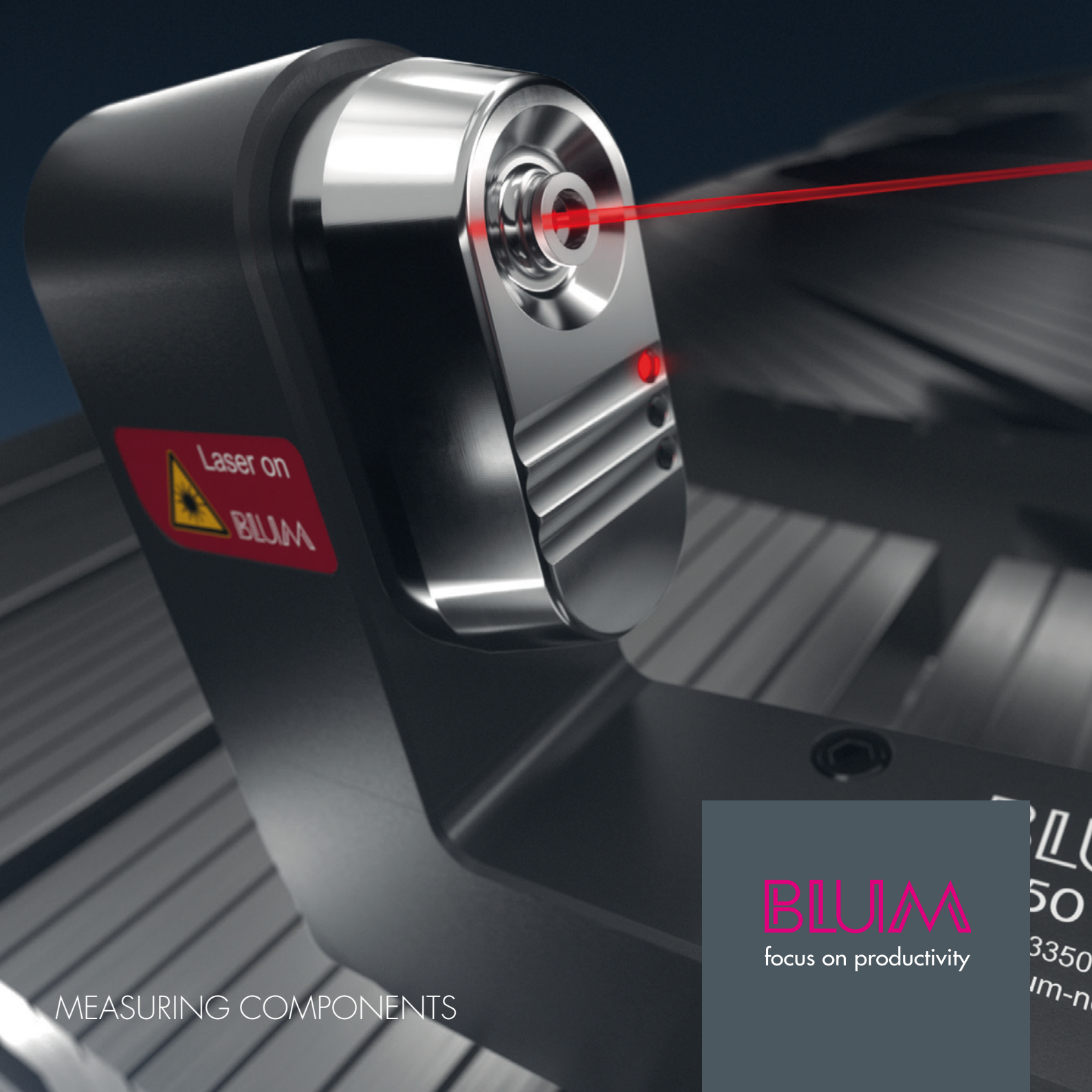




Laser on
BLUM

MEASURING COMPONENTS

BLUM

focus on productivity

50
3350
im-n

Regional roots, international reach.

As a family-run company, we have deep roots in the region while also operating an international network of sales and service subsidiaries. From our sites in Gruenkrut in Baden-Württemberg and Willich in North Rhine-Westphalia, we supply the machine tool, automotive and aerospace industries as well as the energy and medical technology sectors and numerous other demanding industrial areas across the globe.

We are always there wherever you need us – and have been for more than 50 years.

Each of our products combines experience and expertise with an instinct for forward-looking solutions. A comprehensive service portfolio gives us an innovative edge and our customers the assurance of always receiving the best solution. Everyday, more than 700 employees worldwide work to achieve this.

Your productivity is what drives us!



Alexander Blum

BLUM

CONTENT

Mission statement

Measuring components

LaserControl

Tool Setting Probes

Touch Probes

Touch Probes DIGILOG

Surface Roughness Gauges

Software FormControl X

Bore Gauges

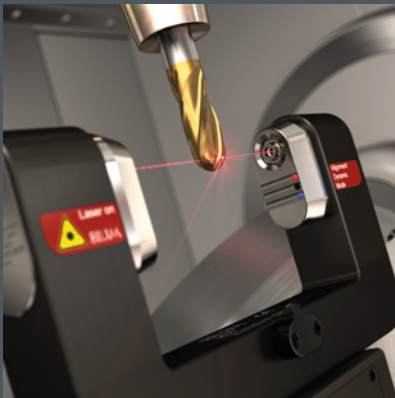
Multi-Purpose Measuring Devices

Sales & Service

International

NOVOTEST Test Engineering Division

Measuring Machines Division



LaserControl DIGILOG

The impressive performance of the LaserControl series has been ensuring maximum precision, reliability and efficiency in countless machining centres for decades now. And the latest generation is writing a new chapter in this success story: The trailblazing DIGILOG technology opens up a multitude of previously inconceivable applications in production measurement technology.

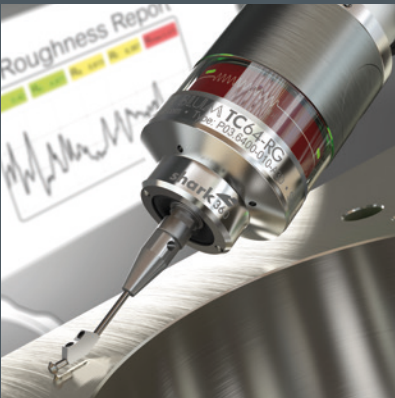
Page 10



High-Speed Touch Probes

Faster, more economic, more precise – the advantages of the high-speed probe series can be summarized as simply as that. The probes impress with their state-of-the-art measuring mechanism technologies and top measuring speeds. Specially designed for the harsh conditions in machine tools, they provide the right solution for any task.

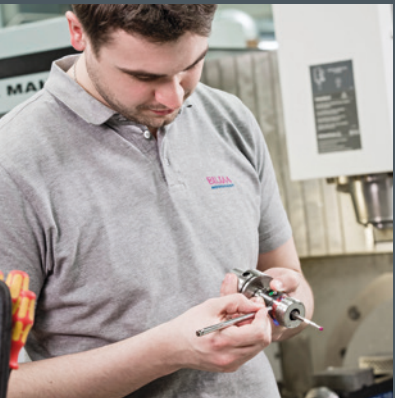
Page 36



DIGILOG: Roughness Measurement and Scanning in the Machining Centre

DIGILOG technology also allows the probes to achieve standards previously thought impossible. While surface roughness gauges are used for precise and automatic inspection of workpiece surfaces, DIGILOG probes quickly and reliably scan complex workpiece contours in milling, turning and grinding machines.

Page 56



Worldwide Service

Take advantage of our comprehensive services to ensure maximum efficiency, process reliability and availability for your production processes. Our worldwide sales and service network allows us to provide optimum support and very short response times.

Page 80

01 OUR AMBITION IS YOUR ADVANTAGE

BLUM-NOVOTEST, MISSION STATEMENT

Quality – Advanced and absolutely reliable solutions that meet the highest quality standards are at the heart of our company. Their sole function is to guarantee the efficiency of your manufacturing processes.

Innovation – We see ourselves as technological pioneers and innovators in the field of measuring and testing technology. With us, you are always one step ahead.

Reliability – Our products stand for uncompromising precision in every environment. This means you are always on the safe side.

Personality – We foster long-term partnerships with our employees, customers and business partners. After all, fairness, trust and reliability are always built on mutual cooperation.

Commitment – Our comprehensive service extends far beyond the norm and is fully focussed on the specific needs of our customers. Their success is our success.

For over 50 years BLUM
has been creating products
that set standards.

There is a reason for that:
Passion





DIGILOG – one technology, many possibilities.

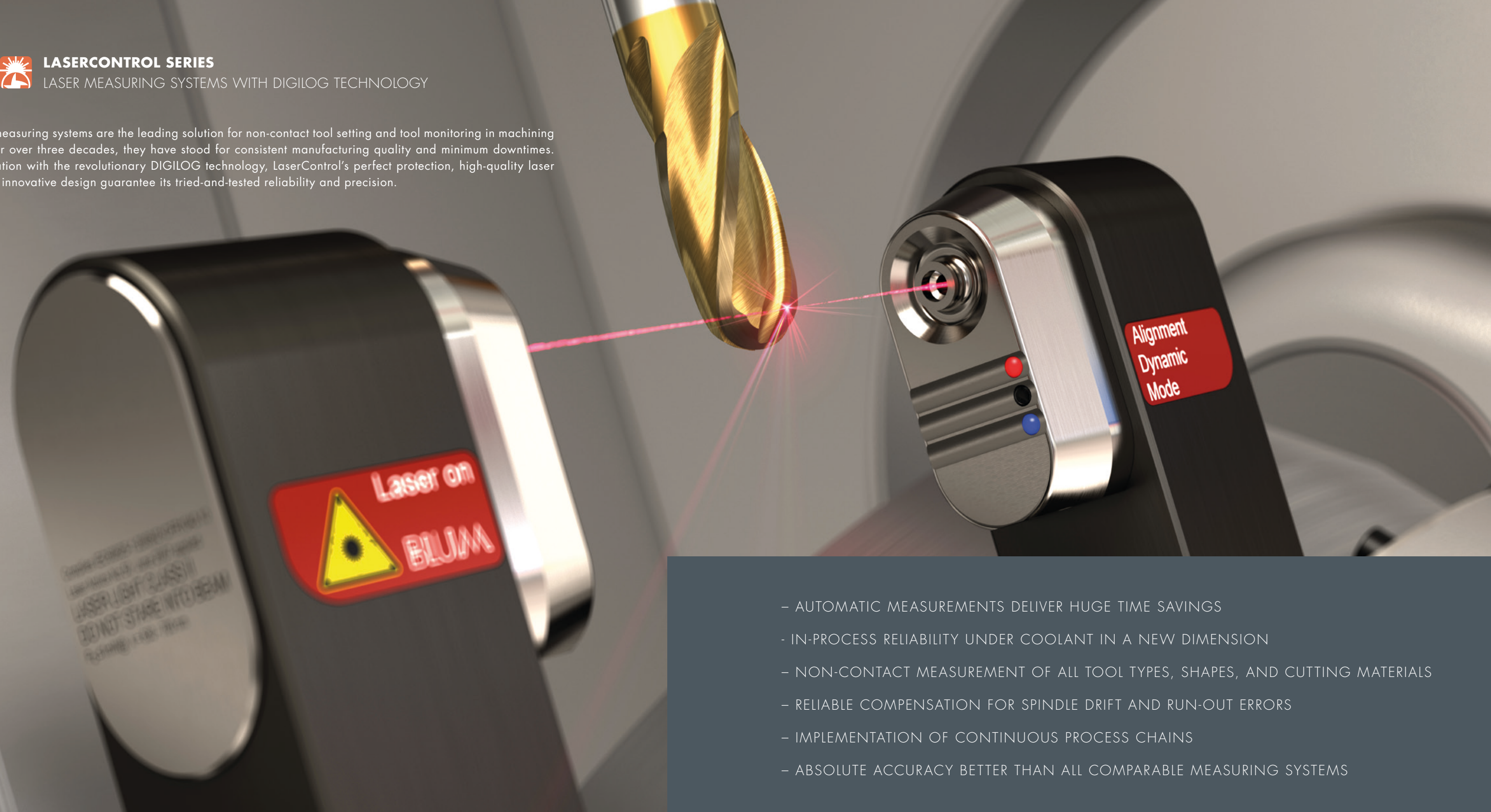
This is where components work together that belong together. Dependable sensor technology is essential for low-labour, in-process reliability in production processes. In response to this, BLUM is already in a position to fulfil the demands that Industry 4.0 networked production will be making. DIGILOG technology will be playing a decisive role here: The future-oriented measuring systems open up revolutionary options for production processes thanks to the data pool generated through thousands of measured values per second. They cover contour scans with DIGILOG probes, process-integrated roughness measurement, bore measuring devices for series production and of course tool measurement using DIGILOG laser measuring systems. The perfect interaction is reflected in the interface hardware as well. It is based on a modular system and can be modified extremely easily to accommodate additional measuring systems.

02

**LASERCONTROL SERIES**

LASER MEASURING SYSTEMS WITH DIGILOG TECHNOLOGY

The laser measuring systems are the leading solution for non-contact tool setting and tool monitoring in machining centres. For over three decades, they have stood for consistent manufacturing quality and minimum downtimes. In combination with the revolutionary DIGILOG technology, LaserControl's perfect protection, high-quality laser optics and innovative design guarantee its tried-and-tested reliability and precision.



- AUTOMATIC MEASUREMENTS DELIVER HUGE TIME SAVINGS
- IN-PROCESS RELIABILITY UNDER COOLANT IN A NEW DIMENSION
- NON-CONTACT MEASUREMENT OF ALL TOOL TYPES, SHAPES, AND CUTTING MATERIALS
- RELIABLE COMPENSATION FOR SPINDLE DRIFT AND RUN-OUT ERRORS
- IMPLEMENTATION OF CONTINUOUS PROCESS CHAINS
- ABSOLUTE ACCURACY BETTER THAN ALL COMPARABLE MEASURING SYSTEMS

02

 LASERCONTROL SERIES
TECHNOLOGY

The laser measuring systems guarantee maximum precision, reliability and efficiency in machining centres. This exceptional performance is made possible by their ground-breaking DIGILOG technology combined with innovative hardware.

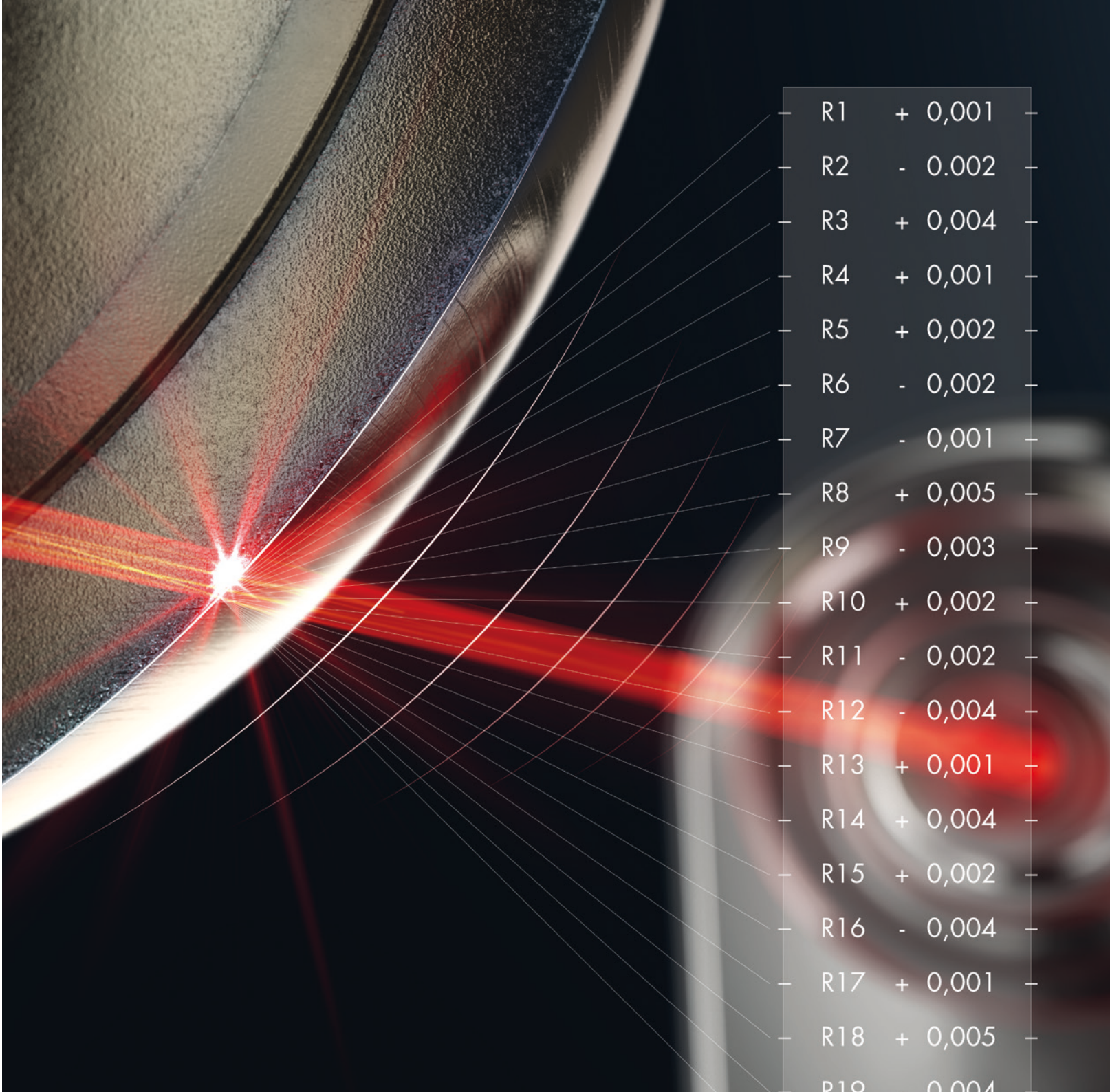
DIGILOG Technology: In-process reliability in a new dimension

The DIGILOG laser measuring systems continuously measure the shading of the laser beam, generating thousands of measured values as a result.

- DRAMATICALLY SHORTER MEASURING TIMES
- MAXIMUM PRECISION WHEN USED WITH COOLANT
- AUTOMATIC RUN-OUT MONITORING
- ANALYSIS OF ANY SINGLE CUTTING EDGE

Technical data

LASER PROTECTION CLASS	Class 2 according to IEC60825-1, CFR 1040.10
LASER TYPE	Visible red light laser 630 ... 700 nm < 1mW
PROTECTION CLASS	IP68



–	R1	+	0,001	–
–	R2	-	0.002	–
–	R3	+	0,004	–
–	R4	+	0,001	–
–	R5	+	0,002	–
–	R6	-	0,002	–
–	R7	-	0,001	–
–	R8	+	0,005	–
–	R9	-	0,003	–
–	R10	+	0,002	–
–	R11	-	0,002	–
–	R12	-	0,004	–
–	R13	+	0,001	–
–	R14	+	0,004	–
–	R15	+	0,002	–
–	R16	-	0,004	–
–	R17	+	0,001	–
–	R18	+	0,005	–
–	R19	0,004	–	–

02 LASERCONTROL SERIES TECHNOLOGY

smartDock: Intelligent Variants for more Flexibility

This innovative interface is the basis for nearly all support systems and contains all the necessary pneumatic valves in addition to the electrical, mechanical and pneumatic connections between the machine and laser measuring system.

- ONE ELECTRIC & ONE PNEUMATIC LINE
- NO SEPARATE PNEUMATIC UNIT NEEDED
- SIMPLE LASER PREPARATION
- FLEXIBLE INTERFACE FOR MACHINE INTEGRATION

Premium Laser Optics

- PRECISION BETTER THAN ALL COMPARABLE MEASURING SYSTEMS

HPC Nozzle

- FOR RESIDUE-FREE TOOL CLEANING

Unique Shutter Systems

- GUARANTEED RELIABLE OPERATION IN ANY MANUFACTURING SITUATION





Software **LC-VISION**

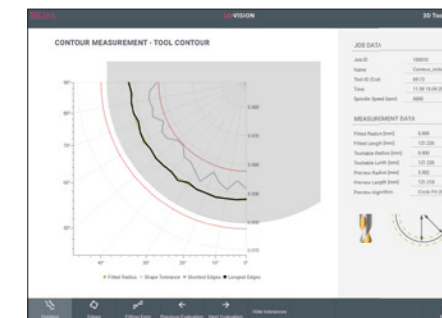
MEASUREMENT AND VISUALISATION SOFTWARE

LC-VISION is an innovative measurement and visualisation software solution for DIGILOG laser measuring systems from BLUM. With its intuitive operating design, a number of measuring tasks can be generated, visualised and analysed quickly and easily on the control screen. The field of application is not only limited to the topic of tool measurement, but also includes a reliable assessment of the motor spindle quality.

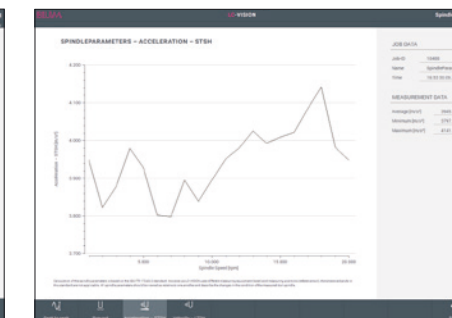
-  Tool Measurement
-  Wear Compensation
-  ToolControl
-  SpindleControl
- and much more...

- STEP BY STEP TO THE MEASUREMENT SEQUENCE EVEN WITHOUT NC PROGRAMMING KNOWLEDGE
- ONE USER INTERFACE FOR ALL COMMON MACHINE CONTROLS
- DIAGNOSTIC VIEW FOR DISPLAYING IMPORTANT SYSTEM DATA AND INFORMATION ON PREVENTIVE MAINTENANCE
- NEW TECHNOLOGY CYCLES SUCH AS SPINDLECONTROL OR TOOLCONTROL ADVANCED
- STABILITY FUNCTION FOR MACHINING UNDER THERMALLY STABLE SPINDLE CONDITIONS
- VISUALISATION AND STATISTICAL EVALUATION OF MEASUREMENTS
- DATA EXPORT OF MEASURED VALUES FOR PROCESSING IN TOOL MANAGEMENT SYSTEMS

Visualisation of the measurement results of a ballnose mill



Example of spindle parameter analysis





Laser Measuring System LC50-DIGILOG
PERFECTION IN TOOL MEASUREMENT

Unbeatable precision and reliability. In order to achieve the greatest possible accuracy in tool measurement in the machining centre, BLUM recommends the use of compact support systems. The LC50 laser measuring system is offered as standard in lengths from 150 to 500 mm. Thanks to the new laser optics, the system also meets the requirements of small high-end machines in micro-machining.

High-precision measurement of all tool types, sizes and shapes



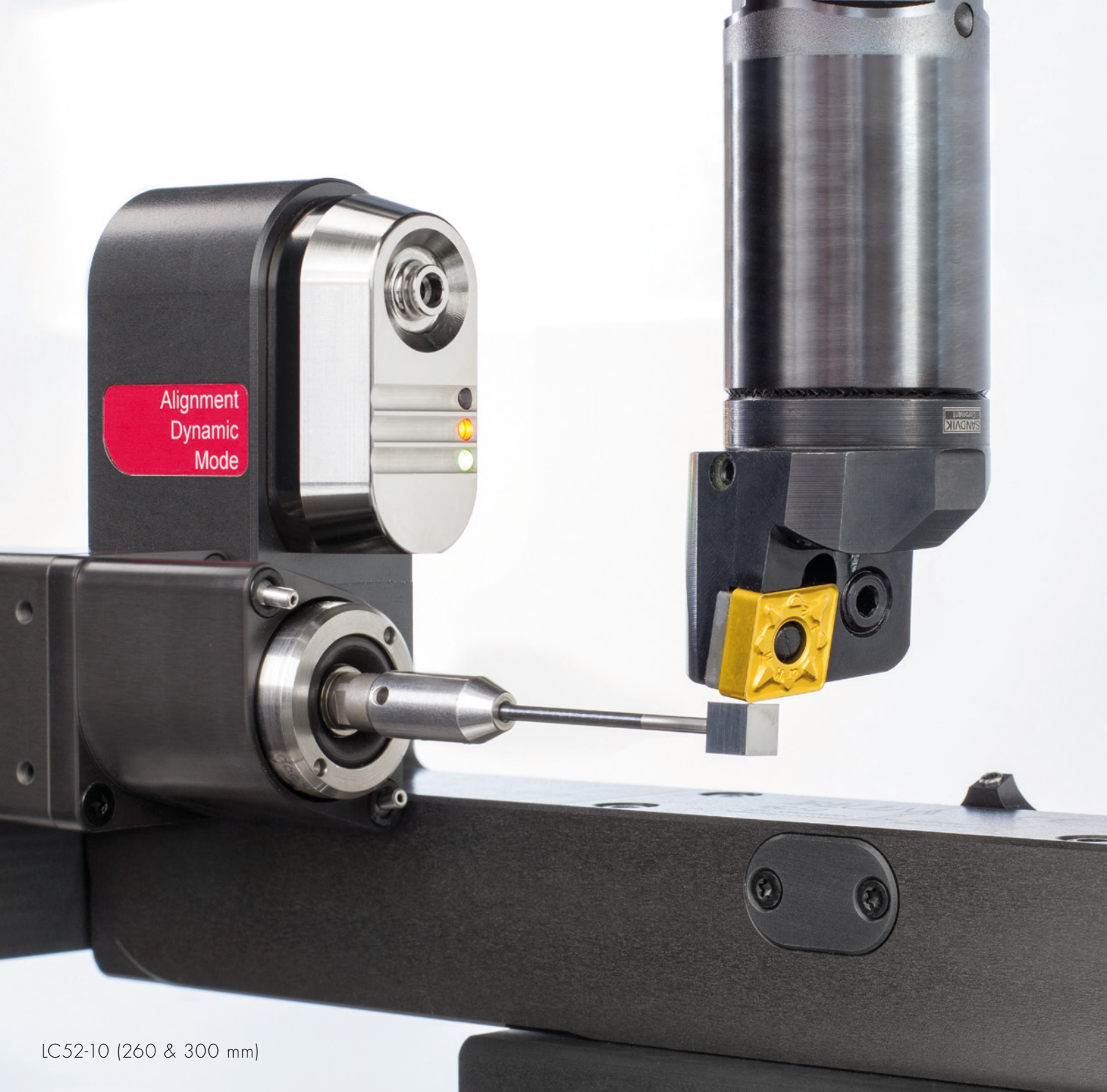
Reliable solutions for every machining operation



-  DIGILOG Technology
-  Tool Breakage Detection
-  Tool Setting
-  Single Cutting Edge Monitoring
-  Tool Contour Measurement
-  Wear Compensation
-  Temperature Compensation
-  RunoutControl
-  MicroWearControl
-  ConicalToolControl
-  GrindingControl
-  ToolControl
-  SpindleControl
- and much more...

System length LC50*	150 mm	200 mm	260 mm	300 mm
MAX. TOOL Ø**	36 mm	120 mm	314 mm	498 mm
MIN. TOOL Ø***	5****/15 µm	20 µm	30 µm	37 µm
REPEATABILITY***	0.2 µm 2σ	0.3 µm 2σ	0.4 µm 2σ	0.5 µm 2σ

* Additional system lengths: 400 mm & 500 mm ** Vertical/Horizontal *** Depending on the installation situation and stability of mounting
**** Contact with local BLUM representative is required



LC52-10 (260 & 300 mm)

Laser Measuring System LC52-DIGILOG
TOOL MEASUREMENT IN TURNING AND MILLING CENTRES

The complete solution for any tool. The LC52 is a compact, high-precision system for measurement of the complete tool spectrum in turning and milling centres. Laser measurement of milling tools can be carried out without contact at nominal rotation speed. Turning tools can be measured quickly and reliably with the adapted probe.

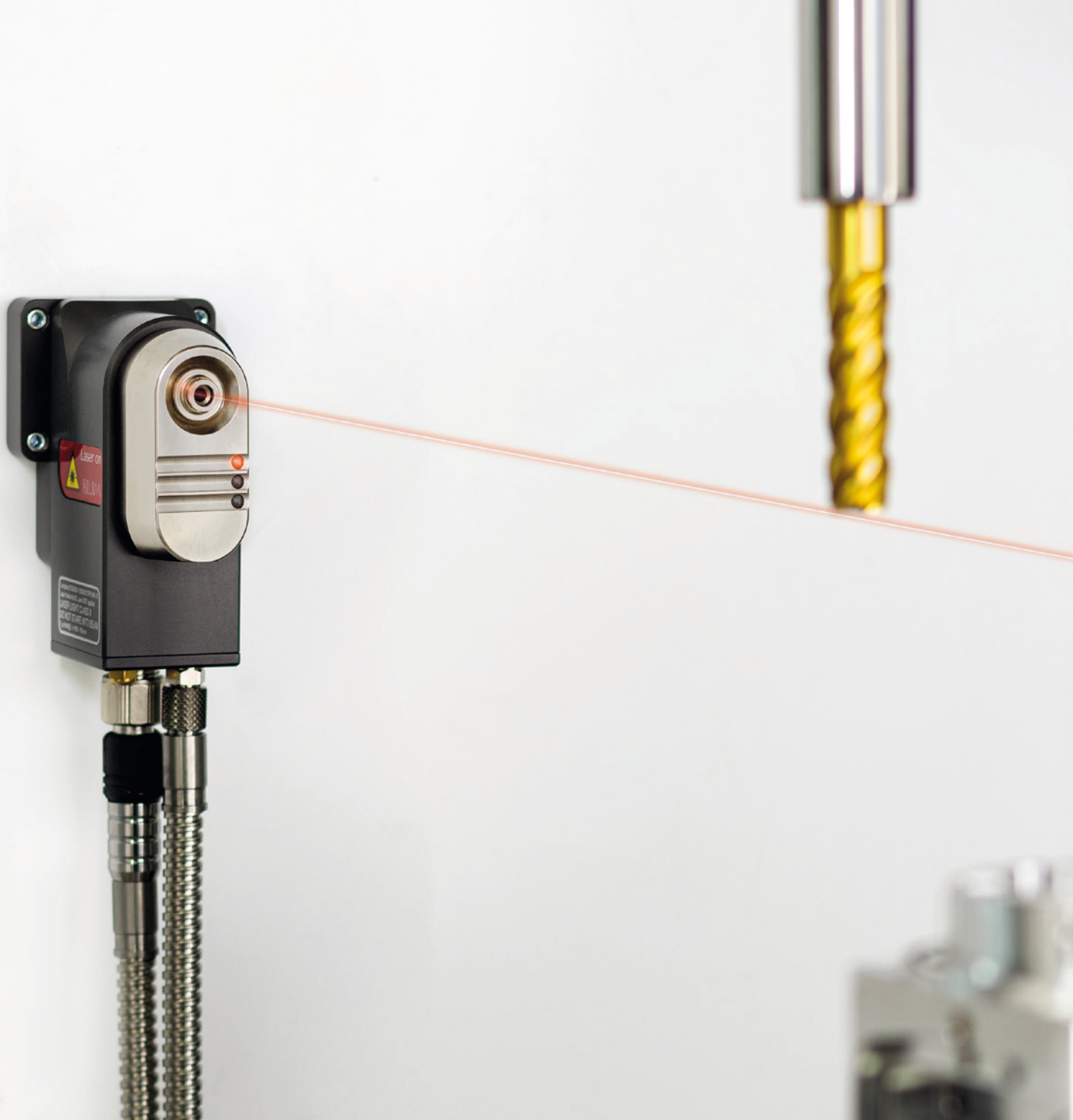
LC52-20 with pneumatically controlled protective sleeve (260 mm) LC52-30 (200, 260 & 300 mm)



-  DIGILOG Technology
-  Tool Breakage Detection
-  Tool Setting
-  Single Cutting Edge Monitoring
-  Tool Contour Measurement
-  Wear Compensation
-  Temperature Compensation
-  RunoutControl
-  MicroWearControl
-  ConicalToolControl
-  GrindingControl
-  ToolControl
-  SpindleControl
- and much more...

System length	200 mm	260 mm*	300 mm
MAX. TOOL Ø**	120 mm	314 mm	498 mm
MIN. TOOL Ø***	20 µm	30 µm	37 µm
REPEATABILITY***	0.3 µm 2σ	0.4 µm 2σ	0.5 µm 2σ

* LC52-20 standard system length: 260 mm ** Vertical/Horizontal
*** Depending on installation situation and stability of mounting system



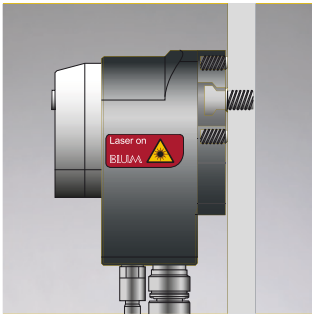
Laser Measuring System LC53-DIGILOG
SYSTEM WITH SEPARATE TRANSMITTER AND RECEIVER UNIT

If installing the support systems is not possible for constructional reasons, the LC53-DIGILOG laser measuring system is used. The separation of transmitter and receiver allows for flexible integration into a wide variety of machine types. Like all current laser measuring systems from BLUM, LC53-DIGILOG features the forward-looking DIGILOG technology, highly precise laser optics and a unique protection system.

Separate transmitter and receiver units provide flexible installation



Intelligent mounting set for easy installation



-  DIGILOG Technology
-  Tool Breakage Detection
-  Tool Setting
-  Single Cutting Edge Monitoring
-  Tool Length Measurement
-  Wear Compensation
-  Temperature Compensation

System distance	500 mm	1000 mm	1600 mm	2200 mm
MIN. TOOL Ø (breakage)*	0.4 mm	0.5 mm	0.5 mm	0.7 mm
MIN. TOOL Ø (measurement)*	1 mm	1 mm	1 mm	1.5 mm
REPEATABILITY*	2.5 µm 2σ	4.5 µm 2σ	6 µm 2σ	10 µm 2σ

* Depending on installation situation and stability of mounting system



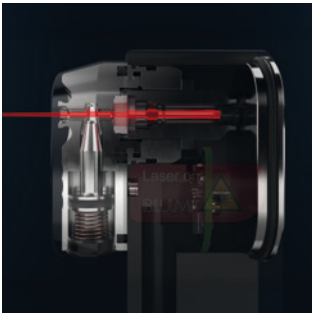
Laser Measuring System LC54-DIGILOG
TOOL MEASUREMENT IN MICRO-MACHINING

The LC54-DIGILOG was developed specifically for tool measurement and monitoring in micro-machining processes. Thanks to its space-saving design, it can be easily integrated into highly compact machine concepts – without compromising on performance or functionality. The combination of DIGILOG technology, premium laser optics and the intelligent MicroTool mode makes it the ideal solution for the most demanding requirements in high-precision machining.

Measurement of standard and micro-tools



High-precision laser optics & BLUM protection system



-  DIGILOG Technology
-  Tool Breakage Detection
-  Tool Setting
-  Single Cutting Edge Monitoring
-  Tool Contour Measurement
-  Wear Compensation
-  Temperature Compensation
-  RunoutControl
-  MicroWearControl
-  ConicalToolControl
-  GrindingControl
-  ToolControl
-  SpindleControl
- and much more...

Technical data

MAX. TOOL Ø	16 mm
MIN. TOOL Ø*	5**/10 µm
REPEATABILITY*	0.2 µm 2σ
Size	120 x 55 x 54 mm (LxWxH)

* Depending on installation situation and stability of mounting system

** Contact with local BLUM representative is required



PSC – PORTABLE SPINDLECONTROL

THE MOBILE SOLUTION FOR SPINDLE MONITORING

Portable SpindleControl (PSC) is a high-precision, portable system for flexible inspection and monitoring of motor spindles in machine tools. With the set consisting of LC50-DIGILOG, the "LC-VISION PSC" software and other accessories, the most important spindle parameters can be quickly and easily recorded and evaluated.

- PORTABLE SYSTEM, PERFECTLY SUITED FOR MOBILE USE
- SPINDLE INSPECTION AT THE TOOL CENTRE POINT AND THROUGHOUT THE ENTIRE SPEED RANGE
- RUN-OUT ANALYSIS, STABILITY ANALYSIS, VIBRATION ANALYSIS & SPINDLE PARAMETER ANALYSIS POSSIBLE
- PLUG & PLAY SOLUTION WITHOUT PLC ADJUSTMENTS
- NO CONNECTION TO THE MACHINE CONTROL SYSTEM REQUIRED
- ENABLES PREVENTIVE MAINTENANCE AND AVOIDS UNPLANNED MACHINE DOWNTIME
- GRAPHICAL DISPLAY, LOGGING AND STATISTICAL ANALYSIS OF RESULTS
- MONITORING OF MOTOR SPINDLE QUALITY THROUGHOUT ITS ENTIRE LIFE CYCLE



DIGILOG Technology



SpindleControl



Modular System



03



TOOL SETTING PROBES

TACTILE TOOL MEASUREMENT

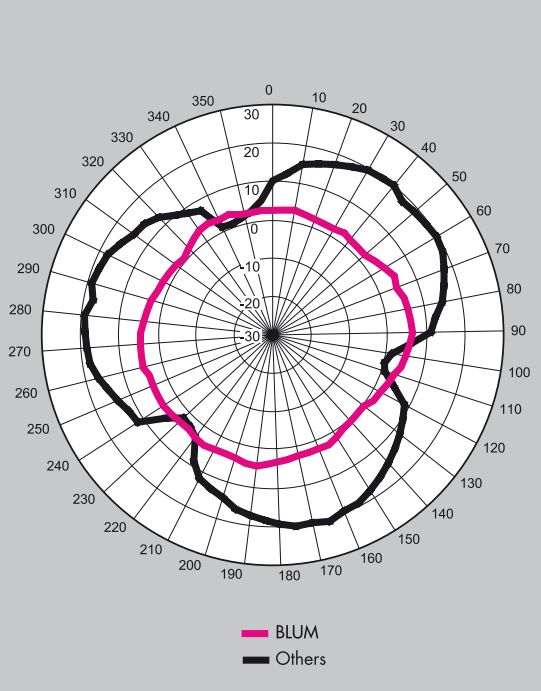
The probe systems are used for quick and automatic tactile tool setting and tool breakage detection. The systems are characterised by extreme durability, precision and economy under the most adverse conditions. Thanks to state-of-the-art transmission technology, they are the ideal add-on to BLUM workpiece probes.



- AUTOMATIC CALCULATION AND CORRECTION OF THE TOOL OFFSET
- AUTOMATIC BREAKAGE DETECTION BETWEEN MACHINING CYCLES
- NO SUBSEQUENT DAMAGES DUE TO TOOL BREAKAGE
- RELIABLE EVEN WHEN USED WITH COOLANT
- ENABLES LOW-LABOUR OPERATION

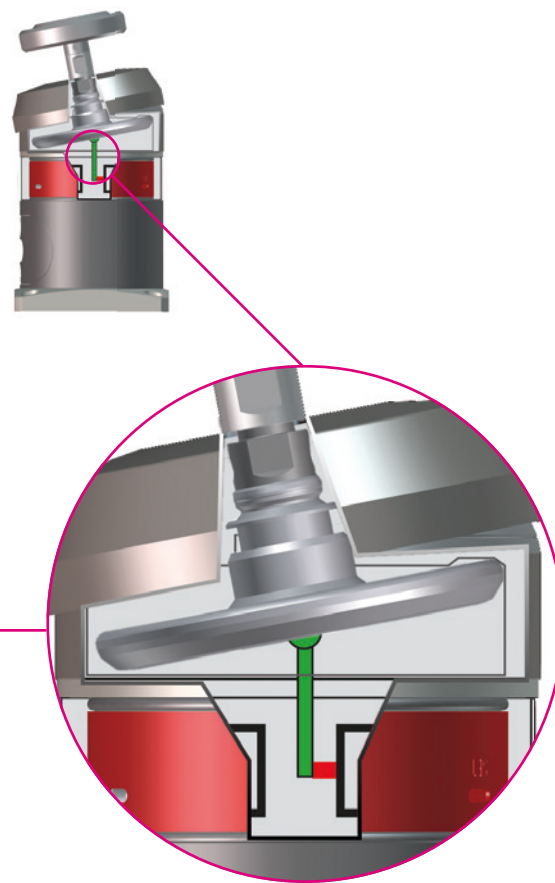
03 **TOOL SETTING PROBES**
TECHNOLOGY

BLUM tool setting probes are characterised by state-of-the-art measuring mechanism technology featuring wear-free optoelectronic signal generation. The sturdy design enables maximum probing speeds with supreme precision. Fast, reliable data transmission is assured by infrared, BRC radio technology or cable connection.



 Multidirectional

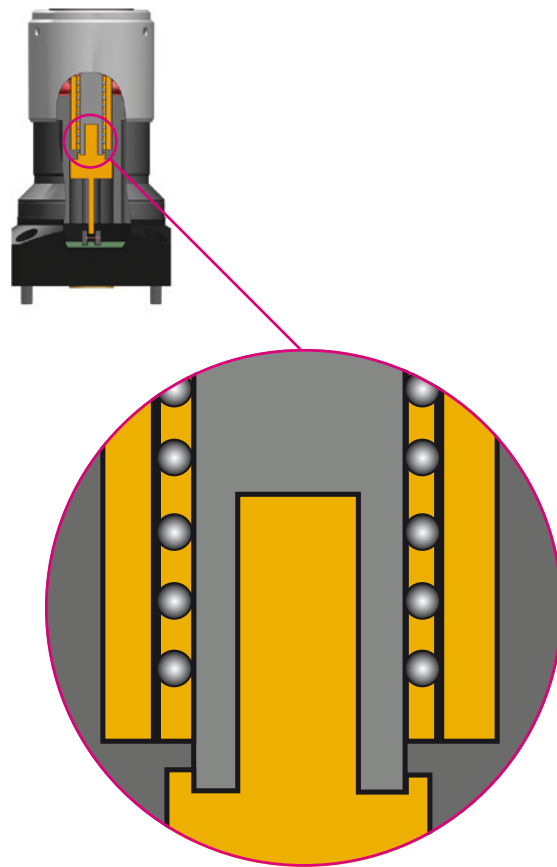
Non-lobing touch characteristics with constant deflection forces.
ZX-Speed/IR/RC



$\pm X, \pm Y, -Z$

 Ball bearing mounted linear guide

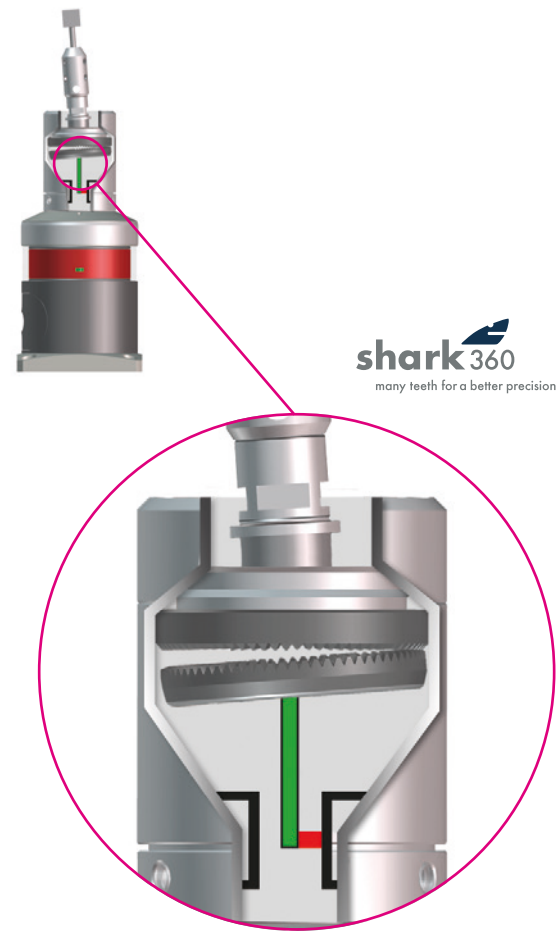
The functional principle permits low measuring forces and prevents lateral forces acting on the tool.
Z-Pico, Z-Nano/IR/RC



$-Z$

 Multidirectional with face gear

The complete solution: High precision even in off-centre probing operations. Ideal for turning machines.
TC53/63, TC54/64, TC76



$\pm X, \pm Y, -Z$

shark360
many teeth for a better precision



Tool Setting Probes Z-Series
COMPACT TOOL MEASUREMENT

Robust and economic – the compact probes are extremely economic solutions for fast tool breakage detection and highly precise length measurements in machine tools. The tried-and-tested design and wear-free optoelectronic measuring mechanism with linear working principle ensure the highest reliability under the most adverse manufacturing conditions.

Z-Nano IR and Z-Nano RC
– the wireless versions



Z-Pico – for micro-machining



-  Linear Working Principle
-  Hardwired
-  Infrared Transmission
-  Radio Transmission
-  Tool Breakage Detection
-  Tool Length Measurement
-  Measurement with Coolant
-  Single and Mass Production
-  Wear Compensation
-  Temperature Compensation

Tool Setting Probe	Z-Pico	Z-Nano	Z-Nano IR	Z-Nano RC
HEIGHT	55 mm	75 mm	100 mm	100 mm
TRANSMISSION	Cable	Cable	Infrared	Radio
REPEATABILITY	1 µm 2σ	0.2 µm 2σ	0.5 µm 2σ	0.5 µm 2σ
MINIMUM TOOL Ø	0.05 mm*	> 0.1 mm* > 0.2 mm**	> 0.1 mm* > 0.2 mm**	> 0.1 mm* > 0.2 mm**

* Depending on the geometry and material of the tool, probing force must not result in damage of tool ** With chip protection



Tool Setting Probes ZX-Speed Series
UNIVERSAL 3D TOOL SETTING PROBES

Versatile and economic – the 3D tool setting probe series consists of universally applicable probes for the measurement of length, radius and tool breakage in the machining centre. The durable probes use a modern, optoelectronic measuring mechanism that impresses with its unparalleled precision and longevity.

*ZX-Speed –
The hardwired version*



Tool length measurement



-  Multidirectional
-  Hardwired
-  Infrared Transmission
-  Radio Transmission
-  Tool Breakage Detection
-  Tool Length Measurement
-  Tool Radius Measurement
-  Measurement with Coolant
-  Single and Mass Production
-  Wear Compensation
-  Temperature Compensation

Tool Setting Probe	ZX-Speed	ZX-Speed IR	ZX-Speed RC
HEIGHT	63.5 mm	86 mm	86 mm
TRANSMISSION	Cable	Infrared	Radio
REPEATABILITY	0.4 µm 2σ	0.4 µm 2σ	0.4 µm 2σ
MINIMUM TOOL Ø	1 mm*	1 mm*	1 mm*

** Depending on the geometry and material of the tool, probing force must not result in damage of tool*

04



TOUCH PROBES

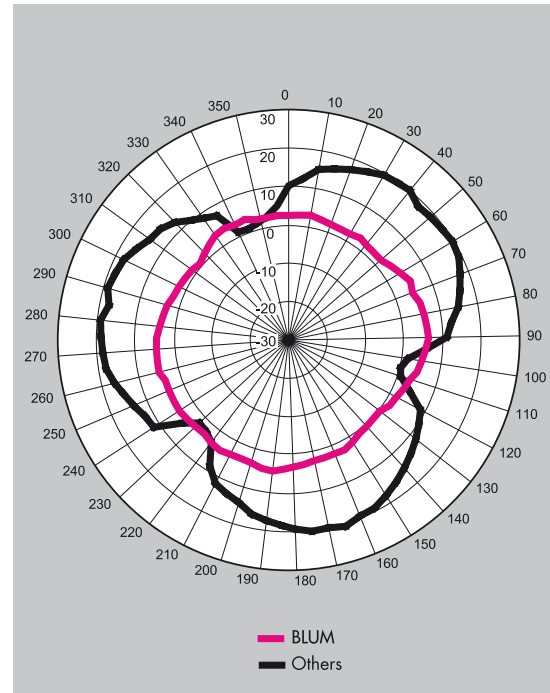
PERFECTION IN WORKPIECE MEASUREMENT

The workpiece probes are used for fast and automatic workpiece measurement and workpiece referencing in machine tools. Specially designed for the harsh conditions in these machines, the probe systems are an effective solution for improving the accuracy of your workpieces and the productivity of your production processes. A range of different measuring mechanisms and design variants guarantee the right solution for any application.

- EXTREME PROBING SPEEDS
- MAXIMUM MEASURING ACCURACY
- RELIABLE EVEN WHEN USED WITH COOLANT
- MECHANICALLY DURABLE DESIGN
- ENABLES LOW-LABOUR OPERATION

04 TOUCH PROBES TECHNOLOGY

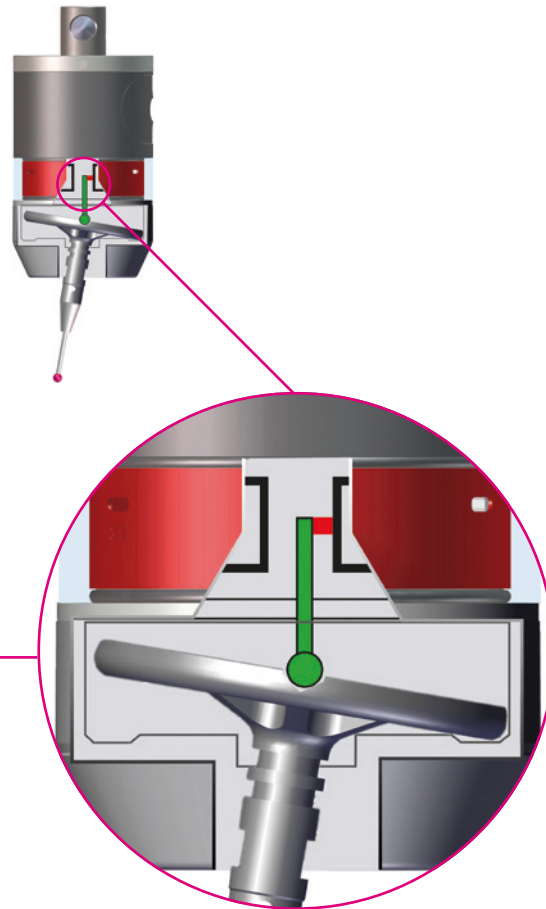
BLUM probes are characterised by state-of-the-art measuring mechanism technology featuring wear-free optoelectronic signal generation. The sturdy design enables maximum probing speeds with supreme precision. Fast, reliable data transmission is assured by infrared BRC radio technology or cable connection.



Multidirectional

Non-lobing touch characteristics with constant deflection forces.

TC50/60, TC52/62



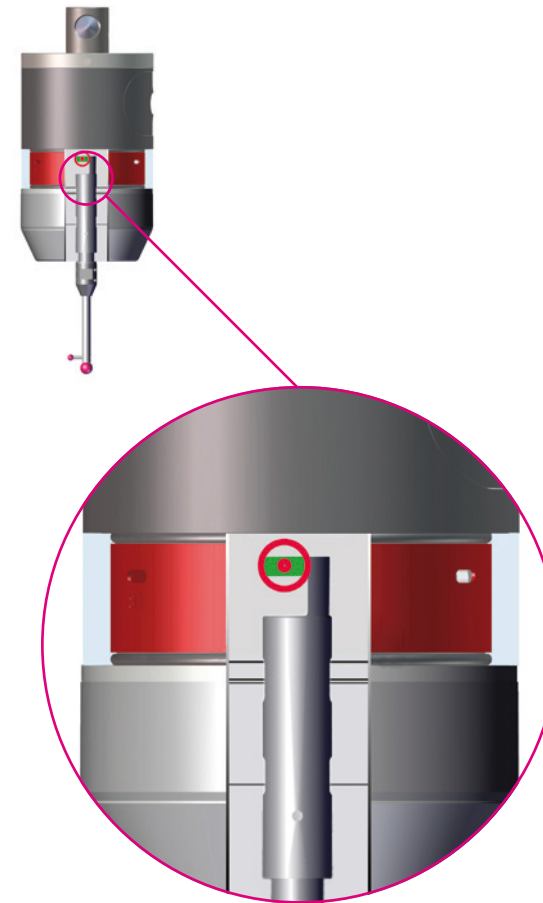
$\pm X, \pm Y, \pm Z$



Bidirectional

For high-speed pulling and pushing measurements.

TC51/61



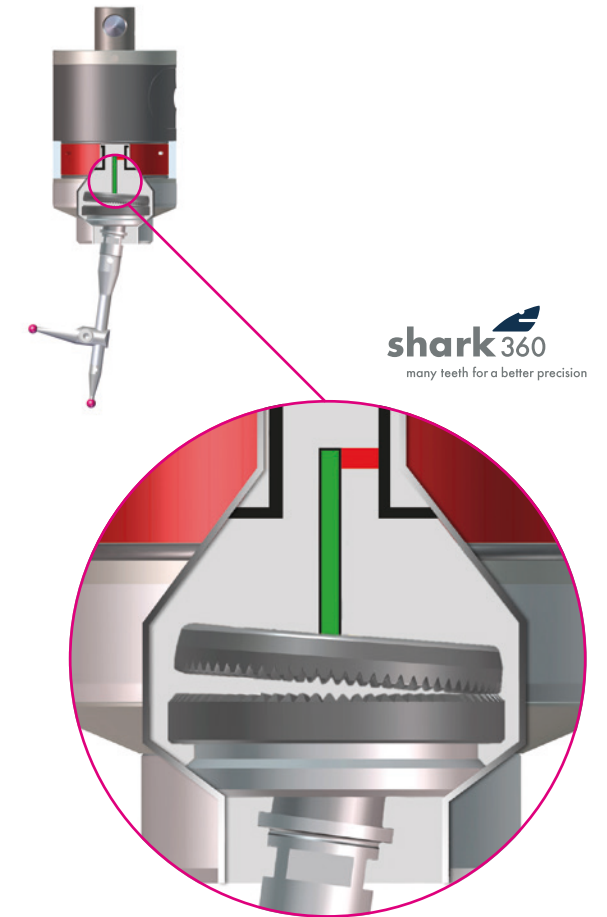
$\pm X^*, \pm Y^*, \pm Z$, * Via spindle indexing



Multidirectional with face gear

The complete solution: Also for pulling and pushing measurements in milling and turning machines.

TC53/63, TC54/64, TC55, TC76, TC63/64/76-DIGILOG, TC63/64/76-RG



$\pm X, \pm Y, \pm Z$



Reliable and proven Transmission Technology

The receiver systems guarantee fast and reliable wireless data transmission. Different systems are available depending on the measuring system used and the required installation type.



Infrared Transmission

- VERY FAST AND SECURE TRANSMISSION IF THERE IS A LINE OF SIGHT TO THE RECEIVER
- SEQUENTIAL OPERATION OF TWO IR MEASURING SYSTEMS POSSIBLE WITH ONE RECEIVER
- IC57: EXTREMELY COMPACT IR-RECEIVER FOR MOUNTING IN THE SPINDLE HEAD



BRC Radio Technology

- FAST SIGNAL TRANSMISSION EVEN WITHOUT A LINE OF SIGHT
- HIGH INTERFERENCE IMMUNITY THANKS TO BROADBAND TRANSMISSION
- NO INFLUENCE ON OTHER RADIO SYSTEMS
- SEQUENTIAL OPERATION OF UP TO 6 RADIO MEASURING SYSTEMS POSSIBLE WITH ONE RECEIVER





SYSTEM OVERVIEW
TECHNOLOGY

BLUM offers the right data interface variant for each measuring system and all common machine requirements. The interfaces control the devices, process the evaluation of the measured values and display them clearly on the control screen or on an optional display. The option of storage, statistical evaluation and visualisation of the results is also available.



OPERATING MODE **NT** — NC



IF10



OPERATING MODE **DIGILOG**



- EM30** PROFIBUS
- EM31** PROFINET & ETHERNET
- EM32** ETHERNET/IP & ETHERNET
- EM33** I/O, SSI, ANALOG, USB
- EM34** ETHERCAT
- EM35** CC-LINK IE FIELD BASIC



DIGILOG Functions

- Tool Measurement
- ToolControl
- SpindleControl
- and much more
- Workpiece Measurement
- Contour Measurement
- Roughness Measurement
- Bore Measurement
- Temperature Measurement



SIEMENS HEIDENHAIN FANUC



IPC48-41
IC-VISION, roughness measurement, DIGILOG contour scan, bore measurement...



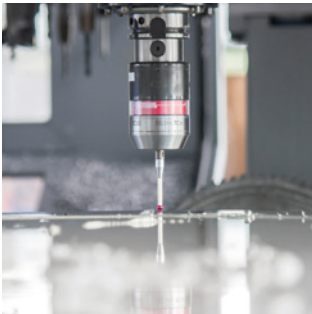
Touch Probes TC50/52 | TC60/62
HIGH SPEED WORKPIECE MEASUREMENT

Faster, more economic, more precise – the advantages of this high-speed probe series can be summarized as simply as that. The multidirectional probes impress with the latest measuring mechanism technology featuring optoelectronic signal generation, the highest measuring speeds, and perfect, rotationally symmetrical probing behaviour with no preferential direction.

TC52, TC62 - for small machining centres



Ideal for single and mass production



-  Multidirectional
-  Infrared Transmission
-  Radio Transmission
-  Position Measurement
-  Measurement Standard Features
-  Contour Measurement
-  Adaptive Machining
-  Measurement with Coolant
-  Wear Compensation
-  Temperature Compensation

Touch Probe	TC50	TC52	TC60	TC62
SIZE	Ø 63 mm	Ø 40 mm	Ø 63 mm	Ø 40 mm
TRANSMISSION METHOD	Infrared	Infrared	Radio	Radio
MAX. PROBING SPEED	3000 mm/min	2000 mm/min	3000 mm/min	2000 mm/min
REPEATABILITY	0.3 µm 2σ	0.3 µm 2σ	0.3 µm 2σ	0.3 µm 2σ



Touch Probes TC51 | TC61
PULLING AND PUSHING MEASUREMENT

Perfect for fast machining centres – the probes were specifically developed for the requirements of highly productive machines. The unique bidirectional measuring mechanism with optoelectronic signal generation features superior accuracy and enables measuring speeds of up to 5 m/min. The TC51 and the TC61 are the only probes worldwide that allow for quick repeated pulling measurements in Z+ without wear.

*Pulling and pushing
measurements possible*



*TC51, TC61 –
Extremely fast and precise*



-  Bidirectional
-  Infrared Transmission
-  Radio Transmission
-  Position Measurement
-  Measurement Standard Features
-  Pulling Measurement
-  Adaptive Machining
-  Measurement with Coolant
-  Mass Production
-  Wear Compensation
-  Temperature Compensation

Touch Probe	TC51	TC61
SIZE	Ø 63 mm	Ø 63 mm
TRANSMISSION METHOD	Infrared	Radio
MAX. PROBING SPEED	5000 mm/min	5000 mm/min
REPEATABILITY	0.3 µm 2σ	0.3 µm 2σ



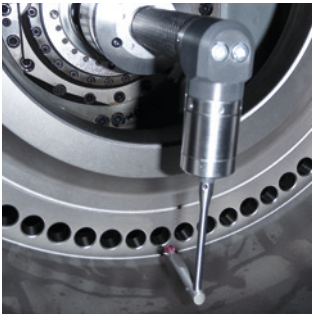
Touch Probes TC53 | TC63
MODULAR PROBES

Innovative, variable and highly precise. The modular TC53/63 series consists of versatile probe solutions in order to quickly adapt to complex customer-oriented measuring tasks. All probes use the patented shark360 measuring mechanism which sets new standards in precision and reliability due to a modified face gear and the optoelectronic signal generation.

Mass production of gearbox housings

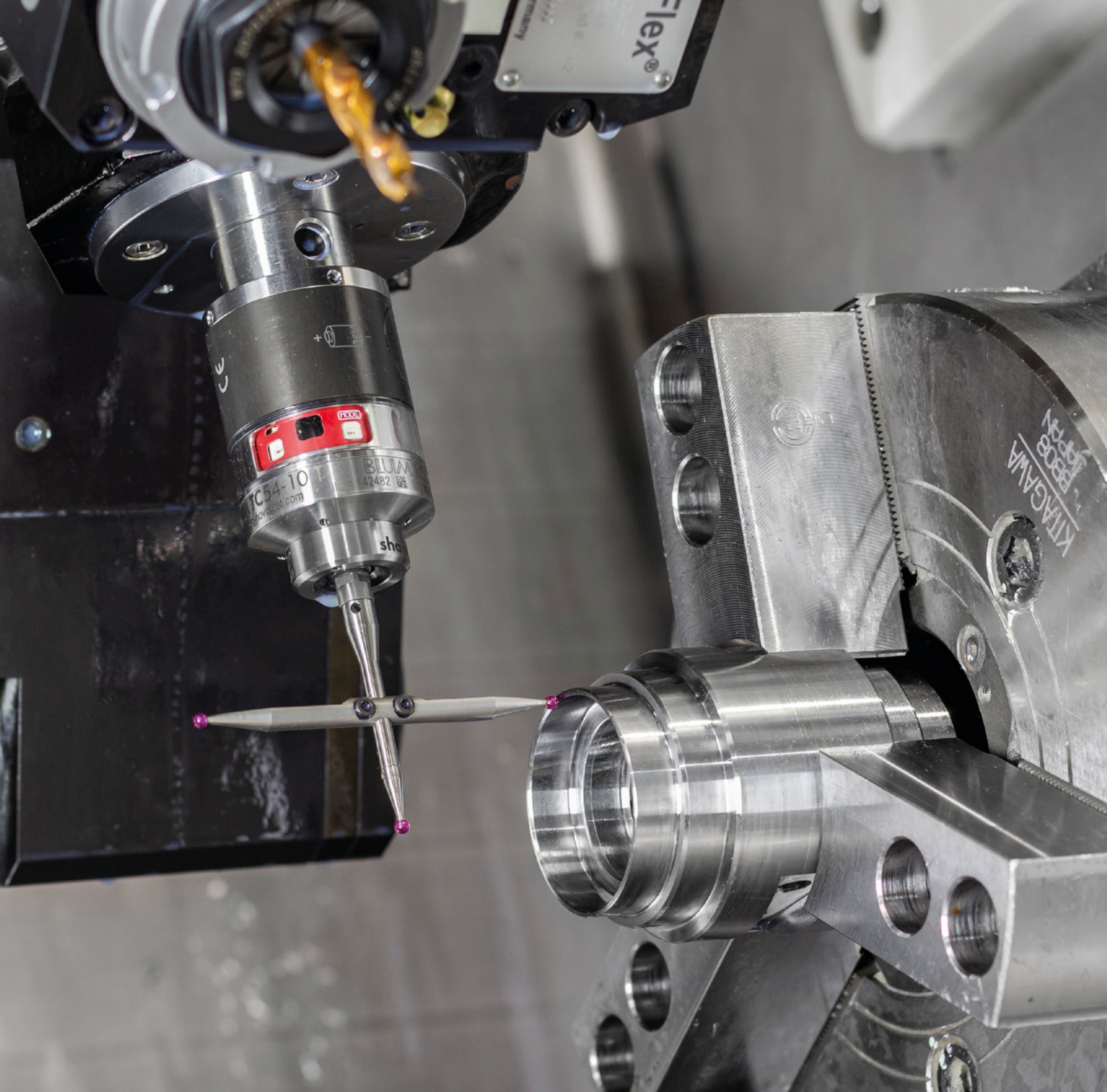


Measurement inside a turbine component



- Multidirectional shark360
- Infrared Transmission
- Radio Transmission
- Modular System
- Position Measurement
- Measurement Standard Features
- Pulling Measurement
- Torsional Measurement
- Adaptive Machining
- Measurement with Coolant
- Wear Compensation
- Temperature Compensation

Touch Probe	TC53	TC63
SIZE	Ø 63 mm	Ø 63 mm
TRANSMISSION METHOD	Infrared	Radio
MAX. PROBING SPEED	2000 mm/min	2000 mm/min
REPEATABILITY	0.4 µm 2σ	0.4 µm 2σ



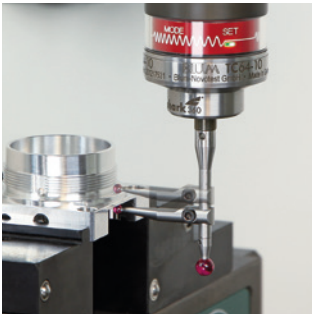
Touch Probes TC54-10 | TC64-10
FOR TURNING AND MILLING MACHINES

The TC54-10 and TC64-10 probes combine all the advantages of the shark360 measuring mechanism with the compactness of a multidirectional BLUM standard probe. Due to the sturdy design and the wear-free face-gearred measuring mechanism, the systems are perfectly suited for the measurement of tools and workpieces in turning and milling centres.

Workpiece measurement in
turning machines

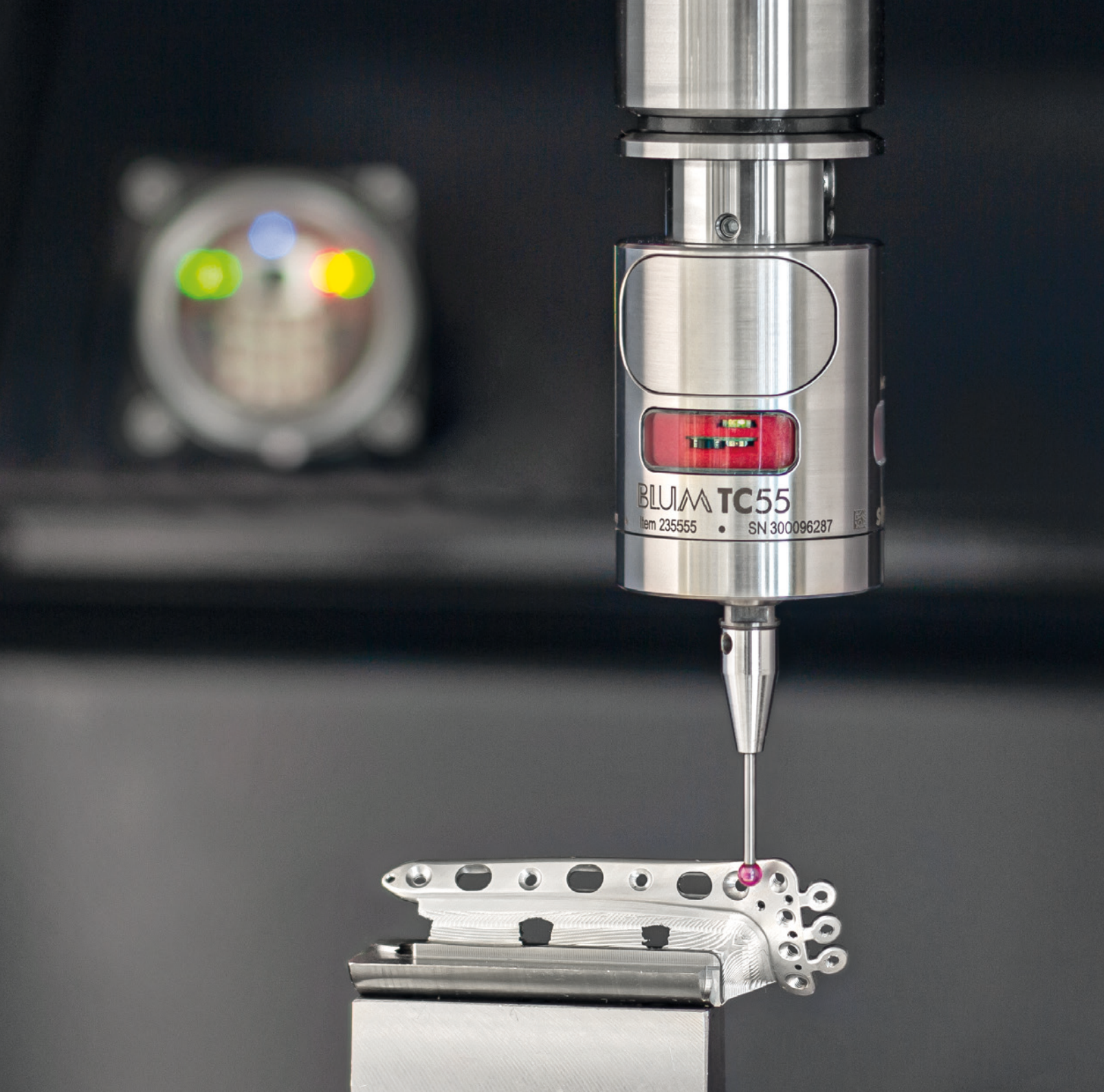


Pulling and pushing measurement



- Multidirectional shark360
- Infrared Transmission
- Radio Transmission
- Position Measurement
- Measurement Standard Features
- Pulling Measurement
- Torsional Measurement
- Adaptive Machining
- Measurement with Coolant
- Tool Breakage Detection
- Tool Length Measurement
- Tool Radius Measurement
- Wear Compensation
- Temperature Compensation

Touch Probe	TC54-10	TC64-10
SIZE	Ø 40 mm	Ø 40 mm
TRANSMISSION METHOD	Infrared	Radio
MAX. PROBING SPEED	2000 mm/min	2000 mm/min
REPEATABILITY	0.4 µm 2σ	0.4 µm 2σ



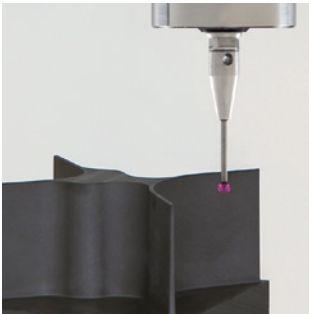
Touch Probe TC55
ULTRA-COMPACT COMPLETE SOLUTION

The TC55 probe is the smallest cable-free touch probe from BLUM so far. It is used in compact milling, turning and turning/milling centres used for microprocessing, medical technology and the measurement of components on machines for additive manufacturing. The integrated shark360 measuring mechanism enables pulling and torsional measurements when the offset stylus is used.

TC55 – the smallest wireless probe from BLUM

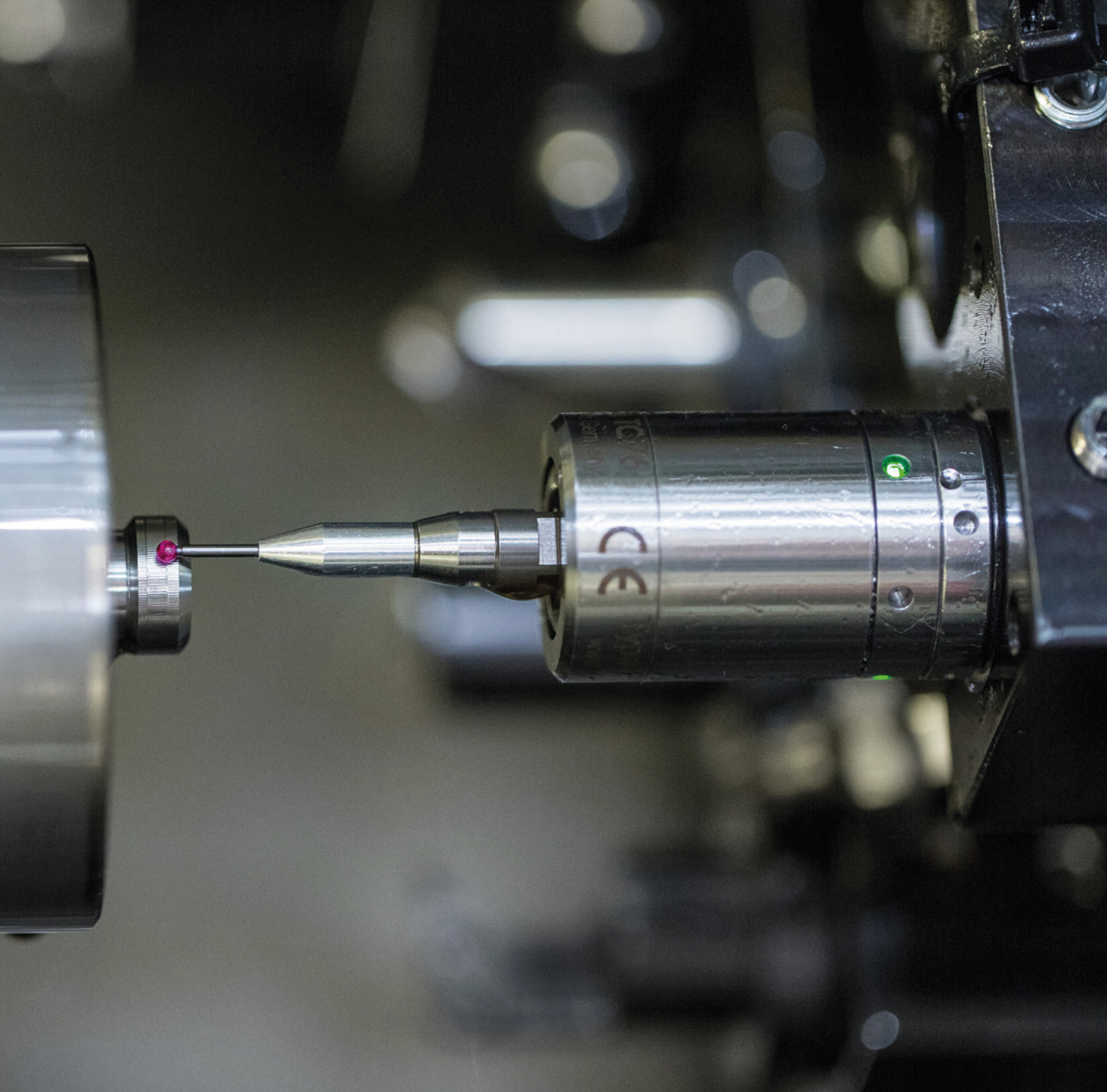


Perfect for delicate parts and small machining centres



- Multidirectional shark360
- Infrared Transmission
- Position Measurement
- Measurement Standard Features
- Pulling Measurement
- Torsional Measurement
- Adaptive Machining
- Measurement with Coolant
- Wear Compensation
- Temperature Compensation

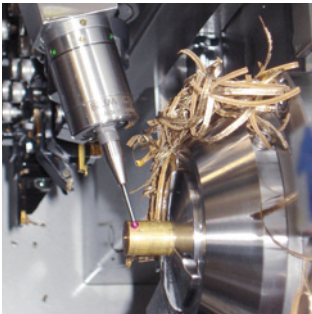
Touch Probe	TC55
SIZE	Ø 32 mm
TRANSMISSION TYPE	Infrared
MAX. PROBING SPEED	2000 mm/min
REPEATABILITY	0.3 µm 2σ



Touch Probe TC76
ULTRA-COMPACT

The compact TC76 probe is used for fast and automatic measurement of tools and workpieces in grinding, turning and milling centres. Thanks to a modified face gear and optoelectronic signal generation, the patented shark360 measuring mechanism built into the probes sets a new standard with regards to precision and reliability.

Workpiece measurement in the turning machine



Tool measurement – TC76 with protective sleeve



- Multidirectional shark360
- Hardwired
- Modular System
- Position Measurement
- Measurement Standard Features
- Pulling Measurement
- Torsional Measurement
- Adaptive Machining
- Measurement with Coolant
- Tool Breakage Detection
- Tool Length Measurement
- Tool Radius Measurement
- Wear Compensation
- Temperature Compensation

Touch Probe

TC76

SIZE	Ø 25 mm
TRANSMISSION METHOD	Cable
MAX. PROBING SPEED	2000 mm/min
REPEATABILITY	0.4 µm 2σ

05

**DIGILOG TOUCH PROBES****SCANNING WORKPIECE INSPECTION**

DIGILOG touch probes by BLUM are used for fast and automatic inspection of workpiece contours in machining centres. Compared to switching measuring systems, analogue scanning measurement enables many more measuring points to be recorded in a fraction of the time. Complex contours can be monitored in series at up to 2 m/min. Using the measuring systems, machine clamping errors can be detected, enabling fast reworking.



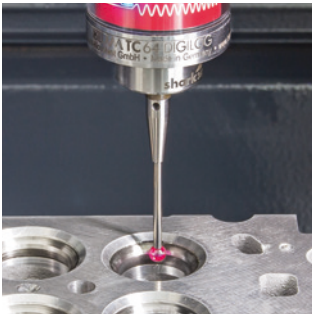
- DETECTION OF MACHINING ERRORS BY ANALOGUE SCANS
- DIGITAL AND ANALOGUE PROBE IN A SINGLE DEVICE
- HIGH SCANNING AND PROBING SPEEDS
- RELIABLE EVEN WHEN USED WITH COOLANT
- IMPLEMENTATION OF CONTINUOUS PROCESS CHAINS



Touch Probes TC63-DIGILOG | TC64-DIGILOG
THE DIGILOG REVOLUTION

DIGILOG = high-precision digital measurement and lightning-fast scans in analogue mode. Featuring BRC radio technology, the DIGILOG probes are particularly well suited to use in milling and turning centres. Machining errors are detected quickly and reliably with analogue scanning of the workpiece surface. The system is also available as a modular version in form of the TC63-DIGILOG.

Analogue contour scan of the sealing chamfer on a valve seat



TC63-DIGILOG – the modular system



-  shark360 DIGILOG
-  Radio Transmission
-  Modular System
-  Position Measurement
-  Measurement Standard Features
-  ContourScan
-  Workpiece Inspection
-  Adaptive Machining
-  Measurement with Coolant
-  Mass Production
-  Wear Compensation
-  Temperature Compensation

Touch Probes

TC63-DIGILOG

TC64-DIGILOG

SIZE

Ø 40 mm

Ø 40 mm

TRANSMISSION METHOD

Radio

Radio

MAX. PROBING SPEED

2000 mm/min

2000 mm/min

REPEATABILITY

0.4 µm 2σ

0.4 µm 2σ



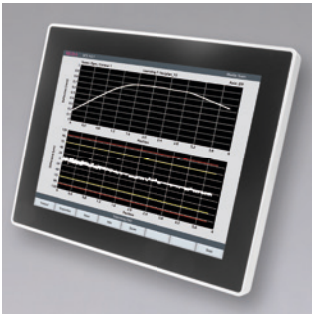
Touch Probe TC76-DIGILOG
DIGITAL MEASUREMENT & ANALOGUE SCANNING

Hardwired probes for turning and grinding machines for automatic inspection of workpiece contours for machining errors. Exact measurement of workpiece position using digital measurement, extreme reduction in measuring time using analogue scanning process at lightning speed.

Detection of machining errors on gear grinding machine



Analysis on control monitor or BLUM touch panel



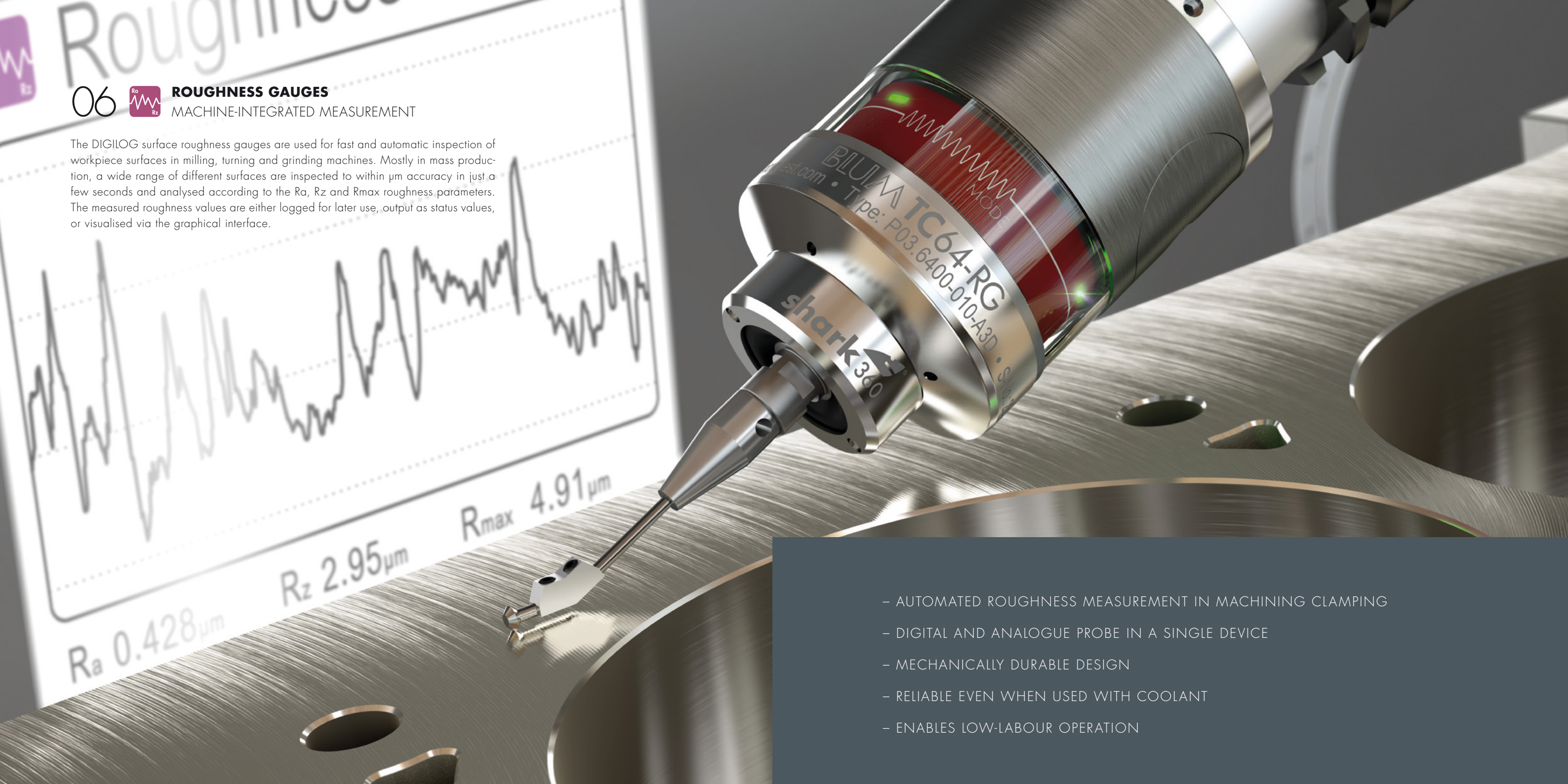
-  shark360 DIGILOG
-  Hardwired
-  Modular System
-  Position Measurement
-  Measurement Standard Features
-  ContourScan
-  Workpiece Inspection
-  Adaptive Machining
-  Measurement with Coolant
-  Mass Production
-  Wear Compensation
-  Temperature Compensation

Touch Probe	TC76-DIGILOG
SIZE	Ø 25 mm
TRANSMISSION METHOD	Cable
MAX. PROBING SPEED	2000 mm/min
REPEATABILITY	0.4 µm 2σ

06

**ROUGHNESS GAUGES****MACHINE-INTEGRATED MEASUREMENT**

The DIGILOG surface roughness gauges are used for fast and automatic inspection of workpiece surfaces in milling, turning and grinding machines. Mostly in mass production, a wide range of different surfaces are inspected to within μm accuracy in just a few seconds and analysed according to the Ra, Rz and Rmax roughness parameters. The measured roughness values are either logged for later use, output as status values, or visualised via the graphical interface.



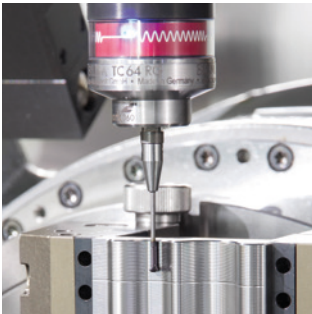
- AUTOMATED ROUGHNESS MEASUREMENT IN MACHINING CLAMPING
- DIGITAL AND ANALOGUE PROBE IN A SINGLE DEVICE
- MECHANICALLY DURABLE DESIGN
- RELIABLE EVEN WHEN USED WITH COOLANT
- ENABLES LOW-LABOUR OPERATION



Roughness Gauge TC64-RG
THE QUANTUM LEAP IN MACHINING CENTRES

Globally unique roughness measuring system for automatic inspection in the original fixturing. Fast digital measurement of workpiece position and reliable detection of poor surface quality using analogue measurement. The roughness parameters Ra, Rz, Rq, Rt, Rmax and Wt are output on the machine controller. Rejects characterised by the "surface roughness" feature can be minimised in this way.

*TC64-RG – roughness measurement
in machining centres*



*Analysis on control monitor or BLUM
touch panel*



Roughness Gauge

TC64-RG

SIZE	Ø 40 mm
TRANSMISSION METHOD	Radio
MAX. PROBING SPEED	2000 mm/min
MEASURABLE ROUGHNESS	> Rz 3 µm

-  shark360 DIGILOG
-  Radio Transmission
-  Position Measurement
-  Roughness Measurement
-  Workpiece Inspection
-  Measurement with Coolant
-  Mass Production



Roughness Gauges **TC63-RG** | **TC76-RG**
MODULAR VARIANTS

The TC63-RG modular roughness gauge allows for adaptation to customer-specific tasks. The single measuring element version delivers maximum measurement accuracy with lower measuring force, and was developed specially for inspection of straight workpiece geometries in milling, turning and grinding machines. Bad surfaces, for instance caused by worn tools, are detected in-process.

TC63-RG – modular system with
shark360 DIGILOG technology



TC63-RG with single-measuring
element



-  shark360 DIGILOG
-  Hardwired
-  Radio Transmission
-  Modular System
-  Position Measurement
-  Roughness Measurement
-  Workpiece Inspection
-  Measurement with Coolant
-  Mass Production

Roughness Gauge	TC63-RG	TC63-RG Single	TC76-RG
SIZE	Ø 40 mm	Ø 40 mm	Ø 25 mm
TRANSMISSION METHOD	Radio	Radio	Cable
MAX. PROBING SPEED	2000 mm/min	100 mm/min	2000 mm/min
MEASURABLE ROUGHNESS	> Rz 3 µm	> Rz 2 µm	> Rz 3 µm

07



SOFTWARE FORMCONTROL X

RELIABLE PROCESS AUTOMATION

FormControl X is a user-friendly measurement software for machining centres for automated quality control of workpieces in individual and series production. It enables maximum productivity and reduces scrap through monitoring measurements between and after machining, statistical process control based on the recorded measured values and reworking in the initial setting.

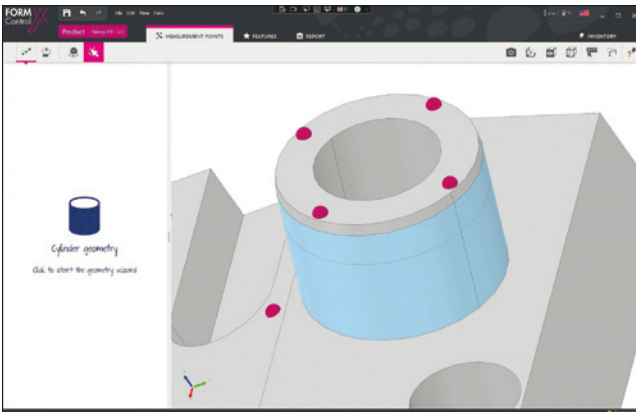
- CREATION OF THE MEASUREMENT PROGRAMME BY MOUSE CLICK
- COMPLEX MEASUREMENTS IN MACHINING CENTRES
- PERFORM 5-AXIS MEASUREMENTS
- OUTPUT OF MEASUREMENT LOGS AS DOCUMENTS AND IN JSON FORMAT
- DISPLAY OF MEASUREMENT RESULTS IN A WEB BROWSER, REGARDLESS OF END DEVICE

Software **FormControl X**
RELIABLE PROCESS AUTOMATION

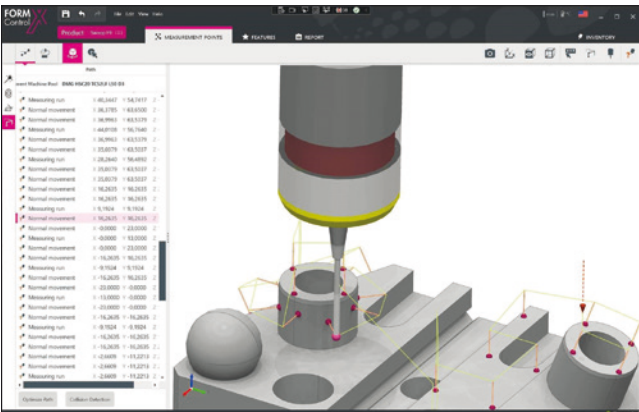
Measuring, automating and evaluating – these three aspects describe the functionalities of the FormControl X measuring software in just a few words. The solution makes it possible to create complex measurement programs in a self-explanatory manner, to automate machining processes by creating closed control loops, to make the measurement results usable in an Industry 4.0 environment. This simplifies and accelerates manufacturing processes, and the quality and manufacturing costs of the finished workpieces are optimised at the same time.

- Position Measurement
- Measurement Standard Features
- Contour Management
- Workpiece Inspection
- Single and Mass Production
- Adaptive Machining

Simple creation of measurement programs using context wizard



With integrated measurement path optimization and collision control



Automation through statistical process control (SPC)

Name	LT	LIT	UT	UT	Nominal value	Value
1	Durchmesser D=8mm	0 mm	0,0015 mm	0,0125 mm	0 mm	0,0015 mm
2	Durchmesser D=8mm	0 mm	0,0015 mm	0,0125 mm	0 mm	0,0015 mm
3	Durchmesser D=8mm	0 mm	0,0015 mm	0,0125 mm	0 mm	0,0015 mm
4	Durchmesser D=42mm	-0,0010 mm	-0,0040 mm	0,0004 mm	0 mm	0,0004 mm
5	Durchmesser D=42mm	0 mm	0,0010 mm	0,0010 mm	0 mm	0,0010 mm
6	Durchmesser D=42mm	-0,0010 mm	-0,0040 mm	0,0004 mm	0 mm	0,0004 mm
7	Durchmesser D=42mm	-0,0010 mm	-0,0040 mm	0,0004 mm	0 mm	0,0004 mm
8	Durchmesser D=42mm	-0,0010 mm	-0,0040 mm	0,0004 mm	0 mm	0,0004 mm
9	Durchmesser D=42mm	-0,0010 mm	-0,0040 mm	0,0004 mm	0 mm	0,0004 mm
10	Durchmesser D=42mm	-0,0010 mm	-0,0040 mm	0,0004 mm	0 mm	0,0004 mm
11	Durchmesser D=42mm	-0,0010 mm	-0,0040 mm	0,0004 mm	0 mm	0,0004 mm
12	Durchmesser D=42mm	-0,0010 mm	-0,0040 mm	0,0004 mm	0 mm	0,0004 mm
13	Durchmesser D=42mm	-0,0010 mm	-0,0040 mm	0,0004 mm	0 mm	0,0004 mm
14	Durchmesser D=42mm	-0,0010 mm	-0,0040 mm	0,0004 mm	0 mm	0,0004 mm
15	Durchmesser D=42mm	-0,0010 mm	-0,0040 mm	0,0004 mm	0 mm	0,0004 mm
16	Durchmesser D=42mm	-0,0010 mm	-0,0040 mm	0,0004 mm	0 mm	0,0004 mm
17	Durchmesser D=42mm	-0,0010 mm	-0,0040 mm	0,0004 mm	0 mm	0,0004 mm
18	Durchmesser D=42mm	-0,0010 mm	-0,0040 mm	0,0004 mm	0 mm	0,0004 mm

Output of measurement logs

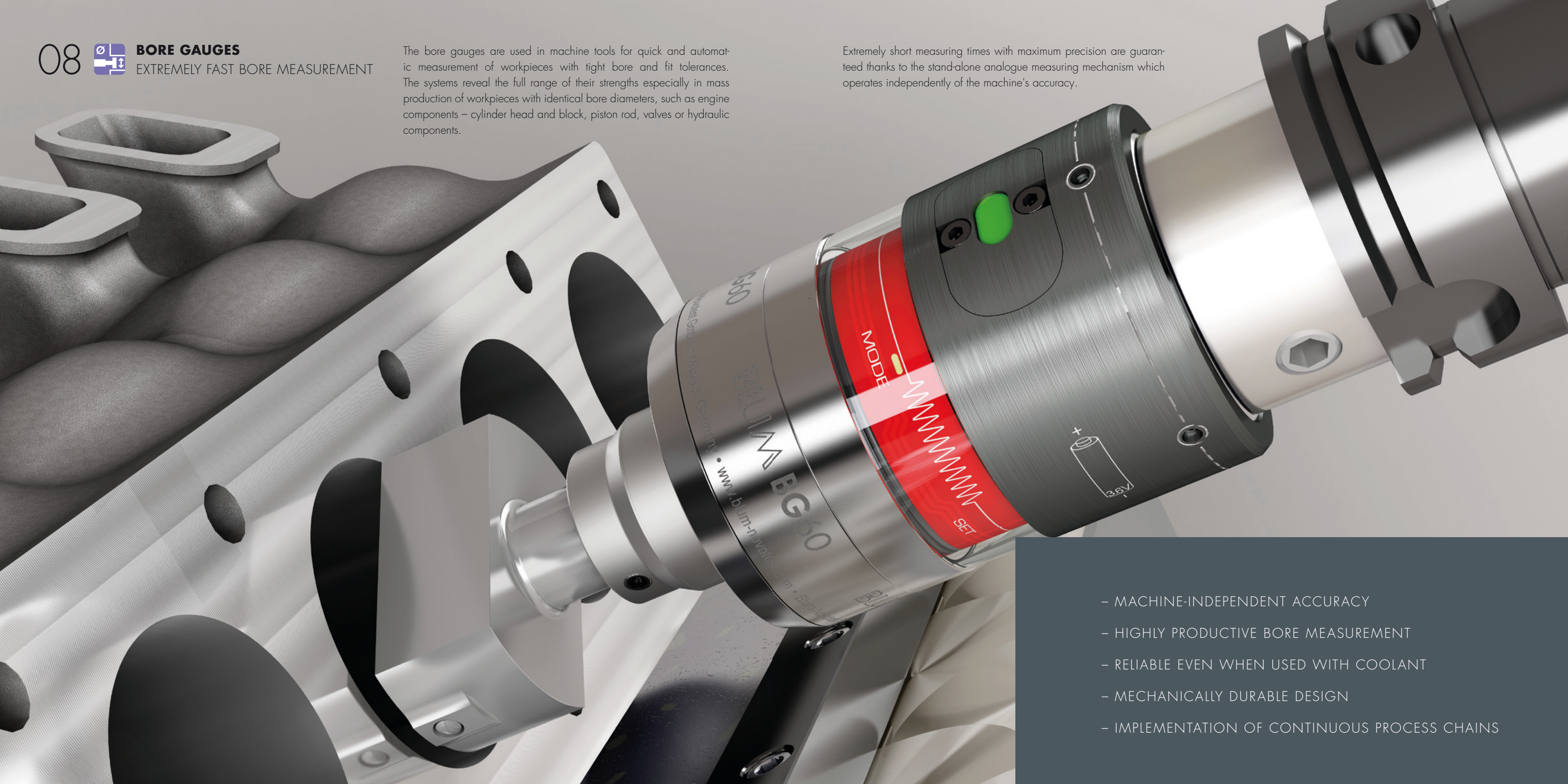
Name	Abw.	UT	OT
1.1.1	-0.0070	-0.0100	0.0100
1.1.2	0.0013	-0.0100	0.0100
1.1.3	-0.0040	-0.0100	0.0100
1.1.4	-0.0031	-0.0100	0.0100
1.2.1	0.0390	-0.0100	0.0100
1.2.2	-0.0235	-0.0100	0.0100
1.2.3	-0.0864	-0.0100	0.0100
1.2.4	-0.0226	-0.0100	0.0100
1.3.1	-0.3431	-0.0100	0.0100
1.3.2	-0.0979	-0.0100	0.0100
1.3.3	0.0974	-0.0100	0.0100
1.3.4	0.1003	-0.0100	0.0100
1.3.5	-0.0802	-0.0100	0.0100

**BORE GAUGES**

EXTREMELY FAST BORE MEASUREMENT

The bore gauges are used in machine tools for quick and automatic measurement of workpieces with tight bore and fit tolerances. The systems reveal the full range of their strengths especially in mass production of workpieces with identical bore diameters, such as engine components – cylinder head and block, piston rod, valves or hydraulic components.

Extremely short measuring times with maximum precision are guaranteed thanks to the stand-alone analogue measuring mechanism which operates independently of the machine's accuracy.



- MACHINE-INDEPENDENT ACCURACY
- HIGHLY PRODUCTIVE BORE MEASUREMENT
- RELIABLE EVEN WHEN USED WITH COOLANT
- MECHANICALLY DURABLE DESIGN
- IMPLEMENTATION OF CONTINUOUS PROCESS CHAINS



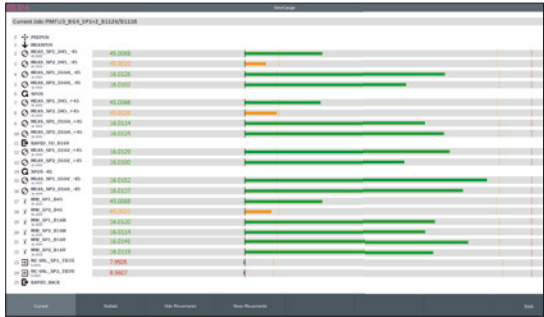
Software **BG-VISION** MEASUREMENT SOFTWARE FOR BORE GAUGES

BG-VISION is an innovative measurement, visualisation and analysis software solution for bore gauges from BLUM. The application, which has been redesigned from the ground up, features an entirely new approach to functionality and ease of use. With its intuitive operating concept, it can be used to generate, document and analyse complex measurement sequences quickly and easily.

-  Diameter Measurement
-  Wear Compensation
-  Adaptive Machining
-  Mass Production

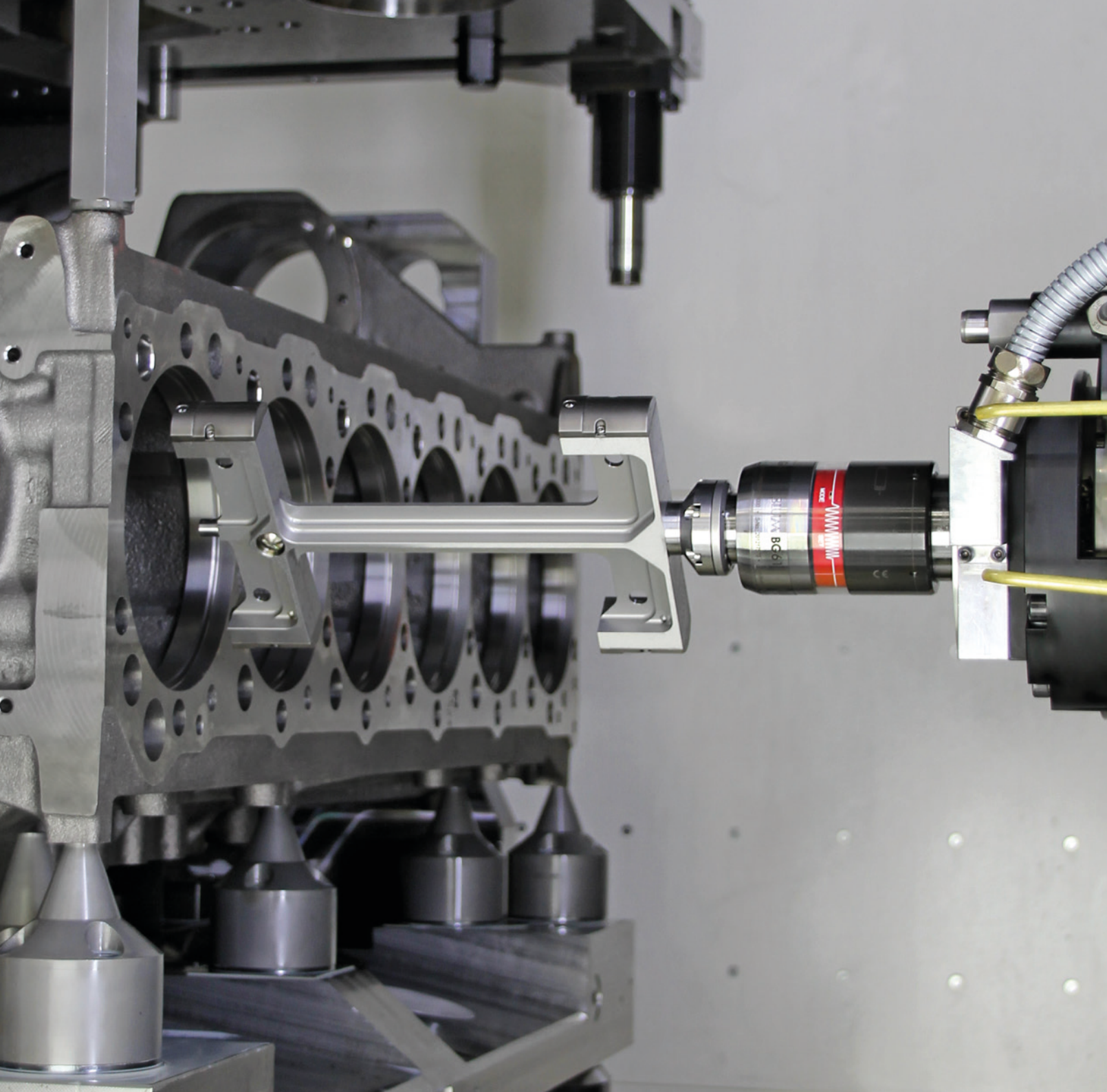
- SIMPLE PC-BASED USER SOLUTION FOR CREATING COMPLEX MEASUREMENT PROGRAMS
- LOGGING, VISUALISATION AND STATISTICAL ANALYSIS
- CONVENIENT HARDWARE MANAGEMENT, INCLUDING SERIAL NUMBERS, SOFTWARE VERSIONS AND SYSTEM SPECIFICATIONS
- OPERATION POSSIBLE WITHOUT ADDITIONAL MEASUREMENT COMPUTER (IPC)
- Q-DAS INTERFACE FOR MEASURING SYSTEM ANALYSIS (OPTIONAL)
- PROCESS CONTROL FOR EXECUTION OF CLOSED PRODUCTION PROCESSES (OPTIONAL)

Visualisation of measurement results



Statistical analysis

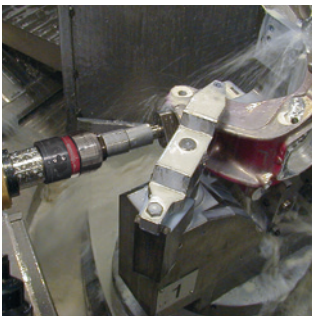




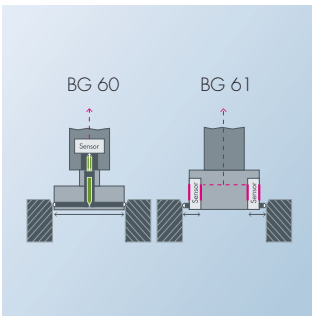
Bore Gauges BG60 | BG61
HIGHLY PRODUCTIVE BORE MEASUREMENT

BLUM bore gauges are machine-independent measuring systems for quality monitoring of tight fit tolerances in highly productive machining centres and transfer lines. The determination of compensation values in the initial setting enables highly accurate process control, e.g. in the production of engines, valves or compressors.

Measurement of a steering knuckle bore before slitting



Measuring principles of the BG series



-  Radio Transmission
-  Diameter Measurement
-  Adaptive Machining
-  Measurement with Coolant
-  Mass Production
-  Wear Compensation

Bore Gauge	BG60	BG61
SIZE	Ø 63 mm	Ø 63 mm
TRANSMISSION METHOD	Radio	Radio
MEASURING ELEMENTS	1	up to 8
RESOLUTION	12 bit / 0.15 µm	12 bit / 0.15 µm



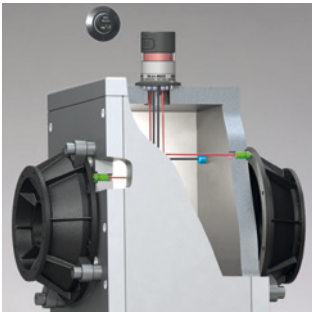
Measuring Systems **MG80** | **MG81** | **TG82**

TEMPERATURE MEASUREMENT & MORE

MG80 & MG81: The multi-purpose measuring devices are attached directly to the clamping devices and can be operated with sensors for parallel recording of machining-related data during main processing time. This includes tool breakage, workpiece temperature, clamping pressure (hydraulic/mechanical), clamping jaw position, presence of the workpiece, etc.

TG82: Measuring system that can be exchanged by the tool magazine to determine the workpiece temperature. The data can be used to calculate compensation values that are incorporated directly into the machining process.

MG80 – with up to 8 sensors in the workpiece clamping device



MG81 integrated in centre clamp with up to 4 sensors



-  Radio Transmission
-  Temperature Measurement
-  Pressure Measurement
-  Presence of the Workpiece
-  Tool Breakage Detection
-  Modular System
-  Adaptive Machining
-  Mass Production
-  Temperature Compensation

Measuring system	MG80	MG81	TG82
SIZE	Ø 63 mm	79 x 62 mm (LxV)	Ø 63 mm
TRANSMISSION METHOD	Radio	Radio	Radio
FIELD OF APPLICATION	Workpiece clamping device	Workpiece clamping device	Machine spindle



09



SALES&SERVICE

FOCUS ON PRODUCTIVITY

Take advantage of our comprehensive services to ensure maximum efficiency, process reliability and availability for your production processes. Our worldwide sales and service network allows us to provide optimum support and very short response times.

- RETROFIT OPTIONS FOR YOUR MACHINE TOOL
- TRAININGS AND WORKSHOPS
- TELEPHONE CUSTOMER SUPPORT
- SOLUTIONS FOR CUSTOMISED MEASUREMENT TASKS
- EXPRESS DELIVERY FOR URGENT SPARE PARTS REQUIREMENTS
- PRODUCT PRESENTATIONS AND ON-SITE CONSULTING



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GRUENKRAUT, GERMANY

BLUM-NOVOTEST GMBH
TEST ENGINEERING DIVISION
WILlich, GERMANY

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COMO, ITALY

BLUM-NOVOTEST LTD.
BIRMINGHAM, ENGLAND

BLUM-NOVOTEST SARL
BORDEAUX, FRANCE

BLUM-NOVOTEST S.R.L.
KROMĚŘIŽ, CZECH REPUBLIC

BLUM-NOVOTEST AB
SKÖVDE, SWEDEN

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BLUM-NOVOTEST SISTEMAS DE MEDIÇÃO LTDA
SAO PAULO, BRAZIL

BLUM-NOVOTEST K.K
NAGOYA, JAPAN

Blum-Novotest CC China Co., Ltd.
SHANGHAI, CHINA

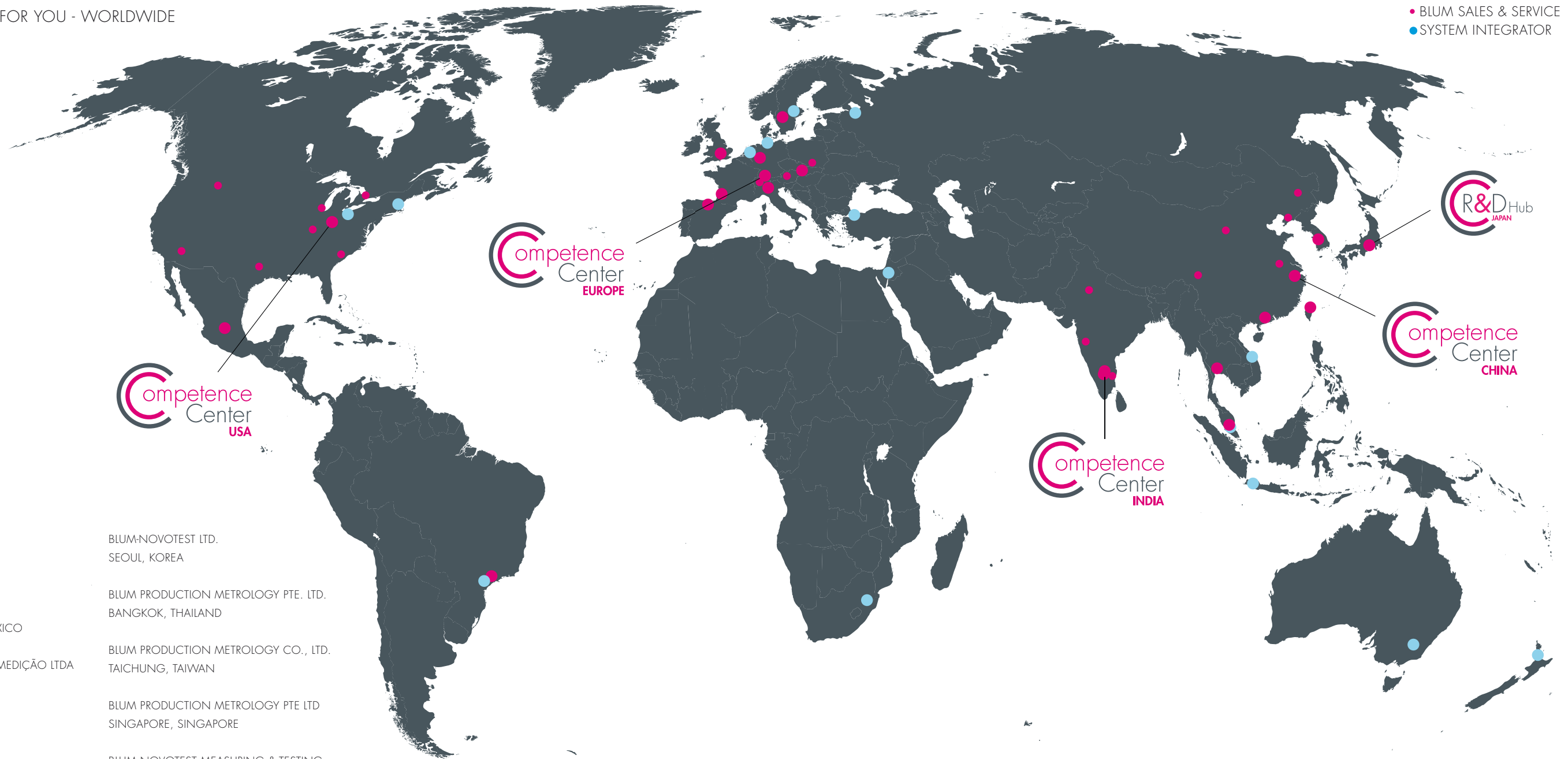
BLUM-NOVOTEST LTD.
SEOUL, KOREA

BLUM PRODUCTION METROLOGY PTE. LTD.
BANGKOK, THAILAND

BLUM PRODUCTION METROLOGY CO., LTD.
TAICHUNG, TAIWAN

BLUM PRODUCTION METROLOGY PTE LTD
SINGAPORE, SINGAPORE

BLUM NOVOTEST MEASURING & TESTING
TECHNOLOGY PVT LTD.
BANGALORE, INDIA



- BLUM SUBSIDIARY
- BLUM SALES & SERVICE
- SYSTEM INTEGRATOR



- Transmission Test Stands
- Drive Shaft Test Stands
- Hydraulic Test Stands
- Spindle Test Stands
- Special Equipment
- Software

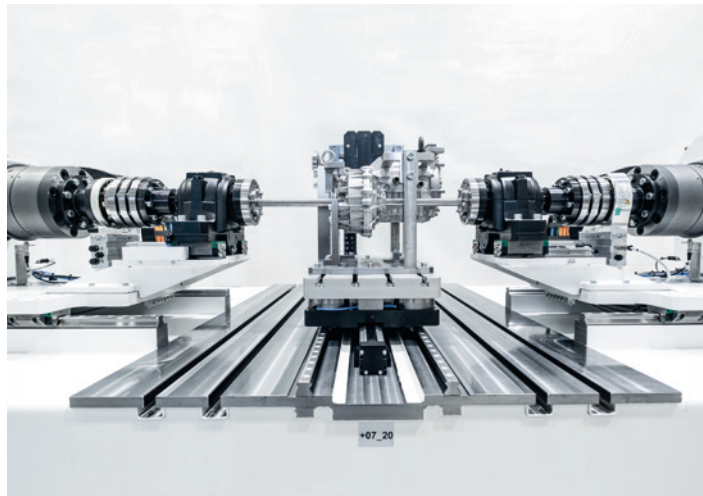
11 NOVOTEST TEST ENGINEERING DIVISION THE SPECIALIST IN TESTING TECHNOLOGY

NOVOTEST is the specialist in test stands for the automotive and hydraulics industries at Blum-Novotest GmbH. The scope of services includes the planning, design and engineering of functional and endurance test stands and dynamometers, as well as integration into customer automation systems.

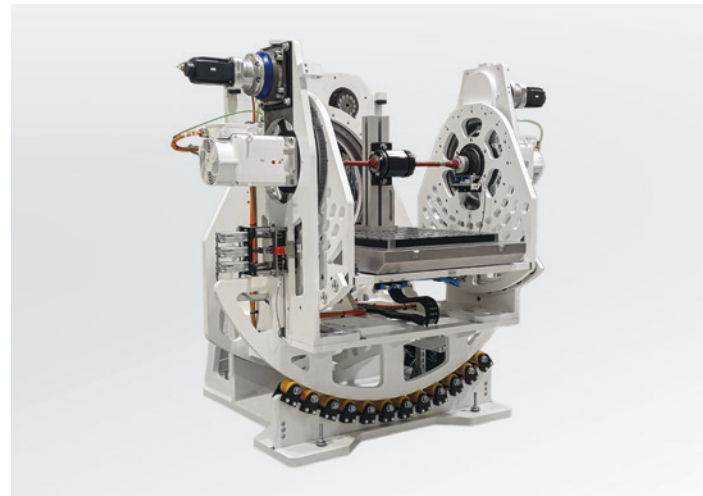
12 MEASURING MACHINES DIVISION POST-PROCESS SOLUTIONS

The Measuring Machines Division develops and manufactures solutions for dimensional and geometric inspection for inline 100% inspection in series production. In addition, you will find an expert partner for specific special measurement and testing requirements according to customer requirements including automation or integration.

- Multipoint Gauging Machines
- Measuring and Automation Cells
- Flexible 2D Measuring Machines
- Software
- Spindle Test Stands
- Crack Detection Testing Machines
- Special Measuring Systems



E-drive test bench for electric axle drives



Swivel test bench for E-drive and AWD products



Multipoint measurement technology



Spindle test stands

www.blum-novotest.com