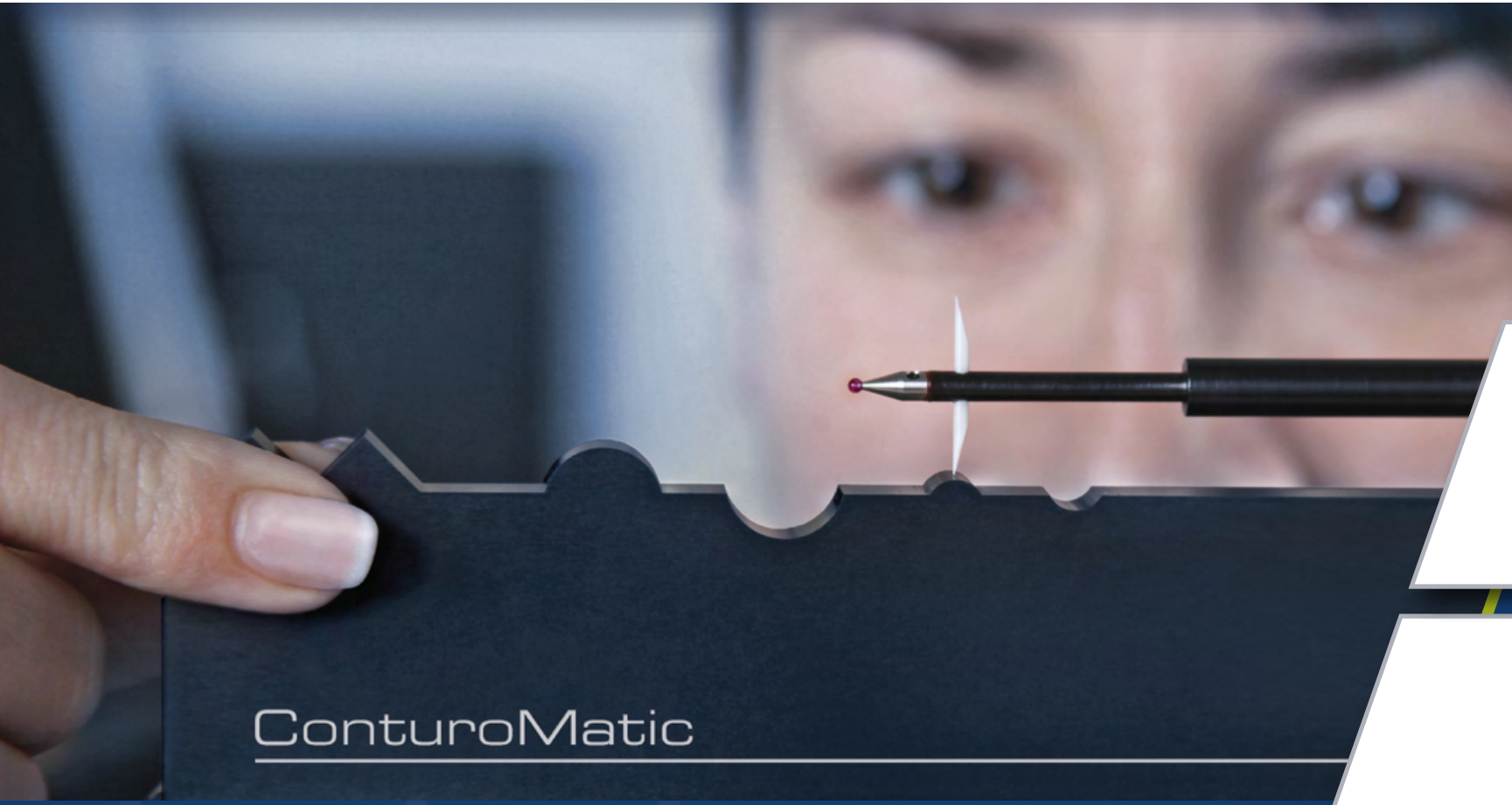
Metrology –
Contour & Roughness Measurement



T&S
just measure

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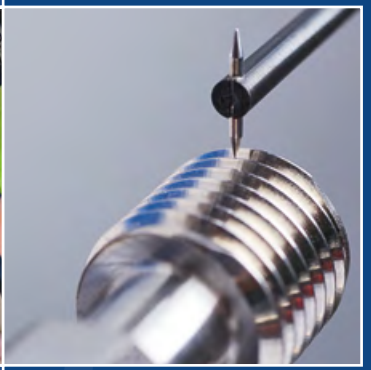
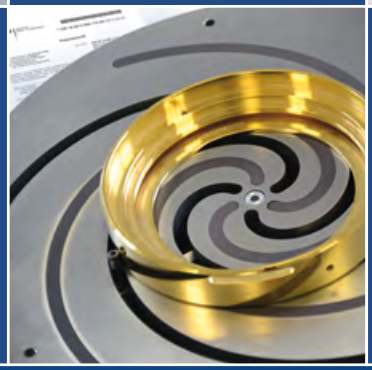
WE

Passion –
we love our job!

Rethinking
the status quo.



Recognize
the obvious.



Explore
new horizons.

Just measure

For us, success means earning the satisfaction and respect of our customers, the recognition of objective critics time and time again. We are successful when we can make a contribution to solving your tasks. The more valuable our contribution is, the more successful we are.

Robert Schmidt – CEO

These principles guide our daily work

- **Quality and reliability**
  Our solutions are used where the quality and success of your products are crucial.
  We are aware of this responsibility.
- **We live and love trust**
  You will get to know us as we are: competent, reliable, friendly and respectful.
- **Sustainable commitment**
  ConturoMatic –„Made in Germany“: We have deliberately chosen Germany as our production location. We prefer to source components for our products from regional partners.
- **Social responsibility**
  We help and support people. Not with words, but actively, through deeds.
- **Continuity and growth**
  We improve the quality of our systems through consistent and continuous development.
  This ensures the future success of our clients – and the future of T&S.
- **You can count on us**
  We stand for quality, service, innovation and fair prices - today and in the future.
  We are proud of this.

Robert Schmidt –CEO

A focus on the essentials

Quality assurance

is far more than the use of suitable measuring equipment

“T & S Gesellschaft für Längenprüftechnik mbH” is a globally operating measuring device manufacturer, solution provider and project service provider for small to complex, requirement-optimized auxiliary systems.

As a demanding user and measurement technician, discover new potential for yourself and your customers with our professional system solutions. Your competent suggestions and proposals for optimization are an incentive for us to constantly improve and further develop our systems.

T&S solutions are used where the quality and success of your products are crucial.
We continuously improve the quality of our systems by consistently developing and utilizing the possibilities of modern 3D CAD design software. This ensures the future success of our clients - and the future of T&S.

The result –
an extensive range of accessories and aids to solve your measuring tasks

We develop and produce our systems on over 700 square meters of fully air-conditioned production space with state-of-the-art equipment. To ensure the quality of the products we manufacture, we are using high-end testing equipment such as laser interferometers with an accuracy in the sub-µm range. Of course, compensation for temperature, air pressure and humidity are also mandatory in this accuracy range. We also use various test standards for contour (in accordance with VDI/VDE 2629 Sheet 1), straightness standards, roughness standards, reference test spheres, glass hemispheres and gauge blocks.

The professional qualifications of our employees are particularly important to us

Through regular training and further education measures, T&S ensures that all employees are always up to date with the latest technical developments. This not only ensures the high quality of our services, but also the quality of your products.

On the following pages, we present an excerpt from our extensive range of contour measuring devices, accessories, test equipment monitoring service, special measuring technology and application-specific solutions.

ConturoMatic

Product News

1 KRN 85-2 – Up/Down Contour Standard
Contour + roughness, wear protection provided by a diamond-hard coating.

2 WFM – WorkFlow Manager
The Swiss Army knife of ConturoMatic software. Repeat measurements, QR-Code scanner, automation of measurement tasks, and much more...

3 GAS 4.0 – Thread Axis Detection
Innovative software tool for automatic zenith detection during thread measurement.

4 Report Generator
Unlimited design options for reports and print templates.

5 Camera module
Unobstructed view of the measurement point.

6 DIN EN ISO 21920 – Surface Roughness
Surface roughness evaluation according to the latest standards.

7 TS mini
Contour & Roughness Measurement – Compact, Modular, High-Performance.

8 TS-X – Speed Mod
Increased positioning speed to optimize measurement time.

9 TS-UP – Ultra Precision
Cost-effective, for the highest precision requirements.

10 Excel Export
Smart, automatable export to Excel.

11 TS-XL HW – for heavy workpieces
Air-bearing "heavy-load" model, table load capacity up to 100 kg.

12 DXF Import
Comparison of measurement data against the ideal CAD-Contour. Result display – numerically and as a vector-deviation plot.

13 ConturoLux
Optical visualization, fully customizable and universally applicable.

14 DFQ Export
Automatic DFQ-Export, fully customizable.

15 UA-150 – Workpiece Holder
Modular, expandable, universal workpiece holder.

16 Ergo Joystick
Ergonomically optimized joystick with an expanded range of functions.

17 Digital Angle Display
Angle positioning accurate to 0.1° for the WSE-300 and ZSR-60.

18 RS – Radial Rotating Units
For rotary contour and roughness measurement.

19 RX – Surface Roughness Measurement with CV Systems
Portable surface roughness measuring device – can be used also independently.

20 FlexScreen
A customizable secondary monitor with touchscreen controls.

1

WorkFlow Manager

2

3

Reportgenerator

4

5

DIN EN ISO 21920

6

7

TS-X – Speed Mod

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Excel Export

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DXF Import

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DFQ Export

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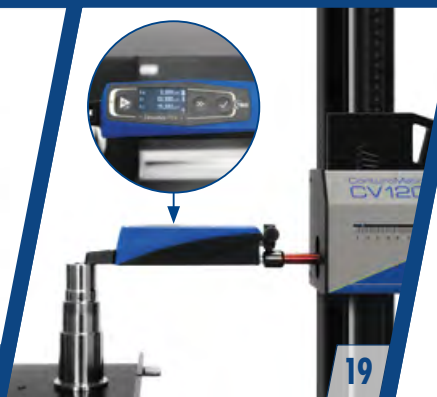

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FlexScreen

20

The other Solution

Contour measurement – off the beaten track

The connection of the X and Z measuring axes in the traverse unit of classic stylus instruments considerably limits the range of applications.

Our solution: separating X from Z.

The X-axis assumes the function of the workpiece holder, while the Z-axis is exclusively responsible for the probing movement. As both axes are motor-controlled, this results in enormous advantages. Regardless of the gradient of the contour, both axes are controlled in such a way that the speed remains constant in relation to the contour. Classic, combined feed systems can only measure at a constant X speed, which inevitably results in a significantly increased measuring point distance on steep contour sections. This discontinuity of the data point density causes leads to mathematical problems that can only be solved by interpolation (mathematical generation of intermediate values).

Our solution automatically leads to a sufficiently constant data point distance.
The calculation of characteristic values is therefore always based on real measured values.

Furthermore, the guidance of the Z-movement follows a straight line. Therefore, there is no longer a restriction on the measuring caused by the circular measuring stroke of angular tracing arms. Our tracing arm is virtually always horizontal. The probe tip can follow the contour dynamically over the entire measuring range of up to 360 x 550 mm and the probing conditions are clearly defined over the entire measuring range. As the position of the probe tip is always repeatably accurate to a fraction of a millimeter, reliable and automatic measurement is possible even in the smallest bores.

In addition, our concept automatically compensates for guide deviations of the Z-axis, which are multiplied as measuring errors due to the leverage effect of the tracing arm length.

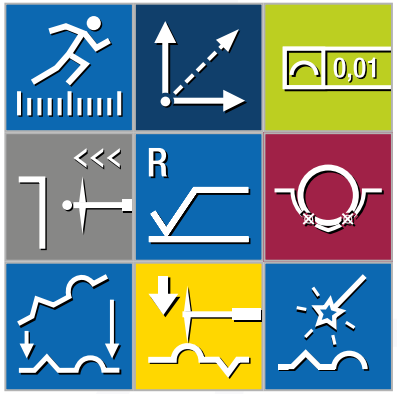
The easy way to measure contours

Our ConturoMatic systems

Developing a range of outstanding contour measuring devices that can be used both in the production environment and in the measuring laboratory thanks to their maximum flexibility and performance was an ambitious goal and a great responsibility. During development, the focus was always on you, the demanding user and metrologist.

The result is a new generation of contour measuring systems: The ConturoMatic series

A development like this always brings many people together. Even better if everyone involved can be proud of the result at the end. Allowing you, the customer, to share this success with us is part of our philosophy. Your competent suggestions and proposals for optimization are the incentive to continuously develop and improve our systems.

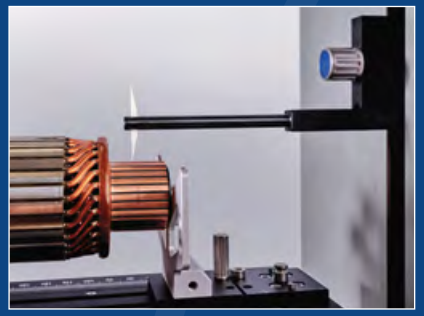


All ConturoMatic systems have a common software basis

Therefore, extensions and innovative new features are available for all systems at the same time. Ease of use with maximum flexibility at a fair price is our top priority.

We can offer you a solution to suit your measuring task for almost all areas of contour and roughness measurement. The range of our ConturoMatic systems includes both the classic basic models with feed unit and motorized column, as well as the group of high-end devices with aerostatic guide units and maximum accuracy.

Contour & Roughness Measurement
Designed for Compactness



Our new ConturoMatic TS mini is a logical extension of the ConturoMatic TS series, delivering the same range of capabilities in a compact format.

It was developed for applications where particularly small workpieces require the highest accuracy without compromising the performance of our established **TS systems**. As such, it is aimed at industries where the manufacture of micro-workpieces and the highest quality requirements are inextricably linked (e.g., micro-threads and thread gauges, the watch industry, miniature ball bearings, ball screws, etc.).

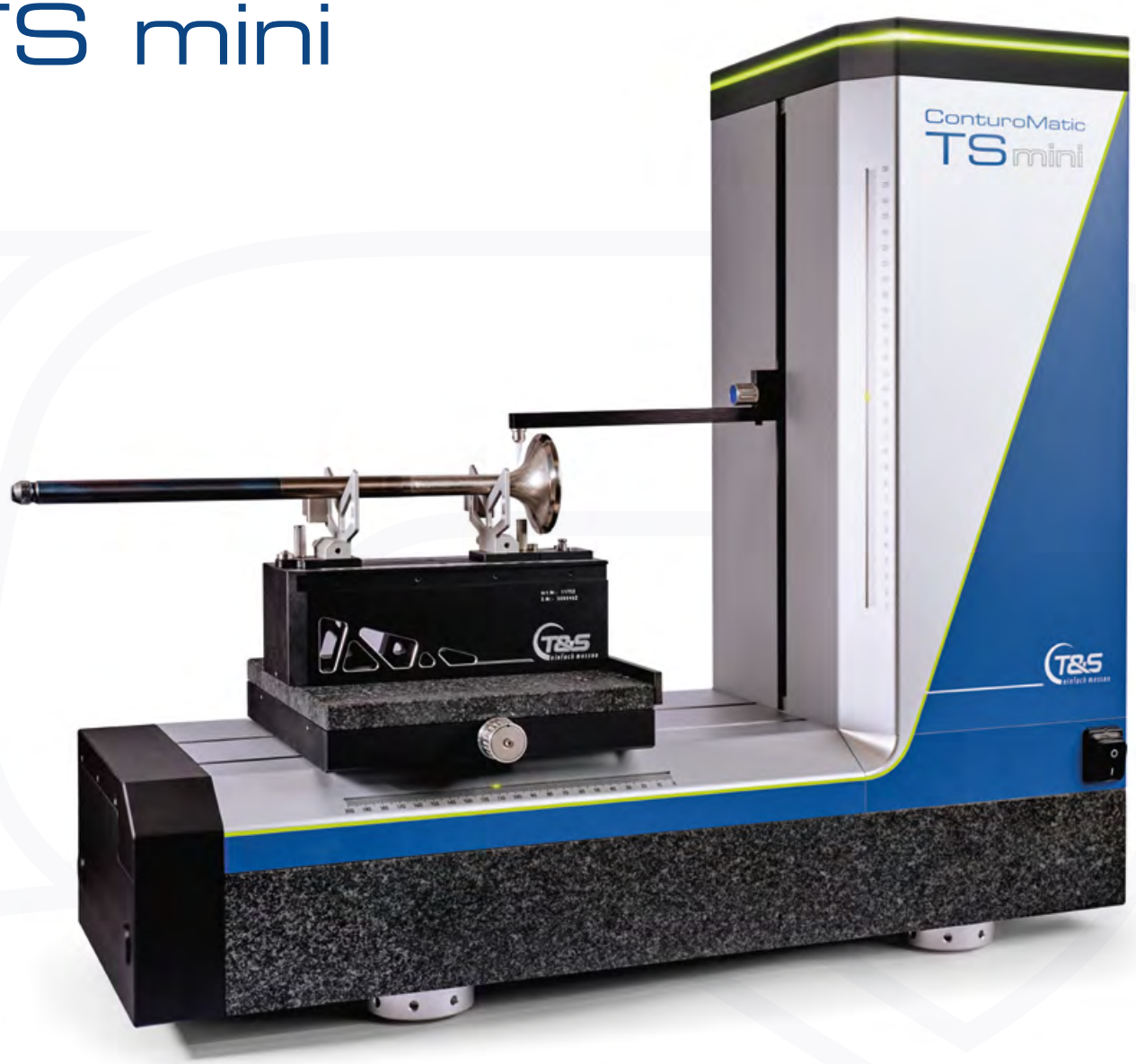
Technical Highlights of the TS mini

- High-performance contour and roughness measurement system from the **ConturoMatic TS-Series**
- Despite its extremely compact dimensions (X = 650 mm | Z = 600 mm | Y = 250 mm), the TS mini has a measurement range of 200 x 278 mm
- High-precision and robust mechanical design—ideal for both, metrology labs and production environments
- Workpiece weight up to 35 kg
- Modular and service-friendly design
- Granite guide elements—the foundation for the highest accuracy requirements
- All measuring axes are motor controlled
- Continuous, dynamic speed control. This ensures constant data point spacing, regardless of the profile's inclination
- Non-contact, incremental measuring systems. Our measuring scales behave thermally like steel. Therefore, in many cases, temperature compensation or complex climate control is unnecessary
- Integrated control electronics
- Data acquisition and control via standard interfaces guarantee future-proofing and independence from changing IT hardware
- No significant radial movement of the probe element. This ensures a unique, horizontal position of the probe at all times
- For example, for automatic contour and roughness measurement in small bores (bore diameter less than 1 mm)
- Accuracy: ± (0.90 + L/100) µm [L = measurement distance in mm]
- Software compatibility with the entire ConturoMatic T-Series

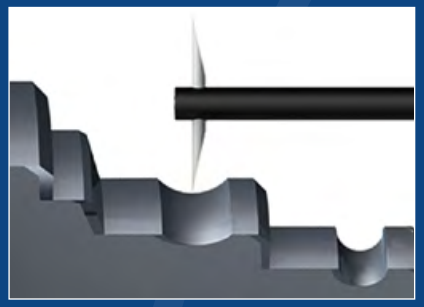
Options

- Basic Roughness (ISO 21920).
- Integrated, motorized Y-Axis stage for automatic zenith detection.
- UD (Up/Down) Option – Automatic measurement direction switching allows for scanning surfaces in two directions without losing the measurement reference.It can be integrated into automated measurement programs without any restrictions.
- Freely configurable Conturo Lux® status display.
- Camera module – for an unobstructed view of the measurement point.
- GAS – Automatic zenith detection on internal and external threads.
- Next Level Thread Measurement – Simple, flexible, and fast measurement of gauge and functional threads – DAkkS-accreditable.
- WorkFlow Manager – for simplified operation, especially in the context of manufacturing monitoring.
- DXF Comparison Module – for advanced contour analysis.
- Data Export Interface – conversion of ConturoMatic measurement data to qs-STAT (Q-DAS ASCII Transfer Format). Result data is converted into a format readable by Q-DAS, for example, and automatically exported.

ConturoMatic
TS mini



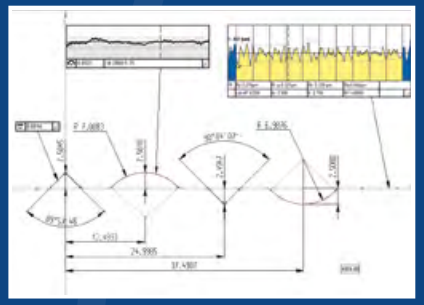
The result –
more than the sum of the individual ideas



The concept behind all ConturoMatic TS systems mainly consists of two motor-controlled measuring axes.
The X-axis carries the workpiece and the Z-axis performs the contour scanning. Both measured value acquisition and control are consistently based on the latest digital technology. Granite of the highest quality serves as the mechanical basis.

The effect

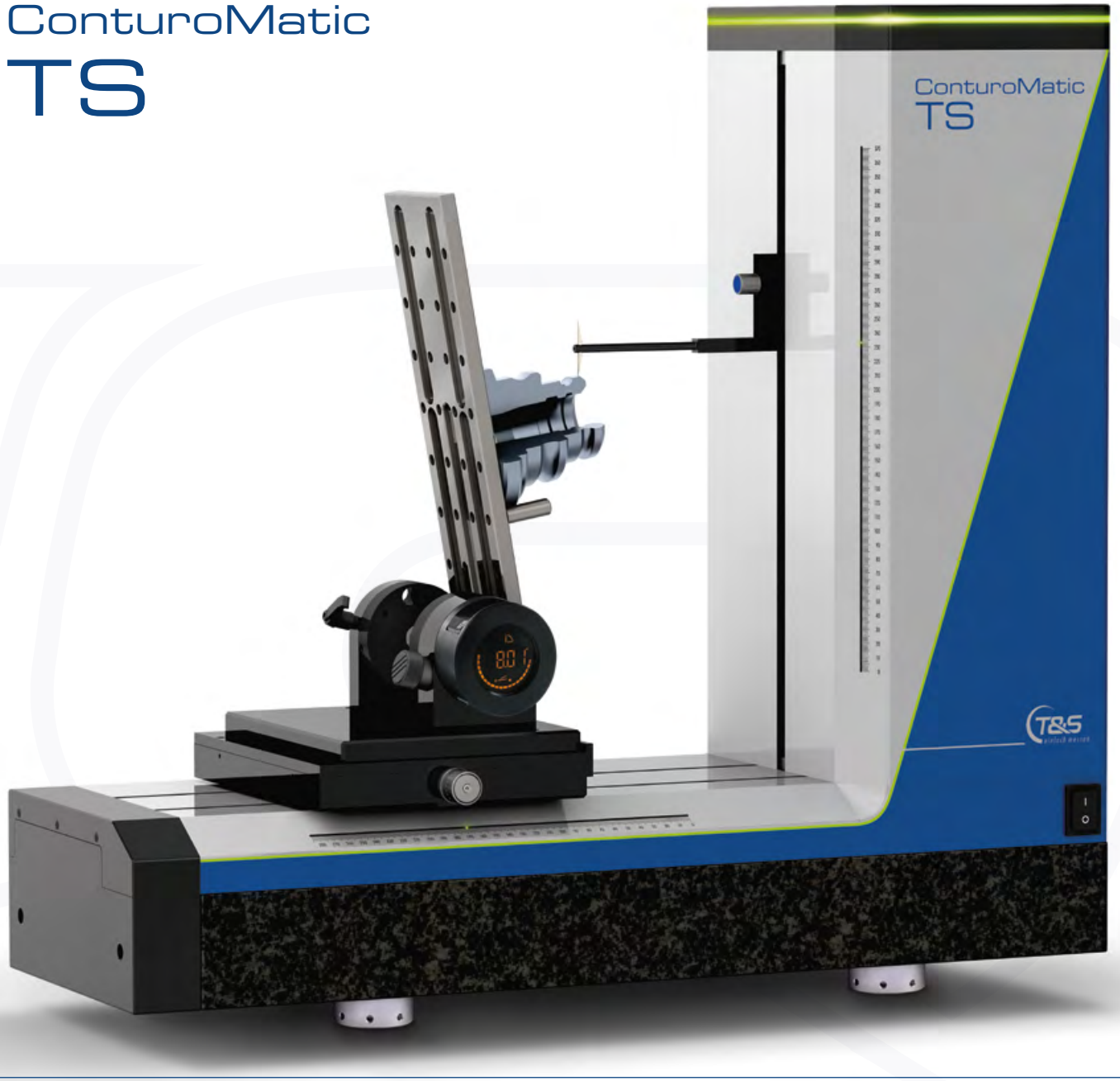
The use of precise basic elements means that subsequent and costly error compensation is not necessary for our systems. Stability and durability are basic elements of our products. **New, different, innovative, technically revolutionary.**



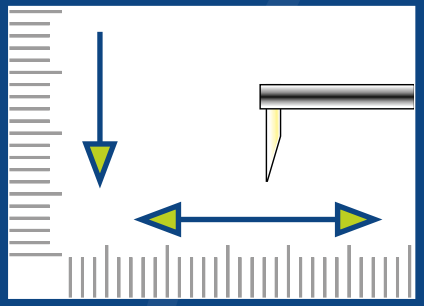
Technical highlights of the TS

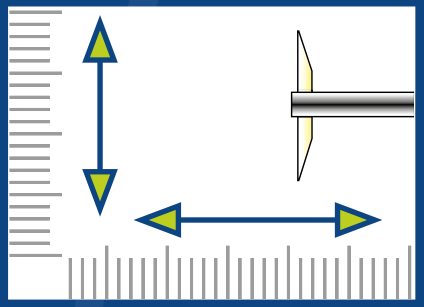
- **NEW: ConturoMatic TS-UP in ultra-precision technology design. More information on request**
- Robust mechanical base
- Large measuring range 300 x 375 (TS/TS-UP), 280 x 350 (TS-X), 360 x 550 (TS-XL)
- Granite guide elements. The basis for maximum guiding accuracy
- Integrated, motorized Y-adjustable table for automatic zenith search (optional)
- Motor-controlled measuring axes
- Permanent, dynamic speed control. This results in constant data point spacing, independent of the profile inclination
- Non-contact, incremental measuring systems. Our scales behave thermally like steel. Therefore, in many cases, temperature compensation or complex air conditioning is unnecessary
- Integrated control electronics and data acquisition via USB standard interfaces ensure future-proofing and independence from changes in computer hardware
- No relevant radius movement of the tracing arm
- Unambiguous, horizontal position of the tracing arm at any times. This enables simple, safe and automatic parts inspection
- Maximum permissible error (MPE): ± (0.90 + L/100) µm [L = measurement distance in mm] (ConturoMatic TS)
- Maximum permissible error (MPE): ± (0.85 + L/100) µm [L = measurement distance in mm] (ConturoMatic TS-X/TS-XL)
- Software base ConturoMatic: W11/64Bit

ConturoMatic TS



Are your requirements growing?





The ConturoMatic TS grows with you.

The modular concept allows an economical entry into the **TS class** with the option of retrofitting additional functions at any time – without mechanical intervention in the existing system, simply by activating in the software.
The optionally available extension packages are completed by various probe arms.

The technical innovations, the advantages that make our new **TS system** the first in its class includes the integrated, maintenance-free, electromechanical system for tracing force adjustment. This function can be used to adjust the contact force for contour and roughness operation. These settings are determined individually for each tracing arm, managed by the software, and are automatically adjusted according to the required measuring function. Only the TS stylus tip calibration standard is required to calibrate the styli and the offset between the upper and lower stylus tips.

The geometrically unique, horizontal position of the tracing arm enables the inspection of contours and bores with a diameter of less than 0.5 mm to over 370 mm.
Probe tip breakage is minimized by the integrated safety shutdown of the Z-axis movement.
The possibility of roughness testing, which is solved by the integrated measuring force adjustment, can be used in combination with contour testing. This eliminates the need to measure again in many cases. Contour and roughness results can be virtually determined in a single run.

Other measurement tasks that can be performed with our **ConturoMatic TS** include the inspection of bores and distances, distances from internal to external contours, threads, taper angles and parallelism, form errors, measurement of interrupted surfaces without loss of dimensional reference, etc.

Add-ons

All options can be combined with each other as required.

Option UD (Up/Down)

The measurement direction changeover allows surfaces to be scanned in up and down direction. This means that internal and external contours can be evaluated in relation to each other without losing the measurement reference. This function can be used without restrictions in automatic measuring programs.

Additional evaluation possibilities:

- Determination of raceway diameters
- Diameter determination
- Thickness measurement
- Parallelism measurement
- Taper angle measurement
- Pitch deviation
- Thread inspection (evaluation software optional)

ConturoMatic TS Option: Roughness Basic

Software options for calculating surface roughness parameters. The currently accepted roughness standards and filters are implemented in the software and are regularly updated (e.g., ISO 4287, ISO 21920, ISO 16610-21, ISO 16610-31, etc.). This feature is also available in combination with the UD-Option described above..

Optional motorized Y-table

Motorized and manually adjustable Y-table for automatic zenith search with 17mm adjustment range. Table load capacity: TS, TS-R, TS-UD, TS-UDR = 35 kg, TS-X = 25 kg, TS-XHD = 50 kg, TS-XL (optional) 100 kg.
Operation of the automatic zenith search is integrated in the software. In order to measure in small bores or narrow measuring points, the Y search path can be set variably.

Advantages

- Operator-independent determination of reversal points with high accuracy
- Avoidance of measurement errors due to axis offset from upper to lower probe tip
- Automatic detection of convex and concave reversal points
- Reversal point search is possible by probing from above and below

Add-on GAS

Software option for automatic zenith search on internal and external threads in conjunction with the motorized Y-table option.

Thread evaluation Add-on

Software option for evaluating the characteristic values of thread gauges and workpiece threads. Can be used with ConturoMatic TS-X/TS-UD/TS-UDR/T3/T1/T1-R.

Overview of integrated standards

- Metric ISO threads in accordance with DIN ISO 1502:1996 (DIN ISO 965:1998)
- Gauges for metric ISO-threads in accordance with ANSI B1.16M-1984
- Metric ISO trapezodial threads in accordance with DIN103:1997
- „Unified“ thread or thread gauges in accordance with ANSI/AMSE B1.1-1983/B1.2-1983
- Thread gauges for „Unified“ (ANSI/ASME B1.1) in accordance with BS 919:Part:1960
- Gauges for pipe threads in accordance with DIN ISO 228:2000
- Gauges for pipe threads in accordance with DIN 259:1979(alt)
- Armoured conduit thread in accordance with DIN 40430, DIN 40431:1972
- Gauges for round threads in accordance with DIN 405:1997
- Whitworth thread or thread gauge in accordance with BS 84:1956/BS 919: Part2:1971
- NPSM thread in accordance with ANSI/ASME 1.20.1-1983
- Betress thread in accordance with DIN 513:1985/company standard
- MJ thread in accordance with ISO 5855:1989
- Gauges for thread inserts (HeliCoil) in accordance with DIN 8140:1999(EG thread)
- Metric and „Unified“ thread in accordance with Böllhoff company standard
- Valve thread in accordance with DIN 7756:1979 and ETRTO V.7
- ACME thread in accordance with ASME/ANSI B1.5-1988
- Stub ACME thread in accordance with ASME/ANSI B1.8-1988
- Thread for bicycles in accordance with DIN 79012
- Adjustment gauges for thread measuring devices in accordance with DIN 2241
- Permanent implementation of further thread standards (current list on request)

Data export interface Add-on

Software option for converting measurement data determined with ConturoMatic systems to qs-STAT (Q-DAS ASCII transfer format)1. (Q-DAS ASCII transfer format)[1]. ConturoMatic result data is converted into a format readable by Q-DAS, for example, and exported.

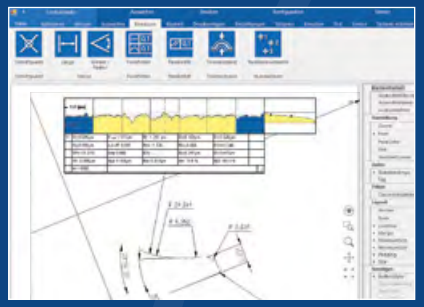
Advantages

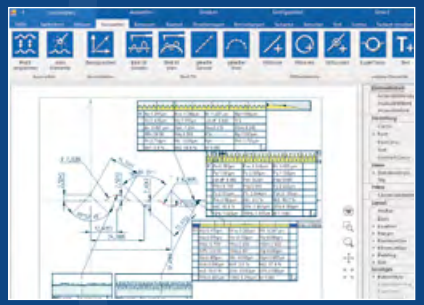
- No additional program required for conversion. The function is integrated in the main program
- Largely freely definable fields (K-fields)
- Transfer of values (actual and target values, tolerances) from the ConturoMatic software
- Header data (e.g. order no., drawing no., etc.) are transferred from the ConturoMatic software
- Path for saving the DFQ file can be freely defined
- Can be retrofitted to all ConturoMatic TS system

[1] Certification of the converter by Q-DAS is not provided.

ConturoMatic Roughness

Capture contours and roughness in one go





Modern versions of contour measuring systems, such as our ConturoMatic T-Series, enable the simultaneous recording and calculation of contour and roughness parameters. However, classic probing and evaluation methods are increasingly failing when it comes to roughness testing on contours with larger gradients. To solve this problem, our calculation algorithms are based on orthogonal regression right from the start. This method, in conjunction with dynamic speed control, which ensures a uniform distance between data points, leads to absolutely accurate measurement results – even on highly curved surfaces. In contrast, with conventional solutions, in order to achieve a constant measuring point distance, new measuring points that do not actually exist must be generated by means of interpolation.

With our Roughness and Roughness Plus software options for the ConturoMatic TS, your contour measuring station becomes a particularly powerful system for surface measurement.

All common parameters can be measured and evaluated automatically. The software is seamlessly integrated into the standard software and can be operated intuitively. The update is possible for all previously supplied **T1, T2 and TS systems** and includes the activation of the roughness software option, an optional roughness tracing arm with 2µm tip radius and 60° angle as well as comprehensive operating instructions. T2 systems must be mechanically retrofitted. The roughness option is included in the standard scope of the **ConturoMatic TS-X/TS-XL**.

Evaluable Parameters

- Pt, Pz, Pa, Pc, Pq, Pp, Pv, Psk, Pku, PSm, Pdq, Pmr(c)
- Rt, Rz, Ra, Rc, Rq, Rp, Rv, Rsk, Rku, RSm, Rdq, Rmr(c), Rk, Rpk, Rvk, Mr1, Mr2, RPc, Rmax (VDA 2006), R3z (DB factory standard)
- Wt, Wz, Wa, Wc, Wq, Wp, Wv, Wsk, Wku, WSm, Wdq, Wmr(c)
- Optional: Dominant waviness according to VDA 2007
- Optional: Robust Gaussian filter according to DIN EN ISO 16610-31

Applied Standards

- DIN EN ISO 4287:2010-07
- DIN EN ISO 4288:1998-04
- DIN EN ISO 16610-21:2013-06
- DIN EN ISO 13565-1:1998-06
- DIN EN ISO 13565-2:1998-06
- DIN EN 10049:2014-03
- VDA 2006:2003-07
- DB N 31007 (1983)
- DIN EN ISO 16610-31 ***(Roughness Option)***
- ISO 21920 ***(Option – Roughness Basic)***
- VDA 2007:2007-02 ***(Option)***

User settings can also be used to assign ratings that deviate from the standard.

ConturoMatic
WorkFlowManager Option

In the WorkFlowManager, individual commands can be created, organized into workflows, and linked together. These workflows can be initiated in various ways and processed automatically. The integrated **QR code toolkit** significantly simplifies operation, particularly in the context of production monitoring. Standard functions such as probe selection or the activation of automated measurement programs can be initiated using a **QR code scanner** without a mouse or keyboard.

The following functions are implemented:

- Scanning of tracing arm codes to directly activate the selected probe.
- Scanning of reference part codes to select any reference task.
- Scanning of reference part codes and automatic start of the measurement task.
- Single measurement and automated multiple evaluations with different evaluation references.
- Automation of series and repeat measurements with a specified number of measurements
- Starting a measurement using a QR-Code mounted on a mounting device
- Automatic saving of individual measurements from measurement series

What‘s Included

- Software update to the latest ConturoMatic version
- „WorkFlowManager“ software activation
- QR/barcode scanner
- Set of QR-Code stickers for tracing arm selection
- Set of QR-Code stickers for reference part selection
- Set of QR-Code stickers for reference part selection + autostart

The WorkFlowManager option is available for all ConturoMatic systems.

Next-Level Thread Measurement

ConturoMatic GS/GM-X

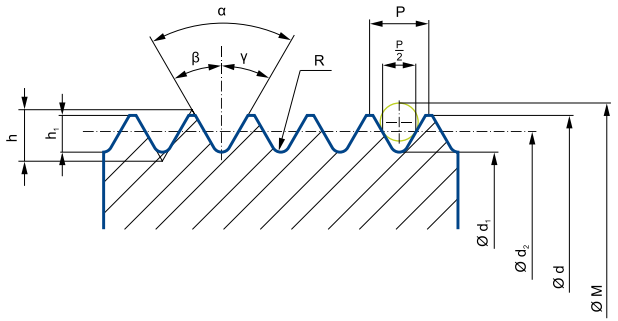
The ever-increasing demands on the precision of threads and thread gauges, as well as the need to ensure the functionality and safety of bolted joints, call for new, state-of-the-art measurement methods. In addition, the requirements of the current IATF 16949 standard call for significantly stricter documentation and test equipment monitoring in the context of product safety. Lightweight construction and high-load connections also demand compliance with even tighter tolerances.

Measurement methods used in the past, such as 3-wire measurement or the determination of flank diameters using spheres, are being replaced by new, more accurate, and reliable methods. The traditional methods for determining pitch on Abbe length gauges allow only limited conclusions to be drawn about the actual thread geometry. The method of “gauge inspection” of threads, which is widely used in manufacturing, is increasingly being supplemented or replaced by scanning measurement methods. The measurement of flank angle, flank form deviation, center diameter, radius at the thread root, and the roughness of the thread flanks is only possible through modern, scanning-based measurement techniques. Parameters that cannot be captured by “gauge checking” can be quickly and reliably determined, recorded, and monitored for compliance with tolerances. Optical measurement is only possible to a limited extent due to obstruction by the thread pitch.

Based on our proven **ConturoMatic-T-Systems**, we have developed measuring instruments that enable flexible, fast, and cost-effective measurements of gauges and functional threads with outstanding effectiveness and accuracy. In combination with **QM-Soft®**, currently the most powerful software for calculating the characteristics of gauge and functional threads, we offer you an unrivaled, efficient, and flexible tool for the modern measurement of gauge and functional threads. The robust design and ease of use allow for trouble-free use in production environments.

Our ConturoMatic GS/GM-X systems are increasingly being used in DAkkS calibration laboratories accredited to DIN EN ISO/IEC 17025:2018-03. In addition, the requirement for internal laboratories specified in IATF 16949, Section 7.1.5.3.1, can be met.

* The measurement procedures DAkkS-DKD-R 4-3, Sheet 4.8:2010
Options 1 through 5, as well as Sheet 4.9:2010, Options 1 through 5 are applicable without restriction.



Simple
Flexible
Time-optimized
DAkkS-accreditable

ConturoMatic GS/GM-X & QM-Soft®

Scanning the entire upper and lower thread contour allows the actual measured points to be used. Interpolation of measurement data – which results in a constant data point spacing orthogonal to the surface – is not necessary.

Applications

The **ConturoMatic GS/GM-X thread scanners** are used in applications such as those in a measurement room or calibration laboratory.

Scope of Application

Thread gauges as well as external and internal threads from M1 to M300. With our **GM-XL model**, up to M500.

Specific Features of our GS/GM-X Systems

The accessories and software for our **ConturoMatic GS thread scanners** and **GM-X thread masters** are specifically designed to meet the unique requirements of thread measurement. All components necessary for measuring thread gauges are included in the system. The supplied **UA-150** allows for the secure mounting of M1–M70 thread gauge rings and M1–M100 gauge plugs. Thanks to a wide variety of available tracing arms and probe tips, most thread types and thread gauges can be measured. We also offer probes and methods for measuring small internal threads starting at M1 (patent pending), as well as form-optimized probes for measuring tapered threads. Our optionally available **SN-100 thread standard** enables rapid system verification.

Contour & Roughness Measurement

The fundamental flexibility of contour and roughness measurement remains fully intact, with the exception of thread measurement. Existing **ConturoMatic T systems** equipped with the **UD option** can be easily upgraded to the **thread scanner**.

Our optimized data interface for the L&W QM-Soft® evaluation software:

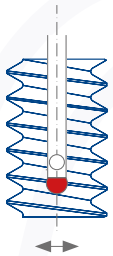
- Automated management of thread measurement processes
- Selection guide for the tracing arm suitable for the thread
- Software-based suitability check of the selected tracing arm
- Detection of measurement errors caused by incorrect parameter settings
- Automatic saving of completed measurements
- Significant time savings through measurement process optimization
- High protection against operating errors thanks to automated processes

The Thread-Measurement Process

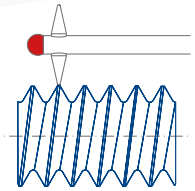
The integration of our **ConturoMatic software** with the thread modules of **L&W QM-Soft®** enables you, the user, to perform precise, fast, and repeatable analyses in just a few steps. The integrated database contains all parameters and tolerances for common as well as exotic thread standards. When calculating the thread contour, various deviations caused by the thread pitch and metrological factors are corrected, and the calculation is adjusted back to the exact actual contour (fit correction).

Time-Optimized Measurement Process

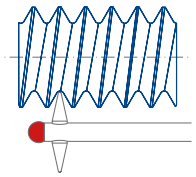
Zenith Search – Center:



Thread measurement – Top:



Thread measurement – Bottom:



Just 2 minutes to results

Automated Series-Measurement of Threads

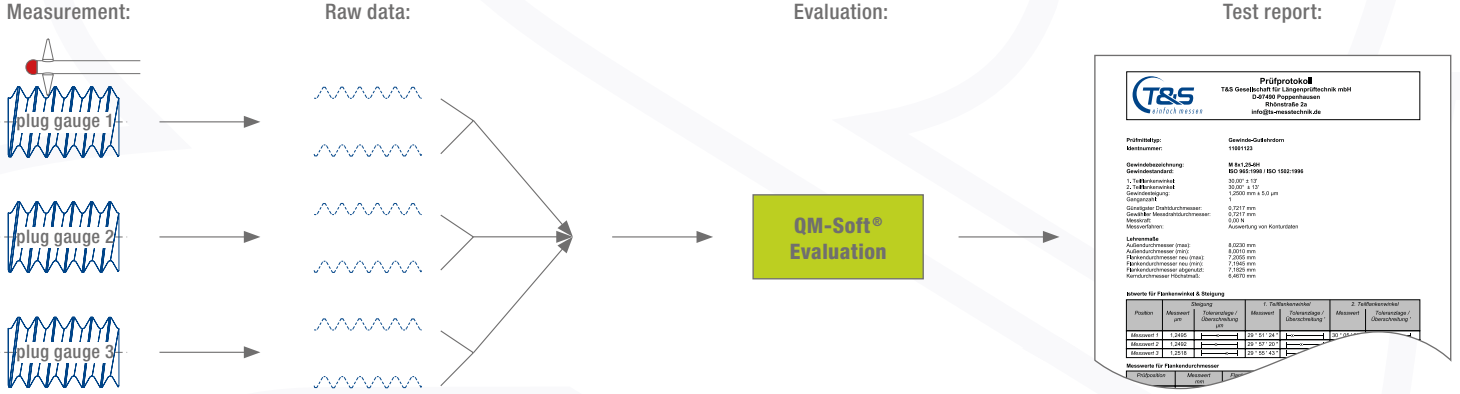
Precise thread measurement requires probing at the zenith of the thread. Due to the thread pitch, manual positioning of the probe is often not possible. Our **GAS module** for thread-axis detection automatically determines the optimal probe tip position (usable for thread gauges starting at M1). For batch measurement of threads, the thread profiles can be captured in a single measurement sequence. Measurement programs are created using our proven, simple **teach-in function**. The operator does not need any knowledge of special software functions to do this. After the fully automated measurement sequence, the digitized data is automatically transferred to **QM-Soft®** for evaluation.

Measurement:

Raw data:

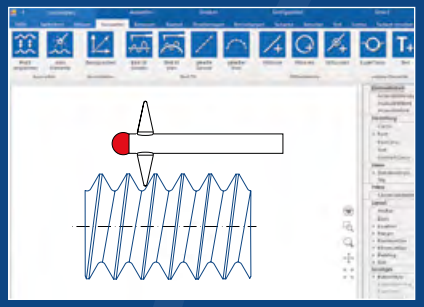
Evaluation:

Test report:



ConturoMatic ThreadScanner

The most effective way to measure threads



The ever-increasing demand for precision and the need to guarantee the function and safety of screw connections, as well as the requirements of IATF 16949, require measurement methods that can no longer be guaranteed with the classic methods of gauge testing or 3-wire measurement. Based on our proven **ConturoMatic T series**, we have developed systems that enable comprehensive and cost-effective testing of gauge and functional threads effectively and with maximum accuracy.

The enormous flexibility of our systems in perspective of contour and roughness measurement is also available. The application range of our **„ConturoMatic GS“** thread scanners, which are specially optimized for thread inspection, as well as the air-bearing **„ConturoMatic GM-X“** thread masters, which meet the highest demands, fulfil all the requirements that a modern and flexible thread measuring system must offer. The scope of delivery is adapted to the specific requirements of thread testing and includes the mandatory Up/Down tracing arm, a holder for thread plug gauges and the software for evaluating cylindrical threads. Our optional software makes it easy to measure common tapered threads.

Our thread scanners are ideal for use in DAkkS laboratories, test centers certified to DIN EN ISO/IEC 17025:2018-03 and also for automated series testing in production.

With our innovative, patent-pending „test method for small internal threads“, internal threads up to M1 can be tested.

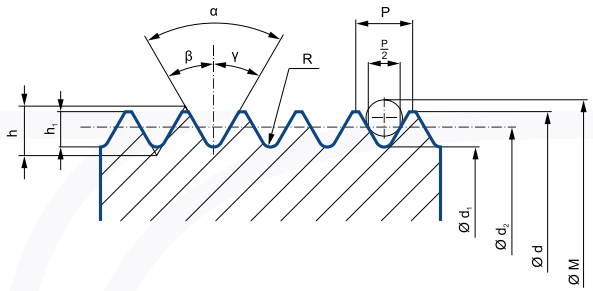
Thread types that can be evaluated

- Metric ISO threads according to DIN ISO 1502:1996 (DIN ISO 965:1998)
- Gauges for ISO metric threads according to ANSI B1.16M-1984
- Metric ISO trapezoidal thread according to DIN103:1997
- „Unified“ threads or thread gauges according to ANSI/AMSE B1.1-1983/B1.2-1983
- Thread gauges for „Unified“ (ANSI/ASME B1.1) to BS 919:Part:1960
- Gauges for pipe threads according to DIN ISO 228:2000
- Gauges for pipe threads according to DIN 259:1979(old)
- Armoured pipe thread according to DIN 40430, DIN 40431:1972
- Gauges for round threads according to DIN 405:1997
- Whitworth threads or thread gauges to BS 84:1956/BS 919:Part2:1971
- NPSM thread according to ANSI/ASME 1.20.1-1983
- Saw thread according to DIN 513:1985/factory standard
- MJ thread according to DIN ISO 5855:1989
- Gauges for thread inserts (HeliCoil) according to DIN 8140:1999(EG thread)
- Metric and „Unified“ HeliColi threads according to Böllhoff factory standard
- Valve thread according to DIN 7756:1979 and ETRTO V.7
- ACME thread to ASME/ANSI B1.5-1988
- Stub ACME thread according to ASME/ANSI B1.8-1988
- Thread for bicycles according to DIN 79012
- Setting gauges for thread gauges according to DIN 2241
- Permanent implementation of further thread standards (current list on request)

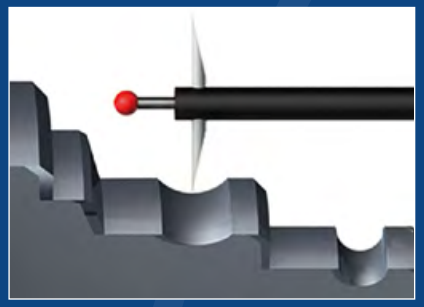
Software for calculation of taper threads *(optional)*:

- according to DIN 2999
- ANSI/ASME B1.20.1 (NPT)
- BS 21, ISO 7-2
- ASME B1.20.5-1991 (NPTF)

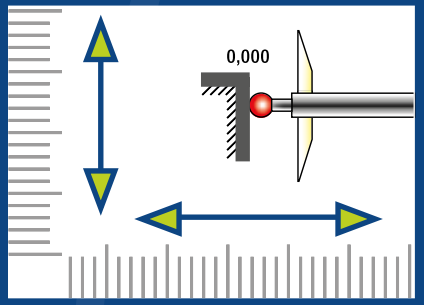
ConturoMatic
GS/GM-X



Measurement
technology for the highest demands



Our proven concept: „Contour and roughness measurements at the highest level“ is a constant driver for the further development of our systems. True to the motto: „Better is the enemy of good“, we took a critical look at all the elements of the **ConturoMatic TS** that are crucial for system accuracy once again. Meticulous fine-tuning of the guides, aerostatic air bearings, fast data transmission, high-speed axis control, optimized tracing arm bearings, newly developed drive units and incremental measuring systems of the highest quality are the results of this comprehensive further development process.



Features of TS-X/TS-XL:

- Friction-free, aerostatic special air bearings in the X and Z axes
- TS-X measuring range: 280 x 350 mm
- TS-XL measuring range: 360 x 550 mm
- Hybrid ceramic tracing arm bearing
- Static probing and measurement data recording in X-direction
- Roughness testing module included as standard
- Table load capacity 25 kg (optionally up to 50 kg)
- Y-table manually and motorized adjustable
- Non-contact, incremental measuring systems on a steel base
- Measuring system resolution 1 nm
- Outstanding price-performance ratio
- Error limit: ± (0.85 + L/100) µm [L = measuring path in mm] (without change of scanning direction)
- Combined contour and roughness measurement in the entire measuring range possible
- ConturoMatic software basis: W11/64Bit

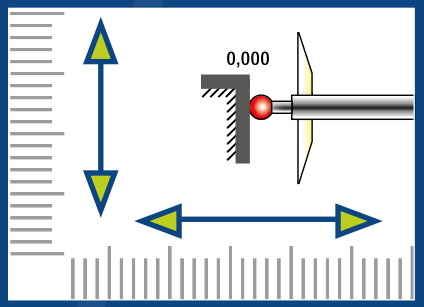
ConturoMatic TS-X/TS-XL Roughness:

- Measurement of surface roughness (mechanical principle of reference surface measurement)
- Measuring range roughness TS-X: 280 x 350 mm
- Measuring range roughness TS-XL: 360 x 550 mm
- Effective resolution: 1 nm
- Measuring speed: 0.1-0.5 mm/s
- Measuring force: 7.5 mN (variably adjustable)
- Measuring point distance: approx. 0.5 µm
- Suitable for roughness: Rz > 0.5 µm, Ra > 0.05 µm
- Accuracy: 5%
- Roughness option included in the TS-X standard package
- DIN EN ISO 16610-31 ***(Roughness Option)***
- ISO 21920 ***(Option – Roughness Basic)***
- VDA 2007:2007-02 ***(Option)***

You will find a description and range of functions on page 20.

ConturoMatic
TS-X / TS-XL

Precision
in large format



We are happy to accept the demand of solving unusual tasks in a simple way as a creative challenge. Examples from our extensive collection of unusual problem solutions are the **ConturoMatic TS-X and TS-X *move***.

The challenge
Testing the contour and roughness of the raceway and lib of bearing rings in the diameter range of 100-1300 mm with workpiece weights of up to 400 kg.

Our solution: ConturoMatic TS-X *move*

Based on the proven concept of our **TS-X HD** with aerostatic bearings, the concept for high-precision testing of large and heavy workpieces was developed. For this purpose, the entire Z-axis was mounted on an air-bearing slide that moves in the X-direction. A robust and flexibly adjustable part holder is used to hold the ring. The fixture base can be swiveled from 0°-60° for functional testing and can be fine adjusted in the Y direction for zenith search. The centric fixable pull-down vice integrated into the fixture considerably extends the range of applications. The **TS-X *move*** is therefore also able to perform all common standard measuring tasks regarding contour and roughness.

Features of the TS-X *move*:

- Friction-free, aerostatic special air bearings in the X and Z axes
- Enlarged measuring range: 370 x 350 mm
- Hybrid ceramic tracing arm bearing
- Static probing and measuring point recording in the X direction
- Roughness inspection module included as standard
- Non-contact, incremental measuring systems based on steel
- Measuring system resolution 1 nm
- Error limit: ± (0.85 + L/100) µm [L = measuring path in mm] (without change of scanning direction)
- Combined contour and roughness measurement possible over the entire measuring range
- ConturoMatic software basis: W11/64Bit

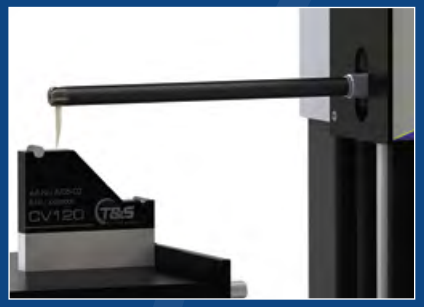
ConturoMatic TS-X *move* Roughness:

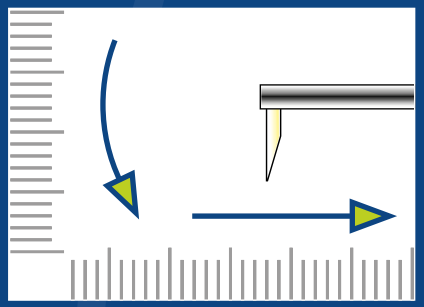
- Measurement of surface roughness (mechanical principle of reference surface measurement)
- Measuring range roughness: 370 x 350 mm
- Effective resolution: 1 nm
- Measuring speed: 0.1-0.5 mm/s
- Measuring force: 7.5 mN (variably adjustable)
- Measuring point distance: approx. 0.5 µm
- Suitable for roughness: Rz > 0.5 µm, Ra > 0.05 µm
- Accuracy: 5%
- Roughness option included in the TS-X standard package
- DIN EN ISO 16610-31 ***(Roughness Option)***
- ISO 21920 ***(Option – Roughness Basic)***
- VDA 2007:2007-02 ***(Option)***

You will find a description and range of functions on page 20.

ConturoMatic
TS-X *move*

Our little one
for big tasks





The concept: focus on the essentials.

The **ConturoMatic CV120** is a classic contour measuring device that impresses with its intelligent functions and practical automation. It offers everything that a powerful and reliable contour measuring system must be able to do.

Originally developed for monitoring industrial production processes, our **CV120** also does a great job in the measuring room thanks to its robust mechanics and powerful software. Workpieces can be measured automatically across the entire measuring range. The entire feed unit is calibrated fully automatic. High measuring precision, detailed evaluation, simple operation and an outstanding price makes the **CV120** particularly attractive. We offer these with a granite base or with an aluminum plate (for mobile use).

Are you still using a contour measuring device with outdated technology?

Regardless of the manufacturer, we offer you our **„ConturoMatic CV120“** as a retrofit system. All existing and still usable components such as X-Y adjustment table, an existing granite base and vice can continue to be used. We supply the necessary components to adapt our **CV120**, giving you a modern, state-of-the-art measuring device at an unbeatable price/performance ratio.

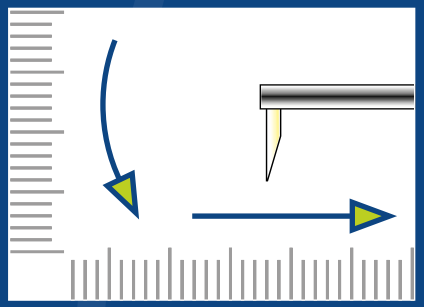
Technical specifications

- External control via standard USB interfaces
- Measuring range CV120: 30 x 120 mm
- Positioning range of the Z-pillar: 380 mm
- Software-controlled tracing arm lift function
- Automatic measurement via teach-in programming
- Even extremely large and heavy test specimens can be measured
- Movement of all axes can be automated
- Simple tracing arm change
- Calibration standard for dynamic X/Z calibration included in the scope of delivery
- As a mobile system with vertical X-axis for contour testing of large workpieces in the production machine (e.g. raceway of large bearing rings)
- ConturoMatic software basis: W11/64Bit
- All-in-one PC with touchscreen ***(option)***

ConturoMatic
CV120

Our large one

for measuring room and production monitoring



Our ConturoMatic CV300, the logical extension of the proven principle of our CV120.

The same applies here: The focus is on the essentials. With its measuring path of 100 x 300 mm, the **CV300** makes it possible to reliably check the contours of even larger and heavier workpieces.

ConturoMatic CV systems are classic contour measuring devices that impress with intelligent functions and practical automation. They offer everything that a powerful and reliable contour measuring system must be able to do.

Are you still using a contour measuring device with outdated technology?

Regardless of the manufacturer, we also offer our **ConturoMatic CV300** as a retrofit system. All existing and still usable components such as the X-Y adjustment table, stone plate and vice can continue to be used. We supply the necessary components to adapt our **CV300**, giving you a modern, state-of-the-art measuring device at an unbeatable price/performance ratio.

Technical specifications

- External control via standard USB interfaces
- CV300 measuring range: 100 x 300 mm
- Positioning range of the Z-pillar: 400 mm (optionally 600 mm)
- Software-controlled tracing arm lifting function
- Automatic measurement via teach-in programming
- Even extremely large and heavy test specimens can be measured
- Movement of all axes can be automated
- Simple tracing arm change
- Calibration standard for dynamic X/Z calibration included in the scope of delivery
- As a mobile system with vertical X-axis for contour testing of large workpieces in the production machine (e.g. raceway of large bearing rings)
- ConturoMatic software basis: W11/64Bit
- All-in-one PC with touchscreen ***(option)***

ConturoMatic
CV300

Lease easily

ContuRent®

Leasing or renting instead of buying – concepts that pay off

Take advantage of the extensive benefits that our ContuRent® leasing offers your company for planned long-term use or rental for short-term requirements.

Your advantages with ContuRent® company leasing:

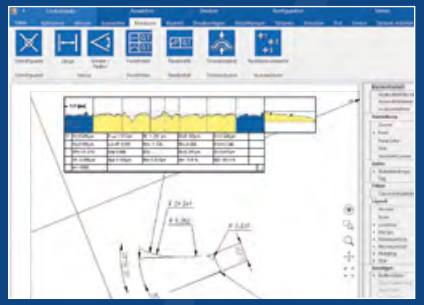
- Proven and generally recognized means of procuring higher-value assets
- Make full use of your tax leeway in times of available liquidity
- Balance sheet neutral - no balance sheet burden
- Flexible term
- Flexible start of the leasing payment
- Flexible structuring of conditions
- Leasing services possible – training, commissioning, project planning
- Reduce your tax burden at the time of purchase thanks to a shorter contract term in the Comparison with the tax depreciation period
- „Full service“ leasing including the necessary accessories, measurement program creation and operator training
- „Innovation leasing“ – For later retrofitting of device options, accessories or technical device renewal
- An increased first leasing installment saves you taxes in the current financial year
- As a rule, no trade tax is payable on leasing agreements
- All depreciation periods do not apply
- **Purchase option** – you want to take over the system at the end of the lease? No problem
- Talk to us and let us create an individual leasing option for you

(Our partner MMV Leasing GmbH, is responsible for corporate leasing).

Your advantages with ContuRent® rental:

- Bridging of short-term utilization peaks of existing measuring systems
- Order-related investment possible
- Competitive advantage in your calculation – renting enables reliable unit cost calculation
- Low capital commitment – costs only arise for the period of use
- Preserve your liquidity and collateral for other projects
- Calculable financing risk
- Immediately deductible operating expenses – the asset is not capitalized as a fixed asset
- Planning security – constant installments over the agreed rental period
- **Purchase option** – you want to take over the system at the end of the rental period? No problem
- Regular maintenance is included in the rental costs
- On request, we can provide you with a project-related „full service“ solution including the necessary accessories, measurement program creation and operator training
- Our rental systems are always state of the art

ConturoMatic S1
Evaluation software



The needs of users have always been at the top of our list of requirements. Our guiding principle right from the start:

Contour measurement must be quick and easy to carry out. The trick is to combine simple and intuitive operation of the systems with unlimited performance versatility.

Our solution for this feat: the ConturoMatic S1 evaluation software

The operating concept of the ConturoMatic S1 evaluation software is ideal both for production monitoring and for use in measuring laboratories. All contour and roughness measuring devices are based on the stylus method. Therefore, we have developed a standardized software platform as an interface for the user.

More efficiency through continuous development

We maintain close communication with our users. This enables us to incorporate our customers suggestions quickly and effectively into the ongoing optimization process for our software solutions.

The advantages at a glance

Just measure

- All evaluation functions can be accessed at the click of a mouse, without cumbersome menu bars and sub-functions
- During production monitoring, operator-independent and therefore operator error-free evaluations and tolerance and tolerance comparisons can be carried out fully automatic
- Once a measurement has been carried out, it basically contains everything, to generate an automatic test sequence including evaluation. Teach-in at its purest form
- Three basic steps lead to an automated test: Measuring, evaluating, saving

Measure more precisely

- Parts that were previously problematic to measure can now be clearly and reproducibly dimensioned
- The software is shape and position tolerant in many areas

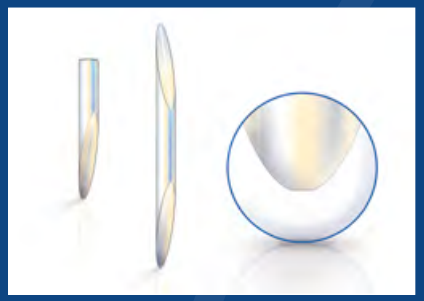
Ready for the future

- Our ConturoMatic software is the basis of our TS and CV systems and is subject to constant further development
- We naturally provide our customers with software updates free of charge

ConturoMatic S1 – list of functions

- Creation of basic coordinate systems
- Regression line, single- and multi-part
- Regression circle, single- and multi-part
- Start and end angle fixing for regression circle
- Start and end fixing for regression line
- Calculation of radius, distance, angle, incline, ...
- Angle display in °/'/", decimal, incline µ/mm
- Generation of auxiliary elements, circle, line, point, coordinate grid, parallel line, vertical line, angle bisector, angle line, ...
- "Fixed circle" fitting
- Intersection generation line/line
- Intersection generation auxiliary line/contour
- Intersection generation line/radius
- Generation of free reference points
- Determine highest point
- Determine lowest point
- Variable vanishing point generation mm or %
- Regression line through x points
- Regression radius through x points
- Ball adjustment
- Torus adjustment
- Form deviation, graphically scalable in X+Z
- Radius deviation, graphically scalable in X+Z
- Parallelism
- Profile rotation
- Gothic profile evaluation (standard)
- Automatic dimensioning with tolerance assessment
- Integration of graphical information on the automatic test process
- Visual tolerance indicator
- DXF fitting
- Free text box
- Contour-bound text box
- Roughness measurement *(Option)*
- Extensive print processor
- Assign print templates to reference part measurements automatically
- Send prints jobs automatically after reference part measurements
- Output results in list form with tolerance evaluation
- Printout in portrait or landscape format
- Numbering of position valves
- Dynamic contour tracing
- Import data from third party systems using various standard formats
- Variable data export
- Automatic data export after measurement
- Export of results
- Export of raw data
- Export of DXF data
- Simple generation of autonomic measuring processes
- Smart tracing path optimization
- Grid lines can be displayed
- Dynamic axis scaling
- Individual color adjustment
- Software-assisted tracing arm calibration
- 15 selectable operating languages
- User administration
- ConturoMatic software base: W11/64Bit

CS Ceramic precision styli



The connection from the workpiece to the measuring device - largely unnoticed and yet of central importance:
Sliding friction, bending effects and tip shape are the main factors influencing the result of the measurement.

The challenge

Sliding friction between the sensing element and the workpiece surface causes bending effects during the measurement. Although this effect is largely corrected by the tracing arm calibration, an undetectable residual error remains. To make matters worse, different materials of the test specimen also cause deviating bending of the stylus tip. These errors cannot be systematically corrected with reasonable effort. The only way out is to reduce friction.

Classic styli

A weak point of classic stylus tips on contour measuring devices is the tip shape, which is not clearly defined. The transition between various radii means that the required tip radius practically only meets the requirements at one point. The tip geometry is no longer defined a little off-axis.

CS ceramic stylus tips

The before mentioned problems caused by sliding friction, bending and tip shape are largely reduced by our patented **CS stylus tips**. The coefficient of friction of our high-performance ceramic stylus tips is many times lower than that of carbide. A defined tip geometry prevents incorrect measured values caused by minor positioning errors. The sum of our improvements leads to a significant reduction in measurement uncertainty.

The advantages at a glance

- Optimized, patented tip geometry
- Significantly less effort required for exact positioning on the test specimen
- Reduced friction compared to carbide
- Electrically non-conductive
- Non-magnetizable
- Resistant to built-up edges
- In the border zone, the probe element follows the test specimen surface much more reliably
- Accurate dimensioned stylus tip geometry
- Consistent high product quality
- High-tech material
- Grain size reduced by 50% compared to conventional carbide
- Exceptionally high wear resistance and hardness
- Reduced susceptibility to breakage
- Lower costs

Standard styli

One direction contour ceramic styli				
Stylus total length	**Stylus Ø**	**Stylus angle**	**Tip radius**	**Item no.:**
6 mm	1.0 mm	19°	25 µm	7181-04-CS42
9 mm	1.0 mm	19°	25 µm	7181-07-CS42
12 mm	1.0 mm	16°	25 µm	7181-082516
20.5 mm	3.5 mm	12°	25 µm	7181-03-CS42
33 mm	3.5 mm	12°	25 µm	7181-02-CS42
59.5 mm	3.5 mm	12°	25 µm	7181-01-CS42
One direction conical contour styli				
6 mm	1.0 mm	24°	25 µm	5730-08-k
20.5 mm	3.5 mm	24°	25 µm	5730-07
33 mm	3.5 mm	24°	25 µm	5730-02-k
Up-Down contour ceramic styli				
2 x 5 mm	1.0 mm	19°	25 µm	7182-03-CS42
2 x 9 mm	1.5 mm	14°	25 µm	7182-02-CS42
2 x 16.5 mm	2.5 mm	12°	25 µm	7182-01-CS42
Up-Down contour carbide stylus				
2 x 5 mm	1.0 mm	24°	100 µm	6810-02-100-k
Diamond styli (roughness)				
1.5 mm	0.5 mm	60°	2 µm	7796
6 mm	1.0 mm	60°	2 µm	7903
10 mm	1.0 mm	60°	2 µm	7636-10
20 mm	1.0 mm	60°	2 µm	7636-2010
Up-Down diamond-styli (roughness)				
2 x 5 mm	1.0 mm	60°	2 µm	7825
One direction ruby ball stylus				
Stylus total length	**Mounting thread**	**Shaft Ø**	**Ruby ball Ø**	**Item no.:**
21 mm	M3	1	1.5 mm	7124
Up-Down T-shape ruby ball styli				
Stylus total length	**Tracing arm shaft Ø**	**Shaft Ø**	**Ruby ball Ø**	**Item no.:**
2 x 5 mm	3.0 mm	0.6 mm	1.0 mm	7487-01
2 x 5 mm	3.0 mm	1.0 mm	2.0 mm	7487-04
2 x 10 mm	3.0 mm	1.0 mm	1.0 mm	7634
Disc-styli				
Disc Ø	**Tracing arm shaft Ø**	**Disc angle**	**Tip radius**	**Item no.:**
2.5 mm	1.0 mm	15°	25 µm	7184-101-L40
5 mm	2.0 mm	15°	25 µm	7184-102-L40

Information without guarantee – as at 01.08.2026

Further probe tips and probe tips for third-party devices on request.

Tracing arms

Examples from our extensive range of over 900 different tracing arms:

One direction contour tracing arm – short version – for use with ConturoMatic T1/T2/T3/TS/TS-UD/TS-X

150/20.5		Item no.: 6829-02-2 Tracing arm total length 150 mm, Stylus tip length 20.5 mm
150/6		Item no.: 6829-01-2 Tracing arm total length 150 mm, Stylus tip length 6 mm

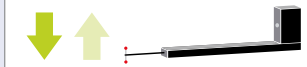
One direction contour tracing arm – long version – for use with ConturoMatic T1/T2/T3/TS/TS-UD/TS-X/CV250/CV250D

260/6		Item no.: 6829-04-2 Tracing arm total length 260 mm, Stylus tip length 6 mm
260/33		Item no.: 6829-05-2 Tracing arm total length 260 mm, Stylus tip length 33 mm
260/59.5		Item no.: 6829-06-2 Tracing arm total length 260 mm, Stylus tip length 59.5 mm

Up-Down contour tracing arm – short version – for use with ConturoMatic T1/T3/TS-UD/TS-X

150/2x5		Item no.: 6829-08-2 Tracing arm total length 150 mm, Stylus tip length 2 x 5 mm
150/2x9		Item no.: 6829-21-2 Tracing arm total length 150 mm, Stylus tip length 2 x 9 mm
150/2x16.5		Item no.: 6829-33-2 Tracing arm total length 150 mm, Stylus tip length 2 x 16.5 mm
190/2x1.25 Disc		Item no.: 6829-24 Tracing arm total length 190 mm, Stylus tip length 2 x 1.25 mm

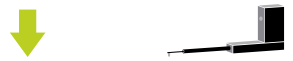
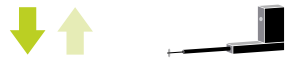
Up-Down contour tracing arm – long version – for use with ConturoMatic T1/T3/TS-UD/TS-X

260/2x10x1.0 Ruby		Item no.: 6829-47 Tracing arm total length 260 mm, Stylus tip length 2 x 10 mm and ruby ball Ø1.0 mm
260/2x16.5		Item no.: 6829-10-2 Tracing arm total length 260 mm, Stylus tip length 2 x 16.5 mm

Up-Down contour tracing arm – short version – for use with ConturoMatic T3/TS-UD/TS-X

150/2x9x1.5 Ruby		Item no.: 6829-87-2 Tracing arm total length 150 mm, Stylus tip length 2 x 9 mm and ruby ball Ø1.5 mm

Roughness tracing arm – one direction and up-down – for use with ConturoMatic T1-R/TS-R/TS-UDR/T3/TS-X

190/6		Item no.: 6829-65-1.0 Tracing arm total length 190 mm, Stylus tip length 6 mm Diamond 60° 2 µm
190/2x5		Item no.: 6829-89 Tracing arm total length 190 mm, Stylus tip length 2 x 5 mm Diamond 60° 2 µm

One direction contour tracing arm – for use with ConturoMatic CV120

120V/6.0		Item no.: 8769-0001 Tracing arm total length 120 mm, Stylus tip length 6 mm
120V/20.5		Item no.: 8769-0002 Tracing arm total length 120 mm, Stylus tip length 20.5 mm

One direction contour tracing arm – for use with ConturoMatic CV300

300V/6.0		Item no.: 10151-0001 Tracing arm total length 360 mm, Stylus tip length 6 mm
300V/33		Item no.: 10151-0005 Tracing arm total length 360 mm, Stylus tip length 33 mm

Custom made tracing arms (examples)

200/90°/20.5		Item no.: 6829-11 Tracing arm total length 200 mm, 90° angled Stylus tip length 20.5 mm
200/2x33 HG		Item no.: 6829-145 Tracing arm total length 200 mm, Stylus tip length 2 x 33 mm 20° inclined tips – forwards

We are happy to offer you special tracing arms for your measuring tasks on request.

Technical specifications

ConturoMatic	TS-mini	TS / GS	TS-X (HD)/GM-X	TS-XL	TS-X *move*	CV120	CV300	Comment
ConturoMatic System specifications								
Measuring range-X ←→	200 mm	300 mm	280 mm	360 mm	370 mm	120 mm	300 mm	
Measuring range-Z ↑↓	278 mm	375 mm	350 mm	550 mm	350 mm	30 mm	100 mm	
Scanning direction ↓	✓	✓	✓	✓	✓	✓	✓	
Scanning direction ↑	•	•	✓	✓	✓	–	–	
Measuring direction ←→	✓	✓	✓	✓	✓	–	–	
X-Measuring point recording ⭾	–	–	✓	✓	✓	–	–	
Measuring speed	0.1-3.0 mm/s					0.03-1.75 mm/s		
Auto-measuring speed optimization	✓	✓	✓	✓	✓	–	–	
Positioning speed	up to 25 mm/s					up to 25 mm/s		
Measuring system(s)	Optically incremental					digital	digital	
Measurement data processing	digital							
Measuring system resolution	0.001 µm	0.001 µm	0.001 µm	0.001 µm	0.001 µm	0.01 µm	0.01 µm	
Guide elements	Plain-Bearings	Plain-Bearings	Air-Bearings	Air-Bearings	Air-Bearings	Plain-Bearings	Plain-Bearings	
Table load max.	35 kg	35 kg	25 kg (50 kg TS-X HD)	50 kg / 100 kg	150 kg	30 kg	75 kg	Centric table load
Error limits *								
Total error	+/-(0,9+L/100) µm	+/-(0.9+L/100) µm	+/-(0.85+L/100) µm	+/-(0.85+L/100) µm	+/-(0.85+L/100) µm			per scan direction L = measuring length [mm]
X-Axis	+/-(0,75+Lx/100) µm	+/-(0.75+Lx/100) µm	+/-(0.5+Lx/100) µm	+/-(0.5+Lx/100) µm	+/-(0.5+Lx/100) µm	+/-(1.2+2Lx/25) µm	+/-(1.0µm+Lx/25) µm	Lx = X - Measuring length in mm
Z-Axis	+/-(0,75+Lz/100) µm	+/-(0.75+Lz/100) µm	+/-(0.5+Lz/100) µm	+/-(0.5+Lz/100) µm	+/-(0.5+Lz/100) µm	+/-(1.8+2Lz/25) µm	+/-(1.5µm+2Lz/25) µm	Lz = Z - Measuring length in mm
Guidance accuracy	(0,15+L/100) µm	(0.15+L/100) µm	(0.08+L/100) µm	(0.08+L/100) µm	(0.08+L/100) µm	(1.5+L/25) µm	(1.2+L/25) µm	L = Measuring length in mm
Min. Measuring Point Spacing	min. 0,5 µm	min. 0,5 µm	min. 0,5 µm	min. 0,5 µm	min. 0,5 µm	min. 0,5 µm		Speed-dependent
Radius measurement	± 0.005 % of the NV at R12.5 mm					± 0.05 % of the NV at R12.5 mm		NV = Nominal value
Distance measurement	+/-(1.2+L/100) µm					+/-(1.8+L/25) µm		
Angle measurement	≤ 30“	≤ 30“	≤ 20“	≤ 20“	≤ 20“	≤ 2´		
ConturoMatic Software								
Contour	✓	✓	✓	✓	✓	✓	✓	
Diameter	•	•	✓	✓	✓	–	–	
NC-Automatic measurement	✓	✓	✓	✓	✓	✓	✓	
NC-Automatic assessment	✓	✓	✓	✓	✓	✓	✓	
Roughness								
Availability	•	•	✓	✓	✓	–	–	
Measuring range Z/X	1,0/200 mm	1.0/300 mm	350/280 mm	550/360 mm	350/370 mm	–	–	
Application ranges Ra	Ra ≥ 0,1 µm	Ra ≥ 0.1 µm	Ra ≥ 0.05 µm	Ra ≥ 0.1 µm	Ra ≥ 0.05 µm	–	–	
Application ranges Rz	Rz ≥ 1,0 µm	Rz ≥ 1.0 µm	Rz ≥ 0.5 µm	Rz ≥ 0.8 µm	Rz ≥ 0.5 µm	–	–	
Measuring point distance	ca. 0,5 µm	ca. 0.5 µm	ca. 0.5 µm	ca. 0.5 µm	ca. 0.5 µm	–	–	
Accuracy	5% MV	5% MV	5% MV	5% MV	5% MV	–	–	MV = Measured value
Measuring speed	0,1 - 0,5 mm/s	0.1 mm/s	0.1 - 0.5 mm/s	0.1 - 0.5 mm/s	0.1 - 0.5 mm/s	–	–	
Measuring force	7,5 mN	7.5 mN	7.5 mN	7.5 mN	7.5 mN	–	–	

* Conditions according to T&S specification • = Option – = not available

Information without guarantee - as of 01.08.2026

Accessories

Quality assurance

more than the use of suitable measuring equipment

It is the optimal combination of sound knowledge, reliable measuring devices, ergonomic operation and the use of practical accessories.

Increasing demands for flexibility, cost pressure and short set-up times call for universal usable accessories. Our professional auxiliary systems offers a clear differentiation from the competition – for example in terms of flexibility, safety, cost efficiency and speed of response. In addition, ongoing inspection of your measuring equipment is essential.

Last but not least, ergonomics leads to relaxed and effective work

Benefit from our expertise and our forward-looking solutions.

Measuring accessories from T&S means:

**Customized, ergonomic and innovative concepts –
from the simple workpiece support to the complex intelligent measuring device.**

Calibration standards

Contour and roughness standards

Every measuring device is only as good as its reference. We offer a wide range of contour and roughness standards for self-monitoring and testing the accuracy of contour measuring devices, e.g. in accordance with VDI/VDE 2629 or IATF 16949. Depending on the type, our standards are manufactured from hardened and aged gauge steel or carbide and sealed with a diamond-like, extremely wear-resistant surface coating. We have developed stable holders with sensitively adjustable inclination axes for secure positioning.

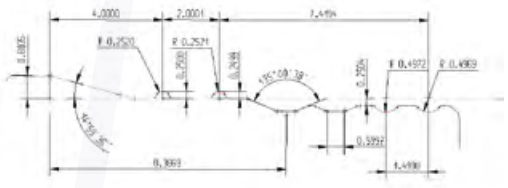
DAkkS-Kalibrierlabor

Deutsche Akkreditierungsstelle GmbH

Deutschen Kalibrierdienst DKD

We can offer you the following test certificates for our standards

- Factory certificate *(standard)*
- DAkkS certificate
- PTB calibration certificate



Contour standard KN180

Contour and roughness standards KN85 / KRN85

Contour standard KN20

Thread standard for pitch and flank angle SN100

Micro - Contour standard KN15

Contour standard for Gothic profiles GN2

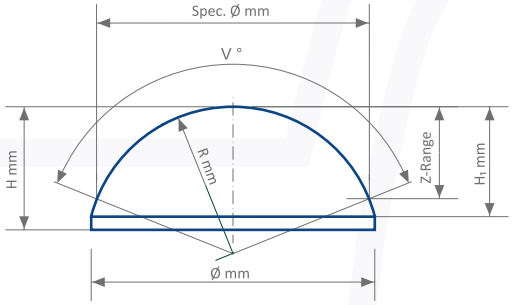
Radius standards

Glass hemispheres – convex and concave

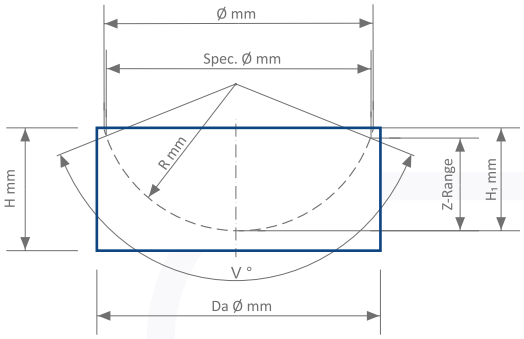
To complement our extensive range of calibration standards, we offer a range of high-precision radius standards. These ultra-precise radius standards are used for dynamic system testing of stylus devices and high-precision 3D measuring devices. Depending on the application and measuring range, we supply these radius standards in convex or concave versions at an extremely attractive price. The radius- and form deviation is in the sub-µm range.

Field of application

Dynamic overall testing of stylus gauges, testing the measuring accuracy of convex and concave radii, basic element for correcting the arcuate stylus arm movement of classic stylus gauges and reference geometry for laser interferometric measuring systems.



convex – roughness = Rq 0.05µm



concave – roughness = Rq 0.05µm

Glass hemisphere

Radius normal parameters

Shape	R[mm]	R-Tol. +/-[µm]	Formal error [µm]	V[°]	Ø[mm]	Spec.Ø[mm]	Z-Range	H[mm]	H_1[mm]	Weight[g]	T&S Nr.
concave	51,68	0,26	0,10	56,60	49,20	49,00	6,18	11,23	-6,23	40	# 12440
convex	38,76	0,19	0,30	142,93	75,00	73,50	26,44	32,62	28,96	235	# 12441
convex	77,52	0,39	0,15	56,60	75,00	73,50	9,26	11,45	9,67	75	# 12442
convex	77,52	0,39	0,30	75,58	100,00	95,00	16,26	21,00	18,28	240	# 12443
convex	207,00	1,04	0,40	56,20	200,00	195,00	24,40	31,00	25,76	1450	# 12444
convex	206,72	1,03	0,65	72,68	250,00	245,00	40,21	45,50	42,07	3100	# 12445

ConturoMatic RS – Rotary unit

Measuring rotary axis for ConturoMatic T-Systems

Our motor-driven RS-1 and RS-2 rotary units are based on precision bearing-mounted rotary axes with an integrated angle measuring system. They extend the application range by a rotary axis and thus enable contour and roughness measurements in radial direction.

Areas of application are for example:
Radial roughness measurement, measurement of spur gears or segmented elements on a defined pitch circle.

All swivel axes of the RS-1 can be leveled in any position.
The end points of the swivel movement can be fixed using a micrometer spindle.

The mechanics of the RS-2 can be used in the probe axis or rotated 90° to it.
For exact positioning on a specified pitch circle, a motor-driven Y-travel unit with incremental measuring system is integrated.

The workpiece is held in a precision 6-jaw chuck as standard, control and data acquisition via a T&S universal USB-Controller.
The rotary unit is compatible with all ConturoMatic T-Systems within the scope of performance of the basic system. Operation and control are integrated into the standard software. The analyse functions of the standard software, including the creation of automatic measuring sequences, are possible without any problems.

ConturoMatic Rotary-Unit RS1 - Example of variable measuring position

Technical data motorized rotation drive

- Runout deviation of the drive spindle: < 2µm
- Spindle position relative to the system axis (RS-1): X=0°-90°, Y 0°-90° or in any intermediate position
- Spindle position relative to the system axis (RS-2): X=0°-90°, Y 0°-90°
- Rotation speeds are variably selectable and dynamically optimizing
- Resolution of the angular measuring system: < 5“
- Radial measuring point distance - variable depending on rotational speed and test diameter
  from 2µm measuring point distance
- Workpiece diameter: 2-100mm
- Part holder: 6-jaw chuck (standard)

ConturoMatic Rotary-Unit RS1- Example of axial 90° measuring direction

ConturoMatic RX

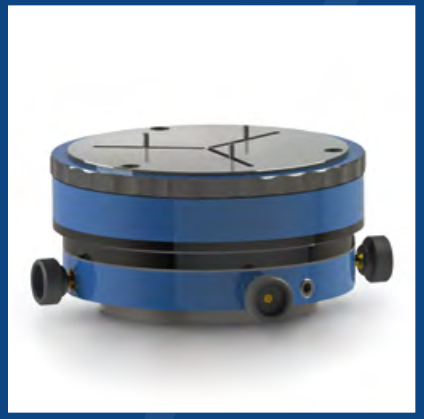
Mobile roughness inspection system

The ConturoMatic RX enables the reliable measurement and evaluation of roughness through extremely simple handling. The skid scanning system can be mounted on the CV120/CV300 with the holder article no. 9002-0076-00 or used independently. Optional tracing arms are available for individual measuring tasks. Being battery-operated, the ConturoMatic RX can evaluate measurements independently or optionally transmit the measurement data via Bluetooth to our **free „Roughness Studio Lite“ evaluation software**.

Technical specification

- Parameters: ISO 4287: Ra, Rq, Rt, Rz, Rmax, Rc, Rsm, Rmr sowie ISO 12085: Pt, R, AR, Ax
- Gaussian filter according to ISO 11562
- Scanning range up to 16mm
- Cut-off: 0.25 - 0.8 - 2.5mm
- Measuring range +/-20µm and +/-80µm
- Resolution 0.01µm and 0.04µm
- Integrated LCD display, 16 characters, 3 lines
- Dirt-repellent membrane keypad
- Rechargeable high-performance battery
- Measurement data transmission via Bluetooth
- Incl. roughness probe SB10
- Incl. roughness standard Ra= 3µm
- Incl. evaluation app „Roughness Studio Lite“ for Windows PC, tablet or smartphone

Centering & Clamping Systems



How does the workpiece gets onto the measuring device?

Thanks to advanced manufacturing technologies, it is now possible to produce in qualities that reach the accuracy limits of metrology. A significant proportion of the uncertainties that arise when carrying out measurements result from inadequate part fixtures. In addition, the precise clamping and alignment of the test specimens in measuring devices often requires a considerable amount of time. However, time is money, especially in series production.

In addition

Faulty test specimens that are not recognized due to incorrect measurements have a negative impact on product quality and image.

Even more, this makes perfect workpiece fixturing important. It has a decisive influence on the quality of a measurement. A correct measurement result cannot be achieved without exact positioning of the test specimen. Unfortunately, in practical applications, a large proportion of the achievable measurement accuracy is often lost due to inadequate positioning in the measuring device. To counteract this, we have developed a range of centering and clamping systems especially for use in quality assurance. The main applications are contour measuring systems, form measuring machines, 3D coordinate measuring machines and optical inspection devices.

Centering and clamping systems from T&S are specially developed for use on testing machines and guarantee accurate measurement results. If our standard is not sufficient, we will work with you to find a customized solution for your specific requirements.

The advantages of our centering & clamping systems

- Flexibility
- Simple, fast handling
- High precision, which generally eliminates the need for re-centering
- Robustness, developed for use close to production
- Variable clamping force for centering thin-walled parts

Centering & Clamping Systems

Series ZSR

Centrically clamping, angle-adjustable and radially rotatable vice, clamping range 75 mm. Thanks to the centric clamping the clamping center always remains in the measuring axis, eliminating the need to constantly move the part holder.

ZSR-60 with digital angle display – Jaw width 98 mm

Series VZ

Vacuum clamping system for holding workpieces on form measuring devices, 3D coordinate measuring machines or optical systems. The battery-operated VZ with integrated vacuum pump is ideal for use on form testing devices with a rotating table.

Vacuum clamping system VZ-4

VZ-4 with centering unit

Series WP/WPS/WSF

Examples from our extensive range of part holders: Weight-optimized swiveling workpiece support. Shaft prism (WP) as an alternative to fixed prisms, with the following advantages: Application range (Ø 25-350 mm), accessibility from above and below and easy handling. Holder for contour standards e.g. KN180 with fine adjustment of all axes.

Shaft prism WP-300

Adjustable mount for KN180

Ultra-light, swivel-mounted parts support

Workpiece holders

Series WSE

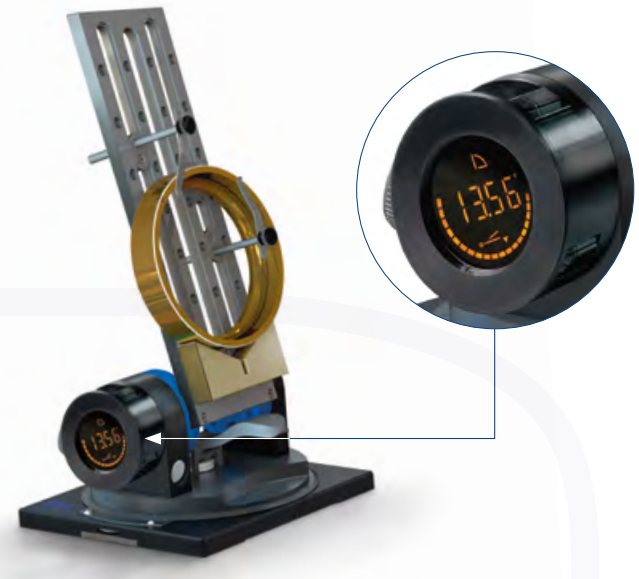
Angle-adjustable universal holders for positioning bearing rings on contour measuring systems. The central groove allows the measuring probe to pass through to the back of the workpiece. The inclination of the support plate is adjusted by a worm gear, with analog or optionally digital angle display.

A movable prism and support bolts are included in the scope of delivery for workpiece positioning.

To prevent the test specimen from tilting, a movable, spring-loaded retaining element is integrated into the device. Spring-loaded contact balls for determining the dimensions of the rear end face and magnetic inserts for securing parts are optionally available.

As an option, we can supply the device rotatable by 360° in the plane. The positions can be adjusted and fixed using a friction wheel and toggle clamp. The angle of rotation is read off using a scale with vernier.

Optional: motorized adjustable tilting axis. This function can be integrated into the automatic measuring programs of our ConturoMatic T-systems.



Radially adjustable WSE-300 with digital angle display

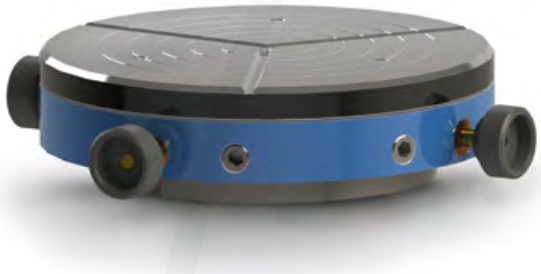
WSE-300 ring holder with digital angle display – Inclined measuring direction

WSE-300 ring holder with digital angle display- Example of measuring direction axial 0°

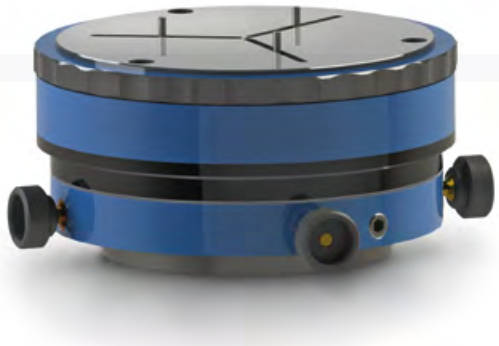
Centering & Clamping Systems

Series KZT

Tilting and centering table for levelling and X-Y axis position adjustment. The adjustment is made via fine-thread spindles. The position and axis inclination can be adjusted for each axis. As an option, we can supply our KZT with an adapted tilting and centering table UZ/AZ.



KZT-160 tilting and centering table



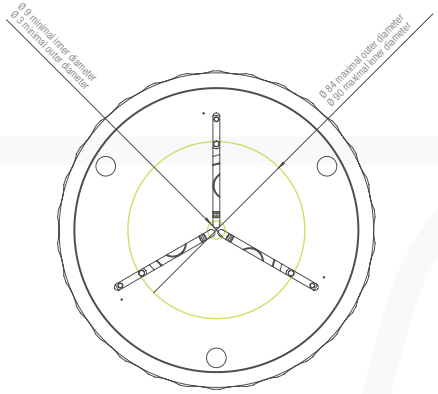
KZT-160 with adapted UZ-160

Series UZ

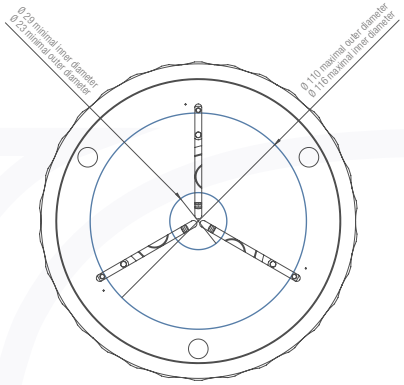
Our universal, patented system for external and internal centering of round test specimens. The guidance of the UZ corresponds to a non-linear curve. This allows us to achieve an outwardly increasing centering force. Larger, generally heavier test specimens are centered with a greater force than small, lightweight workpieces. The centering elements are fastened by a thread and can be adapted to the specific task. An adapter plate is included in the scope of delivery for mounting on rotary tables of common form measuring devices.

UZ-160/240 for external and internal centering of round test specimens up to 230 mm in diameter with integrated magnetic strips (optional)

UZ-160 Area of application

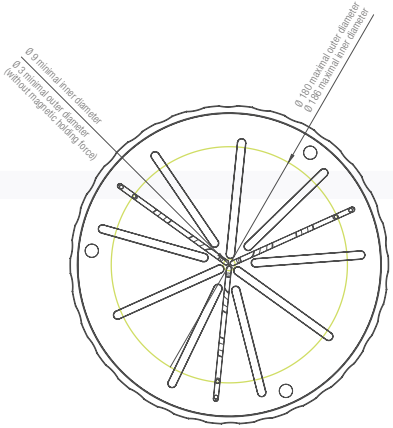


Dimensions for inner position
of the centering pins

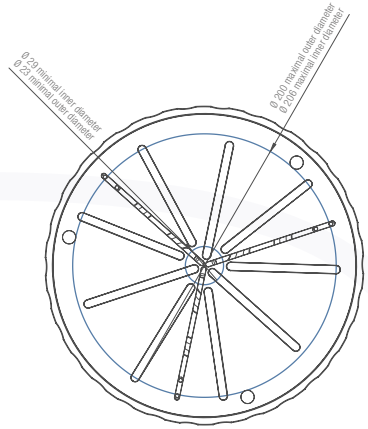


Dimensions for outer position
of the centering pins

UZ-240 Area of application



Dimensions for inner position
of the centering pins



Dimensions with outer position
of the centering pins

Areas of application

		UZ-160	UZ-240
DA	Outer diameter of device	Ø 160 mm	Ø 240 mm
H	Height (without centering pins)	40 mm	42 mm
DP	Support diameter	Ø 145 mm	Ø 230 mm
di	Centering area - inside	Ø 9 – 116 mm	Ø 9 – 206 mm
da	Centering area - outside	Ø 3 – 110 mm	Ø 3 – 200 mm

Information without guarantee - Status 01.08.2026

Centering & Clamping Systems

UA-150 for thread gauge mounting

Universal fixture UA-150

Flexibility is one of the main requirements for measuring systems and the necessary auxiliary and clamping equipment. With this focus in mind, we develop smart workpiece holders to match our ConturoMatic systems, which guarantee flexibility, robustness and a secure and stable support for precise measurements. Combined with simple operation, expandability and variable mounting options for a wide range of test specimens, our universal UA-150 meets these requirements perfectly.

Technical highlights

- The UA-150 can hold shafts via sliding prisms or rings on a support plate that can be swiveled at an angle
- Thread ring gauges from M2 to M70 can be clamped without additional elements
- The central groove allows the measuring probe to be guided through to the back of the workpiece
- The thread plug gauges are supported on sliding prisms
- Spring-loaded holding elements are integrated into the device to prevent shafts from tilting
- The application range for thread gauge measurement is M1 to M100
- A spring-loaded contact ball is integrated for the evaluation of tapered threads
- Universal clamping elements on the base allow easy adaptation to the respective measuring task

UA-150 with supporting prisms

UA-150 with base plate

T&S-Measuring instruments

Repair- and Calibration Service

It's reassuring when it measures correctly! Testing equipment must work reliably. Regular maintenance, calibration and documentation of the measuring devices used are mandatory. In particular, SMEs are often unable to perform these tasks adequately for capacity reasons.

Take advantage of our expertise as a measuring device manufacturer and our existing network. We cooperate with selected and professional experts, we think sustainably. We often have the option of repairing defective measuring equipment instead of procuring new equipment.

Willi Schmidt
Your contact for our Repair- and Calibration Service

What we can do for you:

Repair and calibration of

- Contour standards and roughness standards
- Inductive displacement transducers
- Display systems for inductive displacement transducers
- Plane glasses and glass hemispheres
- Dial gauges and precision indicators
- feeler lever gauges
- micrometers
- Calipers, gauge blocks, gauges, ...

Our services

- Pick-up and delivery service
- Measuring equipment management
- Regular monitoring
- Repair of measuring equipment
- Replacement procurement
- DAkkS calibration of standard measuring equipment
- DAkkS calibration of special gauges
- Parts measurement on a contract basis

Customized solutions

- Development and production of task-specific special systems and measuring devices
- Manufacture of customized measuring tips
- Wear-reducing coating of measuring devices

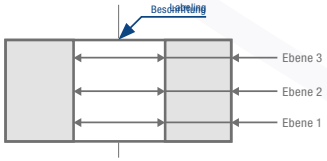
Kalibrierschein / Calibration Certificate

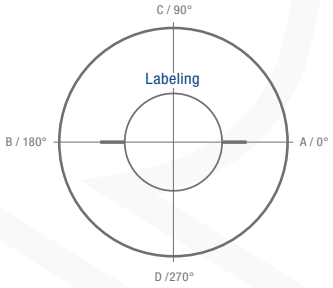
Deutschen Kalibrierdienst DKD

DAkkS - Calibration Certificate

Your advantages:

- Our many years of expertise as a precision measuring device manufacturer
- Competent and reliable contacts
- A network of selected partners
- You have more time for your core competence
- Less organizational effort
- Short distances
- Adherence to deadlines
- We think sustainably: repair instead of buying new

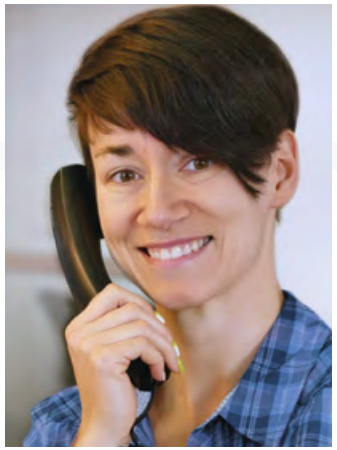




Please contact us!

Phone +49 9725 7106-0 or send an e-mail to pm-service@ts-messtechnik.de

T&S Customer Service



Help when it matters

It's nice when everything runs smoothly. If there are any problems, individual service is a matter of course for us.
Delivering technically outstanding products is not enough for us. The service, expertise and support we provide to our customers must also be first-class.

We also place particular emphasis on robustness and durability when developing our products. T&S is committed to the guiding principle of „Made in Germany" technology and works predominantly with local partners and suppliers. This not only ensures quality assurance, but above all guarantees short distances.

After-Sales-Service

We are at your side with help and advice. Take advantage of our accumulated practical knowledge from over 30 years of experience and several thousand systems delivered worldwide. You can reach us by phone or email during our business hours and, if necessary, our technicians will visit you in person.

ISO 9001:2015-certification
Certified by
DEKRA Certification GmbH

What you can expect from us

- A friendly, helpful and competent service team
- Project support from our technical sales department
- T&S in-house repair service with transport organization
- Technical customer service for on-site repairs
- Maintenance contracts with deadline monitoring by us
- User and advanced training at T&S or at your premises
- Free technical customer service by phone and e-mail
- If possible, loan systems to bridge the repair time
- Worldwide customer service
- Tracing arm repair service
- Free software maintenance

Please contact us!

Phone +49 9725 7106-0 or info@ts-messtechnik.de

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Service

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