



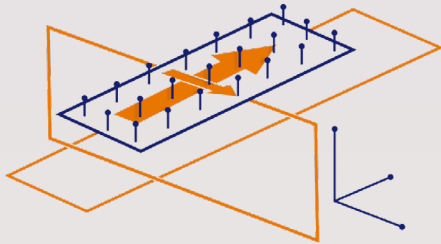
# The Kelvinox Family<sup>®</sup>

Industry-leading refrigerators providing new levels of flexibility and modularity.

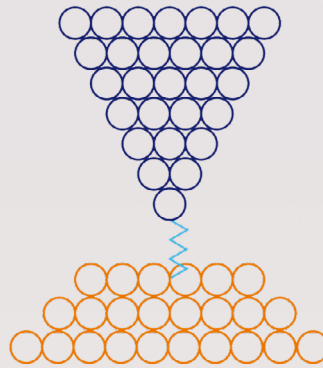
# KelvinoxMX<sup>®</sup>

Versatile wet dilution refrigerator for multi-user experiments down to 10 mK.

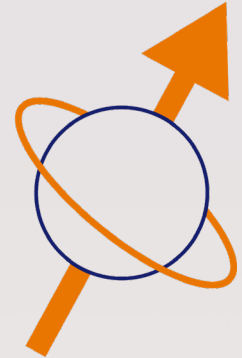
## Electrical Transport Measurements



## Scanning Probe Microscopy



## Spintronics



- Compatible with our wet Integra magnet systems
- Patented solution for experimental insert which separates wiring services from the refrigerator
- Easily change between different experimental configurations
- Easy to upgrade, service and repair
- Standard experimental inserts with configurable wiring solutions and mechanical rotation
- Automated gas handling solution with software for data visualisation and remote control

## Key Specifications

Base temperature	10 mK (basic secondary insert fitted) and $\leq 17$ mK (Versa or rotator secondary insert fitted)
Base temperature stability	$\pm 1$ mK
Maximum temperature	1 K
Cooling power at 100 mK	$\geq 400 \mu\text{W}$ for KelvinoxMX400 and $\geq 200 \mu\text{W}$ for KelvinoxMX200
Sample environment	Sample in vacuum
Continuous operation	Standard (No regeneration cycle required)



## Options and accessories

### Basic Experimental Insert

Supplied as standard, the basic experimental insert has a 6 mm line-of-sight (LOS) access to the inner vacuum chamber (IVC).

### Versa Experimental Insert

Our most versatile experimental insert with four custom configurable wiring ports is specifically designed for easy installation on KelvinoxMX. Choose between a range of wiring options including twisted pairs, flexible coaxes or semi-rigid coaxes to suit your signal requirements.

### Rotator Insert

Mechanical rotator with 15 x 15 mm sample space allows for 260 degree polar rotation in high magnetic fields. The rotator assembly below the mixing chamber is demountable to make space for a cold finger when a fixed sample position is preferred. The drive rod from room temperature is retractable to break the thermal connection to the mixing chamber after rotating the sample. The insert comes with a 12 twisted pair loom, two flexible coaxes and two semi-rigid coaxes to suit a wide range of both DC and RF experiments. Automated stepper motor control using MercuryiTC.

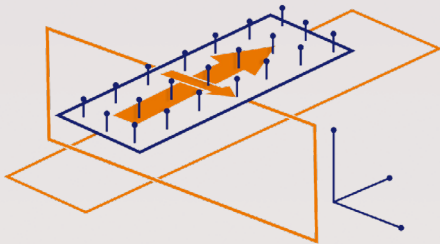
### Low Eddy Current Sample Holder

Our low eddy current sample holder with optimised geometry minimises both sample temperatures during a field sweep and quench forces acting on the refrigerator during a magnet quench.

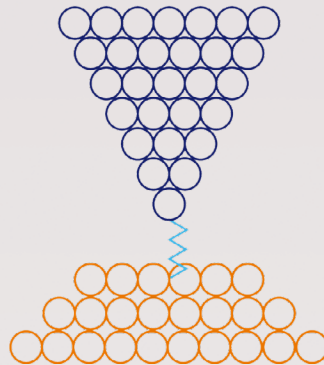
# KelvinoxHA<sup>®</sup>

High performance wet dilution refrigerator for large experiments with many signal lines.

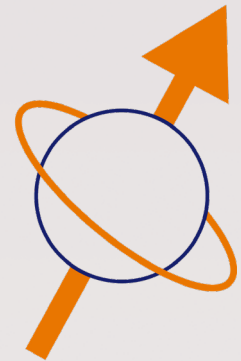
Electrical Transport Measurements



Scanning Probe Microscopy



Spintronics



- Large experimental plates with easily accessible ports for installation of wiring and components
- Three line-of-sight ports for installation of up to six semi-rigid coaxes per port
- Two IVC ports allow electronics to be installed in liquid for improved thermal anchoring
- 144 mm diameter mixing chamber plate with 40 mm diameter sample space at field centre
- Automated gas handling system with software for data visualisation and remote control

## Key Specifications

Base temperature	$\leq 10$ mK
Base temperature stability	$\pm 1$ mK
Maximum temperature	1 K
Cooling power at 100 mK	$\geq 300$ $\mu$ W (guaranteed) $\geq 400$ $\mu$ W (typical)
Sample environment	Sample in vacuum
Continuous operation	Standard (no regeneration cycle is required)

## Options and accessories

### DC and RF Wiring

Choose between a wide range of standard wiring options: twisted pairs of constantan, copper or NbTi for low-frequency measurements, flexible stainless steel coaxes for MHz signals, semi-rigid stainless steel coaxes for up to 18 GHz or Thermocoaxes for heavily filtered low-frequency signals. Alternative wiring materials, attenuators and integrated amplifiers are also available on request.

### Rotator Insert

Mechanical rotator with 15 x 15 mm sample space allows for 260 degree polar rotation in high-magnetic fields. The rotator assembly below the mixing chamber is demountable to make space for a cold finger when a fixed sample position is preferred. The drive rod from room temperature is retractable to break the thermal connection to the mixing chamber after sample rotation. Automated stepper motor control using MercuryITC.

### Low Eddy Current Sample Holder

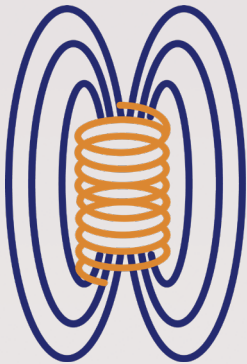
Our low eddy current sample holder with optimised geometry minimises both sample temperatures during a field sweep and quench forces acting on the refrigerator during a magnet quench.



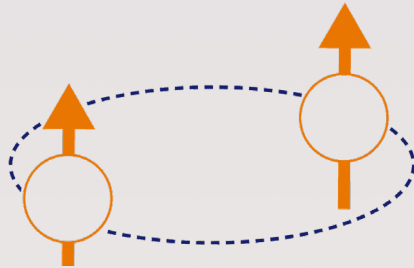
# KelvinoxTLM<sup>®</sup>

Wet dilution refrigerator for top loading samples into the mixture – the ideal solution for sweeping field experiments and rapid sample exchange.

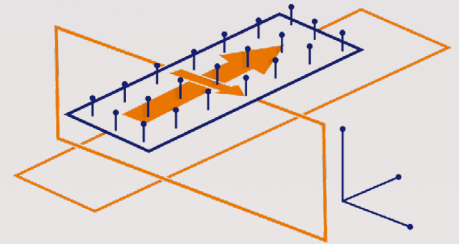
High Magnetic Fields



Unconventional Superconductivity



Electrical Transport Measurements



- Compatible with our wet Integra magnet systems
- Top-loading of the sample directly into the <sup>3</sup>He/<sup>4</sup>He mixing chamber ensures good sample thermalisation, high stability of the thermal environment and guarantee of operation in high magnetic field
- Unique design which can be used with a range of sample probes such as a mechanical rotator or high frequency coaxial lines
- No need to remove the mixture during sample change, giving quicker experiment turnaround times
- Non-metallic sample environment: ideal for experiments such as solid state NMR, where removing metallic material surrounding the pickup coil resonant circuit is key to accurate measurements
- Delivered with a gas handling system, which enables automatic operation of a dilution refrigerator using sophisticated software and virtual instrument drivers for LabVIEW.

## Key Specifications

Base temperature	≤ 15 mK
Base temperature stability	± 1 mK
Maximum temperature	1 K
Cooling power at 100 mK	≥ 400 μW (guaranteed) ≥ 600 μW (typical)
Sample environment	Sample in liquid

## Options and accessories

### Sample Probes

34 mm diameter sample probes for sample-in-liquid experiments of high-magnetic fields. The probe comes with a vacuum lock and sliding seal for safe loading into the mixture, as well as thermometry and a heater for temperature control. Our standard probe has 10 spare connector ports at room temperature for installation of RF and DC wiring, and a dedicated port for installation of a rotator drive rod.

### DC and RF Wiring

Choose between twin-twisted pairs of constantan, copper or NbTi for low frequency measurements, flexible stainless steel coaxes for MHz signals or semi-rigid stainless steel coaxes for up to 18 GHz. Alternative wiring materials and attenuators available on request.

### Mechanical Rotator

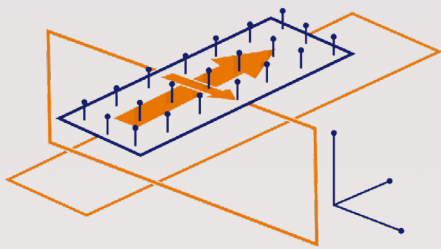
Mechanical rotator with 15 x 15 mm sample space allows for 260 degree polar rotation in high-magnetic fields. Automated stepper motor control using MercuryITC.



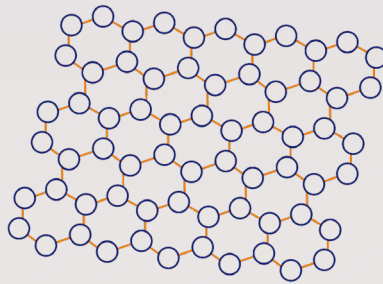
# KelvinoxJT<sup>®</sup>

A dipstick-style dilution refrigerator insert using Joule-Thomson condensation, compatible with wet or dry cryostats.

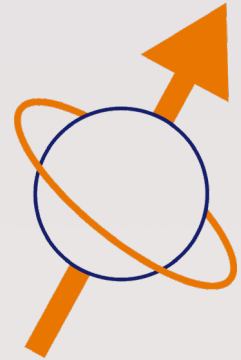
## Electrical Transport Measurements



## Low Dimensional Physics



## Spintronics



- Compatible with our Cryofree<sup>®</sup> TeslatronPT, our wet Integra magnet systems, any liquid helium transport dewar or any VTI with a sample tube diameter of at least 50 mm
- Automated gas handling system with software for data visualisation and remote control
- Inner vacuum chamber (IVC) with automatic exchange gas control
- The IVC is sealed using vacuum grease or CAF paste (no Indium is required)
- One spare 6 mm line-of-sight port for installing experimental wiring.

## Key Specifications

Base temperature	25 mK in a VTI or Teslatron 40 mK in a helium dewar
Base temperature stability	± 1 mK
Temperature control range	25 mK to 300 K in cryogen free system
Cooling power at 100 mK	≥ 20 μW
Sample space	Inner diameter 43 mm x length 180 mm
System cooldown	From room temperature to < 100 mK typically 6 hours in liquid cryogen systems, 12 hours in cryogen free systems



## Options and accessories

### Flexible coax option:

- Two flexible S1 stainless steel coaxial cables, from room temperature to the mixing chamber suitable for low frequencies
- Suitable for signals up to MHz frequency
- Fisher connector at room temperature.

### DC Wiring Option:

- 24-way constantan loom with 12 twisted pairs wired to the mixing chamber
- 24-way Fisher connector at room temperature.



# Service Support Options

## Sustainable Solutions

All Kelvinox inserts are compatible with the IntegraAC re-condensing liquid helium cryostat. This product has been developed to significantly reduce the consumption of liquid helium by re-condensing helium gas evaporated within the system, which would otherwise be vented from the cryostat, decreasing the frequency of helium refills. Cryogenic systems can be kept cold continuously, even when in standby mode, leading to greater freedom to schedule experimental time.

## Live Assist

Live Assist Remote Support empowers your technical staff to resolve issues fast and effectively. Our team of service and engineering professionals use the latest virtual reality tools to support you remotely.

## Proactive Support Plan

Our Proactive Support Plan offers unlimited access to a dedicated help desk and annual service that includes maintenance, training, parts, shipping and travel. This inclusive package provides guaranteed support to those who require more frequent access to our services.

## Related Products



### Nanonis Tramea

Fully integrated measurement ready solution for quantum transport.



### Sample Protect

Protect sensitive samples from electrostatic discharge.

Visit [nanoscience.oxinst.com](https://nanoscience.oxinst.com) or email [nanoscience@oxinst.com](mailto:nanoscience@oxinst.com)

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