

# Universal Cylindrical Grinding Machine



## S30 – The Classical

for medium-sized precision components.

*The Art of Grinding.*



# S30 – The Classical

for medium-sized precision components.

The Universal Cylindrical Grinding Machine with hydraulic drives for the production of medium-sized workpieces.

The S30 is designed for the grinding of workpieces in single-component or small series production. It is suitable for any sector in which medium-sized components are produced. This simple, reasonably priced machine has a tried-and-tested hydraulic infeed system. It is very easy to operate and can be set up extremely quickly. This proven concept enables the specialist to devote his full concentration to the grinding process.

The Granitan S103 machine bed provides the basis for the fitting of technologically outstanding components to form a cylindrical grinding machine guaranteeing the highest possible precision, performance and reliability levels for many years.

The efficient automatic grinding cycles with automatic cut-out are controlled hydraulically, as are all the axes. Features such as rapid infeed, grinding feed, spark-out, rapid retraction of the handwheel to the preset grinding allowance plus the cycles for plunge and traverse grinding are unique and form part of the basic equipment.

The systematic development, production, assembly and testing of our products are carried out in a process-oriented manner. They comply with the stringent VDA6.4 and ISO 9001 norms.



# Advantages:

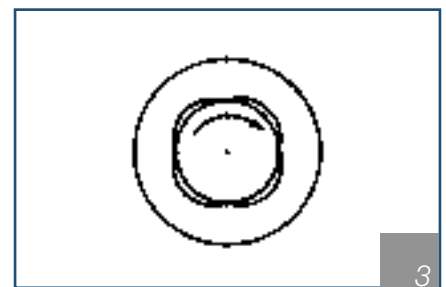


## S30 – Dimensions

- Distance between centres  
650/1000 mm (25.6"/39.4")
- Height of centres 125/175/225 mm  
(4.9"/6.9"/8.9")
- Max. workpiece weight 130 kg  
(286 lbs)

## Features

- Optional wheelhead:
  - Turret wheelhead with grinding wheel on the left and right, plus internal grinding attachment (optional) with 5 deg manual Hirth swivel to a stop of 0 deg and 180 deg
  - External wheelhead with grinding wheel on the left
- Table can be swivelled 10 deg/8.5 deg
- Workhead fitted with hydrodynamic bearing as standard and a roller-bearing workhead (optional) make it possible to grind between fixed centres as well as with rotating centres
- Tailstock with adjustable centre pressure and fine adjustment for quick and easy cylindricity correction
- Control cabinet permanently attached to the machine. Can be expanded for in-process gauging and Sensitron.
- Granitan S103 mineral-cast machine base
- Automatic grinding cycle with automatic cut-out:
  - Rapid infeed
  - Grinding feed 1 and 2
  - Spark-out
- Rapid retraction of the feed handwheel to the preset grinding allowance
- Plunge grinding and travel grinding with or without rapid infeed
- External and internal grinding possible in one clamping
- Extensive range of accessories



## Wheelhead

There is a choice of two variations for universal applications for external, surface and internal grinding:

- Turret wheelhead for external and internal grinding with an external grinding wheel on the right and left and one internal grinding spindle. High-precision manual indexing (5 deg) is possible using a Hirth gear within a swivel range of 0 deg to +180 deg.
- External wheelhead on the left: external grinding with wheel on the left

### Grinding spindle bearing

The hydrodynamic plain bearing of the external grinding spindle guarantees many years of high run-out with minimal maintenance. It is wear-free with no clearance adjustment and low maintenance.

### Internal grinding spindles

Belt-driven spindles can be used for the internal grinding attachment. The belt-driven internal grinding spindle is equipped with an oil mist lubrication device. Nominal rpm: 20 000, 40 000 and 60 000 min<sup>-1</sup>.

External and internal grinding is possible in one clamping.

1 External grinding wheel

2 Internal grinding attachment (optional)

3 Hydrodynamic plain bearing

- 
- Flexible
- 
- Compact
- 
- Internal grinding attachment
-



1



2



3

## Workhead

The swivelling workhead with hydrodynamic bearing makes it possible to grind between fixed centres as well as with rotating centres. The powerful workhead, with relief provided by the belt tension, revolves in a hydrodynamic multi-surface plain bearing. Roundness during live spindle grinding is 0.0003 mm (0.000,012"), with the option of 0.0001 mm (0.000,004") available. The workhead is driven by a stepped AC motor.

- Frequency converter for infinitely variable speed control (optional)
- A workhead with swivelling roller bearing is available as an option

## Tailstock

The rigid tailstock has a generously dimensioned barrel for holding Morse 3 centres. The barrel glides in covered plain bearings, and the centre pressure can be finely adjusted. The fine adjustment enables quick and easy cylindricity correction (optional), as required for the machining of high-precision workpieces.

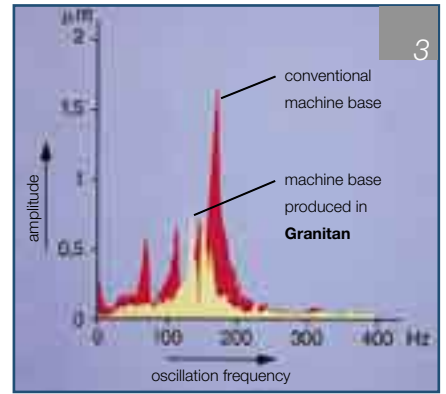
- The tailstock can be fitted with hydraulic barrel retraction and an adjustable dressing device

1 Workhead

2 Tailstock

3 Fine adjustment for taper corrections

- 
- High roundness levels
  - Low maintenance
  - Grinding between centres and live spindle grinding
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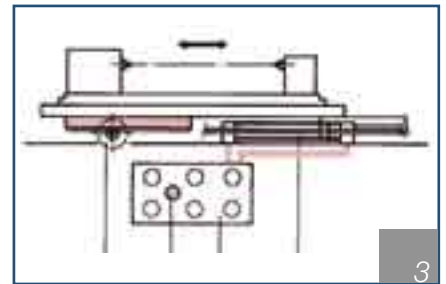
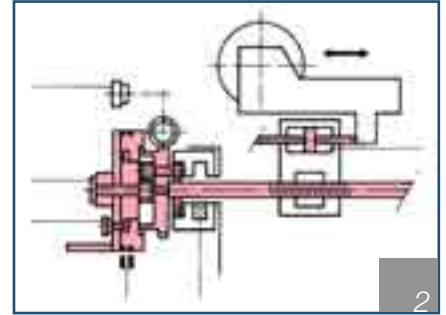
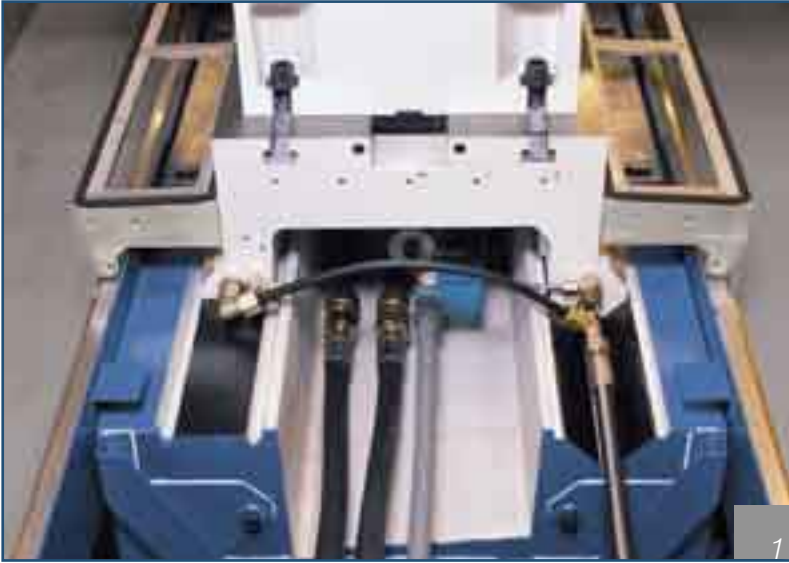
## Granitan S103 mineral-casting machine base

The proven material structure developed by Studer over the years is produced in the company's own plants using the most modern industrial techniques.

- The outstanding damping characteristics have a very positive effect on the surface quality displayed by the ground components. The service life of the grinding wheel increases, leading to a reduction in down times.
- Short-term temperature fluctuations are compensated by Granitan's good thermal properties, resulting in high accuracy to gauge over the entire day.
- The V and flat guideways for the longitudinal and cross slides are moulded directly into the machine bed and coated with the abrasion-proof Granitan S200 surfacing material. The stick-slip effect or floating of the slides observed on conventional guides is virtually eliminated by the patented surface texture of the guideways. Superb guide precision is achieved throughout the entire speed range with high load-bearing and damping capacity. The sturdy, low-maintenance design ensures that these excellent guide properties are maintained over a virtually unlimited service life.

- 1 Machine base with longitudinal and cross guides
- 2 Guideways with patented surface structure
- 3 Vibration behaviour of grey cast iron and Granitan S103

- 
- Vibration-damping
- 
- Thermostable
- 
- Wear-free
-



## Cross and longitudinal slides

The cross and longitudinal slides are made of high-quality grey cast iron and have high-precision, ground V and flat guideways with guideway intervals that are optimal for the rigidity of the overall machine. The Granitan S200 surfacing material ensures stick-slip-free movement of the slides. A continuously functioning lubrication system guarantees a long service life and consistent precision. The slides rest completely on the machine bed guides over the entire travel range. Users benefit from the excellent straightness of the generating line at 0,0025 mm (0.000,10") over a measured length of 630 mm (24.8")!

### Longitudinal slid on the Z axis

The longitudinal slide with swivelling table is driven manually via the handwheel or automatically via hydraulic cylinders with infinitely variable speed control. The quick-reacting hydraulics with soft and very precise conversions ensure high precision during rapid speed changes. Optional: fine adjustment plus air lift to the swivelling table for rapid cylindricity corrections and precise setting of taper angles. Digital display of the position of the longitudinal slide.

### Cross slide on the X axis

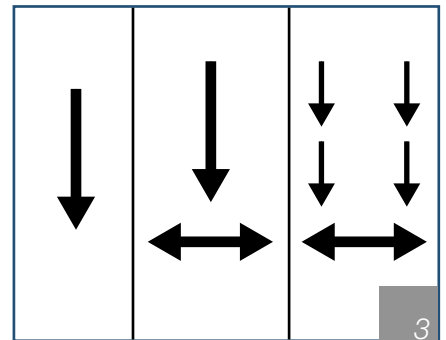
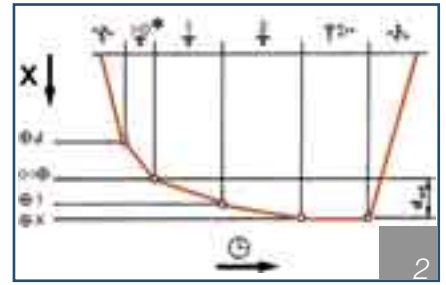
The drive is via a handwheel or automatically via a rolling ball spindle and hydraulic motor. The mechanics of the wheelhead axis include a fine adjustment device, enabling infeed corrections in the range of fractions of a micrometre. Optional: Sensitron contact control unit, OD gauge, digital cross slide position display.

1 V flat guideway (cross slide)

2 Illustration of the wheelhead axis

3 Illustration of the longitudinal axis

- Low coefficient of friction
- Hydraulic rapid approach
- No-play feed system
- Low wear
- Repeatable accuracy



## Machine control and operation

The control cabinet is permanently attached to the machine, making it ready for operation immediately. The control is reliable and maintenance-free. The electrical equipment complies with the relevant safety norms and is EMV-tested. A clear device layout ensures optimum ease of operation.

Automatic grinding cycle with automatic cut-out:

- Rapid infeed
- Grinding feed
- Spark-out
- Rapid retraction of the feed handwheel to the preset grinding allowance

Grinding programs:

- Plunge grinding with short longitudinal slide stroke or travel grinding with continuous infeed
- Travel grinding with intermittent infeed on the left, right or both ends of the stroke

The Sensitron contact control unit including vibration pick-up provides for automatic switch-over of infeed to grinding feed. This contact detection enables the machine to achieve touching speeds of 0,06–30 mm/min (0.002–1.18 ipm). This option reduces grinding and setup times to a minimum.

1 Control panel with possibility of fitting a contact control unit and in-process gauging unit

2 Illustration of the grinding feed

3 Infeed movement of the grinding programs

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- Control cabinet EMV-tested
  - Ergonomically arranged controls



## Accessories and services

There is an extensive range of accessory equipment available for all Studer cylindrical grinding machines, including centres, dressing tools, grinding wheels, clamping devices, internal grinding spindles, in-process gauging devices, etc.

Our Training Department organises courses for hundreds of customers every year specialising in programming and machine use – a recipe for success in using your machine to the optimum. Machine maintenance courses take account of the specific needs of operational maintenance departments. On request, we can also run training courses on the customer's premises or make our specialists available to resolve particular grinding problems.

Our After Sales Service speaks your language. Our service engineers are active around the globe and are based in your vicinity. A well thought-out range of services is available to you after purchase to enable you to exploit your machine to the full. Spare parts can be delivered up to 10 years after conclusion of the machine range.

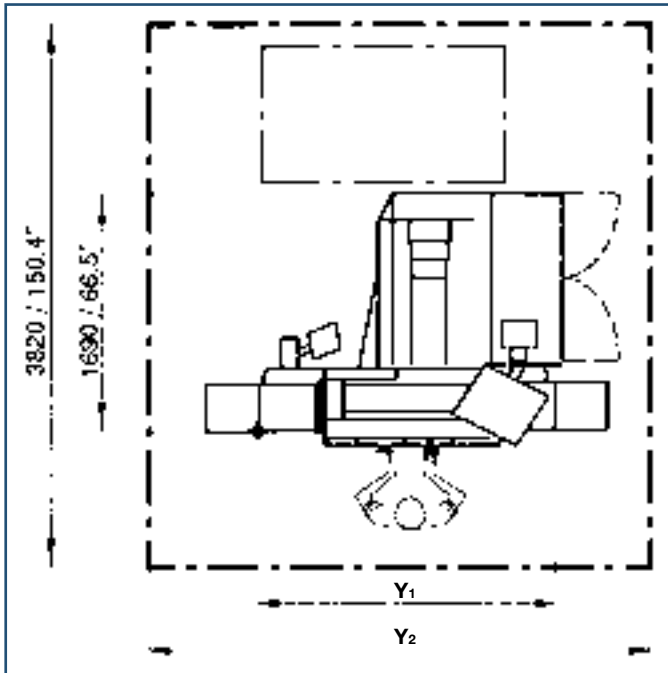
1 Teleservice

2 Deployment of engineers on the customer's premises

3 Operating worldwide

4 Training on simulators

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



Distances between centres	Y <sub>1</sub>	Y <sub>2</sub>
650 mm	2035/80,1"	3500/137,8"
1000 mm	2735/107,7"	3900/153,5"

#### Main dimensions

Distance between centres	650/1000 mm (25.6"/39.4")
Height of centres	125/175/225 mm (4.9"/6.9"/8.9")
Max. workpiece weight between centres	130 kg (286 lbs)

#### Cross slide: X axis

Rapid infeed	60 mm (2.36")
Max. travel	260 mm (10.2") [plunge depth 3,4 mm (0.134")]
Speed	0,012–6 mm/min (0.000,5–0.24 ipm)
Incremental feed	0,001–0,05 mm (0.000,04–0.002")
Spark-out time	0–6 s
Handwheel rotation	4 mm (0.16")/dia.

#### Longitudinal slide: Z axis

Max. travel	700/1050 mm (27.5"/41.3")
Speed	50–5000 mm/min (1.97–197 ipm)
Reverse delay	0–6 s
Minimum automatic table travel	1,5 mm (0.06")
Reverse precision at constant speed	0,02 mm (0.000,8")
Machine table swivel range	10 deg/8,5 deg

#### Wheelhead

Swivel range	0 deg to +180 deg
Fitting taper	dia. 63 mm (2.5")
Driving power	5,5 kW (7.5 hp)
Speeds	1670/2110 rpm
Grinding wheel left, dia. x width x bore	400 x 63 (80F5) x 127 mm (dia. 500 mm Option) [16" x 2.5" (80F5) x 5"]
Grinding wheel right, dia. x width x bore	400 x 40 x 127 mm [16" x 1.6" x 5"]

Circumferential speed	35 m/s (6888 sfpm) to 50 m/s (9840 sfpm)
Internal grinding spindle for belt-driven spindles	optional
Adaption bore	100 mm (3.94")

Workhead swivelling	hydrodynamic bearing	roller bearing
Speed range	30–1000 rpm	35/90/210/520 rpm
Fitting taper	Morse 5	Morse 5
Bar capacity	dia. 30 mm (1.2")	dia. 38 mm (1.4")
Driving power	0,55 kW	0,55 kW
Load during live grinding	100 Nm (74 ft lbs)	160 Nm (118 ft lbs)
Roundness accuracy during live grinding	0,0003/0,0002/0,0001 mm (0.000,012"/0.000,008"/0.000,004")	0,0005 mm (0.000,02")

#### Tailstock

Fitting taper	MK3
Barrel stroke	35 mm (1.37")
Barrel diameter	50 mm (1.97")
Fine adjustment for cylindricity corrections	±40 µm (0.0016")

#### Control

Hydraulic infeed system
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#### Guaranteed working precision

Gauge length 610 mm (24")	0,0025 mm (0.000,10")
Gauge length 950 mm (37.4")	0,003 mm (0.000,12")

#### Connected loads

Total connected load	13kVA
Air pressure	5 bar (73 psi)
Total weight	
Distance between centres 650 mm	3400 kg (7480 lbs)
Distance between centres 1000 mm	3500 kg (7700 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, colours, 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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