°C.

"Simulated Output" Test

1. Turn the knob "COARSE" right to the end, knob of RANGE turn right to the last two position, press "TYPE" key to select "TYPE-E", if display does not show "OL" then adjust VR4 slowly to make display ="OL" **(Note: Take care not to adjust VR4 too far)**.



CL3512A CALIBRATION PROCEDURES

Note: The following calibration procedure should perform only by qualified technicians who have access to the items as following.

Equipment: The class of calibrator had better 10 times greater than the measured meter.

INPUT FUNTION CALIBRATE

1. Before turn on the meter, turn the RANGE knob to position "INPUT" and then move short pin to upper two pin of J5 which is at the left upper of PCB.

2. Input DCV 25.6mV to the T1.After the display is stabilized,then **press** ☼ **" key** and **"0.1"** is displayed.

3. Input DCV 74mV then **press "** ☼ **" key**. After the display is stabilized, then **press "** ☼ **" key** and "OL" is displayed.

4. Input 0°C (K-type). After the display is stabilized and then **press** ☼ **" key**.

5. Don't push any key and the meter will turn off automatically after 10 seconds. Move short pin to lower two pin of J5.

6. Turn on the meter then input 0°C (K-type). The display reading reads 0°C if the calibration procedure is right.

"CALIBRATION FUNTION" CALIBRATE

1.Turn the knob "COARSE" right to the end, knob of RANGE turn right to the last two position, press "TYPE" key to select "TYPE-E", if display does not show "OL", then adjust VR4 **slowly** to make display ="OL" **(if "OL" displayed don't adjust VR4 too far)**.

WARRANTY / DISCLAIMER

OMEGA ENGINEERING, INC. warrants this unit to be free of defects in materials and workmanship for a period of 13 **months** from date of purchase. OMEGA Warranty adds an additional one (1) month grace period to the normal **one (1) year product warranty** to cover handling and shipping time. This ensures that OMEGA's customers receive maximum coverage on each product. If the unit should malfunction, it must be returned to the factory for evaluation. OMEGA's Customer Service Department will issue an Authorized Return (AR) number immediately upon phone or written request. Upon examination by OMEGA, if the unit is found to be defective it will be repaired or replaced at no charge. OMEGA's WARRANTY does not apply to defects resulting from any action of the purchaser, including but not limited to mishandling, improper interfacing, operation outside of design limits, improper repair, or unauthorized modification. This WARRANTY is VOID if the unit shows evidence of having been tampered with or shows evidence of being damaged as a result of excessive corrosion; or current, heat moisture or vibration; improper specification; misapplication; misuse or other operating conditions outside of OMEGA's control. Components which wear are not warranted, including but not limited to contact points, fuses, and triacs.

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RETURN REQUESTS / INQUIRIES

Direct all warranty and repair requests/inquiries to the OMEGA Customer Service Department. BEFORE RETURNING ANY PRODUCT(S) TO OMEGA, PURCHASER MUST OBTAIN AN AUTHORIZED RETURN (AR) NUMBER FROM OMEGA'S CUSTOMER SERVICE DEPARTMENT (IN ORDER TO AVOID PROCESSING DELAYS). The assigned AR number should then be marked on the outside of the return package and on any correspondence.

The purchaser is responsible for shipping charges, freight, insurance and proper packaging to prevent breakage in transit.

FOR **WARRANTY** RETURNS, please have the following information available BEFORE contacting OMEGA:

1. P.O. number under which the product was PURCHASED.
2. Model and serial number of the product under warranty, and
3. Repair instructions and/or specific problems relative to the product.

FOR **NON-WARRANTY** REPAIRS, consult OMEGA for current repair charges. Have the following information available BEFORE contacting OMEGA:

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2. Model and serial number of product , and
3. Repair instructions and/or specific problems relative to the product.

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