

## S 400 GS

Shaving Cutter Grinding Machine



# S 400 GS

## Tradition

Samputensili has been building shaving cutter grinding machines since 1974. The first NC version was introduced in 1988.

The new S 400 GS is the third generation of this type of machine, setting new standards in accuracy, reliability, versatility, ease of operation and productivity.

## Grinding method

The profile to be ground is calculated by the Samputensili interpolation software which coordinates the rectilinear movement of the grinding spindle slide with the rotational movement of the work spindle. A rotational-translational movement is generated, fully adjustable in rolling diameter so that pitch blocks are eliminated. Rolling and indexing are numerically controlled and both generated by one motor.



S 400 GS with new work area guards for perfect visibility yet maximum safety



## Characteristic features

- Electrowelded, heavily ribbed machine bed filled with polymeric cement for vibration-free operation even at highest stock removal rates.

- Measuring system with 0.1 micron resolution.

- Direct-driven, liquid-cooled torque motors for both rotational axes with a patented configuration, supported by hybrid ball bearings (ceramic balls) for extremely high runout accuracy; high-precision angular encoders.

- Linear motor technology for all axes involved in the generation of the profile. Backlash-free, preloaded ball screws and synchronous servomotors for all other linear axes; low-friction Schneeberger linear guides.

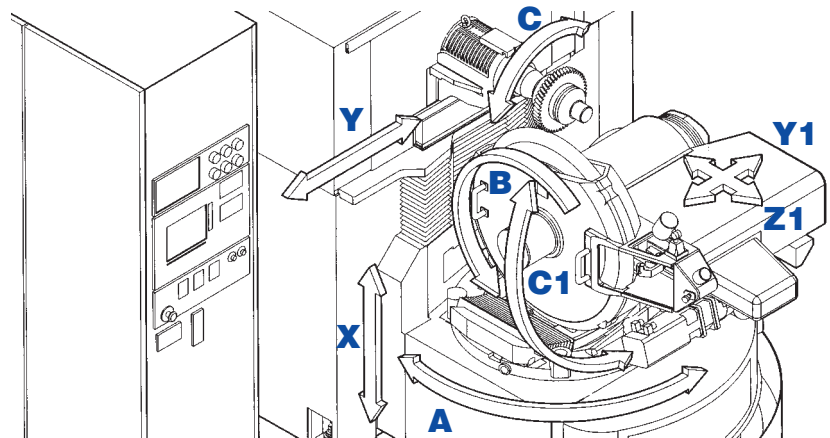
- Reduction of cycle times by 50 % and more without sacrificing accuracy.

- The new concept of the dressing unit with its high-speed dressing axis significantly cuts down dressing time while assuring maximum accuracy. The incremental setting is obtained with just one axis. The active profile is defined by an unlimited number of points of the theoretical involute form (TIF).

- Five different wheel dressing operations are managed entirely by the CNC, employing special software cycles for: active profile, undercut, outside diameter, reduction of wheel tip and wheel back thickness.

- Detection of exact grinding wheel position and geometry without using sensors.

- Comprehensive monitoring and diagnostic system for machine, power unit and control system.



- Siemens 840 D CNC with 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  
 Y: Horizontal work slide movement  
 Z1: Dresser radial stroke  
 Y1: Dresser axial stroke  
 X: Vertical work slide movement  
 C1: Pressure angle adjustment  
 A: Helix angle adjustment  
 B: Grinding spindle rotation

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

- "Autotuning" function during the grinding process.

- Profile, lead and topological modifications are freely programmable.

- Twisted flanks (BIAS) are generated by simple data input for electronic profile generation.

- Interpolated tool withdrawal in case of power failures and emergencies.

- Grinding spindle with low centre of gravity for dynamic stability and convenient operation.

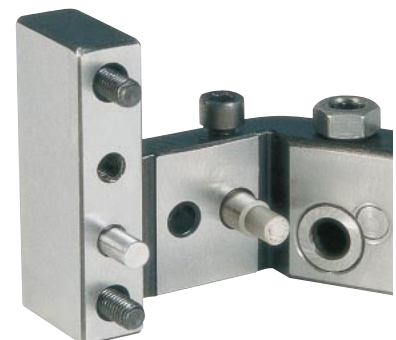
- A grinding spindle swivel angle of up to - 5° (depending on pressure angle) allows lead cavities to be ground into workpieces with an extremely small outside diameter.

- Protection to strict EC standards by newly designed guards with perfect visibility of the process, yet maximum safety.

- The power unit and other service units are separated from the machine to avoid disturbance from vibration, the suction hoses are firmly attached to the machine body.

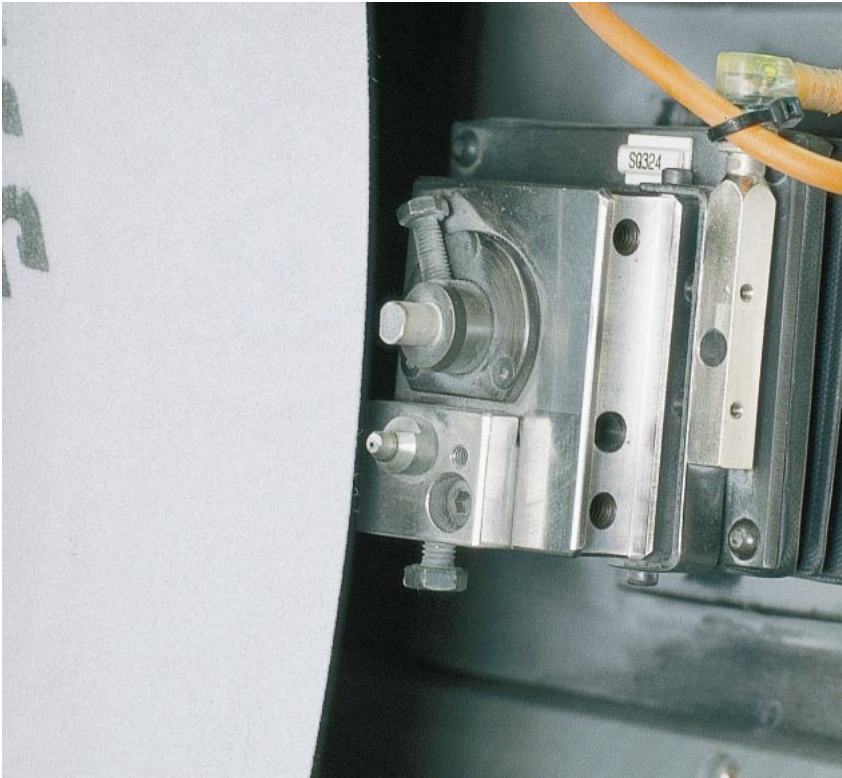
- Remote diagnostics system for software upgrades and troubleshooting.

- Samputensili supplies grinding wheels for every application.



Optional dressing unit

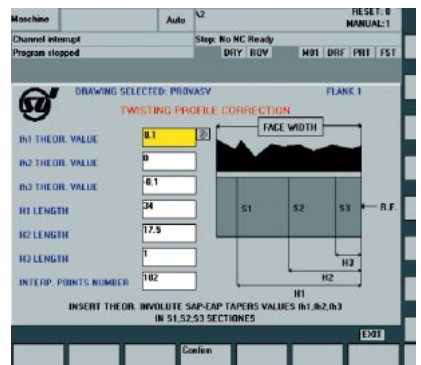
# S 400 GS



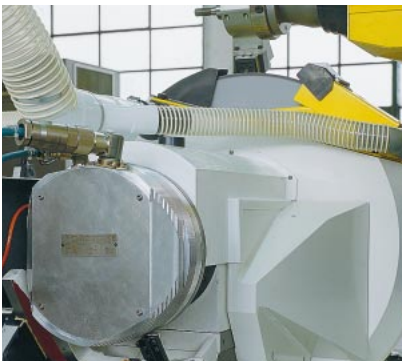
Dressing unit with roughing and finishing diamond



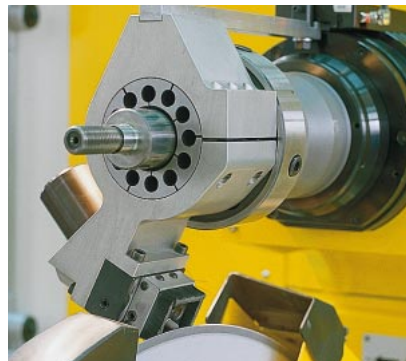
Siemens 840 D with Samputensili Dialogue Software



User-friendly input screens (shown: twisting profile correction)



Direct-driven torque motors for the rotational axes



Dressing unit for wheel back



Easy and fast workpiece change, also available with quick clamping system.



Digital linear motors for all profile-generating axes



Service units separate from machine

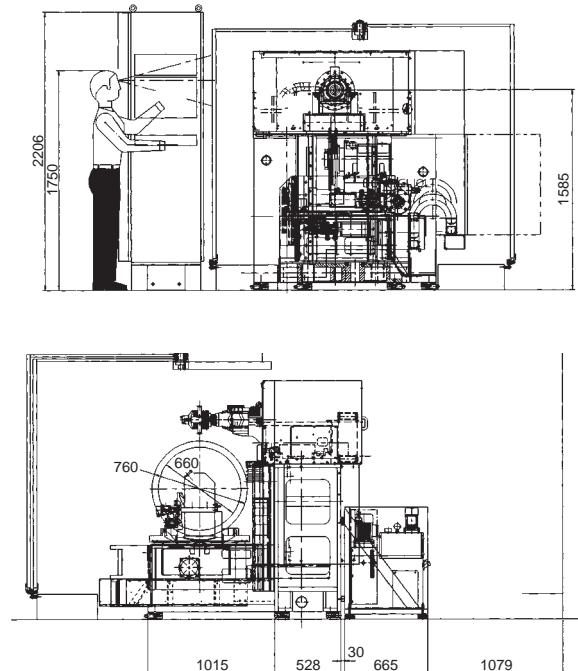
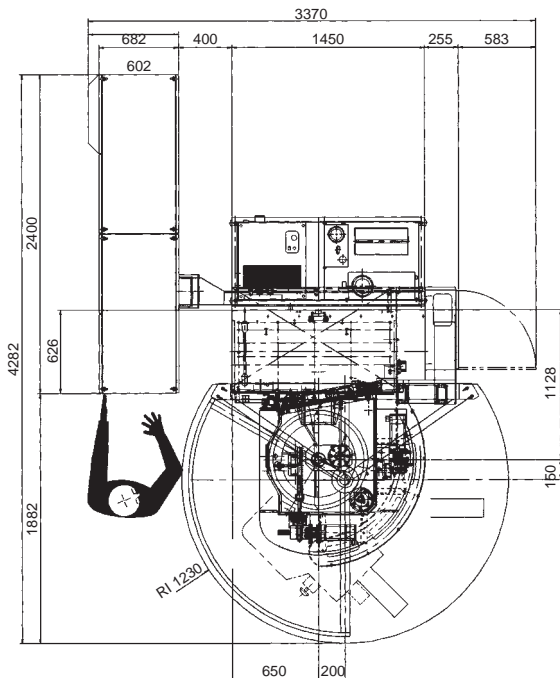


Convenient and fast tool change

# Technical data

|  |               |         |
|--|---------------|---------|
| Workpiece diameter                         | 68 - 400      | mm      |
| Module                                     | 0.5 - 15      | mm      |
| Max. face width                            | 70            | mm      |
| No. of teeth                               | unlimited     | -       |
| Max. speed of grinding spindle slide       | 18            | m/min   |
| Max. stroke rate of grinding spindle slide | 110           | rpm     |
| Diameter of grinding wheel                 | 630 - 760     | mm      |
| Speed of grinding wheel                    | 0 - 900       | rpm     |
| Max. stroke of vertical slide              | 250           | mm      |
| Swivel range of grinding spindle           | RH 38 / LH 60 | degrees |
| Pressure angle range                       | -5 / +30      | degrees |
| Dresser speed                              | 0 - 500       | mm/min  |
| Max. stroke of dresser                     |               |         |
| Y1-axis (parallel to grinding spindle)     | 40            | mm      |
| Z1-axis (perpend. to grinding spindle)     | 90            | mm      |
| Main drive output                          | 10            | kW      |
| Machine weight, approx.                    | 6,000         | kg      |

Technical data is subject to change



# System technology from one source



Cylindrical gear hobbing  
Bevel gear cutting  
Profile grinding  
Continuous generating grinding  
Shave grinding  
Shaving cutter grinding  
Chamfering and deburring

HSS and carbide hobs  
HSS and carbide shaper cutters  
Shaving cutters  
Grinding wheels and grinding worms  
Diamond dressing tools  
Master gears  
Chamfering and deburring tools  
Bevel gear cutting tools

Regrinding of hobs, shaper cutters  
and shaving cutters

Coating of cutting tools, dies, stamps,  
mechanical parts, punching dies/tools

Replating of grinding wheels and  
grinding worms

Grinding of compressor rotors, rotors  
for hydraulic pumps, gears of special  
design, worms and cams



The driving force  
in gear technology

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