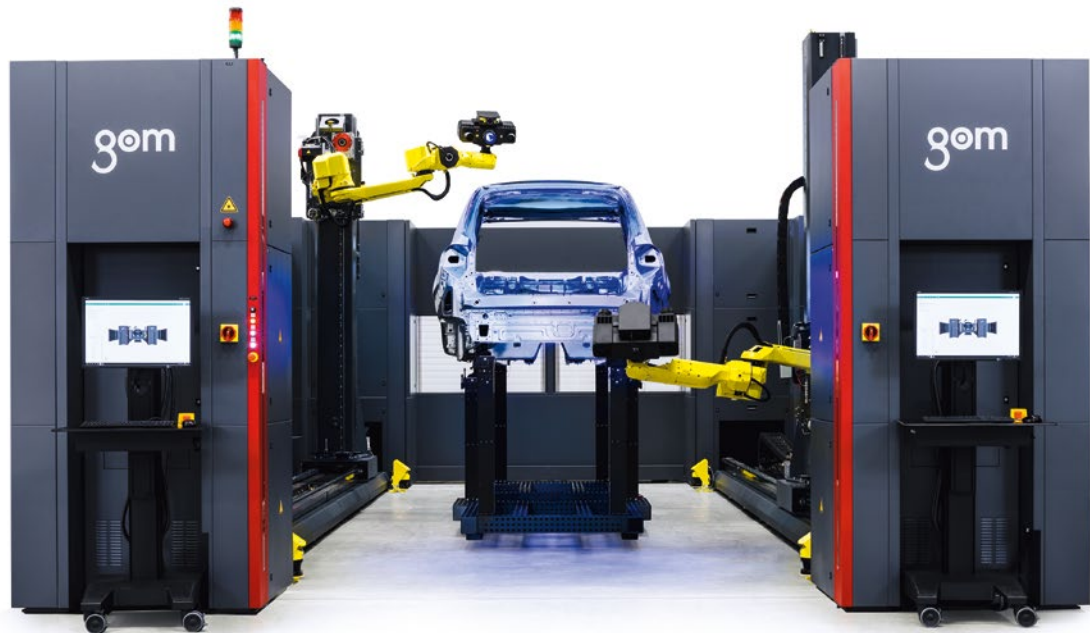


# ATOS ScanBox

Optical 3D Coordinate Measuring Machine



gom



# Optical 3D Metrology

## For Industrial Use

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

While mechanical measuring systems capture data in a point-based or linear manner, optical measuring systems provide 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.

## Measuring Room and Production

Typically, a wide range of different parts is 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.

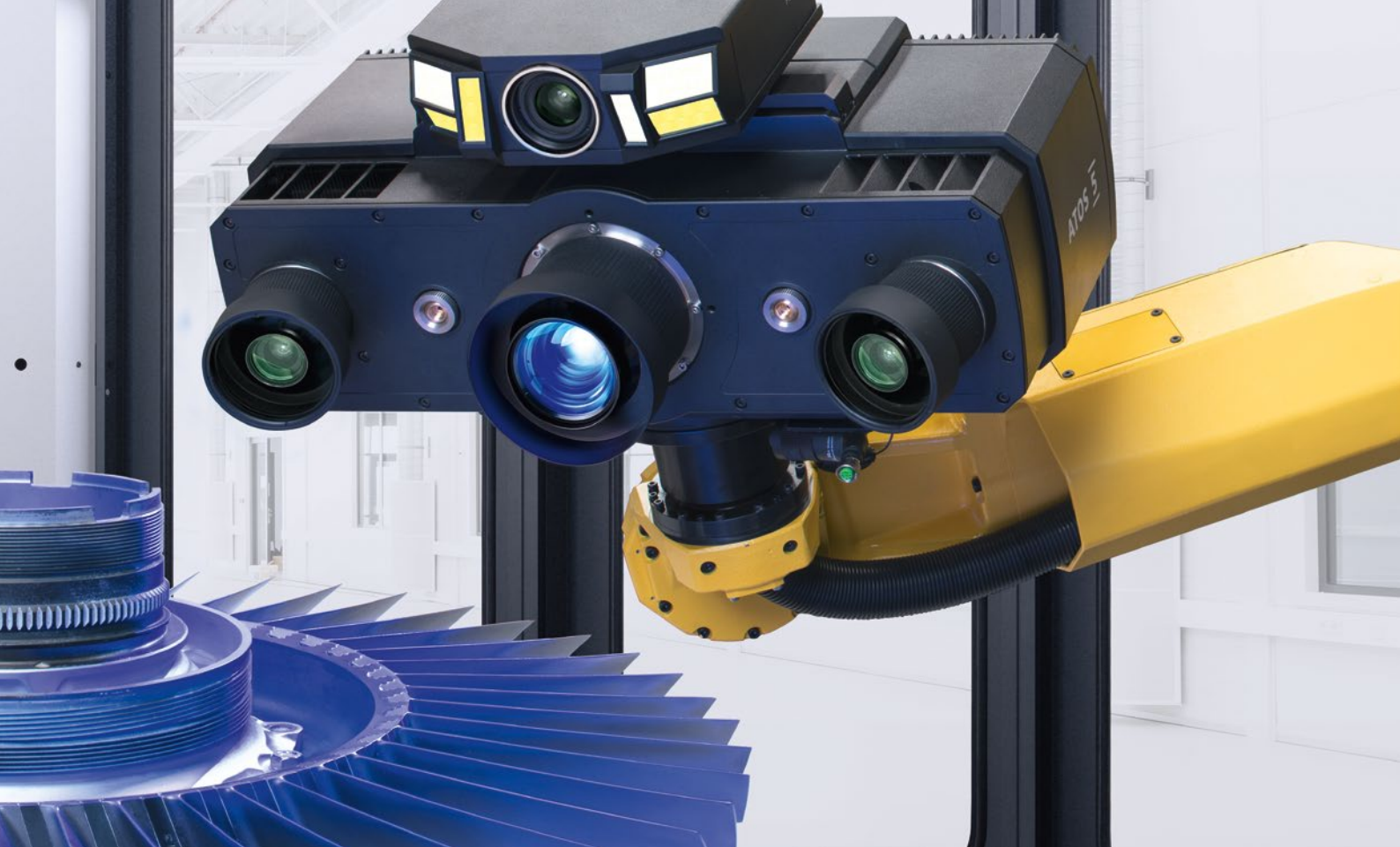
Robustness, measuring speed and compensation for temperature fluctuations are convincing factors of the measuring systems in production. Traceable results can be captured even under harsh conditions.

## High Tech in Robust Machines

The accuracy of optical measuring systems is not due to expensive and high-maintenance precision mechanics but is rather based on state-of-the-art optoelectronics, precise image processing and mathematical algorithms. Thanks to their proven measuring technology, the ATOS systems have established themselves as the preferred measuring system in almost all industries.

## Blue Light Technology

GOM's projection technology works with narrow-band blue light, which means that interfering ambient light can be filtered out during image acquisition. The light sources are so powerful that even on uncooperative surfaces measuring data is captured. In addition, the LEDs of the Blue Light Technology have a life expectancy of far more than 10,000 hours.



## High Measuring Speed

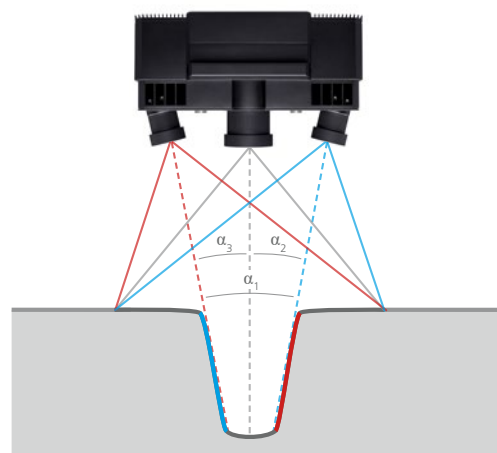
ATOS sensors provide full-field 3D coordinates for each individual measurement. Within a few seconds, up to 16 million independent measuring points are captured per scan. As a result, the measuring data is characterized by very high detailed reproduction, thereby enabling very small component features to be measured.

## Assured Measuring Data Quality

An ATOS sensor is a self-monitoring system. The software of the sensors is continuously monitoring the calibration status, the transformation accuracy as well as environmental changes and part movements in order to ensure the quality of the measuring data.

## Triple Scan Principle

Precise fringe patterns are projected onto the surface of the object and are captured by two cameras based on the stereo camera principle. As the beam paths of both cameras and the projector are calibrated in advance, 3D coordinate points can be calculated from the three different ray intersections. This Triple Scan Principle offers advantages for measuring reflective surfaces and objects with indentations. The result is complete measuring data without holes or erratic points.





# Automated 3D Metrology

ATOS ScanBox



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

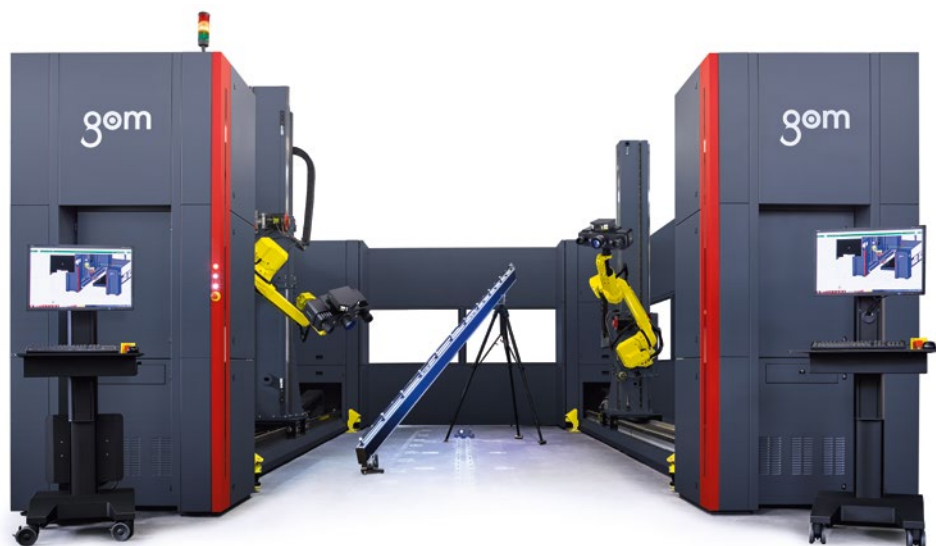
**Standardized quality** – ATOS ScanBox is a standardized measuring machine which is certified in accordance with the Machinery Directive. There is no risk for the customer in terms of costs, performance or delivery date – in contrast to projected individual systems. Even before an order is placed, test 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 days for the small systems (series 5) and up to two weeks for the large systems (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.

**Plus Box** – This add-on sensor, which is directly attached to the ATOS system, enables fully automated measuring of reference point markers with deviations of 3 µm to 30 µm. These reference point markers create a 3D volume, in which the detailed individual measurements of the ATOS sensors are transformed automatically. This is how the accuracy of the overarching photogrammetric measurement is achieved. Bigger components or multiple parts can be measured simultaneously.

**“Closed Loop”** – With robot-based optical measuring machines, a robot moves an optical scanner over the component. The positioning accuracy of the robot is not sufficient for metrological tasks though. To transfer the measurements from all positions into the coordinate system, these must be defined with high precision. Using “Closed Loop” in the ATOS ScanBox systems, 3D coordi-

nates of the characteristics of an object are determined photogrammetrically first without any interference from any ambient influences. In a second step – the actual scanning – based on the previously measured characteristics, the scanner determines its positions and transforms with high precision into a global coordinate system. A second measuring system for tracking the scanner is not needed.



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

**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 4

Measurement of Small Complex Components up to 500 mm in Size



## ATOS ScanBox 4105

Dimensions	1600 × 1200 × 2100 mm <sup>3</sup>
Power supply	Standard, 100 – 240 V (1-phase, 16 A)
Max. part size	Ø 500 mm
Max. part weight	100 kg
Entry	Sliding door with safety lock
Opening width	685 mm
Floor mounting or fixing	Not required, mobile
Loading concept	Manual, crane
Sensor compatibility	ATOS Core, ATOS Capsule

Injection-molded parts and die cast components as well as tools, molds, stamping and bending parts often show complex contours and connection geometries which have to be checked during 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 mounted 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.



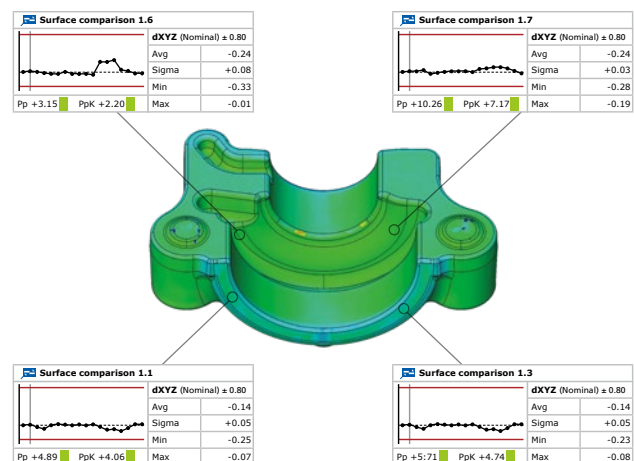
**Plug & Play** – The robust machine housing contains all components of the ATOS ScanBox. As a 100–240 V power supply is used and the measuring system only weighs approx. 900 kg, it can be used for measuring in almost all premises. Four wheels enable the unproblematic repositioning of the ATOS ScanBox in the factory shop. The sliding door is designed in such a way that the ATOS ScanBox 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. The ATOS ScanBox 4105 can be used with ATOS sensors with the measuring area of  $70 \times 50 \text{ mm}^2$ . As a result, it is possible to measure details that are only several tenths of a millimeter in size.

**Measuring uncertainty with reference to 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 a traceable normal 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 automatically with the help of a normal trend project without any additional software or calculations in Excel tables.

### Two user interfaces, one single software program

The measuring room provides the specialist with all the functions of the ATOS Professional 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



	ATOS ScanBox 5108	ATOS ScanBox 5120
Dimensions	2000 × 2550 × 2700 mm <sup>3</sup>	3300 × 3300 × 2700 mm <sup>3</sup>
Power supply	200 – 500 V (3-phase, 16 A)	200 – 500 V (3-phase, 16 A)
Max. part size	Ø 800 mm	Ø 2000 mm
Max. part weight	300 kg	500 kg
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
Sensor compatibility	ATOS Capsule, ATOS Triple Scan, ATOS 5	


## ATOS ScanBox 5108


The ATOS ScanBox 5108 can be used for inspecting parts up to a size of 800 mm. Due to the small dimensions of the ATOS ScanBox, the system is often used by manufacturers of turbines, fans, blisks and cast housings. In airfoil inspections, this model can be used for measuring sharp radii in positions and contours with a detail resolution of more than 20 measuring points per millimeter.

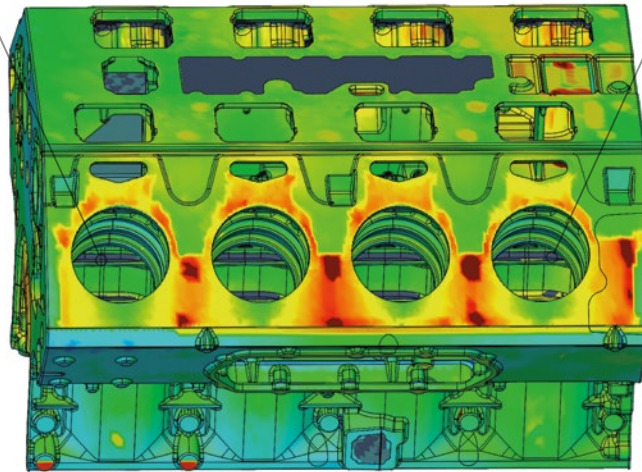
## ATOS ScanBox 5120

As parts of up to 2000 mm in size can be easily measured with the ATOS ScanBox 5120, this model is mainly used for larger parts, such as interior components of vehicles. However, the ATOS ScanBox 5120 has also proven its efficiency in casting and forging applications such as the inspection of cast parts, sand cores and models.



Cyl.1.Position tolerance				
⊕	Zone	Datum	Nominal	Check
	Ø 2.00	DAA Cyl.1 Cyl.4	0.16	

Cyl.4.Position tolerance				
⊕	Zone	Datum	Nominal	Check
	Ø 2.00	DAA Cyl.1 Cyl.4	2.48	

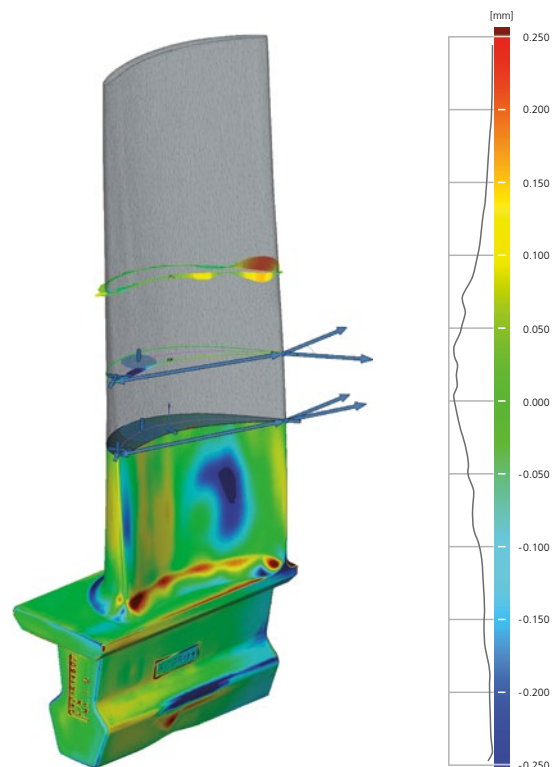


**Module system for robot and rotation table** – In addition to the robot and the rotation table, the entire control, safety and power electronics system is located in or on the modules, which are the size of a Euro pallet and which can be easily moved with a pallet truck.

The industrial robot used enables an internal cable routing. This ensures that the robot paths computed by Auto Teaching do not lead to a jamming or stretching of the sensor cables. The machine housing is constructed around the modules. This ensures occupational safety in accordance with the Machinery Directive.

**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.

**Inspection integrated into production** – For an even higher throughput, the ATOS ScanBox 5108 can be extended by an automated handling system and a programmable logic controller (PLC). The ATOS ScanBox with Batch Processing System enables unmanned loading and unloading and an automated measurement and inspection according to the inspection plan – for example, for electrode production or quality assurance of turbine blades. This way, manual interventions are reduced and long machining times are guaranteed.



# ATOS ScanBox Series 6

Measurement of Parts up to 3000 mm in Size in Production Environment



## ATOS ScanBox 6130

Dimensions	4250 × 4250 × 2700 mm <sup>3</sup>
Power supply	200 – 500 V (3-phase, 16 A)
Max. part size	Ø 3000 mm
Max. part weight	2000 kg
Entry	Safety light sensor
Opening width	3100 mm
Floor mounting or fixing	Required
Loading concept	Manual, transport cart, pallet truck, crane, forklift truck
Sensor compatibility	ATOS Capsule, ATOS Triple Scan, ATOS 5

In production metrology it is important to identify, analyze and correct quality problems as fast as possible. Many parts are to be checked as completely as possible in order to be able to initiate corrective measures and minimize scrap at short notice and in a targeted manner.

**Pallet system** – The components and the fixtures can be set up outside of 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 entrance area 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 measuring machine.

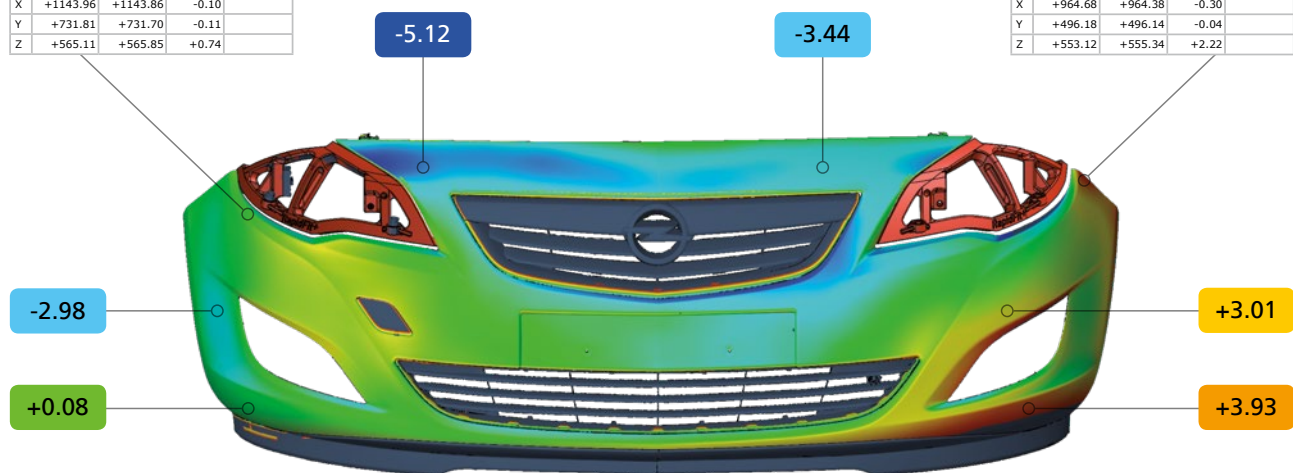


**Full-field trend analysis** – For the verification of components, the full-field data can be analyzed (visualization of deviations, hemmed edges, radii, inspection sections ...). Further measurements of other parts enable completely virtual installations. In the case of inspections during production, 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** – A typical application for the ATOS ScanBox 6130 is quality assurance in production, for example, of attached parts or interior parts, but also product development and tool tryout.

MP RH 1				
i	Nominal	Actual	Dev.	Check
dN			+0.76	
X	+1143.96	+1143.86	-0.10	
Y	+731.81	+731.70	-0.11	
Z	+565.11	+565.85	+0.74	

MP RH 2				
i	Nominal	Actual	Dev.	Check
dN			+2.24	
X	+964.68	+964.38	-0.30	
Y	+496.18	+496.14	-0.04	
Z	+553.12	+555.34	+2.22	





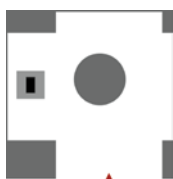
# ATOS ScanBox Series 6

High Throughput with Parts up to 3500 mm in Size

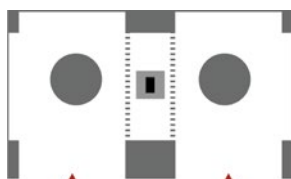


	ATOS ScanBox 6135	ATOS ScanBox 6235
Dimensions	4500 × 4500 × 3250 mm <sup>3</sup>	7665 × 4500 × 3250 mm <sup>3</sup>
Power supply	200 – 500 V (3-phase, 32 A)	
Max. part size	Ø 3500 mm	2 × Ø 3500 mm
Max. part weight	5000 kg *	2 × 5000 kg *
Entry	Safety light curtain	Safety light curtains
Opening width	2850 mm	
Floor mounting or fixing	Required	
Loading concept	Manual, transport cart, pallet truck, crane, forklift truck	
Sensor compatibility	ATOS 5, ATOS 5X	

\* in combination with a palett system: 2000 kg



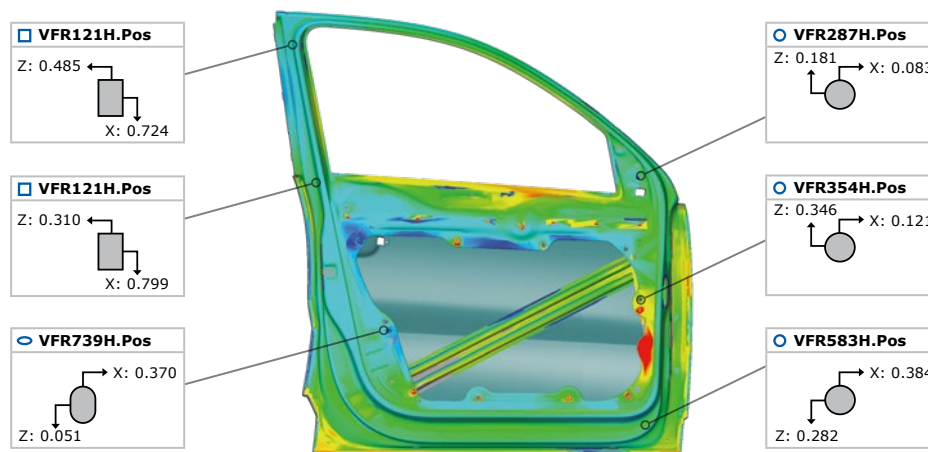
6135 \*



6235

\* Installation of control tower on the left or right, extension to 6235 possible

**High load capacity** – The ATOS ScanBox models 6135 and 6235 are constructed for large and heavy parts, for example, cast parts, attached parts or tools with a size of up to 3.5 m. The rotation table unit of the coordinate measuring machine carries parts with a weight of up to 5,000 kg. Depending on local conditions, the control tower of the ATOS ScanBox 6135 can be positioned on the left or the right side.



**High-speed scanning** – The ATOS ScanBox models 6135 and 6235 are equipped with a safety control to be able to operate sensors with laser technology. Combined with the extremely bright light source of the ATOS 5X, both models allow high throughput with high detail resolution at the same time, which is required in car body manufacturing, for example.

**Loading and measuring at the same time** – The ATOS ScanBox 6235 makes an even higher throughput possible due to two working areas that can be operated independently from each other. The rotation table can be set up parallel to the measurement. In both working areas or on the rotation tables of the ATOS ScanBox 6235, parts such as doors or trunk lids with a size of up to 3.5 m can be placed. Both working areas are operated safely due to the automatic doors.

**Multi-part fixture** – Attached parts, such as trunk lids and doors, can be measured faster with the multi-part fixture because it is not necessary to change the fixture. Using the HMI, the fixture can be easily positioned so that it is possible to exchange parts at the front side.



# ATOS ScanBox Series 7

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



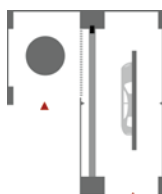
ATOS ScanBox 7160

ATOS ScanBox 7260

Dimensions	4750 × 10150 × 3900 mm	8750 × 10150 × 3900 mm
Power supply	200 – 500 V (3-phase, 32 A)	
Max. part size	6000 × 1250 mm	6000 × 1250 mm, rotation table area up to Ø 3000 mm
Max. part weight	Unlimited	Unlimited, rotation table area up to 2000 kg
Entry	Safety light curtain	Safety light curtains
Opening width	3050 mm	3050 mm, rotation table area up to 3400 mm
Floor mounting or fixing	Required	
Loading concept	Manual, transport cart, pallet truck, crane, forklift truck, sandwich panel transport system	
Sensor compatibility	ATOS Triple Scan, ATOS 5, ATOS 5X	



7160



7260 \*

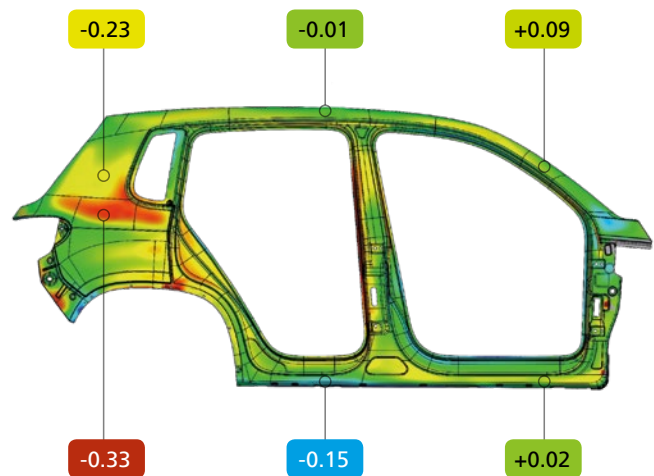
**Modular layout** – Uniform construction components and the modular structure of the ATOS ScanBox Series 7 and 8 enable a demand-oriented extension of the ATOS ScanBox both within series 7 and to series 8.

\*Installation of rotation table on the left or right



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 assurance 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 enables the analysis of hole pattern, trimming and character lines. Heavy and large parts for other applications can also 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. The combination of a linear axis, a vertical lift and an articulated robot with an integrated cable duct allows high flexibility in positioning the sensor thanks to the 8 degrees of freedom.

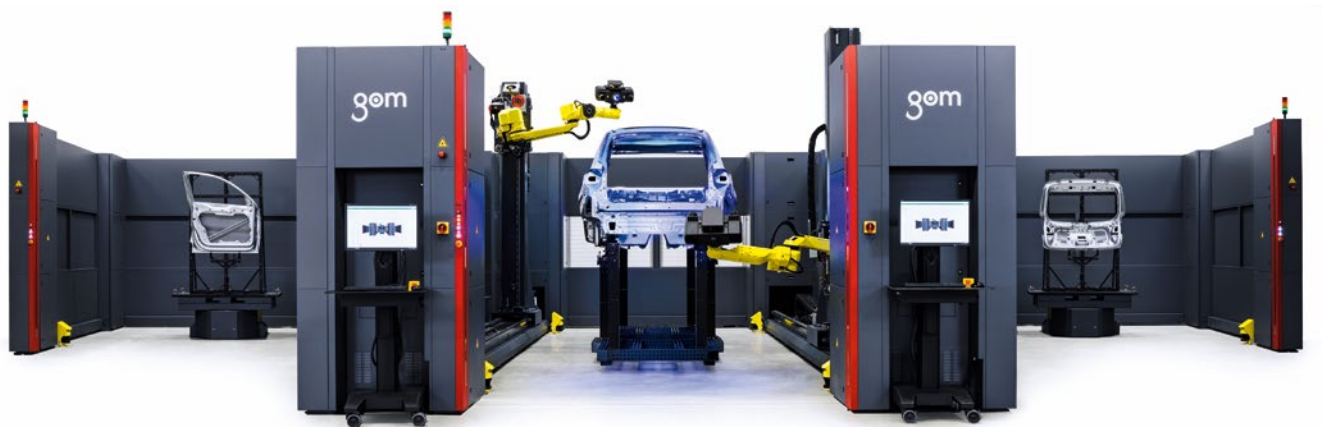
**Rotation table working area** – The ATOS ScanBox 7260 also has a rotation table working area. This corresponds to the ATOS ScanBox 6130 and enables additional measurements of medium-sized components. The rotation table can be loaded with a pallet system and thus guarantees a quick, repeatable and exact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

**Control tower** – All safety systems such as the automatic safety light sensors, floor scanners and the automatic door 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



ATOS ScanBox 8160

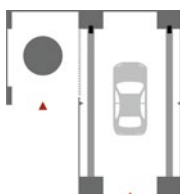
ATOS ScanBox 8260

ATOS ScanBox 8360

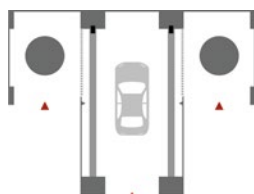
Dimensions	5750 × 10150 × 3900 mm	9750 × 10150 × 3900 mm	13750 × 10150 × 3900 mm
Power supply	2× 200 – 500 V (3-phase, 32 A)		2× 200 – 500 V (3-phase, 32 A)
Max. part size	6000 × 2500 mm	6000 × 2500 mm, rotation table area up to Ø 3000 mm	
Max. part weight	Unlimited	Unlimited, rotation table area up to 2000 kg	
Entry	Safety light curtain	Safety light curtains	
Opening width	3050 mm	3050 mm, rotation table area up to 3400 mm	
Floor mounting or fixing	Required	Required	
Loading concept	Manual, transport cart, pallet truck, crane, forklift truck, sandwich panel transport system		
Sensor compatibility	ATOS Triple Scan, ATOS 5, ATOS 5X		



8160



8260 \*

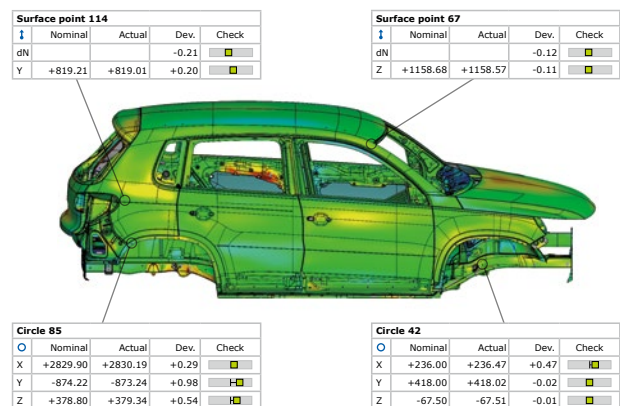


8360

**Extensibility** – Series 8 of the ATOS ScanBox can be extended within the series by one or two rotation table working areas. The upgrade option 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

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 assurance in car body manufacturing. Measurements of several parts can be virtually merged to evaluate information on gap and flush in a linear manner. Other areas of application include, for example, the scanning of cast blanks, quality control of milled tools and tool maintenance.



**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, for example, cranes, can also be used.

**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 ensures 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.





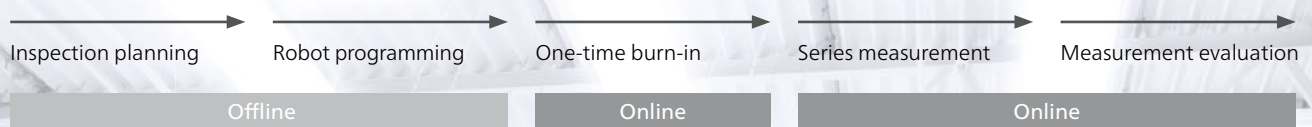
# Workflow

## 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. Thanks to the VMR, the user can work with the system without requiring specific robot programming skills. All robot movements are simulated and checked for safety before being performed in the actual environment.

The VMR covers the full measuring procedure:





**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.

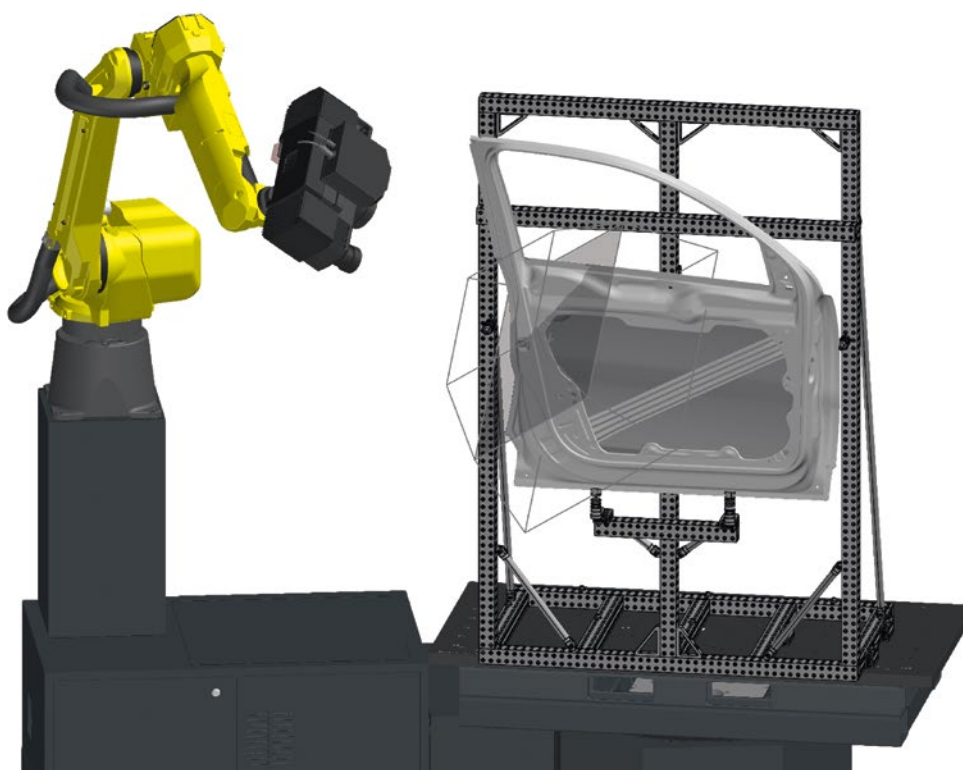
**Parametric Auto Teaching** – The Auto Teaching function in the VMR calculates the required sensor positions for all inspection features and CAD surfaces. The subsequent path optimization improves the sequence of the positions in terms of runtime and collision avoidance. Thanks to Auto Teaching, the time required for creating reliable and runtime-optimized robot programs is kept to a minimum. In addition, changes to the measurement plan are accepted automatically without the user's intervention.

**Burn-in** – The measuring programs created offline are only "burned in" once in the ATOS ScanBox using an automated process. The robot moves to the measurement positions, where it defines the individual measurement parameters, for example, exposure times, on the

real 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.

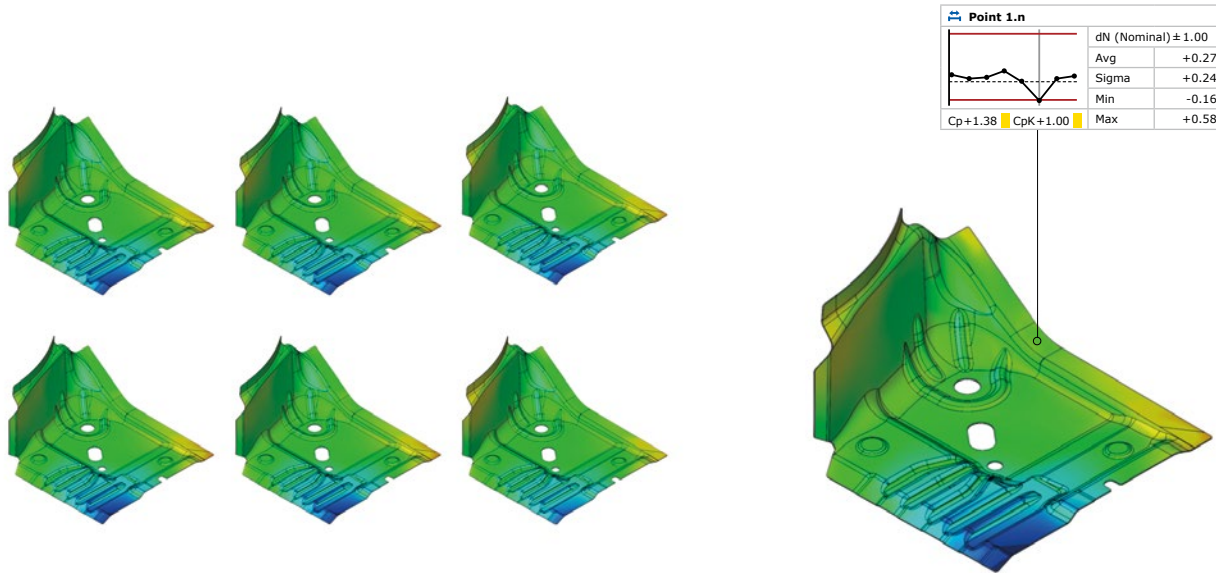
**Series measurement** – Ready-to-use measuring programs can be utilized for inspecting other components. The robot is fully controlled by the software and successively moves along the measurement positions. A check is carried out on each measurement as to whether the results meet the quality criteria.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

**Measurement evaluation** – After data acquisition, 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, for example, for 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 tested by comparing the results from the software with the reference results. The GOM software has been placed in category 1, the category with the smallest measurement deviations.

**Nominal-actual comparison** – The calculated polygon mesh describes freeform 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. A CAD-based generation of standard geometries such as lines, planes, circles or cylinders is also possible.

**Alignment** – The GOM 3D software contains all basic alignment functions. These include: RPS alignment, hierarchical alignment based on geometric elements, alignment in a local coordinate system, using reference points and various best-fit methods such as global best-fit and local best-fit. Customers can also use their own specific alignments such as “Balanced Beam” or “Equalized Nested”, for example, for turbine blades.

**Curve-based inspection** – Based on full-field digitized data, construction functions can be used for curves and their individual properties can be displayed. Edge curves can, for example, be captured, radii and design lines can be analyzed and spline curves can be created. In addition, curve-based inspection allows for gap and flush analyses.

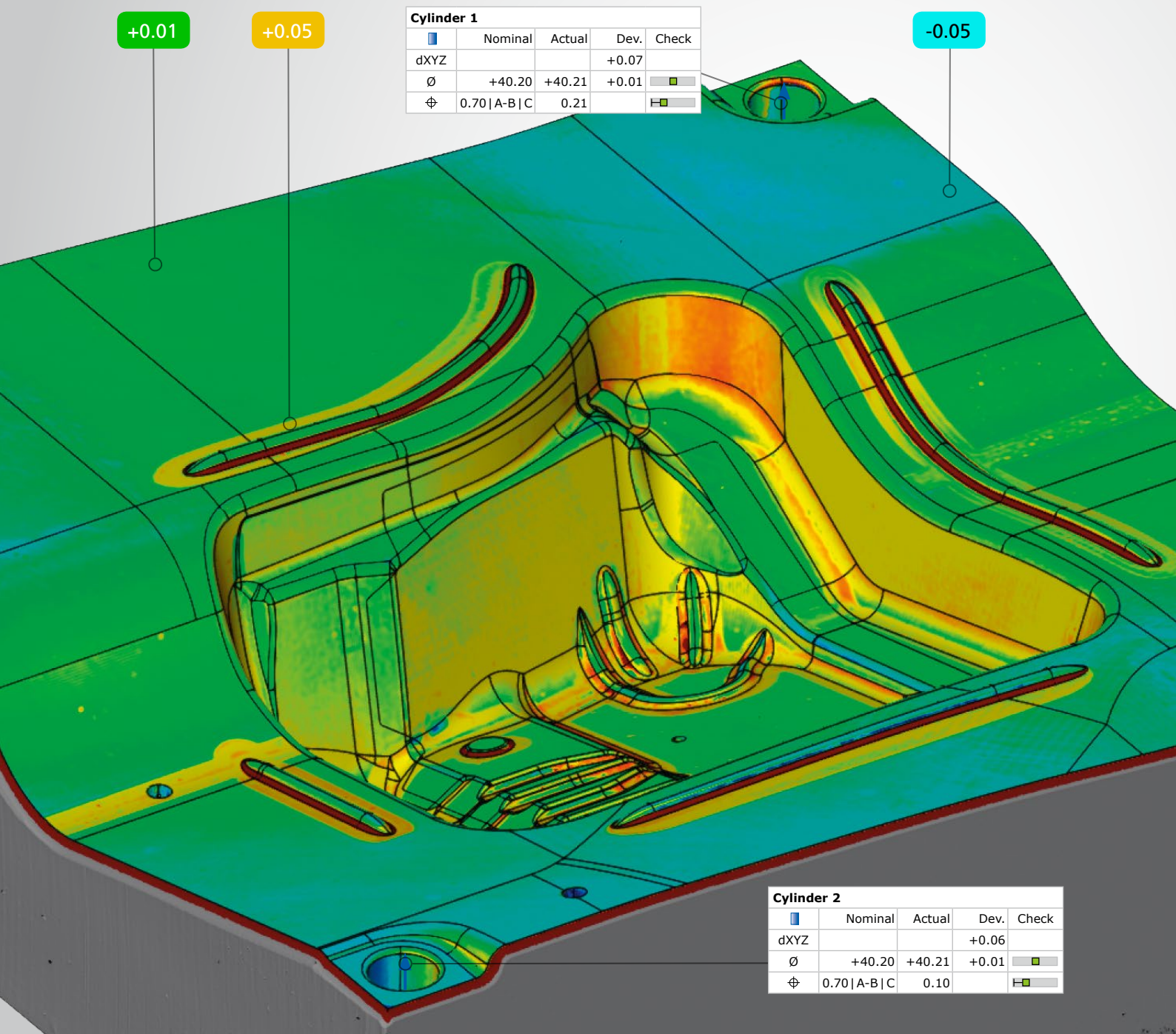
**Trend, SPC and deformation analysis** – The parameter-based approach of the GOM software enables trend analysis for multiple evaluation, for example, for statistical process control (SPC) or deformation analysis. As a result, several parts or stages within a single project can be evaluated in a full-field 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.

**Inspection of surface defects** – Optical metrology allows a series-accompanying and reproducible evaluation of surface defects. The results are objective and available in a shorter time than with the conventional method of the grind stone. For the surface defect map to match the form of the part directly, the GOM software makes an inspection of surface defects even in curved directions possible.

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







# 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 innovative technologies. By continuously developing hardware and software, GOM sets new standards in industrial metrology.

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.

## Worldwide Competence

The worldwide GOM Metrology Network comprises more than 60 sites on five continents. The research and development, production, communication and administration departments are located at the headquarters in Braunschweig. In the research and development departments, engineers, mathematicians and scientists work on the measuring technology of the present and the future.

The certified partners of the network represent GOM worldwide. With more than 1,000 metrology experts, the GOM Metrology Network provides profound advice as well as professional support and service to operators

on-site in their local languages. At three GOM hubs in Europe, Asia and America, GOM service experts give advice to the partner network and global customers.



## Holistic Technology Partner

Numerous services and training courses support the users with their daily work when using 3D measurement technology. Training courses and webinars deepen the knowledge about the software and show further application fields of the measuring systems.

The online portal provides instructions, tutorials and frequently asked questions and answers for the user. Furthermore, there is an application forum for exchanging ideas and supporting each other.

At conferences and application-based workshops, GOM directly shares knowledge on processes and measurement technology. The new GOM Care offer combines support and service for 3D measuring systems from GOM on a contractual basis.



**GOM Care**

With GOM Care, GOM offers fast and reliable customer support and services when necessary. The GOM Care support and services is based on three pillars: Remote Assistance, Services and Contract Plans.



**GOM Training**

The GOM training concept is based on practice-oriented training courses for different levels: basic and advanced training as well as expert courses. The modules can be combined and are based on each other.



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