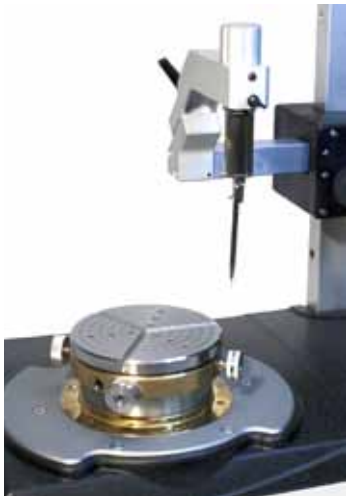
TAYLOR HOBSON®

Surtronic® R-50/R-80

Roundness measurement system



Surtronic® R-series

High speed roundness systems for bearings, automotive and precision industries

Surtronic® R-series

A range of roundness products robust enough for the shop floor but accurate enough for any inspection room.

Working closely with manufacturers across a wide range of industries including bearings, automotive and aerospace engineering, Taylor Hobson has focussed on the key attributes that are most important for quality control in today's precision industries.

The new Surtronic® R-series instruments offer a flexible solution for all your roundness and form requirements with a variety of systems and application specific accessories along with fixtures that can be tailored to your specific need.

Speed (3 parts/minute including set-up)

The most important benefit these systems offer is speed. In precision industries as manufacturing volumes increase all too often the bottleneck is metrology. High measurement throughput systems ensure higher sampling rates are achieved while also supporting increased manufacturing volumes.

Precision (±25 nm spindle accuracy)

Although many times faster than traditional benchtop roundness systems there is no loss of precision or accuracy. Full ISO compliant measurements can be taken with ±25 nm accuracy and 30 nm gauge resolution.

Robustness (suitable for 24/7 operation)

All systems are designed for constant 24 hour, 7 days a week use in demanding shop floor environments; manufactured using only the most durable and hard wearing materials.

Ease of use (touchscreen software)

The X-sight touch screen software platform with intuitive navigation make the Surtronic roundness system as easy to use as a SatNav or SmartPhone with everything you need at your fingertips.

X-sight touch screen software

"Speed and reliability matter; we choose Taylor Hobson metrology."

Dr Sashi Balakrishnan, Chief Tribologist, Mercedes-Benz High Performance Engines (leading Formula 1 engine supplier)

World's highest throughput roundness system...

- Increase manufacturing output
- Reduce part scrappage
- Ensure part traceability
- Improve 'right first time'

What can it measure?

The Surtronic® R-series instruments are ideally suited to measuring high volume production parts across a wide variety of industries including:

Bearings

– Races, Balls, Needles and Rollers

Automotive

– Valves, Con Rods, Pins and Brake Discs

Process Control

– Grinding, Turning, Milling and Honing

and many more...

Patented gauge orientation

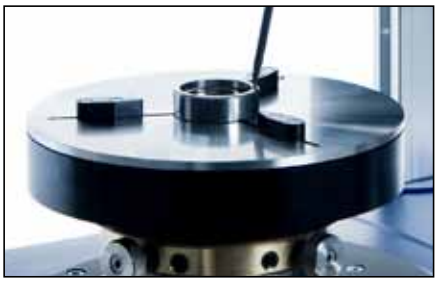
Using Taylor Hobson's patented gauge orientation with its robust locking mechanism changing orientation from roundness to flatness or internal to external only takes a few seconds.

Accurate gauging

All systems incorporate Taylor Hobson's accurate and reliable Talymin gauge technology, delivering 6 nm resolution.

Patented rapid centre™

Rapid Centre avoids valuable cycle time being lost on manual part centring. On most parts precision results are achieved following a very simple and fast loading procedure. Now roundness measurements can be made in less than 30 seconds including part loading, centring, measurement, analysis and results display!



Magnetic fixture with centering attachment

Accessories and standards

A full range of accessories and standards are available to support the instrument. These include Magnetic chuck, Rapid Centre fixture, Glass hemisphere, Calibration set, Precision test cylinder, Cresting standard, Stylus kit, Flick standard (20 µm or 300 µm) and replacement air filter modules.

Surtronic® R-50/R-80

More than a measurement instrument...

...a new measurement concept

Easy to use software

- Developed in collaboration with key bearings, automotive and precision engineering companies
- Large colour display, easy viewing of results
- Touch screen operation means every feature at your fingertips
- Easy analysis setup with single button recall
- Advanced analysis packages for bearings and automotive applications

Taylor Hobson's tried and tested precision diamond-turned air bearing spindle with ±25 nm accuracy
(Now includes auto aligning sleeve for ease of maintenance)

"Our 15 Taylor Hobson roundness machines ensure we maintain our high throughput and accuracies."

Measurement Q/A Coordinator –
Leading global bearings manufacturer

Testimonials

Mercedes-Benz High Performance Engines

Speed and reliability are important both on and off the track for us, we have to work to the tightest of timescales and highest tolerances to get our engines race ready. Taylor Hobson equipment gives us high throughput and the confidence in our manufacturing processes to allow us to continually control and improve them.

Dr Sashi Balakrishnan, Chief Tribologist,
Mercedes-Benz High Performance Engines
(leading Formula 1 engine supplier)

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

Applications

Compressor parts

Orthopaedics

Grinding

Automotive valves

Milling

Optics lens

Gear shafts

Balls

Grinding wheels

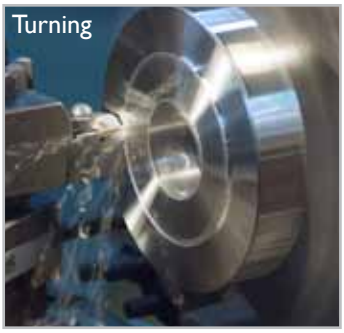
Automotive – injectors

Medical – hypodermic tubes

Honing

Food packaging – dies and punches

Turning



Pipeline – joints

Bearing components

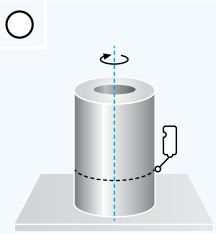
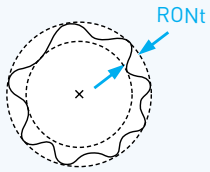
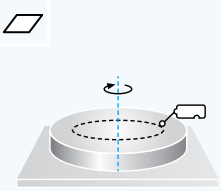
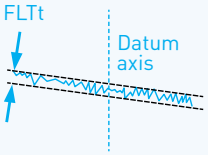
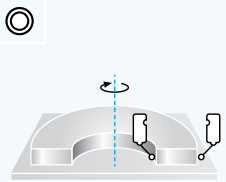
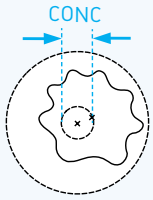
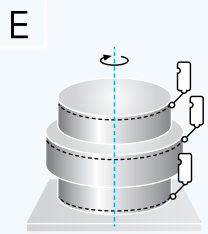
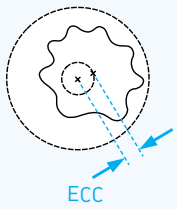
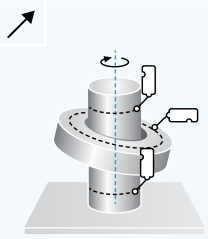
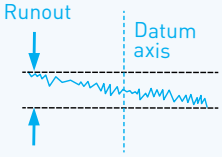
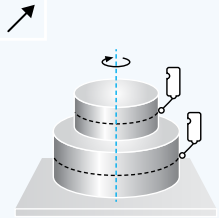
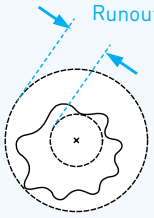
and many more...

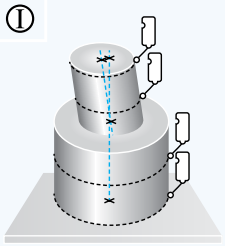
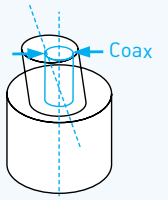
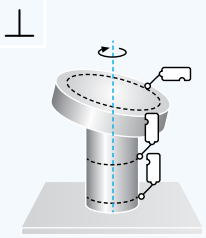
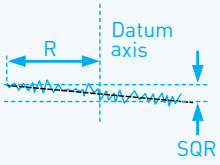
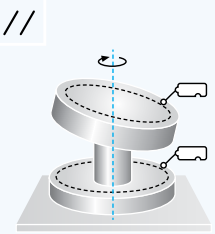
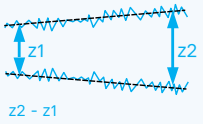
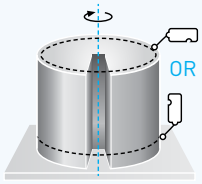
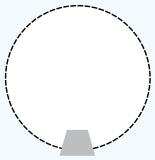
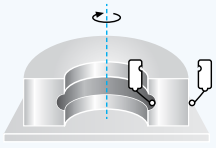
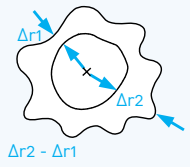
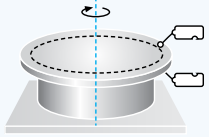
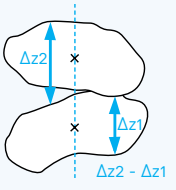
Join the roundness revolution

Whatever your industry or application if you need high speed roundness measurement we have it covered...

- ○ Roundness
- ▱ Flatness
- ⌖ Coaxiality
- E Eccentricity
- ◎ Concentricity
- ↗ Radial runout
- ⊥ Squareness
- // Parallelism
- →|← Thickness variation

Analysis

Type of analysis	Measurement mode	Evaluation diagram	R-50	R-80
Roundness			✓	✓
Flatness			✓	✓
Concentricity			✓	✓
Eccentricity			✓	✓
Runout – Axial			✓	✓
Runout – Radial			✓	✓

Type of analysis	Measurement mode	Evaluation diagram	R-50	R-80
Coaxiality			✓	✓
Squareness			✓	✓
Parallelism			✓	✓
Measure Interrupted Surface			●	✓
Thickness Variation – Radial			●	✓
Thickness Variation – Axial			●	✓

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

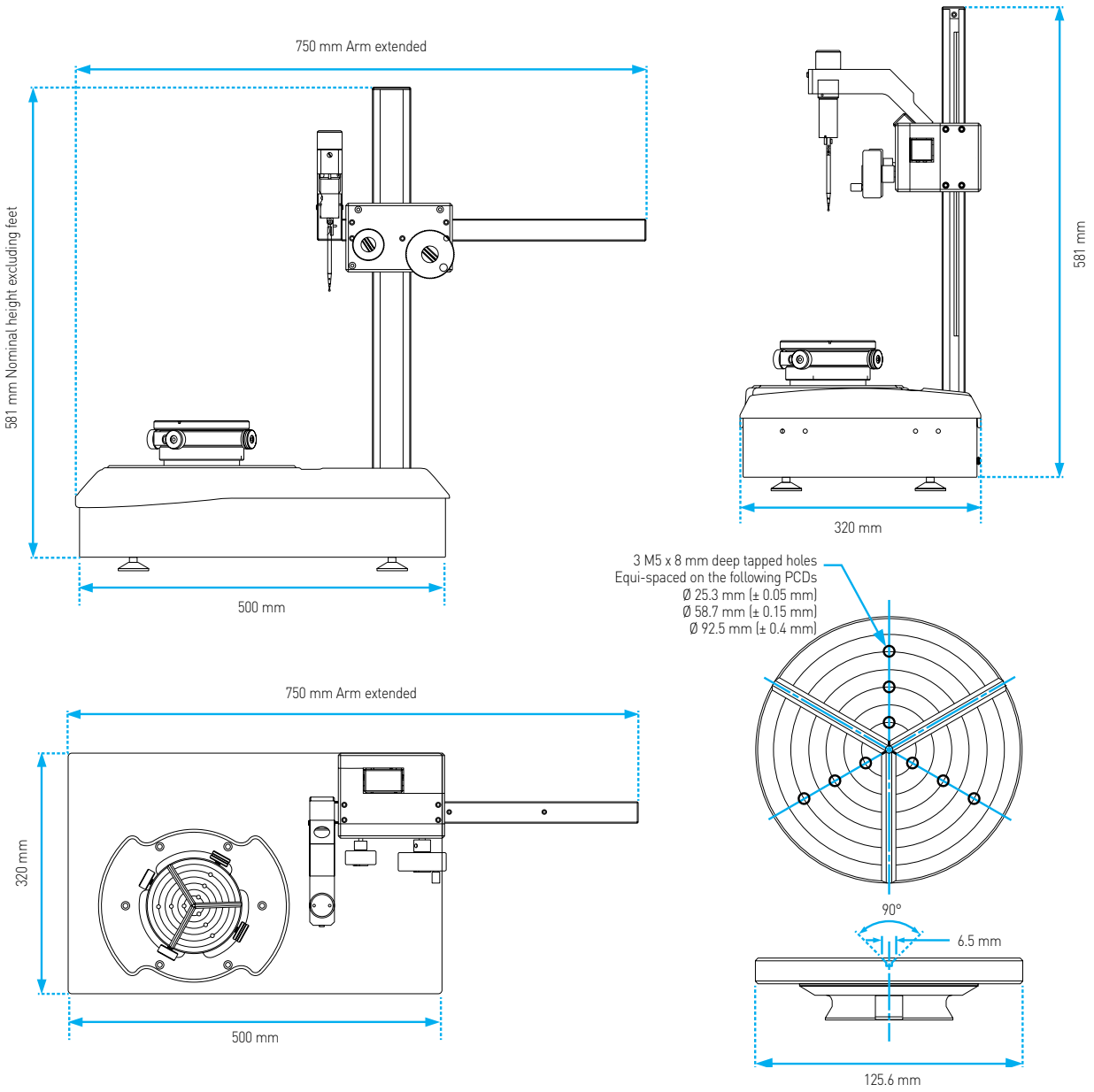
Surtronic® R-series specification
Roundness measurement system

Model number		R-50	R-80
Measuring capacity	Max diameter	300 mm	
	Max height	280 mm	
	Max weight	20 Kg (44 lb)	
Work table	Diameter, standard	125 mm	
	Diameter, accessory	300 mm	
	Centering	±1.25 mm	
	Levelling	30 arc minutes	
	Height of neutral plane	51 mm	
Spindle	Speed of rotation	15 Rpm Max	
	Radial limit of error (departure from the LS circle)	± 25 nm @ 6 Rpm	
Gauge	Range	2 mm	
	Resolution	30 nm	
Filter	Type	None, Gaussian, Robust Gaussian, 2 CR-PC, Fourier	
	Standard filter cut-offs	1–15 upr, 1–50 upr, 1–150 upr, 15–150 upr, 1–500 upr, 15–500 upr	
	Special filters	User selectable & Bandpass	
System features	Roundness/flatness	✓	✓
	Coaxiality, eccentricity,	✓	✓
	Concentricity, radial runout	✓	✓
	Squareness	✓	✓
	Parallelism	✓	✓
	Measure interrupted surfaces	●	✓
	Thickness variation	●	✓
	Centering attachment 200 mm	●	●
	Centering attachment 300 mm	●	●
	Table top 300 mm	●	●

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

All accuracies and uncertainties are quoted at 20°C ± 1°C (68°F ± 1.8°F) with 1-50 µpr Gaussian filter at 6 rpm.
Due to continuing technical improvements, Taylor Hobson reserves the right to change these specifications.

Floor plans



Environmental / services

Model number	R-50/R-80
Weight (without fixtures)	35 Kg
Electrical supply	Alternating supply, single phase with earth (3 wire system) Voltage: 90 - 260 V Frequency: 47 - 63 Hz Consumption (total system): 250 VA max, 160 W
Environmental conditions	Temperature: Operating 10°C - 35°C (50°F - 95°F) Temp / time gradient: less than 2°C / hour (3.6°F / hour) Humidity operating: 30 % to 80 % relative, non-condensing Storage: 10 % to 90 % relative, non-condensing Free air flow rate: 1.0 m / sec maximum 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 cfm) Operating pressure: 4.1 bar (60 psi) Filtering: 5 µm (200 µin) Moisture content – dewpoint: 2 °C (35.6 °F)

Accessories

❶ Flick standard –
For rapid calibration of gauge head sensitivity; alternative to the gauge calibration set.

20 µm (788 µ") range
code 112/2308 optional

300 µm (0.012") range
code 112/2233 optional

❷ 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.

❸ 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**

Bar stylus
A 100 mm (3.9 in) stylus for measuring small diameter components
code 112/3489 optional

'Exploring Roundness' book
A 64-page handbook on the theory and practice of roundness measurement.
code 600-5 standard

❹ Glass hemisphere –
For checking overall system performance. UKAS calibration certificate is optional.

Roundness < 0.05 µm (2 µ")
code 112/436 optional

❺ 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 optional

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

❼ Precision collet chuck – removable
Three ball type location (for use with manual or automated tables)
Note: collet required – see list below.
code 112/3662 optional

112/3554-1.0	1 mm collet
112/3554-1.5	1.5 mm collet
112/3554-2.0	2 mm collet
112/3554-2.5	2.5 mm collet
112/3554-3.0	3 mm collet
112/3554-3.5	3.5 mm collet
112/3554-4.0	4 mm collet
112/3554-4.5	4.5 mm collet
112/3554-5.0	5 mm collet
112/3554-5.5	5.5 mm collet
112/3554-6.0	6 mm collet
112/3554-6.5	6.5 mm collet
112/3554-7.0	7 mm collet
112/3554-7.5	7.5 mm collet
112/3554-8.0	8 mm collet

❽ Magnetic fixture with centering attachment
200 mm internal clamping (max diameter)
80 mm external clamping
code 112/4313

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 optional

Pre-filter element
code 112/2361 optional

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

Kinematic dowel support set –
For stable workpiece mounting.
code 112/1861 optional

Special requests
Taylor Hobson can also provide customized products which are designed to exactly match your requirements. These include work components with specific dimensions and special styli for applications such as small holding devices for bores, shoulders or undercuts.

Surtronic® product range

Surtronic® Duo measures surface roughness at the touch of a button and shows the result on a large colour LCD screen. Cycle time is 5 seconds and the result is saved until another measurement is taken.

- **Ready to use out of the box**
- **Battery life more than 2000 measurements**

Parameters	Range	Resolution
Ra:	40 µm (1600 µin)	0.01 µm (0.4 µin)
Rz, Rv, Rp, Rt:	199 µm (7800 µin)	0.1 um (4 µin)

Surtronic® S-series is range of roughness testers robust enough for the shop floor and flexible enough for any inspection room.

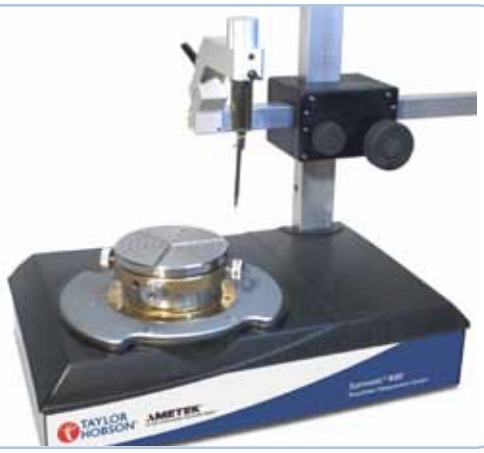
- **Unique stylus lift for total flexibility**
- **Long traverse length & extended pick-up reach**
- **Powerful PC software included**

Inductive pick up	
Gauge range / resolution	400 µm (0.012 in) / 0.01 µm (0.4 µin)
Accuracy (5 µm diamond tip)	1% of reading + LSD µm

The Surtronic® R-50/R-80 is robust enough for the shop floor but accurate for any inspection area, giving a flexible solution for all roundness and form measurements.

- **Patented gauge orientation**
- **Robust enough for 24/7 operation**
- **Easy-to-use touchscreen software**

Feature	
Gauge resolution	30 nm (1.18 µin)
Spindle accuracy	±25 nm (0.98 µin)



Surtronic® R-100 Series builds on the robustness and ease-of-use of the R-50/R-80, offering a higher throughput and improved feature set that includes advanced harmonic analyses and a higher gauge resolution.

- **Robust, fast and easy-to-use**
- **Includes Rapid Centre™ ***
- **Throughput 3 parts / minute including set-up**

Feature	
Gauge resolution	6 nm (0.24 µin)
Spindle accuracy	±25 nm (0.98 µin)

* Centering attachment is supplied as standard with 120/125 models, or available to purchase as an accessory on other models.

TAYLOR HOBSON®

Serving a global market

Full Bright® 福宮通商股份有限公司

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昆山	Tel:	512 - 57751291	Fax:	512- 57751293
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