

## Pour-fill Cryostats

# VPF-100 Series nitrogen-cooled cryostats 65 K to 800 K

VPF-100 Series cryostats are liquid-nitrogen-cooled with the sample located in vacuum. They can withstand high temperatures, with options up to 800 K. Simple to use and refill, the VPF Series use a refill-style displacer assembly that enables refilling of the LN<sub>2</sub> reservoir without affecting the controlled temperature. A built-in heater provides variable temperature operation.

### Key features

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65 K to 500 K (800 K option)

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Fast cooldown — 15 min to 77 K

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Sample in vacuum

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### Featured components

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Built-in heater to for variable temperature control

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Optimized for two-loop temperature control

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High-efficiency, flexible LHe/LN<sub>2</sub> transfer line

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### VPF-100 Series variants

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**VPF-100** maximum temperature 500 K

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**VPF-100-H** maximum temperature 800 K

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# Specifications

|   | VPF-100                | VPF-100-H     |
|---|------------------------|---------------|
| Initial cooldown time (to 77 K)               | 15 min                 |               |
| Temperature range <sup>1</sup>                | 65 K to 500 K          | 65 K to 800 K |
| Typical temperature stability <sup>2</sup>    | ±50 mK                 |               |
| LN <sub>2</sub> hold time (77 K)              | 8 h                    | 5 h           |
| LN <sub>2</sub> hold time (100 K)             | 4.5 h                  |               |
| LN <sub>2</sub> hold time (200 K)             | 2.5 h                  |               |
| Initial vacuum level requirement <sup>3</sup> | ~10 <sup>-3</sup> Torr |               |

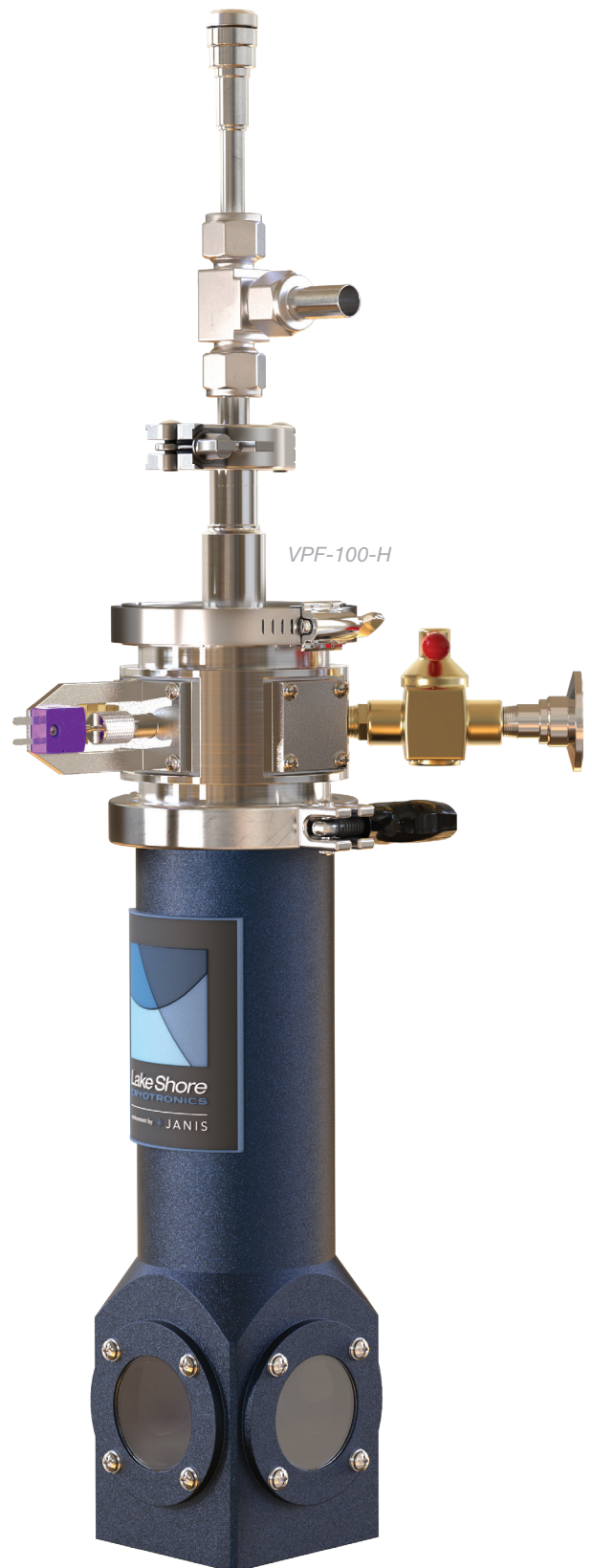
## Size

|                                   |                                      |                  |
|-----------------------------------|--------------------------------------|------------------|
| Height                            | 583 mm (23 in)                       |                  |
| Inner diameter (at sample region) | 76.2 mm (3 in)                       | 63.5 mm (2.5 in) |
| Sample mount diameter             | 31.75 mm (1.25 in)                   |                  |
| Weight (approximate)              | 3.3 kg (7 lb)                        |                  |
| Shipping weight (approximate)     | 9.1 kg (20 lb)                       |                  |
| Shipping dimensions (approximate) | 610 × 406 × 305 mm (24 × 16 × 12 in) |                  |

<sup>1</sup> Operation below 77 K requires pumping manifold

<sup>2</sup> Measured with temperature controller

<sup>3</sup> Pressure measured at room temperature prior to adding cryogen



# Complete your system

## Temperature control

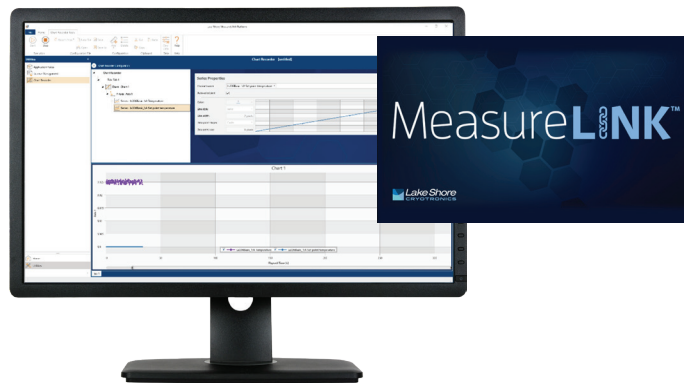
Included



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.

# Configure your cryostat

## 1. Select cryostat variant

|                  |  |
|------------------|--|
| <b>VPF-100</b>   | Optical, 65 K to 500 K, calibrated temperature sensor                                      |
| <b>VPF-100-H</b> | Optical, 65 K to 800 K, type E thermocouple  |
| <b>CUSTOM</b>    | Custom configurations are available to fit your experiment needs—contact Sales for details |

## 2. Select cryostat configurations

### Sample holders

|                                |                               |
|--------------------------------|-------------------------------|
| <b>SH-OPTICAL-1.25-STD</b>     | Optical                       |
| <b>SH-BLANK-1.25-STD</b>       | Blank                         |
| <b>SH-RESISTIVITY-1.25-STD</b> | Resistivity                   |
| <b>SH-OPTICAL-1.25-800</b>     | Optical, high-temperature     |
| <b>SH-BLANK-1.25-800</b>       | Blank, high-temperature       |
| <b>CONSULT</b>                 | Resistivity, high-temperature |
| <b>CONSULT</b>                 | DIP                           |

### Windows

See our cryostat window selection guide for additional information. Contact us for custom window options.

|                    |                       |
|--------------------|-----------------------|
| <b>WR-STD-FS</b>   | UV-grade fused silica |
| <b>WR-STD-SAPH</b> | Sapphire              |
| <b>WR-STD-ZNSE</b> | ZnSe                  |
| <b>WR-STD-CAF2</b> | CaF <sub>2</sub>      |
| <b>WR-6MM-KBR</b>  | KBr                   |
| <b>WR-STD-TPX</b>  | TPX                   |

### Mounting flange

|                      |   |
|----------------------|---|
| <b>BASE-ST-VPF-M</b> | Baseplate for ST-100, ST-300, and VPF-100 Series cryostats—metric threads   |
| <b>BASE-ST-VPF</b>   | Baseplate for ST-100, ST-300, and VPF-100 Series cryostats—imperial threads |

### Pumping manifold

|               |  |
|---------------|--|
| <b>VPF-PM</b> | Pumping manifold (for operation to 65 K) |
|---------------|--|

## 3. Select pump (optional)

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

|                |   |
|----------------|---|
| <b>10RVP</b>   | General-purpose mechanical pumping station  |
| <b>10DDP</b>   | General-purpose mechanical pumping station with LN <sub>2</sub> cold trap and isolation valve |
| <b>TS-85-D</b> | Turbopumping station  |

## 4. Select cryostat wiring

We offer a variety of both unwired and wired feedthroughs to complete your measurement setup. Please refer to the cryostat feedthroughs and wiring guide for more information.

## 5. Select optional system configurations

### Measurement instrumentation

Cryostats come standard with one temperature controller.

|                 |   |
|-----------------|---|
| <b>336</b>      | Model 336 temperature controller  |
| <b>335</b>      | Model 335 temperature controller  |
| <b>335-3060</b> | Model 335 temperature controller with installed 3060 thermocouple option card |
| <b>325</b>      | Model 325 temperature controller  |

### M81-SSM electronic synchronous source measure system

Contact us for cables and adapters for M81-SSM/cryostat integration.

|                  |  |
|------------------|--|
| <b>M81-SSM-X</b> | 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 |
| <b>VM-10</b>     | AC/DC voltage measure module + lock-in   |
| <b>BCS-10</b>    | AC/DC balanced current source module   |
| <b>CM-10</b>     | AC/DC current measure module + lock-in   |
| <b>VS-10</b>     | AC/DC voltage source module  |

## 6. Select optional control software

|               |  |
|---------------|--|
| <b>ML-MCS</b> | 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 one installed temperature sensor. Other sensors are available—contact us.

|                           |  |
|---------------------------|--|
| <b>CX-1050-CU-HT-1.4M</b> | Cernox® magnetic field independent, calibrated |
| <b>CONSULT</b>            | Thermocouple (VPF-100-H only)                  |

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