

## SuperTran Cryostats

# ST-100 Series continuous-flow cryostats 2 K to 800 K

ST-100 Series cryostats are continuous-flow cryostats with the sample located in vacuum. They operate with either liquid helium for operation to 2 K or liquid nitrogen for operation to 77 K and withstand high temperatures with options up to 800 K. A high-efficiency transfer line delivers liquid cryogen to the cold finger for cooling, and temperatures below 4.2 K can be achieved with a vacuum pump. By utilizing the built-in heater and 335 temperature controller, these cryostats offer precise variable temperature control within 50 mK.

ST-100 Series cryostats can be combined with the RGC recirculating gas cooler for fully cryogen-free operation throughout the entire temperature range. This enables unattended cryostat operation, making it perfect for extended-duration measurements.

Custom configurations are also available to fit restricted spaces, such as magnet systems or spectrometers, or to accommodate large samples, including semiconductor wafers and “cold plates” that cool multiple samples at once.

### Key features

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2 K to 500 K (800 K option)

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Fast cooldown — 15 min to 5 K

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Sample in vacuum

### Featured components

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

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Integrated control heater and calibrated control sensor

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Polished aluminum thermal radiation shield

### ST-100 Series variants

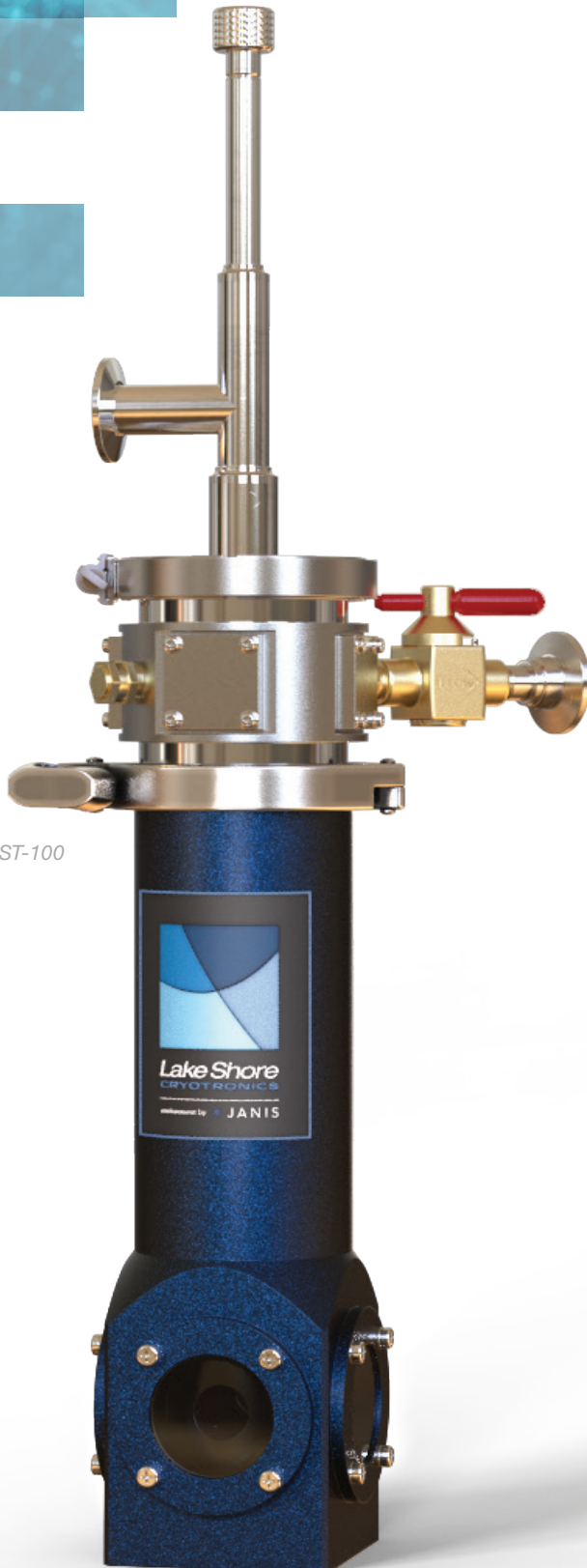
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ST-100 maximum temperature = 500 K

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ST-100-H maximum temperature = 800 K

ST-100



# Specifications

	ST-100	ST-100-H
Initial cooldown time (LHe to 5 K)	15 min	
Temperature range	2 K to 500 K	2 K to 800 K
Typical temperature stability <sup>1</sup>	±50 mK	
Orientation <sup>2</sup>	Any	
Cryogen consumption (LHe room to base temp)	0.4 L	
Cryogen consumption (LHe at 5 K)	0.6 L/h	
Cryogen consumption (LN <sub>2</sub> at 80 K)	0.1 L/h	
Initial vacuum level requirement <sup>3</sup>	~10 <sup>-3</sup> Torr	
Typical base pressure during operation	~10 <sup>-5</sup> Torr	

## Size

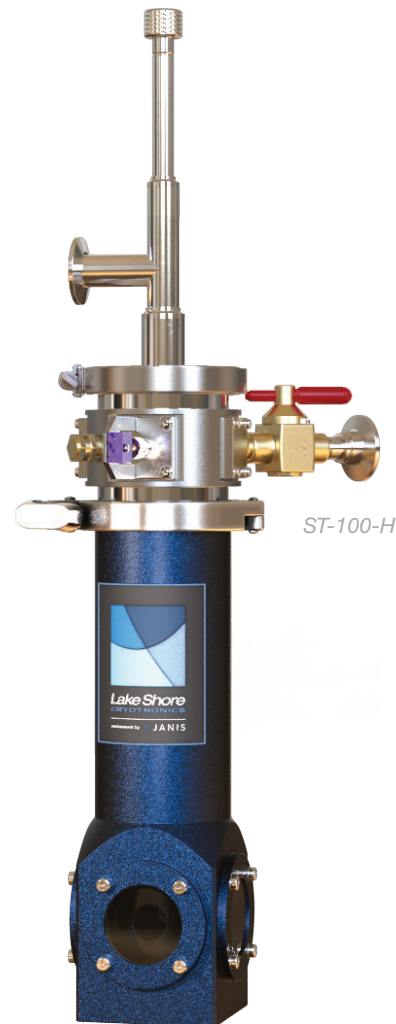
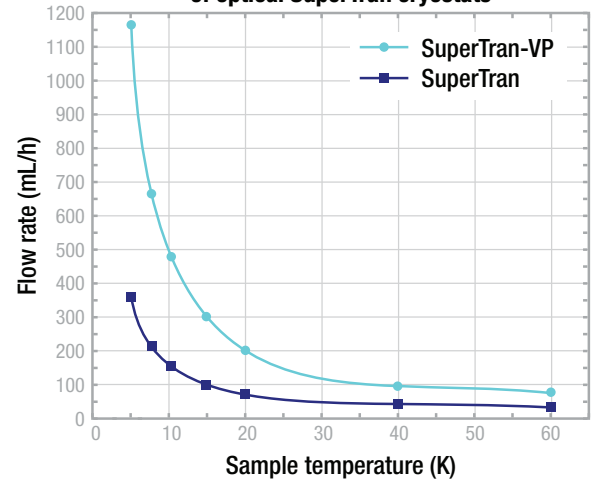
Height	583 mm (23 in)
Inner diameter (at sample region)	62 mm (2.43 in)
Sample mount diameter	32 mm (1.25 in)
Weight (excluding transfer line)	~4.6 kg (10 lb)
Shipping weight (cryostat only)	8.6 kg (19 lb)
Shipping weight (transfer line)	9.1 kg (20 lb)
Shipping dimensions (cryostat only)	762 × 508 × 508 mm (30 × 20 × 20 in)
Shipping dimensions (transfer line)	2057 × 660 × 127 mm (81 × 26 × 5 in)

<sup>1</sup> Measured with temperature controller

<sup>2</sup> Cryogen consumption may be higher during non-vertical operation

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

Typical cryogen consumption of optical SuperTran cryostats



ST-100-H

# Complete your setup

## Temperature control

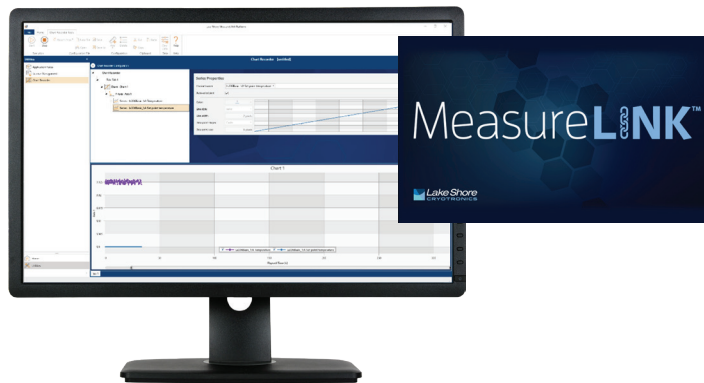
Included



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

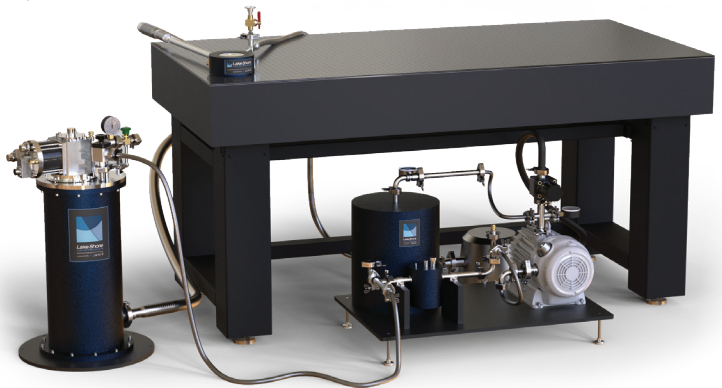
Optional add-on



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.

## Cryogen-free operation

Optional add-on



Cryostats can be combined with the RGC recirculating gas cooler for fully cryogen-free operation throughout the entire temperature range. This enables unattended cryostat operation, ideal for extended duration measurements.

# Configure your cryostat

## 1. Select cryostat variant

<b>ST-100</b>	Optical, 2 K to 500 K, calibrated temperature sensor
<b>ST-100-H</b>	Optical, 2 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-FIXED-STD</b>	Fixed
<b>SH-OPTICAL-1.25-800</b>	Optical, high-temperature
<b>SH-BLANK-1.25-800</b>	Blank, high-temperature
<b>SH-RESISTIVITY-1.25-800</b>	Resistivity, high-temperature
<b>SH-FIXED-800</b>	Fixed, high-temperature
<b>CONSULT</b>	DIP

### Windows (optical variants only)

See our cryostat window selection guide for additional information.

<b>WR-STD-FS</b>	Fused silica
<b>WR-UV-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

### 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

### Optical accessories (ST-100 only)

<b>CONSULT</b>	Reentrant window flange assembly
<b>CONSULT</b>	Bottom window

## 3. Select pump (optional)

Each cryostat requires 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 setup configurations

### Cryogen-free operation

<b>RGC4-10</b>	Recirculating cooler with base temperature <4.3 K
<b>RGC4-15</b>	Recirculating cooler with base temperature <3.5 K
<b>RGC4-20</b>	Recirculating cooler with base temperature <3.3 K

### 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
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## 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>DT-670-CU-HT-1.4H</b>	Silicon diode, calibrated
<b>CONSULT</b>	Thermocouple (ST-100-H only)
<b>CF-100</b>	LHe storage Dewar
<b>LN-50</b>	LN <sub>2</sub> storage Dewar configured for use with SuperTran cryostats

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