

## Liquidus Tracker precision vitrification

Liquidus Tracking is an approach developed to cryopreserve tissues that are unsuitable for preservation using conventional techniques including slow rate freezing and ultra fast vitrification.

Unlike in standard cryopreservation the conditions here are adjusted such that ice cannot form



Liquidus tracking aims for vitrification without fast rates. Avoiding high concentrations of cryoprotectant at the start, the concentration of DMSO is increased as temperature decreases.

The product is designed for research into use of liquidus tracking to cryopreserve samples not suitable for conventional slow-rate freezing or ultrafast vitrification.

Vitrification normally requires ultra-fast cooling rates and usually needs small samples to achieve those rates. Liquidus tracking achieves vitrification without the fast rates. The concentration of cryoprotectant is increased as cooling proceeds; the conditions of the solution that the cells or tissue experience are similar to those that they would experience during conventional cryopreservation with the formation of ice.

There are two methods: dual solution mode - appropriate for small sample containers and single solution mode - for larger sample containers.

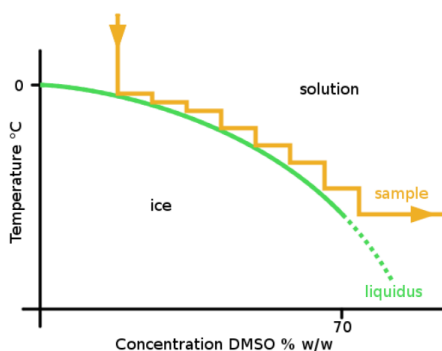
- Dual mode: the two peristaltic pumps feed two solutions to the sample; one pump feeding a high concentration DMSO solution to the sample container and the second pump feeding a 0% solution. Pump speeds are adjusted to control the concentration of cryoprotectant surrounding the sample while maintaining a constant flow rate.
- Single mode: a pump feeds a solution at high DMSO concentration into the sample container and the second pump extracts the solution - constant

volume is maintained. The flow rate into the sample container is adjusted to obtain the correct concentration.

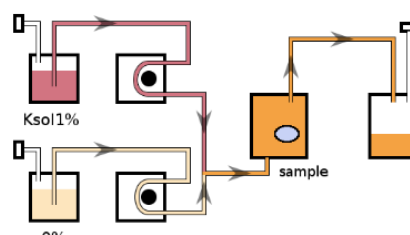
Pumps and chamber are managed by a Controller which includes a simple 3 button user interface to allow runs to be initiated and managed directly from the front panel.

The controller maintains chamber temperature, cooling rates and end concentration.

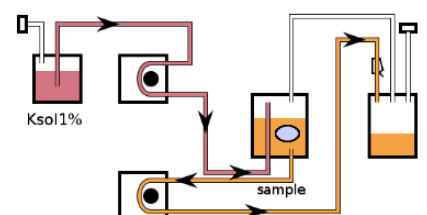
Runs are automatically saved to a removable USB flash drive on completion and file saved as a pdf file.



Dual solution Mode



Single solution Mode



# Liquidus Tracker

## precision vitrification

### Specifications - controller:

Dimensions mm	240H x 235W x 185D
Weight	2.8 kg
Display	2 x 16 LCD with backlight
Key pad	3 key switches
Number of stored profiles	10
Steps per profile	32
Programmable rates	0.01 to 99.9 °C/min (Preliminary)

### Specifications - chamber:

Feature	360-1.7 Chamber	560-16 Chamber
Heating rates	0.01 to 10 °C/min	0.01 to 10 °C/min
Cooling rates	0.01 to 50 °C/min	0.01 to 50 °C/min
Temperature range	+40 to -180 °C	+40 to -180 °C
Weight kg	14.4	23
Capacity L	1.7	16
Dimensions mm	200 x Ø150	320H x 226W x 230D
Chamber access	271 x 217	271 x 217
Sample carriers	Consult Planer PLC	Consult Planer PLC

### Power Requirements:

Includes controller	360-1.7 Chamber	560-16 Chamber
	230V ~, 50/60 Hz, 5A	230V ~, 50/60 Hz, 10 A
	115V ~, 50/60 Hz, 10A	115V ~, 50/60 Hz, 15 A

### Specifications - Pumps and Carriers:

Pumps	Watson Marlow 520Du
Pump speed	0.1 to 220 rpm
Flow rate	0.8mm Marprene/Bioprene 0.01 to 23 mL/min
Power supply	200-240 V~, 50/60 Hz, 135 VA 100-120 V~, 50/60 Hz, 135 VA

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