Vertex

Vertical Measuring System

UKAS CALIBRATION 0333

ELEY METROLOGY LIMITED

Vertex VMS

The patented Vertex VMS (Vertical Measuring System) is unique in the field of Height Gauges.

At the point of release in July 2013 it offered new features to support the claim that this is the best product of its type in the world.

The features include the following:

- 1D and 2D measurement
- Air bearings to the base and the Z axis carriage
- Air bearings to the counter balance system
- Probe contact pressure of 40g (adjustable)
- Pneumatic locks to the carriage and base
- Squareness of front and side planes within 5.0 microns
- Non-error mapped. Maximum error over a range of 3.5 microns (VMS 800)
- Integral printer (optional)
- Customised printer output (optional)
- Orbital "hole in the wall" display
- Dual probe facility as standard
- Unique probe location and securing system
- Motorised probing operation driven through a contactless eddy current clutch
- Latest rechargeable battery technology, continuous usage in excess of a normal shift
- Performance supported by UKAS Certification
- Patented system

1D Measurement

Comprehensive measurement of heights, drops, internal and external diameters, TDC (Top Dead Centre), BDC (Bottom Dead Centre), internal gap, external gap and centre to centre measurement
Multiple datum facility, up to 8 assignable datums
Comprehensive probe qualification
Squareness measurement from front and side surface
Scribing facility for layout work
Print function for ALL or SELECTED output

The Vertex supports the use of an analogue probe if required. An additional unit plugs into the ECU (Electronic Control Unit) to access this feature.

All functions are performed as autonomous routines with no pipes or trailing wires. However, if communications are needed to be passed to peripheral devices like a printer or network then this can be performed via the RS232C or USB facility.

Squareness/Perpendicular face measurements are performed and shown digitally on the ECU. The result can be printed or plotted from the onboard integral printer.


TRI-COLUMN
AIR BEARING CARRIAGE
ECU
(ELECTRONIC CONTROL UNIT)
DUAL PROBE HOLDERS
AIR LOCK- OFF VALVES
MOTOR DRIVE CONTROL
QUICK FUNCTION KEY PAD
AIR BEARING BASE
VMS 1000
VERTEX

2D Measurement

The Vertex offers 2D measurement to supplement the comprehensive 1D capability with powerful onboard processor firmware.

Capabilities include:

- Rectangular and polar coordinates
- Alignment of features
- PCD (Pitch Circle Diameter) measurement

The Vertex has only one axis (X axis). However, if it is possible to rotate the component through a known angle the second axis – the Y-axis can be produced.

A good example of the capability and flexibility of the Vertex when performing a 2D routine is the measurement of a crankshaft.

The crankshaft is shown mounted on V blocks.

The principle of operation is that the features to be measured are numbered in sequential order. The component is required to be accurately rotated to provide the Y axis. In the example it will be rotated 90 degrees. A simple index plate has been attached to the flywheel face in the correct position relative to the required datum. It is set parallel to the surface table. *See fig. 1*

All the numbered features are measured and stored within the ECU. Once the sequence of measurement providing the X axis has been completed the 90 degree rotation is made.

The sequential operation of the X axis is now duplicated 90 degrees out of phase to provide the Y axis. *See fig. 2*

With the entire feature information now stored the ECU firmware can be interrogated from the keyboard. 2D coordinates can be recalled and manipulated. Datums can be moved. Rectangular and polar information, along with diameters can be produced.

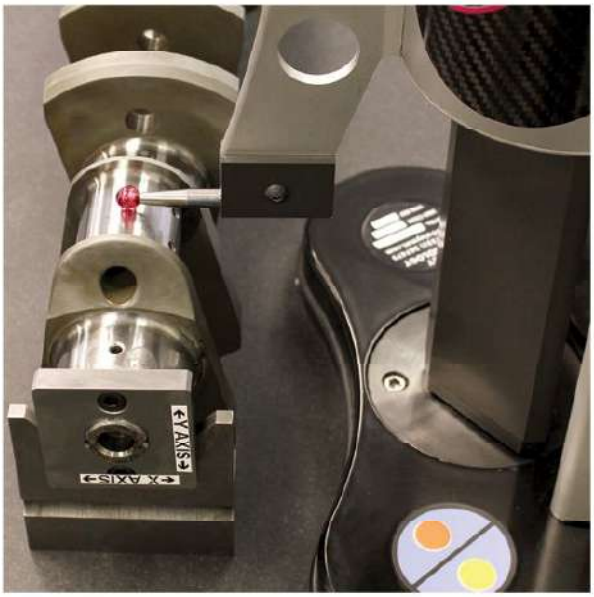


Figure 1

Figure 2

ECU Electronic Control Unit

The programmable 3 axis ECU is reminiscent of a "hole in the wall" display. The viewing area is kept clear apart from key information being displayed. An "orbital keypad" as the description implies is active around the viewing area offering the user an intuitive aspect with regard to software commands.

The viewing screen is produced from a clear robust polycarbonate material. The tactile keypad indicates to the user that a command has been made.

An ergonomic design provides a platform for accessing the multifunctional application software.

The integral printer (optional) offers a specific or print all capability.

A digital probe option is available as a plug in accessory when squareness measurements are made.

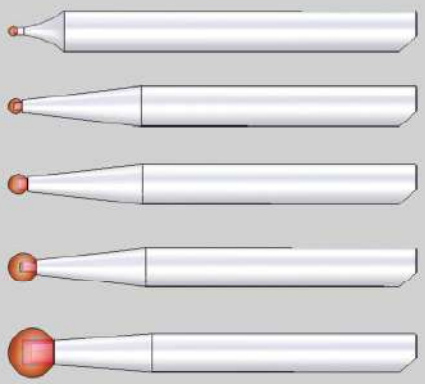
LVDT
Linear Variable Differential Transformer

The LVDT probe is used as an alternative to a test dial indicator to accurately determine the squareness or perpendicularity of a face.

Employed in conjunction with the VMS, it offers greater precision than a laboratory grade, block-type master square.

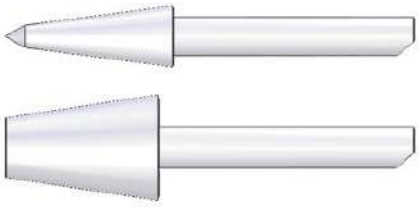
The results can be recorded by the integral mini printer of the ECU.

Vertex Probes and Accessories



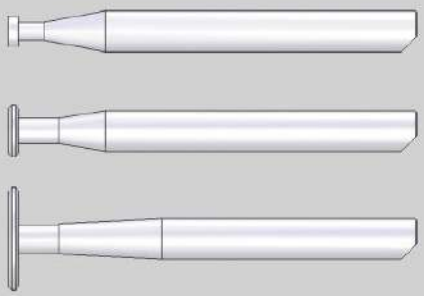
Sphere Probe: Available with ruby or steel spheres in 2,3,4,6 and 10mm diameters.

Uses: *Internal/external diameters, heights, drops, distance between features, centre to centre measurement of diameters.*



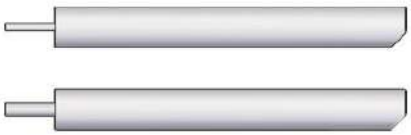
Taper Probe: 0 - 12mm and 12 - 20mm.

Uses: *Pitch between holes.*



Disc Probe: 6, 10 and 20mm diameters.

Uses: *Internal/external diameters and distance. Useful for features such as circlip grooves.*



Pin Probe: 1.5 and 2.5mm diameters.

Uses: *Measuring small features such as holes in sheet metal.*

Parallel Probe

Uses: *Sheet metal internal/external diameters, heights/drops and distance between features.*

Dial Indicator Holder

Uses: *Accepts probes of 6mm diameter.*

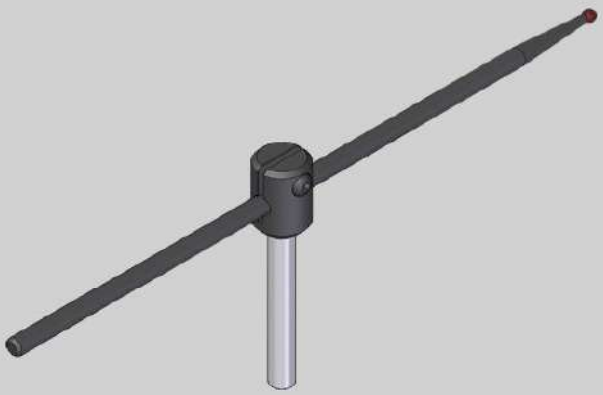
Scriber

Uses: *Layout work on castings, sheet metal etc.*

Vertex Probes and Accessories

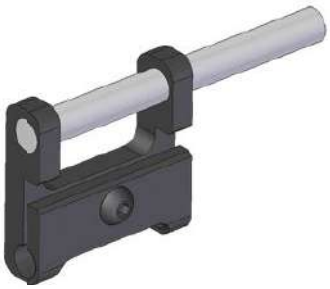
Depth Gauge: Carbon fibre 240mm extension.

Uses: *Measures depths, stepped faces etc.*



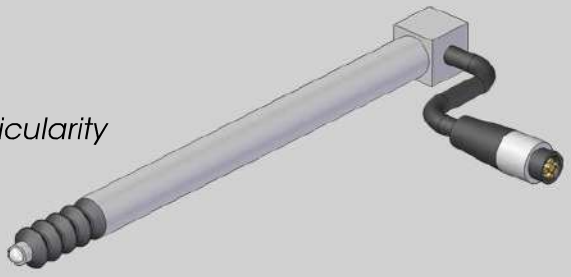
Offset Probe Holder

Uses: *Acts as a reduced height probe holder, useful for hard to reach features inside lips of products etc.*



LVDT Transducer Probe

Uses: *Very high accuracy straightness and perpendicularity measurements.*



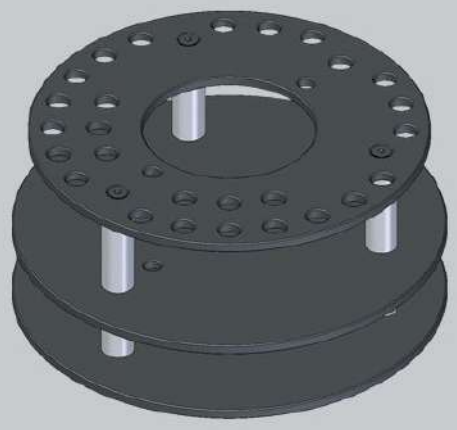
Swivel Probe Holder

Uses: *Holds probe at an angle whilst measuring useful for LVDT transducer probe.*

Carbon Fibre Extension Probe: 150mm extension with 10mm diameter ruby or steel sphere. 150mm extension with 20mm diameter disc.

Uses: *As regular sphere and disc probes but with 150mm length.*

Vertex Probes and Accessories

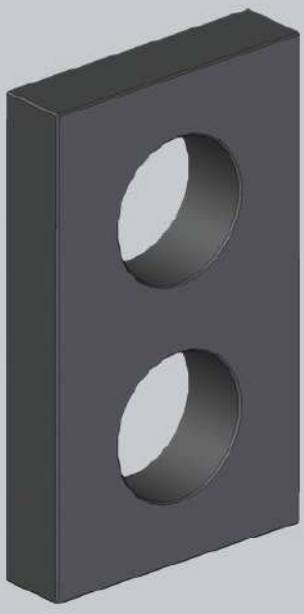


Probe Carousel

Uses: *Stores all probes whilst not in use, helps prevent damage or loss of VMS accessories.*

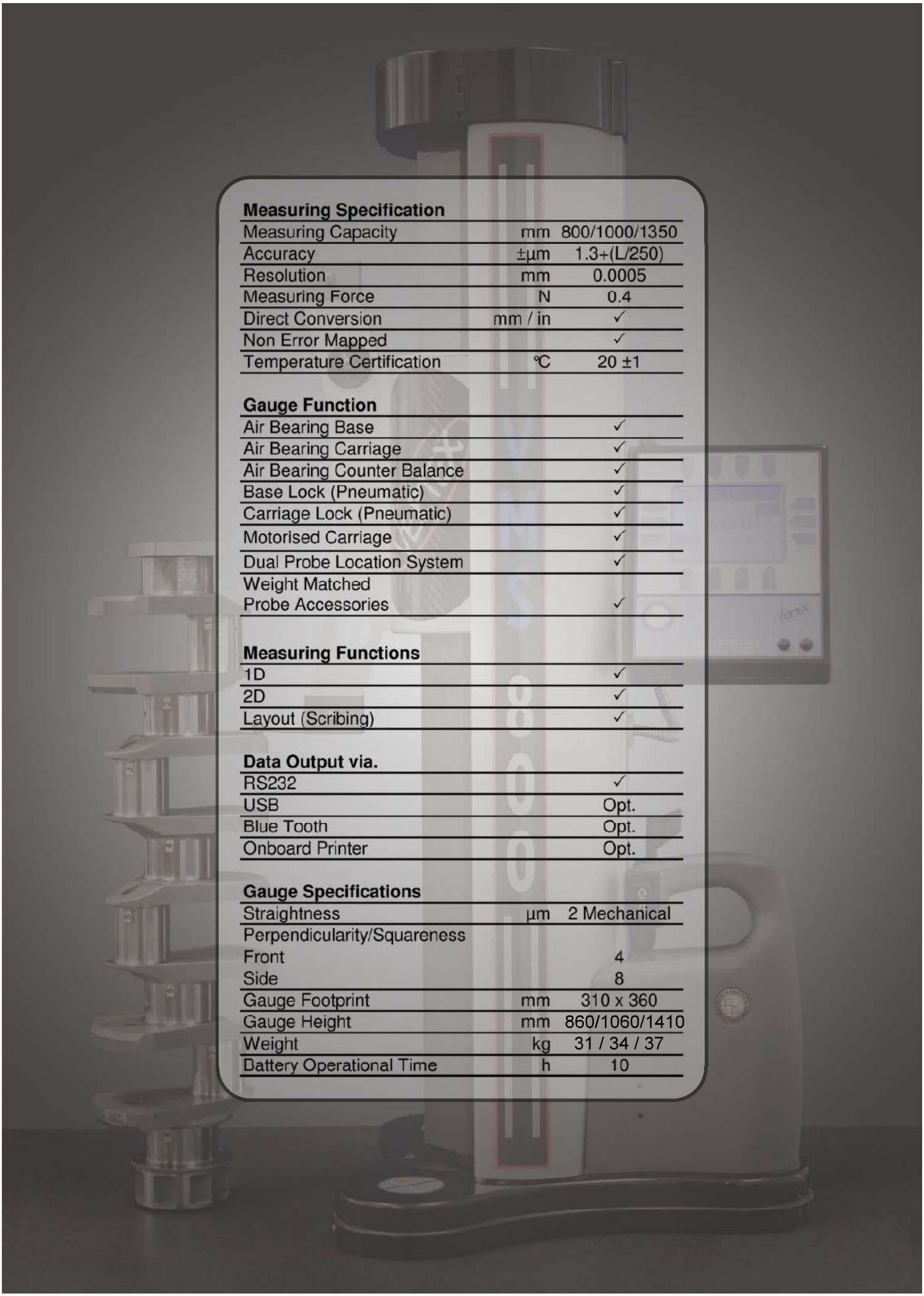
Training Piece: Mounted to 300 x 200 granite square

Uses: *Empolyed during VMS training to perform all measuring procedures.*



Master Granite Block: 500 x 300 granite square - Grade AA

Uses: *Qualifing the VMS gauge.*



Measuring Specification		
Measuring Capacity	mm	800/1000/1350
Accuracy	±µm	1.3+(L/250)
Resolution	mm	0.0005
Measuring Force	N	0.4
Direct Conversion	mm / in	✓
Non Error Mapped		✓
Temperature Certification	℃	20 ±1

Gauge Function	
Air Bearing Base	✓
Air Bearing Carriage	✓
Air Bearing Counter Balance	✓
Base Lock (Pneumatic)	✓
Carriage Lock (Pneumatic)	✓
Motorised Carriage	✓
Dual Probe Location System	✓
Weight Matched Probe Accessories	✓

Measuring Functions	
1D	✓
2D	✓
Layout (Scribing)	✓

Data Output via.	
RS232	✓
USB	Opt.
Blue Tooth	Opt.
Onboard Printer	Opt.

Gauge Specifications		
Straightness	µm	2 Mechanical
Perpendicularity/Squareness		
Front		4
Side		8
Gauge Footprint	mm	310 x 360
Gauge Height	mm	860/1060/1410
Weight	kg	31 / 34 / 37
Battery Operational Time	h	10

Eley Metrology

Eley Metrology Limited was founded in 1976. The corporate strategy began as it remains today, that of total manufacture of products sold by the company.

The first products introduced were precision tooling items and granite artefacts, surface tables to BS817, master granite squares to BS939 and master straight edges to BS5535.

Originally specialising only in the mechanical engineering field it soon became clear that metrology products in their more sophisticated forms were a combination of technologies - precision mechanics, electronic engineering and computer software. By 1984 the company had become well established in all these areas.

In that year the company launched the range of Truth CNC coordinate measuring machines. While the Micro Vertex height gauge, introduced some three years earlier, had gained a foothold in all major markets worldwide.

New custom built freehold premises were completed in 1989 and in 1991 the company became an approved UKAS laboratory, number 0333, offering traceable certificates on all of its products.

In 1996 the Millennium was introduced to enhance and increase the range of coordinate measuring machines produced by the company.

Eley Metrology Limited became the first United Kingdom UKAS laboratory to gain accreditation to ISO 10360, the standard covering accuracy performance verification of CMMs. Thus, underlining commitment to excellence, quality and traceability.

In 2002, Eley Metrology Limited acquired Crown Windley Limited, the oldest metrology company in the world, formed in 1904. Crown became known as the brand leader for their surface plates and tables made from granite and cast iron, along with other metrology standards. The Crown range of cantilever arm CMMs complimented the bridge range of products by their new owners.

The latest product release came in 2012 when Eley Metrology Limited proudly launched and successfully installed their groundbreaking LBM series, and in doing so established new boundaries of precision for the internal measurement of long bores.

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