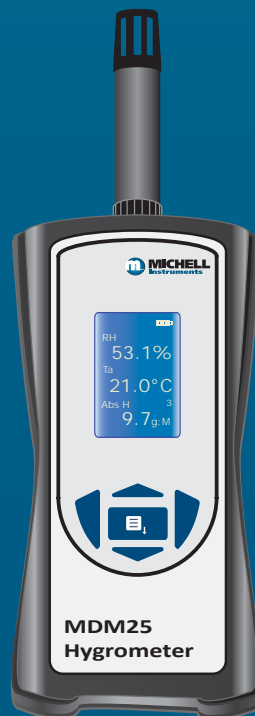




# MDM25 Hygrometer User's Manual



97234 Issue 4  
January 2018

Please fill out the form(s) below for each instrument that has been purchased.

Use this information when contacting Michell Instruments for service purposes.

Instrument	
Code	
Serial Number	
Invoice Date	
Location of Instrument	
Tag No	

Instrument	
Code	
Serial Number	
Invoice Date	
Location of Instrument	
Tag No	

Instrument	
Code	
Serial Number	
Invoice Date	
Location of Instrument	
Tag No	



## MDM25

For Michell Instruments' contact information please go to  
[www.michell.com](http://www.michell.com)

© 2018 Michell Instruments

This document is the property of Michell Instruments Ltd. and may not be copied or otherwise reproduced, communicated in any way to third parties, nor stored in any Data Processing System without the express written authorization of Michell Instruments Ltd.

---

---

---

## Contents

Safety .....	vi
Electrical Safety .....	vi
Pressure Safety .....	vi
Toxic Materials .....	vi
Repair and Maintenance .....	vi
Calibration .....	vi
Safety Conformity .....	vi
Abbreviations .....	vii
Warnings .....	vii
1 INTRODUCTION .....	1
1.1 Description .....	2
1.1.1 Controls and Indicators .....	2
1.1.2 Instrument Display .....	3
1.2 Display Units .....	4
1.3 Display Settings .....	4
1.4 Device Settings .....	4
1.5 About .....	4
2 INSTALLATION .....	5
2.1 Unpacking the Instrument .....	5
2.2 MDM25 Accessories .....	5
2.3 Battery Requirements .....	6
2.3.1 Fitting the Batteries .....	6
2.4 Mounting and Connecting the Probe .....	7
3 OPERATION .....	8
3.1 Preparation for Operation .....	8
3.2 Overall Menu Structure .....	8
3.2.1 Display Settings .....	9
3.2.2 Device Settings .....	10
3.2.3 About .....	11
4 MAINTENANCE .....	12
4.1 Probe Calibration .....	12
4.2 Cleaning .....	12
4.3 Probe Replacement .....	12
4.4 Batteries .....	12

## Figures

<i>Figure 1</i>	<i>Controls and Indicators</i> .....	<i>2</i>
<i>Figure 2</i>	<i>Display</i> .....	<i>3</i>
<i>Figure 3</i>	<i>Battery Compartment Location</i> .....	<i>6</i>
<i>Figure 4</i>	<i>Probe Connections</i> .....	<i>7</i>
<i>Figure 5</i>	<i>Main Menu Structure</i> .....	<i>8</i>
<i>Figure 6</i>	<i>Display Settings Menu</i> .....	<i>9</i>
<i>Figure 7</i>	<i>Device Settings Menu</i> .....	<i>10</i>
<i>Figure 8</i>	<i>About Menu</i> .....	<i>11</i>

## Tables

Table 1	Unit Descriptions .....	4
---------	-------------------------	---

## Appendices

Appendix A	Technical Specifications.....	14
Appendix B	Quality, Recycling & Warranty Information.....	16
Appendix C	Analyzer Return Document & Decontamination Declaration .....	18

## Safety

The manufacturer has designed this equipment to be safe when operated using the procedures detailed in this manual. The user must not use this equipment for any other purpose than that stated. Do not apply values greater than the maximum value stated.

This manual contains operating and safety instructions, which must be followed to ensure the safe operation and to maintain the equipment in a safe condition. The safety instructions are either warnings or cautions issued to protect the user and the equipment from injury or damage. Use competent personnel using good engineering practice for all procedures in this manual.

## Electrical Safety

The instrument is designed to be completely safe when used with options and accessories supplied by the manufacturer for use with the instrument.

## Pressure Safety

This product is not suitable for use at pressures greater than atmospheric.

## Toxic Materials

The use of hazardous materials in the construction of this instrument has been minimized. During normal operation it is not possible for the user to come into contact with any hazardous substance which might be employed in the construction of the instrument. Care should, however, be exercised during maintenance and the disposal of certain parts.

## Repair and Maintenance

The instrument must be maintained either by the manufacturer or an accredited service agent. Refer to [www.michell.com](http://www.michell.com) for details of Michell Instruments' worldwide offices contact information.

## Calibration

An annual calibration is recommended for the RH probe. This should be returned to the manufacturer, Michell Instruments, or one of their accredited service agents for re-calibration.

## Safety Conformity

This product meets the essential protection requirements of the relevant EU directives.

## Abbreviations

The following abbreviations are used in this manual:

Abs H	absolute humidity
°C	degrees Celsius
°F	degrees Fahrenheit
LCD	liquid crystal display
g	grams
g/m <sup>3</sup>	grams per cubic meter
lb	pound
mm	millimeters
oz	ounce
RH	relative humidity
sec	second(s)
T	temperature
Ta	ambient temperature
Td	dew point
Tw	wet bulb temperature
V	Volts
%	percentage

## Warnings

The following general warnings listed below are applicable to this instrument. They are repeated in the text in the appropriate locations.



**Where this hazard warning symbol appears in the following sections it is used to indicate areas where potentially hazardous operations need to be carried out.**

## 1 INTRODUCTION

The MDM25 is a battery operated handmeter.

Available with a number of different probe configurations and the ability to display relative humidity, temperature, absolute humidity ( $\text{g}/\text{m}^3$ ), dew point and wet bulb temperature, the MDM25 is suitable for spot-checking humidity in a wide variety of applications.

The hygrometer is contained within a molded ABS housing with a rubber surround for drop protection - sealed to IP54 standards. The rubber surround allows for comfortable hand-held operation and safe transportation of the unit.

It is powered by 3 alkaline 'AA' size cells, which are designed to last a minimum of 150 continuous hours between replacement. Continuous battery charge status indication is provided by a battery indicator icon.

A graphical display presents the RH and temperature readings, in addition to a selectable third value, in large format characters.



## 1.1 Description

### 1.1.1 Controls and Indicators

The controls and indicators associated with the MDM25 hygrometer are located on the front panel.

The probe connection to the MDM25 hygrometer is made to the top panel, and the battery charger cover is located on the rear of the instrument.

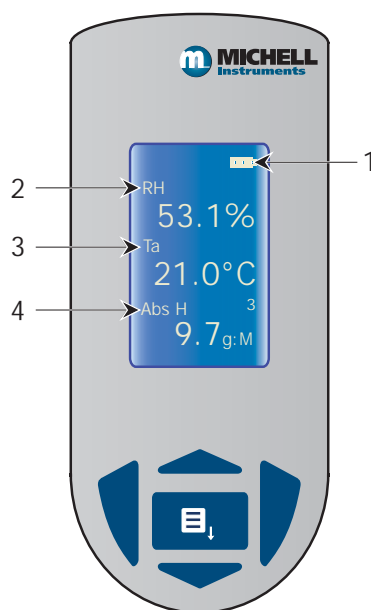
*Figure 1* shows the layout of the controls.



1	Display
2	Left and Exit Key
3	Enter Key
4	Down Key
5	Up Key
6	Power Key

Figure 1      *Controls and Indicators*

1.1.2 Instrument Display



1	Battery Charge Indicator Icon - displays 3 dots when full. When battery icon is empty, replace the batteries.
2	RH Display
3	Temperature Display
4	3rd Output Display - presents the selected 3rd output, either in °C / °F T <sub>d</sub> , g/m <sup>3</sup> , or °C / °F T <sub>w</sub>

Battery Indicator	
Full battery power	
2/3 battery power	
1/3 battery power	
Replace batteries	

Figure 2 Display

## 1.2 Display Units

The MDM25 measures relative humidity and temperature. The third output, when displayed, is calculated from these two parameters.

The table below gives a description of all available units.

Signal	Symbol	Units	Description
Relative Humidity	RH	%	The ratio of water vapor pressure to the saturation water vapor pressure (the maximum amount of water vapor that can exist at a given temperature) over a liquid water surface, expressed as a percentage.
Temperature	Ta	°C or °F	The temperature of a gas determines the maximum quantity of moisture that can be present as vapor in that gas.
Dew Point	Td	°C or °F	The temperature at which dew, or condensation, forms, on cooling a gas. This is, therefore, the temperature at which air becomes saturated in equilibrium with water.
Absolute Humidity	Abs H	g/m <sup>3</sup>	The mass of water vapor present in unit volume of moist air of a given temperature and pressure. SI (metric) units are grams of water per cubic meter of air (g/m <sup>3</sup> ).
Wet Bulb temperature	Tw	°C or °F	Temperature indicated by a thermometer sheathed in wet wicking, and influenced by the rate of evaporation from the wicking.

Table 1 Unit Descriptions

## 1.3 Display Settings

The Display Settings Menu contains options to change the contrast ratio, backlight intensity and orientation of the display.

## 1.4 Device Settings

The Device Settings Menu contains options to change the period of time before power-off, temperature units and 3rd value units.

## 1.5 About

The About Menu gives information about the firmware version and serial number of the hygrometer.

## 2 INSTALLATION

### 2.1 Unpacking the Instrument

Open the box carefully and unpack the contents. Check that the following items are included. Report any shortages immediately.

- MDM25 Hygrometer
- 3 off Alkaline 'AA' cells
- User Manual
- RH & Temp Probe (options available)
- Calibration certificate (optional)

### 2.2 MDM25 Accessories

#### Filters and Protection Caps

For 12mm probe	For 19mm probe
Slotted protection cap, black	Slotted protection cap, black
Mesh filter	Mesh filter
Flat SS sintered dust filter	Flat SS sintered dust filter
Arrow 20µm SS sintered filter	Arrow 10µm SS sintered filter
	Arrow 20µm SS sintered filter
	PVDF filter

#### Probes

- Fixed probe
- Standard probe
- Sword type probe
- Remote high temperature probe, 300mm (18")
- Remote high temperature probe, 500mm (19.6")

#### Other

- Carrying case
- Batteries (3 'AA' Alkaline cells)
- Control Kit of calibration salts

## 2.3 Battery Requirements

The MDM25 is supplied with 3 Alkaline 'AA' size cells. These non-rechargeable Alkaline cells have a high energy density and long shelf-life.



**Do not mix different type of batteries.  
All three batteries must be of the same type.**

### 2.3.1 Fitting the Batteries

Unscrew the battery compartment and insert the three 'AA' cells, according to the image on the inside of the battery compartment.

Refit the compartment cover ensuring the seal is fully compressed.



Figure 3 *Battery Compartment Location*

## 2.4 Mounting and Connecting the Probe

All probes insert directly into the connector on the top of the MDM25.

Align the locating peg with the locating notch and then rotate the knurled thumb wheel until the probe is securely held in place.



Figure 4 *Probe Connections*



**WARNING: Do not over-tighten as this could cause damage to the probe body.**

### 3 OPERATION

#### 3.1 Preparation for Operation

Press the power-on button and observe the readings on the LCD. Some 3rd values may take a few seconds to calculate, depending upon the %RH and ambient temperature (Ta).

If using the MDM25 alongside the S503 RH calibrator, adjust the display orientation to allow for the product to be read correctly when upside down.

If there is there is no reading on the screen check the battery orientation. Replace with new batteries if required.

#### 3.2 Overall Menu Structure

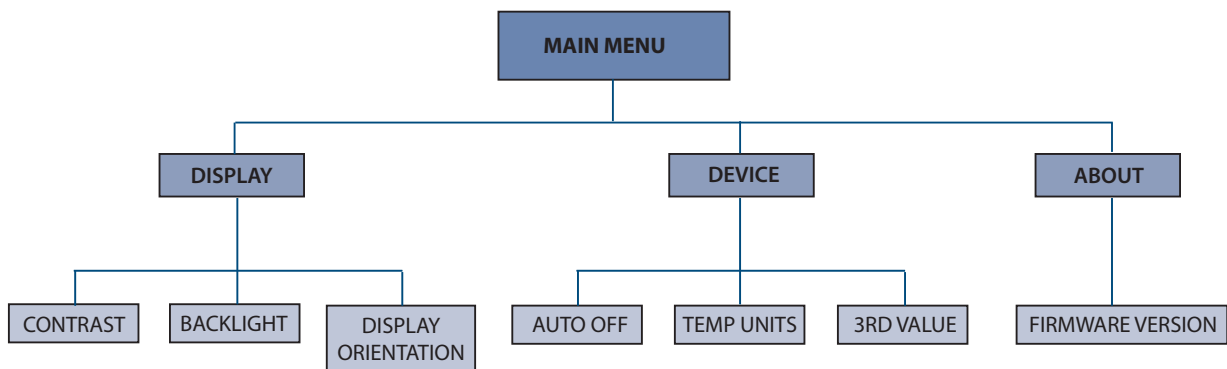


Figure 5 *Main Menu Structure*

3.2.1 Display Settings

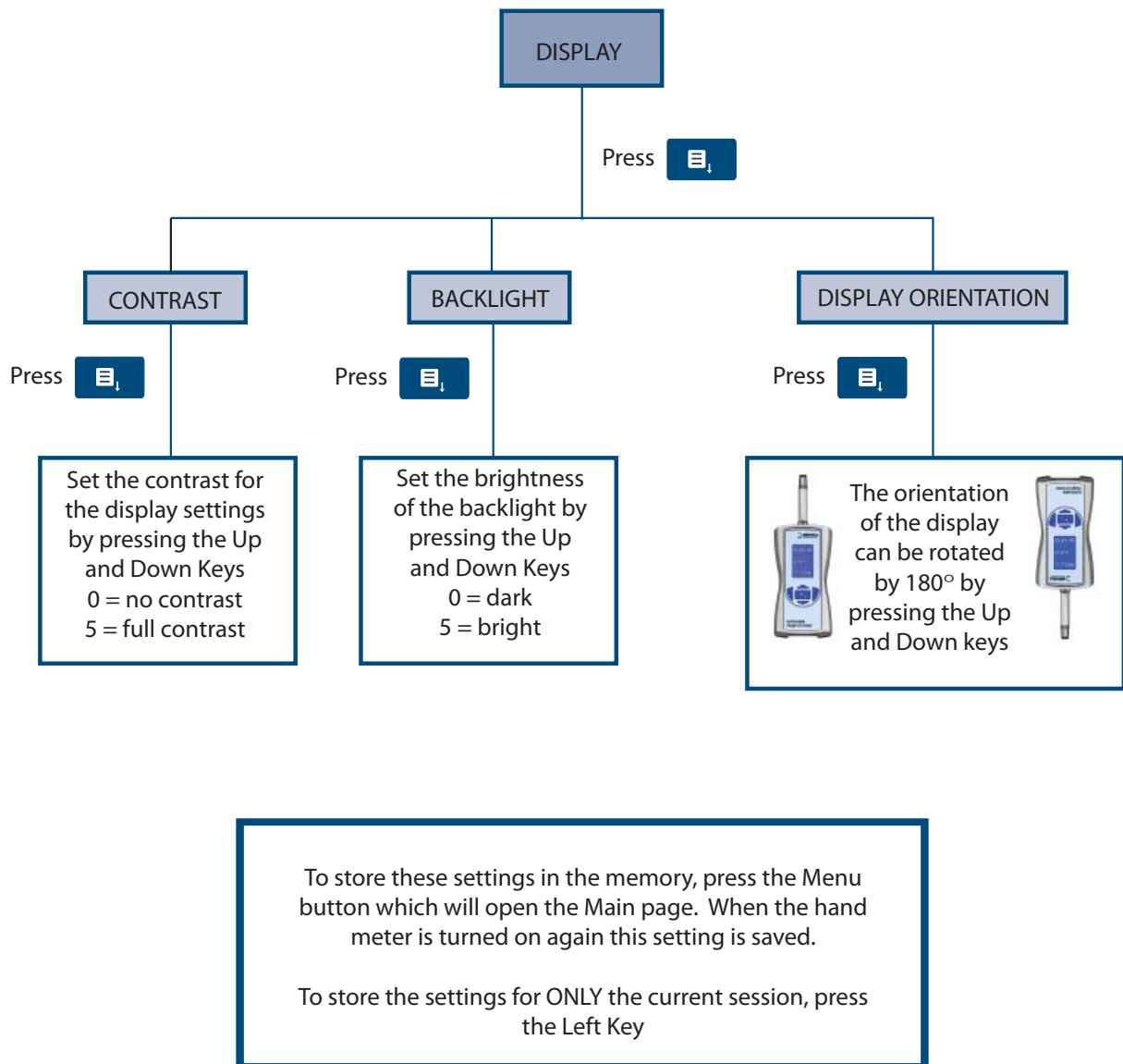


Figure 6 Display Settings Menu



3.2.2 Device Settings

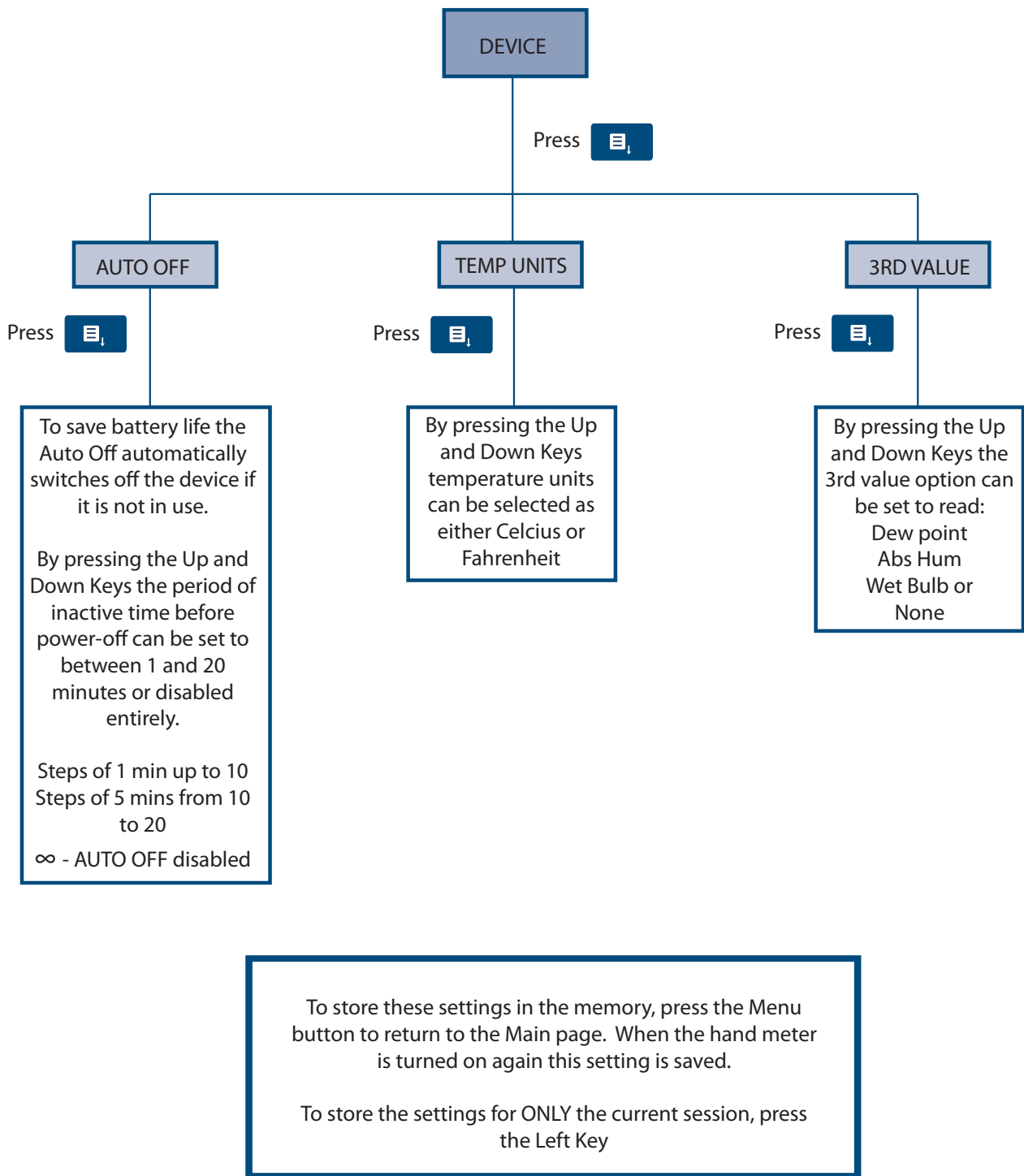


Figure 7 Device Settings Menu

3.2.3 About

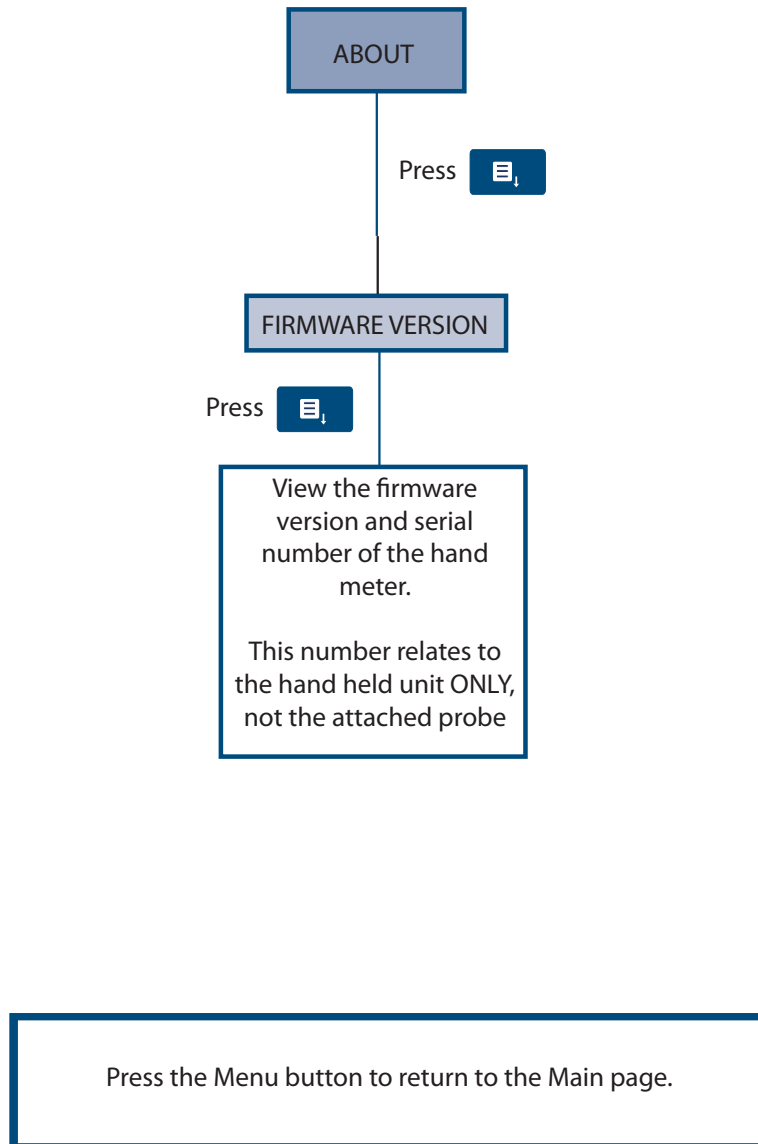


Figure 8 *About Menu*

## 4 MAINTENANCE

The MDM25 is designed to operate either in static ambient conditions, or in a flowing gas stream.

The sensors are designed to have excellent performance in ambient conditions. Therefore, a flow is not necessary to ensure that the probe is reacting rapidly to changes in measured conditions.

If the sensor is installed in a flowing sample, then it is not crucial to regulate the flow rate in order to ensure consistent performance, although it is preferable to avoid excessive flow rates past the sensor during operation.

The use of appropriate filtering for the sample conditions is always recommended – so, where the sample or ambient conditions may contain dust, steam or liquid water, a suitable mesh or sintered filter should be fitted. Protection caps are also available to defend against the possibility of handling damage.

Care should be taken to avoid mechanical shock (impact) or thermal shock (sudden temperature changes).

### 4.1 Probe Calibration

Salt solutions are commonly used for the calibration of RH sensors. Michell Instruments' calibration Control Kit is available to provide a traceable reference to verify the accuracy of the probe.

The Control Kit can be purchased from Michell Instruments (for contact information go to [www.michell.com](http://www.michell.com)).

### 4.2 Cleaning

The enclosure can be cleaned using a mild household detergent and a damp soft cloth or absorbent paper. Remove the connector before cleaning and dry off any moisture before reassembly. **NOTE: Do not use any abrasives - this may cause the LCD display to become obscured.**

### 4.3 Probe Replacement

The probe should be returned to Michell Instruments annually for recalibration. This will ensure continued traceability, and will verify that it is still performing within its specified accuracy.

### 4.4 Batteries

When the battery charge indicator icon on the display is empty, the batteries should be replaced (see Section 2.3). Always install 3 new batteries of the same type.

# Appendix A

## Technical Specifications

## Appendix A Technical Specifications

### HYGROMETER

Performance	
Measurement Units	%RH, °C / °F Ta, °C / °F Td, g/m <sup>3</sup> , °C / °F Tw
Mechanical Specification	
Ingress Protection	IP54
Hygrometer Housing Material	Molded polymer housing ABS + rubber surround
Weight	300g (10.58oz)
Display Resolution	Graphic LCD 128 x 64 pixels
Electrical Output/Input	
Supply Voltage	4.5 V (3 x 'AA' batteries - provide approximately 150 hours of operation)
Electrical Connections	M9 5-way binder connector

### PROBES

Performance			
Measurement Range (RH)	0 - 100% RH		
Accuracy at 25°C (77°F) Temperature	±0.2°C (±0.36°F)		
Stability - RH Sensor	±1% RH/year		
Response time - RH Sensor	<10 sec typical (for 90% of the step change)		
Measurement & Operating Range (T)	<ul style="list-style-type: none"> <li>- Fixed and Standard Probe -20 to +80°C (-4 to +176°F)</li> <li>- Sword Probe -20 to +100°C (-4 to +212°F)</li> <li>- Remote Probe -20 to +150°C (-4 to +302°F)</li> </ul>		
Accuracy at 25°C (77°F) Humidity	<ul style="list-style-type: none"> <li>- Fixed Probe ±2% RH (10 - 90% RH)</li> <li>- Remote Probe ±2% RH (5 - 95% RH)</li> </ul>		
Mechanical Specification			
Weight	Fixed Probe	FPR	30g (1.06 oz)
	Standard Probe	SPR	90g (3.17 oz)
	Sword Probe	SWPR	500g (1.1 lb)
	High Temp 300mm Probe	HTPR300	380g (13.4 oz)
	High Temp 500mm Probe	HTPR500	620g (1.37 lb)

# Appendix B

## Quality, Recycling & Warranty Information

## Appendix B      Quality, Recycling & Warranty Information

Michell Instruments is dedicated to complying to all relevant legislation and directives. Full information can be found on our website at:

[www.michell.com/compliance](http://www.michell.com/compliance)

This page contains information on the following directives:

- ATEX Directive
- Calibration Facilities
- Conflict Minerals
- FCC Statement
- Manufacturing Quality
- Modern Slavery Statement
- Pressure Equipment Directive
- REACH
- RoHS2
- WEEE2
- Recycling Policy
- Warranty and Returns

This information is also available in PDF format.

# Appendix C

## Analyzer Return Document & Decontamination Declaration



## Appendix C Analyzer Return Document &amp; Decontamination Declaration

## Decontamination Certificate

**IMPORTANT NOTE:** Please complete this form prior to this instrument, or any components, leaving your site and being returned to us, or, where applicable, prior to any work being carried out by a Michell engineer at your site.

Instrument			Serial Number	
Warranty Repair?	YES	NO	Original PO #	
Company Name			Contact Name	
Address				
Telephone #			E-mail address	
Reason for Return /Description of Fault:				
Has this equipment been exposed (internally or externally) to any of the following? Please circle (YES/NO) as applicable and provide details below				
Biohazards			YES	NO
Biological agents			YES	NO
Hazardous chemicals			YES	NO
Radioactive substances			YES	NO
Other hazards			YES	NO
Please provide details of any hazardous materials used with this equipment as indicated above (use continuation sheet if necessary)				
Your method of cleaning/decontamination				
Has the equipment been cleaned and decontaminated?			YES	NOT NECESSARY
Michell Instruments will not accept instruments that have been exposed to toxins, radio-activity or bio-hazardous materials. For most applications involving solvents, acidic, basic, flammable or toxic gases a simple purge with dry gas (dew point <-30°C) over 24 hours should be sufficient to decontaminate the unit prior to return. <b>Work will not be carried out on any unit that does not have a completed decontamination declaration.</b>				
<b>Decontamination Declaration</b>				
I declare that the information above is true and complete to the best of my knowledge, and it is safe for Michell personnel to service or repair the returned instrument.				
Name (Print)			Position	
Signature			Date	



F0121, Issue 2, December 2011



Manufacturer: **Michell Instruments B.V.**  
**Krombraak 11**  
**4906 CR Oosterhout**  
**The Netherlands.**



We declare under our sole responsibility that the product:

## **MDM25 Hygrometer**

complies with all the essential requirements of the EU directives listed below.

**2014/30/EU**      **EMC Directive**

**2011/65/EU**      **Restriction of Hazardous Substances Directive (RoHS2)**

Using the standards:

**EN61326-1:2013**      Electrical equipment for measurement, control and laboratory use  
EMC requirements – Group 1, Class B equipment (emissions)  
and Portable Equipment (immunity).

and has been designed to be in conformance with the relevant sections of the following standards or other normative documents.

**EN61010-1:2010**      Safety Requirements for Electrical Equipment for  
Measurement, Control, and Laboratory Use - Part 1:  
General Requirements

**EN60529**      Degrees of Protection Provided by Enclosures.  
Ingress Rating equivalent to IP54



Robert-Jan Pouw RH Business Manager.  
Michell Instruments Benelux B.V. Oosterhout The Netherlands  
Date of Issue 6 December 2017

---

on behalf of  
Peter Haakma Managing Director Michell Instruments Benelux B.V.



<http://www.michell.com>