TRACEABLE® BENCH CONDUCTIVITY METER W/ RS-232 OUTPUT INSTRUCTIONS

92-4163-00

TABLE OF CONTENTS

Redi-Stor™ Probe Storage Solution
(Cat. No. 4170)

Ideal solution for storing conductivity probes. I preserves the probe's cleanliness, eliminates growths found when storing in only water. Maintains the probe for immediate use with no conditioning. 16 ounce bottle.

SPECIFICATIONS

Meter

Conductivity Range: (range selecting automatic & manual)	0.01 to 19.99 µS (micromhos) 0.1 to 199.9 µS (micromhos) 1 to 1999 µS (micromhos) 0.01 to 19.99 m S (mhos) 0.1 to 199.9 m S (mhos)
Accuracy:	±0.3% + 1 digit
Resistivity Range: (range selecting automatic & manual)	0.001 to 1.999 Megohms 0.01 to 19.99 Megohms
Accuracy:	±0.3% + 1 digit
Total Dissolved Solids: (range selecting automatic & manual)	0.01 to 19.99 mg/L (milligrams per liter) 0.1 to 199.9 mg/L (milligrams per liter) 1 to 1999 mg/L (milligrams per liter) 0.01 to 19.99 g/L (grams per liter) 20.0 to 199.9 g/L (grams per liter)
Accuracy:	±0.3% + 1 digit
Salinity:	2.0 to 42.0 (In accordance with International Oceanographic data, ref UNESCO, IASPO (Technical Papers in Marine Science, No. 36-1981))
Accuracy:	±0.5%
Concentration:	0.000 to 9999
Temperature Range:	-30.0 to 130.0° Celsius, -22.0 to 266.0° Fahrenheit
Accuracy:	±0.3° Celsius
Calibration:	4 points are available for calibrating to known standards. Cell constant and the temperature coefficient may also be set.
Temperature Compensation:	Automatically temperature compensated to the international standard of 25° Celsius, temperature may also be compensated manually.
Temperature Compensation Range:	0.0 to 50.0° Celsius.

Temperature Coefficient:	Default value set at 2.000% per degree Celsius. Fully adjustable in the range of 0.000 to 5.000% per degree Celsius.
Output:	Analog— Range of ±200.0 mV, resolution of 0.2 mV, accuracy of ±0.3 mV Digital— RS-232 Baud Rate = 1200, Data Format = 1 start bit/8 data bits/2 stop bits/no parity bits, Voltage Levels = ±5V.
Power:	Continuous AC operation with supplied adaptor or optional 9-volt alkaline battery (supplied) for portable use

Probe

Glass Diameter:	0.472 inches (12 mm)
Glass Length:	4.75 inches (120 mm)
Weight:	3.1 ounces (88 grams)
Cable Length:	72 inches (183 cm)
Range:	0.05 to 200,000 micromhos
Cell Constant (K-factor):	1
Temperature Compensation:	Achieved with internal thermistor
Solution Contact Construction:	Glass and Platinum (guard: acrylic with rubber o-rings)

One-Shot Traceable® Conductivity Calibration Standards (Cat. No.'s 4174-4179 & 4172)

Single-use standards identical to the above bottles; however, calibration is made in the standard's vial. These single-use standards eliminate concerns about external container contamination. Extra large opening 1¾" diameter and extra large depth 3½" allow probe calibration to take place in the standard's polyethylene container. Accommodates virtually all conductivity probes. Supplied as a pack of six One-Shot™ standards. Each standard contains 100 ml.

Cat. No.	micromhos	Megohms	TDS/PPM
4175	10	0.1	6.6
4176	100	0.01	66
4177	1000	0.001	660
4174	1413	0.0007	933
4178	10000	0.0001	6600
4179	100000	0.00001	66000
4172	Assortment (1 of each of the above values)		

Replacement Glass Probe (Cat. No. 4062)

Probe with K=1.0. Glass probe identical to probe supplied with the unit. Range of probe is from 0.05 micromho to 200,000 micromhos.

Accessory Plastic Probe (Cat. No. 4061)

Probe with K=1.0. Plastic probe is similar to the probe supplied with the unit except the body of the probe is plastic. Range of probe is from 0.1 micromho to 200,000 micromhos.

BATTERY REPLACEMENT

Erratic readings, no display, or "BAT" on the display are all indications that the battery needs to be replaced or that the battery is not making proper contact. Slide the battery cover off in the direction indicated by the arrow. Replace the battery with a new 9-volt alkaline battery. Make certain that the battery is inserted properly and that proper contact is made. Low battery power can occasionally cause any number of "apparent" operational difficulties.

ACCESSORIES

Traceable® Conductivity Calibration Standards (Cat. No.'s 4065-4069 & 4173)

Traceable® Conductivity Calibration Standards are traceable to standards provided by National Institute of Standards and Technology (NIST). Traceable® standards are 100% compatible with all makes of conductivity equipment and 100% compatible with all conductivity accreditation analysis requirements. Each bottle is labelled for calibrating conductivity (micromhos), resistivity (Megohms), and total dissolved solids (parts per million). A certificate indicating traceability to standards provided by NIST is provided on each bottle along with complete calibration instructions. Supplied in a 16 ounce brown glass bottle.

Control Cat. No.	micromhos	Megohms	TDS/PPM
4065	10	0.1	6.6
4066	100	0.01	66
4067	1000	0.001	660
4173	1413	0.007	933
4068	10000	0.0001	6600
4069	100000	0.00001	66000

INTRODUCTION

This Traceable® Digital Conductivity Meter is a precision instrument with a state-of-the-art microcomputer processor. It's unique software program allows four calibration points to ensure complete accuracy over the entire measurement range. All calibration data is saved when the unit is turned off. It has both automatic and manual temperature compensation. The unit displays results in conductivity (micromhos/cm), resistivity (Megohms), total dissolved solids (milligrams per liter), salinity, concentration and temperature (Celsius/Fahrenheit). Units are: (micromhos = microsiemens), (micromhos = 1/Megohms), and (Megohms = 1/micromhos). The probe contains platinum electrodes and a thermistor.

DISPLAY SYMBOLS

µS/cm	Micromhos/microsiemens per centimeter
m S/cm	Mhos/siemens per centimeter (multiply displayed value by 1000 to arrive at micromhos/microsiemens)
m S/ m	Mhos/siemens per meter (see "Verifying Cell Constant")
MΩ/cm	Megohms per centimeter
MΩ/ m	Megohms per meter (see "Verifying Cell Constant")
TDS mg/L	Total dissolved solids in milligrams per liter
TDS g/L	Total dissolved solids in grams per liter
SALINITY	Salinity
C	Concentration
°C	Temperature
K	Cell constant (K-factor)
S/cm	Units per centimeter (see "Verifying Cell Constant")
S/ m	Units per meter (see "Verifying Cell Constant")
CAL	Flashing, indicates arrow keys have been used but the ENTER key has not yet been pressed
CAL	Not flashing, indicates the instrument has been calibrated
%/°C	Temperature coefficient (percent per degree Celsius)
CHK	Instrument is in check function and calibration data is being displayed
—	Blinking dash indicates auto-ranging has been disabled

(See Display Messages section for additional messages)

KEYPAD QUICK REFERENCE

⇩ ⇧	Calibration controls used to adjust the display to a known value. Each press of the arrow key increases/ decreases the display.
ENTER	After using the arrow keys to adjust the display to a known solution or a known factor, this key is used to enter the displayed value as a calibration point. (If the arrow keys are not in immediate use, this key will act to disable/enable the Auto-Ranging feature.)
CHECK	Displays any calibration data that has been entered.
K	Displays the cell constant (K-factor). The default value is K=1.000 S/cm. Repetitive presses toggle between units per centimeter and units per meter.
%/°C	Displays the temperature coefficient. The default temperature coefficient value is 2.000% per degree Celsius. This value can be changed by manually entering a known value.
SEND	Transmits data to the printer/computer.
MODE	Changes the measurement mode of the instrument to read Conductivity (uS/cm), Total Dissolved Solids (TDS mg/L), Resistivity (MΩ/cm), Concentration (C), Salinity or Temperature.

GENERAL OPERATING TECHNIQUES

1. Use very clean beakers/flasks.

2. Avoid cross-contamination between measurements by rinsing the probe in deionized/distilled water and by rinsing the probe in the solution to be tested.

3. For best results the solution temperature should remain constant during the readings. The ideal temperature is 25.0° C (77.0° F). See "Accessories" section for information on the Conductivity Bath.

4. Make certain to sustain flow through the probe (or move the probe through the solution in a stirring motion) while making your readings. Stirring helps prevent polarization, ensures that the solution is well mixed, and helps to maintain a uniform temperature within the solution.

RE-PLATINIZING

Although this meter allows for re-platinization of the conductivity cell, user re-platinization of the conductivity cell is not recommended and will void your factory warranty. If you feel your conductivity probe requires re-platinization, return it for factory service. See "Warranty, Service, or Recalibration".

Steps for re-platinizing are as follows:

Do not perform this procedure unless you are absolutely familiar with re-platinization techniques and the proper handling, safety, and disposal procedures required with the chemicals involved in this procedure. Extreme caution should be used when handling hazardous chemicals.

The AC adaptor is required for use when performing re-platinization.

1. De-grease the conductivity cell by washing it in chromic acid (glass-platinum cells only). Other conductivity cells should be de-greased by washing in a dilute solution of liquid detergent.

2. Rinse in deionized water.

3. Rinse with 1 Molar nitric acid.

4. Wash well with deionized water.

5. Prepare a platinizing solution by dissolving 1.0g of chloroplatinic acid and 0.015g of lead acetate in 50mL of distilled water.

6. With the cell connected to the meter, immerse it in the platinizing solution ensuring that both plates are completely immersed.

7. Select "Plate 1" with the platinizing switch located on the back of the unit. "PLAT" should appear on the display. After 30 seconds, select "Plate 2" with the platinizing switch, reversing the polarity every 30 seconds. Continue to do this for 10 minutes.

The plates should have an even coating after 2 minutes; if not, begin the procedure again starting at step 1.

8. Wash in deionized water.

9. Repeat step 7 using a solution of sulfuric acid for the same period (10 minutes) to obtain a more adherent coating.

10. Soak the cell in distilled water for 48 hours before use.

DISPLAY MESSAGES

BAT	Indicates that the battery needs to be replaced.
E6 or E7	Calibration point error. Clear all calibration data and start calibration over. Make certain that the value you are calibrating to is correct and verify the K-factor. See "Troubleshooting".
E4	Factory calibration lost. See "For Service, Repair, or Recalibration".
E8	Serial Code Malfunction. See "For Service, Repair, or Recalibration".
Sc or Oc	Temperature probe (thermistor) short or open probe.
-L or -H	Salinity measurement is below or above the measurement range.

TROUBLESHOOTING

If it appears that the meter is not functioning properly or is giving incorrect readings follow the steps listed below:

1. Clear all calibration data. See "Clearing Calibration Data".

2. Verify the cell constant. See "Verifying the Cell Constant (K-factor)".

3. Disconnect the probe and re-connect it verifying that the probe's keyed connector plug has been properly aligned with the meter's socket. Make certain that the probe connector has not been inserted into the meter socket upside-down.

4. Verify that the solutions being used for calibration are Traceable® Conductivity Calibration Standards. See "Accessories" for the available Traceable® Conductivity Calibration Standards.

WARRANTY, SERVICE, OR RECALIBRATION

For warranty, service, or recalibration contact:

TRACEABLE® PRODUCTS
12554 Old Galveston Rd. Suite B230, Webster, Texas 77598 USA
Ph. 281 482-1714 • Fax 281 482-9448
E-mail support@traceable.com • www.traceable.com

Traceable® Products is ISO 9001:2018 Quality-Certified by DNV and ISO/IEC 17025:2017 accredited as a Calibration Laboratory by A2LA.

5. Be aware that very pure water will pick-up contaminates from the air in a relatively short period of time. In the measurement of extremely pure water consider shielding the measuring vessel. Slight stray electrical signals can change the readings.

6. When finished using the probe, always rinse it in distilled water and store dry, in distilled water, or in Redi-Stor™ Probe Storage solution. Solutions which are allowed to dry on the probe will eventually block out active sites on the internal platinum electrode, the surface area will be reduced, and a new probe may be required. Do not touch the internal platinum electrode, if the surface is damaged linearity will be affected, specifically in the high conductivity readings, and difficulty may be found in achieving high readings.

MAKING MEASUREMENTS (WITH OR WITHOUT CALIBRATION)

1. Connect the probe by placing the connector plug into the keyed socket located on the back of the unit labelled "Conductivity Cell". Make certain that the plug is inserted correctly, do not insert the plug incorrectly and force it.

2. Plug the supplied AC power connector into the socket located at the back of the unit and plug the adaptor into a proper AC power source. Optionally, install the supplied 9-volt alkaline battery.

3. Set the ON/OFF toggle switch located at the back of the unit to the ON position.

4. Make certain that the PLATINIZING toggle switch located on the back of the unit is set to the OFF position.

5. Place the unit in the mode required (conductivity, resistivity, TDS, salinity, concentration or temperature) by pressing the MODE key.

6. Place the probe in the sample solution.

7. Read the answer on the digital display while stirring the probe in the solution.

8. Set the ON/OFF toggle switch located on the back of the unit to the OFF position when finished.

CALIBRATION

Prior to calibrating the meter make certain that all previous calibration data has been erased. See "Clearing Calibration Data".

The unit may be calibrated the following ways:

1. To known solutions— *recommended*
2. To known cell constants— *advanced*
3. To unknown temperature coefficients— *advanced*
4. To known temperature coefficients— *advanced*

Calibration is achieved by using the arrow keys to adjust the display to read to a known value. The ENTER key is used to store a value as a calibration point. Four calibration points may be entered to ensure accuracy over the entire measurement range.

The default of the cell constant is K=1.000 S/cm and the default of the temperature coefficient is 2.000% per degree Celsius. All readings displayed are automatically temperature compensated and corrected to the internationally accepted standard of 25.0° Celsius. Non-temperature compensated readings may also be made, see "Absolute Conductivity Measurement".

The probe supplied has a cell constant (K-factor) of approximately K=1.000 S/cm. In actual manufacturing the cell constant is always slightly less than or greater than 1.000. For this reason **it is strongly recommended to use a known *solution* to calibrate the instrument** in order to achieve accurate measurements. During calibration to known solutions an electronic adjustment is made to enable the instrument to read and display the correct accurate result without any additional manual calculations.

Calibrate in the measurement mode (conductivity, resistivity, or concentration) you intend to use. For most accurate results choose a known calibration solution with a value as close as possible to your unknown. Do not calibrate in a 1000 unit range and read samples in a 10 unit range. If possible the calibration solution and your unknown should be at the same temperature. The ideal temperature is 25.0° C (77.0° F).

All calibration data is saved when the unit is turned off.

Using with a Printer

1. Connect a printer (set at 1200 Baud) to the meter via the RS-232 port located on the back of the meter.

2. To printout the reading being displayed, press and release the SEND key.

Note: Upon connection to a printer, the first time the SEND key is pressed, the following will printout:

DATE_ _ _ _ _ _ _ _ _ _

OPERATOR _ _ _ _ _ _ _ _ _ _

SAMPLE_ _ _ _ _ _ _ _ _ _

COND = ###.# µS/cm T = ##.# C

3. Each subsequent press of the SEND key will printout the reading being displayed on the meter and temperature only. To printout a new identifier (DATE, OPERATOR, and SAMPLE), press and **hold** the SEND key.

Using with a computer

1. Connect the meter to a computer by connecting a cable from your computer's COM port to the RS-232 port located on the back of the meter.

2. Data may be read using any data acquisition software set-up at the proper baud rate and data bit settings. Each line of data that is sent is terminated with a CR LF (carriage return line feed). All characters are ASCII printable alphanumeric.

3. To send the current readings to the computer:
   A. Press and release the SEND key, -or-
   B. Using your computer software, send a command "RD" to the meter.

TEMPERATURE MEASUREMENT

1. Press the MODE key until you enter the temperature mode indicated by "°C" on the display. The temperature mode is after the Concentration (c) mode.

2. To toggle between °C and °F, press the ENTER key.

Note: When displaying temperature in Celsius "°C" appears on the display, when displaying temperature in Fahrenheit "°C" no longer appears on the display.

ABSOLUTE CONDUCTIVITY MEASUREMENT

Non-temperature compensated conductivity measurements or "absolute conductivity" may be read by setting the Temperature Coefficient to zero (0.000 %/°C). See "Calibrating to a Known Temperature Coefficient".

RECORDER OUTPUT

1. Plug the recorder into the red and black 4 mm sockets at the top of the unit. The instrument output specifications to the recorder are as follows:

Mode	Range (mV)	Display Reading	Recorder (mV)
Conductivity	0 to 200	1000 µs/cm	100.0
TDS	0 to 200	666 mg/L	66.6
Resistivity	0 to 200	35.0 MΩ/cm	35.0
Salinity	0 to 200	10.0	10.0
Temperature	±200	25.0° C	25.0

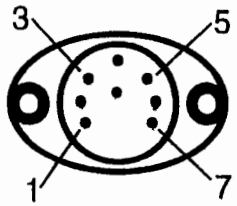
Resolution of 0.2 mV, and an accuracy of ±0.3 mV.

RS-232 OUTPUT

RS-232 output specifications are as follows:

Baud Rate = 1200
Data Format = 1 start bit, 8 data bits, 2 stop bits, no (0) parity bits
Voltage Level = ±5V

Pin 1 = Tx
Pin 3 = Rx
Pin 5 = CTS
Pin 7 = GND



CALIBRATION WITH KNOWN SOLUTIONS— *RECOMMENDED*

1. Erase any existing calibration data. See "Clearing Calibration Data".

2. Insert the probe into a known solution.

3. Press the MODE key to place the unit in the measurement mode desired: Conductivity (uS/cm), Resistivity (MΩ/cm) or Concentration (c). (Calibration while in the TDS or Salinity mode is not possible.)

4. Press the arrow keys to adjust the value on the display to the value of the known solution. "CAL" will flash on the display.

NOTE: Each press of the arrow key increases/decreases the display by 1 digit. To rapidly increase/decrease the display, press and hold down the arrow key, the least significant digit is changed until ten digits have been counted, then the next significant digit, etc..

5. With the correct value on the display, press the ENTER key to enter the value as a calibration point.

The instrument is now calibrated. This procedure may be repeated three (3) additional times (total of four calibration points) using different known solutions to insure accuracy over the entire measurement range.

NOTE: Once calibration has been made in the desired mode, you are not able to calibrate in any other measurement mode or change the cell constant until you have cleared all calibration data. See "Clearing Calibration Data".

6. To now read a sample, see "General Operating Techniques" and "Making Measurements".

CALIBRATION WITH A KNOWN CELL CONSTANT (K-FACTOR)— *ADVANCED*

If the cell constant (K-factor) is already known for a particular probe, it may be entered directly. The cell constant may be entered in units per centimeter (ie: 1.000 S/cm) or units per meter (ie: 100.0 S/ m). Most cell constants are expressed in units per centimeter. **The cell constant for the probe supplied with this unit is approximately 1.000 S/cm.**

1. Erase any existing calibration data. See "Clearing Calibration Data".

2. Press the K key. "K" will appear on the bottom right corner of the display. Each press of the K key toggles between units per centimeter (ie: 1.000 S/cm) and units per meter (ie: 100.0 S/ m).

3. Press the arrow keys to adjust the value on the display to the value of the known cell constant. The cell constant has now been set.

4. Press the MODE key to return the unit to the measurement mode.

5. To now read a sample, see "General Operating Techniques" and "Making Measurements".

CALCULATING AND CALIBRATING TO AN UNKNOWN TEMPERATURE COEFFICIENT—*ADVANCED*

All readings displayed are automatically temperature compensated and corrected to the internationally accepted standard of 25.0° Celsius. The default temperature coefficient to achieve this temperature correction is 2.000% per degree Celsius. This is quite satisfactory for nearly all applications particularly where the temperature of test solutions is unlikely to fluctuate. For high accuracy measurement of solutions where the temperature is changing, perform the following procedure.

1. Erase any existing calibration data. See "Clearing Calibration Data".

2. Place the probe in a solution whose temperature coefficient you would like to calculate.

3. Press the %/° C key, this will display the current temperature coefficient. The default temperature coefficient of 2.000 %/° C.

4. Press the ENTER key, the "%/° C" symbol will begin to flash.

5. Raise or lower the temperature of the solution by at least 10° Celsius. (The temperature may be monitored by selecting temperature using the MODE key)

6. Return to the temperature coefficient display by pressing the %/° C key then press the ENTER key. The calculated temperature coefficient will be displayed. This value is now set in the unit.

7. Press the MODE key to return to the measurement mode.

8. To now read a sample, see "General Operating Techniques" and "Making Measurements".

4. Sensitivity in the Megohm range can be illustrated by observing that in the micromho range there are five possible different readings between 0.0 and 0.5. In the same measurement range in Megohms, there are 1,800 different possible readings. Although no readings are possible between 0.0 and 0.1 micromhos, there are 1000 different readings possible in the Megohm range. This increased sensitivity makes the Megohm range appear to be less stable.

To make measurements, see "General Operating Techniques" and "Making Measurements".

SALINITY MEASUREMENT

Salinity measurements are made in accordance with International Oceanographic data, ref UNESCO, IASPO Technical Papers in Marine Science, No. 36-1981.

Salinity is used for oceanographic reporting, salinity is not used for measuring salt in food. Refer to the above paper for more information concerning salinity measurement.

CONCENTRATION MEASUREMENT

This meter can be calibrated for concentration. If the conductivity of your solution changes in relationship to the increase or decrease of some know substance, then you can use the concentration mode to report your answers in whatever units you desire.

Concentration Example

If you know the following:

1. Solution 1 has 10 grams of "Substance A".
2. Solution 2 has 250 grams of "Substance A".
3. The conductivity of the solution is changed in a linear relationship to the quantity of "Substance A" that is present.

You can then calibrate in the Concentration mode as follows:

1. For Solution 1 calibrate to a value of 10.
2. For Solution 2 calibrate to a value of 250.

Once calibrated, you would be able to measure your unknowns and report your answers in "grams of Substance A".

TOTAL DISSOLVED SOLIDS MEASUREMENT

In the TDS/mg/L mode the meter automatically multiplies the conductivity (micromho) reading by 0.666 to display the TDS/mg/L reading. Mg/L (milligrams per liter) is the same value as PPM (parts per million). The user should be aware that this fixed factor is applicable in most cases, but water from different sources could require a factor as low as 0.550 and as high as 0.800. In those cases where this fixed factor of 0.666 is not applicable, the user should first establish the appropriate factor. Once established, make readings in the conductivity (micromho) range, and multiply the conductivity reading by the appropriate factor.

RESISTIVITY MEASUREMENT

Megohm is a measurement of resistance. Resistivity is the inverse of conductivity (Megohm = 1/micromho)

1. Pure water and other solutions above 2 Megohms are very difficult to maintain because of contamination. High purity water is difficult to keep pure for even a short period of time. Air, plastic containers, glass vessels, etc. can contaminate the water and produce variations in purity readings. Many users take high and low readings of extremely pure water and average them for reporting purposes.

2. Water systems that utilize an in-line meter to make measurements measure water that has not been affected by any outside sources of contamination such as air, plastic containers, glass vessels, etc. For measurement/verification of very pure water from water systems it is recommended that you use an accessory flow-thru cell or the accessory Universal Flow-Thru Adaptor to reduce outside contamination.

3. Expect constant display changes in the Megohm range. Slight stray electrical signals can change the readings. Any stray signals produced by equipment or even your hand will cause significant changes. For precise results, the measuring vessel should be shielded. When making readings in the higher Megohm range, do not hold the probe or unit in your hand.

CALIBRATING TO A KNOWN TEMPERATURE COEFFICIENT—*ADVANCED*

If the temperature coefficient of the solution is already known either by previously using the technique above or by some other means, it may be entered directly.

1. Erase any existing calibration data. See "Clearing Calibration Data".

2. Press the %/° C key.

3. Press the arrow keys to adjust the value on the display to the known temperature coefficient, the temperature coefficient has now been set.

4. Press the MODE key to return to the measurement mode.

5. To now read a sample, see "General Operating Techniques" and "Making Measurements".

REVIEWING CALIBRATION DATA

1. Any time after the unit has been calibrated press the CHECK key once. "CHK" will appear on the display and in an alternating "billboard" readout, the display will first show the calibration number and then the known solution calibration.

An example of the readout:

1	(first calibration)
100 µS	(known solution calibration setting)
2	(second calibration)
250 µS	(known solution calibration setting)
1	(first calibration)... and so on

If no calibration data has been entered, "0" will appear on the far left of the display and the unit will return to the measurement mode.

2. Return to the measurement mode by pressing the MODE key.

CLEARING CALIBRATION DATA

If the unit has been calibrated, "CAL" will appear in the top left corner of the display.

To clear previously entered calibration data, perform the following steps:

Note: The cell constant (K-factor) is not calibration data and will not be cleared. The temperature coefficient will be reset to the default value of 2.000%.

1. Press the CHECK key, "CHK" will appear on the top right corner of the display.

2. Press and hold the ENTER key for 10 seconds, "0" zero will be displayed to the far left of the display to indicate that all calibration data has been cleared.

3. Release the ENTER key to return to the measurement mode.

DISPLAYING THE TEMPERATURE COEFFICIENT

1. Press the %/°C key once to display the temperature coefficient, "%/°C" will appear on the bottom right side of the display. (The default value is 2.000%.)

2. Return to the measurement mode by pressing the MODE key.

VERIFYING THE CELL CONSTANT (K-FACTOR)

The cell constant (K-factor) may be expressed in units per centimeter (ie: 1.000 S/cm) or units per meter (ie: 100.0 S/ m). Most cell constants are expressed in units per centimeter. The cell constant for the probe supplied with this unit is approximately 1.000 S/cm.

1. Press the K key to display the cell constant (K-factor). "K" will appear on the bottom right corner of the display.

Important Note: *The cell constant (K-factor) should always be a value greater than zero (0) and, unless you are using a specialty accessory probe, should be set at 1.000 S/cm.* If an incorrect value is displayed for the cell constant see the "Calibration with a Known Cell Constant (K-factor)" section.

2. Return to the measurements mode by pressing the MODE key.

AUTO-RANGE/HOLD-RANGE FEATURE

The instrument automatically selects the most appropriate range for the current reading in order to display the best accuracy and resolution. The unit automatically defaults to this Auto-Ranging function.

Hold-Range locks in a specific range. (An example of Hold-Range in use would be a reading of 1 µS in the Hold-Range of 0 to 1999 µS, whereas in the Auto-Ranging function the reading displayed might be 1.37 µS.)

To disable Auto-Ranging and enable the Hold-Range feature:

1. Place the probe in a solution which is in the range you wish to hold. (The unit does not have to be calibrated to enable the Hold-Range feature.)

The ENTER key behaves as a toggle to enable/disable the Auto-Ranging and Hold-Range functions when the meter is in a measurement mode and the arrow keys are not in immediate use.

2. Press and hold the ENTER key for approximately 6 seconds, a blinking bar to the left of the value on the display indicates that Auto-Ranging is disabled and the instrument will hold the range it is in.

3. To place the unit back in Auto-Ranging, press and hold the ENTER key for approximately 6 seconds, the flashing bar to the left of the value will no longer appear on the display.

CONDUCTIVITY MEASUREMENT

Micromho is a measurement of conductance. A micromho is the same as a microsiemen (1 micromho = 1 microsiemen).

Be aware that very pure water will pick-up contaminates from the air in a relatively short period of time and yield progressively higher micromho readings.

To make measurements, see "General Operating Techniques" and "Making Measurements".