environment by JANIS

Lake Shore CRYOTRONICS
a DwyerOmega brand

Run a LHe cryostat without the LHe

Convert your liquid helium cryostat with an RGC for cryogen-free operation



RGC helium recirculation

The problem

You want the benefits of a LHe cryostat, but LHe is expensive and difficult to continuously source.

The solution

The RGC brings together the best of both worlds; the low temperatures, sample throughput, and low vibration of LHe cryostats, without the additional cost of LHe.

How it works

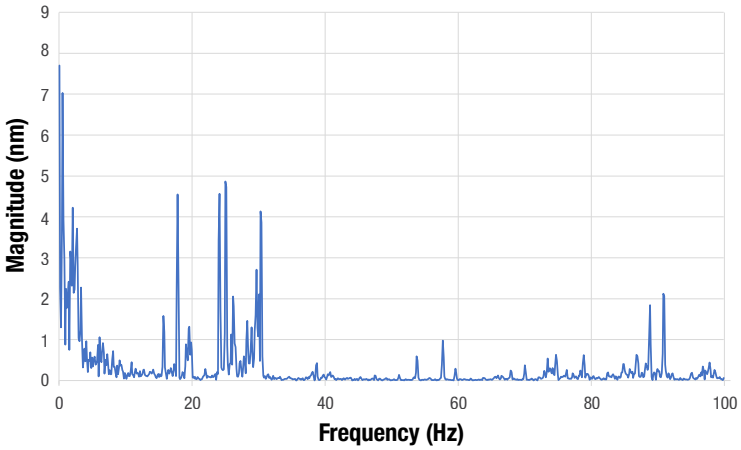
The RGC runs helium in a closed loop, making a continuous-flow cryostat cryogen-free. Helium gas is cooled and liquefied by the RGC's cryocooler, and travels to the cryostat through a flexible vacuum-insulated transfer line. LHe cools the sample. The RGC captures the evaporated gas through the transfer line and reliquefies it, continuously recirculating the helium.

Comparison		Closed-cycle cryostat		LHe cryostat		LHe cryostat + RGC
Cryogen consumption	✓	Cryogen-free	×	Liquid helium	✓	Cryogen-free
Lifetime cost	✓	$	×	$$$	✓	$
Cooling power	×	Lower cooling power	✓	Higher cooling power	✓	Higher cooling power
Low vibration	×	Higher vibrations; cold head is part of system	✓	Low vibration; no cold head	✓	Low vibration; cold head is decoupled from system
Cold head warmup for sample change	×	Warmup required		N/A	✓	No warmup required between sample changes
Test environment footprint	×	Larger footprint in test environment	✓	Small and flexible to different mounting configurations in test environment	✓	Maintain small LHe cryostat; RGC is next to test environment

Ideal for low vibration

Commonly paired with a Lake Shore ST-500 cryostat, the combination is an ultra-stable cryogenic microscopy platform.

Vibration measured on a standard ST-500 cryostat cooled by an RGC system



Sample temperatures	ST-100 and ST-300	ST-400	ST-500	STVP	Probe station
RGC4-10	<4.3 K	<4.0 K (120 mW at 5 K)	<4.2 K (100 mW at 5 K)	<10 K	Consult Lake Shore

The RGC is compatible with Lake Shore ST and STVP cryostats, and can be used with some LHe cryostats from other vendors.