



High accuracy non-contact sensor 3D metrology system HN-C3030

High accuracy non-contact sensor
3D metrology system

HN-C3030



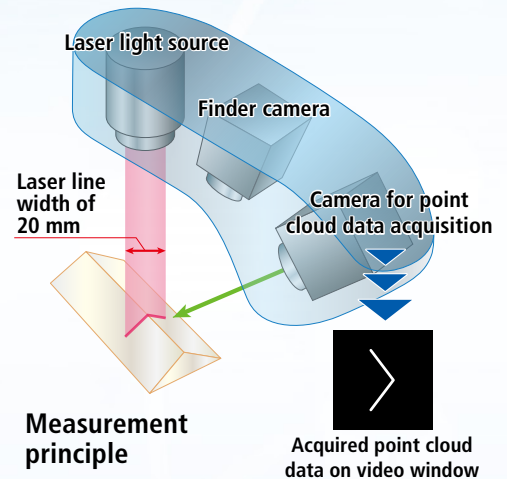
The HN-C3030 opens up a new world of high-speed, high-precision, non-contact 3D metrology

- Non-contact shape measurement with a laser scanner acquires volume data overwhelmingly faster than a contact-type system.
- Reduces the time required for the analysis of shape, waviness, wear, deformity, and minute convexo-concave surfaces.
- Can measure heavy components weighing up to 30 kg.
- The new laser scanner has a 98.6 mm working distance, enabling scanning of highly uneven surfaces while avoiding collisions.
- Can be used outside temperature-controlled rooms, such as at production sites, when connected to an optional thermal regulator.
- Optional dedicated software for gear analysis enables teaching files to be easily made from gear dimensions and mounting position.

Easy-to-use high-precision laser scanner

As a long-established manufacturer of high-quality optical instruments, Nikon has taken a fresh look at non-contact-sensor optical systems. In order to achieve non-contact measurement with an unprecedentedly high degree of precision, Nikon has developed special optics, such as newly designed cylindrical lenses for laser scanner light emitters and an image-side telecentric optical system to capture high-precision images.

Improvements include the employment of a bright optical system that enables detection of glossy or dark surfaces without manual preparations, such as powder spraying. The system has a built-in finder-camera for identifying scanning areas during measurement programming.



High-precision five-axis automatic control

The HN-C3030 automatically controls a high-precision three-axis (XYZ) drive system (MPE_E 1.6 + 4L/1000 μm (L=measured length(mm))/JIS B 7440-2:2003), as well as an unlimited angular rotary stage with a rigid driving mechanism and a laser scanner swing arm with an arc angle of -20° to +135°. This enables laser scanning of wide areas covering top and side surfaces, and even bottom surfaces, of parts.

In addition, the direction of the laser scanner can be changed (-180° to +180° rotatable), allowing scans of various shapes from optimum angles.

Optional chucks are also available to suit the various sizes and shapes of parts.



Multi-angle laser scanner



Rotary stage



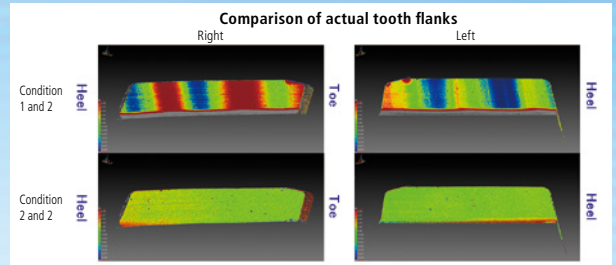
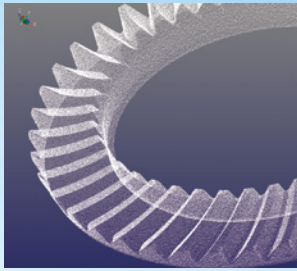
Chuck (option)



Rotatable laser scanner arm

High-speed high-density acquisition of shape point cloud data

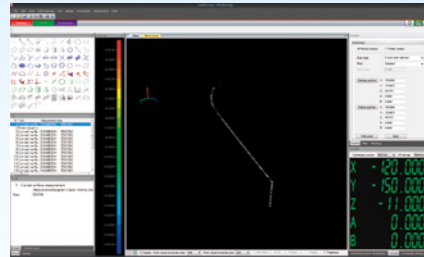
High-speed digital transform processing enables surface point clouds to be acquired at the rate of 120,000 points per second. For example, inspection of all tooth surfaces on a single automotive bevel gear can be completed in only 5 minutes. High-density acquisition of in-line point clouds with a point pitch of 20 μm enables not only analysis of shapes but also of surface waviness.



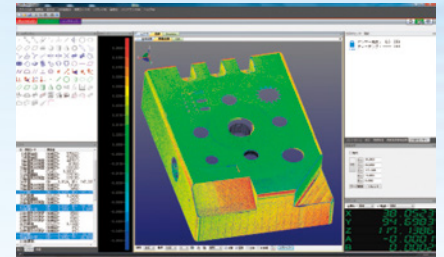
* Images above show tooth flank variation under different processing conditions.

Main software

The main software for the HN-C3030 comes with analysis tools for optimum laser scanning of various sizes, shapes and surface conditions. There is also a tool for picking up required point cloud data from all acquired point cloud data, as well as codes for geometric shape measurements and coordinate setting. These meet a variety of user demands, including the overlay comparison of measured data and dimensional data output. Shape data comparison with 3D CAD is also possible.



Control window

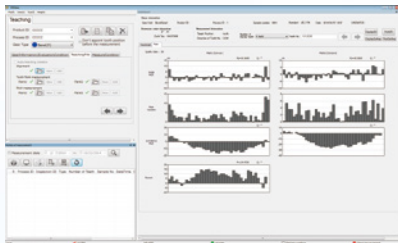


3D CAD comparison (option)

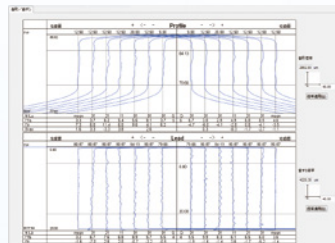
HN Gear application — Gear evaluation system (option)

Once the direction of the laser scanner is set, and gear dimensions and the height at which the gear is attached to the chuck have been input, the laser scanner automatically moves to the appropriate position to establish reference axes and scan the gear tooth. This allows measurement teaching files to be easily made. Tooth profile error and lead error can be displayed after measurement in the same format as with conventional contact gear measuring systems. Applicable workpieces: hypoid gears, bevel gears, helical gears, spur gears, worm gears (option) and internal gears.

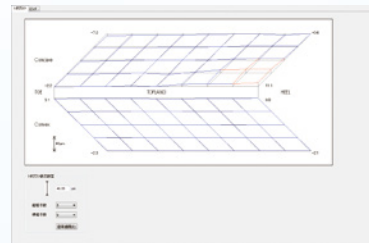
* Dedicated gear evaluation software for hob cutters is also available (option).



Main window



Profile error/lead error indication



Topographic indication

Applications

Various gears, including hypoid gears, bevel gears, helical gears, spur gears, internal gears, splines, turbocharger wings, oil seals, etc. Suitable for analysis and measurement of complex 3D shapes, and for measurement of temporal change and deformation values of before/after usage of the same part.



Hypoid gear



Bevel gear



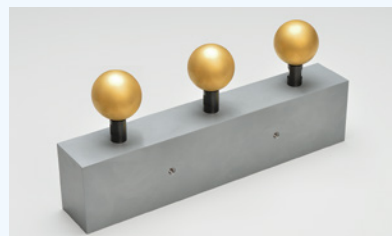
Helical gear



Compressor wheel for automobile turbo charger

Calibration system

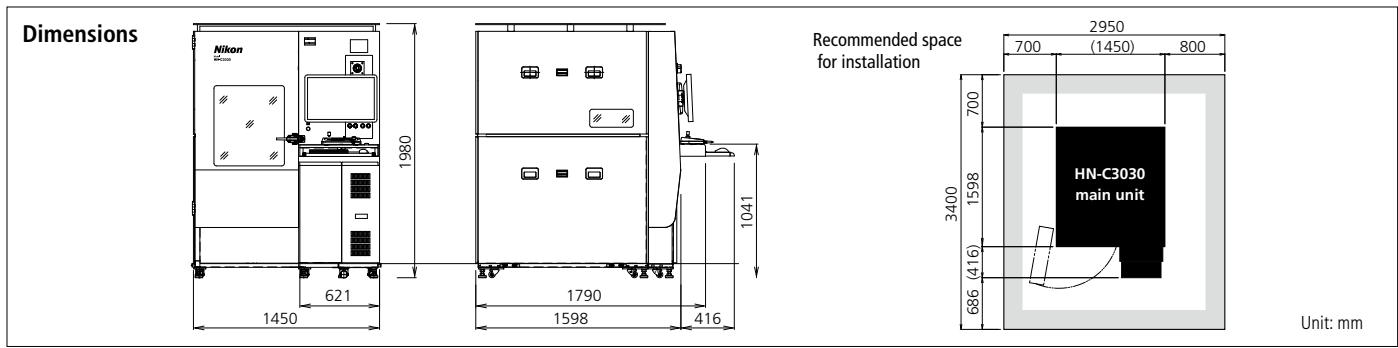
The HN-C3030 complies with the JIS B 7441 (2009) standard. The HN-C3030 uses a ball bar, a standard calibration device for non-contact metrology systems (JIS B 7441 (2009)) that has been calibrated by the National Institute of Advanced Industrial Science and Technology. This guarantees traceability to public and international agencies that require non-contact measurements of the highest precision.



Ball bar



Standard calibration device



Specifications

Max. part size	ø300 x (H) 300 mm*	
Max. part weight for guaranteed accuracy	30 kg (including fixture)	
Effective measurement range (X x Y x Z)	310 x 320 x 400 mm	
Laser scanner	Working distance	98.6 mm (from center of measurement range)
	Measurement distance	20 mm
	Height detection range	±10 mm
	Linear resolution	20 µm
Safety standards	Laser class	Class 1
	Device	EU low voltage directive, EU EMC directive, EU machinery directive
Host computer	OS	Windows [®] 64 bit
	Interface	USB2.0 x 1, IEEE1394b x 1
Dimensions (W x D x H)	1,450 x 1,598 (+416) x 1,980mm	
Weight	1,290kg	
Power	For main unit	Single phase AC200V ±10%, 50/60Hz ±3.5%, 5A
	For PC	Single phase AC100-240V ±10%, 50/60Hz ±3.5%, 15A
Installation requirements	Space (W x D x H)	2,950 x 3,400 x 2,100 mm (including space for operation and maintenance)
	Temperature	20°C ±0.5K, with thermal regulator (option): 15 - 30°C
	Humidity	≤ 70% RH (without condensing)
	Permissible floor vibration	Up to 10 Hz: ≤ 3 µm P-P, 10-200 Hz – with speed of acceleration: ≤ 0.012m/s ² (With active vibration isolation table) Up to 10 Hz: ≤ 10 µm P-P, 10-200 Hz – with speed of acceleration: ≤ 0.04m/s ²
Dust protection	Degree of protection: IP00 (JISC60034-5) (interior, dust protection required)	

* Space for shaft (ø61 x H187 mm extended downward from chuck fixture level) for measurement of shaft-mounted gears

* The HN-C3030 is calibrated to comply with the JIS B 7441 (2009) standard.

Bevel gear image and helical gear image courtesy of Kyouiku Gear Mfg Co., Ltd.

	WARNING
TO ENSURE CORRECT USAGE, READ THE CORRESPONDING MANUALS CAREFULLY BEFORE USING YOUR EQUIPMENT.	

Specifications and equipment are subject to change without any notice or obligation on the part of the manufacturer. March 2016 ©2016 NIKON CORPORATION

CLASS 1 LASER PRODUCT



ISO 9001 Certified
for NIKON CORPORATION
Microscope Solutions Business Unit
Industrial Metrology Business Unit

ISO 14001 Certified
for NIKON CORPORATION



NIKON METROLOGY NV
Geldenaaksebaan 329
B-3001 Leuven, Belgium
phone: +32 16 74 01 00 fax: +32 16 74 01 03
Sales.NM@nikon.com

NIKON METROLOGY EUROPE NV
tel. +32 16 74 01 01
Sales.Europe.NM@nikon.com

NIKON METROLOGY GMBH
tel. +49 6023 91733-0
Sales.Germany.NM@nikon.com

NIKON METROLOGY SARL
tel. +33 1 60 86 09 76
Sales.France.NM@nikon.com

NIKON METROLOGY, INC.
tel. +1 810 2204360
Sales.US.NM@nikon.com

NIKON METROLOGY UK LTD.
tel. +44 1332 811349
Sales.UK.NM@nikon.com

NIKON CORPORATION
Shinagawa Intercity Tower C, 2-15-3, Konan,
Minato-ku, Tokyo 108-6290 Japan
phone: +81-3-6433-3701 fax: +81-3-6433-3784
www.nikon-instruments.jp/eng/

NIKON INSTRUMENTS (SHANGHAI) CO. LTD.
tel. +86 21 5836 0050
tel. +86 10 5869 2255 (Beijing office)
tel. +86 20 3882 0550 (Guangzhou office)

NIKON SINGAPORE PTE. LTD.
tel. +65 6559 3618
nsg.industrial-sales@nikon.com

NIKON MALAYSIA SDN. BHD.
tel. +60 3 7809 3609

NIKON INSTRUMENTS KOREA CO. LTD.
tel. +82 2 2186 8400



More offices and resellers at www.nikonmetrology.com