



## Contact and optical sensors

from a 360 degree view





## **ZEISS sensor technology - where it is needed**

Different sensors, whether optical or contact, touch-trigger or measuring, active or passive, have different advantages and areas of application. Therefore, ZEISS coordinate measuring machines (CMMs) are equipped with various types of sensors.

Depending on the application involved, multiple sensors also can be combined on a single machine. These machines are called "multisensor coordinate measuring machines". The machines from the Visual series are primarily such multi-sensor CMMs, equipped with optical (camera and distance sensor) and contact sensors.

Bridge-type CMMs equipped with the mass (multi-application sensor system) option thus become multisensor CMMs. The robust contact sensors are used for production-integrated CMMs. As with the bridge-type CMMs, the permanently installed contact sensor heads of these machines also can be fitted with a contour tracer for roughness measurements.

Horizontal-arm coordinate measuring machines, which are predominantly used in car body construction, also are available as multisensor CMMs equipped with contact sensors and optical distance sensors.





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# ZEISS RDS

## The basis for maximum flexibility

The best articulating probe holder in its class enables you to reach virtually all spatial directions via numerous single positions.

The ZEISS RDS (Rotary Dynamic Sensor or articulating probe holder) sensor mount is especially suitable for measuring complex parts with features that are located in many different positions and orientations. This "positioning marvel" reaches up to 20,736 positions in steps of 2.5 degrees, thus providing access to every feature of a part. This is based on two rotary axes which are arranged perpendicular to each other and feature rotational ranges of plus/minus 180 degrees.

The RDS positions optical sensors in the optimal measuring position, largely perpendicular to the surface of the component.

With contact sensors, the RDS saves the need to use many different stylus configurations in order to reach features located in different positions and orientations.

With the ZEISS RDS-CAA version, only a few angular settings are sufficient to fully qualify all angular positions for contact sensors. The qualification data of positions which are not directly measured is interpolated based on a computer correction (CAA). During programming, the RDS can be easily positioned using the joystick on the control panel to enable shorter programming times.

With its integrated optical fiber interface, the ZEISS RDS expands the portfolio of applicable sensors to include the DotScan family, while also enabling CNC controlled automatic changing and use of sensors in measurement procedures.



### Compatible sensors:

- ZEISS ViScan
- ZEISS LineScan
- ZEISS DotScan (only on a DotScan-compatible RDS)
- ZEISS VAST XXT
- ZEISS XDT
- ZEISS RST-P

### Compatible ZEISS coordinate measuring machines:

- ZEISS ACCURA
- ZEISS CARMET
- ZEISS CONTURA
- ZEISS MMZ E, MMZ G, MMZ M, MMZ T
- ZEISS PRISMO



*The accuracy and range of motion offered by the ZEISS RDS is not achieved by any other articulating probe system. The ZEISS RDS is highly flexible to boot: both contact and optical sensors can be used equally well with this sensor mount.*

## ZEISS CSC

# Maximum dynamics and precision

More powerful, faster and more accurate – the ZEISS CSC sensor establishes a new standard for continuous articulating units and is thus ideal for the volume measurement demands of complex car body parts.

Optical and contact sensors must be optimally positioned for the volume measurement of complex car body parts and bodyshells in order to reach hard-to-access measuring points in the interior. At the same time, long extensions are often required as well. It is exactly here that ZEISS CSC opens up opportunities that have been unavailable until now: this is due to the significant torque reserves combined with maximum resolution and precision.

In order to optimally control processes in car body construction, the results of the measurement must be available as quickly as possible. The high dynamics of the ZEISS CSC considerably reduce the measuring time – without sacrificing safety. An in-house safety concept enables the integration of a collision-protected bearing for the sensor plate in addition to the known collision protection for the articulating unit. This prevents sensor damage in the event of a collision with the part in setup mode.

Another benefit of the ZEISS CSC is the completely re-engineered stylus changer. As with the ZEISS RDS stepping, articulating unit, the stylus changer now operates completely passively. Therefore, compressed air is no longer required on the measuring machine, which also means cost savings for the user. Furthermore, the changer can be positioned as needed because it also works without electrical connections.



#### Compatible ZEISS coordinate measuring machines:

- ZEISS PRO / PRO T



*The new Continuous Sensor Carrier from ZEISS allows full rotations of 360 degrees in one direction and supports stylus extensions up to 800 millimeters, to provide added flexibility in hard-to-reach locations. The ZEISS CSC is intended for challenging measuring jobs in prototype construction or in process optimization, particularly in the automotive industry.*

# ZEISS VAST gold

## Peak scanning performance guarantee

The active measuring force control enables exact measuring results with complex long stylus systems and a high measuring throughput through navigator technology for optimal scanning performance.

ZEISS VAST gold is the ideal sensor that captures almost any feature exactly. For this purpose, complex stylus systems weighing up to 800 g and with a length of up to 800 mm can be used for scanning and single-point measurement. Asymmetrical stylus systems also are possible with the active measuring force control of the ZEISS VAST gold. The position of the features relative to each other is determined precisely by the fixed stylus systems with different styli without any rotational movements which might influence the accuracy of the measurement.

The active measuring force control is an essential prerequisite for attaining a high scanning speed even with complex styli. It forms the basis for the correction procedure of the navigator technology. One example of such a correction is centrifugal force compensation via active measuring force control.

Furthermore, the navigator technology in ZEISS CALYPSO software provides functions for automatic determination of the optimal scanning speed. The highest throughput possible at the required accuracy is thus always achieved.

Using the FlyScan function based on active force control, discontinuous surfaces can be measured in a single scanning run without stopping.

Of course, the active force control also enables individual adjustment of the measuring force. The force thus can be adapted to the requirements of the measuring task and the material of the workpiece and always has a constant effect - 50 to 1,000 millinewton are programmable.



### Compatible ZEISS coordinate measuring machines:

- ZEISS ACCURA
- ZEISS CenterMax
- ZEISS PRISMO
- ZEISS XENOS



*Size, form and position in one setting  
on one machine in one reference  
system – that is what ZEISS VAST gold  
stands for.*

# ZEISS VAST XT gold

## All systems go for active scanning

The ZEISS VAST XT gold sensor is the compact version of the VAST gold active scanning sensor line from ZEISS. It provides the foundation for entry into the world of active scanning technology.

ZEISS VAST XT gold also is equipped with active measuring force control. The measuring force can be configured depending on the measuring task. It also is used for a number of correction procedures.

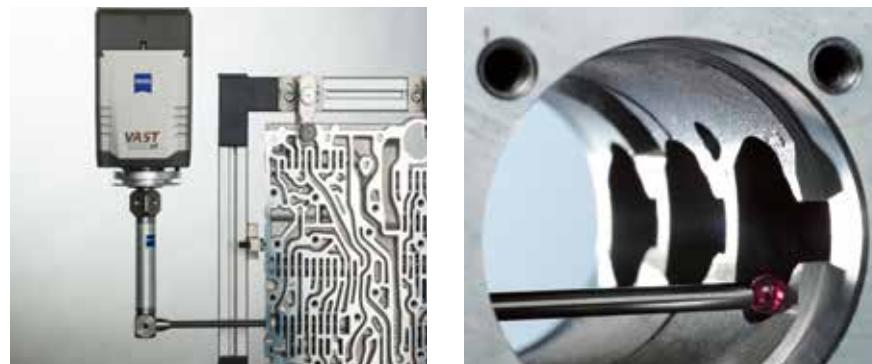
In addition to active scanning, this sensor also allows single-point measurements: for example, the sensor here enables the flexible use of complex stylus systems and self-centering measurements even in the case of large deviations.

Thanks to its high-speed scanning capabilities, ZEISS VAST XT gold can perform practically any job: form and position measurements, curve and free-form measurements, and reverse engineering. The applications here cover molded plastic parts and styrofoam or polystyrene, brake components, crankshafts, engine blocks and turbine blades.



### Compatible ZEISS coordinate measuring machines:

- ZEISS ACCURA
- ZEISS CONTURA
- ZEISS GageMax
- ZEISS MICURA





ZEISS VAST XT gold accommodates complex and thus heavy stylus systems: stylus lengths up to 500 mm and stylus weights up to 500 g can be combined with VAST XT gold.

# ZEISS VAST XTR gold Scores with flexibility

Thanks to the integrated rotary axis, the new ZEISS VAST XTR gold probe always positions the stylus in the direction of the feature being measured, maneuvers effortlessly through gaps and thus gets wherever it is needed.



The probe is based on the ZEISS VAST XT gold. All measuring functions including the active measuring force control also are supported by the ZEISS VAST XTR gold. In addition, ZEISS VAST VTR gold also features an integrated rotary axis. This enables the stylus mount to rotate arbitrarily far in 15 degree increments and thus always be positioned at a right angle to the part.

The ZEISS VAST XTR with its integrated rotary axis is as reliable and accurate as traditional "fixed" styli. Users can therefore rely on its well-known precision. There is a wide range of workpieces on which the probe flexes its muscles. These include parts with many features and angular positions such as those on gear housings for helicopters and locomotives. ZEISS VAST XTR gold is also suitable for rotationally symmetric workpieces such as ventilation gears or turbines. Thanks to the rotary axis, the probe also reaches internal gears that until now could only be measured using complex stylus systems.

The new sensor will have a particularly positive effect on large and heavy parts, for example in shipbuilding and in the wind power industry. With workpieces weighing more than five tons, it is difficult to find a rotary table suitable for the required accuracy and workpiece weight.



## Compatible ZEISS coordinate measuring machines:

- ZEISS ACCURA
- ZEISS CenterMax
- ZEISS CONTURA
- ZEISS GageMax
- ZEISS MICURA
- ZEISS PRISMO



# ZEISS VAST XXT

## Scanning done differently

The ZEISS VAST XXT allows high-accuracy scanning with the ZEISS RDS articulating probe holder.

There are a large number of measuring applications that can benefit from the flexibility of an articulating probe holder combined with scanning capability. ZEISS VAST XXT is ideal for such tasks.

Compared to touch-trigger sensors, ZEISS VAST XXT increases the operational reliability and accuracy of the measurements. It also adds scanning functionality, thus providing information on the form of the features.

The compact design of lightweight scanning sensors on the articulating probe holder requires different sensor modules. With only three modules, ZEISS VAST XXT covers the typical stylus length ranges for this sensor design. This sensor accommodates lateral styli up to 65 millimeters. It is also suitable for fixed installation.



### Compatible ZEISS coordinate measuring machines with RDS:

- ZEISS ACCURA
- ZEISS CONTURA
- ZEISS PRISMO

### Compatible ZEISS coordinate measuring machines (fixed installation):

- ZEISS CONTURA direct
- ZEISS DuraMax
- ZEISS O-INSPECT





Combined with the ZEISS RDS, the ZEISS VAST XXT is particularly well-suited for measurements of complex parts requiring a great many angular positions. Lightweight and compact stylus configurations such as the star probe are used here.

# ZEISS XDT

## Precision in all probing directions

Thanks to a unique combination of technical features, the ZEISS XDT multipoint sensor enables a wide range of applications and delivers high precision in all probing directions.

There are many instances when users require the flexibility of an articulating probe holder. As a replacement for touch-trigger sensors, the ZEISS XDT enables an increase in the operational safety and reliability and in the accuracy of the measurements.

Unlike touch-trigger single-point measurement, single-point scanning with sliding acquisition of measuring points provides a result featuring maximum accuracy and reliability. With "single-point scanning" the measuring point is registered with at least 100 measuring points. Outliers are no longer important, considerably improved accuracy is guaranteed.



### Compatible ZEISS coordinate measuring machines with RDS:

- ZEISS ACCURA
- ZEISS CONTURA

### Compatible ZEISS coordinate measuring machines (fixed installation):

- ZEISS CONTURA direct
- ZEISS DuraMax

*The ZEISS XTD features a robust, long-lasting, wear-free design and high sensitivity – consistently in all spatial directions.*



# ZEISS RST-P

## Precision in all probing directions

Thanks to a unique combination of technical features, the ZEISS RST-P touch-trigger sensor enables a wide range of applications and delivers high precision in all probing directions.

This sensor is known for its fast and dynamic capture of measurement data through single-point probing, free from stylus bending and mechanical hysteresis.

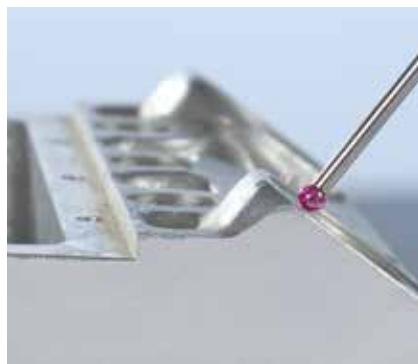
The ZEISS RST-P works according to a dual principle. This means it delivers the actual probing pulse from the piezoelectric elements located in front of the mechanical kink point. The three-point bearing also serves as a mechanical kink point that verifies probing and protects the sensor from damage caused by contact with the workpiece and collisions.

Moreover, the deflection forces caused by the bearings and direction do not influence the measuring result: the ZEISS RST-P delivers the same accuracy in all probing directions. Special calibration is not required for slanted measuring or probing jobs.



### Compatible ZEISS coordinate measuring machines:

- ZEISS CARMET
- ZEISS PRO / PRO T





*The ZEISS RST-P features a robust, long-lasting, wear-free design and high sensitivity.*

# ZEISS ROTOS

## A Whole New Dimension for Roughness Measurements

For the quality inspection of components, e.g. in the powertrain of vehicles, it must be possible to inspect roughness and waviness. The new ZEISS ROTOS roughness sensor makes this possible. Operators benefit from a simplified workflow for added measuring certainty and enormous time savings.

This sensor should be of interest to a wide range of users, and not just because of increasingly stringent quality requirements: maintaining surface properties is also an ecological issue. Being able to inspect surface properties is increasingly the focus of metrology analyses as industrial production methods become more and more precise, especially as concerns machining technical, functional surfaces. Capturing surface properties (form, deviation and roughness) following mechanical processing and understanding the effects on system efficiency have become a key quality factor and differentiator.



Thanks to different stylus arms, the ZEISS ROTOS can measure roughness in deep boreholes and difficult-to-reach areas without any difficulty. The innovative sensor design ensures excellent accessibility. Three axes enable a 180° range of motion in both directions, meaning even overhead measurements are not a problem for the ZEISS ROTOS. Stylus systems designed specially for measuring waviness are also new, and allow the ZEISS ROTOS to capture nearly all workpiece characteristics and check that the surface property tolerances have been met. This is another key feature for increasing process reliability when inspecting machine parts for gearboxes and roller bearings.

### Compatible ZEISS coordinate measuring machines:

- ZEISS PRISMO
- ZEISS CenterMax
- ZEISS MMZ



*Very flexible: The axes of the ZEISS ROTOS can  
be pivoted +/-180°*

# ZEISS ViScan

## Spotlight on two dimensions

Today, the complexity of test specimens is so extensive that contact or optical sensors alone are no longer sufficient. With the ZEISS ViSCAN 2D optical probe, it is now possible to perform contact and optical measuring tasks on a single machine.

The hallmark of the ZEISS ViScan is its flexibility in all aspects: combined with the ZEISS RDS, it permits measurements in all spatial directions. This opens up new opportunities particularly for large parts, since the reclamping of parts is omitted and even minute features predestined for image-based measurement can be captured.

As a fixed installation in the ZEISS O-INSPECT, the sensor excels through a wide variety of lighting options and a CNC-adjustable optical magnification. With its higher resolution and larger measuring field, this solution is particularly well suited for plastic parts, filigree geometries and micromechanics.

In addition, various lenses which were designed emphasizing preservation of the long working distance are available for the ZEISS ViScan on the ZEISS RDS. The long working distance featured by both the ZEISS RDS and the ZEISS O-INSPECT facilitates accessibility, i.e. makes even deeper lying measuring points and features detectable.

In addition to the measurement in the image, the autofocus system also permits measurements perpendicular to the camera plane. The ZEISS ViScan is particularly well suited for the measurement of parts with very small or two-dimensional geometries and/or soft materials such as sheet metal, rubber or plastic parts.

Difficult measurements can also be performed on low-contrast measuring objects such as punched components or printed circuit boards, and even on bridge-type CMMs with the RDS, using the optional, mobile backlight tables with LED illumination.



### Compatible ZEISS coordinate measuring machines with RDS:

- ZEISS ACCURA
- ZEISS CONTURA
- ZEISS O-INSPECT (fixed installation)
- ZEISS PRISMO

*The ZEISS ViScan optical probe is an outstanding tool for 2D image capture on small parts and for non-contact measurements of soft workpieces.*



## ZEISS LineScan

### Point clouds at the speed of light

The ZEISS LineScan is the tool of choice when capturing the entire surface of forms using point clouds is important – whether for a comparison with available nominal CAD data sets or for the creation of new CAD models.

The ZEISS LineScan is extremely fast: up to 700,000 points per second can be captured for high-speed digitizing. The shorter measuring times lead to a considerable increase in productivity. ZEISS CALYPSO measuring software and the automatic sensor change offered by machines featuring MASS technology also contribute to the high productivity of this sensor. The accuracy also increases thanks to the definable point grids and consolidation possibilities for intelligent point reduction.

The ZEISS LineScan optical sensor is the tool of choice, particularly for car bodies, mold/tool making, model construction and design, as well as for contact-sensitive or finely structured surfaces.



#### **Compatible ZEISS coordinate measuring machines with RDS:**

- ZEISS ACCURA
- ZEISS CONTURA
- ZEISS PRISMO

A close-up photograph of a ZEISS LineScan optical sensor. The sensor is a rectangular, light-colored device with a black base. The word "LineScan" is printed in black on the side. The ZEISS logo is visible on the top and bottom. Two yellow warning labels with black text are attached to the side. The sensor is mounted on a larger, grey industrial machine.

ZEISS

LineScan

ZEISS



*When a fast measurement of freeform workpieces for a smooth form measurement is required the LineScan optical sensor is the ideal choice.*

# ZEISS DotScan

## More light on the subject

Chromatic white light sensors enable the non-contact capture of workpiece topography. They are generally used when sensitive, reflecting or low-contrast surfaces make the use of other optical sensors more difficult.



ZEISS DotScan is particularly suitable for the capture of freeform surfaces as well as minute structures. Chromatic white light sensors, and thus the ZEISS DotScan, also are the tools of choice whenever sensitive, soft, reflecting and low-contrast surfaces present added challenges to styli or camera sensors. The ZEISS DotScan allows you to scan highly reflective surfaces such as metal parts in knee implants without having to coat them with a contrasting agent. This enables you to distinguish transparent painted surfaces from the underlying metallic layers.

The ZEISS DotScan is available in three sizes: for ten, three and one millimeter measuring ranges. During an automatic run, the sensor can be inserted for other contact or optical sensors fully automatically. With a step size of 2.5 degrees, the articulated axis of the ZEISS DotScan can be aligned perpendicular to the part surface being scanned. And because the maximum measuring angle of the ZEISS DotScan is 1 mm at +/-30 degrees, it is also possible to scan highly curved parts.

Thanks to the way the ZEISS DotScan works, a wide range of materials can easily be scanned from all sides; in conjunction with a rotary table, measuring tasks can even be completed with 4-axis scanning.

### Compatible ZEISS coordinate measuring machines with RDS and an interface optical fiber interface:

- ZEISS ACCURA
- ZEISS O-INSPECT (direct installation)
- ZEISS PRISMO



*Transparent surfaces or highly reflective surfaces such as here on a rear light are no problem for the DotScan. With the aid of the articulated axis of the RDS, the DotScan can reach all areas without difficulty.*

# ZEISS EagleEye

## Keen eyes in car body measurement

Quality assurance in car body construction is among the most complex tasks in metrology.

The ZEISS EagleEye is based on a completely new optical measuring technology that precisely meets these demands.

Automobile manufacturing requires measurements of countless bores in addition to sections or transitions. Checking boreholes is extremely time-consuming work, particularly for serial inspection. The ZEISS EagleEye leads to a time savings of almost 80% for the entire car body. Typical, labor-intensive steps in traditional measuring methods are completely eliminated: no assembly and disassembly of threaded adapters, no material, storage or handling costs.

But that is not all. The use of the ZEISS EagleEye immediately reduces throughput times and simultaneously increases the quality of parts. This results in top-quality evaluations of the results with information on the diameter, position and form of the part feature down to the micrometer.

The ZEISS EagleEye turns your measuring machine into production equipment.



**Compatible ZEISS coordinate measuring machines with CSC:**  
■ ZEISS PRO / PRO T

The ZEISS EagleEye is based on a very simple mathematical principle: triangulation. This states that all elements of a triangle can be calculated if two angles and a side of the triangle are known.



# ZEISS FalconEye

## For fast, accurate analysis

These days, the automotive industry has less and less time to develop new vehicle models. This means proven solutions have to be combined with the latest technology. With the ZEISS FalconEye, it is now possible to also use the same technology as that of the ZEISS EagleEye on stepping, articulating probe holders.

In car manufacturing, countless elements such as boreholes, sections or threaded bolts have to be measured, including the finished vehicles with their attachment parts. For start-ups of new vehicles, parts must be analyzed quickly and accurately. The requirements are very challenging and inspections are extremely time-consuming – particularly for serial inspection. The ZEISS FalconEye optical sensor system, which is modeled on the technology of the ZEISS EagleEye navigator, overcomes these challenges, as it can be additionally used on stepping, articulating probe holders.

To obtain the required measuring results quickly and easily, the sensor has to be optimally integrated into the overall system. The ZEISS RDS-CAA stepping, articulating probe holder is ideal because only a few individual positions have to be calibrated, however, all angular settings are available for the application. This enables a considerable reduction in measuring times.



Through the utilization of an additional manual rotary axis, the ZEISS FalconEye system can be positioned in three angular settings with very accurate repeatability, permitting the laser line to be aligned relative to the part. Therefore, the sensor provides users with an outstanding system to quickly and accurately complete their jobs. The new ZEISS FalconEye system has also been optimally integrated into the ZEISS CALIGO software package.



### Compatible ZEISS coordinate measuring machine with RDS:

- ZEISS CARMET



The ZEISS FalconEye is primarily used for jobs where results have to be obtained as quickly as possible. The additional rotary axis allows optimal alignment relative to the part.

# ZEISS MSR, ZEISS MSR mini, ZEISS ProMax, ZEISS ProMax light

## Changer racks in a class of their own

When different parts are measured, a variety of stylus systems are required. These are managed and changed using CNC measuring programs. This challenge can easily be mastered with a stylus rack from ZEISS.

### ZEISS MSR, ZEISS MSR mini

The ZEISS multi-sensor rack (MSR) is an intelligent and economical solution for all bridge-type measuring machines. The freely selectable sensor and stylus racks ensure a high level of flexibility, thus keeping all future system enhancements on the table for operators of ZEISS coordinate measuring machines.

#### **Benefits:**

- Flexible loading of the ZEISS MSR with all stylus and sensor racks from ZEISS
- Vertically adjustable assembly level for customized use
- Robust and sturdy design
- Standard: two rack levels, expandable to three levels

### ZEISS ProMax, ZEISS ProMax light

Ten to fifteen styli are often stored on two levels in the measuring range for the measurement of complex workpieces. A typical stylus rack thus requires up to 25 percent of the measuring range of the CMM. The travel range becomes limited as a result of the rigid stylus rack, particularly during the measurement of large workpieces for which very long styli (in the Y direction) are used. The solution: the ZEISS ProMax automatically moves the multi-sensor rack out of the measuring range when a stylus is not needed.

#### **Benefits:**

- The styli are no longer located in the collision range
- The ZEISS ProMax light can be used directly with existing measuring programs without changes
- The ZEISS ProMax light features a robust design and can be configured as easily as the standard rack
- ZEISS CALYPSO and ZEISS CMM-OS compatible



*The ZEISS MSR and the ZEISS ProMax are the tools of choice when many stylus systems are required for measurements.*



# Accessories for sensors

## The right equipment for your requirements

ZEISS stands for maximum quality. This applies just as much to our styli and accessories as it does to our measuring machines. We have many years of experience in the development, manufacture and use of our components for a wide range of tasks.

We implement this know-how in an innovative combination of materials and production techniques to provide you with outstanding benefits.

### Stylus system equipment

Our entire range of styli is designed for volume measurements and for continuous operation in production and in the measuring room.

The quality, type and dimensions of the stylus used depend on how you measure your workpiece. This allows you to fully benefit from the potential of your machine.

### ZEISS ThermoFit® Pro

The ZEISS ThermoFit® Pro kit enables you to quickly build high-quality stylus systems for use in production. The locked connections and our ZEISS ThermoFit® technology provide maximum rigidity and temperature stability. You can easily configure angles and special cubes on site.

### FixAssist® stylus setting devices

FixAssist® XXT and FixAssist® VAST stylus setting devices from ZEISS simplify the precise alignment of your styli when building a stylus system. In this way, you save on time-consuming setting operations and thus easily reduce the downtime of your coordinate measuring machines.

### Artifacts

Artifacts or test pieces are used to regularly monitor the accuracy of measuring machines. We offer calibrated, traceable artifacts and software for the standard-compliant monitoring of coordinate measuring machines, stylus systems and rotary tables. to ensure that you can reliably monitor your measuring results.

Visit our stylus and accessories web shop:  
[www.probes.zeiss.com](http://www.probes.zeiss.com)



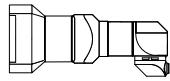


# Technical data of sensors

- CONTACT, ACTIVE SCANNING SENSORS -

	ZEISS VAST XTR gold	ZEISS VAST XT gold	ZEISS VAST gold
<b>Type</b>	Active scanning sensor	Active scanning sensor	Active scanning sensor
<b>Probing method</b>	Single-point, self-centering scanning, navigator capable	Single-point, self-centering scanning, navigator capable	Single-point, self-centering scanning, navigator capable
<b>Probing force*</b>	Continuous from 0.05 to 1 N	Continuous from 0.05 to 1 N	Continuous from 0.05 to 1 N
<b>Probe measuring range</b>	± 1 mm	± 1 mm	± 2 mm
<b>Probe deflection range</b>	x/y ± 1.6 mm z ± 1.6 mm	x/y ± 2.0 mm z ± 2.5 mm	x/y ± 2.5 mm z ± 3.0 mm
<b>Stylus changer</b> Manual change via software (electromagnetic receptacle)	CNC change in conjunction with stylus rack and control software	CNC change in conjunction with stylus rack and control software	CNC change in conjunction with stylus rack and control software; RST-T (temperature sensor) changeable via active interface
<b>Sensor extensions</b>	-	-	-
<b>Stylus weight</b>	max. 500 g	max. 500 g	max. 800 g
<b>Stylus length</b>	max. 350 mm	max. 500 mm	max. 800 mm
<b>Min. sphere diameter</b>	0.3 mm	0.3 mm	0.3 mm
<b>Working Distance</b>	-	-	-
<b>Resolution</b>	-	-	-
<b>Laser class</b>	-	-	-
<b>Line width</b>	-	-	-

## ZEISS RDS



- CONTACT, PASSIVE -  
SINGLE-POINT SENSOR

- CONTACT, PASSIVE SCANNING SENSORS -

### ZEISS XDT



### ZEISS VAST XXT TL1



### ZEISS VAST XXT TL3



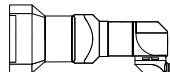
### ZEISS VAST XXT TL4



<b>Type</b>	Multi-point sensor	Passive scanning sensor	Passive scanning sensor	Passive scanning sensor
<b>Probing method</b>	Multi-point sensor	Single-point, scanning	Single-point, scanning	Single-point, scanning
<b>Probing force*</b>	-	Depending on stylus length: 0.01 – 0.13 N	Depending on stylus length: 0.01 – 0.13 N	Depending on stylus length: 0.01 – 0.13 N
<b>Probe measuring range</b>	-	max. $\pm$ 1.7 mm	max. $\pm$ 1.7 mm	max. $\pm$ 1.7 mm
<b>Probe deflection range</b>	max. $\pm$ 3 mm			
<b>Stylus changer</b> Manual change via software (electromagnetic receptacle)	CNC change in conjunction with stylus rack and control software	CNC change in conjunction with stylus rack and control software	CNC change in conjunction with stylus rack and control software	CNC change in conjunction with stylus rack and control software
<b>Sensor extensions</b>	max. 100 mm	max. 100 mm	max. 100 mm	max. 100 mm
<b>Stylus weight</b>	max. 15 g	max. 10 g	max. 15 g	max. 10 g
<b>Stylus length</b>	max. 30 – 150 mm max. 65 mm	30 – 125 mm max. 40 mm	30 – 150 mm max. 65 mm	125 – 250 mm max. 40 mm
<b>Min. sphere diameter</b>	0.3 mm	0.3 mm	0.3 mm	0.6 mm
<b>Working Distance</b>	-	-	-	-
<b>Resolution</b>	-	-	-	-
<b>Laser class</b>	-	-	-	-
<b>Line width</b>	-	-	-	-

# Technical data of sensors

## ZEISS RDS



- NON-CONTACT -  
SCANNING SENSORS

### ZEISS ViScan



### ZEISS LineScan



### ZEISS DotScan



Type	Camera sensor (with software autofocus)	Optical triangulation line sensor	Chromatic-confocal white light sensor
Probing method	Optical 2D scanning	Optical line scanning Measuring rate max. 700,000 points/s max. 1,000 lines/s	Single-point, optical scan- ning, max. 1,000 points/s
Probing force <sup>1)</sup>	-	-	-
Probe measuring range	Camera resolution: 768 pixels (horizontal) x 576 pixels (vertical) O-INSPECT: 1384 x 1032 pixels	8 / 25 / 50 / 100 mm	10 / 3 / 1 mm
Probe deflection range <sup>3)</sup>	-	-	-
Stylus changer	CNC change in conjunction with stylus rack and control software	CNC change in conjunction with stylus rack and control software	CNC change in conjunction with stylus rack and control software O-INSPECT: manual change
Sensor extensions <sup>4)</sup>	-	-	-
Stylus weight	-	-	-
Axial stylus length lateral <sup>2)</sup>	-	-	-
Min. sphere diameter	-	-	-
Working distance	75 – 90 mm depending on lens O-INSPECT: 90 mm	54 / 63 / 94 / 220	55 / 21.5 / 10.5 mm
Resolution	6.25 x 6.5 $\mu$ m pixel size O-INSPECT: 0.9 $\mu$ m x 0.9 $\mu$ m	max. 1280 points/line	60 / 36 / 28 nm
Laser class	Illumination equipment also has laser protection class	2M (no special protection measures)	-
Line width	-	10 / 25 / 50 / 80 mm	Spot size: 16 $\mu$ m / 9 $\mu$ m / 8 $\mu$ m

1) Nominal force while measuring, the force is higher at the moment of contact.

2) Please comply with geometry specifications.

3) Depending on stylus length.

4) Depending on target system, can influence measuring accuracy.

**ZEISS VAST***- CONTACT ROUGHNESS SENSOR -***ZEISS ROTOS**

<b>Type</b>	3-axis sensor mount with contact contour tracer and changeable styli with and without skids
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**Maximum travel path**

Maximum travel path (X axis)	15 mm
Max. resolution in X axis (digital)	0.5 µm
Speed	0.25 - 0.5 mm/s

**Z axis (amplitude of roughness profile)**

Measuring range (Z axis)	up to 600 µm
Max. resolution in Z axis (digital)	0.005 µm

**Accuracy**

Roughness measurable on CMM (Ra)	> 0.05 µm
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**Stylus tip**

Cone radius	2 µm 90°
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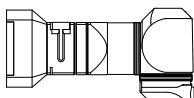
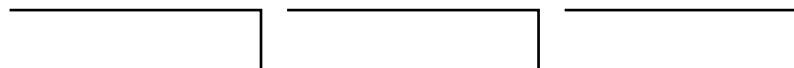
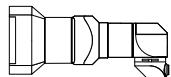
**Requirements**

Minimum height of changer	335 mm from assembly level (position of measuring plate)
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<b>Roughness parameters</b>	Rmr(c), RSm, Pt, Ra, Rq, Rp, Rv, RΔq, S, Rsk, Rmax, R3z, Rk, Rpk, Rvk, Mr1, Mr2, RPe, W, Wt, Rku, Rz, Rt, RHSC
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# Technical data of sensors for the ZEISS PRO/PRO T

ZEISS RDS or  
ZEISS CSC



- CONTACT, TOUCH-TRIG-  
GER -  
SINGLE-POINT SENSOR

ZEISS RST-P



Renishaw TP 6

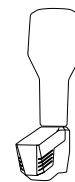


Renishaw TP 20



- OPTICAL R -  
TRIANGULATION LINE  
SENSOR

ZEISS EagleEye<sup>1)</sup>

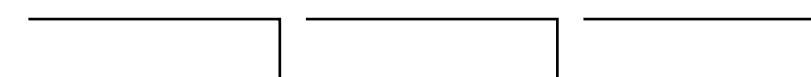
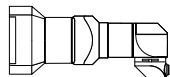


<b>Type</b>	Touch-trigger single-point sensor	3D touch-trigger probe	3D touch-trigger probe	Optical triangulation line sensor
<b>Probing method</b>	Single-point	Single-point	Single-point	Optical line scanning
<b>Probing force<sup>1)</sup></b>	-	-	-	-
<b>Probe measuring range</b>	-	-	-	+ 60 mm - 40 mm
<b>Probe deflection range<sup>3)</sup></b>	-	-	-	-
<b>Stylus changer</b>	CNC change in conjunction with stylus rack and control software	CNC change in conjunction with stylus rack and control software	CNC change in conjunction with stylus rack and control software	CNC change in conjunction with stylus rack and control software
Manual change via software (electromagnetic receptacle)				
<b>Sensor extensions<sup>4)</sup></b>	max. 300 mm	-	-	-
<b>Stylus weight</b>	max. 10 g	max. 5 g	max. 5 g	-
<b>Axial stylus length lateral<sup>2)</sup></b>	max. 90 mm	max. 50 mm	max. 50 mm	-
<b>Min. sphere diameter</b>	0.5 mm	-	-	-
<b>Working distance</b>	-	-	-	90 mm
<b>Resolution</b>	-	-	-	-
<b>Laser class</b>	-	-	-	2M (no special protection measures)
<b>Line width</b>	-	-	-	max. 103 mm min. 48 mm

<sup>1)</sup> Possible only with CSC.

# Technical data of sensors for ZEISS CARMET

## ZEISS RDS



- CONTACT, TOUCH-TRIG-  
GER -

SINGLE-POINT SENSOR

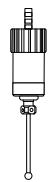
ZEISS RST-P

Renishaw TP 6

Renishaw TP 20

- OPTICAL R -  
TRIANGULATION LINE  
SENSOR

ZEISS FalconEye



Type	Touch-trigger single-point sensor	3D touch-trigger probe	3D touch-trigger probe	Optical triangulation line sensor
Probing method	Single-point	Single-point	Single-point	Optical line scanning
Probing force <sup>1)</sup>	-	-	-	-
Probe measuring range	-	-	-	+60 mm -40 mm
Probe deflection range <sup>3)</sup>	-	-	-	-
Stylus changer	CNC change in conjunction with stylus rack and control software	CNC change in conjunction with stylus rack and control software	CNC change in conjunction with stylus rack and control software	CNC change in conjunction with stylus rack and control software
Manual change via software (electromagnetic receptacle)				
Sensor extensions <sup>4)</sup>	max. 300 mm	-	-	-
Stylus weight	max. 10 g	max. 5 g	max. 5 g	-
Axial stylus length lateral <sup>2)</sup>	max. 90 mm	max. 50 mm	max. 50 mm	-
Min. sphere diameter	0.5 mm	-	-	-
Working distance	-	-	-	90 mm
Resolution	-	-	-	-
Laser class	-	-	-	2M (no special protection measures)
Line width	-	-	-	max. 103 mm min. 48 mm

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