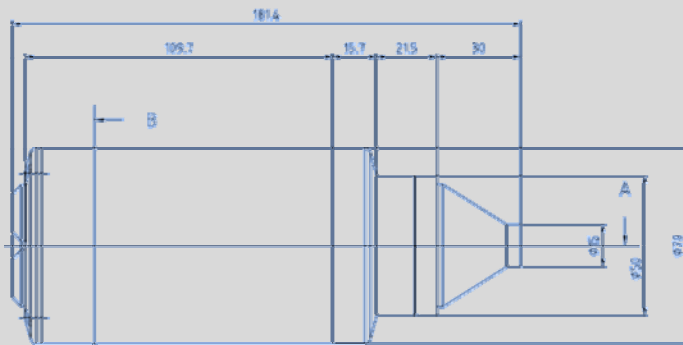


## Sensor OS 500



OS 500-32



### Contactless, robust measuring with scattered light technology

The OS 500 sensor works according to the principle of the angle-resolved scattered light method. As opposed to the traditional methods of surface measurement technology that detect roughness and form via a distance measurement, the scattered light sensor measures the surface gradient angle. Thus it is possible to measure the micro-structure (roughness) as well as the macro-structure (roundness, waviness). With the roundness and waviness measurement you get the form deviation directly in micrometers via simple calculations. For the evaluation of roughness statistical characteristic values from the angle distribution are referenced. There is a special directive for this evaluation (VDA 2009).

Due to physical laws, the angle measurement method has major advantages, because as opposed to distance measurement, it is insensitive to minor changes in distances. This offers significant advantages when measuring in harsh environments where vibration is constantly present.

## Specifications

Because the scattered light sensor measures angles, the measuring range is accordingly specified in degrees of angle. The standard OS 500-32 sensor detects an angle range of 32° and the special OS 500-16 sensor detects a range of 16°. This sensor has the advantage that the resolution on extremely smooth surfaces is higher and the measurement distance in particular is significantly greater than it is with the standard sensor.

The standard measuring spot size ( $\varnothing$ ) is 0.9 mm for the 32° sensor, and 1.8 mm for the 16° sensor. Sensors with smaller measuring spot diameters (to 0.03 mm) are available for measuring objects with significantly curved surfaces (small shafts, spheres). The OS 500 Duo sensor is a special design with switchable measuring spot (0.9 mm/0.03 mm). The area of implementation is simultaneous measurement of roughness and waviness with shaft lengths (to 0.06 mm).

Resolution limits and the repeatability of a measurement at specified tolerance values are important for every measurement device. Here the great strengths of the scattered light sensor are really brought to bear. A perfectly polished silicon surface serves as the comparison standard. The finest roughness that can still be differentiated is  $R_a \approx 1$  nm and a straightness measurement at  $< 0.03 \mu\text{m}$  at 50 mm length. Repeat measurements result in a cg value  $> 1.33$ .

For use in the form measurement or in machines the sensor has a hardware trigger input. The sensor is resistant to spray water and to the vibrations that are usual in production.

For measuring points that are difficult to access, (tooth flanks, bores) various optics adapters are available.

A system controller (PC) is required to operate the sensor. A standard PC or a laptop can handle the task. OptoSurf offers a compact, fanless industrial PC.

Measuring principle	angle-resolved scattered light (ARS) method
Measured value - roughness	Aq, variance of the scattered light distribution (VDA 2009)
Measured value - form	macro angle M (conversion in $\mu\text{m}$ )
Measuring range - roughness	1.6 < Aq < 100 (approx.: $0.05 \mu\text{m} < R_z < 3 \mu\text{m}$ transverse) (approx.: $3 \mu\text{m} < R_z < 30 \mu\text{m}$ longitudinal)
Measuring range - form (32°)	+/- 5.7° form angle range
Measuring range - form (16°)	+/- 2.8° form angle range
Measuring rate	max. 2,000 measurements/s
Measuring spot $\varnothing$ (32°)	0.9 mm, 0.3 mm, 0.03 mm
Measuring spot $\varnothing$ (16°)	1.8 mm, 0.6 mm, 0.06 mm
Measuring distance (32°)	5 mm standard (to 25 mm special)
Measuring distance (16°)	50 mm standard (to 90 mm special)
Dimensions, weight (32°)	length: 182 mm, $\varnothing$ : 70 mm, G: 0.75 kg
Dimensions, weight (16°)	length: 224 mm, $\varnothing$ : 70 mm, G: 0.9 kg
Connections	power supply (110-220V), USB, Trigger (5-24V)
Degree of protection	IP 65

## System controller SC - PI

Type	compact industrial PC (fanless)
Dimensions	200 x 300 x 100 (W x D x H mm)
Hardware, software	Intel Dual Core processor, 160 GB HD operating system: Windows XP Prof.
Monitor, keyboard	17" standard TFT with touch pad
Alternatively	All in One Touch Panel PC

## Optics adapter (details on request)

for bores

for tooth flanks

for narrow points

## Sensor holders (details on request)

Simple holder with cross-piece (6 levels of freedom)

Magnetic stand for flexible mounting in machines

Precision holder with rotary sensor device