



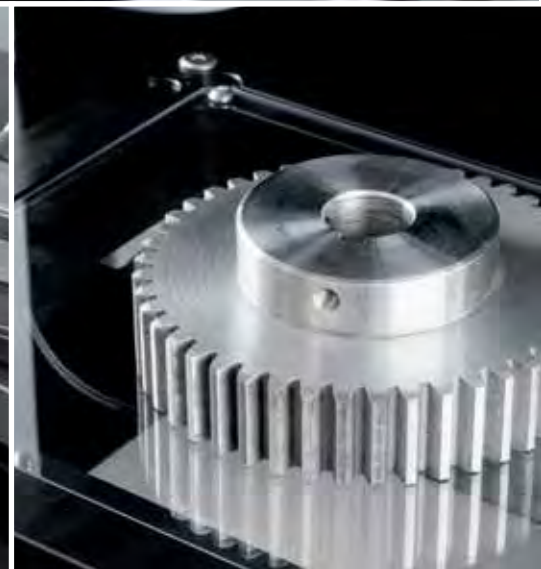
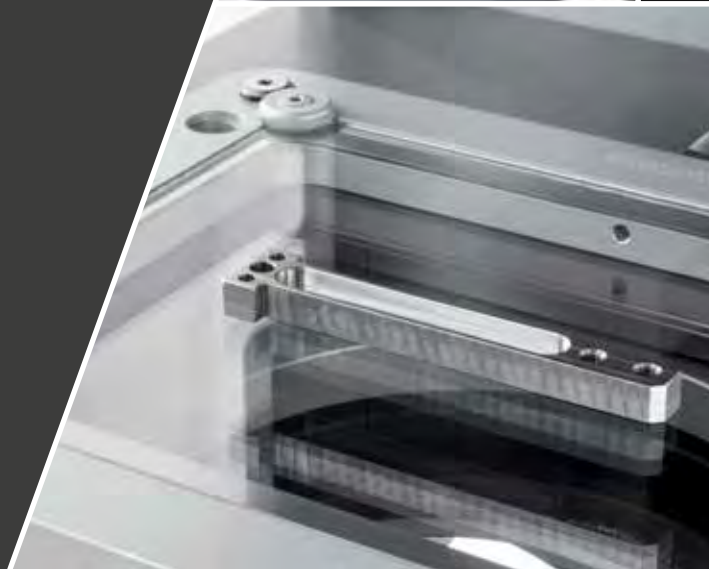
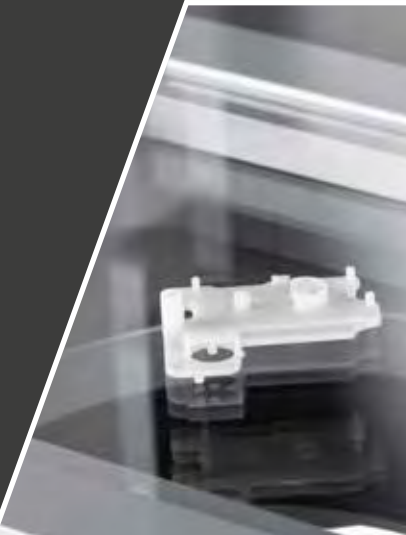
TECHNICAL SOLUTIONS FOR
MECHANICAL INDUSTRY

HOFME™

HOUSE OF MEASUREMENT

SERIES 3000
SERIES 6000
SERIES 9000

BORN IN WORKSHOP
FOR WORKSHOP



HOFME 3000 SERIES

FLEXIBILITY FOR SMALL & MEDIUM-SIZE COMPONENTS

Excellent measurement represents a key factor in every production process. However, quality inspection can be an expensive compromise, when involving great time and labor. In addition, manual checks by traditional measurement systems may be a source of risk due to human failure.

HOFME optical measuring machines are conceived to minimize those risks, improving efficiency and productivity directly on the production floor.

HOFME SERIES 3000, with its **fixed Field of View**, is ideal for both small and medium components dimensional control. Thanks to its 12 Mp Camera and perfect combination among lens, sensor and software, it can easily adapt to a wide range of mechanical parts.

HOFME SERIES 3000 also presents a **CNC version**, with XY axes stroke, offering a great accuracy to inspect bigger components, larger than mm 92 x 48.

Moreover, multisector ringlight offers a frontal illumination performing even on complex samples in terms of surface treatment or shape, and blind holes (greyscale technology).

Main features:

- › Telecentric lens
- › Fixed FoV
- › Collimated backlight
- › 12 Mp Camera
- › Typical accuracy in controlled environment: $\pm 3 \mu\text{m}$
- › FoV dimensions: mm 92 x 48
- › Z Axis Stroke: mm 150
- › Dust protection
- › Multisector frontal illumination [**optional**]
- › XY Axes Stroke: mm 160 x 116 [**CNC version**]



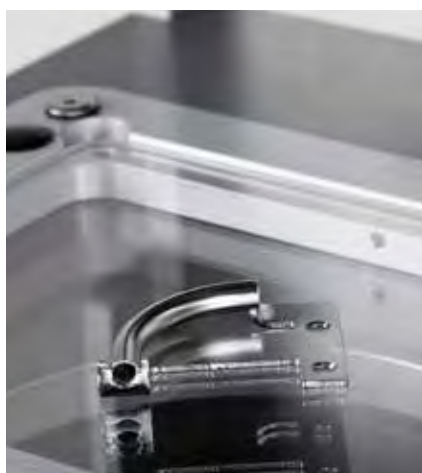
Mechanical component



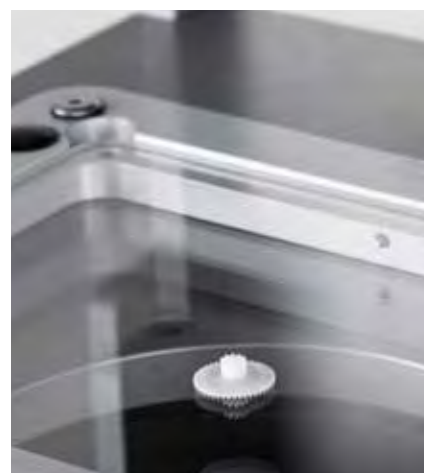
Mechanical component



Moulded plastic component



Carpentry



Gear wheel

PRODUCTION QUALITY ASSURANCE

Working conditions in a production environment are often suboptimal in terms of cleanliness, dust, temperature, humidity and lights regulation.

Being the errors connected to workpiece properties, a golden sample reference is essential to apply systematic offsets and same measurement routine to all samples of the same type. This inspection program, so-called *recipe*, leads to high accuracy and high repeatability in dimensional control.

HOFME 6000 SERIES

ACCURACY FOR BIG PARTS WITH SMALL DETAILS

HOFME measuring machines are designed to be used within the production environment. Dimensional controls next to machine tools, and not only in metrology laboratory, ensures a reduction of non-compliance costs, as well as a contraction of time spent in final test phase and during the whole manufacturing process.

The synergy between **Multi Field of View** technology and camera zooming system makes **HOFME SERIES 6000** the ideal solution to measure big parts with minor details.

As Series 3000, **HOFME SERIES 6000** offers a **CNC version**, ensuring high accuracy to inspect bigger components larger than mm 68 x 56.

Multisector frontal illumination gives an additional great advantage on complex parts in terms of surface finish or shape, and blind holes (greyscale technology).

Lens calibration, light alignment, object plane control, adjustment and autofocus tool combined with motorized vertical axis ensure optimum performance by minimizing any measurement issues arising from system asymmetry or misalignment.

Main features:

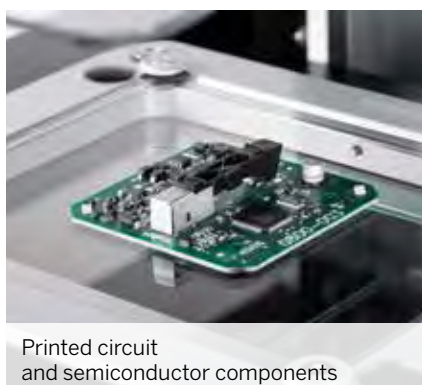
- › Telecentric zoom lens
- › Multi FoV
- › Collimated backlight
- › 5 Mp Camera
- › Typical accuracy in controlled environment: [depending on FoV] from $\pm 0.7 \mu\text{m}$ to $\pm 3.5 \mu\text{m}$
- › FoV 1 dimensions: mm 68 x 56
- › FoV 2 dimensions: mm 34 x 28
- › FoV 3 dimensions: mm 17 x 14
- › FoV 4 dimensions: mm 8.5 x 7.1
- › Z Axis Stroke: mm 150
- › Dust protection
- › Multisector frontal illumination [**optional**]
- › XY Axes Stroke: mm 160 x 116 [**CNC version**]



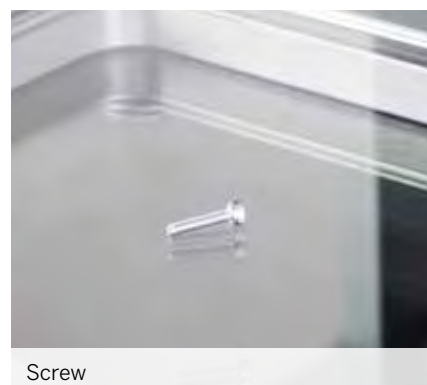
Mechanical component



Mechanical component



Printed circuit and semiconductor components



Screw

HOFME 9000 SERIES

INNOVATION FOR LARGE FORMATS

The combination between mechanical and metrology corporate experience has led to an innovating product, which integrates new resources in information, optics and artificial vision technologies.

HOFME SERIES 9000 applies a state-of-the art technology in dimensional control, presenting a large Field of View within a compact structure, where both vertical and horizontal axes are fixed and stable.

The lens system here is based on an innovating technology and new type of optics.

These characteristics enable a big FoV in a reduced space.

Main features:

- › Telecentric lens
- › Fixed Fov
- › Diffused backlight
- › 12 Mp Camera
- › Typical accuracy in controlled environment: $\pm 3.5 \mu\text{m}$
- › Main Fov dimensions: mm 221 x 162
- › Dust protection



SOFTWARE KEY FACTS

Accurate calibration and measurement over the entire field of view

Live measurement and tracking of objects placed in any position

Intuitive interface, consistent with most CAD environments

Flexible, configurable and open to possible integration with other devices



Cell phone case



Mechanical component



O-ring and sealing rings



Gear wheel

TECHNICAL FEATURES



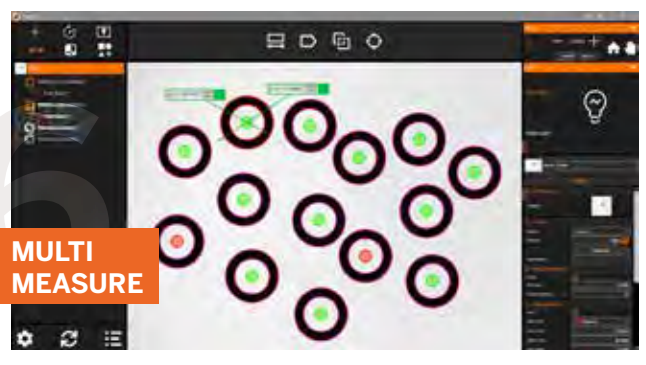
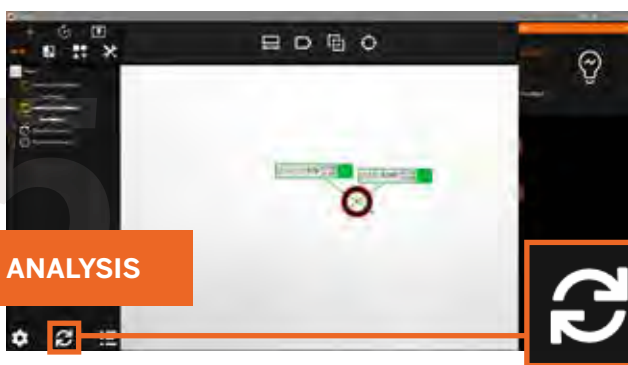
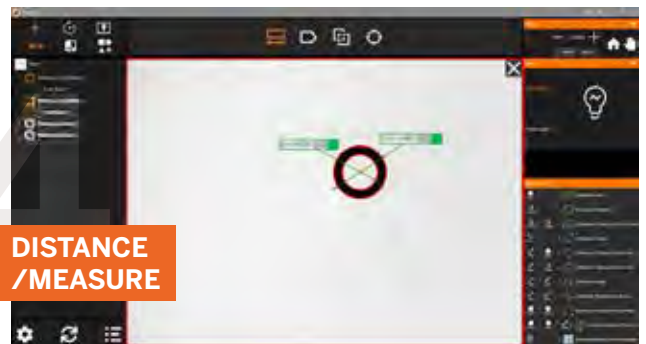
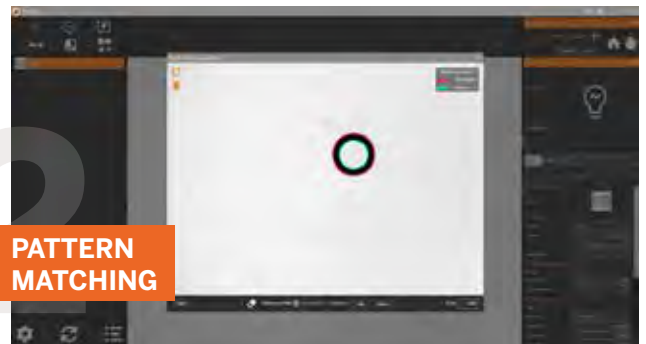
Specifications	3000 SERIES	6000 SERIES	9000 SERIES
Lens	Fixed Telecentric FoV	Revolver Multi FoV	Fixed Telecentric FoV
FoV 1 (mm x mm)	92 x 48	68 x 56	221 x 162
FoV 2 (mm x mm)	n/a	34 x 28	n/a
FoV 3 (mm x mm)	n/a	17 x 14	n/a
FoV 4 (mm x mm)	n/a	8.5 x 7.1	n/a
Measurement accuracy range FoV 1 ¹	±3 µm	±3.5 µm	±3.5 µm
Measurement accuracy range FoV 2 ¹	n/a	±2 µm	n/a
Measurement accuracy range FoV 3 ¹	n/a	±1 µm	n/a
Measurement accuracy range FoV 4 ¹	n/a	±0.7 µm	n/a
Repeatability range	±1.5 µm	From ± 0.4 µm to ±3 µm (FoV)	±2.5 µm
Maximum weight load	< 2 kg	< 2 kg	< 2 kg
Dimensions L(mm) x W(mm) x H(mm)	600 x 320 x 920 [600 x 350 x 920 - CNC]	600 x 320 x 920 [600 x 350 x 920 - CNC]	600 x 430 x 960
Lens optical magnification	0.153	0.125; 0.250; 0.5; 1	0.064
Camera	12 Mp	5 Mp	12 Mp
Back Light	Collimated	Collimated	Diffused
Back Light colour	Green	Green	White
Front Light	1 or 8 sectors, all dimmable	1 or 8 sectors, all dimmable	1 or 4 sectors, all dimmable
Front Light colour	White	White	White
Colour temperature (Kelvin)	6300 K	6300 K	6300 K
Front Light illuminance (WD 350 mm) ²	3280 Lux	3280 Lux	13700 Lux
X,Y axes stroke mm [CNC version only]	160 x 116	160 x 116	n/a
Z axis stroke mm	150	150	n/a
Longitudinal pixel size (mm FOV / camera pixels) / 7	0.0035	0.0038; 0.0019; 0.00097; 0.00048	0.0077
Weight (Kg)	70 [75 - CNC version)	70 [75 - CNC version]	85

Notes

¹ Computed on "n" measurements under controlled temperature and pressure conditions, by using a Metric Gauge Block (size 10, grade 0).

² Theoretical calculation.

SOFTWARE SMART USER-FRIENDLY



ADDITIONAL FEATURES

- › Automatic edge identification
- › Autofocus
- › Thread and gear wheels measure
- › Automatic research of recipes in database
- › Recipes collection
- › DXF Comparison, DXF Import/Export
- › CSV, Excel, PDF export

HOFME

THE VISION OF MEASUREMENT

PRODUCT OVERVIEW

SELF-DETECTION OF GEOMETRIC PRIMITIVES

Automatic identification of geometric primitives by the operator.

PATTERN MATCHING

Creation of synthetic models from images: recognition of the object in any position and whatever rotation within the field of view. In CNC version, editing capabilities include axes positioning, illumination and camera settings relating to the part under inspection.

INSTANT MEASUREMENT

Instant recognition and measurement of objects for fast inspection operations. For every new model, a recipe should be built based on the golden sample that has been selected and measured through mechanical probing or other methods of measurement.

ADVANCED IMAGE EDGE MANAGEMENT

Application of the most appropriate edge placement and position correction, basing on the analysis of black-to-white transition curves, using a sub-pixel accurate edge extraction.

CROSSHAIR

Crosshair function (FoV and CNC version) ensures the analysis when the processing is difficult due to part/environmental conditions and automatic tools might not be enough. User-friendly graphic interface helps defining distances, diameters or angles.

STATISTICAL REPORTS

Database recording of measurement data for easy checking and reviewing of historical and statistical trends. Data management, printing and exporting available.

MEASUREMENT PROGRAM AUTO-SEARCH

Automatic recognition of the object and application of its specific pre-defined measurement program.

SIMPLE FEATURES CREATION TOOL

Guided creation of dimensions, geometric shapes and any other features through descriptions and commands, graphically suggested by the user interface. Easy management of CAD modelling elements (intersections, axes, perpendicularity, parallelism) or geometric nominal values and tolerances.

SMART LIGHT CONTROL INTEGRATION

Software compliance with pre-defined illumination control units. Management of illuminators (1, 4 or 8 sectors front light) by light control tool. Multi-sector ringlights smart control available where specific sectors are turned on.

ADVANCED SYSTEM CALIBRATION AND OPTIMIZATION

Calibration and optimization of all system variables to reach high accuracy and consistency thanks to a complete set of advanced tools. Maximum measurement repeatability guaranteed over the entire field of view.

ACCESSORIES & OPTIONS

PC

- › 1 CPU Intel i7;
- › 8 GB RAM;
- › 256 GB HDD SSD;
- › nVidia Quadro P620 2GB;
- › Win 10 Pro 64;

- › 3 INTEL ETHERNET
Third port necessary to connect PC to the network;
- › Monitor 23,8";
- › Keyboard & mouse.

COMPLIANT CERTIFIED PATTERN

Compliant certified pattern for calibration.

SOLUTIONS SUPPLIED

Tailored idea, design and manufacturing basing on Client's specifications.

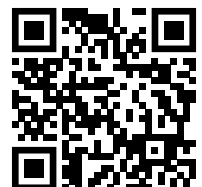
TRAINING

Machines education provided at our facilities or at Client's facilities.

TAILOR-MADE SOFTWARE AND HARDWARE

Customization of both software and machines basing on client's needs.

CONTACTS





DI QUATTRO was established in 1980 as a precision mechanics workshop for the production and manufacturing of mechanical components. Throughout the years, **DI QUATTRO** has been specializing in the supply of mechanical groups and assembled systems, becoming an all-round partner for the design, realization and test of automatic machines and mechanical components in subcontracting.

In order to improve its own measurement instruments and methods, **DI QUATTRO** has gradually integrated into its mechanics and mechatronics knowledge its capabilities in the metrology field, leading to production speed up, measuring costs dilution and human error reduction.

The result is a widespread know-how allowing **DI QUATTRO** to design and develop contactless measuring systems, which apply state-of-the art technology solutions.



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