WENZEL
COORDINATE MEASURING MACHINES

TOP CLASS CMMs

PRODUCT RANGE

COORDINATE MEASUREMENT METROLOGY

WENZEL – **INNOVATION MEETS TRADITION**

PRODUCT RANGE CMM

DR. HEIKE WENZEL AND PROF. DR. HEIKO WENZEL-SCHINZER

MANAGEMENT OF THE WENZEL GROUP

With our product range we are able to support all your measuring needs. As a family business, we strive to achieve long-term partnerships with our customers and for this we invest in the outstanding quality of our machines and offer you excellent service.

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 today primarily for 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. WENZEL have brought numerous innovative solutions into 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.

About WENZEL

Founded in 1968, WENZEL is today the largest family-run measurement technology manufacturer.

More than 10,000 machines installed worldwide

WENZEL Worldwide

More than 600 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

The success of our CMM series is based above all on a coherent overall concept and unconditional perfection in detail. The principle behind the success of this series is mechanical accuracy and top mechanical engineering. The machines of the XO series are the ideal entry-level models for coordinate measuring technology. They combine speed, straightforward operation and an excellent price-performance ratio. The bridge machines of the LH series have air bearing guide elements in all axes which ensure wear-free and smooth operation. The roller-bearing horizontal arm measuring machines of the R series offer a large measuring volume and perfect accessibility from all sides. Both types of design ensure a maximum of flexibility and dynamics.
High precision and user-friendly operation, all rounded off by an intelligent service package - WENZEL thinks ahead. The machines can be equipped with a variety of swivel head and stylus combinations, from rigid heads to motorized rotary heads, from simple probes to high-precision measuring probe systems. The optimal solution for every measuring task!

TYPICAL BUSINESS AREAS

Quality assurance
Product development
Surface testing
Prototype creation
First article inspection
Fabrication
...and many more

TYPICAL APPLICATION AREAS

Mechanical engineering
Automobile manufacturers and suppliers
Aerospace
Foundry technology
Metal and plastics processing industry
Medical technology
Mold and tool making
Electrical engineering/ electronics
Inspection services
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.

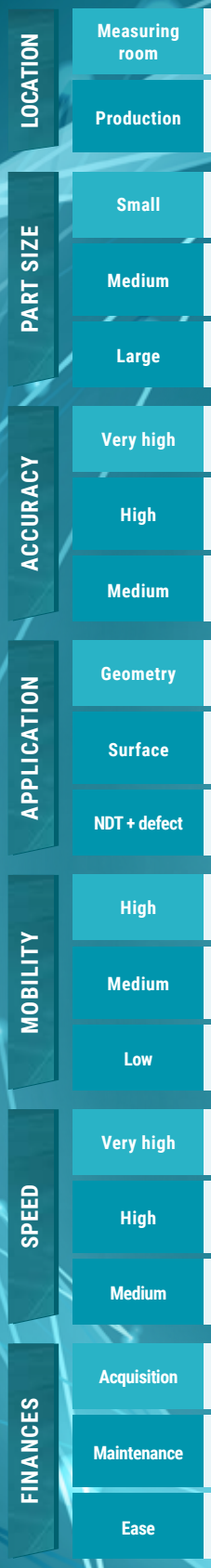
3. Accuracy: Here we differentiate roughly between very accurate, accurate or less accurate.

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.



*depending on the material of the component

PRODUCT RANGE CMM

WENZEL®

TACTILE	OPTICAL	TACTILE	OPTICAL	TACTILE	OPTICAL	TACTILE	OPTICAL	TACTILE	OPTICAL	TACTILE	OPTICAL	TACTILE	OPTICAL
●	●	●	●	●	●	●	●	●	●	●	●	●	●
												●	●
●	●	●	●										
				●	●	●	●	●	●				
								●	●	●	●	●	●
●		●		●		●							
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	●		●		●		●		●		●		●
●	●	●	●	●	●	●	●	●	●	●	●	●	●
●	●	●	●	●	●	●	●	●	●	●	●		●
●	●	●	●	●	●	●	●	●	●				
										●	●	●	●
	●		●		●		●		●		●		●
						REVO ●		REVO ●		REVO ●			
●		●		●		●		●		●		●	
+++	++	+++	++	+++	++	+++	++	++	+	+	+	+	+
+++	+++	+++	+++	+++	+++	+++	+++	++	++	+	+	+	+
+++	++	+++	++	+++	++	+++	++	+++	++	+++	+++	+++	+++
XO 5-5/8-7		LH 6-5/8-7		XO 10-7/12-10		LH 10-8/12-10		LH 15-12/20-15		LHF		R-Series	

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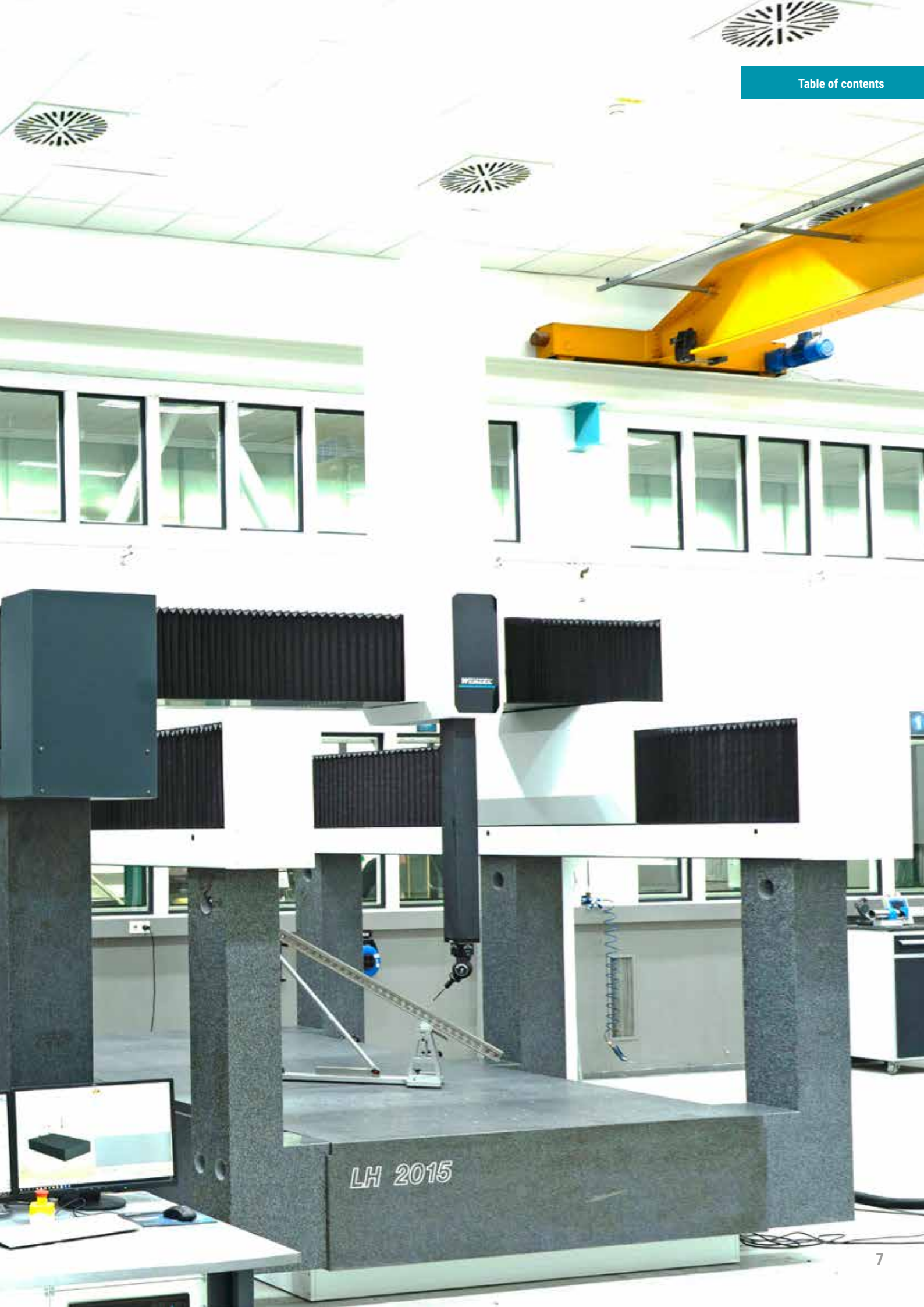
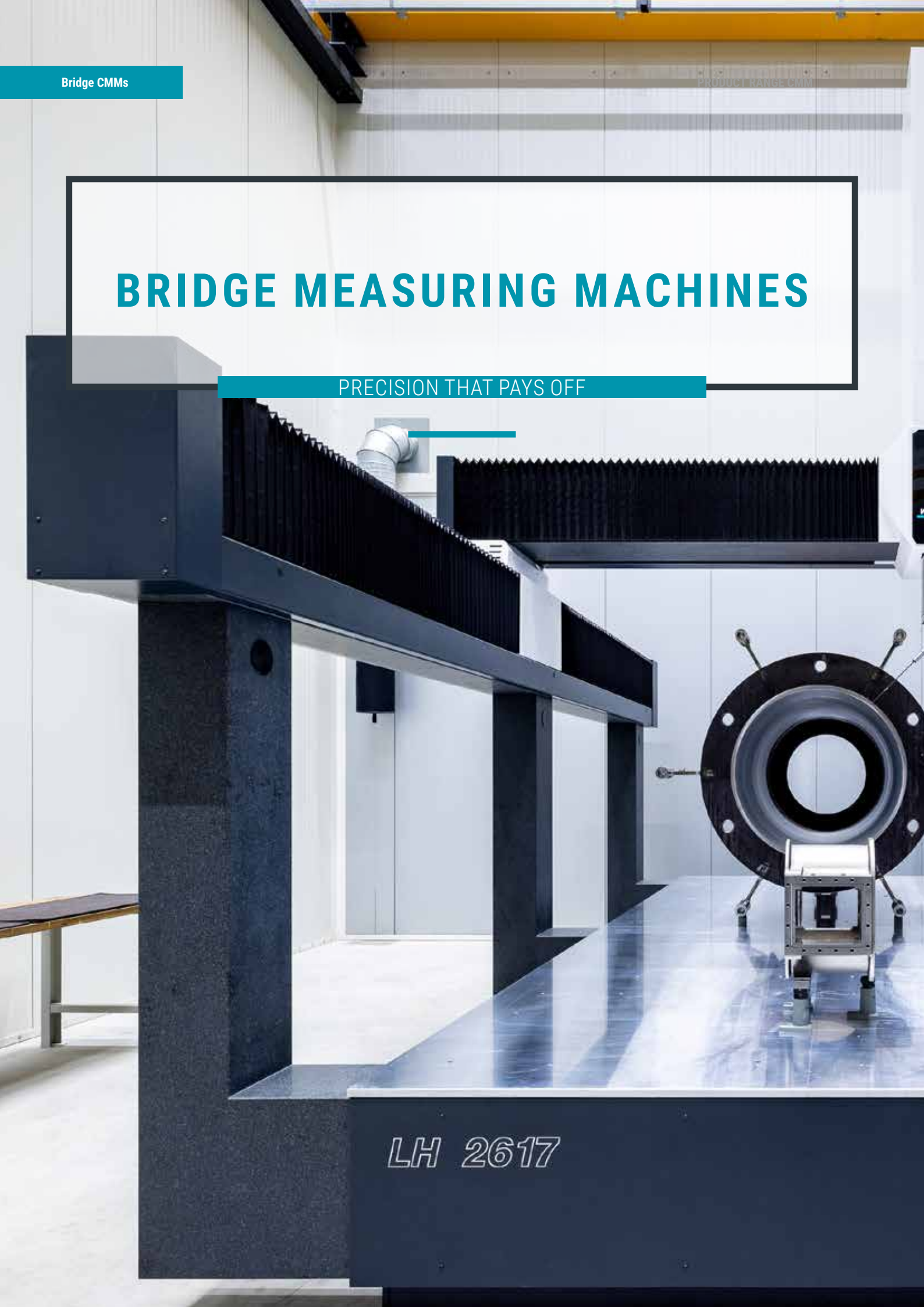

LH 2015

BRIDGE MEASURING MACHINES

PRECISION THAT PAYS OFF



WENZEL BRIDGE CMMS

RANGE OF SERVICES AND FIELDS OF APPLICATION

With the help of coordinate measuring technology, dimensional measured variables of standard geometric elements or free-form surfaces of individual parts, moulds, models and tools can be recorded. The elements are picked up at the workpieces and their measuring points are then processed further on computer. The development of coordinate measuring machines has made it possible to perform measuring tasks faster and with very high accuracy. Coordinate measuring technology is therefore indispensable in today's industrial production process.

Measurement technology has been WENZEL's profession since 1968 and in 1980 the first coordinate measuring machine developed by WENZEL was introduced. Since then, WENZEL has been one of the world's leading suppliers of coordinate measuring machines and the largest family-run company in the industry. Today, the name WENZEL is synonymous with highest precision and innovation in the fields of coordinate measuring technology, computer tomography and high-speed scanning.

With coordinate measuring machines from WENZEL almost all measuring tasks can be mastered. The success of WENZEL's customers depends on the performance of its products and services. Their demands for quality and precision are constantly increasing. WENZEL takes up this challenge every day with the aim to convert the needs of the different industries into efficient products.

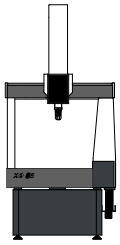
The offer extends far beyond the machine configuration: For special requirements WENZEL has tailor-made solutions ready: From conception and planning to the turnkey handover. In addition to the production and installation of the measuring instruments, this includes, for example, the necessary static calculations as well as the complete installation of the measuring room, including the control and safety technology. Starting with the floor construction up to the software configuration - WENZEL makes almost everything possible.

COORDINATE MEASURING METROLOGY

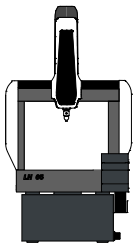
„MADE BY WENZEL“

WENZEL offers well-engineered coordinate measuring machines (CMMs), which have proven themselves many times in the market. In this brochure we first present the XO and LH series of CMMs. The LH series bridge CMMs have air bearing guide elements in all axes which ensure wear-free and smooth operation. The LH base plates as well as traverses and quills are made of granite. Granite's physical properties make it the perfect material for measuring instruments. The LH series distinguishes itself by its high accuracy and high measuring speeds.

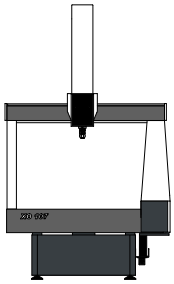
OUR SIZES



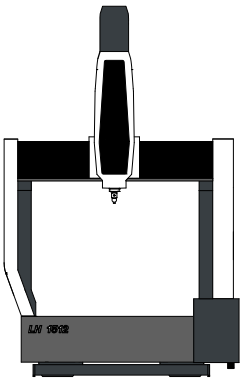
XO 55...



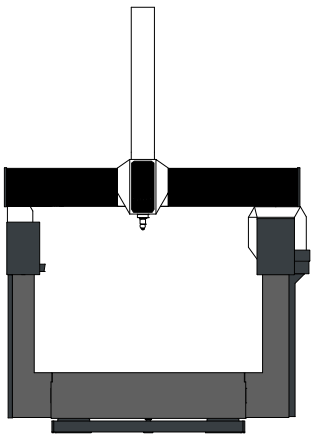
LH 65...



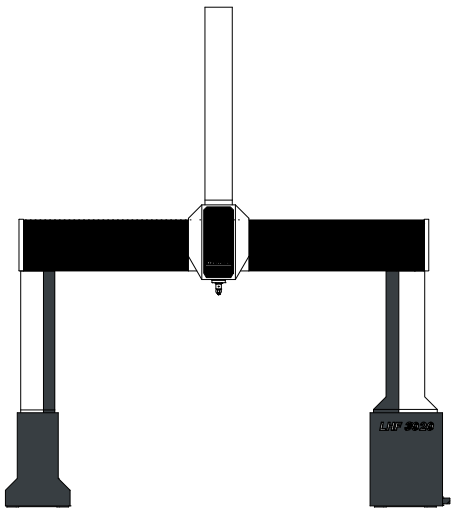
XO 107...



LH 2015P...



LH 2617...



LH 3020...

ACCURACY | GENAUIGKEIT [µm]

<1

1

2

3

	XO 55	LH 65	XO 87	LH 87
<1		PS 0,8 + L/ 450		PS 0,8 + L/ 450
1	P 1,5 + L/ 350	P 1,0 + L/ 400 S 1,2 + L/ 350	P 1,6 + L/ 350	P 1,0 + L/ 400 S 1,2 + L/ 350
2	S 2,0 + L/ 300		S 2,2 + L/ 300	
3				

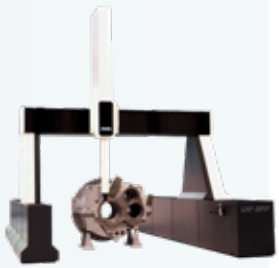
MEASURING VOLUM

XO 107	LH 108	LH 1210	LH 1512	LH 2015
P 1,8 + L/ 350	PS 1,0 + L/ 450 P 1,2 + L/ 400 S 1,4 + L/ 350	PS 1,6 + L/ 450 P 1,8 + L/ 400 S 2,0 + L/ 350	PS 1,9 + L/ 450 P 2,1 + L/ 400 S 2,3 + L/ 350	PS 2,9 + L/ 450 P 3,2 + L/ 400 S 3,5 + L/ 350
S 2,6 + L/ 300				
				

E | MESSVOLUMEN

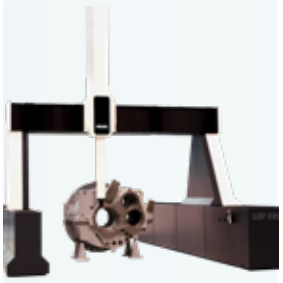
ACCURACY | GENAUIGKEIT [µm]

	LH 2015 G	LH 2317	LH 2617	LHF 2517
2	PS: 2,6 + L/ 450 P: 2,8 + L/ 350			
4-3	S: 3,1 + L/ 300	PS: 3,3 + L/ 450 P: 3,5 + L/ 350 S: 3,8 + L/ 300	PS: 3,6 + L/ 450	PS: 3,5 + L/ 450 P: 4,1 + L/ 350 S: 4,7 + L/ 300
6-5				
8-7				



MEASURING VOLUM

LHF 3020	LHF 3025	LHF 4025	LHF 4027	LHF 5025
PS 4,6 + L/ 450	PS 5,6 + L/ 450	PS 6,6 + L/ 450	PS 7,1 + L/ 450	PS 7,6 + L/ 450
P 5,2 + L/ 400	P 6,1 + L/ 400	P 7,1 + L/ 400	PS 7,8 + L/ 450	PS 8,1 + L/ 450
S 5,8 + L/ 300	S 6,7 + L/ 300	S 7,7 + L/ 300	S 8,3 + L/ 300	S 8,6 + L/ 300


E | MESSVOLUMEN

BRIDGE MEASURING MACHINES

PRECISION THAT PAYS OFF

WENZEL LH coordinate measuring machines are available for different accuracy requirements in three accuracy classes:

Standard | Premium | Premium Select

The already high-precision standard version coordinate measuring machines are surpassed by the Premium and Premium Select models due to even more precisely machined mechanical components, selected materials, optimized acceptance procedures and additional options.

WENZEL ACCURACY CLASSES

AT A GLANCE

- **Perfect interaction** of the machine components
- **Identical thermal behavior** of the granite in all axes
- **Manual** temperature compensation
- **High-resolution** scales
- **State-of-the-art Sensors** (tactile, scanning, optical)
- **Innovative** drive, bearing and guidance technologies
- **Modular design** for retrofitting

- **Online** temperature compensation
- More elaborate **premium acceptance procedure** with tighter tolerances for better CAA Compensation **(Computer Aided Accuracy)**

- Use of the **highest quality granite** for the base plate, cross-beam and sleeve
- **WENZEL-specific** air bearing technology
- Grinding and lapping processing up to the **mechanically feasible limit**
- **Higher resolution** length measuring systems
- Premium Select Acceptance Procedure for **optimal CAA Compensation** (Computer Aided Accuracy)
- Inherent mechanical **accuracy**

WENZEL XORBIT SERIES

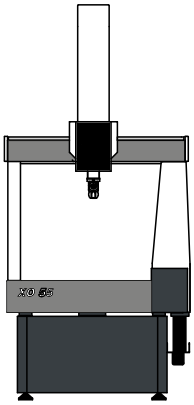
YOUR ENTRY INTO COORDINATE METROLOGY

The WENZEL XOrbit is the ideal coordinate measuring machine for when the essential elements of measurement are important and when speed and ease of operation are required. The XOrbit coordinate measuring machine offers an excellent price-performance ratio and can be equipped with multiple changeable measuring sensors. Its flexibility and suitability for a wide range of applications make the XOrbit an effective all-rounder.

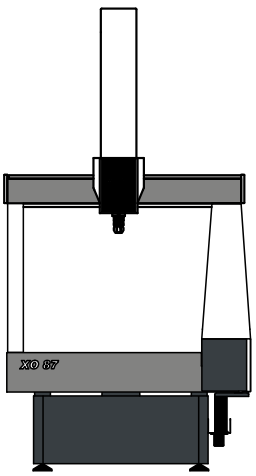
The consistent approach and intelligent machine concept makes it an economical entry into coordinate measuring technology. Simple measurement - simply good. CMMs of the XOrbit series are available in the accuracy classes Standard and Premium.

FIELDS OF APPLICATION

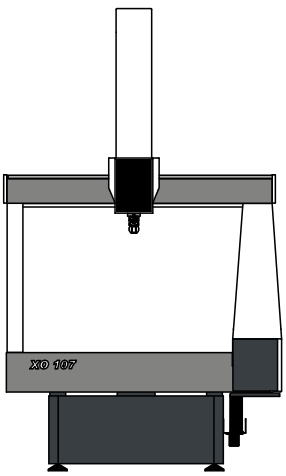
The XOrbit is the all-rounder for every field of application when it comes to measuring standard geometries and free-form surfaces. The XOrbit fulfills all important roles from use in incoming goods through to final inspection. For single or serial parts - the XOrbit is universally applicable.



XO 55



XO 87



XO 107

FEATURES

- **Cost-effective introduction to coordinate measuring technology**
  Excellent price-performance ratio | WENZEL High quality
- **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
- **High flexibility**
  Bellows covers for protection against contamination | Data compatibility with other WENZEL systems | Automation solutions
- **Versatile sensor options**
  Changeable sensor systems | 3-axis scanning | Optical sensors

MEASURING ACCURACY

Type	Measuring ranges X x Y x Z (mm)	Volumetric length measuring uncertainty $E_{L, MPE}$ (µm) Premium
XO 55	500 x 500/700/1000 x 500	1,5 + L / 350
XO 87	800 x 1000/1500 x 700	1,6 + L / 350
XO 107	1000 x 1500/2000 x 700	1,8 + L / 350

Value $E_{L, MPE}$ is only valid with the respective touch probe. Further information can be found in the technical data sheets.
Other Y-lengths on request. Subject to changes in design and scope of delivery as well as further technical development.

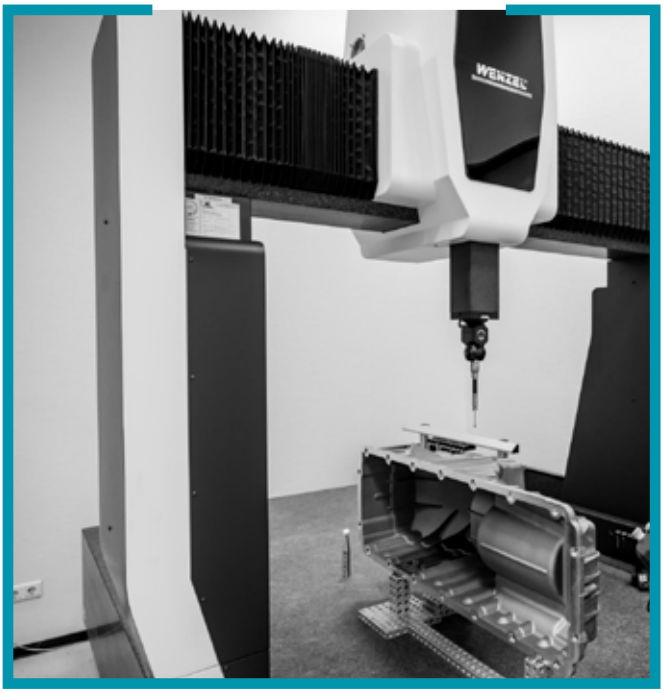
WENZEL LH SERIES

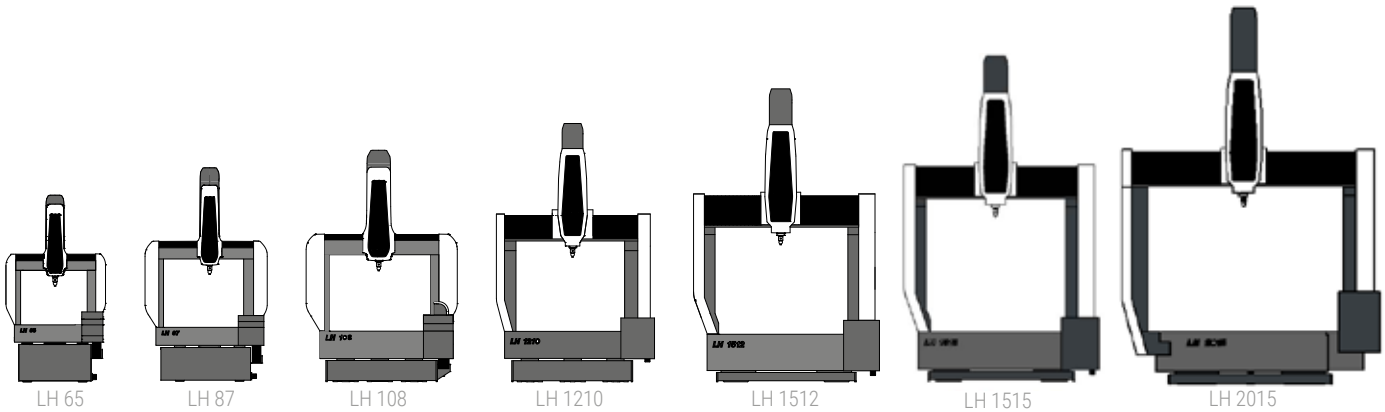
THE FAST AND EASY WAY TO EXACT MEASUREMENT RESULTS

With the LH you benefit from an extremely functional, effective and flexible measuring machine that is reliable and easy to operate.The success of our coordinate measuring machines is based on a proven holistic concept consisting of first-class mechanical engineering, intelligent software and accessory options and a comprehensive service package. Stable, reliable and fully dynamic, the LH is a universal and flexible measuring instrument for a wide range of applications. With the current generation of air-bearing bridge machines, WENZEL continues the progress in precision, efficiency and longevity. With its proven design, the LH impresses with high mechanical accuracy, perfect ergonomics and increased dynamics. CMMs of the LH series are available in the accuracy classes Standard, Premium and Premium-Select.

FIELDS OF APPLICATION

The LH is ideal for all applications requiring high accuracy and high throughput. The LH series is used in almost all areas of industry and measures components in detail from watch manufacture through to the production of large engines. The Y-axis can be customized in length for special sizes.





LH 65 LH 87 LH 108 LH 1210 LH 1512 LH 1515 LH 2015

FEATURES

- **Highest mechanical precision**
  Granite in all axes | Handcrafted | Unique mechanical precision
- **Versatile sensor options**
  Changeable sensor options | 3- or 5-axis scanning | Optical sensors
- **Low operating costs**
  Low air consumption | Fast availability of reliable spare parts
- **Ergonomic design**
  Easy to operate | Ease of maintenance | Aesthetic design
- **High flexibility**
  Customer-specific measuring volume | Data compatibility | Suitable for automation

MEASURING ACCURACY

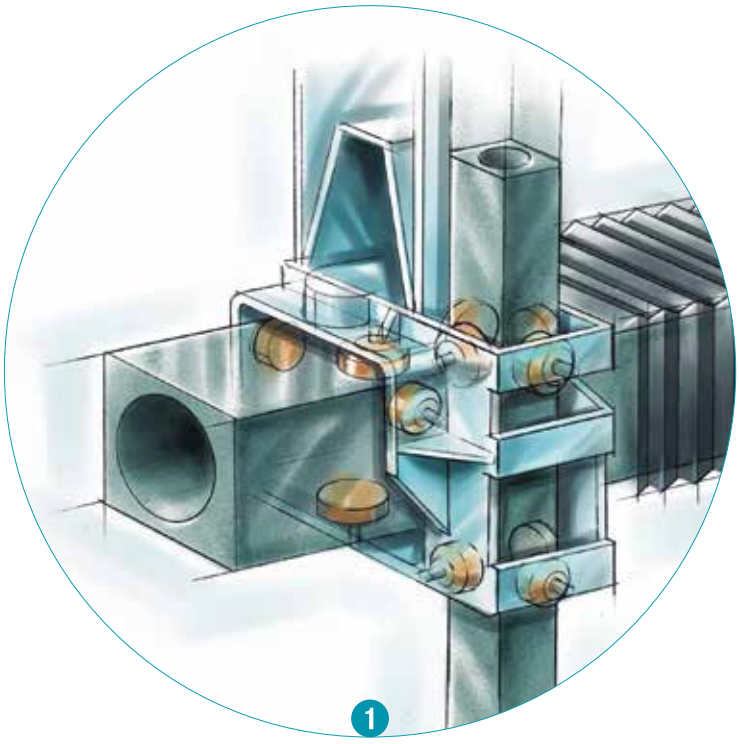
Type	Measuring ranges X x Y x Z (mm)	Volumetric length measuring uncertainty $E_{L,\ MPE}$ (µm) Premium Select
LH 65	650 x 750/1200 x 500	0,8 + L / 450
LH 87	800 x 1000/1500/2000 x 700	0,8 + L / 450
LH 108	1000 x 1200/1600/2000/3000 x 800	1,0 + L / 450
LH 1210	1200 x 1600/2000/2500/3000 x 1000	1,6 + L / 450
LH 1512	1500 x 2000/2500/3000 x 1200	1,9 + L / 450
LH 1515*	1500 x 2000/3000/4000 x 1500	2,3 + L / 450
LH 2015*	2000 x 3000/4000/5000 x 1500	2,9 + L / 450

Value $E_{L,\ MPE}$ is only valid with the respective touch probe. Further information can be found in the technical data sheets.
Other Y-lengths on request. Subject to changes in design and scope of delivery as well as further technical development.
* Estimated value | Machine currently under redesign

THE LH-FEATURES

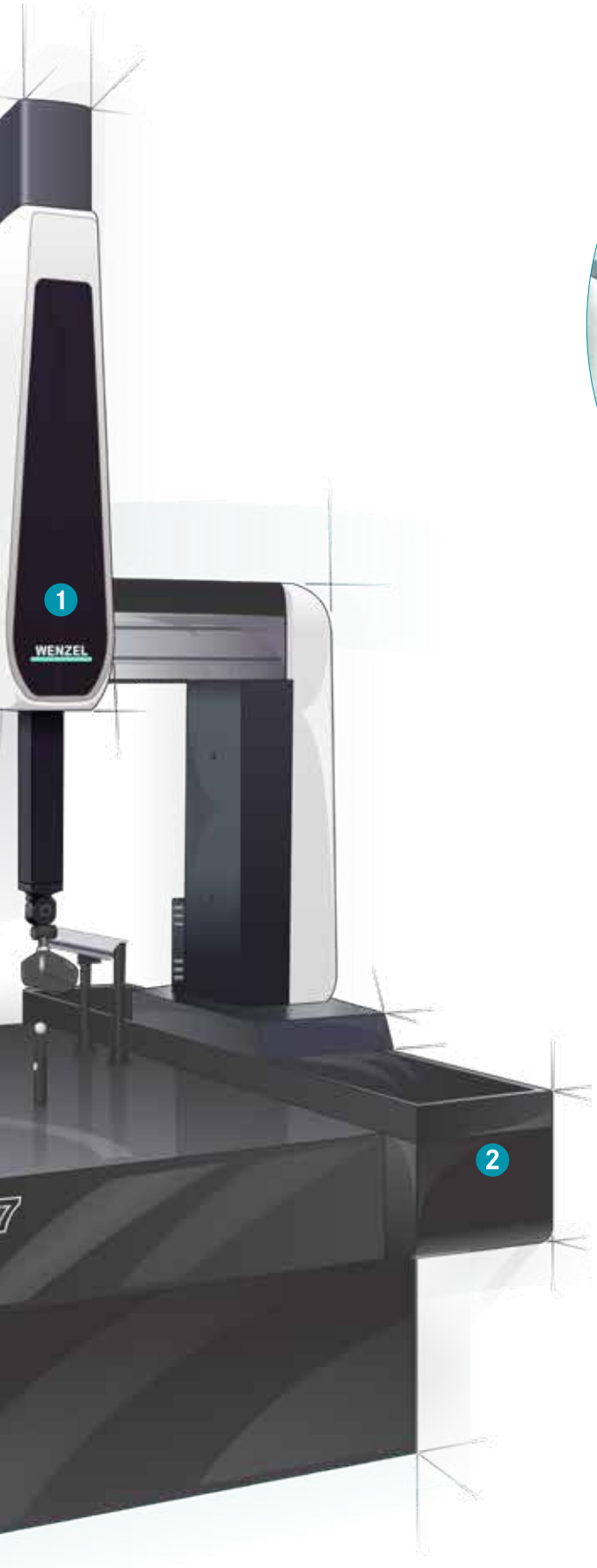
PRECISE IN DETAIL

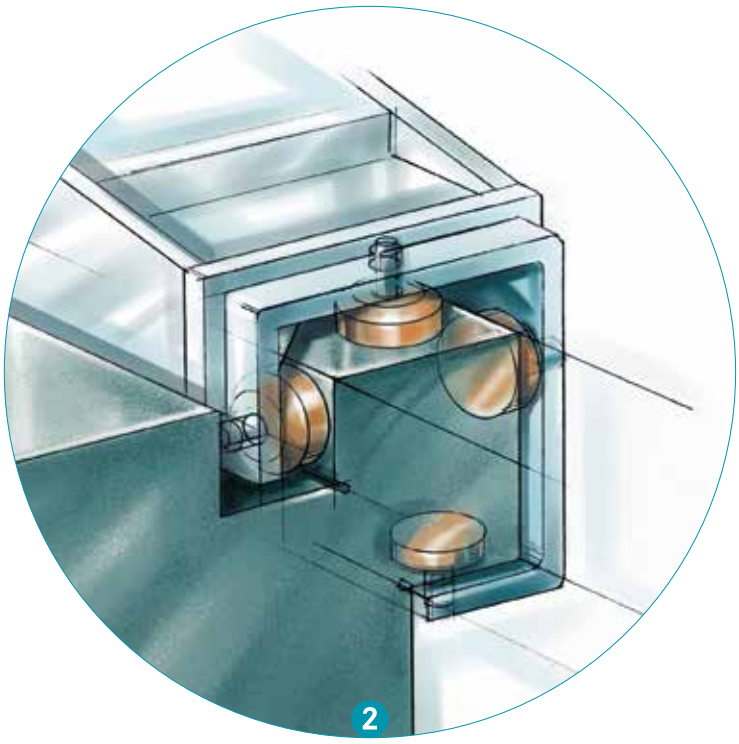
- Base plate, traverse and quill made of dark natural hard stone, ensuring identical thermal behaviour on all axes
- Y-axis guide system integrated directly into the base plate
- Weight compensation of the Z quill by means of a controlled pneumatic cylinder
- Available with active vibration damping
- Air bearing guide elements in all axes for wear-free, smooth-running operation
- Usable surface of the base plate machined according to DIN 876/0
- X- and Y-axis guidance with bellows cover
- CNC control of all axes
- Compact size
- Good accessibility for maintenance work



Components optimized by FEM/CAD guarantee maximum rigidity with reduced moving masses.

Symmetrical guide profiles with reduced wall thicknesses: optimum for predictable expansion behaviour at changing operating temperatures. Bellows protect the traverse as well as the Y-guide against environmental influences.





Preloaded air bearing guides in the Y-axis with high-precision lapped guide surfaces incorporated into the granite base plate: a guarantee for excellent long-term stability.

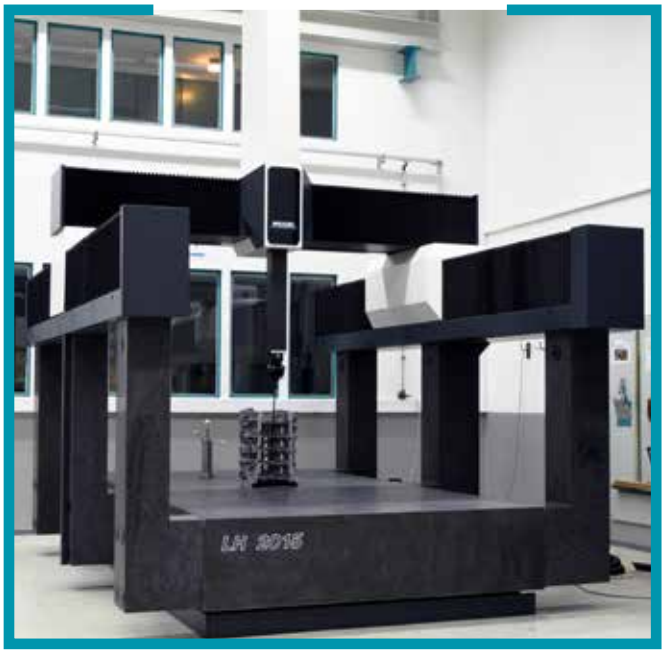
WENZEL LH GANTRY SERIES

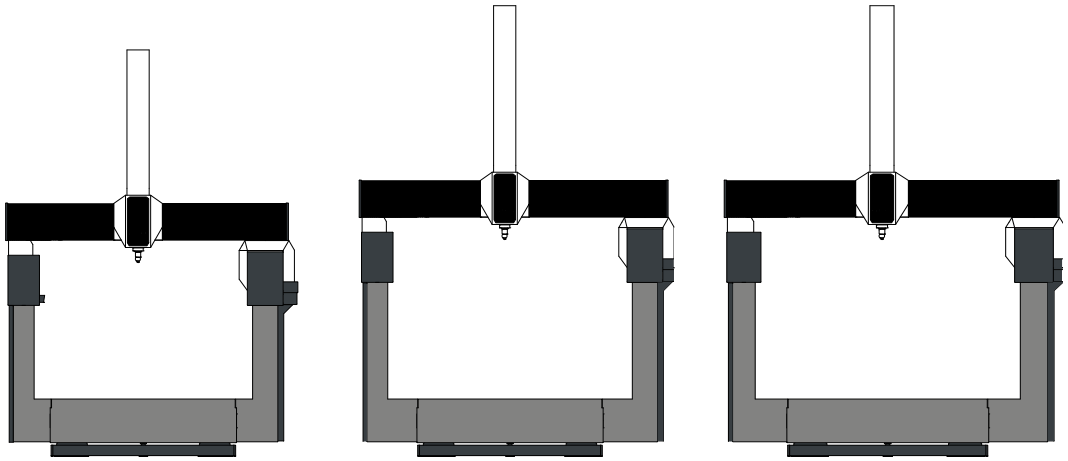
PRECISE RESULTS WHEN MEASURING LARGE COMPONENTS

The LH Gantry is a CNC coordinate measuring machine with air bearings in all axes. It offers all the advantages and application possibilities of the LH Series and has also been specially designed for the inspection of large-volume and heavy workpieces. The raised guides in the Y-axis also ensure maximum stability and rigidity, even with dynamic movements. Overall, the machine body forms an inherently stable, homogeneous unit with optional integrated active vibration damping, which does not require a separate foundation. Thermal environmental influences affecting the workpiece and the CMM can be corrected by means of automatic temperature compensation (optional). The optional use of a rotary table means that even large rotationally symmetrical components can be measured flexibly and accurately. LH Gantry series measuring machines are available in Standard, Premium and Premium Select accuracy classes.

FIELDS OF APPLICATION

Stable, reliable and fully dynamic, LH Gantry machines are flexible, making them universally applicable for a wide range of applications. Typical areas of application are, for example; the measurement of large engines, large gears or heavy machine components. The LH GANTRY Series also meets the growing demand for e-mobility and the associated new challenges for quality assurance. Examples of applications are the measurement of battery boxes for e-cars or e-commercial vehicles. WENZEL is committed to this market and supporting the development of emission-reducing technology.





LH 2015 LH 2317 LH 2617

FEATURES

- **Air bearing guide elements in all axes**
  High mechanical precision | Granite base | Handcrafted
- **Low operating costs**
  Low air consumption | Reliable and inexpensive spare parts
- **High flexibility**
  Customer-specific measurement volume | Data compatibility with other WENZEL systems | Automation solutions
- **Versatile sensor options**
  Switchable sensor systems | 3- or 5-axis scanning | Optical sensors
- **Ergonomic design**
  Simple operation | Simple maintenance | No foundation necessary

MEASURING ACCURACY

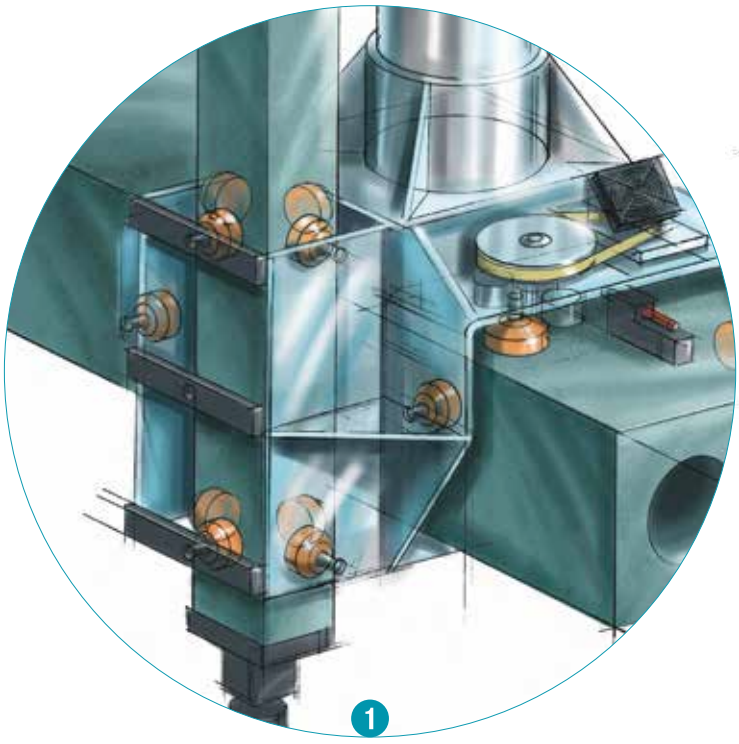
Type	Measuring ranges X x Y x Z (mm)	Volumetric length measuring uncertainty $E_{L,\ MPE}$ (µm) Premium Select
LH 2015	2000 x 3000/4000/5000 x 1500	2,6 + L / 450
LH 2315	2300 x 4000/5000/6000 x 1500	2,9 + L / 450
LH 2317	2300 x 4000/5000/6000 x 1750	3,3 + L / 450
LH 2615	2600 x 4000/5000/6000 x 1500	3,2 + L / 450
LH 2617	2600 x 4000/5000/6000 x 1750	3,6 + L / 450

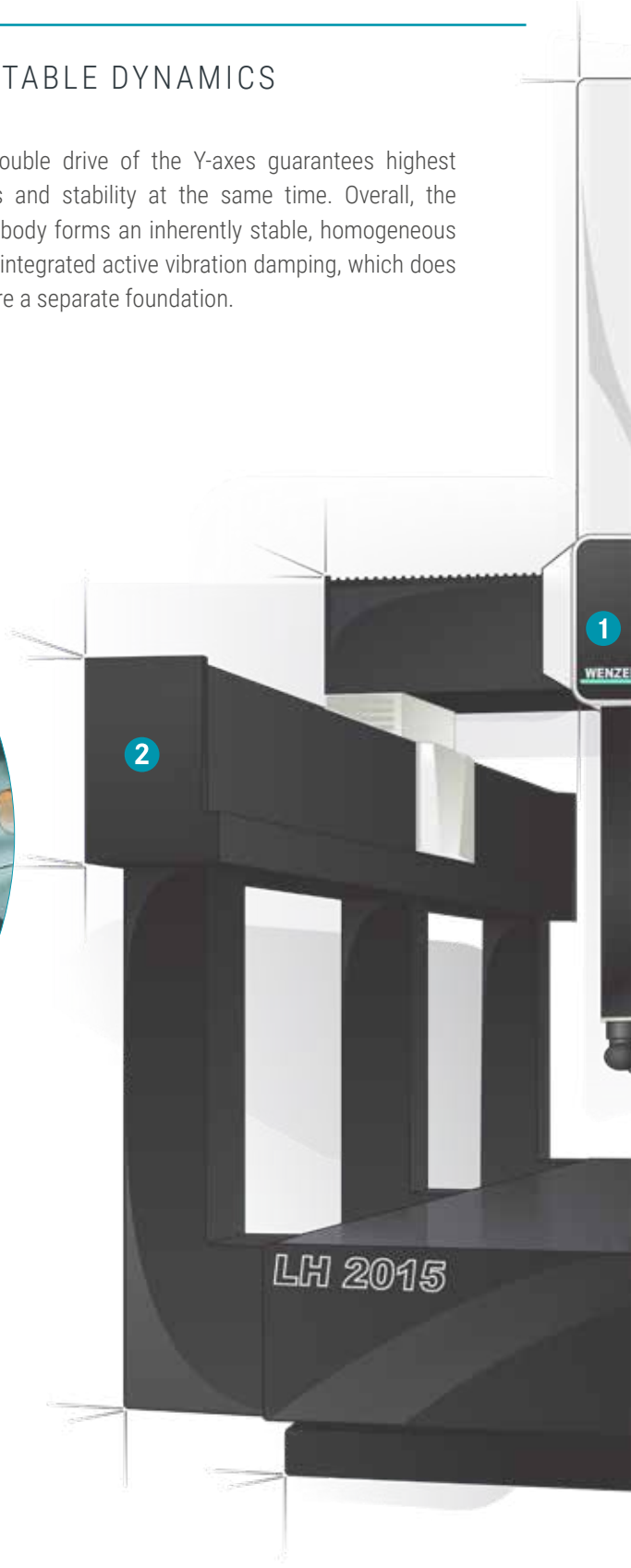
Value $E_{L,\ MPE}$ is only valid with the respective touch probe. Further information can be found in the technical data sheets.
Other Y-lengths on request. Subject to changes in design and scope of delivery as well as further technical development.

THE LH GANTRY-FEATURES

GUIDANCE FROM ABOVE FOR STABLE DYNAMICS

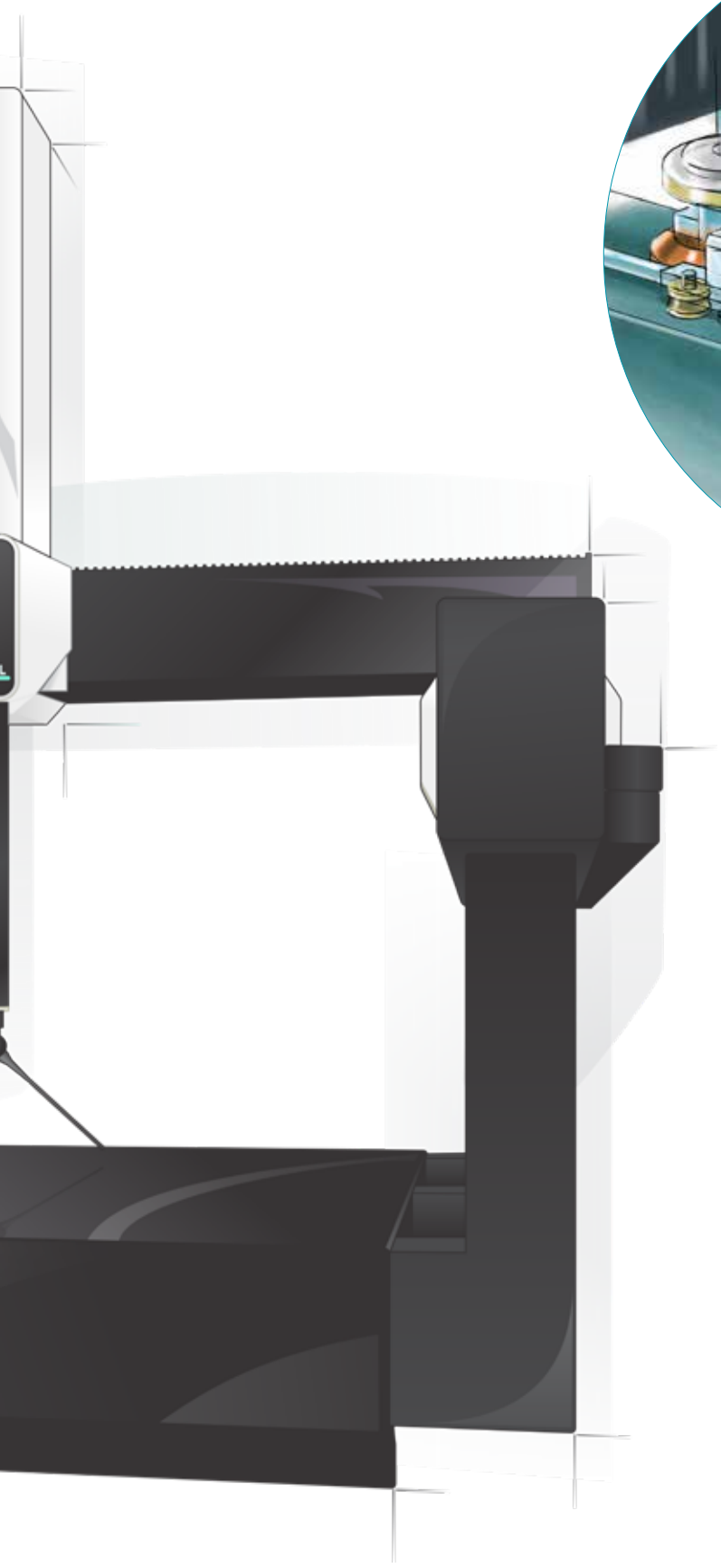
Air bearing guide elements in all axes of the LH Gantry ensure wear-free operation and optimum guidance characteristics. The same thermal behaviour of all axes is guaranteed by a base plate, traverse and quill made of dark natural hard stone. The stiff construction in combination with a double drive of the Y-axes guarantees highest dynamics and stability at the same time. Overall, the machine body forms an inherently stable, homogeneous unit with integrated active vibration damping, which does not require a separate foundation.

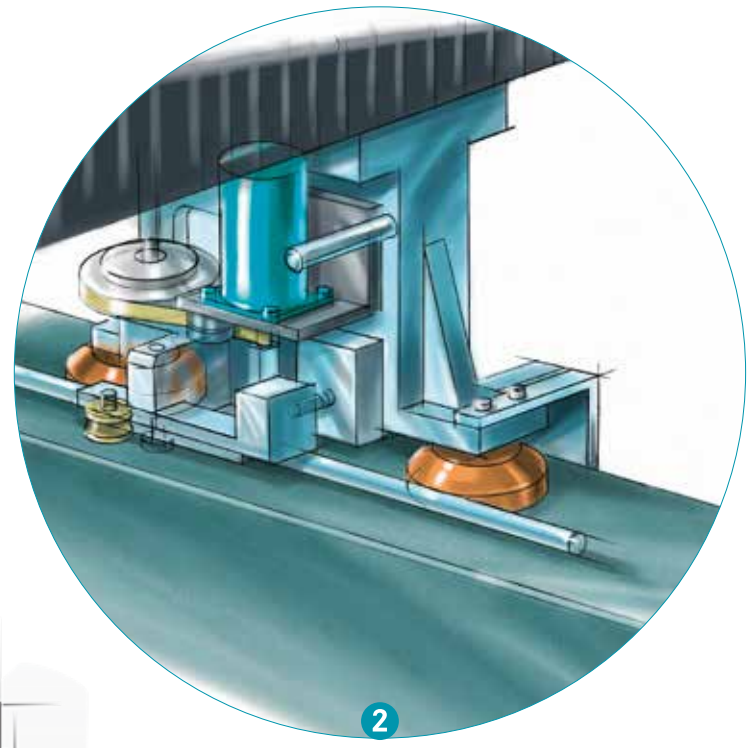




Symmetry everywhere

- Optimized air bearing with “broad base”
- Perfection in detail
- Service friendliness
- Thermal stability





Double drive in the Y-axis for LH 2015

- High dynamic

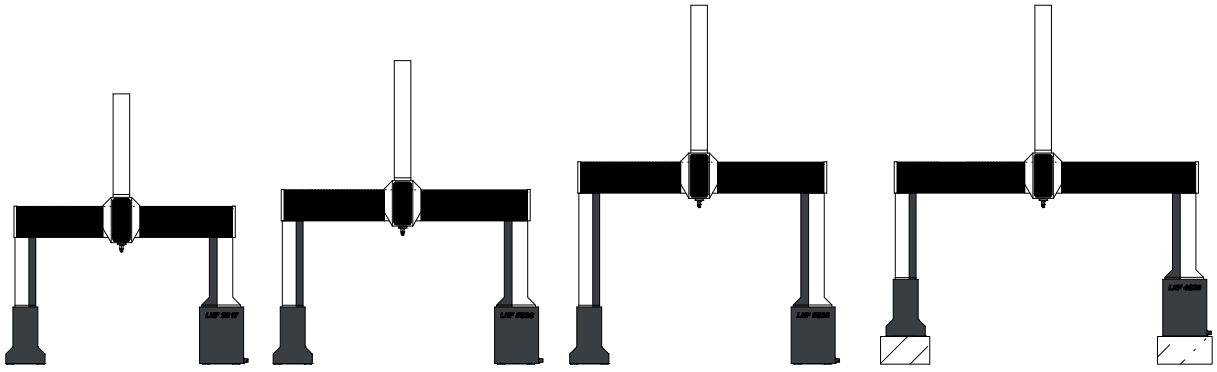
WENZEL LHF SERIES

LARGE MEASURING RANGE AND EXCELLENT ACCESSIBILITY

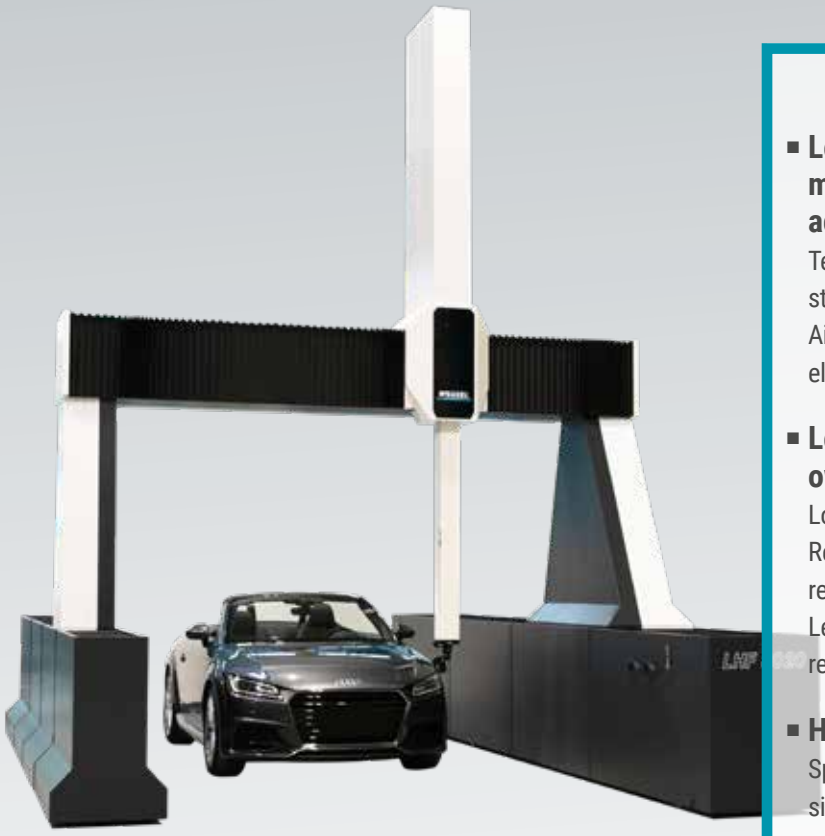
Wide measuring range and excellent accessibility. The LHF is a CNC coordinate measuring machine with air bearings on guide beams, which has been designed for high-precision measurement of large-volume and complex workpieces. Its ground-level design allows excellent access to a large measuring range with maximum freedom of movement. The measuring range in the Y-axis is available in the standard version up to a length of 12 meters. A double drive in the Y-axis of the LHF makes it unbeatable in terms of dynamics. The thermal influences of the environment on the machine and workpiece can optionally be corrected by means of automatic temperature compensation. LHF series measuring machines are available in the accuracy classes Standard, Premium and Premium Select.

FIELDS OF APPLICATION

The WENZEL LHF is designed for high-precision measurement of large-volume and complex workpieces. It is used by innovative medium-sized companies as well as world-famous large corporations - or simply everywhere where high measuring requirements define the requirement.



LHF 2517 LHF 3020 LHF 3025 LHF 4025



FEATURES

- **Long term, mechanical accuracy**
  Temperature stable structure | Hand finished | Air bearing guide elements in all axes
- **Low cost of ownership**
  Low air consumption | Reliable and cheap replacement parts | Less effort in recalibration
- **High flexibility**
  Special measuring sizes on request | Data compatibility with other WENZEL systems | Loading systems | Automation solutions
- **Various sensor options**
  Touch trigger probes | 3- or 5-axis scanning | Optical sensors
- **Ergonomic design**
  Easy to use | Easy to service | Easy to load

MEASURING ACCURACY

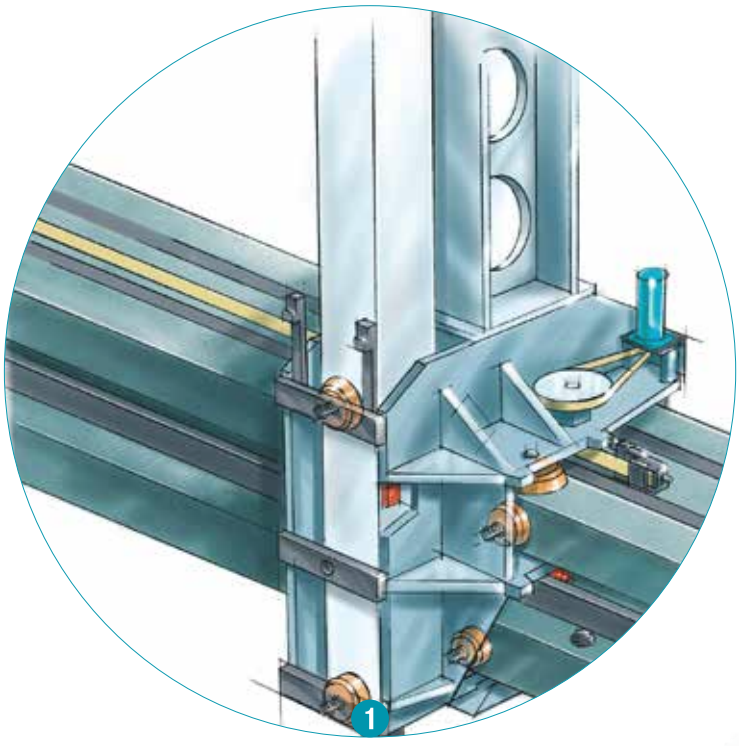
Type	Measuring ranges X x Y x Z (mm)	Volumetric length measuring uncertainty $E_{L,\,MPE}$ (µm) Premium Select
LHF 2517	2500 x 4000/5000/6000 x 1700	3,5 + L / 450
LHF 3020	3000 x 4000/5000/6000 x 2000	4,6 + L / 450
LHF 3025	3000 x 5000/6000 x 2500	5,6 + L / 450
LHF 4025	4000 x 5000/6000 x 2500	6,6 + L / 450
LHF 4027	4000 x 5000/6000 x 2700	7,1 + L / 450
LHF 5025	5000 x 5000/6000 x 2500	7,6 + L / 450

Value $E_{L,\,MPE}$ is only valid with the respective touch probe. Further information can be found in the technical data sheets.
Other Y-lengths on request. Subject to changes in design and scope of delivery as well as further technical development.

THE LHF-FEATURES

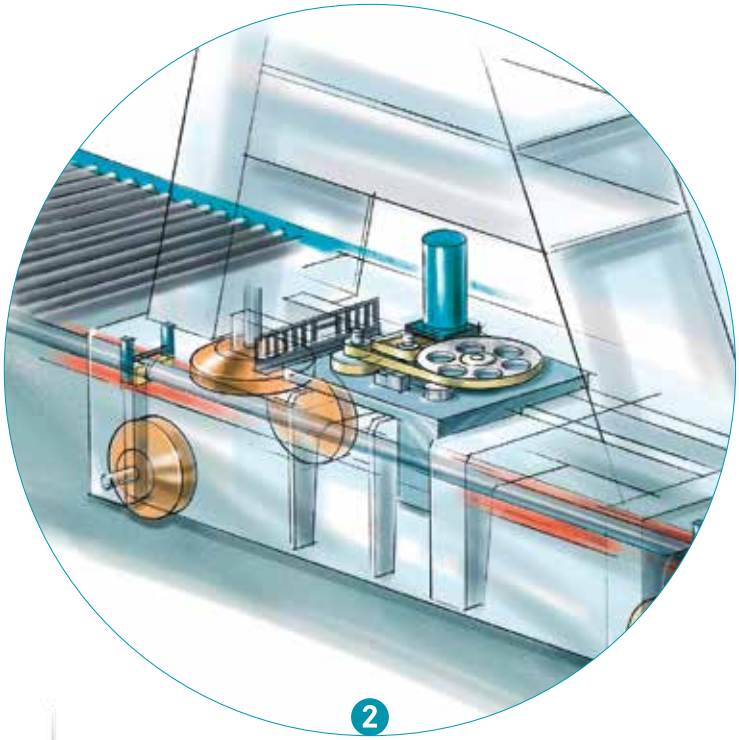
EASY HANDLING FOR LARGE PARTS

The ground level work envelope of the LHF allows excellent access to a large measuring range, and maximum freedom when loading parts. Combined with air bearings on the Y-axis beams, a dual drive system makes the LHF unbeatable in terms of dynamics and operation. Natural granite construction in all axes allows for excellent thermal stability, ensuring consistent, accurate results everytime. As this type of device does not have a stable base plate, an inherently stable foundation is required. With a normal soil ratio, a passively damped foundation is sufficient. In case of strong vibrations, vibration damping elements in the foundation are necessary.



Perfection in Detail

- Air-Bearing Guideways for Low Friction
- Ease of Loading Large Workpieces
- Designed for Servicability
- Accuracy Built In



Inherent Performance

- Dual-Drive Operation
- Thermal Stability
- Granite Construction for Longevity
- Flexible Probing Options

THE LH SERIES WITH ROTARY TABLE

FULL FLEXIBILITY FOR EVERY MEASURING TASK

All measuring machines of the LH series can be configured with an additional integrated rotary table. This enables both the precise 4-axis measurement of rotationally symmetrical components and the reliable measurement of the entire spectrum of prismatic components. The base plate and guideways are all made of thermally stable granite, which provides consistent performance of the machine over time. In order to guarantee the highest precision, air bearings are used in all axes. The optimum measuring system can be configured according to component size, component weight and measurement requirements. Different mounting heads and touch probes allow an optimal adjustment to your measuring requirements.

FIELDS OF APPLICATION

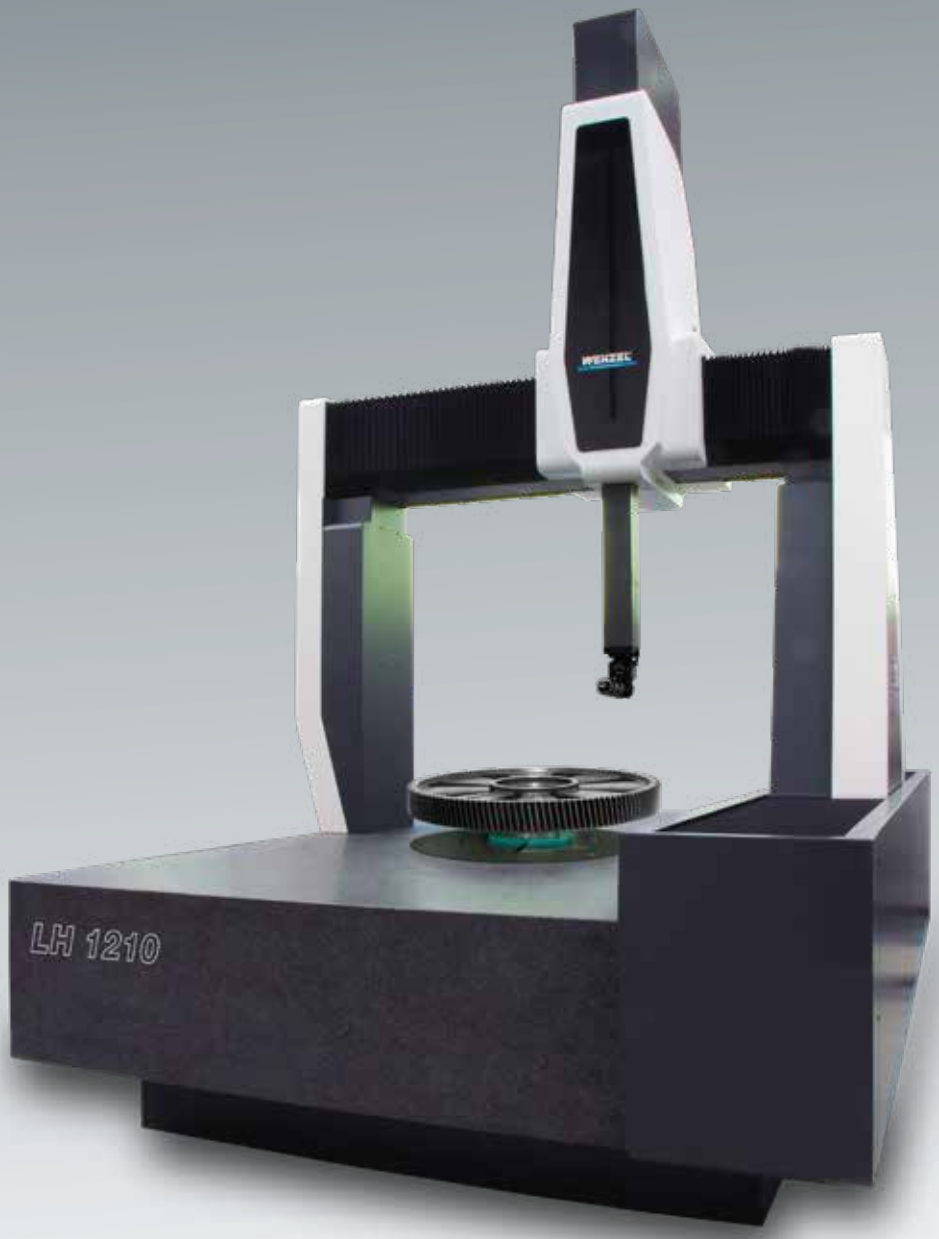
The LH series with rotary table quickly and reliably measures rotationally symmetrical as well as prismatic precision components. With a variety of sizes and accuracy levels, there is a machine to fit any measurement need.

Gears

Bearings and couplings

Shafts and axles

LH Series with rotary table



FEATURES

- **High mechanical precision**
  Granite base | Handcrafted | Precise air bearings in the linear axes
- **Low operating costs**
  Low air consumption | Reliable and inexpensive spare parts
- **Impressive speeds**
  4 axes for ultimate speed and precision | Fully automatic probe changing systems
- **High flexibility**
  Measurement of rotationally symmetrical as well as prismatic components with just one system | Numerous sizes and configurations
- **High reliability**
  High-quality components | Many years of development experience | Renishaw sensor systems

SENSORS AND CHANGE RACKS

FOR BRIDGE CMMs

When combined with a variety of innovative sensors, the LH Series is a flexible solution for a number of different applications. From the smallest injection molded parts up to large sheet metal forming dies – the LH CMM meets your needs! The LH Series can be equipped with both, manual and motorized probe heads as well as continuously recording systems and indexable probe heads. With suitable touch trigger, scanning and optical measurement systems LH CMM offers outstanding results for various applications. The compatible automatic exchange units turn the measuring instruments 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 LH 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 revolutionary 5-axis probe system REVO™ coupled with WM | QUARTIS provides an extremely fast high scanning speed solution with high measurement flexibility, and thus an extremely high throughput.

TP20

Touch trigger probe. Extremely robust and flexible touch trigger probe.

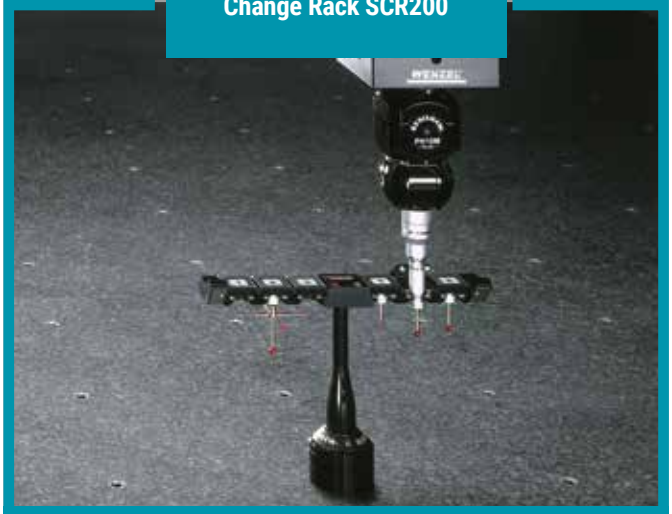
TP200

Compact, module changing touch trigger probe particularly suitable for measuring tasks with tight dimensional tolerances.

SP25M

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

Change Rack SCR200



With the SCR200 change magazine, up to six TP200 stylus modules can be changed quickly and automatically. The SCR200 is controlled by a separate interface (PI 200) and has collision protection against mechanical damage.

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 changing system for automatic changing of SP25M scanning and probe modules with 3 stations (6, 9, 12 and 15 stations possible).

MRS2 modular rack system

MRS2 is available with different column and rail lengths to allow configurations for a variety of applications. When workspace is tight, or a large number of 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 BRIDGE CMMs

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 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 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 the most accurate and fast measurements in various industrial and application areas.

NIKON LC15Dx

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

NIKON XC65

The feature 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.


WENZEL
RENISHAW
PH10M
Nikon


WENZEL
RS 1512

HORIZONTAL ARM MACHINES

LARGE, FAST, PRECISE

HORIZONTAL ARM MACHINES

PRODUCT RANGE AND FIELDS OF APPLICATION

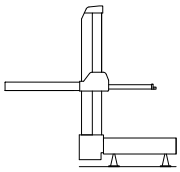
The roller-bearing horizontal arm measuring devices of the R series offer maximum measuring volume for medium to large and particularly overhanging workpieces. Combined as duplex version or by their arbitrarily extendable measuring range, the WENZEL horizontal arm measuring devices can be adapted individually to the measuring requirements and offer solutions, which go far beyond the standard. The superior design and the compact arrangement of the guide elements allow perfect accessibility from all sides and provide maximum flexibility and dynamics. The R Series CMMs can be equipped with a variety of swivel head and probe combinations, from rigid heads to motorized rotary and swivel heads, and from simple probes to high precision scanning touch probes and optical sensors.

R SERIES

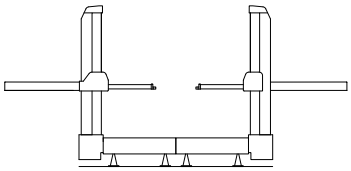
- The universally applicable **RS (roller-bearing side)** stand-alone measuring device with guide elements attached to the base plate at the side can be easily integrated into existing room concepts.
- Defining characteristics of the **RA (roller bearing on base plate) / RAF (roller bearing on guide beam)** series are the floor-level base plates on which the guidance systems are mounted. Due to this design, the coordinate measuring machine can be easily equipped with heavy components up to complete vehicles.
- The **RAX (roller bearing on base plate, XL measuring range)** with its far above-average measuring range was specially developed for the needs of the automotive industry.
- The **RUF underfloor measuring machine** is the ideal supplement to the measuring centers when work pieces are also measured from below.

To extend the Y measuring range, all machines can be supplied as duplex version.

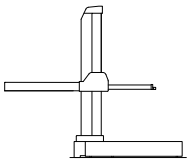
OUR VARIANTS



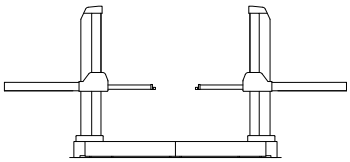
RS (Simplex)



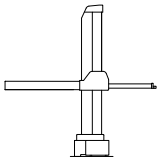
RSD (Duplex version)



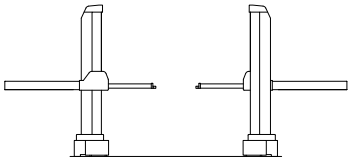
RA (Simplex, on floor)



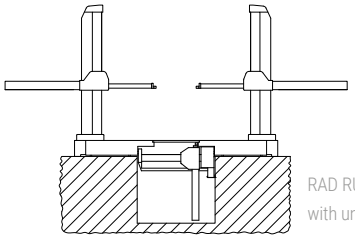
RAD (Duplex version, on floor)



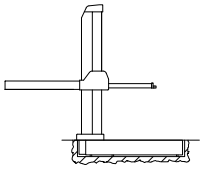
RAF (Simplex, on floor)



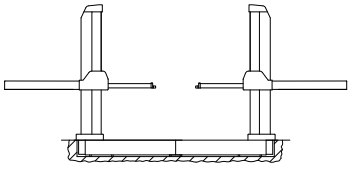
RAFD (Duplex version, on floor)



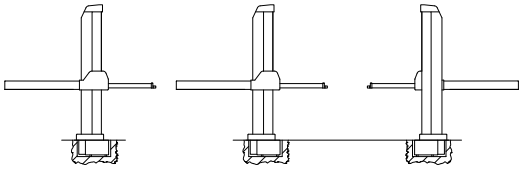
RAD RUF (Duplex version, with underfloor measuring machine)



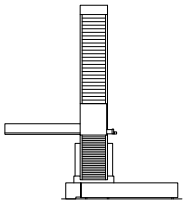
RA (Simplex, flush with floor)



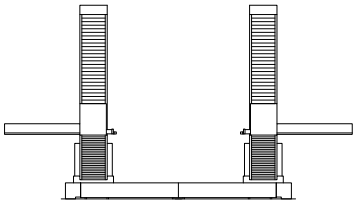
RAD (Duplex version, flush with floor)



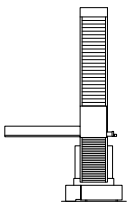
RAF (Simplex, flush with floor) RAFD (Duplex version, flush with floor)



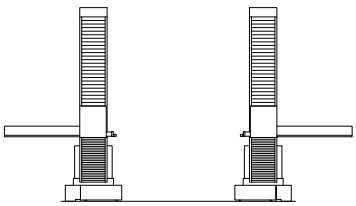
RAX (Simplex, on floor)



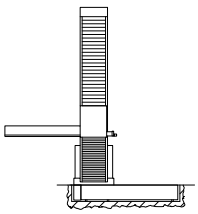
RAXD (Duplex version, on floor)



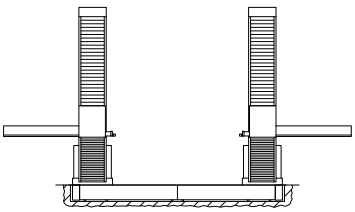
RAXF (Simplex, on floor)



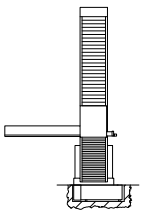
RAXFD (Duplex version, on floor)



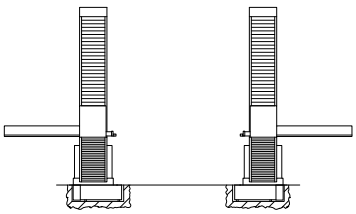
RAX (Simplex, flush with floor)



RAXD (Duplex version, flush with floor)



RAXF (Simplex, flush with floor)



RAXFD (Duplex version, flush with floor)

WENZEL RS SERIES

FAST, PRECISE MEASUREMENT OF LARGE COMPONENTS

The machine concept of the RS Series is based on a stable base plate as a measuring table with a lateral guide system. The RS can be integrated extremely flexibly into an existing room concept without a specific foundation and can be moved to a new location if required.

It is available as a manual or CNC device, combined with decouplable drives, as a single, double or multi-column system, with tactile and optical sensors and also with vibration damping.

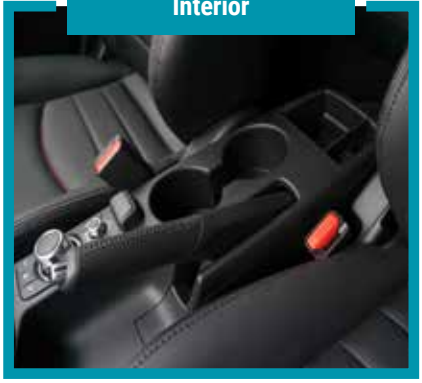
The RS allows production-related measurement of individual parts, assemblies, end products such as car bodies and other large-volume workpieces. The RS is available in two accuracy classes - Standard and Premium.

FIELDS OF APPLICATION

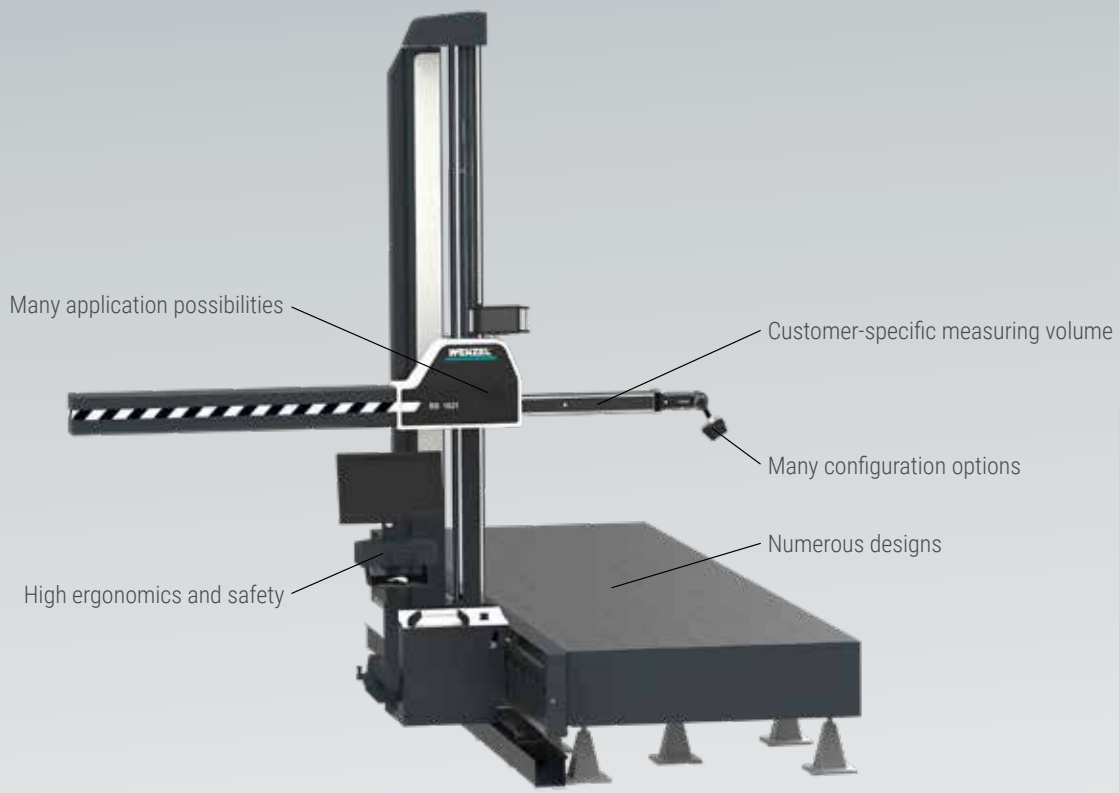
The RS Series is mainly used in the automotive industry for measuring, digitizing and scribing individual parts, assemblies or complete car bodies. Typical components are bumpers, seats, instrument panels, welded structures or fixtures.

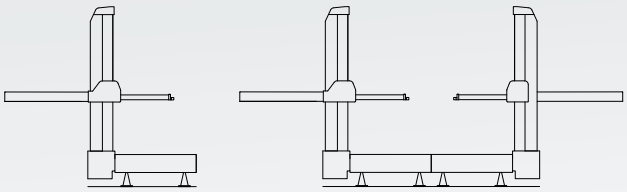
Car bodies

Interior



Wind turbines





RS (Single unit)

RSD (Duplex system)

MACHINE PROFILE

Measuring volume X-axis	**Custom**
Measuring volume Y-axis	**up to 2100; Duplex up to 4000 mm**
Measuring volume Z-axis	**up to 3000 mm**
Measurement uncertainty	**$E_{L,\,MPE}$ from 15+L/45 ≤ 50 (µm)***

*Depending on machine configuration (Premium, Standard) according to current technical data sheets

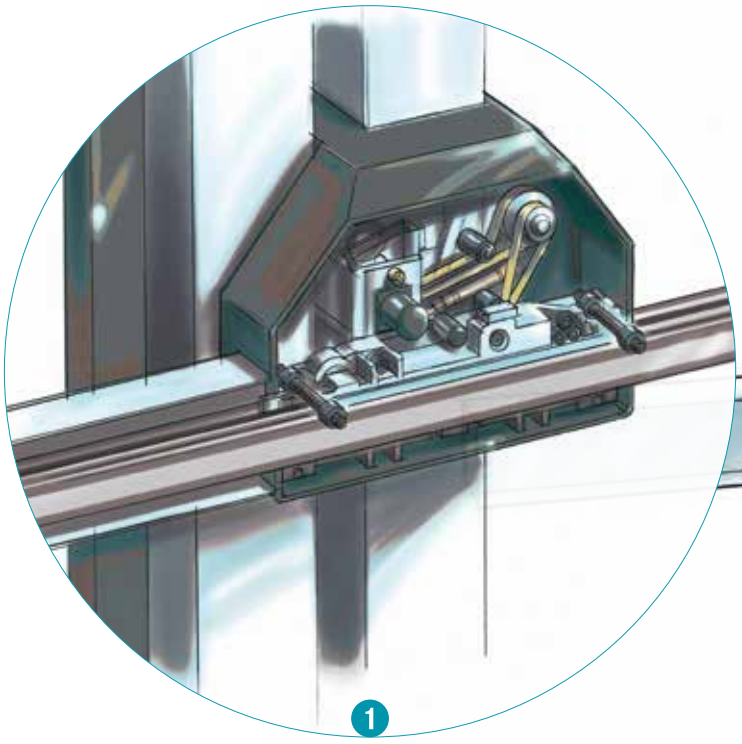
FEATURES

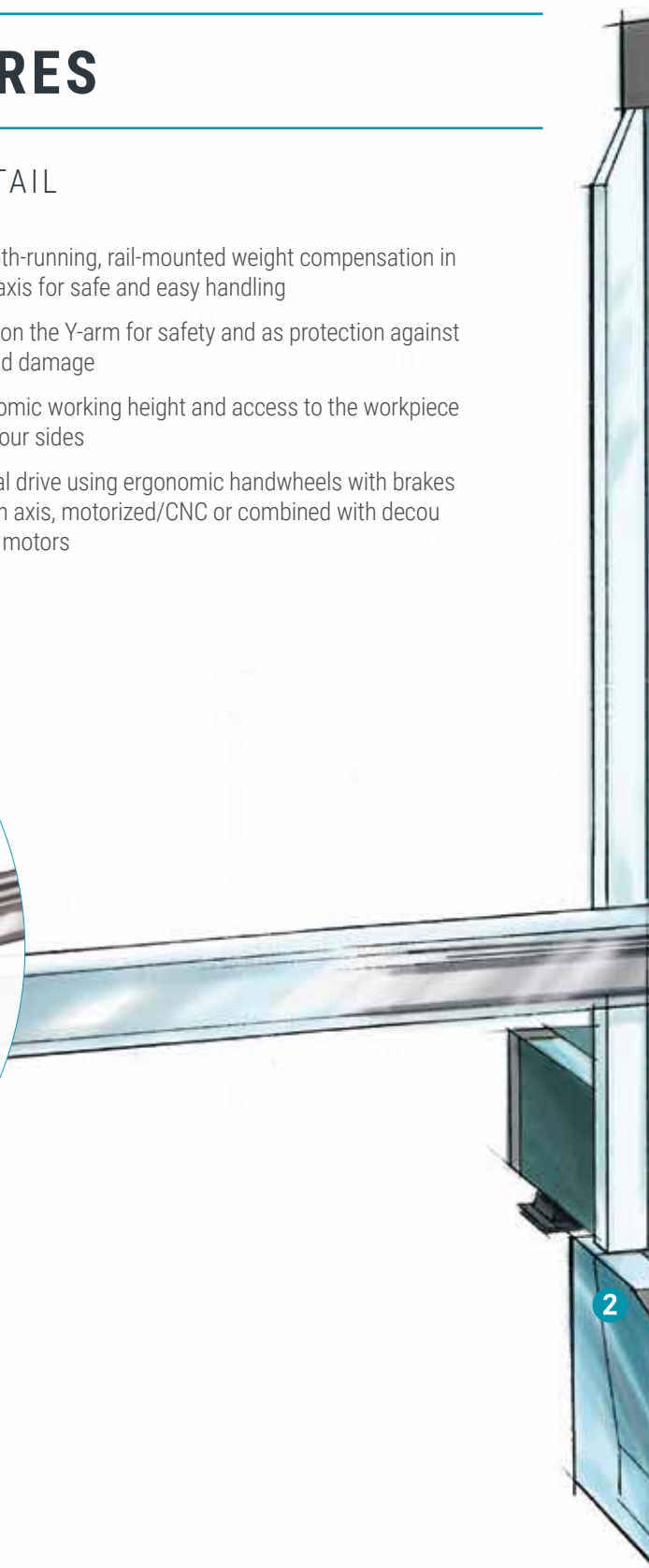
- **Highly maintenance friendly**
  Original manufacturer service | Optimum accessibility | Low downtimes
- **Long service life**
  Machine design with wear-resistant and optimized components | Investment protection through upgradeability and compatibility
- **High flexibility**
  Simple and flexible integration into existing room and building concepts | adaptive to room, building and process changes
- **Diverse fields of application**
  Ergonomic working height makes it also suitable for small parts | Measuring during production
- **You have the choice**
  Base plate available in cast iron or granite | Optionally with active vibration damping | Different operating modes

RS-FEATURES

PRECISE IN DETAIL

- Base plate made of cast iron as standard, for small sizes optionally made of natural hard stone, optionally with damping system
- Surface of the base plate machined to DIN 876/2 as reference surface for the measured object
- Linear bearings in the X-axis and precision roller bear -ings in the Y- and Z-axis
- Carbon fiber Y-arm for high stiffness and dynamics
- Measuring system protected against dirt and damage
- Smooth-running, rail-mounted weight compensation in the Z-axis for safe and easy handling
- Cover on the Y-arm for safety and as protection against dirt and damage
- Ergonomic working height and access to the workpiece from four sides
- Manual drive using ergonomic handwheels with brakes in each axis, motorized/CNC or combined with decou plable motors

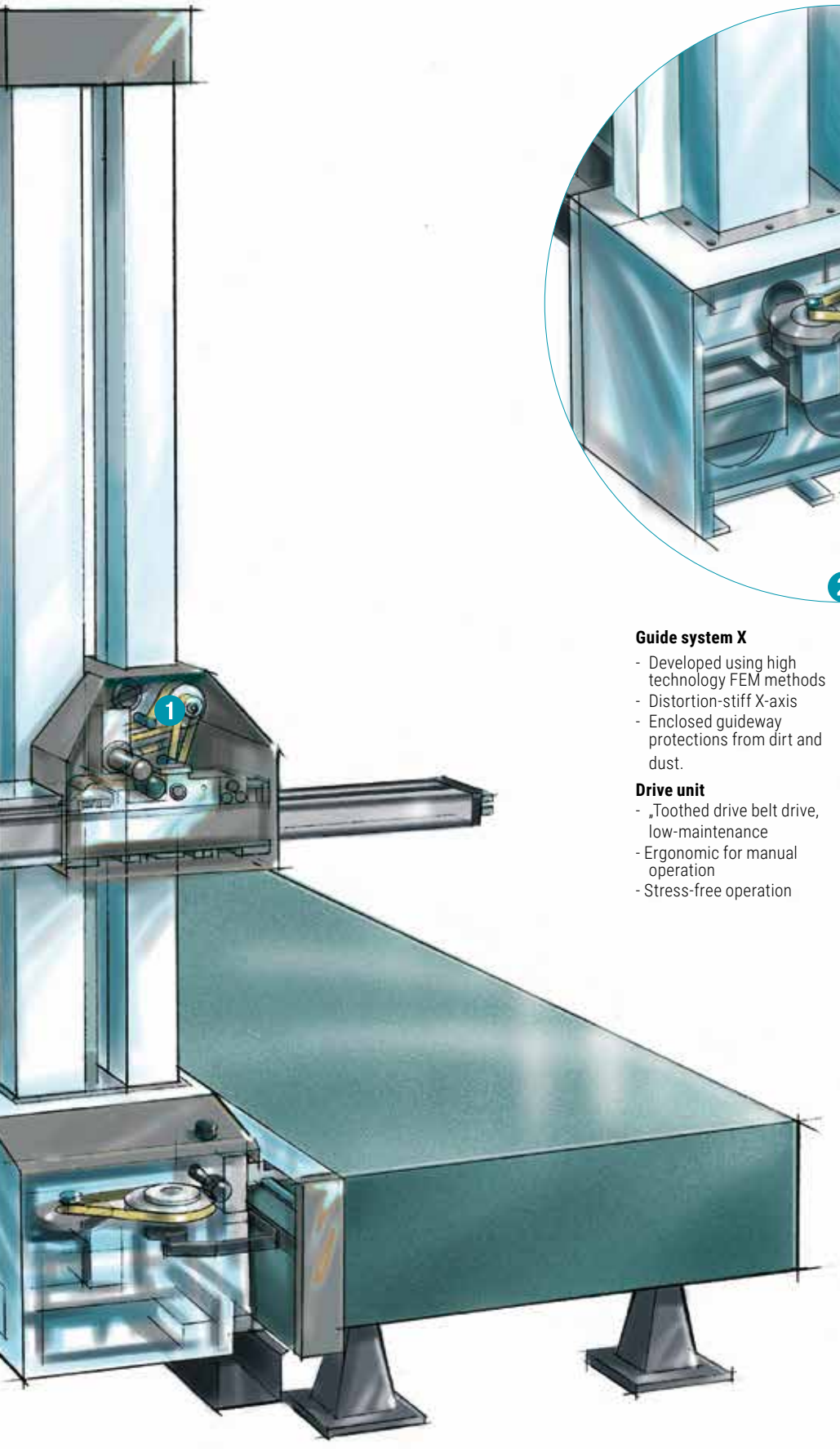


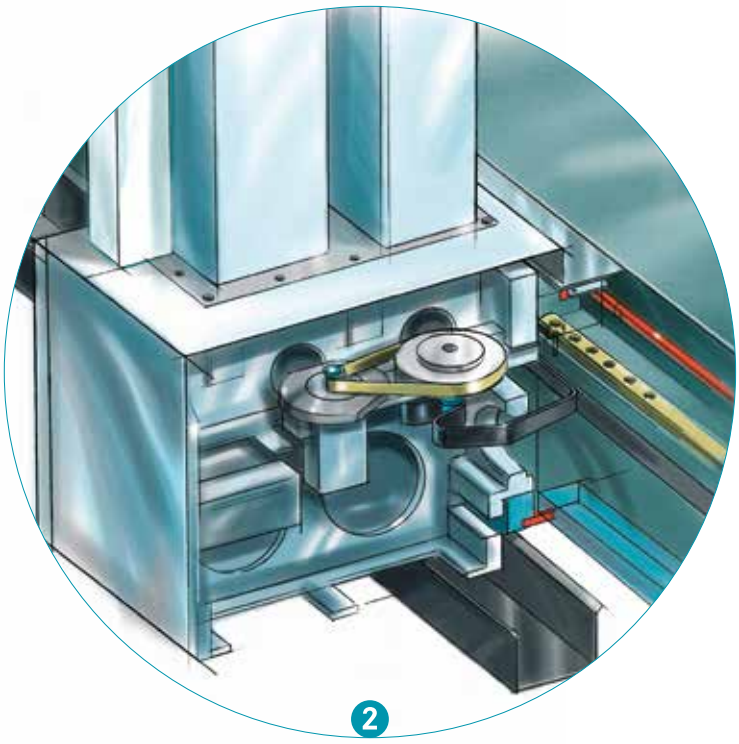


Guide system Y/Z
- Low maintenance
- High reliability
- Easily adjustable
- Robust guide elements
- Low-wear vibration free belt drive

Y-arm produced from carbon fibre
- Reduced weight with improved rigidity

Scale located underneath the arm
- Protected against contamination





Guide system X

- Developed using high technology FEM methods
- Distortion-stiff X-axis
- Enclosed guideway protections from dirt and dust.

Drive unit

- „Toothed drive belt drive, low-maintenance
- Ergonomic for manual operation
- Stress-free operation

Pneumatically disengageable drives

- Eliminate undesired heat sources

Gekapselte Linearführungen

- Hohe Führungsgenauigkeit
- Geringe Schmutzempfindlichkeit
- Hohe Lebensdauer
- Geringer Wartungsaufwand

Controller und PC

- Kompakte Bauweise durch integriertes System (optional)

WENZEL RA SERIES

FAST, PRECISE MEASUREMENT OF LARGE COMPONENTS

A characteristic feature of the RA series is the floor-level base plate, into which the guide system is integrated. Due to this design, the coordinate measuring machine can easily be equipped with large and heavy components such as complete vehicles. Whether as a single boom machine, as a duplex or multi-column system with integrated underfloor measuring device - RA measuring devices deliver the desired results precisely, reliably and quickly. The machine type is available as a manual or CNC machine as well as combined with decouplable drives, with tactile and optical sensor technology and is distinguished by its excellent accessibility, even for workpieces that are difficult to handle. The RA is available in two accuracy classes - Standard and Premium.

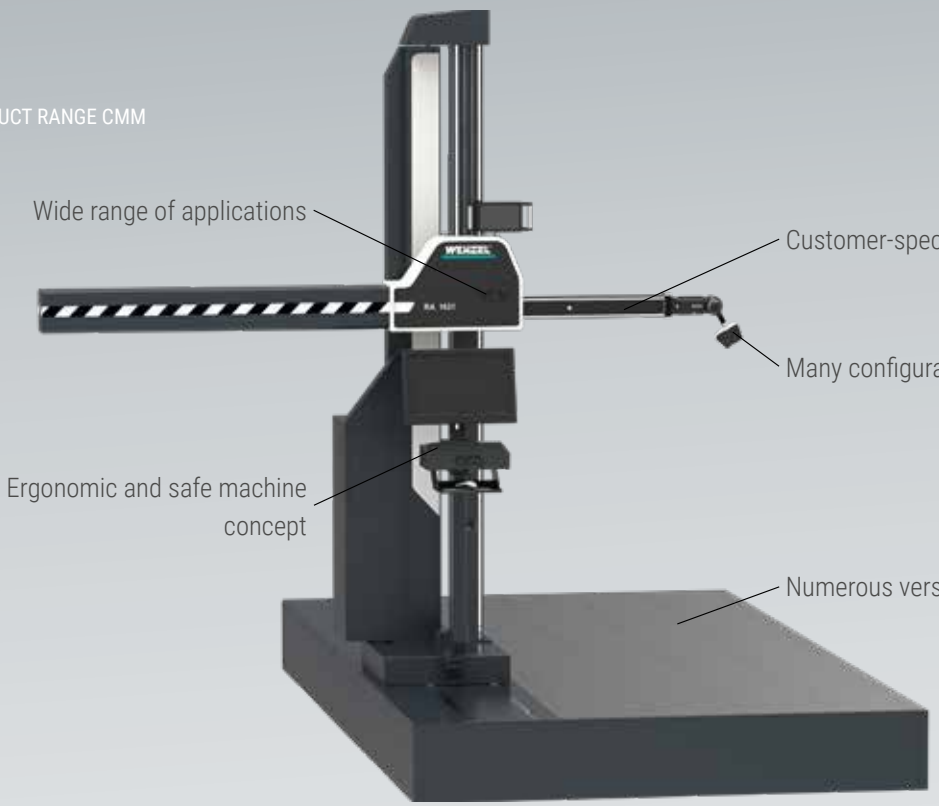
FIELDS OF APPLICATION

The RA series is used by many customers worldwide in individual operation or as a multi-column system for measuring, scribing and digitizing. The main areas of application are in vehicle construction, plant construction and for construction and agricultural machinery. Whether for individual parts, assemblies or complete bodies, the RA series measures the upcoming measuring task quickly and precisely.

Automotive industry

Railroad industry

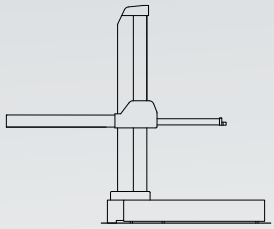
Construction machines



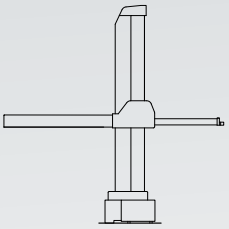
MACHINE PROFILE

Measuring volume X-axis	**Custom**
Measuring volume Y-axis	**up to 2100; Duplex up to 4000 mm**
Measuring volume Z-axis	**up to 3000 mm**
Measurement uncertainty	**$E_{L,\,MPE}$ from 15+L/45 ≤ 50 (µm)***

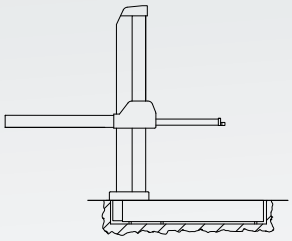
*Depending on machine configuration (Premium, Standard) according to current technical data sheets



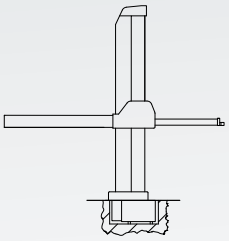
RA (Single unit, onfloor)



RAF (Single unit, onfloor)



RA (Single unit, floor level)



RAF (Single unit, floor level)

Single boom machine, also available as a duplex or multi-column system.

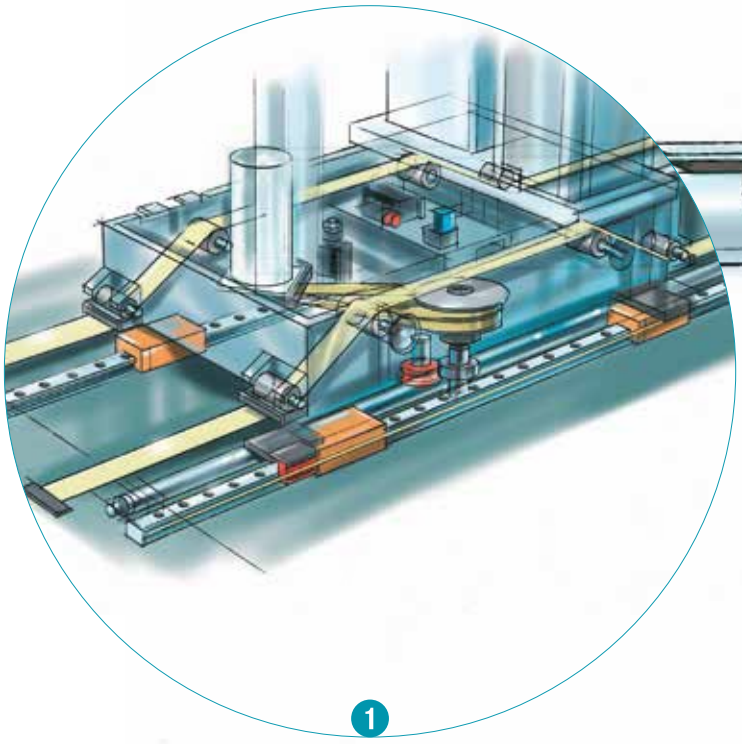
FEATURES

- **Best accessibility**
  Easy loading, positioning and accessibility of workpieces | Floor level and protected guide systems free of tripping hazards
- **High reliability**
  Technology proven over many years even in tough applications | High availability | Economical operation | Long service life
- **High flexibility**
  Modular design | Various system concepts possible | Duplex use possible
- **Precise results**
  Friction-locked power transmission | Combined recirculating ball and roller bearing guide technology | Optimized ratio of movement to precision
- **Many years of project competence**
  Consulting experience already from the plant planning stage | Design of measurement rooms and foundations | Definition and implementation of efficient measurement processes

RA-FEATURES

PRECISE IN DETAIL

- Base plate of the RA or guide beam of the RAF made of cast iron, floor-level as standard, for floor-level access to the measuring volume and workpiece, optionally on floor
- Guide system and transition to base plate covered without gaps, can be walked on or driven on, guide groove protected with stainless steel strips
- Surface of the base plate machined to DIN 876/2 as reference surface for the measured object
- Linear bearings in the X-axis and precision roller bear -ings in the Y- and Z-axis
- Carbon fiber Y-arm for high stiffness and dynamics
- Measuring system protected against dirt and damage
- Smooth-running, rail-mounted weight compensation in the Z-axis for safe and easy handling
- Cover on the Y-arm for safety and as protection against dirt and damage
- Manual drive using ergonomic handwheels with brakes in each axis, motorized/CNC or combined with decou plable motors



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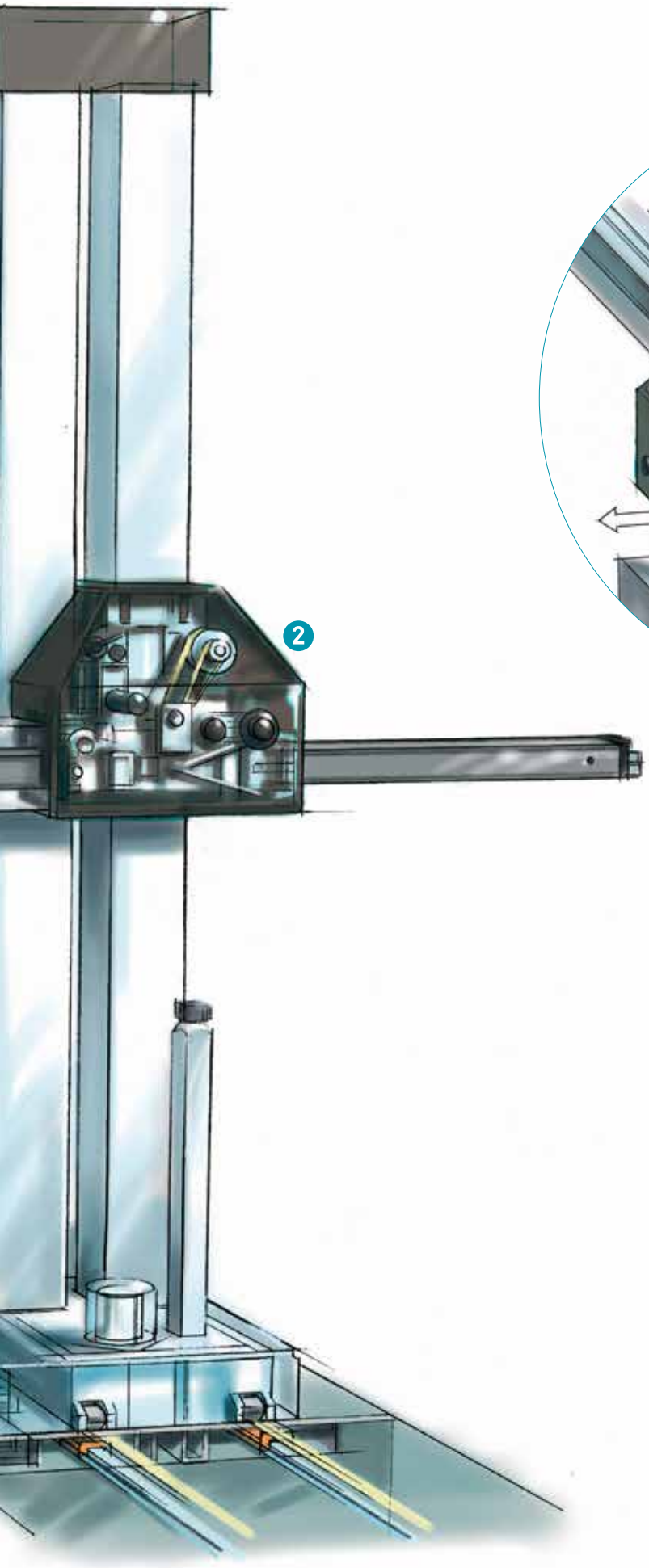
Führungssystem X
- Developed using high technology FEM methods
- Distortion-stiff X-axis

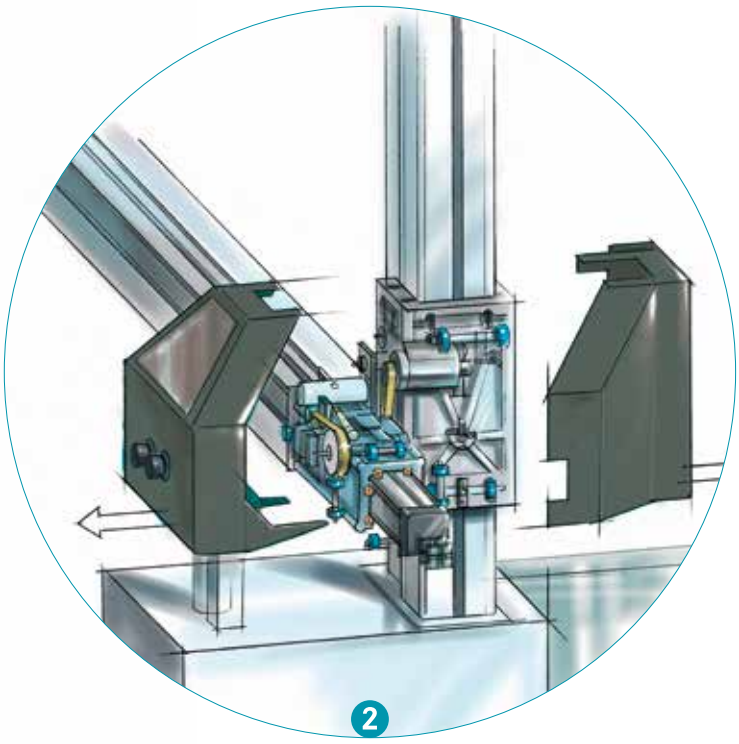
Drive unit
- Collision and Overload protection by means of frictional wheel drive

Pneumatically disengageable drives
- Eliminate undesired heat sources

Encapsulated linear guides
- High precision
- Low sensitivity to contamination
- Long life
- Low Maintenance

Steel band covers
- Steel covers on the X-axis (accessible)
- Stainless steel drive bands
- Optimally self cleaning





Führungssystem Y/Z
- Rapid replacement design providing – minimal down time
- Easily adjustable
- Robust guide elements

Y-arm produced of carbon fibre
- Y-arm produced of carbon fibre

Scale located underneath
- Protects against contamination

WENZEL RAX SERIES

FAST, PRECISE MEASUREMENT OF LARGE COMPONENTS

The RAX is the CNC horizontal arm CMM from WENZEL with the largest measuring volume. The CMM was specially developed for fast and precise measurement of large volume components such as car and commercial vehicle bodies and machine parts. The Z-axis is up to 4,200 mm high. Due to the special design, the measuring range starts directly above the base plate.
For an even larger measuring volume, the RAX can be designed as a duplex system. Typically, the RA series is installed flush with the floor in a foundation for easy accessibility. High rigidity and high precision guides ensure the most accurate measurement results.
The RAX can be equipped with the latest Renishaw sensor systems, such as the PH10M and the stepless PHS, touch-trigger probes and a wide range of optical sensors.

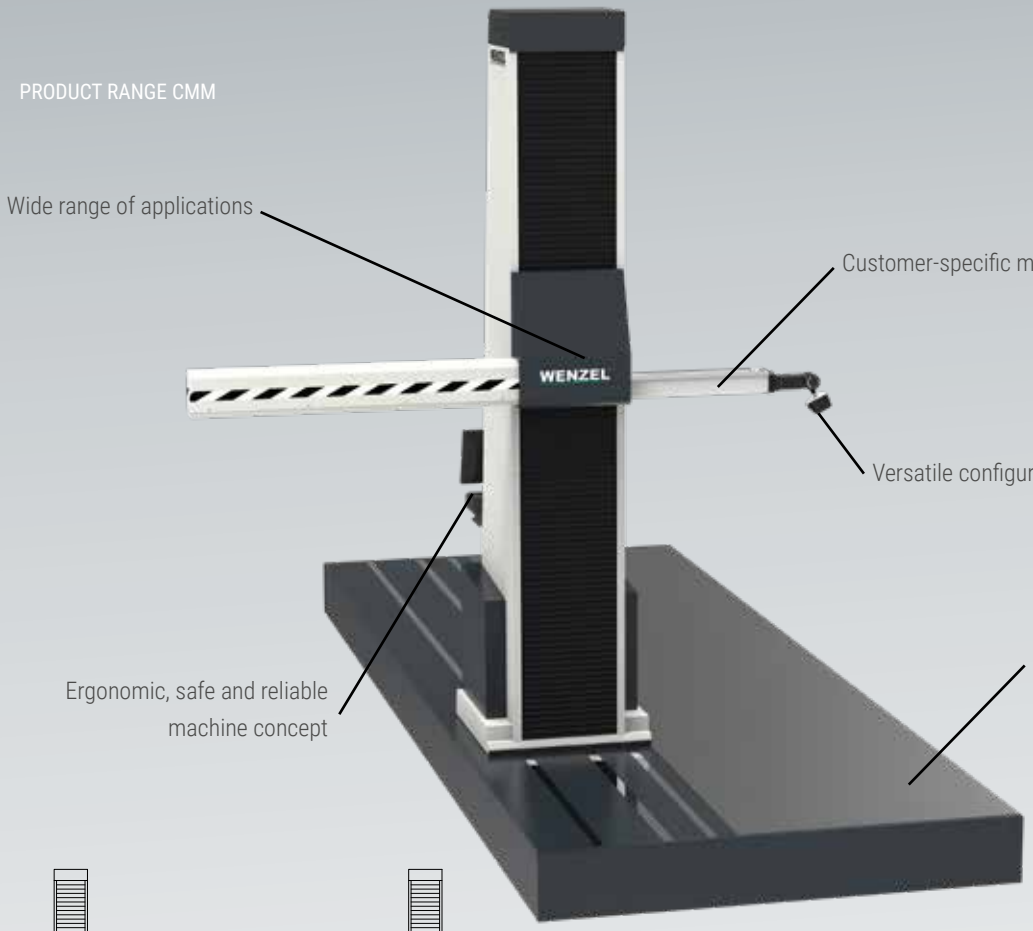
APPLICATION AREAS

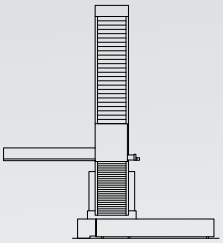
The RAX series is used by many customers worldwide in individual operation or as a multi-column system for measuring and digitizing. The main fields of application are in the following areas: Aerospace, shipbuilding, transport and construction and agricultural machinery. Whether for individual parts or assemblies, the RAX series performs the task at hand quickly and precisely.

Aerospace

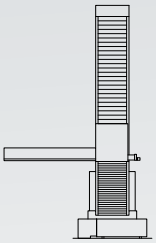
Shipbuilding

Construction machines

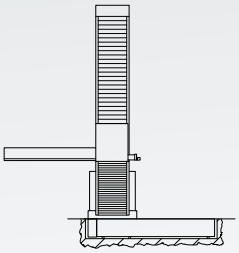




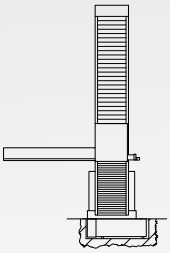
RAX (Simplex, on floor)



RAXF (Simplex, on floor)



RAX (Simplex, flush with floor)



RAXF (Simplex, flush with floor)

Machine, also available as Duplex- or multi-column-system.

MACHINE PROFILE

Measuring volume X-axis	**Custom**
Measuring volume Y-axis	**up to 2000; Duplex up to 3800 mm**
Measuring volume Z-axis	**up to 4200 mm**
Measurement uncertainty	**$E_{L,\,MPE}$ from 18+L/40 ≤ 60 (µm)***

*Depending on machine configuration (Premium, Standard) according to current tech. Datasheets

FEATURES

- **Large measuring range**
  Up to 4200 mm in the Z-axis | Start directly above the base plate | Optimum utilization of the measuring range due to mirror image construction
- **High precision**
  Rigid machine body | Selected linear guides in all axes
- **High flexibility**
  Various system concepts | Various Probes and sensors | Duplex insert possible
- **High measuring performance**
  High dynamics | High speed in combination with safety technology
- **Ergonomics during operation and assembly**
  Control units on wheels | Safety options | Optimum access for loading and operation | Flush with the floor | Free of tripping hazards

SENSORS AND CHANGE RACKS

FOR HORIZONTAL ARM MACHINES

The R series can be equipped with manual, motorized, infinitely variable or indexable probes and swivel heads. These can be combined with an extensive range of touch trigger, scanning and optical 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.

PHS2 servo positioning head

Can be swiveled continuously. Minimum probe calibration efforts. Extensions of up to 750 mm possible.

SP600

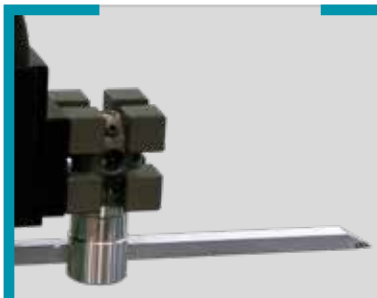
A universal robust probe with scanning functions. Ideal for scanning forms and fine surface details.

TP20

Touch trigger probe. Extremely robust and flexible touch trigger probe with stylus change modules.

Universal mounting head

The mounting head allows the mounting of probe systems and marking tools for all axial directions in a fast, secure and user-friendly way.



Scribing tool

The manual mode of operation of the R series allows the scribing of models in metalworking, mould making, tooling, tooling, etc. and design area.

ACR2 Autochange rack

ACR2 can store up to six probe extensions or probe adaptors. It makes a change of probe extensions or probe adaptors possible so that the measuring tasks do not have to be carried out manually.

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 MCR20

Module change rack enabling automated changing of TP20 stylus modules. The MCR20 module changing rack can store up to six TP20 probe modules for automatic changing under measurement program control.

The pick-up heads and probes shown here are only a small selection from our extensive product range.

For further information please contact your local WENZEL representative.

OPTICAL SENSORS

FOR HORIZONTAL ARM MACHINES

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 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 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 the most accurate and fast measurements in various industrial and application areas.

WM | LS 600

The line width of up to 600 mm makes the WM | LS 600 particularly suitable for especially large components with a low level of detail.

NIKON XC65

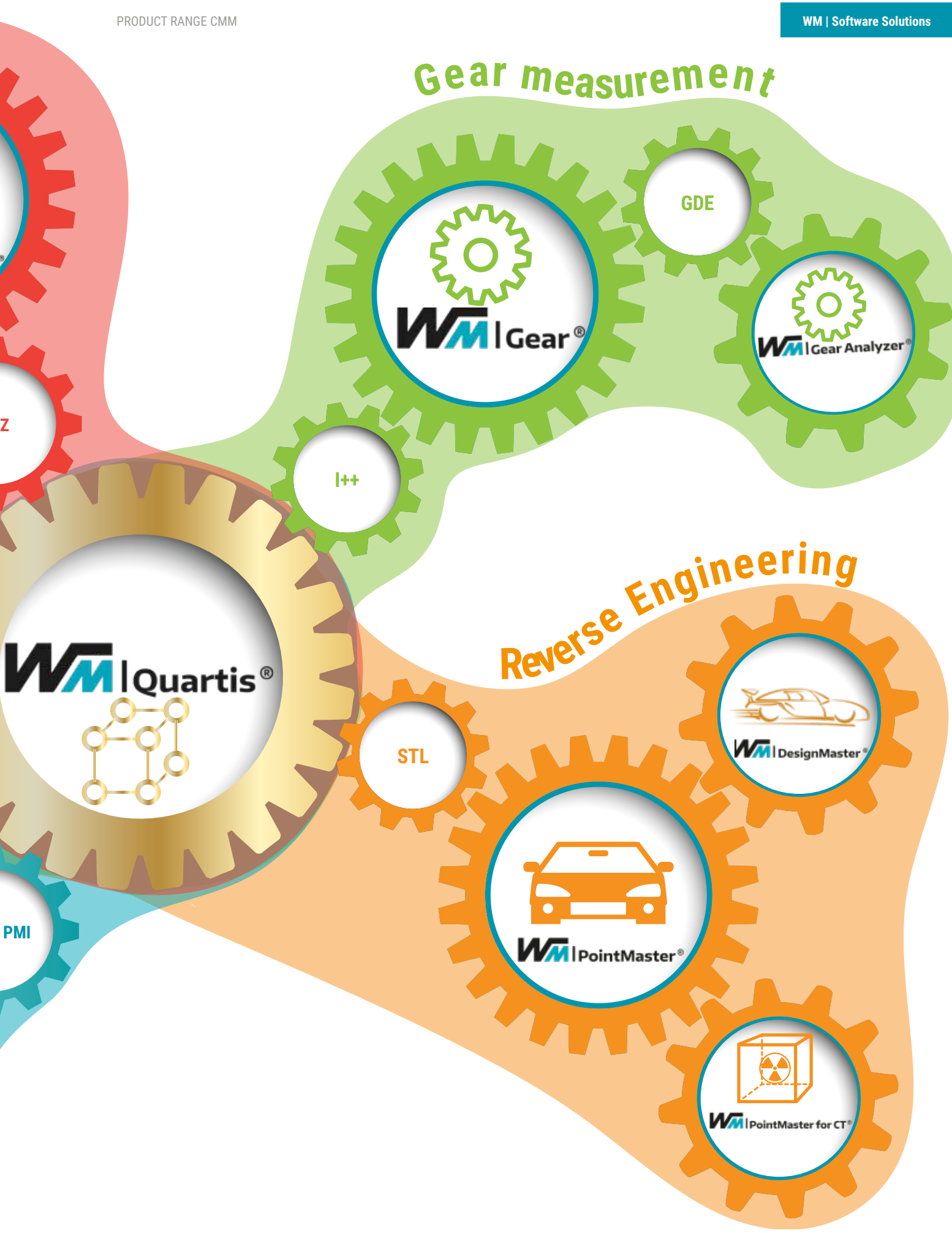
The feature scanner is ideal for gap and flush measurements as well as for applications where a large distance to the component is generally required.

NIKON L100

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


RENISHAW
RENISHAW
PHS-2
WENZEL

WM | Software Solutions®


Gear measurement
GDE
WM | Gear®
WM | Gear Analyzer®
I++
Reverse Engineering
WM | Quartis®
STL
WM | DesignMaster®
WM | PointMaster®
WM | PointMaster for CT®
PMI

ACCESSORIES & OPTIONS

FOR COORDINATE MEASURING 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

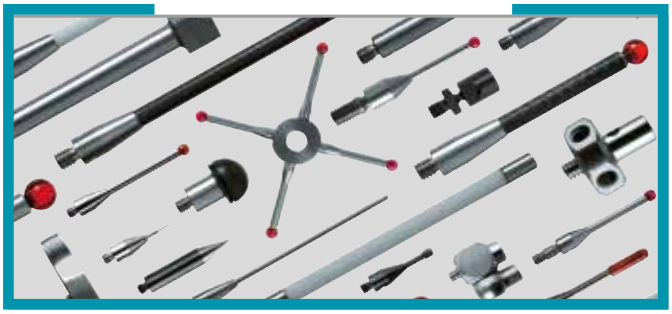
- Wireless control panel HT400RC incl. receiver
- 1 charging cable each 0.5 and 6.0 m
- Charging station and spare battery
- Power supply

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 CMMs IN DETAIL

Guarantors for stable results

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

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

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.

Customer-specific measurement volumes and solutions

One of our strengths are customer-specific designs and individual solutions. Just as the LH machines are also available in particularly long lengths, all axes and design details of the horizontal arm machines can be individually adapted to customer requirements. We advise and support you from project planning to commissioning.

High resolution scales

Accurate positioning thanks to the optimal position measuring system technology
The LH Series is equipped with an incremental measuring system, which has very fine scale pitch, and excellent dirt immunity.

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 10,000 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 600 people worldwide.

YOUR LOCAL CONTACT PERSON

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We are there for you worldwide. You can find our subsidiaries, sales and service partners at **www.wenzel-group.com**.

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SCAN ME