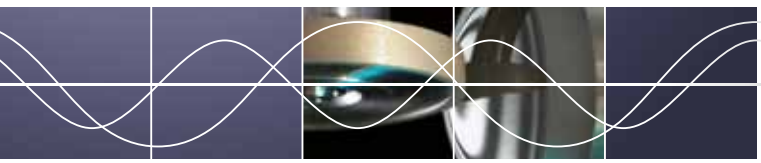
Precision Optics

Grinding

Surfacing Center SCG 100

Efficient grinding of spheres and aspheres



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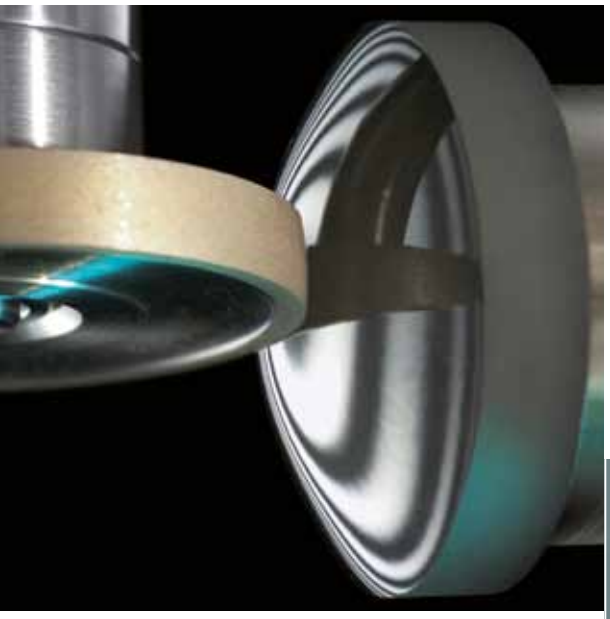


Introducing the Surfacing Center SCG 100

Your requirements for high-performance grinding solutions are constantly changing. The solution: the Surfacing Center SCG 100, a compact and attractively priced grinding machine which comes precisely equipped to your current requirements – whether spherical or aspherical.

Several spindle configuration and other options are available to tailor your investment to your specific requirements.

The modular SCG 100 platform has the capability to combine various spindle configurations. This includes direct drive grinding spindles.

The optional packages offer fast automation and sophisticated in-process measurement technology enabling the optimal configuration even for challenging needs.

Modular kinematics and computer supported setup make it possible to manufacture the whole spectrum, from flat surfaces and spheres to complex aspherical lenses, in an economical way.

Solid foundation
The machine has a stiff cast-iron base for kinematics with up to 5 axes and 5 spindles.

The industrial PC controller system runs the AC servo drives, enabling high precision and excellent dynamics of the lens processing.

Advanced spindle technology
Outstanding is the multi-spindle system of the SCG 100. With the spherical version, up to three independent tool spindles and two workpiece spindles give you the freedom to arrange your processes to your individual needs.

The basic version S2/1 enables you to rough- and fine-grind your lenses with two tool spindles in one process cycle. The tool spindles allow for automated multi-step processing. One spindle does the rough grinding including centering and beveling while the second spindle takes care of the fine grinding. The high reproducibility and quality of the processing allows the fabrication of lenses even if no test glass is available – perfect for the flexible production of small batch sizes.

With the version S3/1 the grinding is brought to the finest level – ready for a first interferometric check. The additional third tool spindle is an air-bearing spindle to meet the highest quality requirements. You can also use your choice of three different tool spindles to increase your flexibility in small-batch processing without a disruptive tool change.

The version S2/2 has its strength in the fully automated two-side grinding. The complete grinding of a lens in one uninterrupted workflow enables the economical production of medium and large batches. The two-side grinding becomes possible by the implementation of a second workpiece spindle and an integrated alignment and flip-over station.

All three versions come with an optional fast automation which includes automatic lens detection, automatic setup cycles and multi-purpose workpiece magazines. Your hands and mind are free to focus on the next step in your work schedule.

As an option, you can choose direct-driven rough- and fine-grinding spindles for even smoother processing with further reduced sub-surface damage.

Automated processing
The combination of the machine with an optional, retrofitable automation assures fast handling, minimum auxiliary times, and thus maximum cost-effectiveness. The module supports carousel or pallet operation and is easy to teach.

Version SCG_A 100 – spheres and aspheres made in one machine
As the companion of the SCG 100 which is solely dedicated to spherical lens grinding, the SCG_A 100 has full grinding capabilities of spheres and aspheres. The extended axis arrangement of the SCG_A 100 with two additional horizontal tool spindles allows optimized, bend-free axis movement. Very precise contour processing of aspherical lenses is guaranteed.

The alternatives wheel grinding and cup wheel grinding as well as edge processing give you the freedom to select the optimal manufacturing processes for convex and concave aspheres.

A comprehensive technology package controls usage and balance behavior of the tools, measures the form accuracies of the different grinding steps and calculates the form corrections. You have optimal control of the individual process steps.

Rough and fine grinding of spheres using the double spindle technology.

The CNC-controlled automation enables an efficient automated production even for small batches.

RFID technology reads and saves parameters of process components. The RFID tag stores the data directly on the tool.

The center-thickness (CT) Control is an integral part of the comprehensive process control package.

In-process metrology
The consistent high performance and tight process control is accomplished with our integrated metrology package. The process control compensates for tool wear and process drift.

- The **CT Control** automatically checks the center thickness of the lens and makes adjustments.
- The **Tool Control** recognizes the grinding tools and reduces significantly the set-up and correction times.
- The **Feed Control** and its first-touch technology reduce the air cutting time during the tool approach to a minimum – saving valuable process time. The Feed Control also optimizes the process during grinding by adjusting the feed rate of the tool with respect to the cutting conditions.
- The **Curve Control** allows for the measurement and correction of the spherical geometry.
- The **Balance Control** allows the operator to control and optimize the smooth run of the tools resulting in significantly reduced subsurface-damage of the valuable work pieces.

In addition to the in-process metrology, the **Geo Control** is a CNC-controlled fine adjustment of the mutual positions of the workpiece and tool spindles to optimize the spherical quality and form error.

Data communication
The system interfaces to an Ethernet network connection and to the **SCHNEIDER Optical Technology (SOT)** software enabling smooth and effective data exchange for setup and operation. Service is supported by an intelligent analysis system with remote diagnostic.

A graphical user interface assists the operator for an easy and fast completion of communication tasks with the SCG 100.

The seamless link of the surfacing center SCG 100 with external measuring equipment assures a smooth and flawless process flow. The corrections are networked into the machine.

When using the Surfacing Center SCG 100 you have the means to be better, faster and more competitive. The processing capability and the widely automated operation of the SCG 100 make this machine a perfect mate for the SCHNEIDER SCP 100 polisher.

Benefits
- Special kinematics optimized for spherical & aspherical grinding
- Integrated process control for high process stability
- High quality and form accuracy
- Aspheric package with cup-wheel and wheel grinding capabilities
- Multiple-step processing in one cycle
- Automated parts handling
- Computer-assisted setup
- Optional direct-drive high-performance rough- and fine-grinding spindles for minimal subsurface damage
- Graphical user interface
- Intelligent analysis system with remote diagnostics
- Modern network connection
- Automated central lubrication
- Excellent cost/performance ratio

High stock removal and excellent contour accuracy is accomplished in the wheel grinding mode for aspheres.

Cup wheel grinding of concave aspheres with standard tools.

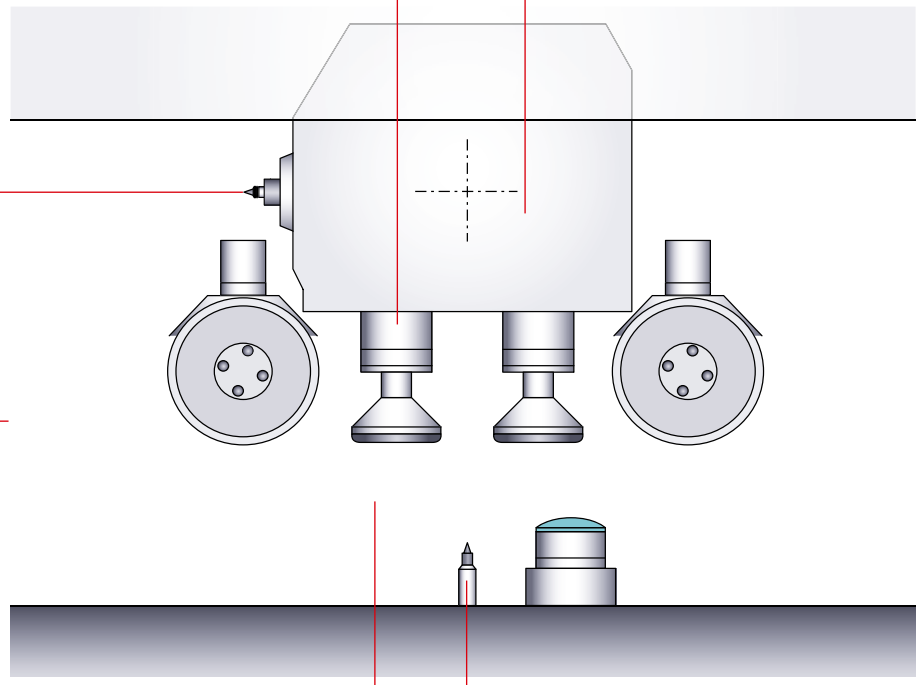
CNC-controlled recognition of the grinding tool reduces the setup time significantly.

The extended axis arrangement of the SCG_A 100 with two additional horizontal tool spindles allows optimized axis movement.

Work space features of the SCG 100

Geo Control
- *CNC controlled axis position*
- *Optimization of sphericity and surface quality*

Feed Control
- *First-touch technology ensures minimal air cutting passes*
- *Load-dependent feed-rate control*



CT Control
- *CNC-controlled measurements ensure precise center thickness control*
- *Reduction of setup times*
- *Process control*

Kinematics
- *Manufactured on a stiff cast-iron base for kinematics of up to 5 axes and 5 spindles*

Tool Control
- *CNC-controlled recognition of the grinding tools*
- *Significant reduction of the setup time*
- *Ensures flawless tool handling*

technical data				
max. working range diameter (mm)				
machine	spheres		aspheres	
	unrestricted	restricted	unrestricted	restricted
SCG 100 S2/1	140	200	–	–
SCG 100 S2/2	140	140	–	–
SCG 100 S3/1	140	200	–	–
SCG 100 S4/1	140	140	140	200
with automation			100 mm	
working range		radius	3 mm – flat	
number of axes			4 + 4 (X, Y, Z, B, optional C, Q1, Q2, Z1)	
feed rate		X-axis	0.01 – 20000 mm/min	
		Y-axis	0.01 – 6000 mm/min	
		Z-axis	0.01 – 6000 mm/min	
positioning and repeat accuracy		X-, Y-, Z-axis	+/- 0.001 mm	
feed rate		B-axis	0.01 – 5400 °/min	
positioning and repeat accuracy		B-axis	+/- 4"	
tool spindle connection			25 x 42 HD, 12 x 30 HD	
speed range grinding tool spindle direct-driven tool spindle high-speed spindle		 max. max.	 rough (fine) 11700 (15000) min^{-1} 15000 min^{-1} 5000 – 50000 min^{-1}	
workpiece spindle connection flange		ø	100 mm	
speed range workpiece spindle			25 – 1200 min^{-1}	
power consumption			20 kW	
compressed air supply		min.	6 bar (90 psi)	
vacuum		min.	0.6 bar (9 psi)	
weight			1700 kg (3750 lb.)	
dimensions without control panel (width x depth x height)			1750 x 1481 x 1940 mm (69 x 58 x 75 inches)	

All data subject to change without notice.

10.2014

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