

SYSTEMS FOR MÖSSBAUER SPECTROSCOPY



CRYO Industries of America, Inc.

Systems for Mössbauer Spectroscopy

Cryo Industries of America, Inc. has numerous designs for Mössbauer Spectroscopy.

In the most common designs, the sample is placed in exchange gas which results in **ultra low vibrations at the sample!**

The cooling is provided by a Gifford-McMahn (GM) or pulse tube closed cycle refrigerator for long term cryogenic operation. No liquid cryogens are needed!

In order to ensure that vibrations from the coldhead are not transmitted to the sample, the coldhead is isolated from the sample via a flexible bellows assembly. This flexible bellows assembly is placed between the refrigerator and a sample support flange.

For additional vibration dampening the support flange is mounted to a vibration isolation stand.

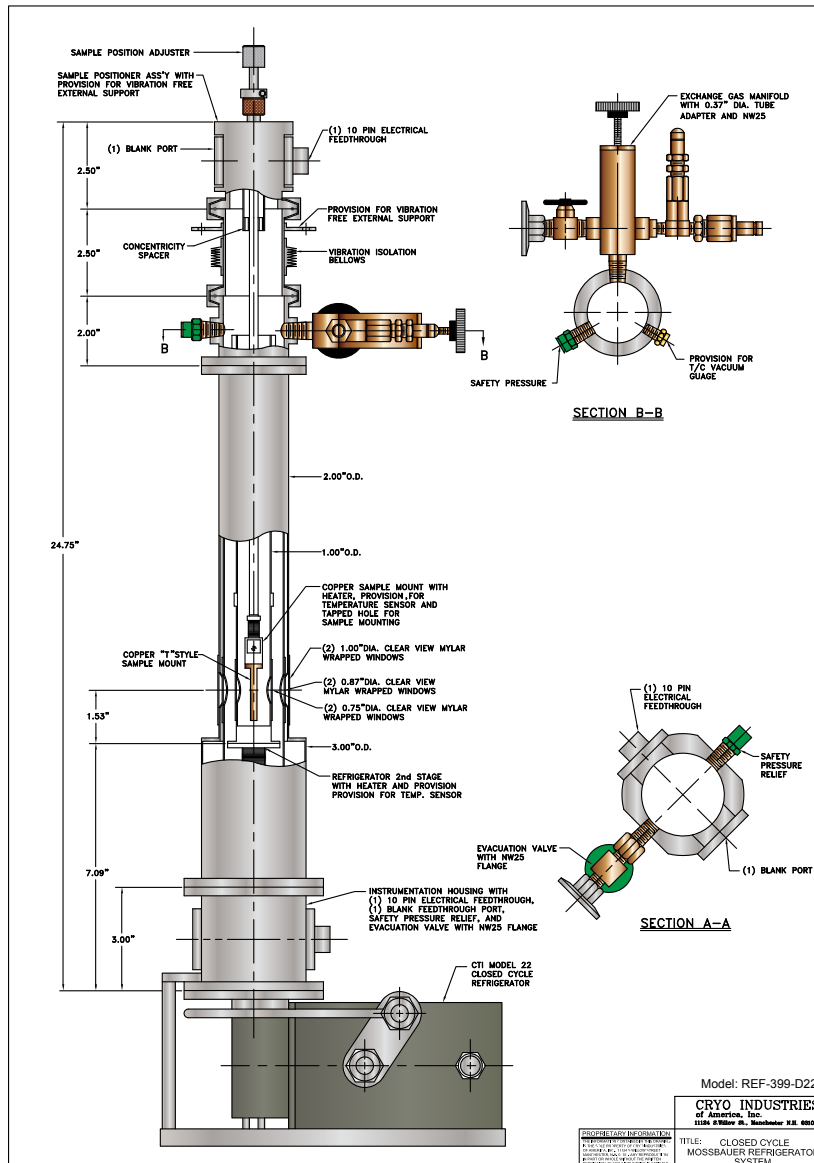
By working with our team of physicists and engineers, Cryo Industries is able to **custom design** a system that will meet all your experimental needs.

Model: REF-399-D22

CRYO's most popular system for Mössbauer Spectroscopy is the 'Top Loading' Sample in Exchange Gas (REF-399-D22). This system is available with an integrated 10 K or 4 K coldhead.

REF-399-D22 features exchange gas cooling of low thermal conductive samples. Samples can be changed in seconds without shutting off or warming the refrigerator. An independent sample mount heater results in fast thermal response. Ultra-stable variable temperature operation.

The Model REF-399-D22 (Mossbauer) features low vibration through bellows, spacer and exchange gas isolation. A vibration isolation stand is included.



ALL REF-399-D22 SYSTEMS FEATURE:

- Vibration isolation bellows assembly
- Low Vibration Support Stand
- Exchange gas manifold
- Sample probe with rotational and linear adjustments
- T-style optical sample holder
- Clear type D mylar windows (0.010" thick)
- Heaters installed on coldhead and sample mount
- Silicon diode temperature sensor installed on sample mount
- Matching silicon diode temperature sensor installed on 2nd stage refrigerator
- 10-pin electrical sample feedthrough
- Sample exchange gas valve with safety pressure relief
- Evacuation valve with safety pressure relief

Model: REF-399-D22

CRYO INDUSTRIES

of America, Inc.

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PROPRIETARY INFORMATION

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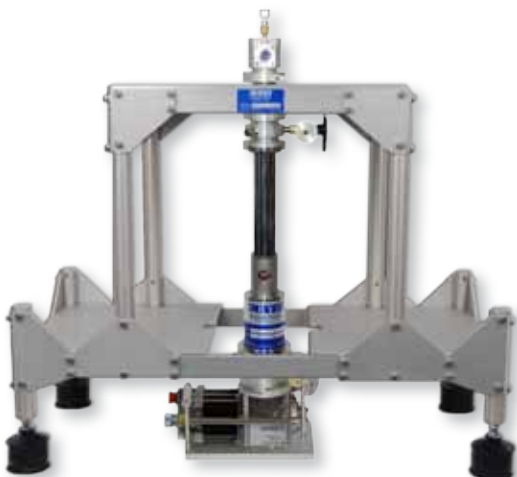
TITLE: CLOSED CYCLE
MOSSBAUER REFRIGERATOR
SYSTEM

Model: REF-399-D22 (cont.)



10 K REF SYSTEM SPECS:

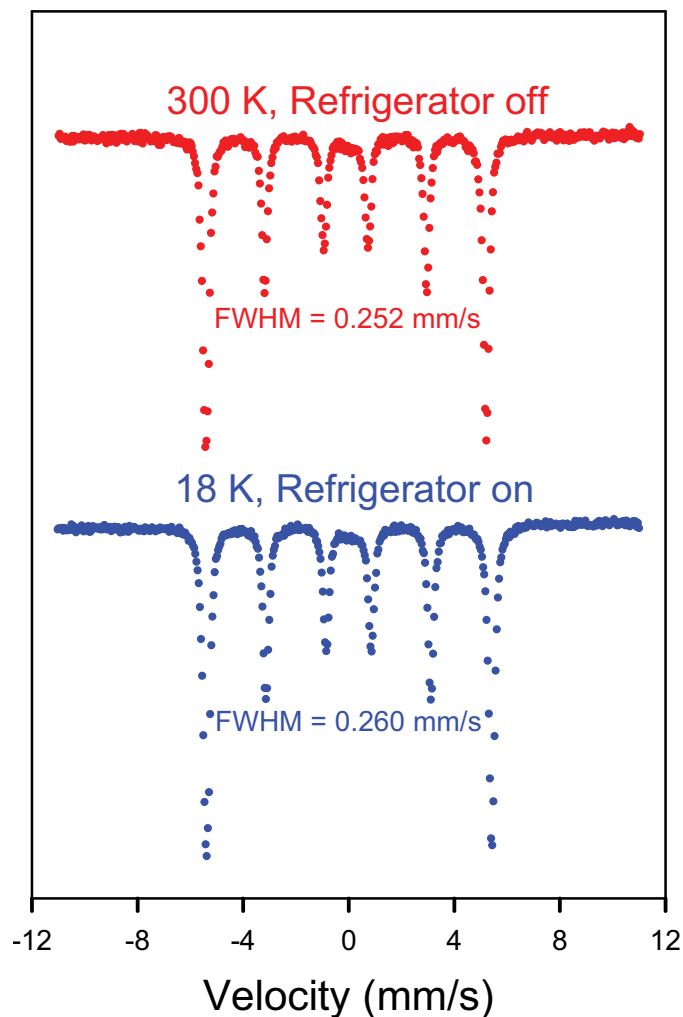
- <15K to 325K operating temperature range
- 2 Stage (GM) coldhead Model 22
 - 1.0 watts @ 20K 2nd stage cooling power
 - 8.0 watts @ 77 K 1st stage cooling power
- CTI Model 8200 Water cooled compressor



4 K REF SYSTEM SPECS:

- <5K to 325K operating temperature range
- 2 Stage (GM) coldhead Model SRDK 408D
 - 0.1 watts @ 5K 2nd stage cooling power
 - 5 watts @ 40 K 1st stage cooling power
- Water cooled compressor

PURE FE FOIL



Above: Fe thin foil spectra. The line widths are 0.252 at 300 K (without refrigerator) and 0.260 with refrigerator.

Virtually no refrigerator induced vibrations.

Model: CF-2497-MOS

Cryogen Free Superconducting Mössbauer Magnet System

Cryo Industries' innovative Cryogen Free Superconducting Magnet Mössbauer System is a true performance by design system.

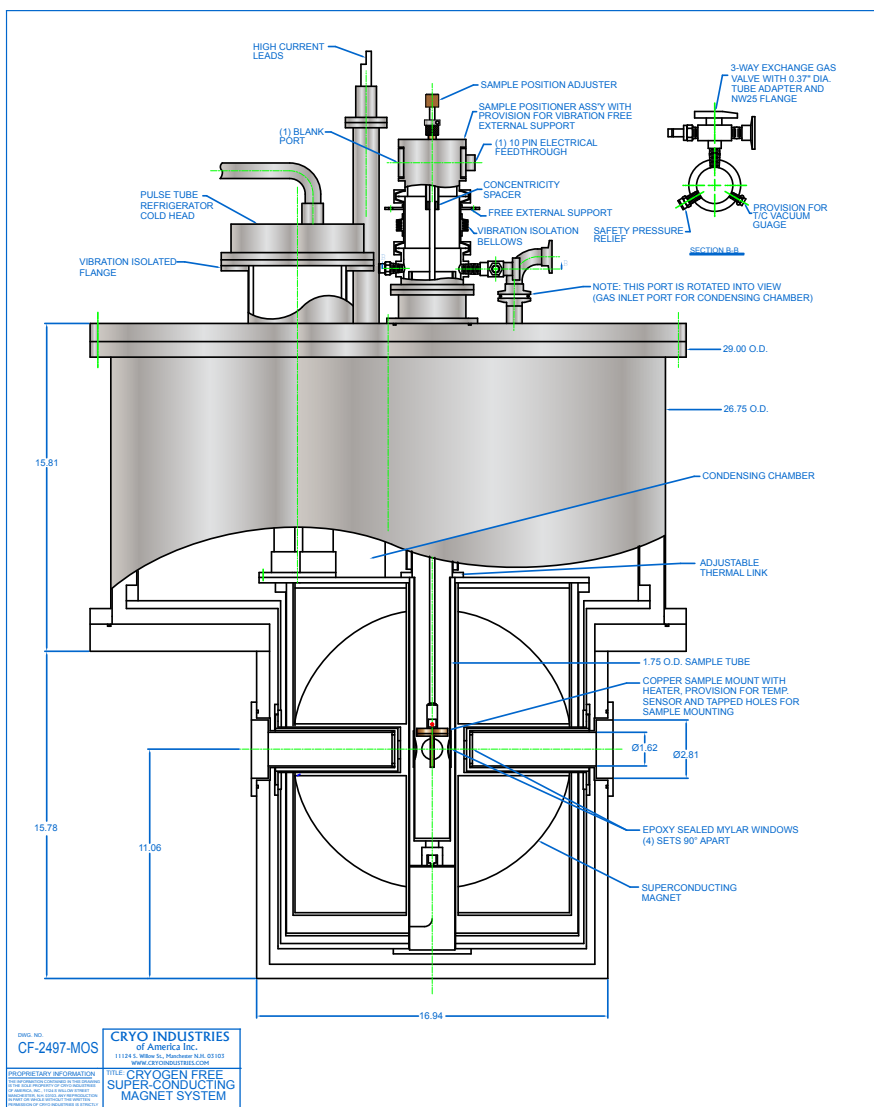
The system offers either a 5 Tesla magnet horizontal field split pair at 4.2 K with active null field positioned in each horizontal port or a 10 Tesla magnet with active null field positioned in the axial ports.

The system can be configured to your experimental needs!



SYSTEMS FEATURES:

- Cryogen Free Superconducting Magnet System with integrated optical variable temperature insert
- 5 Tesla magnet horizontal field split pair at 4.2 K with active null field positioned in each horizontal port (optional 10T with active null fields positioned in axial ports)
- 2 K to 325 K variable temperature range
- $\pm 0.5\%$ homogeneity over central 1 cm DSV
- Stray field <600 gauss at 20 cm from center
- (4) window ports, parallel to the magnetic field and at right angles to the magnetic field with aluminized mylar windows
- HTS magnet current leads
- 1.0 Watt @ 4.2 K pulse tube refrigerator for magnet cooling
- Water cooled compressor



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