S20
CONVENTIONAL UNIVERSAL CYLINDRICAL GRINDING MACHINE

A member of the UNITED GRINDING Group

The Art of Grinding.
APPLICATIONS

STUDER S20 IN USE

The S20 is designed for grinding workpieces in single-part and small-batch production. It is suitable for use in any industry where small precision parts are made. This simple and cost-effective machine has a proven SPC control system. It is very easy to operate, and can be reset in next to no time. The tried and tested design allows the specialist to fully concentrate on the grinding process.
**S20**

**DIMENSIONS**
- Distance between centers 450/650 mm (15.7”/25.6”)
- Center height 100 mm (3.94”)
- Max. workpiece weight 20 kg (44 lbs)

**FEATURES**
- Cross slide with wheelhead for external grinding, with grinding wheel on right and mounting surface for the internal grinding attachment (option)
- Wheelhead with manual swiveling to 0°, 15°, 30°
- Table with swiveling range of:
  - up to 30° for 450 mm (15.7”) distance between centers
  - up to 15° for 650 mm (25.6”) distance between centers
- Workhead with hydrodynamic bearing for grinding between fixed centers or live spindle grinding
- Tailstock with adjustable center pressure and fine adjustment for quick and easy cylindricity correction
- Control cabinet permanently connected to the machine. Can be expanded for measuring system and contact sensors.

**YOUR BENEFIT**
- Pre-installed automated grinding cycles for efficient grinding
- Electromechanically controlled
- Swiveling range of machine table up to 30° for high-precision taper grinding
- Contact sensors for automatic switchover from rapid approach to grinding feed
- Compact machine with a small footprint
- Short setup time
- Exceptional value for money

“*The compact for small precision components.*”
THE MACHINE BASE

The heavily ribbed machine base made of a special casting has a substructure of hydraulic concrete. Damping elements between the machine base and substructure ensure good absorption of external vibrations.

WHEELHEAD AXIS X

Infinitely variable feed. The cross slide is equipped with a low-maintenance, hydraulic rapid approach mechanism. The preloaded, effectively covered needle guideways ensure a precise fine adjustment. Optionally available contact sensors enable a high contact speed and thus saves time.

LONGITUDINAL AXIS Z

The longitudinal slide is driven through a handwheel, travel 15 mm (0.59") per revolution, or automatically by means of an electric motor via a ball screw.

LONGITUDINAL AND CROSS SLIDES

- Vibration-damping
- Swiveling range of up to 30°

The slides rest completely on the guideways of the machine base through the entire traversing range. You benefit from excellent straightness of < 0.0015 mm (0.000060") over a length of 380 mm (14.9").

The cross slide with pretensioned needle guides features exceptional repeatability. The cross slide infeed is infinitely variable.

The longitudinal slide features a high-precision, ground V and flat guideway that is optimal for the distribution of forces. The table’s large swiveling range is a particular advantage. It is 30° for a distance between centers of 400 mm (15.7") and 15° for a distance between centers of 650 mm (25.6"). Fine adjustment and sine stop for the longitudinal slide to enable precise taper adjustment are optionally available.

1. Longitudinal slide
2. Fine adjustment and sine stop
3. Handwheel and reversing
The external wheelhead with grinding wheel right is set up on the cross slide. The wheelhead can be swiveled. The set to fixed angles are 0°, 15°, and 30°. The hydrodynamic plain bearing of the external grinding spindle guarantees many years of excellent run-out with minimal wear and low maintenance. The play does not need to be adjusted. The wheelhead features an extremely impressive run-out.

Belt-driven spindles are used for the internal grinding attachment. Maximum speed range: 20,000, 40,000, and 60,000 rpm.

The rigid tailstock has a generously dimensioned barrel that glides in an effectively protected roller cage. The center pressure can be very finely adjusted. Hysteresis-free fine adjustment enables rapid and simple cylindricity corrections in the range of ±40 µm (± 0.0015”), as is required when machining high-precision workpieces.

The workhead enables grinding between fixed centers or live spindle grinding. The powerful workpiece spindle, which is relieved of belt tension, rotates in a hydrodynamic multi-surface plain bearing. Roundness during live spindle grinding is 0.0003 mm (0.000,012”) as an option 0.0002 mm (0.000,008”).

The workhead has a stepped drive with an AC motor. An infinitely variable drive with a frequency converter is optionally available.

**WORKHEAD**
- Grinding between centers and live spindle grinding
- High roundness accuracy

**WHEELHEAD**
- Flexible
- Compact
- Internal grinding attachment

**TAILSTOCK**
- Excellent stability
- Adjustable center pressure
- Cylindricity correction

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MACHINE CONTROL AND OPERATION

The control cabinet is permanently connected to the machine. This means it is ready for operation immediately. The control unit is reliable and requires no maintenance. The clear panel layout guarantees optimum ease of operation.

Automatic grinding cycles with automatic switch-off function
- Rapid infeed
- Grinding feed
- Spark-out
- Rapid retraction of the rapid infeed and infeed handwheel to the preset grinding allowance

Grinding Programs
- Plunge grinding with oscillation of the longitudinal slide or traverse grinding with continuous infeed
- Traverse grinding with infeed on the left, right, or both ends of the stroke

Contact sensors are used for automatic switchover from infeed to grinding feed. Together with this contact detection, touching speeds of 1–15 mm/min (0.04–0.6 ipm) can be achieved with the machine. Use of this option reduces grinding and setup times to a minimum.

UNITED GRINDING DIGITAL SOLUTIONS™

We develop solutions to support you in simplifying processes, boosting your machines’ efficiency and increasing overall productivity under the «UNITED GRINDING Digital Solutions™» brand.

We are continuously expanding our solution portfolio in the key areas of CONNECTIVITY, USABILITY, MONITORING, and PRODUCTIVITY to make your work in the digital age significantly easier.

Find out more about UNITED GRINDING Digital Solutions™ services on our website in the Customer Care section.

CUSTOMER CARE – WE ARE HERE FOR YOU

Our products are designed to meet customer demands for as long as possible, to operate efficiently, reliably, and be available at any time.

From «start up» to «retrofit» — our Customer Care is there for you throughout the working life of your machine. That’s why over 200 expert service contacts working around the world in 10 different languages are available locally.

- We provide fast, uncomplicated support.
- We help to increase your productivity.
- We work professionally, reliably, and transparently.
- We provide professional solutions to your problems.
TECHNICAL DATA

MAIN DIMENSIONS

Distances between centers 400 / 650 mm (15.7”/25.6”)
Centre height: 100 mm (3.94”)
Max. workpiece weight between centers: 20 kg (44 lbs)

CROSS SLIDE: X AXIS

Rapid approach travel 20 mm (1.18”)
Max. travel 25 mm (0.98”) (plunge depth 1.8 mm (0.07”) / 5 mm (0.2") (Option)
Feed travel with handwheel 25 mm (0.98")
Feed rate 1 (standard) 0.02 – 1.5 mm/min (0.0012 – 0.06 ipm)
Feed rate 2 (option) 0.02 – 0.3 mm/min (0.0008 – 0.012 ipm)
Spark-out time adjustable
Contact speed (option) 1-15 mm/min (0.04 – 0.5 ipm)

LONGITUDINAL SLIDE: Z AXIS

Max. travel 400 / 650 mm (15.7”/25.6”)
Speed 100-2000 mm/min (3.94 – 78.7 ipm)
Smallest automatic travel approx. 1 mm (0.04”)
Reverse delay 0-5 s
Machine table swivelling range 30°/ 15°

WHEELHEAD

Swivel angle 0°/15°/30°
Fitting taper Ø 44, 1:5.715
Driving power 3 kW (4 hp)
Grinding wheel right, dia. x width x bore 14" x 2" (F1) x 5"
Circumferential Speed 30 m/s (5905 sfpm)
Internal grinding attachment for belt-driven spindles (option)
Mounting bore 88 mm
Speeds 20,000/40,000/60,000 rpm
Drive power 1.5kW (2 hp)

UNIVERSAL WORKHEAD

Speeds 80/175/380/860 rpm
Continuously adjustable speed range 36-1,280 rpm (option)
Fitting taper MT 4
Spindle bore (feedthrough) 24 mm (0.95”)
Swivel range 0 – 90°
Drive power 0.25 kW (0.33 hp)
Load, live spindle grinding 12 kgm (9 ft-lbs)
Roundness accuracy, live spindle grinding 0.0003 / 0.0002 mm (0.00012 / 0.00008”)

TAILSTOCK

Fitting taper MT2
Travel of barrel 20 mm (0.79”)
Diameter of barrel 32 mm (1.26”)
Fine adjustment for cylindricity corrections ±46 μm (± 0.0016”)

CONTROL UNIT

PLC control unit

GUARANTEED WORKING PRECISION

Surface straightness
Gauge length 380 mm (14.93") 0.0015 mm (0.00006”)
Gauge length 630 mm (24.62") 0.0025 mm (0.00010”)

CONNECTED LOAD

Total connected load 8 kVA
Air pressure 5.5 - 7 bar (79.7 - 101.5 psi)
Total weight
Center distance 400 mm / 15.7” 1,600 kg (3 520 lbs)
Center distance 650mm / 26” 1,900 kg

DIMENSIONS

A  B  C  D
1,520 mm (59.8”) 2,890 mm (113.8”) 1,450 mm (57.1”) 2,980 mm (117.3”)

DIMENSIONS

A  B  C  D
2,332 mm (91.8”) 3,170 mm (124.4”) 1,450 mm (57.1”) 2,980 mm (117.3”)

The information given is based on the technical levels of our machines 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 binding for the equipping of the machines, and not any general data, information, or illustrations.
The name STUDER stands for more than 110 years of experience in the development and production of precision cylindrical grinding machines. “The Art of Grinding.” is our passion, highest precision is our aim and top Swiss quality is our benchmark.

Our product line includes both standard machines, as well as complex system solutions in high-precision cylindrical grinding for machining small and medium-sized workpieces. In addition we offer software, system integration and a wide range of services. As well as receiving a complete tailor-made solution, the customer also benefits from over 110 years of know-how in relation to the grinding process.