

KEYENCE

NEW 2-Axis Optical Micrometer
LS-9006D / LS-9030D



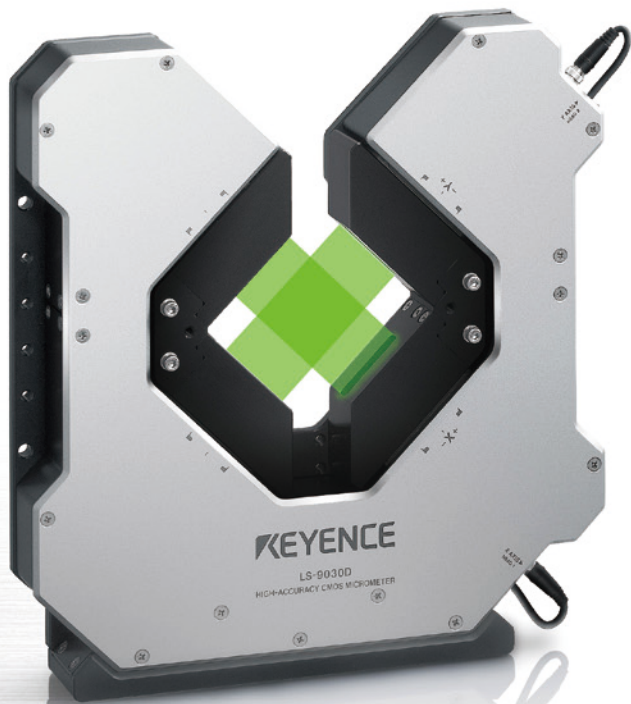
2-AXIS OPTICAL MICROMETER

THE SOLUTION FOR HIGH DURABILITY & LOW MAINTENANCE

LS-9000 Series

THE 2-AXIS OPTICAL MICROMETER

LOWER INSTALLATION COSTS AND ALMOST NO MAINTENANCE



STANDARD MODEL

| | |
|----------------------------|------------------------------------|
| Model | LS-9030D |
| Measurable target | ø0.3 mm to ø30 mm ø0.01" to ø1.18" |
| Smallest detectable object | 0.3 mm 0.01" |
| Measurement accuracy | ±2 µm ±0.08 Mil |
| Repeatability | ±0.1 µm ±0.04 Mil |
| Sampling cycle | 16000 samples/sec. |

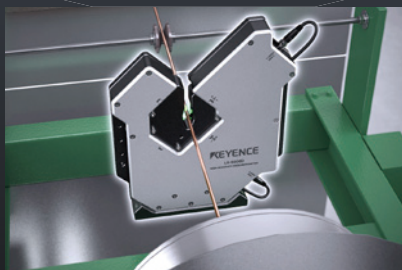


SMALL DIAMETER MODEL

| | |
|----------------------------|-------------------------------------|
| Model | LS-9006D |
| Measurable target | ø0.04 mm to ø6 mm ø0.001" to ø0.24" |
| Smallest detectable object | 0.04 mm 0.001" |
| Measurement accuracy | ±0.5 µm ±0.02 Mil |
| Repeatability | ±0.03 µm ±0.012 Mil |
| Sampling cycle | 16000 samples/sec. |

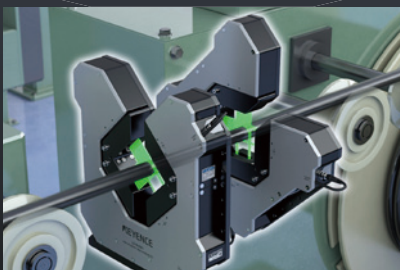
TYPICAL APPLICATIONS

Measurement of the outer diameter of fine wire



The average outer diameter and center position of wire can be measured with a high accuracy of ±0.5 µm ±0.02 Mil.

Outer diameter lump and neck down detection at ultra high speed



With the fastest sampling rate in its class of 16000 samples/sec., this micrometer can simultaneously perform both outer diameter measurement and lump and neck down detection at a pitch of around 1 mm 0.04" on a target traveling down the line at a speed of 1000 m/min. 3280.8'/min.

Outer diameter measurement in harsh environments



With the new revolutionary measurement principle and standard air purge units, accurate measurements are possible in harsh environments.

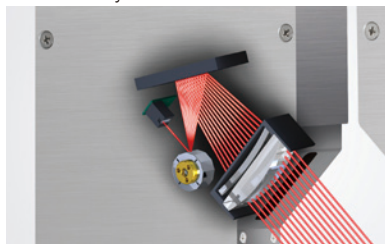
THE SENSOR WITHOUT ANY MOVING PARTS ACHIEVES HIGH DURABILITY AND LOW MAINTENANCE

The design includes no moving parts and an LED light source rendering constant calibration due to motor wear and laser degradation unnecessary. The rugged structure and built in air purge units provide stable measurement and inspection for extended periods of time.

Advantage over conventional systems

By eliminating the polygon mirror and motor, both of which are subject to severe wear during normal operation, a structure without any moving parts is achieved. This significantly reduces the maintenance cost.

Conventional system



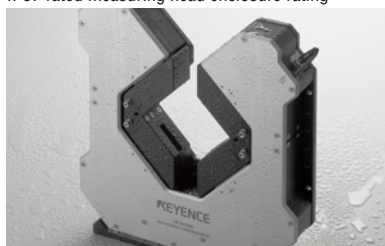
LS-9000



Environmental resistance

Equipped with the IP67 rated enclosure and the air purge unit as standard, the LS-9000 Series ensures safe, long-term use in varied environments.

IP67 rated measuring head enclosure rating



Detachable air purge unit



OUTER DIAMETER, CENTER POSITION, LUMP & NECK DOWN DETECTION CAN BE PROVIDED WITH A SINGLE SYSTEM

The fastest-in-class high-speed sampling at a rate of 16000 samples/sec. and the combination of the delay function and OUT calculation function make it possible for "outer diameter measurement" and "lump and neck down detection" to be performed on a single system, reducing initial and running costs. In the past, each of these required its own system.

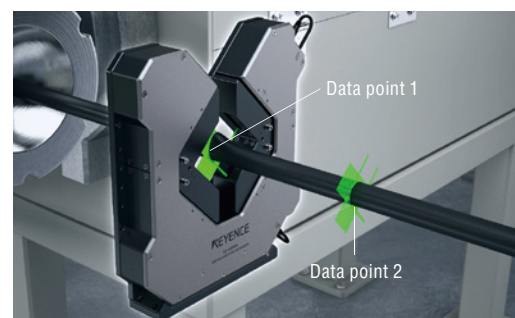
Detection algorithm

The LS-9006D/LS-9030D calculates and displays the difference in measured values between two data points on the moving target: data point 1 that is currently being measured and data point 2 that was previously measured.

(*Delay function + OUT calculation function)

The small gradual variations in outer diameter can be ignored to detect emergent surface defects only.

[Emergent surface defects = Data point 1 – Data point 2]

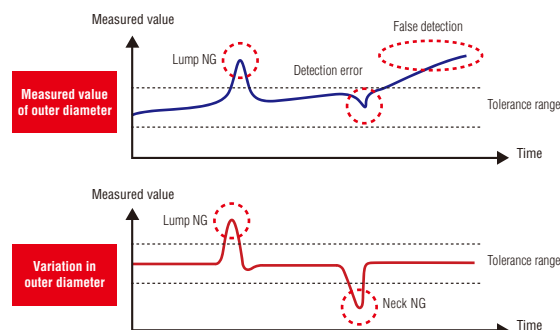


Lump and Neck Down detection algorithm

Many times the outer diameter can grow or shrink over time making Lump and Neck Down detection difficult. The LS-9000 Series eliminates this problem by filtering out gradual changes in measurement while measuring the defects.

Example of detection at a line speed of 1000 m/min. 3280.8'/min.

1000 m/min. 3280.8'/min. ÷ 16000 samples/sec. x 1 sampling = 1.04 mm 0.04"
Surface defects can be detected at a minimum pitch of around 1 mm 0.04".



SPECIFICATIONS

| Model | LS-9006D | LS-9030D |
|---------------------------------|--|--|
| Measurement range | ø0.04 mm to ø6 mm $\pm 0.001''$ to $\pm 0.24''$ | ø0.3 mm to ø30 mm $\pm 0.01''$ to $\pm 1.18''$ |
| Smallest detectable object | 0.04 mm $0.001''$ | 0.3 mm $0.01''$ |
| Repeatability | $\pm 0.03 \mu\text{m} \pm 0.0012 \text{ Mil}^{*1}$ | $\pm 0.1 \mu\text{m} \pm 0.004 \text{ Mil}^{*2}$ |
| Measurement accuracy | $\pm 0.5 \mu\text{m} \pm 0.02 \text{ Mil}^{*3}$ | $\pm 2 \mu\text{m} \pm 0.08 \text{ Mil}^{*4}$ |
| Sampling cycle ^{*5} | 16000 samples/sec. | |
| Light source | InGaN green LED | |
| Monitor camera | Not provided | |
| Environmental resistance | Ambient temperature | 0 to +50°C 32 to 122°F |
| | Relative humidity | 20 to 85% RH (no condensation) |
| | Ambient light | Incandescent lamp/fluorescent lamp 3000 lux or lower |
| | Vibration resistance | 10 to 55 Hz, double amplitude 1.5 mm $0.06''$, 2 hours in each direction (X,Y, and Z) |
| Measuring head enclosure rating | IP67 (including connector) | |
| Material | Aluminum | |
| Weight | Approx. 4.8 kg | Approx. 9 kg |

*1 $\pm 2\sigma$ is the value when the outer diameter of a rod of ø1.0 mm $\pm 0.04''$ is measured at the center of the measuring area while the number of averaging measurements is set to 2048.

*2 $\pm 2\sigma$ is the value when the outer diameter of a rod of ø10 mm $\pm 0.39''$ is measured at the center of the measuring area while the number of averaging measurements is set to 2048.

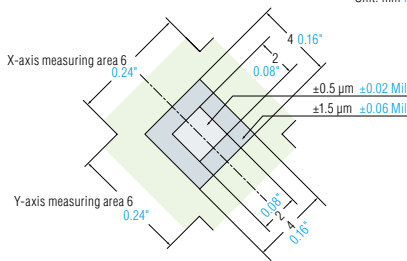
*3 The error when a moving rod of ø1.0 mm $\pm 0.04''$ is measured within the measuring area.

*4 The error when a moving rod of ø10 mm $\pm 0.39''$ is measured within the measuring area.

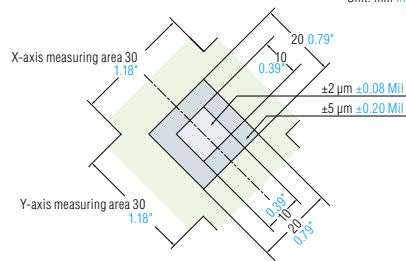
*5 The sampling cycle is changed by the number of OUT set, and by the use of the mutual interference prevention function.

MEASURING AREA & ACCURACY

LS-9006D Unit: mm inch

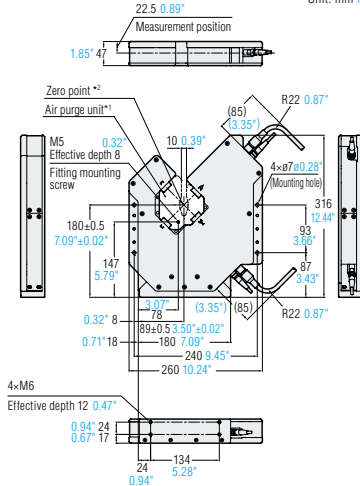


LS-9030D Unit: mm inch

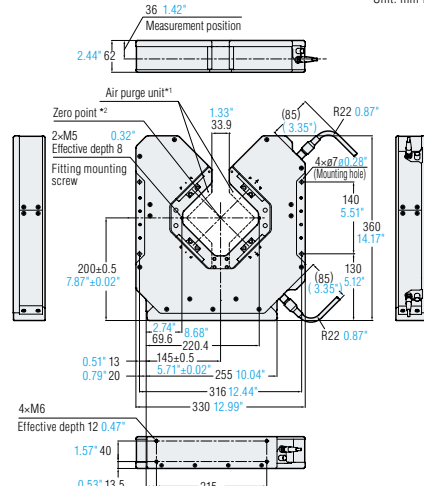


DIMENSIONS

LS-9006D Unit: mm inch



LS-9030D Unit: mm inch



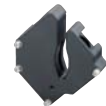
*1 With air purge unit attached.

*2 The zero point represents the intersection of the optical axis center of X-axis head and that of the Y-axis head.

OPTIONS



Replacement air purge unit
OP-87751
(For LS-9030D)



Replacement air purge unit
OP-87752
(For LS-9006D)



Target positioning jig
OP-87749
(For LS-9030D)



Target positioning jig
OP-87750
(For LS-9006D)



Display panel bracket
OP-87757

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SAFETY INFORMATION

Please read the instruction manual carefully in order to safely operate any KEYENCE product.

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