Lake Shore CRYOTRONICS

environment by JANIS

ST-300

SuperTran Cryostats

ST-300 Series continuous-flow cryostats 2 K to 420 K

ST-300 Series cryostats are continuous flow cryostats with the sample located in vacuum, optimized for use in narrow-gap electromagnets and optical configurations with limited available space. They operate with either liquid helium for operation to 2 K or liquid nitrogen for operation to 77 K and withstand high temperatures up to 420 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-300 Series cryostats can be combined with Infinite Helium 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. The compact ST-300-C is our narrowest window block for use with a microscope.

Key features

- 2 K to 420 K
- Fast cooldown — 15 min to 5 K
- Sample in vacuum

Featured components

- High-efficiency, flexible LHe/LN_2 transfer line
- Integrated control heater and calibrated control sensor
- Polished aluminum thermal radiation shield

ST-300 Series variants

- **ST-300**
- **ST-300-C** an ultra-compact ST-300 with adjustable sample holder position to allow varying sample thicknesses

Specifications

	ST-300	ST-300-C
Initial cooldown time (LHe to 5 K)	15 min	
Temperature range	~2 K to 420 K	
Typical temperature stability[1]	±50 mK	
Orientation[2]	Any	
Cryogen consumption (LHe room to base temp)	0.4 L	
Cryogen consumption (LHe at 5 K)	0.6 L/h	
Cryogen consumption (LN_2 at 80 K)	0.1 L/h	
Initial vacuum level requirement[3]	~10^{-3} Torr	
Typical base pressure during operation	~10^{-5} Torr	

Size

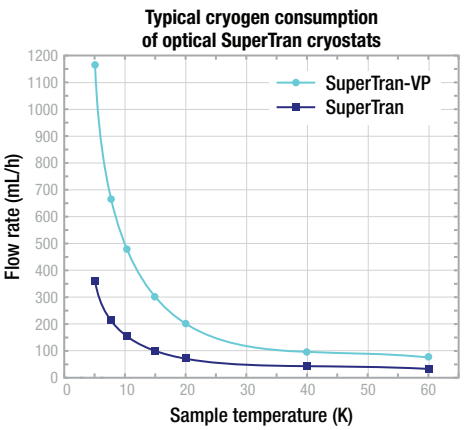
Height	583 mm (23 in)	
Inner space (at sample region)	29 mm (1.13 in) diameter	28.6 mm × 12.7 mm (1.125 in × 0.5 in)
Sample mount diameter	22.4 mm (0.88 in)	31.8 mm (1.25 in)
Window block	44.5 mm (1.75 in) square[4]	31.8 mm × 15.9 mm (1.25 in × 0.625 in) rectangular
Weight (excluding transfer line)	4.6 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)	2057.4 × 660.4 × 127 mm (81 × 26 × 5 in)	

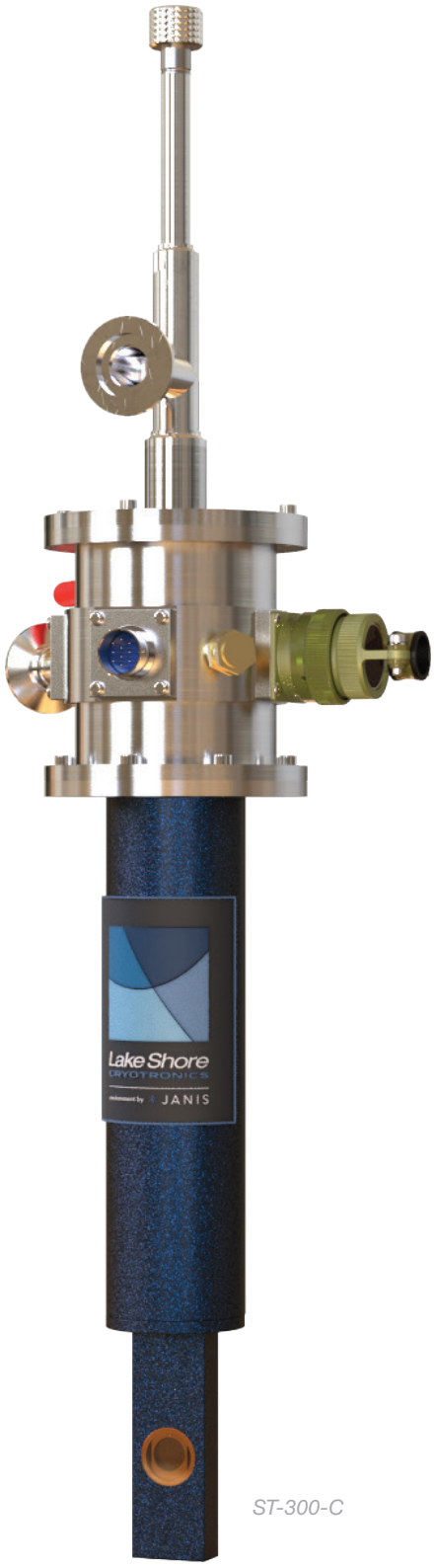
[1] Measured with temperature controller

[2] Cryogen consumption may be higher during non-vertical operation

[3] Pressure measured at room temperature prior to adding cryogen

[4] Window block size may vary with window choice; contact us for details





ST-300-C

Complete your setup

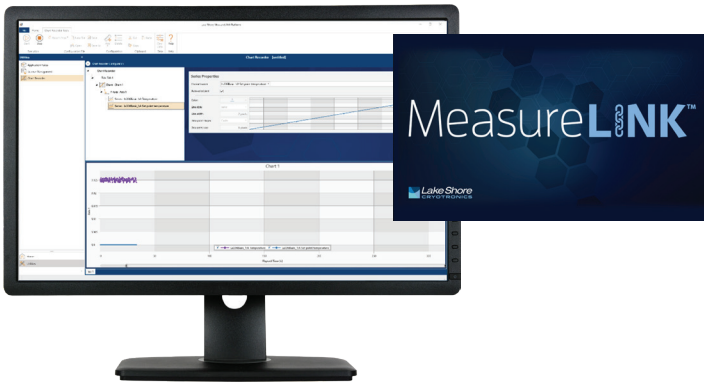
Temperature control

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 Infinite Helium 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

ST-300	Optical, 2 K to 420 K, calibrated temperature sensor
ST-300-C	Compact optical, 2 K to 420 K, calibrated temperature sensor
CUSTOM	Custom configurations are available to fit your experiment needs—contact Sales for details

2. Select cryostat configurations

Sample holders (ST-300 only)

SH-OPTICAL-0.88-STD	Optical
SH-BLANK-0.88-STD	Blank
SH-RESISTIVITY-0.88-STD	Resistivity
CONSULT	DIP

Window material choice (ST-300 with o-ring sealed windows only)

The ST-300 can either have epoxy-sealed, fused silica windows or o-ring sealed windows with your choice of window material. The ST-300-C has epoxy-sealed, fused silica windows. See our cryostat window selection guide for additional information. Contact us for custom window options.

WR-CM-UV-FS	UV-grade fused silica
WR-CM-SAPH	Sapphire
WR-CM-ZNSE	ZnSe
WR-CM-CAF2	CaF_2

Mounting flange (ST-300 only)

BASE-ST-VPF-M	Baseplate for ST-100, ST-300, and VPF-100 Series cryostats—metric threads
BASE-ST-VPF	Baseplate for ST-100, ST-300, and VPF-100 Series cryostats—imperial threads

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.

10RVP	General-purpose mechanical pumping station
10DDP	General-purpose mechanical pumping station with LN_2 cold trap and isolation valve
TS-85-D	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

INFHE-20	Infinite Helium recirculating cooler with base temperature down to <3.3 K
INFHE-15	Infinite Helium recirculating cooler with base temperature down to <3.5 K
RGC4-10	RGC Series recirculating cooler with base temperature down to <4.3 K

Measurement instrumentation

Cryostats come standard with one temperature controller.

336	Model 336 temperature controller
335	Model 335 temperature controller
335-3060	Model 335 temperature controller with installed 3060 thermocouple option card
325	Model 325 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

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 one installed temperature sensor. Other sensors are available—contact us.

CX-1050-CU-HT-1.4M	Cernox® magnetic field independent, calibrated
CF-100	LHe storage Dewar
LN-50	LN_2 storage Dewar configured for use with SuperTran cryostats

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