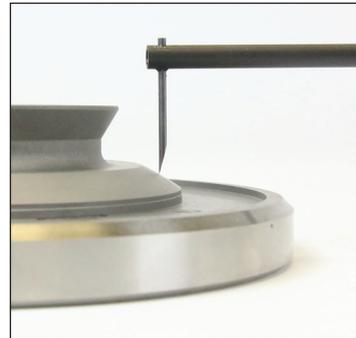
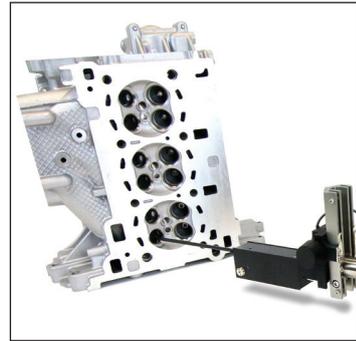


# Intra Touch Intra Contour

Precision shop floor solutions for  
surface finish and contour measurement



Roughness and contour measurement with one gauge

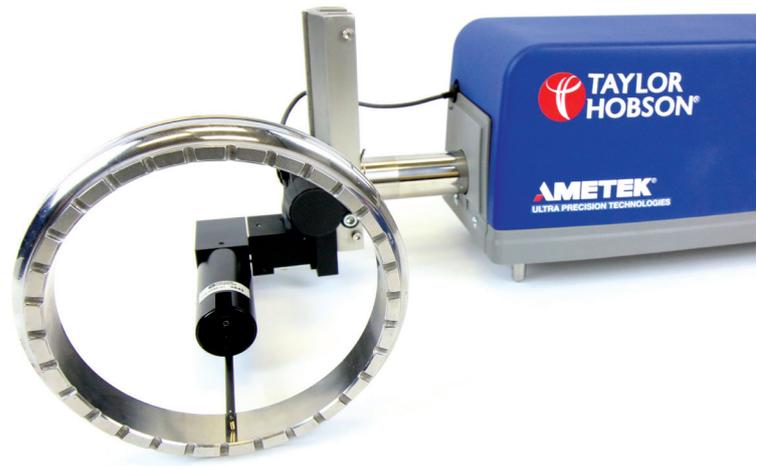
# Intra Range

## Roughness and contour measurement with a single gauge

Housed in a rugged casing, the Intra has a proven history of maintaining accuracy of measurement without the need for constant maintenance or support.

**Quality, flexibility and ease-of-use have enabled the Intra to become a shop-floor standard across a wealth of different industries.**

The Intra combines industry leading specification with simplicity of operation for unbeatable practicality and value



Supplied with All-In-One PC

“Precision shop floor solutions for surface finish and contour measurement”

## Advanced contour measurement

**Cost effective, self-contained, robust portable contour solution with built in 90 mm Z height adjust and optional 350 mm column to accommodate large or tall components.**

Simple, single user interface for calibration, measurement and analysis.

- Patented ball calibration
- Precision glass scale
- Excellent temperature stability
- Roughness and contour on single gauge



### Gauge Linearity

Unless your measurements are all taken within the same vertical position of the gauge range and never exceed the amplitude of the step height master; the data you collect may be non-linear which will cause incorrect results.

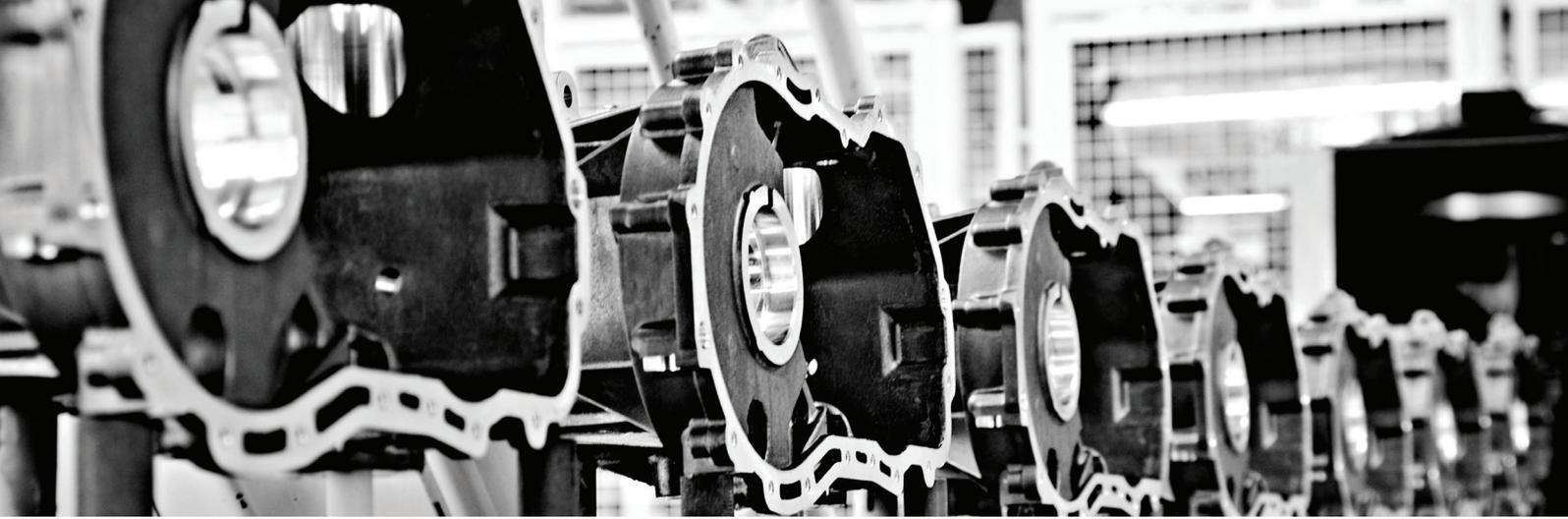
Using ball calibration is more reliable than the step height master as this eliminates non-linearity.

The Intra is calibrated using a unique patented ball calibration to check linearity of the entire gauge range. Many other systems can only use a few points in the range.

### Traverse accuracy

Many roughness checkers are time based, collecting data for a fixed period of time instead of a precise, constant distance. Anything that affects speed of traverse – wear, dirt, slippage, etc. – affects the quantity and spacing of the collected data points which in turn affect the measurement results.

The Intra utilises a glass scale and reading head to ensure that data collection is accurate and consistent. Every measurement on every instrument is calculated from the exact same quantity of identically spaced data points.



## Two gauges to meet all of your demands

You can now use a single gauge to measure both roughness and contour. We offer the high precision gauge for small ranges and a wide range gauge for larger ranges up to 32 mm.

### High precision gauge

This head leads the industry with up to 2 mm (0.08 in) of range and an outstanding range to resolution ratio of 262,144:1. It has a pivoted and balanced beam to allow measurement in any attitude.

#### 1 mm Stylus - Range / resolution

- 1 mm / 4 nm (0.04 in / 0.16  $\mu\text{m}$ )
- 0.2 mm / 0.8 nm (0.008 in / 0.03  $\mu\text{m}$ )

#### 2 mm Stylus - Range / resolution

- 2 mm / 8 nm (0.08 in / 0.31  $\mu\text{m}$ )
- 0.4 mm / 1.6 nm (0.016 in / 0.06  $\mu\text{m}$ )



### Wide range gauge

The wide range gauge provides up to 32 mm (1.26 in) of range with 15 nm (4.8  $\mu\text{m}$ ) resolution. Suitable for form and contour measurements.

#### 32 mm Stylus - Range / resolution

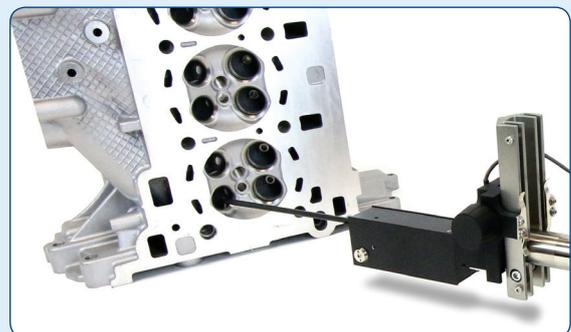
- 32 mm / 125 nm (1.26 in / 4.8  $\mu\text{m}$ )
- 6.4 mm / 25 nm (0.25 in / 1.0  $\mu\text{m}$ )

#### 20 mm Stylus - Range / resolution

- 20 mm / 76 nm (0.79 in / 3  $\mu\text{m}$ )
- 4 mm / 15 nm (0.16 in / 0.6  $\mu\text{m}$ )

#### Four stylus tip options available

- 5  $\mu\text{m}$  roughness tip
- 20  $\mu\text{m}$  chisel tip with 15° included angle
- 0.5 mm (0.02 in) ball tip radius
- 20  $\mu\text{m}$  conical tip with 30° included angle



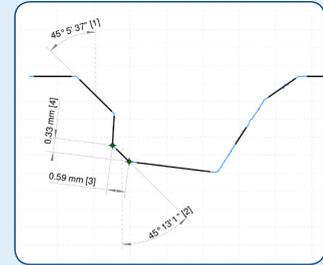
# Designed to suit your application

Meeting the ever increasing demands of next generation technologies

## Measuring brake calliper profile

Measure undercut in two measurements and join them together for analysis

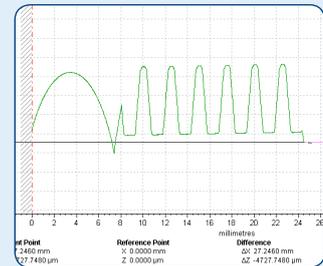
- Intra Contour (wide range gauge)
- 2 mm chisel tip stylus
- TalyProfile Contour software



## Measuring worm gear profiles

Analyse the complete profile for quality checking of parts

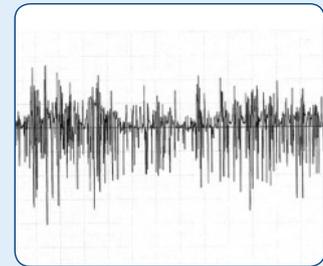
- Intra Contour (wide range gauge)
- 20 mm chisel tip stylus
- TalyProfile Contour software



## Measuring band saw blades

Identify 'chatter' and surface finish variations which can cause fatigue

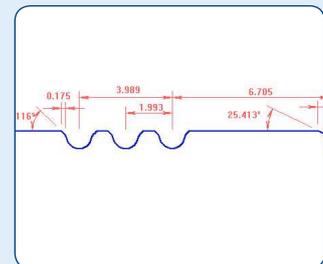
- Intra Touch (high precision gauge)
- 1 mm stylus, column, precision vice and manual Y-stage
- TalyProfile software



## Measuring engine valve grooves

Inspection of parts to eliminate expensive rejects

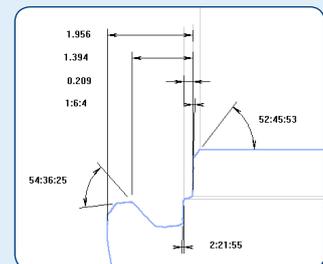
- Intra Contour (wide range gauge)
- 20 mm special knife edge stylus
- TalyProfile Contour software



## Measuring bearing groove

Complete profile quality check on bearings

- Intra Touch (high precision gauge)
- 2 mm chisel tip stylus
- TalyProfile Contour software



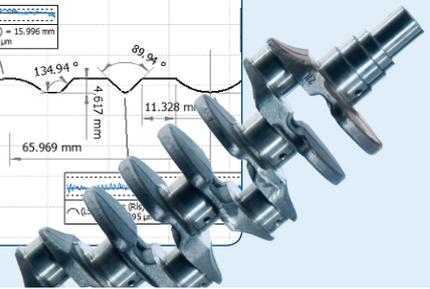
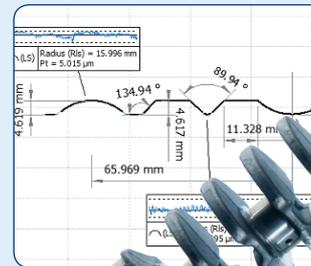
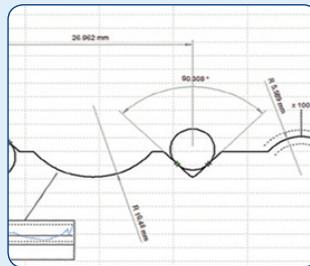


## Key analysis features

Unparalleled measurement capability for surface finish and contour

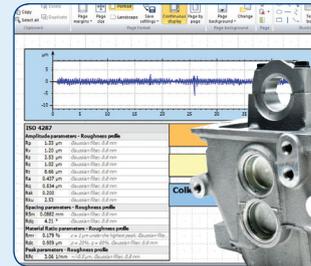
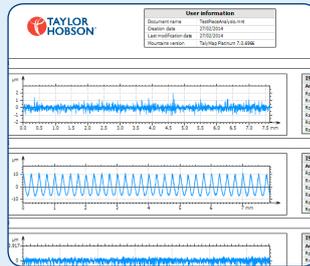
### Contour & Roughness

- Angle, radius & distance
- Form error / Pt
- Arc roughness
- Tolerancing



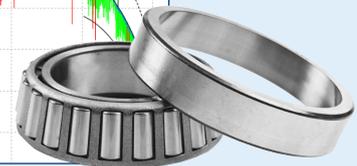
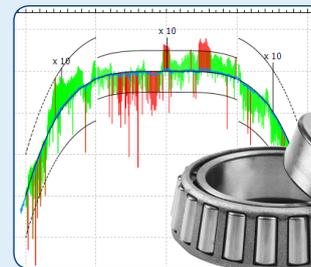
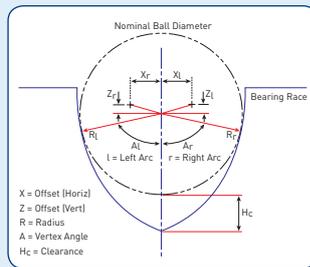
### Roughness & Waviness

- 150 Parameters
- ISO 4287,
- ISO 13565-2
- ISO 12085



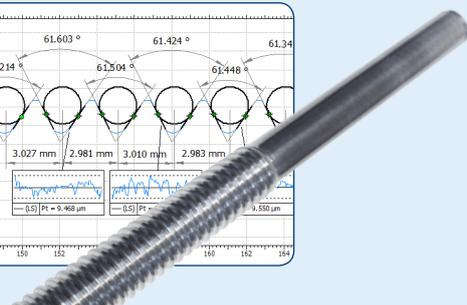
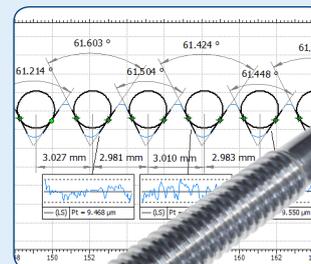
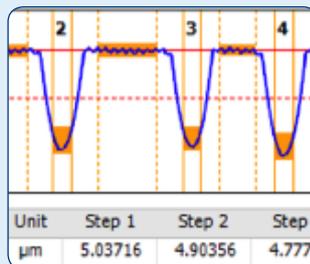
### Advanced Contour

- V-groove analysis
- Gothic arch analysis
- Auto dimensioning
- DXF import and export



### Screws / Steps

- Screw threads
- Ball screws
- Bone screws
- Fluid dynamic bearings



# Powerful software - TalyProfile

TalyProfile is a dedicated, Windows® software package, designed for use with the Intra range.

## Roughness analysis

Two versions are available.

- TalyProfile “**Silver**” has all functions typically used for a shopfloor inspection.
- TalyProfile “**Gold**” has all the benefits of TalyProfile “Silver” with the addition of complete laboratory analysis functions.

	Silver	Gold
Patented Ball Calibration	✓	✓
Multi-language Support	✓	✓
EN, FR, DE, ES, IT, BR, PL, CN, KR & JP	✓	✓
Auto / Manual Levelling	✓	✓
ISO 4287 / ASME B46.1 Parameters	✓	✓
ISO 13565 Automotive Parameters	✓	✓
ISO 12085 R&W motifs	✓	✓
Area of Hole / Peak	✓	✓
Profile Parameters and Curves	✓	✓
Roughness & Waviness Curves	✓	✓
Distance and Height Measurement	✓	✓
Interactive Material Ratio Curve	✓	✓
Tolerance Limits Pass / Fail	✓	✓
Auto Step Height Measurement		✓
Form Removal		✓
Filtering by FFT		✓
Thresholding		✓
Frequency Spectrum		✓
Power Spectrum Density		✓
Retouch / Edit Profile Points		✓
Matlab Script Data Processing		✓

## Windows PC specification

	Recommend
Operating system	Windows 10
Screen size	15 inch
Screen resolution	1920 × 1080
Memory (RAM)	2 GB
CPU speed	1.8 GHz
Hard disc	64 GB

## Contour analysis

Two versions are available.

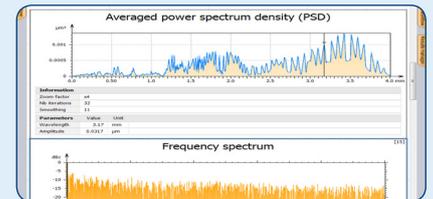
- TalyProfile “**Basic**” Contour
- TalyProfile “**Advanced**” Contour

Both versions of TalyProfile Contour include TalyProfile “**Gold**”

	Basic	Advanced
Distance dimension	✓	✓
Horizontal dimension	✓	✓
Vertical Dimension	✓	✓
Radius dimension	✓	✓
Diameter dimension	✓	✓
Angle dimension	✓	✓
Supplementary angle dimension	✓	✓
Reflex angle dimension	✓	✓
Change angle type	✓	✓
Add label	✓	✓
Zoom Tools	✓	✓
Number of digits	✓	✓
Angular units	✓	✓
Display / Hide results ID	✓	✓
Parameter and tolerances	✓	✓
Auto-dimension		✓
Oblique dimension		✓
Point to arc or segment dimension		✓
Angle of an arc		✓
Reflex angle of an arc		✓
Residue tool		✓
Deviation tool		✓
Table of Gothic Arch parameters		✓
Import / Export DXF		✓
Align profile zones with DXF		✓
Align elements with DXF elements		✓
Align whole profile with DXF		✓
Create DXF from profile elements		✓
Profile matching		✓
Auto-partition		✓
V-Groove analysis		✓
Deviation margins		✓
Deviation tolerance		✓

## Advanced time-saving analysis templates

A ‘template’ can be created whereby a sequence of analysis functions can be saved and applied to future measurements, turning detailed reporting tasks into routine documents.



## Desktop publishing facility

TalyProfile offers a comprehensive desktop publishing function which allows clear presentation of measurements, results and profiles. Graphs, profiles and results can be arranged from within the TalyProfile software giving complete flexibility in reporting.

## In depth analysis

Profiles can be levelled and zoomed to remove unwanted features or defects from the analysis. Distance measurement between features of a profile are easily achieved and the information can be displayed graphically and numerically. Step height and the area of a valley or peak can also be calculated.

## Full compatibility

Surface finish results from other Taylor Hobson surface roughness instruments can be imported to TalyProfile software, allowing a uniform report style to be used throughout your workshop or laboratory.

## Pass / Fail tolerances

All parameters can be assigned nominal, minimum and maximum values.



Taylor Hobson instruments aid the study of the International Space Station Solar Array Anomaly

# Unique patented ball calibration routine

Artefacts from Taylor Hobson's UKAS approved laboratory are used throughout the process

## The benefit

Taylor Hobson's Intra systems use a patented ball calibration routine to ensure that the dimensional measurement capability and gauge linearity are calibrated in a single, automated operation. This routine uses high-precision spherical calibration artefacts that have been produced to exacting standards and then calibrated for radius, form and surface finish in our own UKAS approved laboratory. Our automated routine delivers a true gauge calibration.

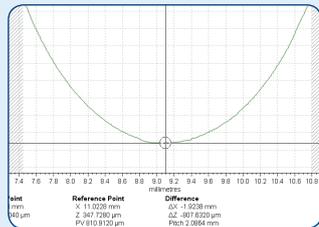
## The process

In operation the user simply completes a dialogue confirming parameters such as the percentage of gauge range to be used and the traverse speed. Working from knowledge of the stylus geometry and the dimensions of the calibration standard, the software automatically calculates the measurement properties and drives the traverse unit, completing the calibration with the minimum of operator intervention.

## Ultra software – comprehensive surface finish analysis

The Intra system is also compatible with Ultra, which is an alternative to TalyProfile. Fundamental roughness and waviness parameters are included, plus form error analysis, feature exclusion, zoom tool and full programmability for shopfloor applications.

- **Form analysis**  
Measure and evaluate radius, angle (slope) and dimension
- **Dual profile analysis\***  
Allows comparison of measurements for wear, tolerancing, etc.
- **Simple user interface**  
Combines simple calibration, measurement and analysis to deliver a true shop floor solution.
- **TalyMap 3D analysis**  
Software utility for topography applications; special hardware is also required.



\* Ultra Software licence options

# Expanding your capability

Everything you need to begin using Intra touch is supplied as standard. However, for more demanding measuring requirements, we have a range of styli and accessories that may be ordered separately.

## Stylus options

### 1 mm / 2mm (high precision gauge)

#### **D 112-2009**

Type: Diamond  
Reach: 50 mm  
Shank Clearance: 5.3 mm  
Tip radius: 2  $\mu$ m  
Tip angle: 90°  
Minimum bore: 10 mm

#### **B 112-2010**

Type: Ball  
Reach: 110 mm  
Shank Clearance: 11.5 mm  
Tip radius: 0.5 mm  
Tip angle: N/A  
Minimum bore: 17 mm

#### **D 112-2011**

Type: Diamond  
Reach: 50 mm  
Shank Clearance: 11.3 mm  
Tip radius: 2  $\mu$ m  
Tip angle: 90°  
Minimum bore: 17 mm

#### **SB 112-2012**

Type: Small bore diamond  
Reach: 50 mm  
Shank Clearance: 0.42 mm  
Tip radius: 2  $\mu$ m  
Tip angle: 90°  
Minimum bore: 1.6\* mm

#### **C 112-2013**

Type: Special chisel  
Reach: 50 mm  
Shank Clearance: 5.3 mm  
Tip radius: 2  $\mu$ m  
Tip angle: 90°  
Minimum bore: 10 mm

#### **D 155-P37279**

Type: Diamond  
Reach: 110 mm  
Shank Clearance: 11.3 mm  
Tip radius: 2  $\mu$ m  
Tip angle: 90°  
Minimum bore: 17 mm

\* 1.6 mm up to 6 mm deep, 2 mm up to 13 mm deep, 3 mm up to 25 mm deep and 5 mm up to 50 mm deep.

### 20 mm (wide range gauge)

#### **C 112-5444**

Type: Chisel  
Reach: 105 mm  
Shank Clearance: 20 mm  
Tip radius: 20  $\mu$ m  
Tip angle: 15°  
Minimum bore: 27 mm

#### **D 112-5446**

Type: Diamond  
Reach: 105 mm  
Shank Clearance: 20 mm  
Tip radius: 5  $\mu$ m  
Tip angle: 60°  
Minimum bore: 27 mm

#### **B 112-5462**

Type: Ball  
Reach: 105 mm  
Shank Clearance: 20 mm  
Tip radius: 0.5 mm  
Tip angle: N/A  
Minimum bore: 27 mm

### 32 mm (wide range gauge)

#### **C 112-5445**

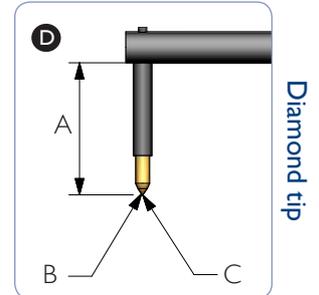
Type: Chisel  
Reach: 173 mm  
Shank Clearance: 32 mm  
Tip radius: 20  $\mu$ m  
Tip angle: 15°  
Minimum bore: 40 mm

#### **B 112-5447**

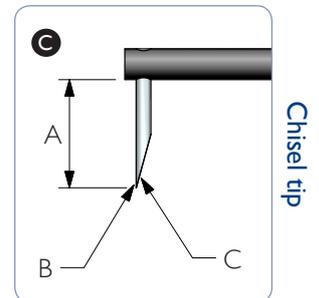
Type: Ball  
Reach: 173 mm  
Shank Clearance: 32 mm  
Tip radius: 0.5 mm  
Tip angle: N/A  
Minimum bore: 40 mm

#### **D 112-5463**

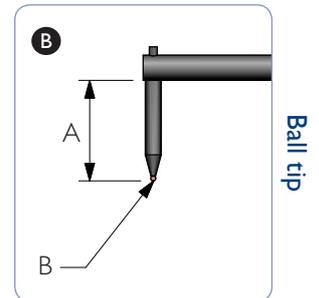
Type: Diamond  
Reach: 173 mm  
Shank Clearance: 32 mm  
Tip radius: 5  $\mu$ m  
Tip angle: 60°  
Minimum bore: 40 mm



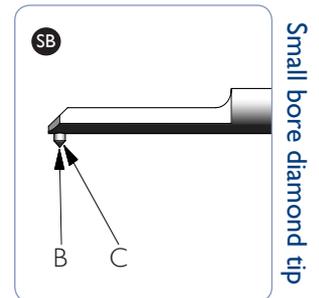
Diamond tip



Chisel tip



Ball tip



Small bore diamond tip

#### Styli tip

- A: Shank clearance
- B: Tip radius
- C: Tip angle

## Standard Intra accessories

### 1 Calibration ball/hemisphere

Glass standards for calibrating the Intra systems.

- 12.5 mm (0.49 in) radius  
**112-2062\***
- 38.76 mm (1.526 in) radius  
**112-5417\***

### 2 Step height and roughness master

- 3 Line (2.5  $\mu\text{m}$  + 0.4  $\mu\text{m}$ ) and Ra (0.8  $\mu\text{m}$ )  
**112-557\***
- 0.3  $\mu\text{m}$  Ra glass standard  
**112-4304\***
- 1.6  $\mu\text{m}$  Ra glass standard  
**112-4303\***

### 3 Ball joint vice

Provides universal positioning via 360° rotation and 180° tilt; especially for lightweight or small components.

**112-2695**

### 4 Precision vice

High carbon steel construction with precision ground faces, 90° vee on clamping jaws.

**112-2694**

### 5 Manual Y-stage

Precision stage assembly with Y-axis positioning for component fixturing and cresting.

**112-3163**

### 6 Y-stage with vee block

Simple stage assembly with Y-axis positioning. 90 x 90 mm (3.5 x 3.5 in)

**112-3067**

### 7 Vee blocks (pair)

For the positioning and support of large, cylindrical components.

**112-1645**

### 8 Right angled attachment

Allows the stylus and gauge (1 mm & 2 mm only) access to components at 90° to the traverse unit.

**112-4485**

### 9 Ball and roller unit

Special fixture for circumferential inspection of surface finish.

**112-3219**

### 10 Roller plates

Cylindrical roller plates for balls with diameters of 1 - 16 mm (0.04 - 0.63 in) - set of 3, fits to 112-3219.

**112-3248**

### Ball roller plates

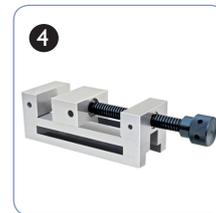
Ball roller plates for balls with diameters of 1 - 25 mm (0.04 - 0.98 in) - set of 4, fits to 112-3219.

**112-3247**

### 11 6-jaw component chuck

Self centring with removable jaws, can be used internally or externally. Mounts kinematically onto table top.

**112-1859**



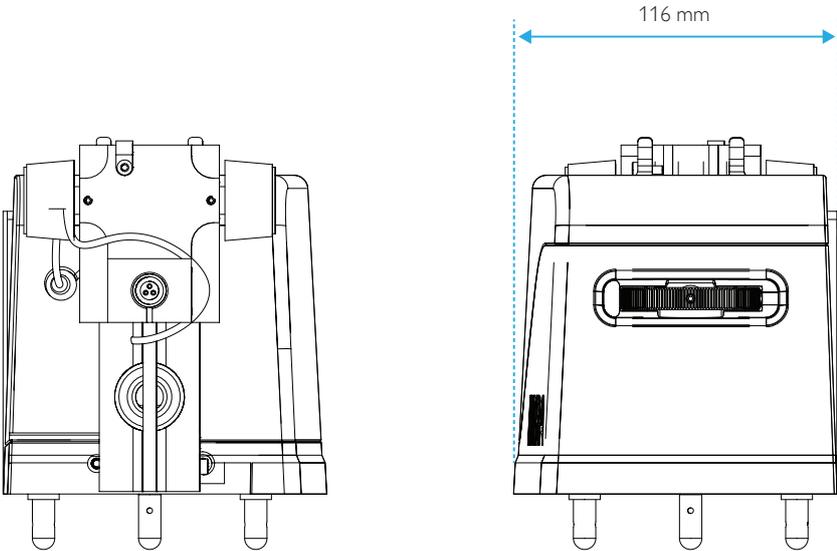
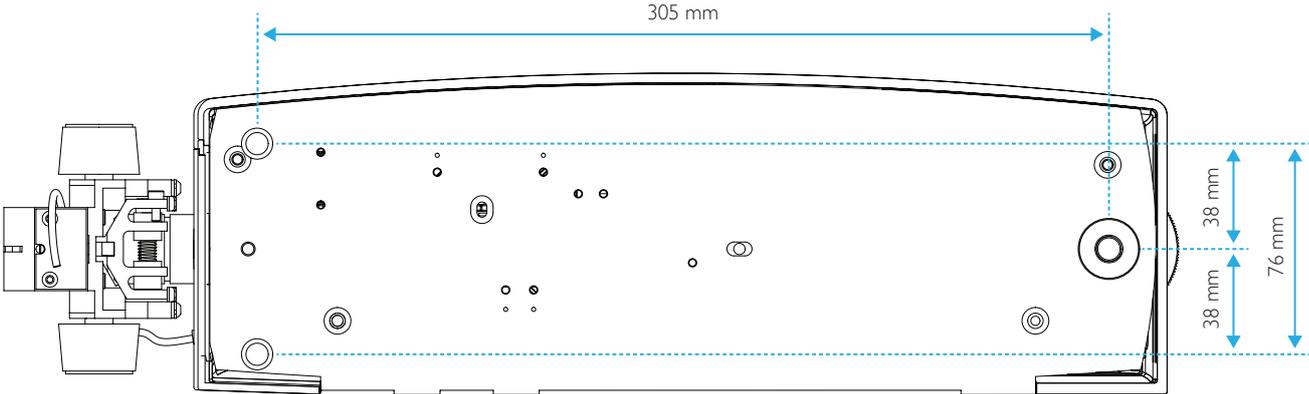
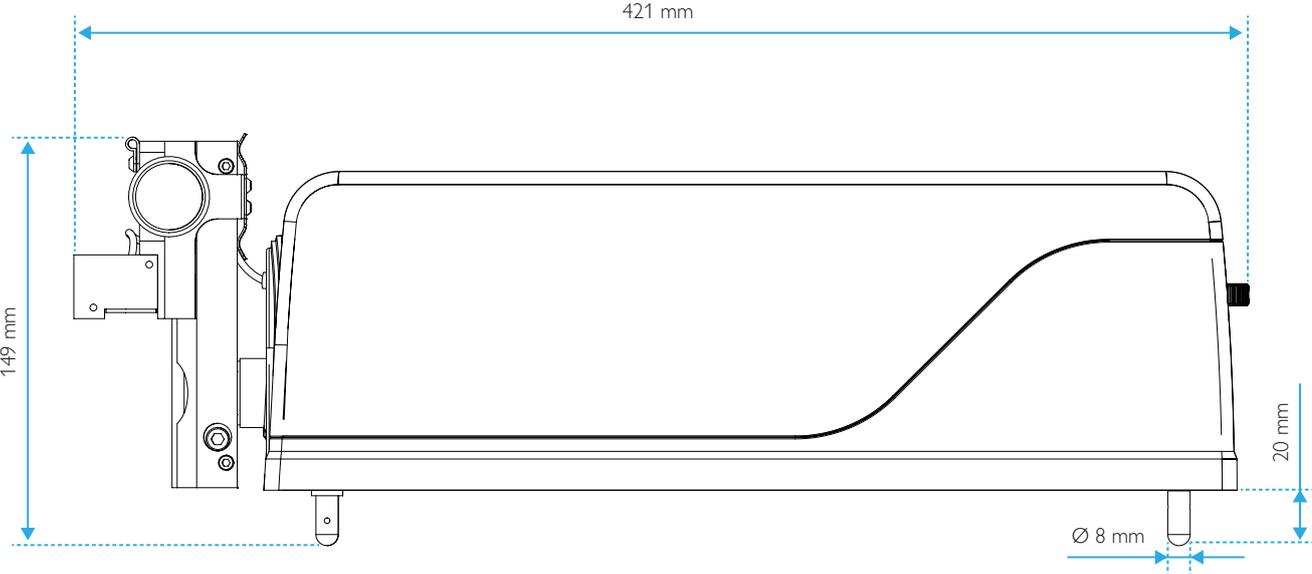
Specifications are subject to change without notice.  
\* UKAS calibration available. Add 'UC' to code.

## Customised solutions

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.



# Intra range dimensions



# Surtronic® product range

**Surtronic® Duo** measures surface roughness at the touch of a button and shows the result on a large colour 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 10,000 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 µm (4 µin)



**Surtronic® R-100 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



**Surtronic® R-100 Series** is range of roundness systems, robust enough for the shop floor but accurate for any inspection area, giving a flexible solution for all roundness and form measurement.

- 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)



**Talyrond® R-170 Raceway** is a high speed roundness measurement system designed specifically to address the extreme demands of high volume bearing production measurement.

- Fully active anti-vibration and active levelling
- Robustness - suitable for 24/7 operation
- Ease of use - touchscreen software

Feature	
Gauge resolution	6 nm (0.24 µin)
Spindle accuracy	±15 nm (0.59 µin)



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

## 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](http://www.taylor-hobson.com)

## Sales department

Email: [taylor-hobson.sales@ametek.com](mailto: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](mailto: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](mailto: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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