

## S 400 GT

Continuous Generating, Profile and Shave Grinding Machine

# S 400 GT

## Flexibility and productivity

The flexible S 400 GT grinding machine has been designed for the following operations using conventional dressable ceramic, ultra-abrasive and electroplated tools:

- continuous generating grinding of external spur and helical gears with grinding worms.
- profile grinding of external spur and helical gears and similar parts.
- shave grinding of external spur and helical gears.

All standard modifications of lead and profile can be generated. This means the user can always choose the most appropriate technology for each job and can also combine different kinds of roughing and finishing technology in the best possible way for a given job.

Due to its extremely high rotational and longitudinal acceleration and resulting absolute speed values, the machine will realise unbeatable, low cycle times and has vast potential to cope with future generations of grinding tool abrasives.



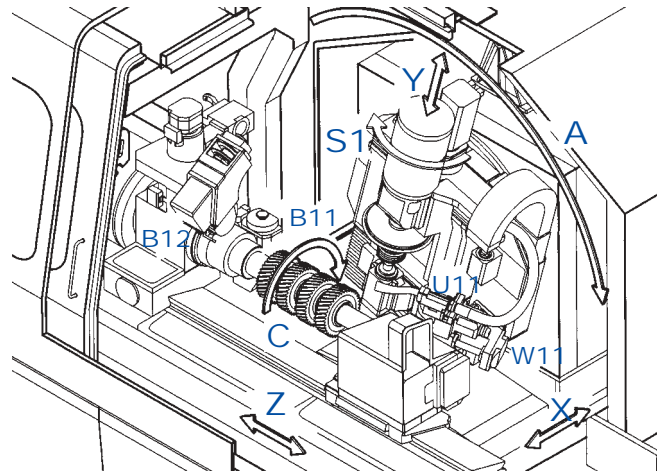
Profile grinding of large module gears with multi-rib CBN grinding wheels.



S 400 GT

## Characteristic features

- Electrowelded, heavily ribbed machine bed filled with polymeric cement for vibration-free operation even at maximum stock removal rates.
- Linear motor technology for radial and axial movement. Backlash-free preloaded ball screws and synchronous servomotor with roller guide-ways for tangential movement.
- Direct-driven, liquid-cooled torque motors on all three rotational axes (patented configuration), supported by hybrid ball bearings with ceramic balls for extremely high runout accuracy. High-precision angular encoders.
- Tailstock with quill supported by high precision bearings. Recirculating lubrication.
- Automatic stock division by contact-free sensor.
- Contour dressing of threaded worms using a standard software cycle.
- Comprehensive monitoring and diagnostics system for machine, power unit and control system.
- Integrated electrostatic oil mist filter.
- Interpolated tool withdrawal in case of power failure and emergencies.
- PLC coolant nozzle control to transport fluids directly to the contact point between tool and gear.
- Siemens 840 D CNC with mobile operator panel and circular and linear interpolation of up to 5 axes. High-level geometric programming for simplified profile and helix angle generation.



- C: Work spindle rotation/indexing
- Z: Work spindle axial movement
- X: Grinding spindle radial movement
- A: Grinding spindle swivel angle
- S1: Grinding spindle rotation
- B11/B12: Dressing of grinding wheel
- Y: Grinding spindle - tangential movement

- Samputensili Dialogue Software for full operator guidance including plausibility checks, management of grinding/dressing cycles and storage of process and profile data without the need for an external PC.

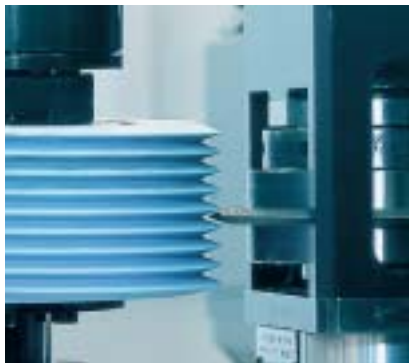
## Programme variants

- Shave Grinding
- Generating Grinding with up to 6 passes for axial and radial/axial grinding, lead and profile modifications, optimisation of the axial path, radial positioning and correction of tooth thickness.
- Profile Grinding with multi-pass cycles for axial and radial/axial grinding, lead and profile modifications, optimisation of axial path, radial positioning and correction of tooth thickness.

## Options

- Measuring unit with touch probe and software for profile, lead, pitch and tooth thickness control.
- Integrated dressing spindle for flank dressing of vitrified CBN or ceramic tools.
- Integrated dressing spindle for outside diameter dressing of vitrified CBN or ceramic tools.
- Integrated dressing spindle for adjusting the pressure angle and the tooth thickness of the grinding tool.
- External balancing unit.
- Interface for data transfer.
- Fire extinguishing system.
- Various tool arbours and flanges.
- Motorized equipment for tool holder change over.
- Various automation systems for workpiece change and storage such as gantry loaders with different gripper elements.
- Centrifugal cleaning station.
- Remote diagnostics for software updates and troubleshooting.

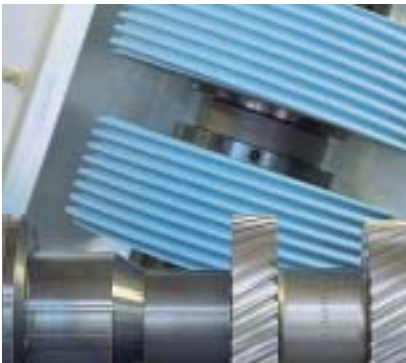
# S 400 GT



Integrated dressing spindle for flank dressing of the grinding tool



Integrated dressing spindle to adjust pressure angle and tooth thickness of the grinding tool



Generating grinding with dressable ceramic grinding worms



Integrated automatic stock division



Integrated dressing spindle to adjust pressure angle and tooth thickness of the grinding tool



Integrated automatic tool change



Profile grinding and shave grinding with CBN tools

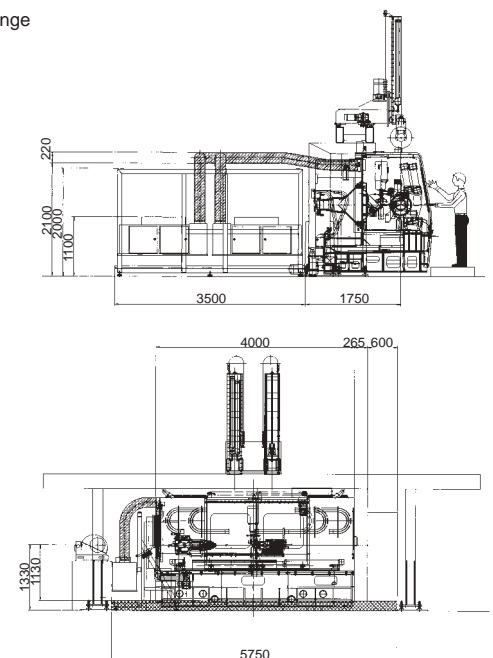
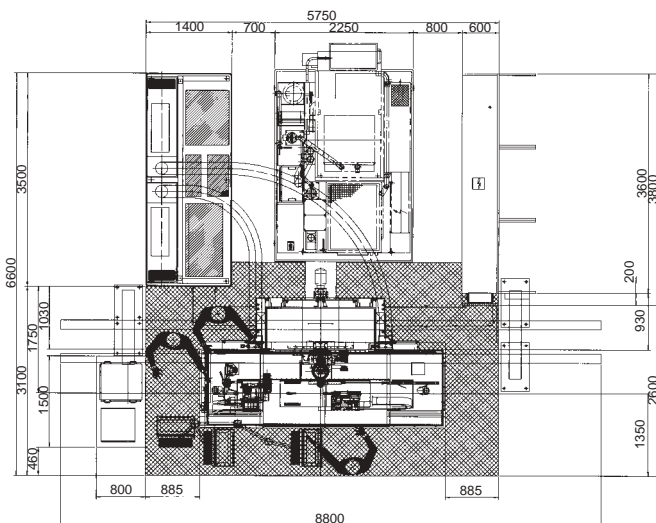


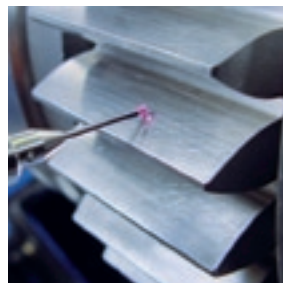
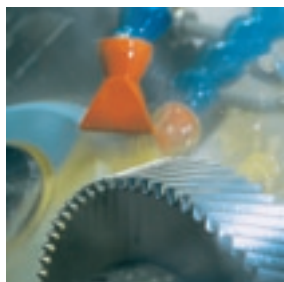
Integrated measuring unit with touch probe

# Technical data

Max. workpiece diameter	400	mm
Max. module for cont. generating grinding (grinding worm)	6	mm
Max. profile depth		
– with dressable profile grinding wheel	0,5 - 20	mm
– with electroplated profile grinding wheel	0,5 - 40	mm
Max. grindable face width	750	mm
Max. workpiece length	900	mm
Centre distance work spindle - grinding spindle	32,5 - 362,5	mm
Tangential travel	220	mm
Stroke of tailstock quill	120	mm
Grinding spindle swivel range	+/- 90	degrees
Diameter of grinding wheel	80 - 280*	mm
Tool spindle speed range	0 - 15,000	rpm
Work spindle speed range	0 - 1,000	rpm
Dresser spindle speed range	0 - 4,000	rpm
Axial and radial feed range	0 - 15,000	mm/min
Tangential feed range	0 - 6,000	mm/min
Main drive output	36	kW
Total connected power	100	kVA
Weight of machine excl./incl. peripherals, approx.	16,000 / 30,000	kg

\* Smaller grinding wheel diameters require special clamping. Technical data is subject to change





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