



LIDKÖPING **High Volume**[™]

SGP 320 External Grinder/
SSB 320 Internal Grinder





ABOUT US

UVA LIDKÖPING develops, markets, manufactures, and installs high-precision grinding machines with surrounding equipment within the area of high precision grinding. We market our products under the trademarks LIDKÖPING and UVA. UVA LIDKÖPING business areas include grinding machines, and complete aftermarket solutions that include service, productivity enhancing upgrades, and rebuilds.

UVA LIDKÖPING has delivered over 10 000 machines, and is represented in every part of the industrialized world. With over a 100 year old tradition of engineering excellence, UVA LIDKÖPING is today a high-technology company in the vanguard of grinding research and development.

Extensive knowledge and grinding experience gives UVA LIDKÖPING a powerful technological advantage and our products are recognized for their consistently high performance and quality. Customers include many of the world's leading producers in the bearing, automotive and hydraulic industries.



The High Volume™ Grinders

A new series of internal and external grinders for high volume manufacturing of bearings and similar parts. The machine concept is based on the earlier generations of LIDKÖPING machines delivered in thousands all over the world. While this concept originally was made for the small range bearing sizes, the all new High Volume™ machines take this well proven concept also into the medium and large segment of bearings and other work pieces.

THE HIGH VOLUME™ SGP 320 EXTERNAL GRINDER

The direct driven grinding wheel spindle carries a Ø 610 mm grinding wheel, up to 120 mm wide, with or without automatic balancing built-in to the grinding wheel flange. With the grinding wheel dresser fixed onto the machine base, during the grinding cycle, the grinding wheel spindle is moving between three positions; grinding, loading and dressing.

THE HIGH VOLUME™ SSB 320 INTERNAL GRINDER

Various speed range high frequency grinding wheel spindles are used and automatic balancing can be built-in to the grinding wheel quill. The cross and length slides are stack mounted while the dressing unit is fixed onto the machine base. All positioning for grinding and dressing is made by the stacked slides.

Fit for Purpose

In order to have an optimal machine investment, the machines are designed with “fit for purpose” as a leading star. No equipment without a clear and specific use is integrated. The machines may, by the customer, be configured and optimized for its exact desired operation.

While using the very same slide modules, the machine is divided into four totally optimized machine working ranges. Should later another machine range be needed, it would only require a light reconfiguration of the machine to have a different working range

MODULAR DESIGN

To the highest degree possible, the very same machine modules are used for both the High Volume™ SSB 320 Internal and SGP 320 External Grinders. This in order to keep the number of needed spare part inventory to a minimum. It will also be a benefit for the machine maintenance since the machine's common building structure will make the machines easier to understand and thus require less training. But maybe the most important: the machine's modern concept and reduced number of components result in a high machine uptime.

The everlasting hydrostatic slides are of LIDKÖPING design and driven by either a servomotor & ball screw or an optional high performance linear motor. The machines are approved for cutting speeds up to 60 m/s.

There are two types of dressing units available; a fast full profile diamond roller dresser for the highest productivity needs and an NC-dresser for more flexibility. The NC-dresser comes with two different dressing tools; single point diamond, cup wheel diamond or diamond disc. The diamond disc dressing spindle could also be fitted with a full profile diamond roller thus uniting the two worlds of productivity and flexibility.

SUSTAINABILITY

The machines only require 4 bars air inlet. By using the Lidköping Energy & Cost saving technology, the compressed air consumption is reduced by more than 50%. (Compared to the earlier generation machines.)

Both dressing and loading systems are built with electrically or pneumatically driven parts. Hydraulics are only used for the hydrostatic slides. Thus the hydraulic unit is very small and in order to reduce energy consumption, its motor is controlled by the control system and only operates when needed.

LOADING & UNLOADING

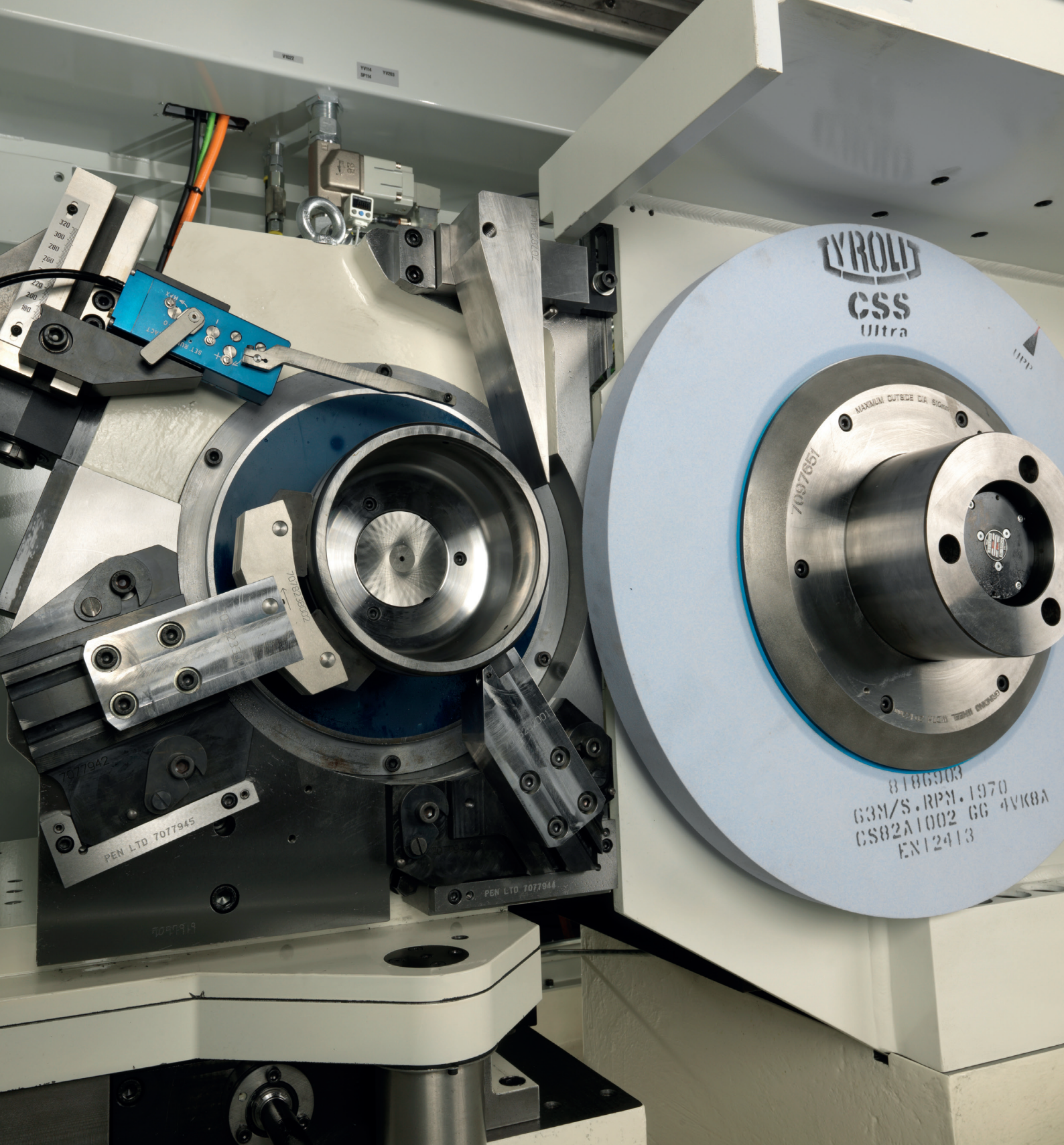
The workpieces are fed in and out of the machine through adjustable in- and outlet chutes. The newly designed loaders, one for each of the three machine ranges, are of 2-arm loading concept and very fast. Loading/unloading times from 1 second for the smallest ring up to 6 seconds for the largest is achieved. These loaders are used for magnetic shoe chucking applications.

The machines can also be configured with a centric chuck for grinding of cogwheels and hub unit rings with flanges. In these cases a V-loader is used. The parts are fed in and out of the machines on chutes or through a gantry loader.

Since the work head is mounted on the box and separate to dressing, the work piece loading/unloading can be made simultaneously as the dressing operation.

HIGH VOLUME PRODUCTION

Both the low cycle times and the high uptime are important factors in ensuring a very high output capacity. The high output makes the machine a perfect match for large batch size manufacturing. Nevertheless, the change-over time from one workpiece to another is less than 30 minutes.



PLUG-AND-PLAY

The machines are designed with small footprint in mind. The electrical cabinet and the control system panel are tightly integrated into the machine cover. The hydraulic unit is also attached to the machine, but only during the transport. During the installation the unit is released and placed on the floor to avoid eventual vibrations being transferred into the machine while grinding. Obviously a small footprint is good for floor space reasons.

Another benefit of the small footprint is that it makes the machines easily transported in standard containers. Several machines can be transported in one single container.

Once the machine is delivered, the installation is plug-and-play, no on-site assembly is required. Thus, the installation time can be kept to a minimum.



HYDROSTATIC SLIDES SYSTEM

The length slides, and the SSB 320 cross-slide, are hydrostatic for a trouble free and accurate positioning. The slide's hydrostatic pockets are cross-balanced thus self-adjusting for lateral forces.

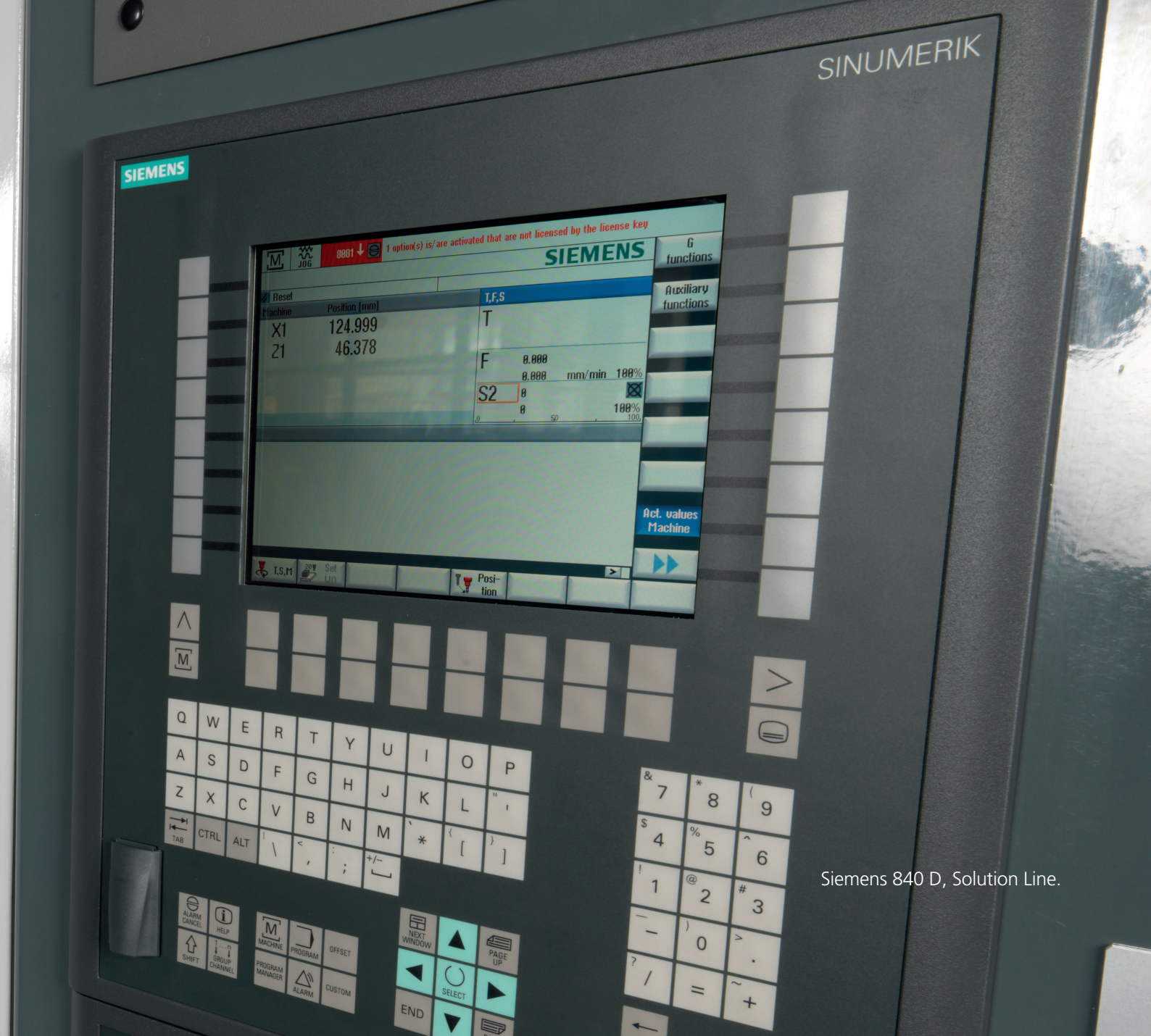
The close to zero-friction avoids all slip-stick effects and since there is no metal-to-metal contact, the hydrostatic slide has everlasting life.

The SGP 320 dovetail type cross slide can be manually operated from the front of the machine, without opening the door.

WORK HEAD

The work head is fitted with a swivel function. The swiveling is used for setting the work head in an angle from 0,5 to 32 degrees. When dressing with a full profile diamond roller, it is also used for manual workpiece taper correction.

The direct driven work head spindle is supported by high precision angular contact ball bearings. The axial run-out is less than 1 μm . By using a direct driven spindle, any unwanted vibrations from belts are avoided. Neither are there any belt maintenance nor belt adjustment needed. The special spindle is manufactured by GMN to our specific UVA LIDKÖPING specification.



Siemens 840 D, Solution Line.

CONTROL SYSTEM

The control system design is also designed with “fit for purpose” thinking. It is simplified however holding a high degree of machine supervising in the background. The operator will see only what is needed for operating the machine. We also have a long experience in making a Human-Machine-Interface for the customer’s specific grinding process with automatic storing of all grinding parameters.

After entering actual part geometry and desired removal rate Q' , the HMI automatically calculates the complete grinding cycle (positions, feed rates etc.). The geometrical compensations are also made easy. After grinding a part and manually measuring it, the operator simply enters the gage’s read outs. The machine then calculates necessary compensations which are performed during the subsequent dressing.

CUSTOMIZATION

As usual UVA LIDKÖPING offer the machines tooled, programmed and fully capability tested using the customer’s own workpieces.

Another option for the experienced customer is to handle the tooling and also the grinding process by themselves. Therefore we offer the machines in un-tooled condition i.e. a thoroughly function tested machine with a machine program for only the basic machine movements.

The machines are built with the UVA LIDKÖPING choice of optimized modules and components. Should it be required we could also offer the machines built to the customer’s own technical specification.

Basic Machine

The following is included in the High Volume™ Grinder basic



- Base, made of cast iron.
- Hydrostatic length slide, driven by servomotor and ball screw.
- Hydrostatic cross-slide, driven by servomotor and ball screw. (SSB 320)
- Dovetail type cross-slide, manually operated. (SGP 320)
- Work head spindle, direct driven.
- Grinding wheel spindle, direct driven.
- Loading unit with adjustable in- and outlet chutes
- Control system, Siemens 840D sl.
- Machine cover and doors.
- Control system cabinet, integrated into the machine's front side.
- Compressor cooled complete electrical cabinet, integrated into the back of the machine.
- Machine light.
- Hydraulic and pneumatic panels with cabling & piping.
- Coolant in- and outlet.
- Oil mist exhaust chimney.

Machine Configuration

MACHINE OPTIONS

Loader & Working Range

- Shoe chuck with 2-arm loader, Ø 20 - 72 mm
- Shoe chuck with 2-arm loader, Ø 50 - 160 mm
- Shoe chuck with 2-arm loader, Ø 120 - 240 mm
- Shoe chuck with 2-arm loader, Ø 190 - 320 mm
- Centric chuck with V-loader

Hydrostatic Slide's Drive

- Ball screw and servomotor
- Linear motor

Dressing Unit

- Plunge dresser for full profile diamond roller, max roller width 50 mm
- Plunge dresser for full profile diamond roller, max roller width 120 mm
- NC-dresser for single point diamond
- NC-dresser with high frequency spindle driven diamond disc
- NC-dresser for diamond disc, max ring width 80 mm. The unit can also use full profile diamond rollers, max ring width 50 mm

Control System

- Machine hard- and software for plunge dressing
- Machine hard- and software(s) for NC-dressing

Grinding Spindle Equipment

- High frequency spindles for several different speed ranges are available (SSB 320)
- Acoustic emission (AE) sensing
- Adaptive grinding force control (SSB 320)

Gauging

- 1-finger in-process gauging (SGP 320)
- 2-finger in-process gauging (SSB 320)

ADDITIONAL OPTIONS

Auxiliary Equipment

- Optimized hydraulic unit
- Cooling water unit
- Oil mist filtration
- Grinding coolant return tank and pump
- Grinding coolant filtration
- Operator's nozzle for compressed air
- Operator's nozzle for grinding coolant

Setting Tools

- General tool box
- Settijng fixture for shoes
- Driving plate grinder
- Lifting hook for grinding wheels (SGP 320)
- Lifting hook for NC-dresser spindle (SSB 320)

Tooling

- Range dependent tooling
- Type dependent tooling

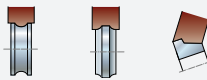
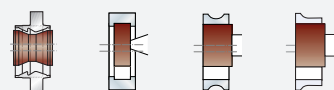
Engineering

- Customer's technical standard
- Machine color(s)
- Control system language
- Documentation, on CD or pntinyted in binders
- Runoff
- Installation at customer's site
- Final acceptance test
- Training

Shipping

- Shipping by truck or sea globally

Technical Data

Machine	Type	Work holding	Principle	Work Piece Dimension	
				OD	WIDTH
SGP320	External	Shoe centerless or centric		ø 20-72 ø 50-160 ø 120-240 ø 190-320	Max 120
SSB320	Internal	Shoe centerless or centric		ø 20-72 ø 50-160 ø 120-240 ø 190-320	Max 120

GENERAL

	SGP 320	SSB 320
Workhead spindle speed	0-1100 rpm	0-1100 rpm
Work height (from floor to work piece centre)	1100 mm	1100 mm
Machine height	2198 mm	2280 mm
Machine weight including electrical cabinet	6500 kg	7500 kg
Footprint	2728 mm x 2190 mm	2920 mm x 2190 mm
Safety standards	Machines 2006/42/ECC EMC 2004/108/EEC Low voltage 2006/95/EEC	Machines 2006/42/ECC EMC 2004/108/EEC Low voltage 2006/95/EEC
Material in base	Cast iron, GJL-250	Cast iron, GJL-250
Noise level	75 db (A)	75 db (A)

LENGTH SLIDE

Slide type	LIDKÖPING System 200 hydrostatic linear slide	LIDKÖPING System 200 hydrostatic linear slide
Type of feeding	Ballscrew or Linear Motor	Ballscrew or Linear Motor
Type of position feedback	Linear encoder	Linear encoder
Position feedback resolution	0,0001 µm	0,0001 µm
Repeatability accuracy	0,05 µm	0,05 µm

CROSS SLIDE

Slide type	Dovetail	LIDKÖPING System 300 hydrostatic linear slide
Type of feeding	Manual	Ballscrew or Linear Motor
Type of position feedback	-	Linear encoder
Position feedback resolution	-	0,0001 µm
Repeatability accuracy	-	0,05 µm

WORKHEAD SPINDLE

	SGP 320	SSB 320
Type/Make	Lidköping / GMN	Lidköping / GMN
Speed	1-1100 rpm	1-1100 rpm
Max torque	100 Nm	100 Nm
Drive motor type	High frequency spindle	High frequency spindle
Rpm supervision type	Built in Encoder	Built in Encoder
Axial run-out	Less than 1 µm	Less than 1 µm
Axial movement driving plate	8 mm	8 mm
Swivel angle	+30° - -0,5°	+0,5° - -30°

GRINDING SPINDLE

Type/Make	Lidköping / GMN	Lidköping / GMN
Speed	1500-2420 rpm	Range dependent
Power	30 kW S1	Range dependent
Drive motor type	High frequency spindle	High frequency spindle
Balancing unit type	Automatic - mechanical	-

GRINDING WHEEL

Grinding wheel Max diameter	Ø 610 mm	Ø 180 mm
Worn out diameter	70% of new wheel	70% of new wheel
Max width	120 mm	120 mm
Max surface speed	60 m/s	60 m/s

CHUCKING AND LOADING

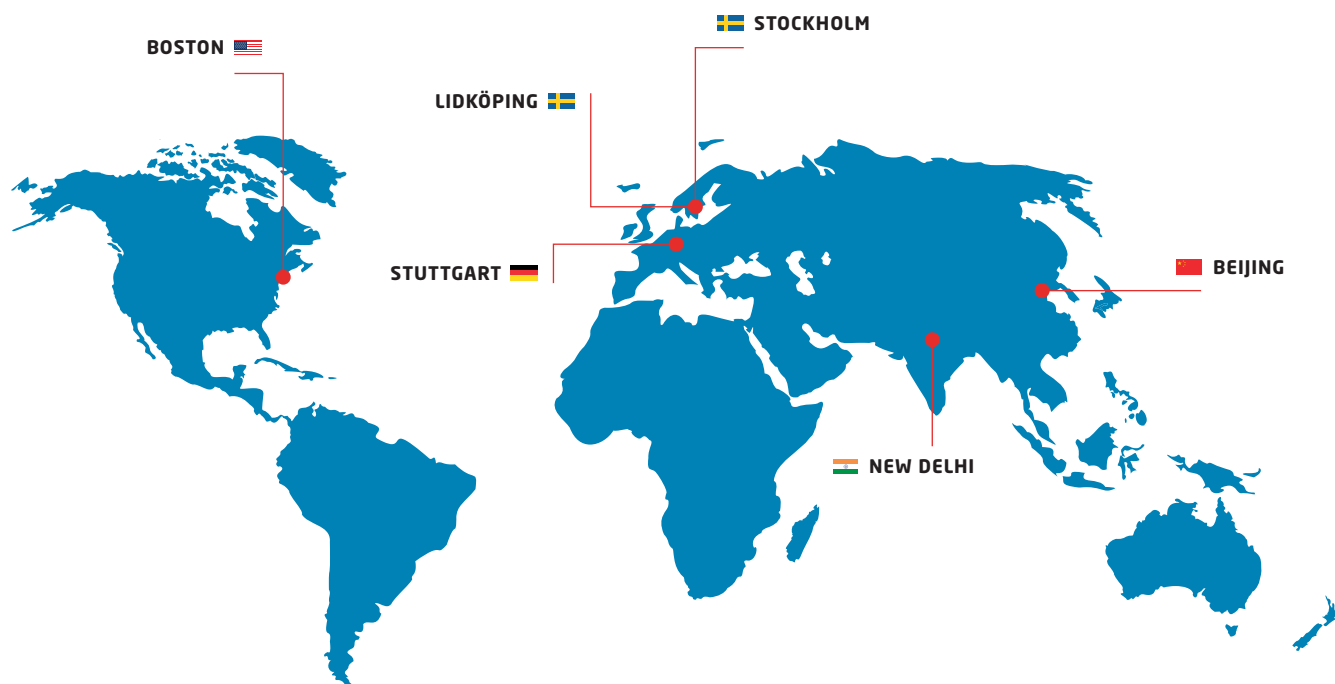
Chuck type	Shoe centerless / centric	Shoe centerless / centric
Loading type	2-arm loading system XS ø 20-72 mm S ø 60-150 mm M ø 120-240 mm L ø 190-320 mm V-loader, max ø 320 mm	2-arm loading system XS ø 20-72 mm S ø 60-150 mm M ø 120-240 mm L ø 190-320 mm
Clamping type	Magnetic / Pneumatic Mechanical centric clamp	Magnetic / Pneumatic Mechanical centric clamp

GAUGING

Type (in/post-process)	In-process	In-process
Type of retraction	Pneumatic	Pneumatic

Please note that all data stated are correct at time of printing but are subject to change.

UVA LIDKÖPING GLOBAL PRESENCE



SALES AND SERVICE OFFICES

UVA LIDKÖPING AB, Stockholm, Sweden
+46 8 634 75 33, sparepartsuva@uvalidkoping.com

UVA LIDKÖPING AB, Lidköping, Sweden
+46 510 88 112, servicelidkoping@uvalidkoping.com

UVA LIDKÖPING Private Limited, India
+91 124 4368361, infoindia@uvalidkoping.com

UVA LIDKÖPING, Inc., Boston, USA
+1 508 634 4301, serviceboston@uvalidkoping.com

UVA LIDKÖPING Precision Grinding (Beijing) Co., Ltd
+86-1065 2205 15, infouva_asia@uvalidkoping.com

UVA LIDKÖPING GmbH, Germany
+49 7152 35 939 14, infouva_germany@uvalidkoping.com