1 YEAR WARRANTY

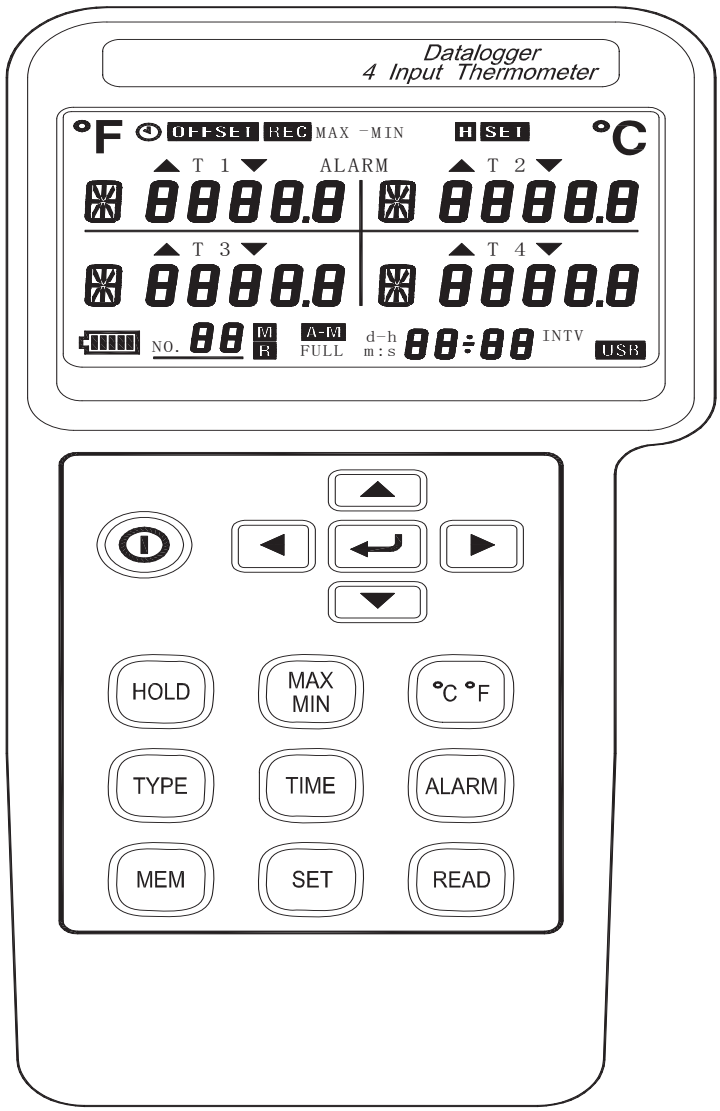
Made in Taiwan

User's Guide

DATALOGGER 4 INPUT THERMOMETER

HH1384

INSTRUCTION MANUAL



1. INTRODUCTION: FEATURES

This instrument is a digital 4 input thermometer and data logger that works with any K, J, E, T, R, S, N, L, U, B and C-type thermocouple temperature sensor.

Temperature indication follows the international temperature scale of 1990 (ITS-90).

- Read the following safety information carefully before attempting to operate the meter.
- Use the meter only as specified in this manual; otherwise, the protection provided by the meter may be impaired.

Environment conditions

① Altitude up to 2000 meters
② Relatively humidity 80% max.
③ Operation Ambient 0～50°C(32°F ~122°F)

Features

- Isolated Input Protection of 350Vp-p between any two inputs.
- Highly accurate thermometer with thermocouple K, J, E, T, R, S, N, L, U, B, C types.
- 4 input function T1/T2/T3/T4 temperature display.
- Programmable Hi – Lo alarm for 4 inputs.
- Display of MAX, MIN and MAX–MIN values of 4 inputs.
- Independent Input Setup (type of thermocouple, Hi – Lo alarm values).
- Memory and Read function (99 sets)
- 512KB auto datalogging capacity.
- USB interface.

Safety symbols

CE Comply with EMC

2. SPECIFICATIONS

2-1 Electronical Specifications

Type	°C		°F	
	Range	**Accuracy**	**Range**	**Accuracy**
K	-200 ~ -150 -150 ~ -100 -100 ~ 999.9 1000 ~ 1370	±3.0°C ±2.0°C ±0.05% ±1.0°C ±0.2% ±1.0°C	-328 ~ -238 -238 ~ -148 -148 ~ 999.9 1000 ~ 2498	±5.4°F ±3.6°F ±0.05% ±1.8°F ±0.2% ±1.8°F
J	-200 ~ -100 -100 ~ 100 100 ~ 999.9	±2.5°C ±1.5°C ±0.05% ±1.0°C	-328 ~ -148 -148 ~ 212 212 ~ 999.9 1000 ~ 1832	±4.5°F ±2.7°F ±0.05% ±1.8°F ±0.2% ±1°F
E	-150 ~ -100 -100 ~ 760	±3.0°C ±0.05% ±1.0°C	-238 ~ -148 -148 ~ 999.9 1000 ~ 1400	±5.4°F ±0.05% ±1.8°F ±0.2% ±1°F
T	-200 ~ -150 -150 ~ -100 -100 ~ 400	±3.0°C ±0.15% ±2.5°C ±0.1% ±1.0°C	-328 ~ -238 -238 ~ -148 -148 ~ 752	±5.4°F ±0.15% ±4.5°F ±0.1% ±1.8°F
R/S	0 ~ 100 100 ~ 300 300 ~ 999.9 1000 ~ 1600	±5.0°C ±3.0°C ±0.05% ±2.0°C ±0.25% ±2.0°C	32 ~ 212 212 ~ 572 572 ~ 999.9 1000 ~ 2912	±9.0°F ±5.4°F ±0.05% ±3.6°F ±0.25% ±3.6°F
N	0 ~ 999.9 1000 ~ 1300	±0.1% ±1.0°C ±0.2% ±1.0°C	32 ~ 999.9 1000 ~ 2372	±0.1% ±1.8°F ±0.2% ±1.8°F
L	-200 ~ 900	±0.1% ±1.0°C	-328 ~ 999.9 1000 ~ 1652	±0.1 % ±1.8°F ±0.2% ±1°F
U	0 ~ 600	±0.1% ±1.0°C	32 ~ 999.9 1000 ~ 1112	±0.1% ±1.8°F ±0.2% ±1°F
B	600 ~ 999.9 1000 ~ 1760	±0.05% ±2.0°C ±0.1% ±2.0°C	1112 ~ 1831 1832 ~ 3200	±0.05% ±3.6°F ±0.1% ±3.6°F
C	0 ~ 999.9 1000 ~ 1760	±0.1% ±1.5°C ±0.2% ±1.5°C	32 ~ 999.9 1000 ~ 3200	±0.1% ±2.7°F ±0.2% ±2.7°F

NOTE

This basic accuracy specification does not include the error of the temperature probe. Please refer to the temperature probe accuracy specification for additional details.

Temperature Coefficient:
0.01% of reading +0.1°C per °C (0.2°F per °F)
outside the specified +18°C to 28°C (+64°F to 82°F) range.

Isolated Input Protection between any Two Inputs : 350Vp-p

Manual Data Memory Capacity: 99 sets.

Continuity Data Logging Capacity: 36,000 sets.

2-2 General Specifications

Power Supply: 6 pcs size AA battery or DC 9V AC adaptor.

Battery Life: approx. 55 hours (Alkaline battery)

Auto Power Off: 5, 15 or 30 minutes (If no key is pressed).

Low Battery Indicator: The ( ) is displayed when the battery voltage drops below the operating voltage.

Measurement Rate : One time per 2 seconds.

Weight : 405g / 14.3oz (batteries included)

Dimension : 18.7(L) × 7.3(W) × 5.3(T) cm
7.3”(L) × 2.9”(W) × 2.1”(T)

Operating Temperature: 0 to 50℃ (32 to 122℉)

and Humidity: Below 80% RH.

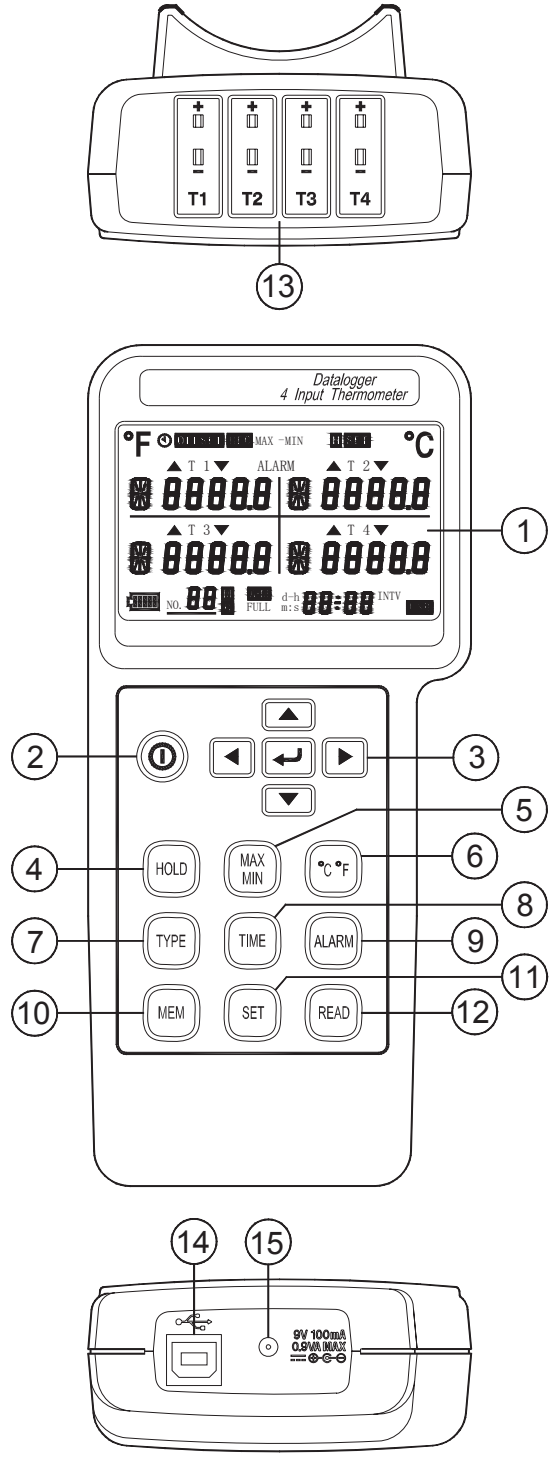
Storage Temperature: -10 to 60℃, 14 to 140℉

and Humidity: Below 70% RH.

Accessories: Instruction manual, alkaline batteries, USB cable, software CD, carrying case and K-type thermocouples (1 per channel).

3. PARTS & CONTROLS

3-1 Description of Parts & Control keys



(1). LCD Display

(2). ⏻ Key : Power on – off control key.

(3). ▲▼◀ ▶↵ Keys: Setting keys.

(4). HOLD Key:

① Data hold function key, press “**HOLD**” key to hold data, the “ H ” symbol is displayed, press this key again to exit this function.

② Press and hold down “**HOLD**” key then press "⏻" key to turn on the meter, the “🕓” symbol disappear, exit auto power off function.

(5). MAX MIN Key: Press “**MAX MIN**” key to circulate the reading of Maximum, Minimum, Maximum minus Minimum, and Current. Press this key for 2 seconds to exit this mode.

(6). °C / °F Key: Press “**°C / °F**” key to switch the units between Celsius (°C) and Fahrenheit (°F).

(7). TYPE Key: Press **"TYPE"** key to enter the thermocouple type select mode, press this key again to exit this mode.

(8). TIME Key: Press “**TIME**” key to circulate display data and time.

(9). ALARM Key: Press “**ALARM**” key to enable or disable Alarm function.

(10). MEM Key: Manual data memory control key.

(11). SET Key: Press “**SET**” key to start or exit setup.

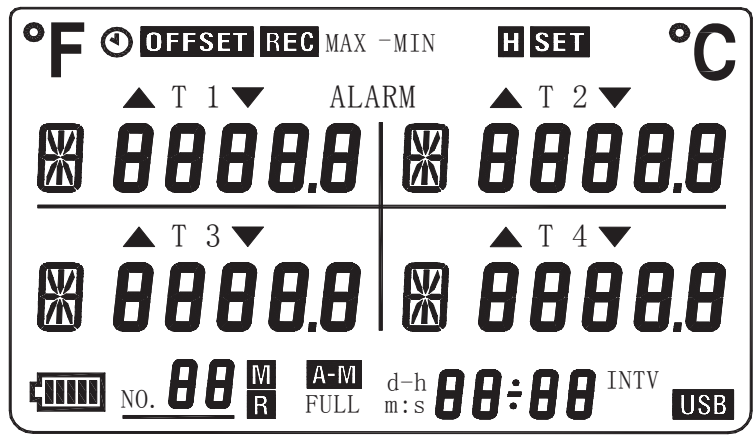
(12). READ Key: Manual memory data reading control key.

(13). T1, T2, T3, T4 : Thermocouple T1, T2, T3 and T4 inputs.

(14). USB Interface Jack.

(15). AC Adaptor Input Jack.

3-2 Description of Display



°F, °C : Temperature units.

: Auto power off indication.

OFFSET : The thermocouple measurement includes an offset indication.

REC : MAX MIN Recording mode and current reading indication.

REC MAX : Maximum reading indication.

REC MIN : Minimum reading indication.

REC MAX-MIN : Maximum minus Minimum value indication.

H : Data hold function indication.

SET : Setting mode indication.

: Thermocouple type indication.

ALARM : Alarm mode indication.

▲**ALARM** : Input temperature exceeds the high limit value indication.

▼**ALARM** : Input temperature is below the low limit value indication.

T1, T2, T3, T4 : Thermocouple T1, T2, T3, T4 input temperature measurement display.

: Battery capacity indication.

: Replace batteries indication.

NO. 88 : Last manual data memory address number indication (01–99).

M : Manual data memory indication, **M** displays one time store one sets data into the memory.

NO. 88 **R** : Manual data memory read address number indication, the memory data displayed for read.

A-M : Auto data logging indication, **A-M** will disappear after storing the data.

INTV : Auto data log interval time setting indication.

Full : Auto data logged memory full indication, if exceeds 255 memory blocks, total maximum record capacity size is 36,000 sets of data for 4 input thermocouple temperature measurement (100,000 sets data for 1 input record).

d-h
m:s 88:88 : Time display indication.

4. OPERATION INSTRUCTION

WARNING

- Before using the meter inspect the case. Do not use the meter if it appears damaged. Look for cracks or missing plastic. Pay particular attention to the insulation around the connectors.
- Disconnect thermocouples from the meter before opening the case.
- Replace the batteries as soon as the battery indicator " ▭ " appears. The possibility of false reading can lead to personal injury.
- Do not use the meter if it operates abnormally. Protection may be impaired.
- Do not operate the meter around explosive gas, vapor or dust.
- Do not use the meter with any part of the case or cover removed.

4-1 Setting the meter

1. Real – Time setting:

(a). Press "ⓘ" key to turn on the meter.

(b). Press "**SET**" key to enter the setting mode, the "Set clock" and " **SET** " symbols are displayed.

(c). Press "↵ " key to enter real time setting mode and the two flicking numbers of year.

(d). Press ▲ or ▼ key to set the year (real time).

(e). Press "↵ " key and move to the two flicking digits of month.
(f). Press ▲ or ▼ key to set month (real time).
(g). Press "↵ " key and move to the two flicking digits of day.
(h). Press ▲ or ▼ key to set day (real time).
(i). Press "↵ " key and move to the two flicking digits of hour.
(j). Press ▲ or ▼ key to set hour (real time).
(k). Press "↵ " key and move to the two flicking digits of minutes.
(l). Press ▲ or ▼ key to set minutes (real time).
(m). Press "↵ " key and move to the two flicking digits of second.
(n). Press ▲ or ▼ key to set seconds (real time).
(o). Press "↵ " key to store real time values.
(r). Press "**SET**" key to exit this mode.

2. Interval – Time setting :

The logging interval time determines how often the meter stores logged readings in memory.

(a). Press "⏻" key to turn on the meter.
(b). Press "**SET**" key to enter the setting mode, then press ▲ or ▼ key until the display shows "Set Intr".
(c). Press "↵" key to enter the interval time setting mode and the three flicking numbers of second.
(d). Press ▲ or ▼ key to set the desired second of interval time (1 to 255 seconds).
(e). Press "↵ " key to store the auto datalogging interval time.
(f). Press "**SET**" key to exit this mode.

3. Offset setting :

You can adjust the meter readings to compensate for the errors of a specific thermocouple. The allowable adjustment range is from +12.7 to -12.8 degree, regardless of the temperature units. You can store individual offsets for T1, T2, T3 and T4.

(a). Press "⏻" key to turn on the meter.
(b). Press "**SET**" key to enter the setting mode, then press ▲ or ▼ key until the display shows "**SEt OFSEt**".

(c). Press "↵ " key to enter the offset setting mode, the " **OFFSET** " symbol is displayed.
(d). Press ◀ or ▶ key to select the desired T1, T2, T3 or T4.
(e). Press ▲ or ▼ key to set the desired offset values.
(f).. Press "↵" key to store the offset value.
(g). Press "**SET**" key to exit this mode.

The temperature measurement plus the offset appears in the display. Remember to set the offset to 0.0 when it is no longer needed. The " **OFFSET** " symbol will disappear when the offset values all are 0.0.

4. Auto Power Off Time setting :

(a). Press "⏻" key to turn on the meter.
(b). Press "**SET**" key to enter the setting mode, then press ▲ or ▼ key until the display shows "**SEt SLEEP**".
(c). Press "↵ " key to enter the auto power off time setting mode, the "**SLEEP**" symbol is displayed.
(d). Press ▲ or ▼ key to choose the desired auto power off time. The choices are: 5, 15 and 30 minutes.
(e). Press "↵ " key to store the choice.
(f). Press "**SET**" key to exit this mode.

5. Alarm High / Low Limit setting :

(a). Press "⏻" key to turn on the meter.
(b). Press "**SET**" key to enter the setting mode, then press ▲ or ▼ key until the display shows "**SEt ALArn**".
(c). Press "↵ " key to enter the alarm high limit and low limit setting mode, the " ALARM " symbol is displayed.
(d). Press ◀ or ▶ key to select the desired T1, T2, T3 or T4.
(e). Press "↵ " key to enter the high limit value setting, the "▲" symbol is displayed.
(f). Press ▲ or ▼ key to set the desired alarm high limit value, the resolution of setting value is 0.1 degree, regardless of the temperature units.

(g). Press "↵ " key to store the alarm high limit value and to enter the alarm low limit value setting, the symbol "▼" is displayed.

(h). Press ▲ or ▼ key to set the desired alarm low limit value, the resolution of setting value is 0.1 degree, regardless of the temperature units.

(i). Press "↵ " key to store alarm low limit value. You can store individual alarm High / Low limit values for T1, T2, T3 and T4, by repeating (c) to (i) procedure.

(j). Press "**SET**" key to exit this mode.

(k). Press "**ALARM**" key to enter the alarm function, the "**ALARM**" symbol is displayed. When the measured temperature value exceeds the setting High temperature value (the "▲" symbol will flicker the display) or below the setting Low temperature value (the "▼" symbol will flicking display.) the beep will sound one time per 4 seconds.

(l). Press "**ALARM**" key again to exit the alarm function.

4-2 Setting the Thermocouple Type

1. Press "⏻" key to turn on the meter.
2. Press "**TYPE**" key to enter the thermocouple type choices. The currently selected thermocouple type blinks.
3. Press ◀ or ▶ key to select the desired T1, T2, T3 or T4.
4. Press ▲ or ▼ key until the thermocouple type you want appears on the display.
5. Press "↵ " key to store the thermocouple type. You can store individual thermocouple types for T1, T2, T3 and T4, by repeated (3) to (5) procedure.

6. Press "**TYPE**" key again to exit this choices.

4-3 Temperature Measurement

1. Press "⏻" key to turn on the thermometer.
2. Plug the thermocouple (s) into the thermocouple input. If no thermocouple is plugged into the selected input or the thermocouple is "open", the display will show "- - -".

3. Press "**°C / °F**" key to desired temperature scale.
4. Perform measurements by contacting the object being measured with the probe sensor.
5. Read the temperature on the display. The display shows "**OL**" (overload) or "**Un**" (under ranges) when the temperature being measured is outside the meter valid range.

4-4 Maximum (MAX), Minimum (MIN) Recording Measurement

1. Press "**MAX MIN**" key to enter the recording mode, the " REC " symbol is displayed.
2. Press "**MAX MIN**" key to circulate the display of the maximum (REC MAX), minimum (REC MIN), maximum minus minimum (REC MAX-MIN) and current REC) reading.
3. Press "**HOLD**" key to paused recording, the "**H**" symbol is displayed, press "**HOLD**" key again will resume recording.
4. Press "**MAX MIN**" key for 2 seconds to exit this mode.

4-5 Manual Data Memory and Read Function Operation

1. Clear the manual memorized data

(a). Press "⏻" key to turn off the meter.

(b). Press and hold down "**MEM**" key, then press "⏻" key again to turn on the meter, the "**CLr YES no M**" symbol is displayed.

(c). Press ◀ or ▶ key to select "**YES**" symbol is displayed flicking.

(d). Press "↵ " key to clear the manual memorized data.

(e). Press "↵ " key again to exit this mode.

2. Store manual data to memory

(a). Pressing "**MEM**" key one time will store one set of measured data to memory. The "**M**" symbol will disappear and the stored memory address will displayed.

(b). Maximum store memory capacity size is 99 sets.

3. Read the manual store data

(a). Press "**READ**" key to enter the read mode, the "**R**" symbol is displayed.

(b). Press ▲ or ▼ key to read the memories data, the memories data address will be displayed.

(c). Press "**READ**" key again to exit this mode.

4-6 Auto Datalogging Function Operation

1. Clear the Auto datalogged data :

Before entering into the clear memory data mode, users must down load the previous memory data to PC.

(a). Press "⏻" key to turn off the meter.

(b). Press and hold down "**MEM**" key, then press "⏻" key again to turn on the meter, the "**CLr YES no M**" symbol is displayed.

(c). Press "↵" key to enter the clear auto datalogged data mode, the "**CLr YES no AM**" symbol is displayed.

(d). Press ◀ or ▶ key to select "**YES**" symbol is displayed flickering

(e). Press "↵ " key to clear the auto datalogged data and exit this mode.

2. Store Auto datalogging data to memory :

(a). Press "**MEM**" key for 3 seconds to start auto datalogging, the "**A-M**" symbol is displayed, the "**A-M**" symbol according to the interval time will disappear after storing one set of data into the memory.

(b). Press "**MEM**" key for 3 seconds to stop data record, the current block number will be displayed for one second. Press "**MEM**" key for 3 seconds will resume data record, but maximum is divided to 255 memory blocks. Total maximum record capacity size is 36,000 sets data for 4

(b). input thermocouple temperature measurement (100,000 sets data for 1 input record).

(c). When maximum block or maximum capacity is full, the "**FULL**" symbol will be displayed, the data record is auto stopped.

3. Download data to PC :

Please refer to the software manual (CD-ROM) to download the data.

4-7 Disable Auto Power off Function

The meter will automatically enter sleep mode approx. 5, 15 or 30 minutes decided by user setting to save power consumption.

1. **Disable auto power off procedure :**
   (a). Press "⏻" key to turn off the meter.
   (b). Press and hold down "**HOLD**" key then press "⏻" key to turn on the meter, the auto power off function will be disabled, and the auto power off symbol "🕓" will disappear.
2. Auto power off mode is enabled each time you turn on the meter and is automatically disabled bt the follow modes :
   (a). MAX MIN record mode.
   (b). Auto datalogging function is active.
   (c). PC linked.

5. MAINTENANCE

5-1 General Maintenance

1. Clean the meter and accessories with a damp cloth and a mild soap. Do not use abrasives, solvent or alcohol.

5-2 Battery Replacement :

WARNING

To AVOID electrical shock, remove any inputs before replacing the batteries.

1. When operating the meter on batteries, periodically check the battery symbol to determine the remaining battery capacity. The number of black segments decreases as the batteries are used up. When the "  " symbol display starts to flash, correct measurement is no longer possible. Replace the batteries with a fresh set.
2. Take care not to reverse the (+) and (-) polarity when inserting the batteries. Always replace all six batteries together. Do not mix old and new batteries or batteries of different type. Remove the batteries from the meter, if the meter is not to be used for a month or longer.

6. USB INTERFACE, SOFTWARE INSTALLATION AND OPERATION

- ❑ For the detailed instruction, please refer to the content of attached CD-ROM, which has the complete instruction of software operation and relevant information.
- ❑ Protocol : are enclosed within the content of CD-ROM, please open the CD-ROM for details.

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If the unit malfunctions, 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 having been 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 in which wear is not warranted, include but are 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. Purchase Order 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. Purchase Order number to cover the COST of the repair,
2. Model and serial number of theproduct, and
3. Repair instructions and/or specific problems relative to the product.

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- Pumps & Tubing
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- Industrial Water & Wastewater Treatment
- pH, Conductivity & Dissolved Oxygen Instruments

M4945/0810