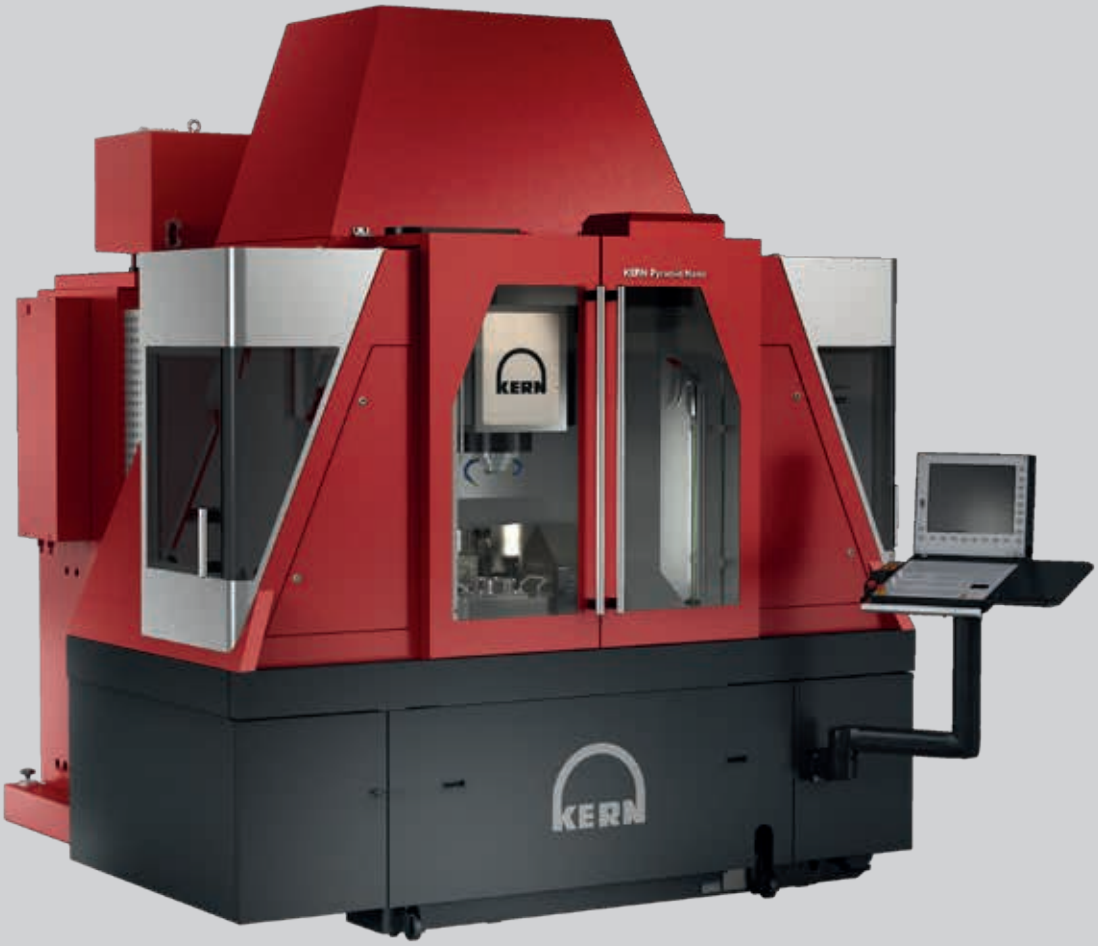
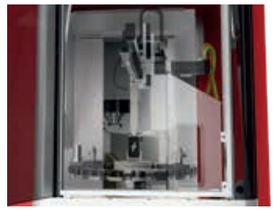


Perfection in every dimension

KERN Pyramid Nano

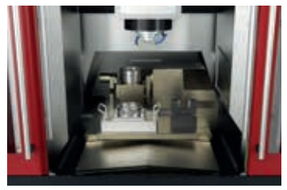
Maximum surface quality and nano precision



Workpiece changing area
internal / external

Tool magazine
HSK 25 / HSK 40

Working area 3/5-axis



Chip disposal

KERN Pyramid Nano

Maximum precision for µ-precise series production

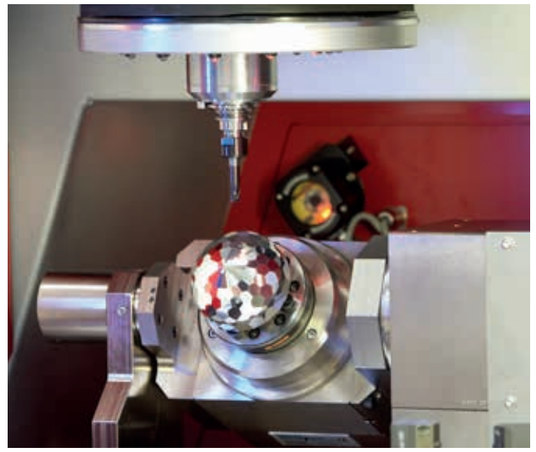
The Kern Pyramid Nano is designed for applications that demand the highest precision and surface quality as well as high cutting performance.

At the heart of the machine are the axes, which are mounted on hydrostatic bearings and therefore promise virtually wear-free precision throughout its lifetime. In addition, the hydrostatic system enables high acceleration with excellent vibration damping, bringing productivity and precision into perfect harmony. In combination with Kern's proprietary temperature management system, an optimally configured machine system is guaranteed at all times.

This uncompromising alignment makes the Kern Pyramid Nano one of the most precise CNC machining centres in the world — which is why it is widely used for the most demanding tasks both in industrial applications as well as research and development. The optional jig grinding package allows efficient milling and grinding in a single clamping, making the Kern Pyramid Nano an incredibly productive milling and grinding solution.

AT A GLANCE

- Hydrostatic guides and drives
- Intelligent temperature management
- Highest productivity and precision
- Wear-free precision throughout its lifetime
- Optimised for specific applications
- Automation and productivity
- Jig grinding
- Multi-shift operation without operators



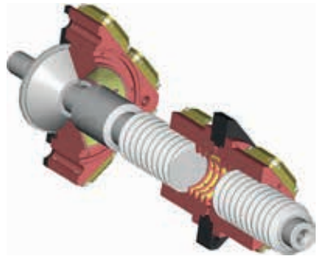
The **KERN** Pyramid Nano pushes the limits of feasibility and guarantees highest precision in a stable serial production - for the entire life of the machine

Hydrostatics

Hydrostatically driven X, Y and Z axes enable the Kern Pyramid Nano to achieve highest precision and best surface quality. In addition, the hydrostatic screw drive combines high accelerations with excellent vibration damping.

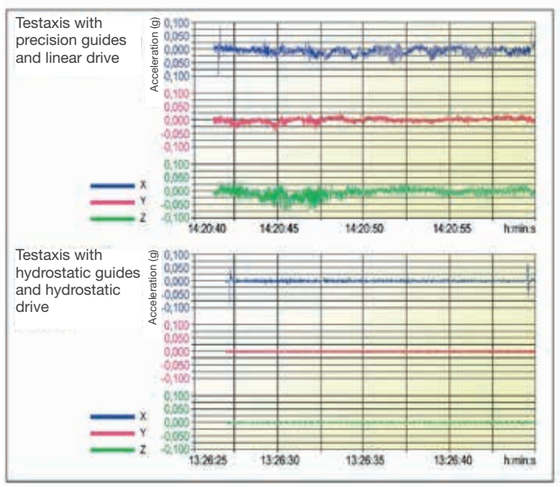
ADVANTAGES AT A GLANCE

- Highest surface quality through hydrostatic damping
- Smallest travel increment is 0.1 µm
- Wear-free guides and drives
- Friction-free movement - no slip stick
- Impervious to high cutting forces
- High dynamic stiffness
- Circulating, cooled hydraulic oil keeps the axes, axes-drives and machine frame thermally stable.
- The rigid but highly dynamic Z-axis construction does not require counter balancing
- All servo motors are located outside the axes - minimizing the thermal influence

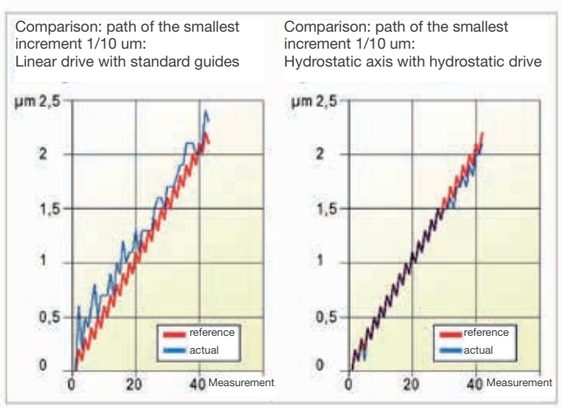


Hydrostatic screw drive

Hydrostatic axes



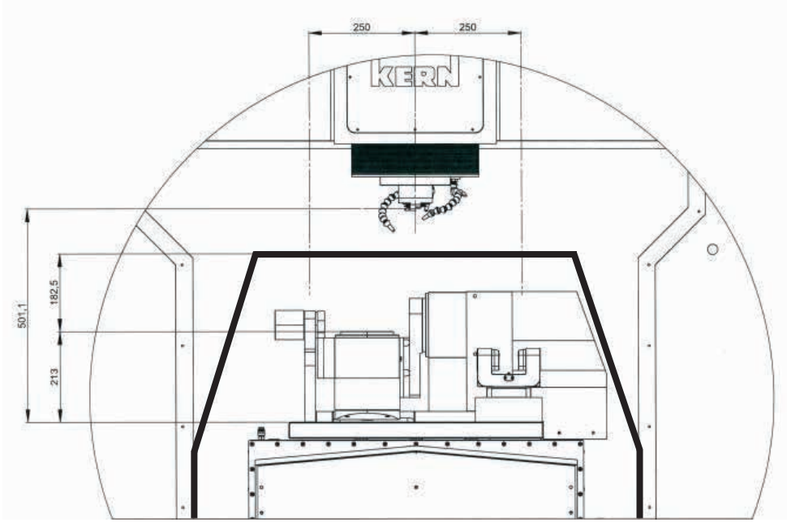
Comparison: Running smoothness of axis /damping



Comparison: Step accuracy

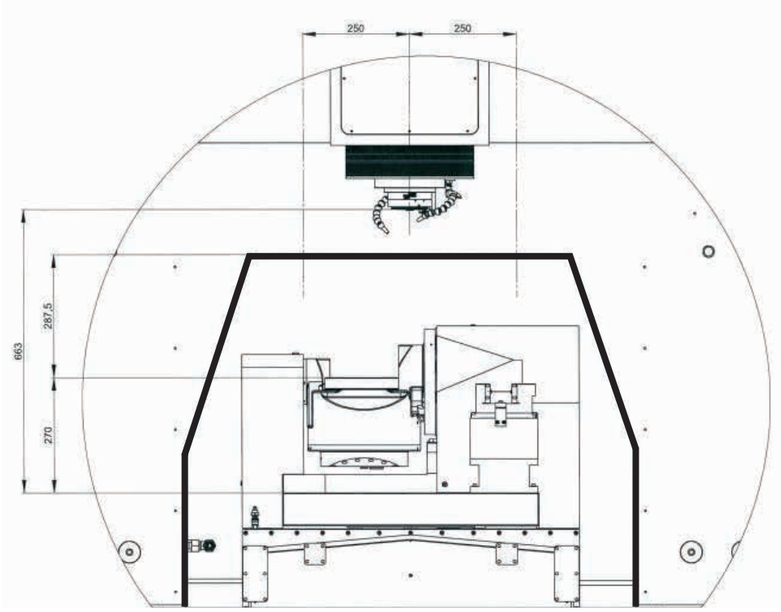
Optional 4th/5th axis

To meet your requirements best, there are two different options of the 4th/5th axis. The two options provide different torques, workpiece weights, and workpiece dimensions.



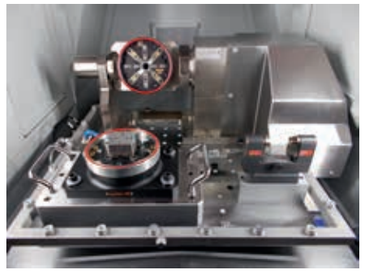
VERSION PYRAMID NANO

- Torque rotary axis: 24 Nm
- Torque swivel axis: 50 Nm
- Workpiece weight: max. 20 kg/44 lbs
- Work envelope: Clearance height max. 395,50 mm/15,7 inch



VERSION PYTON

- Torque rotary axis: 55 Nm
- Torque swivel axis: 120 Nm
- Workpiece weight: max. 50 kg/110 lbs
- Work envelope: Clearance height max. 554,50 mm/22 inch

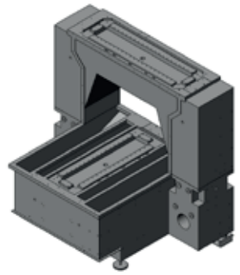


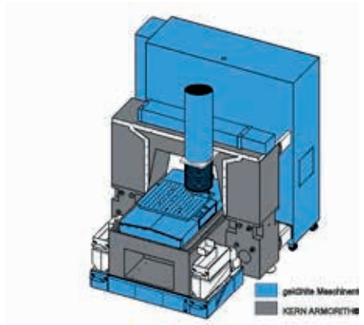
MASTER OF METAMORPHOSIS

With the configurable work area, the Kern Pyramid Nano can be operated in both 3-axis and 5-axis mode. There is also the option of using the working chamber in a combined 3 and 5-axis configuration.

MACHINE CASTING MADE OUT OF KERN ARMORITH®

The base cast of the Kern Pyramid Nano is constructed in a symmetrical portal design. This design combines rigidity and thermosymmetrical stability. The material KERN ARMORITH® provides exceptional damping and has very high tensile and shear strengths.



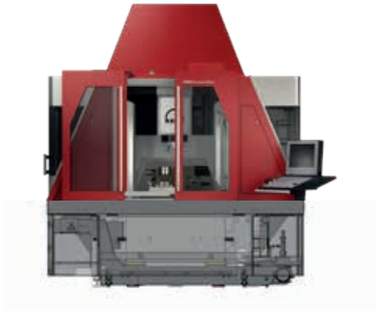


KERN TEMPERATURE MANAGEMENT

With the temperature management developed by Kern, the machine achieves exceptional thermal stability. Five separate cooling circuits keep structural components on temperature. This is the prerequisite for highest accuracy and repeatability on the workpiece.

JIG GRINDING PACKAGE

With the fully integrated jig grinding package, the Kern Pyramid Nano is capable in a large range of applications. The Heidenhain jig grinding cycles are user-friendly integrated in the machine control.

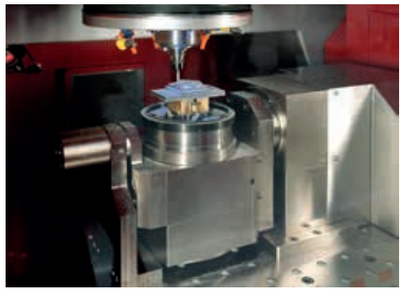


SAVING SPACE

Additional options such as oil mist collector, flood cooling unit or chip conveyor and fire suppression system can be integrated without requiring additional space. Also, the optional paper band filter is closely connected to save space.

FULLY AUTOMATED

In addition to the integrated tool changer, the Kern Pyramid Nano also includes the option for an integrated workpiece changer. With this configuration the machine can run unattended for hours on end. External workpiece changers can easily be connected. The working chamber, tool and workpiece changer are fully accessible at all times.



REMOVABLE 4th/5th AXIS

Turntable with temperature-controlled torque drive. Two different options are available, which can be adapted to the machine table. This means that the machine can also be operated without a turntable for 3 axis operations with a clamping surface of up to 600 x 600 mm.

SUITABLE FOR ANY APPLICATION

With a wide range of options, equipment and accessories, the Kern Pyramid Nano provides the perfect solution for your requirements and applications. The best possible performance for your production is guaranteed.

COOLANT THROUGH SPINDLE

Optional design for using tools with internal coolant supply.
Available only with HSK 40 spindle.

Soruce: Walter AG

PAPER BAND FILTER AND CHIP CONVEYOR

Integrated chip conveyor with ejection to the rear.
Connected to the external belt filter system,
with low pressure. Optionally with high pressure for
ICS. Tank capacity: 490 l (108 gallons).

WORKPIECE CHANGER

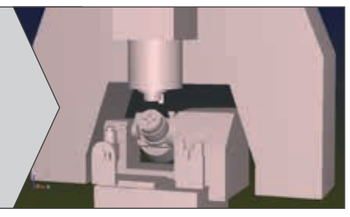
Integrated workpiece changer for up to 20 work pieces allows unmanned operation without additional space requirements. The Kern Pyramid Nano can also be equipped with all common external workpiece changers.

TELESERVICE AND SMART SERVICE

Remote diagnostic with online access for a fast analysis by the Kern service department and process optimization of the Kern Pyramid Nano.
Real-time analysis via "Kern Smart Service" app by tablet or smartphone of the Kern Service

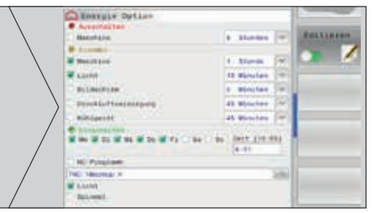
DYNAMIC COLLISION MONITORING (DCM)

Software for real-time collision monitoring of the workspace components (rotary and swivel table, laser, clamping device, spindle and tool holder) in manual and automatic operation.



POWER PACK

To optimize the overall energy consumption as well as to increase the productivity and to ensure maximum availability of the machine.

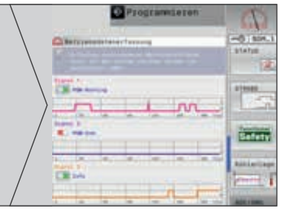


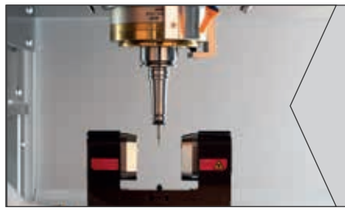
SPINDLE OPTIONS

Different spindle options make the ideal configuration for individual applications possible. High-frequency spindles for roughing and superior finishes, as well as ultra-precise air-bearing spindles for optical quality surface finishing are available.

BDE INTERFACE

Individual monitoring of machine and operating data for control and evaluation in the customer's own system (Industry 4.0).



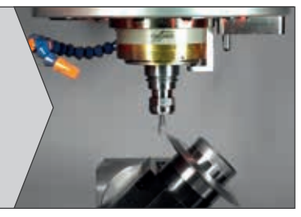


BLUM LASER LC50

Laser measuring system with DIGILOG technology.
For tool presetting as well as breakage and wear control.
Also suitable for smallest tool diameters.
Including calibration mandrel with tool holder.

JIG GRINDING PACKAGE

Fully integrated jig grinding package with dressing spindle, fluid and acoustic emission sensor. Heidenhain jig grinding cycles integrated user-friendly into the machine control



Technical Details

Linear axes
Travel X/Y/Z: 500/500/400 mm
Max. clamping surface: 600 x 600 mm
Max. workpiece weight: 250 kg (3-achsig)
Feed rate: 25 m/min
Acceleration: up to 10 m/s²

Rotary and swivel axes
(Version Pyramid Nano)
Rotary axis: 360° infinite
Swivel axis: +20° up to -110°
Rotary axis: Torque 24 Nm
Swivel axis: Torque 50 Nm
Max. workpiece weight: 20 kg/44 lbs

Rotary and swivel axes
(Version Pyton)
Rotary axis: 360° infinite
Swivel axis: +20° up to -110°
Rotary axis: Torque 55 Nm
Swivel axis: Torque 120 Nm
Max. workpiece weight: 50 kg/110 lbs

Spindle options
HSK 25: 50.000 min^{-1} 6,4 kW (S1) Roller bearing
HSK 25: 80.000 min^{-1} 5,5 kW (S1) Air bearing
HSK 40: 42.000 min^{-1} 11 kW (S1) Roller bearing

Accuracies (VDI/DGQ 3441)
Positioning accuracy P: ≤ 1,5 µm
Repeatability P_S: ≤ 1 µm
Accuracies (ISO 230-4)
Circular deviation GYX: ≤ 2,5 µm
Circular deviation GXY: ≤ 2,5 µm

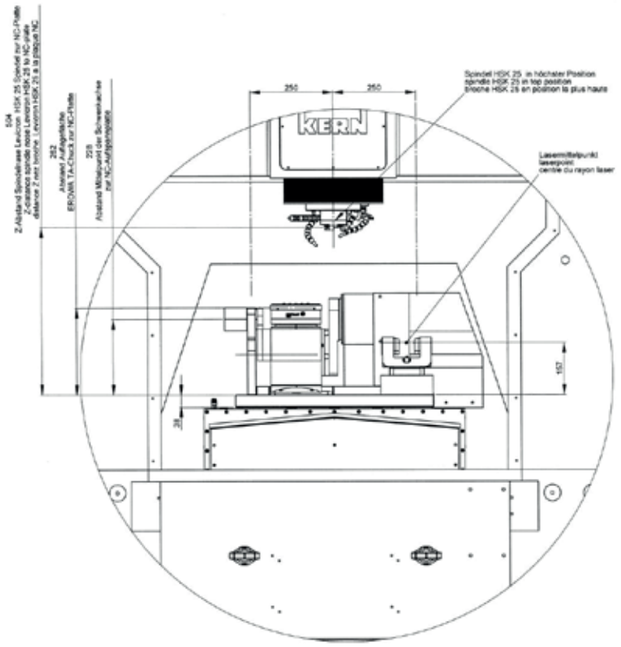
Workpiece changer
Integrated workpiece changing system
(20 positions) or external system

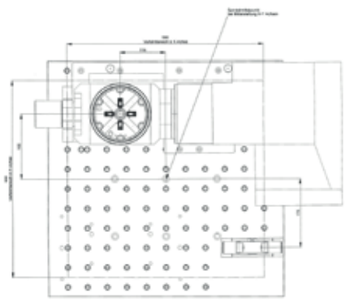
Tool changer
HSK 25: 32-, 64- and 96 pockets
HSK 40: 25-, 50- and 75 pockets
Max. tool diameter: 60 mm
Max. tool length: 160 mm

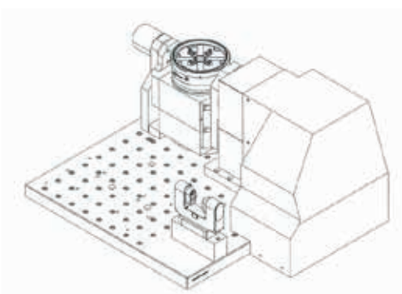
Technology
Central cooling management with 5 circuits
Hydrostatic axes
Portal construction
5-axis simultaneous machining
Heidenhain control TNC 640

Dimension and Weight
Weight: ca. 8.000 kg
Min. space required W/D/H: : 2,76 x 2,90 x 3,15 m

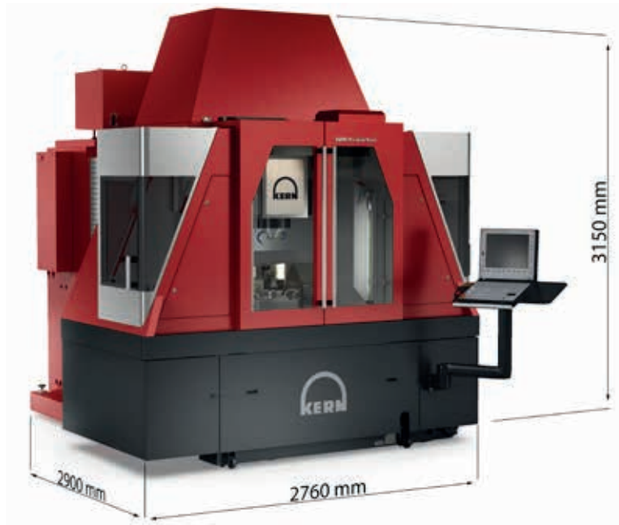
Published 01/2021
Technical details may change

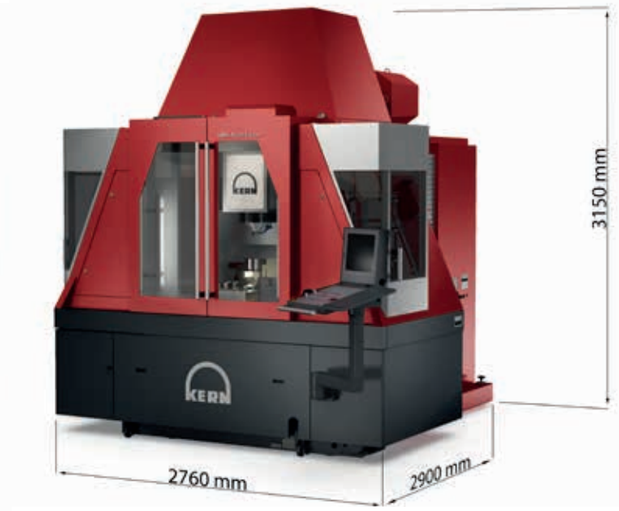


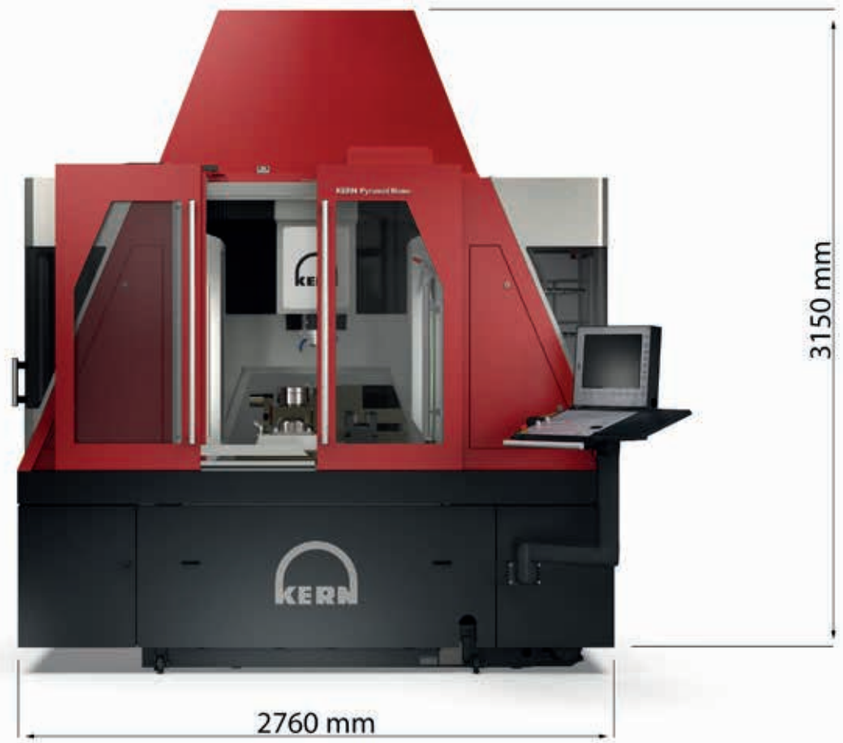




Dimensions







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