

Automatic Prism/Polygon measurement

Automatic Prism/Polygon measurement system

High stability angle measurement and testing of optical prisms, polygons, wedges and angle gauges.

Introduction

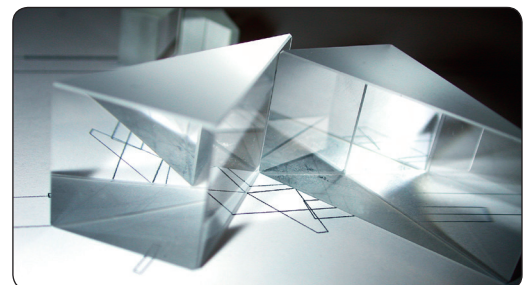
In order to be used successfully in most applications, prisms must be manufactured with very strict tolerances and accuracies. Most high precision prisms tend to be made in small batches, each batch varying in shape, size, and number of surfaces.

The Taylor Hobson automatic prism/polygon measurement system offers high stability angle measurement and testing of optical prisms, polygons, wedges and angle gauges. The reliability and accuracy of this measurement system is down to three key components:

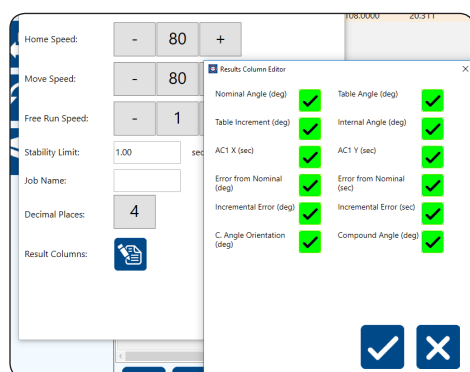
1. The Taylor Hobson digital Ultra Autocollimator is respected throughout industry for its high accuracy and stability, using the latest digital technology to produce a 2 axis, high accuracy (0.2 sec) stable instrument over a wide range (1800 seconds).
2. The Aerotech rotary stage gives precision positioning and movement to less than 1 second
3. Dedicated software allows programmes to be written, saved and recalled using a simple, step-by-step process and the results produced in a detailed report format, giving all angular X and Y results, ready for visual analysis or export in .csv format for further calculations.

The accuracy of the setup is further improved by using an error separation technique on the table.

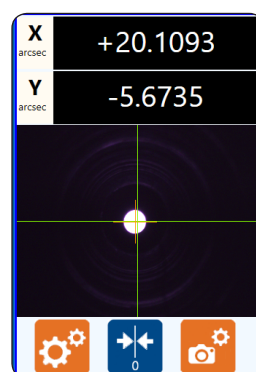
- Automatic polygon measurement to better than 1 second
- Accuracy Y axis pyramidal ± 1 sec
- Accuracy X axis face with error separation better than ± 0.5 sec



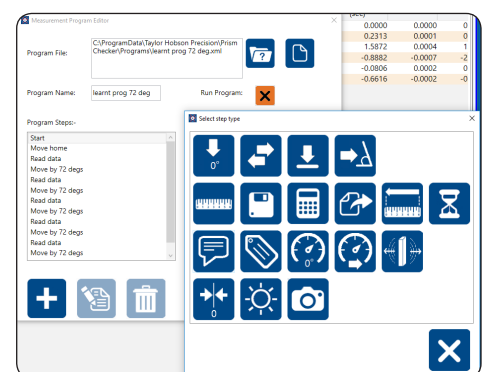
The Taylor Hobson prism checker measures a range of optical prisms, polygons, wedges and angle gauges from as little as 2 mm² in size



Results set up screen



Ultra autocollimator screen



Clear, icon driven programming software

Checking a polygon

Polygons used for checking indexing tables and heads are typically 8, 9 or 12 sided although they can be supplied with as many as 72 faces. Since polygons are not perfectly regular a calibration chart is supplied to detail the deviations.

The Taylor Hobson system offers automatic polygon measurement.

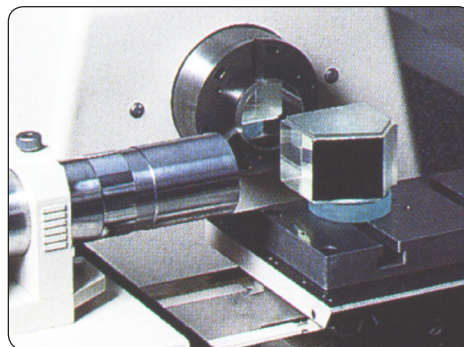
The first polygon face (zero face) is aligned to the autocollimator and set to zero along with the rotary table. The table is then rotated until its readout matches the nominal angle of the polygon (30° increments for a 12 sided polygon). Each face should align with the autocollimator and if perfect the autocollimator reading should read zero.



Taylor Hobson's Autocollimator

Our digital autocollimator range is also ideal for setting and checking optical manufacturing machines:

- Squareness of diamond turning machines
- High accuracy straightness of wafer machines
- Indexing heads



This application note demonstrates just one of the applications for the Taylor Hobson electro-optical metrology range.

Contact Spectrum Metrology to discuss your own measurement requirements.



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