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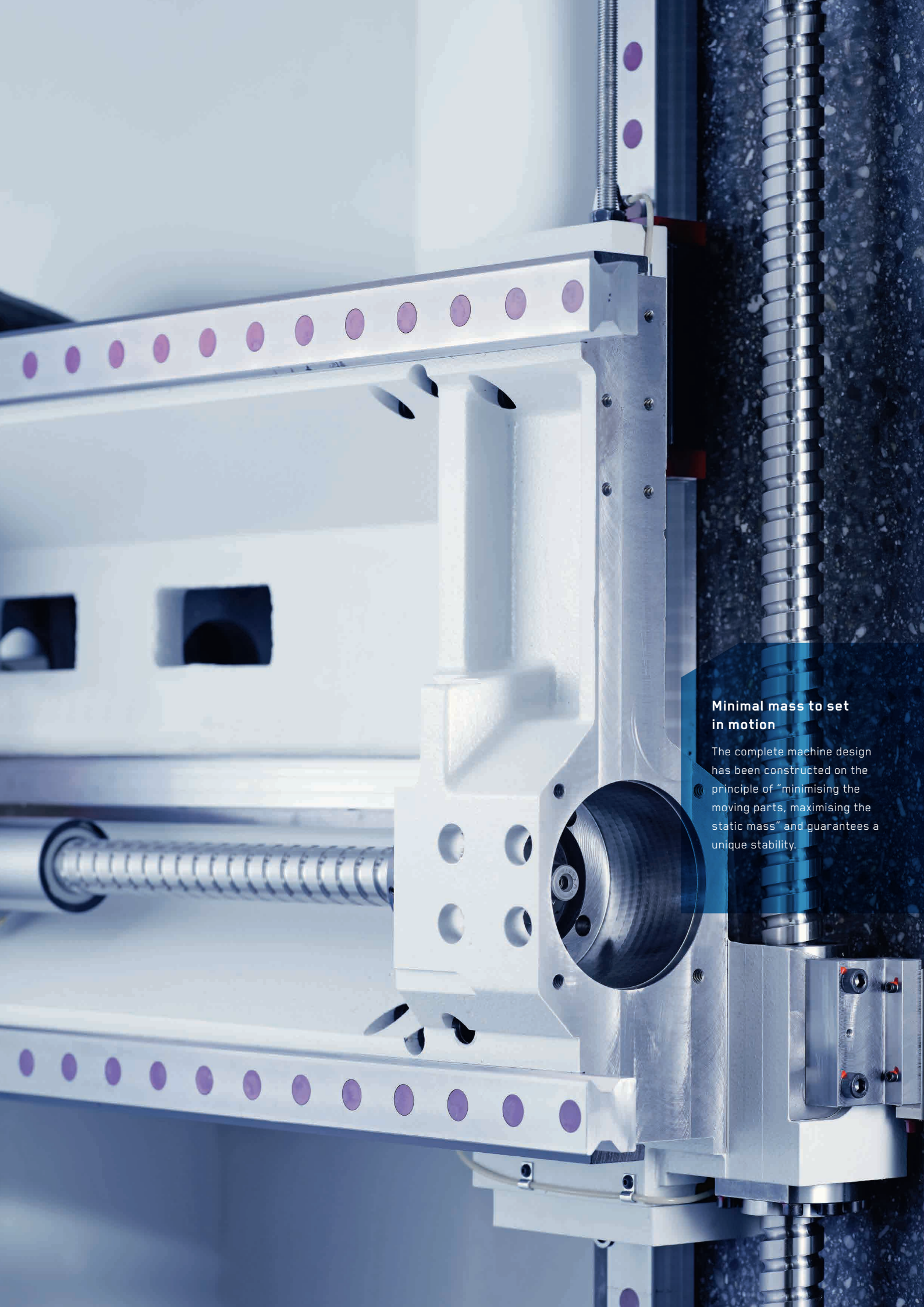


MACHINE TOOL MANUFACTURER

# RX10

5-axis machining center  
a system developed for high performance



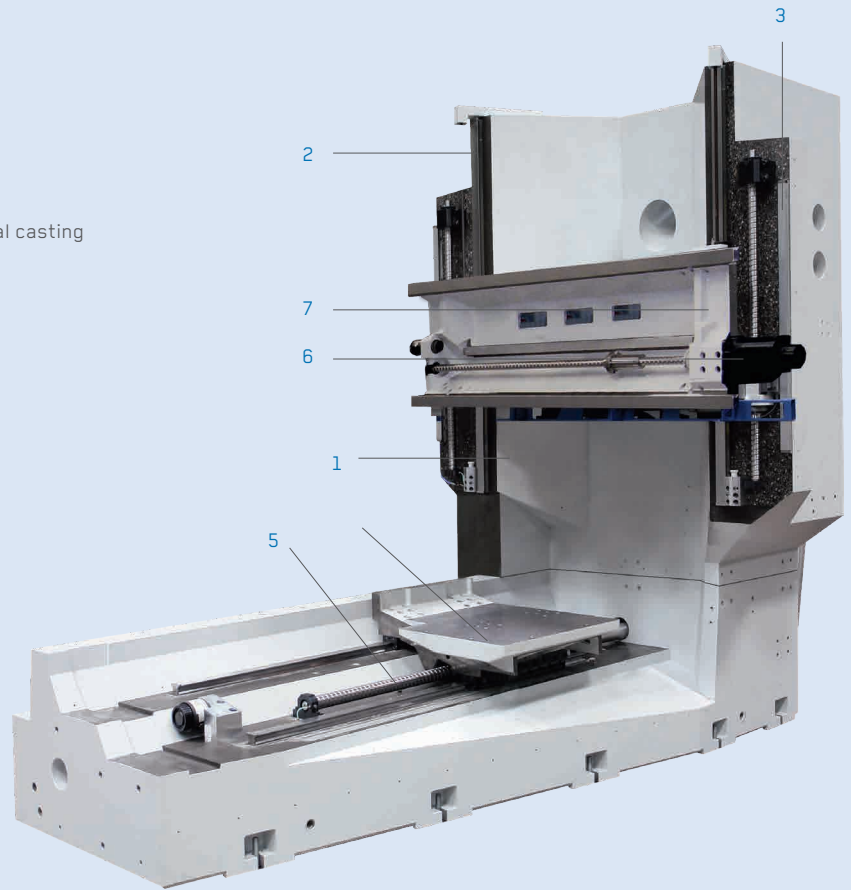


### **Minimal mass to set in motion**

The complete machine design has been constructed on the principle of "minimising the moving parts, maximising the static mass" and guarantees a unique stability.



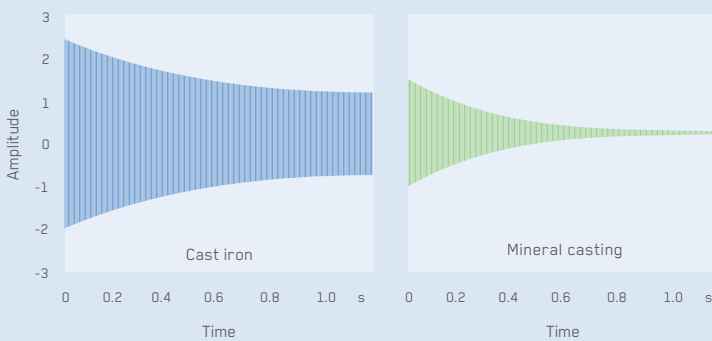
- 1 Machine column and machine bed made of mineral casting
- 2 Linear roller guide ways
- 3 Direct measuring system (glass scales)
- 4 Rotary table support
- 5 Ball screws
- 6 Feed motors
- 7 Strongly ribbed cross slide



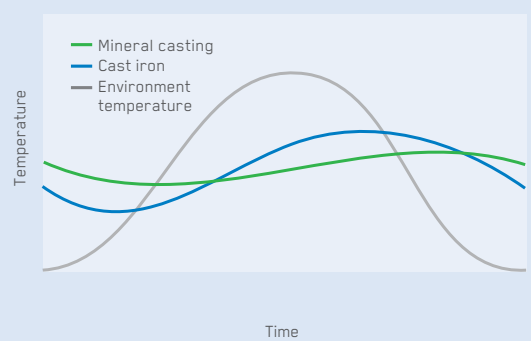
## RIGID CONSTRUCTION

The machine bed and machine column are made of mineral casting and form a massive unity with enormous rigidity and excellent vibration absorbing properties. Thermal and mechanical inherent stability are guaranteed with this type of construction, even at extreme loads.

### Dynamic properties



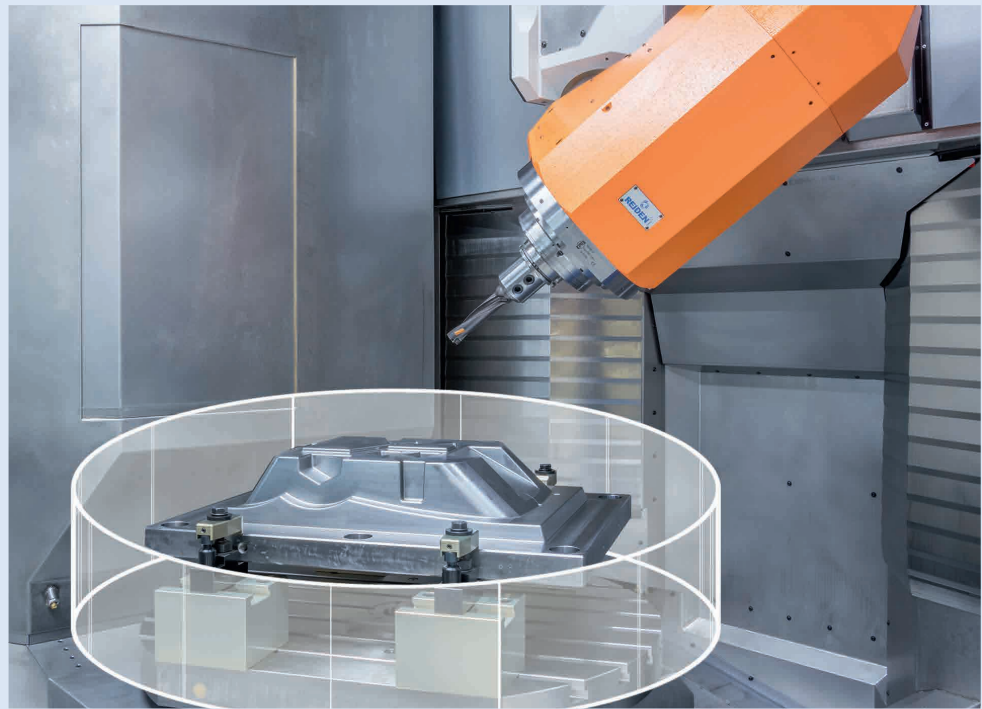
### Thermal properties





**The milling head – slim,  
compact and rigid**

Its compact and slim design guarantees optimum accessibility to the work piece to be machined. The drive is a backlash-free worm drive and can thus counteract high machining forces.



## NO LIMITS ON UNIVERSALITY

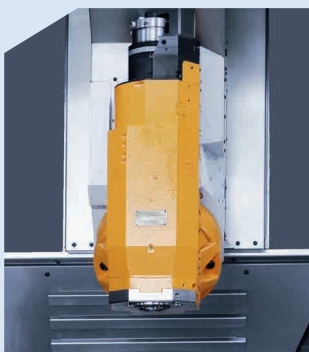
The proven pivoting head design guarantees a high universality for multi-sided machining and is designed for simultaneous milling operations with up to 5 axes. This key technology has been used successfully at Reiden Technik AG for years in different ranges of machinery.

### Clear work space

Even with the milling head pivoted the operator always has an optimal view of the tool and work piece.

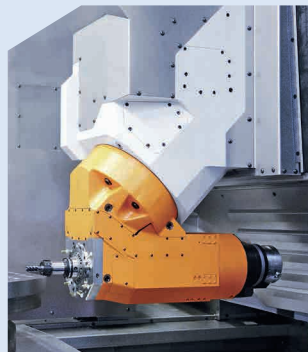
Work pieces of up to  $\varnothing 1'350$  mm can be turned in the whole work space.

For machines with an automatic pallet changer, the swing diameter is limited in the zone of the pallet changer.



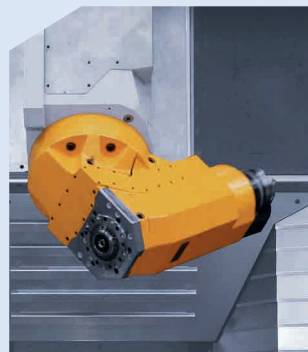
### Vertical milling head position

In the vertical milling head position the front flattened table edge can be driven up to and up to 300 mm behind the flattened table edge.



### Horizontal milling head position

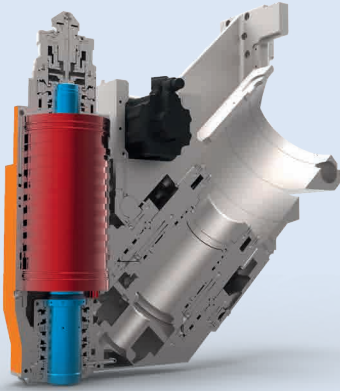
In the horizontal spindle position the spindle center can be driven up to 10 mm below the edge of the table. Work pieces are clamped directly to the table and do not lose any stability by construction using fixtures.



### A axis, continuous programmable

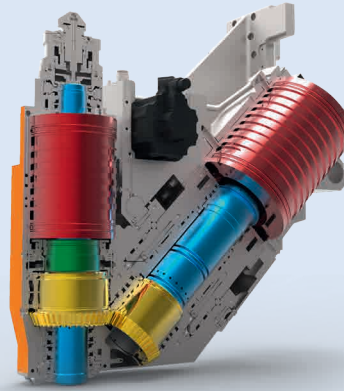
The A axis rotates continuous from  $-1^\circ$  up to  $90^\circ$ . The NC axis is designed for positioning and simultaneous operations.

## Standard motor spindle



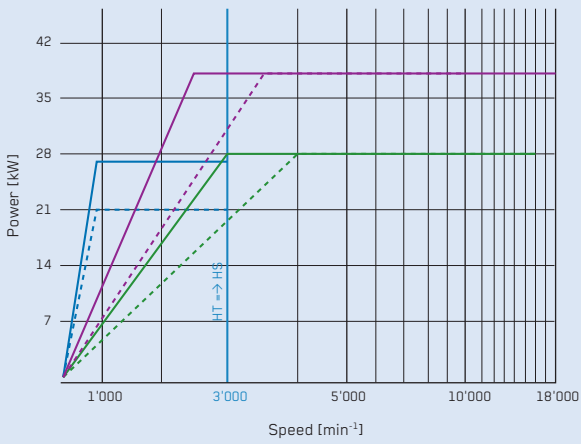
16'000 min<sup>-1</sup>  
105 / 135 Nm  
38 kW

## DDT Double Drive Technology



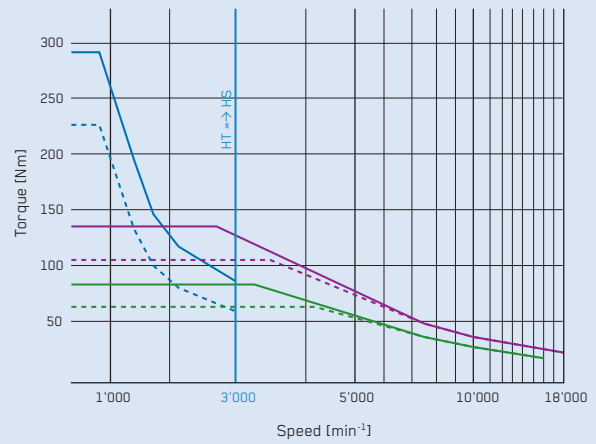
<b>High-Speed</b>	<b>+</b>	<b>High-Torque</b>
18'000 min <sup>-1</sup>		3'000 min <sup>-1</sup>
63 / 83 Nm		226 / 291 Nm
28 kW		21 / 27 Kw

## Performance diagram



— High Torque DDT 291 Nm 40% ED (27 kW)	— High Speed DDT 83 Nm 40% ED (28 kW)	— High Speed 135 Nm 40% ED (38 kW)
- - - High Torque DDT 226 Nm 100% ED (21 kW)	- - - High Speed DDT 63 Nm 100% ED (28 kW)	- - - High Speed 105 Nm 100% ED (38 kW)

## Torque diagram



## Increased machine precision via detecting spindle expansion at source.

By integrating a spindle displacement sensor at the expansion source, this can be measured accurately and compensated electronically. The effective expansion of the spindle is transmitted in sync to the controls and compensated by applying a temperature compensation formula. The longitudinal expansion of swiveled planes is also compensated corresponding to the alignment of the milling head.

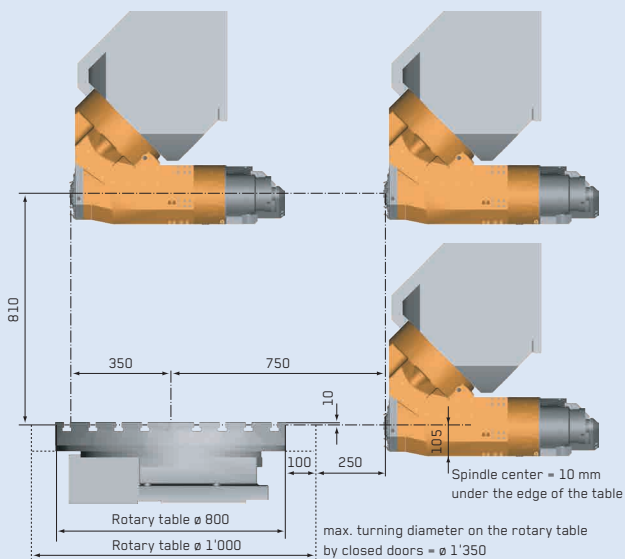
# DDT – DOUBLE DRIVE TECHNOLOGY

## UNIQUE AND PATENTED

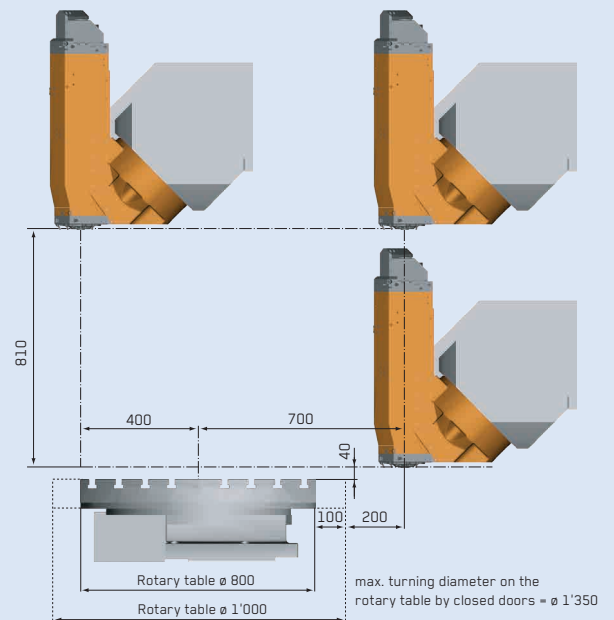
As standard the RX10 is delivered with a motor spindle version of 16'000 min<sup>-1</sup> and a maximum torque of 135 Nm. The Double Drive design patented by Reiden Technik AG is available as an option.

With this version a maximum torque of 291 Nm is reached via the High Torque Motor at up to 3'000 min<sup>-1</sup>. From 3'000 min<sup>-1</sup> the High-Torque-Motor is decoupled and a maximum number of revolutions of 18'000 min<sup>-1</sup> reached via the built in motor spindle in the head.

### Movement diagrams (HSK63 / SK40)



Horizontal



Vertical

### Unique universality

Usable as a horizontal machining center: thanks to the distance of up to 350 mm – from the rear table edge to the spindle nose – even large work pieces can be machined with long tools. Usable as a vertical machining center: in the vertical spindle position the complete table surface can be traversed.





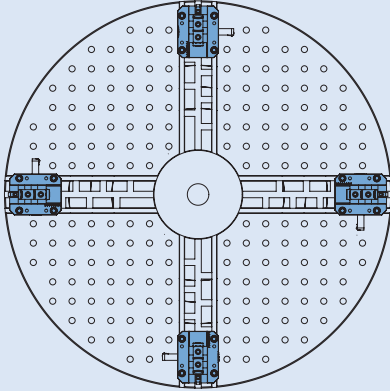
#### **Additional stability**

The HSK100 variant of the milling head also masters high machining forces with flying colours. The hydraulic spindle clamping ensures an optimal grip of the tool even during turning operation.



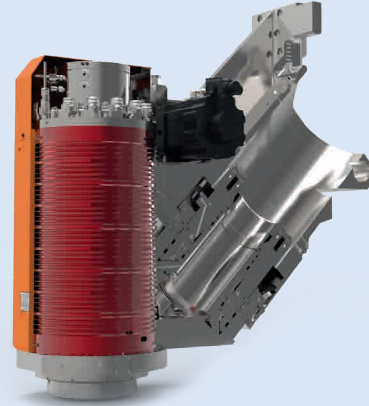
### Plenty of room for individuality

Star-shaped T-slots and factory readying for jaw boxes provide the best possible set-up for clamping circular components. The table surface can however be tailored to customer requirements.



### Motor spindle HSK100

As an alternative spindle for milling and turning operations, the RX10 can be equipped with a powerful motor spindle. The connection of the housing and the motor spindle to the recirculating cooling system and the standard spindle growth sensor guarantee maximum precision on the workpiece.

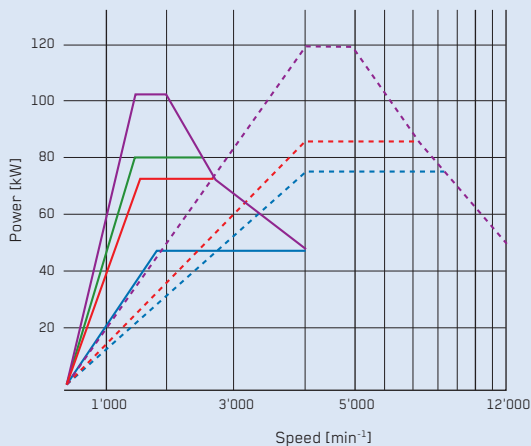


12'000 min<sup>-1</sup>  
300 / 452 Nm  
74 / 84 kW

## MILLING AND TURNING IN ONE SETUP

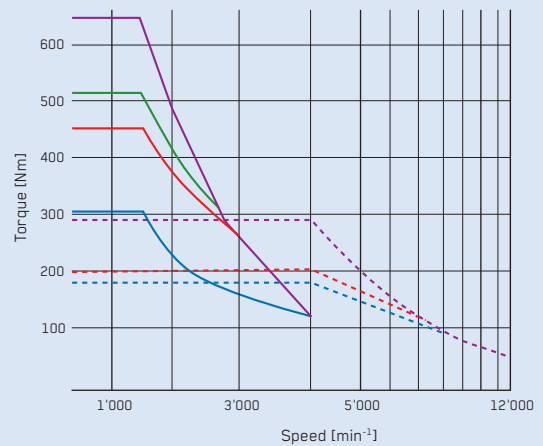
The direct-drive circular table has automatic imbalance detection. Counterweights ensure low-vibration machining even at a maximum speed of 400 min<sup>-1</sup>. Workpieces need no longer be converted between milling and turning operations.

Performance diagram



— S1 100% ED STAR (48 kW / 300 Nm)      — S6 40% ED STAR (71 kW / 452 Nm)  
 - - - S1 100% ED DELTA (74 kW / 177 Nm)      - - - S6 40% ED DELTA (84 kW / 200 Nm)

Torque diagram



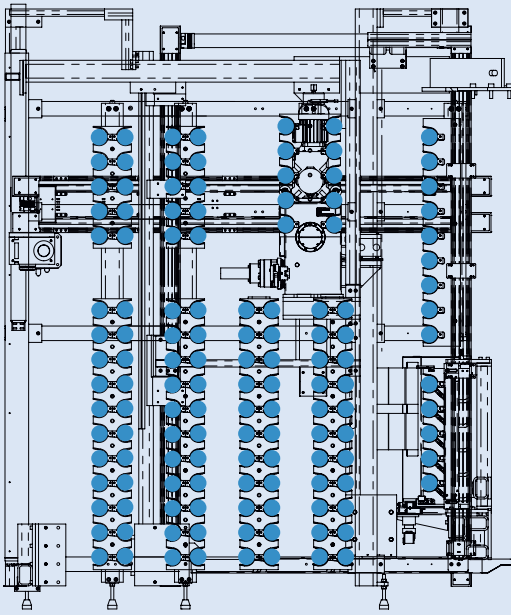
— S6 25% ED STAR (80 kW / 510 Nm)      — S6 MAX STAR  
 - - - S6 25% ED DELTA (120 kW / 287 Nm)      - - - S6 MAX DELTA



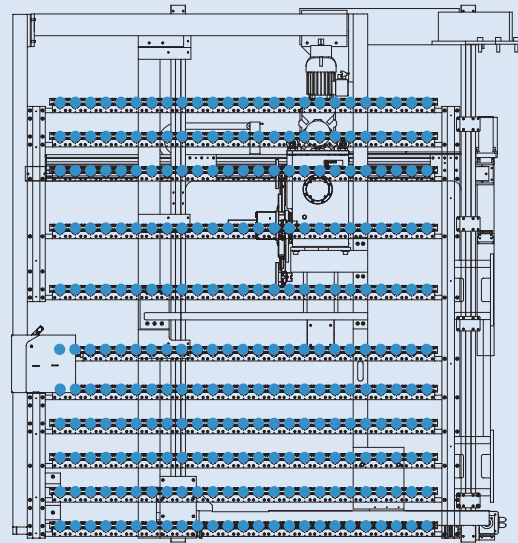
### Loading methods

The tools are assigned to the magazine by means of a loading drawer. 5 tools can be loaded or unloaded simultaneously. The multiple loading ensures efficient and fast handling of the tools. Depending on the type of tool, the loading drawer is arranged horizontally or vertically.

## HSK100 / SK50 Tool magazine



## HSK63 / SK40 Tool magazine



### Tool changer

The tool magazine is arranged laterally to the working area. The tool is set up via 2 independent NC axes and substituted using a double tool gripper. Regardless of which magazine is installed, the installation space always remains equally small.

HSK63 / SK40: 85 / 185 / 260 tool places

HSK100: 65\* / 127 / 147 / 191 tool places

\* version with chain magazine

## TOOL HANDLING QUICK, RELIABLE AND CONVENIENT

On the rear of the machine, tools can be loaded and unloaded quickly in parallel with live operation. A touch panel increases ease of use for users and assists them in managing tools. The controller uses the tool types to determine itself vacant spaces and inhibits neighbouring spaces when large tools are used. A chip system is available as an option that automatically passes tool information to the controller.



# RX10

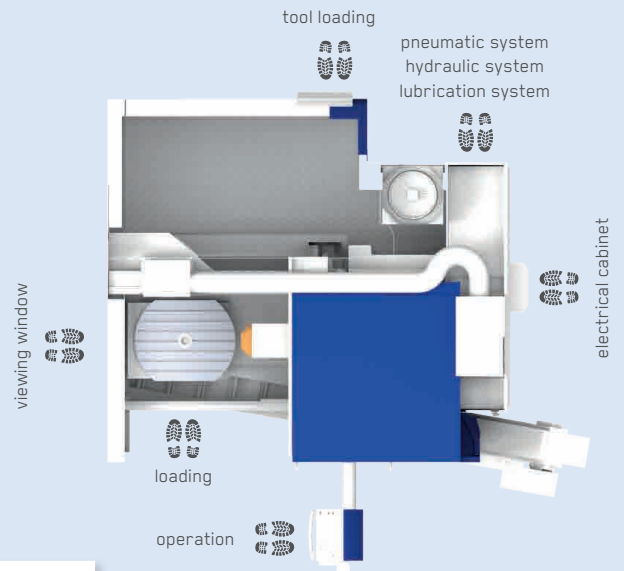
## Good view and accessibility

The optimal arrangement of the controls, good lighting and large windows allow the operator the best possible view of the tool and workpiece. Optionally, the control panel can be electrically adjusted in height. This allows operators, regardless of their height, ergonomic work at the machine.



### Best accessibility

The oblique arrangement of the chip conveyor results in optimal access to the machine table. During set up work there is minimum weight on the back and hinges. Access to maintenance-relevant points is possible at any time and without dismantling effort.



## CLEAR WORKING ENVIRONMENT ERGONOMICALLY COORDINATED ON THE OPERATOR

The incomparable view into the machine allows optimum monitoring of the machining process. Right back in the design stage the concerns and experiences of machine operators have been taken into account. This results in ergonomics which places the operator in the foreground as a central element of the machine.

### Door opening

1'297 mm



### Work piece loading, small

The rapid access with the right machine door allows on the one hand the rapid exchange of small, light work pieces and on the other allows tools to be quickly checked for wear.



### Work piece loading, large

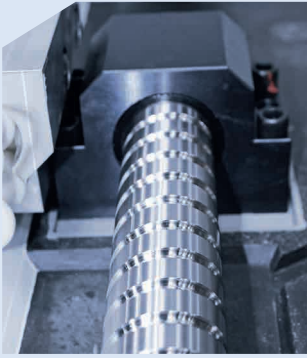
The door can be opened up to 1'297 mm when loading or unloading with the hoisting crane and thus allows maximum accessibility.



### **Linear roller guide ways**

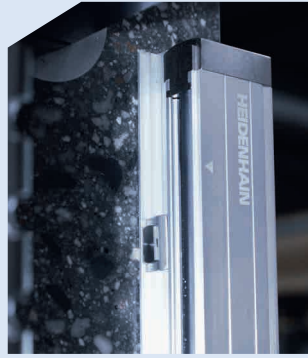
Each linear axis is equipped with four roller shoes. These are connected to the automatic lubrication system and are maintenance-free.





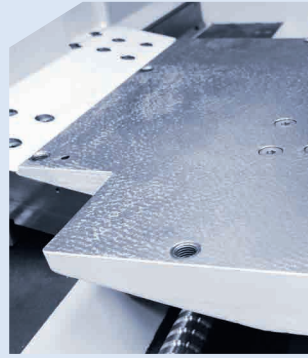
### Axis drives

The axis drive motors are directly linked to the ball screw. The inline design allows direct power transfer and maximum performance. The Z axis is driven with a double-spindle drive (master-slave drive).



### Direct measuring systems

The Heidenhain direct measuring system in the linear and rotary axes, which are connected as standard to the sealing air, guarantee the highest machine precision for years.

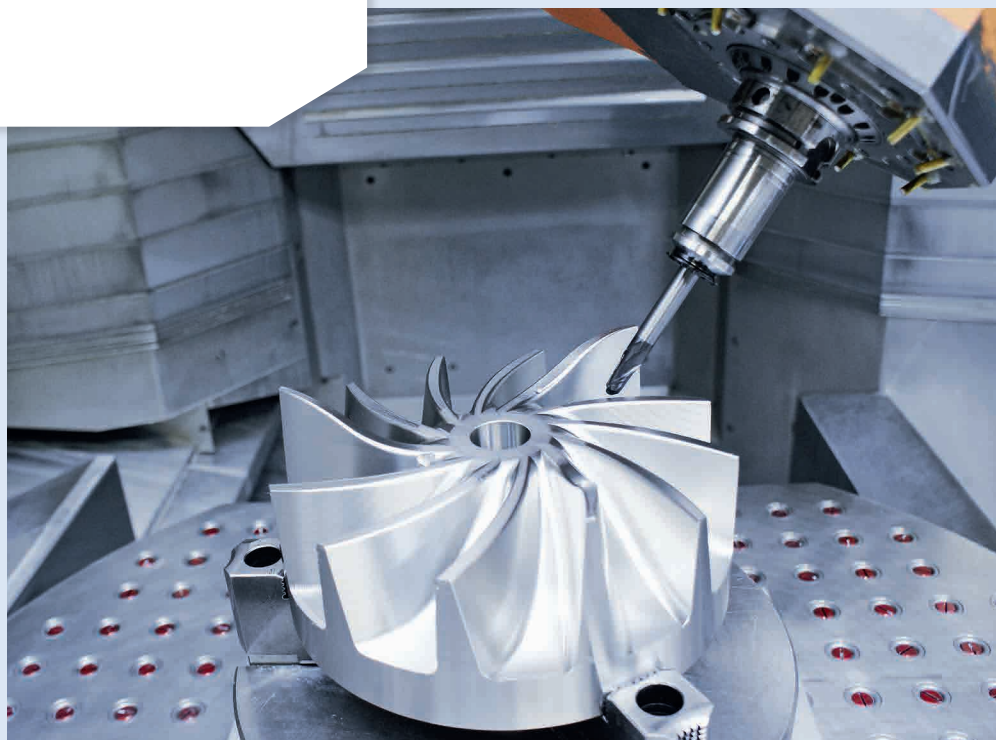


### Table support

High mechanical basic accuracy is the basis for the precision formed on the machined work piece. Therefore the table support is handscraped to the other basic components on the entire surface.

## PRECISION IS PRODUCED IF THE QUALITY IS RIGHT

**Anyone wanting to produce precise work pieces must be able to rely on the machine. What our customers require of us is what we require of our suppliers. We guarantee that only the highest quality components are used in all our machines.**



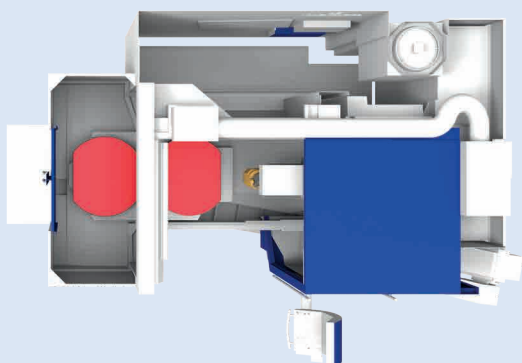


### **Palettenträgertisch**

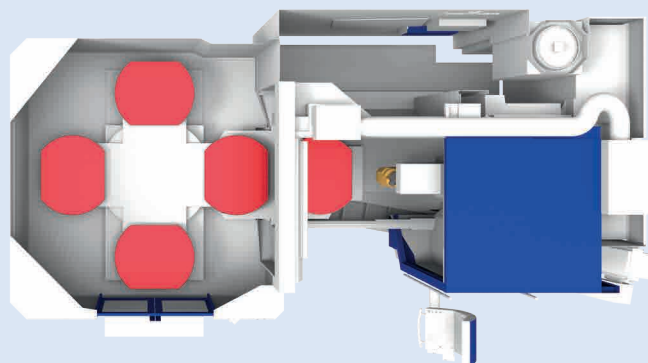
Über vier Nullpunktspannsystemen wird der Palettenträgertisch auf den Palettenträgertisch gespannt. Eine Wiederholgenauigkeit von 0.01 mm ist dabei jederzeit gewährleistet.

 **BERG**  
376 16939-000,1

REIDEN RX10 with 2-fold pallet changer



REIDEN RX10 with 5-fold pallet changer



**REIDEN RX10 PCS (Pallet Changing System)**

Pallet size	mm	1'000 x 800
Max. pallet load	kg	1'600
Number of pallets		2 / 5 / ...
Integration of third-party systems		according to customer requirements

**Small installation space - large benefit.**

**The automatic palette changer**

The installation space of the 2-way palette changer is a very compact and space-saving design, with 1,100 mm additional machine length.

The lateral arrangement always guarantees the operator when entering the program an optimal view of the workpiece being worked on. The 2-way and 5-way palette changer are very easy and user-friendly to programme at the controls and do not require any additional software.

# MODULAR AUTOMATION DESIGN IN A SMALL SPACE

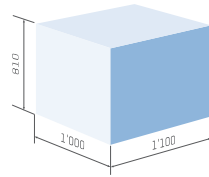
Clamping and setup during running time. Thanks to the ingenious automation design nonproductive time can be reduced to a minimum. The RX10 can be expanded to various levels up to a linear storage unit. User friendliness and access are not affected in the process.



The REIDEN RX10 is equipped even in the basic model with innovative technology for commercial complete machining.

	Basic features	Additional features
<b>Control and operation:</b>		
Control	Heidenhain TNC640	Siemens 840D sl
Portable electronic hand wheel	●	
Height-adjustable control panel		●
2 sets of operating and programming instructions (incl. wiring diagram)	●	
<b>Drive and spindle</b>		
Spindle	16'000 min <sup>-1</sup> (HSK63)	DDT 18'000 min <sup>-1</sup> (HSK63)
Spindle		12'000 min <sup>-1</sup> (HSK100 / SK50)
Automatic pivoting head horizontal / vertical	●	
Milling head cooling system	●	
Airshield system in milling head	●	
C axis 360° (continuous)	●	
Direct drive C-axis		400 min <sup>-1</sup> (only with HSK100)
A axis -1° to 90° (continuous)	●	
Minimal quantity lubrication system		●
<b>Work space and travelling distances</b>		
Full space protection casing	●	
Machine interior lighting	●	
2 angled doors for loading by crane	●	
Mineral glass windows	●	
Rotary table	ø 1'000 / ø 1'000 × 800	
<b>Peripherals</b>		
Tool changer, places (HSK63 / SK40)	85 (shelf magazine)	185 / 274 (shelf magazine)
Tool changer, places (HSK100 / SK50)	65 (chain magazine)	127 / 147 / 191 (shelf magazine)
Chip conveyor, front, lengthwise along machine bed	●	
Rinsing jet with separate coolant pump	●	
Internal coolant supply, form A	30 bar	50 / 80 bar
Pressure regulation of internal coolant supply		●
Coolant recooling		●
Paper band filter	●	
Rotating inspection glass		●
Smoke and coolant mist extractor		●
Touch probe (radio)		●
Laser tool setting and monitoring		●
Pallet exchange system		2-/5-way
Colouring	Light grey RAL7035 / Violet blue RAL5000	upon request

## Specifications



### Cutting area

X axis (longitudinal axis)	mm	1'000
Y axis (transverse axis)	mm	1'100
Z axis (vertical axis)	mm	810
Rotary table versions	∅	1'000 / 1'000 × 800
Max. swing diameter	mm	1'350 (1'050)**
Max. table load	kg	1'600

### Main drive

Spindle power 16'000 min <sup>-1</sup>	kW	38 kW at 100% duty ratio / 38 kW at 40% duty ratio
Spindle power DDT 3'000 min <sup>-1</sup> *	kW	21 kW at 100% duty ratio / 27 kW at 40% duty ratio
Spindle power DDT 18'000 min <sup>-1</sup> *	kW	28 kW at 100% duty ratio / 28 kW at 40% duty ratio
Spindle power 12'000 min <sup>-1</sup> * (HSK100 / SK50)	kW	74 kW at 100% duty ratio / 84 kW at 40% duty ratio
Max spindle torque 16'000 min <sup>-1</sup>	Nm	135
Max spindle torque DDT 3'000 min <sup>-1</sup> *	Nm	291
Max spindle torque DDT 16'000 min <sup>-1</sup> *	Nm	83
Max spindle torque 12'000 min <sup>-1</sup> * (HSK100/SK50)	Nm	452

### Feed motor

Rapid feed X-/Y-/Z axis	m / min	60
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### Tool changer

Max. tool length	mm	400 (365 at SK50)
Max. tool diameter	mm	80 / 160 (125 / 250 at SK50 and HSK100)

### Machine specifications

Machine weight	kg	18'200 / 21'000** / 23'000**
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\* Optional, subject to technical alterations. \*\* for palletisation

## Guaranteed accuracies DIN VDI / DGQ 3441

Accuracy depends heavily on external thermal influences. The values given are reached in the temperature region of 20° +/- 2° during factory approval.

### Linear axes X, Y, Z

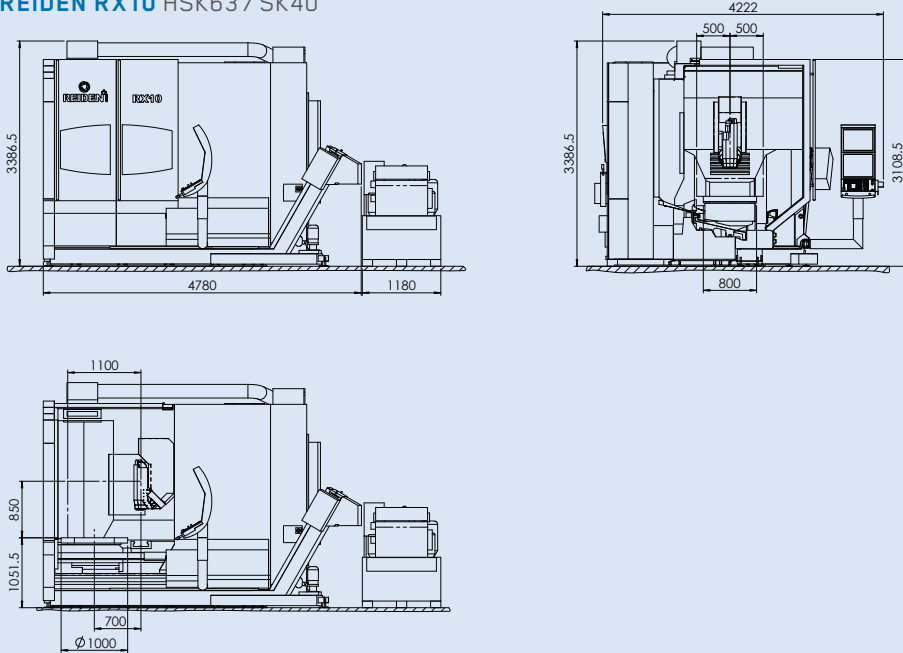
Position error P	5 µm
Position deviation Pa	3 µm
Repeatability Ps <sub>mid</sub>	3 µm
Repeatability Ps <sub>max</sub>	4 µm
Reversal error Ps <sub>mid</sub>	1 µm
Reversal error U <sub>max</sub>	2 µm

### Rotary table C axis

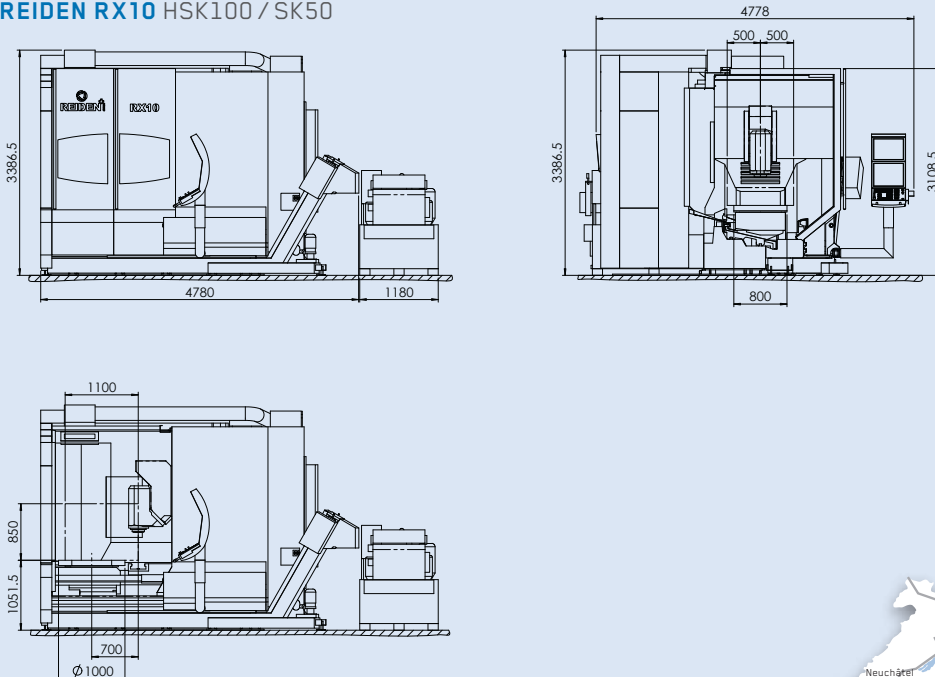
Positioning error P	5 ws
Position deviation Pa	2 ws
Repeatability Ps <sub>mid</sub>	2 ws
Repeatability Ps <sub>max</sub>	3 ws
Reversal error U <sub>mid</sub>	1 ws
Reversal error U <sub>max</sub>	2 ws

## RX10 dimensions

### REIDEN RX10 HSK63 / SK40



### REIDEN RX10 HSK100 / SK50



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