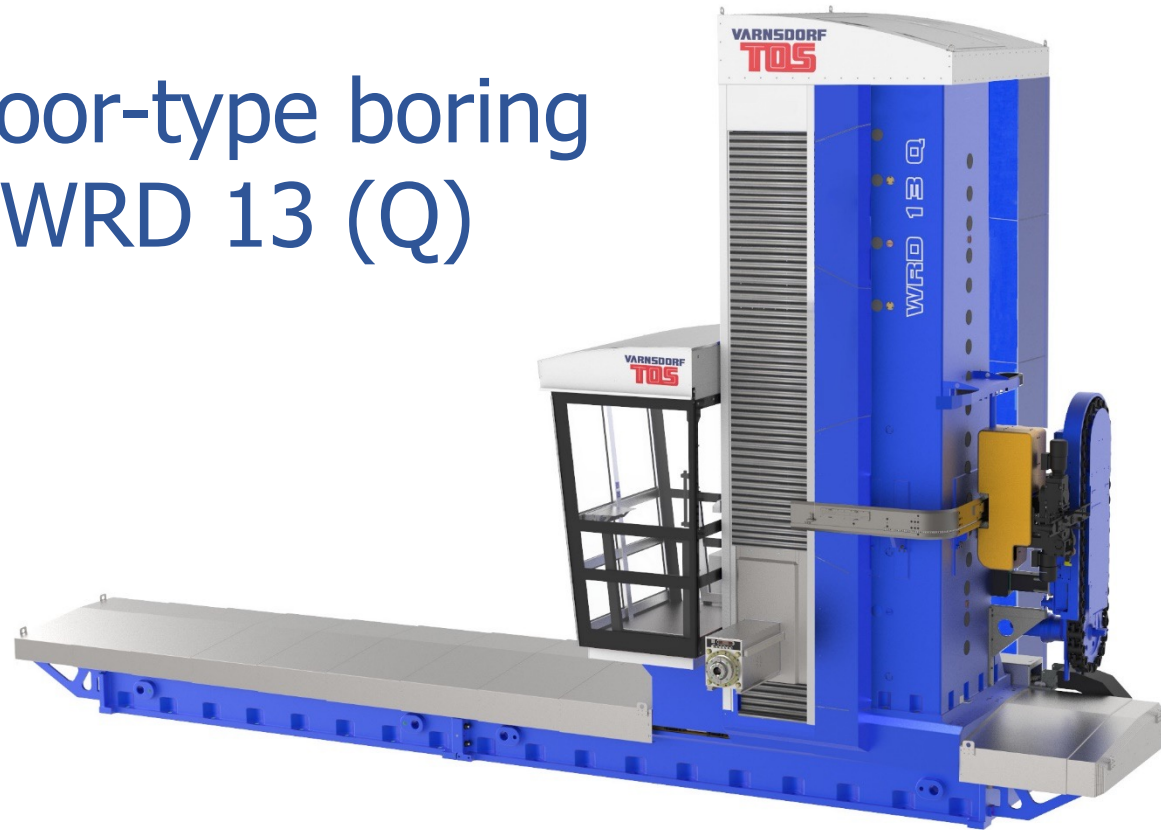


Horizontal floor-type boring machine WRD 13 (Q)



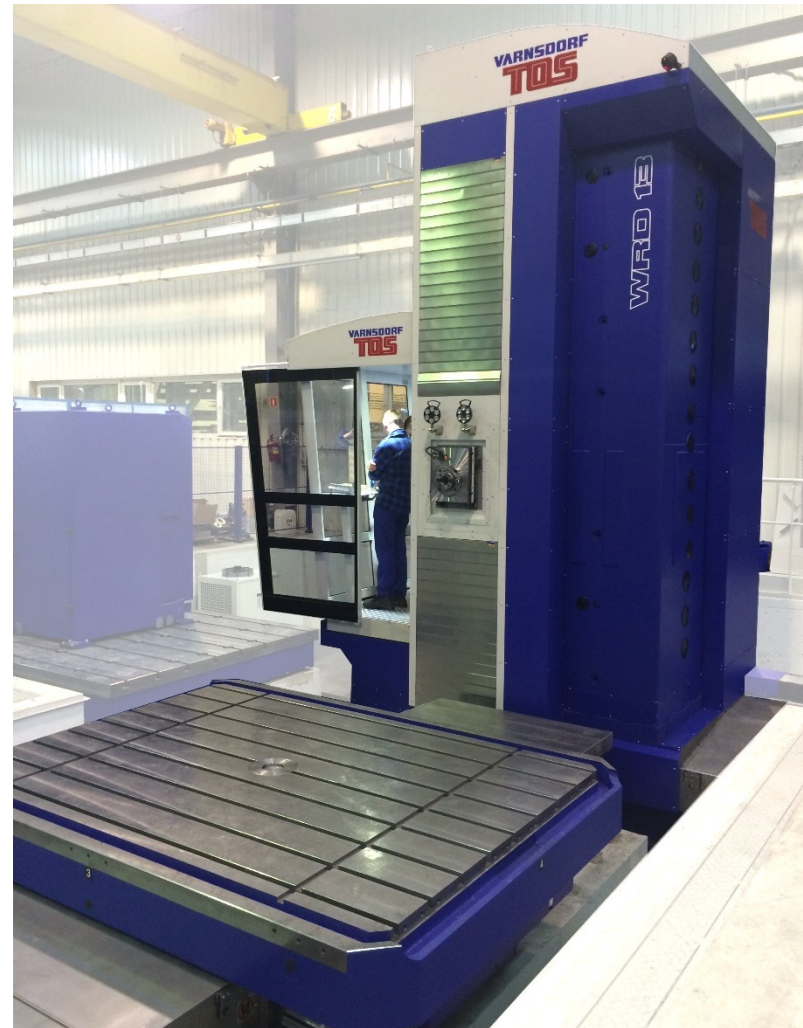
Milling machine producer
TOS VARNSDORF a.s.



FEATURES OF THE PRODUCT

Features of the product:

The WRD 13 (Q) horizontal floor-type boring machine with a tool-holding slide and a work spindle is based on the original generation of CNC horizontal milling and boring machines WHN(Q) 13 CNC produced by TOS VARNSDORF a.s. The headstock and the column are identical with the WHR 13 (Q) machine. The drive in the X axis is the Master&Slave system. Three linear guides in the X axis secure perfect accuracy when machining and high speed traverse up to 21,000 mm/min.

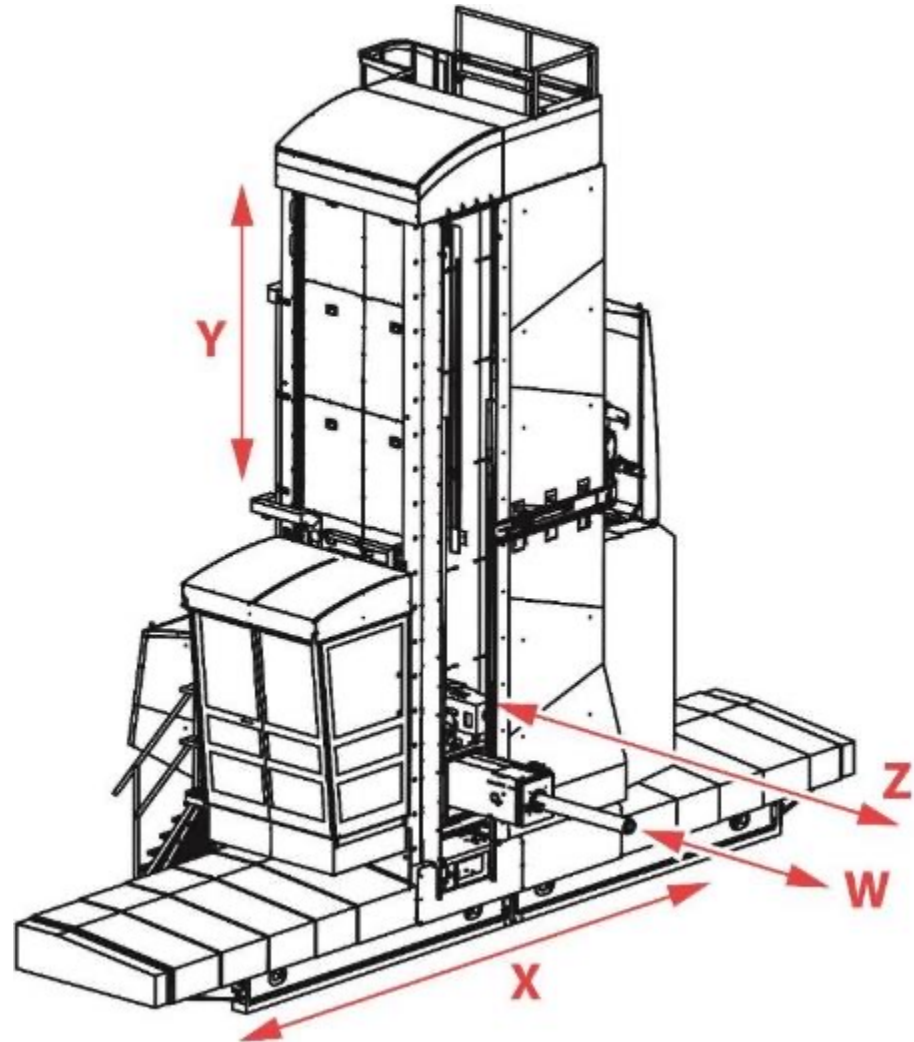


BASIC CONCEPT OF THE MACHINE

Basic concept of the machine:

WRD 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.

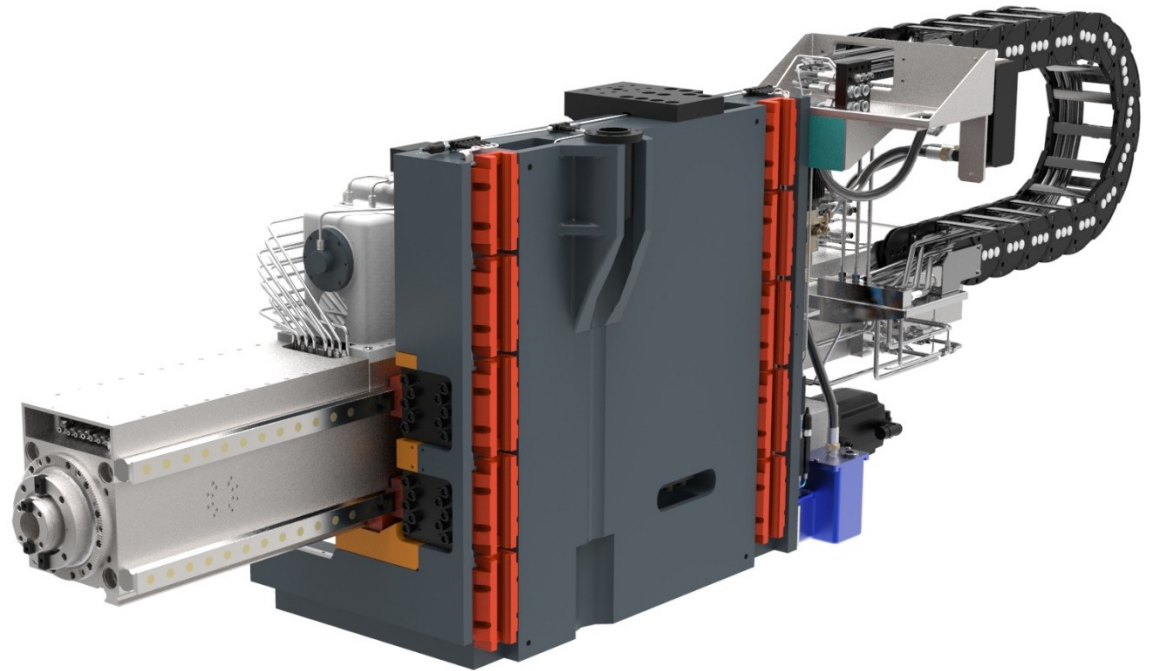
The machines are continuously controlled in four axes (X - base cross travelling, Y - headstock vertical adjustment, Z - sliding block longitudinal travel and W - working spindle longitudinal travel). HEIDENHAIN TNC 640, Sinumerik 840 D-SL or FANUC 30i/31i control system can be selected for controlling the machine.



HEADSTOCK

Headstock:

The main casing is a rigid gray 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.

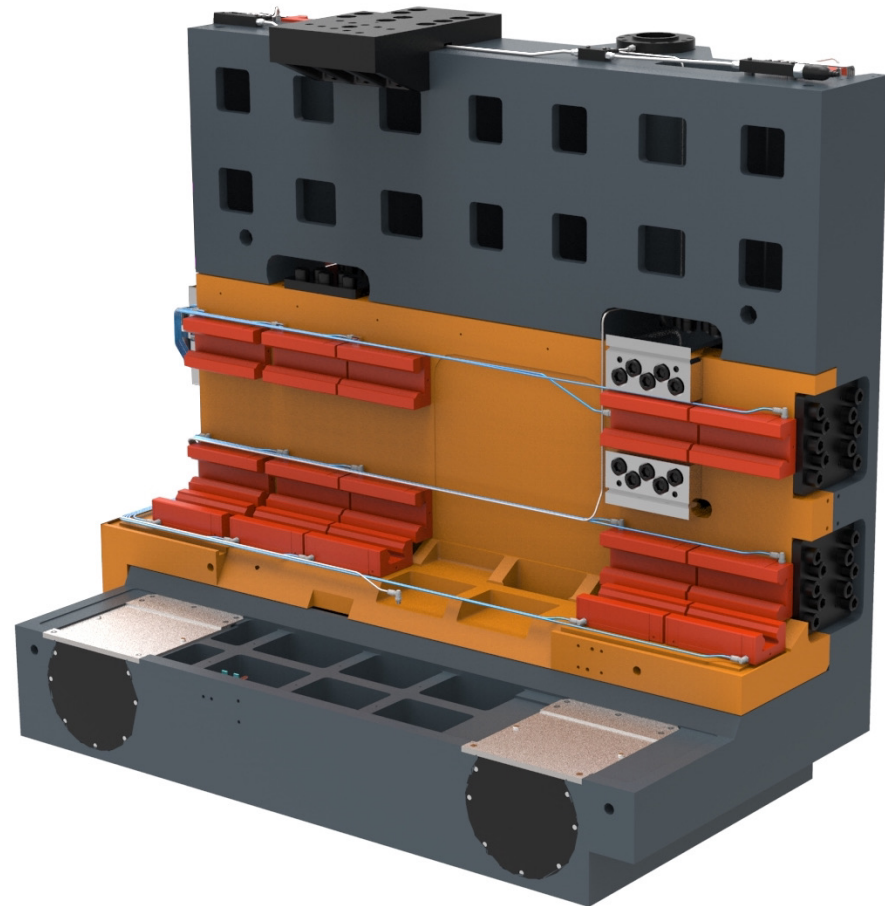


COMPENSATION OF RAM TILTING

Compensation of ram tilting:

This design of slide falling compensation is unique and is patented.

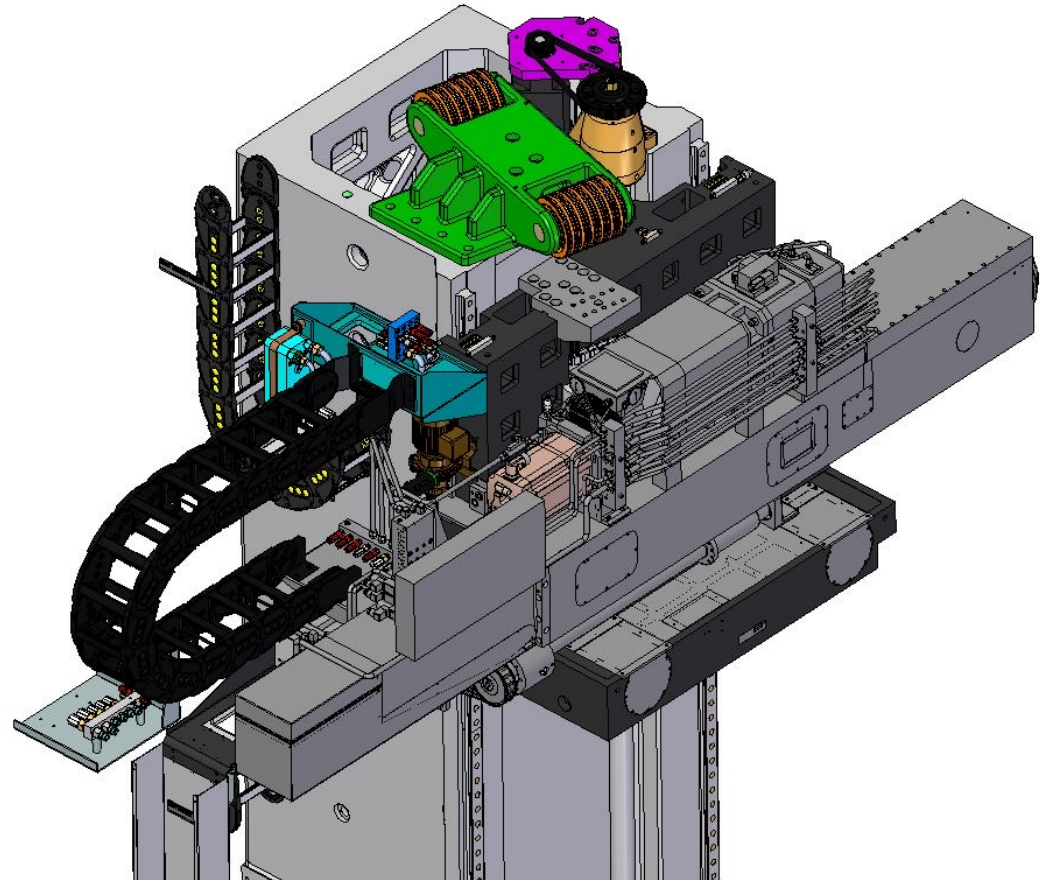
The entire headstock is designed in such a way that it makes it possible to compensate falling of the slide face when it is extended along the Z axis. Slide falling is compensated with a special electro-mechanical system, when an electric stepping motor turns an eccentric on which the whole group of the slide and headstock plate is mounted (a pivot is used for the second mounting of the slide and headstock plate). This design provides a high compensation range without loading the linear guideway with additional forces. This design of slide falling compensation contributes to a longer service life of the linear guideway.



BALANCE AND DRIVE OF AXIS Y

Balance and drive of axis Y:

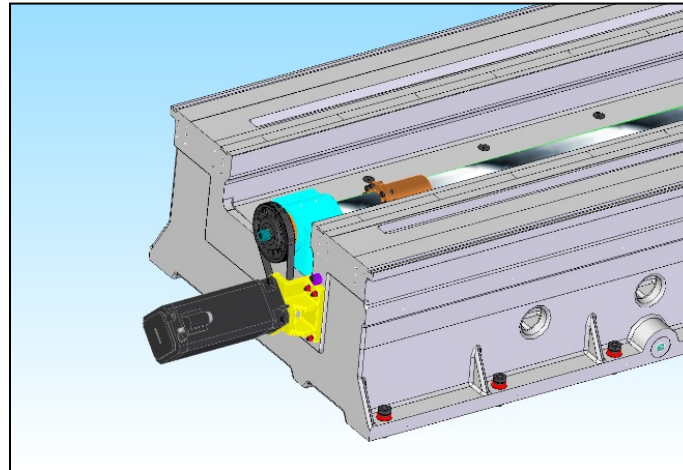
The linear axis Y drives is designed through independent AC-digital servo-drives and cogged-belt transmissions to ball bolts with pre-stressed nuts. After reaching that target positions the Y linear axis is kept live in a closed positional feedback. The spindle head weight is balanced with a counter-balance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



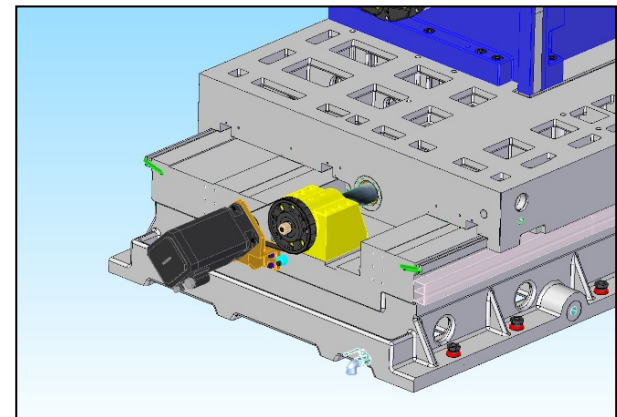
FEED DRIVES AND CLAMPING

Feed drives and clamping:

The drives of linear axes Y, Z and W are implemented using separate AC-digital actuating mechanisms and gearing by indented belts to ball screws with pre-stressed nuts. In order to achieve the required final position, linear axes X, Y, Z and W are kept live in an enclosed positional bond.



Axis X

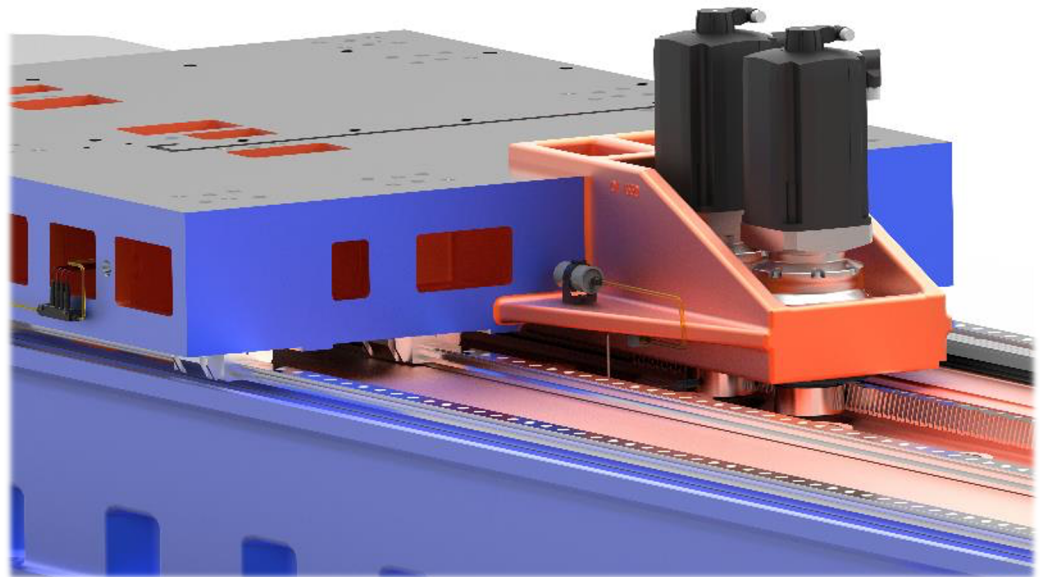


Axis Z

FEED DRIVES AND CLAMPING

Feed drives and clamping:

The drive of linear axis X is implemented using two AC-digital actuating mechanisms with gearing by two pinions to the indented belt (master-slave system).



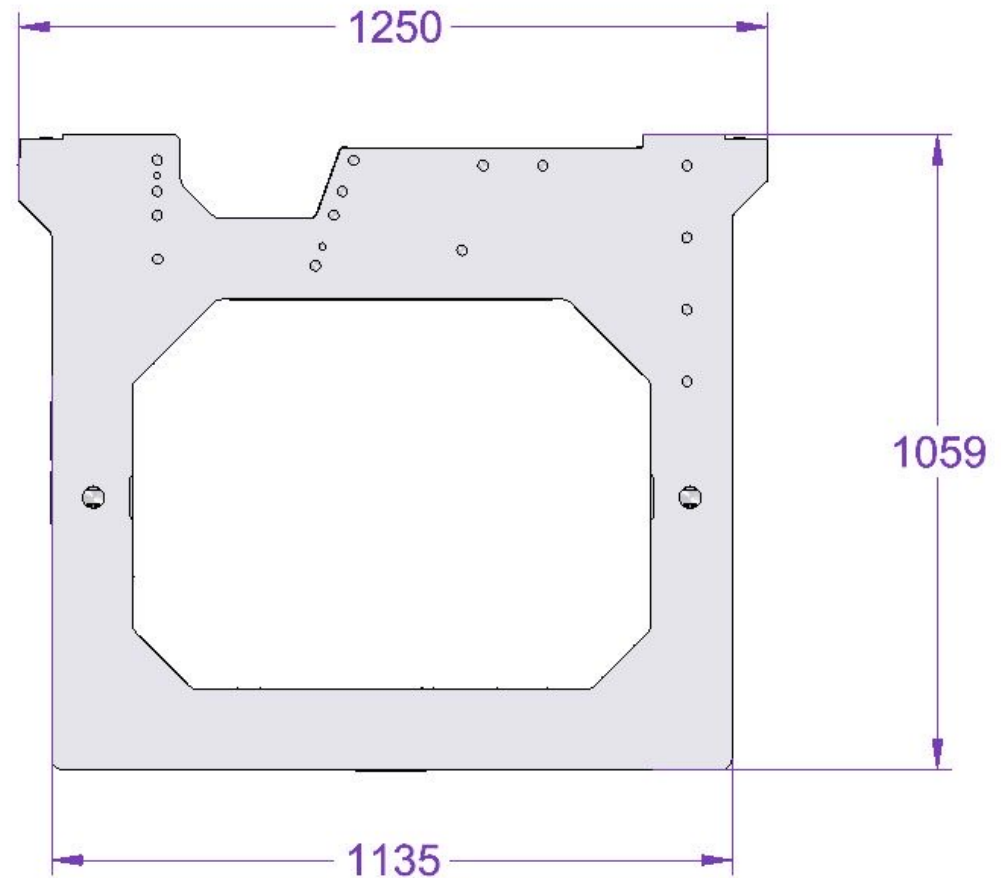
Axis X

GUIDEWAYS OF MOVABLE GROUPS

Guideways of movable groups:

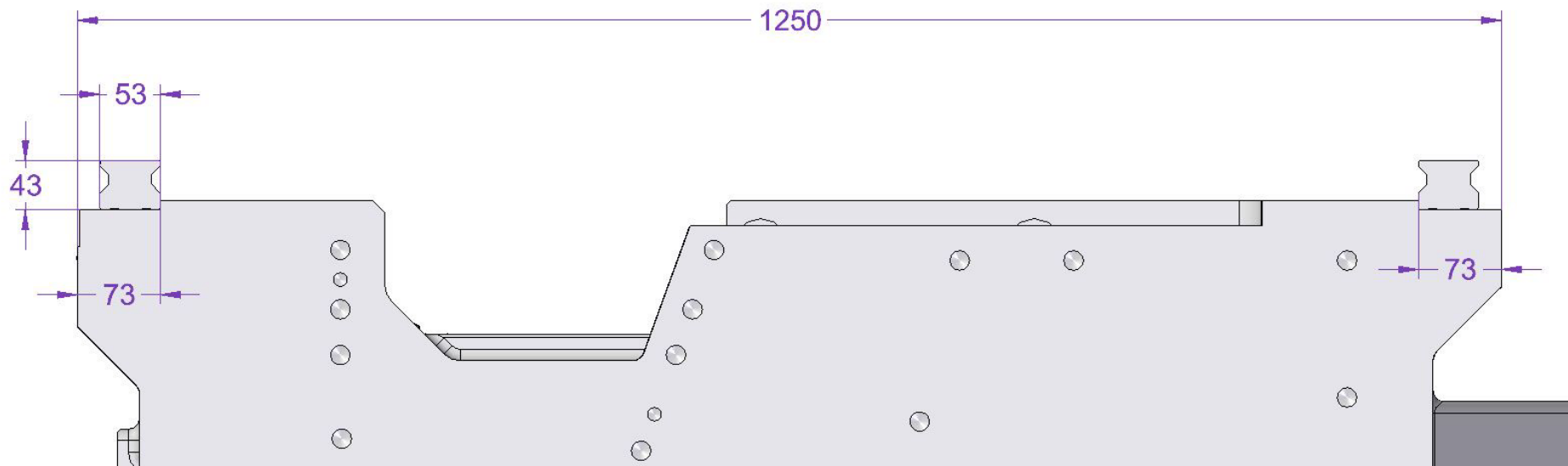
Guides of working spindle W (spindle is nitrided) is sliding with minimum backlash in the hollow spindle.

Guiding of traveling axes V and Y have been designed as rolling type, preloaded, employing the compact linear roller pads.



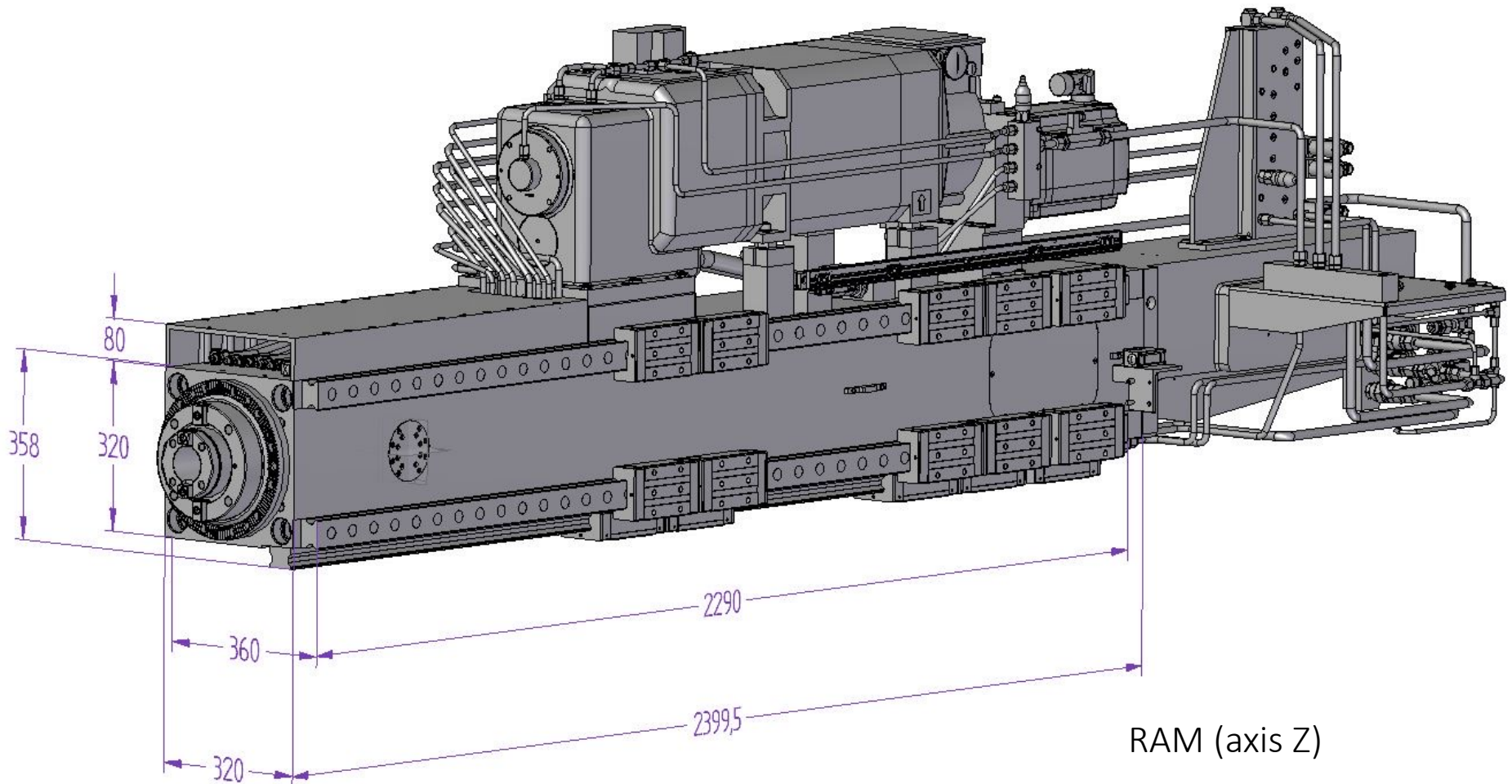
Column (axis Y) WRD 13 (Q)

GUIDEWAYS OF MOVABLE GROUPS

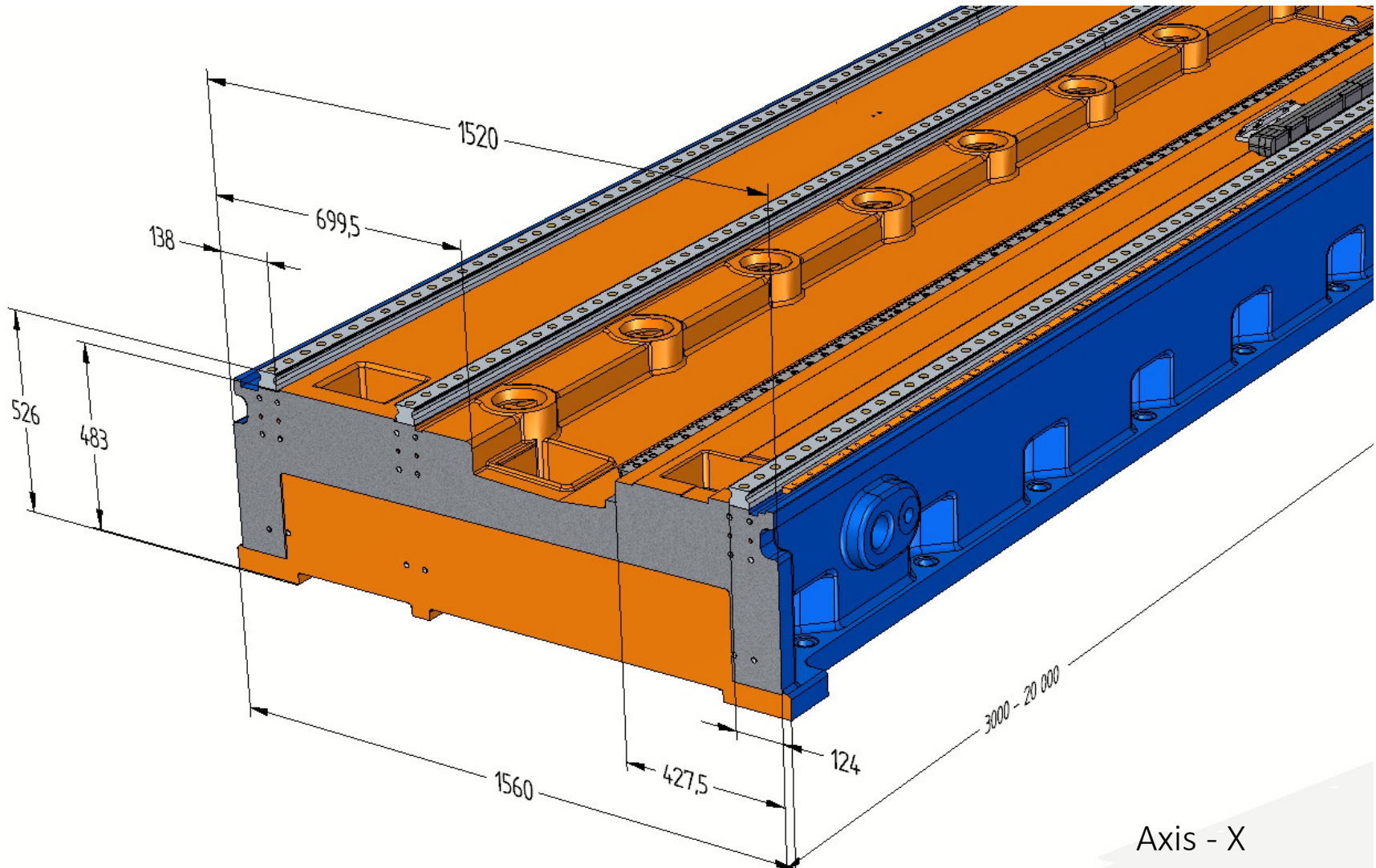


Column (axis Y) WRD 13 (Q)

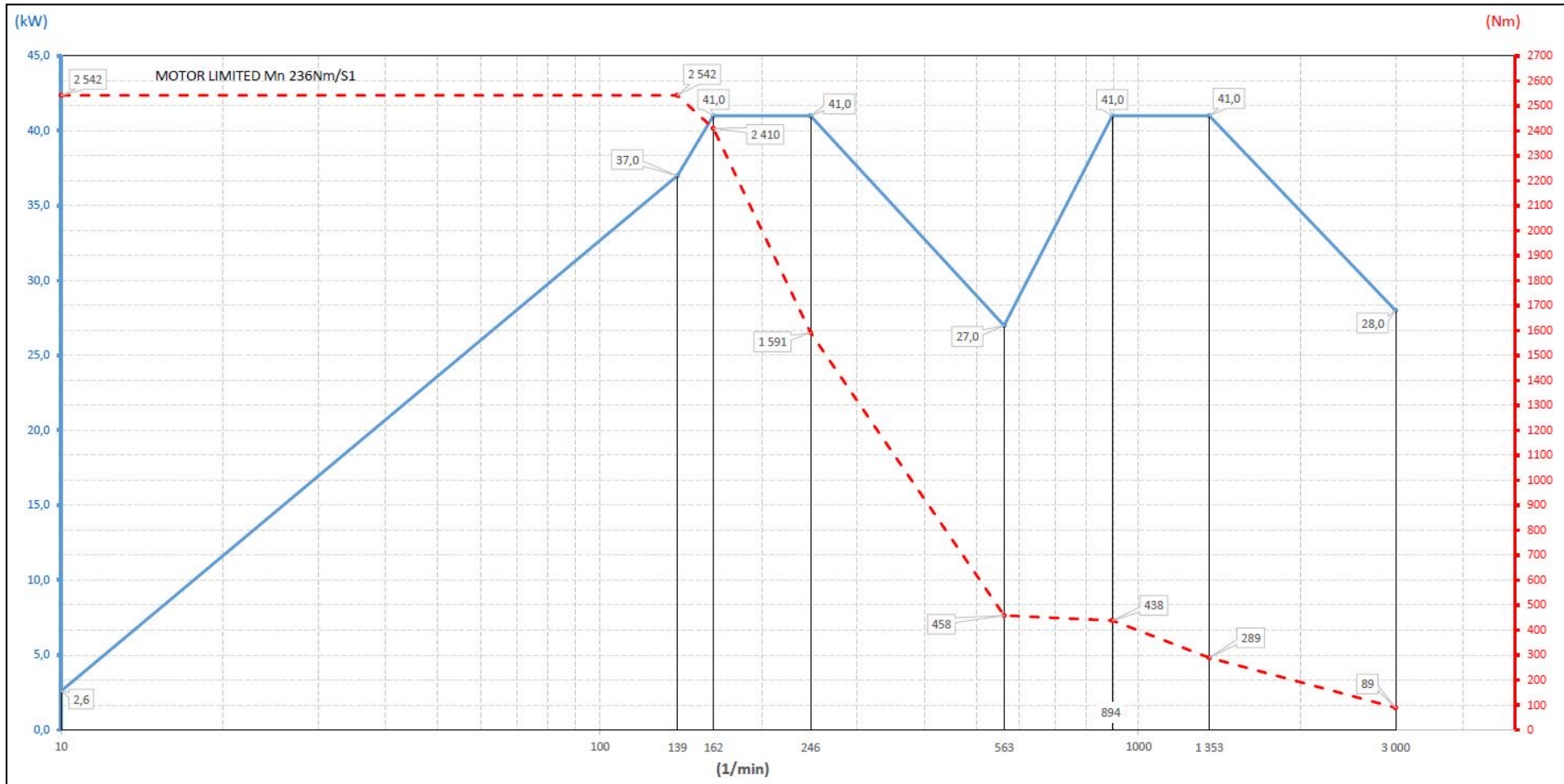
GUIDEWAYS OF MOVABLE GROUPS



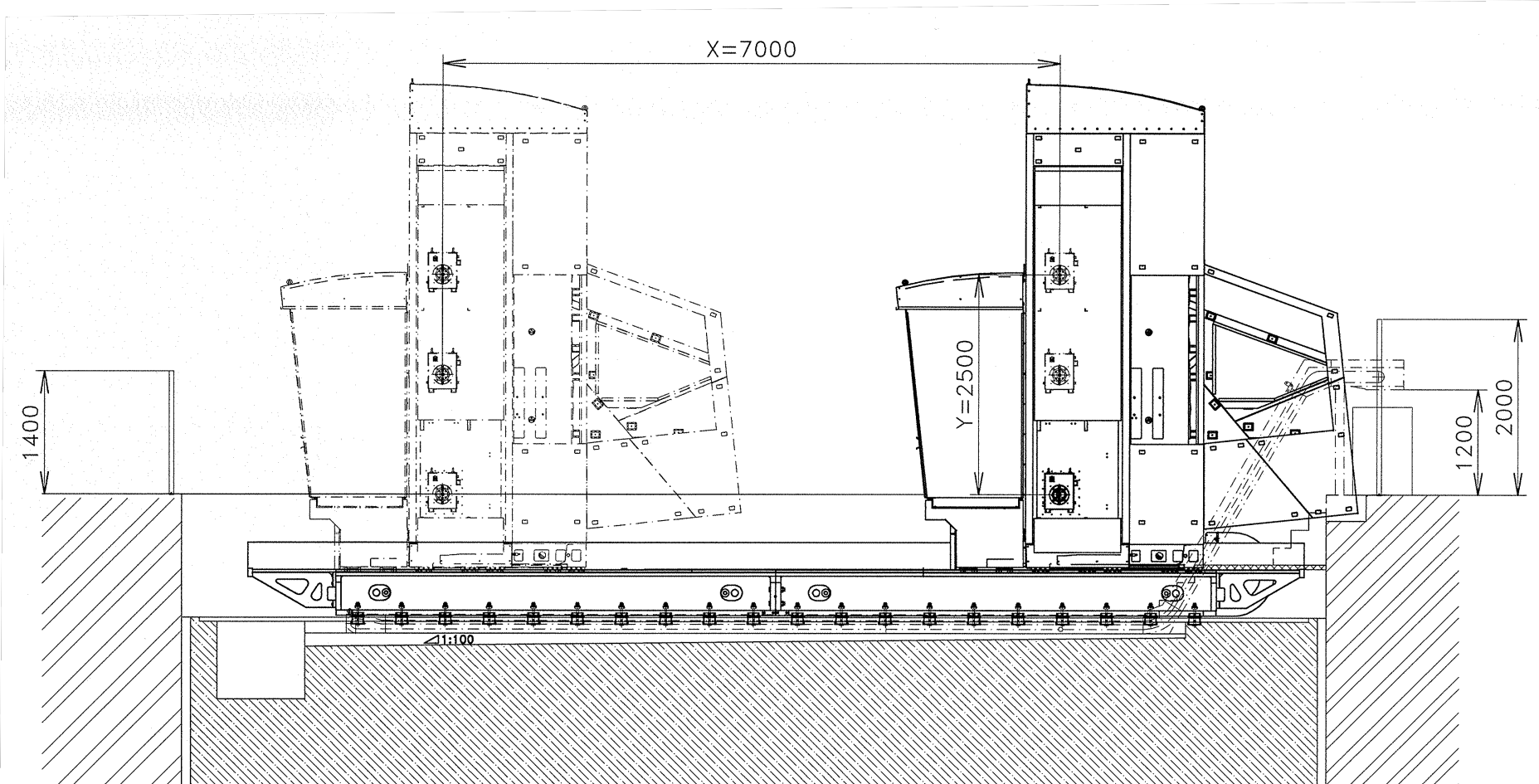
GUIDEWAYS OF MOVABLE GROUPS



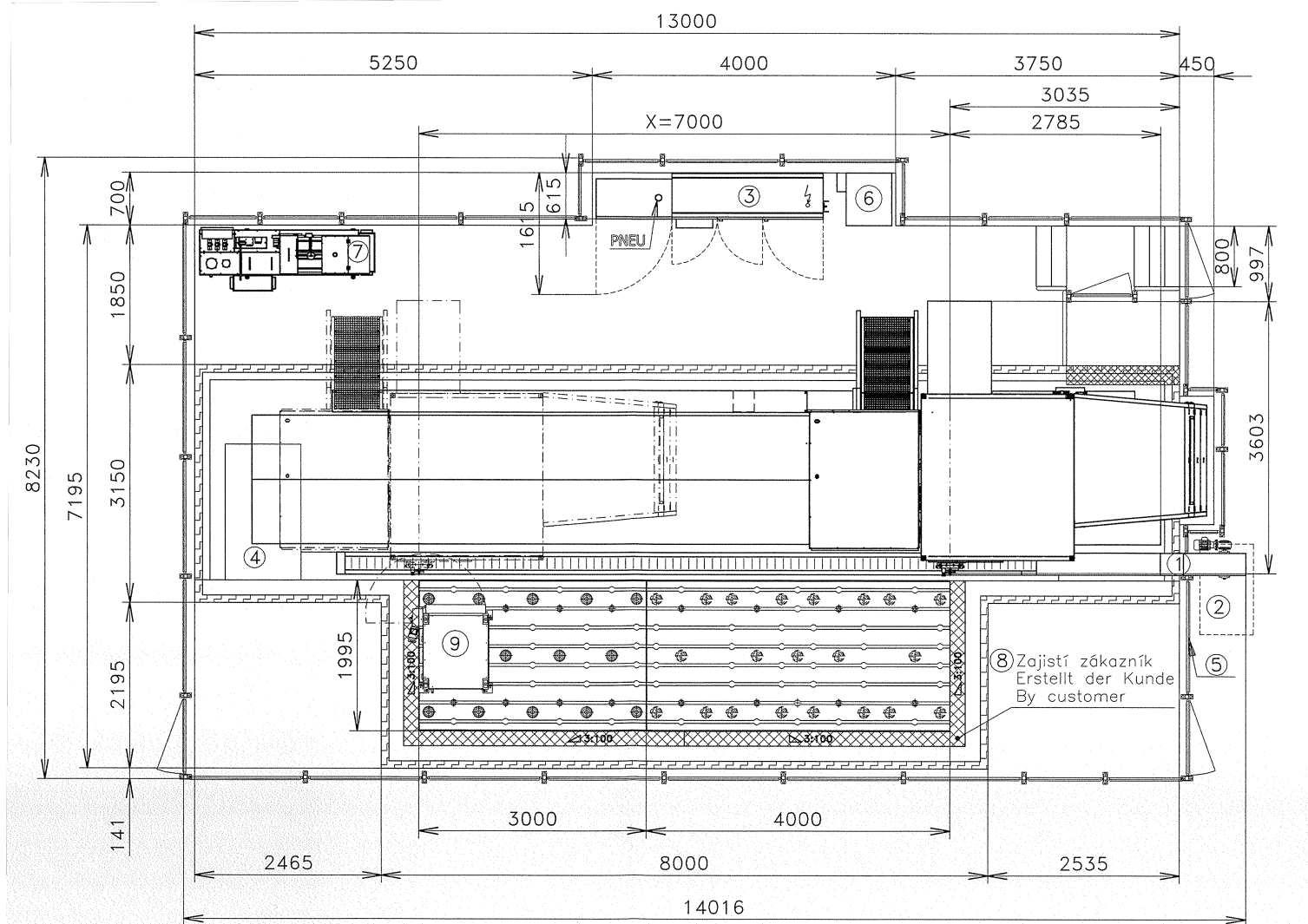
CURCUIT DIAGRAM



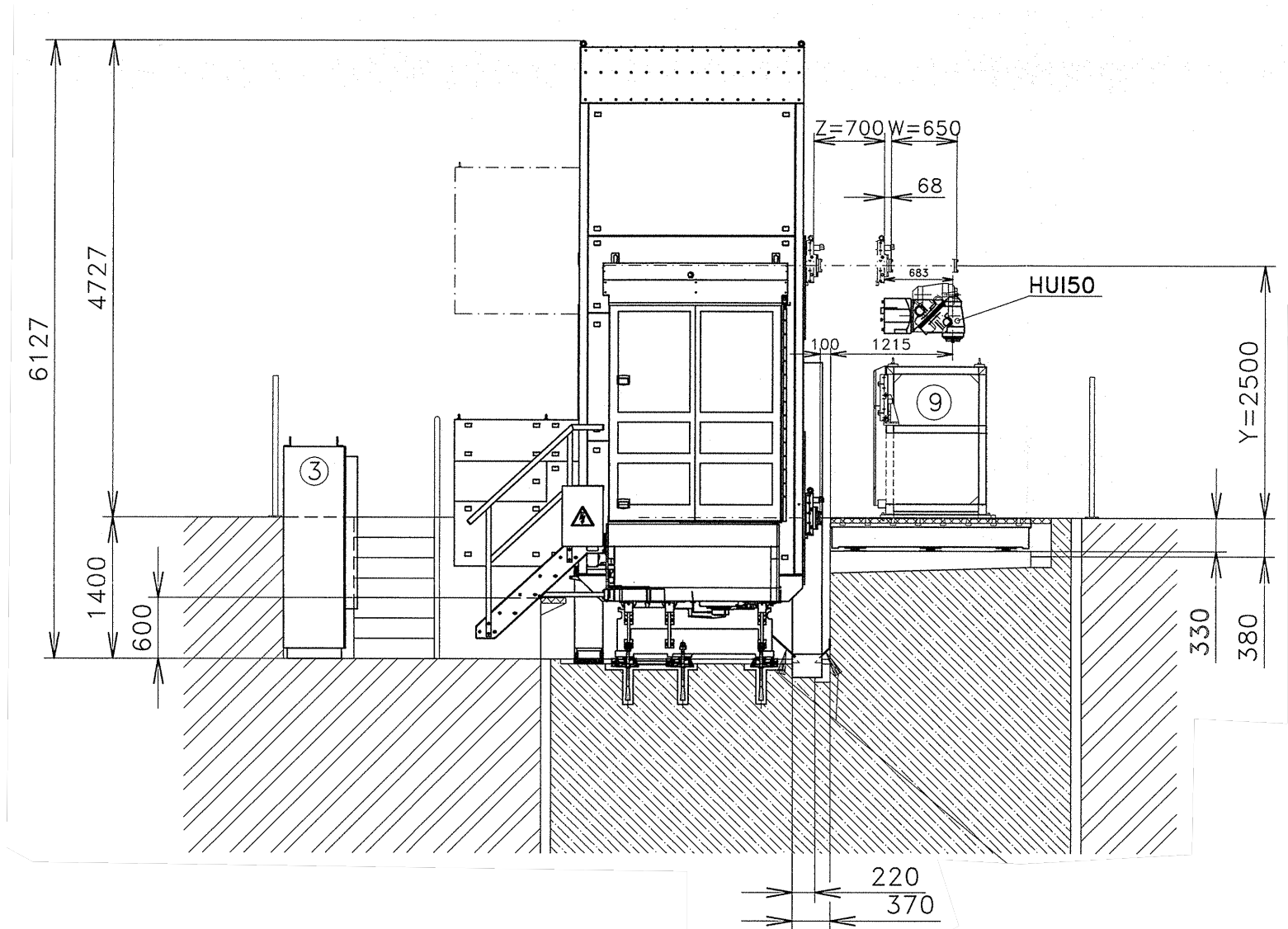
EXAMPLE OF A DIMENSIONAL SKETCH



EXAMPLE OF A DIMENSIONAL SKETCH



EXAMPLE OF A DIMENSIONAL SKETCH



BASIC PARAMETERS

Machine		WRD 13
Spindle diameter	mm	130
Spindle taper		ISO 50 / ISO 50 BIG+
Clamping strength of tool	kN	25
Spindle speed range	1/min	10 – 3 000
Main motor power (continuous load operation S1)	kW	41
Main motor power max. (operation S6 - 60% of the load time)	kW	46
Rated working spindle speed	1/min	162
Spindle torque, rated (S1)	Nm	2 542
Spindle torque max. (S6-60%)	Nm	3 111
The outer diameter of the flange of the hollow spindle	mm	221,44
Spindle stroke W	mm	650
RAM dimensions	mm	320 x 400
RAM stroke V	mm	700

BASIC PARAMETERS

Headstock vertical travel Y	mm	2 000, 2 500, 3 000
Column transverse travel X	mm	3 000 – 20 000 (step 1 000)

Feeds (working and rapid traverse) - X	mm/min	5 – 21 000
Feeds (working and rapid traverse) – Y, Z, W	mm/min	5 – 10 000
Min. programmable positioning increment		
- X, Y, Z, W	mm	0,001
Max. feed forces		
- X, Y	kN	25
- W, Z	kN	25

Number of pockets in magazine		40, 60, 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 (35**)
Total weight of tools in magazine	kg	1 000
Imbalance of tools in magazine max	kg	150
Tool change time (tool – tool)	sec	20

* The device is mounted on a concrete base on the edge X coordinate.

** Option

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