

# ULTRA SPHEROTRONIC

Unsurpassed accuracy for  
test plates calibration



The **TRIOPTICS** Spherometers are on use in hundreds of optical companies and laboratories worldwide. Our spherometers have become an industry standard for ultra-accurate radius measurement and calibration of

test plates. The long term accuracy and automated features make our spherometers the preferred instruments for laboratory and production environments.

## ULTRA SPHEROTRONIC

### GENERAL DESCRIPTION

The Ultra-Spherotronic, the latest addition to our line of automatic spherometers, is the response to increased accuracy requirements in measurement of radii of curvature of optical components. The heart of the new spherometer is a special linear encoder featuring the highest measurement accuracy worldwide.

Under constant temperature conditions the absolute measurement error of the linear encoder is less than  $0.05\mu\text{m}$ . The resolution is selectable :  $0.01/0.05/0.1\mu\text{m}$ . The typical high quality mechanical components and the stability of TRIOPTICS spherometers have been further optimized and perfected during the development of the Ultra-Spherotronic.

The probe is a ruby ball centered precisely to the encoder spindle. The use of ruby ball probe excludes the accidental damage of valuable test plates during measurement. The precise centering of the ruby ball is a key factor in obtaining the high repeatability of the Ultra-Spherotronic. When accuracy really counts, there is no replacement for Ultra-Spherotronic: the unsurpassed accuracy of the linear encoder combined with the high quality of the mechanics leads to new levels of accuracy of radius measurement.

Depending on the diameter of the spherometer ring used, a radius measurement accuracy of approx. 0.005% and a repeatability of 0.001% are achievable.

### OPERATION

In order to further increase the operation comfort, the probe travel is motorized. By simply pressing a button, the spindle of the linear encoder can be smoothly moved up and down.

Moreover, the contact force of the probe is always constant, this contributing to superior repeatability of the measurement results. To adapt to different applications, the requested contact force can be selected by simply switching a three-position selector.

The travel of the linear encoder has been increased to 60mm. This enables a significant increase in the range of measurable radii of curvature.

### CALIBRATION

The test plates used for calibration of the instrument are manufactured to high quality standards and certified by national standard organisations.

The long term calibration is directly traceable to international standards (NIST and NPL).

### SPECIFICATION

MEASUREMENT RANGE	ULTRA SPHEROTRONIC	SUPER SPHEROTRONIC HR*
Radius (convex)	+ 3 mm to $\infty$	+ 3 mm to $\infty$
Radius (concave)	- 6 mm to $\infty$	- 6 mm to $\infty$
Travel of linear encoder	$\pm 30$ mm	$\pm 30$ mm
Motorized encoder	yes	yes
Diameter of part under test	6 mm to 500 mm	6 mm to 500 mm
ACCURACY		
Resolution of the linear encoder	0,01/0,05/0,1 $\mu\text{m}$	0,1 $\mu\text{m}$
Absolute accuracy of the linear encoder	$\pm 0,05$ $\mu\text{m}$	$\pm 0,2$ $\mu\text{m}$
Accuracy of measurement of radius of curvature	0,005 %	0,01 %
Repeatability	0,001 %	0,005 %

\* Super-Spherotronic HR is identical with Ultra-Spherotronic except for the accuracy of the linear encoder