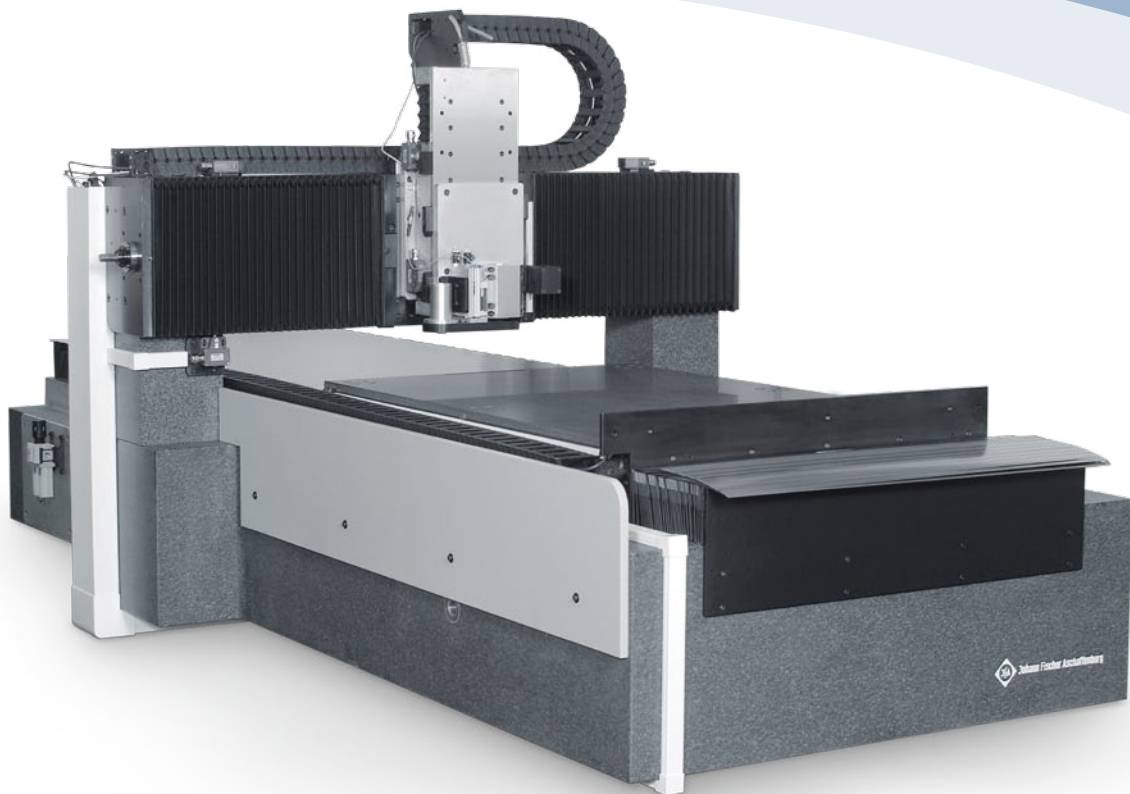




Johann Fischer Aschaffenburg
Präzisionswerk GmbH & Co. KG



› PRODUCT AND SERVICE RANGE



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› **PRECISELY.** SINCE 1929.

TRADITION MEETS FUTURE

› **family business in 4th generation**

Johann Fischer Aschaffenburg Präzisionswerk GmbH & Co. KG – JFA –, a child of the Aschaffenburg measuring tool industry, is today a modern manufacturing and service company with the fields of activity dimensional metrology and precision mechanical engineering.

Founded in 1929 by Johann Fischer and developed into a modern manufacturing company together with his sons, today the 3rd and 4th generation manage the company's fortunes at the Aschaffenburg site – JFA is a classic owner-managed family business of the 'German Mittelstand' brand.



OUR PARTNERS

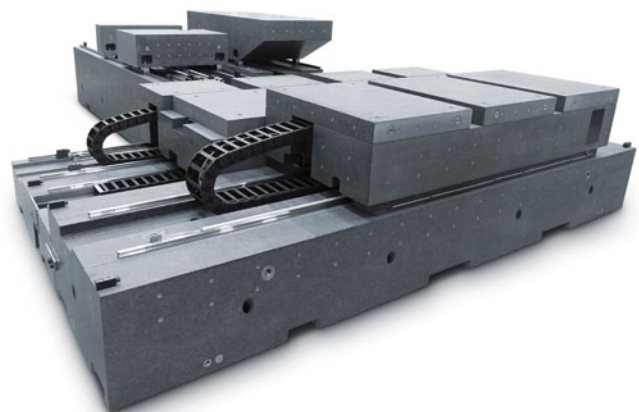
› **from industry and research**

Companies from the precision engineering, semiconductor, laser processing, optical engineering and aerospace industries are among our customers. National and international research institutions are also happy to take advantage of our services. Many customer relationships have been existing for decades. The basis for this has always been a cooperative partnership as well as open and trusting communication.

OUR PRODUCTS AND SERVICES

› **innovative and customized**

Today the design, manufacture, assembly and commissioning of measuring equipment, machine components, precision machine superstructures and special measuring technology made of 'natural hard stone' are the focal points of our range of products and services. Precision machining of difficult-to-machine metallic and ceramic materials as well as calibration and repair services complete the JFA portfolio. The focus is on holistic project support.





OUR PRODUCTION

> from Aschaffenburg to the world

As a child of the Aschaffenburg measuring tool industry, we have always been deeply rooted in our location 'Bayerischer Untermain'. Parallel to the tasks and challenges of our customers, the continuous expansion of our production capacities took place to today's covered area of 7,000 sqm, 1,300 sqm of which are fully air-conditioned.

The machining of workpieces weighing up to 20 tons is carried out on a permanently modernized machine park with surface and guideway grinding machines, CNC drilling, milling and machining centers. Our unique selling point is our high vertical range of manufacture.



Manual finishing in accuracies down to 0.0001 mm as well as the assembly and alignment of components, superstructures, complete systems and guiding systems require constant climatic conditions. With the construction of a fully air-conditioned, 800 sqm lapping and assembly center in 2017, JFA has entered a new dimension.

OUR TEAM

> decades of experience and youthful curiosity

An essential building block of our success are the more than 100 qualified employees, who with their commitment and conscientiousness are the guarantor for the well-known 'JFA-quality'. An important role is also played by our own training department, to which we have attached great importance for generations.

> MILESTONES



Foundation by Johann Fischer. The company's beginnings lay in the production of surface and inspection plates made of cast iron with a fineness and accuracy that had never been achieved before



Resumption of production only a few months after the end of World War II. Expansion of the product range to include prisms and parallel pieces made of cast iron, straight edges and angles 90° made of steel and concentricity test devices



Introduction of the base material '**natural hard stone**' into production. The product portfolio includes among others surface and inspection plates, tailstocks, headstocks, concentricity test devices, length and angle measuring devices

1929

1945

1960

1975

Continuous **expansion** of production areas through the construction of new shed halls and fully air-conditioned measuring and assembly rooms.





JFA celebrates its 90th company anniversary

2019

2017



Construction and commissioning of a fully air-conditioned **800 sqm lapping and assembly center** with floor temperature control, separate storage and shipping areas as well as two 30-ton cranes

2000



Construction of an additional **production hall**, commissioning of several **CNC machining centers** and a guideway grinding machine. Introduction of **new materials** such as various ceramics and composites into the production program.

1988



Accreditation as **calibration laboratory of the 'Deutscher Kalibrierdienst' (DKD)** for straightness deviations, flatness deviations and deviations at angle 90° by the 'Physikalisch-Technische Bundesanstalt Braunschweig' (PTB)

› MEASURING TOOLS

The production of precise measuring instruments is still an integral part of our product range.

Then as now, our experienced employees manufacture the measuring instruments from A to Z as quality products in Aschaffenburg.

What began more than 90 years ago with the cast iron marking plate was subsequently supplemented by a variety of other measuring instruments as the base material 'natural hard stone' was introduced into the production program.

Thanks to its excellent technical properties, JFA today processes only natural hard stone from South Africa for its measuring instruments.



SURFACE AND INSPECTION PLATE MADE OF NATURAL HARD STONE

The precise basis for your measurement tasks

- flatness of top side according to **DIN 876** or to **JFA standard**
- accessories: steel base frames (open or cabinet type), t-guiding- and -clamping slots, threaded inserts, threaded inserts with fitting hole, precisely machined outer sides



WORKING AND LABORATORY TABLE

Air bearing table top according to customer specifications

- table top made of natural hard stone, bearing on air spring elements (vibration isolating from 6 Hertz upwards)
- steel base frames for sitting and standing activity, working height as desired by customer
- accessories: t-guiding- and -clamping slots, threaded inserts, threaded inserts with fitting hole



MEASURING BEAM – STRAIGHT EDGE

For checking straightness and parallelism deviations

- made of natural hard stone – **Diabas**
- **2-sides** precise
- accuracy according to **DIN 874** or **JFA standard**
- 3-sides or 4-sides precise or **lightweight design** on request
- accessories: wooden case for storage, suspension devices



A measurement report is an obligatory part of every JFA measuring tool. On request, you will receive a calibration certificate with traceability to national standards.



SET SQUARE 90° - TRIANGULAR SHAPE

For checking angle 90° deviations

- made of natural hard stone – **Diabas**
- **2-sides, 3-sides** or **4-sides** precise
- accuracy according to **DIN 875** or **JFA standard**
- **lightweight design** on request
- accessories: wooden case for storage, suspension devices



SET SQUARE 90° - QUADRATIC SHAPE

For checking angle 90° deviations

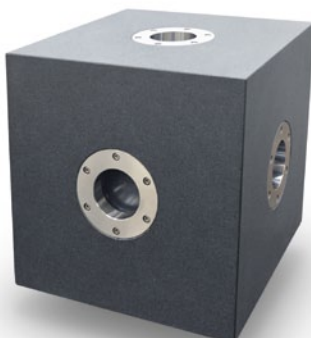
- made of natural hard stone – **Diabas**
- **4-sides, 5-sides** or **6-sides** precise
- accuracy according to **DIN 875** or **JFA standard**
- accessories: wooden case for storage, suspension devices



SET SQUARE 90° - TESTING FRAME

For checking angle 90° deviations

- made of natural hard stone – **Diabas**
- **4-sides, 5-sides** or **6-sides** precise
- accuracy according to **DIN 875** or **JFA standard**
- accessories: wooden case for storage, suspension devices



SET SQUARE 90° - CALIBRATION CUBE

For checking traversing accuracies of machine tools

- made of natural hard stone – **Diabas**
- **4-sides, 5-sides** or **6-sides** precise
- accuracy according to **JFA standard**
- accessories: wooden case for storage, suspension devices, ring gauges, threaded inserts with fitting hole

> MEASURING TOOLS



ROLLER BOOGIES

Precise bearing for concentricity measurements

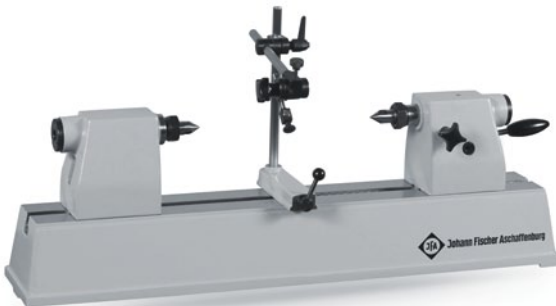
- running accuracy of the (pick-up) rollers: **better 0.002 mm**
- for centerless support of e.g. shafts or cylinders
- demand specific design
- also available as floating or height-adjustable versions as well as gauge block roller boogies



PAIR OF TAILSTOCKS

For precise clamping of workpieces between centers

- height and lateral parity up to **0.002 mm**
- one tailstock with rigid quill, one tailstock with axially adjustable quill, quill adjustment optionally with hand lever or handwheel



CONCENTRICITY TEST DEVICE

For precise clamping of workpieces between centers

- height and lateral running accuracy of the (pick-up) rollers: up to **0.002 mm**
- test bench optionally made of special cast iron or natural hard stone



MEASURING STAND LL – AIR BEARING

For straightness and parallelism control of horizontal and vertical surfaces

- virtually wear-free air bearing guide with vacuum preload
- guidance on horizontal and vertical accurate surfaces of e.g. surface and inspection plates or measuring beams
- running accuracy dependent on the accuracy of the guide surfaces

› COMPONENTS / ASSEMBLIES / SYSTEMS

Thanks to the high level of consulting, design and manufacturing expertise, JFA has built up a reputation over the decades as a reliable and high-performance partner for the implementation of innovative, customer-specific solutions for precision mechanical engineering and applications in ultra-precision technology.

From **machine components** to complex **assemblies** and **special designs** to ready-to-plug-in **systems**, our team designs, manufactures and assembles the optimum solution for your requirements, drawing on its many years of experience.



ADJUSTING DEVICE FOR THE ALIGNMENT OF GUIDE RAILS

Base body with eccentric clamping elements and hardened steel stop bars for alignment

- accuracy: **better 0.002 mm**
- dimensions: ca. 1,000 x 300 x 60 mm
- weight: ca. 70 kg



STRUCTURE 4-PART FOR OPTICAL APPLICATIONS

With finely machined joining surfaces for a very stable screw connection

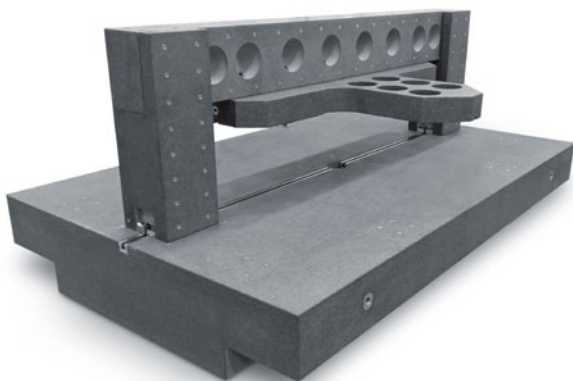
- flatness, parallelism and rectangularity: **better 0.010 mm**
- dimensions: ca. 2,200 x 900 x 1,300 mm
- weight: ca. 1,150 kg



STRUCTURE FOR A MEASURING AND ADJUSTING DEVICE

4-part design with guide surfaces for air bearings

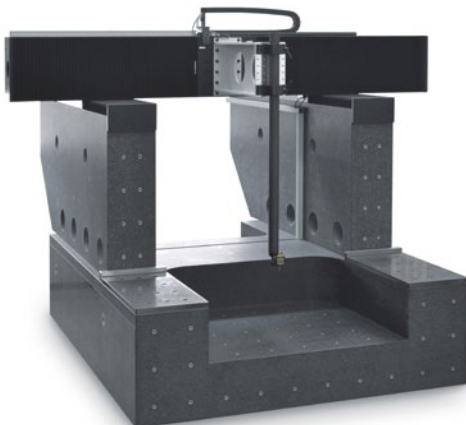
- flatness base plate in air bearing area: **0.001 mm**
- flatness and parallelism cover plate to base plate: **better 0.005 mm**
- dimensions: ca. 2,000 x 1,600 x 1,250 mm
- weight: ca. 5,300 kg



MEASUREMENT SETUP FOR ALIGNMENT AND CALIBRATION OF LINEAR AXES AND XY CROSS TABLES

Gantry columns with air support system in the stands for easy manual handling

- flatness base plate: **better 0.004 mm**
- with longitudinal t-guiding- and clamping slot made of steel
- dimensions: ca. 2,800 x 1,800 x 1,200 mm
- weight: ca. 8,000 kg

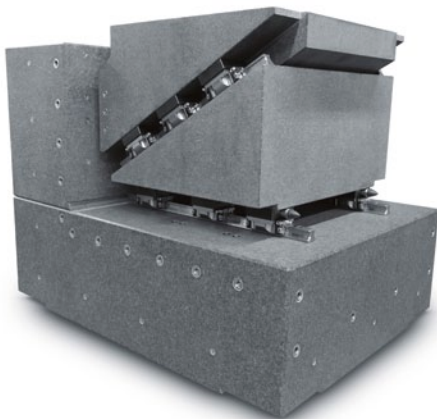


MEASUREMENT SETUP FOR THE TESTING OF SWIVEL ROTARY TABLES

With X/Y axis on roller bearings and spindle drive

- running accuracy: **better 0.003 mm / 1,000 mm**
- dimensions: ca. 3,200 x 3,000 x 2,200 mm
- weight: ca. 12,650 kg

› COMPONENTS / ASSEMBLIES / SYSTEMS



WEDGE LIFTING UNIT FOR BEAMLINE APPLICATIONS

Roller bearing with spindle drive

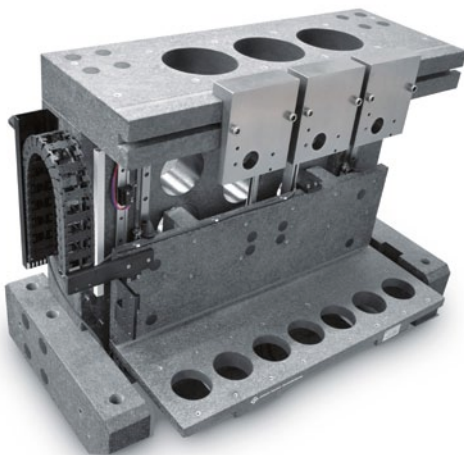
- system accuracy: **better 0.002 mm**
- vertical stroke: +/- 30 mm
- dimensions: ca. 550 x 505 x 420 mm
- weight: ca. 900 kg



REFERENCE MASS WITH AIR SPRING BEARING – VIBRATION ISOLATING AND SELF-LEVELING

With 450 threaded inserts

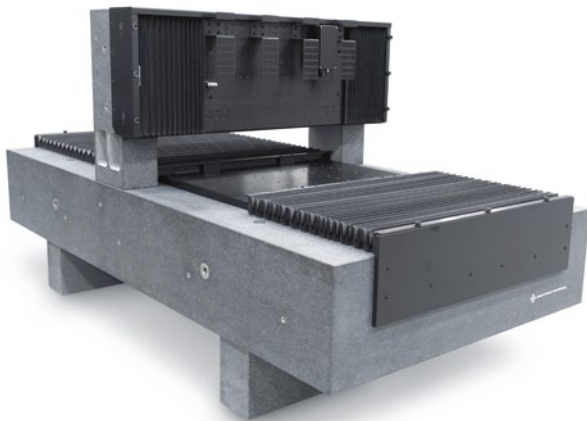
- flatness and rectangularity: **better 0.005 mm**
- dimensions: ca. 1,300 x 1,300 x 1,000 mm
- weight: ca. 5,150 kg



GANTRY STRUCTURE 8-PART FOR INDUSTRIAL 3D PRINTING

With precision clamping system for three laser heads

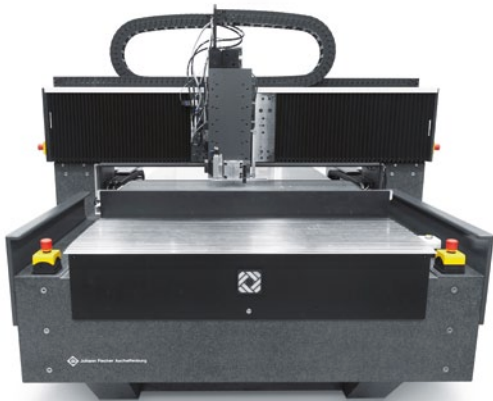
- vertical stroke of lifting table: 300 mm
- flatness, parallelism and rectangularity of the functional surfaces: **0.002 mm**
- dimensions: 950 x 550 mm
- weight: ca. 450 kg



MACHINE SETUP FOR A LASER CUTTING SYSTEM

Workpiece and tool slides (X, Y) with air bearings and linear drive

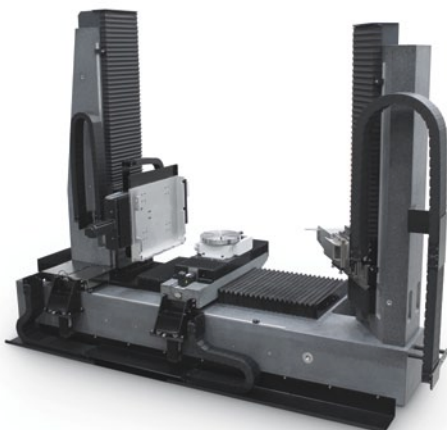
- running accuracy X-slide: **better 0.004 mm**
- running accuracy Y-slide: **better 0.002 mm**
- dimensions: 3,000 x 1,570 x 1,675 mm
- weight: ca. 7,900 kg



MACHINE SETUP FOR MICROMACHINING

Vacuum clamping table with vacuum holes directly drilled into the natural hard stone

- vacuum clamping table size: 1,300 x 1,100 mm
- vacuum clamping holes diameter: **less than 1 mm**
- system accuracy: **better 0.003 mm**
- application areas: e.g. **laser machining, fine milling**



MANIPULATION SYSTEM FOR INDUSTRIAL CT APPLICATIONS

Precise complete system with high repeat accuracy

- modular structure
- base and vertical columns made of natural hard stone
- high inherent stability, good vibration damping and low thermal expansion
- dimensions: 4,000 x 1,600 x 2,900 mm
- system accuracy: **better 0.005 mm**

› NATURAL HARD STONE IN PRECISION MECHANICAL ENGINEERING

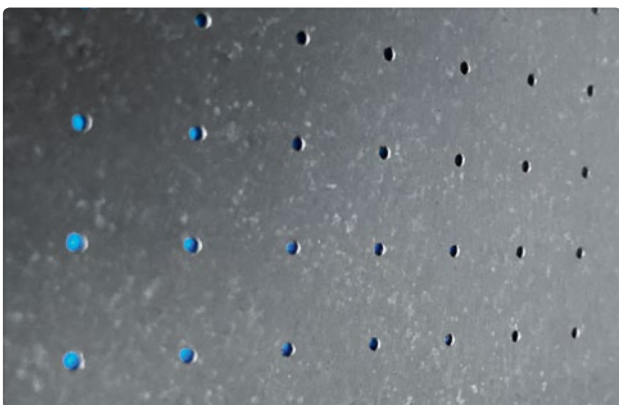
Stability, dynamics, accuracy and sustainability – these are the core requirements that precision mechanical engineering places on increasingly complex machine concepts today.

The material '**natural hard stone**' has proven itself for these requirements for technical and commercial reasons.

Natural hard stone Base material with excellent properties

- › **ultra-precise surfaces with low flatness deviation manufacturable**
- › **very good economic machinability**
- › **factually no residual stress > important for high accuracy and geometry consistency**
- › **low specific weight with high e-module and low thermal expansion**
- › **good damping properties**
- › **hard, low stress, aging resistant, non-rusting, anti-magnetic, eco-friendly**

density (kg/dm ³)	2.9 – 3.0
e-module (N/mm ²)	0.9 – 1.0 x 10 ⁵
compression strength (N/mm ²)	300
bending strength (N/mm ²)	15 – 35
material damping (10 ³ kg/ms)	0.025
thermal expansion (mm/mm x K)	5.5 – 6.5 x 10 ⁻⁶
thermal conductivity (W/m x K)	1.7
thermal capacity (kJ/kg x K)	0.85
hardness	5,7 – 6,6 (Mohs)
magnetic permeability	< 1.01
water absorption (percent by weight)	0.02 – 0.08
friction value (stone on stone, dry)	0.15 (static friction) 0.12 (dynamic friction)



GUIDANCE SYSTEMS <

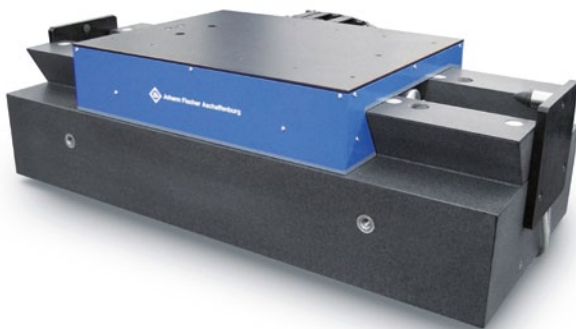
Three guidance systems are particularly suitable for use in conjunction with the base material natural hard stone.

We will be happy to advise you on the selection and constructive design of the appropriate guide system. Our range of services also includes assembly and μ -accurate alignment including documentation of the running accuracies.



ROLLER BEARING GUIDANCE

- ✓ very proven design with high operational reliability
- ✓ high level of standardization
- ✓ integrable into many assemblies with little design effort
- ✓ good price-performance ratio



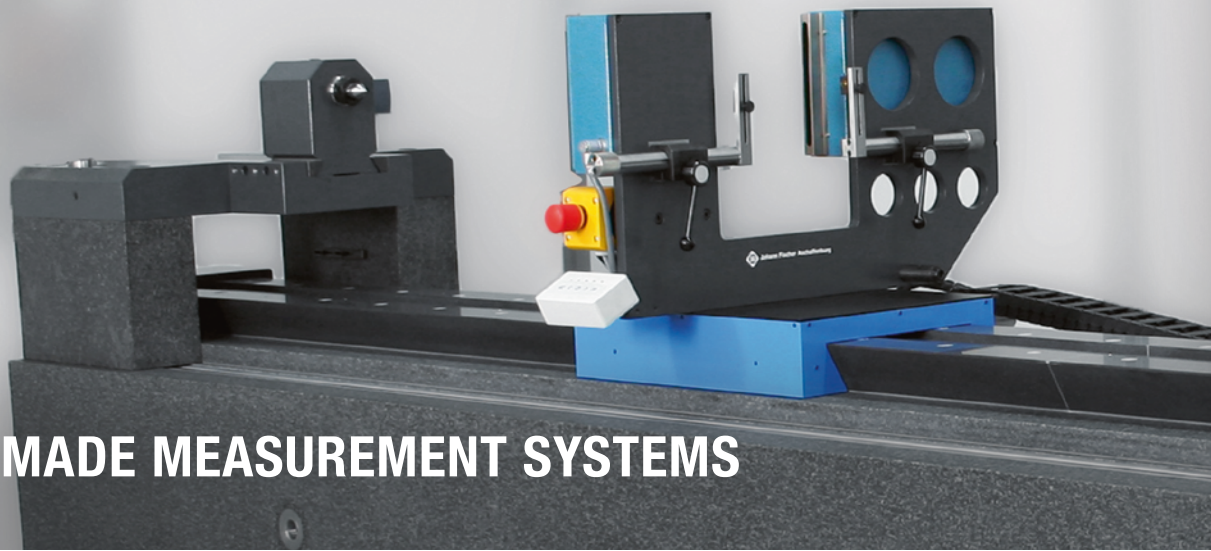
AEROSTATIC GUIDANCE

- ✓ very precise running accuracies
- ✓ high accelerations and speeds feasible
- ✓ good damping capacity
- ✓ friction and wear-free
- ✓ cleanroom suitability



HYDROSTATIC GUIDANCE

- ✓ friction and wear-free
- ✓ high static and dynamic stiffness
- ✓ no stick-slip effect
- ✓ highest running accuracy



› TAILOR-MADE MEASUREMENT SYSTEMS

Customized measuring equipment from JFA

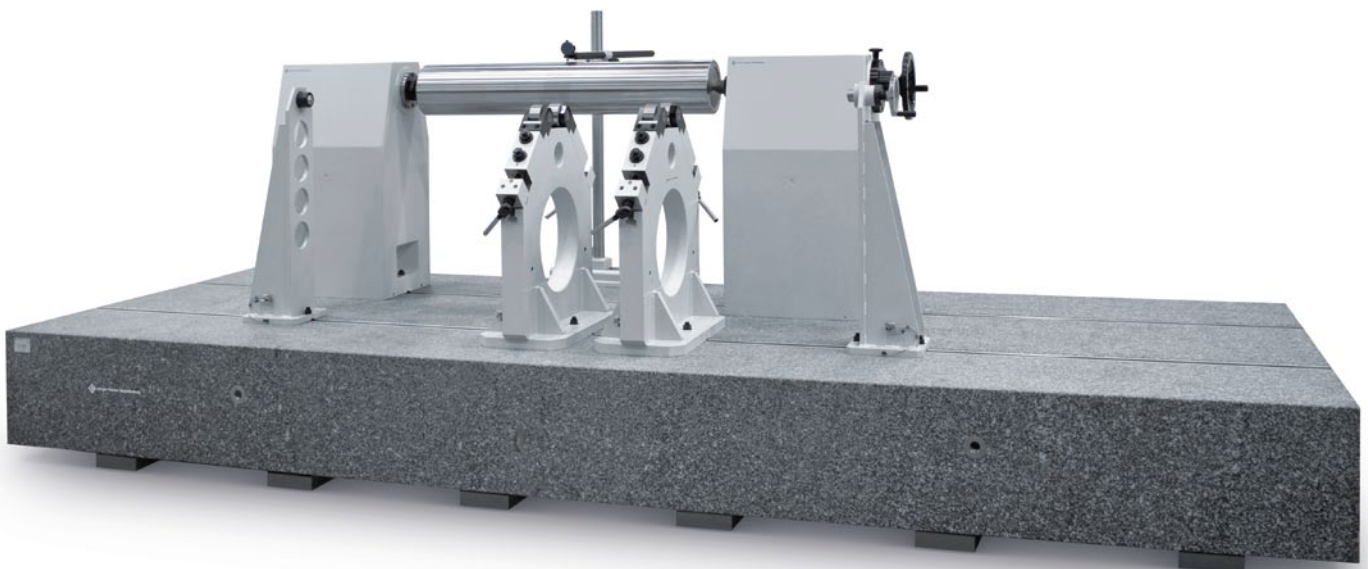
Efficiency, accuracies in the 0.001 mm range and consistently high quality are the requirements placed on workpieces. In order to be able to guarantee these, constant checks before, during and after production are indispensable.

The measuring tasks are just as different as the workpieces themselves. For more than 90 years, JFA has been supplying customized measuring equipment with a convincing price-performance ratio. We offer you holistic service from planning, design and manufacturing to assembly and commissioning.

CONCENTRICITY TEST DEVICE FOR THE PRECISE MEASUREMENT OF LARGE-VOLUME ROTATIONALLY SYMMETRICAL WORKPIECES

Workpiece pickup centerless and between centers

- precision roller boogies with gauges and tailstocks: axle height 1,000 mm
- precision roller boogies with gauges and tailstocks with air support system in the stands for easy and low-wear positioning
- base plate made of natural hard stone with two t-guiding- and clamping slots made of steel
- base plate dimensions: 5,500 x 2,000 x 500 mm

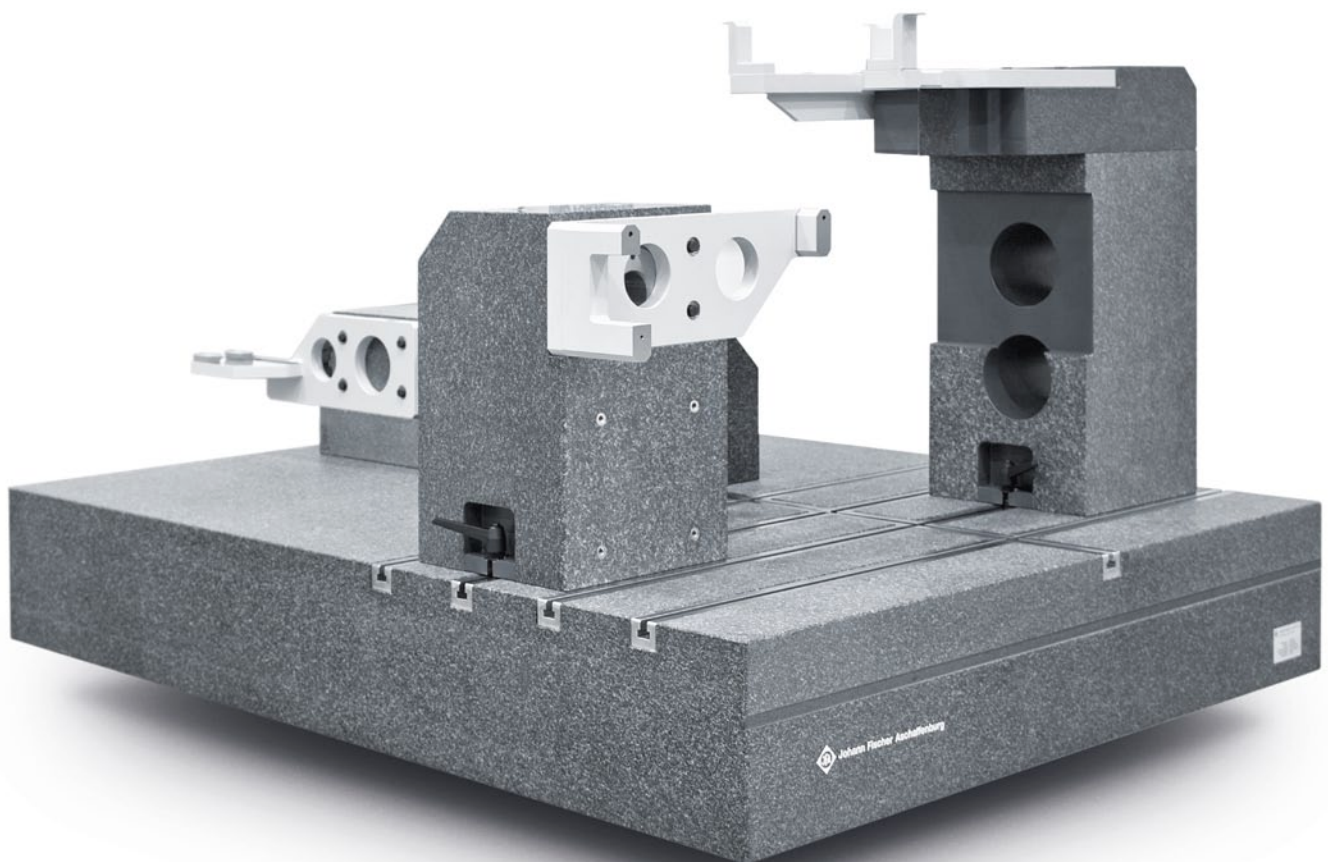


TAILOR-MADE MEASUREMENT SYSTEMS <

MEASURING STATION WITH AIR BEARING CALIBRATION AND ADJUSTMENT STANDARDS

For calibration of different gauges

- multi-part assembly made of natural hard stone and steel components
- base plate with t-guiding- and clamping slots made of steel
- calibration and adjustment standards with air support system in the stands for easy and low-wear positioning
- with individually manufactured steel parts for the precise fitting and positioning of gauges
- dimensions: 2,000 x 1,500 x 1,875 mm





› TAILOR-MADE MEASUREMENT SYSTEMS



MULTI-POSITION MEASURING STATION WITH 2 MEASURING SLIDES AND 2 SETTING STANDARDS

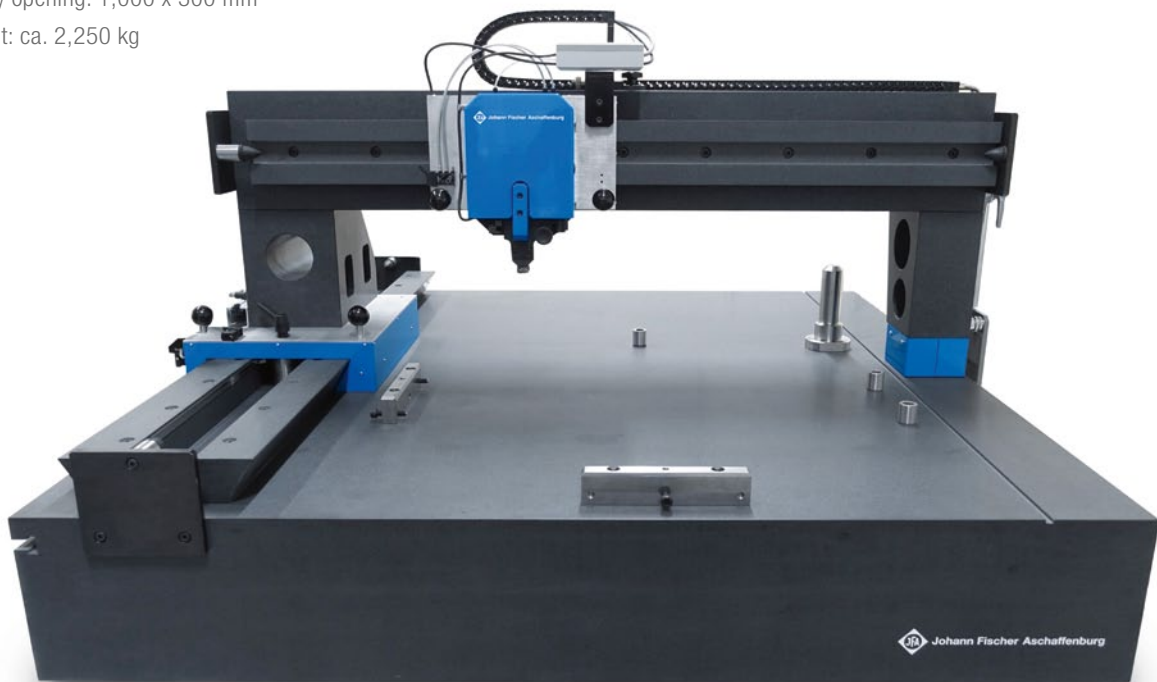
Each measuring slide with 13 adjustable measuring sensor holders

- running accuracy of the measuring slides: **better 0.01 mm** / 5,000 mm
- setting standards with hardened reference surfaces for different workpieces
- angle and dimensional accuracy: **better 0.004 mm**
- overall dimensions: 6,000 x 800 x 900 mm
- total weight: ca. 7,800 kg

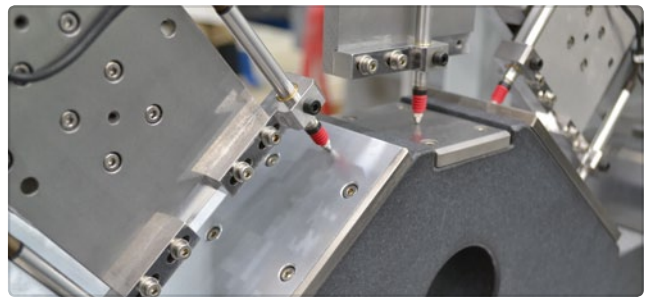
GANTRY SETUP FOR HEIGHT, FLATNESS AND PARALLELISM MEASUREMENTS

With dovetail air bearing guides for high guide stability and ease of movement

- gantry running accuracy: **better 0.002 mm**
- dimensions: ca. 1,600 x 1,600 mm
- gantry opening: 1,000 x 300 mm
- weight: ca. 2,250 kg



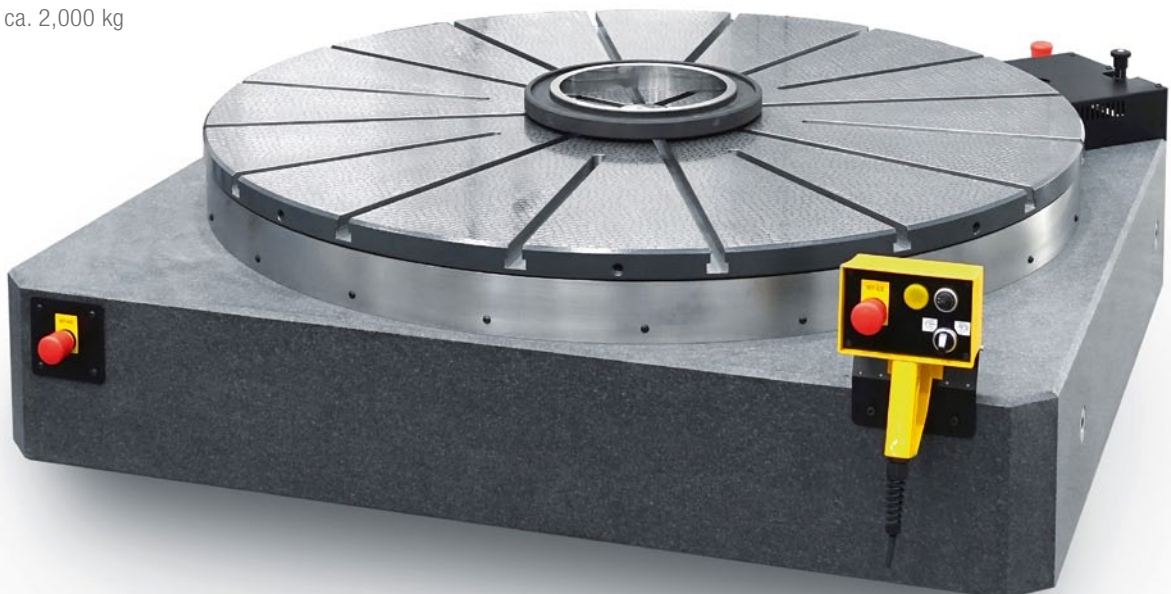
TAILOR-MADE MEASUREMENT SYSTEMS <



ROTARY TABLE RT 1300-M

For axial and radial runout measurements on large rotationally symmetrical workpieces

- diameter: 1,300 mm
- accuracy: **better 0.010 mm**
- 16 t-slots – nominal size 18 mm H12
- center hole \varnothing 32 mm H7
- motorized friction wheel drive
- option: stand column with horizontally and vertically adjustable cross arm
- dimensions: ca. 1,400 x 1,400 x 700 mm
- weight: ca. 2,000 kg



› PRECISION MACHINING OF NEW MATERIALS

In addition to natural hard stone, we also focus on the **precision machining of new materials**, the use of which is of increasing importance due to new technologies and processing techniques.

We have consistently expanded our knowledge in the machine and manual precision machining of materials such as **aluminium oxide**, **SiC**, **SiSiC**, **glass ceramics** and **special steels** such as **Invar** and **titanium**, and have the necessary machining technologies to reliably meet the specified requirements.

In addition, we also offer:

- comprehensive technical consulting for material selection
- machining of large volume workpieces
- clean room environments according to ISO class 5
- ultrasonic cleaning system with effective size of 1,700 x 1,000 x 800 mm

CAMERA GRID MADE OF CARBON REINFORCED SILICON CARBIDE

Use in the LSST camera – largest digital camera in the world

- with 75 ball cups of equal height for precise recording of the CCD sensors
- equality of height of the ball cups: **0.002 mm**
- processing steps: diamond milling, grinding, lapping, polishing
- dimensions: 850 x 830 x 185 mm
- used at the Vera C. Rubin Observatory, Chile



CONTRACT MANUFACTURING <



μ-PRECISE MACHINING

Drilling, milling, surface and guideway grinding



μ-PRECISE MANUAL MACHINING

Scrapping, lapping, polishing – all manual processes that must be reliably mastered in order to achieve final accuracies in the 0.0001 mm range.



μ-PRECISE (CLEAN ROOM) ASSEMBLY

We are also happy to provide assembly services such as the assembly and alignment of linear guides and complete slide units with the associated documentation of the accuracies and running accuracies.



μ-PRECISE (CLEAN ROOM) ALIGNMENT

Manual optimization of the accuracies on your workpieces is performed in a climate-controlled environment by our experienced staff. For particularly demanding tasks, clean room environments according to ISO class 5 and an ultrasonic cleaning system are available.



DIVERSE RANGE OF MATERIALS

- natural hard stone
- ceramics (Al_2O_3 , SiC, SiSiC, ZrO_2 , AlN, Si_3N_4)
- glass, glass ceramic
- steel, stainless steel, Invar, casting, mineral casting
- aluminium, composites (CFC, GRP)



CLEAN

The professional liquid cleaner

For cleaning and care of

- > **SURFACE AND INSPECTION PLATES**
- > **MEASURING STANDARDS**
- > **MACHINE COMPONENTS**

made of natural hard stone



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