PRODUCT BROCHURE

HEXAGON
METROLOGY

DEA GANTRY LINE

Coordinate Measuring Machines

GANTRY CMM UNCOMMON EXPERTISE IN LARGE SIZE CMMS

Hexagon Metrology's success is due to the quality of the design, and to the superior mechanical structure of the machines, backed by the most advanced computer technology, and by an extensive and reliable service and support organization.

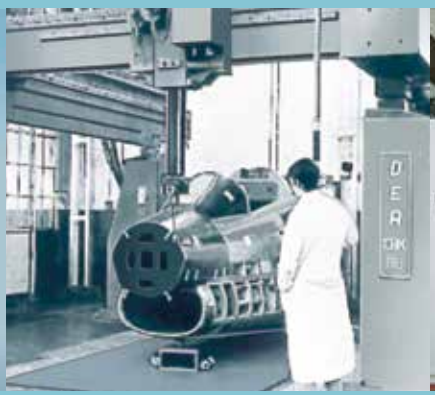
An abridged list of DEA Gantry CMM customers

Active tool
Alenia Aermacchi
Aerospace
Dynamics
Aerospatiale
AG International
Airbus
Alcoa
Asfo
Alfa Romeo
Allison Gas
Ansaldo
Atommash
Audi
Austin Morris
Autolatina
Avion Complex
Becker
Bell Helicopters
Benteler
Berardi
Beretta
BMW
Bisiach & Carru
B.O.C.
Boeing
Bofors
BP Chemicals
BPD
Brenner Tools
Brittain
Cadillac Motors
Candemat
Caterpillar
CFAN
Chengdu Aircraft
Chrysler
China National
Aero Technology
China National
Erzhong Group
Chongqing
Citroën
Comau
Cone Blanchard
Contraves
CPC
Csepel
Cummins
Daimler Benz
Dacia
Daewoo
Danieli
Devlieg
Dismodel
Dostel Makina
EADS (Casa
Espacio)
Exco
Famer
Fasa Renault
FIAT
First Autoworks
Ferrari FMC
Fokker
Ford
Fuji Heavy
GEC Alsthom
General Electric
General Motors
Giddings & Lewis
Hal Bangalore
Hebei
Hes Makina Sanayi
Hispano Bugatti
Honda
Hongdu Aviation
Hyunday
Ideal Tool
Induplan
Isotta Fraschini
Italdesign
Italstampi
Janar Tool
John Deere
Jupasa
Kalt
Kamaz
Kempton Heavy
Ind.
Kitech
Korean Airlines
Kodak
Laepple
Laser Die
Liaoni
Lockheed
Mack Trucks
Magna
Major Tool &
Machine
Mares
Mazda
MBB
McDonnel Douglas
Milford
Mitsubishi
Modelmaster
Modelos Aparicio
MTU
NCR Datong
Electric
Locomotive
Nissan
Ningbo
Northrop
Nuovo Pignone
Nurtanio
Off. Mecc.
Vecchiato
Ogihara
Oto Melara
Pegaso
Peugeot
Pininfarina
Plastic Omnium
Pratt & Whitney
PSA
Radiation System
Ratier
Renault
Rockwell
Rolls Royce
Rover
Rust International
SAAB Skania
Sabca
Sanyo
Saturn
SEAT
Sebewaing
Sermati
Sevel
Shin Meiwa
Siemens
Sikorsky
Skoda
Soko
Stola
Teledyne
Three-M Tool &
Machine
Thyssen
Tianjing Auto
Works
Toyota Motorsport
Transwerk
Uspo
Unipres
VAZ
Vikram
Volkswagen
Volvo
Vought
Weingarten
Westland
World Aerospace
Xian Aero Engine
Ynuma Machinery
ZAZ
ZCZ
ZIL

HEXAGON METROLOGY
THE BIG NAME IN GANTRY CMMS

Forty years of experience in designing, manufacturing and marketing CMMs and an installed base of over 1900 gantry machines in 42 countries has secured Hexagon Metrology position of world leadership in large size CMMs.

Revolutionary through the years since the 60s


DEA ALPHA

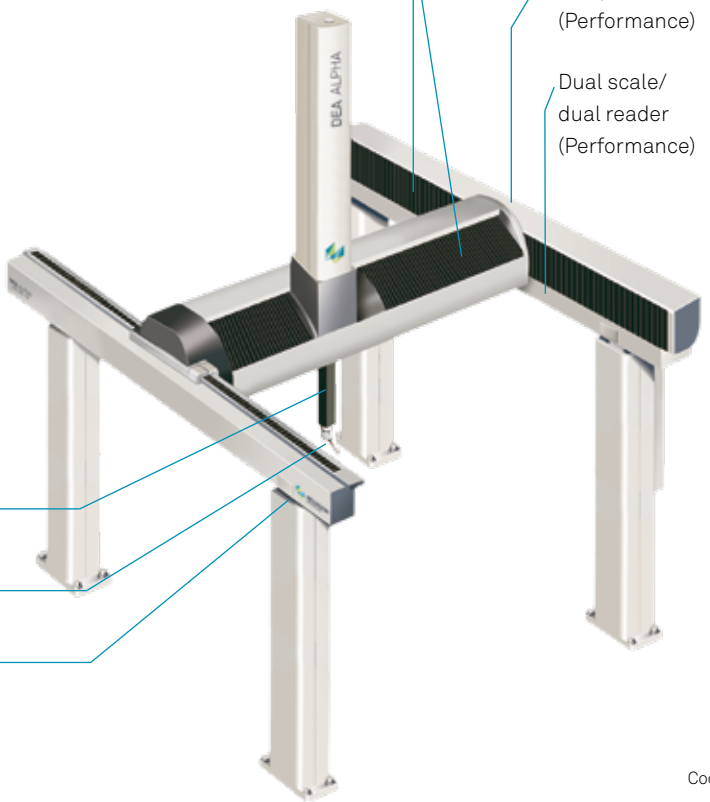
ALPHA BRIDGING THE PRICE-PERFORMANCE GAP IN GANTRY CMMS

An innovative product line of cost-effective, medium capacity multi-sensor gantry CMMs, which combines high throughput and high accuracy with excellent operating reliability and reduced maintenance. DEA ALPHA is available in two versions.

DEA ALPHA Classic is an all-purpose flexible CMM for the dimensional inspection of large castings and machined parts. DEA ALPHA Classic, equipped with high-productivity 3D scanning laser head and continuous servo wrist options, can rapidly acquire millions of data points from complex contoured shapes, and is the ideal system for die and mold manufacturing support.

DEA ALPHA Performance is a high performance gantry CMM, which incorporates several unique design features and state-of-the- art components, such as a high-resolution dual scale system on the Y axis, and a high rigidity silicon carbide spindle.
A linear thermal compensation makes DEA ALPHA Performance an extreme performer, easy to use under all operating conditions.

All DEA ALPHA models can be supplied equipped with optional bellows and covers, which offer machine protection for airborne shop contaminants.



DEA DELTA SLANT THE PERFORMANCE STANDARD IN GANTRY CMMS

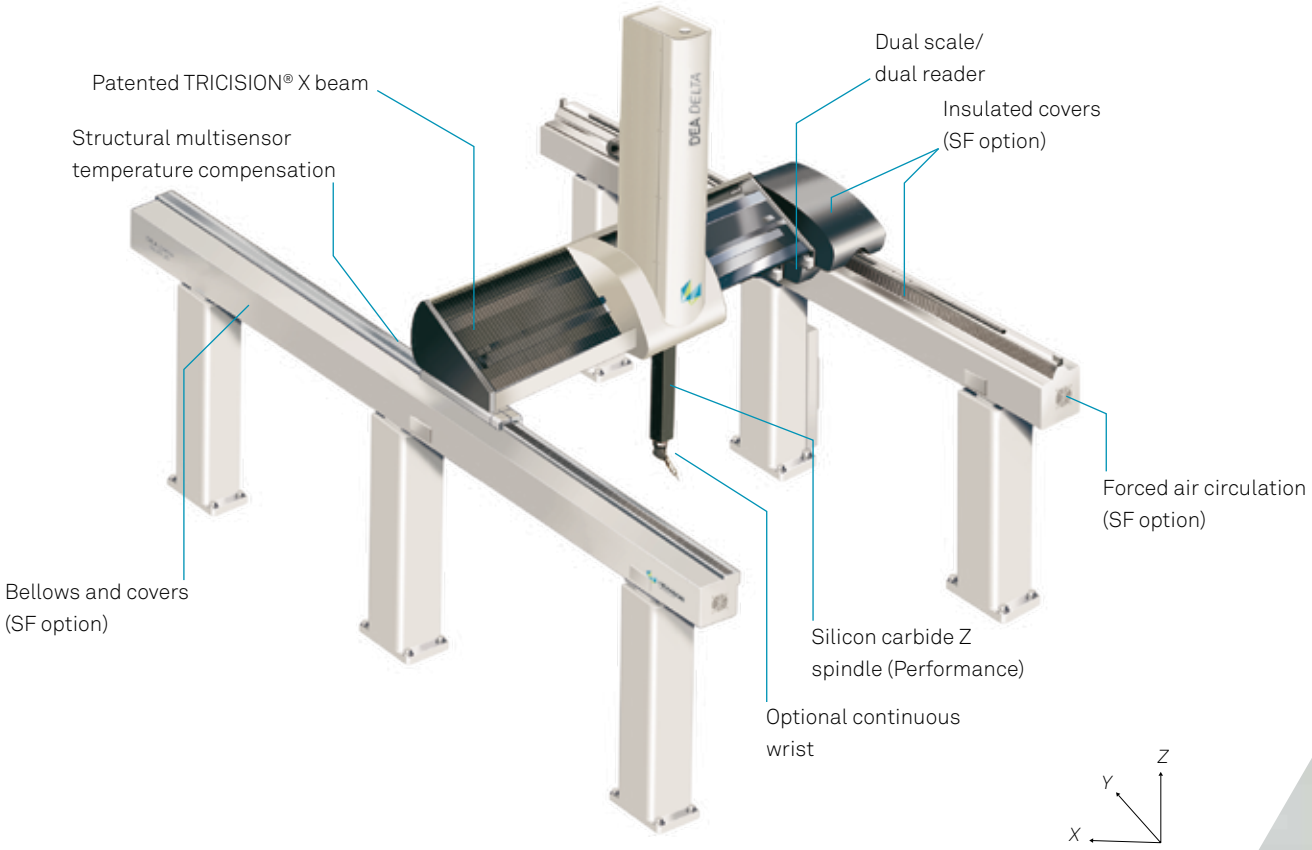
DEA DELTA SLANT is a mid to large sized gantry measuring machine that is the outcome of the many years' experience offered by Hexagon Metrology in the design and construction of gantry measuring machines.

Thanks to substantial improvements, DEA DELTA SLANT now offers new sizes and higher accuracies at an unbeatable price/performance ratio. DEA DELTA SLANT adopts the latest technological innovations of the Group like the X main traverse beam made of extruded aluminium with patented TRICISION® design, dual reader on the Y cross members, as well as the most advanced automatic compensation system for geometric errors, that handles 26 different paramters (Performance version). All DEA DELTA SLANT models are equipped with a structural multisensor temperature compensation. DEA DELTA SLANT is available in the two versions Classic and Performance.

The flexible DEA DELTA SLANT Classic measurement system is a perfect blend of metrology performance, versatility and affordability.
DEA DELTA SLANT Performance is the ideal system for applications requiring higher accuracies and shorter measurement cycles. The typical applications of DEA DELTA SLANT are mid-large sized components of the automotive, aerospace, heavy transport, railway, wind energy and die and mould industry.

DEA DELTA SLANT has the whole range of Hexagon Metrology probes and probe heads available – from the versatile effective indexable probe heads range through the fixed continuous scanning heads, to the HH-ACW-43MW continuous wrists.

To allow the use of DEA DELTA SLANT systems in industrial environments without air-conditioned enclosures, all models may be configured in the SF version (Shop Floor). This exclusive kit consists of covers and bellows for the whole machine structure, including the forced ventilation along longitudinal beams.




DEA DELTA

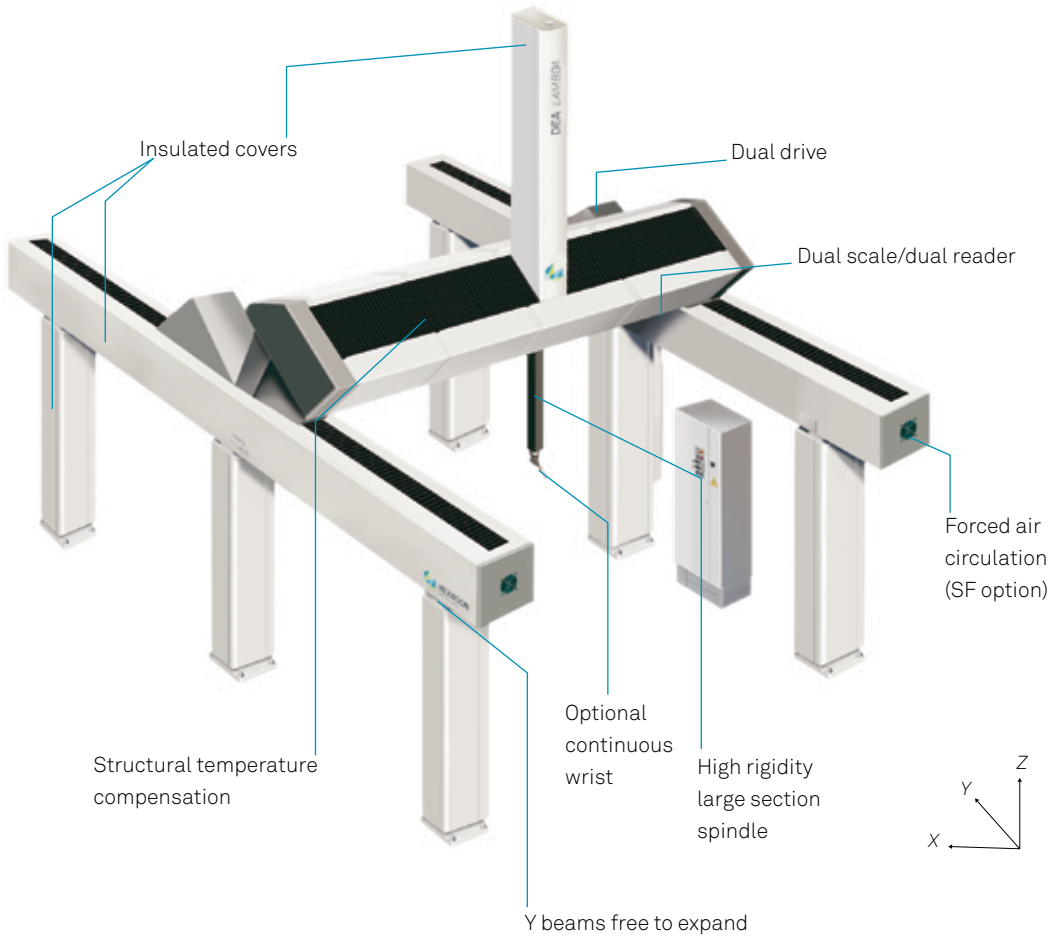

DEA LAMBDA

DEA LAMBDA SP THE HI-TECH GIANT CMMS

DEA LAMBDA SP is a line of very large measuring machines designed for operation in industrial environments. They excel in the high-speed, high-accuracy inspection of huge components, such as marine engines, aircraft structures, turbines, etc. that require open, modular, easily customizable structures with virtually unlimited measuring volumes.

A proprietary dual drive/dual encoder system on the Y-axis simulates a virtual single axis located at the center of the carriage. Carriage yawing and structure deformations during motion are monitored by a distributed sensor system and compensated in real time. This unique configuration prevents the yawing of the carriage ensuring higher dynamics and superior measuring accuracy.

All axes and pillars are protected by wrap-around thermally insulated covers and bellows. Internal forced air circulation eliminates temperature stratification. An advanced multi-sensor temperature compensation system ensures nominal measuring accuracy over an extended ambient temperature range.
High performance servo wrist options handle exceptionally long probe extensions for full accessibility to all part features.



SOPHISTICATED TECHNOLOGY

Superior Long-term Accuracy

- conservative FEA design reduces structural deflections
- dual drive/dual scale versions eliminate carriage yawing
- real time correction of up to 26 geometrical parameters (DELTA SLANT Performance)
- extra large bearing proportions and generous stiffness/mass ratio
- high-rigidity large section Z-spindle
- high resolution scales
- vibration isolation options

Excellent Productivity and Flexibility

- low-mass aluminum alloy moving members
- maximum velocity and acceleration – control of jerk
- continuous axes motion interpolation (FLY)
- automatic optimized tuning of servo parameters
- high throughput non-contact sensor options
- optional servo wrist rotates while the machine moves
- integrated flexible fixturing options

Reliable Design for Effective Integration

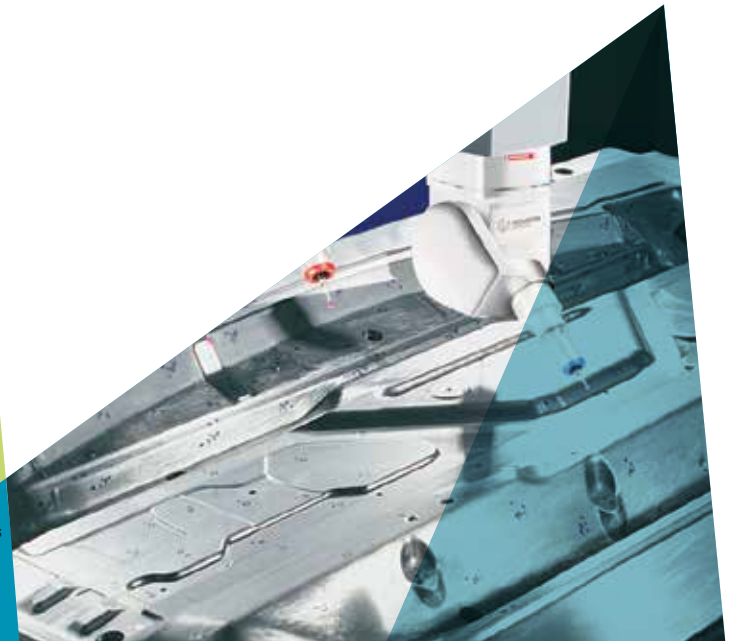
- lower maintenance requirements
- high calibration stability
- reduced field adjustments
- easy access to all machine components
- wear- and damage-free use

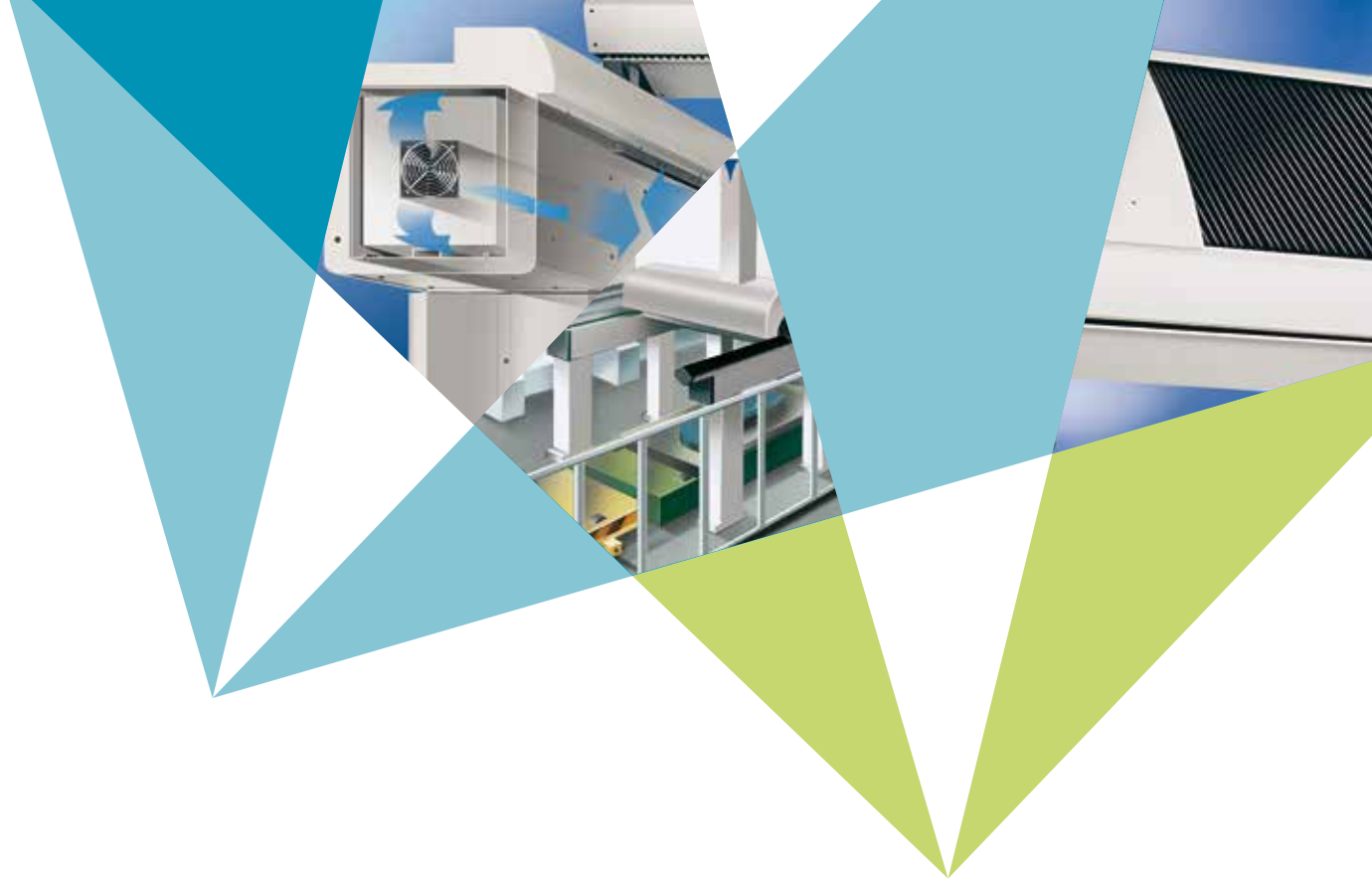
Extended System Availability

- heavy duty proven machine design
- multiple enclosure versions
- partial/full covers
- internal forced air circulation
- thermally insulated
- pneumatic safety brake on the Z-spindle
- reduced number of parts
- industry standard compliance

Safe Operation in Workshop Environments

- Y axis guideways are free to expand without distorting
- scales with certified coefficient of temperature expansion
- thermally stabilized machine versions
- thermally insulated enclosure versions
- high efficiency temperature compensation
  - linear
  - structural





THE DIVERSE FIELDS OF APPLICATION OF THE GANTRY MEASURING MACHINES

Die and Mold Manufacturing

DEA gantry machines provide an advanced tool for model making, die prove-out, inspection analysis and failure analysis.

- High accuracy, high productivity surface mapping capabilities are supported by automatic tactile scanning systems and ultra-high speed non-contact scanning head options that acquire millions of data points from the model real surface.
- Efficient CAD interfaces allow exporting the processed surface point files to CAD/CAM systems for the generation of machining tool paths.

Surface Design & Metrology

An interactive computer graphic environment for the dimensional verification and CAD modeling of free form surfaces, streamlines

- Reverse engineering operations, for the creation, maintenance, and modification of CAD models directly from actual parts.
- the efficient incorporation of design and manufacturing changes back into the CAD database
- the quick and complete verification of complex free form shapes and features directly from their nominal CAD geometry.

Dimensional Inspection

DEA gantry machines excel in inspecting, with superior accuracy, large and very large mechanical parts, high precision machined components, large automotive and aerospace structures.

The application is supported by

- a complete metrology CAM package: bi-directional direct CAD interfaces allow establishing common manufacturing practices driven from CAD databases.
- an interactive graphic user interface, that includes a 3D animation of the full machine kinematics including part and fixtures, and flexible graphical reporting functions.
- advanced scanning options that increase data point density and improve feature dimension, location, and form analysis, while enhancing system throughput.

PROBING THE DIFFERENCE!

A wide range of high-performance probe heads and measurement sensors

HH-A-T5° Indexable Probe Head – Always the Right Attitude!

HH-A-T5° is a motorized articulating probe capable of rotating about two axes in 5° increments, which translates to a total of 2,952 possible positions. The particular asymmetrical shape of the indexing arm and the lateral indexing capability allow to use the full measurement volume. The HH-A-T5° also features high speed indexing with faster index changes than similar products, and thus shorter time cycles. The robust aluminum construction and rugged design permits extension rods with lengths over 300 mm. The TKJ kinematic joint connection allows direct docking with the continuous scanning probes, or coupled with an M8 adaptor, can be used with HP-TM touch trigger probes as well as probes of other manufacturers.

HP-S-X5

Ultra-precise, full 3D, fixed scanning head capable of simultaneously measuring in the X, Y, and Z directions to precisely define the orientation of the workpiece surface. This heavy-duty analog probe features very high and repeatable accuracy even with extra-long probe extensions and heavy styli clusters (up to 500 mm of length and 500 g of weight). It features a proprietary anti-collision system for extra protection of the head. The HP-S-X5 is the ideal tool to verify high accuracy mechanical parts and complex geometries. An automatic tool changing capability allows styli change within a measuring program without the need for probe requalification. Pneumatic clamping of styli on the head permits fast and reliable changes.

HP-S-X1

The HP-S-X1 is a high-accuracy 3D scanning sensor, that can take thousands of points quickly and automatically. The HP-S-X1 allows a thorough evaluation of the measured geometric features, including form, position and size error. It is offered in two different probe types, HP-S-X1S and HP-S-X1H, each optimized for specific styli length ranges.
This sensor uses the same technology adopted for other probe heads in the HP-S-X range. Thanks to the TKJ adapter, HP-S-X1can be changed using the THR-R probe changer rack, while fast and repeatable styli changes are possible with the HP-S-X1 styli changer rack due to the stylus magnetic holder.

HH-A-2.5

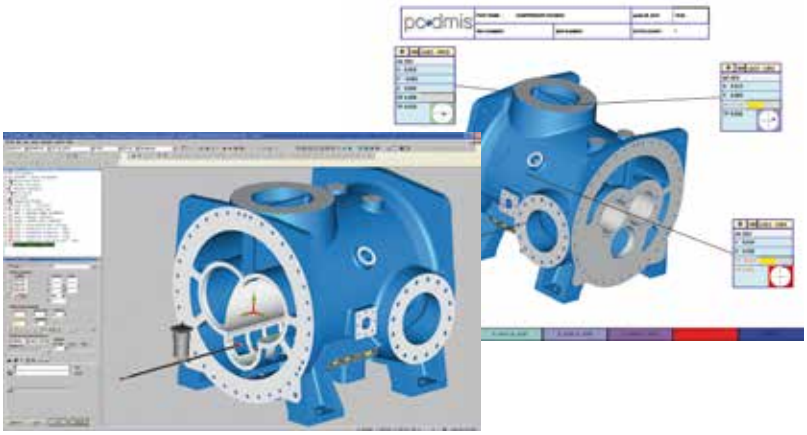
The HH-A-2.5 is a motorized probe head in the Hexagon Metrology Sensor line; the head features a number of new innovations including an embedded controller, capacitive crash protection and positioning is achieved by use of a Hirth Gear. The HH-A-2.5 also benefits from a completely redesigned drive system; it features a large number of indexable positions and very high rotational torque.
The HH-A-2.5 is available in two versions:

- HH-A-T2.5 AUTOMATIC TKJ PROBE HEAD
  The head is fitted with a kinematic joint (TKJ) which can be connected to a Multiwire to give multi sensor support. The TKJ can be changed either manually or automatically (-with the HRR probe changer) without the need for requalification. The probe is capable of indexing in 2.5° increments and can achieve 12,240 unique positions.

- HH-A-H2.5 AUTOMATIC HDKJ PROBE HEAD
  The head is fitted with the all new Heavy Duty Kinematic Joint (HDKJ) which can carry extension of up to 750 mm and can also be connected to a Multiwire to give multi sensor support. Laser scanner and analogue scanning heads can be supported further from the axis of rotation than with conventional heads due to the combination of extreme rotational torque and the HDKJ adaptor. The HDKJ can be changed either manually without the need for requalification or automatically with the HR-R tool changer fitted with the optional HR-RH Heavy Duty Module. The probe is capable of indexing in 2.5° increments and can achieve 20,736 unique positions.


PC-DMIS LEADING-EDGE MEASUREMENT SOFTWARE

Available in three different versions and with a number of optional packages, PC-DMIS measurement and inspection software provides the most comprehensive solution to any kind of metrology applications.



PC-DMIS PRO

Full-featured Metrology Software

PC-DMIS PRO® provides the basic intuitive graphic user interface (without CAD), including a suite of wizards to help operators quickly learn and manipulate key inspection functions. Features include:

- A full programming environment including high level programming functions.
- Customisable menus.
- Quick Start routines for probe qualifications, part alignments and hyper-reporting functions.
- A full suite of customisable reporting and advanced Hyper-Reporting tools.
- Intuitive Probe and Go to automatically recognize feature types and create interactive graphical part representations.

PC-DMIS CAD

Adds the Ability to Import CAD Files

PC-DMIS CAD includes all PC-DMIS PRO functionalities, plus:

- Full 3D animation capability including digitised images of parts and fixtures on the machine so operators can visually verify the setup and program prior to actual part inspection.
- Unknown part documentation to generate computer models for reverse engineering applications.
- Native download of VDAFS, IGES, DXF, DWG, STEP, XYZIJK, STL, DES, and DMIS formats.
- A Direct CAD Interface (DCI) option to create part programs directly from CAD models utilizing the native CAD system algorithms and tools.
- A Direct CAD Translator (DCT) option allows the use of a native CAD model even when the specific CAD system is not owned by the user.

PC-DMIS CAD++

Adds Scanning and Thin-walled Parts

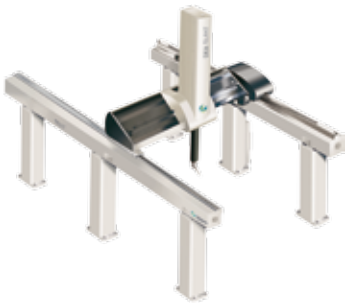
In addition to all PC-DMIS PRO and PC-DMIS CAD functionalities, PC-DMIS CAD++ incorporates scanning and digitising functions that allow fast and efficient measurement of complex shapes such as turbine blades, dies, models, sheet metal components and other curved shapes. Features include:

- Rotary, patch, linear open and closed loop scanning.
- Perimeter, section, UV and edge point scanning.
- Complete probe simulation.
- Full thin-wall feature measurement suite.

DEA ALPHA

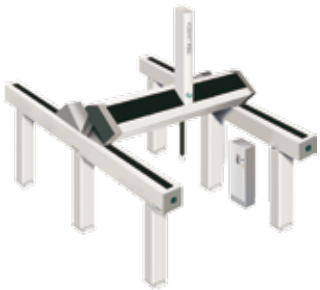
Series	Strokes (mm) X	Y	Z	Overall Dimensions (mm) Length	Width	Height	Weight (kg)
20.33.10	2000	3300	1000	4200	3640	3555	3130
20.33.15	2000	3300	1500	4200	3640	4555	3450
20.50.15	2000	5000	1500	5900	3640	4555	4870
25.33.15	2500	3300	1500	4200	4140	4555	3480
25.50.15	2500	5000	1500	5900	4140	4555	4900
25.33.18	2500	3300	1800	4200	4140	4860	3490

DEA DELTA SLANT



25.51.20	2500	5100	2000	6504	4367	5604	7150
30.51.20	3000	5100	2000	6504	4867	5604	7250
30.51.25	3000	5100	2500	6504	4867	6604	7850
30.63.25	3000	6300	2500	7704	4867	6604	8350
30.80.25	3000	8000	2500	9404	4867	6604	10450
30.51.30	3000	5100	3000	6504	4867	7604	8500
30.63.30	3000	6300	3000	7704	4867	7604	9100
30.80.30	3000	8000	3000	9404	4867	7604	11350
35.51.25	3500	5100	2500	6504	5367	6404	7850
35.63.25	3500	6300	2500	7704	5367	6404	8450
35.80.25	3500	8000	2500	9404	5367	6404	10550
40.51.30	4000	5100	3000	6504	5867	7640	8650
40.63.30	4000	6300	3000	7704	5867	7640	9250
40.80.30	4000	8000	3000	9404	5867	7640	11400

DEA LAMBDA SP



40.51.30	4000	5100	3000	7530	6345	8290	11800
40.63.30	4000	6300	3000	9000	6345	8290	12400
40.80.30	4000	8000	3000	10600	6345	8290	15300
40.100.30	4000	10000	3000	13200	6345	8290	16950
50.51.35	5000	5100	3500	7530	7345	8790	13000
50.63.35	5000	6300	3500	9000	7345	8790	13600
50.80.35	5000	8000	3500	10600	7345	8790	16500
50.100.35	5000	10000	3500	13200	7345	8790	18150
60.51.40	6000	5100	4000	7530	8345	9290	14200
60.63.40	6000	6300	4000	9000	8345	9290	14800
60.80.40	6000	8000	4000	10600	8345	9290	17700
60.100.40	6000	10000	4000	13200	8345	9290	19350

A STANDARD OF QUALITY SECOND TO NONE

The quality and reliability of DEA gantry CMMs result from the accuracy of the manufacturing techniques and total quality control procedures adopted, and the rational interaction of skilled workers with high technology production equipment.

Full Machine Performance Certification

The performance of all machines is checked and certified through the most rigorous application of the test procedures specified by stringent international standards for CMMs (ISO, ASME, VDI/VDE). The tests include:

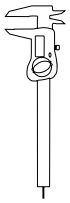
- The verification of the maximum permissible error of indication for size measurement.
- The verification of the maximum permissible probing error.
- The verification of the maximum permissible scanning probing error.

A Commitment to Quality

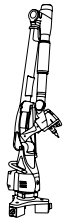
The company's exclusive Quality Information System (SIQ) monitors in real time the quality of each machine produced and its compliance with the specified standard.

All aspects of the activity carried on by Hexagon Metrology, from product design and manufacturing to delivery and customer service have been reviewed and found to meet internationally accepted quality standards (ISO 9001 and VDA 6.4).

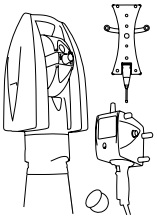
ISO 14001 ISO 9001 VDA 6.4



PRECISION MEASURING INSTRUMENTS

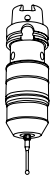


PORTABLE MEASURING ARMS

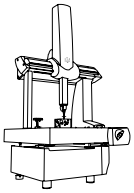


LASER TRACKERS & STATIONS

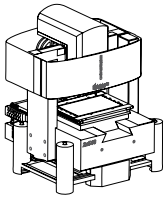
WHITE LIGHT SCANNERS



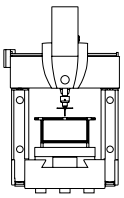
SENSORS



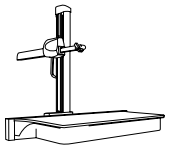
BRIDGE CMMS



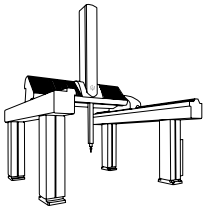
MULTISENSOR & OPTICAL SYSTEMS



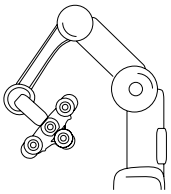
ULTRA HIGH ACCURACY CMMS



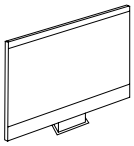
HORIZONTAL ARM CMMS



GANTRY CMMS



AUTOMATED APPLICATIONS



SOFTWARE SOLUTIONS

HEXAGON METROLOGY

Hexagon Metrology offers a comprehensive range of products and services for all industrial metrology applications in sectors such as automotive, aerospace, energy and medical. We support our customers with actionable measurement information along the complete life cycle of a product – from development and design to production, assembly and final inspection.

With more than 20 production facilities and 70 Precision Centers for service and demonstrations, and a network of over 100 distribution partners on five continents, we empower our customers to fully control their manufacturing processes, enhancing the quality of products and increasing efficiency in manufacturing plants around the world.

For more information, visit **www.hexagonmetrology.com**

Hexagon is a leading global provider of information technologies that drive productivity and quality across industrial and geospatial applications. Hexagon's solutions integrate sensors, software, domain knowledge and customer workflows into intelligent information ecosystems that deliver actionable information. They are used in a broad range of vital industries.

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