

Dilution Refrigerators

February 2026

Keeping Things Millikelvin-Cool

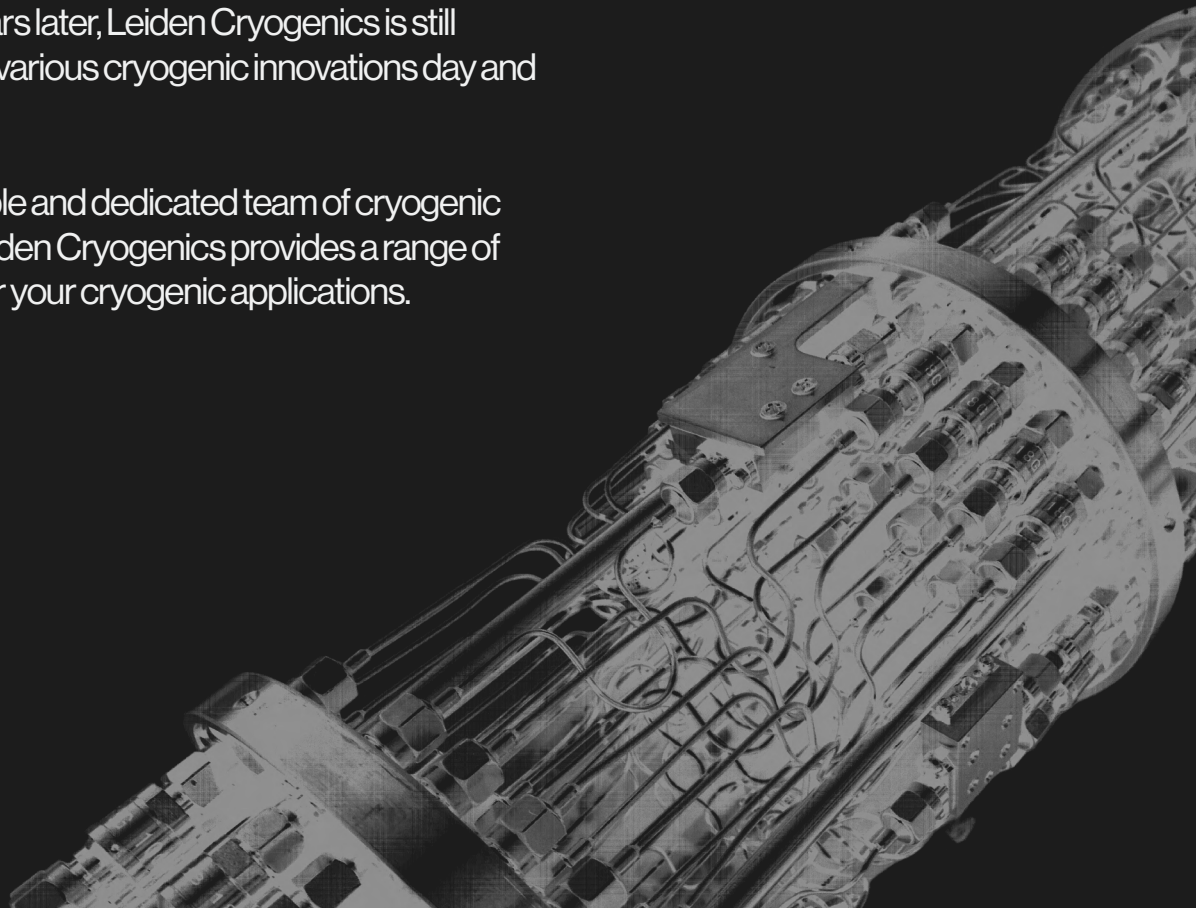
since 1992

About
Quper
Cryogenic Platforms
Probes and Semi-Probes
Representatives

Leiden Cryogenics has been a leader in extreme low temperature techniques for over 30 years.

Founded in 1992 by Prof. Dr. Giorgio Frossati as a spin-off from the University of Leiden, started in a small lab with room for only one dilution refrigerator. Now 34 years later, Leiden Cryogenics is still working on various cryogenic innovations day and night.

With a flexible and dedicated team of cryogenic experts, Leiden Cryogenics provides a range of solutions for your cryogenic applications.



QUPER

We are proud to announce Quper, our fast-turnaround inverted dilution refrigerator, with ergonomic tabletop access. From hot to cold and back again in under 24 hours – no LN2 required, perfect for rapid qubit testing.



$T_{min} < 25 \text{ mK}$
 $Q > 300 \mu\text{W} @ 100 \text{ mK}$
Turnaround Time $< 24 \text{ hrs}$
Mixing Chamber $\varnothing 200 \text{ mm}$
Volume Helium 3 $< 10 \text{ L}$
Up to 36 Semirigid RF
Over 100 High Density RF
OrangeQS FLEX compatible

Key Features

Tabletop Access

Fast Turnaround Times

Compact Design

CF-CS-XXL

When you need the most powerful system on the market, with 3000 microwatts of cooling power, 4 pulse tubes and a plate diameter of 1 m – you'll be on the cutting edge of what's possible.



$T_{min} = 5 \text{ mK}$
 $Q > 3000 \mu\text{W} @ 120 \text{ mK}$
4xPT, 9.4 W @ 4.2 K

Cryogen-free dilution refrigerator
 $\varnothing 1000 \text{ mm}$ mixing chamber plate
Mass > 2.5 tons
12x 120 mm LOS ports for semi-probes
Lifting table for safe single person handling
Space for over: 600 SMA or 2000 high density RF lines
LN2 precooling circuit

System Key Features

Extreme Cooling Power

Our highly developed dilution unit, in combination with a powerful pumping system, allows us to offer the highest cooling power on the market. The CF-CS-XXL offers 3000 μW at 120 mK, while still achieving a 5 mK base temperature.

Designed for Quantum

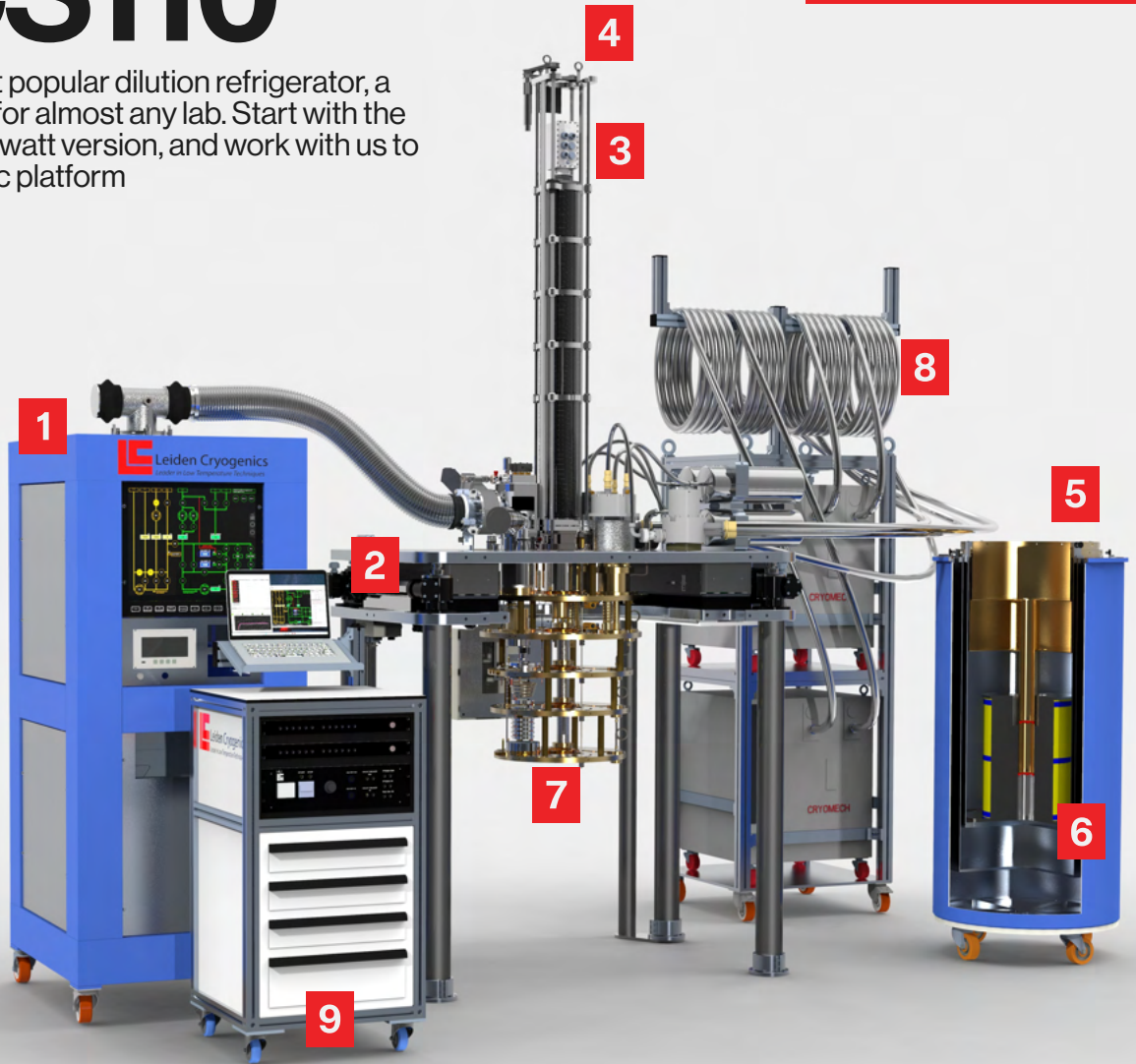
Our XXL line is built for quantum, supporting over 600 SMA or 2,000 high-density RF lines. The 3K plate can be tailored for cryo-CMOS, with the enhanced cooling power of four pulse tubes, and the extra extra large 1 m diameter sample volume.

CF-CS110

Cryogenic Platforms

Leiden Cryogenics' most popular dilution refrigerator, a true workhorse suitable for almost any lab. Start with the 500, 1000 or 1500 microwatt version, and work with us to build your ideal cryogenic platform

- 1 Gas handling system
- 2 Lifting table
- 3 Cold-insertable probe
- 4 Probe lift
- 5 Vacuum can and radiation shields
- 6 Superconducting magnet
- 7 Fridge plates
- 8 Pulse tube compressors
- 9 Electronics trolley



Ø 490 mm mixing chamber plate
160 L of sample space
3-6 120 mm LOS ports for semi-probes
Central 110 mm LOS port for CIP
Lifting table for safe single person handling
LN2 precooling circuit
Advanced GHS with automation software

CF-CS100-500

$T_{min} < 10 \text{ mK}$
 $Q > 500 \mu\text{W} @ 100 \text{ mK}$
1x PT, 2.35 W @ 4.2 K

CF-CS100-1000

$T_{min} < 9 \text{ mK}$
 $Q > 1000 \mu\text{W} @ 100 \text{ mK}$
2x PT, 4.7 W @ 4.2 K

CF-CS100-1500

$T_{min} < 8 \text{ mK}$
 $Q > 1500 \mu\text{W} @ 100 \text{ mK}$
2x PT, 4.7 W @ 4.2 K

System Key Features

Low Vibration Levels

Through our passive and active damping solutions we offer the lowest vibration levels on the market. Ideal for scanning probe applications, such as the AFM-CFM systems of Attocube. Mounted on the fridge itself or a cold-insertable probe.

Fast Turnaround Times

For rapid cooldown, a nitrogen pre-cooling circuit enables cooling from room to base temp in under 24 hours. While high powered heaters allow overnight warm up. Add a top-loading cold-insertable probe for rapid sample exchange, from room to base temp within 6 hours.

Quantum Prepared

We design and manufacture cryogenic systems tailored for quantum. Our CS110 line supports over 300 SMA or 1,000 high-density RF lines. The 3K plate can be tailored for cryo-CMOS, offering enhanced cooling power and increased sample volume.

Easy to Handle

Our cryostats are on a motorized lifting table, allowing single user opening and closing of the system in less than 20 minutes – no heavy lifting required. The lifting table spindles can be retracted to decouple the cryostat from lab floor vibrations.

Probes and Semi-Probes

Cold-Insertable Probes

Top-loading motorised system
6 hour rapid sample exchange
110 mm diameter
Fully customisable
Extension into magnet bore
Fridge wiring clicking option
Temp difference to MC < 4 mK
Q > 100 μ W @ 100 mK*



CIP Key Features

Easy Loading

The motorised probe lift and control software allows single person loading and unloading into the cryostat. Thermalisation is achieved via a pull rod and clamps mounted inside the cryostat, adjusted using a torque wrench.

Cold Fingers and Clicking System

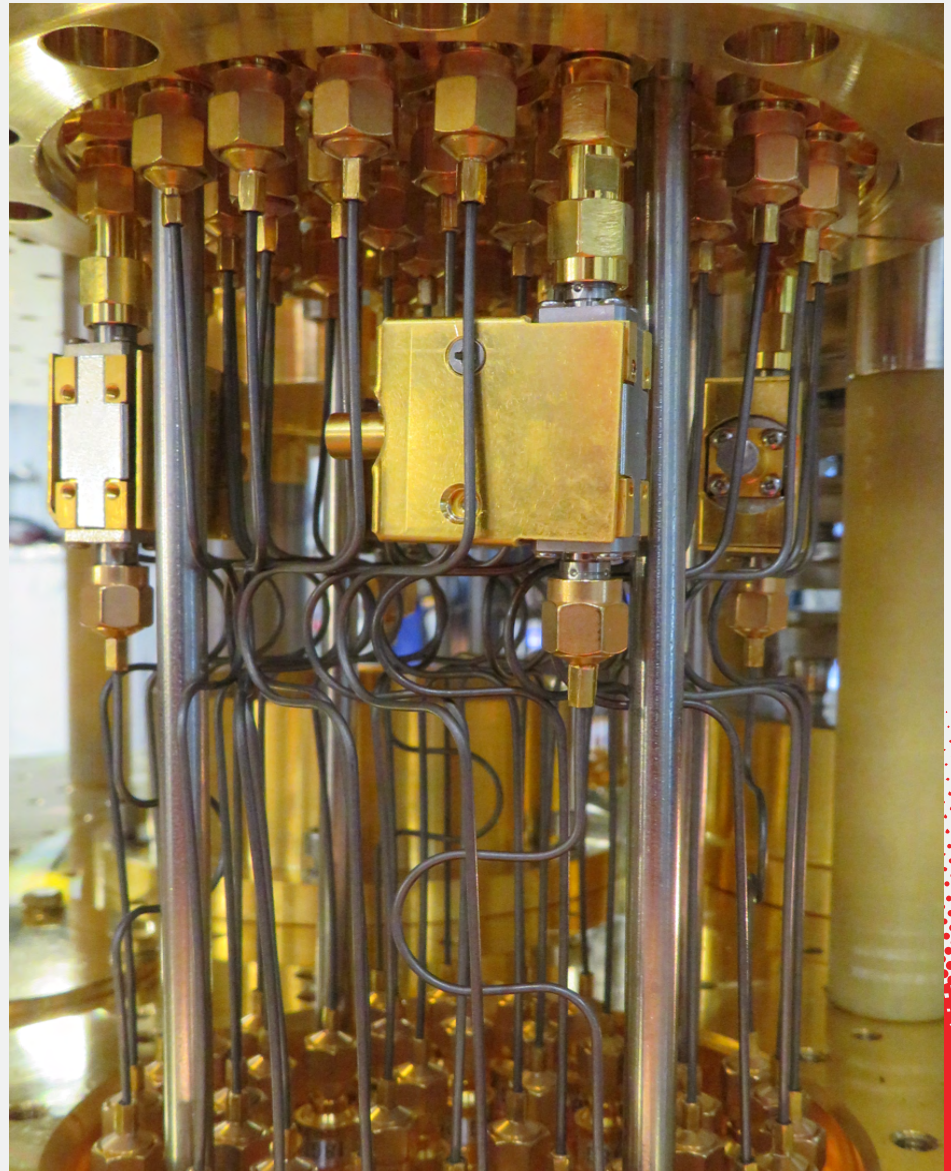
Upgrade your probe with a cold finger below the mixing chamber plate for measurements within the magnet bore. A unique clicking system on the cold finger connects wiring on the fridge to the probe – doubling the available wiring to your sample while lowering heat load.

Rapid Sample Exchange

Top-loading probes cool from room to base temperature within 6 hours. A wide range of custom wiring, optics, thermometry and cold fingers are available.

Warm-Insertable Semi-Probes

RT swappable wiring insert
 120 mm diameter LOS
 DC, RF and optical options
 Passive and active components
 Optical fibre/window options
 High-density RF options
 Single screw plate clamping



Wiring and Customisation

Hassle-Free Wiring

With SMA, SMP or K connectors, including breaks at each stage to future-proof your setup. Standard wiring up to 18 GHz, with upgrades up to 40 GHz available. Attenuators, filters, circulators, amplifiers and many more RF components are available. DC wiring to bias active components is included.

Diverse DC Options

Let us prepare your system to your specifications. From our standard low heat-load DC wiring, twisted and shielded to reduce noise, to Thermocoax, flexible coax, low resistivity and high-voltage wiring. Customise terminations and breaks at any plate.

Window to Low Temperatures

Optical windows and fibre optic feedthroughs can be integrated into our probes and semi-probes. We offer single mode, polarisation maintaining and multimode fibres. Choose from FC/PC, FC/APC, or SMA connectors. Guiding capillaries protect and thermalise your fibres within the probe.

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