

The High-Precision Universal Measuring Machine for
Tool Manufacturing and Grinding Facilities

ZOLLER
expect great measures

genius



Tool Quality – Automatic and Precise

As a tool manufacturer or grinding operation, you are expected to deliver excellent quality. Universal measuring machines in the »genius« series use precise measurement data to deliver unmistakable proof of the excellent production quality offered by your grinding machines.

Prevent complaints and offer your customers perfectly documented quality. The »genius« series of measuring machines check your tools through a fully automatic process using precise measuring technology and comprehensive measuring programs.

»genius« means simple operation and excellent future reliability. Whether you are simulating future measurement processes, networking your production or want to exchange tool data with CNC grinding centers: »genius« makes quality assurance ingeniously simple.

»genius«



04 QUALITY & ERGONOMICS

18 DIGITIZATION & AUTOMATION

28 SERVICE & DATA



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Witold Hutka, Measuring Machine Assembly Technician at ZOLLER

“Every »genius« is a Promise”

“For me, assembling each and every »genius« is a personal project through which I renew ZOLLER's quality promise to our customers.

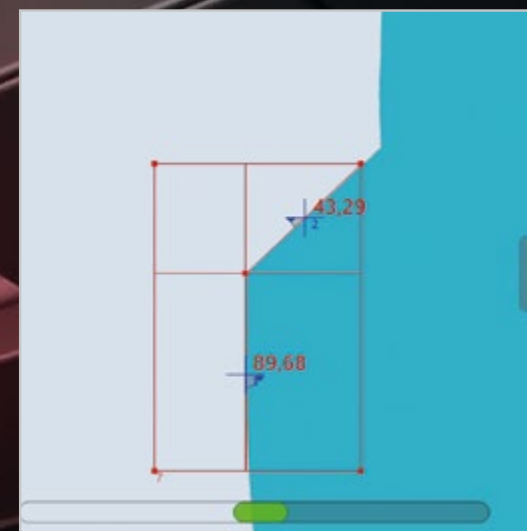
As an assembly technician, I know every machine element and every screw. Every component that makes a »genius« so amazingly precise and versatile passes through my hands. And I know from years of assembly experience why the construction of the »genius« is so unbelievably solid.

That's why I can assure you: When you buy a »genius«, you will get a machine that will impress for its precision and long service life.”

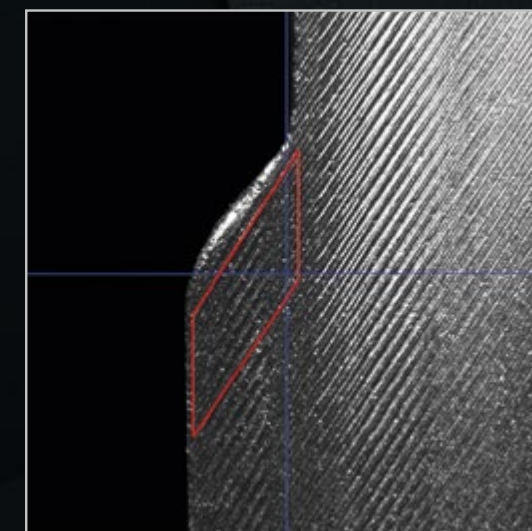
Measuring Technology for Surfaces and Edges

With »genius«, you can complete measurements in incident light and transmitted light with no contact. Utilize multi-sensor technology, regardless of surface compound angle. LED ring lights deliver the ideal illumination for inspecting the face, circumference and flute for any tool.

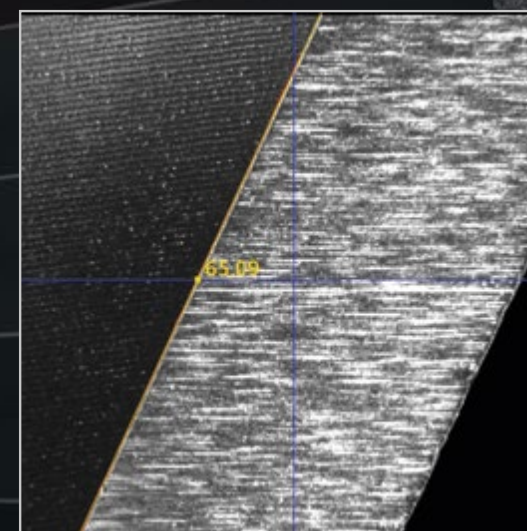
With a ZOLLER »genius« measuring machine, you can measure almost any feature of the tool, no matter how complex it is.



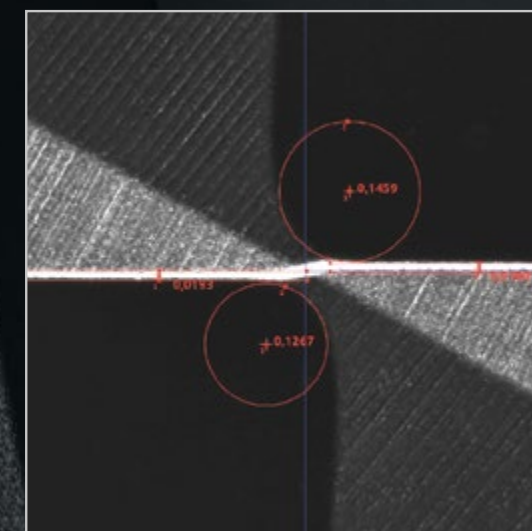
Transmitted light measurement in the profile.



Contour measurement in the flute



Incident light measurement on the circumference



Incident light measurement on the face

Success in Precision

A tool measuring machine is only truly outstanding if it can make its unique precision available to everyone. With a ZOLLER »genius«, any operator can easily achieve the best results right from the start – with consistent support from high-performing software, smart ergonomic elements and comprehensive automatic functions.

Sliding Door with Handle

Keeps external influences like dirt or external light out reliably during measurement, is designed to save space and available as an automated version.

Ergonomic Single-Hand Operating Device »eQ« (ergonomic & quick)

For manual operation of measurement axes in the X, Y and Z directions. The button with the solution symbol can be individually configured with other practical functions, such as tool clamping. This makes operation even simpler.

Transmitted Light Camera with Multi-LED Lighting

Industrial digital camera with high-quality, low-distortion optic and telecentric transmitted light for measuring cutting edge contours precisely down to the μm , as well as step geometry in the silhouette at up to 5 MPx. Multi-LED ring light for bright, high-contrast illumination of the cutting edge and inspection in incident light.

Incident Light Camera with Multi-LED Lighting

For inspection and measurement of tool geometries on the circumference, in the flute and on the face. Simply enter the target parameter into the measuring program dialog box and every variable is measured and logged automatically: Rake angle, clearance angle, flute form and chamfer width. The eight high-power LEDs can be controlled separately, and provide optimal illumination of the cutting edges with the help of automatic intensity regulation.

Convenient Membrane Keypad

Dust and dirt-resistant, impresses with a comfortable feel and ensures easy operation, even under workshop conditions.

Fully Automatic Swiveling Multisensor Optic Carrier »orthoScan«

The optic carrier on the »threadCheck« swivels. This allows cutting edge geometries on helical cutting tools such as taps to be measured without distortion.

Separate Electronics

Detaches electronic heat sources from the measuring process and provides optimal access for maintenance.

»pilot 4.0« Measuring Machine Software

Simple and clear, independent of the operator for reliable measurements. User-specific widgets for customized experience. More information is available from our ZOLLER Software Solutions brochure or at: www.zoller.info/pdf/Software-Solutions-EN

»ace« High-precision Spindle

Micron accuracy for loading and clamping all types of cutting tools. Can be adapted to many different tool holder systems.

»cockpit« Control Unit

Offers comfort and good ergonomics to operators thanks to individual adjustment options. The »cockpit« is height adjustable, and the monitor can be tilted.

Storage Options

Standard integrated pockets for 16 collets and two tool holders inside the machine. Optional rack for three adapters on the exterior.

Certified by Experts

Every »genius« device is inspected in accordance with IEC 61010-1:2010. That means you receive verifiable, certified product safety.



C US

ZOLLER »ace« High-precision Spindle (All-clamping Element)

The ball cage allows any tool holder to be clamped without play and with micron-precision. Round as well as unibody tools can be inserted and power clamped, ensuring precise and repeatable measurements.



Further Highlights of the ZOLLER »ace« High-precision Spindle

- **Power-activated tool clamp** – consistent, independent of the individual user.
- **Tool post with integrated calibration spheres** for simple, fast and exact determining of the spindle zero point.
- **Fast tool post exchange** in less than 10 seconds.
- **High changeover accuracy** of attachment holders – better than 1 µm.
- **High concentricity and axial runout precision of the spindle** – better than 2 µm.
- **Spindle brake** for pneumatic positioning of the spindle in the desired position over the entire 360°, for example to adjust the tool.
- **Spindle indexing** for defined positioning of the tool position in 4 × 90°, can be carried out using the membrane keypad.



Hydro-expansion cylinder D32 with interchangeable bushings D3 to D25mm and D1/8" to D1"



HSK 25 to HSK 125



SK 25 to SK 60 steep taper



Coromant-Capto from C3 to C10



Collet chuck adapter Babychuck D 32



Reversible cutting plate D32



Internal and external 2-jaw gripper



Tool holder fixture D32 mm with calibration edge

Eject Tool Holder Power Clamping Spindle Brake Spindle Indexing

Membrane Keypad to Control Pneumatic Functions

EJECT



CLAMP



BRAKE



INDEX



Never Miss a Measurement – The »expert« Measuring Program

»expert« is the specialist for measuring precision tools. The measurement program generates the optimal measuring procedure based on selected parameters. The program is fully automatic, repeatable, and with photo-realistic parameter selection.

Simply select and confirm the parameters to be measured and start the measuring procedure. »expert« guarantees that »genius« measures each and every detail of the tool.

The screenshot displays the 'expert' measuring program interface, which is divided into several functional areas:

- Live camera image of the tool:** A large window on the left showing a real-time video feed of the tool being measured, with a red rectangular measuring window overlaid.
- Measuring window:** A smaller window within the live image, showing a red rectangle and yellow dots indicating the measurement area.
- Current position of the CNC axes:** A panel on the bottom left showing the current coordinates for the Z, X, C, Y, and B axes. The values are: Z: 77.157, X: -54.229, C: 354.511, Y: 5.150, B: 0.011.
- 2D cutter shape:** A small circular diagram on the bottom left showing the 2D profile of the tool.
- Parameter selection and settings:** A central panel with fields for 'Adp.no.' (1), 'Identity number', 'Designation', and various measurement parameters (Z, X, Radius nominal, Angle 1 nom., Angle 2 nom.) with units (R, A, G, UT, LT). It also includes tabs for 'Default settings', 'Advanced', and 'Illumination'.
- Navigation display:** A panel on the right showing a 'Virtual joystick to align and position the cameras'.
- Function buttons with self-explanatory icons:** A row of buttons at the bottom, including F1 (checkmark), F2 (AUTO), F3 (sun icon), F4 (sun icon), F5, F6, F7, F8, F9, F10, F11, F12 (X icon), and a 'Help' button.
- Widgets and Additional information:** A panel on the far right showing '2D Measurement' (ok) and 'Radial rake angle' (active) with corresponding icons.

»genius«

Measures Standard Tools Down to the Micron

ZOLLER »genius« is the universal measuring machine for cutting tools. From quickly inspecting individual criteria to fully automatic and user-independent complete inspections, »genius« checks your tools quickly, simply and with maximum precision. Your measuring results are documented in detail and can be transferred to grinding machines at the touch of a button. The high precision offered by »genius« is tested in accordance with ISO 17025.

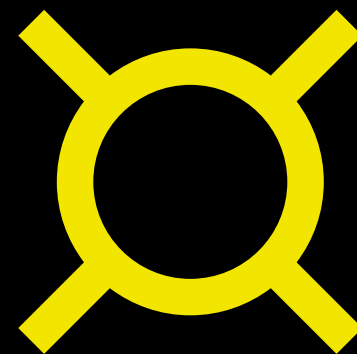
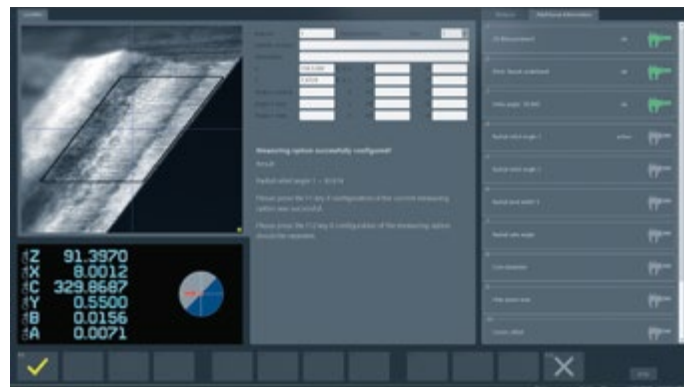
Perfect Lighting

With 8x segmented, automatically adjustable LED ring lights, the optimal lighting situation for any measurement is always available. This guarantees absolute precision and repeatability.



Ideal Support

You don't need advance knowledge or professional expertise to comprehensively measure tools, just the universal measuring program 800 »expert«. You choose the parameters to measure – and »pilot 4.0« handles the rest.



Simple –
user-independent, perfect results

Precise –
measure geometries exactly down to the μm

Innovative –
the next generation of the proven »genius«

genius

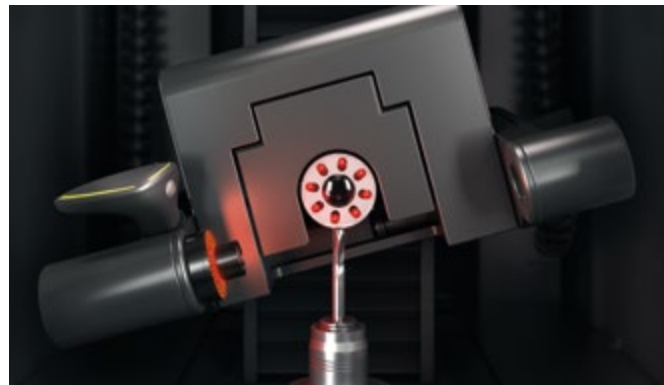
»threadCheck«

Measures Geometries of Threading Tools

Where common measuring technologies meet their limits, the »threadCheck« measuring machine from ZOLLER truly shines. Thanks to its six CNC axes and the swiveling multi-sensor optic carrier »orthoScan«, not only can you measure all kinds of cutting tools with absolute speed and precision, you can also measure threaded cutting tools to the μm and without distortion.

Swiveling Optic Carrier »orthoScan«

The swiveling multi-sensor optic carrier »orthoScan« always finds the perfect angle for viewing each tool. This ensures distortion-free measurements, precise down to the μm even for threaded cutting tools.

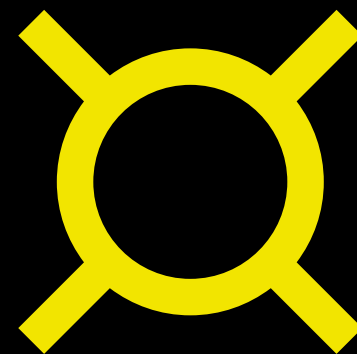


Measure without Programming: Thread Measuring Module

With the ZOLLER thread measurement program for metric ISO, ANSI and Whitworth pipe threads, any parameter on tap drills, cutters, and shapers can be measured and logged with or without spiralization in a fully automatic process.



Z	124.5576
X	4.0307
C	320.0961
Y	-0.0019
B	0.0156
A	1.2500



Distortion-free –
precise results for threading tools

Universal –
suitable for a large number of cutting tools

Fully automatic –
six CNC axes for any positioning task

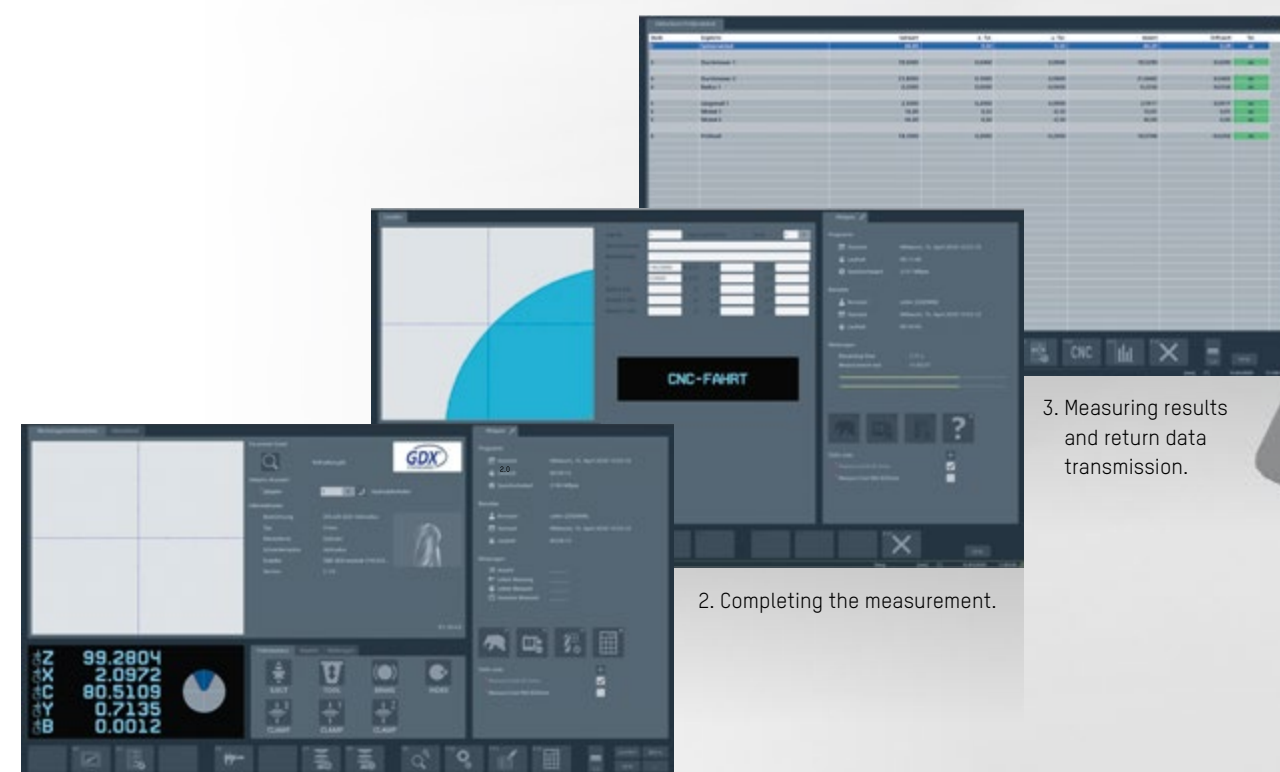
threadCheck

Digitized Measurement Data – Process Optimization with ZOLLER

There is an increasing demand placed on tool grinding and sharpening for cutting tool manufacturers. Traceability and process security are becoming the standard. With ZOLLER, you can handle these challenges with ease.

ZOLLER interfaces ensure smooth processes by opening up all new options for saving money and improving productivity: The grinding program is used to generate the base data for the measuring device, and the fully automatic ZOLLER measuring sequence is generated from it at the same time. Depending on the type of interface used, the measured data is transferred back to the programming system or the grinding machine and the grinding program is temporarily corrected.

This reduces programming effort and machine downtimes to a minimum. You save time and costs – and avoid errors in data input when creating a new grinding program, since the software is user-independent.



1. Access the interface and loading of target data.

2. Completing the measurement.

3. Measuring results and return data transmission.

ZOLLER offers the corresponding interface to almost all systems involved in the grinding process, for example GDX, NUMROTO, Anca, MTS, and many more. From »genius« to »smartCheck« or »smile«: all ZOLLER devices can transmit actual/target tool data in a paperless process (depending on the scope of service/measurement).



ZOLLER measuring machines communicate with grinding machines from many different manufacturers.



Measuring Technology 4.0 – Networked and Precise to the μm

Networking unleashes the potential of measurement data precise to the μm from ZOLLER measuring machines. ZOLLER has developed networking options and interfaces for tool data that are unique around the world.

A new tool is being programmed on the grinder or, more commonly, on an external programming station. After a successful simulation of the grinding process, the actual grinding can begin. At the same time, a tool specific data file is sent from the grinding platform to the ZOLLER measuring machine. The operator can select which tool features to focus on. The file contains all necessary data to allow the measuring machine to fully and automatically create a measuring sequence. Once the first piece is completed it is loaded and measured automatically and user-independently on the ZOLLER measuring machine. Upon completion of the measurements, the actual tool data is transferred to the grinder. There, possible deviations from the nominal are displayed in a table and then integrated into the grinding program. The nominal values are not altered. Rather, a transparent temporary adjustment value to nominal is being set. The second tool then will be in tolerance.



1

Definition of Tool/Programming/ Data Transmission

The production process for tool manufacturing is programmed in existing programming systems from tool grinding machine manufacturers. The NC program used to grind the tool is transmitted both to the CNC grinding machine and to »genius«. ZOLLER uses it to generate the measuring procedure fully automatically.

2

Grinding the First Tool

The new tool is ground on the CNC grinding machine.

3

Tool Measurement and Data Transmission

The ground tool is measured on the ZOLLER »genius« according to the previously generated measuring procedure in a fully-automatic process. Then, »genius« sends the actual tool data back to the grinding machine or programming system.

4

Series Production

The grinding machine optimizes the CNC program based on the transmitted actual tool data. Then batch production starts for tools manufactured precisely to the μm . The »cora« automation system handles logistics.

5

100 % Checks of Manufactured Tools

Manufactured tools can either be checked on a random basis using a »genius« machine, or in complete batches through a fully automatic process with a »genius« machine in combination with the smart »roboSet 2« automaton solution.

6

Delivery with Test Report

Tools are delivered with a ZOLLER test report. This lets you guarantee your customers 100 % precision for their manufactured, ground tools.



Maintain an Overview: The Grinding Wheel Management Package

With the grinding wheel management package, you can measure and manage grinding wheels in a systematic, economical way.

Select the grinding wheels from the extensive grinding wheel library, and the measuring procedure starts automatically. You benefit from simple, precise measurements fulfilling the FEPA standard – independent of the operator. External grinding wheel presetting allows the grinding machine to be more productive. No time is lost by touching off or probing the wheel pack. You can expect a sell-able tool in the setup run when presetting your grinding wheels with a ZOLLER tool presetter. Unlike a machine-integrated probe, the external tool presetter can measure and automatically transfer the wheel corner radius.

Storage location management ensures you have a good overview of your grinding wheels: directly on the monitor in virtual 3D storage spaces, including inventory management for all components.

The ZOLLER software lists all available grinding wheels in a library. You can select your grinding wheel or assemble grinding wheel packages, even complex ones. »genius« measures these automatically based on saved measuring procedures.



Photo-realistic input dialog including documentation and logging: ZOLLER »genius« makes measuring grinding wheels simple and efficient. Transmit measured actual data quickly and efficiently to your grinding machine with just one click.



Individual components are displayed in the bill of materials on the monitor, making it easier to assemble the grinding wheel package. Storage location monitoring for grinding wheels makes it easier to control inventory and monitor products removed. You always have a good overview of your entire inventory.



Once data has been saved in the software, you will never have to search for it again: ZOLLER TMS software indicates what compartment and drawer your grinding wheel package is located in using a three-dimensional model of the »keeper« tool cabinet.



Fully Automated into the Future

Automation is the future – we are convinced of that. We use our passion and spirit of innovation to fully automate your tool production and grinding every day. From self-driving tool carts to tool preparation, which is handled by a collaborative robot, and fully automatic tool measurement, sorting, cleaning and labeling. We already offer you a large number of solutions for grinding your tools more efficiently using automated solutions.



Working for You 24/7 – »genius« with »roboSet 2«

»roboSet 2« loads and organizes tools fully automatically, around the clock, and can be combined with any measuring machine from the »genius« series. The measuring procedure starts up fully automatically after tools are loaded. All measurements are fully documented and can be associated with specific tools at any time. For 100 % checks and 100 % quality

But automatic measurement is not all. The robot in the preparatory tool cleaning »roboClean« grips the shank tool and places it into the ultrasound bath. There, it is cleaned before being clamped and measured in the »genius«.

Tools are marked using »roboMark«. A laser labels the shank of the tool in seconds with full flexibility, including customized data and even measured values or other data calculated during the measuring process itself.



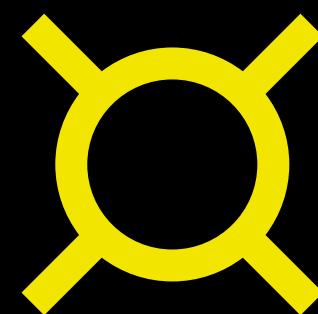
ZOLLER Service

Your goal is maximum efficiency for your production. Our goal is to support you with well-designed system solutions. We also offer comprehensive service. Whether through personal consultation on site or by developing perfectly tailored solutions for individual requirements – if you choose ZOLLER, you will not only receive excellent products, but also unique production know-how on your side. And of course, competent contact partners to answer questions at any time – over the entire life cycle of your ZOLLER products. Utilize ZOLLER know-how to optimize your production processes.



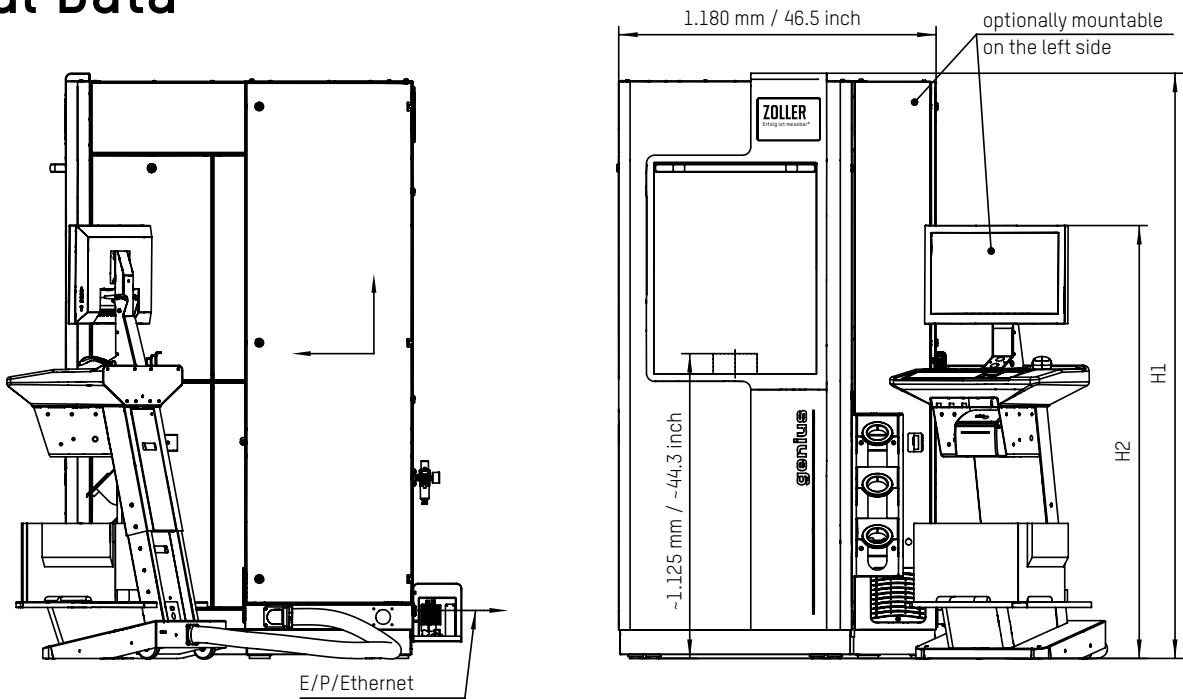
Alexander Zoller | Christoph Zoller

ZOLLER Solutions



With us, you get more than excellent products. You get individual system solutions connected with your tools. We combine hardware, software and services for you. Everything from a single source. Everything for your success. We call it: ZOLLER Solutions.

Technical Data



Pneumatic Connection Values:

DIN ISO 8573-1 class 3
min. 87 psi – max. 116 psi

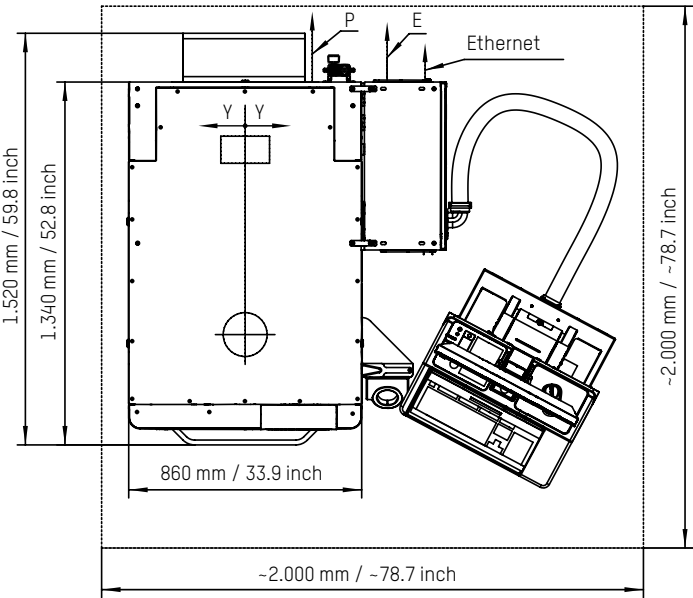
Electrical connection values:

100-120/200-240V~ L+N+PE [*]
50/60 Hz
connection power 600 VA
mains cable line 2.50 m

Minimum door height for transportation:

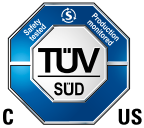
2180 mm / 85.8 inch

*Note: P air connection E electronic connection



Dimensions

»genius« Universal Measuring Machine Series with »cockpit«			
H1 (mm/inch)	H2 (mm/inch)	Weight (kg / pounds)	Weight »cockpit« (kg / pounds)
~2,160 / ~85	1,700 – ~2,160 / 66.9 – ~85	~820 – ~1,400 / ~32.3 – ~55.1	~60 / ~132.3



Measuring Uncertainty

»genius« »threadCheck«

E = 3,0 µm + L/250 µm	•	•
E ₁ = 1,5 µm + L/300 µm	•	•

Camera Configuration

»genius« »threadCheck«

Transmitted Light Optic		
Transmitted Light Camera HR70 4.4 x 4.4	•	•
Transmitted Light Camera 5 MP 3.6 x 3.6		
Transmitted Light Camera 5 MP 15 x 14		
Incident Light Optic		
Standard Incident Light Camera	•	•
Micro Incident Light Camera		

Most Effective Tool Diameter Ranges

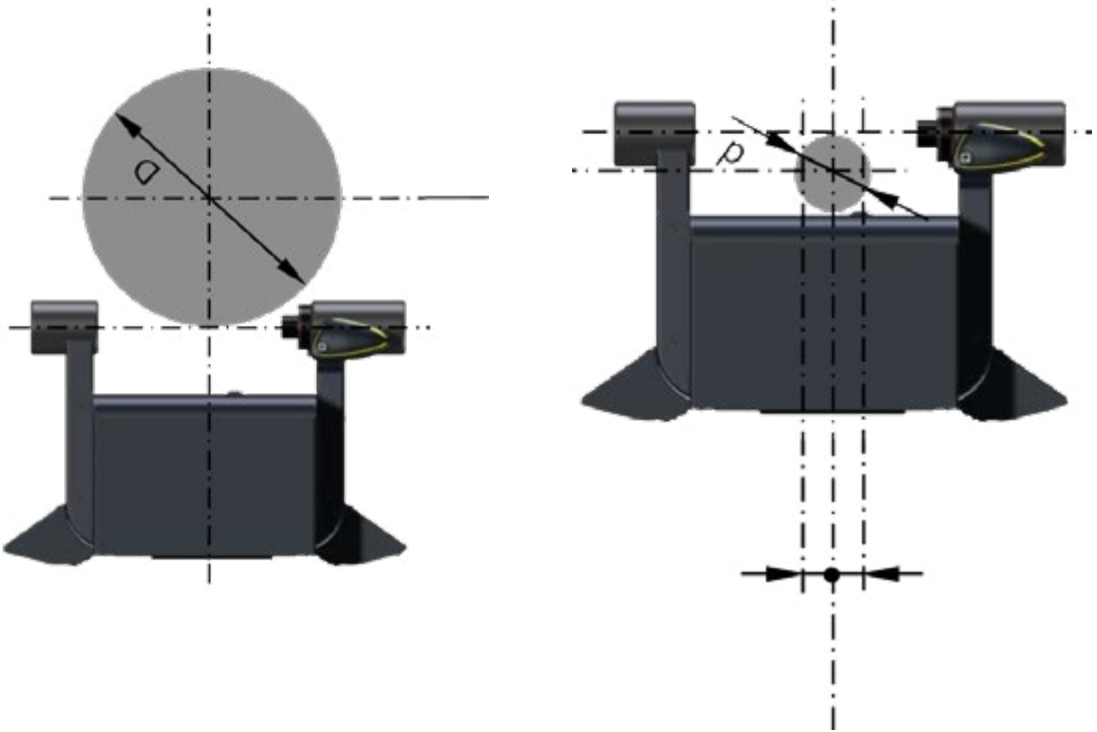
Standard Incident Light Camera	3 mm and up
Micro Incident Light Camera	0.5 mm to 12 mm
All Transmitted Light Cameras	0.075 mm and up

Configuration

»genius« »threadCheck«

Optics Carrier		
Incident Light Swivel Axis	•	–
Incident Light & Transmitted Light Swivel Axis		•

- Standard configuration
- Available options
- Not available



Overview of the »genius« Series

	Application	Maximum tool length	Maximum tool diameter D	Maximum snap gage diameter d	Lateral travel Y	Number of axes
»genius«	Measure standard cutting tools	23.6 inch	15.7 inch	3.9 inch	± 2 inch	5
»threadCheck«	Measure threaded cutting tools	23.6 inch	10.2 inch	3.9 inch	± 2 inch	6

At Home in Germany – around the World for You

ZOLLER quality is “made in Germany” – and there for you, anywhere in the world.

Our company has its own locations and branches at 85 sites in 62 countries guaranteeing we are close to customers and can provide first-class, personal customer advising in local markets.

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- Parent company
- Headquarters
- Branch office
- Representative



ZOLLER

Solutions

More speed, higher quality, safer processes –
with ZOLLER you can get more out of your production.
We combine hardware, software and service to give you
optimum system solutions for presetting, measuring,
inspection and managing cutting tools.

Presetting & Measuring

Tool Management

Inspection & Measuring

Automation

Everything from a Single Source.
Everything for Your Success.
Everything with ZOLLER solutions.

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expect great measures