CRYOFREE

# Spectromag™PT

## Cryofree® magneto-optical superconducting magnet system


OXFORD INSTRUMENTS

*The Business of Science®*

# Spectromag™PT

## Magneto-optical measurements without the need for liquid helium

The **Spectromag**PT is a cryogen-free superconducting split pair, horizontal field magnet system, providing optical access to a sample in a variable magnetic field / low temperature environment.

### Key features and benefits:

- Magnetic fields up to 7 T in a compact geometry. 10 T option available on request. Using the highest specification superconducting wire available on the market, supplied by our sister company Oxford Superconducting Technology
- Low temperature insert providing sample temperatures from 1.5 K to 300 K
- No gas flow over sensitive samples: the system uses a static exchange gas around the sample, preventing flow induced movement of delicate samples or measurements probes
- Quick sample change via top-loading probe. The sample can be changed while the system is cold. No need for complicated load-lock mechanism and reloading into the gas
- No contamination or blockages: using a sealed circulation loop separate to the sample exchange gas. This also increases the continuous running period of this system
- Enables full sample rotation for measurements both parallel and perpendicular to the field. Via 30 mm clear diameter sample tube
- Sample rod with optional ±15 mm axial adjustment and 360° rotation around a vertical axis
- Excellent optical access in the horizontal plane both parallel and perpendicular to the field

### Control system

All standard electronic items are provided with LabVIEW® drivers to allow control through the Oxford Instruments LabView System Control Software. The software allows LabView users to control the sample temperature and magnetic field. In addition it is possible to integrate with other virtual instruments to provide full experimental control.


*System in the early stage of installation, image courtesy of Dr Yossi Paltiel at The Hebrew University, Jerusalem, Israel.*

### Applications:

- Magneto circular dichroism
- Mössbauer spectroscopy
- Raman spectroscopy
- Photoluminescence
- Faraday effect measurements
- Optical characterisation of nano-devices / quantum dots



# Specifications

### Magnet

| | |
|---|---|
| **Field** | 7 tesla |
| **Field direction** | Horizontal |
| **Homogeneity** (over a 10 mm diameter sphere) | 0.3% |
| **Stability in persistent mode** | < 1 x $10^{-4}$ hr |
| **Sweep rate (with IPS120-10)** | 0.07 T/min (100 min to full field) |
| **Magnet cool down time (to base)** | 40 hours |

### Variable temperature insert

| | |
|---|---|
| **Temperature range** | 1.5 to 300 K |
| **Temperature stability (over 10 min period)** | ± 10 mK below 20 K<br>± 100 mK above 100 K |
| **Sample space diameter** | 30 mm |
| **Probe cool down time** | 1.5 h from RT to < 2 K |

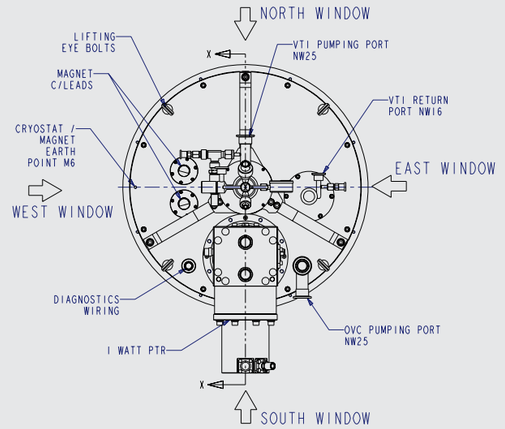
### System components

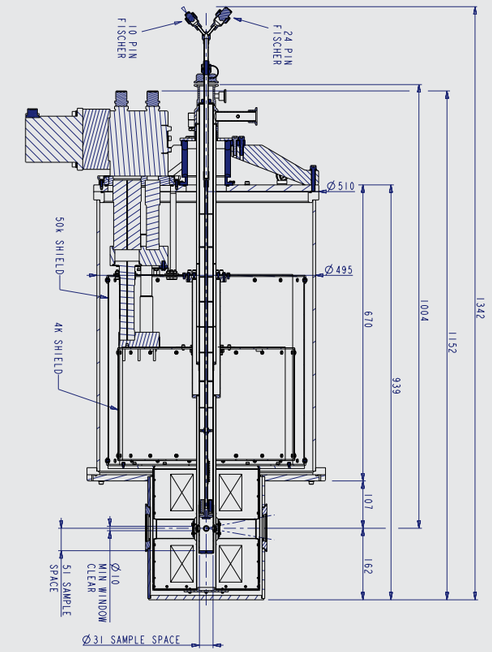
| | |
|---|---|
| **CFSM7T-1.5 Spectromag**PT | • Cryostat with horizontal field split pair magnet<br>• Variable temperature insert<br>• Sample rod with three 10-pin fischer connectors, one wired down to sample position<br>• 4 radial sets of Spectrosil B quartz windows in strain free mounts. Other window materials available on request |
| **CFECSM Electronics console** | • Oxford Instruments magnet power supply<br>• Oxford Instruments temperature controllers |

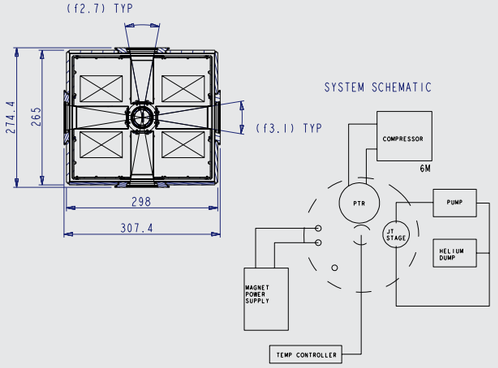
### Options

| | |
|---|---|
| **CFSMSH1** | Plain flat sample holder |
| **CFSMSH3** | Sample holder with 15 mm diameter aperture and clamp |
| **CFSMSR1*** | Sample rod with 1 wired 10 pin Fischer connectors |
| **CFSMSR2*** | Sample rod with 2 wired 10 pin Fischer connectors |
| **CFSMSR3*** | Sample rod with 3 wired 10 pin Fischer connectors |
| **SM HTRPS** | Precision height and rotate adjust option for sample rod, manual operation |

**All CFSM sample rods are wired with a Cernox sensor and a heater.*



| | |
|---|---|
| **SCI** | Extra sensor channel interface for temperature controller |
| **CC4** | Cryostat cable for SCI |
| **HCB** | Heater control board for temperature controller |
| **CX1** | Miniature BNC connector wired down to sample holder position |
| **OXCONT** | Control package with PC, LabVIEW® software and virtual instrument drivers |
| **Pumping system:** | |
| **H4-602** | Large turbo pumping kit 90-127 volts |
| **H4-603** | Large turbo pumping kit 190-260 volts |
| **Spares kit:** | |
| **SKCFSM** | Spares kit for **Spectromag**PT including 'O'rings, screws, etc… |
| **EXSKCFSM** | Extended spares kit for **Spectromag**PT including: tool box; gloves; silicon vacuum grease; allen keys; NW vacuum fittings for cryostat top plate; rubber bladder; spare'O'rings for windows; metric screws; lens cleaner and cloth |

## Maintenance and service contracts from **Oi**Service

By choosing Oxford Instruments as the supplier of your next Cryofree magneto-optical superconducting magnet system not only are you getting a reliable product but also access to a service support team.

**This includes:**

- Our team of 13 expert engineers have more than 100 years of experience based on the successful installation of hundreds of magnet and low temperature systems
- Five people dedicated to helpdesk
- Bespoke Cryospares service

All of our products are supported by a 12-month warranty including parts, labour, on-site visits and third party items like pumps or electronics. Extended warranty are available on request.

## Service*Wise* service contracts:

The **Spectromag**PT uses a pulse tube refrigerator, a compressor and a circulation pump which require regular maintenance to ensure optimum performance. Oxford Instruments offers support packages which can take care of this for you for complete peace of mind.

**www.oxford-instruments.com/SpectromagPT** for more information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