SURFCOM 130

Mobile surface measuring instrument

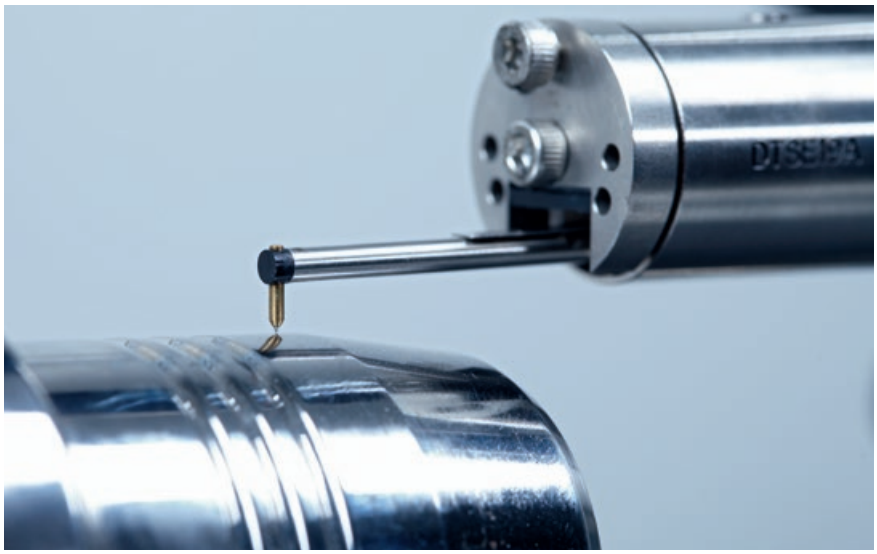
The SURFCOM 130 is designed for mobile use in production. The separate control and analysis unit features a touchscreen display and a printer. An interface enables external data storage and professional analysis with ACCTee PRO on a computer.

Compact tracing driver

- Highly accurate free stylus-and-arm system
- 50 mm traversing length for measuring waviness
- Large deflection range of up to 1.6 mm for measuring roughness on radii
- Easy to exchange the sensing arm

International analysis parameters

Select the required standard: ISO, CNOMO; ASME, JIS



Straightness accuracy	0.3 µm/50 mm
Traversing length	50 mm

Touchscreen control unit with integrated printer

The user-friendly touchscreen display is available in color. Thanks to the integrated printer, reports, graphics and notes can be printed easily.

Virtual notepad

The touch pen allows you to record notes and drawings on the display.

Configurable user interface

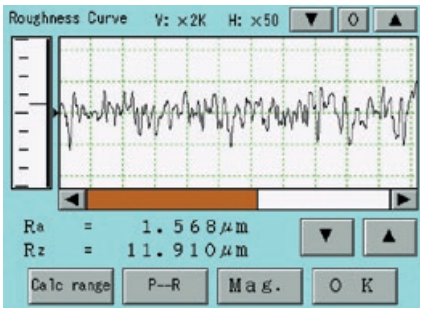
Create a customized menu that only contains the functions you use most.

User guidance
Helps measuring technicians configure all measuring conditions.

Automatic function
The measuring range, overall measuring length, cut-off and display magnification are automatically configured based on the surface quality.

Extensive analysis functions
- Evaluate all roughness values as per the standards: Ra, Rz, Rt, Rsm, etc.
- All waviness parameters
- Various filters, profile types and characteristics

Tilt correction
Six tilt correction methods for profile analysis: line, curve (ARC), first half, second half, beginning / end, spline.



Profile display and parameter results

User-defined main menu

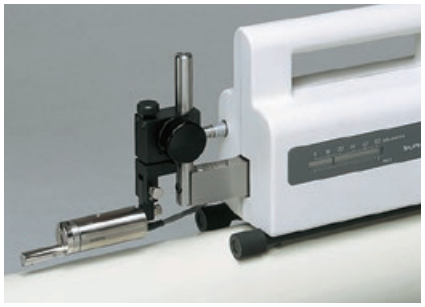
Special evaluations
Each parameter can be recalculated for selected profile areas. The corresponding area is easily configured via the cursor in the profile.

Memory card slot
A PCMCIA slot for saving and managing profiles, results, measuring programs and special programs.

PC interface
RS-232C for professional evaluation with ACCTee PRO roughness software

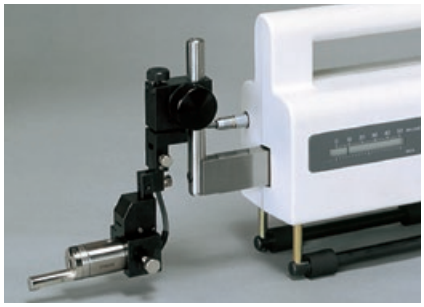
Language selection
German, English, French, Spanish, Portuguese and Japanese

SURFCOM 130
Accessories

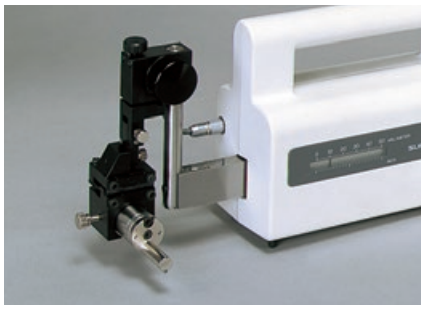


Roll foot, flat
E-MA-S62A
Attachment for easy positioning on shafts. For measurable exterior diameters of 60 mm and more

Roll foot, raised
E-MA-S63A
Raised attachment for easy positioning on shafts. For measurable exterior diameters of 60 mm and more



Universal stylus mount
E-DH-S107A
Stylus mount for measurements on non-flat surfaces
Z = –50 mm



Perpendicular stylus mount
E-DH-S17A
For lateral tracing in the feed direction

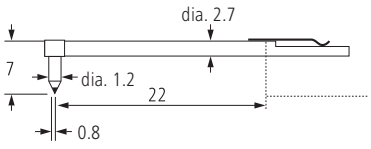
Battery set
E-MA-S65A
AC adapter, battery, charger

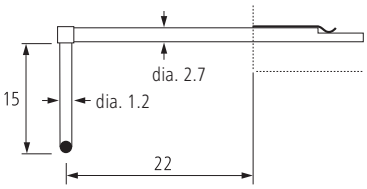
PCMCIA memory cards up to 1 GB
E-MU-S50C
Memory card for up to 7000 measuring conditions and measurement data

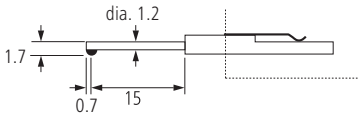
Measuring columns
Measuring columns for quickly and accurately adjusting the height and tilt of the tracing driver
Base plate (granite): 400 x 240 x 50 mm
Max. height (Z): 300 mm

SURFCOM FLEX
Compact control and analysis unit
(see p. 22)

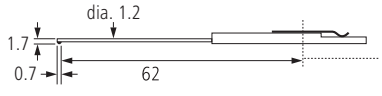
Sensing arms
Excerpt from our stylus catalog

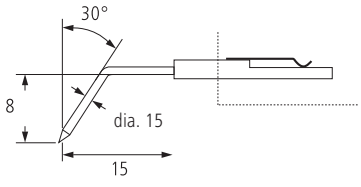


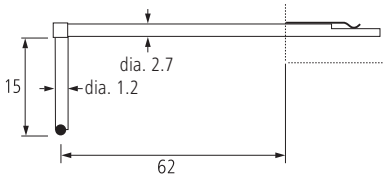




Cat. no.	1059-167	1079-358	1079-356
Length of sensing arm	22 mm	22 mm	15 mm
For boreholes larger than	dia. 7.5 mm	-	dia. 2 mm
For groove depths	<4 mm	<15 mm	-
Measuring range	± 400 µm	± 400 µm	± 400 µm
Stylus tip	2 µm/60°, diamond	2 µm/60°, diamond	2 µm/60°, diamond







Cat. no.	1084-495	1128-388	1054-833
Length of sensing arm	62 mm	15 mm	62 mm
For boreholes larger than	dia. 2 mm	-	-
For groove depths	-	-	<15 mm
Measuring range	± 800 µm	± 400 µm	± 800 µm
Stylus tip	2 µm/60°, diamond	2 µm/60°, diamond	2 µm/60°, diamond

SURFCOM FLEX

Mobile control and evaluation unit

The SURFCOM FLEX is an easy-to-use control and evaluation unit with an integrated printer. It can be used in combination with the HANDYSURF and SURFCOM 130 tracing drivers. Thanks to its ease of use and robustness, the SURFCOM FLEX is at home in the workshop.

The SURFCOM FLEX with optional clamping device for the E-35B or E-40B tracing driver

Small, lightweight and flexible

Thanks to its compact size and robust design, the SURFCOM FLEX controller can be easily transported and used anywhere. The small device also houses a printer. The 8.9 cm color display is very easy to read. Measuring results can be displayed numerically and graphically. They can also be printed using the report printer.

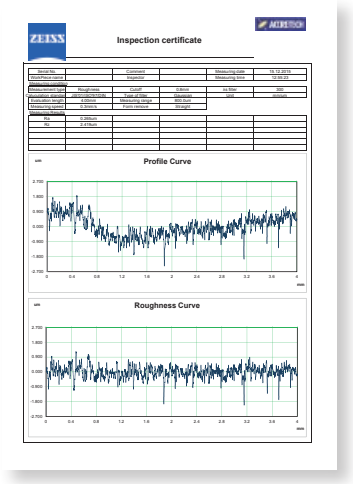
The SURFCOM FLEX can also be operated using a battery. A power supply unit is also included.

Memory and interfaces

Measuring conditions and results can be stored on the internal memory or on the enclosed 8 GB memory card (standard USB). A mini USB interface enables data evaluation on a computer. Excel-based evaluation software is included.

Options

- Holder for the E-35 or E-40 tracing driver
- Data transmission to CALYPSO coordinate measuring machine software for roughness, size, form and position in one report

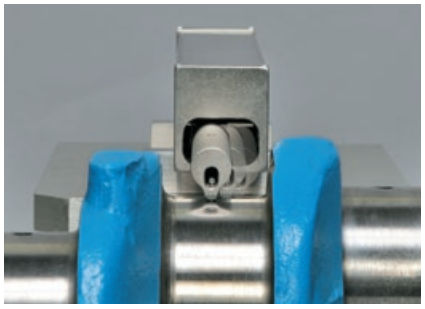


SURFCOM FLEX report

System combination

SURFCOM FLEX 35/40

For surface measurements on all flat surfaces – even vertically and overhead.



SURFCOM FLEX 45

For surface measurements in the axial direction in tight spaces, e.g. to measure crankshaft pins.

SURFCOM FLEX 50

Surface measurements with the SURFCOM 130 tracing driver. To capture roughness, profile and waviness parameters.


SURFCOM FLEX
POWER
MEMORY
COM
MEAS
GRAPH
PARAM
FUNCTION
CONDITION
PRINT
BACK
FEED
MENU
ENTER
RETURN
SLEEP
CHARGE

SURFCOM NEX

One system, every possibility: surface, contour or both?

All SURFCOM NEX machines in the 001 to 141 series use the same base column. Only the sensors are different. By purchasing a sensor, you can turn your surface measuring instrument into a contour measuring system – or vice versa. Furthermore, additional sensors can be retrofitted, e.g. a hybrid sensor or a white light sensor.

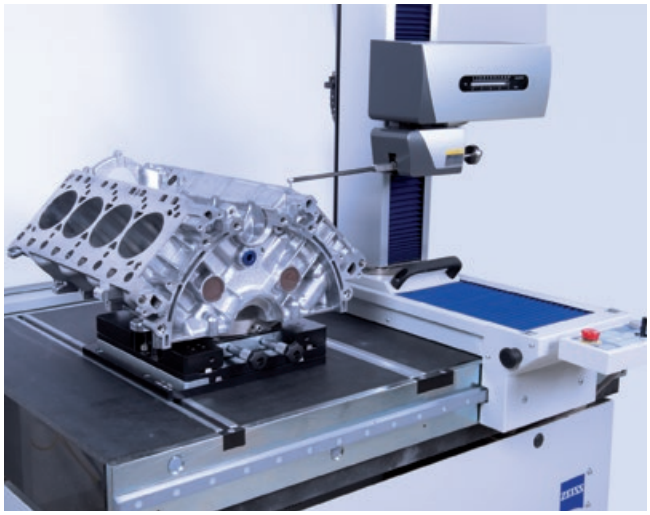
Benefits

- Future-proof modular system, can be upgraded on site
- Considerably faster, less maintenance and fewer vibrations than standard system designs thanks to the patented non-contact linear drive in the X axis
- Topography measurements up to seven times faster than systems with a spindle drive
- Can be used with numerous sensors: surface, contour, hybrid or white light sensors
- Topography function or lead twist measurement function can be quickly upgraded on site
- Optional rotation tracing driver for standards-compliant effective surface measurement on rotationally symmetric features
- Optional hand wheel to turn the tracing driver ±15°
- Can be upgraded through a combined CNC modular system: Y table, horizontal rotary table, vertical rotary table (see p. 32)
- Various furniture solutions for SD versions and fully enclosed DX versions or compact FX versions with integrated active vibration damping and a minimal footprint

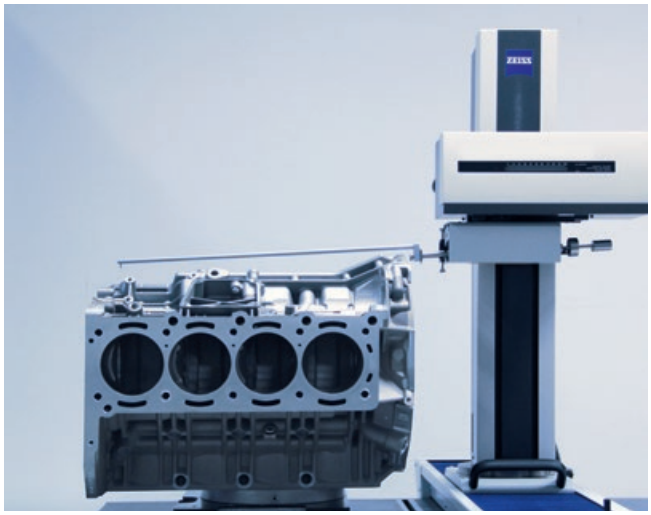
FX version: a compact and active vibration-damping base

DX version: measuring machine, including fully enclosed, active vibration-damping furniture

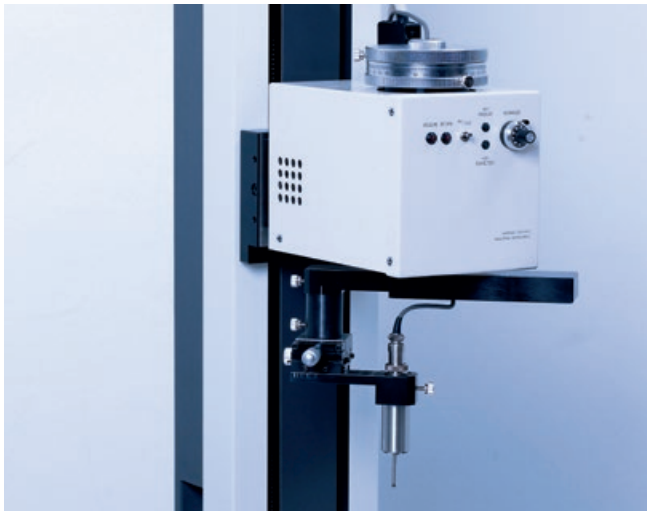
SD version: various furniture solutions available upon request



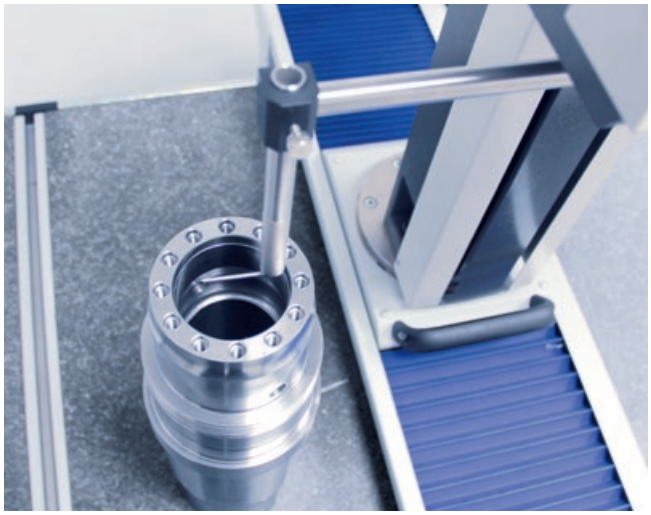
Tailored solutions, such as the XY positioning table, available upon request



Long standard styli (529 mm) for simple contour measurements on deep features



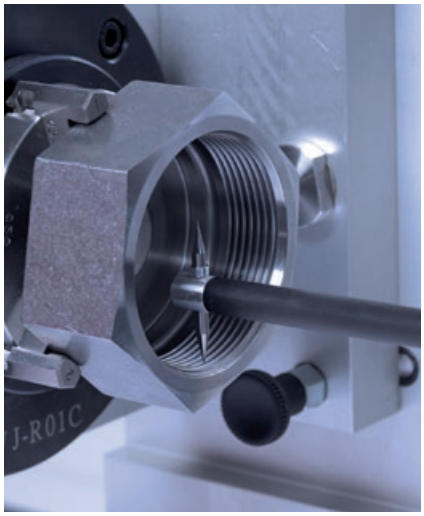
Optional rotating tracing driver for standards-compliant inspection of rotationally symmetrical workpieces



Surface measurements on plane surfaces, even with very deep features

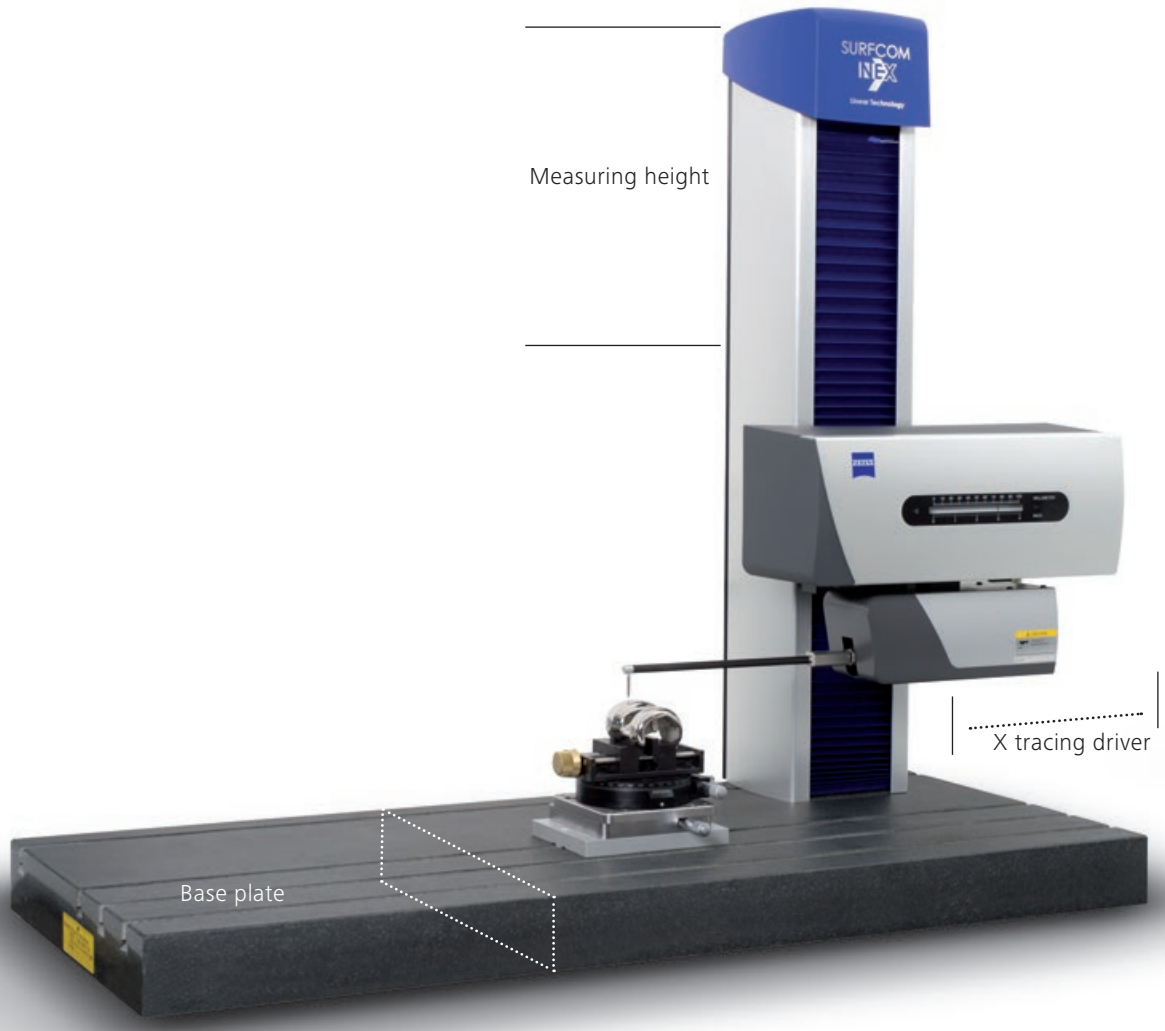
Optional: hand wheel for turning the tracing driver up to ±15°

Magnet fixture for precise positioning and quickly changing the sensing arm



Optional T stylus for simple diameter and wall thickness measurements

Size variations



Sizes	
X tracing driver	100 or 200 mm
Measuring height	250, 450 or 650 mm
Base plate	600 x 450 mm or 1,000 x 450 mm

Size nomenclature

1_ X tracing driver 100 mm
2_ X tracing driver 200 mm
_**2** Z measuring height: 250 mm, Base plate: 600 x 450 mm
_**3** Z measuring height: 450 mm, Base plate: 600 x 450 mm
_**4** Z measuring height: 450 mm, Base plate: 1,000 x 450 mm
_**5** Z measuring height: 650 mm, Base plate: 1,000 x 450 mm

e. g. SURFCOM NEX 001-SD-**23**:
200 mm X tracing driver, 450 mm measuring height, 600 x 450 mm base plate

SURFCOM NEX modular system

The measuring task determines the sensor

In order to be able to optimally meet your particular needs, the SURFCOM NEX system offers different sensors which can be combined with each other.

Roughness

SURFCOM NEX 001

Roughness

White light sensor

Contour

SURFCOM NEX 040

Contour

SURFCOM NEX 030

Roughness and contour

SURFCOM NEX 100

Sensor nomenclature

_ _1 Surface
1_ _ Hybrid
_3_ Contour
_4_ Contour with increased precision and automatic probing force

An overview of the SURFCOM NEX system

Optional for all systems

- Expandable sensors: surface, hybrid, contour
- Topography and lead twist measurement function can be quickly upgraded on site
- Optional rotating tracing driver
- Hand wheel for turning the tracing driver (up to ±15°)
- CNC module for automation
- Different furniture solutions

White light sensor
Quick optical surface measurement

Sensors

- Chromatic interferometric surface sensor

Technical data summary

Resolution
10 µm

Measuring accuracy
0.1 µm

Working distance
4.5 mm

Measurement angle to object surface
90° ± 30°

Measuring spot diameter
5 µm

SURFCOM NEX 001
Convenient measuring station for surface measurements

Sensors

- Surface sensor

Technical data summary

Resolution
0.1 nm at 6.4 µm range
20 nm at 1,000 µm range

Straightness error
0.15 µm with 100 mm measuring path

Traversing length/resolution
0.016 µm

Measuring speed
up to 20 mm/s

Positioning speed
up to 60 mm/s

SURFCOM NEX 100

Measure contours and roughness quickly and precisely in one measuring run

Sensors

- Highly accurate, wide-range dual probe for contour and surface measurements
- Measuring range up to 15 mm

Technical data summary
Resolution
1 nm with 0.05 mm measuring path 100 nm with 5 mm measuring path
Straightness error
0.15 µm with 100 mm measuring path
Z axis measuring error
±(1.0 + 2H/100) µm
Traversing length/resolution
0.1 µm
Stylus deflection
5/10/15 mm
Measuring speed
up to 20 mm/s
Positioning speed
up to 60 mm/s

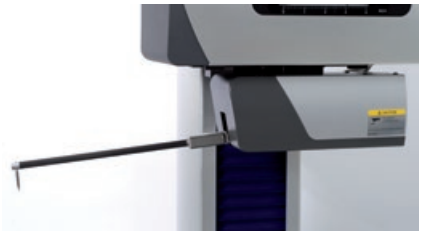
SURFCOM NEX 030

A flexible CNC measuring station for easy contour measuring, collision protection comes standard

Sensors

- Contour sensor
- Easy to change sensing arms by using a magnetic change-out interface
- Manual probing force configuration

Technical data summary
Resolution
0.04 µm
Straightness error
1 µm with 100 mm measuring path 2 µm with 200 mm measuring path
Z axis measuring error
±(1.5 + 2H/100) µm
Traversing length/resolution
0.016 µm
Stylus deflection
60.00 mm
Measuring speed
up to 20 mm/s
Positioning speed
up to 60 mm/s



SURFCOM NEX 040

Flexible CNC measuring station for easy contour measurements with increased precision and automatic probing force configuration and collision protection comes standard.

Sensors

- Contour sensor
- Easy to change sensing arms by using a magnetic change-out interface
- Automatic probing force configuration in the range of 2 to 30 mN

Technical data summary
Resolution
0.02 µm
Straightness error
1 µm with 100 mm measuring path 2 µm with 200 mm measuring path
Z axis measuring error
±(0.8 + 2H/100) µm
Traversing length/resolution
0.016 µm
Stylus deflection
60.00 mm
Measuring speed
up to 20 mm/s
Positioning speed
up to 60 mm/s

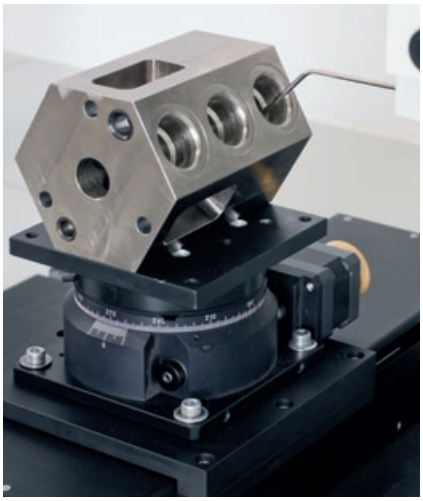
Automation with the CNC modular system

Three combinable modules

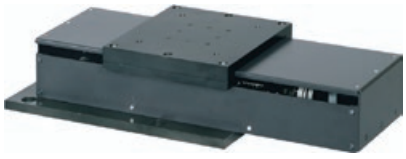
The CNC modular system enables the automation of measuring runs on SURFCOM NEX systems. It is comprised of three modules: a positioning table in the Y direction, a horizontally arranged rotary table and a vertically arranged rotary table. All modules can be combined and can be operated with two- or four-axis control as needed.

Benefits

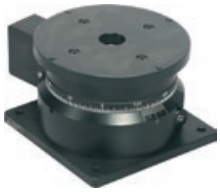
- Upgradeable and adaptable
- No special instruments required
- Programmable using Teach-in with the system software
- Customized measuring equipment for automation upon request



Combination of Y positioning table and rotary table



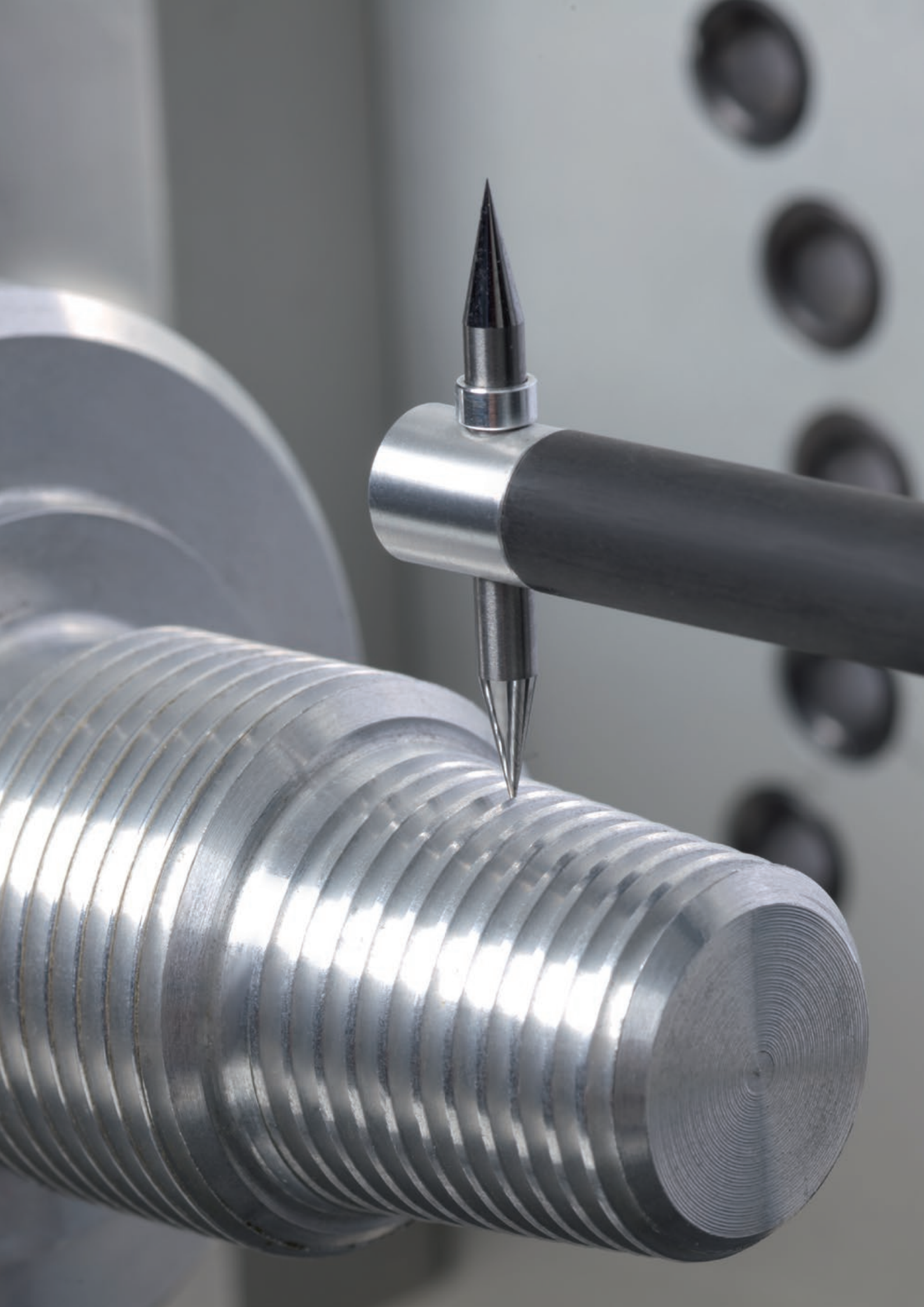
Positioning table in Y direction



Horizontal rotary table

Vertical rotary table

	Y table	Horizontal rotary table	Vertical rotary table
Cat. no.	E-AT-S105A (E-AT-S106A)	E-AT-S107A (E-AT-A144A)	E-AT-S108A
Traversing length	100 mm (200 mm)	360°	360°
Travel speed	50 mm/s	20°/s	20°/s
Positioning accuracy	20 µm	0.03°	0.03°
Max. load	30 kg	15 kg (30 kg)	5 kg
Weight approx.	19 kg (22 kg)	2.5 kg (10 kg)	3.2 kg



Patented linear drive for maximum measuring productivity

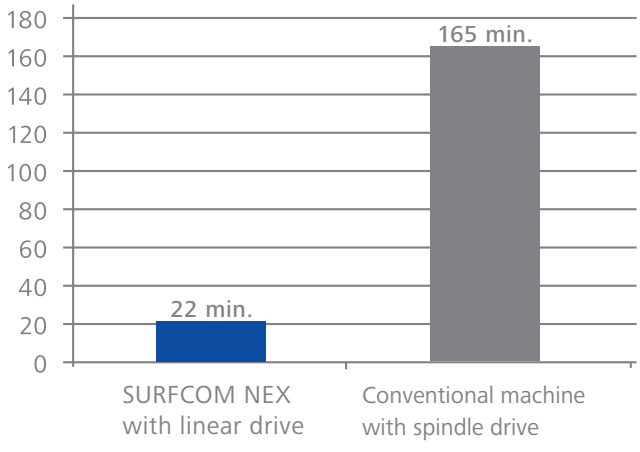
The contour and surface measuring instruments from ZEISS feature a linear drive in the X axis. Compared to the standard spindle drive, significantly higher travel speeds are possible with this magnetic linear drive. Noise from the spindle or spindle eccentricity are avoided. The scale of the X axis is equipped with temperature compensation.

Seven times faster than spindle drives
The patented linear drive enables maximum measuring speeds from 0.02 – 60 mm/s. For topography measurements, SURFCOM NEX completes the measuring job up to seven times faster than a system with a spindle drive.

Friction-free measurements
The linear drive works without any vibrations: it hovers over a magnetic field without contact or friction.

Temperature compensation in the tracing driver
The integrated temperature compensation in the tracing driver at 20 °C ± 5 °C ensures accuracy.

Measuring time comparison for topography measurement



20x20 mm measuring surface, 1,000 measuring lines

3-D topography measurement

The accessories and software from ZEISS enable you to transform your SURFCOM NEX surface measuring instrument into a topography measuring station. The patented linear drives on SURFCOM NEX systems provide the ideal conditions for this.

Y tracing driver
for the SURFCOM NEX 001 through the NEX 041

The patented Y tracing driver moves the sensor line-by-line in the Y direction during topography measurements. Since the part does not have to be moved, the Y tracing driver can also be used to measure very heavy components.

Measuring path	13 mm
Measuring increments	1 µm
Straightness accuracy	1 µm/13 mm

Y sliding table
for the SURFCOM NEX 001 through the NEX 041

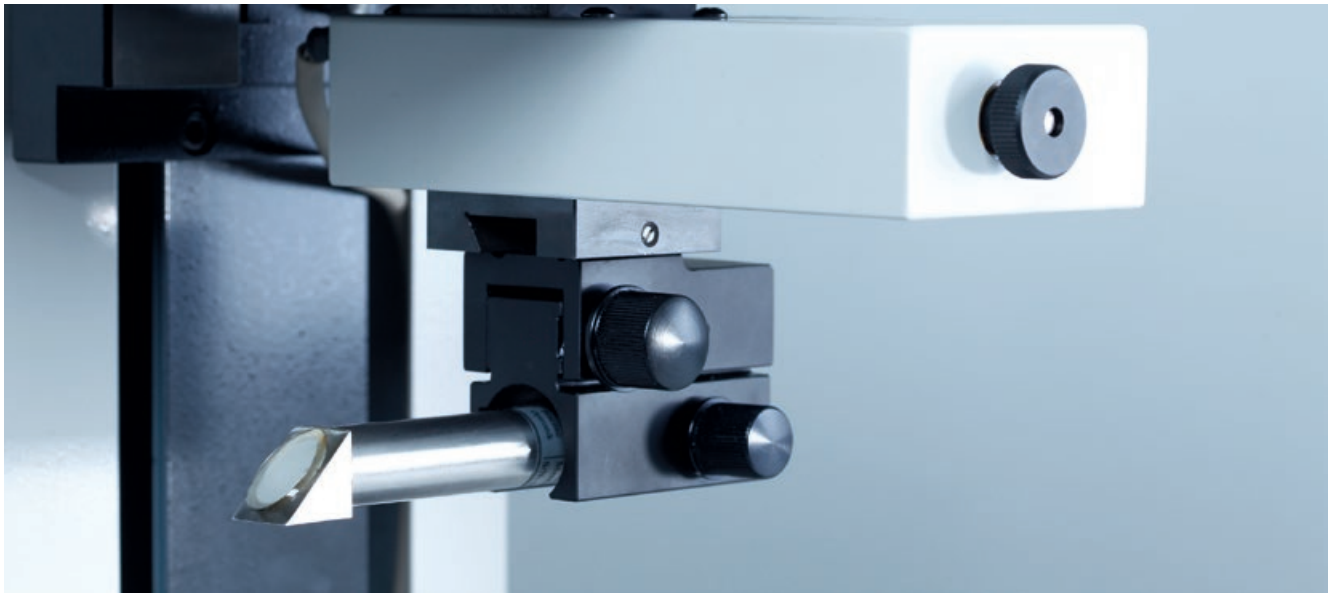
The Y sliding table is a precise positioning table to move the component in the Y direction line-by-line during a topography measurement. Heavy-load configuration upon request.

Measuring path	50 mm
Measuring increments	1 µm
Straightness accuracy	0.05 + 3L/1,000 µm
Component weight	5 kg

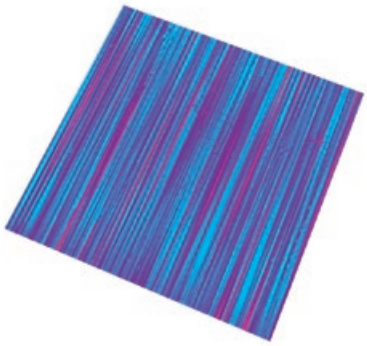
Y sliding table
for the SURFCOM CREST

The Y sliding table is a precise positioning table to move the component in the Y direction line-by-line during a topography measurement. Heavy-load configuration upon request.

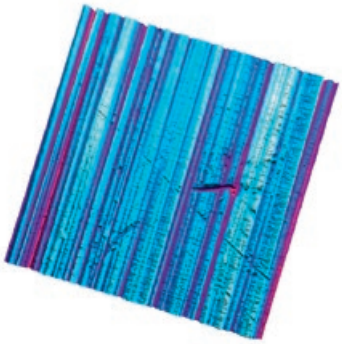
Measuring path	100/150/200 mm
Measuring increments	1 µm
Straightness accuracy	0.05 + 3L/1,000 µm
Component weight	10 kg



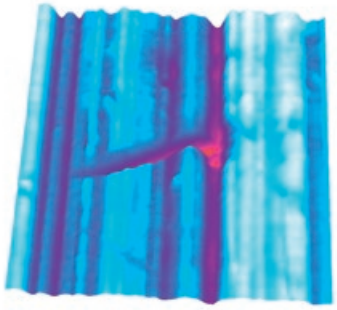
Y tracing driver with white light sensor for topography measurements



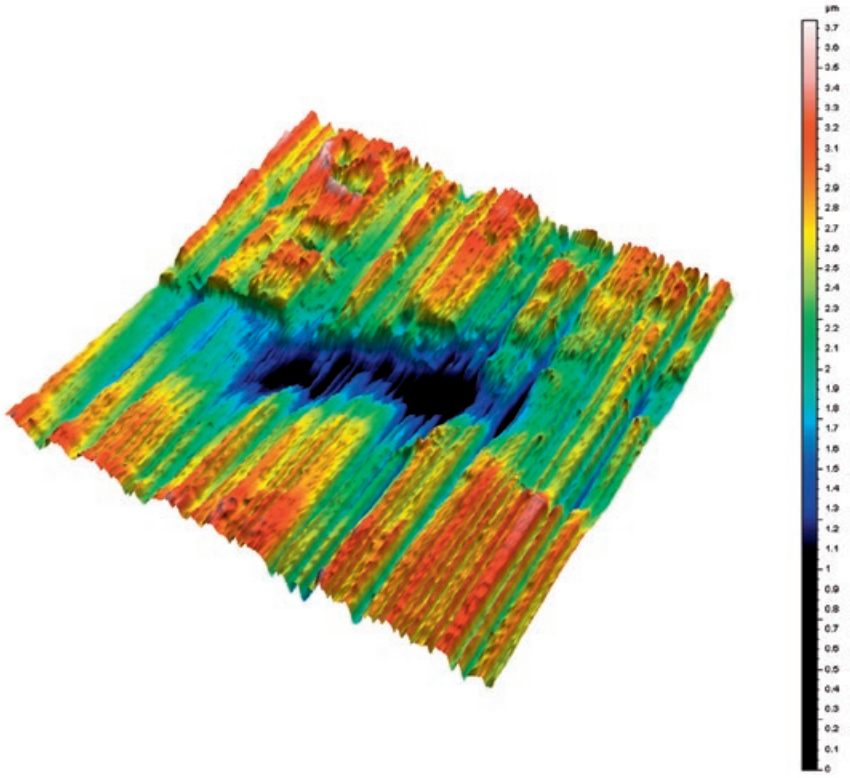
1st magnification level



2nd magnification level



3rd magnification level

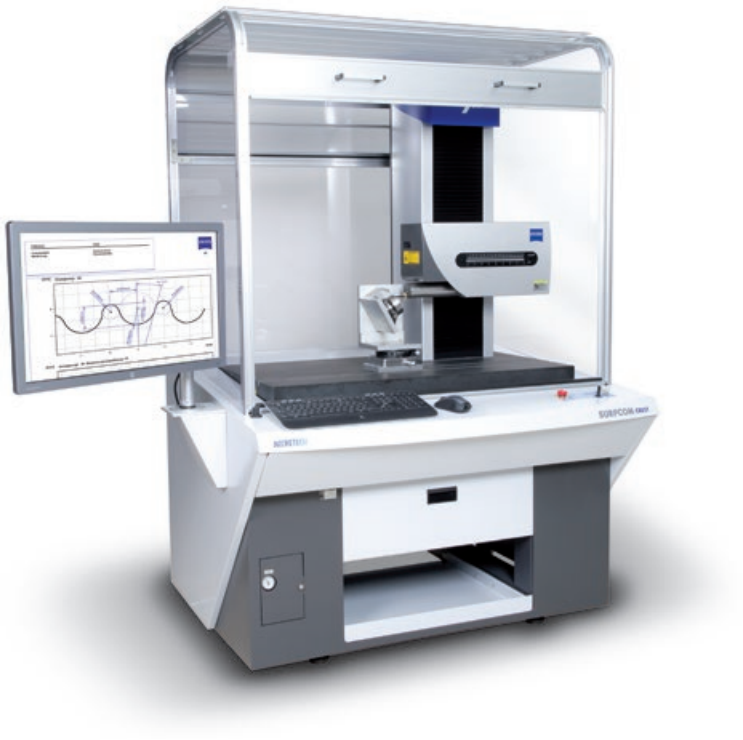


SURFCOM MAP software

- 3D display and analysis of topographical measuring data
- Wide range of evaluation possibilities
- Distance and angle measurements with freely selectable profile points
- Fast generation of measuring reports
- Tolerance input with automatic inspection of the measuring results
- Different distribution options: SPC, qs-STAT, PiWeb

SURFCOM CREST

CNC measuring station for combined contour and surface measurement



SURFCOM CREST

Precise, universal and dynamic – the SURFCOM CREST is the flagship for contour and surface measuring technology from ZEISS and is the benchmark for accuracy and speed. The SURFCOM CREST measures surface parameters and contours in one step, considerably increasing measuring productivity compared to conventional systems.

The SURFCOM CREST flexes its muscles where precision and throughput are vital: in the automotive, mechanical engineering and medical technology industries. For example, it is ideal for lenses, precise bearings, drive spindles, as well as accurate milled, ground, honed and lapped parts.

Advantages

- Extremely stable and highly accurate measuring results ensured by a resolution of 0.31 nanometers. The resolution of the SURFCOM CREST is higher than conventional systems by a factor of five
- Laser interferometer as a measuring system for maximum accuracy. Measuring error in the X direction: ± (0.2 + L/1,000) µm
- Extremely good ratio of measuring range to resolution period. The slightest surface roughness and contours over a very large measuring range can be measured in one run.
- More throughput thanks to extensive automation possibilities
- Higher flexibility for slanted features through CNC swivel tracing driver, ± 45° swivel range and 200 mm tracing driver
- Long penetration depth for measurement of deep features
- Easy automatic measurement thanks to cylindrical stylus-and-arm system
- Easy diameter or wall thickness measurement with T stylus
- More accurate and universal thanks to the outstanding ratio of the measuring range to resolution: 42 million to 1

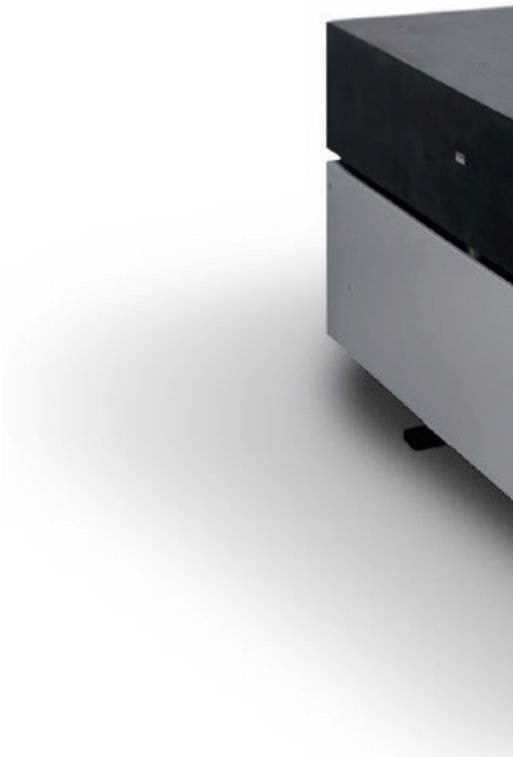
Technical data summary	
Resolution	0.31 nm (50 mm stylus)
X axis straightness error	0.11 µm with 200 mm measuring path
X axis measuring error	± 0.4 µm with 200 mm measuring path
Traversing length/resolution:	200 mm/0.54 nm
Stylus-and-arm deflection:	13 mm (50 mm stylus) 26 mm (100 mm stylus)
Measuring speed	0.03 mm/s – 20 mm/s
Positioning speed	up to 200 mm/s

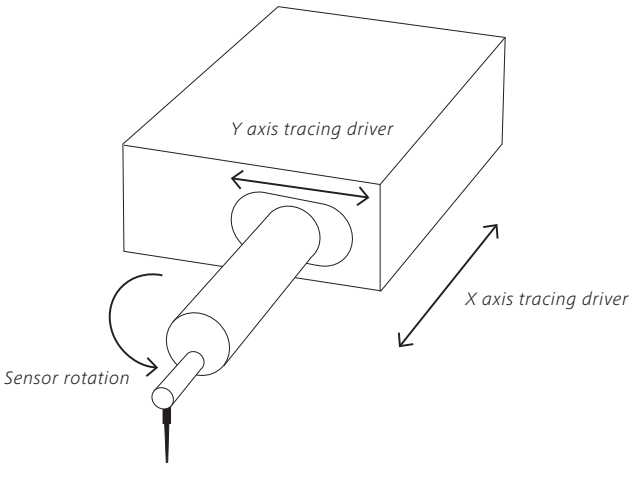
SURFCOM C5

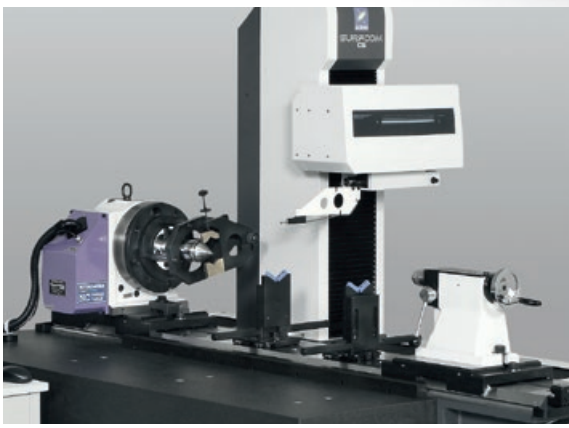
Fully automatic roughness measuring on motor components and shafts

SURFCOM C5

- Ideal for the automated surface measurement of engine components such as cylinder blocks and cylinder heads
- Designed for quality assurance in volume production
- Increased productivity through fully automatic shop floor surface measurement
- Highly flexible: the instrument's design is perfect for connections with component-specific equipment
- Faster, more reliable and more economical thanks to fully automated surface measurement
- Best reachability of the measuring site through 5 CNC axes
- Short setup times through integrated patented Y tracing driver in the X axis
- Measurements in all directions using the integrated rotation sensor
- Considerably faster, less maintenance and fewer vibrations than standard systems thanks to its patented non-contact linear drive (X axis)
- High positioning speeds of 100 mm/s for high measuring efficiency, even on large components
- Extensive patented safety concept – for maximum operator and machine safety







The SURFCOM C5 Type S: with additional rotary axis for measuring crankshafts and cam shafts

Technical data summary	
Measuring range/resolution (Z axis)	500 mm/0.1 µm
Measuring range/resolution (X axis)	200 mm/0.1 µm
Measuring range/resolution (Y axis)	800 mm/0.1 µm
Measuring range/resolution (Y transverse tracing driver)	30 mm/0.1 µm
Positioning speed	100 mm/s
Measuring speed	0.03–20 mm/s

Additional instrument configurations upon request