ScanBox

Optical 3D measuring machine for efficient production control

ZEISS

Seeing beyond

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ScanBox

Using optical 3D metrology in the industry

Automated quality assurance processes play a central role for economic success in the production environment. They ensure that sources of error can be identified at an early stage and necessary correction measures can be implemented. The ScanBox optical measuring machine is the ideal solution for efficient quality control in the production process of both small and large parts.

The standardized ScanBox systems compare all of a part's actual 3D coordinates with the CAD model or the specifications from the measurement plan and create inspection reports right at the production plant. The optical measuring machines come in 11 different models for different applications and part sizes – from locking hooks to complete car bodies – and enable fast and highly precise automated measurements.

The systems deliver accurate and traceable results, guarantee high throughputs, and are easy to operate thanks to an intuitive user interface and the virtual measuring room (VMR), i. e., the central control and measurement planning software. This makes ScanBox an all-in solution that covers all process steps – from programming to automated digitization to inspection and reporting.

Five reasons for automated quality assurance

Accelerated measuring times
Particularly for parts with complex geometries or freeform surfaces, the full-field measurement with ScanBox is faster than the traditional measurement by 50 – 80 %.

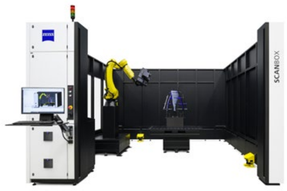
Easy operation
It takes just a few clicks in the virtual measuring room (VMR) to plan your measuring procedures and execute them fully automated.

Numerous applications
The various ScanBox machines for different part sizes are complete systems that can be directly integrated into production, saving routes, time and costs.

Effective analysis tool
Strong combination of hardware and software: ScanBox covers all process steps from programming to automated digitization to inspection and reporting.

Outstanding performance in numerous industries
ScanBox has established itself worldwide as the preferred measuring system for production control in a wide range of industries, such as automotive, aerospace or energy.

Series 4



Series 5

Series 6

Series 7

Series 8

ATOS Technology

Each ScanBox comes with an ATOS sensor. The high-resolution optical digitizers assist customers worldwide in increasing product quality, optimizing processes and thus making production more efficiently.

- **Laser Light Compressor**

  Learn more

- **High measuring speed**

- **Triple Scan Principle**

  Learn more

Virtual Measuring Room

The virtual measuring room (VMR) is the central controlling and measurement planning software for all elements of optical measuring machines. The VMR functionally represents the real environment, i. e., robot, sensor and part, in the measuring cell, as a simulation. Programming includes the kinematics of the robot paths, the fixture, and the measurement plan. Thanks to the VMR, no specific robot programming skills are required by the user. All robot movements are simulated and checked for safety before being performed in the actual environment.

Advantages for the entire workflow

Inspection planning: The CAD data set is imported together with the corresponding measurement plan. The measurement principles stored in the measurement plan are automatically assigned to the inspection features. The report can also be prepared offline in advance.

Process-reliable and runtime-optimized: The Smart Teach functionality in the virtual measuring room simplifies the creation of robot programs. Measurement positions are automatically updated whenever the CAD model or single elements are modified.

Burn-in procedure: The measuring programs created are read in once-off with the help of an automated process. The robot approaches the measurement positions and defines individual measurement parameters at the real component.

Serial measurement: The measurement programs can be used for additional part testing. Due to the parameter-based software design, changes to the CAD data and the measurement plan can be easily updated with the touch of a button.

Reporting with a single click: Once inspection is complete, the results can be compiled into a customized report with photos, tables, diagrams, text, and graphics.

ScanBox Series 4

Measuring small, complex parts up to 500 mm in size

Injection-molded parts and die cast components as well as tools, molds, stamping and bending parts often show complex contours and connection geometries that must be checked during series and batch production ramp-up. For these applications ScanBox 4105 is an efficient 3D measuring machine.

High detail resolution

Small geometries such as locking hooks or catches for injection-molded parts are digitized in ScanBox 4105 with the optical ATOS Q 3D scanner. ATOS Q is available in two versions with different camera resolutions (12M and 8M). The accuracy, the resolution, and the measuring area are fully customizable. Five precision lenses that cover measuring areas of various sizes are available. All this allows for measuring the smallest details with a size of tenths of millimeters.

Easy to use

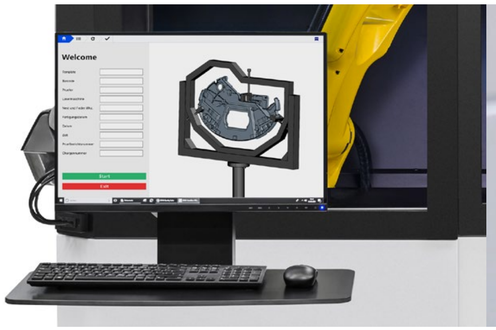
The ScanBox 4105 optical measuring machine can be programmed and controlled via an intuitive user interface, the so-called Kiosk Interface. Shop floor workers do not require any expert knowledge for operation. After the part has been inserted, the measuring program is selected, and the measurement is started at the touch of a button.

Ergonomic functions

The flexible user interface offers various ergonomic functions: The integrated swivel arm can be adjusted to the desired position so that the optical 3D measuring machine can be operated while standing or sitting.

Plug & play

As the optical measuring machine ScanBox 4105 needs a default 100–240 V power supply and only weighs approx. 900 kg, the compact and mobile system can be set up almost everywhere. Four wheels allow for easy repositioning of ScanBox 4105 in the shop floor. The sliding door is designed so as to enable loading with a crane.



Technical data

	ScanBox 4105
Dimensions	1700 × 1200 × 2420 mm
Max. part size	**Ø 500 mm**
Max. part weight	**100 kg**
Opening width	680 mm
Sensor compatibility	ATOS Q

ScanBox Series 4 RC

Automated loading and measurement of parts

ScanBox 4105 RC (Remote Control) is an optical 3D measuring machine with a motorized sliding door. Parts up to 500 mm in size can be loaded into the ScanBox 4105 RC using a robot or an individually configured loading system and placed on the turntable module. The elimination of individual manual loading significantly reduces the time required and therefore ensures a higher throughput in quality assurance.

Autonomous part inspection

The autonomous operation of the ScanBox Series 4 RC increases machine utilization, speeds up measurement cycle times and allows personnel to be deployed more efficiently. The system has been specially developed for applications that require a high level of throughput and integration.

High throughput for series monitoring

For efficient quality assurance of series products, production processes must be monitored, scrap reduced and cost-intensive rework minimized. The ScanBox Series 4 RC optical 3D measuring machine with the ATOS Q sensor supports users in this: the full-surface actual data of the series components can be compared directly with the CAD model or with specifications from the measurement plan. Inspection reports can be created directly at the production plant and data can be exported directly to systems for statistical process control.

Automated process control

ScanBox 4105 RC can be programmed via the ergonomic operator interface integrated into the control tower. Automated part inspection is carried out with the ScanBox 4105 RC via a start signal from a higher-level control system. ZEISS offers communication interfaces based on fieldbuses (CC-Link, ProfiBus, ProfiNet, EtherCat, EtherNet/IP, OPC UA).

ScanBox 4105 for eMotors

Inspecting and digitizing hairpins and stators

ScanBox for eMotors allows for inspecting entire stators including the hairpins – both a single hairpin as well as several hairpins at once – fully automatically in a minimum of time. No prior surface treatment is required. Afterwards, the acquired 3D measuring data can be visualized and analyzed in the powerful 3D Metrology software ZEISS INSPECT.

Digital geometric twin

While a stator is inspected for cracking, deformations of the winding basket or the connection points, bendings, displacements and the roundness of the inner cylinder, among others, the hairpin inspection focuses on features such as deformations at the ends of the hairpin or the bending and edging process. It is also possible to check the cutting angle and stripping lengths as well as the air gap.

Trend analysis

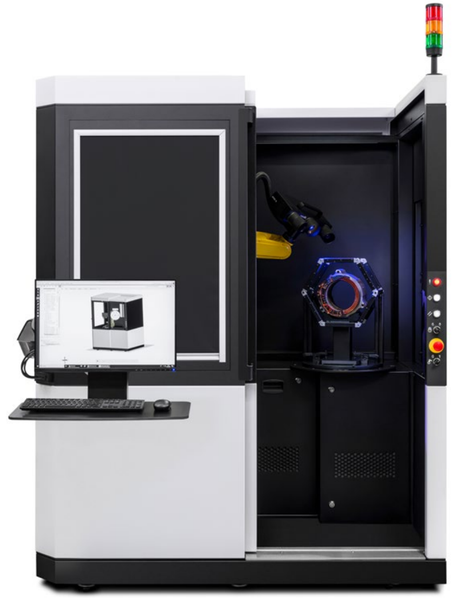
Based on the automatic trend analysis, you can identify deviations from the ideal model at an early stage. This helps you to quickly detect changes in previous production steps by continuous measurement. Consequently, you can develop necessary corrections and implement them in previous production steps.

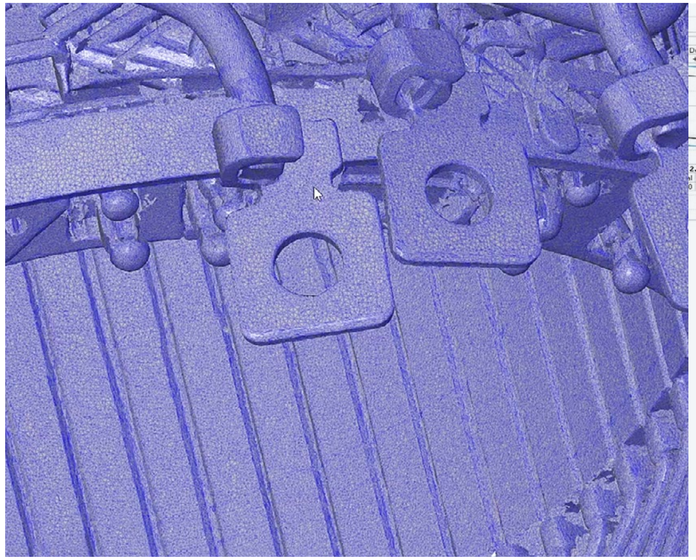
Digital assembly

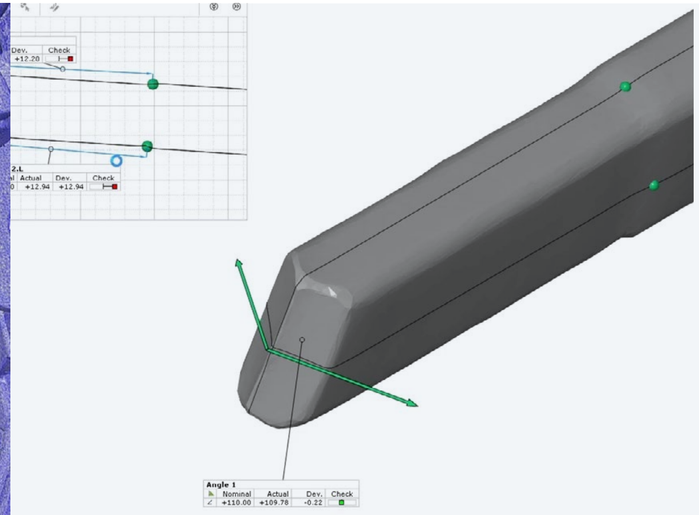
In the electric engine, stator and rotor must be precisely aligned to each other. With the help of the digital assembly, this can already be simulated and tested previously. The aim is to analyze the accuracy of fit of the measured parts.

ScanBox 4105 for eMotors RC

The optical 3D measuring machine is also optionally available with a motorized sliding door for the automated loading and measurement of components. As individual loading by the user is no longer necessary, the time required for quality assurance is significantly reduced.







Technical data

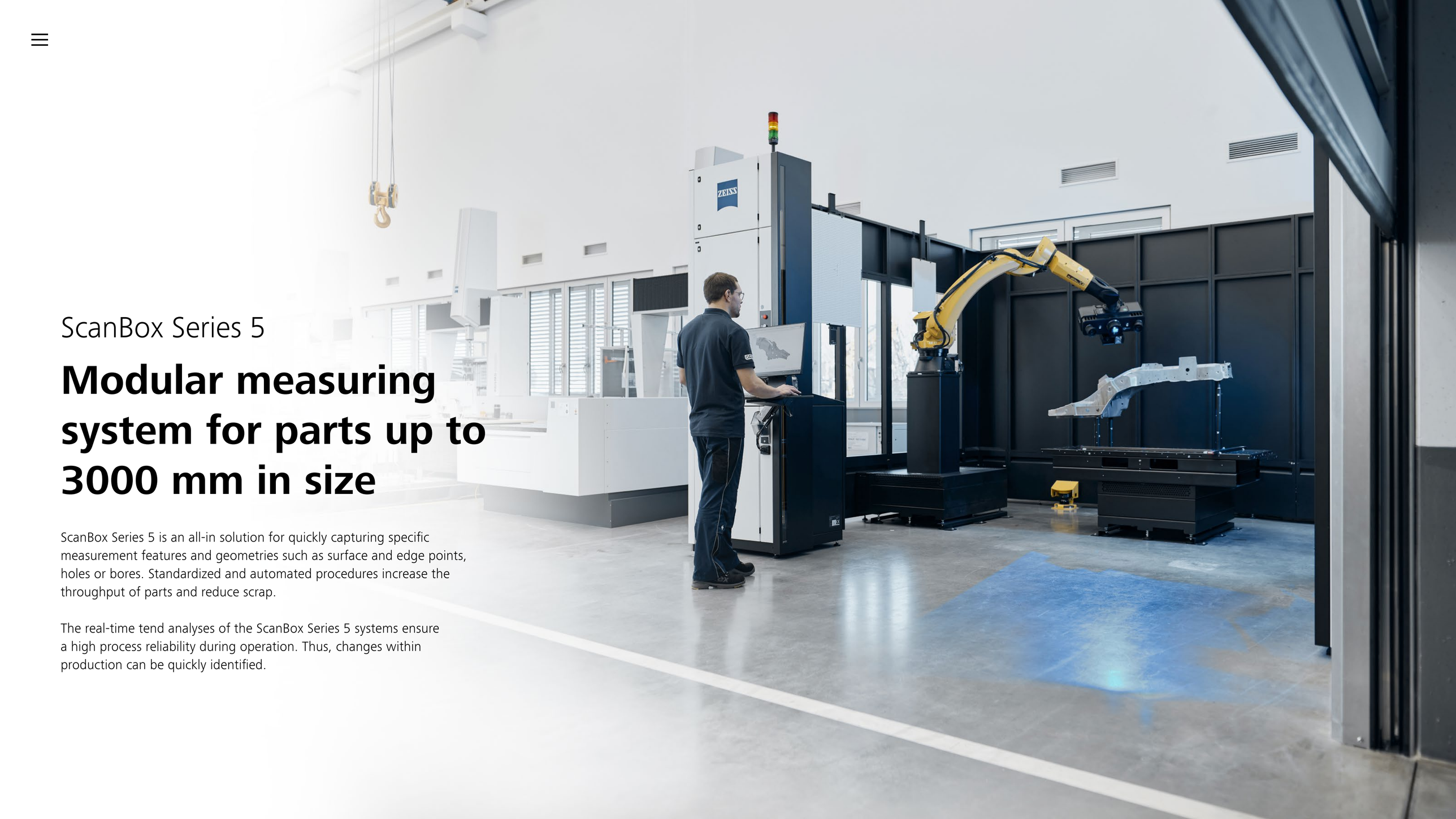
	ScanBox for eMotors
Dimensions	1700 × 1200 × 2100 mm
Max. part size	**Ø 500 mm**
Max. part weight	**100 kg**
Opening width	680 mm
Sensor compatibility	ATOS Q for eMotors

ScanBox Series 5

Modular measuring system for parts up to 3000 mm in size

ScanBox Series 5 is an all-in solution for quickly capturing specific measurement features and geometries such as surface and edge points, holes or bores. Standardized and automated procedures increase the throughput of parts and reduce scrap.

The real-time tend analyses of the ScanBox Series 5 systems ensure a high process reliability during operation. Thus, changes within production can be quickly identified.



Modular system

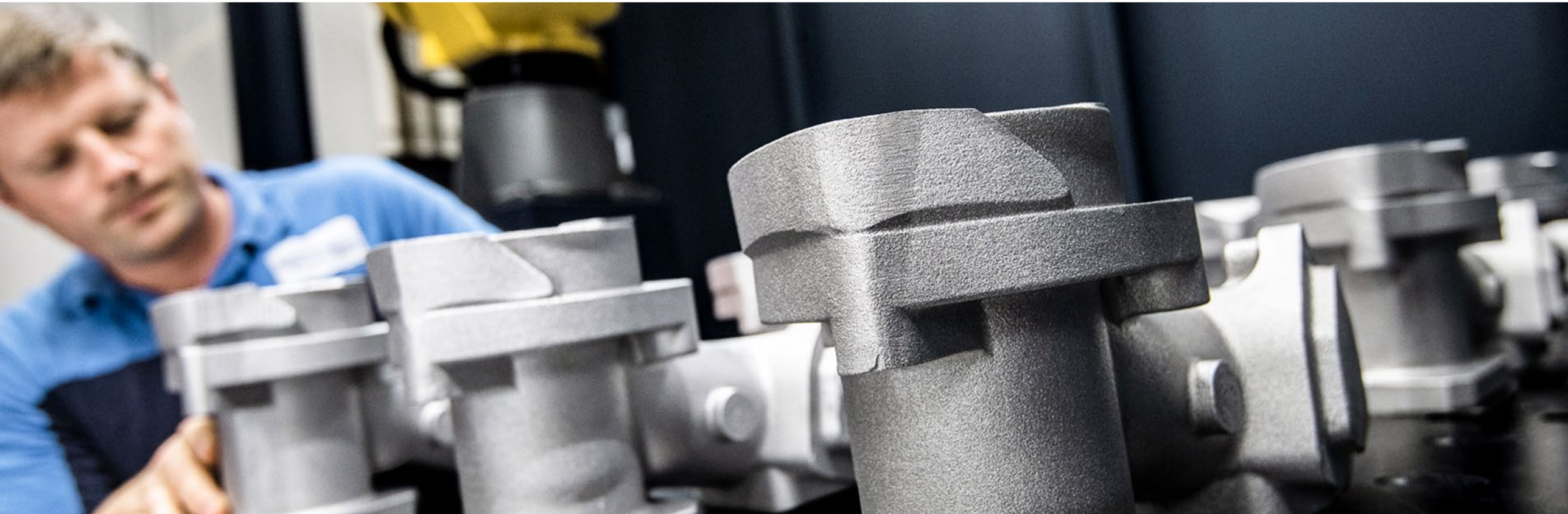
A functional design ensures efficient workflows and optimum ergonomics. The series comprises three models. The individual components are identical and therefore offer ideal possibilities for upgrading to different layouts.

Learn more

Optical serial measurement

All models of ScanBox Series 5 were designed for quality assurance and serial monitoring within production. ScanBox 5110 allows for inspecting parts with up to 1,000 mm in size, i.e., complex airfoils, fans, or blisks.

In ScanBox 5120 and 5130, larger hang-on parts such as hoods or trunk lids or battery modules are measured. These ScanBox systems are also frequently used in casting and forging applications, such as the inspection of cast parts, sand cores, and models.



ScanBox 5110 D[1]

ScanBox 5120 D[1]

ScanBox 5110 LC[2]

ScanBox 5120 LC[2]

ScanBox 5130 LC[2]

Technical data

	ScanBox 5110 D/LC	ScanBox 5120 D/LC	ScanBox 5130 LC
Dimensions	2200 × 2850 × 3050 mm (D)[1] 2200 × 3550 × 3050 mm (LC)[2]	3600 mm × 3550 mm × 3050 mm (D)[1] 3600 mm × 4250 mm × 3050 mm (LC)[2]	4300 mm × 4250 mm × 3050 (LC)[2]
Max. part size	**Ø 1000 mm**	**Ø 2000 mm**	**Ø 3000 mm**
Max. part weight	**2000 kg[3]**	**2000 kg[3]**	**2000 kg[3]**
Opening width	950 mm (D) 1000 mm (LC)	2050 mm (D) 2400 mm (LC)	3100 mm (LC)
Sensor compatibility	ATOS 5 for Airfoil, ATOS 5[4]	ATOS 5, ATOS 5 for Airfoil	ATOS 5

[1] D: Door; [2] LC: Light Curtain; [3] the allowed application weight may be restricted by the selected rotation table plate; [4] final setup check required.

ScanBox Series 5 RC

High throughput for series monitoring

ScanBox Series 5 RC (Remote Control) is an optical 3D measuring machine with a motorized sliding door. Parts such as airfoils, add-on parts or tools can be automatically loaded into the ScanBox Series 5 RC using a robot or an individually configured loading system and placed on the rotary table module. As individual loading by the user is no longer necessary, the time required for quality assurance is significantly reduced.

Autonomous part inspection

ScanBox Series 5 RC is available in two model variants and has been specially developed for applications that require a high level of integration and throughput. Thanks to its small footprint, the system can be easily integrated into any production line.

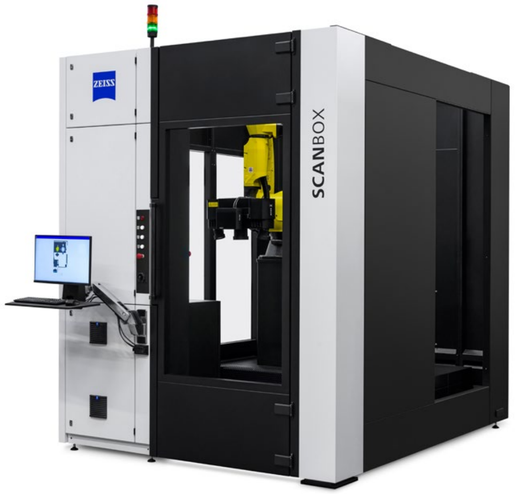
Maximum machine utilization and optimized processes

To utilize the full potential of the ScanBox Series 5 RC, the 3D measuring machine can be combined with a ZEISS feeding and loading system. With the ZEISS Integration Series, the loading of parts is automated, thus avoiding downtimes. The parts flow and operating time are optimized.

Learn more

Automation technology with magazine loading system

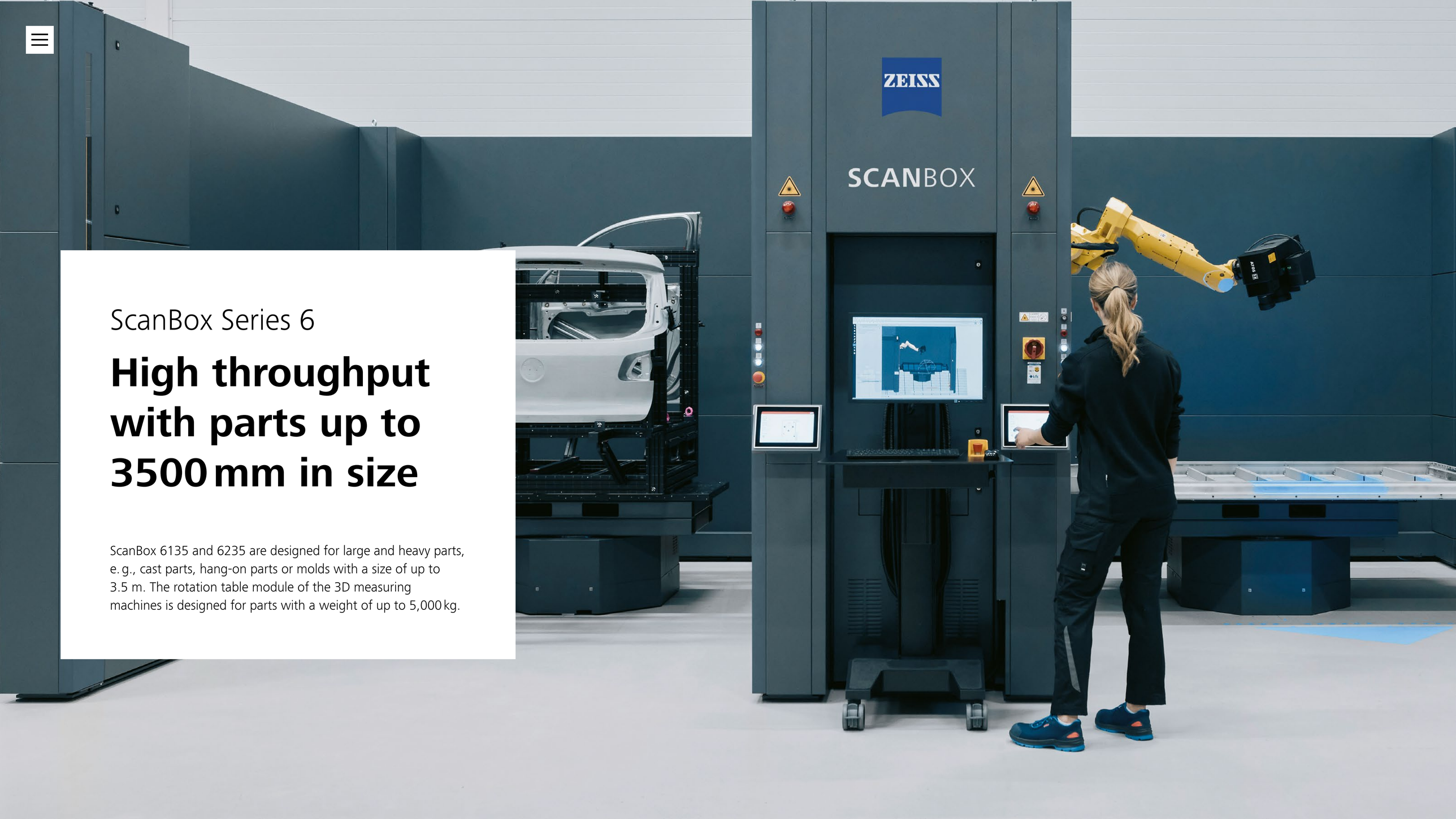
The integration of a magazine loading system enables even faster cycle times and reduced personnel requirements - the system measures autonomously for up to eleven hours. The magazine loading system is manually filled with batches of parts such as turbine blades. Each measurement image is provided with an RFID chip for unique identification. The corresponding measuring program is automatically selected based on this information. Once the inspection is complete, the part is automatically returned.



Technical data

	ScanBox 5110 RC	ScanBox 5120 RC
Dimensions	2200 x 2850 x 3050 mm	3600 x 3550 x 3050 mm
Max. part size	**Ø 1000 mm**	**Ø 2000 mm**
Max. part weight	**2000 kg**	**2000 kg**
Sliding door opening width	1000 mm	1350 mm
Sensor compatibility	ATOS 5 for Airfoil, ATOS 5[1]	ATOS 5 for Airfoil, ATOS 5[1]

[1] Verification of setup necessary.



ScanBox Series 6

High throughput with parts up to 3500 mm in size

ScanBox 6135 and 6235 are designed for large and heavy parts, e. g., cast parts, hang-on parts or molds with a size of up to 3.5 m. The rotation table module of the 3D measuring machines is designed for parts with a weight of up to 5,000 kg.

High throughput

Parts and fixtures can be set up on changing pallets outside of the ScanBox Series 6 system. This results in a high throughput of parts and is ideally suited for serial production.

Loading and measuring at the same time

The two working areas of ScanBox 6235 are able to be operated separately. This way, loading and measuring can be carried out at the same time. Both working areas and the rotation tables are designed for parts with a size of up to 3,500 mm, e. g., doors or trunk lids. Automatic doors ensure the safe operation of both working areas.

Fast part change

Hang-on parts such as trunk lids and doors can be measured faster with the multi-part fixture because the fixture does not have to be changed. Using the Human Machine Interface (HMI), the fixture can be easily positioned so that it is possible to exchange parts at the front.

Technical data

	ScanBox 6135	ScanBox 6235
Dimensions	4500 × 4500 × 3250 mm	7665 × 4500 × 3250 mm
Max. part size	**Ø 3500 mm**	**Ø 3500 mm**
Max. part weight	**5000 kg**	**2 × 5000 kg**
Opening width	2850 mm	2850 mm
Sensor compatibility	ATOS 5, ATOS 5X	ATOS 5, ATOS 5X

ScanBox Series 7

Measuring large and heavy parts up to 6000 mm in size

ScanBox Series 7 is mainly used in car manufacturing, try-out tool manufacture, and press shops. The optical measuring system performs complete analysis measurements for comparison in the try-out phase or is used for quality assurance in production.

Quality assurance for large parts

The ScanBox system measures metallic side panels and hang-on parts for automotive vehicles with a size of up to 6 m. The full-field measuring data enable the analysis of hole patterns, trimmings and character lines. Heavy and large parts for other applications can also be measured and inspected with ScanBox Series 7. Special designs make it possible to measure parts of 10 m in size. The rotation table working area of ScanBox 7260 allows for measuring medium-sized parts.

Modular layout

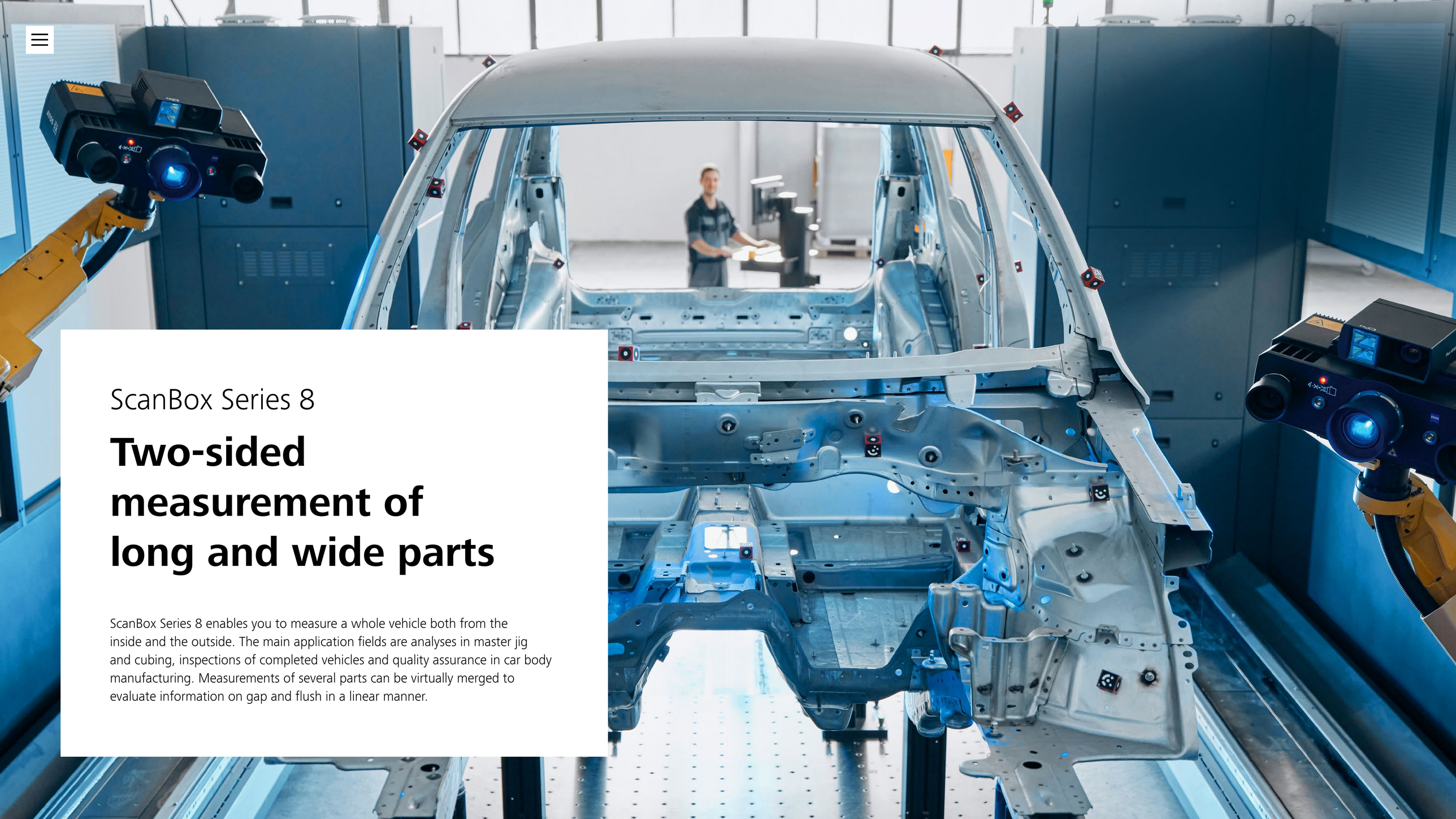
Uniform construction components and the modular setup of ScanBox Series 7 and 8 enable a demand-oriented ScanBox extension both within Series 7 and up to Series 8.

8-axis kinematics

The 8-axis kinematics – a combination of a horizontal rail, a vertical lift and an articulated robot – guarantees for smooth full-field measurements of large and heavy parts. Thanks to 8 degrees of freedom, the ATOS sensor is very flexible in its positioning and measures 3D data of the smallest details in practically no time.

Technical data

	ScanBox 7160	ScanBox 7260
Dimensions	4750 × 10150 × 3900 mm	8750 × 10150 × 3900 mm
Max. part size	**6000 × 2500 mm**	**6000 × 2500 mm, rotation table up to Ø 3000 mm**
Max. part weight	**unlimited**	**unlimited, rotation table up to 2000 kg**
Opening width	3050 mm	3050 mm, rotation table 2950 mm
Sensor compatibility	ATOS 5, ATOS 5X	ATOS 5, ATOS 5X



ScanBox Series 8

Two-sided measurement of long and wide parts

ScanBox Series 8 enables you to measure a whole vehicle both from the inside and the outside. The main application fields are analyses in master jig and cubing, inspections of completed 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.

Loading concept

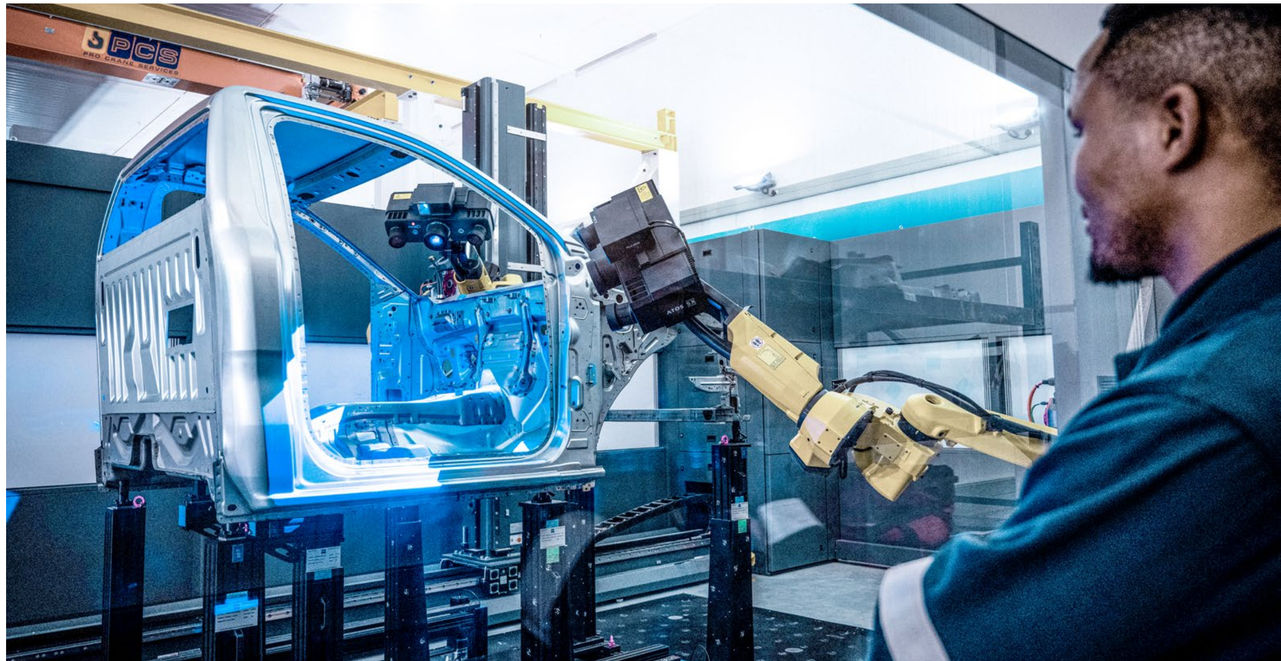
ScanBox Series 8 can be loaded with a driverless sandwich panel transport system including a track system, drive computer, and safety technology. The automatic loading system guarantees for the fast, repeatable and precise positioning of car bodies in the optical 3D measuring machine. Alternatively, the parts can also be transported to the respective rotation table working area by transport cart, pallet truck, crane or forklift truck.

Automated scanning in duplex operation

The two 8-axis kinematics allow for a smooth full-field measurement of particularly large assemblies. The double robot mode ensures the synchronous, coordinated use of two robots in the measuring cell. In this process, a joint data set of measurements is created, as the double robot mode is carried out in a shared coordinate system. Depending on individual requirements, the two robots of ScanBox Series 8 are also able to measure two different parts independently from each other.

Expandability

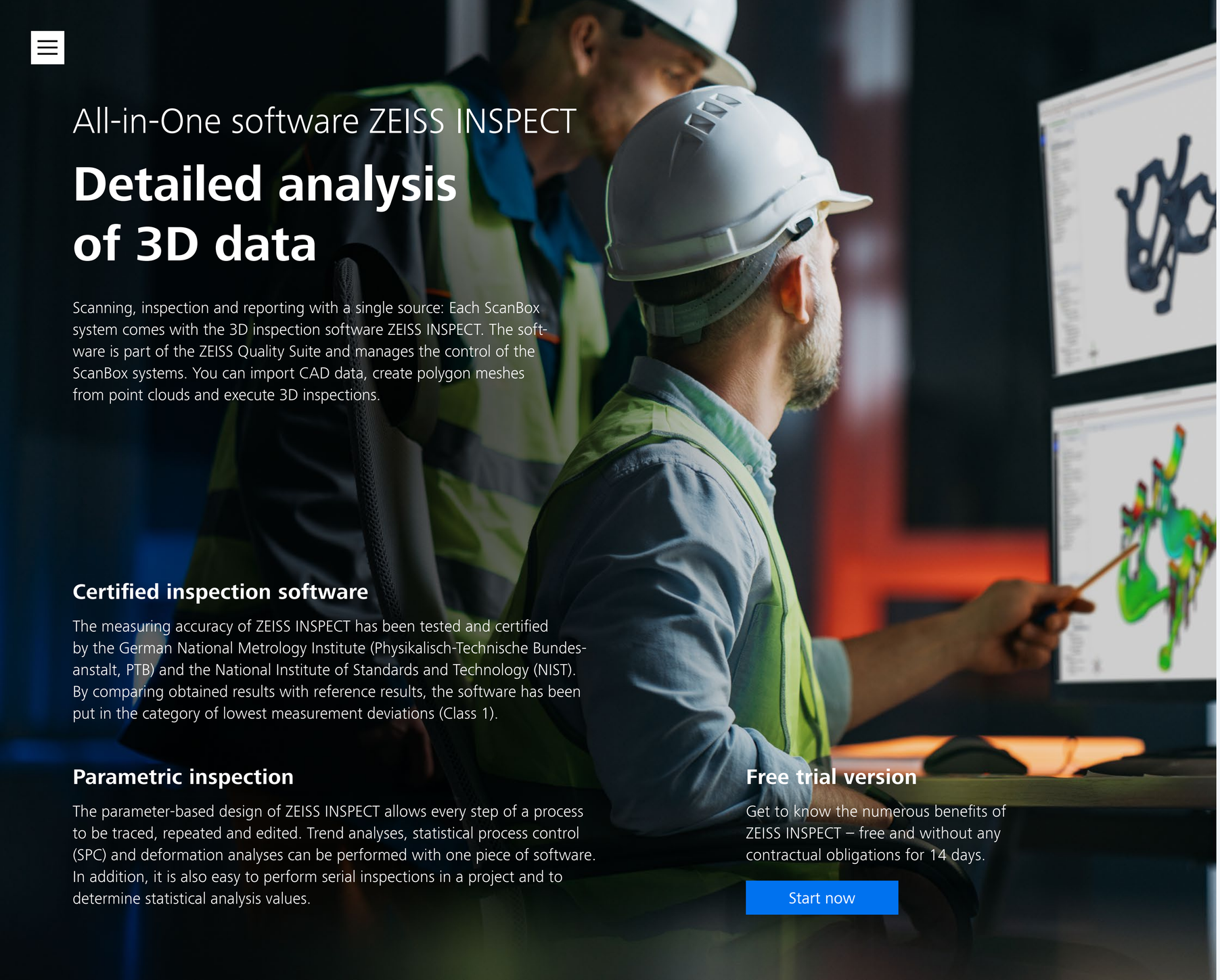
ScanBox Series 8 can be extended by one or two rotation table working areas. This upgrade opportunity makes it possible to respond quickly and flexibly to production changes and make adjustments to increase the throughput.



Technical data

	ScanBox 8160	ScanBox 8260	ScanBox 8360
Dimensions	5750 × 10150 × 3900 mm	9750 × 10150 × 3900 mm	13750 × 10150 × 3900 mm
Max. part size	**6000 × 2500 mm**	**6000 × 2500 mm, rotation table up to Ø 3000 mm**	**6000 × 2500 mm, rotation table up to Ø 3000 mm**
Max. part weight	**unlimited**	**unlimited, rotation table up to 5000 kg[1]**	**unlimited, rotation table up to 5000 kg[1]**
Opening width	3050 mm	3050 mm, rotation table 2950 mm	3050 mm, rotation table 2950 mm
Sensor compatibility	ATOS 5, ATOS 5X	ATOS 5, ATOS 5X	ATOS 5, ATOS 5X

[1] The allowed application weight may be restricted by the selected rotation table plate.



All-in-One software ZEISS INSPECT

Detailed analysis of 3D data

Scanning, inspection and reporting with a single source: Each ScanBox system comes with the 3D inspection software ZEISS INSPECT. The software is part of the ZEISS Quality Suite and manages the control of the ScanBox systems. You can import CAD data, create polygon meshes from point clouds and execute 3D inspections.

Certified inspection software

The measuring accuracy of ZEISS INSPECT has been tested and certified by the German National Metrology Institute (Physikalisch-Technische Bundesanstalt, PTB) and the National Institute of Standards and Technology (NIST). By comparing obtained results with reference results, the software has been put in the category of lowest measurement deviations (Class 1).

Parametric inspection

The parameter-based design of ZEISS INSPECT allows every step of a process to be traced, repeated and edited. Trend analyses, statistical process control (SPC) and deformation analyses can be performed with one piece of software. In addition, it is also easy to perform serial inspections in a project and to determine statistical analysis values.

Free trial version

Get to know the numerous benefits of ZEISS INSPECT – free and without any contractual obligations for 14 days.

Start now

Numerous CAD formats

Native CAD formats, such as CATIA, NX, SOLIDWORKS and Pro/E, can be imported into the software at any time.

Teaching by doing

Thanks to continuous buffering, the desired inspection steps can be transferred to subsequent parts without any programming effort.

Digital assembly

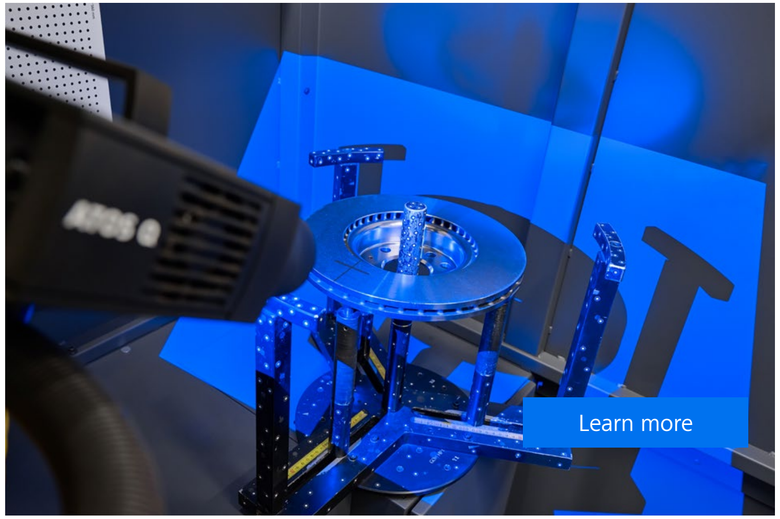
Digital assembly allows for the alignment of parts to one another and an analysis of whether they fit accurately, regardless of where the parts were manufactured.

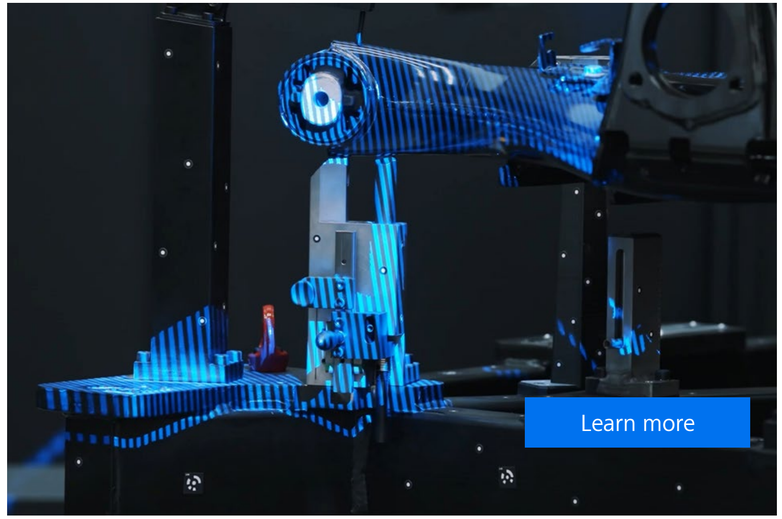
Customization

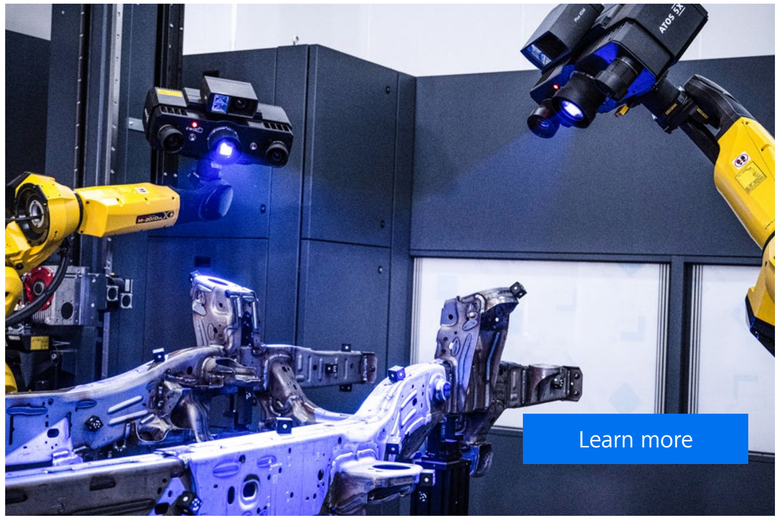
A command recorder saves all executed operations as a Python script, which can then be repeatedly applied or adjusted for additional measurements.

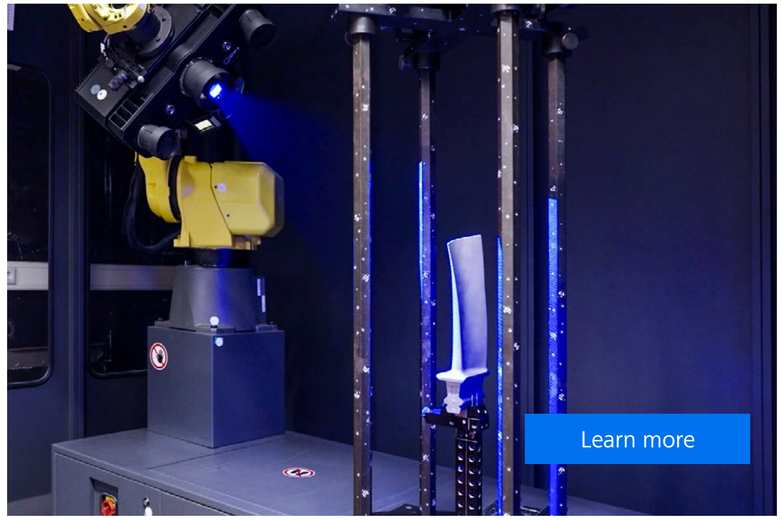
The software supports the measuring and inspection process with detailed analysis and reporting functions. The results are displayed in a simple and clear manner.

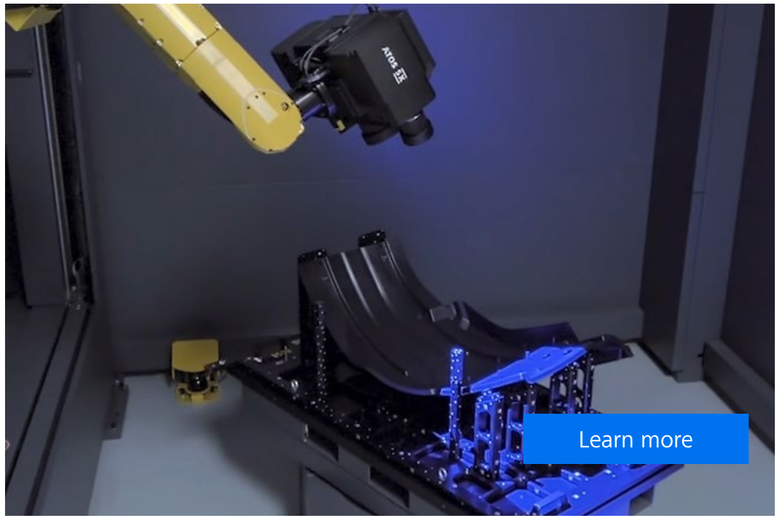
Customer testimonials











ZEISS Portfolio

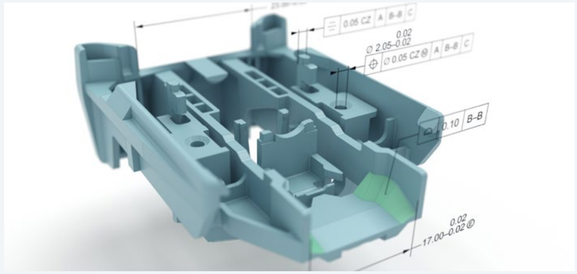
CMM

Optical 3D

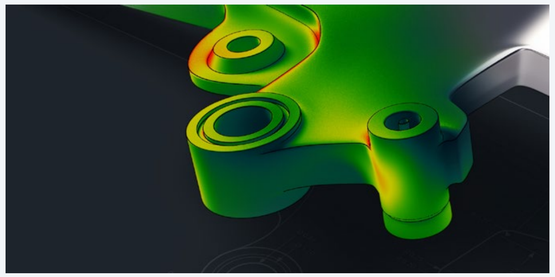
X-Ray

Industrial Microscopy

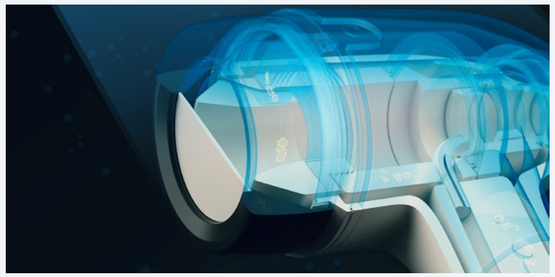
ZEISS CALYPSO



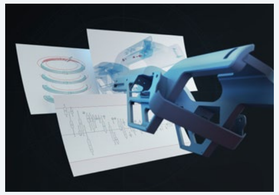
ZEISS INSPECT Optical 3D



ZEISS INSPECT X-Ray



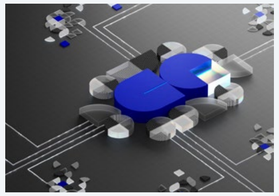
ZEISS ZEN core



DATA MANAGEMENT

ZEISS PiWeb scalable reporting and quality management software combines metrology results from different measuring technologies for efficient tracking of production quality. Its powerful features and intuitive templates handle huge amounts of data and provide immediate results.

Read more



METROLOGY HUB

ZEISS CONNECTED QUALITY seamlessly connects your measuring systems, operators and quality data worldwide. The new product family enables completely new dimensions of collaboration! Easily monitor your systems from anywhere, at any time – using a tool of your choice.

Read more

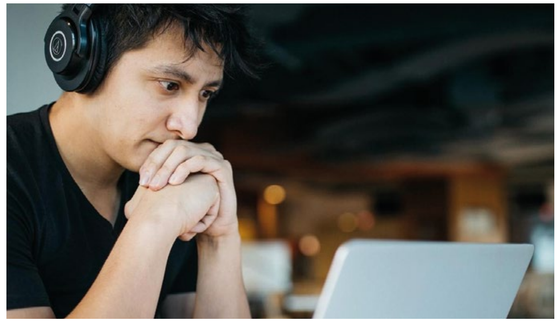
ZEISS – Services and Support

As a comprehensive solutions provider, ZEISS remains at your side independent of the purchase of a measuring system. From measuring services and training to enhanced application support – only ZEISS Industrial Quality Solutions is able to offer you the right expertise at all stages of the product life cycle.

We offer customized service packages, tailored to the needs of our customers and serve them through a highly skilled, global network of technicians. Equipped with enhanced digital tools and technologies, we are able to help our customers maximize their machine uptime, increase equipment utilization efficiencies and thereby resulting in better customer satisfaction.

ZEISS QEC

Knowledge



Maintenance & Repair

Retrofit & Productivity

Did ScanBox get your attention?

Contact us for a free demonstration –
on site or online.

Contact us

ZEISS Industrial Quality Solutions
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