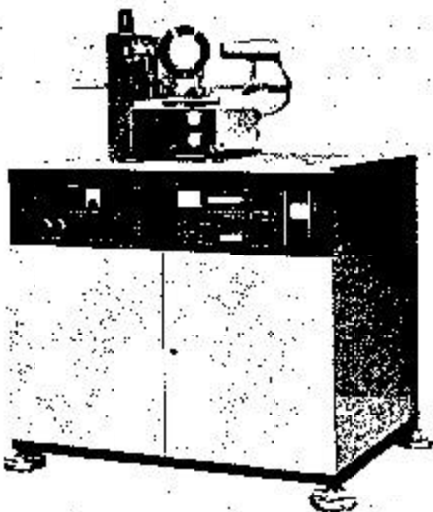

Product Information

AUTOMATIC PIEZO GONIOMETER SYSTEM FOR Si WAFERS



The progress of IC industry in recent years is noteworthy in both quality and quantity. The production of silicon single crystals which serve as the materials is increasing accordingly with a trend toward larger diameters. Against this background there is a growing demand for automated, rapid quality control in the production process with, of course, a higher degree of accuracy.

The automatic piezo goniometer system for silicon wafers described here is designed to allow four simple measurement of the orientation of such wafers by the operator in the field of manufacture without particular expert knowledge of X-rays. To operate this system one has only to install a 2 to 6" dia. silicon wafer to a vacuum type sample holder and to press the

measurement start button. The measurement will be performed automatically.

The measuring procedure is such that step scanning is first made on the sample axis (ω -axis) covering the prescribed angular range, thereby the peak position is read and stored. The sample is then rotated in the plane by 180° and the peak position is measured similarly. From the difference in position between these two peaks a deviation δ_1 of the cut plane in this direction with respect to the crystal lattice plane is calculated. After that, the sample is rotated once again in the plane by 90° and the resulting deviation in this direction δ_2 is calculated in the same way as before. From these deviations δ_1 , δ_2 in the two orthogonal directions it is possible to learn the direction and magnitude of a deviation of the cut plane from the crystal plane. The measurable reflection planes of silicon are (111), (220), (400), (422), and (511).

The total measurement accuracy of this system is within 0.01° . The goniometer is driven by a step-ping motor and is controllable down to 0.001° . A suction pump is adopted for the installation of the sample (wafer), and an optional size of sample 2" to 6" diameter may be installed. Safety measures are complete with an electromagnetic shutter, a radiation enclosure, etc.

In addition to the above model an opposed dual station type automatic piezo goniometer system is also available.