

HEIDENHAIN



KNL 4000

Control your machine's kinematic behavior

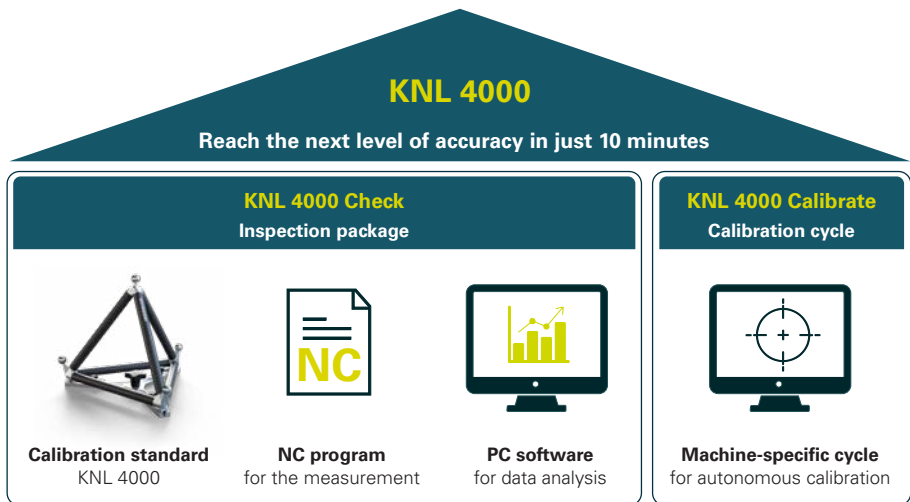
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Higher accuracy in less time

Reach the next level of accuracy in just 10 minutes!

Optimal part quality and reliable process stability start with a highly accurate machine tool. With the new Kinematics Normal Linear 4000, machine operators can quickly and easily improve the positioning accuracy and squareness of their machine tool's linear axes through regular inspection and calibration.

- KNL 4000 Check machine inspection package
 - Kinematics Normal Linear available in sizes matched to your machine
 - NC program for the measurement sequence
 - PC software for data analysis
- KNL 4000 Calibrate: The machine-specific calibration cycle

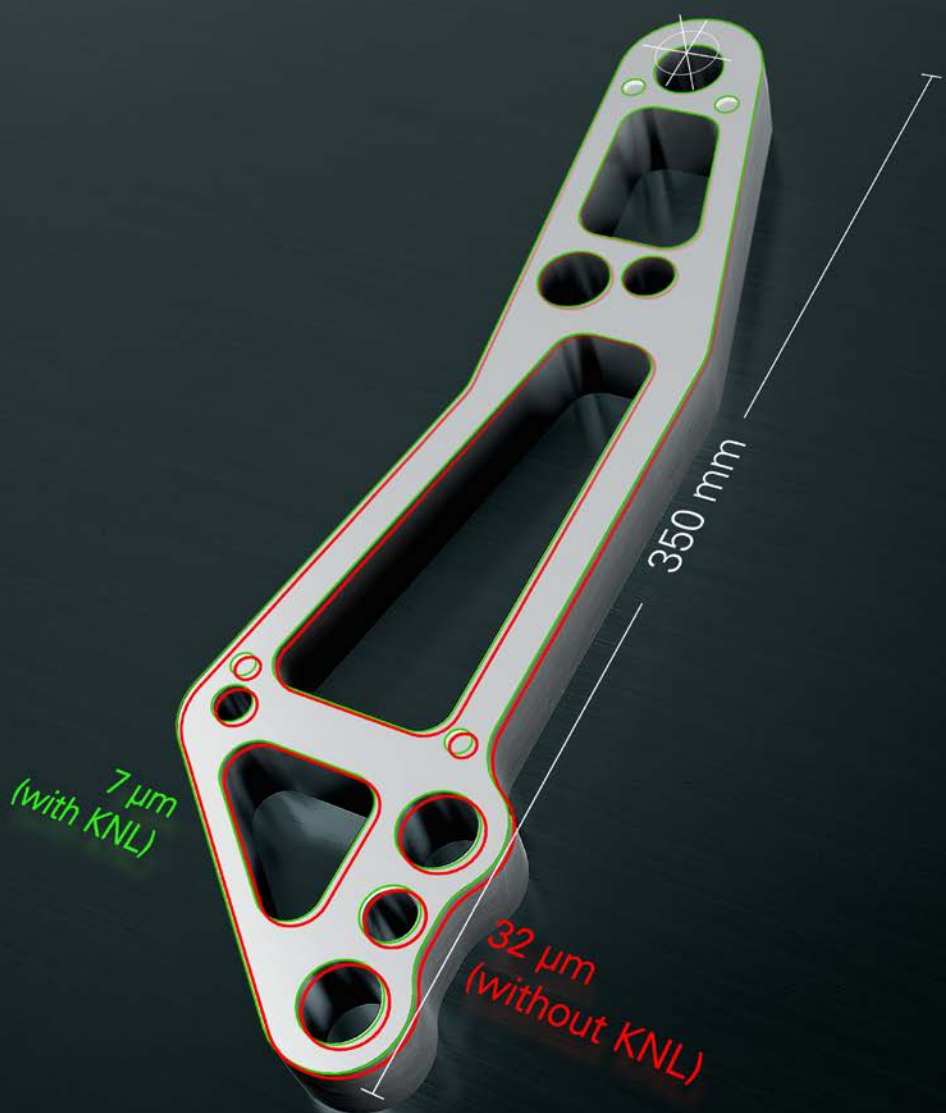


Your benefits

- Determine machine accuracy in just 10 minutes and reduce inspection time by over 95% compared to conventional methods
- Use KNL 4000 Check and KNL 4000 Calibrate yourself, without a service visit from the machine manufacturer
- Significantly improve machining accuracy, for example from IT8 to IT5

Typical use cases

- High requirements for machining accuracy
- Varying production conditions
- Fast and easy inspection after collisions



Measure and inspect linear axes

The KNL 4000 Kinematics Normal Linear

Your benefits

- Quick and easy installation in the machine
- Mechanically and thermally stable CFRP design
- Developed specifically for machine tools
- Available in three sizes for machines with axis travels from 350 mm to 1200 mm

It's that simple!

- Secure the mounting fixture (six-point support) to the machine table with a single screw
- Attach the KNL 4000 standard to the mounting fixture



Evaluate your machine

Rapid evaluation with the KNL 4000 Check machine inspection package

By probing the spheres at the four corners of the tetrahedron, you can independently determine your machine's accuracy and obtain reliable information about its current condition as well as its suitability for upcoming machining tasks.

Your benefits

- Inspect the machine accuracy in only 10 minutes
- Analyze the accuracy after a collision or before demanding machining operations
- Determine the squareness deviations and positioning errors of the linear axes
- Perform the verification yourself, without a separate commissioning service
- Monitor the machine's capabilities over the long term

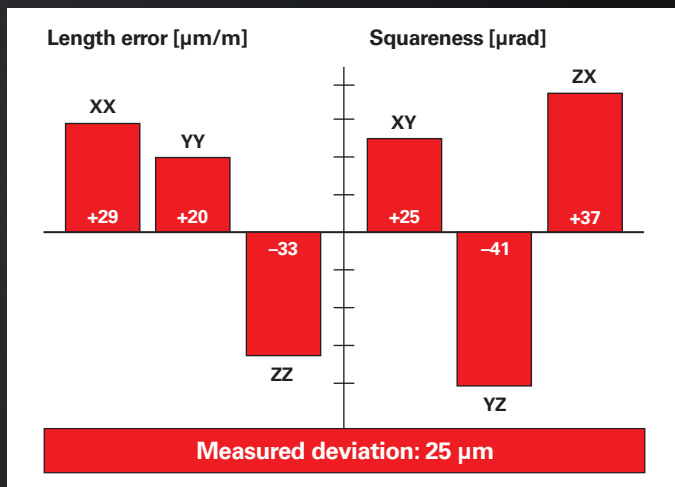
It's that simple!

- Insert the touch probe
- Position the touch probe above the first sphere
- Start the measurement sequence with NC Start

What's included with the KNL 4000 Check machine inspection package?

- KNL 4000 Kinematics Normal Linear
- NC program for the measurement sequence using a HEIDENHAIN touch probe
- PC software for data analysis

Data analysis results



Reach the next level of accuracy

Compensate errors with KNL 4000 Calibrate

The PC software included in the KNL 4000 Check machine inspection package provides a preview of the achievable improvement in machining accuracy. With KNL 4000 Calibrate, you can fully utilize your machine's potential.

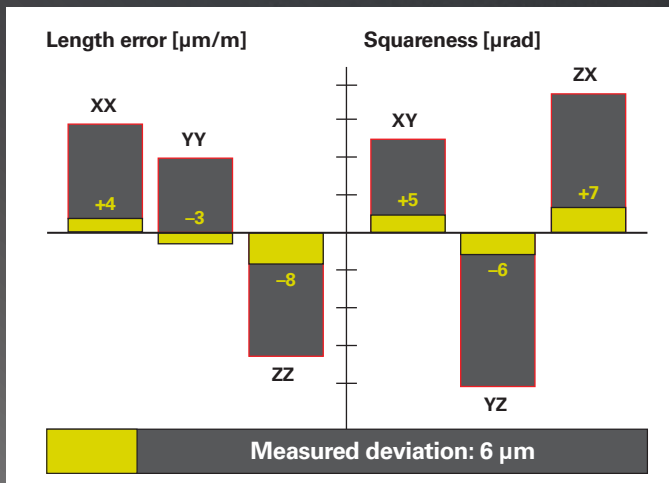
Your benefits

- Directly convert the measurement results from KNL 4000 Check into calibration data
- Adapt the results to material and temperature conditions
- Maintain control of machine kinematics yourself, without requiring a service visit
- Significantly improve machining accuracy, for example from IT8 to as high as IT5

What's included with KNL 4000 Calibrate?

- Machine-specific calibration cycle for the TNC control
- Initial setup by the HEIDENHAIN Technical Academy

Results after calibration



Probe faster and more accurately

TS 760 workpiece touch probe

For probing the KNL 4000 tetrahedron and achieving optimal measurement results, we recommend the highly accurate TS 760.

- Highest probing accuracy: $\pm 1 \mu\text{m}$
- Greatest probing reproducibility: $2 \sigma \leq 0.25 \mu\text{m}$
- Probing speed: up to 1 m/min
- Minimal probing forces
- Dust-proof and water-resistant
- Radio or infrared signal transmission



KNL 4000 Check and KNL 4000 Calibrate

Control your machine's kinematic behavior

Simple:	Mount the tetrahedron and measure it
Fast:	Inspect the machine accuracy in 10 minutes
Independent:	Inspect and calibrate without a service visit
Tailored:	Machine-specific calibration cycle
Reliable:	Processes can be automated

HEIDENHAIN

DR. JOHANNES HEIDENHAIN GmbH

Dr.-Johannes-Heidenhain-Straße 5

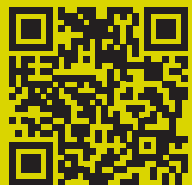
83301 Traunreut, Germany

☎ +49 8669 31-0

[FAX] +49 8669 32-5061

info@heidenhain.de

www.heidenhain.com



HEIDENHAIN
worldwide