TTB

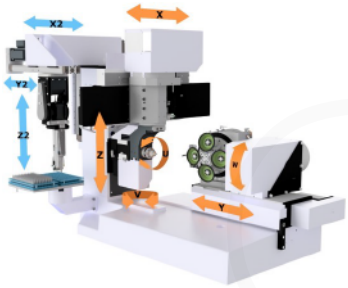
SWISS PRECISION

TTB GEAR

GRINDING MACHINE FOR GEAR CUTTING TOOLS

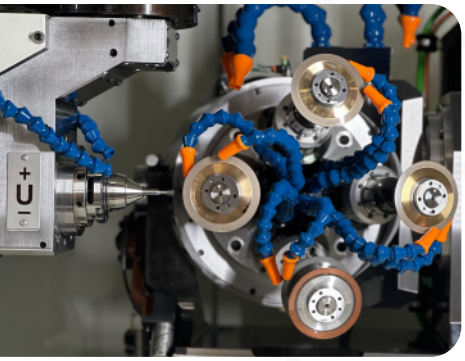
PRECISION ICON

The 6-axis TTB **GEAR** tool grinding machine has been developed for the precise sharpening of gear cutting tool such as hobs, shaper cutters, and power skiving tools with modules from 0.02 to 1 in AAA class. Grinding is carried out through profiling using software for calculating logarithmic



Unique Kinematics

TTB's exclusive kinematics are its hallmark. Thanks to its innovative technology, it ensures exceptional isolation from external vibrations. In addition, the unique axis movements guarantee extremely precise and repeatable positioning.



Revolver

The innovative revolver, with 4 positions, allows both perfect wheel alignment with a positioning repeatability of less than 0.3 µ m and an ultra- fast wheel change in just 2 seconds!

PRECISION

PRODUCTIVITY

Continuous Production

The production of gear cutting tools with small modules and tolerances in the order of a few microns often involves very long cycle times. The TTB GEAR is capable of producing such delicate tools continuously, even for entire days, without the need for corrective interventions by the operator and even without constant supervision. This minimizes machine downtime to the greatest extent.

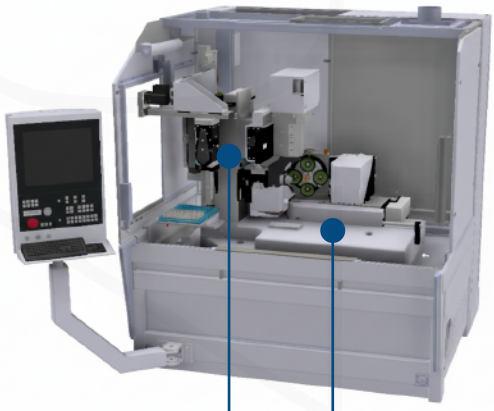
TOTAL CONTROL

relief angles. The innovative thermal management system, which leverages targeted use of cutting oil and 8 temperature temperature sensors, ensures exceptional stability even during very long production cycles. This machine is ideal for industries requiring the highest precision, such as watchmaking, robotics, and micromechanics.

Thermal Stability
Outstanding thermal stability thanks to the use of cutting oil for cooling the machine structure and the integration of dedicated thermal sensors.

Mechanical Stability
The adoption of low-wear mechanical solutions ensures process stability and a machine lifespan that extends over decades.

STABILITY

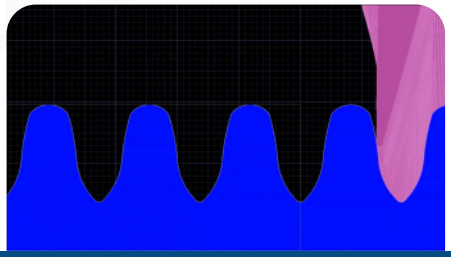


The cutting oil flows inside the machine base, keeping the internal temperature constant.

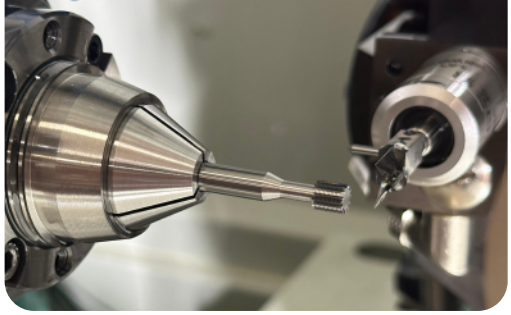
FLEXIBILITY

Various Clamping Methods
It is possible to produce hobs, shaper cutters, and power skiving tools by clamping them directly in collets. However, they can also be manufactured using the tailstock and clamped between centers, achieving exceptional concentricity.

Pointed or Form Grinding Wheels
Depending on the requirements, the teeth can be ground with pointed wheels for profiling, using the exclusive TTB software, or with shaped grinding wheels.

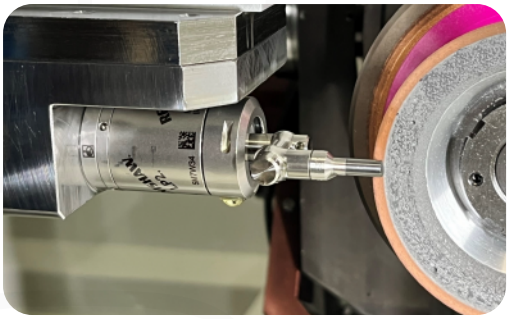


CONTINUOUS MONITORING



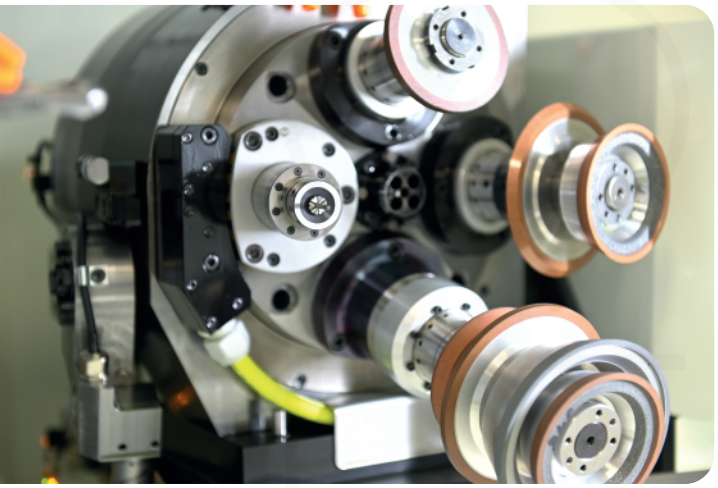
WORKPIECE PROBE

High-precision probing of the workpiece, allowing the exact determination of the tool position in space. Repeatability is guaranteed up to 1 µm.



WHEEL PROBE

Monitoring of grinding wheel wear via precision probe, with auto-calibration to ensure maximum measurement accuracy. Wheel probing can also be performed during the machining cycle.



GRINDING WHEEL SPINDLES

HSK 32 SPINDLES

Permanently lubricated spindles, available in long and short versions for optimal adaptation to any production requirement. Each spindle can hold up to three wheels.

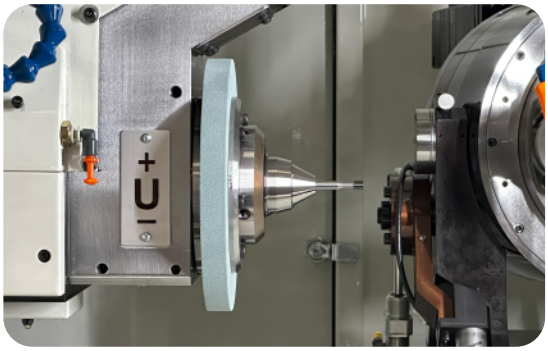
HIGH-FREQUENCY SPINDLES

High-frequency spindle, up to 150'000 rpm for special machining operations. HF spindle installation and setup are simple and fast. Up to 4 high-frequency spindles can be mounted simultaneously.

DRESSING OF GRINDING WHEELS

DRESSING WHEEL

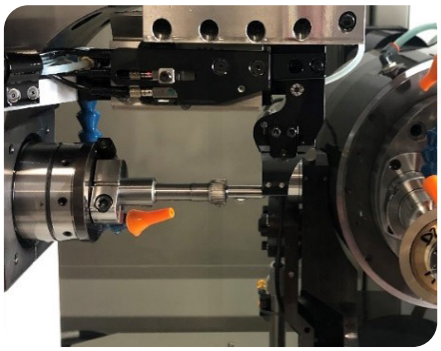
In-process wheel dressing to compensate for wear and ensure machine autonomy even for very large series. Dressing wheel mounted behind the tool. Dressing frequency can be programmed according to grinding requirements.



TOOL CLAMPING

ELASTIC COLLETS

Cylindrical shank clamping with elastic collets; Morse taper clamping types 1, 2, 3, and 4. Collet clamping is ideal for “fly” grinding of the gear tool, meaning without tailstock support.



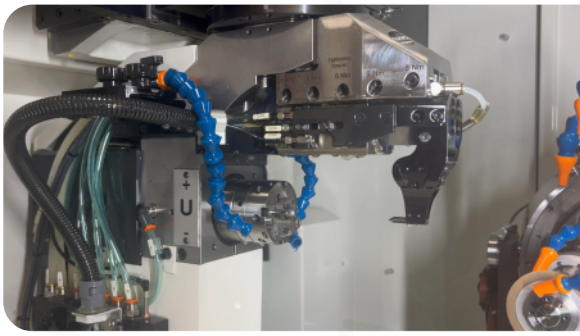
BETWEEN CENTERS

When high concentricity is required, the workpiece can be clamped directly between centers and moved using a drive dog with the aid of the tailstock.

TOOL SUPPORT

TAILSTOCK

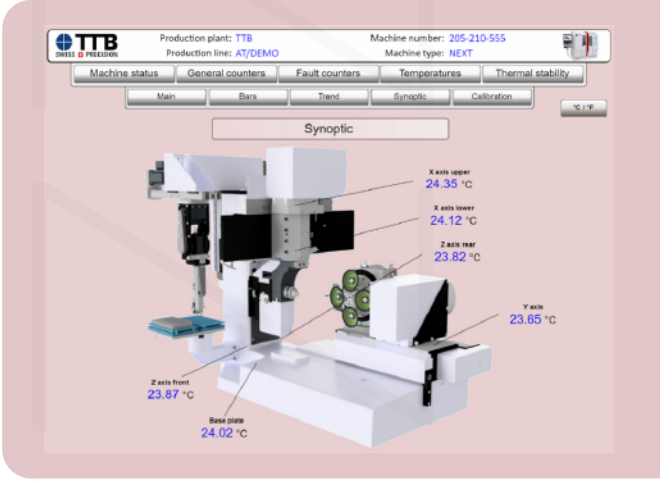
Tailstock designed for optimal support of the workpiece during grinding, ideal for long components. Ensures concentricity below 1 µm, providing precision and stability. Available with various inserts, also customizable according to specific requirements.
Simple and quick mounting and setup.
Fully compatible with automatic loading.



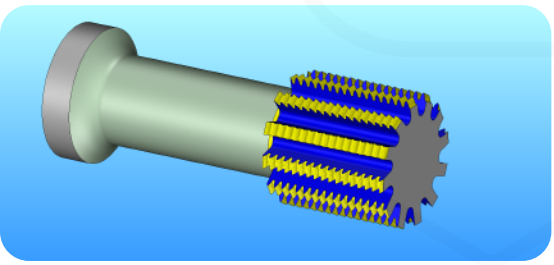
TEMPERATURE SENSORS

8 THERMAL SENSORS

Thanks to 8 thermal sensors positioned at key points of the machine, the TTB GEAR constantly monitors its temperature. This system allows immediate detection of any deviation from optimal values, enabling prompt intervention to restore the machine’s ideal temperature.

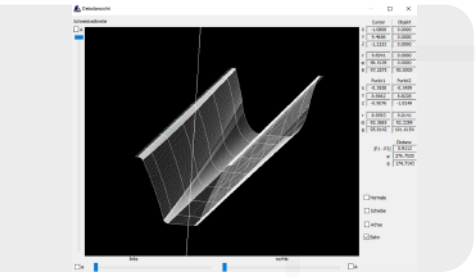


SOFTWARE



NUMROTO®

Cutting-edge programming software, intuitive and easy to use. Equipped with 3D simulation and an integrated collision control system, it allows rapid program changes while ensuring precision, safety, and productivity.
Thanks to the NUMroto® module, developed exclusively for TTB, which enables 6-axis interpolation, it is possible to grind gear cutting tools with profiling.

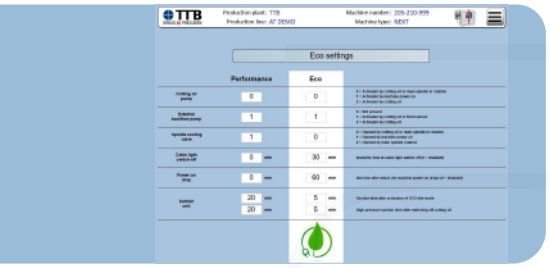


SCG

The SCG software, developed in-house by the Saacke group, precisely calculates the tooth profile of gear cutting tools, ensuring optimal grinding for power skiving and shaper cutters.

TTB DASHBOARD

Data export interface compliant with Industry 4.0 standards; dedicated hour counters for each component enable effective preventive maintenance management. An intuitive dashboard, also accessible from smartphones, provides real-time monitoring.



ENERGY SAVING

The Eco function significantly reduces the machine's power consumption while still ensuring maximum performance during machining. Cycle optimization and intelligent resource management are fully integrated.

COMPLETE SUPPORT

Our commitment does not end with the delivery of the machine: we offer a 360° after-sales service designed to ensure continuity, efficiency, and maximum performance for your TTB machines.

- Support for productivity improvement
- Minimization of machine downtime
- Production continuity

FAST AND EFFICIENT INTERVENTIONS

Carried out by our specialized technicians.

REMOTE ASSISTANCE

For maintenance and programming support.

DEDICATED SPARE PARTS WAREHOUSE

For fast and guaranteed supply.

MAINTENANCE AND PREVENTIVE INSPECTION PACKAGES

To prevent problems and machine downtime.

VIDEO TUTORIALS

With instructions for repairs and part replacements.

SERVICE PACK

Box containing wear parts such as filters and relays.

TTB GEAR
GRINDING MACHINE FOR GEAR CUTTING TOOLS

TECHNICAL DATA

Linear Axis Travel		**Rotary Axis Travel**	
X Axis	290 mm	V Axis	270 °
Y Axis	250 mm	U Axis	∞
Z Axis	155 mm	W Axis	± 16°

Axis Feed Rates	
X, Y, Z Axes	3 m/min
V Axis – Orientation	36'000 °/min
U Axis – Orientation	72'000 °/min
U Axis – Rotation	0 - 1'500 rpm
Axis Resolution	
Linear Axes X, Y, Z	0,0001 mm
Rotary Axes U, V	0,0001 °

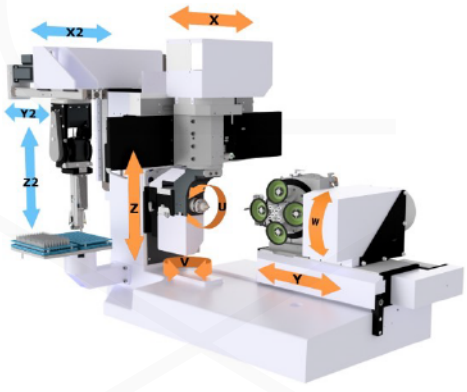
Measurement System	
Linear Axes X, Y, Z Resolution	0,01 µm
Rotary Axis V Resolution	± 2"
Rotary Axis U Resolution	± 20"
Rotary Axis W Resolution	± 2"

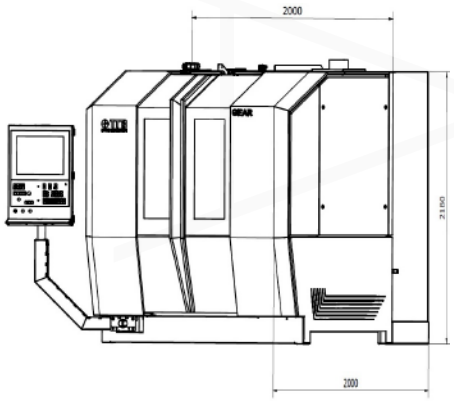
Revolver and Grinding Wheel Spindles	
Number of grinding wheel spindles (HSK C32)	4
Spindle drive power (Pn-S1)	10,0 kW
Max spindle speed	12'000 rpm
Number of wheels per spindle	1 - 3
Wheel revolver positioning	2 sec.

Workpiece Clamping	
Cylindrical clamping device	Tailstock W25, W20, 215 Hydraulic clamping
Conical clamping device	Cono Morse 1, 2, 3 e 4
Clamping diameter in collet	1 – 25,4 mm
Clamping length in collet	Up to 250 mm
Clamping length between centers	Up to 155 mm

Application	
Module	0,02 – 1
New production and regrinding diameters	Ø 6,00 – 40,00 mm
New production and regrinding lengths • Hobs • Shaper cutter and power skiving	 • 3,00 - 50,00 mm • Up to 20,00 mm

CNC Control	**NUM**
Dimensions *(see figure below)*	**2'000 x 2'000 x 2'180 mm**
Approx. Weight	**3'950 kg**





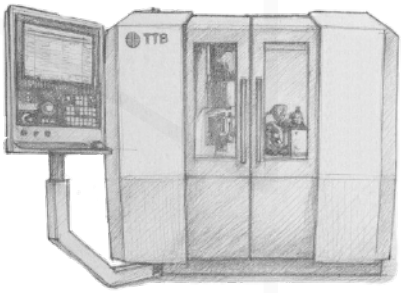
THE WORLD TTB

SWISS PRECISION

TTB GEAR
FOR GEAR CUTTING TOOLS

TTB NEXT
FOR ROTARY CUTTING TOOLS

TTB EDGE
FOR INSERTS



ONE OFF
FOR SPECIAL APPLICATIONS

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