

Cole-Parmer SMP20

Cole-Parmer Stuart SMP20 Digital Melting Point Apparatus User Manual

1. INTRODUCTION

This manual provides instructions for the safe and efficient operation of the Cole-Parmer Stuart SMP20 High Resolution Digital Melting Point Apparatus. This instrument is designed for precise measurement of melting points in laboratory settings, offering digital temperature display and enhanced sample observation.

Key features of the SMP20 include:

- Digital temperature selection, measurement, and display, eliminating the need for glass thermometers.
- Ability to test two samples simultaneously.
- Integrated magnifying lens with built-in illumination for clear sample observation.
- Adjustable viewing angle via extendable back feet.
- Programmable plateau temperature for initial warm-up, allowing for unattended operation until the target temperature is reached.
- Controlled heating rate of 2°C per minute after warm-up for improved accuracy.



Figure 1: The Stuart SMP20 Digital Melting Point Apparatus with power cables and sample tubes.

2. SAFETY INFORMATION

Always adhere to standard laboratory safety procedures when operating this apparatus. Failure to do so may result in injury or damage to the instrument.

- **Electrical Safety:** Ensure the apparatus is connected to a grounded power outlet of the correct voltage (120 VAC for this model). Do not operate with damaged power cords.
- **Hot Surfaces:** The heating block and surrounding areas become very hot during operation. Avoid direct contact. Allow the instrument to cool completely before handling or cleaning.
- **Sample Handling:** Use appropriate personal protective equipment (PPE), such as gloves and eye protection, when handling samples.
- **Ventilation:** Operate the apparatus in a well-ventilated area to dissipate any fumes that may be released from samples during heating.
- **Placement:** Place the instrument on a stable, level, heat-resistant surface away from flammable materials.

3. SETUP

1. **Unpacking:** Carefully remove the apparatus and all accessories from the packaging. Retain packaging for future transport or storage.
2. **Inspection:** Inspect the instrument for any signs of damage incurred during shipping. Contact your supplier immediately if damage is found.
3. **Placement:** Position the apparatus on a stable, level laboratory bench. Ensure adequate clearance around the unit for ventilation.
4. **Power Connection:** Connect the provided power cord to the power inlet on the rear of the apparatus and then

to a suitable grounded 120 VAC power outlet.

5. **Adjust Viewing Angle:** Extend the back feet of the apparatus if a more inclined viewing angle is desired for comfortable observation.



Figure 2: Rear view of the apparatus, highlighting the power input.

4. OPERATING INSTRUCTIONS

4.1 Sample Preparation

- Ensure samples are dry and finely powdered.
- Fill melting point capillary tubes to a height of 3-5 mm with the prepared sample.
- Gently tap the capillary tube to ensure the sample is packed uniformly at the bottom.

4.2 Loading Samples

1. Open the sample chamber cover.
2. Insert up to two prepared capillary tubes into the designated slots in the heating block.
3. Close the sample chamber cover.

4.3 Setting Temperature and Operation



Figure 3: Control panel and digital display of the apparatus.

1. **Power On:** Flip the main power switch located on the side of the unit to the 'ON' position. The digital display will illuminate.
2. **Set Plateau Temperature:** Use the arrow keys (Up/Down) to set a plateau temperature. This is an initial warm-up temperature below the expected melting point. The apparatus will heat rapidly to this temperature.
3. **Start Warm-Up:** Press the 'Start' button to begin the warm-up phase. The display will show the current temperature.
4. **Set Target Temperature (after plateau):** Once the plateau temperature is reached, the heating rate will automatically slow to 2°C per minute. At this point, you can set the final target temperature using the arrow keys, or allow the apparatus to continue heating at the controlled rate.
5. **Observe Melting:** Look through the magnifying lens to observe the samples. The built-in illumination provides clear visibility. Note the temperature displayed when the sample begins to melt and when it is fully melted.
6. **Record Data:** Record the observed melting point range.
7. **Cool Down:** After completing the measurement, press the 'Stop' button. Allow the apparatus to cool down before removing samples or preparing for the next test.

5. MAINTENANCE

Regular maintenance ensures the longevity and accuracy of your melting point apparatus.

- **Cleaning:** Disconnect the power cord before cleaning. Use a soft, damp cloth with a mild detergent to clean the exterior surfaces. Do not use abrasive cleaners or solvents. Ensure no liquids enter the instrument.
- **Sample Chamber:** Periodically clean the sample chamber and heating block to remove any residue from samples. Use a small brush or cotton swab if necessary. Ensure the heating block is cool before cleaning.
- **Storage:** When not in use, store the apparatus in a clean, dry environment, protected from dust and extreme temperatures.

6. TROUBLESHOOTING

This section addresses common issues you might encounter. For problems not listed here, contact technical support.

- **Apparatus does not power on:**
 - Check if the power cord is securely connected to both the apparatus and the power outlet.
 - Verify that the power outlet is functional.
 - Ensure the main power switch is in the 'ON' position.
- **Temperature display is erratic or incorrect:**
 - Ensure the sample chamber is clean and free of debris.
 - Allow the unit to cool down completely and restart.
 - If the issue persists, contact technical support for calibration or service.
- **Samples are not melting or melting too quickly:**
 - Verify that the correct plateau and target temperatures have been set.
 - Ensure samples are properly prepared and packed in the capillary tubes.
 - Check the heating rate setting.

7. SPECIFICATIONS

Feature	Specification
Model Number	AO-03011-45
Display	4-digit LED
Maximum Temperature	300°C
Minimum Temperature	Ambient
Temperature Resolution	0.1°C
Temperature Accuracy	1.0°C up to 20°C; 2.5°C at 300°C
Heat-up Time	50 to 350°C in 15 minutes
Heating Rate (after plateau)	2°C per minute
Power Requirements	120 VAC, 60 Hz
Package Dimensions	14 x 11 x 10.23 inches
Package Weight	1 Pound

8. WARRANTY AND SUPPORT

This Cole-Parmer Stuart SMP20 Digital Melting Point Apparatus is covered by a standard manufacturer's warranty against defects in materials and workmanship. For specific warranty terms and conditions, please refer to the documentation included with your purchase or visit the official Cole-Parmer website.

For technical assistance, troubleshooting, or service inquiries, please contact Cole-Parmer customer support. Have your model number (AO-03011-45) and serial number ready when contacting support.

Cole-Parmer Contact Information:

Please refer to the official Cole-Parmer website or your purchase documentation for the most current contact details.

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