WEMA GLAUCHAU

WOTAN® S6I

INTERNAL CYLINDRICAL GRINDING MACHINE

for processing very heavy components
or particularly deep bores
with the highest precision

THE NSH GROUP

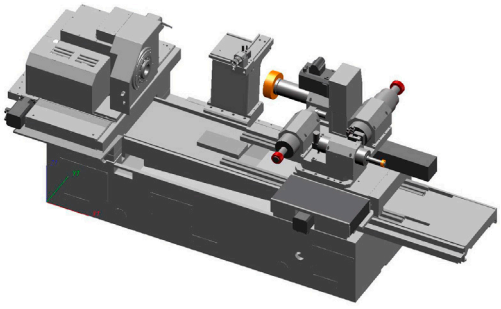
WOTAN® S6I INFO

The machine for highly demanding jobs...

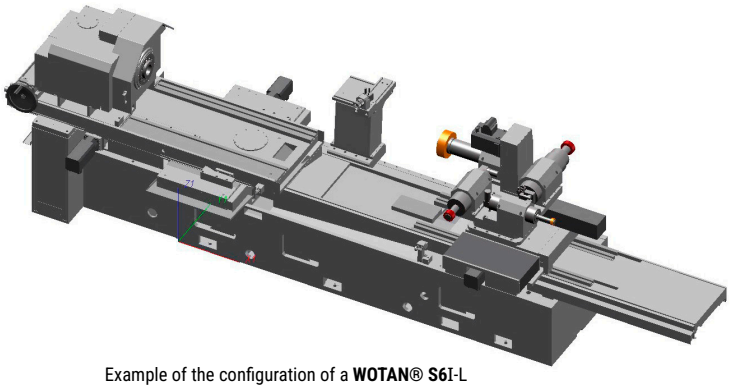
Internal cylindrical grinding machines of the WOTAN® S6I series are designed for processing medium-sized and large workpieces. The workpiece spindle can handle loads of up to 1,300 kg. Our flexible machine design enables us to optimize each machine for your specific grinding jobs.

The **WOTAN® S6I** in its **WOTAN® S6I-F** configuration is suitable for high-precision cylindrical grinding for the bore machining of chuck parts with a swing diameter of up to 820 mm and a workpiece length of up to 800 mm, which are clamped in a flying arrangement without additional support – especially for grinding internal front surfaces, internal tapers and internal diameters.

As an alternative, the machine can be configured with an extended work area as **WOTAN® S6I-L**. This version makes it possible to process shaft-type components with a length of up to 1 200 or 1 800 mm and a diameter of up to 500 mm, apart from chuck parts clamped on one side only, for which a steady rest needs to be added.



Example of the configuration of a **WOTAN® S6I**-F



Example of the configuration of a **WOTAN® S6I**-L

WOTAN® S6I-L

The **WOTAN® S6I**-L offers an extended work area. The entire workpiece spindle headstock will be placed onto a longitudinal guide (L-adjustment) on the side of the workpiece spindle, so that the headstock can be moved towards the Z-direction, which will also allow using a steady rest on the same longitudinal guide.

...in the field of high-precision internal grinding.

WORKPIECE SPINDLE

On the machining side, the machine is equipped with a swivel axis (B1 axis) which can either be manually operated (with an angle measuring system) or be CNC-controlled. The workpiece spindle headstock will be swiveled with the help of the B1 axis which allows not only a correction of the cylinder but also taper grinding in an optimal way.

Moreover, the entire workpiece spindle headstock can be mounted on a transverse axis (U axis). This extends the machine's working range by allowing the entire workpiece spindle headstock to be positioned transversely in the X direction. As the U axis is a positioning axis, it remains fixed during the grinding process.

LARGE SELECTION OF SPINDLES

Depending on the accuracy requirements, the workpiece spindle can be configured as a belt-driven, direct-drive or hydrostatically supported spindle. If the workpiece spindle is equipped with a measuring system (C axis), you can perform high-precision out-of-round grinding operations in various applications on a cylindrical grinding machine.

The machine is equipped with a Z axis and an X axis (cross table) on the side of the grinding spindle. The grinding unit is mounted on the cross table, with the X axis arranged at right angles to the Z axis. Up to four grinding spindles – designed as belt-driven and/or motor spindles – can be mounted on a grinding spindle rotary table, enabling components to be ground economically and efficiently in a single setup.

Always on the move for you –

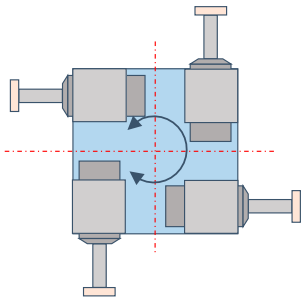
FLEXIBLE GRINDING SPINDLE ROTARY TABLE

The machine can optionally be equipped with a grinding spindle rotary table (B2 axis) with 2 to a maximum of 4 grinding spindles, significantly increasing flexibility and versatility without any spindle changeover.Depending on the application, either belt-driven grinding spindles or high-frequency grinding spindles, or a combination of both, can be used. Belt-driven spindles can be manually exchanged which increases the variability even more.

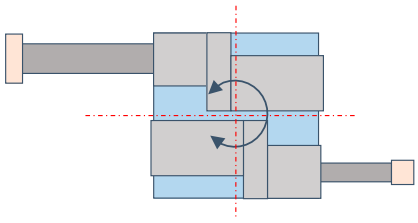
EXTERNAL AND SURFACE GRINDING IS ALSO POSSIBLE

The machine will also allow the additional external and surface grinding of short seats. In order to do so, a belt-driven grinding spindle equipped with an external and surface grinding wheel (›vector wheel‹) that is profiled on both sides will be positioned on the spindle rotary table (B2 axis). Further internal grinding operations can be carried out using additional grinding spindles positioned on the grinding spindle rotary table.

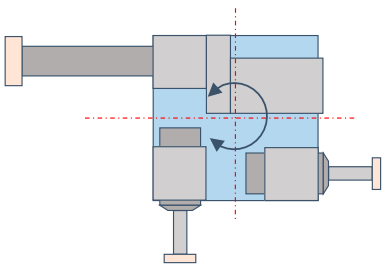
EXAMPLES OF CONFIGURATIONS FOR THE B2 AXIS



4 high-frequency spindles



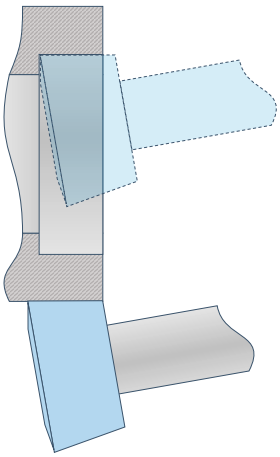
2 belt-driven spindles

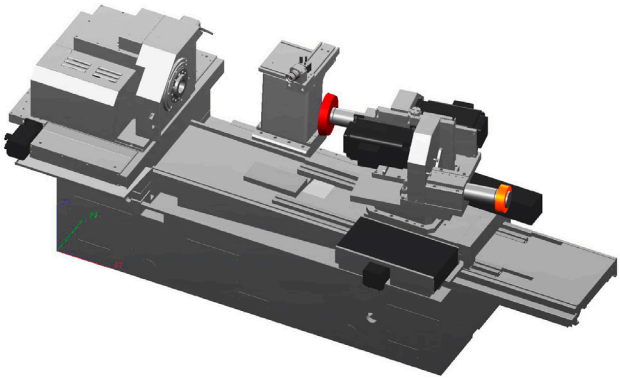


1 belt-driven spindle +
2 high-frequency spindles

VECTOR WHEELS

allow the grinding of internal front surfaces and internal diameters as well as external front surfaces and external diameters.





Example configuration of a grinding spindle rotary table with vector wheel (red) and second belt-driven spindle for internal grinding operations

Options for more flexibility.

VARIOUS DRESSERS CAN BE SELECTED

The dressing unit can be equipped with stationary and driven dressing tools, allowing the use of conventional corundum as well as CBN grinding wheels.

MODERN CONTROL AND EASY USER INTERFACE

The drive package is based on a **SINUMERIK ONE** control with the corresponding drives and motors from SIEMENS.

In addition to the standard SIEMENS user interface, all machines are equipped with our own user-friendly WOP™ Touch operator interface for workshop-oriented programming, which allows simple, menu-guided operation and programming without any CNC knowledge. All functions required for the process ensure continuous handling of the machine, regardless of its operating status.

NUMEROUS OPTIONS AVAILABLE

Depending on the grinding task, we also integrate spark-in/cutting-in detection via fluid sensor technology, additional measuring systems, tool and/or workpiece changing systems, and much more.

WOTAN® S6I at a glance:

		WOTAN® S6I-F (for components clamped on one side only)	**WOTAN® S6I-L** (for component length of up to approx. 1 200mm | 1 800mm)
Work area of the machine			
swing/workpiece diameter in front of the swivel plate	mm (max.)	820	820
swing/workpiece diameter above the swivel plate	mm (max.)	–	650
workpiece diameter in the steady rest	mm (max.)	–	500
workpiece length clamped on one side only	mm (ca.)	800	800
workpiece length with steady rest	mm (ca.)	–	1.200 | 1.800
grinding diameter during internal grinding	mm (max.)	620	620
Internal grinding depth, current	mm (max.)	650	1.200
grinding diameter during external/surface grinding	mm (max.)	on request	on request
grinding length during external/surface grinding	mm (max.)	on request	on request
load-bearing capacity at the spindle head (200 mm from the spindle nose)			
› for chuck parts (clamped on one side only)	kg (max.)	650	650
› for shaft-type components (supported by the steady rest)	kg (max.)	–	1.300
Workpiece spindle headstock			
workpiece spindle			
› belt-driven		standard	standard
› directly driven		option	option
› with hydrostatic bearing		option	option
swiveling range B1 axis (manual with angle measuring system)	from/to °	+12 / –1	–
automatic angle adjustment via B1 axis (CNC)	from/to °	+12 / –1	+12 / –1
C axis for out of round grinding		option	option
U axis (CNC) positioning the entire workpiece spindle headstock crosswise			
› travel	mm (max.)	300	300
› Control system calculation accuracy	mm	0.0001	0.0001
› minimum adjusting increment	mm	0.001	0.001
› speed	m/min	10	10
› resolution of the scale	mm	0.000 01	0.000 01
adjustment of the workpiece spindle headstock in Z-direction	mm (max.)	–	1.400 | 2.000
option to use steady rests		–	standard
coolant flow in through the workpiece spindle		option	option
incision detection/spark-in control via the fluid sensor system when grinding		option	option
Dressing unit			
designed to operate with stationary dressing tools		standard	standard
designed to operate with driven dressing tools		option	option
spark-in control via acoustic emission (AE) sensors during dressing		option	option

		WOTAN® S6I-F (for components clamped on one side only)	**WOTAN® S6I-L** (for component length of up to approx. 1 200mm | 1 800mm)
Grinding unit			
Z axis (CNC)			
› travel	mm (max.)	800 / 1.100	1.100 / 1.380
› Control system calculation accuracy	mm	0.0001	0.0001
› minimum adjusting increment	mm	0.001	0.001
› speed	m/min	15	15
› resolution of the scale	mm	0.000 01	0.000 01
X axis (CNC)			
› travel	mm (max.)	245	245
› Control system calculation accuracy	mm	0.0001	0.0001
› minimum adjusting increment (on the radius)	mm	0.0005	0.0005
› speed	m/min	15	15
› resolution of the scale	mm	0.000 01	0.000 01
spindle rotary table (B2 axis)		option	option
Stationary grinding spindles without / with grinding spindle rotary table	max. Pcs.	1 / 4	1 / 4
continuously variable speed adjustment		standard	standard
grinding with conventional corundum grinding wheels		standard	standard
grinding with CBN grinding wheels		option	option
spark-in control via power shut-down		standard	standard
spark-in control via acoustic emission / structure-borne sound		option	option
Measuring instruments			
measurement sensor for zero point detection		option	option
further measuring equipment		on request	on request
laser measurement of all CNC linear axes in-house		standard	standard
Machine control & operation			
SINUMERIK ONE from SIEMENS		standard	standard
proprietary operator interface WOP™ Touch		standard	standard
option of remote diagnosis		standard	standard
CNC knowledge required to operate the machine		none	none
Automatic workpiece and/or tool changing system			
for workpieces or grinding tools, measurement sensors, etc.		option	option
Other items			
maintenance contract		option	option
spare and wear parts package		option	option
operator training / production support		option	option

WOTAN®-I
INTERNAL GRINDING

WOTAN®-U
UNIVERSAL GRINDING

WOTAN®-A
EXTERNAL GRINDING

WOTAN®-W
ROLLING BEARING

Special Solutions
TAILORED PRODUCTS

Our experts will accompany you on the way from the first inquiry to the after-sales service thus ensuring the daily operations of your machine, so that you will get an optimal grinding machine from us.

- exact agreement of the requirements
- individual offer for a grinding machine
- individual design
- production
- quality assurance
- test grinding
- pre-acceptance of the machine
- delivery & installation
- training & familiarization
- after-sales service

We will be pleased to demonstrate the potential of all our WOTAN® machines at our headquarters in Glauchau, where we also accept grinding jobs for test purposes and on a contract basis.

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