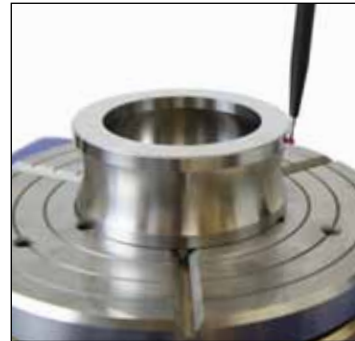


Talyrond® 131 & 130

For economical, high precision inspection of roundness and circular geometry



Unparalleled measurement capability

Talyrond® 131 and 130

For economical, high precision inspection of roundness and circular geometry.

Process control right at the point of manufacture is cost effective and convenient. Correlation between multiple units is assured thanks to exacting specifications.

Quality control at a central inspection station or in the gauge room is comprehensive and in full accordance with international metrology standards.

Measuring excellence

The degree of excellence for any gauging device is its range to resolution. Taylor Hobson gauge heads, with wide range and selectable resolution, vastly improve the measure of precision in your manufacturing process.

- **Wide range - 2mm (0.078")**
Simplifies initial set-up of the component and eliminates the need for special fixtures
- **Normal resolution**
30 nm (1.18 μ") - is ideal for most measurement requirements
- **High resolution - 6 nm (0.24 μ")**
Used when component deviations are less than 0.40mm (0.016")



Customized workholding devices can be used with Talyrond® 131 systems to expand capability or simply increase throughput.



Wide range gauge with wrist assembly provides high resolution in any attitude or orientation

Powered by ultra Roundness software

ultra software provides comprehensive analysis and programmable measurement capabilities for the Talyrond® 131 and 130 instruments. It is the ideal tool for any environment where rapid component inspection is desired.

World leading performance

Both the Talyrond® 131 and 130 incorporate a number of industry leading features that combine to deliver high accuracy, repeatability and ease of use.

Mechanical excellence throughout the measuring loop

Diamond turned air bearing spindle

Spindle accuracy is crucial to the performance of any roundness instrument.

Radial limit of error is a constant value measured at the table top. Coning error, how well the spindle rotates on its axis, increases relative to distance above the table top.

Although radial error can be improved through software correction, coning error can be minimized only through meticulous construction. Taylor Hobson's ultra high precision spindle provides the best combination of precision and "stiffness" in the world. The result is coning error less than $0.00025 \mu\text{m}/\text{mm}$ ($0.25 \mu\text{"/inch}$).

Versatile gauging

The measuring gauge is carried in a "wrist" assembly for rapid changeover between vertical and horizontal attitudes while maintaining the exact center point of the stylus contact ball. Vertical for internal and external surfaces; horizontal for surfaces which may be upper or lower, external, angled or conical.

High density zinc alloy base

Compact design is important for the workshop where tabletop space is always at a premium.

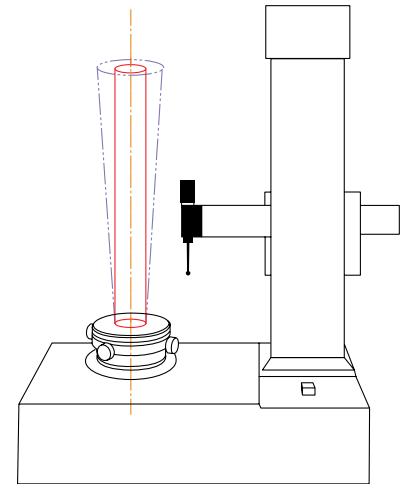
Taylor Hobson uses a special zinc alloy casting to assure that small size does not compromise performance. This dense material is extremely stable even under typical production floor conditions.

Integrated vibration isolation

As a further guarantee that laboratory grade metrology is attained on the shop floor, vibration isolation pads are built into both the Talyrond® 131 and 130 instruments. In all but extreme circumstances no additional anti-vibration materials are required.

Engineering assisted center and leveling

The centering and leveling knobs are differentiated by look and feel, allowing operators to view the screen while setting the component to the spindle axis. In addition, the neutral tilting plane is at a height above the tabletop that facilitates the leveling of both short and tall components.



Tall components can be measured with confidence and accuracy because coning error is minimized to a remarkable $0.00025 \mu\text{m}/\text{mm}$ ($0.25 \mu\text{"/inch}$)



Gauge arm in horizontal attitude with orientation downward to measure top face



gauge arm in vertical attitude with orientation retracted to measure an inside diameter

µltra Software

µltra was developed first of all to function in accordance with the highest standards of metrology.

That it turned out also to be clever, comprehensive and easy-to-use reflects the Taylor Hobson expertise at putting metrology to work in support of manufacturing.

Total system control

µltra takes charge of all functions to eliminate hardware / software conflicts typically created by third party or after market software packages. Mechanical performance is optimized by use of patented software routines and proprietary calibration techniques.

- **Mechanical functions**
Positioning and speed of all axis movements
- **Administrative functions**
User preferences, data storage and retrieval
- **Analysis functions**
Application of filters and constants, calculation of results
- **Display functions**
Screen graphics, customized templates, print commands

Compatibility

µltra was designed to be fully compatible with older Taylor Hobson data file formats, thus enabling re-analysis and comparison of old data. It also has a programmable facility for the simple export of results to standard packages such as SPC and Excel™.

Compliance with international standards

Whatever the parameter and wherever in the world it happens to be measured it is guaranteed to be correct. µltra also adheres to industrial metrology disciplines as practiced by leading manufacturers around the globe.

- Calibration routines are easily integrated into corporate ISO 9001 procedures
- Artifacts used for calibration can be identified and referenced to certification date
- Calibration history regarding operator, artifact and date is automatically stored
- Separate calibrations for different probe arms can be saved and easily restored

Industrial strength interface

Although written with familiar Windows conventions, µltra has the look and feel of a machine tool interface. Commands are direct, purposeful and driven by intuitive logic. Perhaps for the first time in metrology the computer is a bridge instead of a barrier between operator and instrument.



µltra powers Intra surface roughness measuring systems



µltra powers Talyrond® roundness and cylindricity measuring systems



µltra simplifies training and eliminates the need for dedicated, single system operators

Multi-instrument architecture

µltra takes full advantage of client/server technology and is designed to drive all Taylor Hobson hardware devices including Form Talysurf® Series instruments and Talyrond® roundness systems.

- Operators familiar with µltra can easily operate multiple instruments
- No need for dedicated, single instrument operators
- Transfer of knowledge is simplified when operators are promoted or transferred
- Network ready for central data storage and output to network printers

Compatibility

µltra includes as standard everything important to the measurement of circular geometry. All the basic roundness parameters are here along with advanced analysis tools that are either unavailable or available only at extra cost from other suppliers.

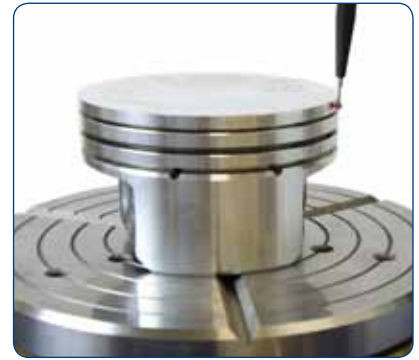
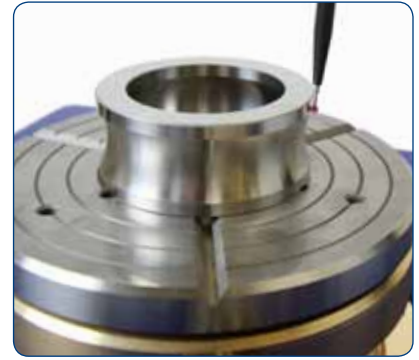
- Asperity removal
- Coaxiality
- Cylindricity
- DFTC / DFTP
- Harmonic analysis
- Hole and edge removal
- Slope

Computer aided center and leveling

Any operator can center and level a component quickly and correctly just by following a few screen prompts. During the process a dynamic on-screen display shows the operator the exact position of the gauge head. With practice, high speed is possible. With µltra, accuracy is guaranteed.

Programmable measuring routines

Whether in semi-automatic, manual or automatic mode, the entire measuring sequence can be programmed. This ensures that every step is performed in the right sequence and that filters, parameters and evaluation methods are always identical.



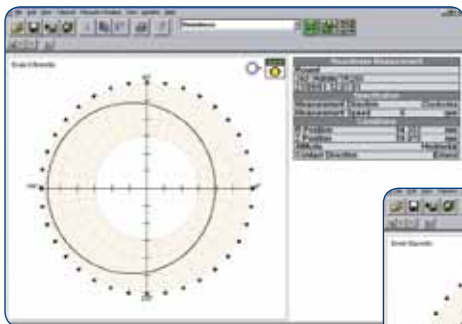
µltra Roundness software - at work on a typical component

To illustrate the effectiveness with which µltra can achieve the highest possible accuracy, a series of measurements will be performed on a typical manufactured component.

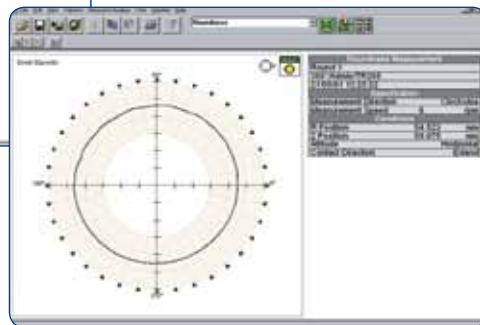


Roundness on continuous surface

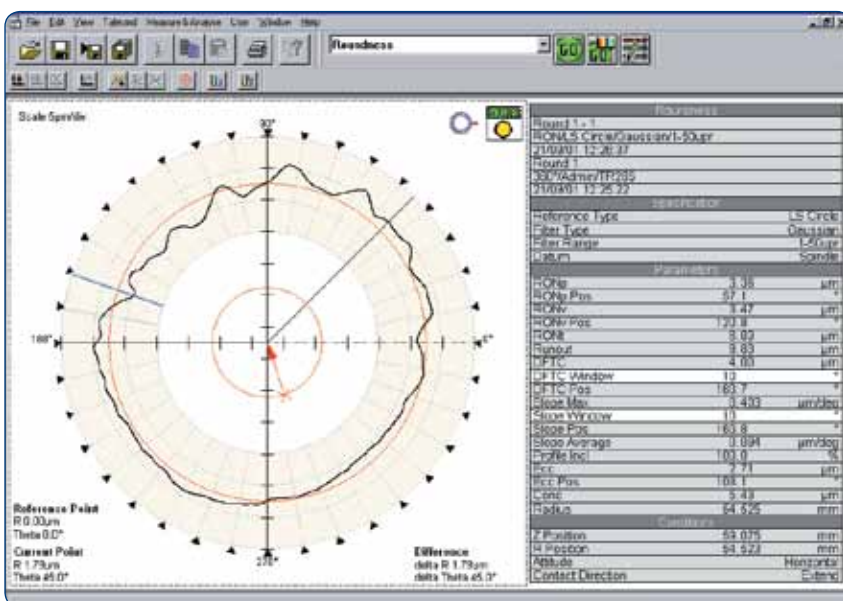
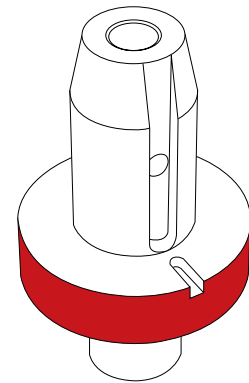
The first procedure will be a basic centering and leveling routine made on the surface indicated in red. Centering and leveling repositions the table to mechanically align the axis of the component with the axis of the spindle. This serves to prevent the inclusion of fixturing errors in the roundness analysis.



Before centering



After centering



Measurement results

After centering and leveling is complete a fresh measurement is taken and the roundness results are displayed in both tabular and graphical format. µltra provides a full and accurate assessment of roundness with respect to any of the four internationally recognized reference circles.

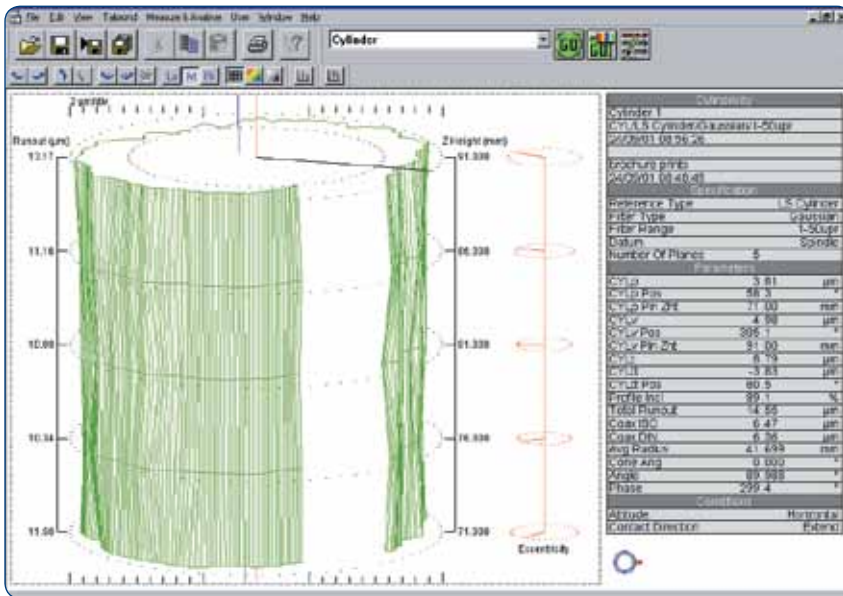
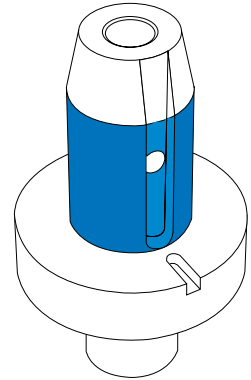
- Least Squares Circle
- Minimum Zone Reference Circle
- Minimum Circumscribed Circle
- Maximum Inscribed Circle

Measurements on interrupted surfaces

Interruptions and asperities will have a detrimental influence on measurement results if they are not excluded from the analysis. ultra can automatically or manually exclude data caused by intended or unintended interruptions.

Cylindricity / Coaxiality / Concentricity

Cylindricity is a powerful tool that combines data from multiple roundness profiles into a single geometric figure. For this example four profiles will be measured on the surface indicated in blue. Note that the keyway has been automatically excluded from analysis.

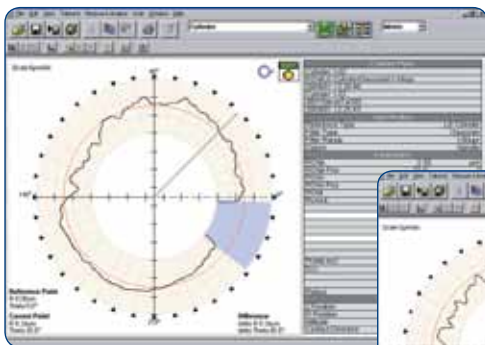


Cylindricity results (Talyrond® 131 only)

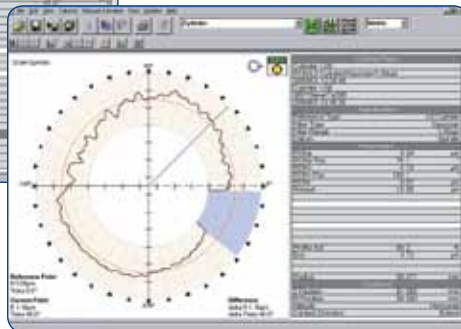
ultra provides a full and accurate assessment of cylindricity with respect to any of the four internationally recognized reference systems.

- Least Squares Cylinder
- Minimum Zone Reference Cylinder
- Minimum Circumscribed Cylinder
- Maximum Inscribed Cylinder

In addition, the axis calculated from the cylinder analysis can be used as a reference datum and compared with another axis for the assessment of coaxiality, concentricity, run-out and total run-out.



Profile plane 2



Profile plane 4

Individual planes can be extracted from the cylinder for additional analysis. In this case the roundness values for planes 2 and 4 are displayed.

Note, the blue shaded area indicates data excluded from the measurement results.

Accessories

All the accessories you need to begin using Talyrond® 131 and 130 are supplied as standard. However, for more demanding measuring requirements, we have a range of accessories which may be ordered separately.

1 Large computer desk

1260 mm wide x 850 mm deep x 750 mm high (49.6" x 33.5" x 29.5"). Locking cabinet can be assembled to left or right of the desk.

code 112-2998

2 Storage unit

820 mm wide x 625 mm deep x 640 mm high (32.3" x 24.6" x 25.2"). Designed to fit under the small computer desk. Features lockable doors and is mounted on castors for easy installation.

code 112-3142

3 Small computer desk

900 mm wide x 850 mm deep x 750 mm high (35.5" x 33.5" x 29.5"). A small drawer is provided for tools, styli, etc.

code 112-3144

Monitor Support

Monitor support with vertical and swivel adjustment.

code 112-3182 (Optional)

4 Rapid centre™

For repeatable centering of small components. 200 mm internal clamping. 80 mm external clamping.

code 112-4313

5 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

6 Stylus arms

Ruby ball x 100 mm (3.94").

1 mm (0.039in) diameter;
code 112-2253

2 mm (0.078in) diameter;
code 112-2254

4 mm (0.157in) diameter;
code 112-2255

Bar Stylus

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

code 112-2256

Stylus stop attachment

For limiting movement of the stylus when measuring interrupted surfaces.

code K501-1547

Kinematic dowel support set

For stable workpiece mounting.

code 112-1861

Reservoir assembly kit

If the air supply is of poor quality or unreliable and does not meet the instrument's standards, then the reservoir assembly is recommended to provide an even flow of air to the spindle.

code 112-2869

Instrument cover

To protect the instrument when not in use.

code 112-1393

Fuse and bulb kit

code 112-2131



7 Glass hemisphere

For checking total system performance; UKAS calibration certificate is optional.

Roundness < 0.05 μm (2 μm)

code 112-436

8 Calibration set

For calibrating the gauge head. Comprises a circular glass flat and three gauge blocks (2.5 mm, 2.8 mm and 3 mm). UKAS calibration certificate is optional

code 112-1874

9 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 μm)

Straightness < 0.5 μm (20 μm)*

code 112-1888

* Straightness over central 90% of cylinder length

10 Cresting standard

For checking the vertical and horizontal alignment of the gauge head.

code 112-1876

Pre-filter element

code 112-2859

11 Flick standard

For rapid calibration of the gauge head; alternative to the standard gauge calibration set.

20 μm (788 μm) range

code 112-2308

300 μm (0.012") range

code 112-2233

Accessory case

A useful case for carrying standard and optional accessories.

code 48-453

Coalescing filter element

Secondary filter to be changed every three months to maintain a clear air supply, (1 included with the instrument).

code 112-2858

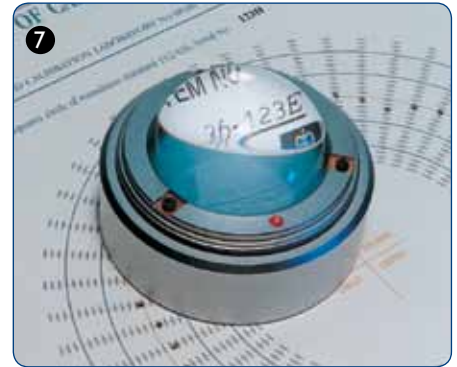
Set of hexagonal wrench keys

To assist with minor adjustments on the instrument.

code 630-412

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.

Talyrond® 131 and 130

Choosing the right product...

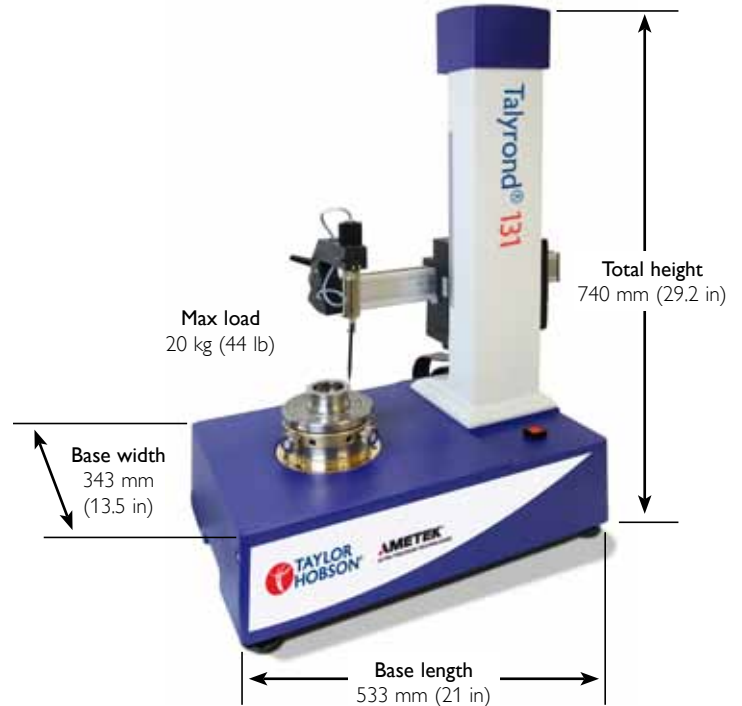
Talyrond® 131

Cost effective cylindricity

Motorized for automatic measuring

Talyrond® 131 systems incorporate a motorized column and radial arm for automatic measuring runs. Programmed routines shorten cycle times and minimize operator influence on results. The built in vertical reference unit extends capability to include cylindricity and total run out.

- Capacity for large components
- Functional, low maintenance construction
- Equally at home in the inspection room or on the production floor
- Simple to set up and operate
- Integrated electronic interface module



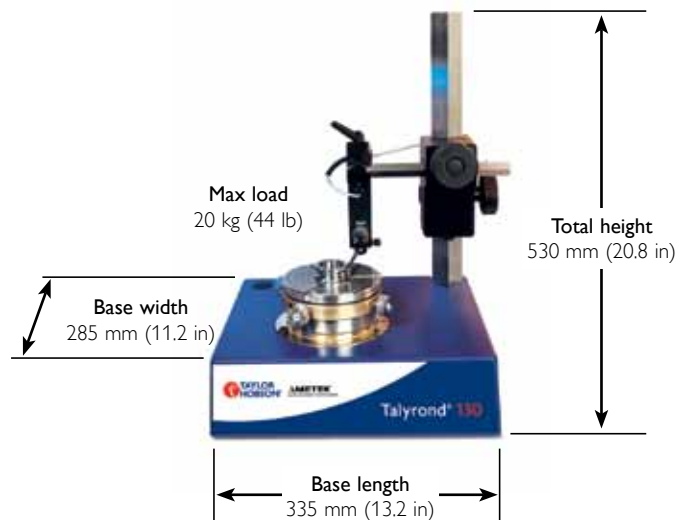
Talyrond® 130

Affordable and accurate roundness

Precise manual positioning

The Talyrond® 130 is equipped with positive friction positioning controls on the column and the arm. This direct drive response to movement of the large, ergonomic hand wheels feels precise and is precise. Drift, backlash and slop are greatly reduced without the need for clumsy, inefficient clamping devices.

- Interactive programming with operator prompts
- Rugged, compact construction for use anywhere in the plant
- Engraved scales for accurate positioning
- Self contained electronic interface module,
 - Length = 250 mm (10 in)
 - Width = 160 mm (6.3 in)
 - Height = 80 mm (3.2 in)



Note: To allow for supply fluctuations, the preferred air pressure is 80-120lbf/in² (5.4 to 8.1 bar) however where a constant supply pressure can be maintained, a minimum air pressure of 50lbf/in² (3.4bar) is acceptable. Talyrond® 130 and 131 instruments conform to all applicable requirements of BS EN 50081-2 (1994) and BS EN 50082-1 (1998) and comply with the requirements of the EMC Directive 89/336/EEC.

Roundness, concentricity, eccentricity and run out measurements can be made with reference to Least Squares Circle, Minimum Zone Circle, Maximum Inscribed Circle or Minimum Circumscribed Circle, flatness and squareness to Least Squares and Minimum Zone

Product specification

Measuring capacity	Talyron® 131	Talyron® 130
Max diameter	370 mm (15 in)	200 mm (8 in)
Max height	325 mm (9 in)	200 mm (8 in)
Max weight (balanced load)	20 kg (44 lbs)	20 kg (44 lbs)

Weights and dimensions	Talyron® 131	Talyron® 130
Main instrument (overall weight)	62 kg (136 lbs)	38 kg (85 lbs)
Overall length (arm fully retracted)	820 mm (32 in)	455 mm (17.9 in)
Overall width	343 mm (13.5 in)	285 mm (11.2 in)
Overall height	740 mm (29.2 in)	530 mm (20.8 in)

Cylindricity reference unit	Talyron® 131	Talyron® 130
Straightness error*	<3 µm / 225 mm (118 µin / 8.8 in)	-
Parallelism (in the measuring plane)*	<3 µm / 225 mm (118 µin / 8.8 in)	-
Positional control uncertainty	± 250 µm (0.01 in)	-

Worktable and spindle	Talyron® 131	Talyron® 130
Worktable diameter	125 mm (4.94 in)	
Range of manual centering	± 1.25 mm (±0.054 in)	
Range of manual leveling	± 30 arc minutes	
Height of neutral plane	51 mm (2 in)	
Speed of rotation	6 rpm clockwise nominal	
System roundness limit of error**	± (0.025 µm + 0.00025 µm / mm) ± (0.98 µin + 0.25 µin / in)	
Axial limit of error	0.025 µm (0.98 µin)	

Gauge range and resolution	Talyron® 131	Talyron® 130
Maximum range	± 1 mm (+/- 0.039 in)	
Resolution at maximum range	0.03 µm (1.18 µin)	
Minimum range	± 0.2 mm (+/- 0.008 in)	
Resolution at minimum range	0.006 µm (0.24 µin)	

Filter options
Phase corrected 2CR, gaussian and bandpass filtering available by menu selection.
Filtering is operator selectable from 1-15upr; 1-50upr; 1-150upr; 1-500upr; 15-150upr; 15-500upr and user selected.

Electrical (alternating supply, single phase with earth, 3 wire)	
Voltage	90 - 260V
Frequency	47 - 63 Hz
Consumption (total system)	250VA max, 160 w

Environmental conditions	
Operating temperature	10°C - 35°C (50°F - 95°F)
Storage temperature	-10°C - 50°C (14°F - 122°F)
Temp/time gradient	less than 2°C / hour (3.6°F / hour)
Operating humidity	30% to 80% relative, non-condensing
Storage humidity	10% to 90% relative, non-condensing
Free air flow rate	1.0 m / sec max. steady (39.4 in / sec)

Air source requirements	
Maximum source pressure	8.1 bar (120 psi)
Minimum source pressure	5.4 bar (80 psi)
Air consumption	0.037 cu.m / min (1.3 scfm)
Operating pressure	4.1 bar (60 psi)
Filtering	5 µm (200 µin)
Moisture content - dewpoint	2°C (3.6°F)

* Straightness/parallelism specification based on calculations from a series of radial traces using an LS circle.

** Departure from the least squares circle at 6 rpm with 1-50 upr filter (departure may be inward or outward).

Note:

All accuracies and uncertainties are quoted at 20°C ±1°C (68°F ± 1.8°F). Taylor Hobson pursues a policy of continual improvement due to technical developments. We therefore reserve the right to deviate from catalog specifications.

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

Tel: +44 (0) 116 276 3771

- **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

Email: taylor-hobson.service@ametek.com

Tel: +44 (0) 116 246 2900

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



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Taylor Hobson UK

(Global Headquarters)

PO Box 36, 2 New Star Road
Leicester, LE4 9JQ, England

Tel: +44 (0)116 276 3771

taylor-hobson.sales@ametek.com



Taylor Hobson France

Rond Point de l'Epine Champs
Batiment D, 78990 Elancourt, France

Tel: +33 130 68 89 30

taylor-hobson.france@ametek.com



Taylor Hobson Germany

Rudolf-Diesel-Straße 16,
D-64331 Weiterstadt, Germany

Tel: +49 6150 543 0

taylor-hobson.germany@ametek.com



Taylor Hobson Italy

Via De Barzi, 20087 Robecco sul Naviglio,
Milan, Italy

Tel: +39 02 946 93401

taylor-hobson.italy@ametek.com



Taylor Hobson India

Divyasree NR Enclave, 4th Floor, Block A,
Plot No. 1, EPIP Industrial Area, Whitefield,
Bengaluru - 560066, India

Tel: +91 80 6782 3346

taylor-hobson.india@ametek.com



Taylor Hobson China

taylor-hobson-china.sales@ametek.com

Shanghai Office

Part A1, A4, 2nd Floor, Building No. 1, No. 526
Fute 3rd Road East, Pilot Free Trade Zone,
Shanghai, 200131, China

Tel: +86 21 5868 5111-110

Beijing Office

Western Section, 2nd Floor, Jing Dong Fang
Building (B10), No. 10, Jiu Xian Qiao Road,
Chaoyang District, Beijing, 100015, China

Tel: +86 10 8526 2111

Chengdu Office

Unit 9-10, 10th Floor 9/F, Hi-tech Incubation
Park, No.26 West Jinyue Road, Chengdu,
610041, China

Tel: +86 28 8675 8111

Guangzhou Office

Room 810 Dongbao Plaza, No.767 East
Dongfeng Road, Guangzhou, 510600, China

Tel: +86 20 8363 4768



Taylor Hobson Japan

3F Shiba NBF Tower, 1-1-30, Shiba Daimon
Minato-ku, Tokyo 105-0012, Japan

Tel: +81 34400 2400

taylor-hobson.japan@ametek.com



Taylor Hobson Korea

#309, 3rd FL, Gyeonggi R&DB Center, 105,
Gwanggyo-ro, Yeongtong-gu, Suwon-si,
Gyeonggi-do, Korea, 16229

Tel: +82 31 888 5255

taylor-hobson.korea@ametek.com



Taylor Hobson Singapore

AMETEK singapore, 10 Ang Mo Kio Street 65,
No. 05-12 Techpoint, Singapore 569059

Tel: +65 6484 2388 Ext 120

taylor-hobson.singapore@ametek.com



Taylor Hobson Thailand

89/45, Moo 15, Enterprise Park, Bangna-Trad
Road, Tambol Bangkaew, Amphur Bangplee,
Samutprakarn Province 10540, Thailand

Tel: +66 2 0127500 Ext 505

taylor-hobson.thailand@ametek.com



Taylor Hobson Taiwan

10F-5, No.120, Sec. 2, Gongdao Wu Rd.,
Hsinchu City 30072, Taiwan

Tel: +886 3 575 0099 Ext 301

taylor-hobson.taiwan@ametek.com



Taylor Hobson Mexico

Acceso III No. 16 Nave 3 Parque Ind. Benito
Juarez Queretaro, Qro. Mexico C.P. 76120

Tel: +52 442 426 4480

taylor-hobson.mexico@ametek.com



Taylor Hobson USA

27755 Diehl Road, Suite 300, Warrenville,
IL 60555, USA

Tel: +1 630 621 3099

taylor-hobson.usa@ametek.com



1100 Cassatt Road, Berwyn, PA 19312, USA

Email: info.corp@ametek.com

Web: www.ametek.com