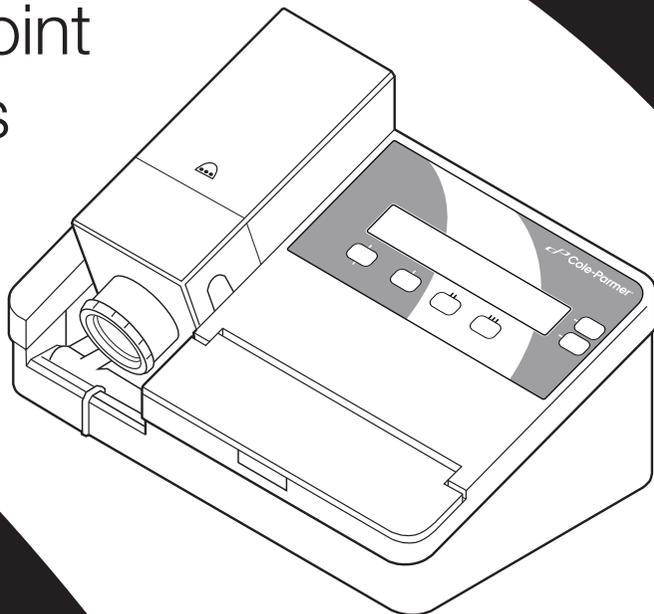


Advanced Digital Melting Point Apparatus



User Guide

 **Cole-Parmer®**

Figure 1: Front view

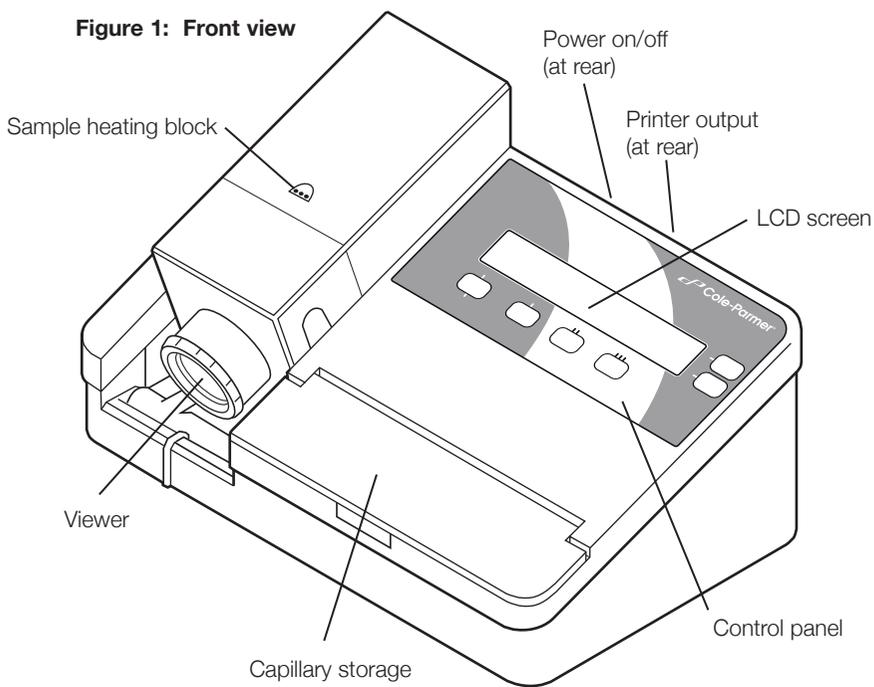
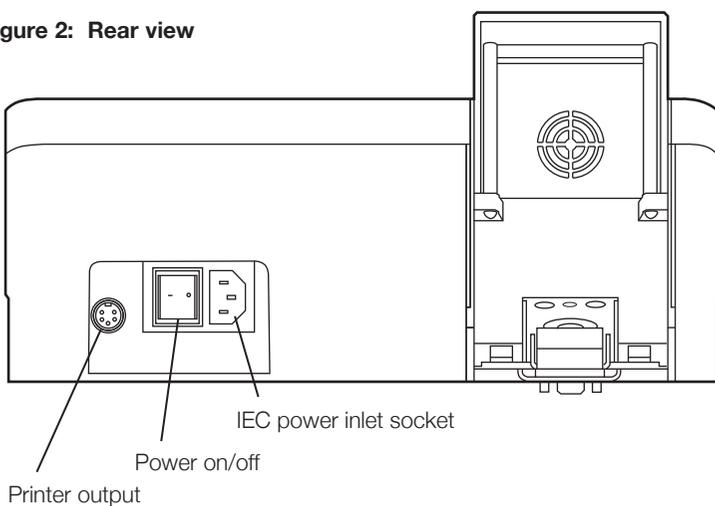


Figure 2: Rear view



Advanced Digital Melting Point Apparatus

Introduction

Thank you for purchasing this Cole-Parmer product. To get the best performance from the equipment, and for your own safety, please read these instructions carefully before use. Before discarding the packaging check that all parts are present and correct.

This equipment is designed to operate under the following conditions:

- ❖ For indoor use only
- ❖ Use in a well ventilated area
- ❖ Ambient temperature range 5°C to 40°C (41°F to 104°F)
- ❖ Altitude to 2000 m (6500 ft)
- ❖ Relative humidity not exceeding 80%
- ❖ Mains supply fluctuations not exceeding 10% of nominal
- ❖ Overvoltage category II IEC60364-4-443
- ❖ Pollution degree 2 IEC664
- ❖ Use with a minimum distance all round of 200 mm (8 in.) from walls or other items

If the equipment is not used in the manner described in this manual and with accessories other than those recommended by the manufacturer, the protection provided may be impaired.

Electrical installation



THIS INSTRUMENT MUST BE GROUNDED

Before connection please ensure that the line supply corresponds to that stated on the rating label.

Power requirements:

03012-27 81 W Universal 120-230 V

The Advanced Digital Melting Point Apparatus is provided with a NEMA 5-15 plug for 120 V installations and a UK 3-pin and a "Schuko" 2-pin plug for 230 V installations.

Should the cable not be suitable for connecting to the power supply, replace the plug with a suitable alternative.

THIS OPERATION SHOULD ONLY BE UNDERTAKEN BY A QUALIFIED ELECTRICIAN.

NOTE: Refer to the equipment rating plate to ensure that the plug and fusing are suitable for the voltage and wattage stated.

The wires in the power cable (120 V) are colored as follows:

BLACK - HOT/LIVE
WHITE - NEUTRAL
GREEN – EARTH

The wires in the power cable (230 V) are colored as follows:

BROWN - HOT/LIVE
BLUE - NEUTRAL
GREEN/YELLOW – EARTH

IF IN DOUBT CONSULT A QUALIFIED ELECTRICIAN

Should the power cable need replacing, a cable of 1mm² of harmonized code H05W-F connected to an IEC320 plug should be used.

The appropriate power cable should be connected BEFORE connection to the power supply.

General Description

The Cole-Parmer Advanced Digital Melting Point Apparatus has been designed for fast and accurate determination of melting points. Up to three samples can be tested simultaneously within the optimized heating block. The tubes are illuminated with bright white LED's to give a clear view of the samples during the melt. It is possible to record up to seven events in memory for each of the three sample tubes, recording both the temperature stamping and the date and time of the melt. There is also a large backlit LCD on the control panel that clearly guides the user through the melting process and is switchable between English, Spanish, German, French and Italian.

This unit features a unique "head-up" display, programmable methods, and a two-stage viewing head adjustment for more comfortable viewing angles and easy storage. The "head-up" feature projects a floating image of the block temperature in the same viewing field as the magnified tubes. This integrated display eliminates the need for the user to constantly switch their gaze between the tubes and the temperature shown on the control panel. Three methods can be programmed for repeated use with the plateau temperature and heating rate being fully customizable. Additionally, up to seven melt temperatures per capillary tube can be saved and recalled on the LCD. The two-stage head adjustment allows the viewing tube to be adjusted towards the user and tilted up/down for the individual user. When not in use, the viewing head can be stored safely back within the body of the unit for storage.

Available separately is an accessory printer to produce a hard-copy record of the melts and different types of capillary tubes. Please visit the Cole-Parmer website www.coleparmer.com for further information.

Safety Advice

Users should be aware of the following safety advice:

- ❖ HIGH TEMPERATURES ARE DANGEROUS as they can cause serious burns to operators and ignite combustible material.
- ❖ USE CARE AND WEAR PROTECTIVE GLOVES TO PROTECT HANDS.
- ❖ DO NOT use combustible substances near hot objects.
- ❖ NEVER lift or carry the instrument until it has been switched off and allowed to cool for at least 30 minutes.
- ❖ The unit should be carried using both hands with the fingers under the side edges.
- ❖ NEVER move or carry the unit while still connected to the power supply.
- ❖ DO NOT position the unit such that it is difficult to disconnect it from the power by removing the power cable from the socket at the back or where the ventilation slots at the back of the sample block are obstructed.

Before Use

Place the Advanced Digital Melting Point Apparatus on a firm, level surface and adjust the viewing tube so that it is at a convenient viewing angle. Connect to the power supply and switch the unit ON using the power On/Off switch. When the instrument is first switched on the display will show the welcome screen. Then after a short pause, the display will change to the main menu screen.



Caution: The heating block may be HOT. As a precaution for the user, all menu screens display the time and current block temperature.

NOTE: If the unit has been used recently the block may be too hot for your sample. If this is the case, press the stop button and allow the unit to cool before proceeding.

Operation

The Advanced Digital Melting Point Apparatus has been designed to give both quick and accurate results as well as measure and record the temperatures of crystalline samples held within the capillary tubes. Melting point samples are placed in a glass capillary tube which is placed in the aluminum block inside the sample chamber. This block is heated and the sample observed through the magnifying lens on the viewing tube until the melt occurs. The melting point temperature is displayed inside the eyepiece (of the viewing tube) on the head-up display (see Figure 3) or on the control panel's LCD (see Figure 4). The temperature ranges from ambient to 400°C and the heating rate is variable between 0.5°C per minute and 10°C per minute. Once the melt is started, the unit will heat up to the pre-programmed plateau temperature at the maximum rate before stabilizing at the plateau temperature for 120 seconds. An alarm will sound to indicate that the unit is ready to start heating at the pre-programmed rate. Once the melt has occurred and the cycle stopped, cooling is automatic to ambient temperature.

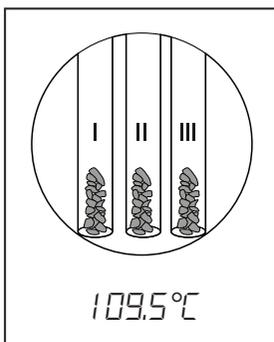


Figure 3:
Temperature shown
on inside of viewing tube

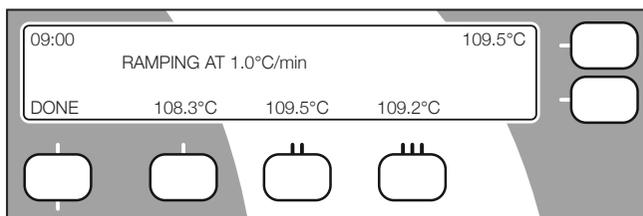


Figure 4:
Temperature shown on LCD
on control panel

Adjusting the Viewing Angle and Height

The viewer can be manually adjusted and, once adjusted, will remain in the desired position until another adjustment is made by the user. Figure 5 shows the maximum angles of adjustment:

NOTE: Do NOT place undue strain on the adjustment mechanisms or use excessive force to change the position of the viewer.

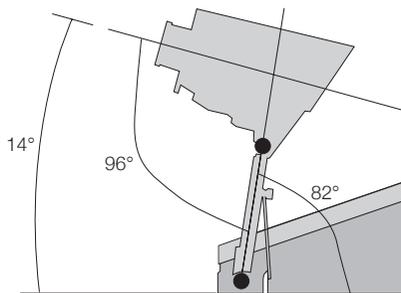


Figure 5

Adjusting the Head-Up Display

There are thumb screws located on each side of the viewer which allow the position of the temperature reading in front of the sample tubes inside the eyepiece to be fine tuned (see Figure 3).

Preparing the Sample

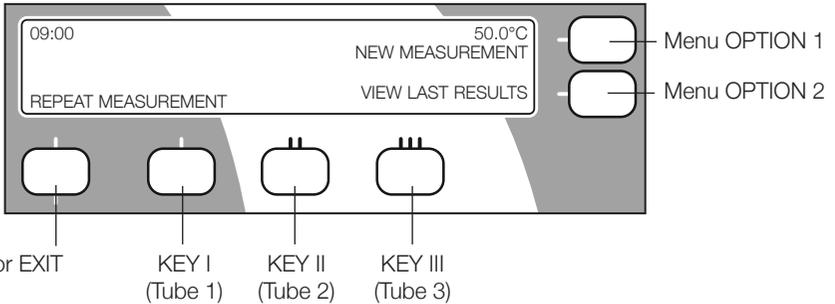


Caution: The heating block may be HOT.

1. Prepare up to three samples by placing a small amount in the end of a sealed capillary tubes.
NOTE: Full length capillary tubes, 100 mm (4 in.), should be used with this device. Tubes shorter than 60 mm may be extremely difficult to retrieve from inside the block.
NOTE: If the unit has been used recently, the block may be too hot for your sample. Allow the unit to cool before proceeding.
2. Insert the sealed end of the capillary tube into the heating block via the holes provided (see Figure 1).
3. Adjust the viewer until it is at a comfortable viewing angle.
4. Decide on a suitable plateau temperature. This should be approximately 10°C below the expected melting point of the sample. If the melting point is unknown, it may require a trial run to gauge an approximate temperature range and determine the ideal heating curve.

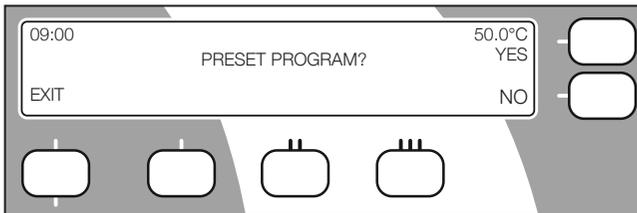
Measuring a Melting Point

Switching the unit ON will present the user with a welcome screen for a few seconds before displaying the main menu screen with three menu choices. All menu screens display the current time and block temperature on the top line.



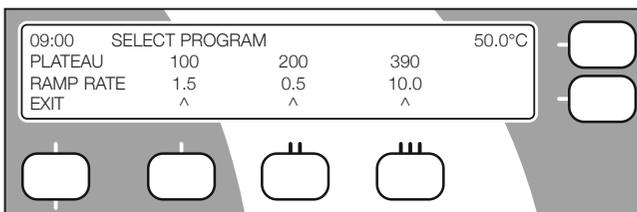
New Measurement Selection

1. Select the NEW MEASUREMENT option (Menu OPTION 1).
2. Select the desired action from the second screen:
 - YES See Using a Preset Program section.
 - NO See Setting up a New Measurement section.
 - EXIT Return to the main menu screen



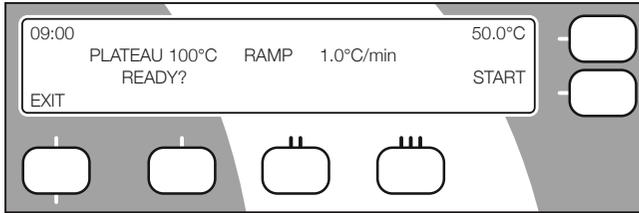
Using a Preset Program

1. Selecting YES will display the three programmable preset methods or press EXIT to return to the main menu screen.



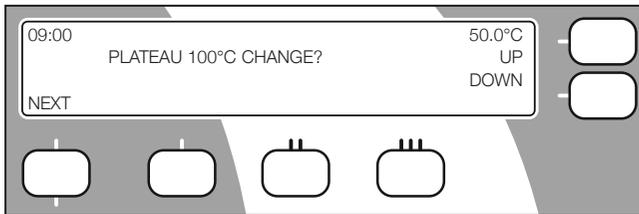
- Select the desired action using KEY I, II or III.

NOTE: To edit these values, please see Changing the Settings section on page 11.
- Check the method parameters on screen and check sample position in the viewer.
- To continue, go to Starting the Melt section on page 9.



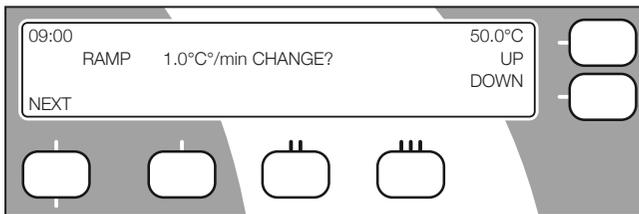
Setting up a New Measurement

- Selecting NO will ask the user to adjust the Plateau UP or DOWN.

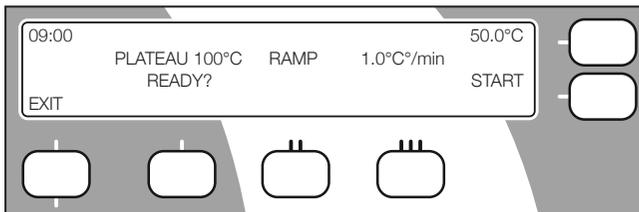


NOTE: Pressing and holding the button will increase the rate at which the values change.

- When the desired value has been reached, select NEXT.
- Adjust the Ramp Rate UP or DOWN. When the desired value has been reached, select NEXT.

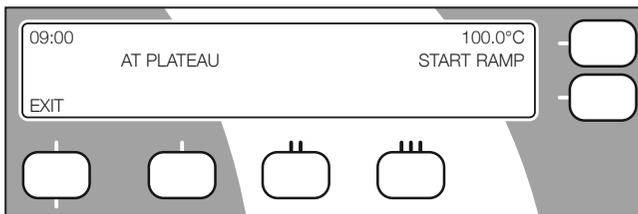


- Check the method parameters on screen and check sample position in the viewer. If incorrect, select EXIT to return to the main menu and repeat the setup process above.
- To continue, go to Starting the Melt section on page 9.

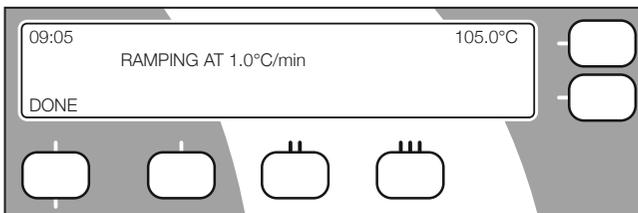


Starting the Melt

1. Selecting START will instruct the unit to begin heat/cool to the plateau temperature and display the estimated time to reach temperature.
2. Once achieved, the unit will stabilize at the plateau temperature and display a count down from 120 seconds to 0 seconds before emitting a beep to indicate the unit is ready to start the ramp.

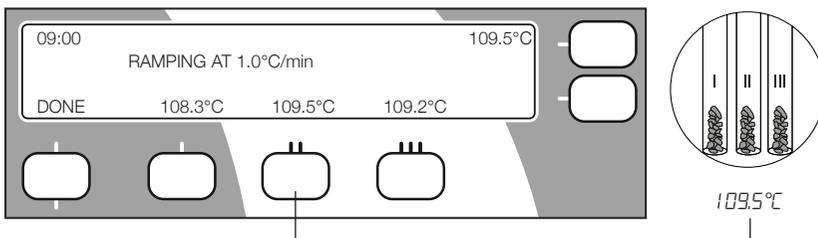


3. Pressing START RAMP will begin heating and display the rate rate selected in the method.



Recording Melt Temperatures

1. While viewing the sample tubes in the viewer, the melt temperature can be recorded into memory by pressing and holding the I, II or III KEY for the corresponding tube location shown below. A short beep sounds to confirm the melt temperature has been recorded and the recorded temperature is then displayed on the screen.

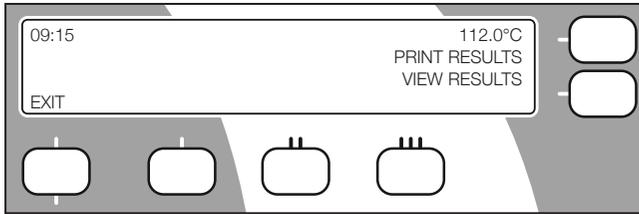


NOTE: Up to seven different temperatures can be stored for each capillary tube. If an eighth measurement is attempted, the unit will emit a long beep which indicates the memory is full. Records are held in memory until overwritten and are maintained even when disconnected from the power supply.

2. Once the melts are complete, select DONE to view or print the melt record.

Viewing or Printing Results

1. Selecting DONE after the melt process will display the following screen:



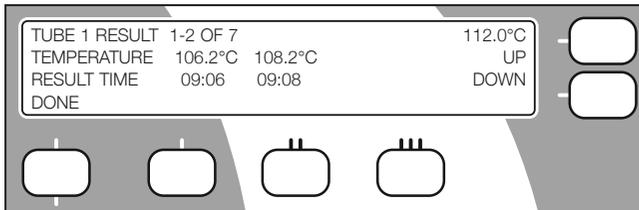
2. The accessory printer is required in order to use PRINT RESULTS. Sample of the printed results below:

```
Serial number           00001
Software issue          123456
Calibrated              04 JANUARY 2016

DATE                   04 JANUARY 2016
TIME                   9:15
Material.....
User.....
Reference.....
Plateau temperature    100...C
Ramp rate              1.0...C/min

Tube 1      Tube 2      Tube 3
106.2...C   106.2...C   106.2...C
9:00        9:00        9:00
108.3...C   108.3...C   108.3...C
9:02        9:02        9:02
108.9...C   108.9...C   108.9...C
9:02        9:02        9:02
109.3...C   109.3...C   109.3...C
```

3. Selecting VIEW RESULTS will display two measurements at a time on the screen:



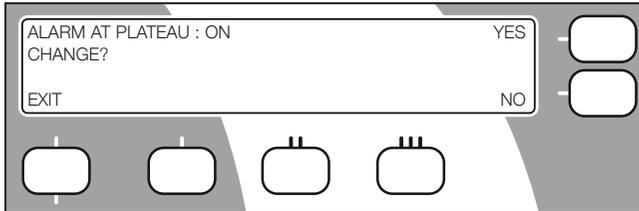
4. Individual tube's results can be displayed selecting the I, II or III KEY and selecting UP or DOWN will scroll through the recorded results.
5. Select DONE to return to the screen in step 1 or EXIT to return to the main menu screen.

NOTE: The unit may show a cooling status message until the block reaches ambient temperature.

Changing the Settings

1. Switch the unit ON, and press and hold the TOP RIGHT KEY during start-up.
2. Select the desired option by selecting YES or NO to each setting. Available settings are:

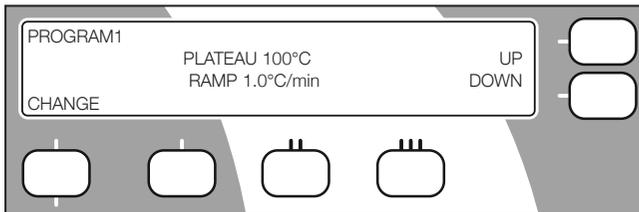
| | |
|----------------------|--|
| ALARM AT PLATEAU | ON or OFF |
| HEAD-UP DISPLAY | ON or OFF |
| LANGUAGE | ENGLISH, SPANISH, FRENCH, ITALIAN or GERMAN |
| TIME / DATE | HH:MM and DD:MM:YYYY |
| PRESET PROGRAM (1-3) | Adjusts default PLATEAU and RAMP RATE values |
3. To adjust a setting, select YES, then use UP or DOWN to adjust the value on the screen.



NOTE: Selecting NO will automatically scroll to the next available setting.

NOTE: Selecting EXIT will return to the main menu screen.

4. To edit or create a PRESET PROGRAM, use UP or DOWN to scroll between PROGRAM 1, 2 or 3 before selecting CHANGE to edit values for PLATEAU and RAMP.



5. When edits have been completed, select DONE and then EXIT to return to the main menu.

NOTE: If there is more than one setting that can be adjusted (i.e., hours and minutes), then NEXT will be displayed at the bottom left of the screen instead of DONE.

Cleaning and Care



Before Attempting Cleaning:

Ensure that the block is cool, then disconnect from the power supply.



WARNING: Ensure the unit is disconnected from the power supply before attempting maintenance or servicing.

Metal Casework:

The metal casing should be cleaned using a damp cloth and a mild detergent solution.

Cleaning is made easier if spillages are attended to promptly. In any case, spillages of alkali, phosphoric acid and hydrofluoric acid **MUST** be removed immediately as these chemicals can attack and damage the glass ceramic. Ensure that the appropriate safety precautions are observed.

Calibration

This instrument can be recalibrated and adjusted by an end-user. Please contact Cole-Parmer for details of the procedure quoting your model and serial number.

Servicing and Repair

This product range does not require any routine servicing.

NOTE: There are no internal user replaceable parts.

In the event of product failure, it is recommended that any repair is only undertaken by suitably qualified personnel. For advice, please contact Cole-Parmer quoting the model and serial number. Only spare parts supplied by the manufacturer or its agent should be used. Fitting of non-approved parts may affect the performance of the safety features of the instrument.

If in doubt, please contact Cole-Parmer.

Warranty

Cole-Parmer warrants this equipment to be free from defects in material and workmanship, when used under normal laboratory conditions, for a period of **three (3)** years. In the event of a justified claim, Cole-Parmer will replace any defective component or replace the unit free of charge.

This warranty does NOT apply if:

- ❖ Any repair has been made or attempted other than by the manufacturer or its agent.
- ❖ Any minor coating chips or scratches occur during normal use (i.e., wear and tear).
- ❖ Damage is caused by fire, accident, misuse, neglect, incorrect adjustment or repair, damage caused by installation, adaptation, modification or fitting of non-approved parts.

Calibration Certificate

Catalog Number _____

Serial Number _____

Calibration Date _____

Temperature readings

| Set temp. | °C | Measured temperature °C |
|-----------|------|-------------------------|
| 60°C | ±0.5 | _____ |
| 100°C | ±0.5 | _____ |
| 200°C | ±1.0 | _____ |

Quality Assured

 **Cole-Parmer®**

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Phone: 847-549-7600
Fax: 847-247-2929
www.coleparmer.com

Technical Specification**03012-27**

| | |
|------------------------|--|
| Number of samples | 3 |
| Temperature range | Ambient to 400°C |
| Temperature resolution | 0.1°C |
| Digital display | Alphanumeric 4 x 40 character LCD, backlit |
| Light source | White LEDs |
| Sensor | PT100 |
| Ramp rate | 0.55 °C to 10°C per minute |
| Cooling time | 350°C to 50°C in approximately 12 minutes |
| Memory storage | 7 temperature readings per sample tube |
| Dimensions (WxDxH) | 325 x 200 x 170 mm (12.8 x 7.9 x 6.7 in.) |
| Electrical supply | 120 to 230 VAC, 50/60 Hz |
| Net weight | 3.6 kg (8 lb) |



This product meets the applicable EC harmonized standards for radio frequency interference and may be expected not to interfere with, or be affected by, other equipment with similar qualifications. We cannot be sure that other equipment used in its vicinity will meet these standards

and so we cannot guarantee that interference will not occur in practice. Where there is a possibility that injury, damage or loss might occur if equipment malfunctions due to radio frequency interference, or for general advice before use, contact the manufacturer.

Declaration of Conformity

Catalog Number: 03012-27 Description: DIGITAL MELTING POINT, ADVANCED, UNIVERSAL VAC

These products comply with the requirements of the EU Directives listed below:

| | |
|--------------------|------------------------------------|
| 2004/108/EC | EMC Directive |
| 2006/95/EC | Low Voltage Directive (LVD) |
| 2011/65/EC | RoHs Directive |



**For technical, sales or
servicing information,
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