

favoritCNC

The price winner
for a large range of applications.

The Art of Grinding.



Total Grinding Solutions

Advantages

favoritCNC – dimensions

- Distance between centers 650 mm (25.59")
- Height of centers 175 mm (6.89")
- Max. workpiece weight 80 kg (176lbs)

Hardware

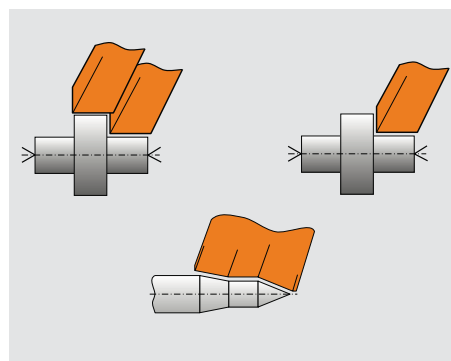
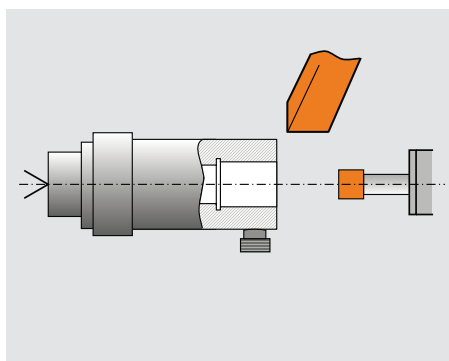
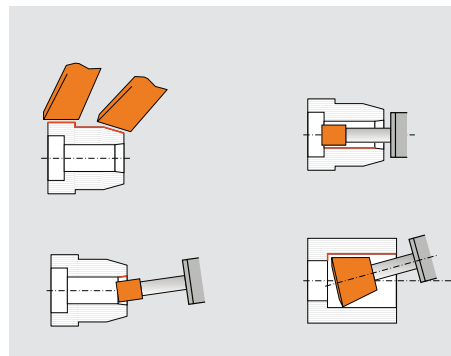
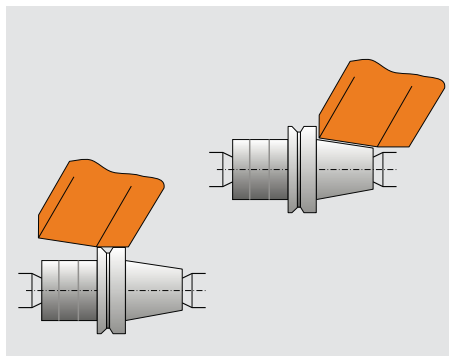
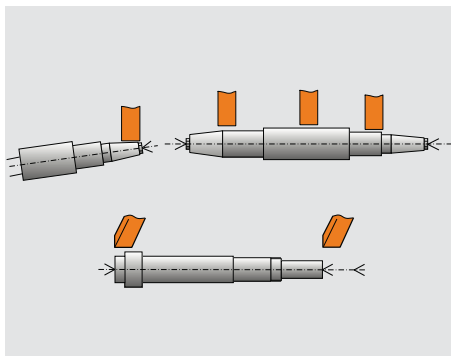
- Turret wheelhead with grinding wheel on the right and internal grinding unit (optional) with manual swivel 2.5° Hirth
- External and internal grinding possible in one setup
- Granitan® mineral-casting S103 machine base
- Complies with CE standards

Software

- Extremely easy programming with Studer Pictogramming
- StuderGRIND programming software optionally available to create grinding and dressing programs on an external computer

favoritCNC





The sales winner for the most important applications.

The CNC Universal cylindrical grinding machine for small budgets and high standards.

This CNC universal cylindrical grinding machine is designed for grinding medium-sized workpieces in individual and serial production. With various options, such as in-process gauging, balancing system, contact detection and length positioning, the machine can be adapted for other grinding applications at a later date.

The machine bed made of solid Granitan® S103 forms the foundation of the cylindrical grinding machine, which is equipped with high-quality components and can guarantee exacting precision, performance and reliability for years. The full enclosure ensures an optimal view of the grinding process.

The practical Studer grinding software with its proven pictogramming means that even less experienced users can quickly and efficiently program grinding and dressing cycles. The optional StuderGRIND software is also available, and allows special applications such as profiling grinding wheels for complex workpiece shapes to be programmed efficiently. Development, production, assembly and testing of Studer products all take place in a process-oriented manner and comply with the stringent directives stipulated in VDA 6.4 and ISO 9001.

Granitan mineral-casting S103 machine base® S103

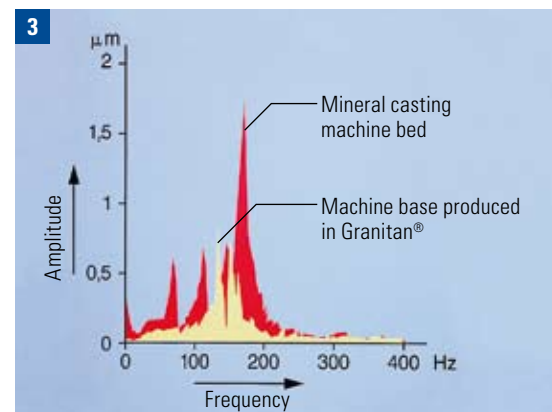
The material structure developed by Studer has proven its superb efficiency over many years and is produced in the company's own plant using the most modern industrial techniques.

- The excellent dampening behavior of the machine base ensures outstanding surface quality of the ground workpieces. The service life of the grinding wheel is also increased, leading to reduced downtimes.
- Temporary temperature fluctuations are extensively compensated by the favorable thermal behavior of Granitan®. This provides high stability throughout the day.
- The V and flat guideways for the cross slides are moulded directly into the machine base and are finished with a non-abrasive Granitan® S200 slideway coating. The patented surface structure prevents the slides from hydroplaning and also eliminates the stick-slip effect, which can be found in conventional guideways. The guideways offer the best possible accuracy throughout the entire speed range with high load capacity and dampening levels. Thanks to the robust and maintenance-free design, these excellent guideway characteristics are retained more or less without limit.

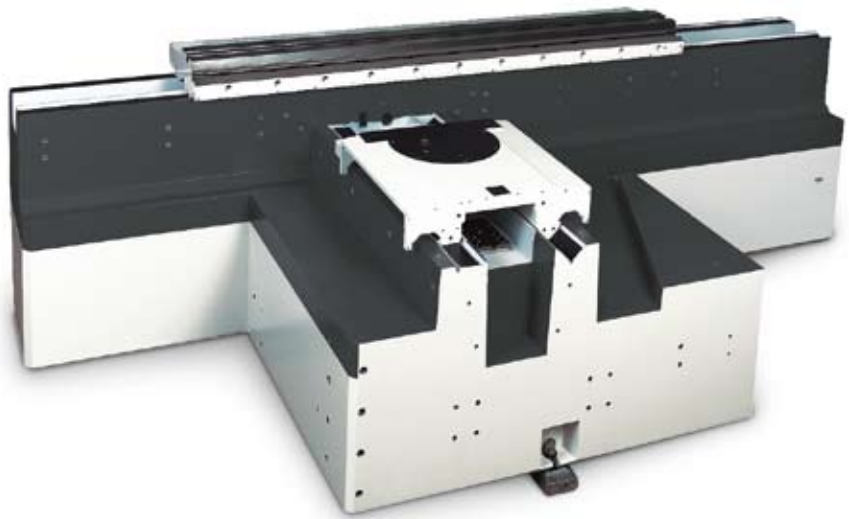


- Vibration-dampening
- Thermal stability
- Non-wearing

- 1 | Machine bed with longitudinal and cross slides
- 2 | Guideways with patented surface structure
- 3 | Vibration behavior of gray cast iron and Granitan® S103
- 4 | Machine beds with both longitudinal and cross slides
- 5 | Workpiece table with swivel unit and set-up scale



- High-accuracy axis movements
- Effective covering of the guideways
- Auxiliary scale for setup and resetting
- Swiveling longitudinal table 8.5°



Longitudinal and cross slides

The longitudinal and cross slides are manufactured from high-quality gray cast iron and have very precise, ground V and flat guideways, with the distance between the guideways optimally suited to the machine's overall rigidity. These distances are specifically coordinated to benefit the overall rigidity of the machine. The slides rest completely on the guideways of the machine bed through the entire speed range, which is the basis for the excellent straightness of 0,0025 mm (0.98mill") over 650 mm (25.59") measuring length. The slides are advanced by 40 mm (1.57") diameter circulating ball screws connected to a three-phase servomotor via torsion-resistant,

bellow-type couplings. This enables the axes to achieve high process speeds on one hand, while short auxiliary times also guarantee maximum precision with in-feed movements of 0.0001 mm (4 mill") on the other.

Use of the swiveling machine table on the longitudinal slide enables the whole length of the surface to be ground and acts as a support for the workhead, the tailstock, and also accessories and devices.



Wheelhead

- 1 | Internal grinding attachment
- 2 | Length positioning facility
- 3 | Turret wheelhead
- 4 | Tailstock
- 5 | Fine adjustment for cylindrical corrections on the tailstock
- 6 | Dressing tool holder behind tailstock
- 7 | Roundness during live spindle grinding operations
- 8 | Fine adjustment for cylindrical corrections
- 9 | universal workhead

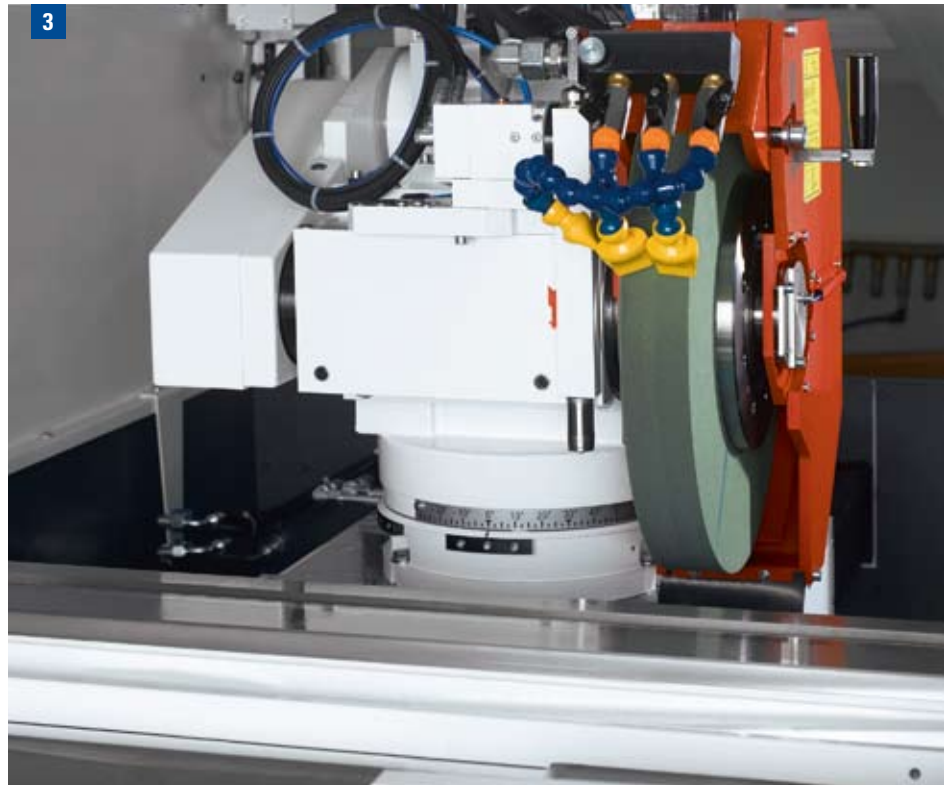
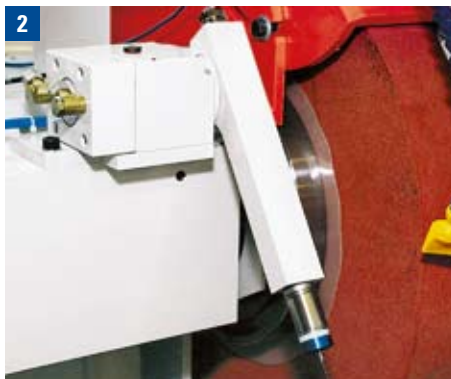
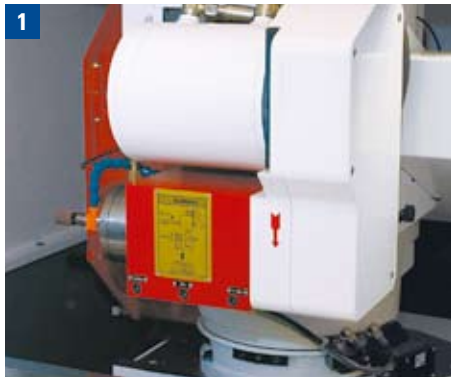
The turret wheelhead can be used for both external and internal grinding; it can be equipped with an external grinding wheel (right) and an internal grinding spindle for this purpose. With extreme precision, the user can manually (2.5°) index the turret wheelhead in a Hirth gear within a swiveling range of -15° / +195°.

Grinding wheel dimensions: Diameter 500 mm (19.69"), width 63 / 80 F5 mm (2.48" / 3.15" F5), bore 203 mm (7.99"). It has a drive power of 9 kW (12HP). The cutting speed of maximum 50 m/s (9,843 SFPM) enables efficient removal values

during the grinding process.

The speed of the belt-driven internal grinding spindle can be infinitely variably regulated. Spindles are available with nominal speeds of 20 000, 40 000 and 60 000 RPM⁻¹.

- Turret wheelhead
- Complete machining
- High performance of 9 kW (12HP)
- Cutting speed of up to 50 m/s (9,843 SFPM)
- Internal grinding spindle includes infinitely variable speed adjustment

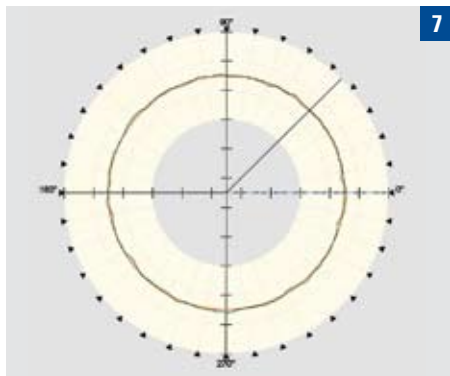
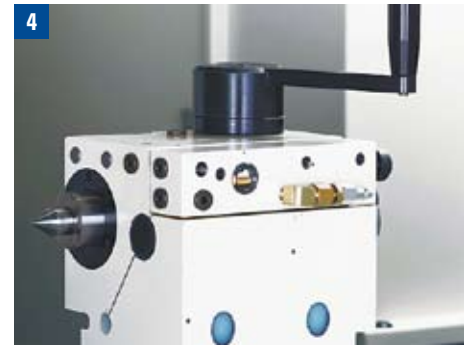


Tailstock

The generously dimensioned barrel, designed for the deployment of Morse 4 taper centers, glides in the tailstock housing. The center pressure can be adjusted with the delicate precision required for grinding high-precision workpieces. The fine adjustment enables taper corrections in the range below 1 μm when grinding between centers.

In order to guarantee optimum thermal stability, a cooling lubricant is passed through the tailstock, and completely covers the barrel and diamond holder.

- Taper corrections
- Thermal stabilization via overflow capacity
- Pneumatic lifting
- High roundness accuracy < 0.0004 mm (15.7 mill")
- Large speed range 1 – 1500 rpm



Workhead

The versatile universal workhead with MT5 fitting taper is capable of both live spindle grinding and grinding between centers. The workhead spindle is mounted on roller bearings, is low-maintenance and possesses an excellent roundness accuracy of below 0.0004 mm (15.7 mill"). The fine adjustment allows for cylindrical corrections in

the 1 μm range during live spindle operations. A pneumatic lifting process facilitates movement of the workhead during setup and resetting.

9



Machine control and operation

The Fanuc Oi CNC control with active flat color monitor (10.4") is extremely reliable and optimally matched to the drive elements.

The control cabinet is bolted to the machine bed. The electrical equipment complies with established safety standards and is EMC-tested.

All controls are clearly and ergonomically arranged.

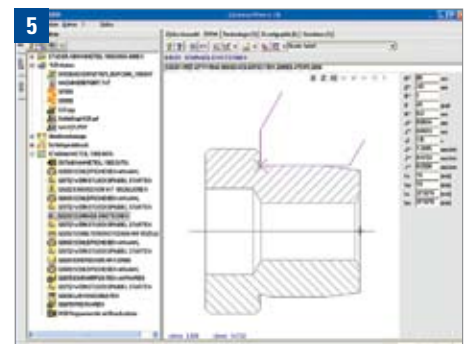
An important role is played by the portable control unit, which facilitates setup close to the grinding process.

The optional Sensitron electronic contact detection function enables downtimes to be reduced to a minimum.

- PCU manual control unit
- EMC-tested control cabinet
- Ergonomically arranged controls
- Latest software technology
- Pictogramming
- Programming software StuderGRIND (Option)



- 1 | Machine control
- 2 | Internal view of the control cabinet
- 3 | Manual control unit
- 4 | Pictogramming
- 5 | StuderGRIND programming software
- 6 | Dynamic balancing system
- 7 | In-process gauging unit
- 8 | Diameter measuring head
- 9 | Length positioning measuring head



Programming

The sophisticated mechanical engineering concept of the favoritCNC is completed by a grinding software program developed in-house by Studer which is continuously further optimized in collaboration with users of the software. This software offers:

- Pictogramming: The operator strings the individual grinding cycles together, and the control system generates the ISO code.
- Grinding and dressing process sequences can be programmed freely to optimize the grinding process.

- StuderGRIND (Option): Programming software for special applications such as profiling the grinding wheel for complex workpiece forms. The program is created on the PC and transferred directly to the machine control unit.

- Configuration is flexible
- Simple to retrofit
- Diameter measuring head
- Length positioning measuring head

Additional options

One strength of the favoritCNC is that the machine can be adapted to suit different requirements. The range of applications can be extended with additional options that are quickly available. The following options are available:

Sensitron 6 electronic contact detection:

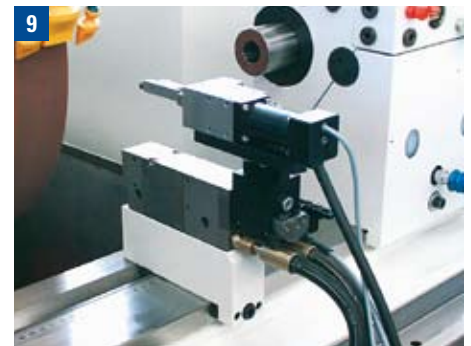
The Sensitron 6 contact control unit automatically switches from infeed to grinding feed. The air gap between the set allowance and the contact point is bypassed very quickly with a high infeed speed.

Dynamic balancing system: An optimally balanced grinding wheel is a precondition for good

grinding results. The dynamic balancing system displays the imbalance and the grinding wheel can be balanced directly on the machine by manually adjusting weights.

In-process gauging unit: This accessory kit has two measuring circuits with which it controls the automatic feed sequence relative to the workpiece dimension during external grinding. It helps to further increase process reliability, productivity and quality. Products are available from Movomatic and Marposs.

Length positioning: This allows the workpiece zero point to be captured in the Z-axis.



Measuring heads for the in-process gauging unit

Depending on the application, different diameter measuring heads are available. They have an electric or pneumatic probe lift-off and use one or two measuring circuits, depending on the application.

The length positioning measuring head is suitable for the passive length positioning of interrupted or non-interrupted surfaces. It has an electric or pneumatic probe lift-off and uses one measuring circuit.

Measuring range: ± 2.5 mm (0.1").

- Commissioning
- Training
- Warranty extension
- HelpLine
- Repair
- Spare parts
- Teleservice
- Inspection
- Maintenance
- Overhaul

1 | Service engineer at customer site

2 | Training on simulators



Accessories and services

There is an extensive range of accessories available for all Studer cylindrical grinding machines. These include centers, dressing tools, grinding wheels, clamping devices and internal grinding spindles.

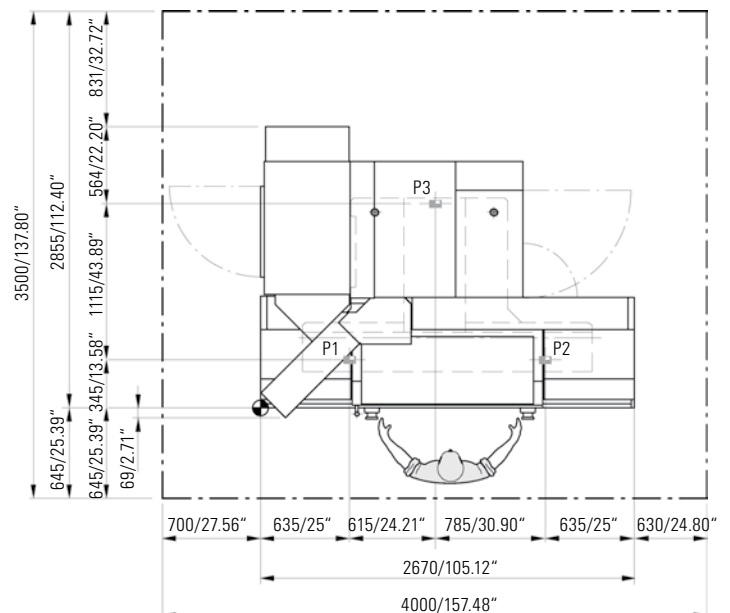
The Studer Training Department organizes courses for hundreds of customers every year specializing in programming and machine use – a sound basis for the optimum utilization of your Studer machines.

Studer specialists help you with any grinding problems, in order to find the perfect solution.

After-sales services speak the user's language and operate at an international level, meaning that the service technicians can be at the client's site quickly. With a well-planned range of services offered, they help the user get the most use of his machine. Spare parts are available for at least ten years after discontinuation of a machine model.

Main dimensions	
Distance between centers	650 mm (25.6")
Height of centers	175 mm (6.9")
Max. workpiece weight between centers	80 kg (176 lbs)
Cross slide: X-axis	
Max. travel	285 mm (11.2")
Speed	0.001 – 5000 mm / min (0.000.04 – 197 ipm)
Resolution	
Rotative encoder	0.0001 mm (0.000.004")
Longitudinal slide: Z-axis	
Max. travel	800 mm (31.5")
Speed	0.001 – 10 000 mm / min (0.000.04 – 394 ipm)
Resolution	
Rotative encoder	0.0001 mm (0.000.004")
Machine table - swiveling range	8.5 deg
Wheelhead	
Swiveling range	-15 to +195 deg
Swiveled manually	2.5 deg Hirth
Fitting taper	dia. 63 mm (2.48")
Driving power	9 kW (12 hp)
Right grinding wheel , Ø x width x bore	500 x 63 (80F5) x 203 mm (20" x 2.5" (3.15"F5) x 8")
Peripheral speed	Up to 50 m/s (9840 sfpm)
Internal grinding attachment for belt spindle	dia. 100 mm (3.94")
Speeds	20 000 / 40 000 60 000 rpm
Universal workhead	
Rpm range	1 – 1500 rpm
Fitting taper	MT5
Bar capacity	dia. 30 mm (1.18")
Driving power	1,8 kW (2.4 hp)
Load for live spindle grinding	70 Nm (52 ft lbs)
Roundness during live spindle grinding operations	0.0004 mm (0.000.016")
Tailstock	
Fitting taper	MT4
Barrel stroke	35 mm (1.37")
Barrel diameter	50 mm (1.97")
Fine adjustment for cylindrical corrections	±40 µm (0.0016")

Control system	
Fanuc Oi	
Guaranteed working precision	
Straightness of the generating line	
Gauge length 650 mm (25.6")	0.0025 mm (0.000.10")
Connected loads	
Total connected load	20 kVA
Air pressure	5.5 bar (80 psi)
Total weight	
4000 kg (8800 lbs)	



The information given is based on the technical levels of our machine at the time of this brochure going to print. We reserve the right to further develop our machines technically and make design modifications. This means that the dimensions, weights, colors, etc. of the machines supplied can differ. The diverse application possibilities of our machines depend on the technical equipment specifically requested by our customers. The equipment specifically agreed with the customer is therefore exclusively definitive for the equipping of the machines, and not any general data, information or illustrations.



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