

Talyrond 385 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	900mm Column
Maximum Component Diameter		∅ 400mm (15.7in) [extendable to 485mm (19.1in)]	
Maximum Component Height	300mm (11.82in)	500mm (19.7in)	900mm (35.4in)
Maximum Measuring Depth *	160mm (6.3in)	160mm (6.3in)	160mm (6.3in)
Maximum Measuring Diameter		∅ 350mm (13.8in) [extendable to 435mm (17.1in)]	
Maximum Component Weight		Auto Center and Level: 75kg (165lb)	
Maximum Worktable Moment Loading	Auto C&L: 1250kg/mm (108lb/in) within a central 80mm (3.15in) equilateral triangle		
Instrument Dimensions	300mm Column	500mm Column	900mm Column
Instrument Width	870mm (34.2in)	870mm (34.2in)	870mm (34.2in)
Instrument Depth	705mm (27.75in)	705mm (27.75in)	705mm (27.75in)
Instrument Height	1460mm (57.5in)	1660mm (65.4in)	2260mm (89in)
Height of worktable	890mm (35in)	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)	299kg (658lb)
Column axis	300mm Column	500mm Column	900mm Column
Column construction		Precision machined cast iron datum	
Column length	300mm (11.8in)	500mm (19.7in)	900mm (35.4in)
Straightness over column length	0.3µm / 300mm (11.8µin / 11.8in)	0.3µm / 500mm (11.8µin / 19.7in)	1.0µm / 900mm (39.4µin / 35.4in)
Vertical axis to spindle axis parallelism	0.5µm / 300mm (20µin / 11.8in)	1µm / 500mm (39.4µin / 19.7in)	2µm / 900mm (78.8µin / 35.4in)
Straightness over any 100mm (3.94in) (5.9µin / 3.94in)	0.15µm / 100mm (5.9µin / 3.94in)	0.15µm / 100mm (11.8µin / 3.94in)	0.3µm / 100mm
Speed of traverse - Moving		0.25 - 20mm/s (0.01 - 0.8in/s) stepped	
- Measuring		0.25 - 20mm/s (0.01 - 0.8in/s) stepped	
- Contacting		0.5 - 5mm/s (0.02 - 0.2in/s) stepped	
Positional control	+/- 5µm (200µin)	+/- 5µm (200µin)	+/- 10µm (400µin)
Indicated Position uncertainty		(0.3µm + 0.03µm/mm)	
Positional resolution		0.25µm (0.98µin)	
Number of data points (selectable)		200,000 maximum	
Spindle axis		Ultra precision air bearing	
Spindle construction		0.6, 1, 2, 6, 10rpm, bi-directional	
Speed of rotation			
Radial limit of error (height above table)		+/- (0.02µm + 0.0003µm/mm) +/- (0.8µin + 0.3µin/in)	
Axial limit of error (radius from center)		+/- (0.02µm + 0.0003µm/mm) +/- (0.8µin + 0.3µin/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	
Minimum movement	
Number of data points (selectable)	

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 + 0.03µm/mm)	
0.25µm (0.98µin)	
0.05mm (0.002in)	
200,000 (maximum)	

Motorized Radial Arm

Extruded aluminum datum	
200mm (7.9in)	
N/A	
N/A	
N/A	
0.25 - 15mm/s (0.01 - 0.6in/s) stepped	
N/A	
0.5 - 5mm/s (0.02 - 0.2in/s) stepped	
25mm (0.98in)	
+/- 5µm (200µin)	
(0.3µm + 0.03µm/mm)	
0.25µm (0.98µin)	
0.05mm (0.002in)	
N/A	

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 Centering	
Achievable accuracy of Auto Leveling	
Worktable diameter	

Automatic

Patented 3 point kinematic support	
Automatic with continuous spindle rotation	
Yes	
+/- 5mm (0.2in)	
+/- 0.5°	
N/A	
< 0.8µm (32µin)	
< 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)
Crutch angle	Adjustable
Cresting	Dual cresting facility (horizontal and vertical)

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
Maximum RMS vertical floor vibration	0.05mm/s (0.002in/s) at < 50Hz 0.10mm/s (0.004in/s) at > 50Hz
Free air flow rate (steady)	1.0m/sec (39.4in/sec) maximum

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	2500VA 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 - 50 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.