
The CRYOSTATION with Magneto-Optic Module

MONTANA INSTRUMENTS
COLD SCIENCE MADE SIMPLE

MONTANA INSTRUMENTS
COLD SCIENCE MADE SIMPLE

Integrated into the Cryostation

Keep all the Cryostation performance and add magnetic fields to your experiments!
The Magneto-Optic module simply wraps around the sample chamber and introduces the field with magnet poles that reach through the optical ports.



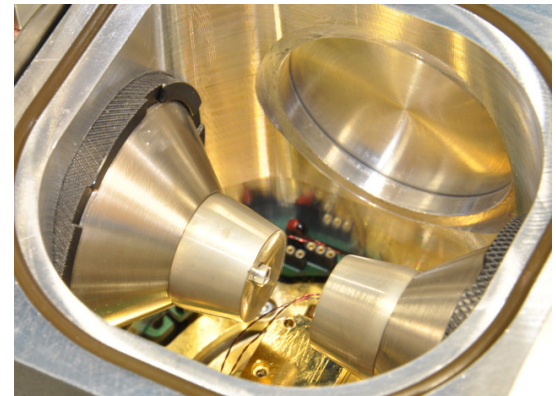
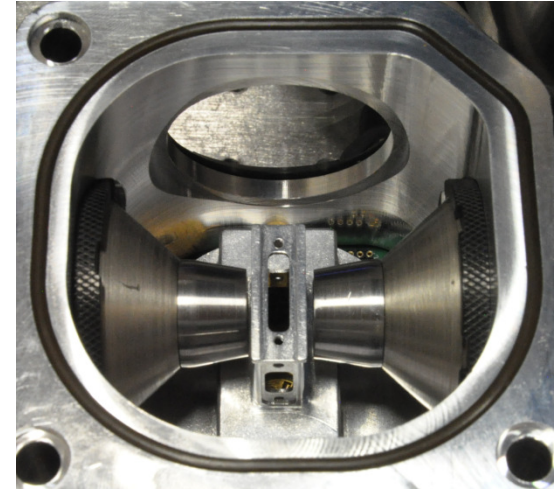
Sample Space



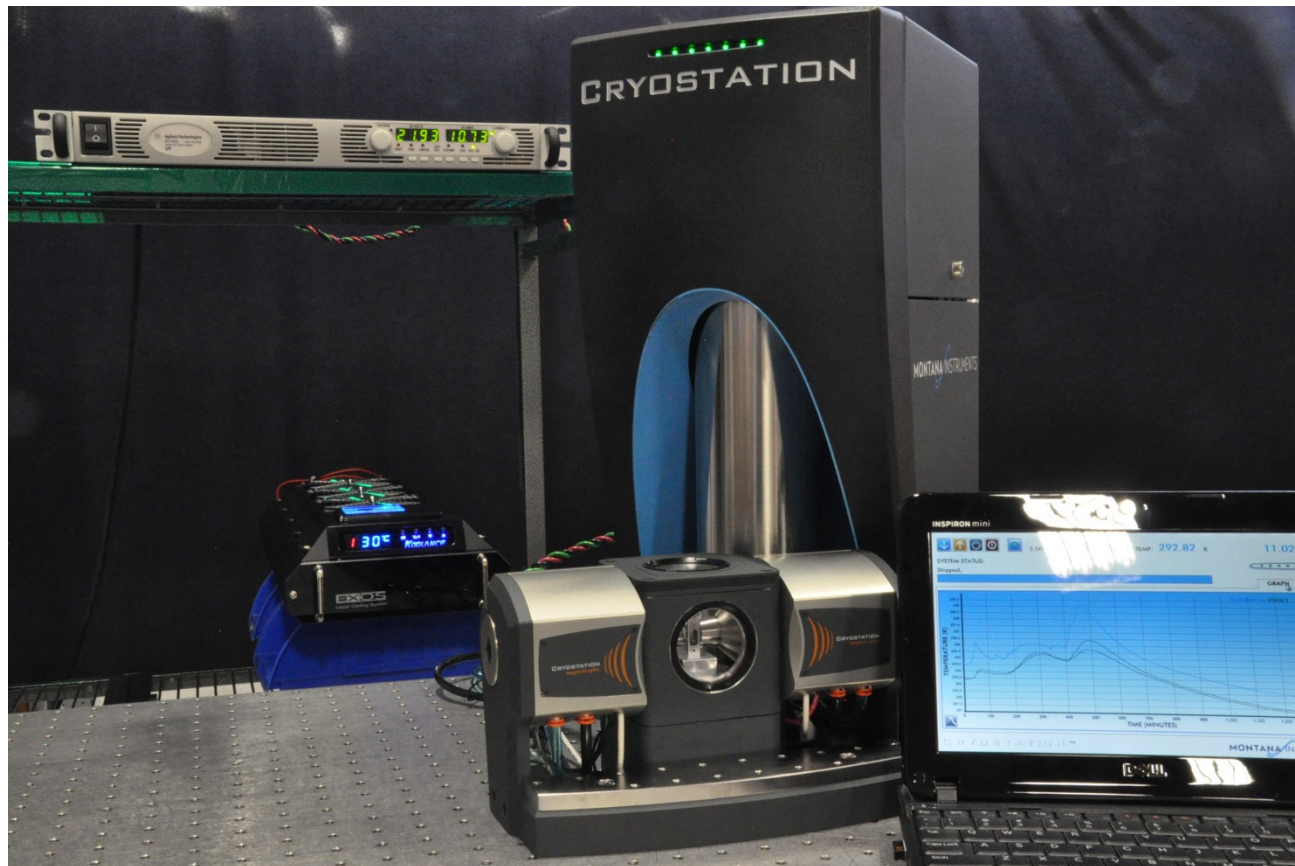
The sample space includes a small radiation shield that allows close pole spacing. Optical access is available through the two large side windows, the top, or through bores in the magnet pole axis.

Pole Tips

- The pole tips may be replaced by the user to effect different field strengths.
- The poles may have a central bore of about 6mm that allows optical access through the pole.
- Small lenses may be placed on the ends of the tips to focus the laser on the sample.



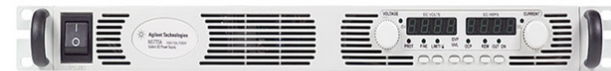
System Installation



System Includes:

- Room Temperature electromagnets with optical access through bores
- Pole tips for 12mm and 5mm spacing
- Cryostation Sample Housing and internal Radiation Shield
- Power Supply with 2.3mA programming resolution
- Cooling Subsystem with automated cooling rate, temperature monitoring, safety interlock, and all hoses

Entire system can be controlled remotely.
This is a turnkey solution - integrated and ready to go!



Front



Back



Power Supply

- The power supply allows fine control of the electromagnet field. The supply step is 2.3mA and may be controlled by a front panel knob, USB, or TCP/IP. The voltage and current are displayed for the user.

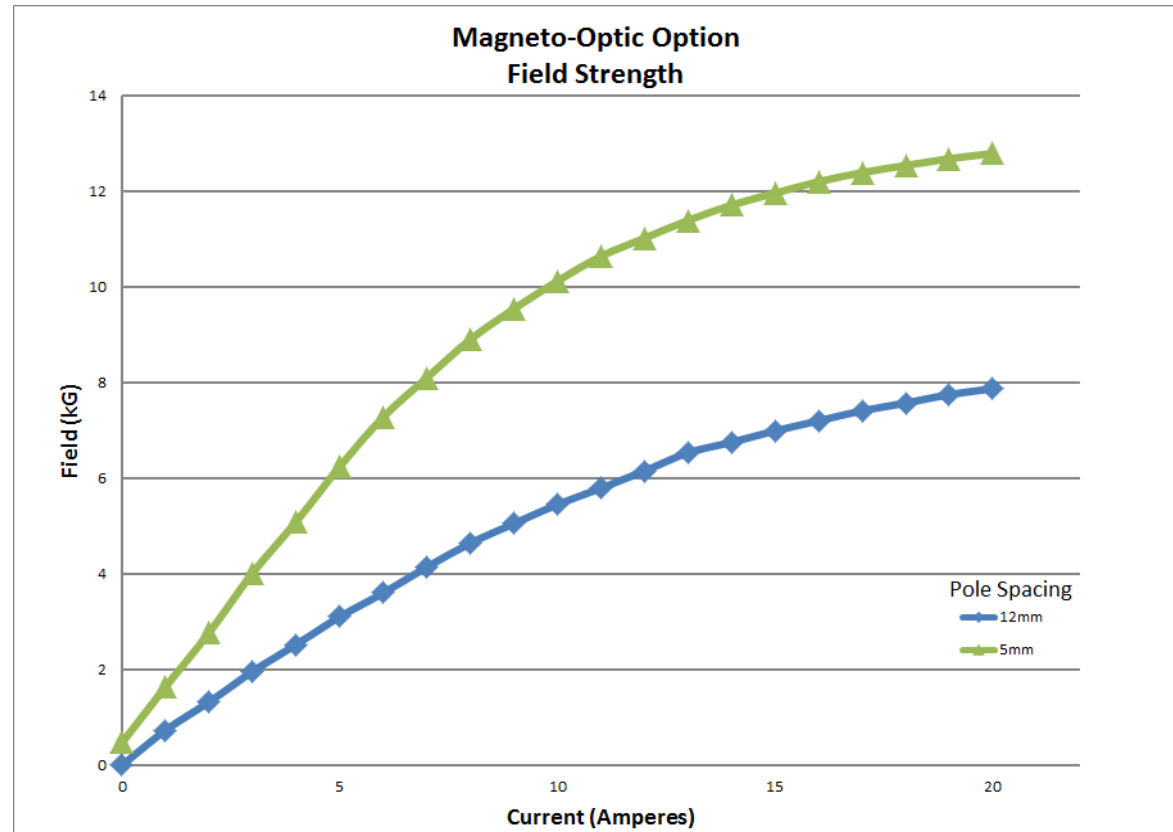


Field Strength

The field strength depends on the power supply current and the magnet pole spacing.

The system can be run at 14 amps continuously with the cooling system operating.

The typical pole spacing with the radiation shield in place is 10-12mm.

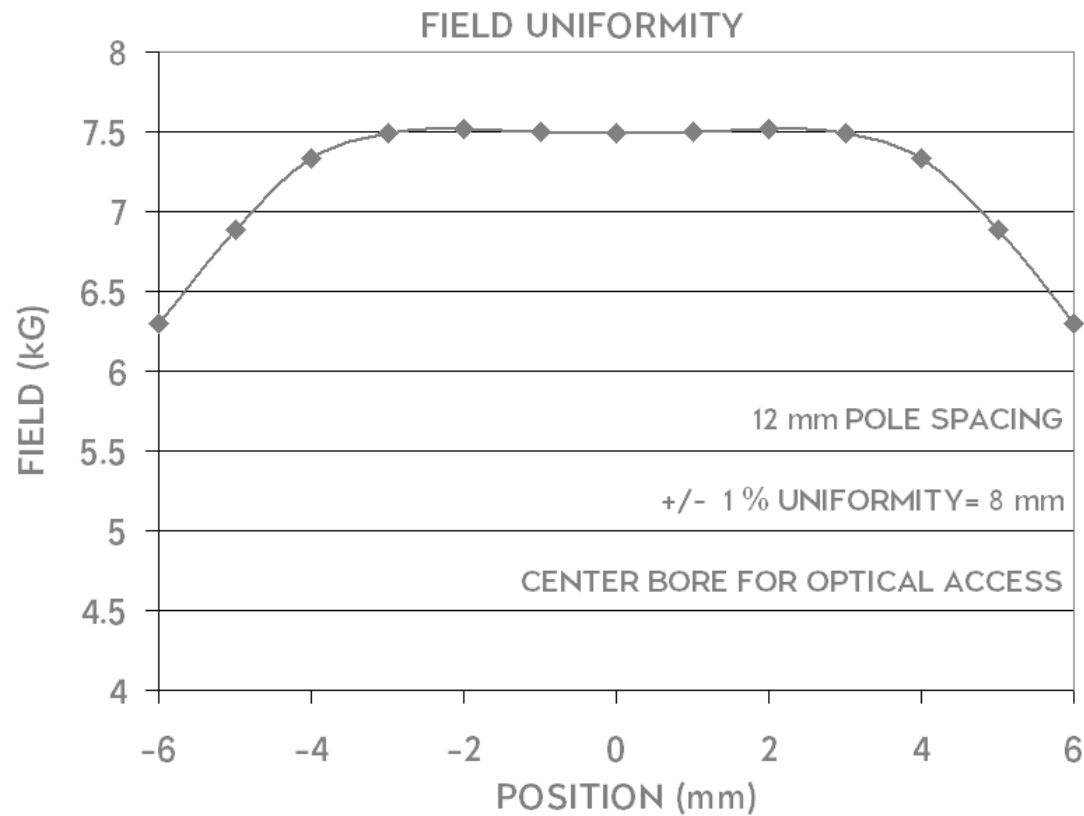


Field Strength Control

- The power supply for the magnet is 40VDC, 19A with 13 bit programming control. The power supply is mounted separately (1U) and may be controlled remotely by LAN, GPIB, or USB.

Uniformity

The field uniformity varies less than 1% in the central 8mm of a 12mm gap. This test was run on a system with bore in the magnets.

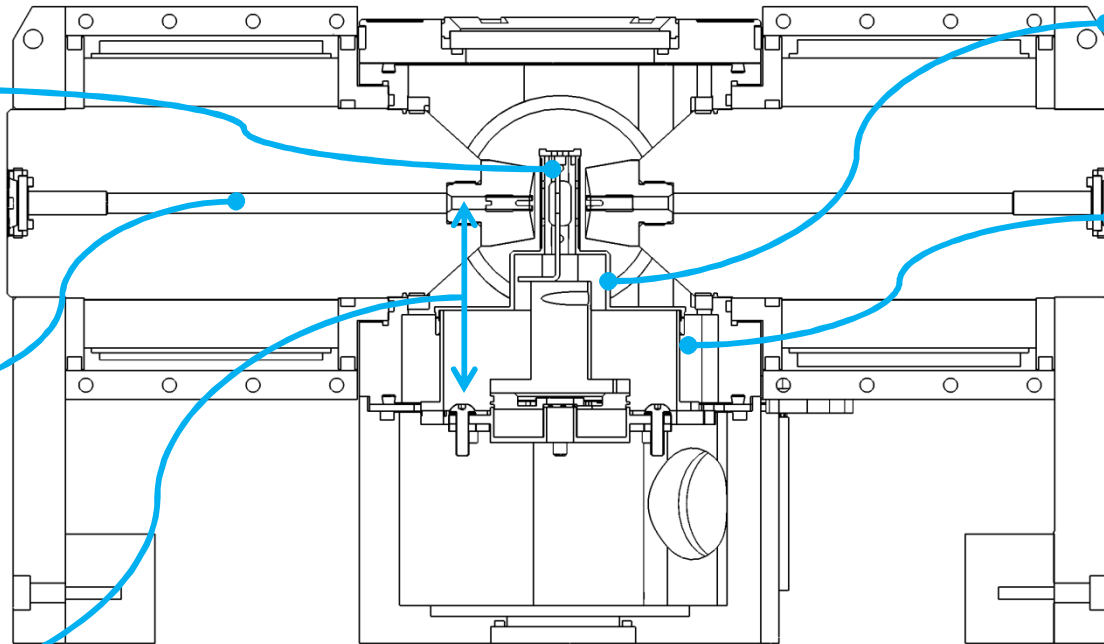


Dimensions

The sample space inside the radiation shield is 7mm x 22mm x 20mm tall

Poles have bore with 2.5 degree internal angle to allow laser focusing

The height from the platform to the beam centerline is 43.2mm



The beam height is 100mm

The chamber cap is 20.8 x 46 mm rounded

The main chamber is 53 mm diameter

These spaces allow room for nano-positioners below sample

Overall assembly width is 255mm

Reaching Full Field Strength

There are several configurations of the system when trying to optimize field strength. The table below summarizes some test results that may help you design your application.

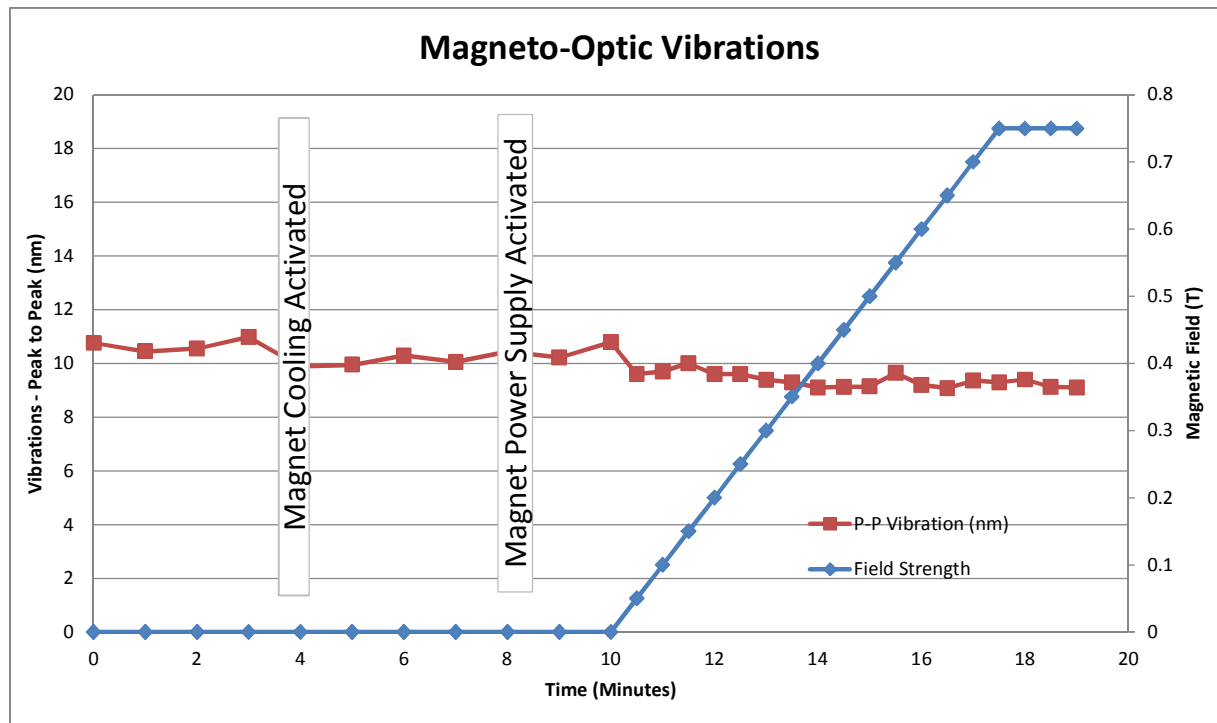
Mode	Radiation Shield	Pole Spacing	Field Strength	Sample Temp
Standard	Yes, with windows	12 mm	0.78 T	3.1 K
Close	Removed	5 mm	1.25 T	~ 10K
Tight	Yes, windows removed, poles through ports	7mm	> 1 T	4.2 K
Magnet boosted	Yes, with windows	12 mm, donut magnets on tips	> 1 T	< 4 K

Continuous Operation

- With the chiller in place, you can operate continuously with pole spacing of 12mm at 0.6T or pole spacing of 5mm at 1T. If you are able to have some "off" time for temperature recovery, then larger fields for periods of time are possible. Our chiller will cool the magnets from an operating temperature of 55C to 40C in about 90 seconds.

Vibrations

The peak to peak vibrations are <12nm with the magnet option installed, primarily due to the increased sample height off the table, whether or not the chiller pump or magnet is on



Other Notes

- The magnet poles and sample mount may be operated independently of the Cryostation without the cold space.
- This option can be added to an existing Cryostation by the user.
- The magnet poles may be removed from the ports and replaced with 50mm windows for experiments without field control.



Contact us

Montana Instruments

www.montanainstruments.com

sales@montanainstruments.com

(406) 551-2796 office