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Cryogen Free Microscopy Cryogenic Workstation

Optical Cryostats for Use in Microscopy and Spectroscopy

'performance by design'

CLOSED CYCLE CRYOGEN FREE REFRIGERATOR SYSTEM FOR MICROSCOPY

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Closed Cycle Refrigerator System Microscopy

Cryo Industries pairs innovative design with leading edge technology in the Closed Cycle Refrigerator System for Microscopy. This is a true 'performance by design'.

The Closed Cycle Refrigerator System for Microscopy has **no direct mount to the refrigerator** making this system ideal for low vibration experiments. It also employs a closed loop circulation of helium gas used for sample cooling

Warm gas enters the refrigerator cryostat where it is cooled to low temperatures. The cold gas flows through a transfer line (bellows section) to the microscopy cryostat's cold finger. The sample is attached to the cold finger, which is cooled by the cold gas stream.

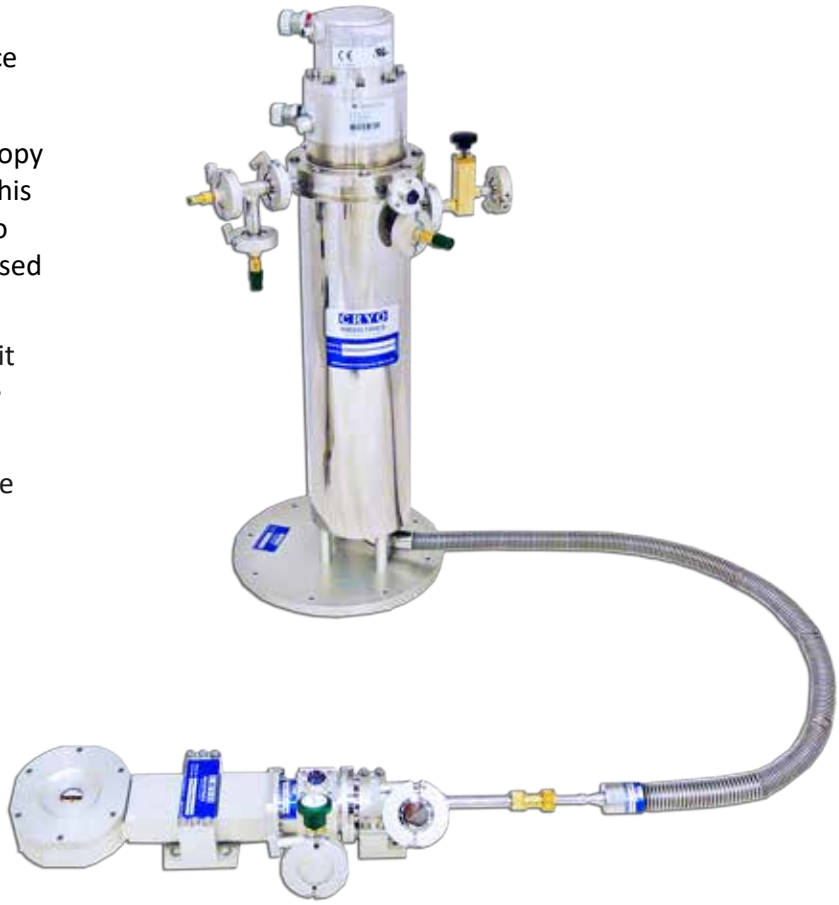
The Refrigerator cryostat transfer line is interchangeable with CRYO's liquid helium XE transfer line. Hence, the microscopy cryostat can be used with either the Refrigerator cryostat or standard liquid helium transfer line.

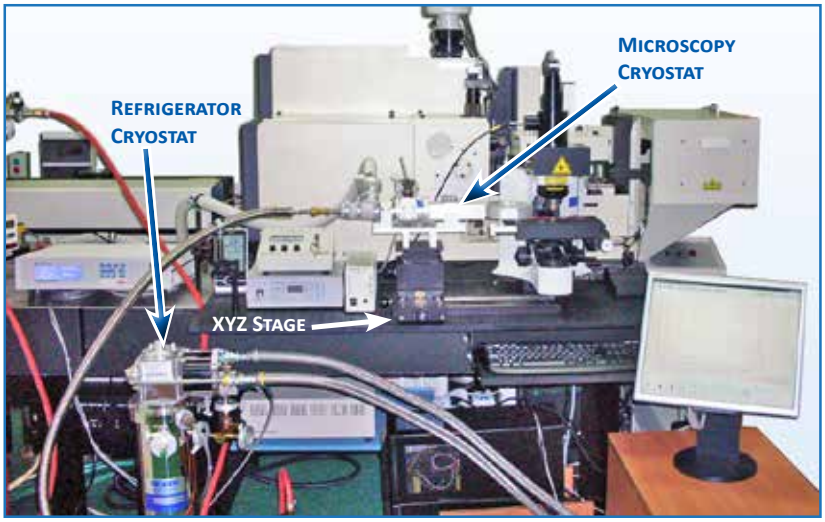
Two temperature ranges are available:

<8 K to 325 K

or

20 K to 325 K





Interfacing the microscopy (sample) cryostat with your spectrometer/microscope and mounting it on an external XYZ stage is simple since the refrigerator cryostat (cooling source) is separate from sample cryostat.

Right: Closed Cycle Refrigerator system for microscopy installed in end user lab.

Mode of Operation

CRYO's closed cycle '**CRYO COOLER**' provides a continuous cold helium gas stream – without using liquid helium. Press the On/Off switch and the cooling begins.

The refrigerator vibration is isolated because the microcopy cryostat is separate from the refrigerator cryostat. The system is ideal for low vibration sensitive experiments.

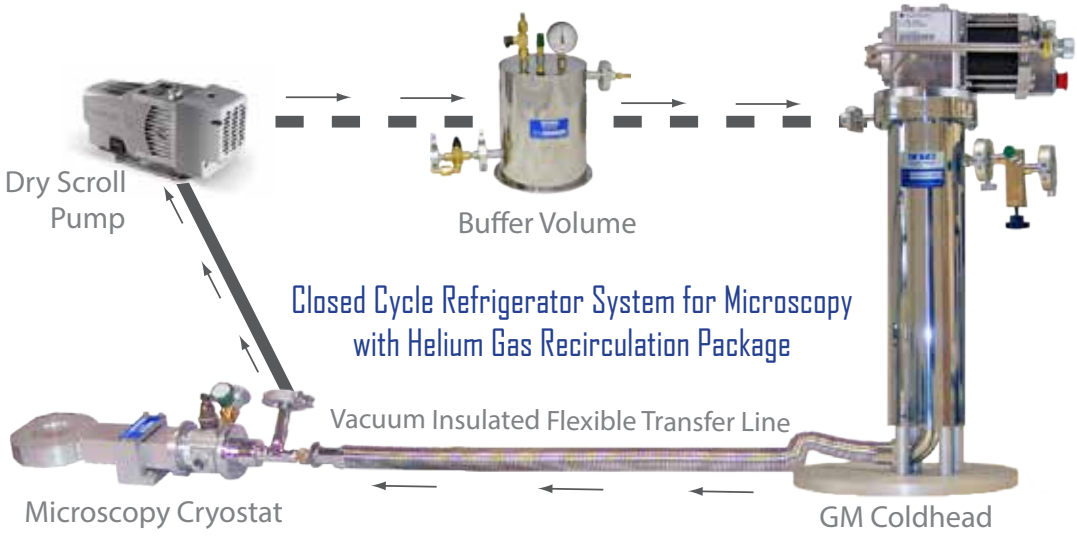
Sample c**ooling gas loop**: Warm helium gas flows into the refrigerator cryostat where it is cooled by two heat exchangers. This inlet helium gas flows in a tube internally attached to each 'heat station of the refrigerator. The refrigerator removes heat from the gas flowing in the tube. The gas is cooled first by the 1st stage of the refrigerator and then by the 2nd stage. The cold gas flows from the 2nd stage heat exchanger through the transfer line into the microscopy cryostat. The 'cold finger' in the microscopy cryostat is cooled by the cold gas stream. The dry scroll pump returns the gas to the refrigerator cryostat. A temperature controller is attached to the cold finger of the microscopy cryostat, allowing automatic continuous control of the sample temperature. The controller continuously controls and displays the temperature.

The temperature controller is also attached to the second stage of the refrigerator allowing automatic continuous control of the gas temperature. The controller continuously controls and displays the temperature.

Liquid helium is not used. The refrigerator provides the cooling needed, reliably and economically.

Turn on some gas flow, start the compressor, set the temperature controller and the gas flows and cools.

Closed Loop Configuration



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Microscopy Cryostat

RC102-XEM Microscopy Cryostat offers lowest thermal drift, excellent temperature stability and ultra low vibration.

Optical cryostat for use in microscopy, spectroscopy, wafer probing, IC testing and more.

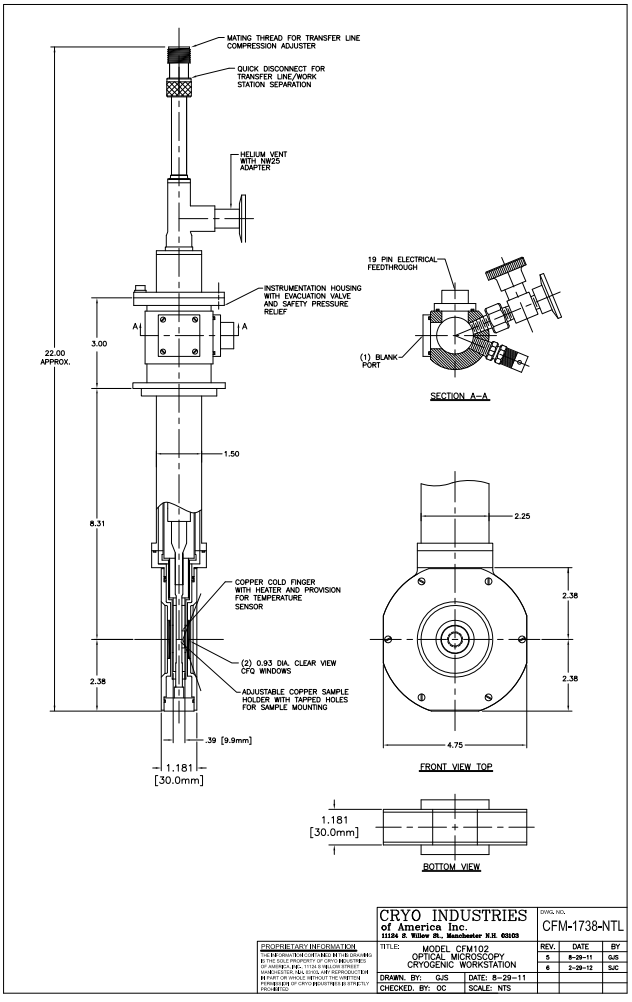
The RC102-CFM is a 'sample in vacuum' cryostat and can be operated in any orientation.

Interchangeable sample holders provide height adjustment and optimize the cryostat for varying samples and different experimental configurations. The sample can be set to be very close to the window.

System Features:

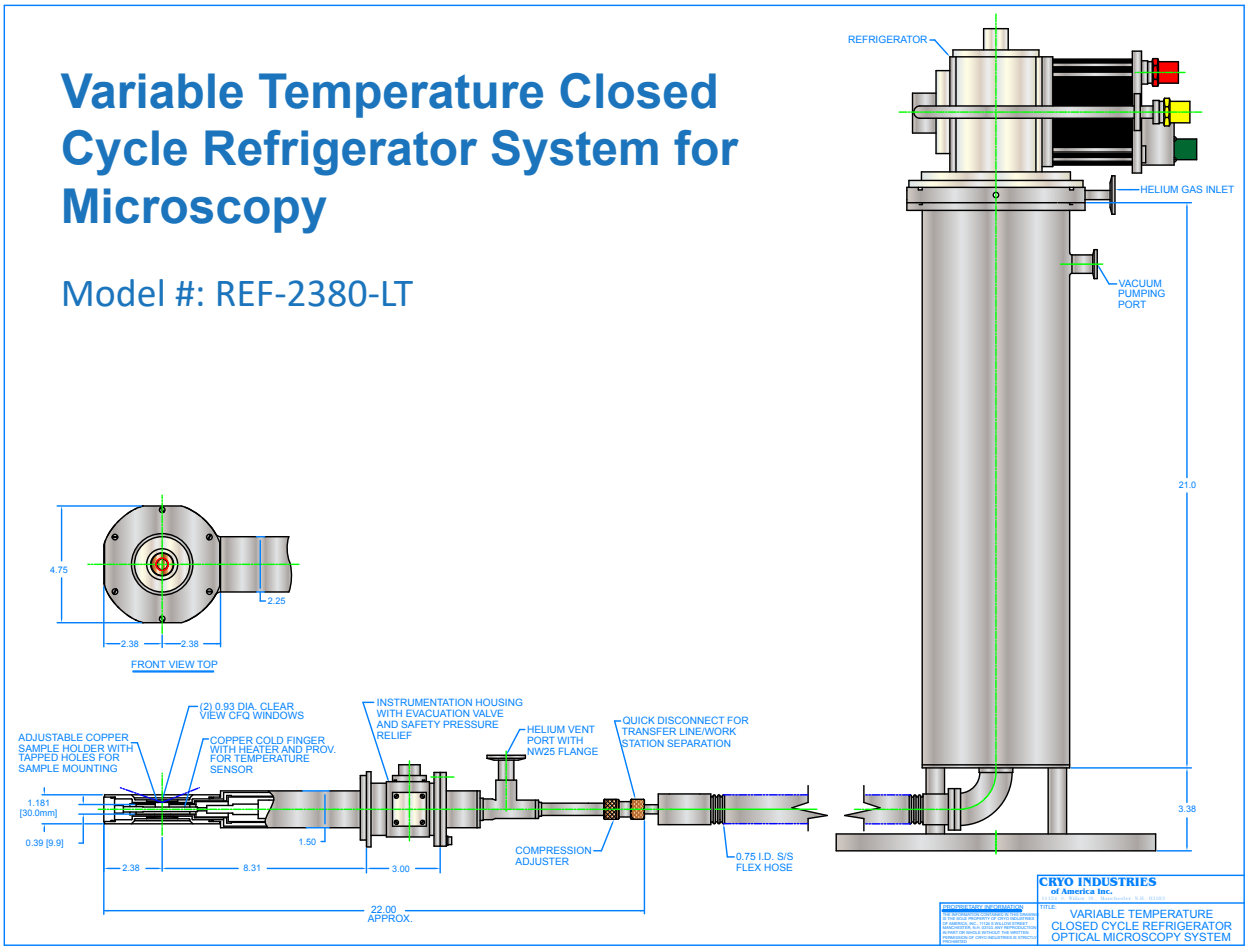
- Large clear view windows
  Reflection and transmission
- Short working distance
  Sample height adjustment up to the window
- Ultra low nanometer drift and sample vibration
- Sturdy strong stable sample support
- 'HiRes-NOMOVE' design results in near zero movement due to thermal contraction
- Go THIN - 30 mm thick
  'THIN' fits more microscopes

- Compact, lightweight and portable, easily integrated into microscopes and spectrometers
- Versatility - expansion kits include 2 inch wafer probing, DIP IC testing, magnetic fields .....



Variable Temperature Closed Cycle Refrigerator System for Microscopy

Model #: REF-2380-LT



All Models Feature:

- **Low vibration - no direct mount to refrigerator**
- Two operating temperature ranges to select from <8 K - 325 K or 20 K - 325 K

Microscopy Cryostat including:

- (2) 0.93 inch diameter x 0.062 inch (1.59 mm) thick clear optical quartz windows (optional .020 inch thick window available)
- Adjustable sample holders
- 19-pin hermetic electrical feedthrough
- Temperature sensor installed near sample holder
- 30 mm thin
- NOMOVE' support
- Sample supported on ends for thermal contraction toward center - virtually no movement
- ***Welded flexible stainless steel transfer line***
- Two stage Sumitomo SHI coldhead and water cooled compressor with interconnecting refrigerator hoses
- Long term continuous operation

Temperature Controller

- Remote interfaces include Ethernet, RS-232, and IEEE- 488.2 (GPIB)

Monitors and controls

- Sample mount temperature
- 2nd Stage refrigerator temperature
- 1st Stage refrigerator temperature

Helium Gas Recirculation Package

- Closed loop circulation of the helium gas used for sample cooling
- Complete system test and one year warranty

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CRYO INDUSTRIES
OF AMERICA

11124 South Willow St.
Manchester NH 03103
Tel: 603.621.9957 . Fax: 603.621.9960
E-mail: cryo@cryoindustries.com
www.cryoindustries.com