



GS 400
Shaving cutters and
master resharpening machine



Samputensili began producing gear cutting tools in 1949. Quality requirements were not satisfied by the production machinery available on the market at that time. These production requirements lead to many technological innovations including our sharpening technology which was born in the early 1960's and is now into its fourth generation of development.

The new GS 400 is the 4th generation of this type of machine, setting new standards in accuracy, productivity, reliability, versatility and ease of operation.

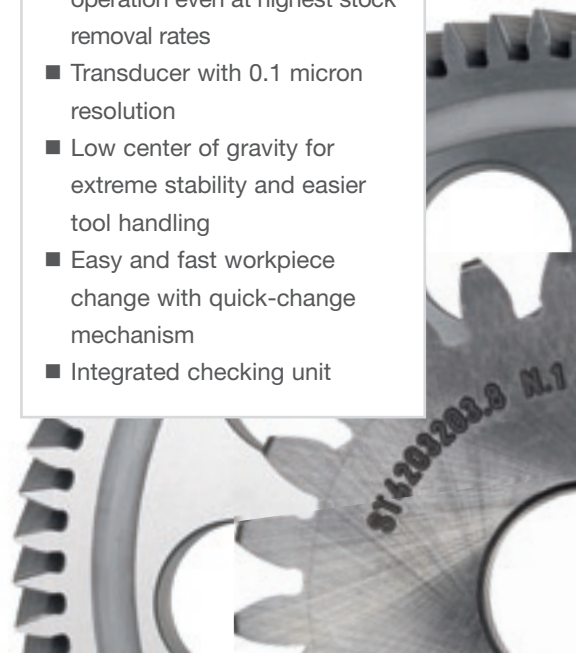
The profile to be ground is calculated by Samputensili interpolation software which coordinates the rectilinear movement of the grinding spindle slide with the rotational movement of the work spindle. A rotational-translational

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.

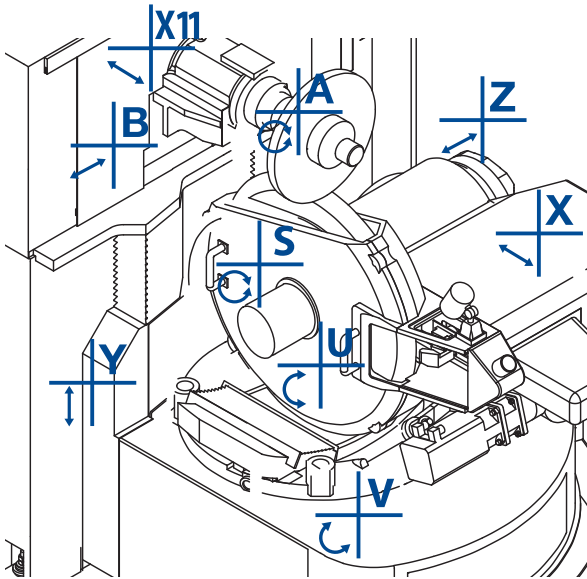
The GS 400 is equipped with direct-driven torque motors for both rotational axes. The patented pole configuration is supported by hybrid ball bearings with ceramic balls for extremely high runout accuracy.

Linear motors drive all axes involved in the generation of the profile. Backlash-free, preloaded ball screws and synchronous servomotors support all other linear axes; low friction linear guides.

- Electrowelded, heavily ribbed machine bed filled with polymeric cement for vibration-free operation even at highest stock removal rates
- Transducer with 0.1 micron resolution
- Low center of gravity for extreme stability and easier tool handling
- Easy and fast workpiece change with quick-change mechanism
- Integrated checking unit



Fully NC controlled process with additional X11 axis



- A: Work spindle rotation/indexing
- B: Horizontal work slide movement
- X: Dresser radial stroke
- Z: Dresser axial stroke
- Y: Vertical work slide movement
- U: Pressure angle adjustment
- V: Helix angle adjustment
- S: Grinding spindle rotation
- X11: Work spindle feed axis

An additional NC-controlled axis has been integrated on the work spindle group to move workpieces axially in relation to their own bores.

- Accurate planar positioning of the workpiece by avoiding accumulated errors caused by mechanical spacers
- Minimum set-up times due to less mechanical adjustments
- Precise location of the exact centre of the workpiece tooth, the point over which the maximum outside diameter of the grinding wheel has to pass
- Simplified control system for greater reliability
- Grinding of workpieces with large face widths up to 70 mm, obtaining a correct profile in all points
- Higher accuracy on both the helix and involute profile
- Execution of helix profile with different cavities
- Less eccentricity errors
- One-flank grinding with sliding X11 axis

Integrated checking

Integrated measuring unit with electronic probe for on-the-machine checking of profile, lead and pitch errors. The CNC provides automatic feedback if corrections are required. During the grinding process the checking unit is stored away safely, protected from heat and grinding dust.

precision



Different dressing options for fast and reliable profile correction

The new concept of the dressing unit with its high-speed dressing axis significantly cuts down dressing time while assuring maximum accuracy. 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. The exact grinding wheel position and geometry is detected without using sensors.



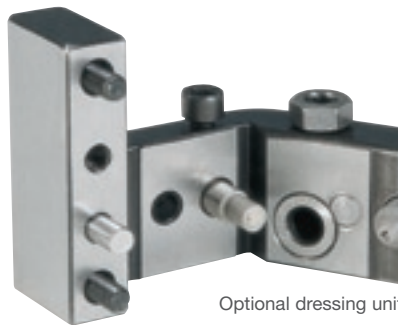
Dressing unit with diamond for rough and finish dressing



Dressing unit for grinding wheel back

Easy and intuitive operator guidance

- Samputensili Dialogue Software for full operator guidance including plausibility checks, management of grinding/dressing processes and storage of process and profile data.
- Siemens 840 D CNC with high-level geometric programming for simplified profile and helix angle generation:
- “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.
- Remote diagnostics system for software upgrades and troubleshooting.



Optional dressing unit

Resharping diagrams



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

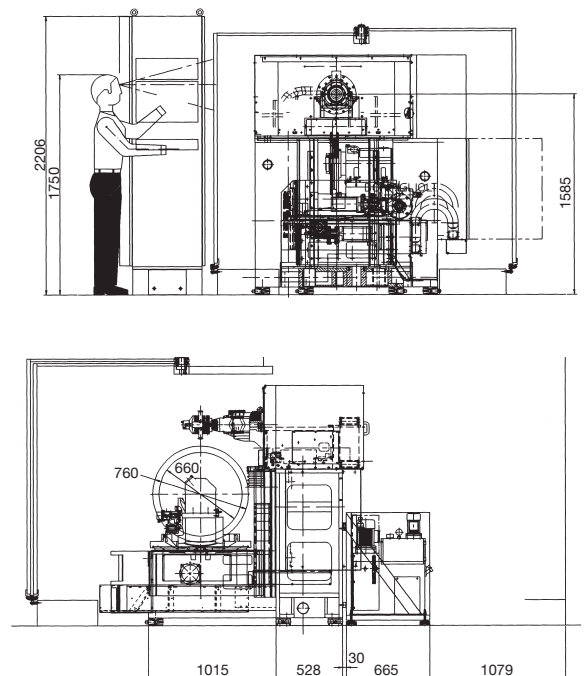
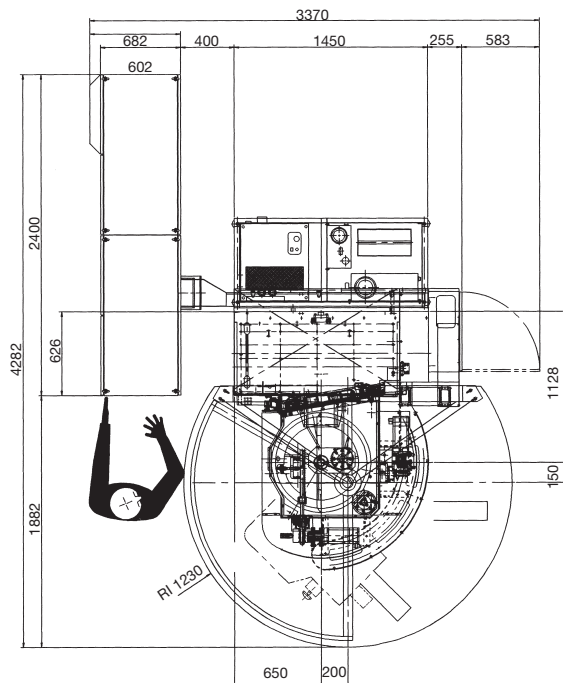


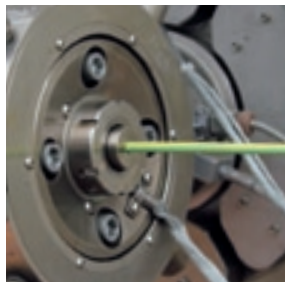
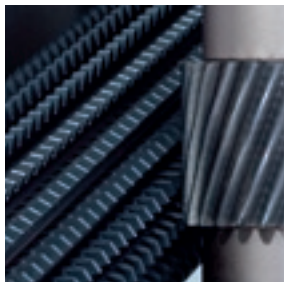
Input drawing

Technical data

Workpiece diameter	mm	68 - 400
Module	mm	0.5 - 15
Face width, max.	mm	70
No. of teeth		unlimited
Speed of work spindle slide, max.	m/min	18
Stroke rate of work spindle slide, max.	rpm	80
Diameter of grinding wheel	mm	630 - 760
Speed of grinding wheel	rpm	0 - 900
Stroke of vertical slide, max.	mm	250
Swivel range of grinding spindle	degrees	RH 38 / LH 60
Pressure angle range	degrees	-5 / +30
Dresser speed	mm/min	0 - 500
Stroke of dresser, max.		
Z-axis (parallel to grinding spindle)	mm	40
X-axis (perpend. to grinding spindle)	mm	90
Main drive output	kW	12
Machine weight, approx.	kg	6,000

Technical data is subject to change, maximum values depending on application





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