

## MA2100-B-PM

# Mistral-Air® Test Equipment - SYK User Manual



[www.mistral-air.nl](http://www.mistral-air.nl)

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## Introduction

The Mistral-Air® Test Equipment was developed to simulate the unique combination of the:

- MA0100 Mistral-Air® Warming Unit (220-240V~, 50Hz)
- MA0115 Mistral-Air® Warming Unit (110-120V~, 60Hz)
- MA1100-EU Mistral-Air® Plus Warming Unit (220-240V~, 50/60Hz)
- MA1100-US Mistral-Air® Plus Warming Unit (220-240V~, 60Hz)
- MA1100-PM Mistral-Air® Plus Warming Unit (220-240V~, 60Hz)
- MA1100-JP Mistral-Air® Plus Warming Unit (100-110V~, 50/60Hz)

with the Mistral-Air® Blankets, in terms of temperature performance and flow resistance.

If you identify any improvements and/or find other applications during the use of this product, please let us know.

The 37 Company B.V.

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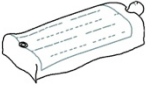



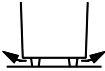




The Surgical Company International B.V. reserves the right to make alterations and improvements to the equipment. These cannot yet be described in the instructions. The Surgical Company International B.V. cannot be held liable for the final outcome of treatment of the patient.



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These instructions are intended for service engineers and other professionals involved in servicing the Mistral-Air® Warming Units and/or Mistral-Air® Plus Warming Units.

# 1 Warnings and precautions

Please read and understand all warnings and precautions before using the MA2100 Mistral-Air® Test Equipment.

   	<p>The Mistral-Air® Test Equipment shall only be used to test/simulate the unique combination of the Mistral-Air® Warming Unit or Mistral-Air® Plus Warming Unit and the Mistral-Air® Blankets</p> <p>The use of a different warming unit and/or combination with different blankets is not representative for practical performance.</p> <p>Testing the Mistral-Air® Warming Unit or Mistral-Air® Plus Warming Unit shall only be executed with this dedicated Mistral-Air® Test Equipment.</p>
	<p>Avoid blocking the air inlet at the bottom of the Mistral-Air® Warming Unit or Mistral-Air® Plus Warming Unit</p>
	<p>Maintenance and repairs should be performed by certified medical instrument technicians only.</p>
	<p>Read the technical manual of the Mistral-Air® Warming Unit or Mistral-Air® Plus Warming Unit as well.</p>
	<p>Do not use the Mistral-Air® Warming Unit or Mistral-Air® Plus Warming Unit if damaged.</p>
	<p>Connect the Mistral-Air® warming unit to an earthed socket only.</p>

	<p>Do not immerse the Mistral-Air® Warming Unit, Mistral-Air® Plus Warming Unit or the Mistral-Air® Test Equipment in fluid. Clean the appliance with standard cleaning agents.</p>
	<p>Dispose battery in accordance with European Directive 2002/96/EC (WEEE)</p>

## 2 User Instructions

The Mistral-Air® Test Equipment shall be used in a draft free room with an ambient temperature of 22 °C (± 1.5 °C).

The Mistral-Air® Test Equipment is used to simulate the unique combination of Mistral-Air® Warming Unit or Mistral-Air® Plus Warming Unit and the Mistral-Air® Blankets performance in terms of temperature and resistance.

Please follow the next steps for successful use of the Mistral-Air® Test Equipment:

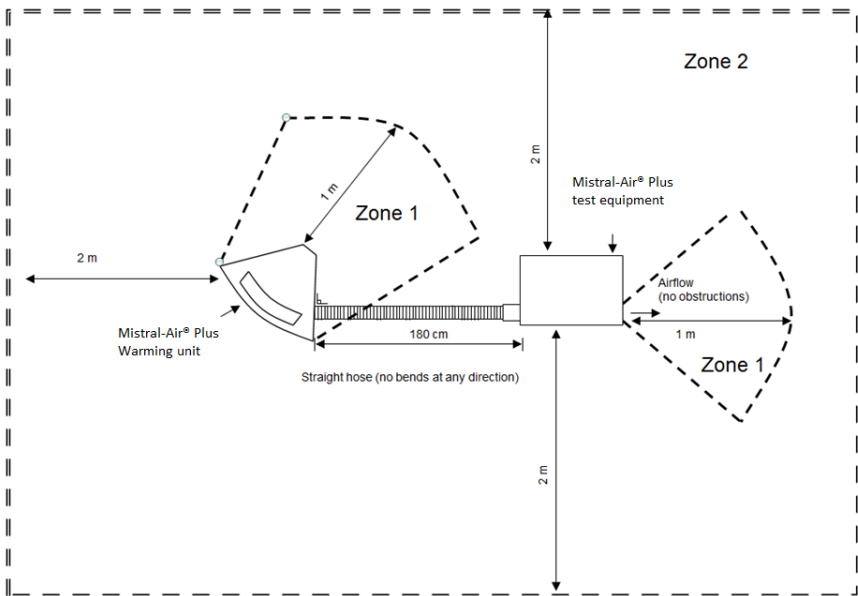
1. Before opening the case, make sure that the handle is facing down.
2. Open the case via the 2 push keys.



3. Place a Mistral-Air® Warming Unit or Mistral-Air® Plus Warming Unit at a rigid surface.
4. Connect the hose-end of the Mistral-Air® Warming Unit or Mistral-Air® Plus Warming Unit to the right side of the Mistral-Air® Test Equipment.



- Place the Mistral-Air<sup>®</sup> Warming Unit or Mistral-Air<sup>®</sup> Plus Warming Unit and the Mistral-Air<sup>®</sup> Test Equipment at an area in accordance with the following zone definition:



- - - - Zone 1: No air obstructions or heat sources

= = = Zone 2: No airconditioning units

- Make sure that the hose is stretched at a distance of 1.8 m (6 ft) between the Mistral-Air<sup>®</sup> Warming Unit or Mistral-Air<sup>®</sup> Plus Warming Unit and the Mistral-Air<sup>®</sup> Test Equipment and the hose is perpendicular

(90°) to the unit. Make sure that the hose is lying at an insulated support:

7. Switch the thermometer of the Mistral-Air® Test Equipment ON. Now the meter switches through 4 display settings. Finally the actual temperature will be displayed: BAT-18.8.8 → °C → Po.F → 22.4 (actual temperature)
8. Select the desired temperature at the Mistral-Air® Warming Unit or Mistral-Air® Plus Warming Unit.

## 2.1 Temperature measurements & test protocol

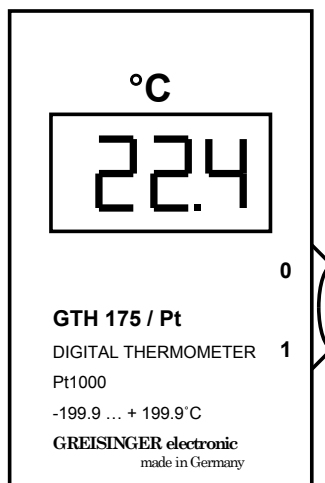
Consult the technical manual of the Mistral-Air® Warming Unit or Mistral-Air® Plus Warming Unit.

## 2.2 Calibration procedure of the warming unit

Consult the technical manual of the Mistral-Air® Warming Unit or Mistral-Air® Plus Warming Unit.

## 3 Thermometer

The thermometer can be switched ON and OFF by moving the slide at the right side to respectively “1” and “0”.

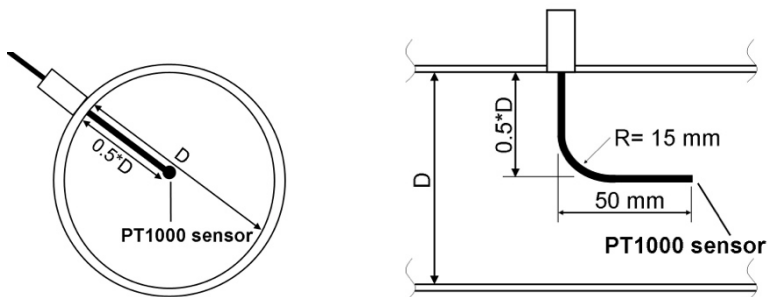


Battery replacement:  
INT/R632-PM/0-12/13

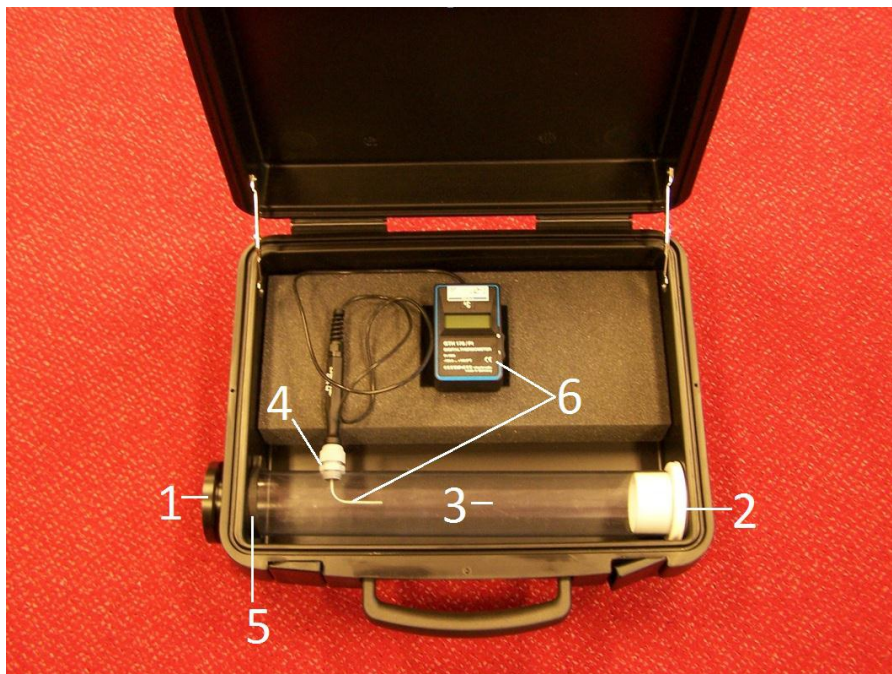


1. Remove thermometer slowly of the Velcro
2. Open battery storage compartment
3. Replace 9 VDC battery
4. Close battery storage compartment
5. Replace thermometer at Velcro

Sensor position: make sure the tip of the PT1000 is located at the centre of the test tube:

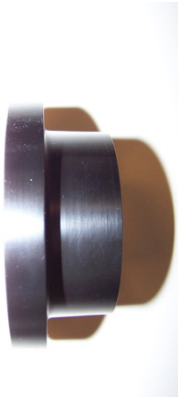


## 4 Component list

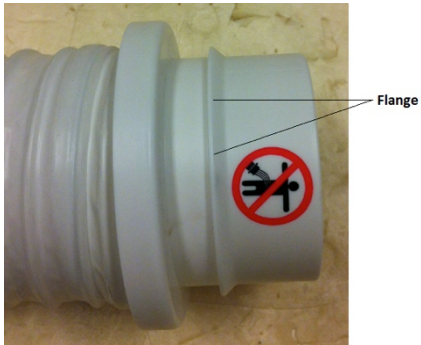


<b>Content Mistral-Air® Test Equipment</b>
1. Adapter for hose end with flange <sup>1</sup>
2. Nozzle, type N1
3. Transparent test tube
4. Transition plug
5. Tube clamp
6. Pt-1000 thermometer (calibrated)

<sup>1</sup> If the hose end is equipped with a flange, an adapter shall be fixed to the inlet of the Mistral-Air® test equipment



Adapter



Hose end with flange

## 5 Warranty

For the general The 37Company warranty statement please visit our website [www.the37company.com](http://www.the37company.com).

Contact your local distributor or sales representative for in-warranty repair and exchange.

## 6 Technical specifications

### Test equipment


Measuring range	: -199.9...+199.9 °C
Resolution	: 0.1 °C
Accuracy (at 25 °C)	: 0.1 °C + 1 digit
Sensor type	: Pt1000
Operating conditions	: 1) Draft free, ambient temperature 22 °C ( $\pm 1.5$ °C), 2) Basic thermometer operation: -30 to 45 °C, 3) RH: 0-80 % RH (non-condensing).
Storage temperature	: -40 to 70 °C
Power supply	: 9V block battery
Battery lifetime	: Approx. 200 hours
Low battery warning	: "BAT" automatically displayed if battery is low
Weight	: Approx. 190 g, incl. battery and sensor
EMC compliance	: The device is in compliance with the regulations of the European EMC Directive 2004/108/EC

### Mistral-Air® Warming Unit or Mistral-Air® Plus Warming Unit:

Temperature accuracy :  $\pm 2.5$  °C

## Appendix A - Calibration of the MA2100-B-PM Test Equipment

The Mistral-Air® Test Equipment is calibrated at 20 °C, 40 °C and 60 °C. At these temperatures calibration limits have been defined as  $\pm 0.5$  °C. The calibration report is attached to the Mistral-Air® Test Equipment.

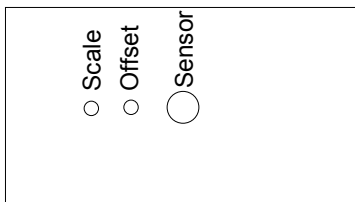
	If the calibration period is expired or if the sensor or thermometer is replaced, new calibration is required.
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Calibration has been executed for the complete set of thermometer and thermocouple.


If during the calibration procedure, measured temperatures exceed the temperature tolerances ( $\pm 0.5$  °C), the thermometer shall be re-calibrated conform the next chapter's instructions.

### Calibration procedure

Scale and offset adjustments are mainly intended to be used to compensate errors of the external temperature probe. These adjustments can be made by the 2 screws on top of the thermometer:



After this procedure the screws shall be closed by tape or covered by ink to avoid inadvertent adjustments.

	Adjustments shall only be made by an accredited calibration institute.
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# The 37° Company

The Surgical Company International B.V.  
Beeldschemweg 6F  
3821 AH Amersfoort  
The Netherlands  
[www.the37company.com](http://www.the37company.com)

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Distributed by:  
Stryker Medical  
3800 E. Centre Ave.  
Portage, Michigan 49002  
USA  
(800) 327-0770

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