Cryo Manipulators
A complete range for ARPES

A complete range of cryo manipulators is available for the ARPES Lab. These state-of-the-art cryo manipulators come in 4-, 5- and 6-axes and both open and closed cycle versions, with lowest possible sample temperatures, proven ARPES performance and attractive pricing.

The Extreme 5-axes Closed Cycle Cryo Manipulator achieves guaranteed temperatures lower than 5K, including counter-heating capability. This base temperature yields minimal thermal broadening of 1.5 meV, complementing the high energy resolution of the DA30-L analyzer series.

In combination with the ultra-narrow bandwidths of the VUV5k and VUV Laser sources offered by Scienta Omicron, new levels of energy resolution are now accessible to ARPES-Lab users.

All axes are motorized and software integrated, providing precise sample scans and accurate movement between measurement positions (ARPES, LEED, etc.). All Scienta Omicron ARPES-Lab systems include security interlocks that prevent clashes, ensuring a user friendly environment.

These cryo manipulators are also available as components through your local Scienta Omicron sales representative.

Cryo Manipulators advantages:

- Closed cycle temperatures from 4K
- 4-, 5- and 6-axes manipulators available
- All axes motorized and integrated in system measurement control software for high resolution translation and rotation
- System integrated functionality such as bake-out cycle and clash protection

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The manipulator rotations are used to align the Brillouin zone points of interest to the analyzer in order to maximize the efficiency of the measurement. Once in position, the DA30-L deflection mode executes the ARPES measurement without further movement of the sample. This ensures reliable measurement position on a fixed sample point. For samples with large BZ the data acquisition can be combined with a manipulator scan.

**Technical Data**

**Selected Specifications:**
- Temperature range
  - Closed cycle: 4-325 K
  - Open cycle: 3.5-400 K
- Fast cooling rate:
  - Closed cycle: RT to 6 K 4-5 hours
  - Open cycle: RT to 10 K <15 min (2-3 hours to ultimate T)
- Vibration level:
  - Closed cycle: <20 µm
  - Open cycle: no source for vibration
- Built in Gold reference sample (evaporator needed)
- Counter heating in all versions for temperature dependent studies
- Strictly non-magnetic materials used, optimized for ARPES

**Rotations:**
- Polar rotation +/- 180 degrees
- 2nd rotation axes: Azimuth maximum +/- 120 degrees (maximum +/- 180 degrees with decreased lifetime)
- 3rd rotation axes: Tilt -15 (face up) to +45 degrees (face down)

**Option highlights:**
- Inside cryoshield (typ. 1 K effect on base temperature of primary stage):
  - Second 4K sample receiving station instead of Au reference position
  - Sample isolation/bias
  - 4 electrical contacts on primary sample stage
- Outside, below cryoshield (no effect on base temperature):
  - Heating stage, e-beam, up to 1000 K
  - YAG crystal for photon alignment
  - 2-slot sample parking station
  - Sample cleaving station
  - Angular test device

**Upgrade possibilities:** 4-axes manipulators can be upgraded to a higher specification version, both in temperature and number of rotations within the open and closed cycle families. It is for example possible to start with an Advanced closed cycle 4-axes manipulator and later upgrade to extreme closed cycle 5.5-axes.

5.5-axes denotes a 6-axes manipulator with motorized motion except the azimuth which is manually actuated by wobble stick.

**How to contact us:**
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**Specifications and descriptions contained in this brochure are subject to change without notice.**

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