environment by JANIS

Lake Shore CRYOTRONICS
a DwyerOmega brand

*Cryogen-free*

# Large sample space cryostats <4 K to 300 K

These Lake Shore closed-cycle refrigerator cryostats cool a large cold plate in vacuum. Cold plates are available from 102 mm (4 in) to 305 mm (12 in) in diameter. RF and DC feedthroughs and wiring are available, as well as custom optical designs.

*CCS-CP*

## Key features

- Standard 200 mm (8 in) diameter cold plate (other sizes available)
- <4 K to 300 K
- Cryogen-free
- Sample in vacuum
- Split design for easy access to the sample area

## Featured components

- DC and high-density RF feedthrough options, with thermally anchored wiring installed to the cold plate
- Choice of cryocooler to match performance and cooling requirements
- Integrated control heater and calibrated control sensor
- Controlled radiation shield temperature for fast warmup
- Includes the new Lake Shore model 346 temperature controller as standard, with 100 W output to both cryostat heaters and the capacity for reading multiple temperature sensors

## Cryostat models

- **CCS-CP** non-optical

# Specifications

| | | CCS-CP |
|---|---|---|
| Minimum temperature options | 408 | <4 K |
| | 415 | |
| | 418 | |
| Maximum temperature | | 300 K |
| Typical temperature stability[1] | | ±50 mK |
| Cold head location | | Bottom |
| Optical | | ✕ (Optional top or side windows) |
| Cold plate size | | 200 mm (8 in) diameter standard; other sizes up to 300 mm (12 in) available |
| Shielding | | Cooled radiation shields on first stage and cold plate |
| Recommended maintenance | | 13,000 h |

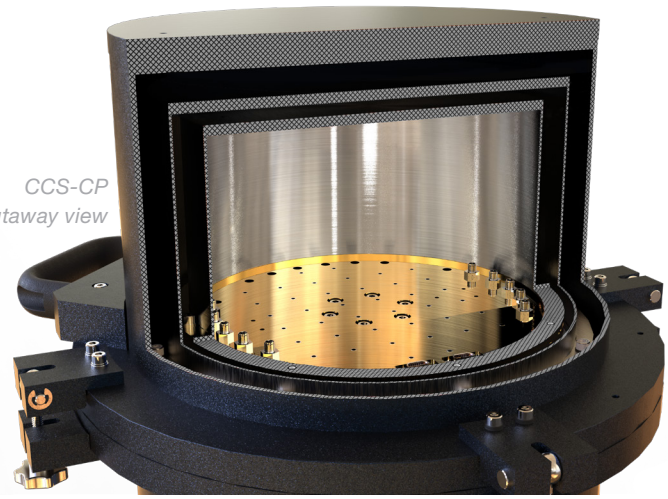
[1] *Measured with temperature controller*

# Wiring options

**DC** Up to 100 PhBr wires (twisted pairs), thermally anchored at the first stage and terminated in D-sub connectors at the cold plate.

**RF** Standard SMA or high-density feedthroughs with 0 dB attenuators at the first stage and SMA connectors at the cold plate.

40 GHz and 67 GHz options also available.



*CCS-CP cutaway view*

## Facility requirements

| | | Recommended | | Water-cooled | | | | Air-cooled | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| CCS- | Cold head | Compressor maintenance interval | Cold head maintenance interval | 60 Hz power requirements | 50 Hz power requirements | Cooling water requirements | Compressor size | 60 Hz power requirements | 50 Hz power requirements | Cooling air requirements | Compressor size |
| CP | -408<br>-415<br>-418 | 30,000 h | 10,000 h | 200 VAC, 3-phase, 7.5 to 7.8 kW or 480 VAC, 3-phase, 7.5 to 7.8 kW | 200 VAC, 3-phase, 6.6 to 6.9 kW or 380 to 415 VAC, 3-phase, 6.6 to 6.9 kW | 6 to 9 L/min at 5 to 25 °C | 443 mm × 493 mm × 532 mm high; 100 kg | 200 VAC, 3-phase, 7.5 to 8.3 kW steady state or 460/480 VAC, 3-phase, 7.5 to 8.3 kW | 200 VAC, 3-phase, 6.5 to 7.2 kW steady state or 380/400/415 VAC, 3-phase, 6.5 to 7.2 kW | 23 $m^3$/min | 450 mm × 485 mm × 925 mm high; 155 kg |

# Complete your setup

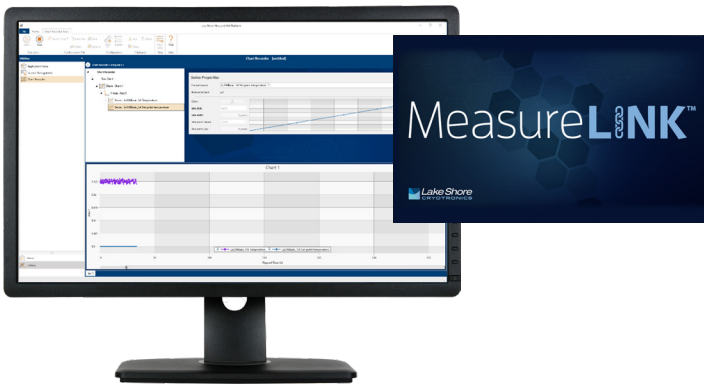
## Temperature control

*Included*

Every cryostat includes a Lake Shore temperature controller and calibrated sensor.

## MeasureLINK control software

*Optional add-on*




MeasureLINK software enables a wide range of capabilities including charting and logging, system monitoring with a cryostat-specific process view, and controlling Lake Shore equipment as well as third-party instrumentation. No programming required—drag-and-drop to create temperature sweeps, access measurements, and see real-time internal cryostat temperatures in process view.

## Source + measure + lock-in

*Optional add-on*

The Lake Shore M81-SSM provides highly synchronized DC, 100 kHz AC, and mixed DC + AC sourcing and measuring—including both voltage and current lock-in measurement capabilities—for low-temperature material research performed in your cryostat. It supports up to three remote-mountable source and three measure modules per a single M81-SSM-6 instrument and, owing to its modularity, allows signal and source amplifiers to be located as close as possible to the sample being characterized. This minimizes the signal wiring to the sample, reduces noise, and increases measurement sensitivity.

# For low-vibration applications

Pair an ST-500-LGV with an Infinite Helium

# Configure your cryostat

## 1. Select cryostat

| | |
|---|---|
| **CCS-CP** | Non-optical, vacuum, 200 mm (8 in) cold plate large sample space |
| **CUSTOM** | Custom configurations are available to fit your experiment needs—contact Sales for details |

## 2. Select cryostat wiring

DC — specify number required (up to 100).
RF — specify number and frequency required: high-density or standard configuration.

## 3. Select cryostat configurations

**Windows**
For optical variants, windows are available in multiple thicknesses and materials. Custom options include four side-looking windows or one top window. Cooled radiation shield windows also included.

**Compressor type**

| | |
|---|---|
| **CONSULT** | Substitute air-cooled compressor in place of standard water-cooled |

## 4. Select pump (optional)

Each cryostat requires a pump to operate. If you do not have an existing pump, select one of the pumps below.

| | |
|---|---|
| **TSJ-85-D** | Turbopumping station with scroll backing pump |

## 5. Select optional setup configurations

**Measurement instrumentation**
Cryostats come standard with one temperature controller.

**M81-SSM electronic synchronous source measure system**
Contact us for cables and adapters for M81-SSM/cryostat integration.

| | |
|---|---|
| **M81-SSM-X** | M81-SSM instrument with X = 2, 4, or 6 channels; half the channels are dedicated to sourcing and the other to measurement; see modules below |
| **VM-10** | AC/DC voltage measure module + lock-in |
| **BCS-10** | AC/DC balanced current source module |
| **CM-10** | AC/DC current measure module + lock-in |
| **VS-10** | AC/DC voltage source module |
| **SMU-10** | Source measure unit module |

## 6. Select optional control software

| | |
|---|---|
| **ML-MCS** | MeasureLINK-MCS software with scripting development license; includes lifetime activation for version purchased and full MeasureLINK capability on up to 5 computers with Lake Shore instrument drivers, chart recorder functionality, and drag-and-drop measurement sequences; some application packs sold separately |

## 7. Select additional accessories

Cryostats come standard with two installed temperature sensors. Other sensors are available—contact us.

| | |
|---|---|
| **CX-1050-CU-HT-1.4M** | Cernox® magnetic field independent, calibrated |
| **DT-670-CU-HT-1.4H** | Silicon diode, calibrated |

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