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Czech Republic: Frystska 184, 733 01 Karviná, Czech Republic
Tel: +420 (0)59 6311899 FAX: +420 (0)59 6311114
Toll Free: 0800-1-66342 e-mail: info@omegashop.cz

France: 11, rue Jacques Cartier, 78280 Guyancourt, France
Tel: +33 (0)1 61 37 29000 FAX: +33 (0)1 30 57 5427
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e-mail: sales@omegaeng.fr

Germany/ Austria: Daimlerstrasse 26, D-75392 Deckenpfronn, Germany
Tel: +49 (0)7056 9398-0 FAX: +49 (0)7056-9398-29
Toll Free in Germany: 0800 639 7678
e-mail: info@omega.de

United Kingdom: One Omega Drive Riverbend Technology Centre
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WARNING: These products are not designed for use in, and should not be used for, human applications.

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's 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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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:
1. P.O. number to cover the COST of the repair,
2. Model and serial number of product, and
3. Repair instructions and/or specific problems relative to the product.

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User's Guide

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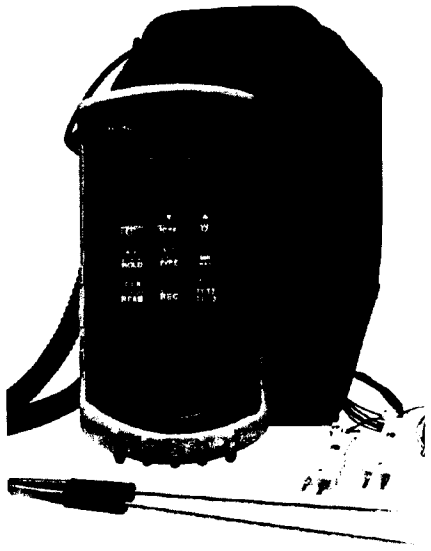


HH86
Digital Thermometer

INTRODUCTION

This instrument is a portable 3½ digit, compact-sized digital thermometer designed to use external K-type and J-type thermocouple as temperature sensor. It also has the feature that sensor offset can be adjusted for in the field.

There are 2 sets of sockets for thermocouple plugs at the top of HH86 marked with T1and T2.

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 voltages at the measurement surface exceed 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.

Packing List

1. HH86 handheld thermometer with protective boot.
2. Teflon insulated beaded wire thermocouple.
3. 9 volt battery.

SPECIFICATIONS

ELECTRICAL

Temperature Scale:
Celsius or Fahrenheit user-selectable.

Measurement Range:
K-Type -100°C to 1372°C, (-150°F to 1999°F)
J-Type -100°C to 1200°C, (-150°F to 1999°F)

Resolution: 1 degree or 0.1 degree form -59.9 to 199.9 degree C or F (autoranging).

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.
±(0.1% rdg + 1°C) on °C
±(0.1% rdg + 2°F) on °F

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.

Reading Rate: 1 times per second.

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

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 maximum reading of 1999.

Overload: "-OL" is displayed.

Battery: Standard 9V battery (NEDA 1604, IEC 6F22 006P).

Battery Life: 200 hours typical with carbon zinc battery.

Auto Power Off: Approximately 20 minutes.

Dimensions: 192mm(H) x 91mm(W) x 52.5mm(D).

Weight: 365g.

Supplied Wire: Tow(2) 3 feet type "K" beaded wire thermocouple teflon insulated. Maximum insulation temperature 200°C (392°F). Wire accuracy ±2.2°C or ±0.75% of reading (whichever is greater) from 0°C to 800°C.

OPERATING INSTRUCTIONS

Power Button

Press the " ⏻ " button to turn on or off thermometer.

°C/°F Selecting the Temperature Scale

Readings are 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/°F" button.

☼ Button (Display Back-Light)

Pressing the "☼" button to trigger on the Back-Light.

Pressing the "☼" button again to make the Back-Light lighter and press "☼" button once more to cancel the Back-Light function.

Back-Light on → lighter → Back-Light off

HOLD Button

Press the "HOLD" button to enter the Data Hold mode , the "HOLD" annunciator is displayed at the higher-center of display.

When HOLD mode is selected, the thermometer held the present readings and stops all further measurements.

Press the "HOLD" button again cancels HOLD mode, causing thermometer to resume taking measurements.

TYPE Button (APO)

Press "TYPE" button to select the type of T/C, thermocouple "K" or "J". Make sure the proper type has been selected.

Press and hold down "APO" button for 2 seconds to trigger on or off APO (Automatic Power Off) mode, and then APO annunciator will appear or disappear on the display.

Power is automatically turn off, if no operation for a periad of time, and "APO" annunciator is displayed at upper-left corner when APO function is enabled.

MIN MAX Button

Press "MIN MAX" button to enter the MIN MAX recording mode. (displays the Maximum reading, Minimum reading, "MAX-MIN" reading stored in record mode)

Press "MIN MAX" button to cycle through the MAX, MIN, MAX -MIN readings. In this mode, press "HOLD" button to stop recording, all values are frozen, press again to restart recording.

In this mode, the APO function and other buttons are disabled, excluding "HOLD" and " ☼ " buttons.

To prevent accidental loss of MAX, MIN and MAX-MIN, in this mode can only be cancelled by pressing and holding down the "MIN MAX" button for 2 seconds to exit and erased recorded reading.

READ/CLR Button

Press "READ" button to enter READ Mode, the "READ" annunciator is displayed at upper-right corner. Press "▲ "or " ▼" button to review the data you recorded. The LCD automatically scrolls data and index.

Press "CLR" button and hold down for 2 seconds to clear the memory data.

RECORD Button

There are 125 datas could be recorded into memory.

Press "REC" button to record the data, press once to record another one till the memory is full. When the data is recorded, "REC" mark is displayed at the Upper-Right corner.

If the memory is full, data will not be recorded into the memory and "REC" mark will not be displayed.

Data can be recorded after it be cleared.

T1/T2/T1-T2 Button

Press "T1", "T2", "T1-T2" button to select input mode T1, T2 or T1-T2.

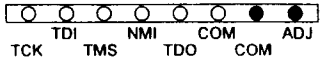
The input selection indicates which input is selected for display. T1 thermocouple, T2 thermocouple or the differential between the two thermocouples(T1-T2), when the thermocouple is turned on, it is set to T1.

ADJUST THERMOCOUPLE OFFSET

1. Insert the thermocouple into a known temperature (T) until the display equal to known temperature (T).
   exp: ice point at 0°C
   boiling water at 100°C
2. Press "▲ "or " ▼" to add or subtract the value.
3. It can be adjusted ±6°F(±3°C) of default. If you can't adjust your T/C, please check your T/C or send the meter to be calibrated.
4. Press "ENTER" button to confirm.

PROCEDURE OF CALIBRATION

1. It will not enter into calibration procedure at LOWBAT condition.
2. Make COM & ADJ pin short and then turn on the meter.



The procedure as follow:
Supply 35°C (K type) from calibrator and LCD displayed nearly 35°C → press backlit button → LCD displayed "00.1" → press backlit button → supply 1300°C (K-type) from calibrator and LCD displayed nearly 1300°C → press backlit button → supply 0°C (K-type) from calibrator and LCD displayed nearly 0°C → press backlit button → OFF automatically (calibration is completed)

3. Take off the short pin when the calibration is completed then temperature measurement is workable.

Noth: Both T1 and T2 need to be calibrated. So that, T1 and T2 should be insent thermocouple when yor are calibrate the meter.

OPERATOR MAINTENANCE

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

Battery Replacement

1. Power is supplied by a 9 volt "transistor" battery. (NEDA 1604, IEC 6F22)
2. The "🔋" appears on the LCD display when replacement is needed. To replace battery remove screw from back of meter and lift off the battery cover.
3. Remove the battery from battery contacts and replace.
4. When not use for long time remove battery.
5. Do not store in a place with high Temp. or high humidity.

Cleaning

Periodically wipe the case with a damp cloth and detergent, do not use abrasives or solvents