

Congratulations !

You have purchased the latest in Handheld Relative Humidity and Temperature instrumentation. We trust that your new **MC-83** Relative Humidity-Temperature meter will give you many years of reliable service.

The **MC-83** is a breeze to operate. This manual has been designed to help you get started, and also contains some handy 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-83**. It also contains a full listing of all of the items that you should have received with your **MC-83**. 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-83**, including operating modes, troubleshooting, specifications, and warranty terms.

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Model MC-83 Relative Humidity- Temperature Meter

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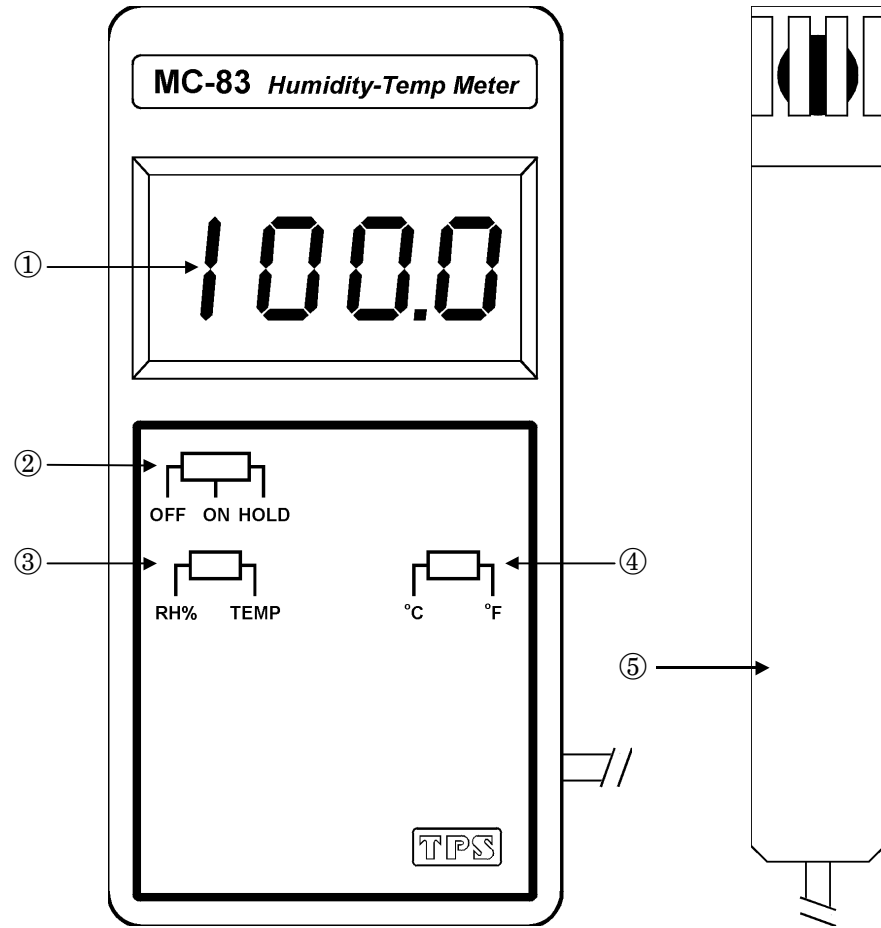
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1. Introduction

1.1 MC-83 Display and Controls



① **Display**

3½ digit Liquid Crystal Display with 18 mm digits, max display 1999

② **OFF / ON / HOLD**

Used to switch the **MC-83** on and off. Also used to freeze a reading on the display. This feature is useful in rapidly changing environments (section 4).

③ **RH% / TEMP**

Selects Relative Humidity of Temperature Readout mode.

④ **°C / °F**

Selects either °Celsius or °Fahrenheit units in Temperature readout mode.

⑤ **Relative Humidity & Temperature Probe**

The Relative Humidity & Temperature Sensor is conveniently supplied with 1 metre of cable. The humidity sensor is a high precision thin-film capacitance type for fast response. The bead type thermocouple temperature sensor is also designed for fast response in air.

1.2 Unpacking Information

Before using your new **MC-83**, please check that the following accessories have been included:

	Part No
1. MC-83 Relative Humidity-Temperature Meter	126106
2. 9V Battery	130026
3. MC-83 Handbook	130050

Options that may have been ordered with your **MC-87**:

1. NiCad Rechargeable battery and charger	130007
2. Hard Plastic Carry Case	130057
3. 75% Relative Humidity Standard, 100mL	130090
4. 12% Relative Humidity Standard, 100mL	130091

1.3 Specifications

Mode	Range	Resolution	Accuracy
RH%	10% to 95 %RH	0.1 %RH	±3 %RH
°C	0 to 60 °C	0.1 °C	±0.8 °C
°F	32 to 140 °F	0.1 °F	±1.5 °F

Display	: 18mm, 3½ Digit Liquid Crystal Display, max display 1999
Sensor Type	: Humidity : Thin-film capacitance sensor Temperature : Naked bead thermocouple sensor, type K (NiCr-NiAl)
Power	: 9V Alkaline Battery for 75 hours operation. Optional NiCad battery/charger pack available.
Dimensions	: Instrument : 157 x 78 x 35 mm Probe : 157 x 26mm dia
Mass	: Instrument only : Approx 200g Full Kit : Approx 0.5kg
Environment (instrument)	Temperature : 0 to 50 °C Humidity : 0 to 90 % R.H.

2. Humidity Measurement

1. Switch the **OFF / ON / HOLD** selector to the **ON** position.
2. Switch the **RH% / TEMP** selector to **RH%**.
3. The display will show the Relative Humidity reading from the sensor.

3. Temperature Measurement

1. Switch the **OFF / ON / HOLD** selector to the **ON** position.
2. Switch the **RH% / TEMP** selector to **TEMP**.
3. Switch the **°C / °F** selector to the desired position.
4. The display will show the Temperature reading from the sensor.

4. Freezing the Reading on the Display

When taking measurements in a rapidly changing environment, or in a difficult to reach areas, the operator is able to freeze the display. This allows readings to be correctly noted.

1. To freeze the display, switch the **OFF / ON / HOLD** selector to **HOLD**.
2. To resume normal measurement, switch the **OFF / ON / HOLD** selector back to **ON**.
3. To switch the instrument off, switch the **OFF / ON / HOLD** selector to **OFF**.

5. Battery Replacement

1. When the battery volts drops below 6.5-7.5V the display shows “**BAT**” in the lower left hand corner. When this occurs the battery must be replaced as soon as possible, otherwise readings will become inaccurate.
2. Loosen the battery cover screw on the rear of the **MC-83** and slide the battery cover away.
3. Remove the battery and replace it with a new 9V battery. Alkaline batteries are preferred.
4. Replace the battery cover and re-tighten the screw.

6. Humidity Calibration

The **MC-83** is supplied pre-calibrated. Re-calibration will be required periodically (approx annually), depending on application, environment etc. 75% and 12% Relative humidity standards are available from TPS. Table 1 shows the Relative Humidity characteristics of these two standards.

When making up your own standards...

- The solution must be saturated with the salt, ie. no further solids will dissolve.
- Use distilled water.
- Use a plastic bottle that allows the sensor tip to fit snugly into the top of the bottle, making a good seal.
- Allow 24 hours after mixing for the temperature to stabilise.
- Standards can be stored (sealed) for approximately one year.

6.1 Calibration Procedure

1. (This step is optional)

Fit the sensor head into a bottle of 12% humidity standard (part no 130091).

The sensor head must be above the level of the standard (see Figure 1).

DO NOT IMMERSE THE SENSOR.

Leave for 3 hours to allow the Relative Humidity in the bottle to stabilise.

2. Switch the **OFF / ON / HOLD** selector to the **ON** position.

Switch the **RH% / TEMP** selector to **RH%**.

Wait for the displayed Relative Humidity reading to stabilise (up to 3 minutes).

3. Loosen the battery cover screw on the rear of the **MC-83** and slide the battery cover away.

Adjust RV1 (Figure 2) until the display shows the appropriate value for the temperature, as detailed in Table 1.

Switch the **OFF / ON / HOLD** selector to the **OFF** position.

4. Fit the sensor head into a bottle of 75% humidity standard (part no 130090).

The sensor head must be above the level of the standard (see Figure 1).

DO NOT IMMERSE THE SENSOR.

Leave for 3 hours to allow the Relative Humidity in the bottle to stabilise.

5. Switch the **OFF / ON / HOLD** selector to the **ON** position.

Switch the **RH% / TEMP** selector to **RH%**.

Wait for the displayed Relative Humidity reading to stabilise (up to 3 minutes).

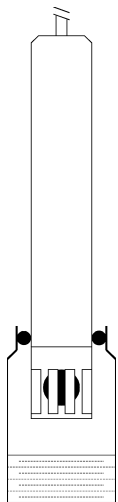
Adjust RV2 (Figure 2) until the display shows the appropriate value for the temperature, as detailed in Table 1.

6. Replace the battery cover and re-tighten the screw.

Table 1: Relative Humidity Vs Temperature of Standard Solutions

Temp °C	Lithium Chloride LiCl	Sodium Chloride NaCl
0	11.2	75.5
5	11.3	75.7
10	11.3	75.7
15	11.3	75.6
20	11.3	75.5
25	11.3	75.3
30	11.3	75.1
35	11.3	74.9
40	11.2	74.7
45	11.2	74.5
50	11.1	74.4

Figure 1: Position of Sensor in Calibration Standard Bottle



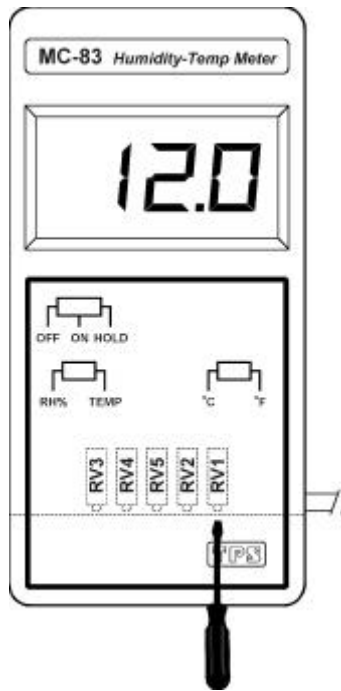


Figure 2: MC-83 Calibration controls

Note: RV3, RV4 and RV5 are for temperature calibration, and are factory-set. Do not adjust these controls, as this may cause temperature errors.

7. Troubleshooting

Symptom	Possible Causes	Remedy
Unstable readings	<ol style="list-style-type: none"> 1. Battery is low 2. Requires re-calibration 3. Sensor is faulty. 	<p>Replace battery.</p> <p>Re-calibrate meter.</p> <p>Return to factory for repair.</p>
Display shows just "1 . ." or "-1 . ."	<ol style="list-style-type: none"> 1. Meter has over-ranged. 2. Instrument or sensor is faulty. 	<p>Check that the R.H. or temperature are within the specified ranges (section 1.3)</p> <p>Return to factory for repair.</p>
Meter will not turn on.	Battery is exhausted.	Replace the battery.
Reading does not change. Fixed at one value.	OFF / ON / HOLD selector switched to HOLD position.	Switch back to ON for normal operation.

8. 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.**