

A Company for Metrology Solutions



## Laboratory Measuring Equipment

Measuring Machines  
for Precision Calibration

Shaft Measuring  
Machines



Multi-Gauging Systems

Auto-Gauging Systems

Robotic Inline  
Inspection Systems

3D Co-ordinate  
Auto-Gauging Systems

## Customised Gauging Solutions



## Global Customers

Major Customers for Calibration laboratory equipments -  
ISO / IEC 17025 Accredited Laboratories Worldwide.



## Our worldwide presence



## Our Esteemed Clients



## Award, Recognition & Certification



**CODISSA Award**  
Innovative Product Award for  
LMM 300 – Length Measuring Machine  
at INTEC 2010 – Coimbatore

### FIE Foundation Award



Innovative Technology Product Award  
for Metro Form – Crank & Cam Shaft  
Metrology System at IMTEX 2011 – Bangalore



Certification : ISO 9001 : 2015

Group Companies :





### *About Us*

**Octagon Precision India (P) Ltd.** Established in 2005, is a mainly R & D intensive company that designs, develops and manufactures a wide range of metrology products. Our expertise and in-house infrastructure in precision mechanics, application software, robotics and automation enables us to reliably bring world best laboratory equipment and customised gauging products from concept to market.

Over a span of nearly two decades, we have developed a complete range of Dimensional Calibration Lab equipment which are now been installed in 1000+ accredited calibration labs in 50+ countries. In customised gauging system we offer, PLC based completely automated gauging systems for measurement and analysis of multiple dimensional parameters of precision engineering parts, for shortest cycle time targets.



*Assembly Shop, Pune*

We are a team of 50 highly skilled and motivated personnel who are committed to the highest work ethics, customer service and innovative thinking. Since its incorporation in 2005, Our Company has grown consistently and has exceeded 50% growth in the last few years. We at Octagon Precision are committed to produce cutting-edge technology products at world-beating prices. To achieve this, we think creatively, carry out intensive R & D and persistently work hard to adopt latest technology products and processes. We work very closely with our customers from the design and development stage itself, thereby achieving holistic product designs that will invariably succeed in the market.



*Sales and Marketing Office in Pune*

# Universal Length Measuring Machines

- Granite or Seasoned Rugged Cast Iron Base for Highly Stable precision measurement application
- High Resolution Optical Incremental Encoder Systems or Laser Interferometer system.
- Compliance with Abbe's principle.
- 5 axis machine work table with fine movement for easy location of inversion point.
- Interfaced with Windows based Octagon ULM Inspect Gauge calibration and management Software.



## LMM Silver

**Measuring Range:** External – 400mm/ 600mm, Internal – 300mm/ 450mm

**Resolution:**  $0.1\mu\text{m} / 0.01\mu\text{m}$ . **M.U.:**  $0.3 + L / 2000\mu\text{m}$



## LMM Gold

**Measuring Range :** External – 600mm / Internal – 450mm

**Resolution:**  $0.1\mu\text{m} / 0.01\mu\text{m}$ .

**Measurement Uncertainty:**  $0.2 + L / 2000\mu\text{m}$ ,

$*0.09 + L / 2000\mu\text{m}$  (\*Available on request )

Air bearing slides for precision rapid movements for measuring head & tail stock.

## LMM Gold Plus

LRSER 

**Measuring Range:**

Absolute Range 1000mm/2000mm/3000mm

**Resolution :**  $0.01\mu\text{m}$

**Measurement Uncertainty :**

$0.1 + L / 2000\mu\text{m}$





### LMM 40

#### Measuring Range :

External – 60mm / Internal – 40mm

Resolution:  $0.1\mu\text{m}$

M.U.:  $0.5 + L / 1000 \mu\text{m}$

#### Application : Calibration of

- Plain Plug Gauges
- Thread Plug Gauges
- Plain Ring Gauges
- Thread Ring Gauges
- Snap Gauges
- Long Gauge Blocks
- Length Bars
- Setting Rods
- Taper Gauges
- Taper Thread Plug Gauges
- Spline Plug Gauge
- Spline Ring Gauge
- Plunger Dial Gauge
- Lever Dial Gauge
- Bore Gauges
- External Micrometers
- Internal Micrometers (2 point / 3 point).



### LMM 100

Measuring Range : Internal – 100mm

Resolution:  $0.1\mu\text{m}$

M.U. :  $0.5 + L / 1000 \mu\text{m}$



### LMM 400

Measuring Range : External – 400mm/  
Internal – 300mm

Resolution :  $0.1\mu\text{m}$

Measurement Uncertainty :  $0.5 + L / 1000 \mu\text{m}$



### LMM 600

Measuring Range :

External – 600mm /  
Internal – 450mm

Resolution :  $0.1\mu\text{m}$

Measurement Uncertainty :

$0.5 + L / 1000 \mu\text{m}$



**Octagon**

He-Ne Laser measurement system allows for longer absolute measuring range. Air bearing slides for precision rapid movements for measuring head and tail stock.

# Precision Length Measuring Machines



## Octagon - LMM Diamond

**Measuring Range :** 400mm/ 700mm/ 1000mm/ 1500mm/ 2000mm/ 3000mm

**Measurement Uncertainty :**  $1.5 + L / 400 \mu\text{m}$

- A model of Length Measurement Machine for larger direct absolute range.
- Simplest, fastest, most reliable, precise measuring machine for instrument settings.
- Optical Scales with absolute and incremental correction
- Wide range of accessories, for variety of measurement & setting applications.

## ULM Inspec Software



- Online Data acquisition from ULM
- Operator guided measurement program for plain gauges, thread gauges, spline gauges & inspection / calibration measuring instruments like dial indicators, bore gauges & micrometers.
- Facility for thermal error corrections (Manual / Online)
- Calibration report generation in the format complying to ISO/IEC 17025.
- Gauge record management including calibration date, user details, gauge type, due dates etc.



# Scale & Tape Measuring System



## MSTC -1000 / 2000

**Measuring Range :** 1000mm/ 2000mm **Resolution :** 0.001mm

**Measurement Uncertainty :**  $\pm(10 + L / 100) \mu\text{m}$

Measuring Scale & Tape Calibration System

Calibration unit for Precision measuring scales, rules & measuring tapes.

Motorised,  
Computer Programmable  
Movement available as  
an option.

### Features

- Cost effective calibration unit.
- Most advance digital Imaging technology
- High Precision digital incremental measuring system with 0.001 mm resolution as reference.
- Stable & Robust measuring structure designed for user friendly operation.
- Powerful Software assisted measurement and evaluation system.

### Applications

- For checking scale and measuring tapes.
- Comparison of digital image with 10X Magnification.
- Loading System : Tapes are clamped at their start ( or other position) & fixed or counter set. Clamped section of the tape become exposed to a drawer load.
- Steel rules are clamped and counter set against their reference side.

### Software ▶



- Online Data Acquisition
- Selectable measuring steps
- Graphical presentation
- Tabulated measurement Results.

# Floating Carriage Diameter Measuring System



## FCDM 100

**Measuring Range :** 100mm **Resolution :**  $0.1 \mu\text{m}$

**Measurement Uncertainty :**  $0.5 + L / 1000 \mu\text{m}$

- Specially designed for measurement of external screw thread diameters including pitch diameter, major and minor diameters of various forms including ISO Metric, Unified, Withworth, Buttress, BA, Pipe Threads, Trapezoidal, ACME, StubACME including taper threads of NPT, NPTF & BSPT.
- Compliance with Abbe's Comparator principle.
- Designed to comply requirements of NPL UK Specifications MOY/SCMI/9.
- Digital readout system helps to avoid manual calculation errors.



**Cy. Thread Plug Gauge measurement (2 wire method)**

**Accessories :**



**Thread measuring prisms**



**Thread measuring wires**



# Dial Calibration Systems



## Motorised Semi-automatic DCT 50 M / DCT 100 M

Measuring Range : 50mm/ 100mm

Resolution : 0.01/ 0.1  $\mu\text{m}$

Measurement Uncertainty :

0.2  $\mu\text{m}$  +L/250  $\mu\text{m}$  (L in mm)\*

- Motorised movement of calibrator provides Semi-automatic operation for calibration of analog dial indicators and Automatic calibration Inductive probes.
- Specially designed for calibration of high precision electronic inductive probes, plunger type dial indicators, lever type dial indicators and bore gauges.
- Computerised measurement and analysis of MPE as per ISO standards.
- High Precision incremental linear encoder system with direct measuring range of 50 mm & 100 mm
- Compliance with Abbe's Principle.



## Camera based Fully-automatic DCT 50 C / DCT 100 C

Measuring Range : 50mm/ 100mm

Resolution : 0.01/ 0.1  $\mu\text{m}$

Measurement Uncertainty :

0.5  $\mu\text{m}$  +L/250  $\mu\text{m}$  (L in mm)\*

### Added Features in comparison to Semi-automatic

- Software Version with image processing : fully automatic measurements
- Automatic camera based data processor -unit enables short testing times whilst precision is significantly greater compared to manual.
- Fast image processing using USB 3.0 camera
- The measuring process is based on automatic recognition of scaling and compares with target values.



### OCTA DIAL :



Windows based program for evaluation of measuring errors, a laptop or PC.

Online Data acquisition, Data recording, certificate generation.

Measurement program complying to calibration method recommended by IS / ISO / DIN standards. Calibration certificate format complying to ISO/IEC 17025

# Gauge Block Measuring Machines

- Gauge Block Comparator for comparative measurement- calibration of gauge blocks by comparison method with high resolution two mutually opposed aligned probes connected in sum measurement (A+B). Method complying to ISO 3650.
- Rigid cast-iron stand to ensure high thermally stable comparator structure.
- Computer aided measurement system for online data transfer of length & temperature values, measurement & analysis of gauge block length, parallelism.

## GBC 170

**Measuring Range:** 0.5-170mm,

**Comparison Range:** 0.2mm

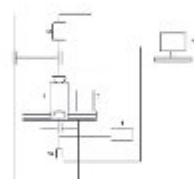
**Resolution:** 0.01 $\mu$ m,

**Measurement Uncertainty:** 0.03  $\mu$ m

With high precision inductive probes



**GBC 150 Gold**



**GBC 150 Silver**

**Measuring Range:** 0.5-150 mm, **Comparison Range :** 20 mm

**Resolution:** 0.001 $\mu$ m, **Measurement Uncertainty:** 0.01  $\mu$ m/ 0.03  $\mu$ m with

interferometric probe from SIOS, Germany/ optical probe from Heidenhain, Germany



**Octagon LMM Gold ++**

**Measuring Range:** 1000mm/2000mm/3000mm

**Resolution:** 0.01 $\mu$ m, **Measurement Uncertainty:** 0.1 + 0.5 L / 1000  $\mu$ m

- Granite horizontal base for structural stability and minimising effect of the temperature variations.
- Very high precision length measuring machine with highly stable He-Ne Laser interferometer specially designed for calibration of Long Gauge Blocks and Length Bars.
- Compliance with Abbe's Principle.

## CNC Gauge Block Comparator

- CNC version has minimum manual intervention. CNC operation for 5 point measurement program (or only midpoint measurement program) with number of selected runs.
- Loading/unloading operation of gauge block will only be manual.
- This CNC system with Gauge block comparator is most efficient.



## Automatic Gauge Block Comparator

- Fully automated gauge block calibration system completes calibration of entire set of Gauge block without manual intervention.
- The PLC based Gauge block comparator has Robotic automation for loading/ unloading of gauge blocks.
- Measurements of all M122 gauge blocks with-out manual intervention in a cycle time of 8 ½ hrs for 5 point measurement cycle & 3 repeat measurement runs on each gauge block.



## Octa-Block

- A Windows based Software program for measurement of Gauge Blocks.
- Computer-aided online data transfer and evaluation of the measuring values as per ISO 3650 ASME B89.1.9, BS-04311-1.
- Facility for thermal error corrections (offline / Online), and correction of systematic machine errors.
- Measurement program for both Imperial (inch) and Metric gauge blocks set.
- Five Point measurement central length deviation and parallelism of faces fu & fo.
- Storage of measurement records, calibration report generation in the format complying to ISO /IEC 17025.

# Precision Gauging Tools

## Air Plug Gauge

- Quick, easy and precise measurement of bore
- Possible to check through or blind bores
- 2 jets / 3 jets for checking size, taper, ovality / lobbing.
- Also offered with multiple jets as an option
- With extensions to check deeper bores
- Hard chrome plating for extended life



## Air Caliper Gauge

- Most suitable for measuring diameters of jobs held between the centers on machine or interrupted shafts like crankshafts, Ideal for collared diameters i.e. crankshaft pin and journal
- Multi-jet air calipers available for multi-point measurement i.e. to check crowning of crank pins and journal diameters



- "V" support for perfect centering and stability
- Optional bench mounted design for checking small diameters.

## Contact Type Plug Gauge

- Reliable, rapid precision measurement of wide variety of bore diameter and form error
- Possible to check through or blind bores
- Standard 2 point / 3 point probing contact
- Repeatability < 0.001 mm
- Can be offered with Tungsten carbide contact points.
- With extensions to check deeper bores
- Hard chrome plated / Titanium coated surface body for extended life



Solotron UK  
LVDT Probes

## Contact Type Caliper Gauge

- Suitable for measuring dia. of jobs held between the centers on machine or interrupted shafts like crankshafts, Ideal for collared diameters i.e. crankshaft pin & journal
- Built in miniature inductive probes from Knäbel Germany.
- Multi-point measurement i.e. to check crowning of crank pins and journal diameters
- Tungsten carbide probing contacts.
- "V" support for perfect centering and stability



Knäbel  
Germany  
IET Probes

## Knäbel Mandrels for cam bore measurement

- Measurement of diameter in Two axes and co-axiality of Cam Bore.
- Contact probing - Inductive built-in transducer for each diameter
  - Cylinder form in static way

## Dial Snap Gauges

- Indicating snap Gauges, can be used with sensing device mechanical type e.g. dial indicator or electronic probes.
- Ground and lapped carbide measuring anvils Dia 8mm.
- Aluminum frame ensures light weight for easy handling.

### Measuring Range in mm

0-25, 25-50, 50-75.....250-275, 275-300.

Anvil size 14 mm x 14 mm



## Adjustable Snap Gauges

- Go/No go Attribute Gauge range setting up to 6 mm
- Go/ Nogo Attribute gauge resetting Facility in the event of wear.
- Available with hardened steel Flat round or grooved type anvil design for the different measuring application

### Measuring Range in mm

0-6, 6-13, 13-19.....263-275, 275-288, 288-300.



# Gauging Displays & Controllers

## Single / Multi Channels Smart Gauging Displays



**JUPITER**



**JUPITER Silver**



**JUPITER Gold**

### Features:

- Specially designed to cater the need of automation of gauging systems, data recording.
- Multi Channel Gauging system suitable for Air gauges or Inductive probe gauging.
- Cater to emerging needs of **Industry 4.0**.
- Highly stable performance with variation in Air pressure (Operating Air Pressure Range 3.5 - 6 bar). Auto air cut-off while gauge not in use.
- Compact design ensures space saving on the 'shop- floor'.
- Flexibility of programming & measurement programs storage with part information and dimensional data, program can be recalled easily.
- Data transfer to central server. Data can be collected in Q-DAS\* .(\* Feature in Jupiter Gold only)
- Statistical parameters like Cp, Cpk, Run chart. (In Jupiter Silver and Jupiter Gold)
- Data sorting / Grading up to 25 grades. (In Jupiter Silver and Jupiter Gold)
- Feed back to CNC Machine for Process correction (In Jupiter Silver and Jupiter Gold)

Features:	Jupiter	Jupiter Silver	Jupiter Gold
Input Channels	Max 2	Max 8	Max 8
Resolution	Linear : 0.1 $\mu$ m / 0.2 $\mu$ m / 0.5 $\mu$ m / 1 $\mu$ m / 2 $\mu$ m / 5 $\mu$ m		
Units	Linear : MM, INCH, microns		
Dimension Type	Linear	Linear & Angle	Linear & Angle
Measurement Modes	CUR, MIN, MAX, Diff, AVG.		
Output Parameters	Max 4	Max 16	Max 32/ 64
Part Setups	Max 10	Max 49	Max 99
Result Formula Editor	Result formula can be edit for combinations of PIEZO and LVDT channels and / or other results.		
Digital Outputs Indications	OK, Reject, Rework		
Calibration	Single master / Double master configurable		
Touch LCD Screen	4" INCH Color	7" INCH Color	7" INCH Color
PC Connectivity	RS-232, Ethernet	2 No of Ports of RS-232 & Ethernet	
USB host interface	USB 2.0		
Digital Input / Outputs	Max 3 O/p	Max 8 I/p & 8 O/p	
Foot switch interface	Available		
Display Graph	Digital Readout / Dial/ Bar graph/ Run Chart		+ Histogram + X Bar Chart
SPC	✗	✓	
Memory	8GB		

# Customised Multi-Gauging Systems

## GAUGING SYSTEMS COMPLIANCE TO INDUSTRY 4.0



### Multi Gauging System

- Customized design to measure a number of dimensions simultaneously. Also capable of dealing with very large number of interrelated dimensions.
- Built either completely special or built using a series of modular elements.
- The feature gauged could be external / internal diameters, lengths, straightness, Profile, squareness, ovality, run-out of faces etc.
- Part to be gauged are compared with a setting master which simulates the component.
- Dimensional difference between the components and the master are sensed by mechanical contact probes, Air probes or inductive electronic probes and the difference amplified.
- Display of readings may be offered either in the form of simple dial gauges or some form of electronic system, computer based system.
- Displays may be analogue, digital or graphical with clear indication of with-in and out-of tolerance.

### Multi-Gauging system for Connecting Rod



- Contact type / pneumatic (Non-contact) Measurement system for dimension and geometric measurement of connecting rods.
- Measurement of small end bore diameter, large end bore diameter, centre distance between two bores, axis parallelism in two planes (twist and bend)

### Gauging System for Cylinder Head : Valve Seat & Cam bore



#### Knäbel Slide Scan

SlideScan ( Intake & Exhaust) A common system for Intake and exhaust valve seat – Measurement of following parameters of valve Seat • Valve Seat Angle • Valve seat width • Straightness of cone • Gauge line position / position of gauge line diameter.

#### Knäbel VSM

VSM - A set of two different equipments VSM( Intake ) & VSM (Exhaust) - Measurement of following parameters of valve Seat. • Roundness of valve seats • Concentricity between valve-guide & seat ( Run-out).

# Customised Auto-Gauging Systems



## Automated Measurement System

Designed for auto component

- PLC / CNC controlled Automatic / Semi automatic cycle for various operations including measurement, loading, un-loading, sorting OK/NG, Grading and component marking.
- Automatic Gauging Machines incorporate both automated loading hopper, magazine, pick and place robot and automated segregation of inspected components.
- Multi-probing absolute measurement system makes smart replacement for 3D-CMM application to achieve accuracy and match production cycle time.
- Autogauging is essential where the complexity of the component is such that manual methods can not achieve the desired levels of accuracy.
- Autogauging with Grading & Marking System
- Poka-Yoke to avoid wrong loading.
- Safety barrier interlocks in automated cycle to avoid accidents.
- Optimized cycle time to match the production cycle.



**Semi-Automatic Gauging Station**  
For Auto Components

## Customised Auto-Gauging Systems



### Robotic Automation

- Robotic Automation ensure flexibility in applications – single machine used for measurement various models of cylinder heads (common machine for different 3 & 4 Engine Cy. heads).
- Measurement system consist of multiple air gauging tools/ multi-jet air plug mandrels for cam bore, valve guide bore and spark plug bore. (option available for measuring mandrels with contact type inductive probing system)
- Based on model identification, automatically right tool is selected from the tool library.



### Cylinder Head Measuring and marking machine

Measuring parameters: various Inlet & exhaust Cam bore diameters & ovality , various Valve Guide bore diameters, ovality & taper , Spark Plug bore diameters, ovality & taper. Total Measurement and analysis parameters : 35 ( Linear / Form and Geometry ) Cycle time (Measurement + marking) : < 60 Sec.





### Camshaft Measuring & Marking Machine

Measurement Parameters : Multiple Cam profiles -Lobe angles, lobe heights, lifts, Base circle dia, various journal diameters and forms, Run outs Etc. w.r.t. Centre axis as well as axis of end journals.

Total Measurement and analysis parameters : 149 (Linear / Form and Geometry) Cycle time (Measurement + marking) : <60 Sec.

- Customised design, fully automatic measuring machine for final inspection of precision machined auto component at production line .
- PLC based fully automated cycle including loading / unloading, measurement and marking operations with assurance of highest safety POKA/ YOKE.
- On loading of component, automatic model identification is provided with Camera based image processing software.
- Automatic selection of measurement program for different models.
- Powerful software for synchronised data acquisition, processing, analysis (including SPC) / reporting, storage and data transfer to main server.
- On-line thermal error corrections provided to ensure highly accurate measurements at ambient atmospheric conditions.
- Measurement cycle integrated with LASER marking machine for QR code marking on OK Components.
- Auto generated QR code linked to Component number, model, date and time , shift and operator.
- Industry 4.0 Compliance

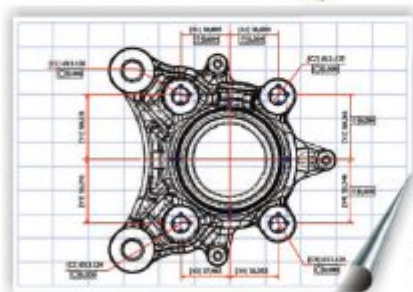
# 3D Coordinate Auto-Gauging Systems

## Auto-Gauging with 3D Coordinate Metrology : Powered by Renishaw Equator

Hybrid Gauging Solution developed jointly with Renishaw India in which conventional Multi-Gauging & 3D Coordinate metrology of Renishaw Equator is used to complete shop floor Metrology and Automation requirements.

### Features :

- Hybrid Gauging Solution with combination of conventional Multigauging & 3D Coordinate Metrology
- GD&T & Form Measurement
- 100% Inspection
- Inline Gauging System
- Faster Cycle Time
- Turnkey Solution
- Easy programable for new part measuring requirement
- Suitable for unskilled operator
- Process control tool for Auto machine correction
- Versatile and Robust
- Intelligent Manufacturing



### Measurement Report

Position tolerance measured by 3D coordinate metrology software

- Metrology on the Shopfloor - Unbeatable repeatability and data co-relation with high end Lab CMM.
- Versatile Multigaugage – Can accommodate multiple models in just a single click.
- Robust – proven on the shop-floor and thermally 'insensitive'
- Form measurement at Shop Floor (GD&T)
- In Process Tool Wear compensator
- In Process Position (w.r.t. different datums) compensator
- System integration with automated machine cell e.g. machine tool, gantry, robot, scanner, laser marking machines.



**3D Metrology Software : MODUS™**

- Rapidly create gauging routines for a wide range of parts
- Easily program scanning or touch measurements on the Equator gauge
- CAD-driven offline programming, supporting IGES, STEP, Parasolid® & VDA-FS formats
- Integration with CATIA® (v4 & v5), Siemens® NX™, Pro/E® and Solidworks® CAD/CAM solutions • Native DMIS support • Full motion simulation and collision detection • Powerful text and graphical reporting
- Flexible data output, including certified Q-DAS

Features:	Equator 300	Equator 300 EH	Equator 500	Equator 500 EH
Working volume XY	Ø 300 mm	Ø 300 mm	Ø 500 mm	Ø 500 mm
Working Height Z	150 mm	300 mm	250 mm	400 mm
Comparison uncertainty	±2 µm			
Operating temperature	+5 °C to +50 °C			
3D Metrology Software	MODUS™			



**Update multiple machines**

Update several machines on a per feature basis, and feed back to multiple tools. This enables control of multiple manufacturing operations with one gauging cycle.

**Control processes**

Measure size, position and 3D geometry data at the point of manufacture to update offsets and improve process capability. Measurements from multiple parts can be averaged to reduce variation.

**Manage tool life**

Better understand the life of your cutting tools, and set user-defined tool wear warning limits. Sister tooling is supported.

# Crankshaft-Camshaft Metrology Systems



## Octagon Metroform 360/660/1060

- High resolution metrology system for evaluation of crankshaft and camshaft geometry.
- Fully CNC - single button operation
- Ultra precision grade liner guides.
- User friendly window based setup and analysis.

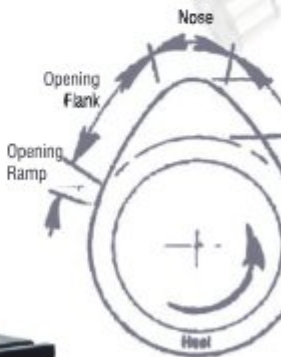


- 1) Menu driven and easy to use GUI's
- 2) Single page test setup Polar Representation
- 3) Cam Profile 4) Cam Shaft Measurement
- 5) Graphical Analysis of Cam Lobes
- 6) Radial Parameters



## Octagon MetroForm Horizon- with MetroLab Software

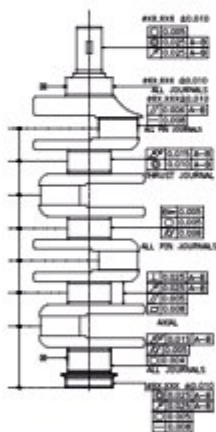
- Metrology system for analysis of cylindrical parts specifically automobile cam lobe profile.





### Autogauging Crankshaft Measurement System Features :

- Measurement parameters diameter of various main journals and pin journals, run-outs with center axis/ end journals, roundness of main journals and pin journal
- Auto / Semi auto cycle
- Integration with gantry system possible



### Octagon MetroForm Mini

- Cam Profile measurement specially designed for Single Cylinder Engine Camshaft
- Multiple radial measuring heads for simultaneous measurement of number of cam lobes in just a single rotation.

### Common Features

- Durable carbide followers (flat and disc)
- High resolution glass encoder system for both rotary and radial axis
- Automatic computerised data acquisition system for complete 360°.
- Mathematical data conversion for different follower geometry.
- Complete lobe measurement, graphical display and analysis of: lift, velocity, acceleration, jerk (3rd derivative), radius of curvature, pressure angle.
- Available in manual, motorised and CNC mode of operations.

**Opticline** - Fast, optical non-contact measuring principle, measurements are performed with an extremely high level of flexibility, repeatability and accuracy.

**Opticline CS** series shaft measuring systems have been designed for production - related applications and offer a high degree of measuring performance and absolute precision from 2µm, in an extremely compact design.

**Opticline C** series shaft measuring systems offer maximum gauge repeatability and reproducibility from 1µm. With different configurations, such as a high-precision C-axis or multi-sensor system, the performance capability can be customized to suit your requirements. The instruments thus offer the highest level of flexibility, accuracy and stability.

**Opticline CA** - PLC measuring station with shaft measurement automation

Max. diameter [mm] 50, 80, 140  
Length [mm] 150, 300, 600



These additional evaluation possibilities add to the quality information within one single measurement run and offer higher flexibility.

### Multi-sensor technology for additional evaluation possibilities

Opticline can be optionally extended with a tactile probing system. Tactile measurements can be seamlessly integrated into the optical measurement run and depending on the design, are suitable for specific applications, such as measurements of axial run-out, grooves or bores.



### Tolaris Optic.

Operating and evaluation software for precise results in seconds

- User-friendly, intuitive operation
- Optimized measuring runs
- Reliable analysis of measurement results
- Documented quality and seamless integration

#### Dimensional measurement

- Length
- Diameter
- Radius
- Angle

#### Thread measurement

- Dimension
- Form

#### Form measurement

- Straightness
- Roundness
- Cylinder form
- Conicity
- Flatness

#### Profile forms

- Free form
- Tolerance range

#### Position measurement

- Radial run-out/ total radial run-out
- Axial run-out/total axial run-out
- Straightness
- Symmetry
- Parallelism
- Concentricity
- Coaxiality
- Perpendicularity

**Octagon**<sup>®</sup>  
PRECISION

**HOMMEL** ETAMIC

## Formline

**Fully automatic measuring of all form and positional tolerances**

From the fully automatic CNC measuring station for all form and positional tolerances to combined form and roughness measuring systems.

**Highly accurate air bearing rotary table ( $\varnothing$  250 mm) with automatic centering and leveling of the workpiece**

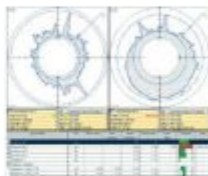
- Three motorized measuring axes CZ R
- Vertical measuring axis with a measurement range of either 350 mm or 550 mm
- Motorized tilt and rotation module MDS or tilt arm FS1 for perfect probe positioning, even on complex workpieces
- Magnetic coupling for fast probe arm changes and collision protection
- Available as compact desktop device or integrated into an ergonomic measuring station with damping.



## Turbo Form.

**Software with clear user guidance for reliable measurement evaluation**

The graphical, function-oriented user interface of Turbo Form ensures simple operation, even when performing complex measurement tasks.



### Form tolerances

- Roundness
- Straightness
- Flatness
- Cylinder form

### Run-out tolerances

- Radial run-out
- Axial run-out
- Total radial run-out
- Total axial run-out

### Position tolerances

- Parallelism
- Perpendicularity
- Angularity
- Coaxiality, concentricity

### Specific parameter

- Conicity
- Position deviation
- Length
- Thickness and thickness deviation
- Stroke radius
- Crowning
- Angle deviation
- Waviness analysis
- Twist
- Roughness
- Dominant roundness waviness
- Polar and line form
- Cam form

## Waveline - Roughness and Contour Metrology

Mobile and stationary systems for efficient, automatable measurements in the metrology lab or in production.

- Excellent measuring accuracy in combination with Nanoscan probe system
- Dual operation of two probe systems; a roughness probe system can also be installed on the front of the traverse unit; also suitable for optional rotary module
- Optional motorized tilt unit for precise adjustment of the tilt angle and automatic alignment of the probe to the workpiece level.

Traverse unit [mm] 120 or 200

Measuring column [mm] 500 or 800

## Evovis.

**Evaluation software for roughness and contour measurement**



### Tactile roughness measurement

- Roughness parameters
- Core roughness parameters
- Profile parameters
- Waviness parameters
- Motif parameters
- JIS parameters
- Topography evaluation
- Dominant waviness
- Twist parameters

### Tactile contour measurement

- Angle
- Radius
- Distance
- Parallelism
- Crowning
- Gothic arcs
- Edge geometries
- Line profile
- Threads
- Diameter

# Surface Roughness Measurements



## BMT – MiniProfiler

Stylus Based Roughness Test Equipments (Customized designed)



- Very small in size & Light weight
- Specially designed for production environment.
- With reference Datum (Skid less).
- Mostly available in Customized design

**Measurement uncertainty <0.5%**

Evaluation length 12.5, 25, 50, 100 mm

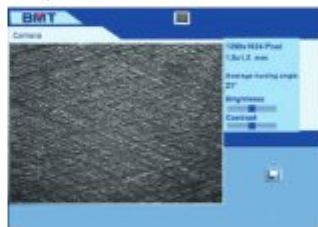
## BREITMEIER – MiniProfiler- C

Roughness Tester integrated with Mini Camera - Honed surface inspection



- Honing angle measurement of engine cylinder wall with roughness measurement
- Measurement of surface roughness directly inside the cylinder
- Photograph of the crosshatch structure and honing angle calculation

## Computerised Analysis :



### • ISO 25178, DIN 4287

Profile parameters :

Pt; Pc; Pv; Py; Pa; Pp; Pmr

Waviness parameters :

Wt; Wc; Wv; Wy; Wa; Wp

Roughness parameters :

Rt; Rv; Ry; Ra; Rmr; Rp; Rq; Rz; Rmax

### • ISO, DIN 13565

Core roughness parameters:

Rk, Rpk, Rpk\*, Rvk, Rvk\*, Mr1, Mr2

### • JIS B-0601: Rz; Rmax; RzISO



## Miniprofiler on CMM

Roughness measurement on CMM.

Fully automatic measurement cycle



Inspection of Honed surface of engine cylinder wall





## Laser Interferometer SP-NG Series

- Flexible, ultraprecise length measuring system
- Minimization of alignment errors
- Compact electronics unit for mobil calibration tasks



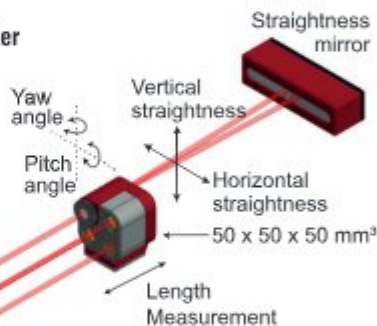
### Applications

- Precision length measuring system as a measuring or calibration instrument for installing in measuring tables, microscope stages, positioning tables, measuring machines, machine tools, hardness and material testing instruments

Measurement range	≤ 80m
Resolution	5µm
Max. tilt of hollow reflector	± 22.5°
Laser wavelength	632.8nm
Frequency Stability (HeNe Laser)	2.10 <sup>-8</sup>

## Calibration Laser Interferometer SP 15000 C – Series

- Simultaneous, three-channel length, pitch and yaw angle measurement as well as straightness measurement with highest accuracy
- Laserinterferometric measurements on linear guides and translation stages



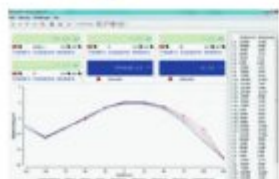
- Calibration of high-precision axes in measuring and machine tools, as well as coordinate measuring instruments



3 DOF / 5 DOF  
Simultaneous  
multi-axis measurement.

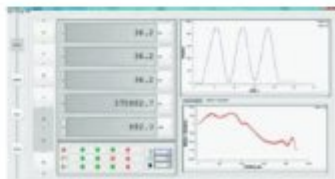
Measuring	Range	Resolution	Uncertainty
Length	15 m*	<20 µm	± 0.12 ppm
Angle	± 5 grad	<0.0004 arcsec	± 0.0085 arcsec
Straightness	± 4 mm	<10 nm	± 0.1m

\* (50 m on request)



### Calibration software InfasAXIS

InfasAXIS with SP 15000 C5 allows the calibration of machine tools, positioning tables etc. in 5 degrees of freedom: position, pitch and yaw angle and straightness in horizontal and vertical direction. Selection of the standard: VDI/DGQ 3441, DIN ISO 230 or VDI 2617



### Alignment software InfasALIGN

InfasALIGN with SP15000 C becomes measuring tool for highly accurate alignment and adjustment of machine components. The pitch and yaw angles, the straightness derived from the angle measurement and the interferometric straightness can be displayed separately or simultaneously.

# Special Designed Measuring Instruments

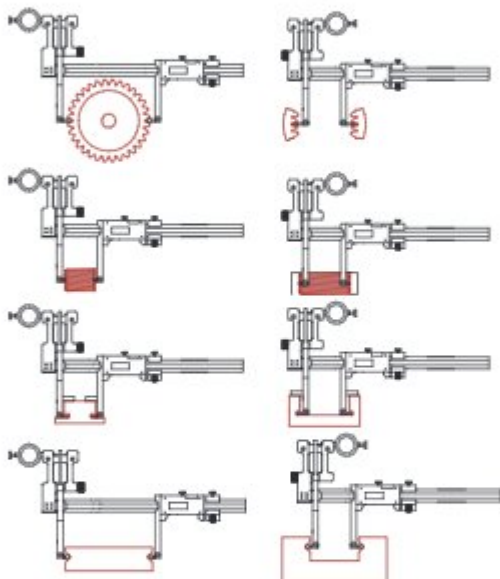
**Octagon**<sup>®</sup>  
PRECISION



## DEMMA Italy - DIGI BASCOM

Caliper for Inside/ Outside Measurement

- Light weight caliper in hardened stainless-steel
- Easy to operate
- Interchangeable rods for various applications including plain diameter, Internal / External Threads and Outside / Inside gear tooth.



## DEMMA Italy - IRIS FE

Electronic Measuring Gauge for External Threads

- Interchangeable measuring anvils for different pitch.  
1.0, 1.25, 1.5, 1.75, 2.0, 2.5, 3.0 mm
- Available in different measuring range. 0-24, 20-40, 40-60, 60-80 mm



## DEMMA Italy - IRIS FI

Electronic Measuring Gauge for Internal Threads



- Interchangeable measuring anvils for different pitch.  
1.0, 1.25, 1.5, 1.75, 2.0, 2.5, 3.0 mm
- Available in different measuring range. 13-27, 25-45, 40-65, 60-80 mm

# Retrofitting & Up-gradation Services



Up-graded Measuring Head

SIP MU 214 Optical measuring machine digitised by Octagon with Heidenhain Electronics



Octagon Gauge management Software

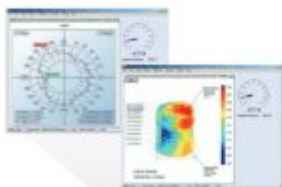
Zeiss ULM Optical measuring machine digitised by Octagon with Heidenhain Electronics



Traditional Gauge Block Compactors with inductive probe system are Upgraded with SIOS Interferometric Probing Facilitating enhancement of comparison range from 10µm to 20mm with improved measuring accuracy.



## Form measuring machines



### OctaForm

Roundness Cylindricity Analysis software complying to latest ISO standards

Old Form taster upgraded by **Octagon** Interfaced with **OctaForm** roundness cylindricity software



# Robotic - Inspection system

## Robotic - Inspection System

Designed for Automobile precision machine part on Industrial Robot by using Air Plug gauges.



Non contact Pneumatic Probe with multiple jets



Contact type measuring mandrel **Knaeble GmbH**



Laser Triangulation Line sensor **Micro Epsilon GmbH**

- Inspection systems with various makes robots available in the market, like Universal, Kuka, Fanuc, ABB or any other make.
- Programmable multi-gauging station by which various gauging tool selection is possible for a part program measurement
- Offered with multiple gauging tools contact type, non-contact type air gauging, camera based optical measurement, stylus based roughness measurement, laser sensors.
- Flexible system - Just by changing the measurement program, system can accommodate any design change. Easy adoption to change in the Measurement sequence.
- Flexibility in process - Addition / deletion in the measurement parameters can be easily introduced.
- Easy maintainability - Due to Main Robot will be a standard product.
- Lifelong investment - Major investment cost will be in Standard Robot, can be utilized in any other applications in case the change in design / or measurement parameters.
- Price advantage - Price comparable or lesser to the customized dedicated measurement systems.

## Dealer & Channel Partner

**breitmeier**  
A Nondestructive Technology

Surface  
Measuring  
Technology

**SIOS**  
Interferometric

Precision Laser-  
Interferometric  
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**KNABEL**  
Engineering

Cylinder Head Valve  
Seat Geometry  
Measurement

**HOMMEL-ETAMIC**

Optical & Tactile Shaft Metrology  
Form / Contour & Roughness Metrology

**RENISHAW**  
apply innovation™

Equator™ gauging system

**Octagon**  
PRECISION

ISO 9001 : 2015  
Certified



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