



Section 6. Low Temperature Manipulators

6.1 Multi-axis Helium-Free Manipulator

6.2 Multi-axis Low Helium Consumption Manipulator

Multi-axis Helium-Free Manipulator



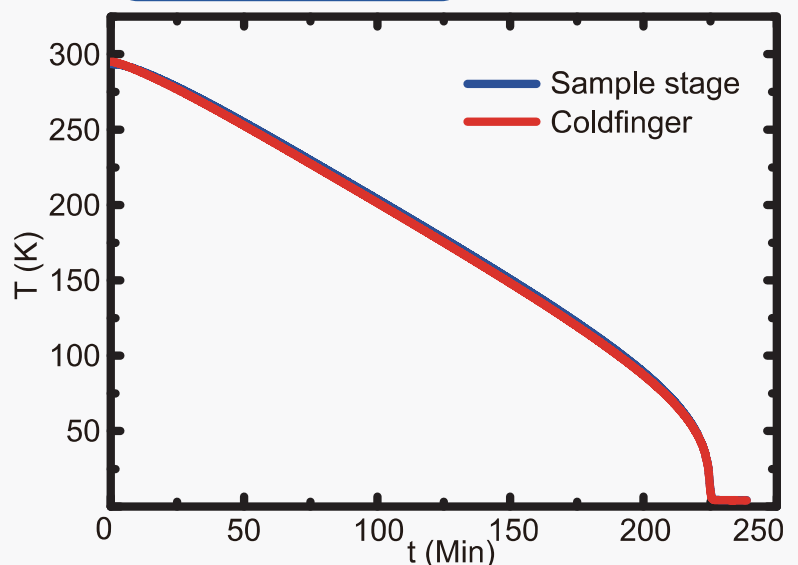
Highlights

- **Liquid Helium Free**
Low cost of ownership
- **Lowest Temperature < 6K**
Temperature range: <6K - 325K
- **Fast Cooling Rate**
RT to 6K, < 4 hours
- **Non-magnetic Materials**
Ti alloy, BeCu, OFHC-Cu
- **Fully Customized**

Mechanical Specifications

Polar rotation	$\pm 180^\circ$
Tilt rotation	$60^\circ (-15^\circ, +45^\circ)$
Azimuthal rotation	$180^\circ (-90^\circ, +90^\circ)$
X/Y movements	25mm (max 50mm)
Z movement	Up to 650mm I.D. ≥ 90 mm

Cooling Curves



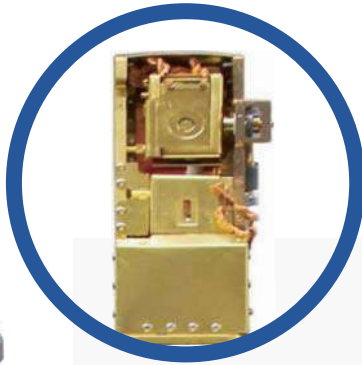
Options

- **Double Sample Stages**
Extra stage directly attached to cryostat, with lowest temperature ~ 4 K.
- **Motorization**
All axes could be motorized
- **Sample Current**
Floating Sample Stage
- **Ultra Low Vibration**
 $\sim 1\mu\text{m}$

Multi-axis Low Helium Consumption Manipulator



<3K

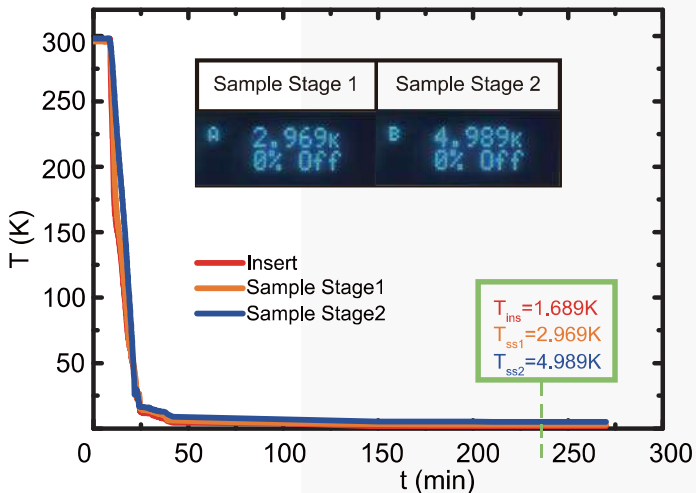


Highlights

- **Vibration Free Cryostat**
Cooled by liquid helium
- **Multiple Axis**
Up to 6
- **Lowest Temperature ~3K**
Working temperature: 3K- 400K
- **Fast Cooling Rate**
RT to 10K, < 15 min
- **Liquid Nitrogen Compatible**
< 65 K Operation
- **Fully Customized On Request**
- **Cryostat Maintenance Free**

Options

- **Micron Space Resolution Manipulator Option**
The space resolution is within 1 μ m
- **Additional Sample Stage**
Directly attach to cryostat
- **Motorization**
All axes could be motorized
- **Sample Current Measurement**
Dark current < 5E -14 A within full temperature range



Standard Technical Data

Polar rotation	$\pm 180^\circ$
Tilt rotation	$60^\circ (-15^\circ, +45^\circ)$
Azimuthal rotation	$180^\circ (-90^\circ, +90^\circ)$
X and Y movements	25mm (max 50mm)
Z movements	Up to 650mm, I.D. ≥ 90 mm