

# Micro-Osmometer

Type 6M



Sample volume 10 - 25  $\mu$ l · Measuring time approx. 1,3 minutes

Simple operation · User guiding  
3-point push button calibration · Reasonable price  
Single-use plastic sample tubes · Air cooling

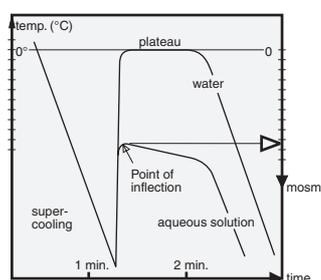


## Measuring Principle

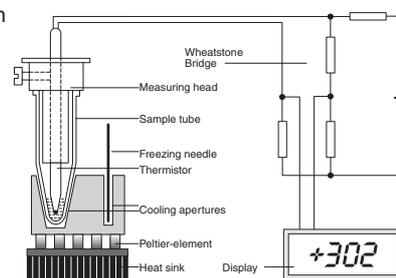
The freezing point of aqueous solutions is measured. The depression of freezing point compared to pure water is directly related to the osmotic concentration. Pure water freezes at 0°C, an aqueous solu-

tion with an osmolality of 1 osmol / kg water at -1.858°C. 1 Mol of a substance dissolved in 1 kg of water gives a solution with an osmotic concentration of 1 osmol / kg water only if it is an ideal solution and if the substance does not dissociate.

Typical cooling curves of water and aqueous solutions



Schematic diagram



## Function and Description

The sample (serum, blood, urine or any other aqueous solution) is filled in a plastic sample tube and cooled via a Peltierelement. These are semiconductor devices, which become cold on one side and warm on the other when electrical current flows through. The cold side cools the sample whilst the heat from the warm side dissipates into the air by convection.

The Löser-Osmometer transports the warmth via cooling surfaces into the atmosphere, an extra water supply is not necessary. Operation of the instrument requires only an electrical socket. The temperature on the cold side is kept electronically constant.

During the measuring process the temperature of the sample is measured by a thermistor (a temperature dependent resistor). This is part of the measuring head onto which the tube is placed.

The measuring head is attached to guide rods which protect it from accidental damage.

At a defined supercooling the freezing process must be started by lowering a needle with ice crystals into the sample tube. The freezing point of the sample is reached.

The method of initiating the freezing process is important for the reproducibility of measurements. Dipping a needle with ice crystals into the sample gives more exact results than stirring with a wire which is constantly dipping into the sample.

Because of linear correlation between osmolality and freezing point the measurement of freezing point is a determination of osmolality. The results are displayed as mosm / kg H<sub>2</sub>O.

## Technical Data

Sample volume: 10 µl to 50 µl

Measuring time: approx. 1.3 minutes (50 µl)

Reproducibility: ± 0.5% (50 µl) / ± 1% (10 to 25 µl)

Measurement range: 0 ... 2500 mosm / kg H<sub>2</sub>O

Measurement display in mosm / kg H<sub>2</sub>O

3-point push button calibration with memory

Analogue output for xy-plotter (optionally)

Power supply: 230V AC (100/115V AC on request) approx. 45 VA

Dimensions: Width 180 mm, height 278 mm, depth 216 mm

Weight: approx. 4.8 kg

The Instrument is CE-labelled

### Accessories included:

50 plastic tubes, operating instructions, little awl for cleaning,

2x10 vials of standard solution 300 and 900 mosm / kg H<sub>2</sub>O,

Spare thermistor, spare freezing needle, spare fuses.

## Calibration

The zero point is calibrated with distilled water and a standard point with the NaCl-solution of 300 mosm / kg H<sub>2</sub>O supplied. Occasional checks shows that the calibration is very stable.

An additional 900 mosm-solution can be used to calibrate, whereby the linearity is raised by higher concentrations.

## Special Features and Advantages

- Very small sample volumes.
- Automatic result recognition and storing ensure reliable measurements.
- Large illuminated LCD display.
- Single use plastic tubes.
- User guiding and error messages with lamps and display.
- User friendly push button calibration prevents calibration error.
- Additionally third calibration point at 900 mosm provides increased accuracy at higher concentrated solutions.
- Reduced operating costs as no extra water supply is necessary.
- Reasonable price.

## Operating of the Instrument

- Switch on instrument, wait for ready display (approx. 3 minutes).
- Place 25 µl sample in the sample tube (± 10 %).
- Place the sample tube onto the measuring head.
- Lower the measuring head. The sample tube is dipped into the cooling slot.
- Supercooling is reached after about 1 minute, a buzzer sounds.
- Now dip the needle with the ice crystals into the sample.
- As freezing point is reached, the display shows the measurement value in mosm / kg, the »ready« lamp shines and the instrument gives an audible tone. The measurement value is stored in the memory until the next measuring is started.
- Slide measuring head from cooling slot and remove the sample tube.
- Wipe the thermistor with a soft tissue.

## Extra Accessories

- Analogue output for XY-plotter
- Calibration solution 900 mosm / kg H<sub>2</sub>O

Subject to technical changes.