



AWM-Precision GmbH
Parkallee 5 · 16727 Velten · Deutschland
Amtsgericht Potsdam · HRB 30034 P · USt-IdNr.: DE312793309

STUDER S30-1 · Year 2005 · No. 019.3784

Application sheet: universal cylindrical grinding in carbide tool manufacturing — complete technical data, fields of use and the honest limits of the machine

This sheet summarises additional technical information on this machine. The data are taken from the **original operating manual supplied with the machine by Fritz Studer AG** and from the **manufacturer's series brochure**, complemented by the nameplate, the operating hour counter and our own photo documentation. We deliberately distinguish between the factory specification of the S30 series and the configuration of this individual machine. Figures we have not yet measured ourselves are marked "to be confirmed".

Need a value more precisely? Simply send us a request naming the dimensions or properties that matter to you — we will measure them on the machine and confirm the result to you in writing before conclusion of the contract. We do not put anything into a datasheet that we cannot substantiate.

01 Identification and configuration

Item	Value
Manufacturer	Fritz Studer AG, CH-3602 Thun — UNITED GRINDING / KÖRBER
Type · year · series · machine no.	S30-1 · 2005 · 090 · 019.3784
Machine code	0091 211 C
CE marking	present; EC declaration of conformity issued for this machine number, Thun, 27 Sept 2005
Operating hours (counter)	38,388.5 h
Centre distance version	1,000 mm (per the factory documentation of this machine)
Wheelhead	swivelling, external grinding wheel on the left Ø 400 × 80 × Ø 127 mm, hydrodynamic plain bearings. The series is supplied either as a universal wheelhead (wheel left, right and internal grinding attachment) or as an external wheelhead; the version of this machine is confirmed upon inspection
Workhead	per operating manual 30–1,000 rpm stepless, MT 5, W-25 collets — to be confirmed
Readout / gauging	Sony LD10 digital readout on a swivel arm fitted. No in-process gauging is identifiable on our photos; it is an accessory at the manufacturer
Machine base	Granitan® S103 mineral casting, guideways coated with Granitan® S200
Documentation supplied	original operating manual DE/EN/FR (edition 0091 211 C/00) incl. spare parts catalogue, lubrication and maintenance sections, noise measurement protocol

The 1,000 mm version is documented in the factory paperwork supplied with this machine: in all four grinding-geometry tables of the operating manual exactly the row for 1,000 mm (clamping length 1,030 mm, table stroke 1,050 mm) is set in bold, the other sizes are not. Centre height (125 / 175 / 225 mm) will be confirmed bindingly before delivery or at inspection — we deliberately state no value we have not measured ourselves.

02 Complete technical data

Parameter	Value
Main dimensions	
Centre distance · clamping length · table stroke	1,000 · 1,030 · 1,050 mm
Centre height	125 / 175 / 225 mm (to be confirmed)
Max. workpiece weight between centres	130 kg
Table swivel	8.5°
Cross slide — X axis	
Rapid adjustment · max. travel	60 mm · 300 mm per manual (brochure: 255 mm) · infeed depth 3.4 mm on Ø
Feed 1 · feed 2 · incremental infeed	0.012–6 mm/min · 0.012–1.2 mm/min · 0.001–0.05 mm
Spark-out time ·	0–6 s · 4 mm on Ø

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handwheel
revolution

Longitudinal slide — Z axis

Max. travel · speed
1,050 mm · 50–5,500 mm/min

Smallest automatic table travel · reversal accuracy
1.5 mm · 0.02 mm

Wheelhead

Swivel range · indexing · taper
0° to +180° · 5° Hirth coupling · Ø 63 mm

Drive power · speeds
5.5 kW per manual (previous supplier: 7.5 kW — to be confirmed) · 1,670 / 2,110 rpm

Grinding wheel max. · peripheral speed
Ø 400 × 80 × Ø 127 mm · 35.0 / 44.2 m/s

Wheel spindle bearings
hydrodynamic plain bearings — wear-free, no clearance adjustment

Workhead · tailstock · internal grinding

Speeds · taper · collets · swivel
30–1,000 rpm stepless · MT 5 · W-25 · 0–90°

Drive · load in chuck grinding
0.55 kW · 100 Nm

Roundness in chuck grinding
0.0003 mm (hydrodynamic) · 0.0005 mm (roller bearing)

Tailstock: taper · quill stroke · quill Ø
MT 3 · 35 mm · Ø 50 mm

Wheel dressing
adjustable dressing attachment on the tailstock, mounted · dressing by hand via table travel and infeed handwheel · no automatic dressing cycle and no dressing control

Cylindricity fine adjustment
± 40 µm

Internal grinding attachment
factory data for the series: hinged, for belt spindles · 1.5 kW drive · reach to face 210 mm · max. workpiece Ø 129 mm in three-jaw chuck, 140 mm with steady rest

Guaranteed working accuracy
straightness 0.0025 mm over 400 mm · 0.004 mm over 650 mm

Power supply · air · noise level
400 V / 50 Hz, max. 13 kVA · 5 bar · ≤ 75 dB(A) per factory protocol

Weight
approx. 3,500 kg (factory brochure, 1,000 mm version)

03 Why this machine suits carbide work

The speed steps hit the diamond window precisely

For resin-bonded diamond wheels on carbide the working window of peripheral speed is **18–35 m/s**; above 40 m/s wheel wear and fire risk rise sharply.

Ø 400 wheel · step 1: $\pi \times 0.400 \times 1,670 / 60 = \mathbf{35.0 \text{ m/s}}$

Ø 400 wheel · step 2: $\pi \times 0.400 \times 2,110 / 60 = \mathbf{44.2 \text{ m/s}}$

Wheel dressed down to Ø 316 · step 2: $\pi \times 0.316 \times 2,110 / 60 = \mathbf{34.9 \text{ m/s}}$

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The first step sits exactly on the upper limit of the window. Once the wheel has been dressed down to roughly Ø 316 mm, the second step restores the same value. The machine therefore holds the cutting speed in its optimum **across the entire wheel life** — STUDER quotes 35 m/s as the design figure for the S30.

Granitan® S103 — the manufacturer's measured figures

Property versus grey cast iron	Factor
Vibration damping	up to 15× better
Heat absorption	2× higher
Heat conduction	up to 13× slower
Thermal expansion	same as steel — no stress at the interfaces between assemblies

For carbide work this pays off twice: the damping protects the expensive diamond wheel and prevents edge chipping on the brittle material, while the thermal behaviour holds size across the whole shift. STUDER names the increased **wheel life** alongside surface quality as a direct consequence of the damped base.

Process reliability through the hydraulic cycle

The automatic grinding cycle is hydraulically controlled: rapid approach, two working feeds, adjustable spark-out time and automatic shut-off — repeatable, and without control electronics that would no longer be available after twenty years. Together with the guaranteed working accuracy of 0.0025 mm over 400 mm measuring length and a roundness of 0.0003 mm in chuck grinding, the process window lies clearly within what **h5/h6 shanks** require — cylindrical grinding industrially achieves IT5–IT6 at Ra 0.16–0.04 µm. In-process gauging that compensates wheel wear and temperature during grinding is offered by STUDER for this series as an accessory; none is fitted to this machine.

04 Case study: interchangeable-head milling cutters

Taking a solid-carbide interchangeable head of the ISCAR Multi-Master type MM ERS160B12-5T10 IC908 (Ø 16.00 mm, 5 flutes, ap 12 mm, T10 thread, seating diameter 15.30 mm, head length 20.50 mm, 45° helix), it is easy to show which part of the manufacturing a universal cylindrical grinder covers — and which it does not.

The interface of such systems carries load through three elements: a **short precision taper** for centring, a **face contact** created by elastic deformation of the female taper inside the shank, and a **thread with a special profile** that only clamps. It follows necessarily that taper, seating face and thread must be ground and precisely aligned to each other and to the cutting envelope — the taper governs runout, the face governs the projection length.

#	Operation	Machine
1	Cylindrical grinding of the blank to reference diameter	S30 YES
2	Face grinding of the end faces	S30 YES
3	Grinding the short centring taper	S30 YES
4	Grinding the Ø 15.30 seating face square to the axis	S30 YES
5	Thread grinding T10	thread grinder NO
6	Flutes, 45° helix	5-axis tool grinder NO
7	Reliefs, gashing, 0.4 × 45° chamfer, edge preparation	5-axis tool grinder NO

The second half of the system — the shank

The **shank side** is the second half of the job. Adaptor shanks of such interchangeable-head systems are rotational parts in steel, solid carbide or heavy metal with a precise outside diameter and an internal taper seat. The outside diameter to h5/h6, the faces and the centring taper are ground by this machine. The **internal taper seat**, however, requires the hinged internal grinding attachment — it is not part of the scope of delivery of this machine and is available from STUDER as an accessory (attachment, belt spindle, internal wheels, arbors). Only then does the coaxiality of seat and shank arise in one setup; it cannot be repaired afterwards. "External and internal grinding in one setup possible" is how STUDER describes the series — *possible*, not standard.

Head data: ISCAR Multi-Master catalogue, "Indexable Solid" edition, item tables. The allocation of manufacturing steps to machine types is our own engineering assessment, not a statement by the tool manufacturer. Tolerances and repeatability figures of the interface are not published.

05 What the machine cannot do

No thread grinding — by design

The longitudinal slide of the S30 is driven **hydraulically**. There is neither a lead screw with change gears nor an electronic coupling between workpiece rotation and Z feed — a thread lead cannot be generated. STUDER offers thread grinding exclusively on CNC machines with a **C axis on the workhead** and the StuderThread software (S31 / S33 / S41). No thread-grinding attachment exists for the S30.

Also outside the machine's scope: flute grinding, relief grinding, CNC form grinding and automatic multi-diameter cycles. These are tasks for 5-axis tool grinders.

06 Classification

- The S30 is **not a discontinued model**: Fritz Studer AG still lists the series in its current production programme (brochure 04/2024). Spare parts, service and assembly or machine overhaul run through UNITED GRINDING Customer Care.
- Hydraulic control carries **no obsolescence risk in the control electronics** — with CNC machines of this vintage that is the usual cause of failure after twenty years.
- STUDER positions the series explicitly for **single-piece and small-batch production** with short set-up times — the profile of a special-tool shop.

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- The machine stands **packed and ready for shipment in Velten**; delivery 1–2 working days after receipt of payment. Delivery term **FCA Velten (Incoterms 2020)** — **loading onto your means of transport is carried out by our staff** and is included in the price. On request we organise transport to your factory. A factory-refurbished comparable machine of the same year is currently offered with an 8–10 week lead time.

Note on the technical data

The technical data stated in this sheet are taken from the manufacturer's documentation (series brochure/catalogue) and from the operating manual supplied with the machine, and reproduce the content of those documents as information received; we have not carried out our own metrological verification of every individual value. Unless expressly agreed otherwise in the purchase contract or in our order confirmation, they therefore do not constitute an agreement on quality (Beschaffenheitsvereinbarung) or a guarantee within the meaning of Sections 434, 443 of the German Civil Code (BGB). We will verify and confirm individual values material to you upon specific request or jointly at the inspection appointment; we expressly recommend inspecting and testing the machine before conclusion of the contract. This offer is non-binding; errors, technical modifications and prior sale remain reserved. Our statutory liability for intent and gross negligence, for injury to life, body or health, for fraudulently concealed defects and under any expressly assumed guarantee remains unaffected. In case of discrepancies, the German version of this notice prevails.

Sources: Fritz Studer AG, S30 brochure (editions 06/2018 and 04/2024) · studer.com product and Granitan® pages · the original operating manual supplied with this machine, incl. technical data sheet BA 0091 504 A, grinding geometry tables and noise protocol · UNITED GRINDING on coolants for carbide · technical data on resin-bonded diamond wheels · ISCAR Multi-Master catalogue and grade chart · our own photo documentation of the machine. Issued 18.08.2026 · AWM-Precision GmbH · Errors and prior sale excepted.

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