environment by JANIS

Lake Shore CRYOTRONICS
a DwyerOmega brand

*FTIR Cryostats*



*ST-FTIR-VAC*

# **FTIR** helium-cooled cryostats <2 K to 500 K

STVP-FTIR, ST-FTIR, ST-FTIR-VAC, and VPF-FTIR cryostats are optimized for use with commercial FTIR spectrometers. An integrated translation stage is used to move a reference or sample into alignment with the IR beam. Sample holders have three positions and integrated rotation provides additional sample-to-beam alignment. Mounting flanges are available for securing to a wide range of FTIR sample compartments, including purged and evacuated configurations. Access to the sample space is provided by a quick disconnect clamp. The four-way optical sample chamber can be configured for reflectance or transmission measurements. Optional window materials can be installed to span the far/mid-IR, VUV, and x-ray regions for a variety of spectroscopic measurements. A compact vacuum shroud is available for use with the reflectance accessory of most commercial FTIR spectrometers. For the STVP and ST models, temperatures below 4.2 K are achieved by reducing the venting helium gas pressure using a vacuum pump.

STVP-FTIR and ST-FTIR/-VAC cryostats can be combined with Infinite Helium for cryogen-free operation, enabling unattended cryostat operation — ideal for extended duration measurements.

## Key features

- Integrated sample translator
- Linear manipulator with 51 mm (2 in) travel
- Multiple-position sample holder

## Featured components

- Copper sample mount with removable multi-position optical sample holder
- Integrated linear sample translator to shift between a reference position and multiple samples
- Compact optical vacuum shroud with four o-ring sealed window ports — enables compatibility with FTIR reflectance accessories and increased numerical aperture (ST and VPF only)
- Mounting flanges to integrate with many commercial spectrometers
- Polished aluminum thermal radiation shield (ST and STVP only)
- High-efficiency, flexible LHe/$LN_2$ transfer line (ST and STVP only)

## FTIR models

- **STVP-FTIR** maximum temperature = 325 K
- **VPF-FTIR** maximum temperature = 500 K
- **ST-FTIR** maximum temperature = 500 K; tapped mounting holes
- **ST-FTIR-VAC** maximum temperature = 500 K; mounting flange and sample compartment cover for a vacuum bench spectrometer

# Specifications

| | STVP-FTIR | ST-FTIR/-VAC | VPF-FTIR |
|---|---|---|---|
| **Temperature range[1]** | <2 K to 325 K | <2.5 K to 500 K | 65 K to 500 K[2] |
| **Typical temperature stability[3]** | | ±50 mK | |
| **Cooldown time** | 15 min | 15 min (Lhe to 5 K) | 15 min (to 77 K) |
| **Cryogen consumption (LHe room to base temp)** | 0.5 L | 0.4 L | — |
| **Cryogen consumption (LHe at 5 K)** | 1.3 L/h | 0.6 L/h | — |
| **Cryogen consumption ($LN_2$ at 80 K)** | | 0.1 L/h | — |
| **$LN_2$ hold time (77 K)** | — | | 8 h |
| **$LN_2$ hold time (100 K)** | — | | 4.5 h |
| **$LN_2$ hold time (200 K)** | — | | 2.5 h |
| **Initial vacuum level requirement[3]** | | ~$10^{-3}$ Torr | |
| **Typical base pressure during operation** | | ~$10^{-5}$ Torr | |
| **Height (approximate)** | 762 mm (30 in) | 635 mm (25 in) | 876 mm (34.5 in) |
| **Inner space (at sample region)** | 38.1 mm (1.5 in) | 44.5 mm (1.75 in) | 63.5 mm (2.5 in) |
| **Sample mount diameter** | 31 mm (1.25 in) | 25 mm (1 in) | 31.75 mm (1.25 in) |
| **Window block** | 108 mm (4.25 in) | 58 mm (2.28 in) | 58 mm (2.28 in) |
| **Weight (excluding transfer line, approximate)** | 7 kg (15.4 lb) | 10 kg (23 lb) | 3.3 kg (7 lb) |
| **Shipping weight (approximate)** | 61 kg (135 lb) cryostat and line | 22.1 kg (49 lb) cryostat and line | 9.1 kg (20 lb) |
| **Shipping dimensions (approximate)** | 1905 × 990.6 × 431.8 mm (75 × 39 × 17 in) cryostat and line | 762 × 508 × 508 mm (30 × 20 × 20 in) cryostat and 2057 × 660 × 127 mm (81 × 26 × 5 in) line | 610 × 406 × 305 mm (24 × 16 × 12 in) |

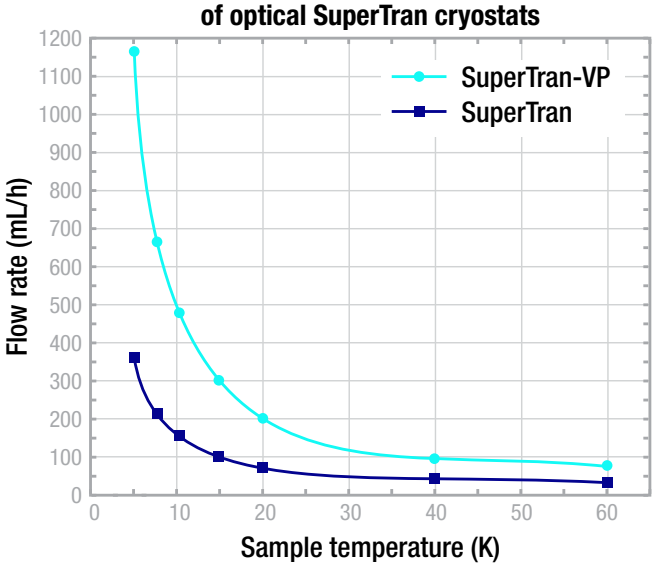
*[1] Custom models that go up to 800 K are available, consult us*

*[2] Operation below 77 K requires pumping manifold*

*[3] Measured with temperature controller*

*[4] Pressure measured at room temperature, prior to adding cryogens*

**Typical cryogen consumption of optical SuperTran cryostats**



# Complete your setup

## Temperature control

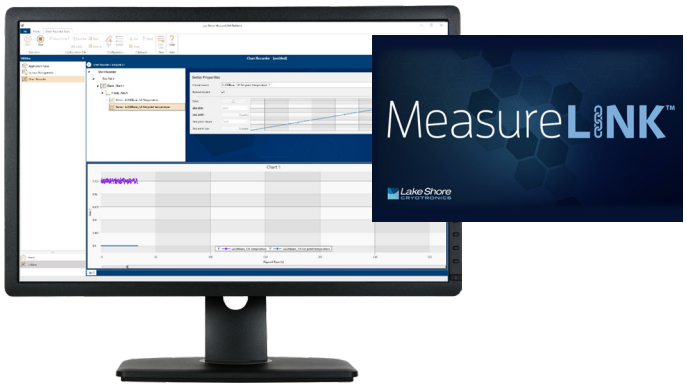
*Included*




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.

## Cryogen-free operation

*Optional add-on (ST-FTIR/-VAC and STVP-FTIR only)*




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

| | |
|---|---|
| **STVP-FTIR** | Optical, <2.5 K to 500 K, calibrated temperature sensor |
| **VPF-FTIR** | Optical, 65 K to 500 K, calibrated temperature sensor |
| **ST-FTIR** | Optical, <2 K to 325 K, calibrated temperature sensor; includes tapped holes for baseplate mounting |
| **ST-FTIR-VAC** | Optical, <2 K to 325 K, calibrated temperature sensor; includes mounting flange and sample compartment cover for a vacuum bench spectrometer |
| **CUSTOM** | Custom configurations are available to fit your experiment needs—contact Sales for details |

## 2. Select cryostat configurations

**Spectrometer**
Let your salesperson know your spectrometer model so we can include the correct cryostat interface.

**Sample holders**
FTIR cryostats come standard with a three-position optical sample holder. Consult us for other options.

**Windows**
Windows are available in multiple thicknesses and materials. See our cryostat window selection guide and contact sales for additional information.

## 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 (ST-FTIR and STVP-FTIR only)**

| | |
|---|---|
| **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.

## 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

ST-FTIR and VPF-FTIR cryostats come standard with one installed temperature sensor. STVP-FTIR comes standard with two installed sensors. Other sensors are available—contact us.

| | |
|---|---|
| **CX-1050-CU-HT-1.4M** | Cernox® magnetic field independent, calibrated |
| **CONSULT** | Thermocouple (ST-100-H only) |
| **CF-100** | LHe storage Dewar |
| **LN-50** | $LN_2$ storage Dewar configured for use with SuperTran cryostats |

*Copyright © Lake Shore Cryotronics, LLC All rights reserved. Specifications are subject to change.*

*102126 12:35*