Talyrond® 565/585HS

A multi-axis measurement system for single or multi-part measurement

Unparalleled measurement capability
The Talyrond® 565/585HS

The Talyrond® 500 is the number one choice for manufacturers of precision components including bearings, lens moulds, fuel injectors and much more...

The Talyrond® 500 is a world leader in speed, position control and accuracy and has the lowest noise floor of any instrument of its kind. These characteristics combined with the systems unique gauge capability enable measurement of roundness, roughness and contour from a single metrology platform.

With the addition of an automated rotary stage the system can now measure multiple components in a single set up making it truly unrivalled in capability and efficiency.

“Measurement without compromise”

Complete automation of multi-part measurement, provides cost effective, high volume throughput

The optional rotary stage transforms the Talyrond® 500HS into a multi-part measurement system. This portable device simply sits on the spindle table via three point location and plugs into a concealed socket.

Reproducible measurement results

The rotary stage has a unique counterbalanced design ensuring measurement without any loss of accuracy. Simple control is provided via our Ultra software interface, enabling complete automated measurement of up to 20 parts. This makes the Talyrond® 500HS ideal for the measurement of small components in the bearings, optics, medical and automotive industries.

<table>
<thead>
<tr>
<th>4</th>
<th>Gauge</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gauge Range</td>
<td>Up to 4 mm</td>
</tr>
<tr>
<td>Resolution</td>
<td>Down to 0.3 nm</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Roundness</th>
</tr>
</thead>
<tbody>
<tr>
<td>Radial Accuracy</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Roughness</th>
</tr>
</thead>
<tbody>
<tr>
<td>Noise</td>
</tr>
<tr>
<td>Ra values</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Contour</th>
</tr>
</thead>
<tbody>
<tr>
<td>LS Arc measurement</td>
</tr>
<tr>
<td>Pt</td>
</tr>
</tbody>
</table>
The new rotary stage transforms the Talyrond® 500HS into a unique, high accuracy, multi-part measurement system

**Features and benefits**

- The Talyrond® 500HS carries on working after you go home
- Multi-tooling operations and greater flexibility have enabled machining of more complex components while keeping cost to a minimum
- The Talyrond® 500HS combined with the carousel stage has been designed with this in mind, drastically reducing inspection time and minimising operator attendance
- The addition of a calibration artefact onto the carousel removes the need to switch between part and standard further reducing measurement cycle time

**Principle of operation**

- The user simply loads the carousel fixture, in this example there are twenty components
- The pitch circle diameter of each part passes through the spindle axis meaning each part axis will pass through the spindle axis when the carousel is rotated
- The carousel is rotated to the first component and a centre and level process takes place
- The part can then be measured for roundness, surface finish, contour...
- On completion the carousel moves to the next angular position and the process starts again
Unparalleled measurement capability

Five measurements in one

Our world leading Talymin 6 gauge with 4 mm range and any attitude orientation has capability beyond that of normal roundness systems

1. **Roughness**
   High resolution gauge and low axis noise enables linear or circumferential surface roughness measurement.

2. **Roundness**
   Frictionless air bearing spindle and precision column for roundness, cylindricity and straightness measurements.

3. **Contour**
   Our patented calibration technique enables measurement of radius, angle, height, length, distance and more.

4. **Cylindrical mapping**
   Precision control and low noise in all axes allows in depth analysis of cylindrical components including wear scars and material volume.

5. **Cams and pistons**
   A precision encoder and linear scales in all axes enables measurement of non round parts such as cams and pistons.
**Designed to suit your application**

Meeting the ever increasing demands of next generation technologies

Taylor Hobson have had a long association with advanced manufacturing, this association has helped to evolve powerful software solutions to suit your applications

<table>
<thead>
<tr>
<th><strong>Bearings</strong></th>
<th><strong>Tilt and form error to axis</strong></th>
<th><strong>Roundness</strong></th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th><strong>Medical applications</strong></th>
<th><strong>Form &amp; radius analysis</strong></th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th><strong>Fuel injectors</strong></th>
<th><strong>Surface finish</strong></th>
<th><strong>Roundness</strong></th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th><strong>Camera phone lens holders</strong></th>
<th><strong>Parallelism</strong></th>
<th><strong>Roundness</strong></th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th><strong>Lens moulds</strong></th>
<th><strong>Surface finish</strong></th>
<th><strong>Parallelism</strong></th>
<th><strong>Cylindricity</strong></th>
</tr>
</thead>
</table>
Advanced harmonics – identify the cause of bad parts

Ordinary inspection might detect bad components but Talyrond® 500HS can help you fix the production issues that are causing them. Deviation in form on a workpiece can be broken down into irregularities that have both frequency and amplitude. Harmonic analysis identifies these imperfections allowing you to pinpoint and correct their cause, reducing the need for ever tighter tolerances on size.

- Full histogram view with tolerance bands
- Pass/Fail and warning messages
- Ranking system according to wave depth or harmonic amplitude
- Comparison to CSV or GKD files
- Up to 5000 upr
- Wave depth or harmonic amplitude format

New Advanced Harmonic Standard

A precision machined standard with the following undulations in 360 degrees:

<table>
<thead>
<tr>
<th>Harmonic</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>15 upr</td>
<td></td>
</tr>
<tr>
<td>50 upr</td>
<td></td>
</tr>
<tr>
<td>150 upr</td>
<td></td>
</tr>
<tr>
<td>500 upr</td>
<td></td>
</tr>
<tr>
<td>1500 upr</td>
<td></td>
</tr>
</tbody>
</table>

3D cylindrical mapping

For production issues beyond the scope of traditional 2D inspection techniques

With high accuracy and high resolution in all axes, Talyrond® 500HS allows you to measure in 3 dimensions for more thorough examination of flaws, defects and cutting tool geometry effects that influence performance or lead to component malfunction.

- Twist or lead detection
- Machining defects
- Wear scar analysis
- Leak detection and more
Q-Link Production Interface
A simplified interface designed specifically for production environments

Q-Link offers simplicity, versatility and traceability and provides direct communication with SPC software which delivers feedback to your manufacturing process.

<table>
<thead>
<tr>
<th>QDAS accredited</th>
<th>Meets the demands of the Advanced Quality Data Exchange Format</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reporting</td>
<td>Instant screen report summary with pass/fail results</td>
</tr>
<tr>
<td>Implementation</td>
<td>Easy to learn, simple to operate</td>
</tr>
<tr>
<td>Tolerancing</td>
<td>Visually identifies the parameter and its tolerance band</td>
</tr>
<tr>
<td>Protection</td>
<td>Allows different user levels and configurations</td>
</tr>
<tr>
<td>Traceability</td>
<td>Configurable fields; serial number, operator name, machine number etc...</td>
</tr>
<tr>
<td>Statistical studies</td>
<td>Automatic R&amp;R Studies available as standard</td>
</tr>
<tr>
<td>Compatibility</td>
<td>Across the range of roundness and surface finish products</td>
</tr>
</tbody>
</table>

“Widely used in automotive and aerospace component manufacturing where data and strict standard operating procedure control is mandatory.”
Designed for metrology without compromise
The construction of the Talyrond® 500HS is key to measurement integrity

Reproducing the part
Taylor Hobson’s core competencies are in cylindrical grinding, surface grinding and diamond turning. All of these disciplines coupled with knowledge in drive mechanisms go towards constructing an instrument with low noise and high geometric accuracy, ensuring reproducibility of the component.

Frictionless air bearing spindle
The instrument’s spindle axis, like any spindle based machine tool, is paramount in ensuring integrity of measurement. Utilising Taylor Hobson’s own diamond turning lathe we are able to create a reference datum unsurpassed in accuracy and reliability.

Instrument base
Using finite element analysis software, the cast iron base provides a solid foundation for both the high precision air bearing spindle and vertical straightness datum, ensuring movement and weight do not effect results. A choice of passive or active isolation mounts are available, which have been designed for either inspection laboratories or production environments.

Straightness datums
The vertical column is machined for straightness, waviness and roughness to an exacting standard, using traceable standards and techniques developed by Taylor Hobson. The straightness datums are further enhanced to ensure reproducibility of the part with little or no instrument influence.

Industry specific software
Velocity analysis allows bearing manufacturers to evaluate harmonics with respect to amplitude and predict function with respect to speed

Important features of a roundness system

1. Parallelism of column to spindle axis
2. Column and arm straightness
3. Low vertical and radial arm noise
4. Squareness of arm to spindle axis
5. Radial run-out of spindle
6. Low spindle noise
7. Minimised coning error of spindle
8. Accurate glass scales in all axes

“World-beating noise floor”
Traceability
Full traceability to international standards

Roundness
Using a precision polished glass hemisphere calibrated to an uncertainty of less than 5 nm Taylor Hobson can guarantee your spindle is within specification and maintain quality of results.

Arcuate correction (contour option)
Taylor Hobson’s patented calibration routine and calibration ball corrects for the arcuate motion of the stylus allowing dimensional measurement. This routine is critical to measurement of radius and angled parts when normal calibration routines will not suffice.

Axis calibration
Automated or manual routines are supplied allowing the user to set coordinates to the part or instrument axes. The fully automated routine calibrates the arm, column and spindle.

Straightness, squareness and parallelism
To ensure the column and radial straightness unit conform to specification we can provide standards that are either cylindrical or flat. These standards provide certainty of the measurement axes. These artefacts are combined with special software routines to enhance all axes for correct geometrical form.

Traceability
All calibration standards can be provided with traceability to international standards using Taylor Hobson’s own UKAS laboratory.

Automated probe calibration
The Talyrond® 500HS has a unique automated gain calibration for the instrument’s gauge; the routine is automated and takes a matter of seconds to set. Alternatively a set of calibrated slip blocks traceable to primary standards are also supplied.

Surface finish
A unique standard is available that provides measurement traceability for roughness in both a vertical and circumferential direction.
Accessories

All the accessories you need to begin using Taylor Hobson roundness measuring systems are supplied as standard. However, for more demanding requirements or improved measurement throughput, we have a range of accessories which may be ordered separately.

1. **Environmental cabinet and active AV mounts**
   Recommended for use in production or non controlled environments.

2. **Environmental cabinet**
   The environmental cabinet forms part of the instrument structure and protects against airflow, dust and external influence.
   code 112-4276

3. **Active anti-vibration mounts**
   The active AV mounts protect the system from external vibration by use of piezo actuated mounts.
   code 112-4277

4. **Active AV mounts with environmental cabinet**
   Provides isolation from airflow, dust and external vibration
   code 112-4278

5. **Talyrond® ball calibration standard**
   Required for use with contour or form software, this calibration standard corrects for gain, tip and arcuate motion of the stylus.
   Talyrond® ball standard rad 7.5 mm (Not recommended for 4 mm range)
   code 112-4305UC
   Talyrond® ball standard rad 12.5 mm (Not recommended for 4 mm range)
   code 112-4319UC
   Talyrond® ball standard rad 22.5 mm
   code 112-4092UC

6. **High precision test cylinder**
   For verification of the instrument’s vertical straightness accuracy and parallelism of the vertical axis to the spindle axis. UKAS calibration certificate is optional.
   code 112-3670-01 optional

   Precision test cylinder
   For verification of the instrument’s vertical straightness accuracy and parallelism of the vertical axis to the spindle axis. UKAS calibration certificate is optional.
   300 mm (11.8”) cylinder
   Roundness < 0.25 µm (10 µ") Straightness < 0.5 µm (20 µ")*
   code 112-1888 optional
   500 mm (19.7") cylinder
   Roundness < 0.25 µm (10 µ") Straightness < 0.5 µm (20 µ")*
   code 112-1997 optional
   1000 mm (39.4") cylinder
   Roundness < 0.75 µm (30 µ") Straightness < 3 µm (120 µ")*
   code 112-3604 optional

* Straightness over central 90% of test cylinder length

**Calibration standard**
Vertical and circumferential roughness.
code 112-4341

**High precision glass hemisphere**
For checking total system performance; UKAS calibration certificate is optional.
Roundness < 0.02 µm (0.8 µ")
code 112-2324 optional

**Glass hemisphere**
For checking total system performance; UKAS calibration certificate is optional.
Roundness < 0.05 µm (2 µ")
code 112-436 optional

**Flick standard**
For rapid calibration of the gauge head; alternative to the standard gauge calibration set.
20 µm (788 µ") range
code 112-2308 optional
300 µm (0.012") range
code 112-2233 optional

**Customised solutions for special applications**
Our strategy for success is simple, instead of just selling products, we provide solutions. If our standard instruments and accessories do not satisfy your needs, we can customise a solution to exactly match your application.

Specifications are subject to change without notice.
<table>
<thead>
<tr>
<th>Parameters</th>
<th>Type of analysis</th>
<th>Measurement mode</th>
<th>Evaluation diagram</th>
<th>Talyrond® 500HS</th>
<th>Type of analysis</th>
<th>Measurement mode</th>
<th>Evaluation diagram</th>
<th>Talyrond® 500HS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Roundness</td>
<td></td>
<td>![Roundness]</td>
<td>![Roundness Diagram]</td>
<td>![Talyrond® 500HS]</td>
<td>Radial Runout</td>
<td>![Radial Runout Diagram]</td>
<td>![Talyrond® 500HS]</td>
<td></td>
</tr>
<tr>
<td>Parallelism</td>
<td></td>
<td>![Parallelism]</td>
<td>![Parallelism Diagram]</td>
<td>![Talyrond® 500HS]</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cylindricity</td>
<td></td>
<td>![Cylindricity]</td>
<td>![Cylindricity Diagram]</td>
<td>![Talyrond® 500HS]</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Straightness</td>
<td></td>
<td>![Straightness]</td>
<td>![Straightness Diagram]</td>
<td>![Talyrond® 500HS]</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Flatness</td>
<td></td>
<td>![Flatness]</td>
<td>![Flatness Diagram]</td>
<td>![Talyrond® 500HS]</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Coaxiality</td>
<td></td>
<td>![Coaxiality]</td>
<td>![Coaxiality Diagram]</td>
<td>![Talyrond® 500HS]</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Concentricity</td>
<td></td>
<td>![Concentricity]</td>
<td>![Concentricity Diagram]</td>
<td>![Talyrond® 500HS]</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Eccentricity</td>
<td></td>
<td>![Eccentricity]</td>
<td>![Eccentricity Diagram]</td>
<td>![Talyrond® 500HS]</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* = Included  • = Optional  X = Not available
(Customer specific analysis available on request)
The metrology experts

Taylor Hobson is world renowned as a manufacturer of precision measuring instruments used for inspection in research and production facilities. Our equipment performs at nanometric levels of resolution and accuracy.

To complement our precision manufacturing capability we also offer a host of metrology support services to provide our customers with complete solutions to their measuring needs and total confidence in their results.

www.taylor-hobson.com

---

**Centre of Excellence department**

Email: taylor-hobson.cofe@ametek.com
Tel: +44 (0)116 276 3779

- **Inspection services** – measurement of your production parts by skilled technicians using industry leading instruments in accord with ISO standards
- **Metrology training** – practical, hands-on training courses for roundness and surface finish conducted by experienced metrologists
- **Operator training** – on-site instruction will lead to greater proficiency and higher productivity
- **UKAS calibration and testing** – certification for artifacts or instruments in our laboratory or at customer’s site

---

**Service department**

Email: taylor-hobson.service@ametek.com
Tel: +44 (0)116 246 2900

- Preventative maintenance – protect your metrology investment with an Amecare support agreement

---

**Sales department**

Email: taylor-hobson.sales@ametek.com
Tel: +44 (0)116 246 2034

- Design engineering – special purpose, dedicated metrology systems for demanding applications
- Precision manufacturing – contract machining services for high precision applications and industries

---

Copyright © 2016 · Taylor Hobson Talyrond® 565/585 HS_09/2016