VARNSDORF TOS

WHR / WRD 13 (Q)

HORIZONTAL MILLING AND BORING MACHINES

1915 100th ANNIVERSARY OF HORIZONTAL BORING MILLS PRODUCTION 2015

New goals need new solutions

WHR 13 (Q)

WRD 13 (Q)

02/2015

Certificated management system VARNSDORF TOS SKQS reg. č. 12392-01 ISO 9001:2008

TOS VARNSDORF a.s.

ABOUT COMPANY

www.tosvarnsdorf.com

Company TOS VARNSDORF a.s. situated in Varnsdorf, Czech Republic has a years-lasting tradition in machine toolproduction. The company was founded, under the name of Arno Plauert Machine Works, as early as 1903 and up to now it grew up into a big engineering company, known with its products all around the world.

The company's manufacturing program is based on the development, manufacture and sale of machine tools, integrated with a wide offer of services, such as:

- training for operators and maintenance workers
- technological studies
- installations of new machines
- warranty and after-warranty (extended) servicing
- spare parts sales
- overhauls and modernizations

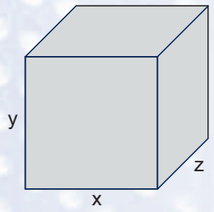
In addition, the company provides for the services in the form of outwork offers (Metalworking, Measuring services, Chemical and Heat Treatment of Metals).

High engineering standards of TOS VARNSDORF a. s. products were recognized in 1996 when the company was awarded the ISO 9001 certificate.

PRODUCTION PROGRAM

PRODUCTION OF MACHINE TOOLS

- HORIZONTAL MILLING AND BORING MACHINES
- FLOOR TYPE HORIZONTAL BORING MILLS
- MACHINING CENTRES
- PORTAL TYPE MACHINING CENTRES
- SPECIAL MACHINES
- ACCESSORIES

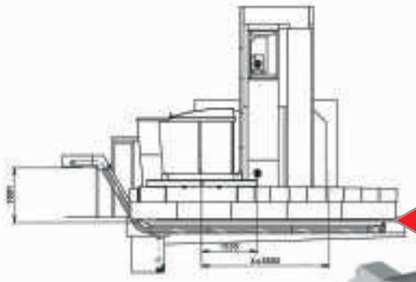


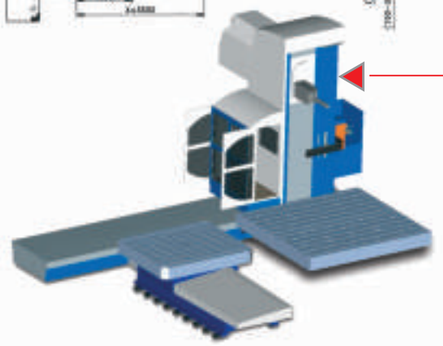
> 1 m³ (0.01mm)
x > 1 m
y > 1 m
z > 1 m

SERVICES

- TECHNOLOGICAL SUPPORT: TRAINING, TECHNOLOGICAL STUDIES, ETC.
- SPARE PARTS, OVERHAULS AND MODERNIZATIONS
- COOPERATION (METALWORKING, MEASURING SERVICES, CHEMICAL AND HEAT TREATMENT OF METALS)

CONTENT





HORIZONTAL MILLING AND BORING MACHINE WHR 13 (Q)

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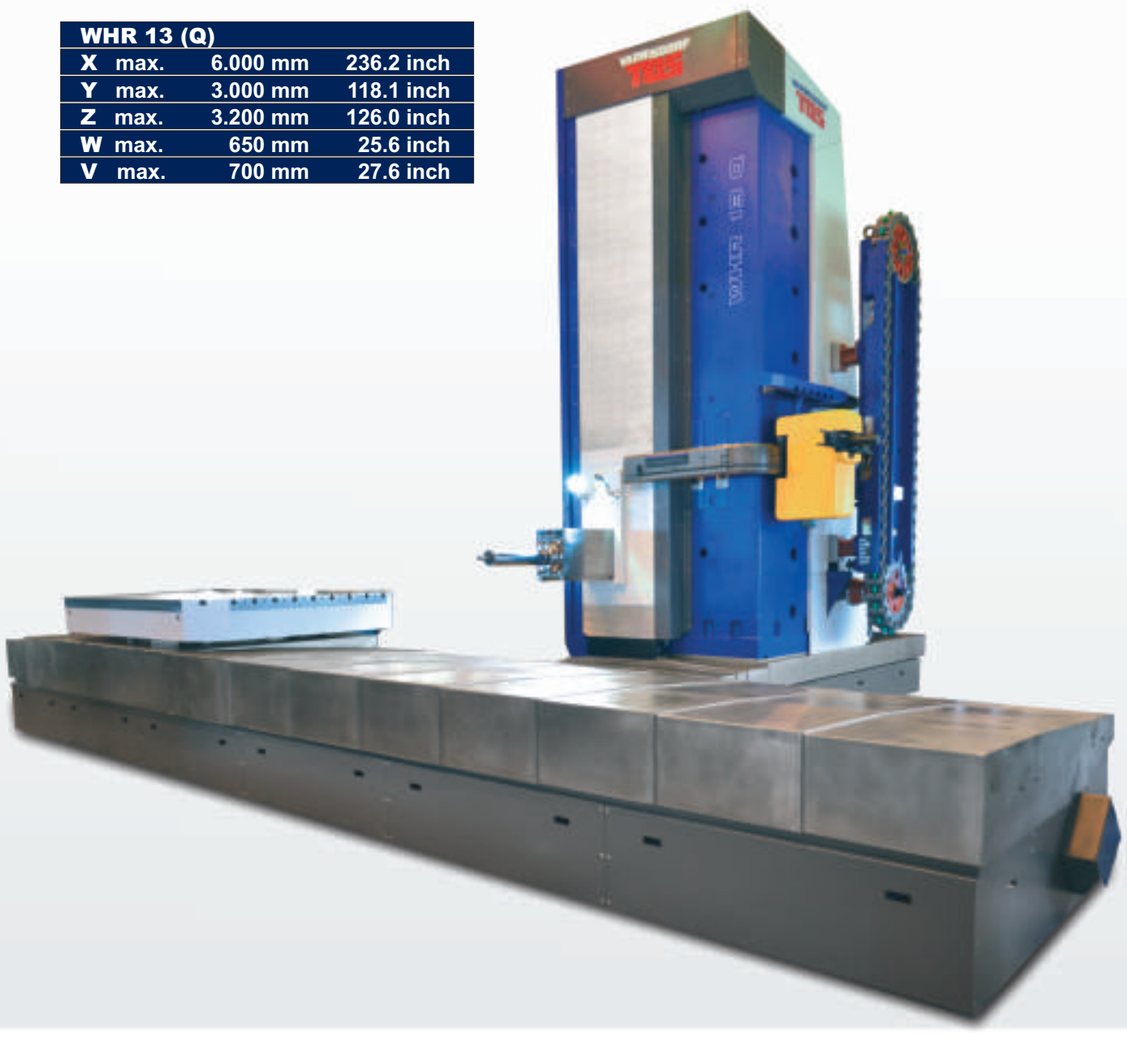
WHR 13 (Q) is cross-bed table type horizontal milling and boring machine. is based on the original generation of CNC horizontal milling and boring machines WHN (Q) 13 CNC of TOS VARNSDORF a.s. The machine WHR 13 (Q) won its respect thanks to its great power, large travel spans and a progressive and wisely simple design that lends it an amazing reliability. In this machine the high manufacture quality and the up-to-date design are in excellent balance with the price. It is an ideal machine for effective, heavy duty, complete machining of larger workpieces at the workshops where high cutting power, broad application, high reliability and user-friendly operation are the priorities. The technological performance of the machine may be expanded by the use of special technological accessories.

WHR 13 (Q)		
X max.	6.000 mm	236.2 inch
Y max.	3.000 mm	118.1 inch
Z max.	3.200 mm	126.0 inch
W max.	650 mm	25.6 inch
V max.	700 mm	27.6 inch

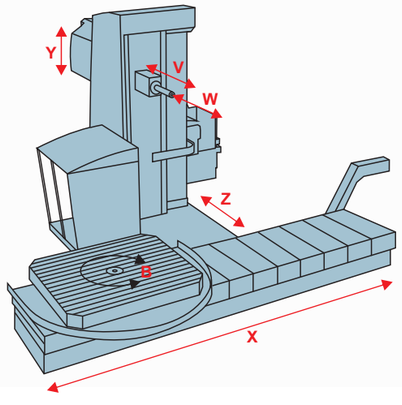


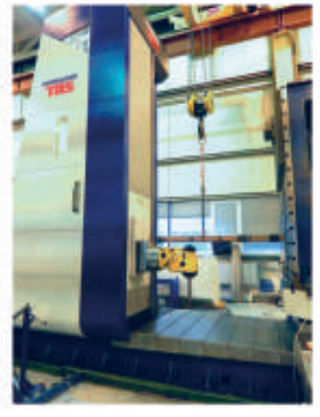
WHR 13 (Q) – TECHNICAL PARAMETERS

BASIC SPECIFICATIONS

Headstock	
Spindle diameter	130 mm // 5.1 inch
Spindle taper	ISO 50 / ISO 50 BIG+
Spindle speed range	10 - 3,000 RPM
Main motor power (S1/S6-60)	37 / 46 kW // 49.6 / 61.7 HP
Spindle torque (S1 / S6-60)	2,537 / 3,111 Nm // 1871 / 2295 ft lb
Spindle stroke **W**	650 mm // 25.6 inch
Table transverse travel **X**	2,000; 3,500; 4,000; 5,000; 6,000 mm // 78.7; 137.8; 157.5; 196.9; 236.2 inch
RAM size	320 x 400 mm // 12.6 x 15.7 inch
RAM travel **V**	700 mm // 27.6 inch
Column	
Headstock vertical travel **Y**	2,000; 2,500; 3,000 // 78.7; 98.4; 118.1 inch
Column longitudinal travel **Z**	1,250; 1,600; 2,200; 3,200 // 49.2; 63; 86.6 inch
Table	
Workpiece weight max	12,000 / 25,000 kg // 26,455; 55,114.6 lbs
Table clamping surface	1,800 x 1,800; 1,800 x 2,200; 1,800 x 2,500 mm 70.9 x 70.9; 70.9 x 86.6; 70.9 x 98.4 inch
Option design No. 1	16,000 / 2,500 x 3,000 kg/mm // 35,280 lbs / 98.4 x 118.1 inch
Option design No. 2	18,000 / 2,000 x 3,000 kg/mm // 39,690 lbs / 78.7 x 118.1 inch
Tilting table	
Workpiece weight max	16,000 kg // 35,280 lbs
Tilting range	0 - 5°
Automatic pallet change	
Pallet clamping surface	1,800 x 1,800; 1,800 x 2,200; 1,800 x 2,500 mm 70.9 x 70.9; 70.9 x 86.6; 70.9 x 98.4 inch
Workpiece weight max.	16,000 kg // 35,280 lbs
Number of pallet in system	2
Time of pallet change	20 sec
Feeds	
Feed range - **X**	4 - 5,000 (8,000)* mm.min^{-1} // 0.16 - 197 (315.2)* inch.min^{-1}
Feed range - **Y, Z, V, W**	4 - 5,000 mm.min^{-1} // 0.16 - 197 inch.min^{-1}
Feed range - **B**	0.003 - 1.5 RPM
Rapid traverse - **Y, Z, V, W**	10,000 mm.min^{-1} // 394 inch.min^{-1}
Rapid traverse - **X = 2 000, 3 500 (S12)**	10,000 (12,000)* mm.min^{-1} // 394 (472.4)* inch.min^{-1}
Rapid traverse - **X = 2 000, 3 500 (S25)**	8,000 mm.min^{-1} // 315.2 inch.min^{-1}
Rapid traverse - **X = 4 000, 5 000, 6 000**	8,000 mm.min^{-1} // 315.2 inch.min^{-1}
Rapid traverse - **B S12 / S25**	2 / 1.5 RPM

* option





WHR / WRD 13 (Q) – HEADSTOCK

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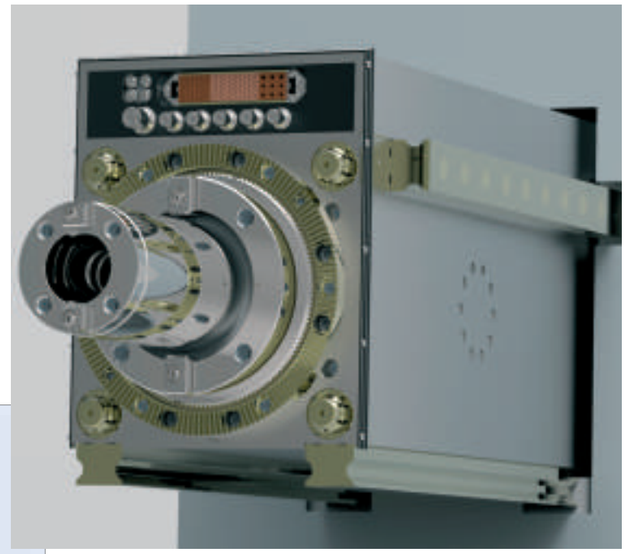
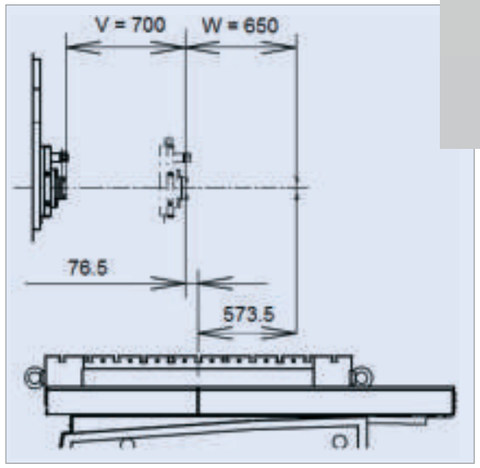
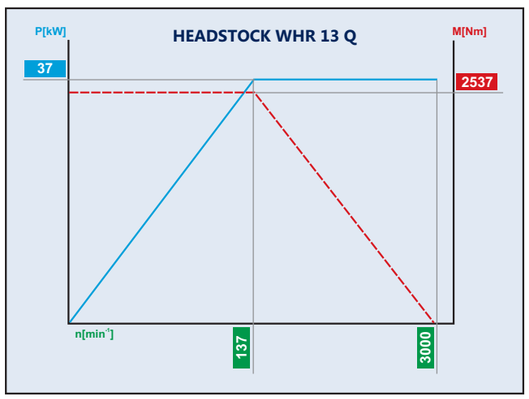
Headstock
The main casing is a rigid grey iron casting of L shape which is directly integrated lines for ram. Ram tilting compensation is realized by means of adjustable plate at the back of the headstock. The main spindle assembly is an assembly of a hollow and working spindle. The hollow spindle runs in precision spindle ball bearings with angular contact design with multiple preloaded. The spindle speed is thus controlled in two mechanical sequences.

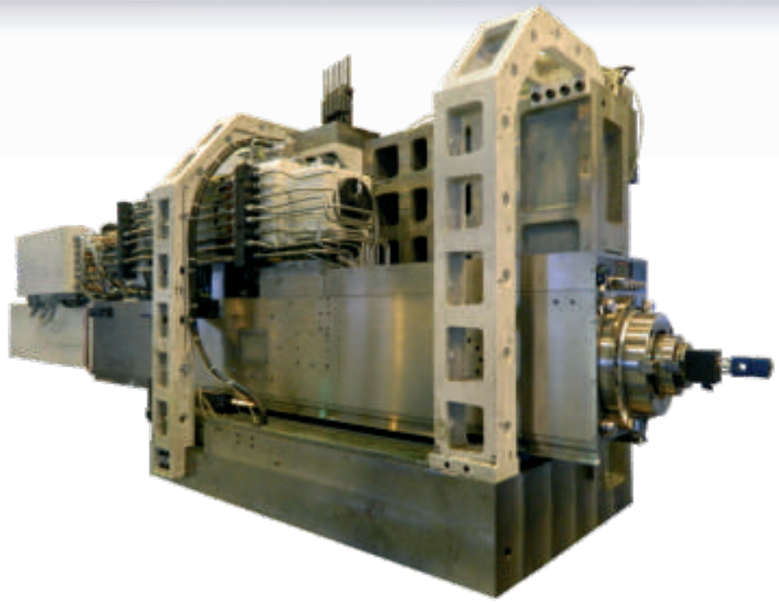






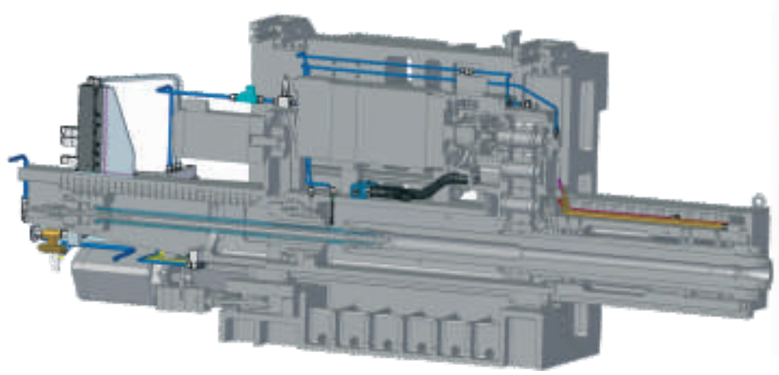
WHR 13(Q)

HEADSTOCK		
Main motor power (S1/S6-60)	kW	37 / 46 // 49.6 / 61.7
Spindle torque (S1 / S6-60)	Nm	2,502 / 3,111



THE SPINDLE AND RAM TRAVEL
Linear axis **V** (ram travel) is equipped with direct measuring using sealed electro-optical scales of HEIDENHAIN. Linear axis **W** (spindle travel) is measured indirectly using an electro-optical rotary encoder. The revolutions of the spindle are measured directly using an electromagnetic sensor HEIDENHAIN.

THE SPINDLE AND RAM DRIVE
has been resolved in two mechanical rows banked automatically by hydraulic feeding attachments.



WHR / WRD 13 (Q) – AUTOMATIC TOOL CHANGE (ATC)

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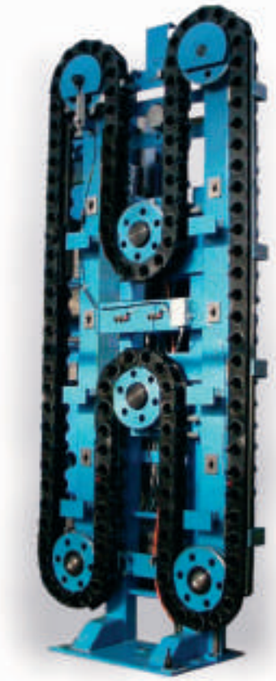
ATC consists of a chain or loop type tool magazine and horizontally traversing manipulator with rotating two-arm hand, manipulator is fitted to the back of the column (basic design for 40 or 60 tools).The ATC equipment adapted with respect to the tool standard can be as follows:
CSN 22 0432
CSN 22 0434
DIN 69871
BT 50 MAS 403-1982
CAT ANSI/ASME B5.50-1985

CHAIN MAGAZINE

LOOP MAGAZINE



TOOL MANIPULATOR

Quantity of pockets in magazine	40, 60, 80*, 120*
Pitch of pockets in magazine	130 mm // 5.1 inch
Tool dia max	
- with fully loaded magazine	125 mm // 4.9 inch
- with free neighbouring places	320 mm // 12.6 inch
Tool length max.	500 mm // 19.7 inch
Tool weight max.	25 kg // 55.1 lbs
Total tool change time	15 sec

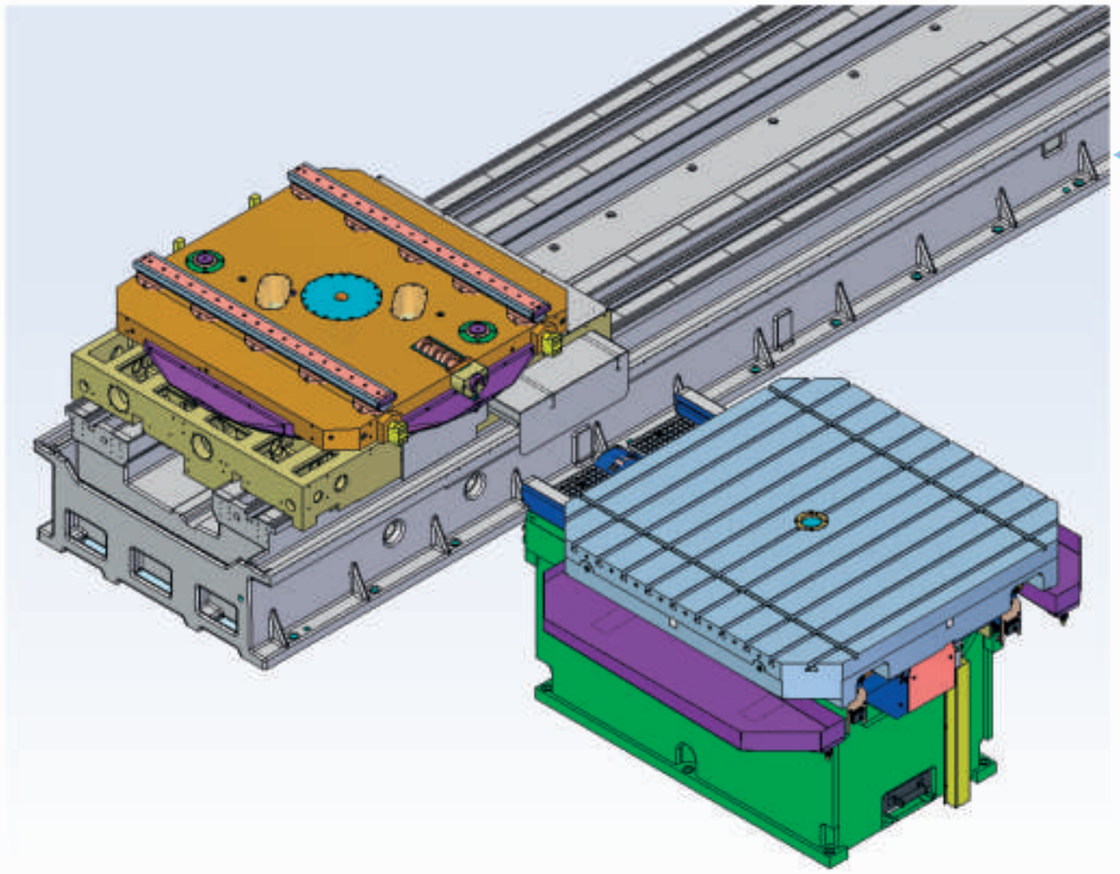
** stationary magazine beside column*

(ATC) CONTROLPANEL

WHR 13 (Q) – AUTOMATIC PALLET CHANGE (APC)

Concept of the pallet change system is based on automatic change of production pallets between pallet stations, which are equipped with pallet changing mechanism, and a pallet clamping base on the machine saddle. Pallet is arrested on the clamping base by Hirths tooth system (center rings and base of the pallets) and it is clamped by cup springs, unclamping of pallet is hydraulic. Dimensions of pallet and T-slots are given with ISO standard.
When two pallet system is used, pallets are changed directly between stations and the pallet base.

Pallet clamping surface	1,800 x 1,800; 1,800 x 2,200; 1,800 x 2,500 mm 70.9 x 70.9; 70.9 x 86.6; 70.9 x 98.4 inch
Workpiece weight max.	16,000 kg // 35,280 lbs
Size of T-slots	22H8 mm // 0.87H8 inch
Number of pallet in system	2
Time of pallet change	120 sec



WHR 13 (Q) – DESIGN OF MACHINE GROUPS

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COLUMN
The structure and ribbing of the column mouldings guarantee their high rigidity.

THE FEED DRIVES
are equipped with digitally controlled AC servo-drives from Siemens. There is a clearance-free gearing in between the servo-drive and the round-headed screw in order to achieve increased shearing force.

HEADSTOCK COMPENSATION
The weight of headstock is compensated by opposite plumb fixed over pulleys on set of ropes in column cavity.

ROTATION CLAMPING TABLE
Table rotation is realized as by CNC controlled positioning (one pinion drive), or as connected controlled (2 pinion drive controlled by Master - Slave system). It is in its center equipped by rotation sensor, which gives the possibility of automatic table positioning with increment of 0.001°.

HYDRO-AGGREGATE
Guideways of **X, Y, Z** and **B** axes are lubricated automatically by means of oil metering unit placed together with hydro-aggregate in the separate energobox.

THE ELECTRIC OUTFIT
The electrical installation is mostly wired into an independent electrical box. It contains a basic control system module, components controlling the servo- and spindle-drives plus other electrical elements supplied by leading specialized companies. The electrical box is cooled by a unit integrated into the box door.

THE OPERATOR PLATFORM
The WHN(Q) 13/15 CNC machine in standard execution is equipped with operator platform upon which the central control panel is placed. The operator platform is autonomously convertible-vertically and parallel with spindle axis as well.

WHR 13 (Q) – DESIGN OF MACHINE GROUPS

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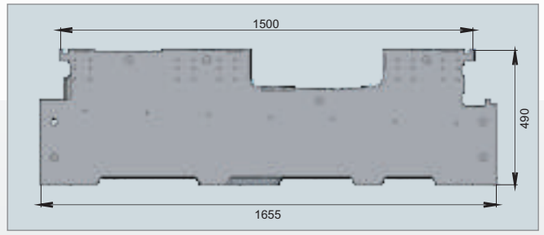
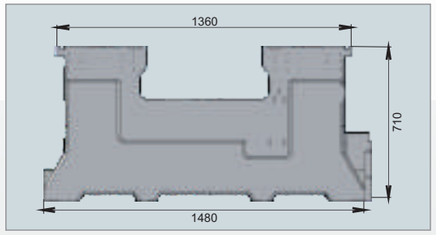
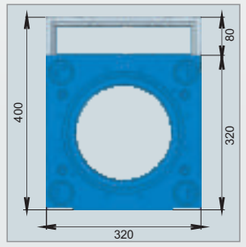
BAD OF AXIS Z



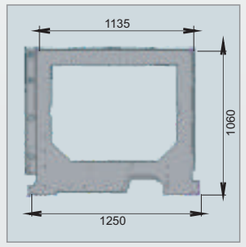
BAD OF AXIS X



RAM



COLUMN (AXIS Y)



GUIDEWAYS OF MOVABLE GROUPS
Guides of all linear axes **X, Y, Z** assemblies are mounted to slide. The main Guideways are laser-hardened. Hardened steel rails on Guideways are placed under the bearings and on the other stressed places. The counter-surfaces are provided with artificial sliding low-friction materials.

MACHINE COVERS

On the customer's request we deliver following types of covers:

COMPLETE COVERING
the top quality design without any residual risks

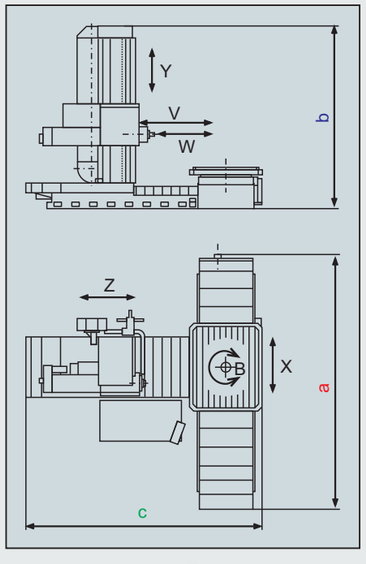
KVR CABIN
protective covers for working space

C-COVER
compact and technically advanced design

MOBILE / MOVABLE
protective partitions

DIMENSIONS AND WEIGHTS

Coordinate travel		Dimension	
X	2,000 mm // 87.7 inch	5,630 mm // 221.7 inch	a
	3,500 mm // 137.8 inch	7,125 mm // 280.5 inch	
	4,000 mm // 157.5 inch	7,650 mm // 301.2 inch	
	5,000 mm // 196.9 inch	8,650 mm // 340.6 inch	
	6,000 mm // 236.2 inch	9,750 mm // 383.9 inch	
Y	2,000 mm // 87.7 inch	4,850 mm // 190.9 inch	b
	2,500 mm // 98.4 inch	5,350 mm // 210.6 inch	
	3,000 mm // 118.1 inch	5,850 mm // 230.3 inch	
Z	1,250 mm // 49.2 inch	6,807 mm // 268.0 inch	c
	1,600 mm // 63 inch	7,307 mm // 287.7 inch	
	2,200 mm // 86.6 inch	7,807 mm // 307.4 inch	
	3,200 mm // 126 inch	8,807 mm // 346.7 inch	



Machine weight		
X	**Y**	Table dimensions
3,500 mm 137.8 inch	2,500 mm 98.4 inch	1,800 x 2,200 mm 70.9 x 86.6 inch
WHR 13 (Q)	**WRD 13 (Q)**	
39,850 kg // 87,852 lbs	39,850 kg // 87,852 lbs	

Note: Over the left edge of the machine moves the spindle jib at a distance of 450 mm behind the machine. Detailed dimensions are always drawn in situational sketch of the machine.

WHR / WRD 13 (Q) – MACHINE CONTROL

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THE WHR / WRD 13 (Q) MACHINE IS NORMALLY CONTROLLED BY THE HEIDENHAIN iTNC 530 HSCI, SINUMERIK 840 D-SL OR FANUC 31i CONTROL SYSTEM

All types of control systems in basic configuration consists of:
- basic electronic module
- collor LCD display unit
- operational panel with keyboard
- portable auxiliary control panel with an electronic handwheel.

In addition, control system functionsand equipment may be equipped with:
- measuring touch probes
- network interface allowing remote diagnostics

All offered systems provide full control of 6 machine axes (**X, Y, Z, ,V, W** and **B**) plus spindle rotation ©.

An independent digital AC servo-drives applied with all convertible groups allow for simultaneous interpolation:
- linear - upto 5 axes
- circular
- helical

Option: continuously controlled **B** axis

CONTROL PANEL OF SINUMERIK 840 D-SL CONTROL SYSTEM

CONTROL PANEL OF HEIDENHAIN iTNC 530 HSCI CONTROL SYSTEM

CONTROL PANEL OF FANUC 31i CONTROL SYSTEM

PORTABLE CONTROL PANEL SINUMERIK HT2

PORTABLE CONTROL PANEL HEIDENHAIN (OPTION TYPE HR 520)

PORTABLE CONTROL PANEL FANUC

WORKPIECE AND TOOL PROBES

WE DELIVER THE FOLLOWING PROBES AS STANDARD:

MEASURING TOOL PROBE for the system:		
iTNC 530 HSCI	HEIDENHAIN TT 160	measuring touch probe with cable transmission
iTNC or Sinumerik 840D-SL	RENISHAW TS 27 R	measuring touch probe with cable transmission
MEASURING WORKPIECE PROBE for the system:		
iTNC 530 HSCI	HEIDENHAIN TS 260	measuring touch probe with cable transmission
	HEID. TS 460 + SE 660	measuring touch probe with radio or infrared transmission
iTNC or Sinumerik 840D-SL	RENISHAW OMP 60 - set	measuring touch probe with optical transmission
	RENISHAW RMP 60 - set	measuring touch probe with wireless transmission
	M+H 20.41 Multi	measuring touch probe with wireless transmission

TOOL CONTROL PROBE

MEASURING TOUCH PROBE

WE ALSO OFFER A SYSTEM OF SERVICES FOR THE PERMANENT SUPPORT OF CUSTOMERS:

TOS*message*
- ensures communication between the machine's control system and the customer's mobile phone. The customer is informed about the predefined statuses of the machine, e.g. the completion of an automatic cycle or possibly program interruption.

TOS*wide*
- the remote diagnostic system allows our service engineer to obtain required data about the status of the machine necessary to specify possible diagnostic messages about the non-standard condition of the machine's control system.

WHR / WRD 13 (Q) – OPTIONAL ACESSORIES

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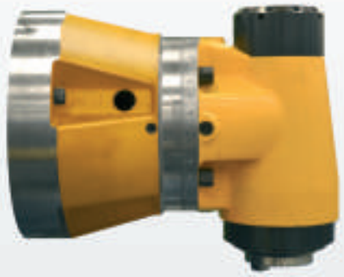
MILLING HEADS

HPR 50



The HPR 50 and HUR 50 heads are used for machining the surfaces that are oriented in the basic direction (also generally) with regard to the orthogonal coordinate system of the machine.

HUR 50

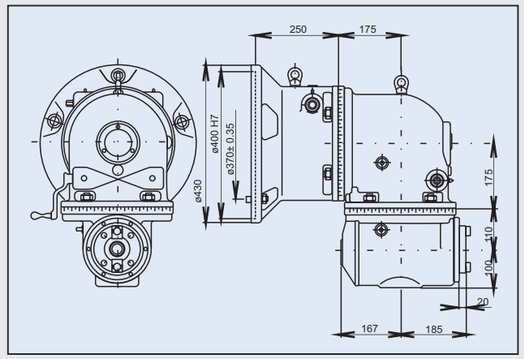
HUI 50

The HUI 50 head is automatically indexed on both the planes with an increment of 2.5°, providing higher efficiency during the turning of the head spindle with regard to the orthogonal coordinate system of the machine.

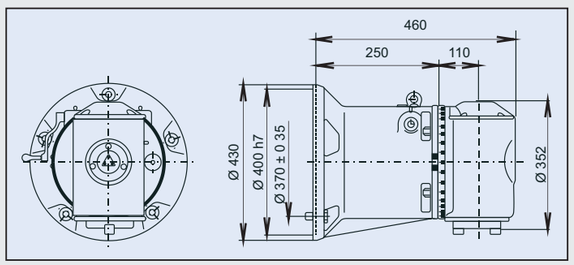
HUF 50

Universal milling head continuously positioned HUF50 serve as special technological accessories. Milling head HUF 50 it is possible positioned in all axes 0.001 °.

UFP 50-13
universal milling head



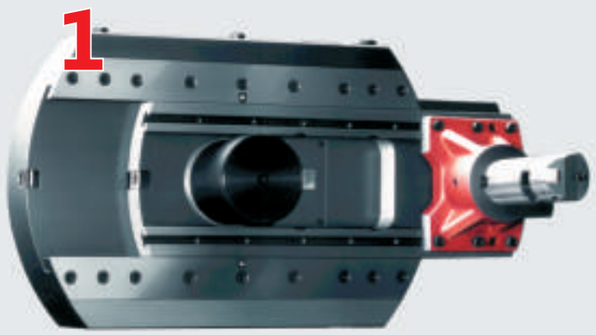
FP 50-13
vertical milling head



FACING HEAD

Facing head LD 650 (1) or D´Andrea (2) are used for demanding technological operations with the posibility of continuous CNC control of the slide position.

1



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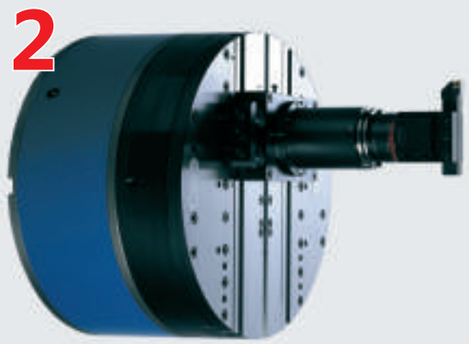


FASTENING OF MILLING HEADS

MANUAL FASTENING
Manual fastening of the head on the machine is carried out by means of a lifting device.

HALF-AUTOMATIC FASTENING
The head is fixed to the machine also in a half-automatic way from an auxiliary rack. The auxiliary rack is manually locked on hinged arms on the table.

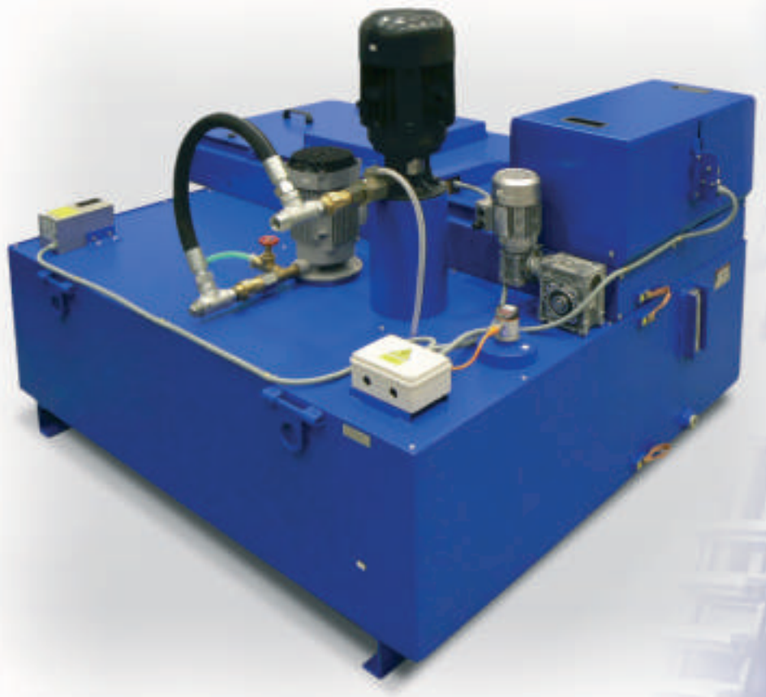
AUTOMATIC FASTENING
Automatic fastening of the head (facing head) on the machine is carried out by means of an accessory magazine. Its execution is subject to prior consultation with the manufacturer.

ANOTHER OPTIONAL ACCESSORIES YOU CAN FIND ON www.tosvarnsdorf.cz/en/products/accessories/

WHR / WRD 13 (Q) – OPTIONAL ACESSORIES

TOOL COOLING DEVICE

Customer may choose ether CHZ 13/15 outer tool cooling kit or CHOV 13/15 through spindle tool cooling kit which brings coolant to the cutting edge through outsider nozzles as well. Possible choose is 10, 20, 30 or 40 bar.



CLAMPING ANGLE PLATES

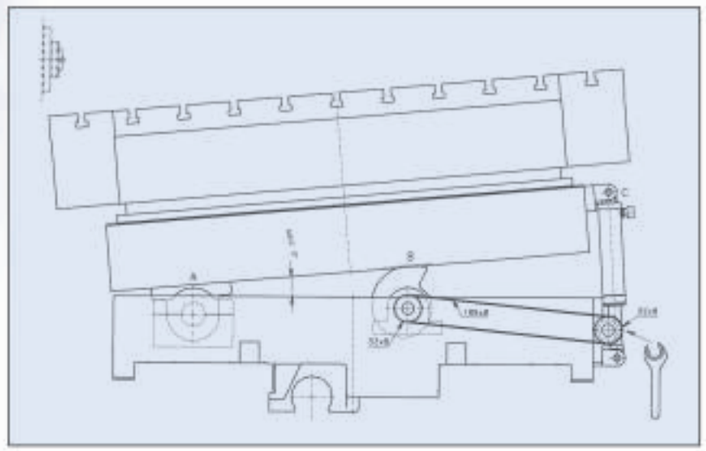
Clamping angle plates are supplied in the following sizes as standard: 800; 950; 1,120; 1,450; 1,620; 2,000; 2,500; 3,000; 3,500 mm // 31.5; 37.4; 44.1; 57.1; 63.8; 78.7; 98.4; 118.1; 137.8 inch.

CLAMPING CUBES

UK 500, UK 1000, UK 1500, UK 2000, UK 2500, UK 3000

TILTING TABLE

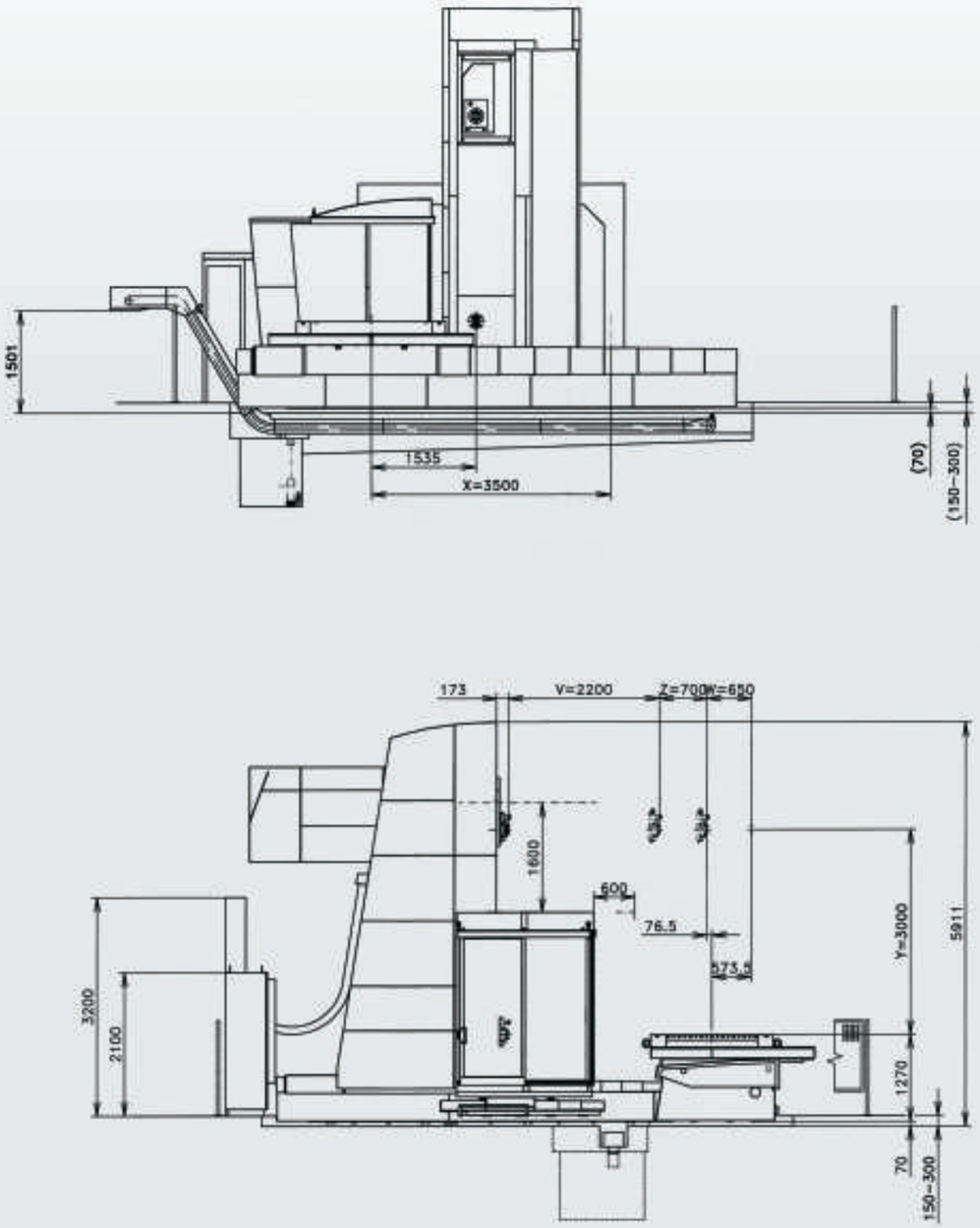
Tilting table is possible to use for workpiece clamping and positioning, in axes **B** and **X** is controlled by control system of the machine, tilting mechanism is carried out by air-driven hydraulic pump.

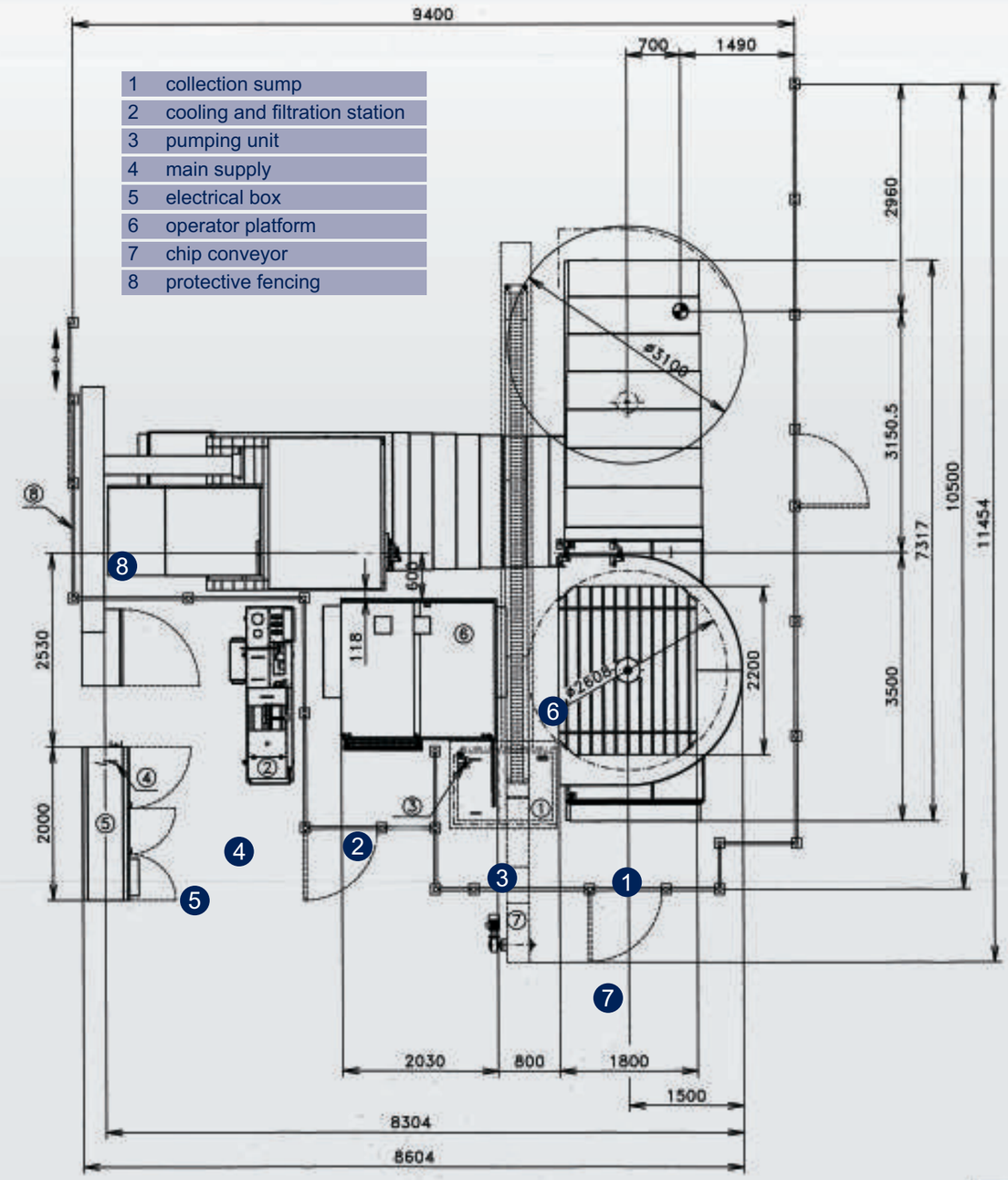


CHIP CONVEYOR

The length of a chip conveyer and its discharge height can be accommodated to user's needs.

MACHINE LAYOUT





1	collection sump
2	cooling and filtration station
3	pumping unit
4	main supply
5	electrical box
6	operator platform
7	chip conveyor
8	protective fencing

HORIZONTAL MILLING AND BORING MACHINE WRD 13 (Q)

www.tosvarnsdorf.com

The floor type milling machine with traveling ram and the working spindle type WHR / WRD 13 (Q) is based on the original generation of CNC horizontal milling and boring machines WHN (Q) 13 CNC of TOS VARNSDORF a.s

WHR 13 (Q) horizontal boring mill is milling and boring machine with traveling working spindle and traveling RAM. Machines are offered with spindle diameter 130 mm.

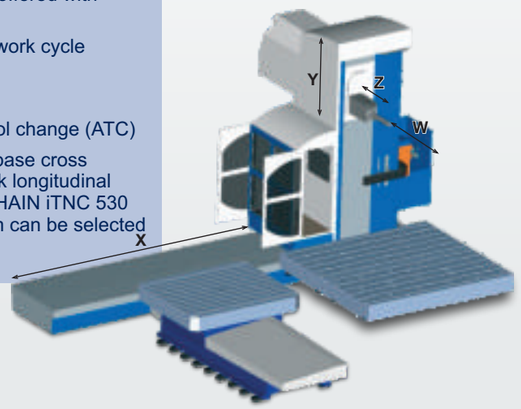
Basic design options of these machines are defined by the work cycle automation level:

- WRD 13 - basic design

- WRD 13 (Q) - machine design equipped with automatic tool change (ATC)

The machines are continuously controlled in four axes (**X** - base cross travelling, **Y** - headstock vertical adjustment, **Z** - sliding block longitudinal travel and **W** - working spindle longitudinal travel). HEIDENHAIN iTNC 530 HSCI, Sinumerik 840 D-SL or FANUC 30i/31i control system can be selected for controlling the machine.

WRD 13 (Q)	
X max.	20,000 mm // 787.4 inch
Y max.	3,000 mm // 118.1 inch
Z max.	700 mm // 27.6 inch
W max.	650 mm // 25.6 inch



BASIC TECHNICAL DATA

Headstock		
Spindle diameter		130 mm // 5.1 inch
Spindle taper		ISO 50 / ISO 50 BIG+
Spindle speed range		10 - 3,000 RPM
Main motor power (S1 / S6 – 60)		37 / 46 kW // 49.6 / 61.7 HP
Spindle torque (S1 / S6 – 60)		2,537 / 3,111 Nm // 1871 / 2295 ft lb
Spindle stroke **W**		650 mm // 25.6 inch
RAM dimensions		320 x 400 mm // 12.6 x 15.7 inch
RAM stroke **Z**		700 mm // 27.6 inch
Column		
Column transverse travel **X**		3,000 - 20,000 step 1,000 mm // 118.1 - 787.4 step 39.4 inch
Headstock vertical travel **Y**		2,000; 2,500; 3,000 mm // 78.7; 98.4; 118.1 inch
Additional rotary table*		
S16 – additional rotary table		
Workpiece weight max.		16,000 kg // 35273.4 lbs
Table clamping surface dimensions		1,800 x 2,240 mm // 70.9 x 88.2 inch
T-slots on the table	- dimension	28H8 mm // 0.87H8 inch
	- pitch	200 mm // 7.9 inch
	- number	9
Table centering hole diameter		100H6 mm // 3.9H6 inch
Table transverse travel **V**		1,400 mm // 55.1 inch
Feeds		
Feed range	- **X, Y, Z, W**	4 - 5,000 mm.min^{-1} // 0.6 - 196.9 inch.min^{-1}
Rapid traverse	- **X, Y, Z, W**	10,000 mm.min^{-1} // 393.7 inch
Min. programmable positioning increment	- **X, Y, Z, W**	0.001 mm // 0.00004 inch
Max. feed forces	- **X, Y**	25 kN
	- **W, Z**	25 kN

* example of optional accessories. The machine WRD 13 (Q) can be equipped with different types of devices for clamping workpieces, such as clamping plates or additional tables from the range TOS VARNSDORF.

NOTES

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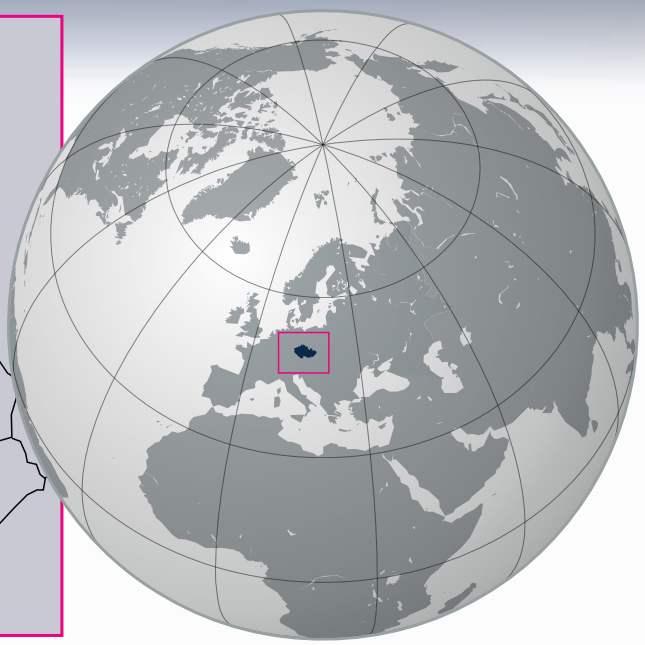

TOS VARNSDORF a.s.
Říční 1774, 407 47 Varnsdorf
Czech Republic

Phone: +420 412 351 203
Fax: +420 412 351 269
E-mail: info@tosvarnsdorf.com
www.tosvarnsdorf.com
www.tosvarnsdorf.eu

www.tosvarnsdorf.com