



# AC Susceptibility

Cryogen-Free AC Susceptibility Cryostat

**A complete cryogen-free system at a lower price than most other liquid helium style systems. No more liquid cryogen continuing costs. No liquid helium transfers required; just 'plug and play'.**

**CRYO** Industries of America has developed a very versatile and economical low-temperature cryogenic system that not only eliminates the necessity of using liquid cryogen, but can be configured to perform a multitude of low-temperature experiments. A two-stage Gifford-McMahon helium closed-cycle refrigerator that can obtain base temperatures of 10 Kelvin provides the refrigeration. An optional rare earth regenerator configuration can extend the base temperature to less than 4 K. The top-loading exchange gas configuration means that different experimental stages and samples can be easily and rapidly transferred into the cold stage without having to interrupt the operation of the refrigerator.

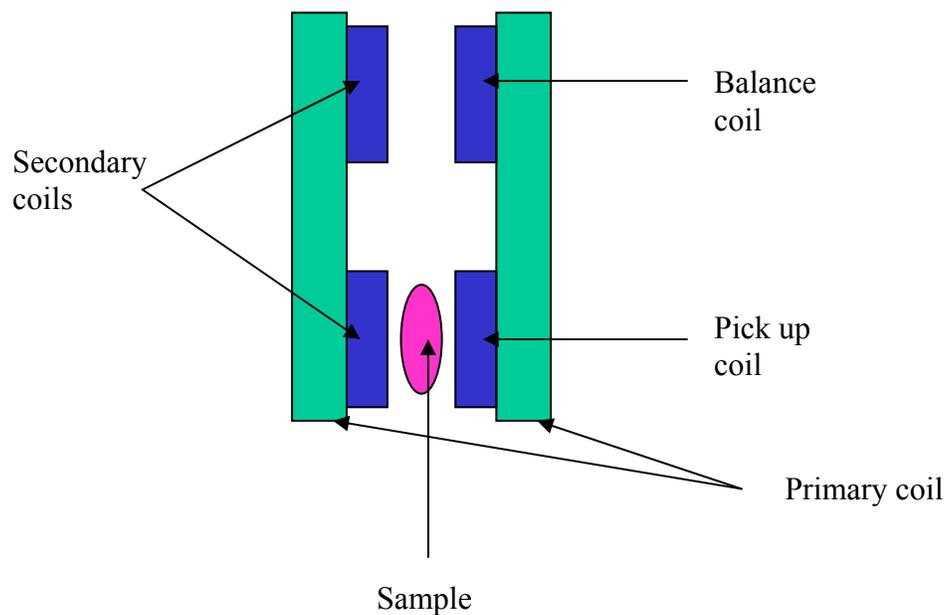
The AC Susceptibility top-load probe assembly is constructed completely from a non-magnetic composite material to minimize induced eddy current noise and magnetic contamination. The primary excitation coil can generate an AC magnetic field up to 10 gauss and the high turns density counter-wound secondary pickup coils provide high sensitivity with an equivalent level of  $10E-5$  emu. This setup is ideally suited for characterizing high temperature ceramic superconductor materials, particularly in determining the critical transition temperature.

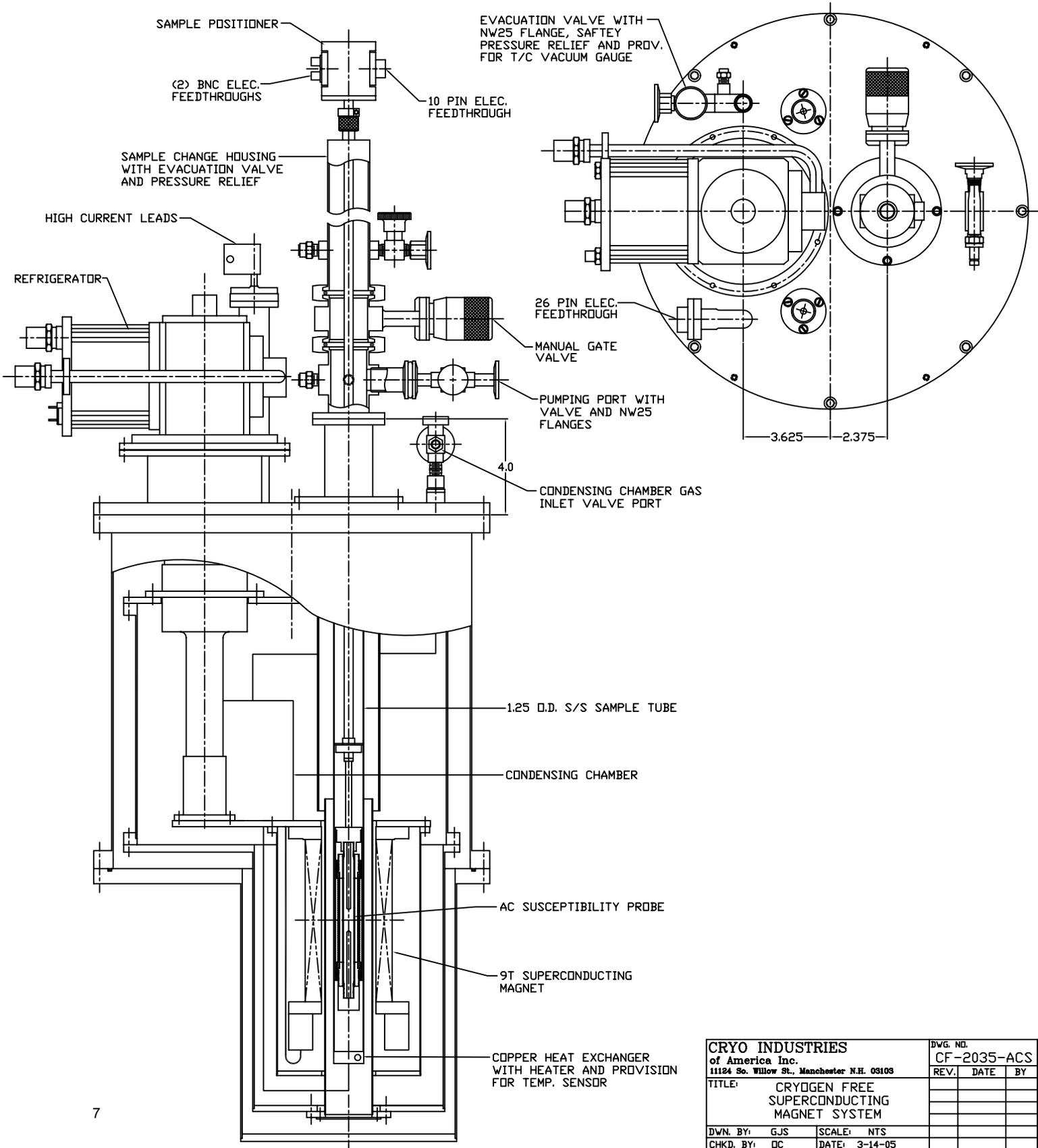
Some standard configurations for the experimental stages are AC susceptibility, Hall effect, DC resistivity and high-frequency measurements. Optional features include optical light paths, variable applied magnetic field, sample manipulators, and hot-stages that extends the experimental temperature range to 800 Kelvin. Additional unique options for the CRYO top-load system are a rare-earth based Gifford-McMahon refrigerator which lowers the operating temperature to below the liquefying point of liquid helium; or, alternatively a liquid helium continuous flow cryostat can be installed to provide a dual refrigeration unit.

## Coils and sample mounting

The AC Susceptibility top-loading probe assembly is constructed completely from a non-magnetic composite material to minimize induced eddy current noise and magnetic contamination.

The primary excitation coil can generate an AC magnetic field up to 10 gauss and the high turns density counter-wound secondary pickup coils provide high Sensitivity with an equivalent level of  $10E-5$  emu.

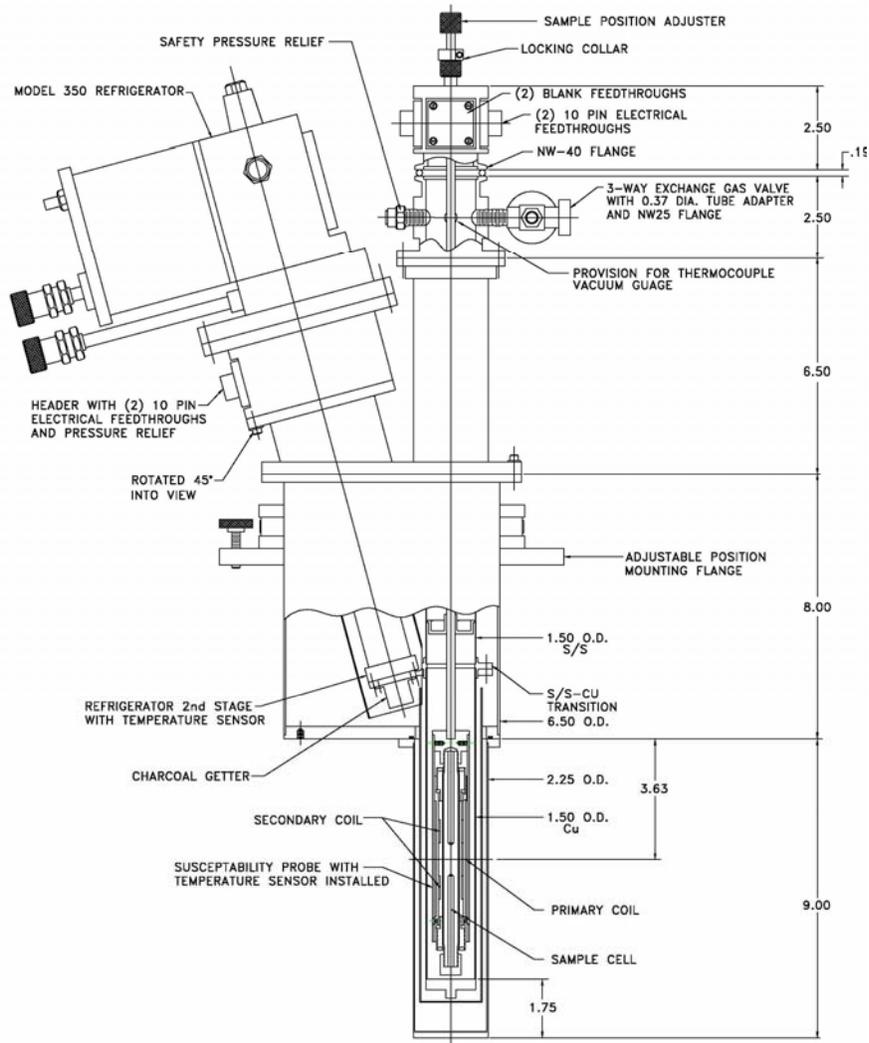




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|---|---------------|-------------|------|
| <b>CRYO INDUSTRIES</b>                            |               | DWG. NO.    |      |
| of America Inc.                                   |               | CF-2035-ACS |      |
| 11124 So. Willow St., Manchester N.H. 03103       |               | REV.        | DATE |
| TITLE: CRYOGEN FREE SUPERCONDUCTING MAGNET SYSTEM |               |             |      |
| DWN. BY: GJS                                      | SCALE: NTS    |             |      |
| CHKD. BY: DC                                      | DATE: 3-14-05 |             |      |

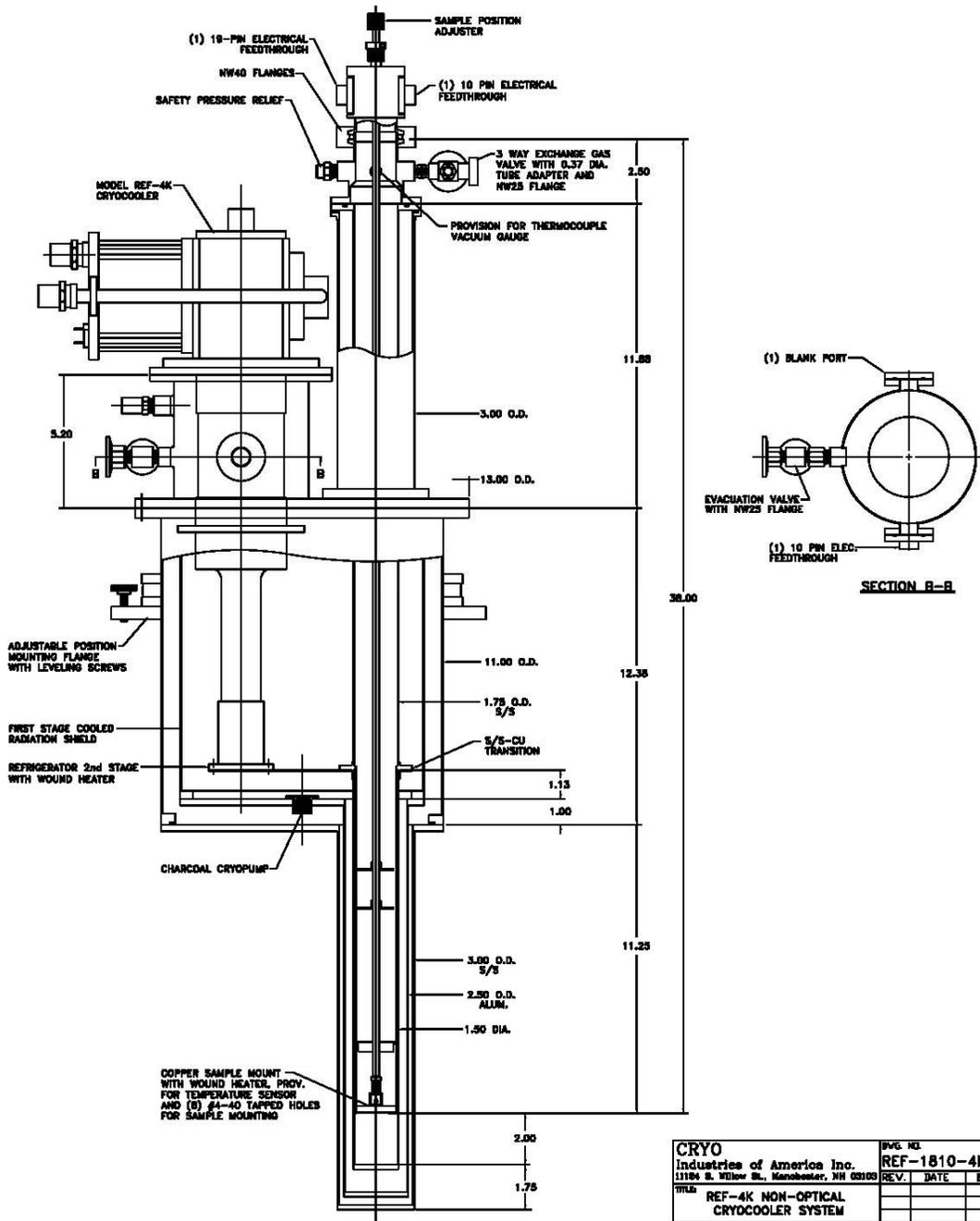


# 10 K AC Susceptibility Cryocooler System with Top-Loading Probe



|  |                                  |
|--|----------------------------------|
| CRYO<br>Industries of America, Inc.<br>11124 S. Willow St., Manchester, NH 03103 | DRWG. NO.<br><b>REF-1808-ACS</b> |
| TITLE:<br>CLOSED CYCLE<br>REFRIGERATOR SYSTEM                                    | REV. DATE BY<br>1 3-18-03 MSS    |
| DWN. BY: MSS SCALE: NTS  |                                  |
| CHKD. BY: GJS DATE: 3-17-2003  |                                  |

# 4 K Cryocooler System for use with Resistivity and AC Susceptibility Top-Loading Probes



|   |               |              |         |
|---|---------------|--------------|---------|
| <b>CRYO</b>                               |               | DWG. NO.     |         |
| Industries of America Inc.                |               | REF-1810-4KN |         |
| 11184 S. Willow St., Manchester, NH 03103 |               | REV.         | DATE BY |
| TITLE                                     |               |              |         |
| REF-4K NON-OPTICAL CRYOCOOLER SYSTEM      |               |              |         |
| DRAWN BY: GJS                             | SCALE: NTS    |              |         |
| CHECKED BY: GC                            | DATE: 3-14-08 |              |         |