



## MODEL 1062 TrionMill

A fully automated tabletop argon ion mill that features highly flexible milling parameter adjustment. The instrument offers large-scale milling of planar and cross-section samples. Samples of up to 50 mm diameter are effectively processed with three ion sources, which creates the largest and most uniform flat area achievable by ion milling. Allows the direct transfer of environmentally sensitive materials to a scanning electron microscope (SEM) or focused ion beam system (FIB).

### Model 1062 TrionMill specifications

#### Ion sources

- Three TrueFocus ion sources
- Variable energy (100 eV to 10.0 keV) operation
- Beam current density up to 10 mA/cm<sup>2</sup>
- Milling angle range of 0 to +10°
- Choice of single, double, or triple ion source operation
- Motorized ion source angle adjustment
- Independent ion source energy control
- Adjustable spot size (300 μm to 5 mm)
- Faraday cups for the direct measurement of beam current from each ion source; allows optimization and adjustment of the ion source parameters for specific applications
- Beam alignment camera
- Milling rates in excess of 500 μm/hour
- Low ion source maintenance

#### Load lock

- Front-loading load lock for high sample throughput
- Pneumatic vacuum gate valve
- Bayonet sample holder capture with quick release functionality

#### User interface

- Instrument operation controlled via 254 mm [10 in.], ergonomically adjustable touch screen

#### Automatic termination

- Automatic termination by time or temperature

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<b>Sample stage</b>	<p>Offers both planar and cross-section milling capabilities:</p> <ul style="list-style-type: none"><li>• <b>Planar</b> Up to 50 mm diameter x 25 mm height [1.968 x 0.787 in.]</li><li>• <b>Cross section</b> Maximum: 10 x 10 x 4 mm [0.39 x 0.39 x 0.157 in.]</li></ul> <p>Automatic height detection establishes the milling plane, which yields repeatable results</p> <p>360° sample rotation or rocking motion with variable speed</p>
<b>Sample cooling (optional)</b>	<p>Liquid nitrogen conductive cooling with integral dewar</p> <p>Dewar access positioned close to instrument operator</p> <p>Offers cryo protection capability, which automatically stops milling operations if the stage temperature rises above a user-selected temperature threshold</p>
<b>Cross-section station (optional)</b>	<p>Produces pristine cross-section samples</p> <p>Samples are secured to the mask by an adhesive</p> <p>Allows precise positioning of the area of interest – X, Y, and <math>\theta</math></p> <p>Effective for use with a wide variety of materials, including semiconductor devices, multilayers, ceramics, and hard/brittle materials</p> <p>Prepared region of interest is flat and free from damage for subsequent SEM imaging and analysis</p> <p>Accommodates a wide range of sample and mask sizes:</p> <ul style="list-style-type: none"><li>• Sample and mask align both laterally and angularly</li><li>• Multiple uses from a single mask</li></ul>
<b>Clamping cross-section station (optional)</b>	<p>Produces pristine cross-section samples</p> <p>Ideal for samples that can be damaged by exposure to adhesives; samples are secured via a clamping mask, without adhesives</p> <p>Allows precise positioning of the area of interest – X, Y, and <math>\theta</math></p> <p>Effective for use with a wide variety of materials, including semiconductor devices, multilayers, ceramics, and hard/brittle materials</p> <p>Prepared region of interest is flat and free from damage for subsequent SEM imaging and analysis</p> <p>Accommodates a wide range of sample and mask sizes:</p> <ul style="list-style-type: none"><li>• Sample and mask align both laterally and angularly</li><li>• Multiple uses from a single mask</li></ul>

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<b>Transfer device</b> (optional)	<p>Active Cooled Transfer (ACT) device allows direct transfer of a sample at vacuum, in inert gas, or at a cryogenic temperature to a SEM or FIB; transfer device without cryogenic cooling is also available</p> <p>A collaboration with Quorum Technologies Ltd.</p>
<b>Sample viewing</b> (optional)	<p>Sample can be monitored in situ in the milling position when using the high-magnification microscope</p> <p>Microscope options:</p> <ul style="list-style-type: none"><li>• 525X high-magnification microscope</li><li>• 1,960X high-magnification microscope</li></ul> <p>Viewing window is protected by a programmable shutter that prevents buildup of sputtered material and preserves the ability to observe the sample in situ</p>
<b>Sample image acquisition</b> (optional)	<p>CMOS (complementary metal oxide semiconductor) camera for image acquisition and display</p> <p>Useful for monitoring the delayering process</p> <p>Image acquisition system includes:</p> <ul style="list-style-type: none"><li>• CMOS camera</li><li>• Secondary monitor</li><li>• Imaging computer</li><li>• Keyboard</li><li>• Mouse</li></ul> <p>Images can be saved to the imaging computer or transferred to another computer</p>
<b>Stack light indicator</b> (optional)	<p>Allows the determination of milling operation status from a distance</p>
<b>Sample illumination</b>	<p>Both high-magnification microscopes have light sources that provide top-down, user adjustable, reflected sample illumination</p>
<b>Process gas</b>	<p>Argon <math>\geq 99.9999\%</math> purity (ultra high, Grade 5.0)</p> <p>Automatic gas control using three mass flow controllers</p>
<b>Control gas</b>	<p>Nitrogen <math>\geq 99.99\%</math> purity (high, Grade 4.0) or clean, dry air (CDA)</p>
<b>Vacuum system</b>	<p>Turbomolecular drag pump and an oil-free, multi-stage diaphragm pump</p> <p>Vacuum sensing with a cold cathode, full-range gauge</p>

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<b>Enclosure</b>	Width: 75.46 cm [29.71 in.] Height: <ul style="list-style-type: none"><li>• Touch screen: 66.13 cm [26.04 in.]</li><li>• High-magnification microscope: 85.27 cm [33.57 in.]</li></ul> Depth: 85.91 cm [33.82 in.] Enclosure design offers easy access to internal components
<b>Weight</b>	99.8 kg [220 lb.]
<b>Power</b>	100/120 or 220/240 VAC; 50/60 Hz; 1000 W
<b>Warranty</b>	One year
<b>Service contracts</b>	Contact <a href="mailto:sales@fischione.com">sales@fischione.com</a> for pricing



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The Model 1062 TrionMill is the subject of United States Patent  
No. 9,214,313.  
Document Number SP1062 Revision 09/07/2024