S20

The Compact
for small precision components.

Key data

The S20 is a universal cylindrical grinding machine with electromechanical drives for the production of small workpieces.
It has a distance between centres of 400/650 mm and a centre height of 100 mm.
It can machine workpieces with a maximum weight of 20 kg.

STUDER

Fritz Studer AG

The name STUDER stands for more than 100 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 tailormade solution the customer also benefits from our 100 years of know-how in relation to the grinding process.

Our customers include companies from the machine tool industry, automotive engineering, tool and die makers, the aerospace industry, pneumatics/hydraulics, electronics/electrical engineering, medical technology, the watch industry and job order production. They value maximum precision, safety, productivity and longevity. 24 000 manufactured and delivered systems make us the market leader and are clear evidence of our technological leadership in universal, external, internal and noncircular grinding. Around 800 employees, including 75 apprentices, make it their goal every day to ensure that «The Art of Grinding.» will continue to be closely linked to the name STUDER in the future.

S20

If you also want to grind automatically with a conventional machine, you need look no further than the S20. Pre-installed automatic grinding cycles ensure efficient grinding. The machine table with a swivelling range of up to 30 deg enables high-precision taper grinding. The S20 is also very compact and offers an advantageous price-performance ratio.

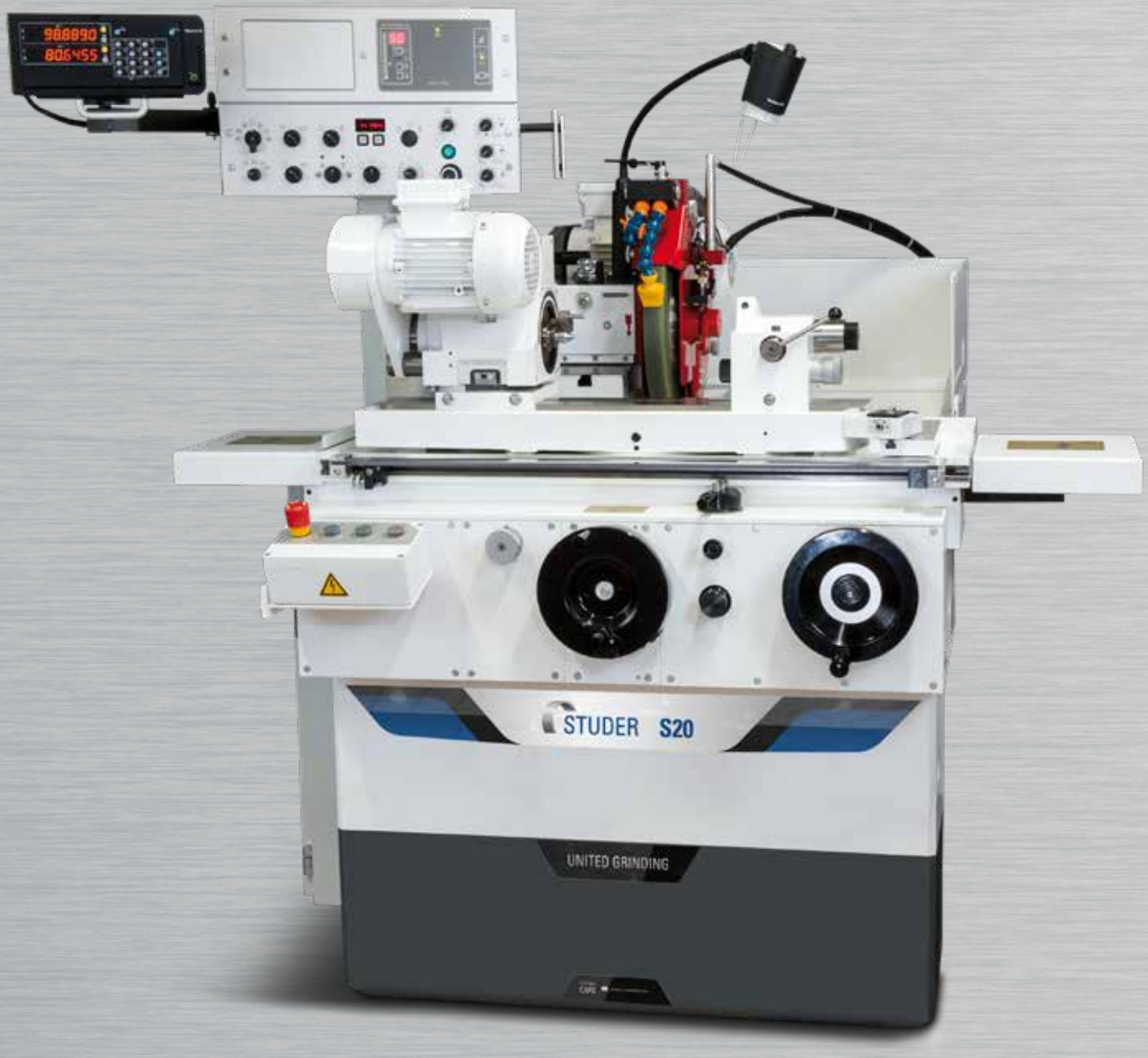
Characteristics

Dimensions

- Distance between centres 400/650 mm (15.7"/25.6")
- Height of centres 100 mm (3.94")
- Maximum workpiece weight 20 kg (44 lbs)

Features

- Cross slide with wheelhead for external grinding with grinding wheel on the right and location area for the internal grinding unit (optional)
- Wheelhead with 15 and 30 deg manual swivel
- Table with swivelling range of:
  – up to 30 deg 400 mm distance between centres
  – up to 15 deg 650 mm distance between centres
- Workhead with hydrodynamic bearing for grinding between fixed centres or with rotating spindle
- Tailstock with adjustable centre pressure and fine adjustment for rapid and easy cylindricity correction
- Control cabinet connected to the machine. Can be expanded to include in-process gauging and Sensitron



- Automatic grinding cycles for plunge and traverse grinding operations
- Automatic grinding cycle with automatic cut-out:
  – Rapid in-feed
  – Grinding feed
  – Spark-out
- Rapid retraction of feed handwheel to the preset grinding allowance
- Plunge grinding and travel grinding with or without rapid infeed
- Compact design
- Varied range of accessories

The Universal Cylindrical Grinding Machine with electromechanical drives for the production of small workpieces.
The S20 is designed for the grinding of workpieces in single-component or small series production runs. It can be used in any sector where small components are manufactured. This simple and very reasonably priced machine has a tried-and-tested SPS control unit. It is easy to operate and the machine can be reset very quickly. The proven design allows the specialist to concentrate fully on the grinding process.

The efficient automatic grinding cycles with automatic cut-off are controlled electro-mechanically, as are all the axes. Features like rapid infeed, grinding feed, spark-out, rapid retraction of the handwheel to the preset grinding allowance, plus cycles for plunge and traverse grinding are unique and included in the basic equipment.

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

Wheelhead

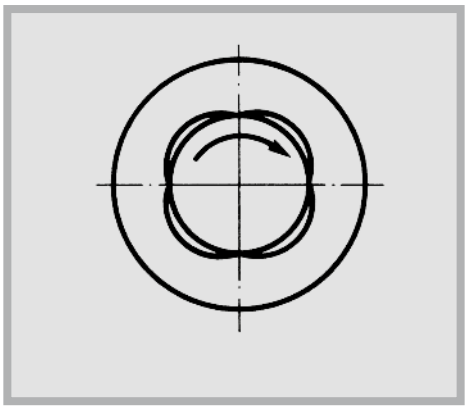
1

- Flexible
- Compact
- Internal grinding attachment

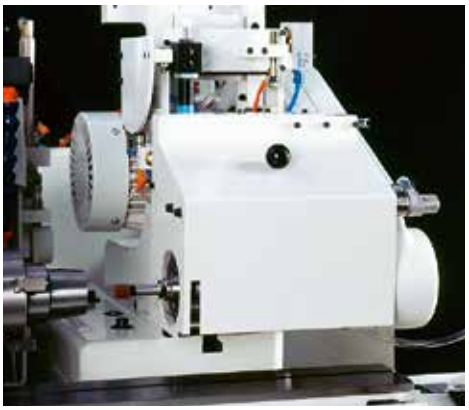
The external wheelhead with the grinding wheel on the right is mounted on the cross slide. The wheelhead can be adjusted to fixed settings, with swivel angles of 0, 15 and 30 deg. The hydrodynamic plain bearing on the external wheelhead guarantees high run-out with minimal maintenance over many years. It is wear-free and low maintenance. Clearance does not need to be set. The run-out of the wheelhead is outstanding.

Belt-driven spindles are used for the internal grinding attachment. Nominal speeds: 20 000, 40 000 and 60 000 rpm. The internal grinding attachment is fitted with an oil mist lubricating unit.

2



3



1 External grinding wheel
2 Hydrodynamic plain bearing
3 Internal grinding attachment (optional)

Workhead

1

- Grinding between centres and live spindle grinding
- High roundness precision

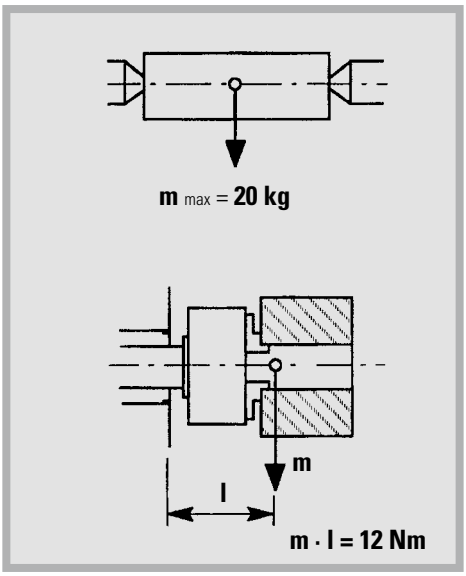
The workhead enables grinding between fixed centres and with a rotating spindle. The powerful workhead spindle, relieved from belt tension, rotates in a hydrodynamic multi-surface plain bearing. Roundness in live spindle grinding operations is 0,0003 mm (0.000,012"), with the option of 0,0002 mm (0.000,008").

Workhead drive:
Stepped AC motor
Frequency converter for stepless drive (optional)

Tailstock

2

3



- High stability
- Adjustable centre pressure
- Cylindricity correction

The rigid tailstock has a generously dimensioned barrel that glides in effectively covered roller bearings. The centre pressure can be very finely adjusted. Hysteresis-free fine adjustment enables rapid and simple cylindricity correction in the range of ±40 µm, as required when machining high-precision workpieces.

1 Workhead
2 Tailstock

3 Permissible weight on the workhead spindle. Higher load on request.e.

Machine base

The special-cast strongly ribbed machine base has a hydraulic concrete substructure. Damping elements between the machine base and the substructure ensure optimal absorption of external vibrations.

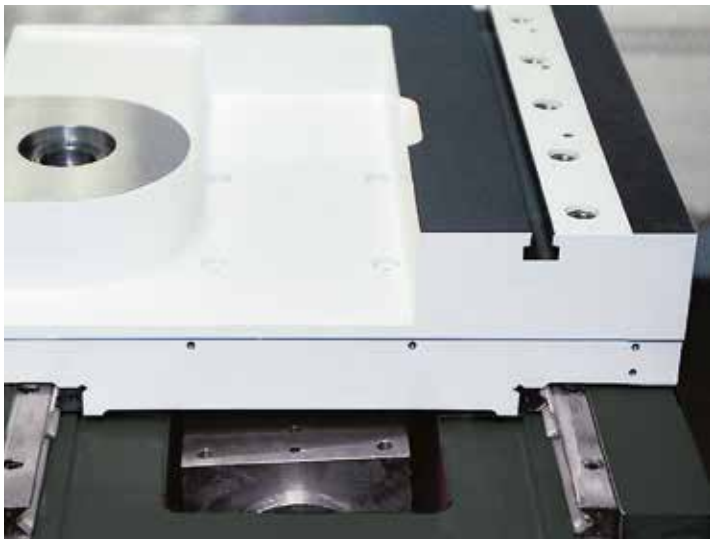
Cross and longitudinal slide

- Vibration damping
- Swivelling range up to 30 deg

1

2

3



The slides rest completely on the machine base guides over the entire travel range. They benefit from the excellent straightness of the generating line, i.e. 0,0015 mm (0.000,06") over a measured length of 380 mm (14.9")!

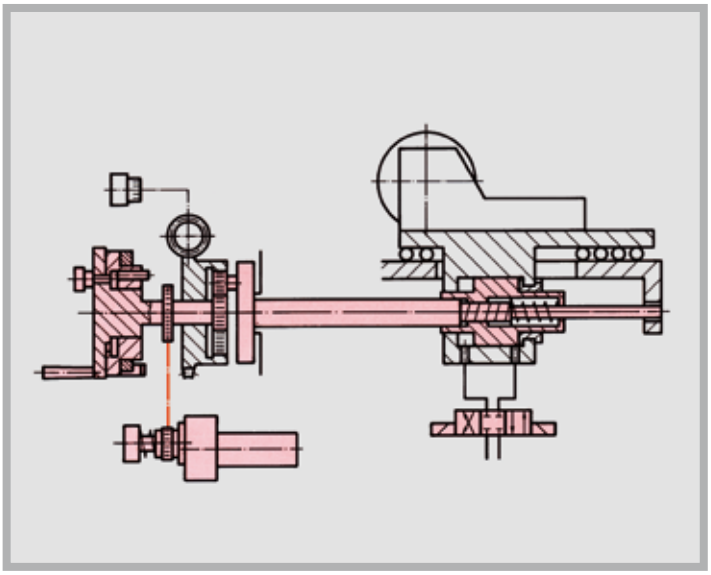
One of the outstanding features of the cross slide with pretensioned needle guides is its exceptional repeatability. The wheelhead axis feed is infinitely adjustable.

The longitudinal slide has a high-precision, ground V and flat guideway, which is optimum for the flow of forces. A particular advantage is the wide swivelling range of the table, i.e. 30 deg for 400 mm (15.7") distance between centres and 15 deg for 650 mm (25.6") distance between centres. Fine adjustment and angle stop on the longitudinal slide for precise setting of tapers (optional).

1 Longitudinal slide
2 Fine adjustment and sine stop
3 Cross slide

Wheelhead axis X

1



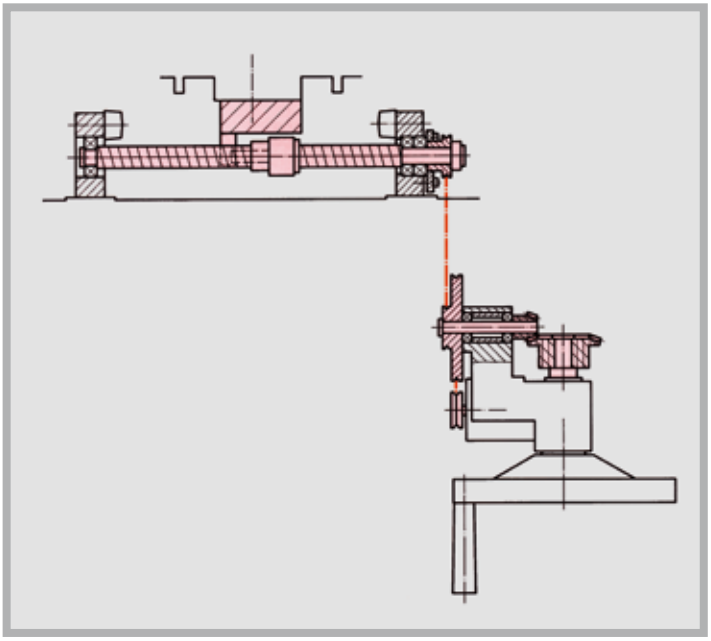
Infinitely variable feed. The cross slide is fitted with a low-maintenance hydraulic rapid approach. The pretensioned needle guides ensure stick-slip-free fine adjustment. High touching speeds and time savings are ensured by the Sensitron contact control unit (optional).

- Rapid-response hydraulics with fast reverse
- Hydraulic unit outside the machine
- Second, slow feed speed (optional)

Longitudinal axis Z

- Longitudinal feed can be switched between manual and automatic
- Well-tried mechanics

2



The drive for the longitudinal axis ensues via a handwheel, with an adjustment range of 15 mm (0.59") per rotation or automatically by means of a DC motor via a circulating ball screw. Repetition accuracy is < 0.02 mm in a variable speed range.

- The reverse stops are set mechanically
- Digital position display (optional)

1 Illustration of X axis
2 Illustration of Z axis

Machine control and operation

1

- Control cabinet EMV-tested
- Ergonomically arranged controls

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

Automatic grinding cycle with automatic cut-out

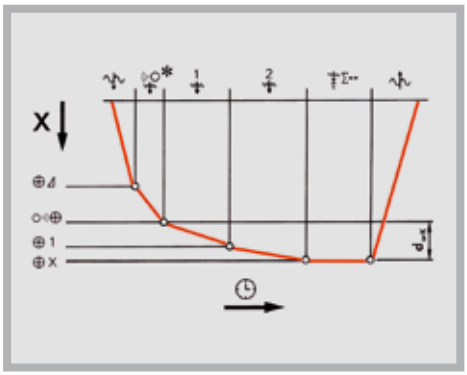
- Rapid infeed
- Grinding feed
- Spark-out
- Rapid retraction of rapid infeed and feed handwheel to the preset grinding allowance

Grinding programs

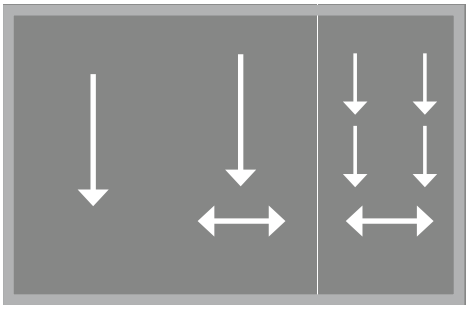
- Plunge grinding with short stroke of the longitudinal slide or travel grinding with continuous infeed
- Travel grinding with intermittent infeed on the left, right or both ends of the stroke

The Sensitron contact control unit, including vibration pick-up, enables automatic switch-over from infeed advance to grinding feed. Together with this contact detection, touching speeds of 0,06 to 30 mm/min (0.002–1.18 ipm) can be achieved with the machine. Using this option reduces grinding and setup times to a minimum.

2



3



1 Machine control with position indicator
2 Infeed motions of the grinding programs
3 Illustration of grinding feed

Customer Care

STUDER cylindrical grinding machines should fulfil the customer's requirements for as long as possible, work cost-effectively, function reliably and be available at all times. From «start up» through to «retrofit» – our Customer Care is there for you throughout the working life of your machine. 30 professional helplines and more than 60 service technicians are available in your area, wherever you are in the world.

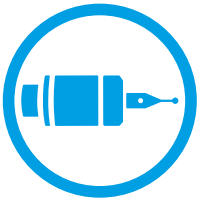
- We will provide you with fast, uncomplicated support.
- We will help to increase your productivity.
- We work professionally, reliably and transparently.
- We will provide a professional solution to your problems.

Start up
Commissioning
Warranty extension

Qualification
Training
Production support

Prevention
Maintenance
Inspection

Service
Customer service
Customer consultation
HelpLine
Remote service



Material
Spare parts
Replacement parts
Accessories

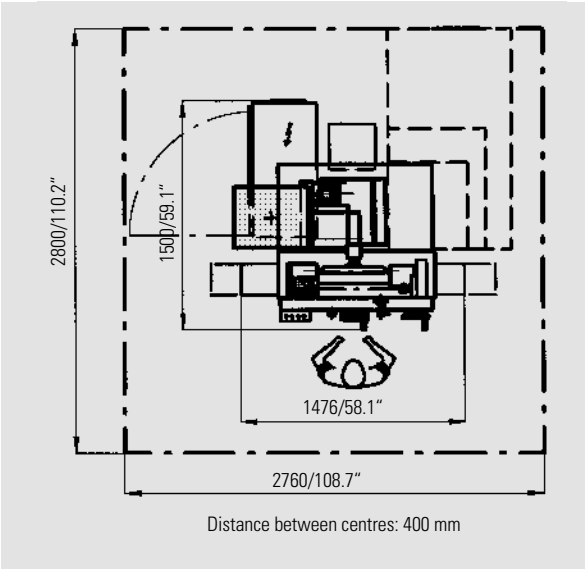
Rebuild
Machine overhaul
Assembly overhaul

Retrofit
Modifications
Retrofits

Technical data

Main dimensions

Distance between centres	400 / 650 mm (15.7"/25.6")
Centre height	100 mm (3.94")
Max. workpiece weight between centres	20 kg (44 lbs)



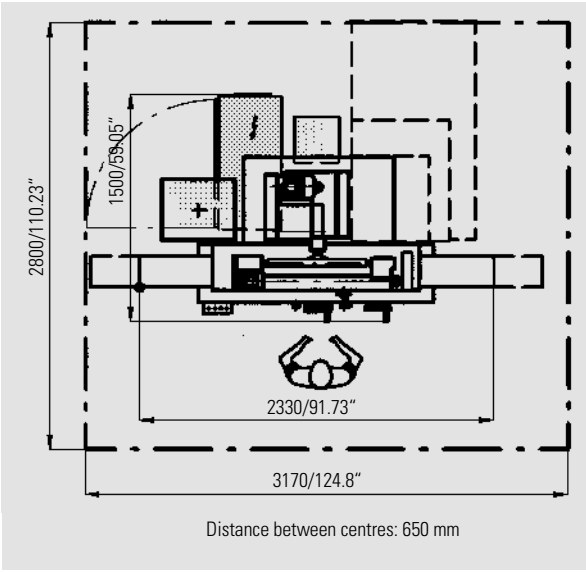
Distance between centres: 400 mm

Cross slide: X axis

Rapid approach	30 mm (1.18")
Max. travel	25 mm (0.98") [recess depth 1,9 mm (0.7") / 5 mm (0.2") (optional)]
Speed	0,03 – 1,5 mm/min (0.0012 – 0.06 ipm)
Feed travel with handwheel	25 mm (0.98")
Feed 1	0,03–1,5 mm/min (0.001 – 0.06 ipm)
Diameter plunge feed incremental	0 – 0,16 mm (0 – 0.006")
Feed 2 (optional)	0,02 – 0,3 mm (0.0008 – 0.01")
Spark-out time	0 – 5 s
Touching speed (optional)	0,06 – 30 mm/min (0.002 – 1.18 ipm)

Longitudinal slide: Z axis

Max. travel	420 / 650 mm (16.5"/25.6")
Speed	100 – 3500 mm/min (3.94 – 138 ipm)
Reverse precision	0,02 mm (0.000,8")
Smallest automatic travel	aprox. 1 mm (0.04")
Reverse delay	0 – 5 s
Machine table swivelling range	30 / 15 deg



Distance between centres: 650 mm

Wheelhead

Swivel range	0 / 15 / 30 deg
Fitting taper	dia. 44 mm (1.73") 1:5,715
Drive power	3 kW (4 hp)
Grinding wheel right, dia. x width x bore	350 x 32 (50F5) x 127 mm [13.78" x 1.26" (2F5) x 5"]
Circumferential speed	30 m/s (5905 sfpm)
Speeds	1 600 / 1 975 / 2 200 rpm

Internal grinding attachment for belt-driven spindles (optional)

Adaption bore	80 mm (3.15")
Speeds	20 000 / 40 000 / 60 000 rpm

Universal workhead

Speeds	80 / 175 / 380 / 800 rpm
Speed range infinitely variable (optional)	30 – 1200 rpm
Fitting taper	MT 4
Spindle feedthrough	24 mm (0.95")
Swivelling range	0 – 90 deg
Driving power	0,5 kW (0.66 hp)
Load during live spindle grinding	12 Nm (9 ft lbs)
Roundness accuracy during live grinding	0,0003 / 0,0002 mm (0.000,012 / 0.000,008")

Tailstock

Fitting taper	MT 2
Travel of barrel	20 mm (0.79")
Barrel diameter	32 mm (1.26")
Fine adjustment for cylindricality corrections	±40 µm (0.0016")

Control unit

SPS control

Guaranteed working precision

Straightness of surface line

Gauge length 380 mm (14.97")	0,0015 mm (0.000,06")
Gauge length 630 mm (24.82")	0,0025 mm (0.000,10")

Connected loads

Total connected load	8 kVA
Air pressure	5 bar (72 psi)

Total weight

Distance between centres 400 mm	1 600 kg (3 520 lbs)
Distance between centres 650 mm	1 900 kg (4 180 lbs)

STUDER

Fritz Studer AG
3602 Thun
Switzerland
Phone +41 33 439 11 11
Fax +41 33 439 11 12
info@studer.com
www.studer.com

S20 · Printed in Switzerland · V4 · 06/2018 · en

BLUECOMPETENCE Alliance Member
Partner of the Engineering Industry Sustainability Initiative

ISO 9001
VDA6.4
certified

SWISS MADE