

WENZEL SHOPFLOOR SOLUTIONS

ROBUST, FAST, READY FOR AUTOMATION



PRODUCT RANGE
SHOP FLOOR SOLUTIONS

WENZEL – INNOVATION MEETS TRADITION



DR. HEIKE WENZEL & PROF. DR. HEIKO WENZEL-SCHITZER

MANAGEMENT OF THE WENZEL GROUP

The WENZEL Group GmbH & Co. KG is a leading Manufacturer of innovative measuring technology solutions. The success of the largest family-run company in the industry is based on German quality, technology, flexibility and strong partnerships.

Founded in 1968, the name WENZEL stands the highest precision, reliability and technological competence.

In recent years, measurement technology has changed a lot. The measuring tasks are performed in production as well as in the measuring room. In addition to high-precision tactile measurement, optical sensors as well as new technologies such as computed tomography have found their place in metrology. We as WENZEL have brought numerous innovative solutions onto the market in recent years so as to offer our customers the right products. In addition to the product itself, we also supply you with turnkey solutions. This makes us flexible experts for innovative measurement solutions.

Industrial measurement technology is increasingly used directly in production. We supply innovative solutions for the shop floor, with which our customers can cover their very different requirements with our well-known highest quality.



About WENZEL

Founded in 1968, WENZEL is now the largest family-owned measurement technology manufacturer.

More than 12,000 machines installed worldwide



WENZEL Worldwide

More than 500 employees worldwide

Subsidiaries & representatives in more than 50 countries



Our Headquarters

Wiesthal, Germany

Total area: 54.000 m²
of which buildings: 15.500 m²
air-conditioned: 5.000 m²

OUR APPLICATIONS



OUR PRODUCT LINES

OUR FOCUS INDUSTRIES

Measurement technology has been our profession since 1968 and we have developed it to absolute perfection over the years. WENZEL stands for highest quality standards and reliability - without forgetting that only those who have their sights set on the future and their vision constantly in mind can survive. WENZEL offers numerous innovative solutions for measurement solutions for production, which we present here in this segment brochure. The shop floor measuring technology has two main tasks: on the one hand it serves to monitor the process stability in the production and on the other hand the dimensional accuracy of the components. For testing the stability, fast but not quite as accurate solutions are often sufficient: we at WENZEL offer you measuring arms with tactile and optical sensors and comparators such as the Equator from Renishaw. However,

ensuring dimensional accuracy still requires highly accurate measuring equipment. We at WENZEL offer you our own range of SF solutions for this purpose. With the SF 55, 87 and 1210 we cover a wide range with which we can meet a great many requirements. These machines differ from our "classical" measuring machines mainly by a higher robustness regarding temperature variation and environmental conditions like dirt and vibrations. All solutions from WENZEL are available with different tactile and optical sensors and are optimally operated by our own software. Our high quality demands on the machines should also be demonstrated by our users: simple operation despite a deep functional diversity - WENZEL is your long-term partner for today and tomorrow. Enjoy reading and challenge our flexibility: we are ready to be there for you!

TYPICAL
BUSINESS AREAS

**General Part Inspection
Sheet Metal & Trim
Powertrain & Engine
Blade & Gear
Reverse Engineering
... and many more**

TYPICAL
APPLICATION AREAS

**Automotive manufacturers and suppliers
Aerospace
Mechanical Engineering
Foundry Technology
Metal and plastic processing industry
Medical Technology
Mould and tool making
Electrical engineering / electronics
Measurement service provider
Research and science
...and many more**

WENZEL SOLUTION FINDER

THE RIGHT SOLUTION FOR EVERY TASK

WENZEL offers you the appropriate solutions for your different requirements. But which one suits you? On this double page we want to give you a qualified overview. Of course, we would also be happy to advise you on a detailed analysis and examination.

1. Installation location: Here we differentiate whether the machine is fundamentally designed for the measuring room or for production, i.e. without any special precautions.

2. Component size: Here we roughly distinguish between small, medium and large components.

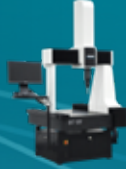
3. Accuracy: Here we differentiate roughly into very accurate, accurate or less accurate.

4. Application: Here we make a rough distinction between geometry, free-form surfaces, non-destructive testing and defect detection.

5. Mobility: The main issue here is the amount of work required for the measuring instrument to be able to work at a different location.

6. Speed: The higher the speed, the lower the achievable cycle times.

7. Financials: In addition to the acquisition costs, this also includes maintenance and service costs as well as operating costs (e.g. simple operation). Of course, all our solutions have a very good price/performance ratio, but require investments in different amounts. We differentiate between lower, medium and higher investment.



LOCATION	Measuring room											
	Production											
PART SIZE	Small											
	Medium											
	Large											
ACCURACY	Very high											
	High											
	Medium											
APPLICATION	Geometry											
	Surface											
	NDT + defect											
MOBILITY	High											
	Medium											
	Low											
SPEED	Very high											
	High											
	Medium											
FINANCES	Acquisition											
	Maintenance											
	Ease											
		TACTILE	OPTICAL	TACTILE	OPTICAL	TACTILE	OPTICAL	TACTILE	OPTICAL	TACTILE	OPTICAL	
		WM MMA		SF 55		SF 87		SF 1210		CORE D/M		

*depending on the material of the component

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WENZEL SHOP FLOOR MACHINES

RANGE OF SERVICES AND FIELDS OF APPLICATION

The market trend is towards measurement solutions that can be easily integrated into the customer's production process. The fields of application are complex and require flexible and robust measuring systems that function reliably under different environmental conditions. For these applications the shop floor solutions of WENZEL were developed. These guarantee that errors are detected early and thus downtime costs are minimized.

WENZEL has invested a lot in the development of its Shopfloor measuring systems, in order to reduce the influence of temperature and dirt on the measuring results. The award-winning SF 87 CMM requires little floor space and offers the best ratio of measuring volume to floor space in its class on the market. This makes the SF 87 ideal for a large part of the cutting and forming industry. Furthermore WENZEL offers with the robust SF 55 the smallest coordinate measuring machine for the shop floor area, which among other things is characterized by a high efficiency. The new SF 1210 offers a low footprint, good accessibility and short measuring times with an enormous measuring volume.

The highly dynamic optical high-speed scanning system CORE was specially developed for the non-contact measurement of turbine blades, medical products and many other parts with polished, reflective surfaces and sharp edges in the production environment. With the CORE, cycle times are tremendously reduced and a significantly higher measurement throughput is possible.

Often, a comparison with a master part or a quick scan is all that is needed for process control in production. At this point WENZEL has extended the product portfolio by partner solutions. Together with Renishaw their Equator was integrated into the WENZEL solutions. With KREON the WENZEL measuring arm WM | MMA was developed, which can also be operated directly with the WENZEL software.



SHOP FLOOR MACHINES

INLINE METROLOGY IN SYNC WITH PRODUCTION

The reduction of batch sizes and the strongly growing interest in 100% measurements require more and more automation solutions in the shop floor environment with the aim of achieving full process control. The trend is towards intelligent and integrated solutions. This means that measuring systems can be loaded automatically and measuring programs can be started directly. But it also means that data such as measuring programs and results can be exchanged and further processed via standardized interfaces.

Whether close to production or fully integrated, the production measuring devices from WENZEL as well as the exaCT U computer tomograph are designed in such a way that they can match the cycle time of production via automatic loading. WENZEL Shop Floor solutions offer clear competitive advantages to the customer, by making a failure-free production and a perfect material flow possible. Production costs are lowered and productivity, flexibility as well as the product quality are increased.



SF Series

PRODUCT RANGE SHOPFLOOR SOLUTIONS

WENZEL SF SERIES

ROBUST, FAST & PRECISE





THE NEW WENZEL SHOPFLOOR SERIES

CMMs FOR USE IN THE WORKSHOP

WENZEL's workshop-suited CMMs are universally applicable. The WENZEL SF 55, SF 87 and SF 1210 coordinate measuring machines can be used to measure both series and individual parts in the direct production environment, in incoming

goods and in classical quality assurance. The intelligent and compact design is suitable for a wide range of applications in the production environment, especially in the cutting and forming industry.

WENZEL SF 55

The SF 55 is a CNC bridge measuring device for use in a production environment and can be equipped with both tactile and optical sensors. The corrosion-free guides of the machine are made of granite and hand lapped with high precision. The guide ways are completely covered and protected against contamination. The controller and PC are integrated into the machine for a minimum foot print. The space requirement is low with excellent price-performance ratio. The SF 55 has passive vibration damping and can optionally be equipped with active vibration isolation.



WENZEL SF 87

The new SF 87 coordinate measuring machine is the universal measuring machine for the production environment. The SF 87 requires little floor space and offers an optimized measuring volume of 800x700 x 700 mm. This makes it ideal for a large part of the metal cutting and forming industry.

The machine concept offers a very good price-performance ratio with low space requirements. High traversing speeds and accelerations ensure high productivity. The combination of powerful probes and optical sensors leads to a considerable increase in efficiency in your measuring and testing process.



WENZEL SF 1210

The latest model in the SF series is the SF 1210, which offers a measuring volume of 1,200 x 1,500 x 1,000 mm, which is unique on the market for a coordinate measuring machine of this type. The Y-axis can be individually adapted. The CMM is accessible from four sides and is therefore ideally suited for automation. The SF 1210 is equipped with high-quality linear guides and is therefore ideally suited for the rough environmental conditions. The complete WENZEL portfolio of tactile and optical sensors is supported.



WENZEL SF 55

MEASURING IN THE PRODUCTION ENVIRONMENT

The SF 55 is a CNC bridge measuring device for use in a production environment and can be equipped with both tactile and optical sensors. The corrosion-free guides of the machine are made of granite and hand lapped with high precision. The guide ways are completely covered and protected against contamination.

The controller and PC are integrated into the machine for a minimum footprint. The space requirement is low with

excellent price-performance ratio. The SF 55 has passive vibration damping and can optionally be equipped with active vibration isolation. For use in serial measurements, the machine achieves a multiple of the usual scanning speed in comparator mode with only slightly poorer repeatability values.

FIELDS OF APPLICATION

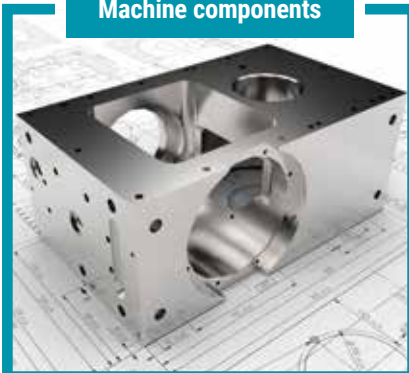
The SF 55 can be used universally. Serial and individual prismatic and free-form workpieces can be measured with the coordinate measuring machine in a production environment, for incoming goods and for classic quality assurance.



Steel bushings

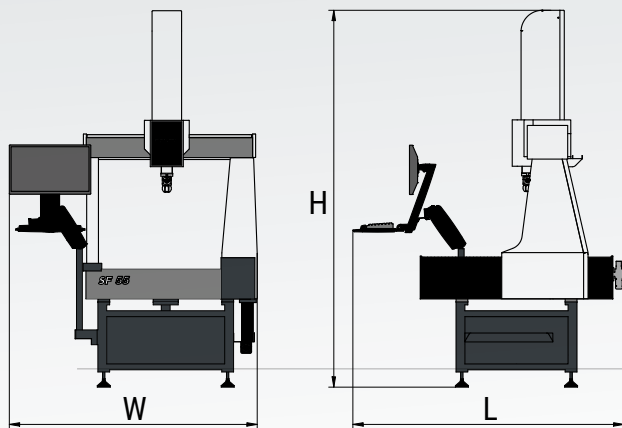


Machine components



Gearboxes





MACHINE PROFILE

Space Requirements (L x W x H)	1730 x 1440 x 2555 mm
Machine weight	980 kg
Max. Workpiece weight	200 kg
Measuring ranges	500 x 500 x 500 mm*

* with touch probe PH10M PLUS

FEATURES

- High flexibility**
 Bellows covers to protect against contamination |
 Data compatibility with other WENZEL systems |
 Height-adjustable operating arm
- Versatile sensor options**
 Swapable sensor systems |
 3-axis scanning |
 Optical sensor technology
- Suitable for automation and integration into the line**
 WENZEL-Automation-Interface (WAI) |
 Good accessibility |
 WM I SYS Analyzer
- High mechanical precision**
 Granite base | Hand-lapped base plate (DIN 876/0) |
 Air bearing guide elements in all axes
- Low operating costs**
 Low air consumption |
 Renishaw sensors |
 Reliable and inexpensive spare parts

WENZEL SF 87

MEASURING IN THE PRODUCTION ENVIRONMENT

The new SF 87 coordinate measuring machine is the universal measuring machine for the production environment. The SF 87 requires little floor space and offers an optimized measuring volume of 800 x 700 x 700 mm. This makes it ideal for a large part of the metal cutting and forming industry.

The machine concept offers a very good price-performance ratio with low space requirements. High traversing speeds and accelerations ensure high productivity. The combination of powerful probes and optical sensors leads to a considerable increase in efficiency in your measuring and testing process.

FIELDS OF APPLICATION

The SF 87 is a workshop-ready 3D coordinate measuring machine for measuring small to medium-sized production parts. The intelligent and compact design is suitable for a wide range of applications in the production environment, especially in the cutting and forming industry.



Steel bushings

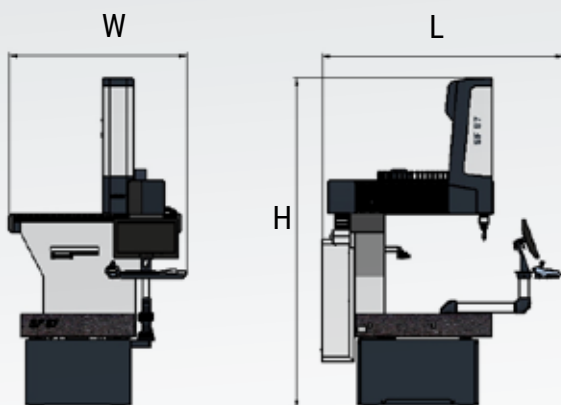


3-cylinder engine block



Gearboxes





MACHINE PROFILE

Space Requirements (L x W x H)	2130 x 1560 x 2890 mm
Machine weight	1850 kg
Max. Workpiece weight	300 kg
Measuring ranges	800 x 700 x 700 mm*

* with touch probe PH10M PLUS

FEATURES

- Suitable for work-shop and production use**
 Temperature compensation | Active damping as an option
- Excellent price-performance ratio**
 Large measuring volume with small footprint | Low operating costs | No compressed air required
- Flexible and universal use**
 Multisensor capable (optical and tactile) | 5-axis measuring technology | Available with matching probe changing units
- Integration into the line and into automation processes**
 WENZEL-Automation-Interface (WAI) | Can be equipped from three sides | WM I SYS Analyzer
- Modern machine design**
 Ergonomic and user-friendly | Bionic structures and massless weight compensation | Turntable option

WENZEL SF 1210

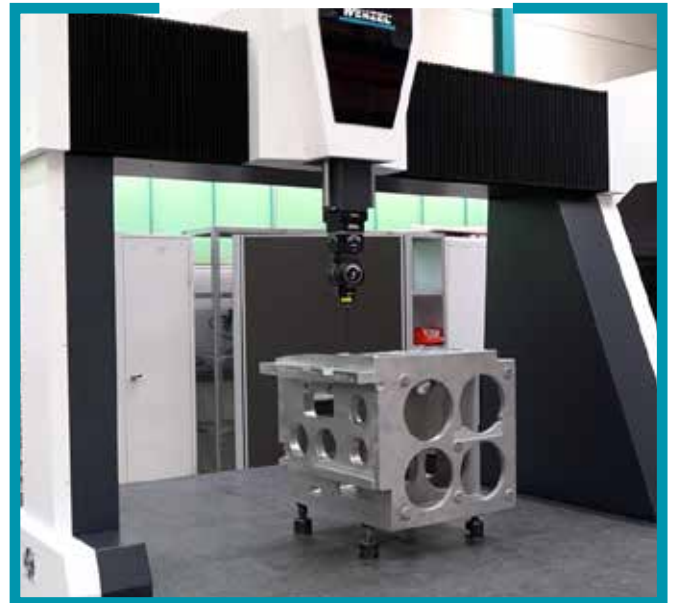
MEASURING IN THE PRODUCTION ENVIRONMENT

The new coordinate measuring machine SF 1210 is WENZEL's answer to the trend to bring metrology closer to production. The SF 1210 offers a large measuring volume of 1200 x 1500 x 1000 mm. This makes it ideal for a major part of the cutting and forming industry. The extended temperature range makes it the ideal system solution for manufacturers of e.g. castings, chassis parts, subframes, engines, etc. The machine concept offers a very good price-performance ratio with a small footprint. The double

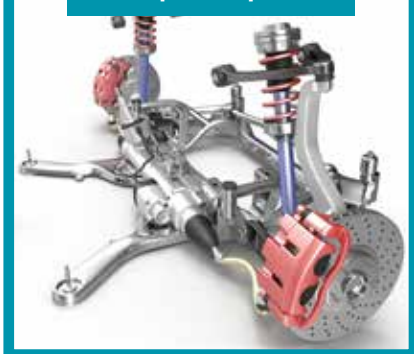
drive in the Y-axis provides for highest accelerations and speeds and thus for high productivity, e.g. also in connection with an automation. The SF1210 is compatible with the complete sensor program from WENZEL. This flexibility ensures efficiency increases in your measuring and testing process.

APPLICATIONS

The SF 1210 is a 3D coordinate measuring machine for measuring medium to large production parts in the shop floor environment. The intelligent and compact design is suitable for a wide range of applications in the production environment, especially in the cutting and forming industry. Examples are:



Suspension parts

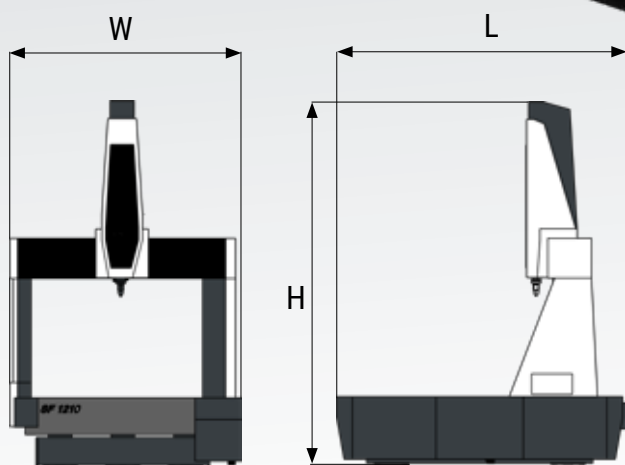


Electric motors



Cast housings





MACHINE PROFILE

Space Requirements (L x W x H)	2976 x 2302 x 3928 mm
Machine weight	6655 kg
Max. Workpiece weight	1000 kg
Measuring range	1200 x 1500 x 1000 mm*

* with touch probe PH10M PLUS

FEATURES

- Suitable for work-shop and production use**
 Temperature compensation | Active damping as an option | Robust linear bearings | Broad temperature range
- Flexible and universal use**
 Multisensor capable (optical and tactile) | 5-axis measuring technology | Available with matching probe changing units
- Excellent price-performance ratio**
 Large measuring volume with small footprint | Low operating costs
- Integration in the line and in automation processes**
 WENZEL-Automation-Interface (WAI) | Can be equipped from four sides | WM I SYS Analyzer
- Modern machine design**
 Ergonomic and user-friendly | Bionic structures and massless weight compensation | Barrier-free accessibility from 4 sides

SENSORS & CHANGE RACKS

MOUNTING HEADS, PROBES AND SCANNERS

Combined with a variety of innovative sensors, the WENZEL SF series machines are flexible even for the most difficult of applications. From smallest injection moulded parts to large sheet metal punching tools - our product series meet your requirements! They can be equipped with manual, motorized, infinitely variable or indexable mounting heads.

With the corresponding touch-trigger, scanning and optical measuring systems, our product series achieve results for all applications. The compatible automatic changing racks turn the measuring machines into homogeneous and versatile measuring systems.



PH10T PLUS / PH10M PLUS / PH10M iQ PLUS

Automatically indexable probe head PH10M: Fast probe changing (auto joint) with a variety of rack options.



PH20

The 5-axis PH20 and CMMs are an efficient solution for measuring 3D and prismatic components. The 'Head Touch' function takes measurement points very quickly and reduces cycle times.



REVO-2

The 5-axis probe system REVO™ coupled with WM | Quartis provides an extremely fast high scanning speed solution with a high degree of measurement flexibility, and thus an extremely high throughput.



TP20

Touch trigger probe. Extremely robust and flexible touch trigger probe with stylus module.



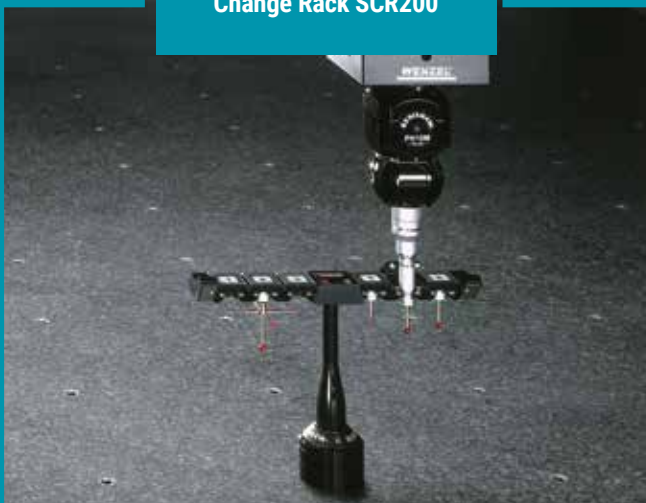
TP200

Compact, modulechanging touch trigger probe particularly suitable for measuring tasks with tight dimensional tolerances for 3D free-form surfaces with longer styli.



SP25M

The most compact and versatile probe system for scanning on a global scale.

Change Rack SCR200

The SCR200 provides automatic, high speed changing between up to six TP200 stylus modules. The SCR200 is powered by the separate probe interface, PI 200, and provides features to facilitate safe stylus changing.

Change Rack ACR3

ACR3 uses Renishaw's unique autojoint connector to attach probes and extensions to the PH10M PLUS and PH10MQ PLUS motorised indexing heads. It can support a range of sensors from Renishaw and other metrology suppliers. Although the ACR3 is a four port unit, two can be linked together so that eight different probes or extensions can be stored in the rack - sufficient for any measurement task.

Change Rack FCR25

Flexible change racks for automated changing of SP25M scanning and touch-trigger 3 Station (6, 9, 12 and 15 Stations available).

MRS2 Stylus Module Rack

MRS2 is available with different column and rail lengths to allow configurations for a variety of applications. When the CMM workspace is tight, or when many probes and styli are needed, additional rails can be attached to the MRS2 to configure a multi-stage magazine. The rail is compatible with the following interchangeable systems: ACR3, FCR25, memory module and roughness probe SFA for REVO probes.

OPTICAL SENSORS

FOR OUR SF SERIES

Combined with our wide range of optical sensors, our CMMs become true high-speed measuring machines. Our extensive portfolio allows us to offer the right sensor for every customer in terms of cycle time, accuracy and resolution. Even shop floor CMMs already in use can be retrofitted with optical sensors. The choice of the right sensor depends on various factors. Not only

component size, composition and shape, but also the batch size and manufacturing time determine the right choice. With the right combination of shop floor CMM and sensor, you can ensure that your quality control always stays within the cycle time of your production.



WM | Shapetracer

The WENZEL SHAPETRACER II is a highly flexible 3D line scanner for the acquisition and processing of point clouds on a multi-sensor coordinate measuring machine.



WM | LS 50 & WM | LS 150

The WM | LS 50 & WM | LS 150 3D line scanners turn your coordinate measuring machine into the ideal tool for capturing and processing point clouds.



WM | LS 70

Developed for demanding applications, the WM | LS 70 enables accurate and fast measurements in various industrial and application areas.



NIKON LC15Dx

The LC15Dx offers significant advantages in quality control many precision parts & geometries, including small details, semi-rigid materials, & complex components.



NIKON XC65

The scanner is ideal for gap and flush measurements as well as for applications where a large distance to the component is generally required.



NIKON L100

The L100 is ideal for testing large-volume components where productivity is a priority, but without compromising accuracy.



SF 1210

CORE Series

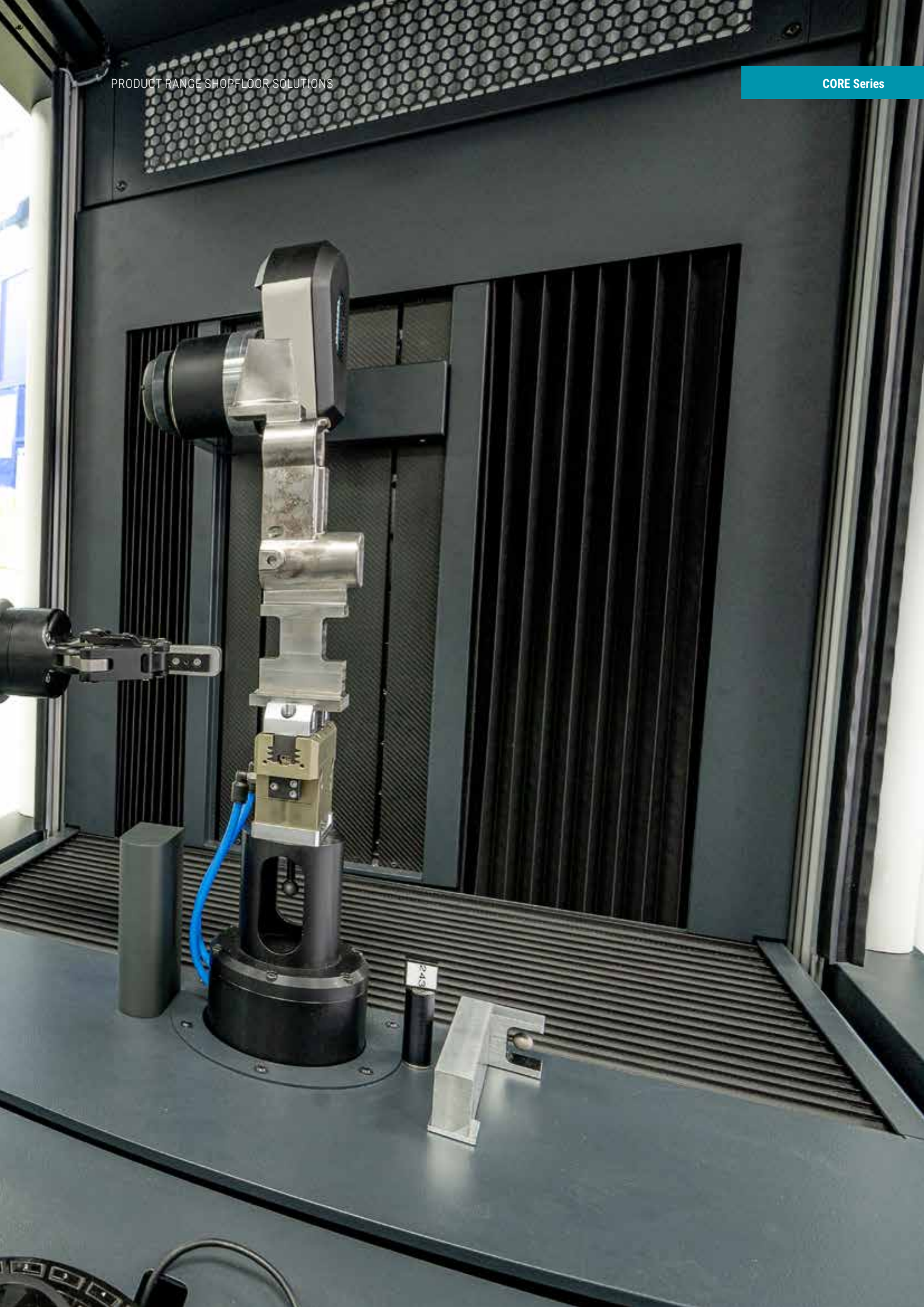
PRODUCT RANGE SHOPFLOOR SOLUTIONS

WENZEL CORE SERIES

BLADES, BLISKS & MORE



PROF.



WENZEL CORE

MEASUREMENT OF BLADES, BLISKS AND IMPLANTS

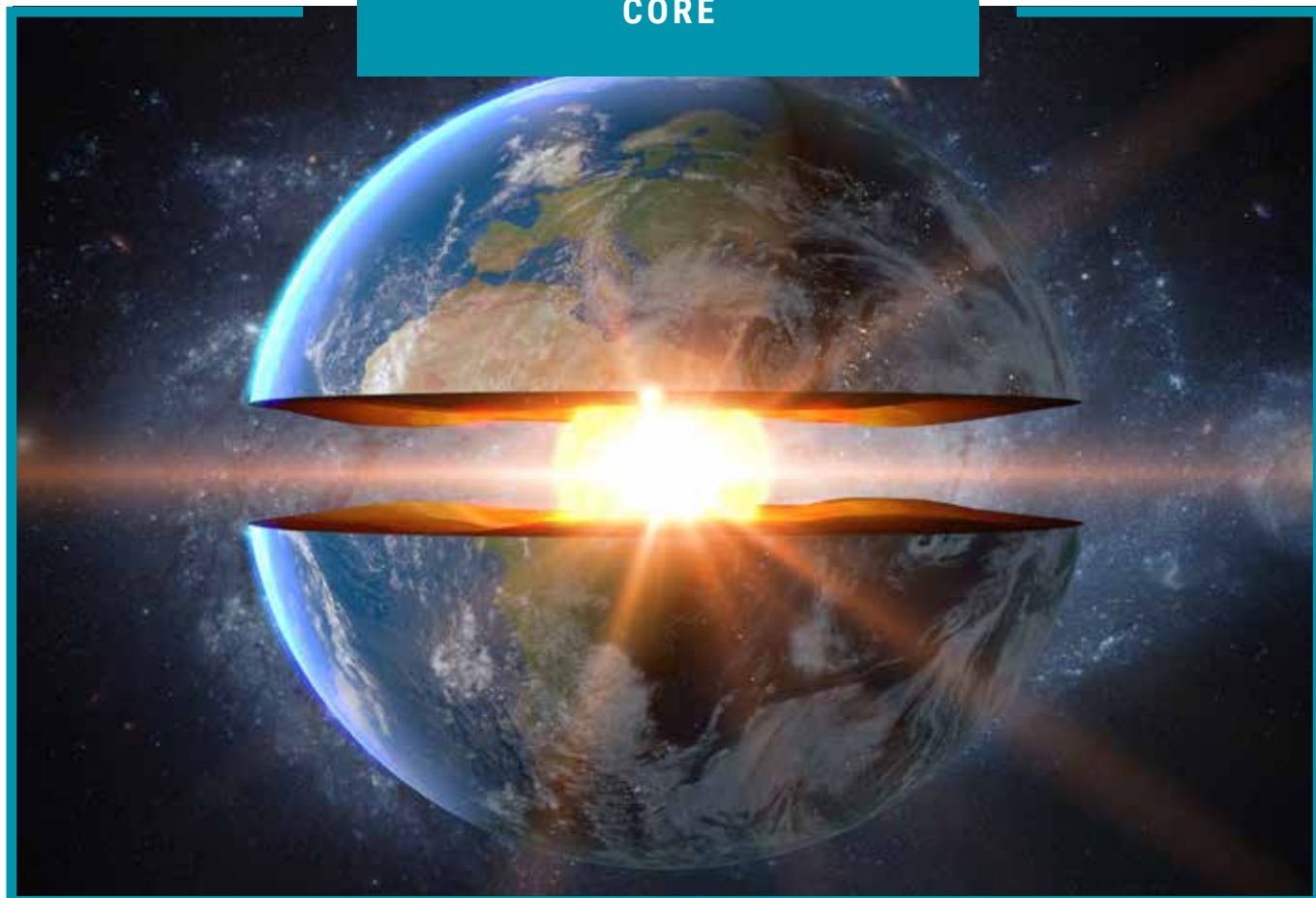
Hollywood, for example, used it for the film "The Core". In sports, "core training" means the training of the central body part, in physics "core" is the most important part of a nuclear reactor in which the chain reaction takes place. No matter what we have looked at so far, they all have one thing in common: it is about the innermost, the central part.

In addition to measurements in the measuring room, it is now important to move metrology into the production area close to the processing machines in order to be able to react quickly to deviations. With this in mind, WENZEL's CORE product range was developed for the central part of a production plant - the

quality of the products. No matter whether the measurement is carried out directly after production or during post-processing within the maintenance cycle at a later point in time, the CORE is the appropriate coordinate measuring machine for this. The measuring machine can be used directly in the production area and measure the relevant characteristics. It is possible to measure on almost all surfaces, whether shot peened, lacquered, polished or matte. Due to the unique optical sensors of the CORE product line it is possible to measure all these surfaces.

Some may now think that optical sensors cannot measure everything. That's right, every technology has its limits. For

CORE



this reason, WENZEL has developed a hybrid sensor that combines the characteristics of optics and tactile sensors and is outstanding in this regard, but not only are the sensors to be emphasized here, also the machine itself impresses with its small space requirement in comparison to similar measuring machines. The CORE product range is also characterized by its incredible flexibility. Depending on the model, the CORE can be equipped with 6 axes and a measuring turntable. This combination allows almost unrestricted access to the components in order to measure as many features as possible in a single operation without re-clamping. This measurement is not done in hours, days or weeks, no, the development of the CORE product line has been designed to measure within the cycle time of production. Fast measurements can be achieved as a result of high acceleration of the individual axes. Yet the accuracy is not overlooked, resulting in the best possible relationship between measurement time and accuracy. In addition, the CORE product range can also be integrated into

a fully automated production line. Whether using a robot or an automatic feeding system - with the CORE, WENZEL can make real almost any automation.

What would a measuring machine be today without the right software? It would probably only function in a limited way. For this reason the CORE is now available with the well-known WM | Quartis software from WENZEL. The areas of application for CORE are wide. For example, turbine blades from the aerospace industry or industrial gas turbines can be inspected. In medical technology, joints and prostheses can also be measured, as can components from other diverse markets. Small, medium and large components with a length of more than 2m can be measured with the CORE product range. No matter whether you want to check the quality of your products directly after manufacture or at a later point in time, CORE will not let you down. Do not leave the quality of your products to chance, but entrust this important central part of the CORE to WENZEL.

OPTICAL MEASUREMENT OF TURBINE BLADES



WENZEL CORE S

OPTICAL MEASUREMENT AT PRODUCTION CYCLE SPEED

Designed to increase the speed of the production process, the CORE Optical High Speed Scanning System offers a highly flexible 3D inspection solution for demanding measurement requirements in global manufacturing. The CORE is based on a proven mechanical structure, developed and manufactured in WENZEL's renowned production facility in Germany. This forms the cornerstone for its accuracy, reliability and quality.

With a scanning speed of up to 400 mm/s, the CORE provides time savings by a factor of about 4 compared to tactile coordinate measuring machines.

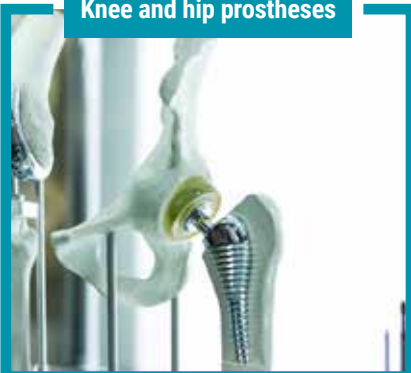
For customers with different requirements regarding shop floor resilience and footprint WENZEL has developed the CORE S E (Essential) which is available at a lower price offering a lower footprint but no automatic protection cover.

FIELDS OF APPLICATION

Multiple sensor options enable a wide range of applications. Typical applications of CORE can be found in a wide variety of industries, for example in tool and mold making, prototype construction, the automotive industry, reverse engineering and above all in medical technology and aviation. CORE is used to measure turbine blades, joints, implants and vehicle parts.



Knee and hip prostheses



Turbine blades



Pumps



FEATURES

■ Fast and efficient

Fast point detection |
Minimization of machine
movement | Repositioning
during measurement

■ Easy integration

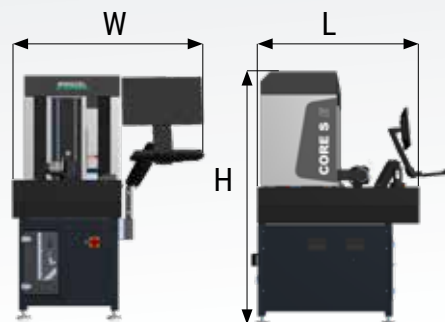
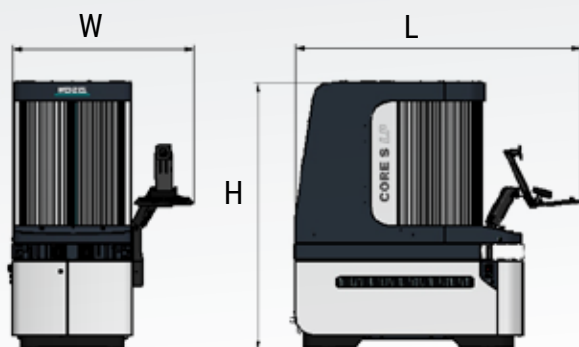
Compact design with
a small footprint |
Controller and computer
integrated in the unit |
Accessible work area |
No compressed air requi-
red | Easy to relocate

■ Unique sensors

Simple measurement
of critical areas | Direct
measurement of polished
and highly reflective
surfaces | Large working
distance and measuring
range

■ Latest technology

Can be automated |
Connection of robots for
assembly | Temperature
stability from 15°C - 30°C |
Dirt-resistant due to
protected guides |
Vibration-resistant |
Use of precision scales |
5-axis measuring system
| Angle acceptance of the
sensors of 90° ±85°



MACHINE PROFILE CORE S LP

Space Requirements (L x W x H)	2255 x 1500 x 2100 mm
Machine weight	1500 kg
Acceleration	> 3000 mm/s ²
Measurement system resolution	0,1 µm

MACHINE PROFILE CORE S E

Space Requirements (L x W x H)	1660 x 1300 x 1820 mm
Machine weight	775 kg
Acceleration	> 3000 mm/s ²
Measurement system resolution	0,1 µm

WENZEL CORE M

OPTICAL MEASUREMENT AT PRODUCTION CYCLE SPEED

The CORE M High Speed Optical Scanning System is a device that was developed to meet the increasing demand for 100 % inspections. It works quickly and efficiently directly in production. Designed to increase the speed of the production process, the CORE M offers a highly flexible 3D optical inspection solution for

large components and demanding measurement requirements in global manufacturing. The CORE is based on a proven mechanical structure, developed and manufactured in WENZEL's renowned production facility in Germany. This forms the cornerstone for its accuracy, reliability and quality.

FIELDS OF APPLICATION

The CORE M is the optimal solution for the measurement of turbine blades, shafts, various vehicle parts and much more. The optical high-speed measuring system is used in a wide variety of industries, such as tool and mold making, prototype construction, the automotive industry, reverse engineering and aviation.



Vane blade segment

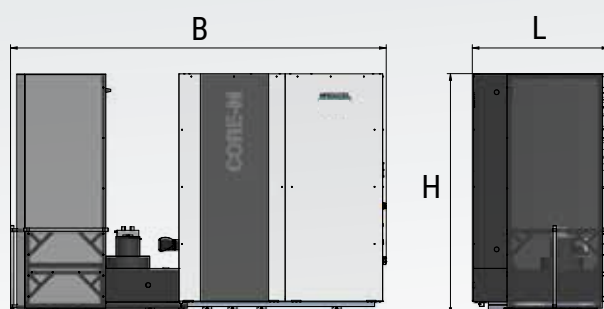


Turbine blade



Common Rail





MACHINE PROFILE

Space Requirements (L x B x H)	1140 x 3970 x 2530 mm
Machine weight	6300 kg
Acceleration	10.000 mm/s²
Measurement system resolution	0,1 µm

FEATURES

■ Dynamic and effective

Acceleration up to 10,000 mm/s | Travel speed of 800 mm/s | Minimization of machine movement | Repositioning during measurement

■ Compact design

Small footprint with large measuring volume | Working range accessible from 3 sides | Integration of controller and PC in the device | Protective hood for unfavorable lighting conditions | No compressed air required

■ Unique sensors

Simple measurement of critical areas | Direct measurement of polished and highly reflective surfaces | Large working distance and measuring range

■ State-of-the-art technology

Can be automated | Robotic integration capability | Temperature stable in a range from 18°C - 30°C | Dirt resistant due to protected guides | Earthquake proof up to 6.5 on the Richter scale | Use of precision scales | 6-axis measuring system | Angle acceptance of the sensors of 90° ±85°

WM | HS, WM | DS & WM | RS-C

FOR CORE SERIES

The WM | HS and WM | DS have been specially developed for the CORE product range. The WM | DS is based on a double-eye principle which enables the precise measurement of particularly small radii. The WM | HS is a hybrid sensor, which fulfills your measuring task at top speed by the combination of optical and tactile at a CORE with a 5-axis scanning. Both sensors are de-

signed for use in the production environment. The latest addition is the optical sensor WM | RS-C, which allows the CORE to optically measure roughness parameters and evaluate them with the corresponding software. All sensors of CORE are designed in such a way that they can also be used in the shop floor area.



WM | RS-C



WM | DS



WM | HS

AUTOMATION SYSTEMS

FOR MEASURING SYSTEMS FROM WENZEL

WENZEL offers various solutions to combine production and measurement technology on the shop floor. No matter for which machine type, for which kind of integration whether Atline or Inline WENZEL has a solution for almost every requirement. Thus it is possible to integrate the measuring technology in form of a coordinate measuring machine into the production and to measure geometrically the manufactured parts faster. Due to this in-/atline measuring, deviations can be quickly detected and corrected. This results in a lower waste rate and there-

fore lowers costs for your company. Whether you decide for a classical coordinate measuring machine, a CORE or a computer tomograph, at WENZEL you will find the suitable product and the suitable solution for your specific measuring task including the appropriate automation for your production. Be ready for the next step and take it together with WENZEL.

WENZEL - Automation ready

Z&K CHAMELEON MONO

The integrated, fully automatic loading system can be equipped with up to 126 workpieces, e.g. electrodes, and thus guarantees a higher utilization of your machine and lower personnel costs, e.g. due to unmanned shifts.

High economic efficiency in a very small space. The ideal introduction to the automation of your stand-alone machine.



EASY ROBOTICS PROFEEDER

The ProFeeder in combination with a Universal Robot represents a compact, modular automation cell that in most cases does not require any additional safety technology. The ProFeeder can be quickly adapted and converted to various tasks and machines and can be expanded in several steps from support for small series to the set-up for monitoring series production on your Stand-alone machine.



WM | MMA

7 AXIS MEASURING ARMS





WM | MMA SERIES

MOBILE MEASUREMENT IN THE PRODUCTION ENVIRONMENT

Mobile measuring arms from WENZEL are characterized by great flexibility, enabling use in both production and quality assurance processes. By combining a portable 7-axis measuring arm with a high-resolution line scanner, which captures every detail contact-free, the measuring arms represent a useful complement to your established classical coordinate measuring systems. The use of the latest materials makes the measuring arm a lightweight unit that delivers highly accurate

and reproducible measurement results in mobile applications. The measuring arm can be used directly on the component - both with optical and tactile sensors - without any warm-up time and without sticking markers to the component. The measurement results obtained can then be transmitted via a WiFi interface for further use. The capacity and low consumption of the integrated battery ensure reliable operation of the measuring arm over a long period of time.

MEASURING ARM

- Freedom of movement due to 7 axes with axis limit detection
- Automatic button recognition
- WiFi
- Battery operation
- Temperature compensated
- Stable resting position
- Internal weight compensation with damping element

MEASURING ARM PROFILES

The measuring arm is available in different accuracy classes (Standard & Premium) as well as in different versions - suitable for individual measuring requirements and tasks.

Type	Arm length	EUNI	Tactile (at the scanner)	
			PSIZE	PFORM
WM MMA 2.0	2,0 m	0,037 mm	0,012 mm	0,020 mm
WM MMA 2.5	2,5 m	0,041 mm	0,015 mm	0,024 mm
WM MMA 2.5 P	2,5 m	0,033 mm	0,012 mm	0,022 mm
WM MMA 3.0	3,0 m	0,069 mm	0,020 mm	0,035 mm
WM MMA 3.0 P	3,0 m	0,057 mm	0,017 mm	0,030 mm
WM MMA 3.5	3,5 m	0,079 mm	0,024 mm	0,041 mm
WM MMA 3.5 P	3,5 m	0,067 mm	0,021 mm	0,037 mm
WM MMA 4.0	4,0 m	0,094 mm	0,029 mm	0,048 mm
WM MMA 4.0 P	4,0 m	0,084 mm	0,026 mm	0,042 mm
WM MMA 4.5	4,5 m	0,114 mm	0,045 mm	0,060 mm
WM MMA 4.5 P	4,5 m	0,105 mm	0,040 mm	0,051 mm



FEATURES

■ High flexibility

7 axes for freedom of movement | Can be used with tactile and optical sensors | Axis limit detection

■ Mobile use

Suitable for industrial use | Portable light weight | Integrated battery & WiFi

■ High process efficiency

No marker sticking | No warm-up time | Automatic button recognition

■ Accurate and reproducible measurement results

Temperature compensation | Stable rest position | Internal weight compensation with damping element

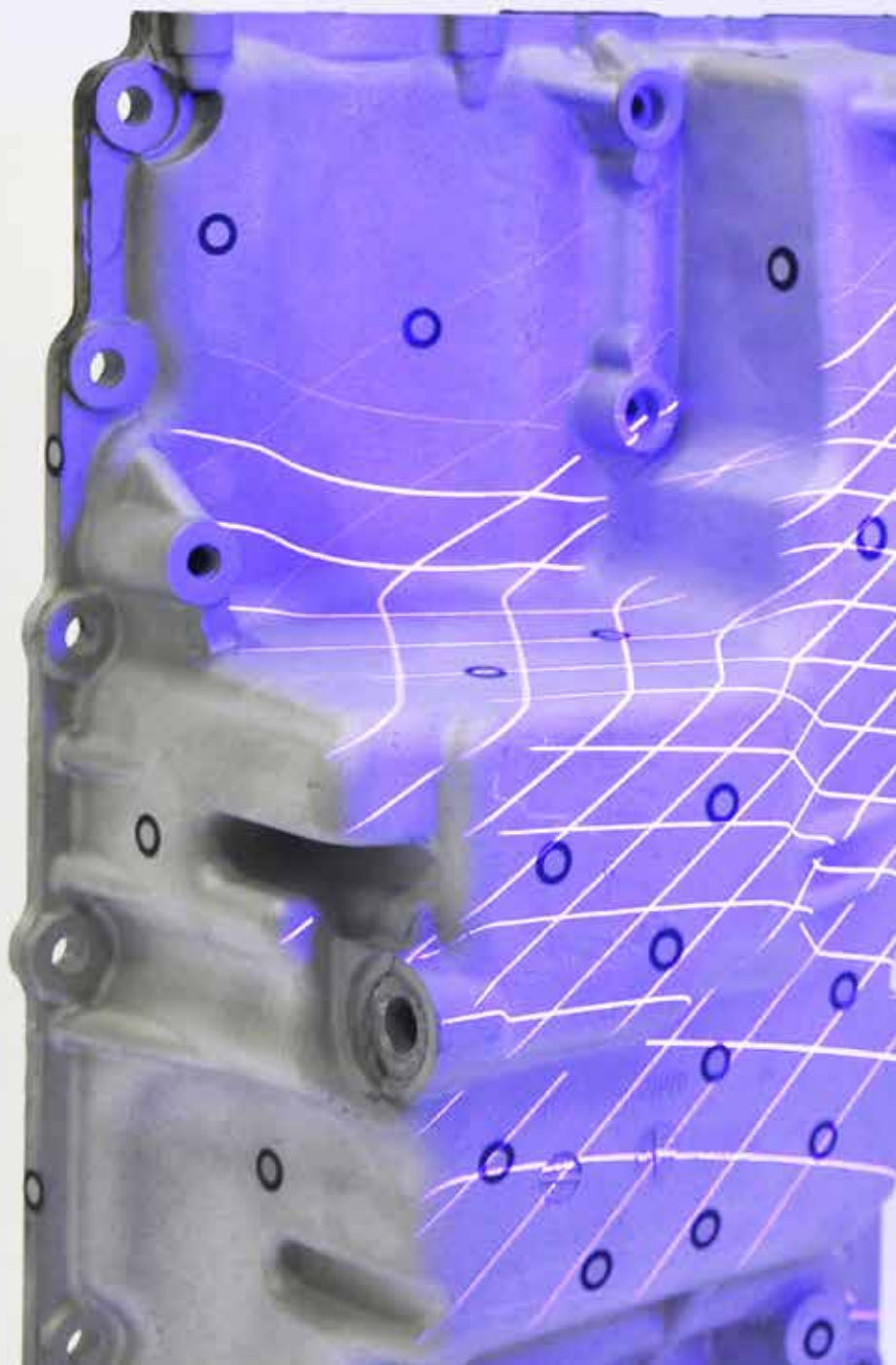
■ Data evaluation and security

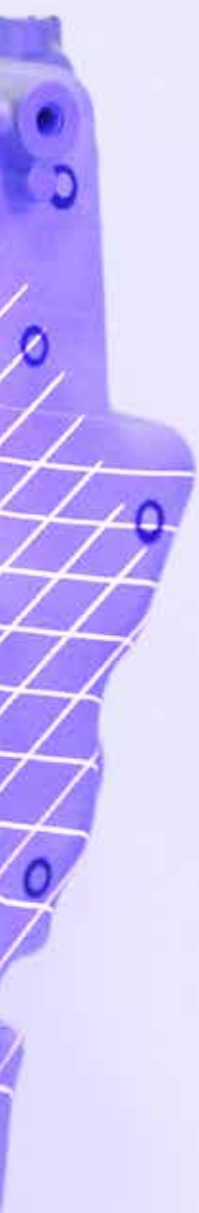
Integrated WiFi interface | Evaluation with QM | Quartis Mobile

LDIA	SPAT	Optical		
		WM MLS 100P LDIA scanning	WM MLS 200 LDIA scanning	WM MLS 100 LDIA scanning
0,044 mm	0,022 mm	0,043 mm	0,047 mm	0,049 mm
0,055 mm	0,027 mm	0,049 mm	0,053 mm	0,055 mm
0,047 mm	0,025 mm	0,045 mm	0,049 mm	0,052 mm
0,081 mm	0,042 mm	0,064 mm	0,066 mm	0,068 mm
0,074 mm	0,039 mm	0,055 mm	0,059 mm	0,062 mm
0,095 mm	0,054 mm	0,079 mm	0,082 mm	0,084 mm
0,089 mm	0,045 mm	0,069 mm	0,074 mm	0,076 mm
0,115 mm	0,066 mm	0,091 mm	0,102 mm	0,105 mm
0,105 mm	0,054 mm	0,080 mm	0,084 mm	0,087 mm
0,125 mm	0,078 mm	0,120 mm	0,130 mm	0,132 mm
0,114 mm	0,067 mm	0,095 mm	0,104 mm	0,110 mm

WENZEL mScan

HANDHELD SCANNER





WENZEL mScan

EASE OF USE

The mobile handheld 3D scanner WENZEL mScan enables fast and reliable measurements with easy operation. The System is characterised by sophisticated technology, high flexibility, precision, speed and reliability. The ergonomic design enables comfortable operation for the user. The scanner can easily be

used in complex environments and is the ideal tool for reverse engineering and diverse industrial, medical application areas. The WENZEL mScan can be combined with a wide range of software products and impresses with its technical parameters as well as an extensive range of practical accessories.

FIELDS OF APPLICATION

Industrial Applications

Product development, reverse design and quality inspection, NDT testing Engineering services, automotive, aerospace, rail transportation and other mechanical manufacturers industries.

Non-Industrial Applications

Education, scientific research, innovative digital medical, digital arts and cultural creation, cultural relic restoration and virtual museum, 3D sculpture, 3D creation, 3D display VR / AR, virtual exhibition hall, product development differentiated design, 3D design and 3D printing

Extended Application

Combining the INNO-LOCATOR-portable 3D photogrammetry system to achieve high precision positioning and measurement of large parts Automated online 3D scanning and inspection system. Coordinate alignment automatically, scanning and measurement fully automatically.



Single line scanning mode for deep holes



High precision scanning mode

High speed scanning through cross blue laser lines

The resolution ratio is up to 0.100 mm presenting complex details and outputting high quality results



Single line scanning to deal with deep holes and concave surface perfectly and capture every detail

Large reference distance, point spacing up to 15 cm, with less sticking points and preparation

Based on advanced algorithms, can easily scan the highlighting and black surface

High quality standard core components, ensuring the overall stability and reliability of the equipment

Equipment: Carry case, calibration board, USB cable, power supply and 2,000 positioning targets



FEATURES

- **Portability:** flexible and convenient
- **Accuracy:** high-resolution industrial CCD, high precision metrology and measurement, accuracy is up to 0.025 mm, to ensure clear details
- **High Speed:** the measurement rate is up to 1,300,000 measurements per second with 22 cross blue laser lines
- **Ease of Use:** plug and play, real-time display, user-friendly

ADVANTAGES

- **Maintenance friendly**
Optimum accessibility | Cost-effective software and hardware upgrade program
- **User friendly**
Ergonomics interface | Easy to use | Plug and play, regardless of the using experience
- **Diverse fields of application**
Product analysis | Custom measurement | Concept design | Reverse engineering | Profile analysis

TECHNICAL PARAMETERS

Technical Parameters	mScan III
Laser Type	34 + 1 Blue Laser Crossed Lines Class II Eyes Safety
Measurement Rate	2,000,000 measurements/s
Point Resolution	0.020 mm
Surface Resolution	0.100 mm
Accuracy*	0.035 mm
Scan Range	450 mm x 565 mm
Volumetric Accuracy (mScan)* Volumetric Accuracy (with m-LOCATOR)*	0.020 mm + 0.040 mm/m 0.020 mm + 0.015 mm/m
Stand Off Distance	425 mm
Depth of Field	350 mm
Part Size	0.05–4 m
Software	mScan
Output Format	.igs, .asc, .txt, .ply, .stl
Compatible Software	WM PointMaster, WM Quartis, Dassault (CATIA V5 and SOLIDWORKS), 3D Systems (Geomagic® Solutions), InnovMetric Software (PolyWorks), PTC (Creo), Siemens (NX and Solid Edge), Autodesk (Inventor, Alias, 3ds Max, Maya, Softimage)
Transmission Interface	USB 3.0
Operating Temperature Range	0–40°C
Operating Humidity (Non-Condensing)	10–90%
Certification	Complies with EC standards (Electromagnetic Compatibility Directive, Low Voltage Directive), can be used with rechargeable batteries (if applicable), IP50 WEEE

Standard:

VDI/VDE 2634 Part 3 *

Subject to changes in design and scope of delivery as well as further technical development.

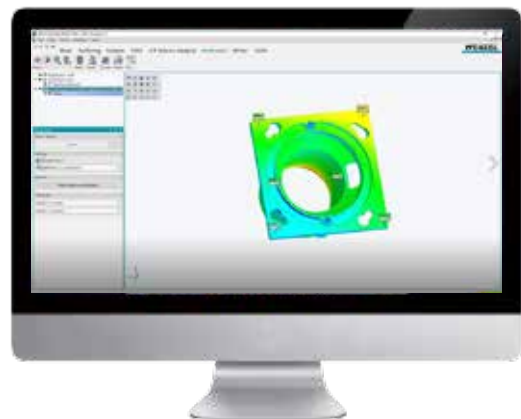
Software for the WENZEL mScan

WM | PointMaster

Point Clouds Processing and Reverse Engineering

The all-rounder for scan data processing, supporting users in the further processing of point clouds and polymer meshes right up to the reverse engineering process quality control.

Fully automatic calculation of error-compensated new tool geometry taking into account a nominal geometry, the shrinkage factor of materials as well as the original tool geometry.

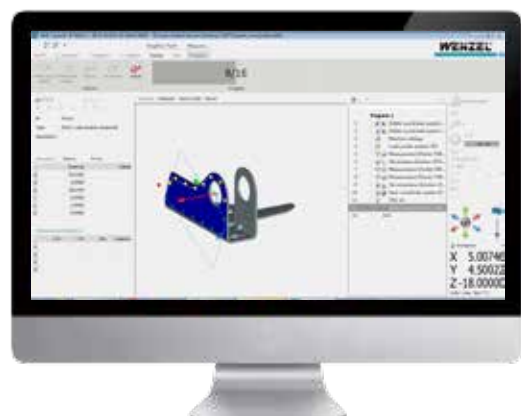


WM|QUARTIS

Virtual Measurement

Automatic creation of measuring programs, significantly simplifies the application of the powerful functions. You can obtain correct measurement results, impressive test reports and meaningful statistics more quickly and easily. Support of offline programming and virtual measurement.

The optimized screen layout and the dynamic, result-oriented ribbons significantly speed up workflows. The easy-to-use, task-oriented and individually configurable graphical user interface is suitable for every measuring task.



WM | Software

SMART



Concept

One Stop Software
for all of your
measuring tasks





ACCESSORIES & OPTIONS

FOR SHOP FLOOR MACHINES

WENZEL EVALUATION STATION

- Compact workstation with integrated media supply
- Mounting the WENZEL CNC-Controller
- Housing of the evaluation PC system in desk form (120 cm x 90 cm) 19" technology

WENZEL evaluation system CNC

- Optimized machine performance
- Optimized for WENZEL & Renishaw sensors
- Scanning button possible via option cards

Interfaces WPC2040

- Ethernet
- RS232
- Readerhead input (5V TTL)
- Push-button input (5V TTL)
- Motor connections



CONTROL PANEL HT400RC

- Wireless control panel HT400RC incl. receiver
- 1 charging cable each 0.5 and 6.0 m
- Charging station and spare battery
- Power supply

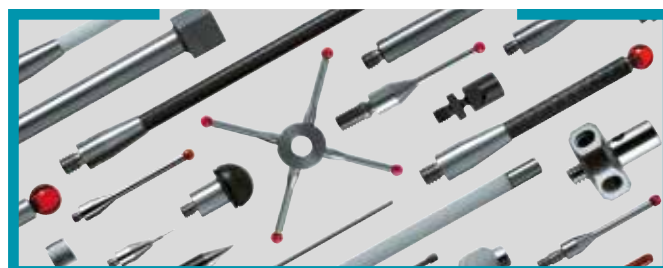


STYLI

Comprehensive range of styli for every application

The accessories shown here are only a small selection from our extensive product range.

For further information please contact your local WENZEL representative.



TECHNOLOGY AND SUPPORT

WENZEL SHOPFLOOR SOLUTIONS IN DETAIL



Service and application support - We are there for you

Professional user training

Training can be offered as individual training, group training and seminars. The Training can be performed at your facility or at your WENZEL technical center.

Qualified service team

Our service team is there to assist you: For repairs, maintenance, retrofitting and telephone support or with WENZEL Online Service (WOS) - the Internet-based remote diagnostics and remote maintenance service.



Reliable results on the shop floor

Active damping

The SF Series can optionally be equipped with a pneumatic active damping system, which protects the CMM from external vibrations and kinematic influences.

Thermal compensation

The SF Series can be equipped with automatic temperature compensation. Thus, the measuring device and work piece are protected against the thermal influences of the environment.



High resolution scales

Accurate positioning thanks to the optimal position measuring system technology

The SF CMMs are equipped with an incremental measuring system, which has very fine scale pitch, and excellent dirt immunity.



Robust and efficient

The measuring systems from WENZEL for the shop floor area are not only robust and insensitive, but are also characterised by high dynamics and productivity as well as low space requirements and good accessibility, making them ideally suited for the rough, often cramped conditions in the workshop, series monitoring or automation.

Thus, the best position resolution and stability at high speed in all linear axes is possible. The highly precise and robust scale tapes compensate inherent hysteresis.

INNOVATION MEETS TRADITION

The WENZEL Group is one of the leading suppliers in the field of industrial metrology and styling solutions. WENZEL's product portfolio includes coordinate and gear measuring machines with tactile and optical sensors, multi-sensor systems, optical high speed scanning and 3D X-ray measuring technology based on computer tomography. In addition to these systems WENZEL also offers comprehensive metrology software, which is used by many thousands of users for the measurement and analysis of parts. WENZEL's measuring solutions

are used in various industries, including the automotive sector, aerospace, power generation and medical devices. Our solutions also support reverse engineering, inspection, and analysis for a variety of fields including power generation, vehicle electrification, and additive manufacturing. Over the years WENZEL has installed more than 12,000 machines worldwide. Subsidiaries and agencies in more than 50 countries support the sales and ensure the after sales service for our customers. The WENZEL Group employs more than 500 people worldwide.



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