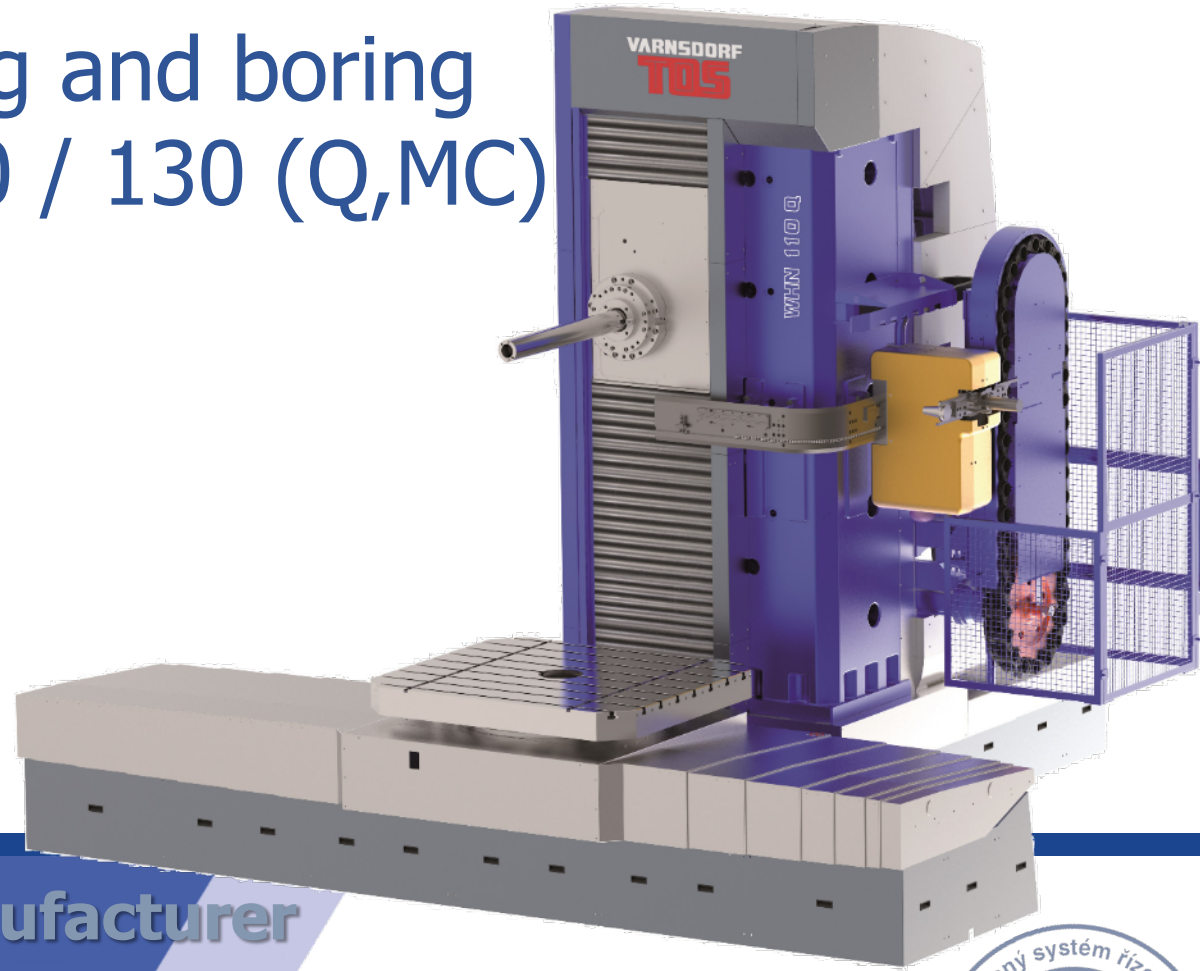


Horizontal milling and boring machine WHN 110 / 130 (Q,MC)



Milling machine manufacturer

TOS VARNSDORF a.s.



BASIC CHARACTERISTIC

Basic characteristic:

The **WHN 110 / 130 (Q, MC)** table type, cross bed, live spindle horizontal boring mill is a medium size representative of the new and advanced generation of the CNC horizontal borers of TOS VARNSDORF. These offer high performance parameters and user comfort based on the technically progressive philosophy of the design and the broad menu of its parametric options and user functions. The comfort of this solution has its ground in the modular conception of the new generation machines and in the qualities of the advanced peripheral and optional equipment. The table may also optionally be delivered as rotary or just plain, or even as an automatically changeable pallet.

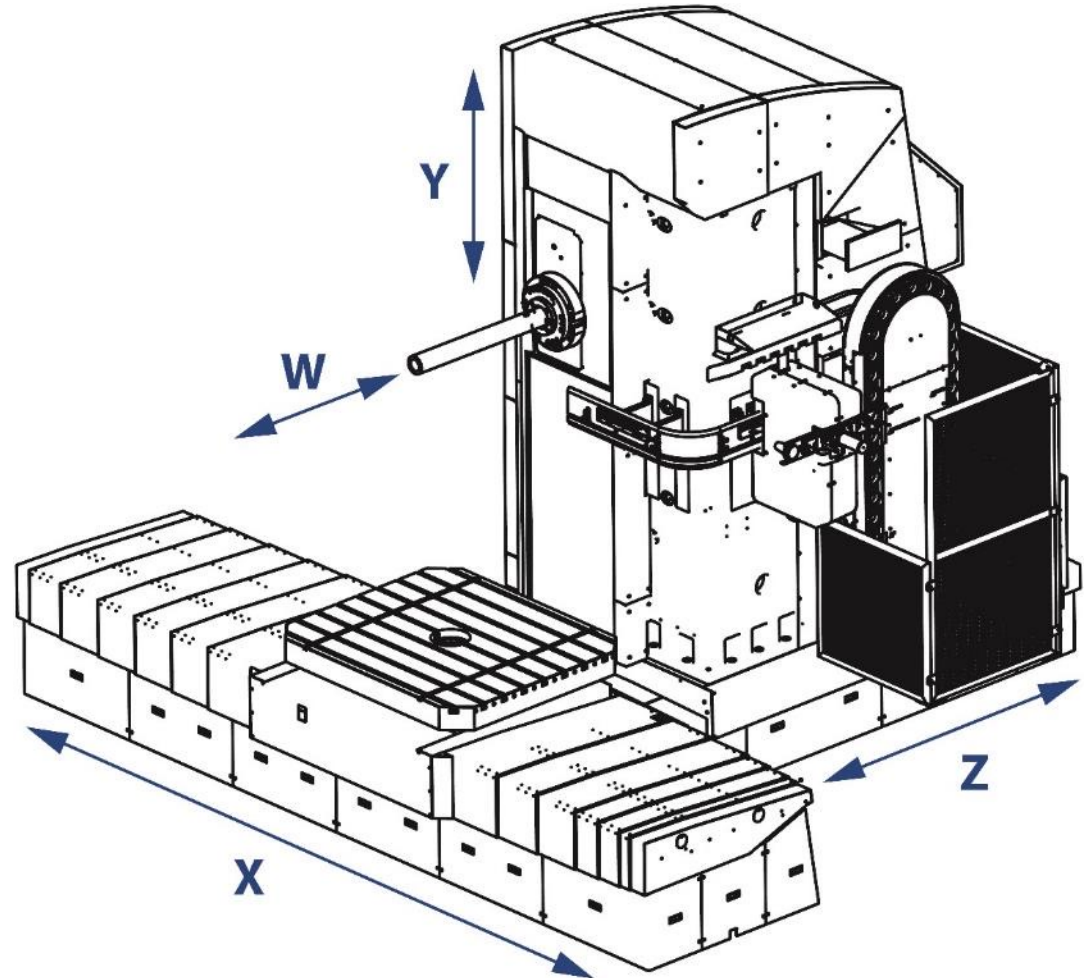


BASIC CONCEPTION

Basic conception:

WHN 110 / WHN 130 (Q, MC) horizontal boring mill is milling and boring machine tool with bed arrangement into shape T with transversally movable rotary table or pallet and longitudinal movable column.

The machine has got 5 controlled axes. Linear axes (X - cross travel of the table, Y - vertical travel of the headstock, Z - longitudinal travel of the column, W - spindle travel, B - table rotation) are full controlled.



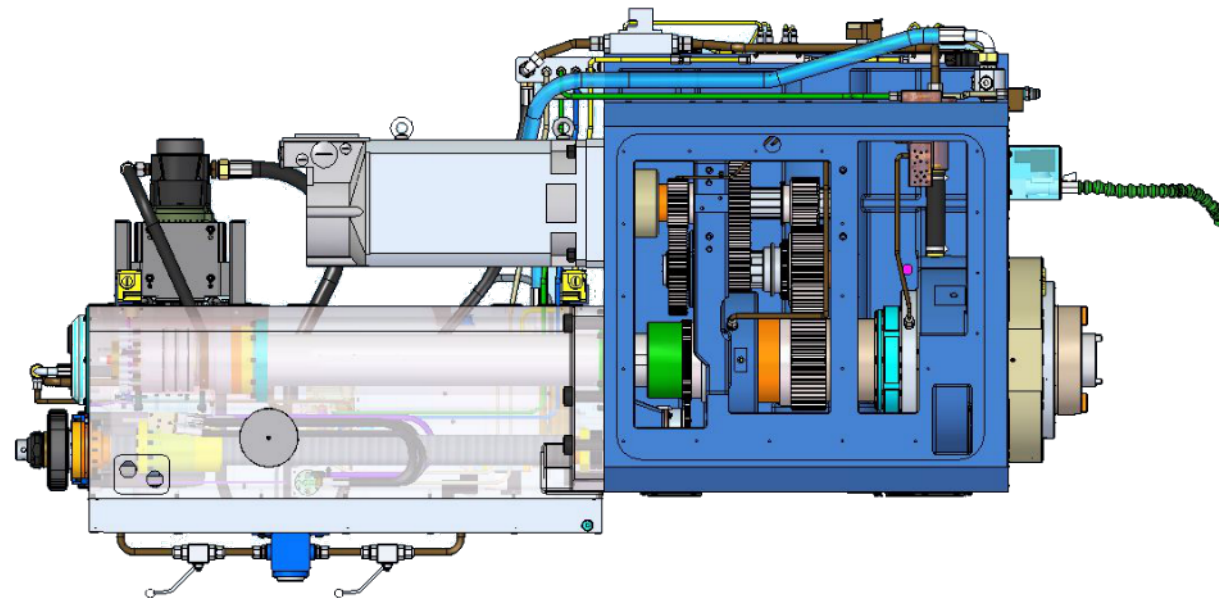
HEADSTOCK

Headstock:

The headstock contains all the spindle bearings and the spindle driving mechanism as well as the ones for the longitudinal travel of the live spindle (W-axis). Various items of standard or optional equipment such as spindle guiding support, facing or milling head etc., may be mounted on the headstock face.

Spindle bearing setup:

- with the headstock N/R - precise spindle type pre-loaded multiple setup ball-bearings.



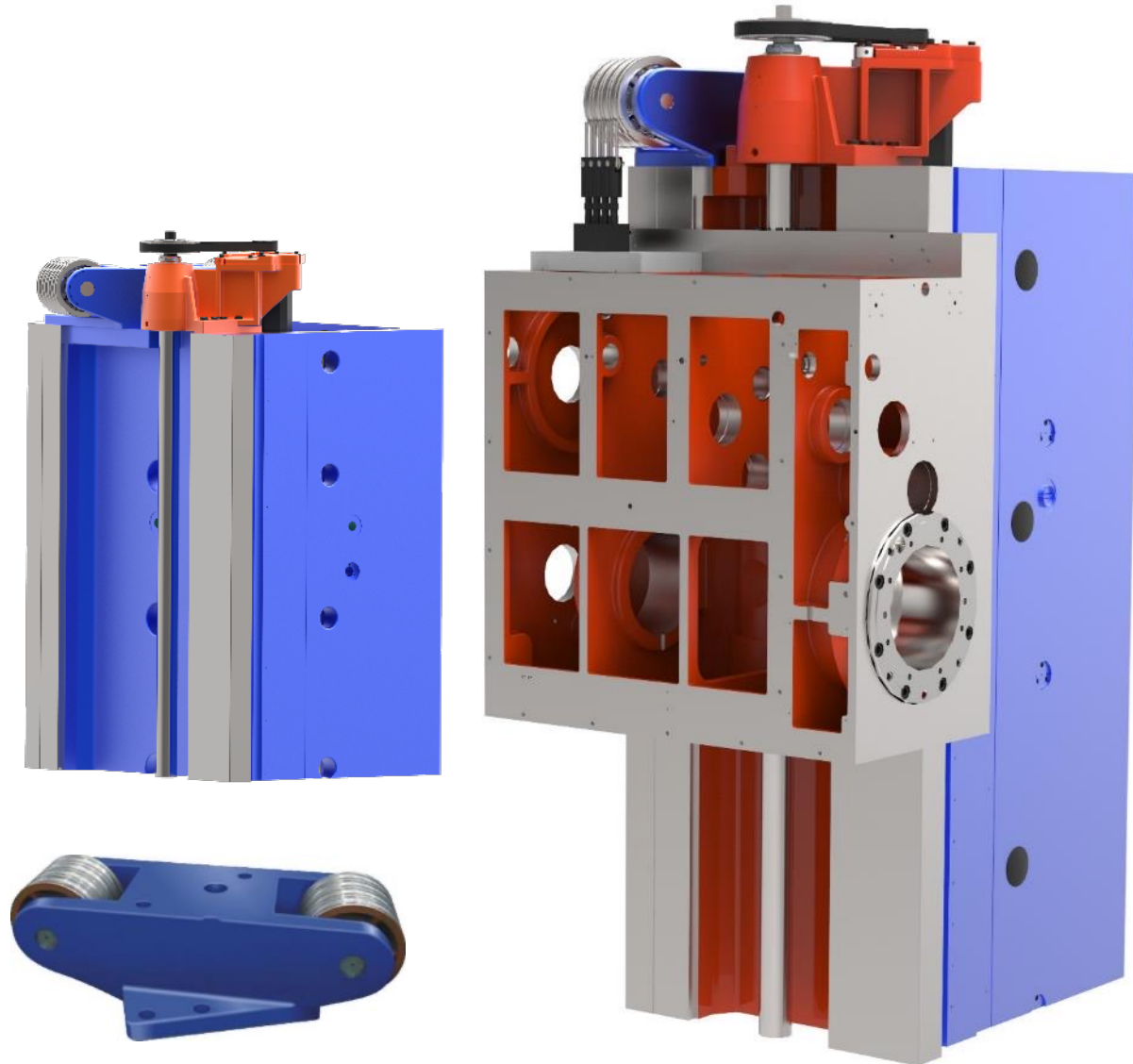
HEADSTOCK



BALANCE AND DRIVE OF AXIS Y

Balance and drive of axis Y:

The linear axis Y drives is designed through independent AC-digital servo-drives and cogged-belt transmissions to ball bolts with pre-stressed nuts. After reaching that target positions the Y linear axis is kept live in a closed positional feedback. The headstock weight is balanced with a counter-balance suspended on ropes and guided in the machine frame.

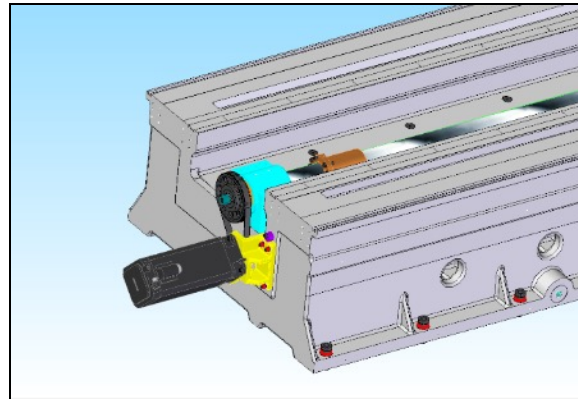


FEED DRIVES AND CLAMPING

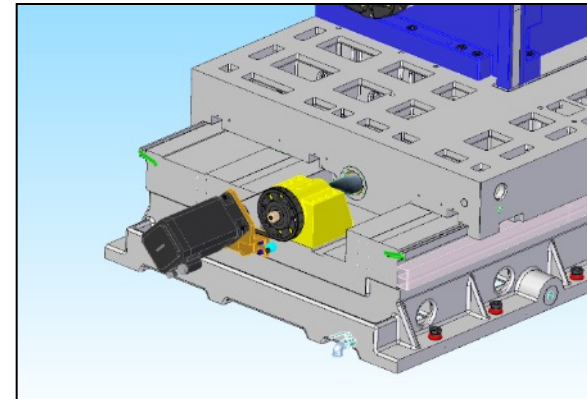
Feed drives and clamping:

The feed drive mechanics at all the CNC coordinates has been designed as backlash-free and pre-loaded, consisting of:

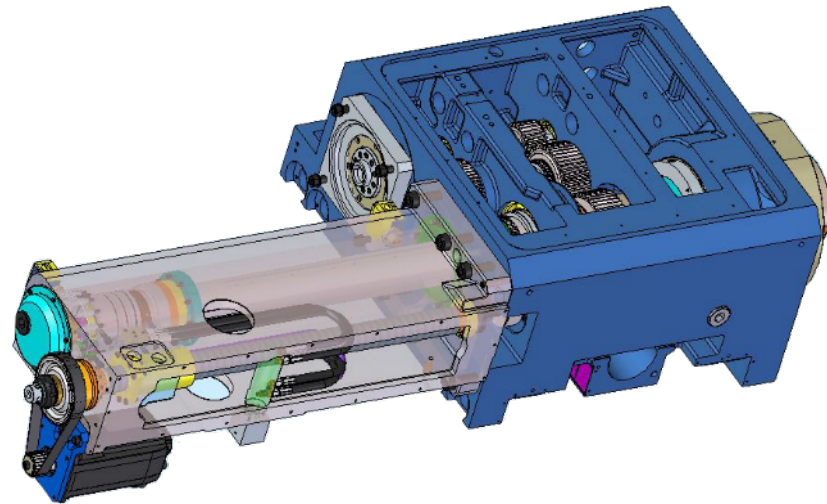
- ballscrew and nut - drives of the table saddle, column slide, headstock and the spindle stroke
- ring gear and pre-loaded couple of pinions - rotary table.



Axis X



Axis Z

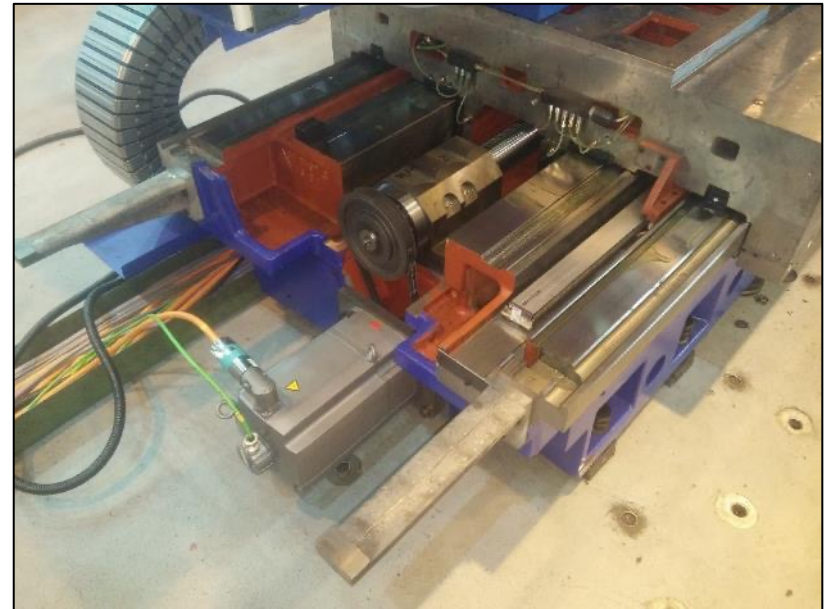


Axis W

FEED DRIVES AND CLAMPING



Axis X



Axis Z

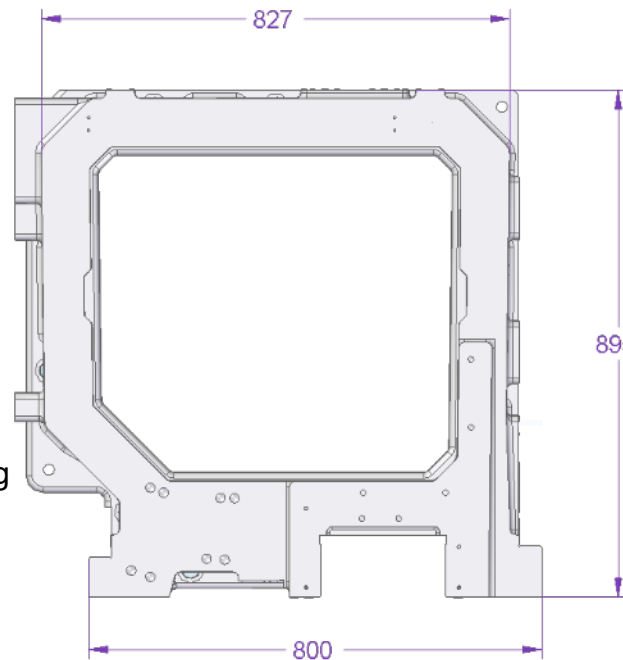
GUIDEWAYS OF MOVABLE GROUPS

Guideways of movable groups:

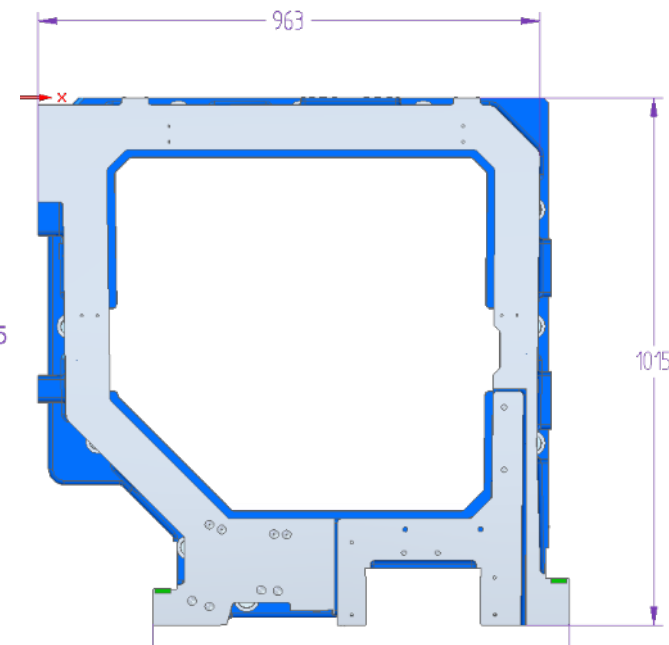
Guides of working spindle W (spindle is nitrided) is sliding with minimum backlash in the hollow spindle.

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.

The table is laid on external circular sliding housing and – near the centre – on a circular antifriction bearing. At their beds, the guides are protected against dirt with retractable covers, while the machine frame guiding surfaces are protected with bellows covered with steel slats.



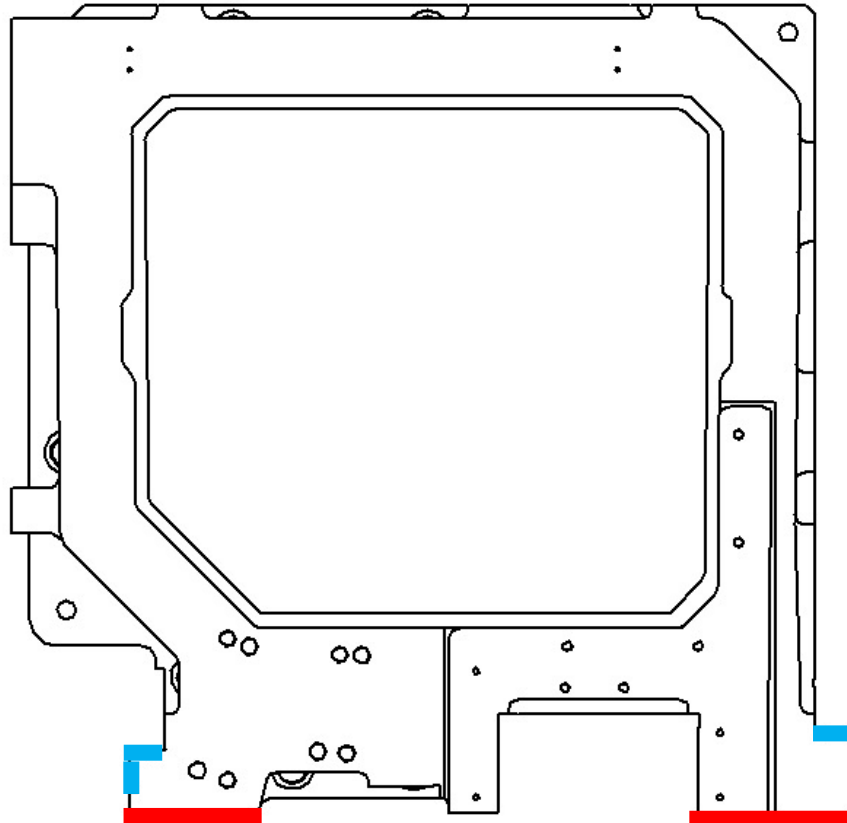
Column of machine (axis Y): WHN 110





WHN 130

GUIDEWAYS OF MOVABLE GROUPS

Column (axis Y) WHN 110 / 130

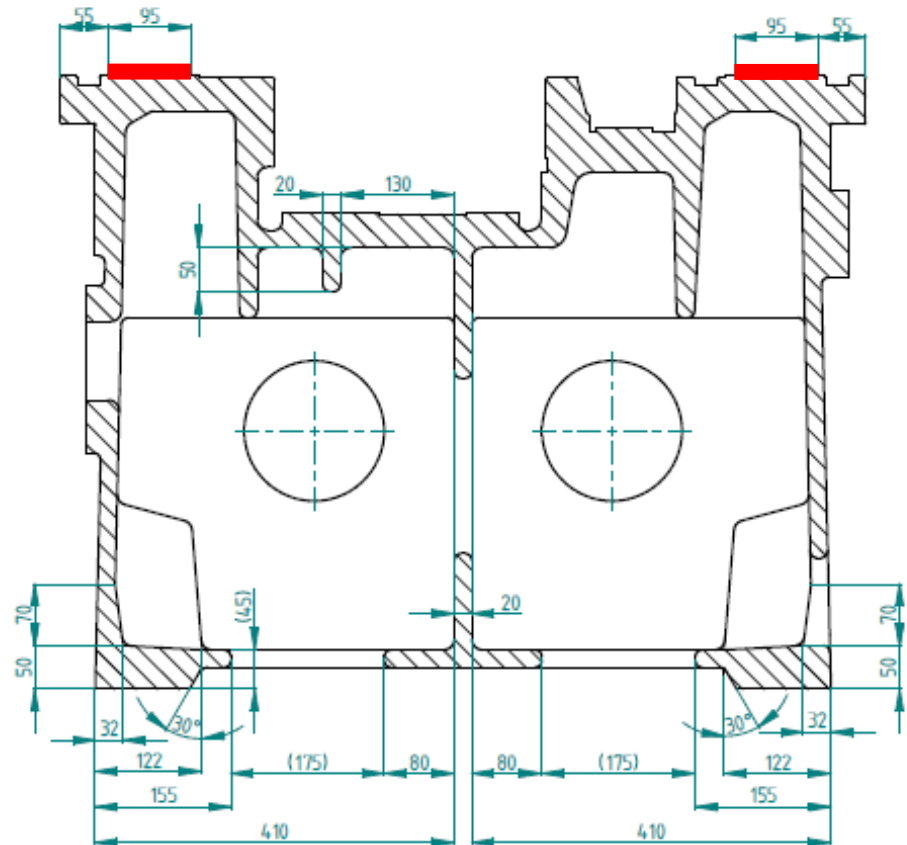
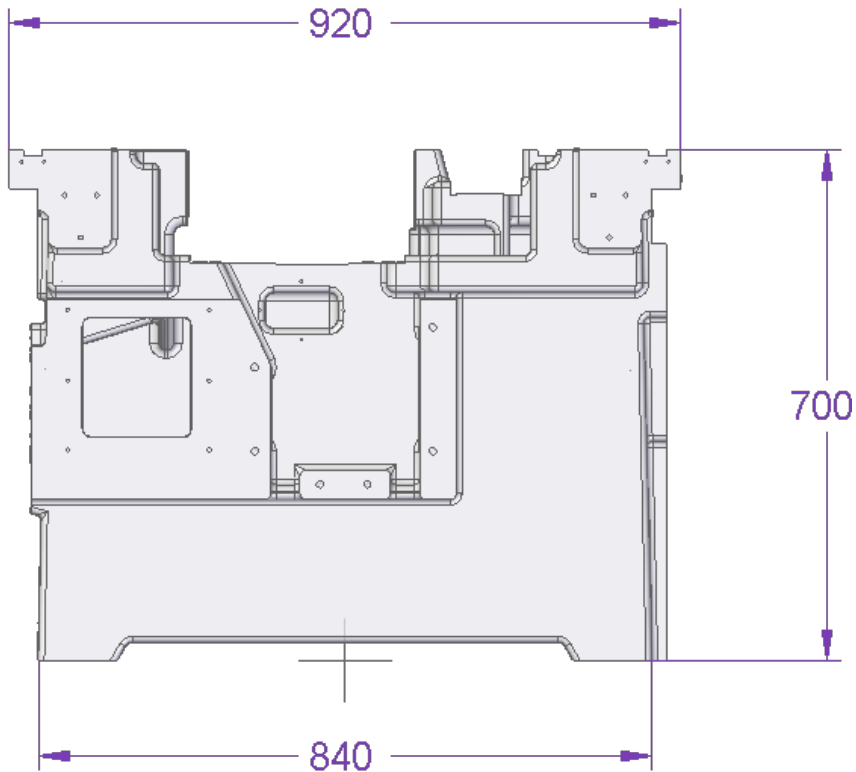


-  Hardened steel rails
-  Laser-hardened surface

GUIDEWAYS OF MOVABLE GROUPS

Axis X machine WHN 110

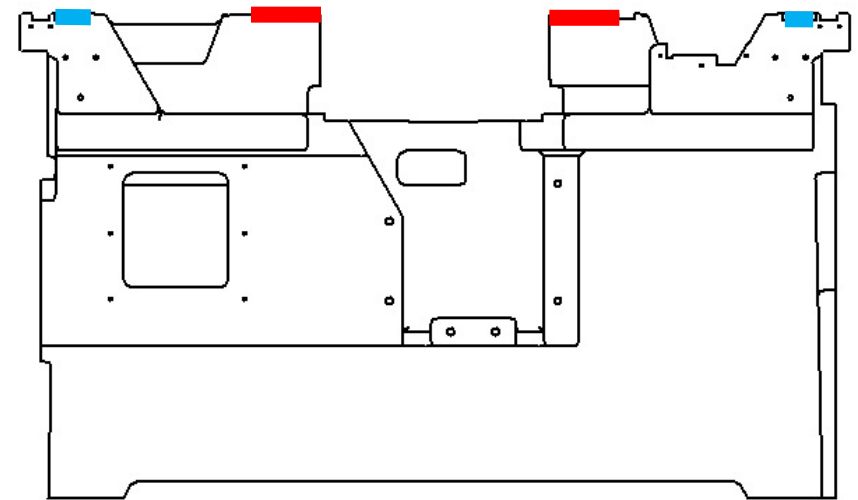
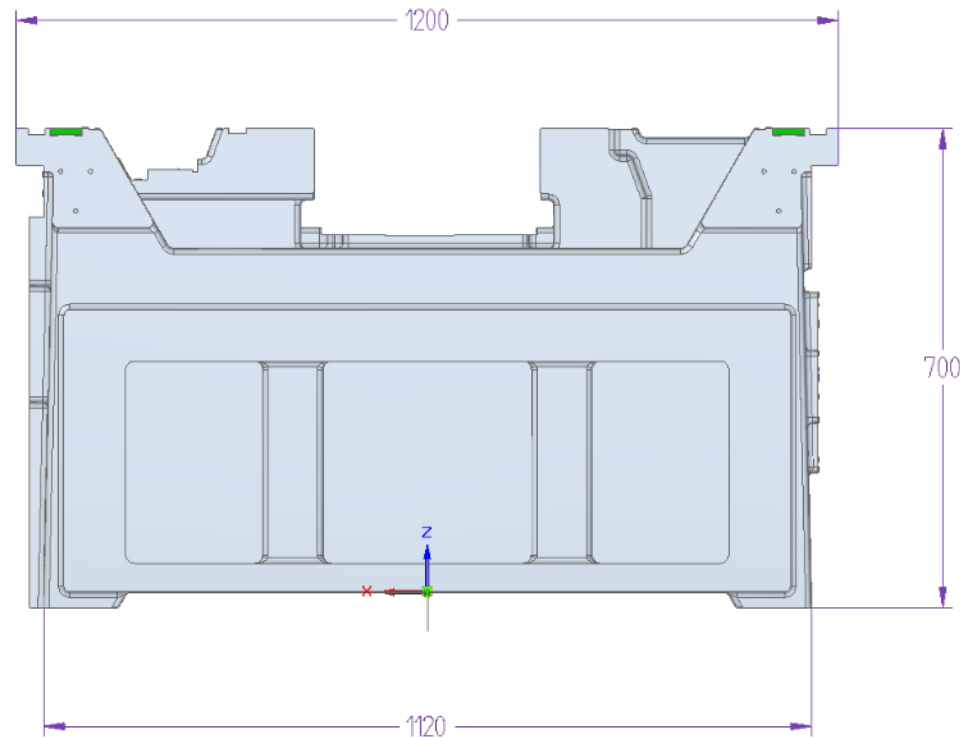
 Laser-hardened surface



GUIDEWAYS OF MOVABLE GROUPS

Axis X machine WHN 130

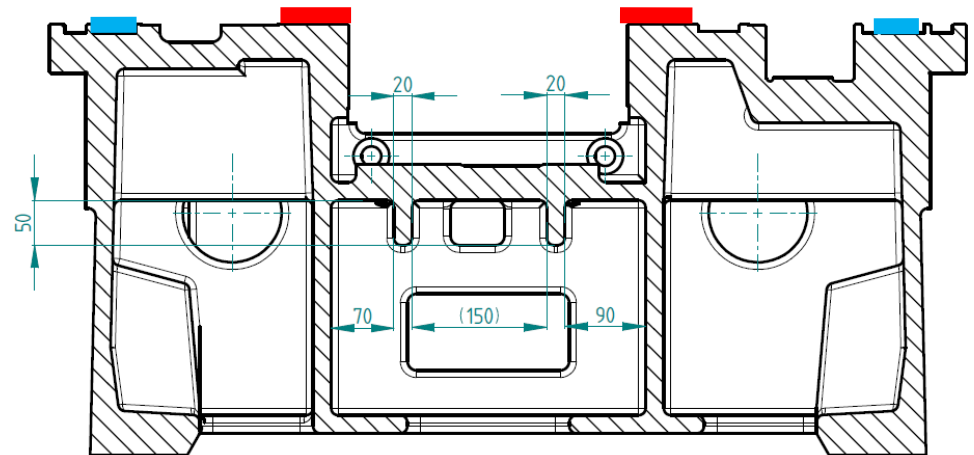
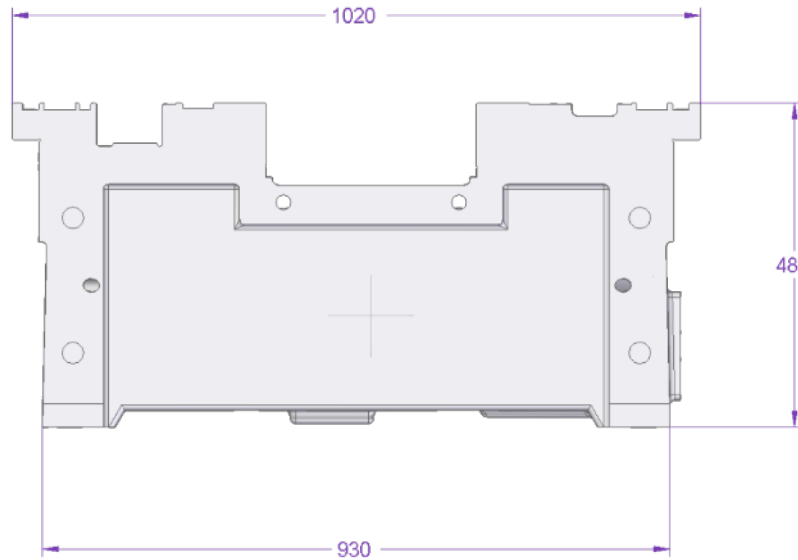
- Hardened steel rails
- Laser-hardened surface



GUIDEWAYS OF MOVABLE GROUPS

Axis Z machine WHN 110

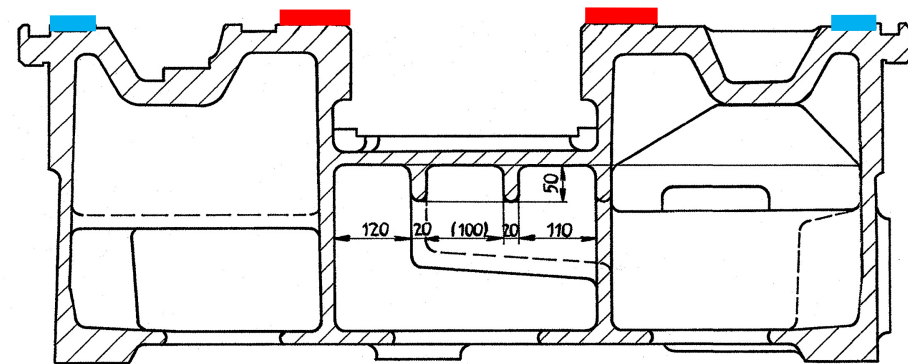
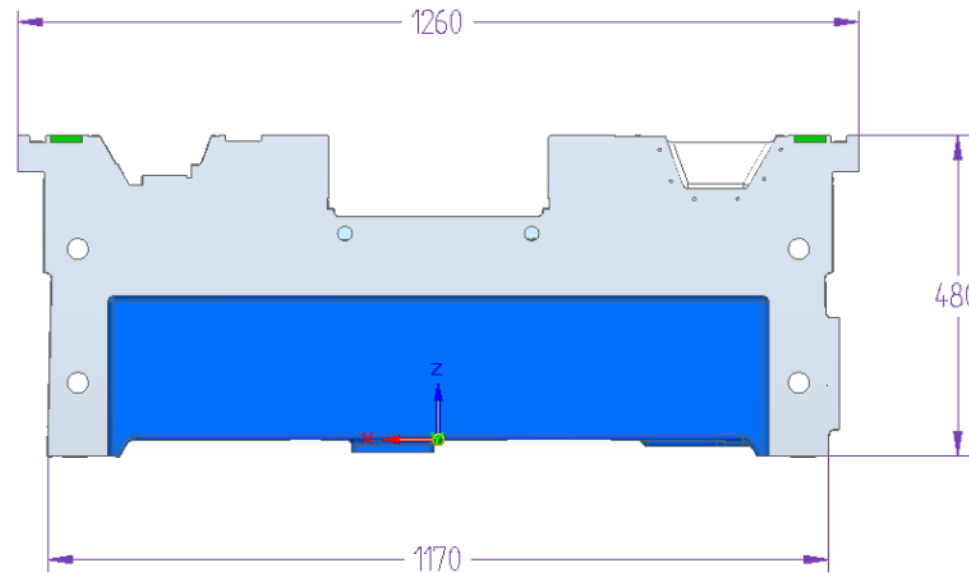
- Hardened steel rails
- Laser-hardened surface



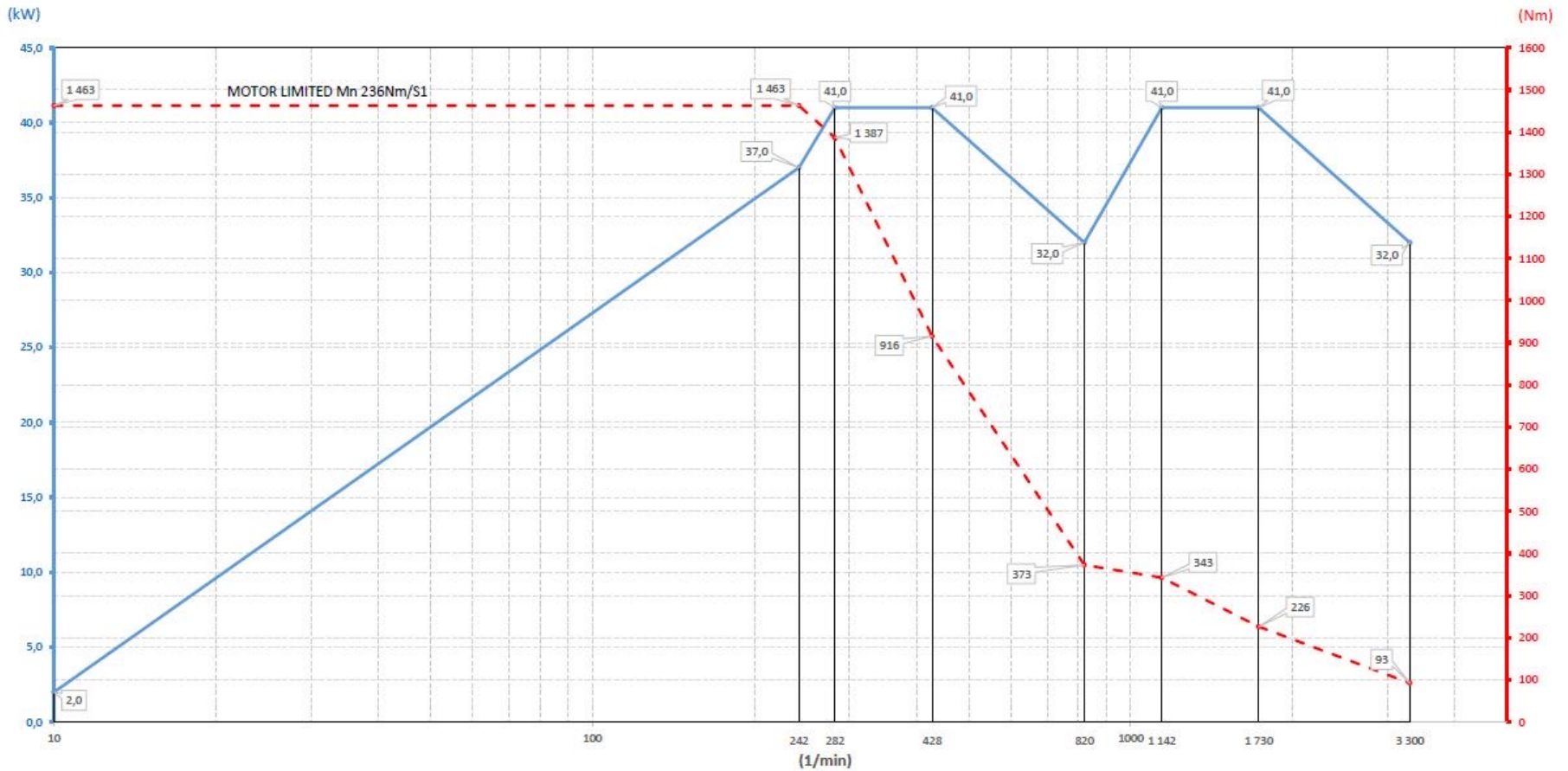
GUIDEWAYS OF MOVABLE GROUPS

Axis Z machine WHN 130

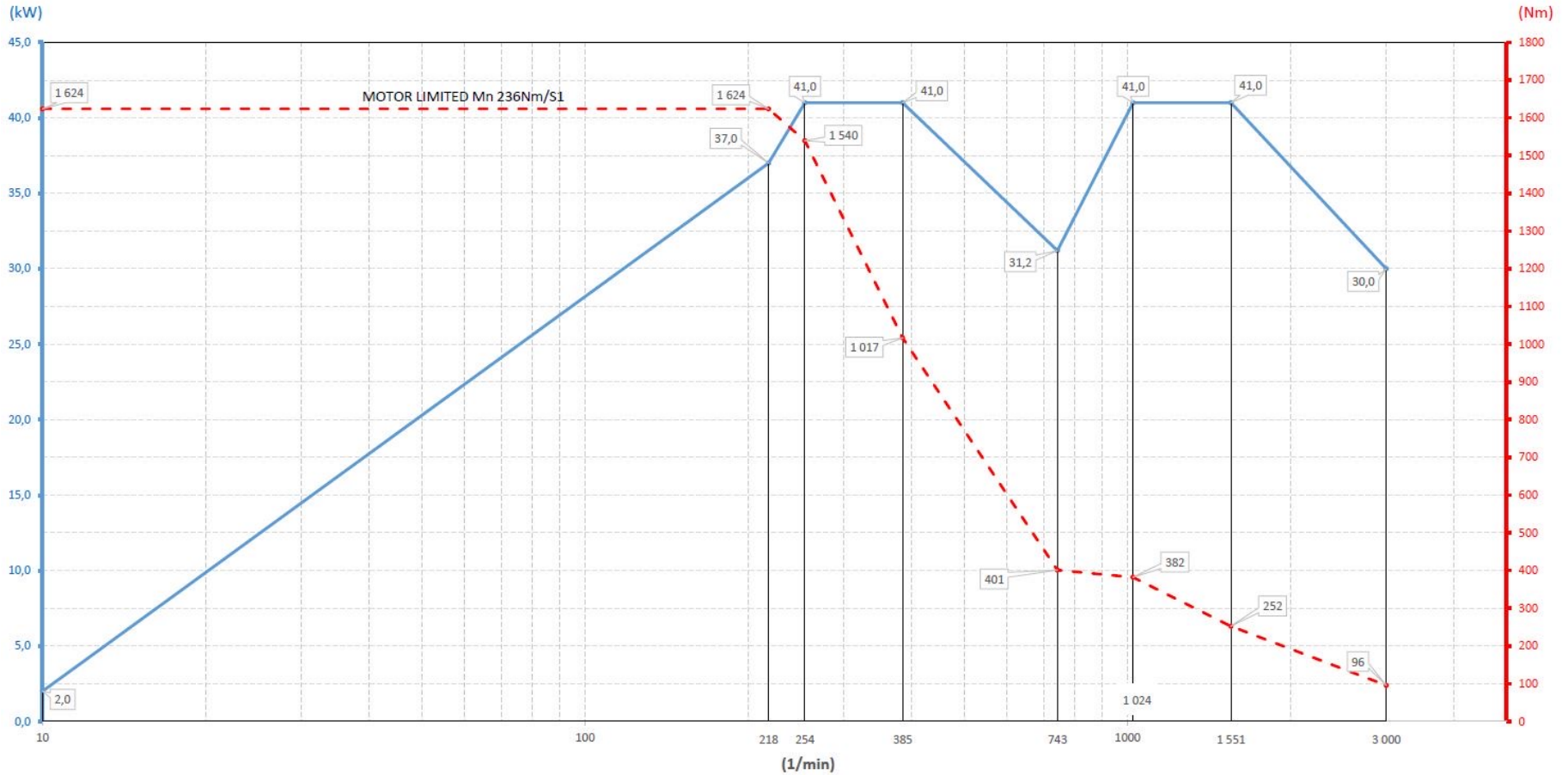
- Hardened steel rails
- Laser-hardened surface



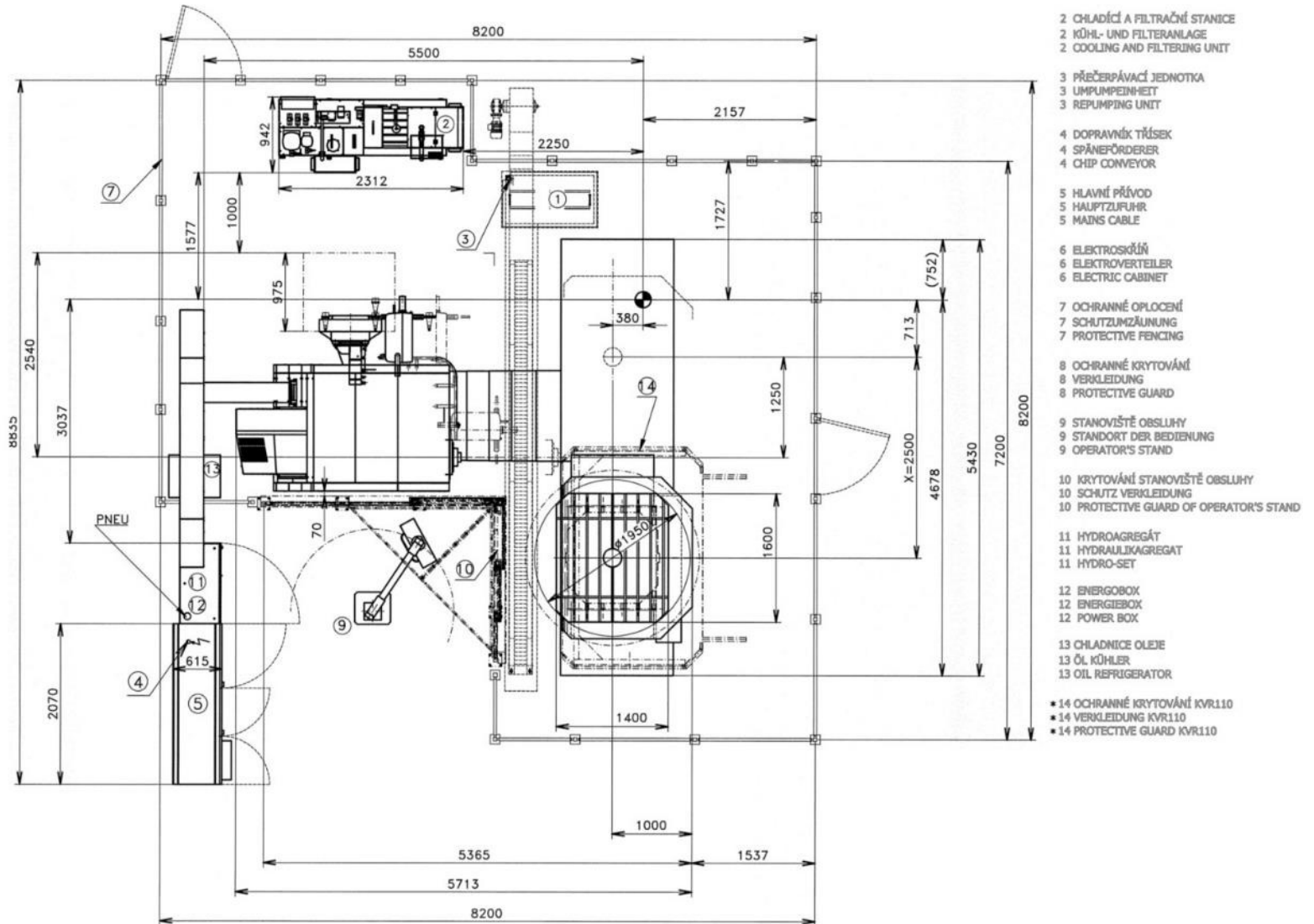
WHN 110 (Q, MC) – HEADSTOCK N/R



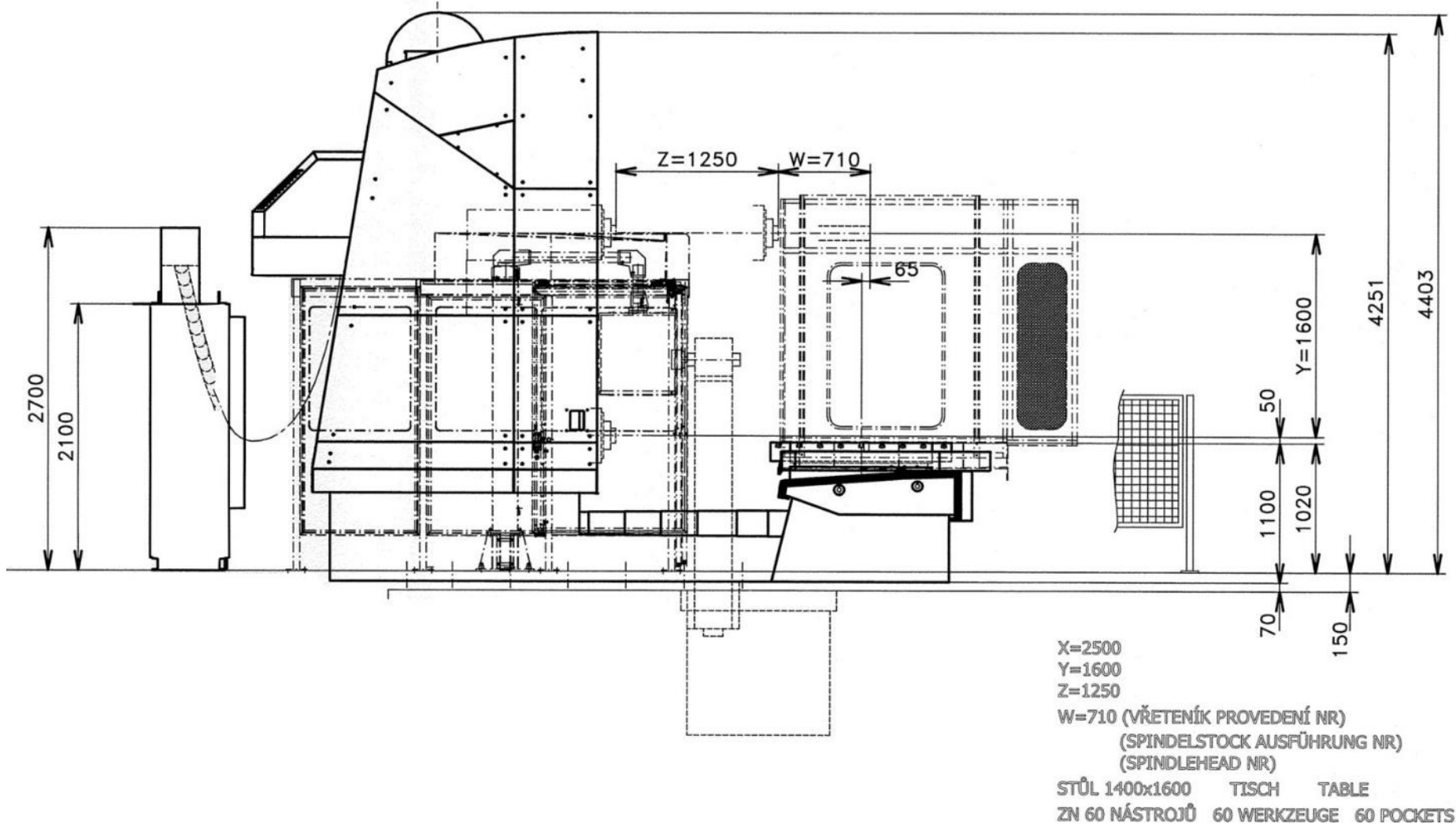
WHN 130 (Q, MC) – HEADSTOCK N/R



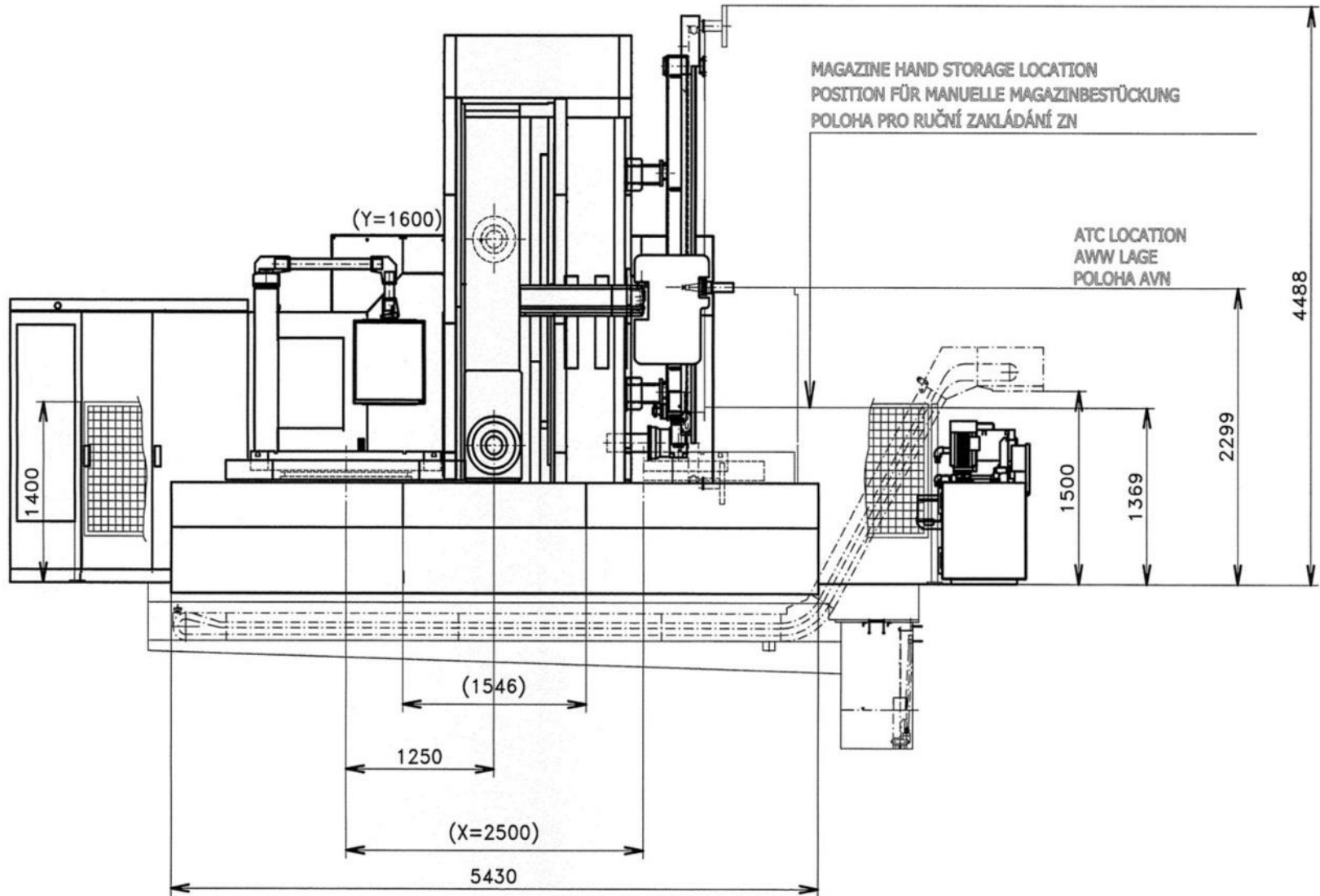
EXAMPLE OF A DIMENSIONAL SKETCH



EXAMPLE OF A DIMENSIONAL SKETCH



EXAMPLE OF A DIMENSIONAL SKETCH



BASIC PARAMETERS WHN 110 (Q,MC)

Headstock type		„N/R“
Spindle diameter	mm	112
Spindle taper		ISO 50 / ISO 50 BIG+
Taper standards available		BT 50 MAS 403-1982 CAT ANSI/ASME B5 DIN 69871/A (without tool cooling kit) DIN 69871/AD (with tool cooling kit)
Spindle speed range	R.P.M.	10 – 3 300
Main motor power, rated (continuous load operation S1)	kW	41
Main motor power max. (operation S6 - 60% of the load time)	kW	46
Spindle revs, rated	R.P.M.	282
Spindle torque, rated (S1)	Nm	1 463
Spindle torque max. (S6-60%)	Nm	1 811
Spindle stroke W	mm	710

Table		
Workpiece weight max.	kg	8 000
Table clamping surface dimensions	mm	1 250 x 1 400, 1 400 x 1 600, 1 400 x 1 800
T-slots on the table		
- dimension	mm	22H8
- pitch	mm	160
- number		9
Table centering hole diameter	mm	100H6
Table transverse travel X	mm	1 600, 2 000, 2 500, 3 000

BASIC PARAMETERS WHN 110 (Q,MC)

Headstock vertical travel Y - design with the standard table - design with the pallet	mm	1 250, 1 400, 1 600 1 120, 1 250, 1 400
Minimum distance of the spindle axis above table / pallet	mm	50 / 0
Column longitudinal travel Z	mm	800, 1 000, 1 250

Pallet		
Workpiece weight max.	kg	5 000
Pallet clamping surface dimensions	mm	1 250 x 1 400, 1 250 x 1 600
T-slots on the pallet		
- dimension	mm	22H8
- pitch	mm	160
- number		9
Pallet centering hole diameter	mm	100H6
Number of pallet in system		2
Time of pallet change	sec	85

Feed range (working and rapidtraverse) - X, Y, Z, W	mm/min	1 – 10 000
- B	1/min	0,003 - 2,5
Min. programmable positioning increment		
- X, Y, Z, W	mm	0,001
- B	grad	0,001
- C	grad	0,1
Max. feed forces		
- X, Y	kN	20
- Z	kN	40
- W	kN	30
- B	kN	10
Clamping strength for B axis on R = 0,55 m	kN	30

Number of pockets in magazine - drive		40; 60
Number of pockets in magazine - stationary		80; 120
Pitch of pockets in magazine	mm	130
Tool dia max		
- with fully loaded magazine	mm	125
- with free neighboring places	mm	320
Dia max. of a special flat tool	mm	390 (600)
Tool length max	mm	500
Tool weight max	kg	25
Total weight of tools in magazine	kg	1,000
Imbalance of tools in magazine max	kg	150
Tool change time (tool – tool)	sec	15

BASIC PARAMETERS WHN 130 (Q,MC)

Headstock type		„N/R“
Spindle diameter	mm	130
Spindle taper		ISO 50 / ISO 50 BIG+
Taper standards available		DIN 69871/A (without tool cooling kit) DIN 69871/AD (with tool cooling kit) BT 50 MAS 403-1982 CAT ANSI/ASME B5
Spindle speed range	R.P.M.	10 – 3 000
Main motor power, rated (continuous load operation S1)	kW	41
Main motor power max. (operation S6 - 60% of the load time)	kW	46
Spindle revs, rated	R.P.M.	254
Spindle torque, rated (S1)	Nm	1 624
Spindle torque max. (S6-60%)	Nm	2 017
Spindle stroke W	mm	800

Table		
Workpiece weight max.	kg	12 000
Table clamping surface dimensions	mm	1 600 x 1 800, 1 800 x 2 240
T-slots on the table		
- dimension	mm	22H8
- pitch	mm	160
- number		9, 11
Table centering hole diameter	mm	100H6
Table transverse travel X	mm	2 000, 2 500, 3 000, 3 500, 4 000

BASIC PARAMETERS WHN 130 (Q,MC)

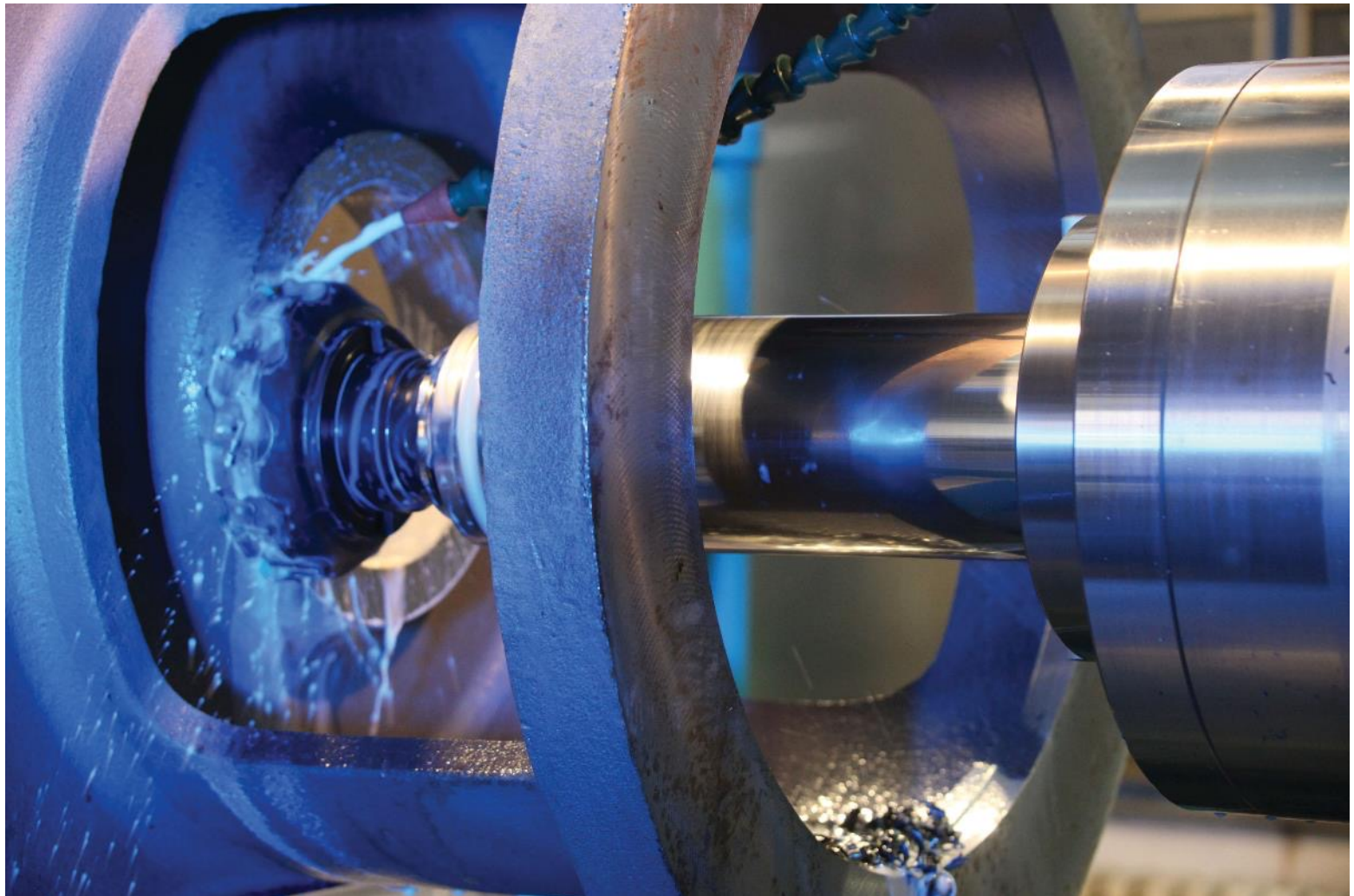
Headstock vertical travel Y - design with the standard table - design with the pallet	mm	1 600, 2 000, 2 500 1 400, 1 800, 2 240
Minimum distance of the spindle axis above table / pallet	mm	50 / 0
Column longitudinal travel Z	mm	1 000, 1 250, 1 600, 2 000

Palet		
Workpiece weight max.	kg	8 000
Pallet clamping surface dimensions	mm	1 600 x 1 800
T-slots on the pallet		
- dimension	mm	22H8
- pitch	mm	160
- number		9
Pallet centering hole diameter	mm	100H6
Number of pallet in system		2
Time of pallet change	sec	85

Feed range (working and rapid traverse) - Y, Z, W	mm/min	1 – 10 000
- X = 2,000; 2,500; 3,000; 3,500	mm/min	1 – 10 000
- X = 4,000	mm/min	1 – 8 000
- B	1/min	0,003 - 2
- X, Y, Z, W	mm	0,001
- B	grad	0,001
- C	grad	0,1
Max. feed forces		
- X, Y, W	kN	30
- Z	kN	40
- B	kN	11
Clamping strength for B axis on R = 0,55 m	kN	30

Number of pockets in magazine - drive		40, 60
Number of pockets in magazine - stationary		80, 120
Pitch of pockets in magazine	mm	130
Tool dia max		
- with fully loaded magazine	mm	125
- with free neighboring places	mm	320
Dia max. of a special flat tool	mm	390 (600)
Tool length max	mm	500
Tool weight max	kg	25
Total weight of tools in magazine	kg	1 000
Imbalance of tools in magazine max	kg	150
Tool change time (tool – tool)	sec	15 / 20*

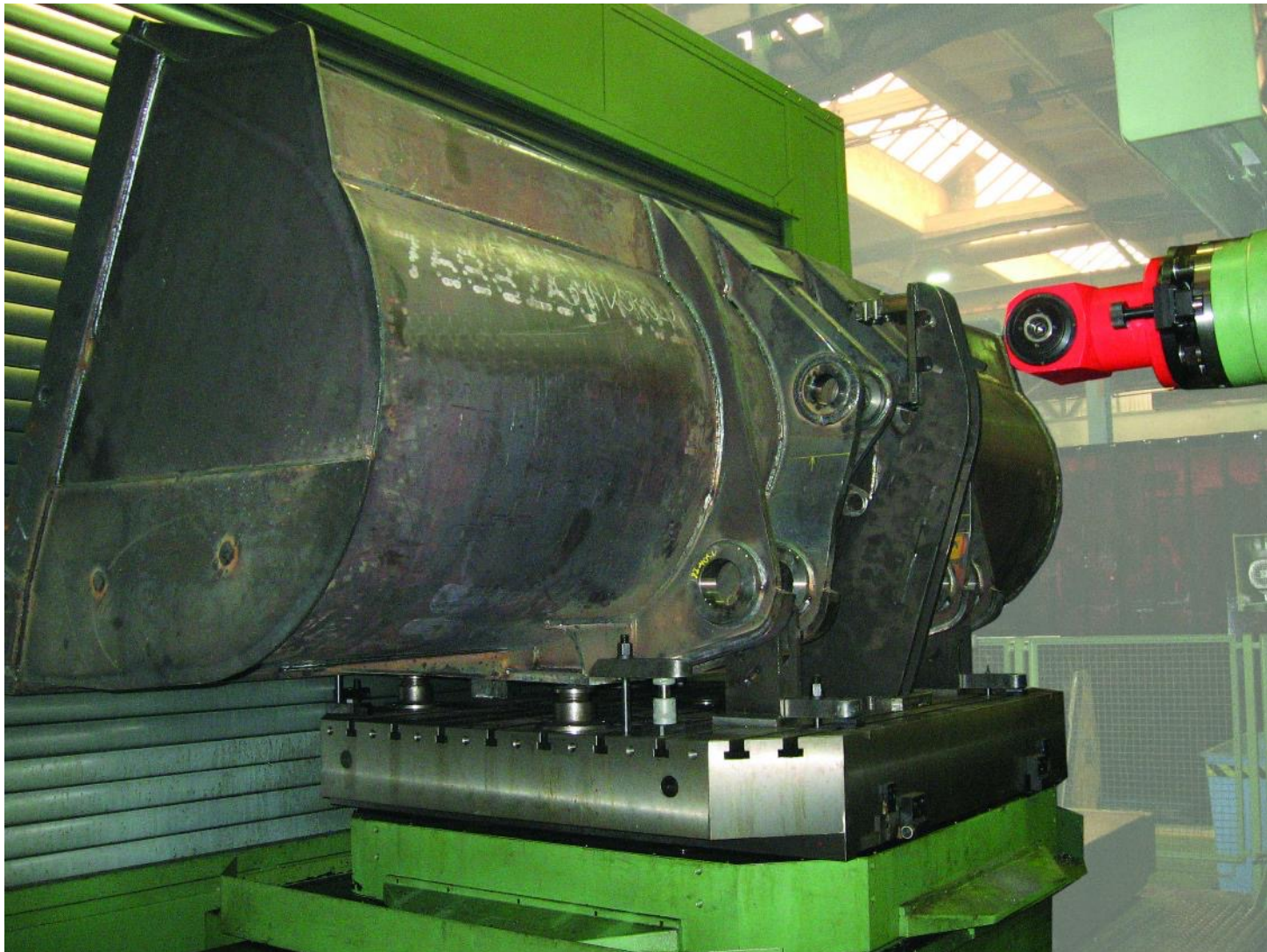
TECHNOLOGICAL EXAMPLES



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