Congratulations !

You have purchased the latest in Handheld Conductivity-Salinity-Temperature instrumentation. We trust that your new **MC-84** will give you many years of reliable service.

The **MC-84** is a breeze to operate. This manual has been designed to help you get started, and also contains some handy application tips. If at any stage you require assistance, please contact either your local TPS representative or the TPS factory in Brisbane.

The manual is divided into the following sections:

1. **Table of Contents**
   Each major section of the handbook is clearly listed. Sub-sections have also been included to enable you to find the information you need at a glance.

2. **Introduction**
   The introduction has a diagram and explanation of the display and controls of the **MC-84**. It also contains a full listing of all of the items that you should have received with your **MC-84**. Please take the time to read this section, as it explains some of items that are mentioned in subsequent sections.

3. **Main Section**
   The main section of the handbook provides complete details of the **MC-84**, including operating modes, calibration, troubleshooting, specifications, and warranty terms.

4. **Appendices**
   Appendices containing background information and application notes are provided at the back of this manual.

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Model MC-84
Conductivity-Salinity-Temp. Meter

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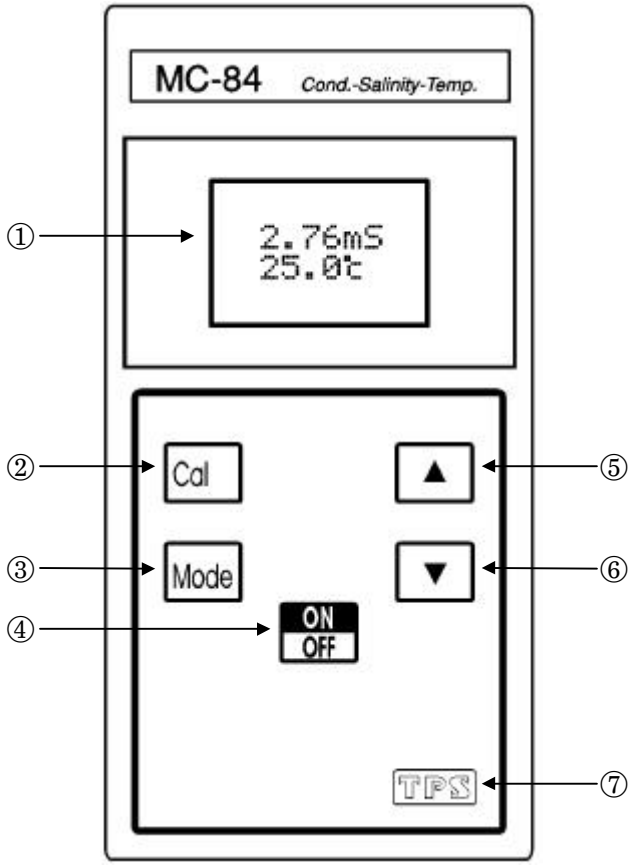
1. Introduction

1.1 MC-84 Display and Controls



① **Display**

16 character alpha-numeric display. Shows Conductivity/Salinity and temperature simultaneously. A unique “Large Digit” mode nearly doubles the size of the digits. See section 2.1. User-friendly prompts and error messages are also provided.

② Cal

Used to calibrate Conductivity, Salinity and Temperature. See sections 3.1, 4.1 and 5.

Used to select k=10 or k=0.1 sensor at turn-on. See section 6.

③ Mode

Switches between Conductivity/Salinity and Temperature modes.

Hold this key for 2 seconds to toggle between Conductivity and Salinity modes.

See section 2.2.

④ ON OFF

Switches the **MC-84** on and off.

Hold this key for 3 seconds to invoke Battery Saver mode. See section 6.

⑤ ▲ and ⑥ ▼

These keys toggle the **MC-84** between Large Display mode and Dual Display mode. See section 2.1.

NOTE: The digits in Large Display mode are made by combining the two rows of the display. This results in a small gap approximately half way up the digits.

⑦ TPS

The TPS logo. Your guarantee of **T**echnology, **P**recision and **S**ervice, in electrochemistry.

1.2 Unpacking Information

Before using your new **MC-84**, please check that the following accessories have been included:

	Part No
1. **MC-84** Conductivity-Salinity Temperature Instrument	122158
2. k=1/ATC/Temperature Electrode, plastic body	122201
3. 2.76mS/cm Conductivity Standard, 200mL	122306
4. 2ppK TDS Standard, 200mL	122307
5. 9V Battery	130026
6. **MC-84** Handbook	130050

Options that may have been ordered with your **MC-84**:

1. k=10/ATC/Temperature Electrode, plastic body	122220
2. 36ppK Salinity Standard, 1L	122304
3. Low volume, k=1/ATC/Temp sensor, glass body	122216
4. k=0.1/ATC/Temperature Electrode, glass body	122229
5. NiCad Rechargeable battery and charger	130007
6. Hard Plastic Carry Case	130057

1.3 Specifications

	Ranges			Resolution		Accuracy
Conductivity	k=0.1 cell	0 to 2.000	µS/cm	0.001	µS/cm	±0.2% of full scale of selected range
		0 to 20.00	µS/cm	0.01	µS/cm	
		0 to 200.0	µS/cm	0.1	µS/cm	
		0 to 2000	µS/cm	1	µS/cm	
		0 to 10.00	mS/cm	0.01	mS/cm	
	k=1 cell	0 to 20.00	µS/cm	0.01	µS/cm	
		0 to 200.0	µS/cm	0.1	µS/cm	
		0 to 2000	µS/cm	1	µS/cm	
		0 to 20.00	mS/cm	0.01	mS/cm	
		0 to 100.0	mS/cm	0.1	mS/cm	
	k=10 cell	0 to 200.0	µS/cm	0.1	µS/cm	
		0 to 2000	µS/cm	1	µS/cm	
		0 to 20.00	mS/cm	0.01	mS/cm	
		0 to 200.0	mS/cm	0.1	mS/cm	
		0 to 1000	mS/cm	1	mS/cm	
Salinity	k=0.1 cell	0 to 1.000	ppM	0.001	ppM	±0.3% of full scale of selected range
		0 to 100.0	ppM	0.01	ppM	
		0 to 1000	ppM	1	ppM	
		0 to 10.00	ppK	0.01	ppK	
		0 to 50.0	ppK	0.1	ppK	
	k=1 cell	0 to 10.00	ppM	0.01	ppM	
		0 to 100.0	ppM	0.1	ppM	
		0 to 1000	ppM	1	ppM	
		0 to 10.00	ppK	0.01	ppK	
		0 to 50.0	ppK	0.1	ppK	
	k=10 cell	0 to 100.0	ppM	0.1	ppM	
		0 to 1000	ppM	1	ppM	
		0 to 10.00	ppK	0.01	ppK	
		0 to 100.0	ppK	0.1	ppK	
		0 to 500	ppK	1	ppK	
Temperature	-10.0 to 120.0 ^{o}C (Sensor limit 60 ^{o}C)			0.1 ^{o}C		±0.2 ^{o}C

Temperature Compensation	: Automatic, 0 to 50.0 °C	
Conductivity Sensor Span Range	: 75 to 133 %	
Temperature Sensor Offset Range	: -10.0°C to +10.0°C	
Auto Standard Recognition	: Cond.	: 150µS/cm, 2.76mS/cm, 58.0mS/cm
	Salinity	: 69.5ppM, 2.00ppK, 36.0ppK
Display	: 16 Character alphanumeric LCD, with full text prompts and error messages.	
Power	: 9V Alkaline Battery for 70 hours operation. Optional NiCad battery/charger pack available.	
Battery Saver	: On : Auto switch-off after 5 minutes	
	Off : Continuous use	
Dimensions	: 157 x 78 x 35 mm	
Mass	: Instrument only	: Approx 200g
	Full Kit	: Approx 1.5kg
Environment	Temperature	: 0 to 45 °C
	Humidity	: 0 to 90 % R.H.

2. Operating Modes

2.1 Display Modes

The **MC-84** has two display modes:

1. Dual Display mode
2. Large Display mode.

Press the ▲ or ▼ keys to toggle between these two modes.

2.2 Readout Modes

The **MC-84** has three readout modes.

In Dual Display mode, the three readout modes are:

1. **Conductivity**
   Displays Conductivity and Temperature readings simultaneously.
   eg : **2.76mS/cm**
   25.0°c
2. **Salinity**
   Displays Salinity and Temperature readings simultaneously.
   eg : **2.00ppK**
   25.0°c
3. **Temperature**
   Displays just the temperature reading.
   eg: **25.0°c**

In Large Display mode, the three readout modes are:

1. **Conductivity**
   Displays just the Conductivity reading in large digits.
2. **Salinity**
   Displays just the Salinity reading in large digits.
3. **Temperature**
   Displays just the temperature reading in large digits.

Press and HOLD the Mode key for 3 seconds to alternate between Conductivity and Salinity readout modes.

Press the Mode key momentarily to alternate between Conductivity/Salinity and Temperature readout modes.

Note: The decimal point is replaced by a ∗ if a Conductivity, Salinity or Temperature calibration has failed (see sections 3.1, 4.1 and 5), if the unit is initialised (see section 8), or if the unit has lost its factory calibration (see section 9.1).

3. Conductivity Calibration

3.1 Calibration

1. Press the ON/OFF key if the meter is not already switched on.
2. Press the Mode key until the meter is in Conductivity mode (see section 2.2).
3. Plug the Conductivity electrode into the **Sensor** socket. If a k=10 or k=0.1 sensor is being used, ensure that it has been correctly selected (see section 6).
4. Rinse the Conductivity electrode in distilled water. Shake off as much water as possible. Blot the outside of the electrode dry. DO NOT BLOT THE ELECTRODE WIRES.
5. **Zero Calibration**
   Let the electrode dry in air.
   When the reading has stabilised at or near zero, press and hold the Cal key for 2 seconds.
   The ∗ will not be removed after a zero calibration.
6. **Standard Calibration**
   Allowable Conductivity standards are 150µS/cm, 2.76mS/cm and 58.0mS/cm, and should be selected according to your range of interest.
   Place the electrode into a sample of Conductivity standard, so that it is immersed at least to the vent hole in the white plastic cover. The white plastic cover MUST be in place for correct readings.
   DO NOT place the electrode directly into the bottle of standard. Discard the used sample of standard after use. It is advisable to use a narrow sample vessel to minimise the use of standard solution.
   When the reading has stabilised, press and hold the Cal key for 2 seconds to calibrate.
   The ∗ will now be replaced by a decimal point, if calibration was successful.
7. The **MC-84** is now calibrated for Conductivity and is ready for use.

3.2 Calibration Notes

1. A Zero calibration should be performed at least monthly. In low conductivity applications (where a zero error is particularly significant) a zero calibration may have to be done weekly.
2. A Standard calibration should be performed at least weekly. Of course, more frequent calibration will result in greater confidence in results.
3. Conductivity and Salinity calibration data is stored separately in memory. Ensure that the **MC-84** has been correctly calibrated for the mode in which it will be used. The **MC-84** does not require recalibration when alternating between Conductivity and Salinity modes, providing the instrument has been correctly calibrated for both.
4. All calibration information is retained in memory when the **MC-84** is switched off, even when the battery is removed.

3.3 Calibration Messages

1. If a Zero calibration has been successfully performed, the **MC-84** will display the following message.

   Zero
   Cal. OK

2. If a Standard calibration has been successfully performed, the **MC-84** will display the following message, and then the span of the electrode.

   eg: **Span** then: **Span**
   Cal. OK **100.0%**

3. If a Standard calibration has failed, the **MC-84** will display the following message, and then the failed span value of the electrode.

   eg: **Span** then: **Span** or: **Unknown**
   Cal.Fail **60.0%** **Standard**

   Note that the decimal point is replaced by a ∗ when a Standard calibration fails.

4. Salinity Calibration

4.1 Calibration

1. Press the ON/OFF key if the meter is not already switched on.
2. Press the Mode key until the meter is in Salinity mode (see section 2.2).
3. Plug the Conductivity electrode into the **Sensor** socket. If a k=10 or k=0.1 sensor is being used, ensure that it has been correctly selected (see section 6).
4. Rinse the Conductivity electrode in distilled water. Shake off as much water as possible. Blot the outside of the electrode dry. DO NOT BLOT THE ELECTRODE WIRES.
5. **Zero Calibration**
   Let the electrode dry in air.
   When the reading has stabilised at or near zero, press and hold the Cal key for 2 seconds.
   The ∗ will not be removed after a successful zero calibration.
6. **Standard Calibration**
   Allowable Salinity standards are 69.5ppM, 2.00ppK, and 36ppK, and should be selected according to your range of interest.
   Place the electrode into a sample of Salinity standard, so that it is immersed at least to the vent hole in the white plastic cover.
   DO NOT place the electrode directly into the bottle of standard. Discard the used sample of standard after use. It is advisable to use a narrow sample vessel to minimise the use of standard solution.
   When the reading has stabilised, press and hold the Cal key for 2 seconds to calibrate.
   The ∗ will now be replaced by a decimal point, if calibration was successful.
7. The **MC-84** is now calibrated for Salinity and is ready for use.

4.2 Calibration Notes

1. A Zero calibration should be performed at least monthly. In low Salinity applications (where a zero error is particularly significant) a zero calibration may have to be done weekly.
2. A Standard calibration should be performed at least weekly. Of course, more frequent calibration will result in greater confidence in results.
3. Salinity and Conductivity calibration data is stored separately in memory. Ensure that the **MC-84** has been correctly calibrated for the mode in which it will be used. The **MC-84** does not require recalibration when alternating between Salinity and Conductivity modes, providing the instrument has been correctly calibrated for both.
4. All calibration information is retained in memory when the **MC-84** is switched off, even when the battery is removed.

4.3 Calibration Messages

1. If a Zero calibration has been successfully performed, the **MC-84** will display the following message.

   Zero
   Cal. OK

2. If a Standard calibration has been successfully performed, the **MC-84** will display the following message, and then the span of the electrode.

   eg: **Span** then: **Span**
   Cal. OK **100.0%**

3. If a Standard calibration has failed, the **MC-84** will display the following message, and then the failed span value of the electrode.

   eg: **Span** then: **Span** or: **Unknown**
   Cal.Fail **60.0%** **Standard**

   Note that the decimal point is replaced by a ∗ when a Standard calibration fails.

5. Temperature Calibration

The decimal point in the temperature readout is replaced by a ∗ if the reading is not calibrated.

1. Press the On/Off key if the meter is not already switched on.
2. Press the Mode key until the meter is in Temperature mode. (See section 2.2, Readout Modes)
3. Plug the Conductivity electrode into the **Sensor** socket.
4. Place the electrode into a beaker of room temperature water, alongside a good quality mercury thermometer. Stir the electrode and the thermometer gently to ensure an even temperature throughout the beaker.
5. When the reading has stabilised, press and hold the Cal key for 2 seconds.
6. The reading from the electrode is now displayed on the top line, and the value you are going to set is on the bottom line.
   eg: **25∗0 °C**
   ↑26.0↓
7. Press the ▲ and ▼ keys until the bottom line shows the same temperature as the mercury thermometer.
8. Press the Cal key to calibrate the temperature readout.
   Alternatively, press the Mode key to abort temperature calibration.

5.1 Calibration Notes

1. Temperature calibration information is stored in memory when the meter is switched off, even if the battery is removed.
2. Temperature does not need to be recalibrated unless the Conductivity electrode is replaced or the meter is initialised.
3. The temperature readout does not affect the accuracy of the conductivity or salinity measurements. Temperature compensation is performed by a separate sensor built into the conductivity electrode, which does not require calibration.

5.2 Calibration Messages

1. If a temperature calibration has been successfully performed, the **MC-84** will display the following message and then the offset value of the probe.
   eg: **Temp** then: **Offset**
   Cal. OK **1.0°C**
2. If a temperature calibration has failed, the **MC-84** will display the following message, and then the failed offset value of the probe.
   eg: **Temp** then: **Offset**
   Cal.Fail **10.5°C**

6. Selecting k=10 or k=0.1 sensor

The **MC-84** automatically recognises a k=1.0 sensor. The **MC-84 does not** automatically recognise k=0.1 or k=10 sensors. When a k=0.1 or k=10 sensor is used, the **MC-84** must be set to the correct k factor before use. The following procedure describes how to select a k=0.1 or k=10 sensor.

1. Switch the meter **OFF** with the ON/OFF key.
2. Connect the k=0.1 or k=10 sensor.
3. Press and HOLD the F2 key while switching the meter back on.
   The k factor selection menu is now displayed
   (only if the k=0.1 or k=10 sensor is connected).
   eg: **k=10** ↑↓
   k Factor
4. Press the ▲ and ▼ keys to alternate between a k=10 and a k=0.1 sensor.
5. Press the Cal key to save the selected setting.

Notes

1) The manual k factor selection is kept in memory when the meter is switched off, even if the battery is removed.
2) The manual k factor selection is reset to k=10 during initialisation.
3) The **MC-84** will always automatically recognise a k=1.0 sensor, regardless of the manual k factor selection.
4) Calibration settings for k=0.1, k=1.0 and k=10 sensors are **NOT** stored separately. The **MC-84** requires re-calibration when a new k factor sensor is connected.

7. Battery Saver Function

The **MC-84** is equipped with a battery saver function. If no button has been pressed for five minutes, the unit beeps and flashes the display for 20 seconds, and then shuts off. This function can be disabled for continuous use.
To enable or disable the battery saver function:

1. Press the ON/OFF key if the meter is not already switched on.
2. With the meter already switched on, press and HOLD the ON/OFF key for 3 seconds.
3. The display should now look like this:
   Either: **:ON** / **9.00V** or: **:OFF** / **9.00V**
4. In this mode, use the ▲ or ▼ keys to toggle the battery saver function on or off.

NOTE: The display also shows the battery volts. This gives the operator an idea of how much battery life is remaining. The battery symbol flashes when the battery volts drops below 7.50 volts. At 6.00 volts the meter turns itself off.

5. When you have set the battery saver function to the desired position, press the Mode key to return to normal measurement mode.

8. Initialising the MC-84

If the calibration settings of the **MC-84** exceed the allowable limits, and the unit cannot be recalibrated, then it may need to be initialised to factory default values. This action may be required if the electrode is replaced.

To initialise the **MC-84**:

1. Switch the **MC-84** off, by pressing the ON/OFF key.
2. Press and hold the ▲ key while switching the **MC-84** the on with the ON/OFF key.
3. The following messages should be displayed:
   Memory Reset ! then: **You MUST Re-Cal.** then: **TPS MC84 Cond Sal**
4. The meter then displays Conductivity and Temperature. Note that the decimal points have been replaced with a ∗, to indicate that the unit requires recalibration.

9. Troubleshooting

9.1 General Error Messages

Error Message	Possible Causes	Remedy
Factory Cal. Fail See Handbook	The EEPROM chip which contains the factory calibration information has failed.	The unit must be returned to TPS for service. • Conductivity and Salinity readings will be accurate. only if used in same range in which it was calibrated. • Temperature readings may be up to 10% incorrect.
Memory Failed Calib. Lost Memory Reset ! You MUST Re-Cal.	User calibration settings have been lost or corrupted.	Re-calibrate the instrument. Both a Zero and a Standard calibration will be required for Conductivity and Salinity (sections 3.1 and 4.1) and a 1 point calibration for temperature (section 5).
Meter displays the word **OFF**, and switches off.	Battery is below 6.00 volts.	Replace the battery.
Meter will not turn on.	Battery is exhausted.	Replace the battery.
Flashing symbol.	Battery is below 7.50 volts.	Replace the battery soon. Note that the unit will switch itself off when the battery falls below 6.00 volts.

9.2 Conductivity and Salinity Troubleshooting

Symptom	Possible Causes	Remedy
Unit fails to calibrate, even with new electrode.	Calibration settings outside of allowable limits due to previous failed calibration.	Initialise the unit. See section 8, Initialising the MC-84.
Unit attempts Span calibration instead of Zero calibration.	Electrode has Zero error.	Thoroughly rinse electrode in distilled water and allow to completely dry in air before attempting zero calibration. If instrument does not calibrate at Zero with electrode disconnected, then the instrument is faulty.
Standard calibration fails, and span is less than 75%.	1. Electrode is not immersed deeply enough.	Immerse electrode at least to the vent hole in the white plastic cover.
	2. Electrode may have a build-up of dirt or oily material on electrode wires.	Clean electrode, as per the instructions detailed in section 11.1.
	3. Platinum-black coating has worn off.	Electrode requires replatinisation. Return to the factory, or see details in section 11.2.
	4. Standard solution is inaccurate.	Replace standard solution.
	5. Electrode is faulty.	Return electrode to factory for repair or replacement.
Standard calibration fails, and span is greater than 133%.	1. White protective cover is not fitted.	The white protective cover MUST be fitted for correct readings.
	2. Standard solution is inaccurate.	Replace standard solution.
	3. Electrode may have a build-up of conductive material, such as salt.	Clean electrode, as per the instructions detailed in section 11.1.
	4. Electrode is faulty.	Return electrode to factory for repair or replacement.

Continued next page...

Conductivity and Salinity Troubleshooting, continued...

Inaccurate readings, even when calibration is successful.	1. Electrode may have a build-up of dirt or oily material on electrode wires.	Clean electrode, as per the instructions detailed in section 11.1.
	2. Platinum-black coating has worn off.	Electrode requires replatinisation. Return to the factory, or see details in section 11.2.
Readings drift.	1. Electrode may have a build-up of dirt or oily material on electrode wires.	Clean electrode, as per the instructions detailed in section 11.1.
Readings are low or near zero.	1. Electrode may have a build-up of dirt or oily material on electrode wires.	Clean electrode, as per the instructions detailed in section 11.1.
	2. Electrode is not immersed deeply enough.	Immerse electrode at least to the vent hole in the white plastic cover.
	3. Electrode is faulty.	Return electrode to factory for repair or replacement.

9.3 Temperature Troubleshooting

Symptom	Possible Causes	Remedy
Displays "**OVR°C**" when electrode is plugged in.	1. Faulty electrode.	Fit new electrode, part number 122201.
	2. Faulty instrument.	Return instrument to factory for repair.
Temperature inaccurate and cannot be calibrated.	1. Faulty connector.	Check the connector and replace if necessary.
	2. Faulty electrode.	Fit new electrode, part number 122201.
	3. Faulty instrument.	Return instrument to factory for repair.

10. Warranty

TPS Pty. Ltd. guarantees all instruments and electrodes to be free from defects in material and workmanship when subjected to normal use and service. This guarantee is expressly limited to the servicing and/or adjustment of an instrument returned to the Factory, or Authorised Service Station, freight prepaid, within twelve (12) months from the date of delivery, and to the repairing, replacing, or adjusting of parts which upon inspection are found to be defective. Warranty period on electrodes is three (3) months.

There are no express or implied warranties which extend beyond the face hereof, and TPS Pty. Ltd. is not liable for any incidental or consequential damages arising from the use or misuse of this equipment, or from interpretation of information derived from the equipment.

Shipping damage is not covered by this warranty.

PLEASE NOTE:
A guarantee card is packed with the instrument or electrode. This card must be completed at the time of purchase and the registration section returned to TPS Pty. Ltd. within 7 days. No claims will be recognised without the original guarantee card or other proof of purchase. This warranty becomes invalid if modifications or repairs are attempted by unauthorised persons, or the serial number is missing.

PROCEDURE FOR SERVICE
If you feel that this equipment is in need of repair, please re-read the manual. Sometimes, instruments are received for "repair" in perfect working order. This can occur where batteries simply require replacement or re-charging, or where the electrode simply requires cleaning or replacement.

TPS Pty. Ltd. has a fine reputation for prompt and efficient service. In just a few days, our factory service engineers and technicians will examine and repair your equipment to your full satisfaction.

To obtain this service, please follow this procedure:
Return the instrument AND ALL SENSORS to TPS freight pre-paid and insured in its original packing or suitable equivalent. INSIST on a proof of delivery receipt from the carrier for your protection in the case of shipping claims for transit loss or damage. It is your responsibility as the sender to ensure that TPS receives the unit.

Please check that the following is enclosed with your equipment:

- **Your Name and daytime phone number.**
- **Your company name, ORDER number, and return street address.**
- **A description of the fault. (Please be SPECIFIC.)**
  (Note: "Please Repair" does NOT describe a fault.)
- **either $13.50 for return freight for units under warranty,**
  or $24 to cover inspection costs and return freight.

(These amounts are not applicable to full-account customers.)

Your equipment will be repaired and returned to you by air express where possible.

For out-of-warranty units, a repair cost will be calculated from parts and labor costs. If payment is not received for the additional charges within 30 days, or if you decline to have the equipment repaired, the complete unit will be returned to you freight paid, not repaired. For full-account customers, the repair charges will be debited to your account.

- **Always describe the fault in writing.**
- **Always return the sensors with the meter.**

11. Appendices

11.1 Care, Cleaning and Maintenance of Conductivity Electrodes

11.1.1 Care of Conductivity electrodes

The conductivity section of the electrode supplied with your **MC-84** consists of two platinum wires that are plated with a layer of "platinum-black". This is quite a soft layer and is required for stable, accurate measurements. In time, the platinum-black layer may wear off in some applications, at which time the electrode will require replatinising (see section 11.2). You can help to maintain the platinum-black layer by following these simple rules:

1. **NEVER** touch or rub the electrode wires with your fingers, cloth etc.
2. Avoid using the electrode in solutions that contain a high concentration of suspended solids, such as sand or soil, which can abrade the electrode wires. Filter these types of solutions first, if possible.
3. Avoid concentrated acids. If you must measure acids, remove the electrode immediately after taking the measurement and rinse well with distilled water.

Conductivity electrodes can be stored dry. Ensure that the electrode is stored in a covered container, to avoid dust and dirt build-up.

11.1.2 Cleaning of Conductivity of Electrodes.

Platinised platinum Conductivity electrodes can only be cleaned by rinsing in a suitable solvent. **DO NOT wipe the electrode wires**, as this will remove the platinum-black layer.

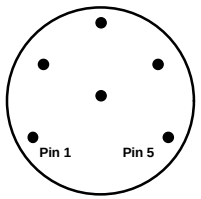
1. Rinsing in distilled water will remove most build-ups of material on the electrode wires.
2. Films of oils or fats on the electrode wires can usually be removed by rinsing the electrode in methylated spirits.
3. Stubborn contamination can be removed by soaking the electrode in a solution of 1 part Concentrated HCl and 10 parts distilled water. The electrode should not be soaked for more than approximately 5 minutes, otherwise the platinum-black layer may start to dissolve.
4. If all of these methods fail, then the last resort is to physically scrub the electrode wires, which will remove the contaminant and the layer of platinum-black. Use only a cloth or nylon scouring pad. DO NOT USE STEEL WOOL. The electrode will then need to be cleaned in HCl, as per step 3 and replatinised, as per section 11.2.

11.2 Replatinising Conductivity Electrodes

There are several ways to replatinise Conductivity electrodes.

1. The simplest way is to return the electrode to the TPS factory. We can fully clean the electrode, replatinise it and test all aspects of its performance.
2. An automatic replatiniser is available from TPS, along with replatinising solution. This will plate the electrodes for the right amount of time at the correct current. Ordering details are as follows:
   Automatic Conductivity Electrode Replatiniser Part No 122160
   20mL Platinising Solution (suitable for approx 30 uses) Part No 122300

1. Conductivity electrodes can be manually replatinised, according to the following procedure:
   1) Soak the electrode in a solution of 1 part Concentrated HCl and 10 parts distilled water for approximately 5 minutes.
   2) Rinse the electrode well in distilled water.
   3) Immerse the electrode in platinising solution at least to the vent hole in the white plastic cover. Platinising solution is available from TPS (part no 122300). Alternatively, platinising solution can be prepared by dissolving 1g of Hydrogen Chloroplatinate (H_2PtCl_{16}) in 30mL of distilled water, and including about 0.01g of Lead Acetate ($(CH_3COO)_2Pb$) and a drop or two of concentrated HCl.
   4) Apply a direct current of 10mA between pins 1 and 5 of the electrode plug, as per the diagram below. Reverse the polarity every 30 seconds. After approximately 8 minutes (4 minutes per electrode wire), they should have an even “soot” like appearance. Avoid excess current and this will cause incorrect platinising.
   5) After platinising, rinse the electrode well in distilled water.
   6) If you have any doubts about any of these steps, then you should consider returning the electrode to the factory. The cost of replatinising is quite low, and you will be guaranteed of the best possible result.



Electrode Connector

11.3 Instrument software version number.

If you need to phone or fax TPS for any further technical assistance, the version number of your **MC-84** firmware may of benefit to us. Please obtain the version number as follows, before phoning or faxing:

1. Switch the **MC-84** on by pressing the ON/OFF key.
2. While the model is being displayed, press the Mode key.
3. The unit will now display the model and version number,
   eg: **TPS MC84**
   Ver 1.02

After a few seconds, the **MC84** returns to normal operation.