

ReTOS Varnsdorf s.r.o., The Czech Republic, followed up with 40 years tradition in the field of horizontal boring machines overhauls. We use the most modern technologies as our parent company TOS Varnsdorf a.s.

Features

- contouring horizontal boring machine WHN13-CNC/30
- cross-shaped beds
- 4 linear axes, rotary table
- sliding workspindle
- machine designed for universal application in engineering production
- suitable for roughing as well as precision contouring
- optionally can be fitted by tool magazine with manipulator (ATC), tool cooling kit (CHZ), cooling through spindle axis (CHOV), oil-mist cooling or swarf conveyor
- also can be fitted by non-sliding workspindle up to 5000 rpm or by motorspindle as specified by client

Controlling of the machine

- all functions of the machine, except tool clamping and unclamping, are controlled via the control panel, which consists of a keyboard, a switch panel and a LCD monitor
- the tool clamping and unclamping is controlled by switches on the headstock
- the control panel is completed with a portable control panel (handwheel), which duplicates some basic functions of the control of the machine
- the control panel is rotary situated on operator platform placed in front of the headstock
- the control system allows manual, semi-automatic and fully automatic modes
- in case the machine is fitted with the automatic tool changer (ATC), the extra hand-held ATC control panel is needed. This is used when the magazine is loaded.
- the standard communication interface allows connection with ethernet for easy administration and distribution of technological programs as well as diagnostic or service works of the control system

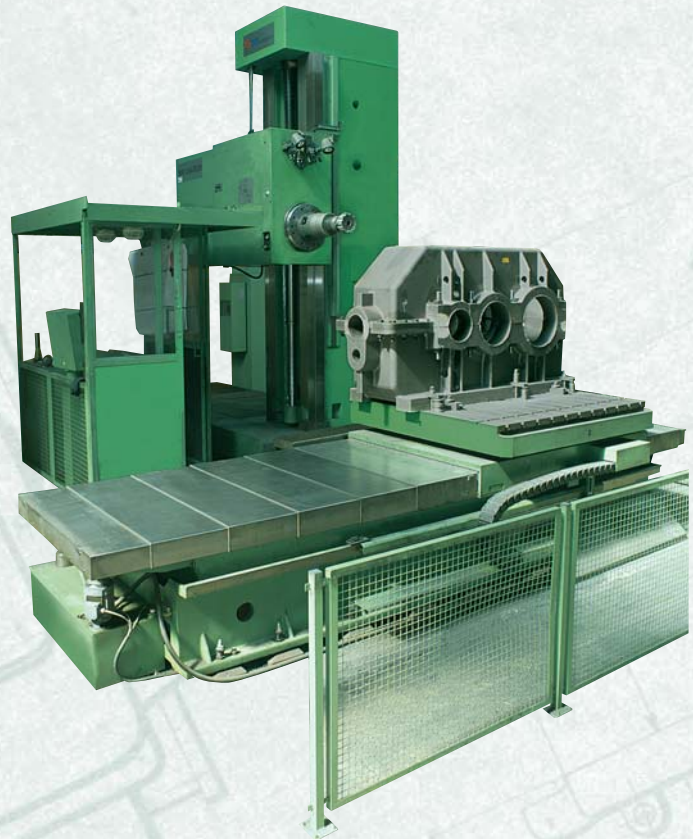
Low-end version

Control system

- HEIDENHAIN iTNC 530 + handwheel
- SIEMENS SIN 840D + handwheel

Powered Axes

- X – travel of rotary table slide on transversal bed
- Z – travel of column slide on longitudinal bed



- Y – vertical headstock travel on column
- W – spindle travel
- B – table rotation
- S – rotation of the sliding workspindle

Machine capabilities

- X, Y, Z, W axes powered in interpolation
- B axis powered only positionally
- linear interpolation of four axes
- circular interpolation of two of four axes powered in interpolation
- spiral interpolation
- spacial interpolation - spline in space

Kinematics of the movable

X, Y, Z, W groups

- brushless digital servomotor with servo-drive
- clearance-free gearing of the timing belt
- ball screw

Kinematics of the B axis

- brushless digital servomotor with servo-drive
- planetary gearbox with minimum clearance
- gear set + gear ring

Group guidance

- guideways on all linear axes are reinforced with hardened steel plates
- counterways casted by plastic or lined with TURCITE (up client request)

- counterways of headstock are lined with TURCITE including keys standardly
- guideways of the rotary table are casted by plastic

Lubrication

- central, axial lubrication
- frequency of lubrication cycles correlates to travelled track of a particular group

Clamping

- X, Y, Z, B axes – hydraulically
- W axis - not clamped, positional feedback

Headstock

- sliding workspindle
- spindle cavity blown with air during tool-changing cycle
- spindle driven by two mechanical lines – gears
- hydraulic shifting of each line
- headstock balancing - ropes and counterweight led in column
- setup of tool cooling by jets on headstock front side

Hydraulic power pack

- HYTOS hydraulic and lubrication set
- lubrication of all groups
- clamping X, Y, Z, B
- unclamping of the tool

This document covers all machines in the development range WH13, WHN13A, WHN13B, WHN13C c. up to 1990 which are of the same concept after reconstruction and differ only in the details.



Admeasurement of position

- HEIDENHAIN digital optical admeasuring
- X, Y, Z, W axes – LS 187 (LB 382 - X=3500mm) rules
- B axis – ROD 780
- S axis – ROD 486

Energy distribution

- IGUS chain energy carriers

Coverage of machine

- complete coverage of guideways of X, Z axes
- partial coverage of Y axis

CE

- comprehensive safety elements according to the applicable legislation and technical standards
- new covered operator platform
- stairs to platform
- working area of the machine is fenced off

Optionally

ATC

- ATC facility is a separate unit
- magazine with servodrive for tool beds positioning
- changer driven electrically / pneumatically

CHZ

- tool cooling set with jets on headstock front side
- separate cooling unit – tank with pump, level gauge, pressure test
- tank volume approx. 150 l
- maximal pressure 4 bars / 32 l/min
- setup for tool cooling always included – distribution pipes, jets

CHOV

- once production has started is not possible to add into configuration
- separate cooling unit with filter and magnetic swarf separator required
- maximal pressure 40 bars – emulsion - tank volume 1000 l
- maximal pressure 80 bars – oil - tank volume 100 l
- both emulsion and oil may not be used for one particular machine
- other necessary alterations to machine and CE features depend on the required cooling pressure
- for pressure higher than 10 bars the cover of the workpiece must be used, minimally by copy of sliding table with mechanical-pneumatic opening of door and top

Oil-mist cooling

- can be added to machine at any time
- easy to assemble
- easy to use

Non-sliding spindle

- non-sliding spindle up to 5000 rpm

Machine parameters

Control system + motors / drives	Heidenhain iTNC 530 + Heidenhain Siemens SIN 840 D + Siemens	
Workspindle diameter	130	mm
Clamping taper	50	ISO
Tool shank	2080	DIN
Clamping adapter - screw	69872-A	DIN
Spindle speed range	10 - 3300	rpm
Main motor power	37	kW
Main motor nominal speed	1500	rpm
Main motor maximal speed	7000	rpm
X...transversal travel of table	2000 / 3500	mm
Z...longitudinal travel of column	1250	mm
Y...vertical travel of headstock	2000 / 2500 / 3000	mm
W...spindle stroke	800	mm
Table clamping surface	1600 x 1800	mm x mm
	1800 x 1800	mm x mm
	1800 x 2200	mm x mm
Width of T-slots	23 H8	mm
Table loading capacity	12000	kg
Feeds... X, Y, Z, W - manual mode	4 - 500	mm / min
Feeds... X, Y, Z - automatic mode	4 - 10000	mm / min
Feeds... W - automatic mode	4 - 8900	mm / min
Rapid traverse...X, Y, Z	10000	mm / min
Rapid traverse...W	8900	mm / min
Rapid traverse of table rotation...B	1,84	rpm
Nominal torque of feed motors... X, Y, Z	38	Nm
Nominal torque of feed motors... B	23	Nm
Nominal speed of feed motors	2000	rpm
Total power consumption	82	kVA
Machine weight - to type	40000 - 45000	kg
Total area including CE - approximate	8300 x 9000 (8700)	mm x mm

ATC parameters

Tool changing time	10	s
Number of tools	60	pcs
Pitch of beds	130	mm
Maximal tool diameter – unrestricted	125	mm
Maximal tool diameter – with free beds	200	mm
Maximal tool length – restricted / unrestricted	500 / 420	mm
Maximal tool weight	25	kg
Maximal weight of tools in magazin	560	kg / wheel
Maximal weight of tools in magazin total	1120	kg
Maximal tool unbalance in magazine-wheel	150	kg
Maximal speed of wheel	8	rpm
Operating air pressure	5	bar
Required air purity	40	microns
Weight	1500	kg

- distance of spindle face from headstock face c. 400 mm
- spinle drive with four hydraulically switched mechanical lines remains principally the same

Motorspindle

- spindle parameters as specified by client

Swarf conveyer

- placed under longitudinal bed in hole in machine foundation (between table and column)

- Machine design can be tailored to suit the needs of the client.