

Horizontal milling machine and machining center WHT 130 (C)

Milling machine manufacturer

TOS VARNSDORF a.s.



WHT 110/130 C

Basic introducing

WHT 110/130 C

Main goals of the new machines

- A complete range of machines (horizontal milling machine and center)
- Machine tools with higher cutting parameters
- Multifunction machines (milling, turning)
- Lot of options for automation (ATC, ACSA, APC)
- Ergonomics operate and service machines (operator panel, program support, service entry)
- Unification of design and construction solutions (standard components)
- Reduction of piece costs
- Shorten service times and delivery times of spare parts



WHT 110/130 C

	Horizontal milling machine	Milling center
Size / spindle diameter	WHT 110	WHT 110 C
	WHT 130	WHT 130 C

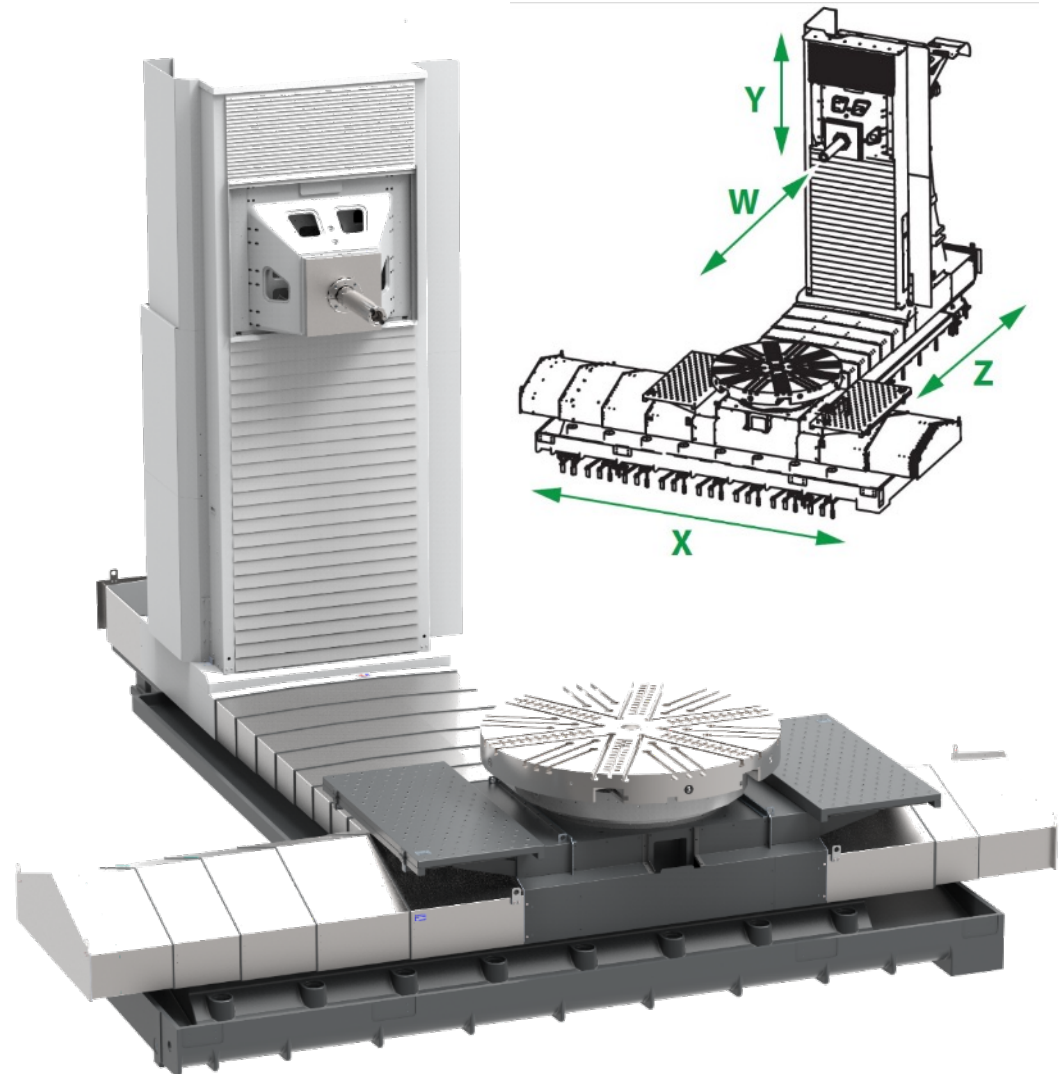


The main advantages

- New construction of connected beds X, Z
- Integrated chip conveyors (functional chip removal)
- The thermal compensation of the machines
- New type of manipulator ATC
- Possibility of turning table / pallet
- The new machine design / control panel - Ergonomics
- Options functions to the CNC control system (TOS Control)
- Service entry (blind cover on the Z-axis and magnets covers)

WHT 130

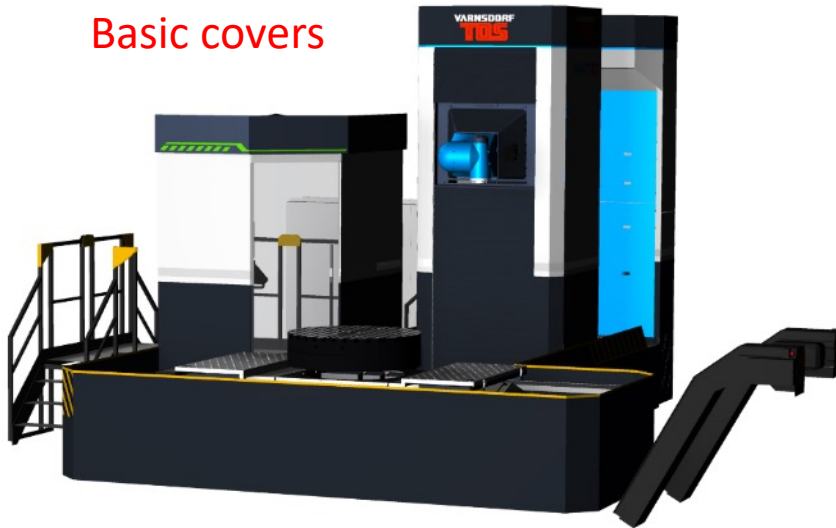
	<u>Horizontal milling machine</u>
Machine type	WHT 130
Headstock (W)	4 000 R.P.M.
Feeds (X,Y,Z)	25 m/min
Machine covers	operator station - Cover of ATC - KVR cover - „C“ type cover
Basic equipment of machine	Chip conveyor Modification for the manual change of the manually adjusted milling heads Remote diagnostics



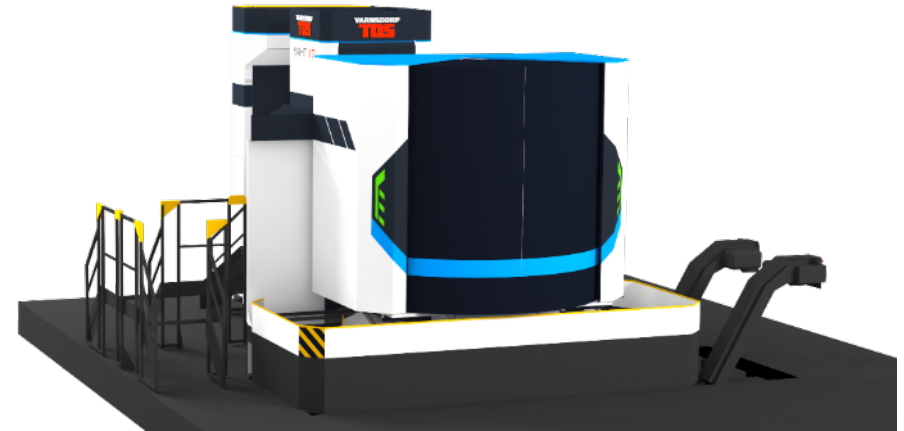
WHT 110/130

Machine without fairings

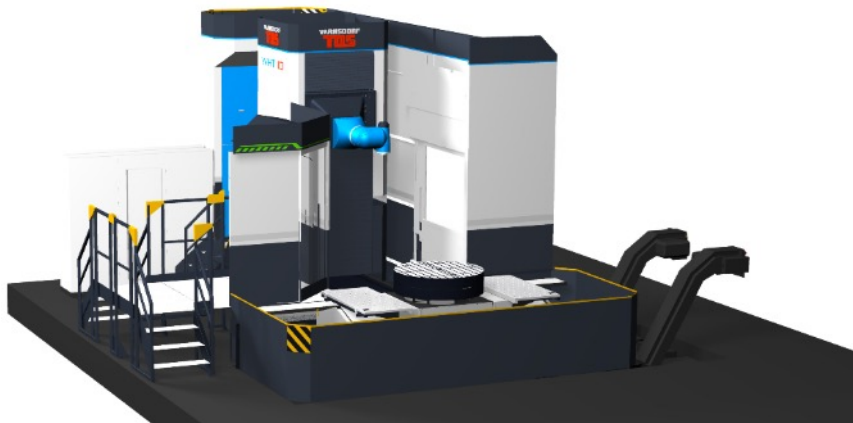
Basic covers



KVR type



Basic covers with ATC



„C“ type covers



WHT 130 (C)

	<u>Machining center</u>
Machine type	WHT 130 C
Headstock (W)	5 000 (4 000) RPM
Feeds (X,Y,Z)	36 m/min
Covers of machine	Full covering of machine <ul style="list-style-type: none"> - Rins of chips - workspace exhaustion
Basic equipment of machine	<ul style="list-style-type: none"> Chip conveyor Remote diagnostics Automatic tool change ATC 40 CHZ tool cooling (via the external nozzles) Modification for the automatic change of milling heads



WHT 110/130 C

C = machining center with full fairings



WHT 130 (C)

TOS Control – machine management software with supporting applications

- Screen status
- CNC control system
- Documentation
- IP Camera
- Calendar
- In-proces measurement

- Other applications are being prepared:
 - Technological calculator
 - Job management



WHT 130 (C)

Machine construction

FEATURES OF THE PRODUCT

Features of the product:

- The new high-performance milling machine called WHT 130 (C).
- The machine can be used for milling, boring, gear cutting, turning operations, toothed gear manufacturing, and 5-axis machining.
- Machines WHT 130 (C) may be drafted as machining centers and horizontal milling machine
- A wide choice of clamping devices. Rotary tablem, Up to 4 automatically changeable palettes, turning table



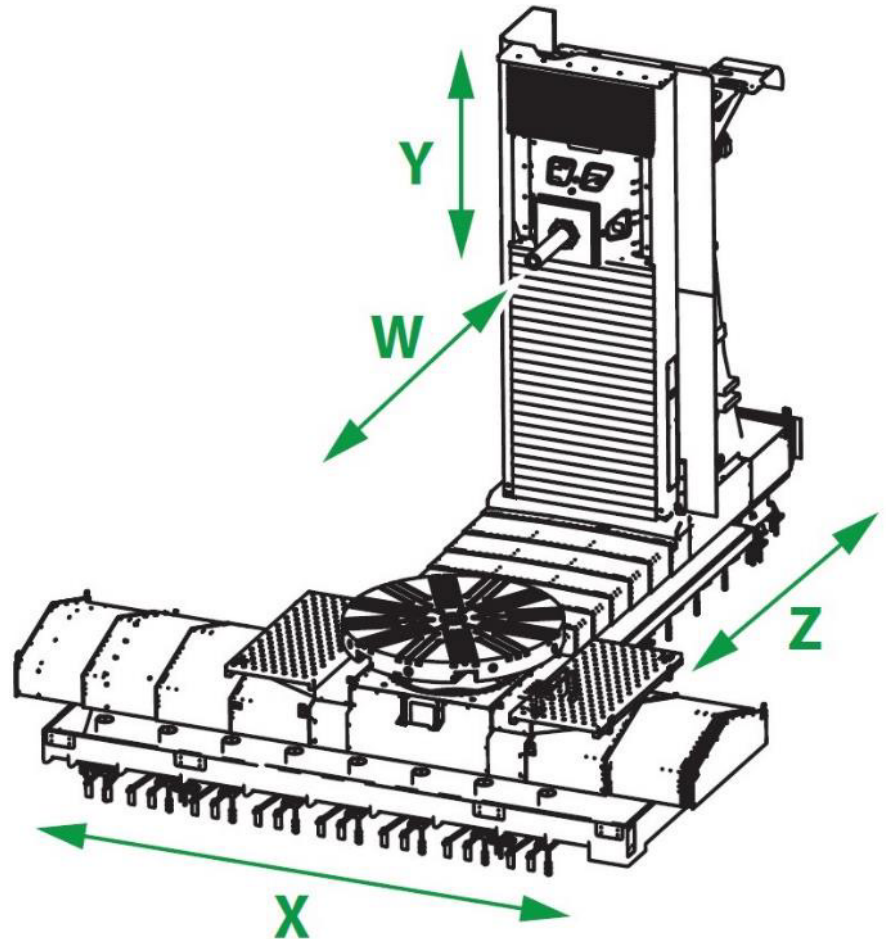
BASIC CONCEPT OF THE MACHINE

Basic concept of the machine:

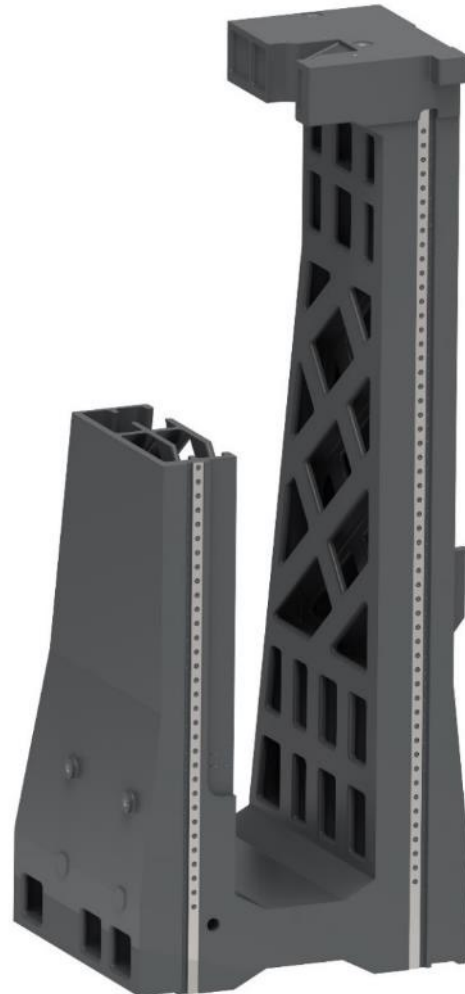
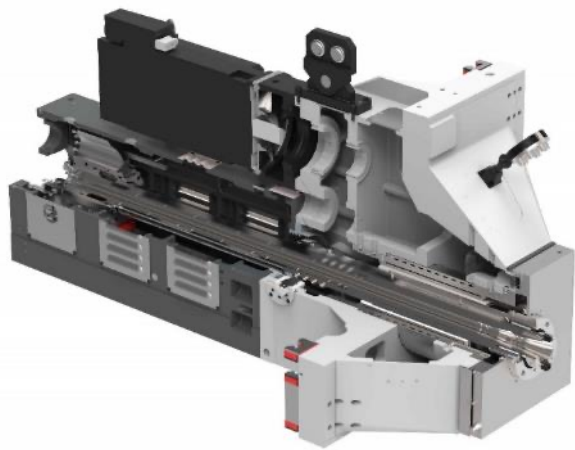
- 5 controlled axes
- X - cross travel of the table
- Y - vertical travel of the headstock
- Z - longitudinal travel of the column
- W - spindle travel
- B - rotary table and CNC controlled spindle including spindle orientation feature.

- AC-digital feed drives and AC-digital spindle drive made by Siemens.

- Control systems:
HEIDENHAIN TNC 640,
Siemens Sinumerik 840 D-SL



MACHINE CONSTRUCTION



MACHINE FRAME

- Basic heavy machine parts is from grey iron
- Longitudinal and transverse machine bed is anchored to the base and they are connected.
- WHT machine 130 (C) are each equipped with two screw conveyors integrated into the bed.



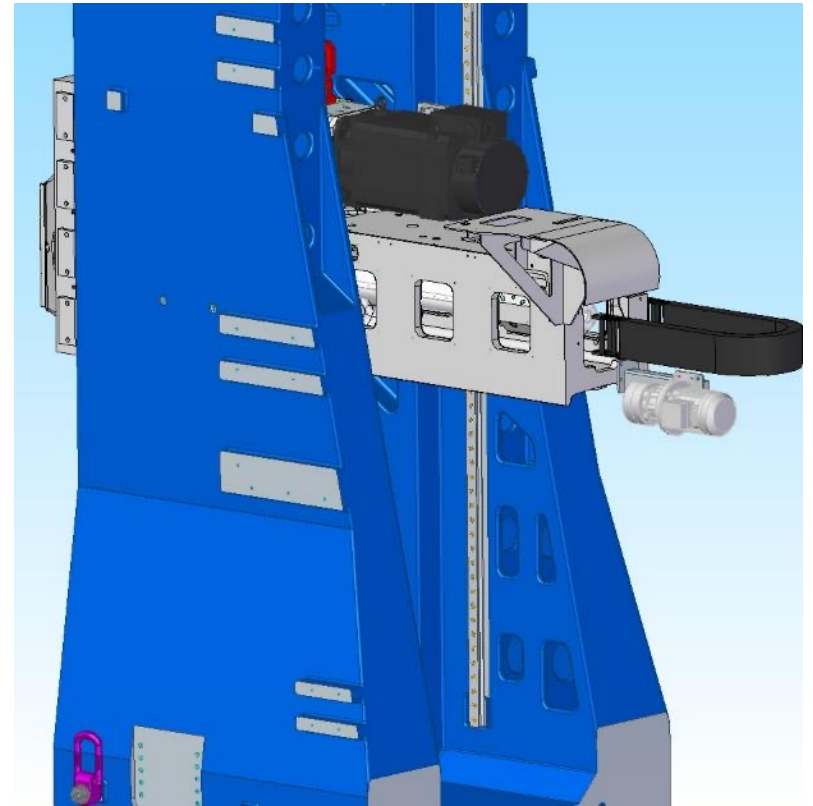
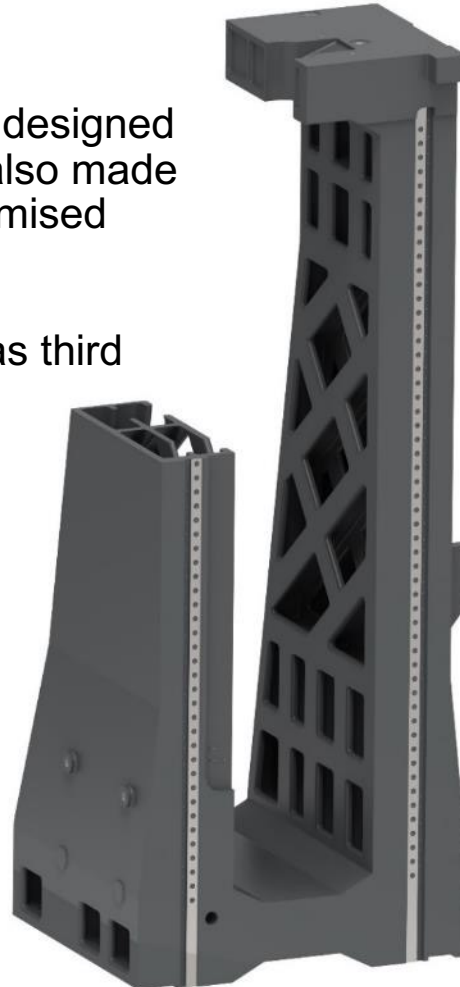
Axis X and Z

Column		
Headstock vertical travel, Y	mm	1 500, 2 000, 2 500, 3 000
Longitudinal column adjustment Z	mm	1 500, 2 000, 2 500, 3 000
Rotary table		
Transverse table travel, X	mm	2 000, 3 000, 4 000, 5 000
Max. workpiece weight	kg	20 000
Table clamping area dimesions	mm	1 800 x 1 800 2 000 x 3 000
		1 800 x 2 200 2 500 x 3 000
		1 800 x 2 500 ;

MACHINE FRAME

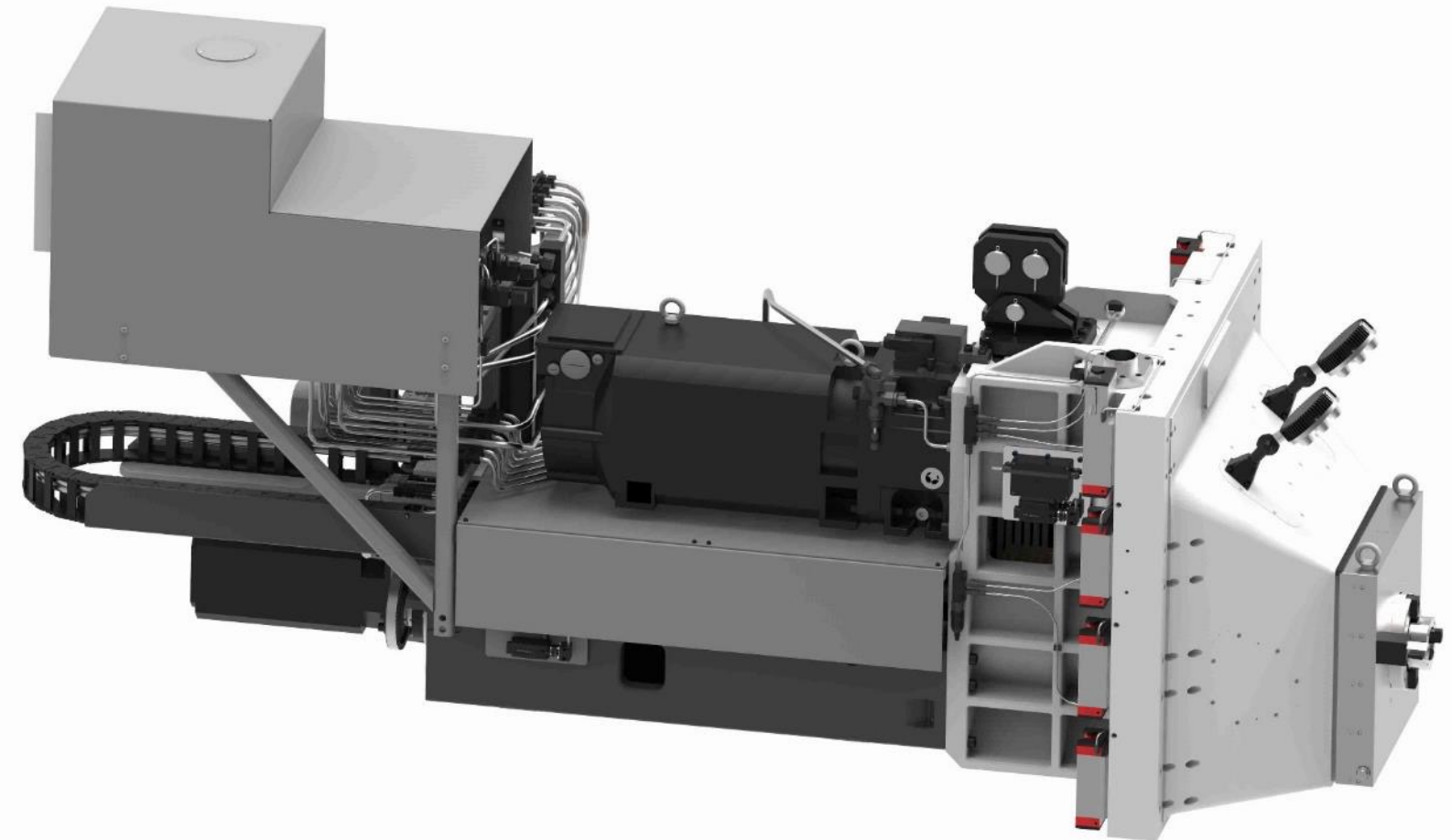
- The machine column is designed as a twin-shell casting also made of grey iron with an optimised structure.
- The machine column has third linear guide for higher rigidity

Column Y



HEADSTOCK

Headstock WHT 130



FEED DRIVES AND CLAMPING

Guideways of movable groups:

- pre-stressed compact linear rolling guides in axes X, Y, Z, (W).
- The extendable spindle is slidingly guided in the hollow spindle
- The table is housed on a large radial-axial ball bearing, thus having a high bearing capacity and rigidity.



FEED DRIVES AND CLAMPING

Feed drives and clamping:

- The linear axes are driven by separate servo drives with incorporated belt gear and ball screws with steep lead.
- X and Z axes are driven by a ball screw with a rotating ball nut.
- The Y and W axes are driven by a rotating ball screw

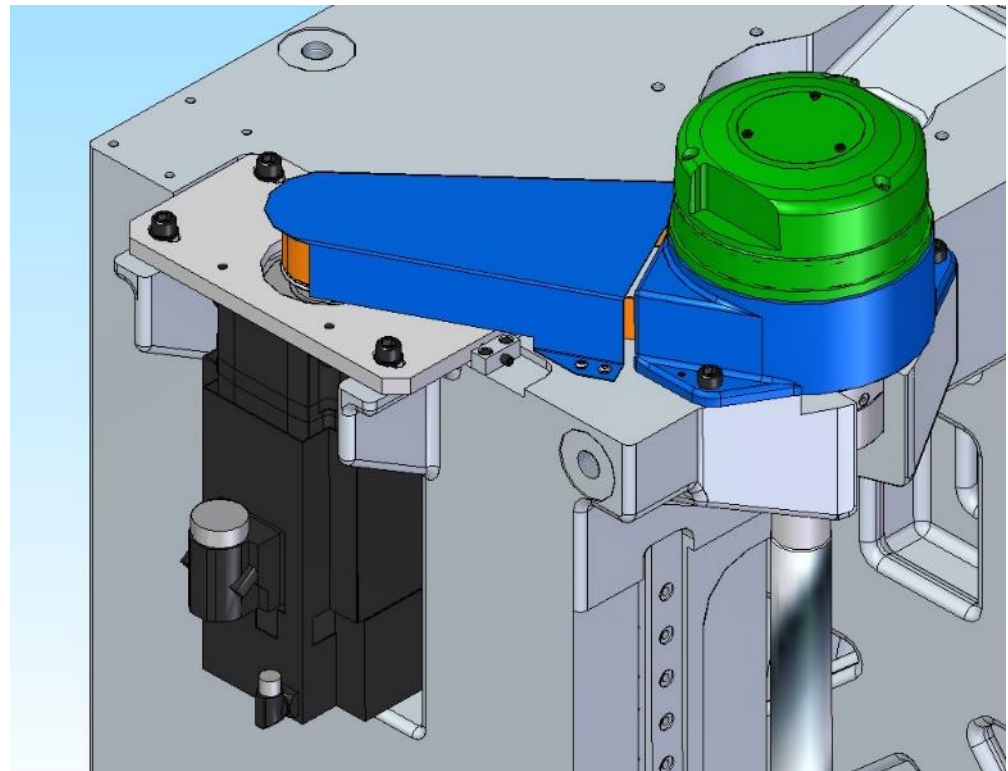


Axis Z

DRIVE OF AXIS Y AND BALANCE

Drive of axis Y:

- Feed drives of all linear axes are provided by individual servodrives with standard gearbox and steep pitch ballscrew
- Weight of the headstock is balanced hydro-mechanically by means of standalone hydraulic unit.



Axis Y

BALANCE AND DRIVE OF AXIS Y

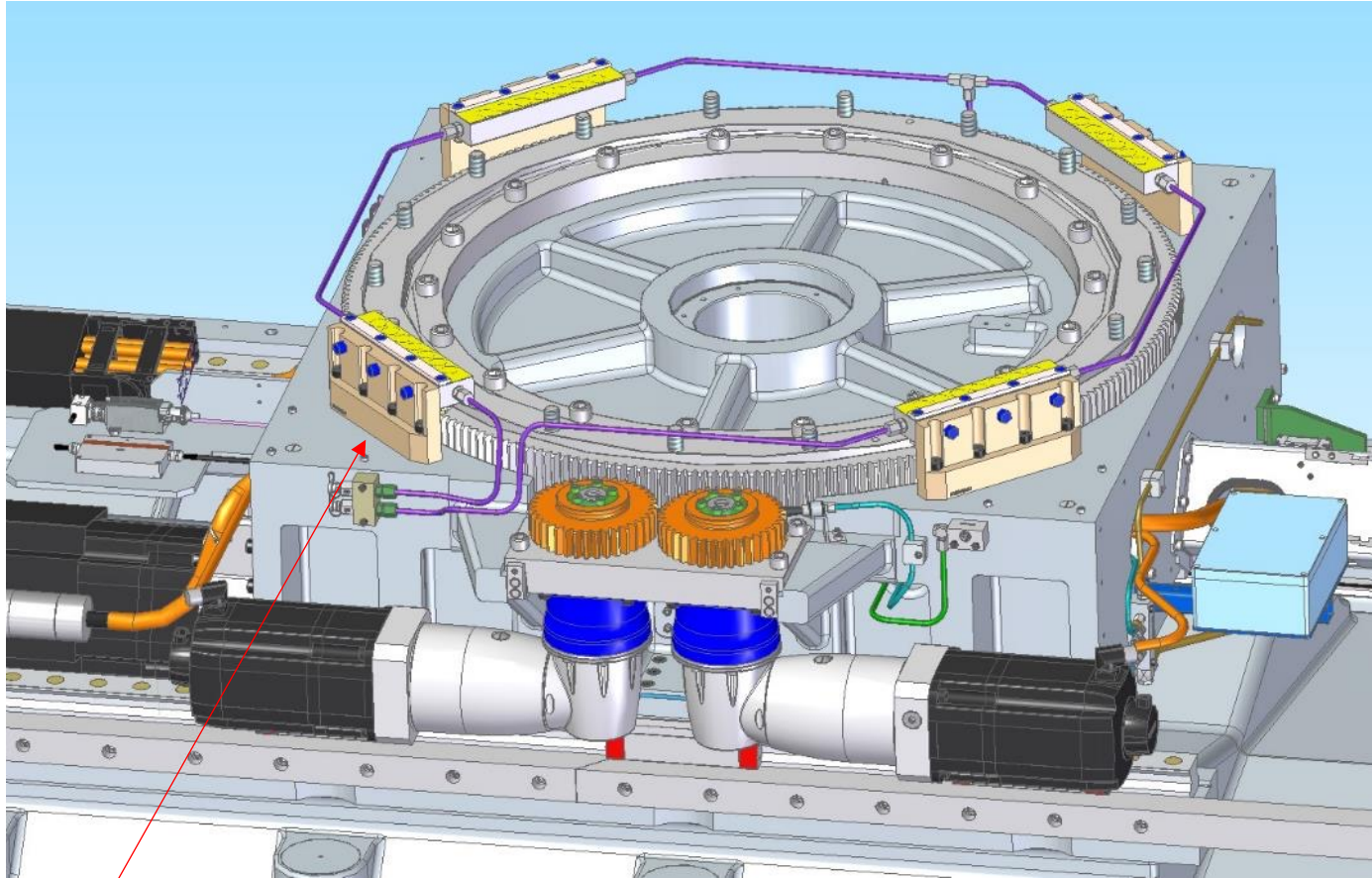
Balance:

- Weight of the headstock is balanced hydro-mechanically by means of standalone hydraulic unit.



Balance of Axis Y

FEED DRIVES AND CLAMPING



The B-axis is always clamped

Drive of axis B, – always perform Master & Slave
(rotary table, pallet)

WHT 130 (C)

Optional machine design

AUTOMATIC PALLET CHANGE

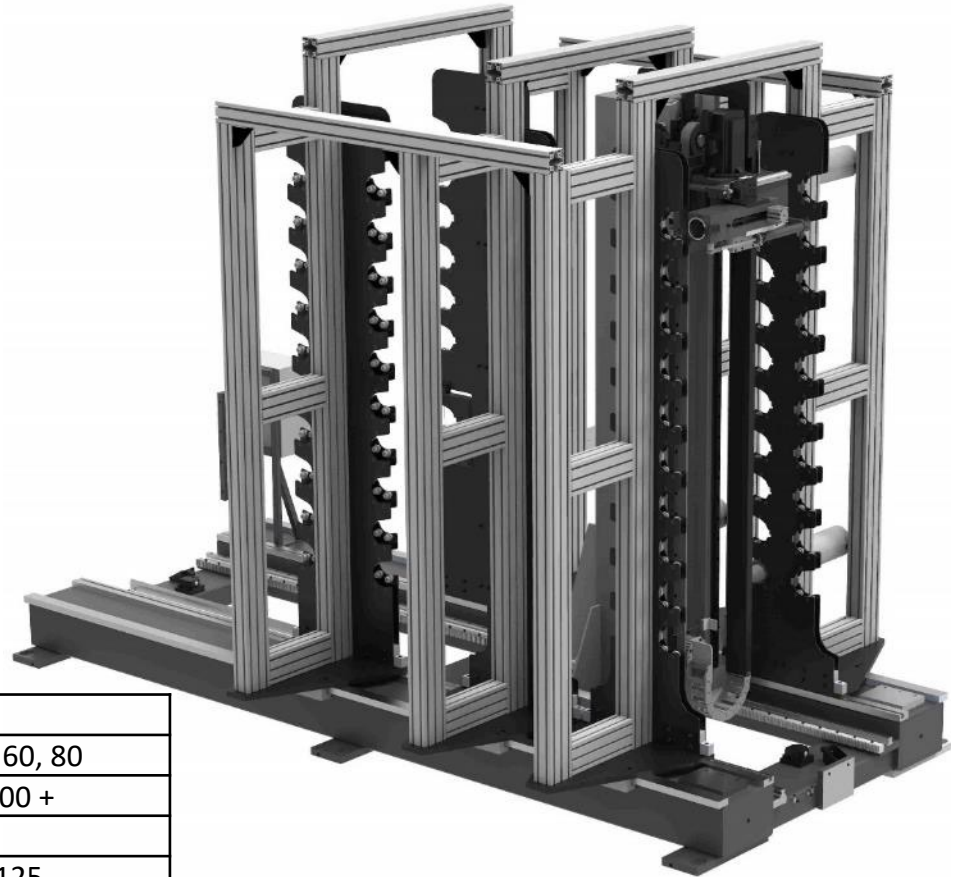
- Automatic exchange of technological pallets is between stationary stations and stowage basis clamping pallets on the machine
- Pallets are always with rotating manipulator, in order to maintain uniform design covers.



Automatic pallet change		
Transverse table travel, X	mm	2 000, 3 000, 4 000, 5 000
Max. palette load (carousel palette)	kg	16 000 (10 000)
Palette clamping area	mm	1 600 x 1 600, 1 600 x 2 000, \varnothing 2000
Max. number of palettes	Ks	2 - 4

AUTOMATIC TOOL CHANGE

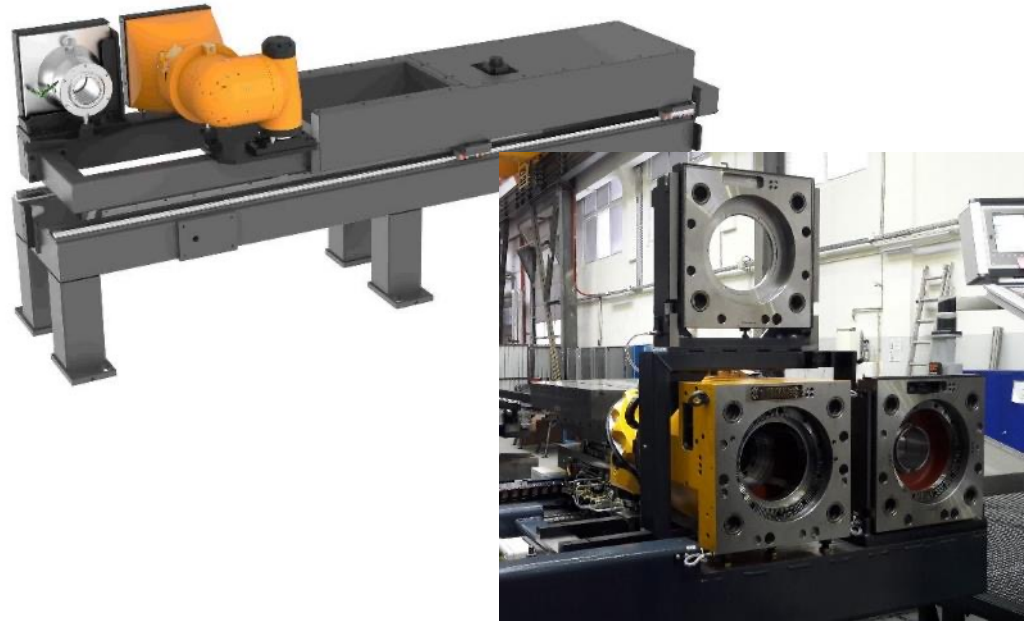
- Automatic tool change is a separate unite located on the base next to machine
- Several different designs differing in the number of beds of tools and constructional solutions.
- Search tool is conceived on the basis of coded beds in the tool magazine



Automatic tool change		
Number of pockets – chain type magazine	pc.	40, 60, 80
Number of pockets – rack type magazine	pc.	100 +
Max. tool diameter		
– with the magazine fully occupied	Mm	125
– with the free adjacent positions	mm	300
Max. tool length	mm	500
Tool change time (tool – tool)	sec	10

AUTOMATIC CHANGE OF SPECIAL ACCESSORIES

- a) Stand placed on a concrete floor next to the machine, usually on the edge of coordinates X
 - b) additional stand which is fixed and locked on the surface of the rotary table
- The machine is equipped with modification for the manual change of the manually adjusted milling heads
 - For automatic change of special accessories is necessary equipped machine with modification for the automatic change of the milling heads (UPPT)



The Z axis must be equal to or more than 2000 mm for the automatic exchange of milling heads

Automatic tool change to SA axis Z must be 2500 mm

AUTOMATIC CHANGE OF SPECIAL ACCESSORIES

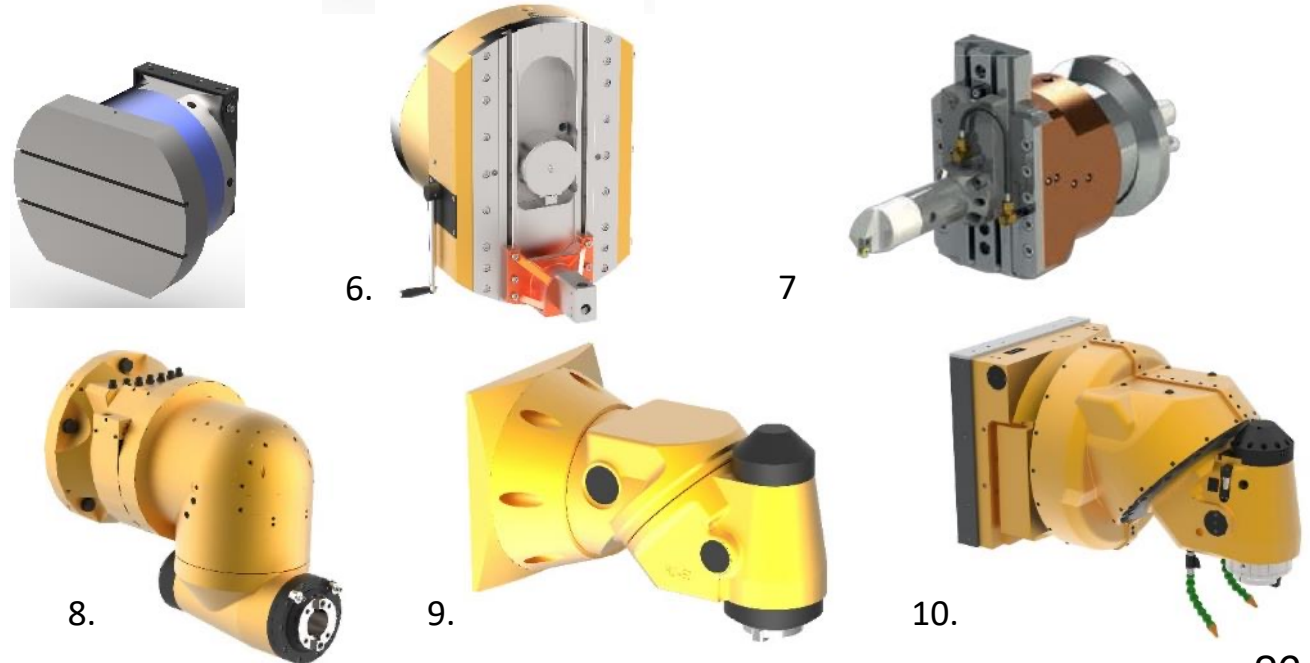
Manual changes heads:

1. HUR 50
2. HPR 50
3. PVK 130 – 250R
5. UT3/UT5 D'Andrea
6. LD 650
7. ZX xxx Cogsdill



Automatic changes heads:

4. PVD 130 – 340A
5. UT3/UT5 D'Andrea
6. LD 650
8. HOIL 50
9. HUI 50
10. HUF50



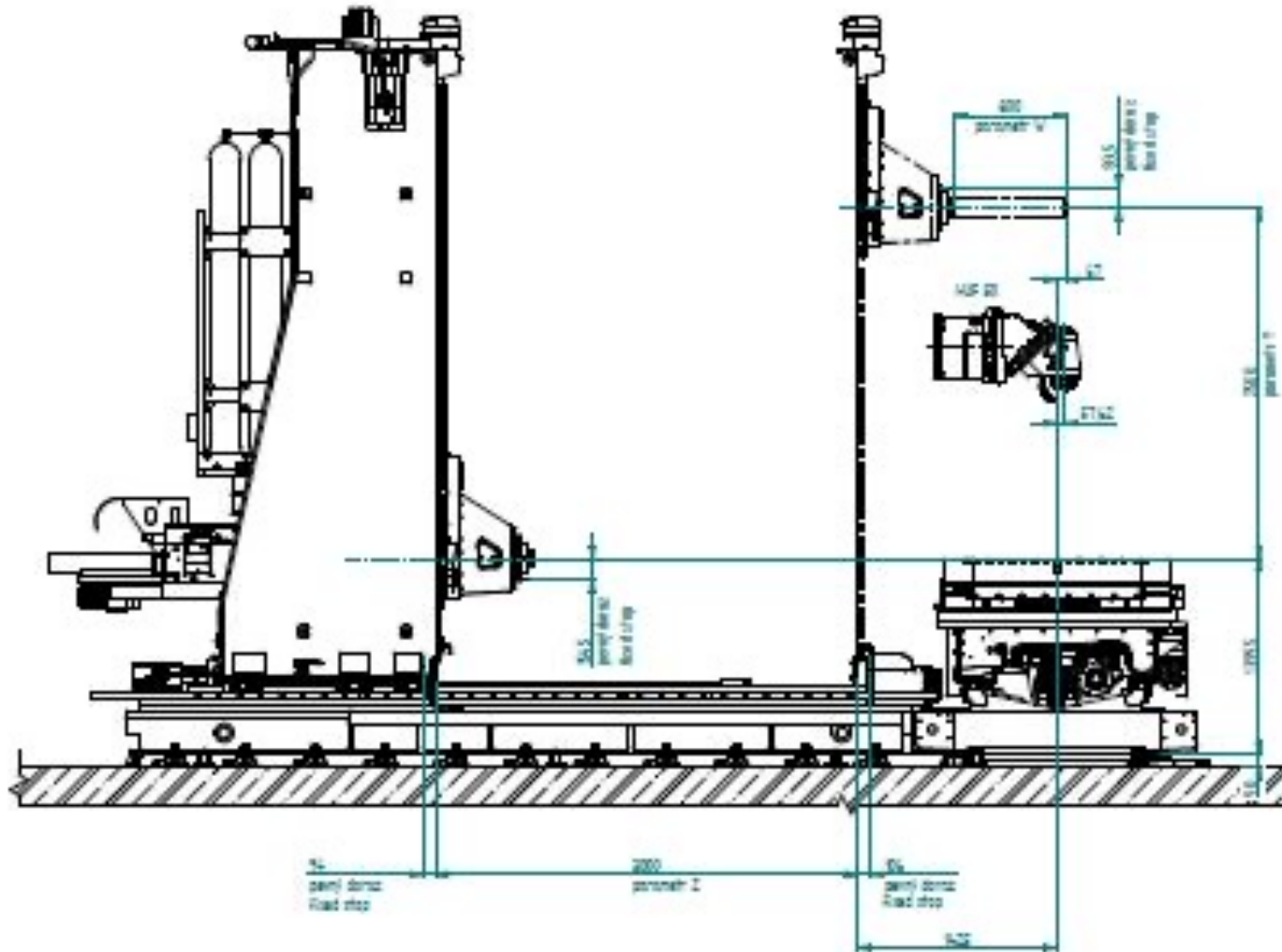
CHZ / CHOV

CHZ - the equipment is used for the tool cooling utilizing the external supply of the coolant through nozzles.

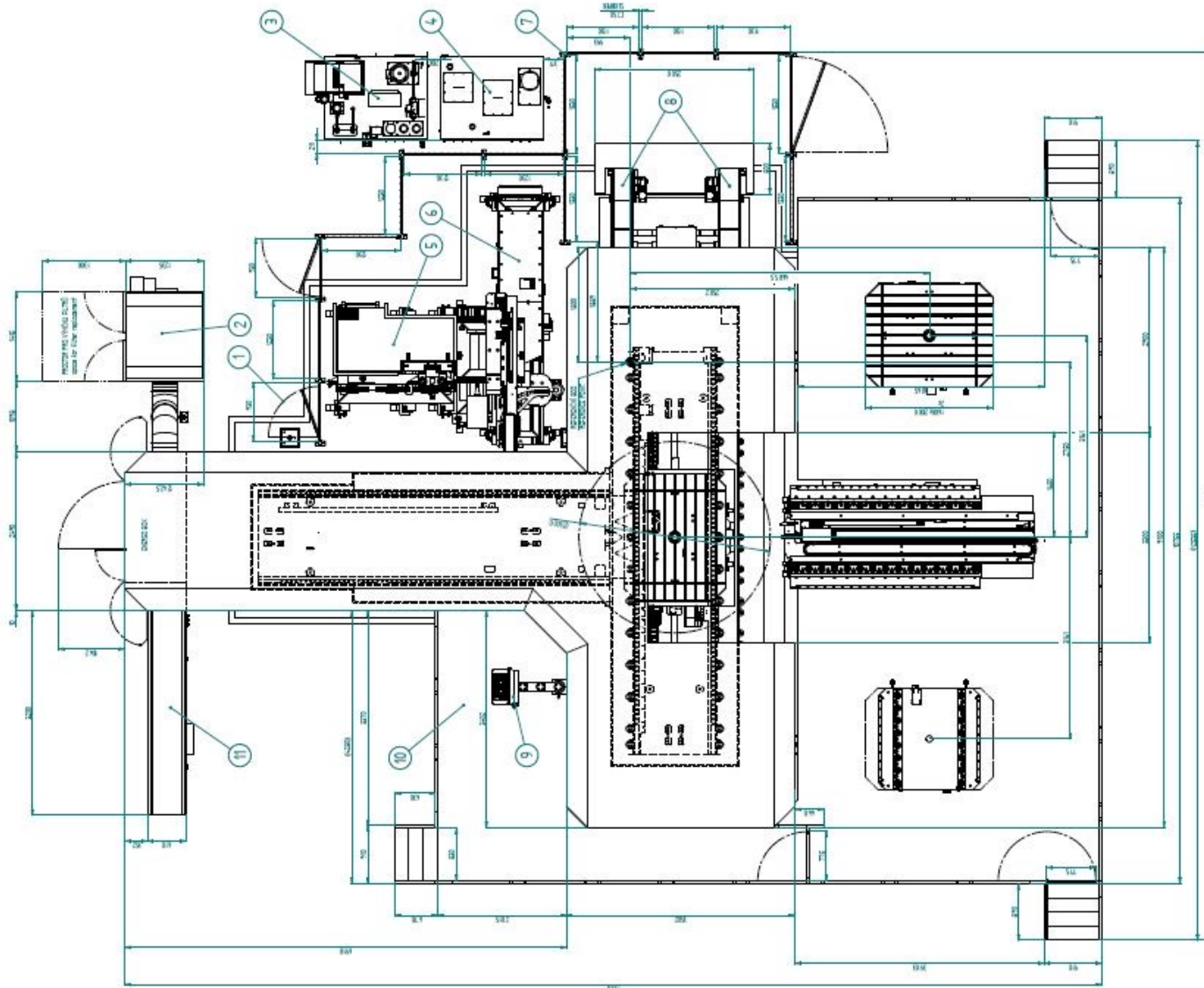
CHOV is the special equipment for machine WHT 130. It serves for bringing of coolant to the cutting edge both ways, through the spindle and through outside piping ended up with nozzles.



EXAMPLE OF A DIMENSIONAL SKETCH



EXAMPLE OF A DIMENSIONAL SKETCH



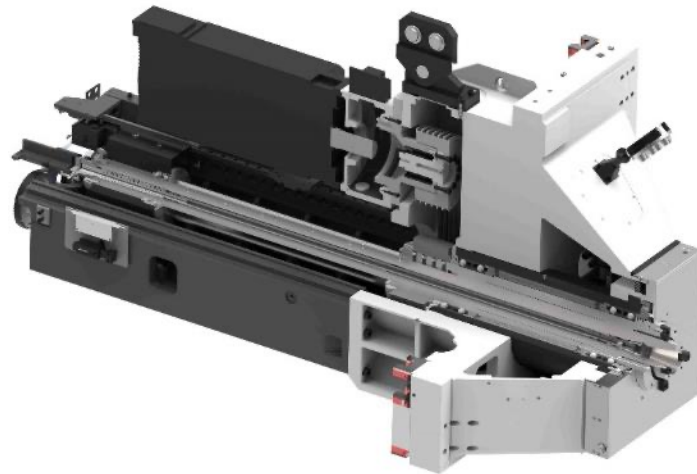
WHT 130

Horizontal milling machine

HEADSTOCK OF HORIZONTAL MILLING MACHINE WHT 130

Headstock:

- Central headstock. This concept is optimal as regards even thermal and power load on the machine's frame
- The spindle drive is provided by standard gearbox which is attached to the main motor. The gearbox has got 3 gear stages
- Working spindle is guided in a hollow spindle
- Lubrication of main housing by system oil / air
- Hybrid bearings on the main housing



Headstock		WHT 130
Spindle diameter	mm	130
Spindle taper		ISO 50
Spindle speed range	1 / min	10 - 4 000
Main motor power	kW	41
Torque on the spindle	Nm	3 200

FEED DRIVES AND CLAMPING

Feed drives and clamping:

- The linear axes are driven by separate servo drives with incorporated belt gear and ball screws with steep lead.
- X and Z axes are driven by a ball screw with a rotating ball nut.
- The Y and W axes are driven by a rotating ball screw



Axis Z

Feeds			
Feed and rapid traverse ranges – X, Y, Z	mm/min		25 000
Feed and rapid traverse ranges – W	mm/min		20 000
Feed and rapid traverse ranges – B	1/min		3

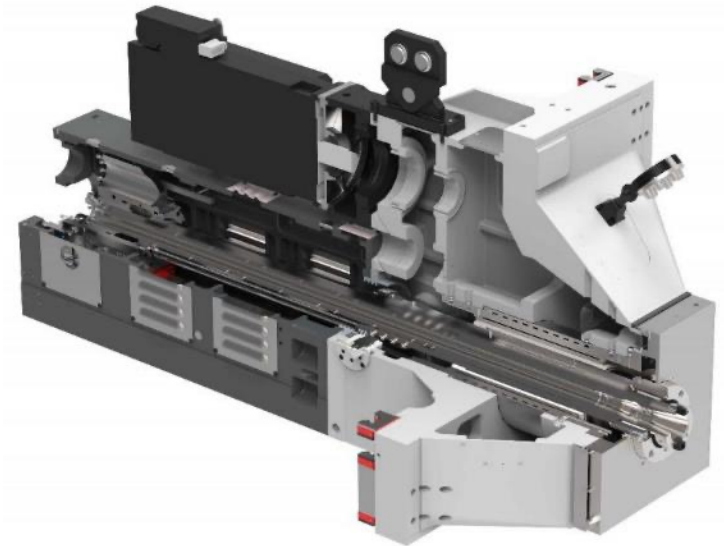
WHT 130 (C)

Horizontal machining center

HEADSTOCK FOR WHT 110 C (CENTER)

Headstock:

- Central headstock. This concept is optimal as regards even thermal and power load on the machine's frame
- the spindle drive is provided by standard gearbox which is attached to the main motor. The gearbox has got 2 gear stages
- Working spindle is guided in a hollow spindle
- Lubrication of main housing by system oil / air
- Hybrid bearings on the main housing
- 5 000 RPM

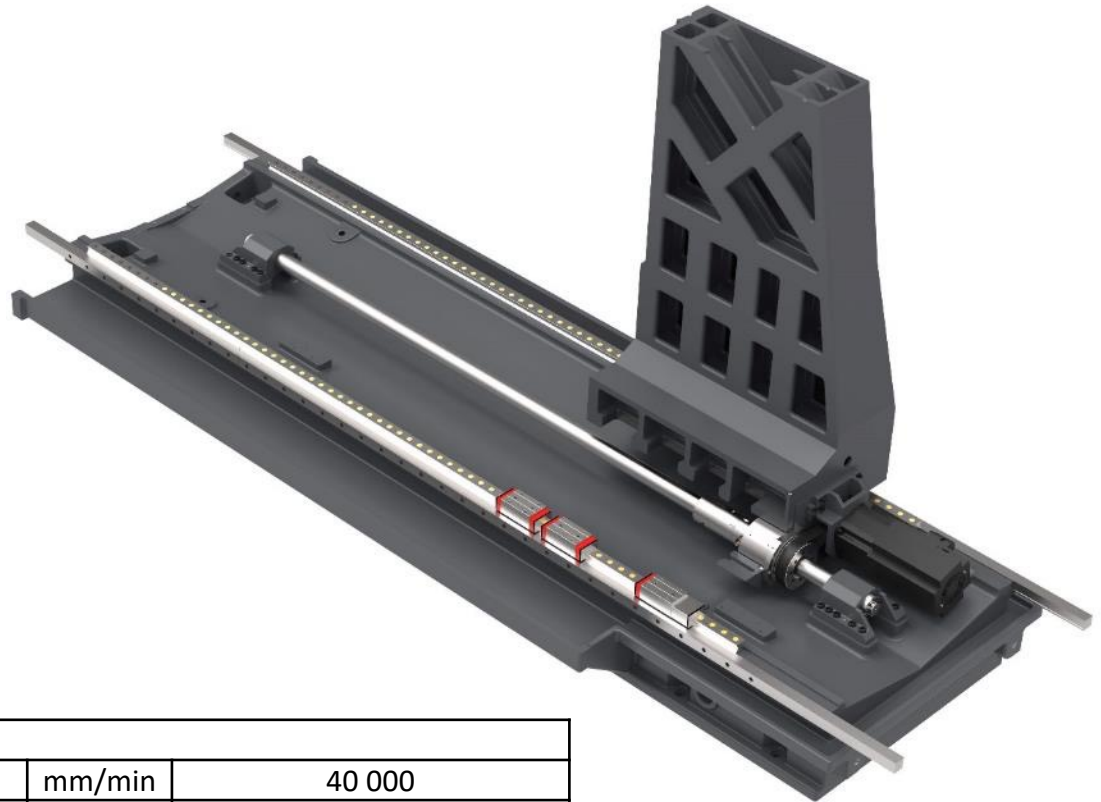


		WHT 130 C	
Headstock			
Spindle diameter	mm	130	
Spindle taper		ISO 50	
Spindle speed range	1 / min	10 - 4 000	10 - 5 000
Main motor power	kW	41	41
Torque on the spindle	Nm	3 200	1 718

FEED DRIVES AND CLAMPING

Feed drives and clamping:

- The linear axes are driven by separate servo drives with incorporated belt gear and ball screws with steep lead.
- X and Z axes are driven by a ball screw with a rotating ball nut.
- The Y and W axes are driven by a rotating ball screw

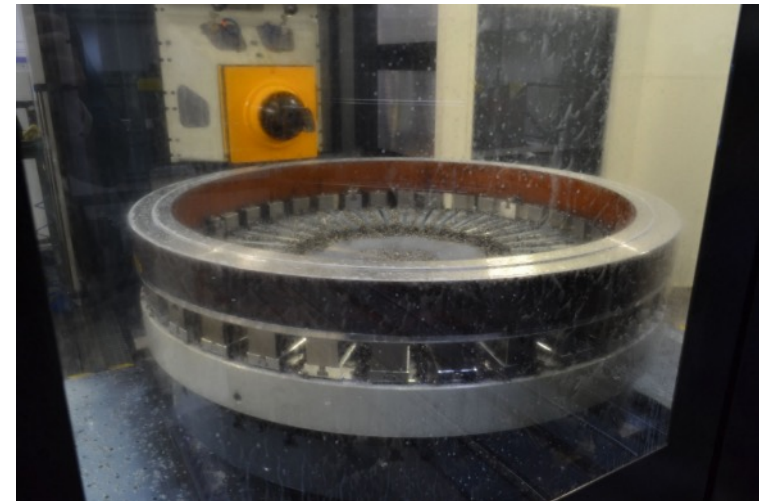


Axis Z

Feeds			
Feed and rapid traverse ranges – X, Y, Z	mm/min		40 000
Feed and rapid traverse ranges – W	mm/min		20 000
Feed and rapid traverse ranges – B	1/min		3

TURNING TABLE

- Turning table from made by company Fibro
- Clamped by hydraulic system
- Controlled B-axis
- torsional engine



Turning table		
Traverse table travel, X	mm	2 000, 3 000, 4 000
Max. workpiece weight (max. palette load)	kg	10 000
Table clamping area dimensions	mm	Ø 2 000
Torque	Nm	8 000
Reverse of turning table	1/min	250

HORIZONTAL MACHINING CENTER COVERING

A complete covering of the machining centre.
In addition to the covering, a chip washing
option or the workspace exhaustion can be
specified.

Service entry (blind cover on the Z-axis
and magnets covers)



WHT 130 (C)

Options and parameters

BASIC PARAMETERS

Basic machine:		WHT 130 S	WHT 130 L	WHT 130 SC	WHT 130 LC
Headstock					
Spindle diameter	mm	130			
Spindle taper		ISO 50			
Spindle speed range	1/min	10 - 4 000		10 - 5 000	
Main motor nominal power (S1)	kW	41		41	
Spindle nominal torque (S1)	Nm	3 200		1 718	
Spindle stroke W	mm	800			
Column					
Headstock vertical travel Y	mm	1 500	2 500	1 500	2 500
Column longitudinal travel Z	mm	2 000	3 000	2 000	3 000
Rotary table					
Table transverse travel X	mm	2 000	4 000	2 000	4 000
Max. workpiece weight	kg	20 000			
Table clamping surface dimensions	mm	1 800 x 1 800	1 800 x 1 800	1 800 x 1 800	1 800 x 1 800
Feeds					
Feed and rapid traverse ranges - X, Y, Z,	mm/min	25 000		36 000	
Feed and rapid traverse ranges - W	mm/min	20 000		20 000	
Feed and rapid traverse ranges - B	1/min	3			
Machine standard equipment:					
Chips conveyor		•		•	
Machine operator covering		•		•	
X, Z-axis covering		•			
Modification for the manual change of manually adjustable milling heads		•			
Remote diagnostics		•		•	
Machine complete covering (including the machine operator)				•	
ATC40 Automatic Tool Change				•	
Modification for the automatic milling head change (UPPT)				•	
CHZ Tool cooling (with external nozzles)				•	

OPTIONS PARAMATERS

		WHT 130	WHT 130 C	
Headstock				
Spindle diameter	mm	130		
Spindle taper		ISO 50		
Spindle speed range	1 / min	10 - 4 000	10 - 4 000	10 - 5 000
Rated spindle speed	1 / min	122	122	195
Main motor nominal power (S1)	kW	41	41	41
S1 Spindle nominal torque (S1)	Nm	3 200	3 200	1 718
Spindle stroke W	mm	800		
Column				
Headstock vertical travel Y	mm	1 500, 2 000, 2 500, 3 000*		
Column longitudinal travel Z	mm	1 500, 2 000, 2 500, 3 000		
Rotary table				
Table transverse travel X	mm	2 000, 3 000, 4 000, 5 000*		
Max. workpiece weight	kg	20 000		
Table clamping surface dimensions	mm	1 800 x 1 800, 1 800 x 2 200, 1 800 x 2 500 2 000 x 3 000, 2 500 x 3 000		
Turning table				
Table transverse travel X	mm	2 000, 3 000, 4 000		
Max. workpiece weight	kg	10 000		
Table clamping surface dimensions	mm	∅ 2 000		

* Only for WHT 130 „milling machine“

OPTIONS PARAMETERS

		WHT 130	WHT 130 C
Automatic pallet change			
Table transverse travel X	mm	2 000, 3 000, 4 000, 5 000*	
Max. workpiece weight	kg	16 000	
Pallet clamping surface dimensions	mm	1 600 x 1 600, 1 600 x 2 000	
Max. pallet in system	ks	2 až 4	
Automatic tool change			
Number of pockets – chain type magazine	ks	40, 60, 80	
Number of pockets – rack type magazine	ks	100 and more	
Max. tool diameter			
– with the magazine fully occupied	mm	125	
– with the free adjacent positions	mm	300	
Max. tool length	mm	500	
Tool change time (tool – tool)	sec	10	

* Only for WHT 130 „milling machine“

WHT 130 (C)

Discussion...

The end

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