

TalyMaster

A brand new inspection concept



TalyMaster: A three-in-one automated inspection system for high volume production



A brand new inspection concept combining roughness, roundness and contour on a fully automated inspection system.

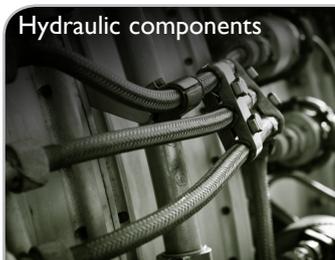
This instrument incorporates complete part manipulation ensuring high throughput and significantly reduced inspection costs compared to traditional inspection methods.

Multi-part measurement

The TalyMaster been developed specifically to cope with the rigorous demands of high volume production, yet still flexible enough to be used in batch inspection and even R&D facilities. Not only is this advanced inspection system capable of measuring multiple parts it can inspect over 50 parts in a single measurement program with no operator intervention. This both speeds up the measurement cycle and frees operators to carry out other tasks.

Multi-featured parts

Multi tooling, automation and greater machine tool flexibility have enabled machining of more complex assemblies while keeping operations to a minimum. The TalyMaster has been designed with this in mind to reduce the number of inspection operations and dramatically reduce attendance times.



Hydraulic components



Bearings



Fuel injectors



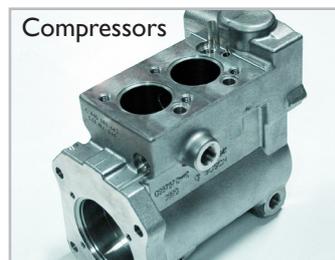
Camera phone lens holders



Hard discs



Fuel pumps



Compressors



Lens molds

Simplified production interface



Advanced multi-part measurement

The TalyMaster enables full inspection of parts of varying type or size in a single operation increasing throughput and removing inspection room bottlenecks. Multiple part types can be loaded onto a single pallet with each individual location having an explicit measurement sequence and analysis.

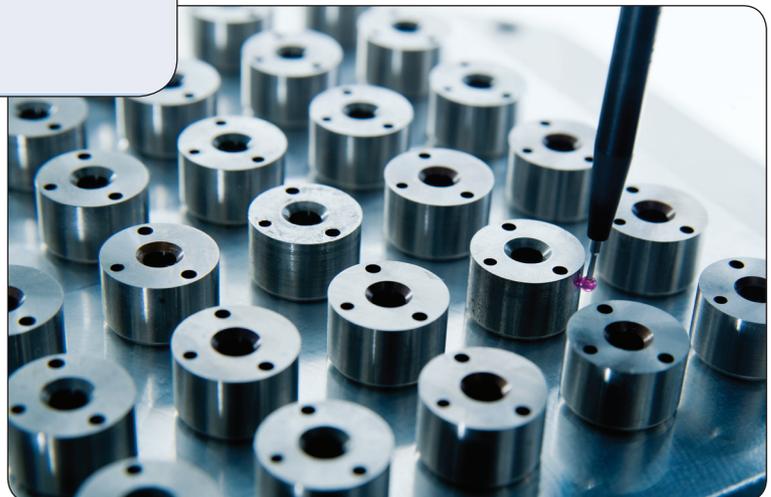


Instant pass/fail results

A simple user interface with configurable pallet layout allows the user to start and stop the measurement program at the touch of a button. Parts are identified according to location with a simple green, red and amber color system to identify pass, fail or measurement warnings.

Simultaneous measurement and analysis

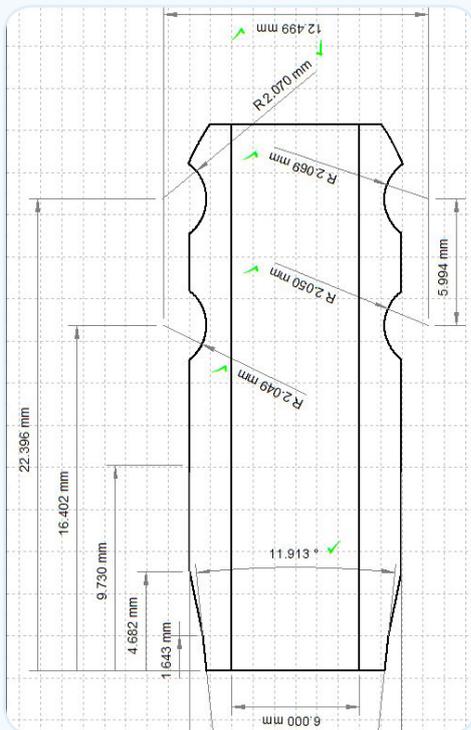
To speed up the measurement process even further the TalyMaster can multi-task by analysing one part at the same time as measuring the next component. Suspect parts can be re-checked by simply selecting the location and carrying out repeat measurement print or display at any time.



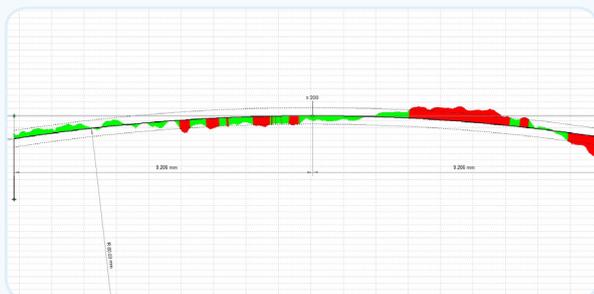
Contour measurement

Automated contour analysis

Integrated into the analysis menu our powerful contour software makes for seamless operation allowing analysis of length, radius, diameter, angle, height and form. Making use of the instruments coordinate system multiple profiles can be analysed, allowing measurement of internal and external parts that share a common axis as well as allowing measurement of profiles that would normally lie outside the gauge range.



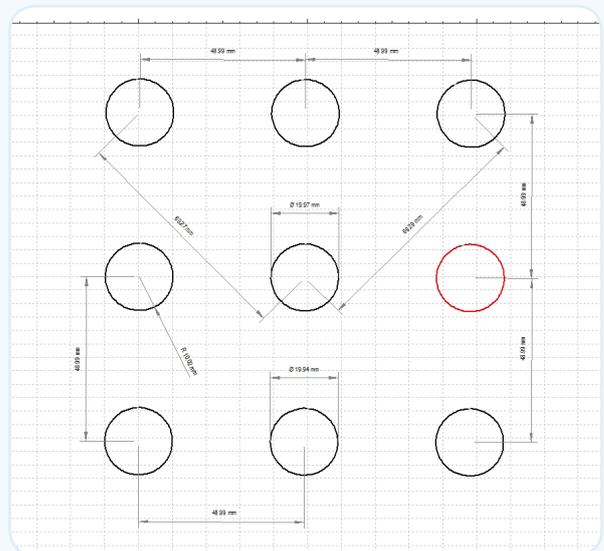
Four trace profile



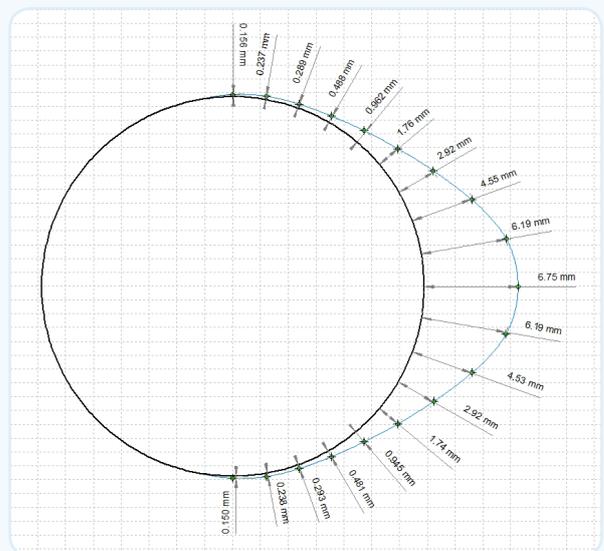
Crown measurement

Offset measurement

Making use of the X,Y table co-ordinate system it is possible to measure offset on multiple features from roundness to roundness planes or from an internal or external trace. For example we can measure pitch circle diameter of multiple bores as well as the roundness, angle and surface finish of the bore. For threads it is possible to get the pitch diameter as well as the pitch form. The ability to measure multiple parts makes the TalyMaster unique in its capability and the only instrument to offer all these features in one instrument.



9-hole array

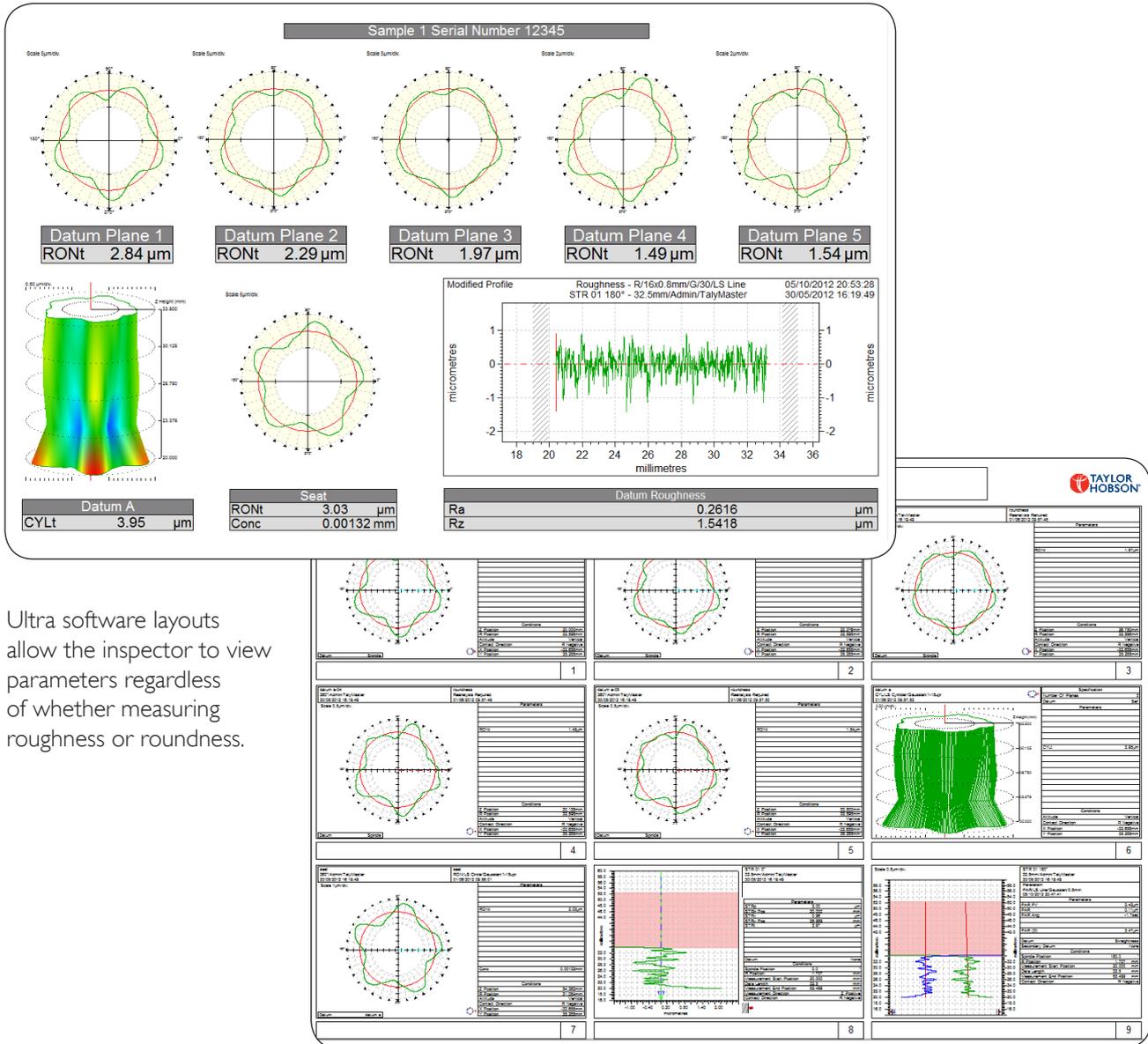


Cam

Rapid visual feedback

Layouts and results

With multiple measurements comes multiple reporting, the TalyMaster has a number of display and print options including standard, multi-plot and special customised layouts. Analysed data can be viewed by simply selecting the part location on the pallet interface and selecting 'Display' allowing rapid visual feedback.

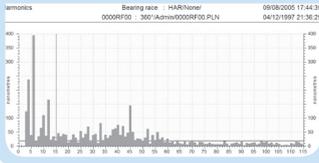


Ultra software layouts allow the inspector to view parameters regardless of whether measuring roughness or roundness.

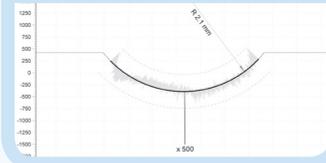
Applications

Inner bearing races

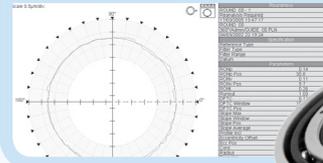
Harmonic analysis



Form & radius analysis

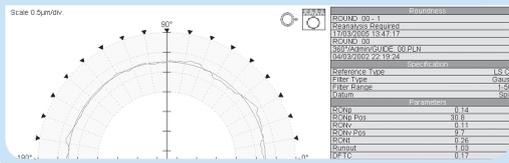


Roundness

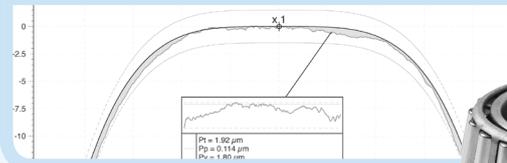


Roller bearings

Roundness

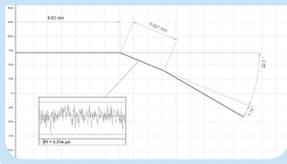


Tilt and form error to axis of rotation

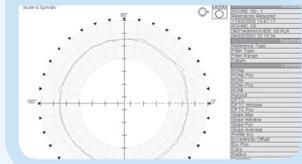


Fuel injectors

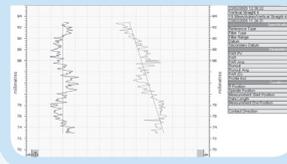
Angle and distance



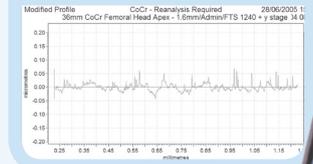
Roundness



Parallelism

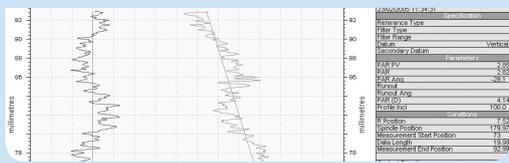


Surface finish

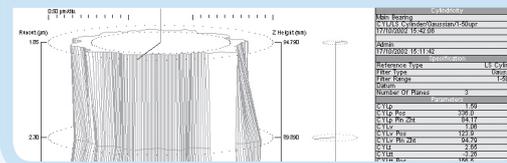


Cylinders

Parallelism

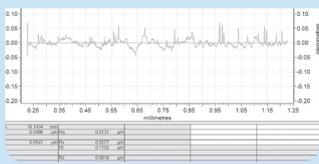


Cylindricity

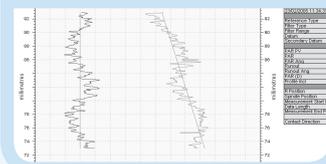


Compressors

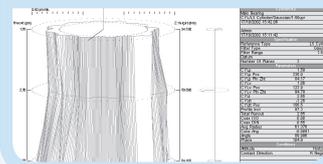
Surface finish



Parallelism



Cylindricity



Testimonial

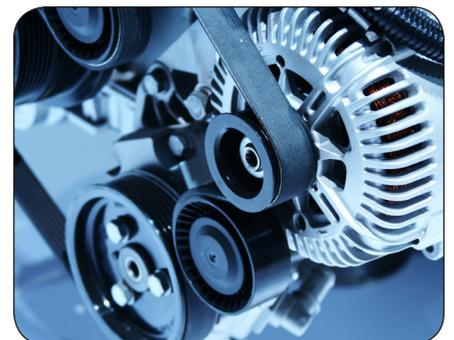
Ultra precision bearings are produced to the highest standards available. They are used in industries with a necessity for critical tolerances, high speeds and reliable performance under demanding operating conditions. Ultra precision bearings are also used in safety-critical and harsh environment applications.

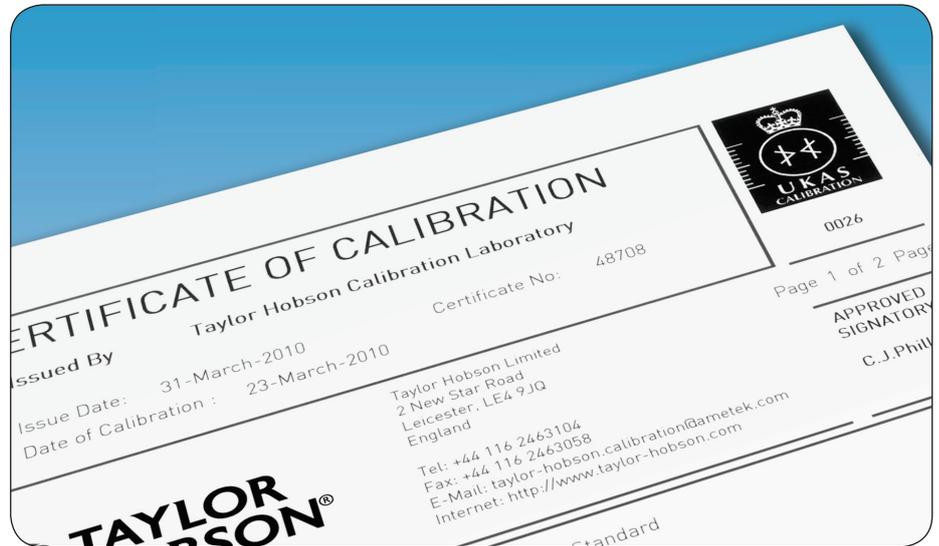
Industries and applications:

- Automotive
- Aerospace
- Bearings
- Hydraulics
- Optics
- Dental and medical
- Industrial plants

“Having the responsibility to ensure 1.5 million bearings each year are manufactured to the highest quality, means controlling our components at all stages of manufacturing. We have 15 Taylor Hobson roundness measuring instruments that help us maintain high throughput and the accuracies we require to ensure every one of our bearings is of the highest quality.”

Measurement Q/A Coordinator – Leading global bearings manufacturer





Traceability

Full traceability to international standards

Traceability

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

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.



Roundness

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

Gain correction

The TalyMaster 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.



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.

Axis calibration

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

Surface finish

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

Industry specific software

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



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 Arcuate correction standard

Required for use with contour or form software, this calibration standard corrects for gain, tip and arcuate motion of the stylus.

7.5 mm radius

code 112-4261

2 Calibration standard for vertical and circumferential roughness

code 112-4341 UCR

3 Six jaw component chuck

A 6 jaw precision scroll chuck.

Capacity - Inside diameter
20 mm - 95 mm (0.78 in - 3.74 in).

Capacity - Outside diameter
2 mm - 32 mm (0.08 in - 1.26 in).

code 112-1859 optional

4 Standard stylus arms

Ruby ball x 100 mm (3.9 in)

1 mm (0.039 in), **code 112-3245**

2 mm (0.078 in), **code 112-3244**

4 mm (0.157 in), **code 112-3243**

5 Precision collet chuck - removable three ball type location (for use with manual or automated tables)

Note: Collet required - see list below.

code 112-3662

code 112-3554 1.0 1 mm Collet

code 112-3554 1.5 1.5 mm Collet

code 112-3554 2.0 2 mm Collet

code 112-3554 2.5 2.5 mm Collet

code 112-3554 3.0 3 mm Collet

code 112-3554 3.5 3.5 mm Collet

code 112-3554 4.0 4 mm Collet

code 112-3554 4.5 4.5 mm Collet

code 112-3554 5.0 5 mm Collet

code 112-3554 5.5 5.5 mm Collet

code 112-3554 6.0 6 mm Collet

code 112-3554 6.5 6.5 mm Collet

code 112-3554 7.0 7 mm Collet

code 112-3554 7.5 7.5 mm Collet

code 112-3554 8.0 8 mm Collet

Adjustable End Stop Recommended

For use with 112/3549 or 112/3662; may require modification to suit the component under test.

code 112-3555

Bar stylus

A 100mm (3.9in) stylus for measuring small diameter components.

code 112-3489 optional

Diamond styli

Conisphere stylus with 90° included angle; required for cylindrical mapping or surface finish applications.

code 112-3806 optional 5 µm Rad

code 112-3807 optional 10 µm Rad

Kinematic dowel support set

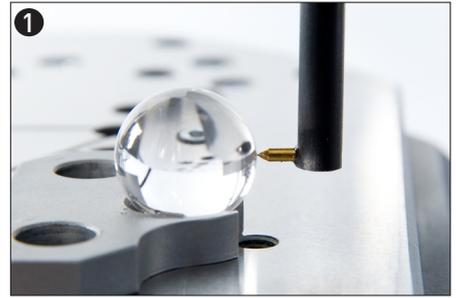
For stable workpiece mounting.

code 112-1861 standard

Reservoir assembly kit

If the air supply is unreliable or of poor quality then the reservoir assembly is recommended to provide an even flow of air to the spindle.

code 112-2869 optional



Force setting gauge

Recommended with diamond styli and where specific stylus forces are required.
code 112/3808 optional

6 High precision glass hemisphere

For checking total system performance. UKAS calibration certificate is optional.
Roundness < 0.01 μm (0.4 μm)
code 112/2324 optional

Glass hemisphere

For checking total system performance; UKAS calibration certificate is optional.
Roundness < 0.05 μm (2 μm)
code 112/436 optional

7 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 checking 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 μm)
Straightness < 0.5 μm (20 μm)*
code 112/1888 optional

500 mm (19.7") cylinder
Roundness < 0.25 μm (10 μm)
Straightness < 0.5 μm (20 μm)*
code 112/1997 optional

1000 mm (39.4") cylinder
Roundness < 0.75 μm (30 μm)
Straightness < 3 μm (120 μm)*
code 112/2333 optional

* Straightness over central 90% of test cylinder length

8 Cresting standard

For checking the vertical and horizontal alignment of the gauge head.
code 112/1876 optional

9 Flick standard

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

10 Calibration set

For calibrating the gauge head. The set comprises a circular glass flat and four gauge blocks. UKAS calibration certificate is optional.
code 112/2889 standard

Glass flat 250 mm (10") diameter
For checking the straightness and alignment of the horizontal arm with respect to the spindle axis.
code 112/1998 optional

Pre-filter element
code 112/3351 optional

Accessory case
A useful case for carrying standard and optional accessories.
code 48/453 optional

Set of hexagonal wrench keys
To assist with minor adjustments on the instrument.
code 630/412 optional

Coalescing filter element
Secondary filter to be changed every 3 months to maintain a clear air supply, (1 included with the instrument).
code 112/3378 optional



Customized 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 customize a solution to exactly match your application. This may include such things as work holding devices or special styli for applications such as small bores, shoulders or undercuts.

Specifications are subject to change without notice.

Parameters

Type of analysis	Measurement mode	Evaluation diagram	TalyMaster	Type of analysis	Measurement mode	Evaluation diagram	TalyMaster
Roundness			✓	Radial Runout	Axial		✓
Parallelism			✓		Radial		✓
Cylindricity			✓	Squareness		✓	
Straightness			✓	Parallelism		✓	
Flatness			✓	Measure Interrupted Surface		✓	
Coaxiality			✓	Harmonic Analysis		●	
Concentricity			✓	Thickness Variation	Radial		●
Eccentricity			✓		Axial		●

✓ = Included – ● = Optional
(Customer specific analysis available on request)

The Metrology Experts

Established in 1886, Taylor Hobson is the world leader in surface and form metrology and developed the first roundness and surface finish measuring instruments.

www.taylor-hobson.com

Sales department

Email: taylor-hobson.sales@ametek.com

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

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

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- **Preventative maintenance** – protect your metrology investment with an AMECare support agreement.



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