

Optical Orientation Instrument



The Model 210 Optical Orientation Instrument

The Model 210 Optical Orientation Instrument is used to determine the orientation of a crystal or to align a crystal so that specifically oriented surfaces can be cut or polished. The Model 210 uses a laser beam that is reflected off a cleaved or preferentially etched crystal surface back onto a target that is perpendicular to the laser beam. Optical orientation is an orientation technique that can be used as an alternative to more hazardous and expensive x-ray techniques.

Operation

The mount that holds the laser on the track has both horizontal and vertical adjustments that are used to position the laser beam parallel to the optical track and perpendicular to the goniometer face with all settings at zero. The distance from the top of the optical track to the laser beam is 3.625". This distance can be increased to 4" with a standard adapter added to the laser mount. The reflected laser beam from the crystal surface, with a known orientation, is adjusted by changing the elements of the goniometer until the beam reflects back onto itself.

Goniometers

Any goniometer that will fit on a 1.99" or 2.19" wide track and has a height of 3.625" or 4" from the track to the center of the mounted crystal can be used on the Model 210 Optical Orientation Instrument. South Bay Technology currently makes 4 suitable goniometers:

- Model 250 2-Axis Goniometer
- Model 260 3-Axis Goniometer
- Model 65005 2-Axis Goniometer
- Model 66005 2-Axis Goniometer

In addition to these goniometers, the Model 170 Multi-Axis Lapping Fixture can also be mounted on the track.

Accuracy

Optical orientation can be very accurate. Accuracy depends on getting a good reflection of the laser beam. With a good reflective oriented surface and a distance of 50cm between the target and the face of the crystal, a displacement of 1 beam diameter (0.7mm) on the target is equal to 0.08° on the goniometer. Resolution of less than 1/4 beam diameter is easily obtained which translates to less than 0.02° on the goniometer.

Specifications

Dimensions (without laser):	40" W x 2" H x 3" D
Net Weight (without laser):	20 Lbs.
Electrical input:	Refer to laser manufacturer's specifications

Laser Specifications

Dimensions:	3.82" W x 2.95" H x 16.65" L
Power:	0.5 mW
Beam Diameter:	.59mm
Input Voltage:	115/230 VAC

