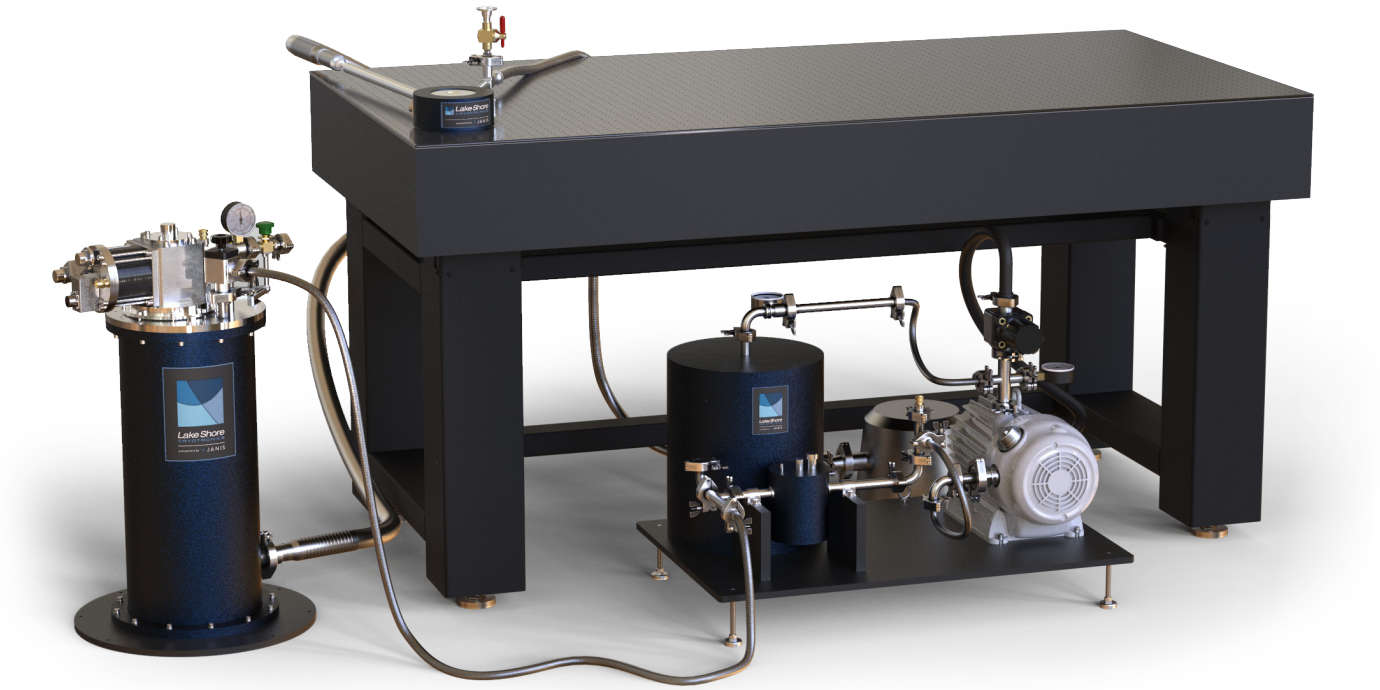
Lake Shore CRYOTRONICS

environment by JANIS

RGC Series recirculating gas coolers

RGC Series convert a liquid helium cryostat to operate without liquid helium, for cryogen-free operation. Compatible with Lake Shore ST and STVP cryostats.



RGC Series recirculating gas coolers

RGC Series recirculating gas coolers run 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.

Samples can be changed without warming up the RGC, allowing fast turnaround times. When paired with a Lake Shore ST-500 Series cryostat, the combination is an ultra-stable cryogenic microscopy platform, cooling samples and devices to below 4 K without the use of liquid helium.

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

Key features

- Maintain benefits of a LHe cryostat without the LHe
- Ideal for low vibration
- Excellent thermal performance
- Fast sample change without warming up the RGC

RGC Series

Featured components

Two-stage Gifford-McMahon (G-M) cold head with compatible compressor (pulse tube cooler optional)

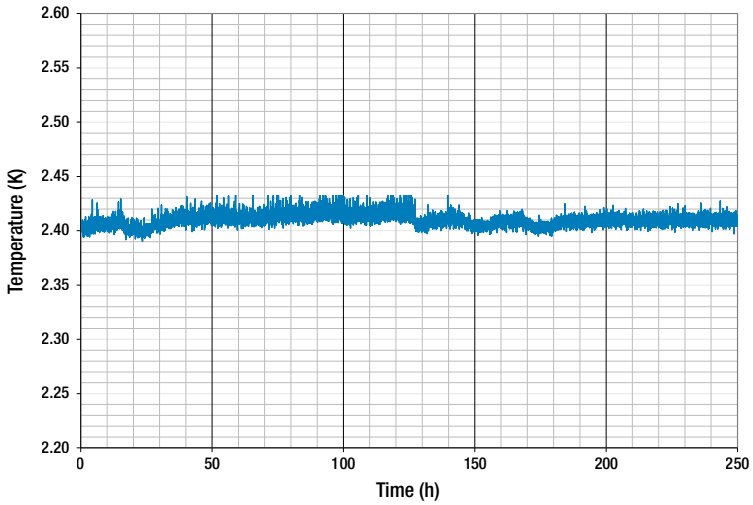
Vacuum shroud containing internal helium lines with special heat exchangers for cooling the circulating helium gas, radiation shield, and two diagnostic standard curve silicon diode temperature sensors

Gas handling system with hermetically sealed oil-free gas circulating pump, storage volume, and interconnecting pumping lines and valves

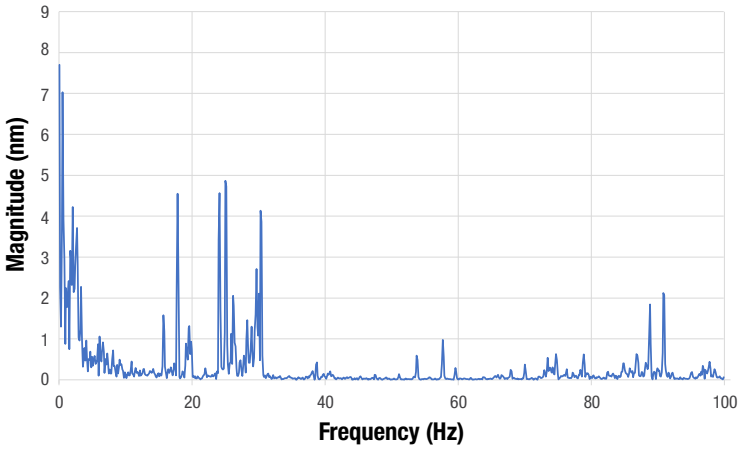
Vibration isolation for gas circulation line

Helium transfer line to deliver helium to cryostat

Base temperature of ST-500 microscopy cryostat cooled by RGC4 system



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



Selections

Cryocooler models

RGC4-10: 1 W

RGC4-15: 1.5 W

RGC4-20: 2 W

Compressor

Water-coooled

Air-cooled

Gas handling system pump

3.6 cfm scroll pump (standard)

10.6 cfm scroll pump

Custom configurations

Pulse tube cryocooler instead of G-M cryocooler

Elbow on transfer line

Compatible cryostats

Compatible with Lake Shore ST and STVP cryostats, and can be used with some LHe cryostats from other vendors as well.

Specifications

Sample temperatures[1]	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
RGC4-15	<3.5 K	<2.9 K (220 mW at 5 K)	<3.8 K (210 mW at 5 K)	<8 K	
RGC4-20	<3.3 K	<2.6 K (280 mW at 5 K)	<3.5 K (250 mW at 5 K)	<7 K	

Size

Gas handling system dimensions	533.4 mm × 838.2 mm × ≈711.2 mm (21 in × 33 in × ≈28 in)
RGC cryocooler dimensions	457.2 mm (18 in) base diameter × 787.4 mm (31 in) tall
Gas handling system weight (approximate)	56.7 kg (125 lb)
RGC cryocooler weight (approximate)	36.3 kg (80 lb)
Shipping dimensions for three RGC system crates (approximate)	Crate 1: 109 cm × 84 cm × 147 cm (43 in × 33 in × 58 in); Crate 2: 81 cm × 81 cm × 91 cm (32 in × 32 in × 36 in); Crate 3: 102 cm × 102 cm × 163 cm (40 in × 40 in × 64 in)
Shipping weights for three RGC system crates (approximate)	Crate 1: 211 kg (464 lb); Crate 2: 123 kg (271 lb); Crate 3: 113 kg (250 lb)

[1] Temperatures listed are for models when used with standard pumps; for larger-capacity pump temperatures, contact Lake Shore.

Facility requirements

	Recommended		Water-cooled				Air-cooled			
Model	**Compressor maintenance interval**	**Cold head maintenance interval**	**60 Hz power requirements**	**50 Hz power requirements**	**Cooling water requirements**	**Compressor size**	**60 Hz power requirements**	**50 Hz power requirements**	**Cooling air requirements**	**Compressor size**
RGC4-10 RGC4-15 RGC4-20	30,000 h	10,000 h	200 VAC, 3-phase, 7.5 to 7.8 kW or 480 VAC, 3-phase, 7.5 to 7.8 kW	200 VAC, 3-phase, 6.6 to 6.9 kW or 380 to 415 VAC, 3-phase, 6.6 to 6.9 kW	6 to 9 L/min at 5 to 25 °C	443 mm × 493 mm × 532 mm high; 100 kg	200 VAC, 3-phase, 7.5 to 8.3 kW steady state or 460/480 VAC, 3-phase, 7.5 to 8.3 kW	200 VAC, 3-phase, 6.5 to 7.2 kW steady state or 380/400/415 VAC, 3-phase, 6.5 to 7.2 kW	23 m³/min	450 mm × 485 mm × 925 mm high; 155 kg

Ordering information

RGC Series recirculating coolers

RGC4-10	1 W
RGC4-15	1.5 W
RGC4-20	2 W

Accessories

10RVP	Vacuum pumping station
10DDP	Vacuum pumping station
TS-85-D	Turbomolecular pumping station
336	Model 336 temperature controller
335	Model 335 temperature controller
325	Model 325 temperature controller

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