

# Melting Point Apparatus

*DigiMelt — Digital melting point apparatus for students*



## DigiMelt

- **Mercury free**
- **Fast, safe, reliable measurements**
- **Built-in digital thermometer**
- **Microprocessor controlled ramps**
- **Ramp rates from 0.5 to 20 °C/min**
- **Easy to clean and maintain**
- **Tube tapper packs samples**
- **Safety certified**

• **DigiMelt (MPA160) ... \$790 (U.S. list)**

DigiMelt is a modern, low cost, digital melting point apparatus designed specifically for the student lab. Students learn the visual detection capillary method of melting point determination without the frustration of trying to control the oven temperature. DigiMelt rapidly heats the oven to the programmed start temperature, then ramps at the specified rate. The student carefully observes the samples and records the melting points with a touch of a button.

### Digital Temperature Readout

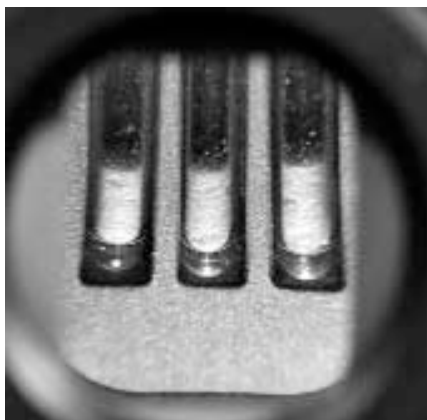
DigiMelt incorporates a platinum resistance temperature detector (RTD) instead of the usual mercury thermometer. This means better accuracy on the readings, and no more mercury cleanup from broken thermometers. The RTD is encased inside the oven block making it virtually unbreakable.

### Microprocessor Temperature Control

Some student instruments use a large knob that simply throttles power to the oven without any sense of what the target temperature is. DigiMelt uses an RTD for feedback, so it "knows" the oven temperature. This means the students can enter a start temperature, a ramp rate, and a stop temperature and the microprocessor takes care of the rest. Furthermore, the microprocessor can deliver variable amounts of power to the oven, so it can quickly ramp to the starting temperature, then perform the ramp as slowly as 0.5 °C/min.

### High Quality Optics

Rather than forcing the student to peer through a tiny lens with poor illumination, the DigiMelt uses a large magnifier that allows plenty of eye relief. The user can see all three capillaries easily at a comfortable distance from the instrument. White LEDs are used to provide high-contrast illumination.



### Tube Tapper

For many students, the melting point lab is the first time they have touched a capillary. This can lead to lots of capillaries on the floor and many broken capillaries. DigiMelt employs an integral cell phone vibrator motor to let students pack their sample without tapping them on the bench or dropping them through a long glass tube. A molded guide in the chassis allows students to pack three samples at a time.

### Easy Maintenance

Cleaning the lens is as simple as removing the lens retaining ring. If a student should break a capillary, the entire lens holder assembly slides out for easy clean up of the broken glass. Replacing thermometers is a thing of the past as the RTD will never break and cannot be removed from the instrument. Unlike conventional incandescent bulbs that must be periodically replaced in some student instruments, the white LEDs used in DigiMelt will last a lifetime.

### Safer for Students

The DigiMelt uses an internal RTD thermometer, which means students and TAs are never exposed to toxic mercury vapors. Some student instruments will reach 500 °C and stay at that temperature indefinitely — a severe burn hazard. The DigiMelt's maximum temperature is 260 °C, which allows testing of virtually all organic compounds a student might examine. Intelligently designed cowlings protect students from touching the hot oven. Furthermore, the oven will automatically turn off after being idle for 30 minutes.

## DigiMelt Specifications

### Display

|         |   |
|---------|---|
| Type    | 4-digit LED   |
| Readout | Start, stop or ramp rate, oven temperature, and stored measurement data |

### Temperature

|                 |   |
|-----------------|---|
| Resolution      | 0.1 °C  |
| Accuracy        | $\pm(0.45 + 0.0045T)$ where T is temperature in Centigrade<br>Typical:<br>$\pm 0.6$ °C (<200 °C)<br>$\pm 1.0$ °C ( $\geq 200$ °C) |
| Reproducibility | 0.2 °C  |

### Oven

|                     |  |
|---------------------|--|
| Range               | 50 °C to 260 °C                                  |
| Ramp rates          | 0.5, 1.0, 2.0, 5.0, 10, 20 °C per minute         |
| Heat-up time        | ~2.5 minutes to 100 °C<br>~6.5 minutes to 250 °C |
| Thermometer         | Built in Pt RTD                                  |
| Temperature control | Closed-loop PID                                  |
| Safety shut off     | Automatic after 30 minutes idle time             |

### Capillaries

|                |                                   |
|----------------|-----------------------------------|
| Dimensions     | 1.4 mm to 1.8 mm outside diameter |
| Capacity       | 3 tubes                           |
| Fill height    | 2 mm to 3 mm                      |
| Sample packing | Automatic (tube tapper)           |

### General

|             |  |
|-------------|--|
| Power       |  |
| MPA160      | 100 to 132 VAC, 50 to 60 Hz,<br>1 A, 75 W nominal  |
| MPA161      | 200 to 250 VAC, 50 to 60 Hz<br>1/2 A, 75 W nominal |
| Environment | 0 °C to 30 °C, non-condensing                      |
| Humidity    | <90%   |
| Weight      | 2 lbs.   |
| Dimensions  | 6.5" × 9.5" × 5.25" (WHD)                          |

### Ordering Information

|          |                         |       |
|----------|-------------------------|-------|
| DigiMelt | Melting point apparatus | \$790 |
| O100MPC  | Capillaries (300 pcs.)  | \$150 |
| O100MPS  | Melting point standards | \$295 |