



## Kryo Series precision controlled-rate freezers

### Kryo 560 - 16 - fully featured Tissue Bank freezer

- Controller displays demand, sample and chamber temperatures
- Menu driven controller, simple to programme and operate
- Freeze samples in bags, ampoules and straws
- Forced laminar flow for efficient and even cooling
- Trigger on sample, time or temperature



#### Kryo 560

The Kryo 560 - 16 incorporates all of the critical features expected from a high class biological freezer. The system is specifically designed with full system safety protection.

The  $-180^{\circ}\text{C}$  end temperature ensures sample integrity during transfer to storage whilst the flexibility of the system, including protocol stage transition based on sample or chamber temperature or time, is ideal for the more demanding protocols associated with the most advanced cryopreservation techniques.

The high capacity LNP4 active nitrogen pump offers both faster cooling rates and, when combined with a LAB 30 dewar, a large reservoir offering the reassurance of an extended hold time at the protocol end temperature. The system sample capacity is sufficient for the busiest laboratory and the state of the art compact design will enhance the most modern facility.

The top opening chamber, combined with a unique forced laminar flow pattern of the coolant and cryogenic insulation, ensures even and accurate temperature control in all phases of the protocol and prevents the lid from freezing shut at cryogenic temperatures.

The MRV controller system has been created to offer multiple protocols whilst remaining simple to programme and operate. Both during and after a run it offers the widest range of displayed information, alphanumerically and graphically via the easy view display and as a print out on the integral full view printer.

Validation is a high priority and the MRV offers password controlled access on multiple user levels, time and date stamping, programme preview/verification before running and data storage for the last 5 runs for subsequent printing.

User calibration with associated hard copy is featured and PC connection compatible with our comprehensive Delta T™ software application is standard. These help protect against power failure and PC failure when running with software. Processor or system problems are controlled and the system restarts to protect samples. For example all control and data systems are separated, the controller can be removed from the operating freezer with no loss of programme integrity; data storage and processing are run on completely isolated electronic systems.

#### SPECIFICATION OVERVIEW

- Chamber volume: 16 litres
- Capacity: 11 x 250/500ml bags, horizontally or vertically in chamber
- Ampoule capacity: 726 x 2ml in baskets
- Straw capacity: 608 x 2ml on canes (horizontal)
- Lower temperature limit:  $-180^{\circ}\text{C}$
- Cooling rates:  $-0.01$  to  $-50^{\circ}\text{C}/\text{Min}$
- Controlled heating rates:  $0.01$  to  $10^{\circ}\text{C}/\text{Min}$
- Standard operating features:-
  - Start above ambient
  - Controlled heating
  - Data Printing (integral printer)
  - Comms port for PC connection
  - Fast cooling rates
  - Multiple safety features
- System controller: MRV
- System Pump: LNP4
- System Dewar: LAB 30
- PC Software: Delta T™

#### SYSTEM REQUIREMENTS

5 psi or 22 psi Liquid Nitrogen Supply

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### System Specification:

• Range	+30°C to -180°C
• Heating rate	0.01°C/min to 10°C/min
• Cooling rate	-0.01°C/min to -50°C/min
• Controller accuracy	$\pm(0.3 + 0.005 \times TM)^{\circ}\text{C}$ (where TM is the magnitude of the temperature)
• Storage temperature	-10 °C to +50 °C
• Storage humidity	5 % to 95 % relative humidity non-condensing
• Operating temperature	5 °C to 40 °C
• Operating humidity	5 % to 90 % relative humidity non-condensing

### Controller Specification:

• Dimensions	80mm high x 220mm wide x 350mm deep
• Weight (approx.)	2.6 kg
• Display	240 x 64 LCD with CCFL backlight
• Printer	320/640 dot thermal printer
• Keypad	20 key membrane keypad
• Programmable Cooling Rate Range	-0.01 °C/min to -99.9°C/min
• Number of profiles	10
• Steps per profile	32
• Number of stored runs	5

### Chamber Specification:

• Weight (approx)	23 kg
• Capacity	16 litres
• Chamber dimensions	350mm high x 230mm wide x 230mm deep
• 0.25ml straws	608 horizontal or 250 vertical
• 0.5ml straws	68
• 2ml ampoules	726
• 50ml blood bags	22
• 250ml blood bags	11
• 500ml blood bags	11
• Power requirements (including MRV Controller)	115V~ 50/60Hz 1500VA / 230V~ 50/60Hz 1500VA

### Recommendation of additional equipment:

• 5 psi System	System Pump - LNP4-C System Dewar - MVLAB 30
• 22 psi System	System Cylinder - MVEUROCYL230SB Phase Separator - MVPHASE
• 22 psi System (alternative)	Vacuum Jacketed Pipe Work System Phase Separator - MVPHASE

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