Precise Industrial 3D Metrology

ATOS ScanBox

Optical 3D Coordinate Measuring Machine

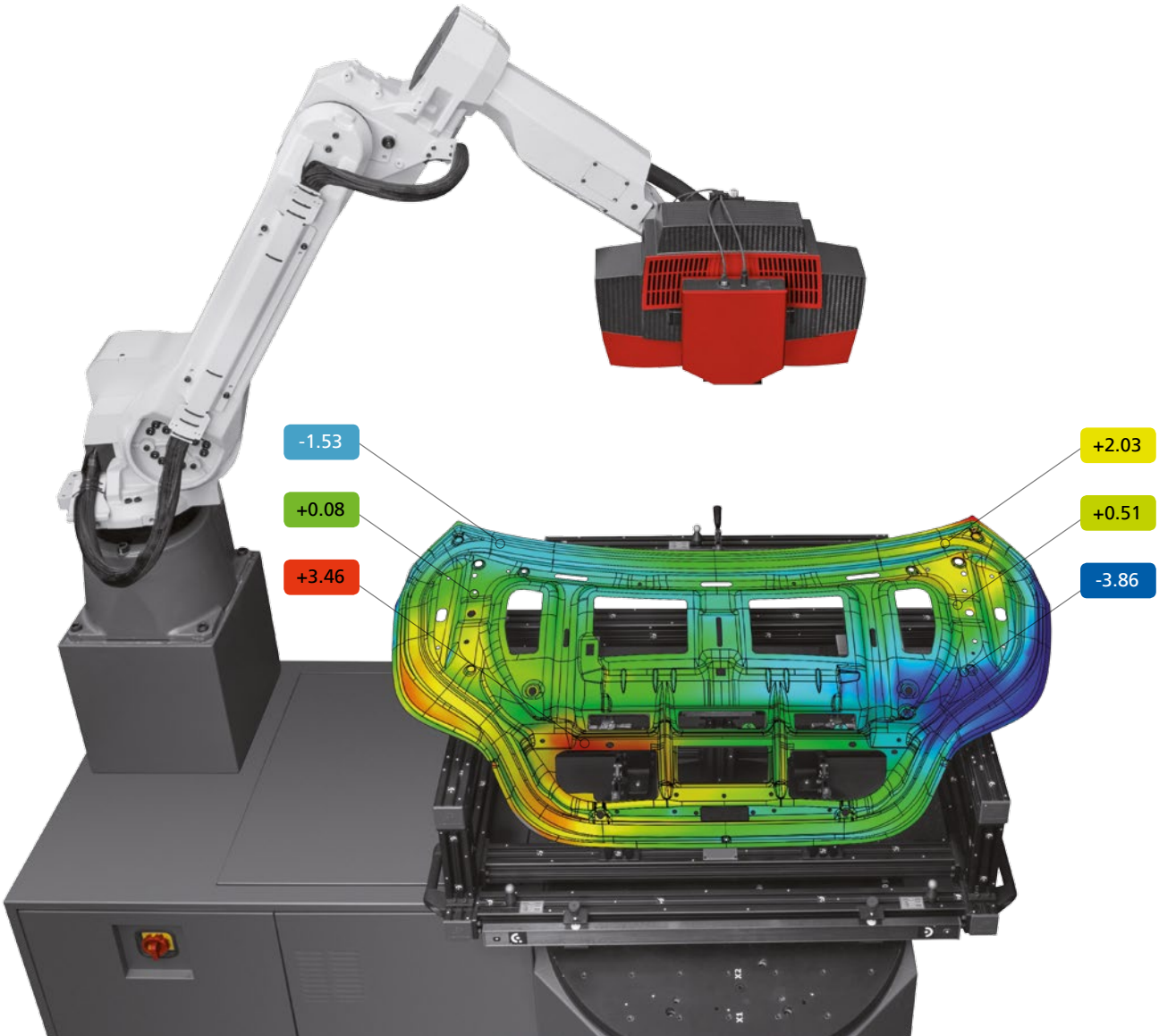
For measuring room and production
Full-surface component analysis
GD&T, hole pattern and trimming

Optical 3D Measuring Technology

In Industrial Quality Control

Optical 3D coordinate measuring machines are replacing tactile measuring systems and gages in many areas of industry. They capture more detailed and more easily interpretable quality information of an object with significantly shorter measuring times.

Whereas mechanical measuring systems capture data in a point-based or linear manner, optical measuring systems return full-field data about deviations between the actual 3D coordinates and the CAD data. As this measuring data contains all the object information, in addition to the surface deviations from the CAD, the software also automatically derives detailed information such as GD&T, trimming or hole positions.



The accuracy of optical measuring machines is not due to expensive and high-maintenance precision mechanics, but is rather based on state-of-the-art optoelectronics, precise image processing and mathematic algorithms. Few precision standards and automated calibration that can be performed by the customer ensure the accuracy of the machine. This also means no loss of accuracy due to wear under harsh conditions. As with the tactile machines, measuring uncertainty is certified with the help of ball bars or step gauges.

Over 14,000 GOM measuring systems worldwide ensure the dimensional quality of automotive, sheet-metal, cast and injection molded products as well as turbine blades and wheels. In most cases, the detailed analyses are not used for a simple "OK"/"not OK" evaluation, but rather form the basis for the optimization of production and machine parameters as part of a value-added measuring procedure.

Measuring Room

Typically, a wide range of different parts are handled in the measuring room. The measurement engineer creates both the measuring programs and the evaluation templates, together with the measuring reports, offline on the computer in a CAD-like environment. Special Auto Teaching functions speed up programming and ensure process reliability. After the actual measurement, the previously created evaluation templates are filled with real measuring data, deviations from the nominal value are calculated and the reports are automatically generated.

Production

Robustness, measuring speed and compensation for temperature fluctuations are convincing factors in production, enabling traceable results to be captured even under harsh conditions. As the machines can be operated close to production, the work-intensive transportation of components can be omitted. The operator works on the system in an encapsulated mode (Kiosk Interface), which means that precise measurements can be performed and measuring reports can be created without any knowledge of measuring technology.

GOM Sensors

High Tech in Robust Machines

ATOS 3D Sensors

The core of all the ATOS ScanBox systems is the ATOS 3D scanner, which GOM has offered since 1995. The ATOS sensor is currently available in three different model ranges for diverse applications.

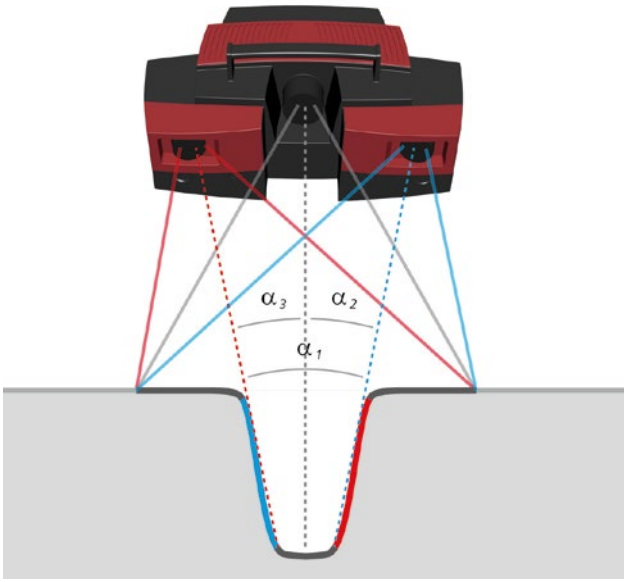
ATOS Triple Scan

ATOS Core

High image resolution and measuring speed – The ATOS sensors return full-field distributed 3D coordinates for each individual measurement. Up to 16 million independent measuring points are captured within 1 to 2 seconds. The measuring data is characterized by very high detailed reproduction, thus also enabling very small component features to be measured.

ATOS Plus – In GOM measuring machines, the ATOS sensors are typically operated together with the Plus Box. The latter is a photogrammetric add-on sensor which can be directly attached to the ATOS system. This enables, with a total measuring volume of 500 x 500 x 500 mm³ to 6000 x 3000 x 3000 mm³, reference point markers with deviations from 3 µm to 30 µm to be measured fully automatically. These reference points then form the basis for the overall accuracy. If the ATOS sensor detects one of these reference points in a number of individual measurements, it is transformed into the 3D volume which spans these points. In this way, the measuring accuracy of the overarching photogrammetric measurement is achieved.

Triple Scan Principle – Precise fringe patterns are projected onto the surface of the object and are recorded by two cameras, based on the stereo camera principle. As the beam paths of both cameras and the projector are calibrated in advance, 3D surface points from three different ray intersections can be calculated: Visual beam camera/camera, visual beam camera on left/projected beam projector and camera on right/projected beam projector. This automatic principle offers advantages for measuring reflective surfaces and objects with indentations. If a ray intersection is not possible for a ray combination due to reflection or indentation, the other two are used. The result is complete measuring point distributions without holes or erratic points.



Blue Light Technology – GOM projection technology works with narrow-band blue light, which means that interfering ambient light during image acquisition can be filtered out. The light sources are so powerful that short measuring times can be achieved even on uncooperative surfaces. In addition, they have a life expectancy of well over 10,000 hours.

Self-calibration – The ATOS sensors are fully self-calibrating. The ATOS ScanBox contains a certified calibration panel and two certified scale bars in the vicinity of the object. Prior to and after the measurements, these normals are recorded from different directions. On the basis of the acquired images and the calibration data of the normals, self-calibration of the sensors is performed without any operator intervention, by the definition of many thousands of imaging and geometry parameters. As the expansion coefficients of the normals are known, the ATOS ScanBox can be operated in a wide ambient temperature range as automatic self-calibration is carried out at the appropriate temperature.

Workflow

ATOS Professional VMR Software

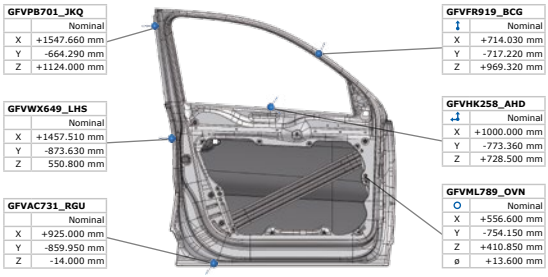
Virtual Measuring Room (VMR)

The virtual measuring room is the central control station and measurement planning software for all elements of the ATOS measuring cells. It offers the functional representation of a real measurement environment in a virtual simulation. Due to the VMR, the user can work with the system without the requirement for specific robot programming skills. All robot movements are simulated and checked for safety before being performed in the virtual measuring room.

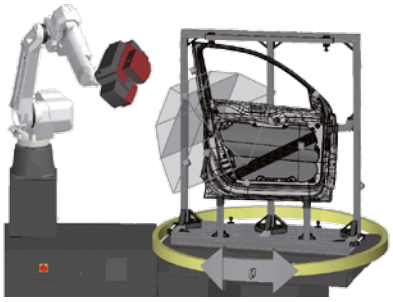
The VMR covers the full measuring procedure:

Inspection Planning	Robot Programming	One-Off Burn-In	Series Measurement	Measuring Evaluation
Offline		Online	Online	

Inspection planning – The CAD data set is imported together with the associated measurement plan. The inspection features stored there are automatically assigned to the inspection characteristics from the measurement plan. The measuring report can also be prepared offline in advance. The actual measuring results can be displayed after the measurement procedure.



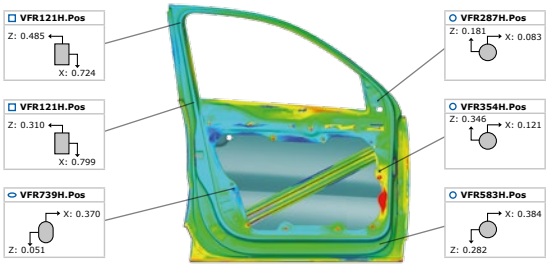
Robot programming – The Auto Teaching function in the VMR calculates the required sensor positions for all inspection features and CAD surfaces. The subsequent path optimization improves the sequence of the positions in terms of runtime and collision avoidance. Thanks to Auto Teaching, the time required for creating reliable and runtime-optimized robot programs is kept to a minimum.



Burn-in – The measuring programs created offline are only once "burned in" in the ATOS ScanBox using an automated process. The robot moves to the measurement positions, where it defines the individual measurement parameters, e.g. exposure times, on the real life component. Using a special procedure, the software automatically detects component mirroring and adapts the fringe projection in order to prevent measuring errors caused by mirroring.

Series measurement – Ready-to-use measuring programs can be utilized for inspecting other components. The robot is fully controlled by the software and successively moves along the measurement positions. A check is carried out on each measurement as to whether the results meet the quality criteria. Changes to the data status of the CAD or the measurement plan can be quickly updated by the parameterized software.

Measuring evaluation – After data acquisition has been performed, the software calculates a polygon mesh of the surface of the component as well as the actual values of the inspection feature plan. This data is compared with the nominal data and is presented in a report. The measuring results are automatically saved in special export formats, e.g. databases for statistical quality control. The measuring procedure for different components can be performed fully automatically.



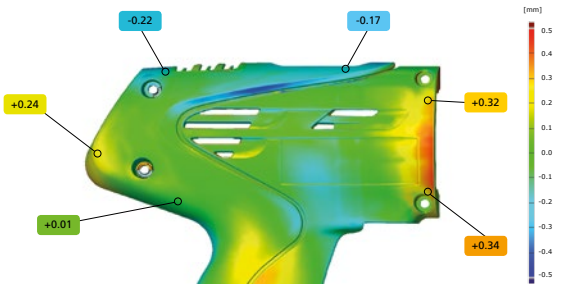
Evaluation and Measuring Reports

ATOS Professional VMR Software

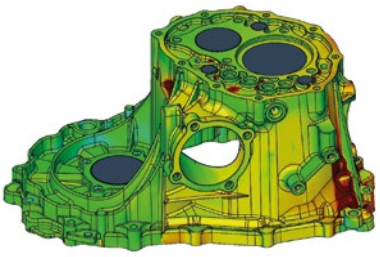
Certified Inspection Software

To ensure precise measuring accuracy, the GOM software packages have been tested and certified by the two institutes PTB and NIST. The accuracy of the inspection software is confirmed by the comparison of the results obtained with the reference results. The GOM software has been placed in Category 1, the category with the smallest measurement deviations.

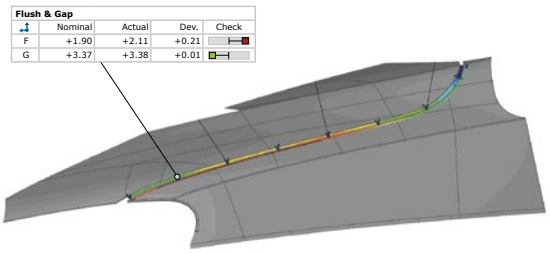
Actual-nominal comparison – The calculated polygon mesh describes free-form surfaces and standard geometries. These can be compared with the drawing or directly with the CAD data set with the help of a surface comparison. A 3D analysis of surfaces as well as a 2D analysis of sections or points can be implemented in the software. CAD-based generation of standard geometries such as lines, planes, circles or cylinders is also possible.

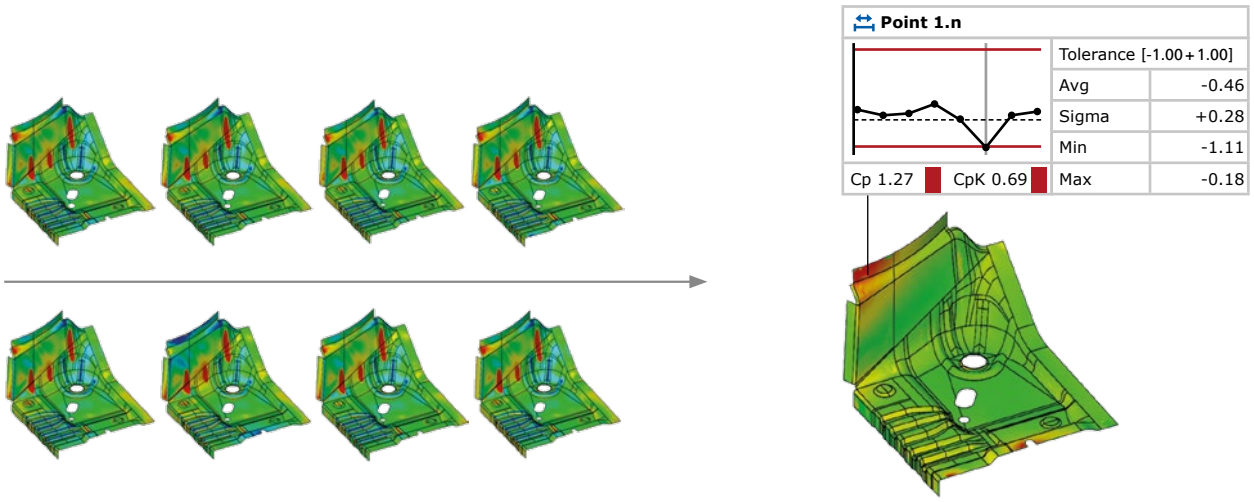


Alignment – The GOM 3D software contains all standard alignment functions. These include RPS alignment, hierarchical alignment based on geometric elements, alignment in a local coordinate system, using reference points as well as various best-fit methods such as global best-fit and local best-fit. Customers can also use their own specific alignments, e.g. for turbine blades, such as balanced beam or equalized nested.



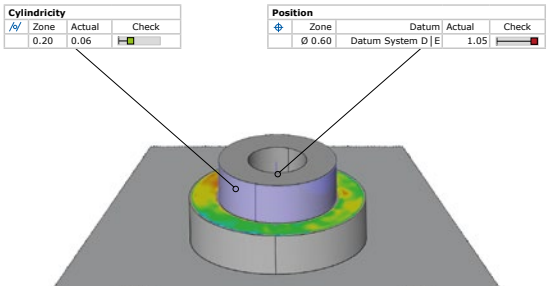
Curve-based inspection – On the basis of full-field digitalized data, construction functions can be applied for curves and their characteristics can be visualized. Edge curves can, for example, be captured, radii and design lines can be analyzed and spline curves can be created. Curve-based inspection is also used to evaluate gap and flush.



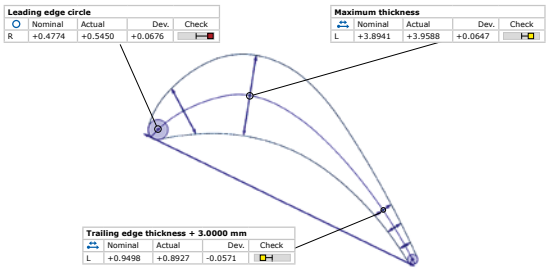


Trend, SPC and deformation analysis – The parameter-based approach of the GOM software enables trend analysis for multiple evaluation, e.g. for statistical process control (SPC) or deformation analysis. As a result, several parts or stages within a single project can be evaluated in a full-field manner, and statistical analysis values such as Cp, Cpk, Pp, Ppk, Min, Max, Avg and Sigma can be determined.

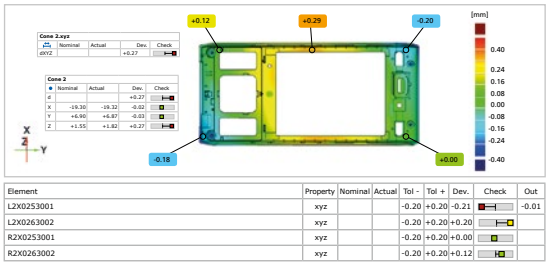
GD&T analysis – In contrast to the pure dimension analysis, the GD&T analysis focuses on the functional aspect of the part. Corresponding GD&T elements are, for example, planarity, parallelism or cylindricity. Both, a standardized analysis of 2-point distances and of the maximum material requirement as well as the position tolerance in local datum and coordinate systems are possible.



Airfoil inspection – Special functions are available for the quality control of turbine blades, which can be used, for example, to inspect the profile mean line, profile chord line or profile thickness of turbine blades on the basis of 2D sections. The profile centroid, profile radii and profile twists can also be calculated.



Reporting – The reporting module enables users to create reports containing snapshots, images, tables, diagrams, texts and graphics. The results can be visualized and edited in the user interface as well as exported as a PDF file. Templates are reusable, and each scene saved in a report can be restored in the 3D window.



ATOS ScanBox

Complete System from a Single Source

The ATOS ScanBox is a complete optical 3D measuring machine which was developed by GOM for efficient quality control in the production and manufacturing process. The ATOS ScanBox has been installed several hundred times worldwide and is successfully used in a variety of industries. Nine models are available for different part sizes and applications.

Standardized quality – The ATOS ScanBox is a standardized measuring machine which is certified in accordance with the machinery directive and is already in use in many applications. There is no risk for the customer in terms of costs, performance or delivery date – in contrast to projected individual systems. Even before an order is placed, test measurements can be performed in an identically designed ATOS ScanBox to verify measuring equipment capability.

An ATOS ScanBox is usually supplied ex stock at short notice. Depending on the type, commissioning may take a few hours for the small boxes (Series 4) and up to two weeks for the large boxes (Series 7 and 8). The entire kinematics is based on robust automation components instead of precision mechanics. The machines are hardly subject to any wear even under harsh ambient conditions and retain their full accuracy.

Space saving – All ATOS ScanBox models are characterized by their compact design. The ATOS ScanBox models 4105, 5108 and 5120 do not have to be anchored in the floor of the factory or on special measuring tables. They can easily be transported to the required place within a short period. All that is needed at the location is a power connection.

ATOS ScanBox Series

Series 4

Series 5

Series 6

Simple operation – The Kiosk Interface is a special user interface for a simplified operation of the ATOS ScanBox. The software handles the entire process control and performs the measuring and inspection procedure automatically. As human interaction is reduced, high precision and data quality are guaranteed: Measurement parameters, data, and the operating system are protected.

High measuring speed – Compared to a traditional tactile coordinate measuring system, the ATOS ScanBox can reduce the measuring and inspection time for a component by more than half.

"Closed Loop" vs. "Open Loop" – With robot-based measuring systems, an optical scanner is moved over the component. To bring the measurements from all the positions into a coordinate system, these must be defined with high precision, as the positioning accuracy of the robot is not sufficient for metrological tasks.

Using "Open Loop", the scanner is tracked with a second measuring system. As movements of the tracking system result in measuring errors, floor movements and vibrations are disturbing. Complete measurements or measurements inside a car body are in this case problematic as the optical tracker cannot track the scanner.

Using "Closed Loop", 3D coordinates of the characteristics of an object are first determined photogrammetrically without any interference from any ambient influences. During subsequent scanning, the scanner determines its position itself on the basis of the previously determined characteristics and transforms with high precision into a global coordinate system.

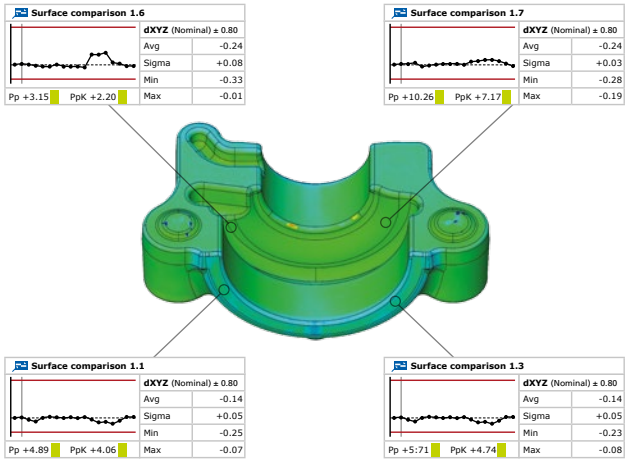
Series 7

Series 8

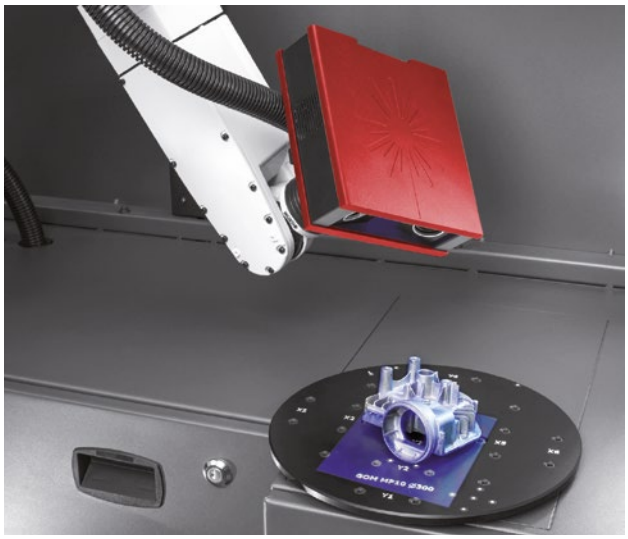
ATOS ScanBox Series 4

Measurement of Small Complex Components up to 500 mm in Size

Injection and die-cast parts and their tools, molds, stamped and drawn parts often have very complex contours and connection geometries which have to be checked during the series and batch production ramp-up. The ATOS ScanBox 4105 is an efficient 3D measuring machine for these applications.



Optimized kinematics – The ATOS ScanBox 4105 shares its kinematic concept with the large measuring machines of Series 5 and 6: The ATOS sensor is attached to a robust and fast industrial robot. The components to be measured are positioned on a rotation table to enable the sensor to measure all the areas of the object from above and below with short distances. This is possible thanks to the very compact dimensions of the ATOS ScanBox. As the entire kinematics is controlled by a single electronics system, robot and rotation table can move synchronically, and at the same time, potential collisions are monitored.



Plug & Play – The robust machine housing contains all components of the ATOS ScanBox. As a 100 - 240 V power supply is used and the measuring system only weighs approx. 900 kg, it can be used for measuring in almost all premises. Four wheels enable the unproblematic repositioning of the ATOS ScanBox in the factory shop. The sliding door is designed in such a way that it can be loaded with a crane.

High detail image resolution – Small geometries such as locking hooks or catches for injection molded parts are often very important for the function. In the ATOS ScanBox 4105, ATOS sensors with the smallest individual measurement field of 80 x 60 x 60 mm³ can be used. As a result, it is possible to measure details which are only several tenths of a millimeter in size.

ATOS ScanBox 4105

Dimensions	1600 × 1200 × 2100 mm
Power supply	Standard, 100 - 240 V (1-phase, 16 A)
Max. part size	Up to Ø 500 mm
Max. part weight	Up to 100 kg
Automated axes	7
Entry	Sliding door with safety lock
Opening width	685 mm
Floor mounting or fixing	Not required, mobile
Loading concept	Manual, crane

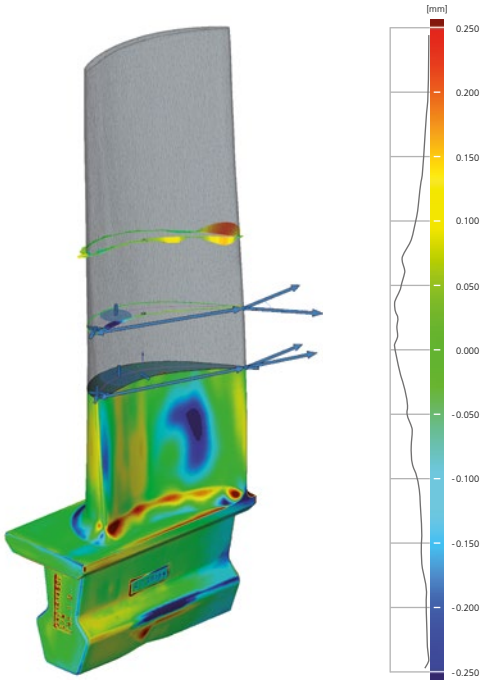
Measuring uncertainty in accordance with VDI 2634 – The requirements in terms of measuring uncertainty are high for nearly all the applications of the ATOS ScanBox 4105. The acceptance and monitoring of the system with traceable normals is therefore an integrated function of the software. As the determination of Cg /Cgk and Cp /Cpk values is also implemented as part of the trend analysis, the process and measuring equipment capability can be analyzed with the help of a normal trend project without any additional software or calculations in Excel tables.

Two user interfaces in one single software program – The measuring room provides the specialist with all the functions of the ATOS VMR software for teaching, measuring and evaluating. The Kiosk Interface is activated in production. This way, parts can be measured at the press of a button using existing project templates. The measuring programs and evaluations cannot be changed by the user and the operating system of the integrated computer can no longer be accessed.

ATOS ScanBox Series 5

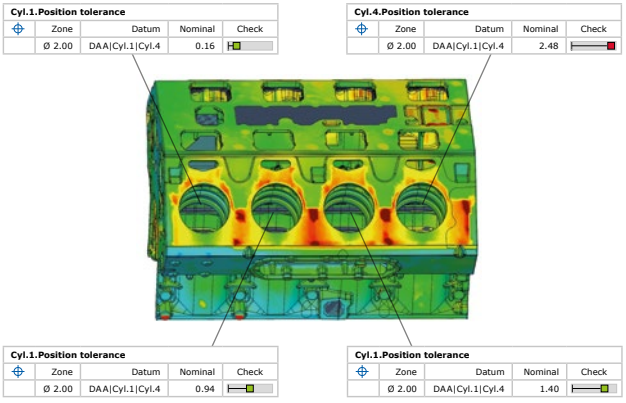
Mobile Measuring System for Parts up to a Size of 2000 mm

Both ATOS ScanBox models use ATOS Triple Scan sensors of the highest performance class. Thanks to the automatic precision calibration, high levels of accuracy are also achieved with large parts. As the relative position between the component and the sensor is constantly monitored throughout the entire measurement, interfering ambient influences can be detected and eliminated.



Mobility – The Series 5 machines are designed in such a way that they can be assembled and dismantled within one day. As no floor anchors are required and transportation is by truck, they can be quickly and easily transported from one location to another.

Module system for robot and rotation table – In addition to the robot and the rotation table, the entire control, safety and power electronics system is located in or on the modules, which are the size of a euro pallet and which can be easily moved with a pallet truck. The industrial robot used enables an internal cable routing. This ensures that the robot paths calculated by Auto Teaching do not result in jamming or strain of the sensor cables. The machine housing is constructed around the modules to ensure occupational safety in accordance with the machinery directive.



ATOS ScanBox 5108

Parts up to 800 mm in size are inspected with the 5108. Due to the small dimensions of this box, manufacturers of turbines, fans, blisks and cast housings often opt for this model. With airfoil inspections, sharp radii can be recorded in terms of their position and contour with a detailed image resolution of more than 20 measuring points per mm.

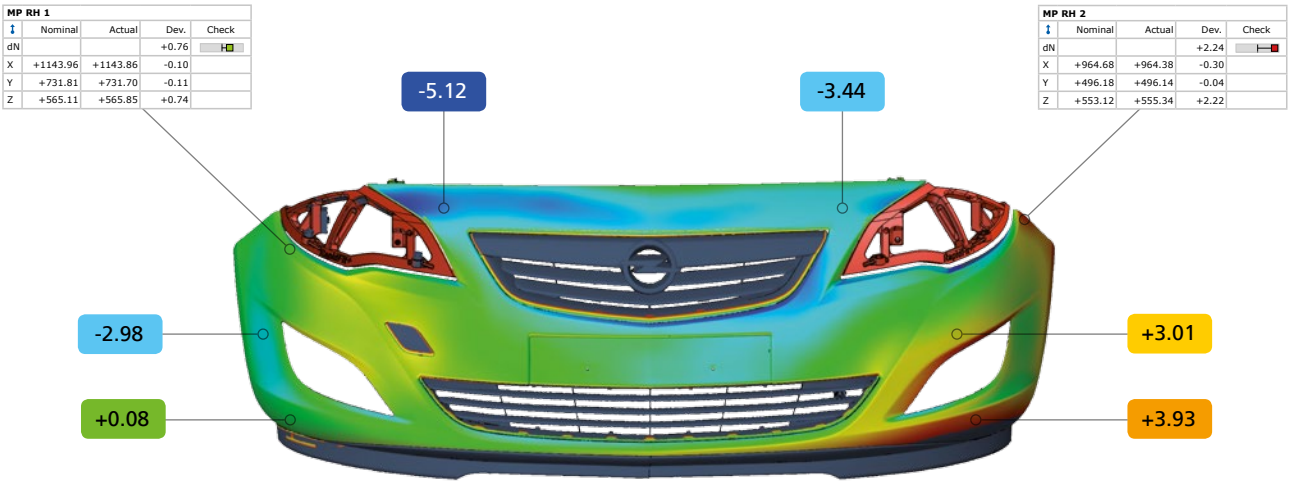
ATOS ScanBox 5120

As parts of up to 2000 mm in size can be easily measured with the 5120, this model is mainly used for larger parts such as interior components of vehicles. This ATOS ScanBox is also often used in foundry and forging applications, e.g. for inspecting cast parts, sand cones and models.

	ATOS ScanBox 5108	ATOS ScanBox 5120
Dimensions	2000 × 2550 × 2700 mm	3300 × 3300 × 2700 mm
Power supply	200 – 500 V (3-phase, 16 A)	200 – 500 V (3-phase, 16 A)
Max. part size	Up to Ø 800 mm	Up to Ø 2000 mm
Max. part weight	Up to 300 kg	Up to 500 kg
Automated axes	7	7
Entry	Sliding door with safety lock	Sliding door with safety lock
Opening width	800 mm	1400 mm
Floor mounting or fixing	Not required	Not required
Loading concept	Manual	Manual, transport cart, pallet truck

ATOS ScanBox Series 6

Measurement of Parts up to 3000 mm in Size



In production metrology, it is important to check a large number of parts as completely as possible, in order to be able to correct faulty production processes at short notice and in a targeted manner.

Pallet system – The components and the fixtures can be set up outside the ATOS ScanBox on changing pallets. The pallets are loaded quickly and reproducibly using positioning pins. This results in a high throughput of parts and is ideally suited for series production.

Quick loading and unloading – Measuring 3.1 m, the entry of the ATOS ScanBox 6130 is very wide and is secured by a safety light sensor. This allows an uncomplicated use of loading tools such as cranes, forklift trucks or pallet trucks in order to be able to place large parts on the measurement machine.

ATOS ScanBox 6130

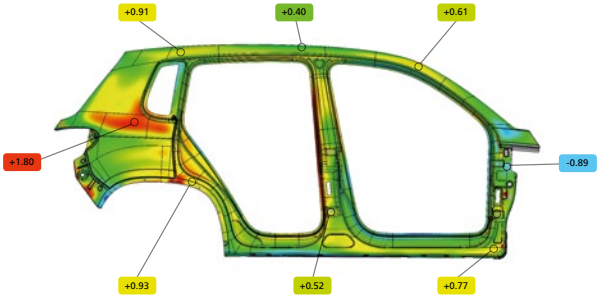
Dimensions	4250 × 4250 × 2700 mm
Power supply	200 – 500 V (3-phase, 16 A)
Max. part size	Up to Ø 3000 mm
Max. part weight	Up to 2000 kg
Automated axes	7
Entry	Safety light sensor
Opening width	3100 mm
Floor mounting or fixing	Required
Loading concept	Manual, transport cart, pallet truck, crane, forklift truck

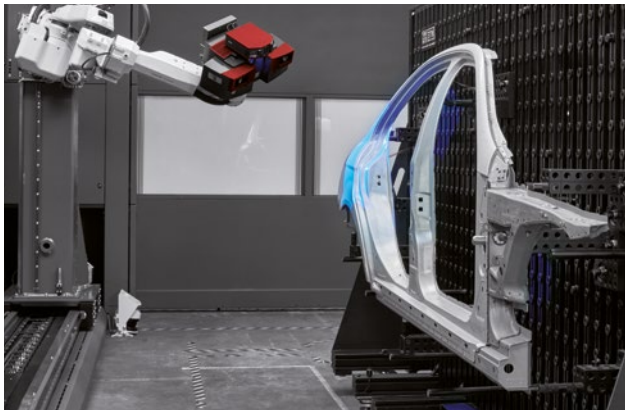
Full-field trend analysis – For the verification of components, the full-field data can be analyzed (visualization of deviations, hemmed edges, radii, inspection sections, …). Further measurements of other parts enable completely virtual installations. In the case of inspections during production, all the inspection characteristics and functional dimensions are recorded. These are transferred to the statistical process control systems and presented as trend analyses.

Production monitoring – Typical applications for the ATOS ScanBox 6130 are quality control in production, e.g. of attached parts or interior parts, but also product development and tool tryout. Very large or heavy parts can also be measured in the ATOS ScanBox 6130, for example cast parts or tools.

ATOS ScanBox Series 7

Measurement of Large and Heavy Components up to 6000 mm in Size





The ATOS ScanBox Series 7 is mainly used in car manufacturing, in try-out toolmaking and in press shops. The optical 3D measuring system performs complete analysis measurements for comparison in the introductory phase or is used for quality control in production.

Large parts such as automobile side panels and attached parts of up to 6 m in size can be measured. The full-field measuring data enable the analysis of hole pattern, trimming and character lines.

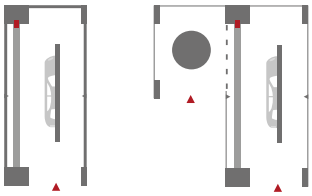
Even heavy and large parts for other applications can be measured and inspected with the ATOS ScanBox Series 7.

8-axis kinematics – GOM developed the new 8-axis kinematic system for the measurement of very large parts. A combination of a linear rail, vertical lift and an articulated robot with integrated cable routing allows the ATOS sensor to be positioned with the greatest possible flexibility thanks to the 8 degrees of freedom.

Rotation table working area – The ATOS ScanBox 7260 also has a rotation table working area. This corresponds to the ATOS ScanBox 6130 and enables additional measurements of medium-sized components. The rotation table can be loaded with a pallet system and thus guarantees a quick, repeatable and exact positioning of components.

ATOS ScanBox 7160 and 7260

	ATOS ScanBox 7160	ATOS ScanBox 7260
Dimensions	4750 x 10150 x 3900 mm	8750 x 10150 x 3900 mm
Power supply	200 – 500 V (3-phase, 32 A)	200 – 500 V (3-phase, 32 A)
Max. part size	Up to 6000 x 1250 mm	Up to 6000 x 1250 mm, rotation table area up to Ø 3000 mm
Max. part weight	Unlimited	Unlimited, rotation table area up to 2000 kg
Automated axes	8	9
Entry	Safety light curtain	Safety light curtains
Opening width	3050 mm	3050 mm, rotation table area 3400 mm
Floor mounting or fixing	Required	Required
Loading concept	Manual, transport cart, pallet truck, crane, forklift truck, sandwich panel transport system	



7160 7260*

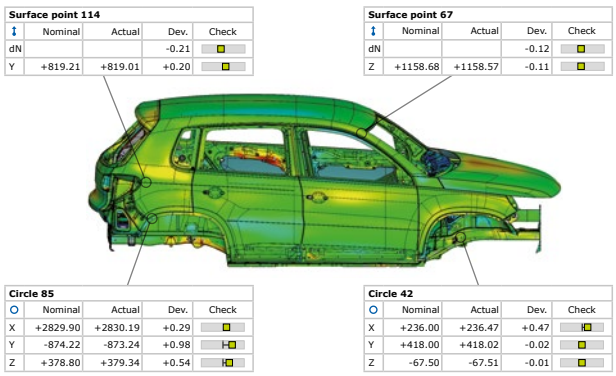
Modular layout – Uniform construction components and the modular structure of the ATOS ScanBox Series 7 and 8 enable a demand-oriented extension of the ATOS ScanBox both within Series 7 and to Series 8.

* Installation of rotation table on the left or right

Control tower – All safety systems such as the automatic safety light sensors, floor scanners and the safety gate system are controlled by the control tower. It also provides information about the machine status, serves as a robot controller and contains the image-processing computer. Thanks to the mobile operator station, the ATOS ScanBox can be operated and used for teaching from various locations.

ATOS ScanBox Series 8

Two-Sided Measurement of Long and Wide Components

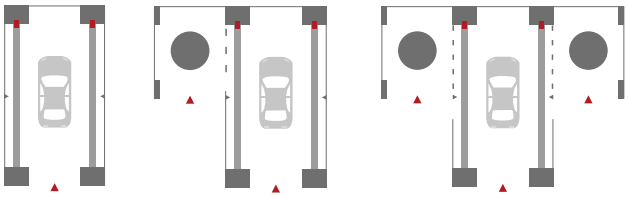


With the ATOS ScanBox Series 8, GOM is offering a measuring system that can measure complete vehicles both outside and inside. The main application areas are analyses in Meisterbock and Cubing, inspection of complete vehicles and quality control in body manufacturing. Measurements from several components can be merged virtually in order to evaluate information about flush and gaps. Other areas of application include, for example, the scanning of cast blanks, quality control of milled tools and tool maintenance.

Two 8-axis kinematic systems and sensors in duplex operation – The new GOM 8-axis kinematic concept enables the measurement of complete car bodies from above, below, from the side and inside, while at the same time taking up very little space. The so-called duplex operation enables a synchronous and coordinated deployment of two robots in one measuring cell. In this process, a joint data set of measurements is created, as the robot operation takes place in a shared coordinate system. Series 8 of the ATOS ScanBox also enables the independent measurement by two robots on two different components.

ATOS ScanBox 8160, 8260 and 8360

	ATOS ScanBox 8160	ATOS ScanBox 8260	ATOS ScanBox 8360
Dimensions	5750 x 10150 x 3900 mm	9750 x 10150 x 3900 mm	13750 x 10150 x 3900 mm
Power supply	2x 200 – 500 V (3-phase, 32 A)	2x 200 – 500 V (3-phase, 32 A)	2x 200 – 500 V (3-phase, 32 A)
Max. part size	Up to 6000 x 2500 mm	Up to 6000 x 2500 mm, rotation table area up to Ø 3000 mm	Up to 6000 x 2500 mm, rotation table area up to Ø 3000 mm
Max. part weight	Unlimited	Unlimited, rotation table area up to 2000 kg	Unlimited, rotation table area up to 2000 kg
Automated axes	16	17	18
Entry	Safety light curtain	Safety light curtains	Safety light curtains
Opening width	3050 mm	3050 mm, rotation table area 3400 mm	3050 mm, rotation table areas 3400 mm
Floor mounting or fixing	Required	Required	Required
Loading concept	Manual, transport cart, pallet truck, crane, forklift truck, sandwich panel transport system		

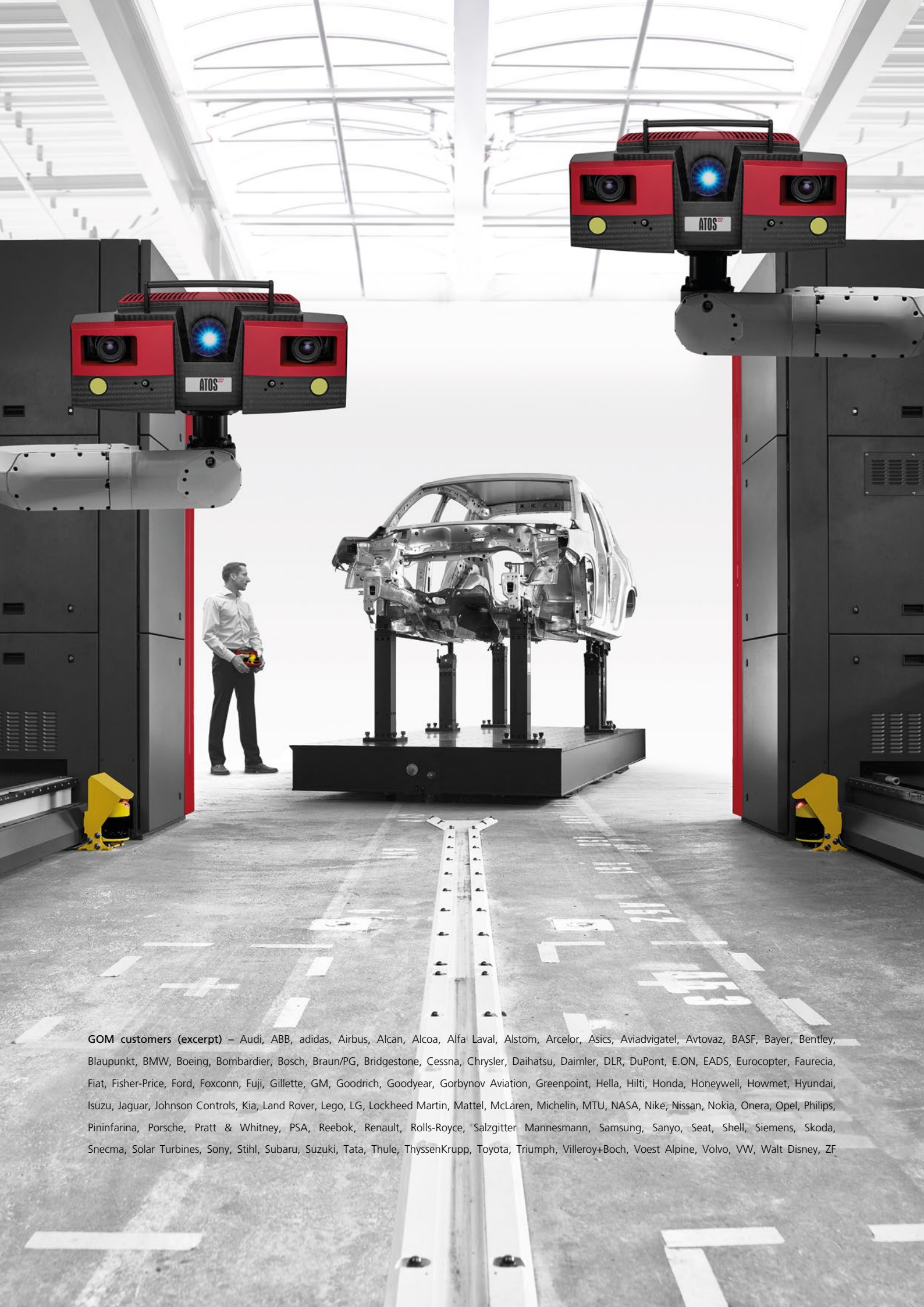


8160 8260* 8360

Extensibility – Series 8 of the ATOS ScanBox can be extended within the series by one or two rotation table working areas. The upgrade offers the possibility of responding quickly and flexibly to production changes and of making adjustments with regard to increasing the throughput.

* Installation of rotation table on the left or right

Loading concept – The ATOS ScanBox Series 8 can be loaded with a driverless sandwich panel transport system including a track system, drive computer and safety systems. The automatic loading system guarantees a quick, repeatable and exact positioning of car bodies in the ATOS ScanBox. Other loading systems, e.g. cranes, can also be used.



GOM customers (excerpt) – Audi, ABB, adidas, Airbus, Alcan, Alcoa, Alfa Laval, Alstom, Arcelor, Asics, Aviadvigatel, Avtovaz, BASF, Bayer, Bentley, Blaupunkt, BMW, Boeing, Bombardier, Bosch, Braun/PG, Bridgestone, Cessna, Chrysler, Daihatsu, Daimler, DLR, DuPont, E.ON, EADS, Eurocopter, Faurecia, Fiat, Fisher-Price, Ford, Foxconn, Fuji, Gillette, GM, Goodrich, Goodyear, Gorbynov Aviation, Greenpoint, Hella, Hilti, Honda, Honeywell, Howmet, Hyundai, Isuzu, Jaguar, Johnson Controls, Kia, Land Rover, Lego, LG, Lockheed Martin, Mattel, McLaren, Michelin, MTU, NASA, Nike, Nissan, Nokia, Onera, Opel, Philips, Pininfarina, Porsche, Pratt & Whitney, PSA, Reebok, Renault, Rolls-Royce, Salzgitter Mannesmann, Samsung, Sanyo, Seat, Shell, Siemens, Skoda, Snecma, Solar Turbines, Sony, Stihl, Subaru, Suzuki, Tata, Thule, ThyssenKrupp, Toyota, Triumph, Villeroy+Boch, Voest Alpine, Volvo, VW, Walt Disney, ZF

GOM

Precise Industrial 3D Metrology

GOM develops, produces and distributes software, machines and systems for industrial and automated 3D coordinate measuring technology and 3D testing based on latest research results and innovative technologies.

With more than 60 sites and an employee network of more than 1,000 metrology specialists, GOM guarantees professional advice as well as support and service to operators on-site in their local languages. In addition, GOM shares knowledge on processes and measurement technology in training courses, conferences and application-based workshops.

GOM has been developing measuring technology in Braunschweig since 1990. In the respective research and development departments, more than 100 engineers, mathematicians and scientists shape the measuring technology of the present and the future.

Today, more than 14,000 system installations improve product quality and accelerate product development and manufacturing processes for international companies in the automotive, aerospace and consumer goods industries, their suppliers as well as many research institutes and universities.

GOM headquarters in Braunschweig, Germany

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