Instruction manual

Melting point determination with the MPM-V-01

Preamble

The melting point determination device MPM V01 is an automatic measuring instrument for the proof of identity of the starting materials in pharmacies and laboratories as well as for the inspection of various incoming goods in the industrial sector, according to the capillary method.
It determines the melting temperature of substances, according to the Eur. Ph. European Pharmacopoeia, as they change from solids to their liquid state of aggregation.
(The melting temperature of substances according to Eur. Ph. Europe Pharmacopoeia determines the from solid to liquid, transparent physical state pass over)
The MPM V01 offers you a modern, easy-to-use melting point determination device with all necessary documentation options (for) at your disposal.
We reserve the right to misprints and errors.

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Safety instructions

Technical specifications/ Accessories

Please read all safety instructions before using!

The manufacturer accepts no liability for non-observance of the savety instructions and the resulting consequences.

(For non-observance and the resulting consequences will not be charged by the manufacturer liability assumed.)

- Use a safe and suitable location for the device
- No access for untrained or uninstructed persons.
- Service work/repairs may only be carried out by authorized specialists.
- Ventilation slots must not be covered.
- Do not introduce any foreign objects to the ventilation slots or the heating block (No foreign objects or liquids in the ventilation slots or the Insert heating block.)
- Always allow the device to cool down before switching it off.
- Do not use the device to perform measurements on explosive, flammable or explosive substances which could react when heated and create danger for the user and their surroundings. (No measurements with explosive, flammable or other substances perform in which by heating for the user and those around them dangers can arise.)
- When handling and filling the capillary with chemicals, the respective safety regulations are to be observed.
- Only use the capillaries provided for measuring purposes.
- The device may only be packaged when it has cooled down.

The manufacturer reserves the right to make technical and visual changes.

Technical specifications

net:	100 –240 V/AC 1,3A
protection class:	IP20
temperature measuring range:	40 -200 °C +/-0,2 °C
	200 –340 °C +/-0,4°C
heating rate adjustable:	0,5 / 1 / 2 / 3 / 4 / 5 °C/Min
capillary insertion:	sliding system (capillary falls and centers itself automatically)
cooling:	Automatic recooling fan
memory:	10 Measurements in device / SD Card requirements / PDF document accordingly
input device:	LCD colour touch display
melting progress display:	bar chart
connection:	USB incl. PC Software / SD-card memory Printer connection: SUB-D 9 pin for Citizen CBM 911 II or equivalent
capillary size:	1,4 mm diameter +/-0,05 mm 80mm long closed on one side.
housing:	W x H x D mm 275 x 125 x 285
color:	RAL 7035 light grey
device net weight:	3 kg

Accessories:

power cord,
USB-cable,
SD-card,
 capillaries (100 pieces),
PC software on SD-carrd,
Capillary guidance

Options:
printer Citizen, power adapter, printer cable

Installation

- Carefully unpack the device and accessories from the box.

- Check the device for any transport damage and for completeness.

- Decide on a suitable location with access to a power outlet.

- Screw the enclosed capillary guide into the cover plate of the heater block opening.

- Connect the device to the rear power connector and the power outlet.

- Insert the SD disk into the slot at the front.

- If necessary, connect the device to the PC using the USB-cable.

- If necessary, connect the device to the printer.

Turn on the device

Figure 1: Main menu
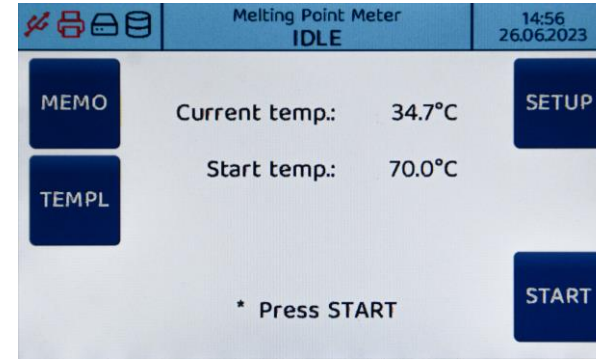
Roughly three seconds after the device is turned on the screen will display the functions **UPDATE** and **SERVICE** as well as the date of the last calibration. These functions will be explained at a later point.

After another 3 seconds, the display will change to the main menu.

In the main menu (Figure 1) you will see 4 symbols at the top left.

1. Trident. Connection to PC (active) black, not connected (inactive) red
2. The Printer icon is always red and turns black when printing.
3. SD Memory card without card in slot red, with card inserted black
4. Storage space on the device

The storage locations under points 3 and 4 indicate how much storage is left.

Settings

Figure 2: Configuration
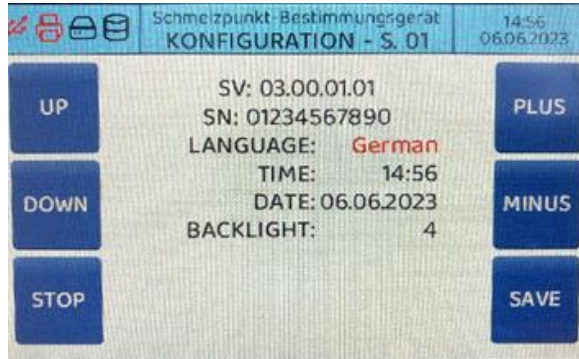
Pressing the function **SETUP** (see previous page, Figure 1) will send you to the configuration menu (Figure 2). The current software version and the serial number of the device are displayed.

1. With the functions **UP** and **DOWN** the cursor jumps into the functions language, time, date and backlight (screen brightness). Set them in the desired setting via **PLUS / MINUS** on the cursor and then save them with **SAVE**. You will then automatically be sent back to the main menu. The backlight (screen brightness) is only changed after you Save and switch the device off and on once.
2. Using the function **STOP** exits the menu without saving and returns you to the main menu (Figure 1).

Saved measured results

Figure 3: measurement results
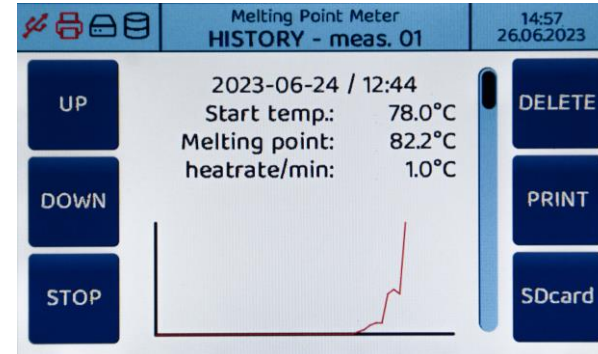
Using the function **MEMO** (Figure 1) takes you to the menu displaying your last 10 measurements (Figure 3). With the functions **UP** and **DOWN** scroll the measurement from 1 to 10.

- **DELETE** always deletes the currently displayed measurement result.

- **PRINT** prints the currently displayed data.

- **SD card** saves the currently displayed results in CSV format to the SD card.

Templates / Database

The function **VORLA** (Figure 1) shows the substances which you have saved on your SD card and their associated melting temperatures.

Select the desired substance with the function **UP/DOWN** with their associated start temperature. The device starts automatically and after reaching the desired temperature, it will be ready for measurement.

Creation of a database with substances on the SD card

Figure 4: Create database
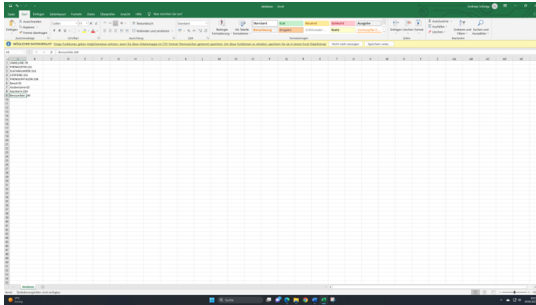
Plug the SD card into the PC drive, open the file database (Excel). Click with the mouse on the next free column in the list. e.g. A7; A8 etc.

Then go to the edit bar at the top and enter the chosen substance e.g. Saccharin: 222 C a (label; colon; degrees Celsius). Enter 5 as the starting temperature C below the expected melting point, so for saccharin 217 C. The substance is now in the selected column. Then save the file.

Plug in the SD Card into the switched off melting point determination device on and turn it on. The database is automatically transferred from the SD card to the device and updated. You can now use the function **VORLA** (Figure 1) to query the current database or start measurements. Using these steps you can increase or decrease your database at will.

Melting point determination (1/3)

Figure 5: Preheat
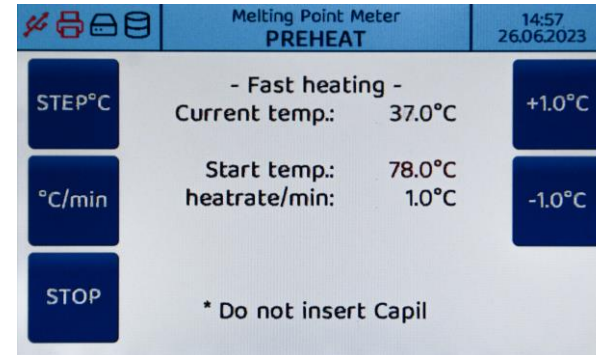
Use the function **START** in the main menu (Figure 1). The device will start the heating process (Depiction 5).

Now select the desired starting temperature using the functions on the right of the display **+ 1,0 ˚C** or **– 1,0 ˚C**

- Each tap changes the start temperature in increments of 1 ˚C.
- With the function **STEP˚C** you select by which increments the starting temperature is changed via **+ /-**. The selected increment, 1˚C, 10 ˚C oder 100˚C, is displayed accordingly. Thus, the selection of the starting temperature is made easier, even when using extreme temperature changes.
- With the function **˚C/min** you set the heating rate at which the measurements are to be carried out.

Melting point determination (2/3)

Figure 6: Automatic measurement
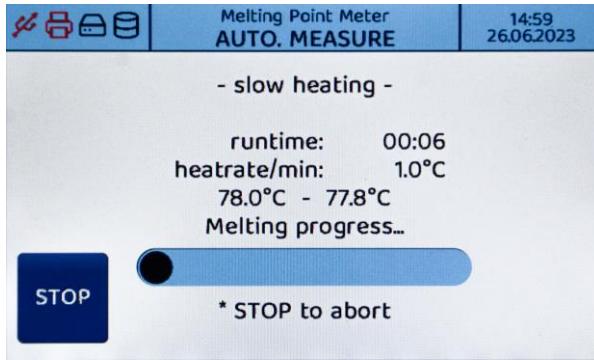
When the device signals that the starting temperature has been reached, slide the filled capillary into the measuring channel. The device automatically switches to the measuring mode slow heating and determines the melting point.
During the measurement you can track the progress via a progress bar on the display (Figure 6) and observe the change in the substance during the course of melting.

Melting point determination (3/3)

Figure 7: Measurement completed
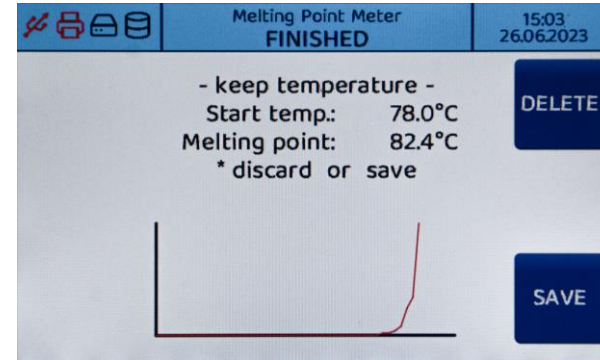
Once the melting point is reached, you can choose between **DELETE** and **SAVE**. Accordingly, the measurement result is deleted or saved and can later be queried using the **MEMO** (history) function and further processed.

If no function is activated after 10 minutes, the device starts cooling and saves the result automatically. It is always the last 10 measurements that are automatically saved in the order of measuring. They remain even after switching off of the device. You can always use the function **HISTO** to view them.

With the beginning of the 11th measurement, it is indicated that the memory is full and the device requests you to delete one or more saved results.

Documentation (1/2)

Figure 8: measurement protocol
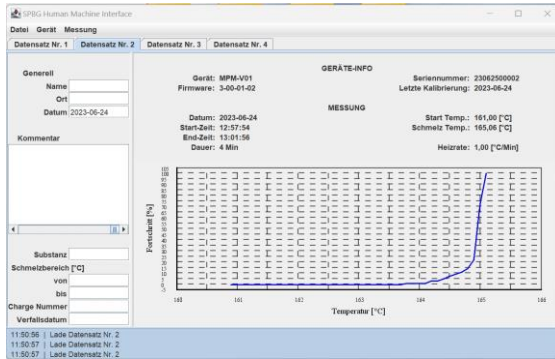
Once the melting point has been determined, you have the choice of Documentation type:

* Printout of a simplified log using the **Print** function (Figure 3)
* Storage on the SD card using the **SD Card** function (Figure 3)
* Download to PC via the PC software on your PC

Open the Start app for your PC software and choose the tab **DEVICE** and then the **CONNECT** function. The footer now displays **SPBG Device connected to com** in the top left of the device display. The connection icon (trident) is now black.

# Documentation (2/2)

Figure 9: Download
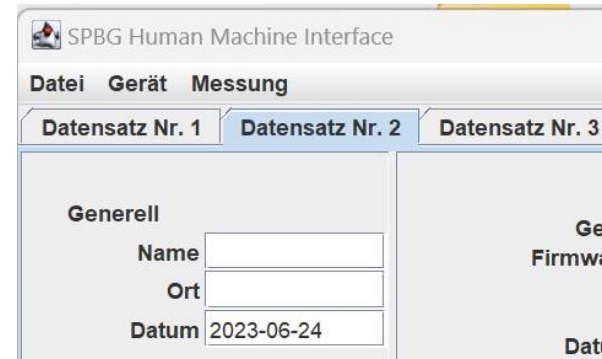
In the next step select the function **ABOVE** again in the **DEVICE** tab and then the function **LOADING DATA**. Now transfer your measurement results from the melting point determination device into the software on your PC, then select via the tab **MEASURE**, **LOAD GRAPH** and transfer the associated measurement curve to the graphic field provided. Now enter your data in the respective free fields. All fields must be filled out with the exception of the comment field (optional), so that a PDF protocol can be generated. With the tab **FILE , PDF EXPORT PATH** you select where on your PC the PDF document should be saved and then go to the tab **MEASUREMENT** to **EXPORT PDF** and export your file in the selected destination folder.

In the tab **FILE** you can now close the program with EXIT.

PC Software Installation

Figure 10: Software installation
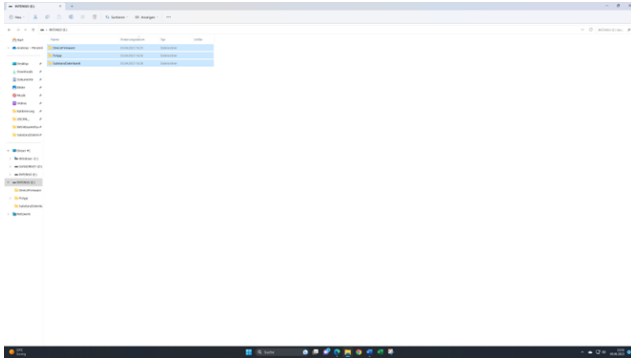
1. Connect the melting point device to your PC via USB and turn on the device.
2. Insert the SD card into your PC slot and copy the Device folder firmware; PC app; Substance Database (Excel) from your SD card to your personal computer
3. Open the PC App folder.
4. Then start the start app (the measurement log form opens on your PC).
5. Click on the tab at the top left DEVICE
6. Choose connect.
7. The connection is now established and will appear in the bottom left of the blue footer **connected to SPBG device at COM5**. On the display at the top left the trident now appears in black.
8. For further handling we recommend a shortcut. Create an app on your desktop to start the software faster in the future.

The functions can also be used directly using the SD-card without installation on your computer.

Adjust (offset) of the device (1/2)

Figure 11: Calibration with reference substances
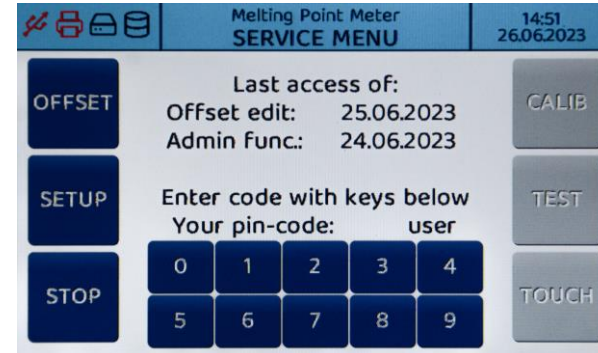
When the device is switched on, the display will show the functions **UPDATE** and **SERVICE**. Select the **SERVICE** function.

Offset edit with date shows the date of the last adjustment with calibration-substances.

Enter the code **4711**. Then select the **OFFSET** function. The display shows Temp.Offset-1/3. There are three measurement bases each shown above. 1 out of 3, 2 out of 3, 3 out of 3. For offset it is recommended to use only certified calibration substances according to WHO, e.g.
- Vanilla 81.8 to 83 C,
- sulfanilamides 164.7C to 165.9C,
- caffeine 235.8C to 237

Adjust (offset) of the device (2/2)

Gerätesoftware Update

Now set the desired temperature to the decimal point as per the temperature mentioned in the certificate of the calibration substance. With the function **STEP ˚C** change the temperature using the + or - ˚C function. According to the setting the temperature selection then jumps to 0.1 C/1/ C/10 C/100 C increments.

The device automatically heats up to a starting temperature of 5 degrees below the start temperature. Once the temperature is reached, insert your calibration substance. The device then starts the measurement. After completing the measurement go over the function **SKIP** to the TEMP offset location 2 and then run the next measurement with the next substance. Use the SKIP function to jump to the memory location 3 and carry out the third measurement with the third substance.

After the third measurement, all three measurement points and the determined Temperature offset displayed. With the function **SAVE** they are saved. The device is now recalibrated. The new date of the adjustment then appears in the service menu.

It is recommended to repeat the Adjustment every two years.

Figure 12: Software Update
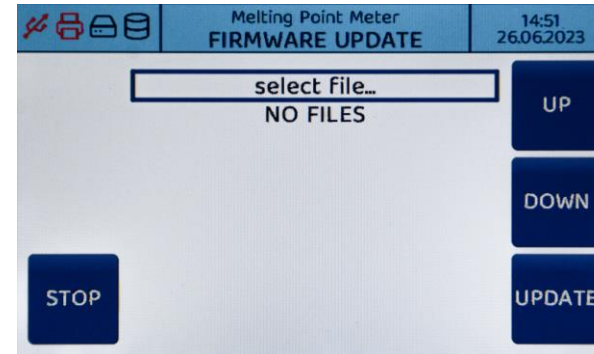
You can update your device software when you switch on the device:

• In the first approx. 4 seconds after switching on, the screen shows the **UPDATE** and **SERVICE** functions
• Choose the function **UPDATE** and put the SD card with the new software into the SD slot.
• Using the function **UP** and **DOWN** select the appropriate file and start the download via the **UPDATE** function.
• The software will now be updated automatically and the progress is shown via a progress bar.
• The device must then be restarted.

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