

Talyrond 395 Roundness Measurement

SPECIFICATION

Analysis Capability

Standard software	Roundness Squareness Harmonics	Concentricity Coaxiality Slope	Cylindricity Total Run-Out Flatness	Eccentricity Run-Out Parallelism	Vertical Straightness Partial Arc Flatness Partial Arc Roundness Cylindrical mapping	Departure from True Plane (DFTP) Departure from True Circle (DFTC) Radial Straightness (RSU) Multiplane Flatness (RSU)
Optional software	Cylindrical 3D mapping Piston Measurement		Commutator analysis Disk Thickness	Velocity analysis Wall thickness	RTA analysis Groove analysis	

Filters Phase corrected 2CR and Gaussian. Filtering is user selectable from 1-5000upr.

Measuring Capacity

	300mm Column	500mm Column
Maximum Component Diameter		Ø 400mm (15.7in)
Maximum Component Height	300mm (11.82in)	500mm (19.7in)
Maximum Measuring Diameter		Ø 350mm (13.8in)

Instrument Dimensions

	300mm Column	500mm Column
Instrument Width	870mm (34.2in)	870mm (34.2in)
Instrument Depth	705mm (27.75in)	705mm (27.75in)
Instrument Height	1460mm (57.5in)	1660mm (65.4in)
Height of worktable	890mm (35in)	890mm (35in)
Instrument workstation dimensions	900mm x 850mm x 750mm (35.4in x 33.5in x 29.5in)	
Recommended Installation floor area	1000mm x 800mm + Workstation (39.37in x 31.49in + Workstation)	
Nominal Instrument Weight	276kg (610lb)	282kg (620lb)

Column axis

	300mm Column	500mm Column
Column construction		Precision machined cast iron datum
Column length	300mm (11.8in)	500mm (19.7in)
Straightness over column length	0.2µm / 300mm (7.9µin / 11.8in)	0.2µm / 500mm (7.9µin / 19.7in)
Vertical axis to spindle axis parallelism	0.5µm / 300mm (20µin / 11.8in)	0.75µm / 500mm (29.5µin / 19.7in)
Straightness over any 100mm (3.94in)	0.12µm / 100mm (4.7µin / 3.94in)	0.15µm / 100mm (5.9µin / 3.94in)
Speed of traverse	- Moving - Measuring - Contacting	0.25 - 20mm/s (0.01 - 0.8in/s) stepped 0.25 - 20mm/s (0.01 - 0.8in/s) stepped 0.5 - 5mm/s (0.02 - 0.2in/s) stepped
Positional control		+/- 5µm (200µin)
Indicated Position uncertainty		(0.3µm + 0.003µm/mm)
Positional resolution		0.25µm (9.8µin)
Number of data points (selectable)		200,000 maximum
Position Calibration		Automatic/Manual

Spindle axis

Spindle construction	Ultra precision air bearing
Speed of rotation	0.6, 1, 2, 6, 10rpm, bi-directional
Radial limit of error (height above table)	+/- (0.01µm + 0.0003µm/mm) +/- (0.4µin + 0.012µin/in)
Axial limit of error (radius from center)	+/- (0.02µm + 0.0003µm/mm) +/- (0.8µin + 0.0.12µin/in)
Positional control	+/- 0.2°
Positional resolution	0.02°
Minimum movement	0.1°
Number of data points (selectable)	18,000 maximum

Horizontal arm axis

Arm construction
 Movement range
 Straightness over full length of travel
 Straightness over any length of travel
 Squareness to spindle axis (75mm above table)
 Speed of traverse - moving
 - measuring
 - contacting
 Over-center travel
 Positional control
 Indicated Position uncertainty
 Positional resolution
 Number of data points (selectable)
 Position Calibration

Radial Straightness Unit

Lapped ceramic datum
 200mm (7.9in)
 0.25µm/200mm (10µin/7.9in)
 0.125µm+0.000625µm/mm (5µin+0.025µin/in)
 1µm/200mm (39.4µin/7.9in)
 0.25 - 15mm/s (0.01 - 0.6in/s) stepped
 0.25 - 15mm/s (0.01 - 0.6in/s) stepped
 0.5 - 5mm/s (0.02 - 0.2in/s) stepped
 25mm (0.98in)
 5µm (200µin)
 (0.3µm + 0.003µm/mm)
 0.25µm (0.98µin)
 200,000 (maximum)
 Automatic/Manual

Center and leveling axis

Construction
 Center and leveling Table Control
 Follow mode center and leveling
 Centering range
 Leveling range
 Height of Neutral plane above worktable
 Achievable accuracy of Auto Leveling
 Worktable diameter

Automatic

Patented 3 point kinematic support
 Automatic with continuous spindle rotation
 Yes
 2.5mm
 +/- 0.5°
 N/A
 < 0.8 arc secs
 300mm (11.8in)

Gauge Attitude/Orientation

Attitude	Horizontal and vertical (fully automated)
	Orientation
Attitude vertical	Internal/external
Attitude horizontal	Up/down
	Extend/retract
	*Rotation in steps of 1°
	*(for measurement of conical/tapered surfaces)

Gauge

Gauge Type	Talymin 5 single bias inductive transducer
Normal Range/ Normal Resolution	+/- 1mm Range, 0.03µm Resolution (0.039in Range, 1.2µin Resolution)
Mid Range/ Medium Resolution	+/- 0.2mm range, 0.006µm resolution (0.0078in range, 0.24µin resolution)
Low Range/ High Resolution	+/- 0.08mm range, 0.0012µm resolution (0.003in range, 0.05µin resolution)
Stylus tip force	0 to 15g adjustable (roundness mode)
Cresting	Dual cresting facility (horizontal and vertical)
AutoCalibration	Yes

Air Supply

Air Pressure	550 to 1030 kPa (5.5 to 10.3 bar) (80 to 150 psi)
Regulator (pre-set)	350 kPa (3.5 bar) (50 psi)
Max. particle size	5 micron (0.0002in)
Moisture content – dew point	-20°C (-4°F)
Flow rate at operating pressure	150litres/minute (minimum) 5.3ft³/minute
Max oil content	25mg/m³ (0.01 grains/ft³)
Solid Particle Content	5mg/m³ (0.002 grains/ft³)

Environment

Operating temperature	10°C to 35°C (50°F to 95°F)
Storage temperature	-10°C to 50°C (14°F to 122°F)
Temperature gradient	< 2°C / hour (< 3.6°F / hour)
Operating humidity	30% to 80% relative humidity non condensing
Storage humidity	10% to 90% relative humidity non condensing
Free air flow rate [steady]	1.0m/sec (39.4in/sec) maximum

Isolation from Floor vibration:

Dynamic anti-vibration mounts giving low frequency isolation beginning at ~2Hz. Transmissibility at 10Hz is typically 0.16 (-16dB)

Electrical (alternating supply, single phase with earth, 3-wire)

Instrument and computer voltage	90V-130V or 200V-260V (switch selectable)
Frequency	47Hz to 63Hz
Supply voltage transients	
- amplitude	Maximum five times RMS operating voltage
Supply voltage transients	
- width	Not less than 2µs and not greater than 20µs
Power consumption	500VA maximum
Safety	EN 61010-1: 2001
EMC	EN 61000-6-1: 2001, EN 61000-6-4: 2001

All accuracies are quoted at 20° C ± 1° C (68° F ± 1.8° F).
 All roundness and flatness results are quoted as the departure from the Least Squares Circle (LSC) at 1 - 15 UPR, Gaussian filter, 6 RPM, clockwise rotation (unless otherwise specified).
 All errors are quoted as maximum permissible errors (MPE).
 All straightness / parallelism results are quoted with an 8mm cut-off, low pass filter, 5mm/s measuring speed, Minimum Zone (MZ) reference.
 Quoted uncertainties are at 95% confidence in accordance with recommendations in the ISO Guide to the Expression of Uncertainty in Measurement (GUM: 1993).
 All measurements are taken using a standard 100mm-length stylus with 2mm-diameter ball tip.

All measurements of roundness and flatness are quoted using the gauge horizontal orientation. All measurements of roundness are relative to the calibrated form of a glass hemisphere. Calibration error of glass hemisphere is ± 5nm.
 The above quoted technical data is for measurements taken with good metrology practice in a draft free, controlled environment isolated from low frequency floor borne vibration (i.e., metrology laboratory or Taylor Hobson supplied environmental enclosure).
 Taylor Hobson pursues a policy of continual improvements due to technical developments. We therefore reserve the right to deviate from catalog specifications.