

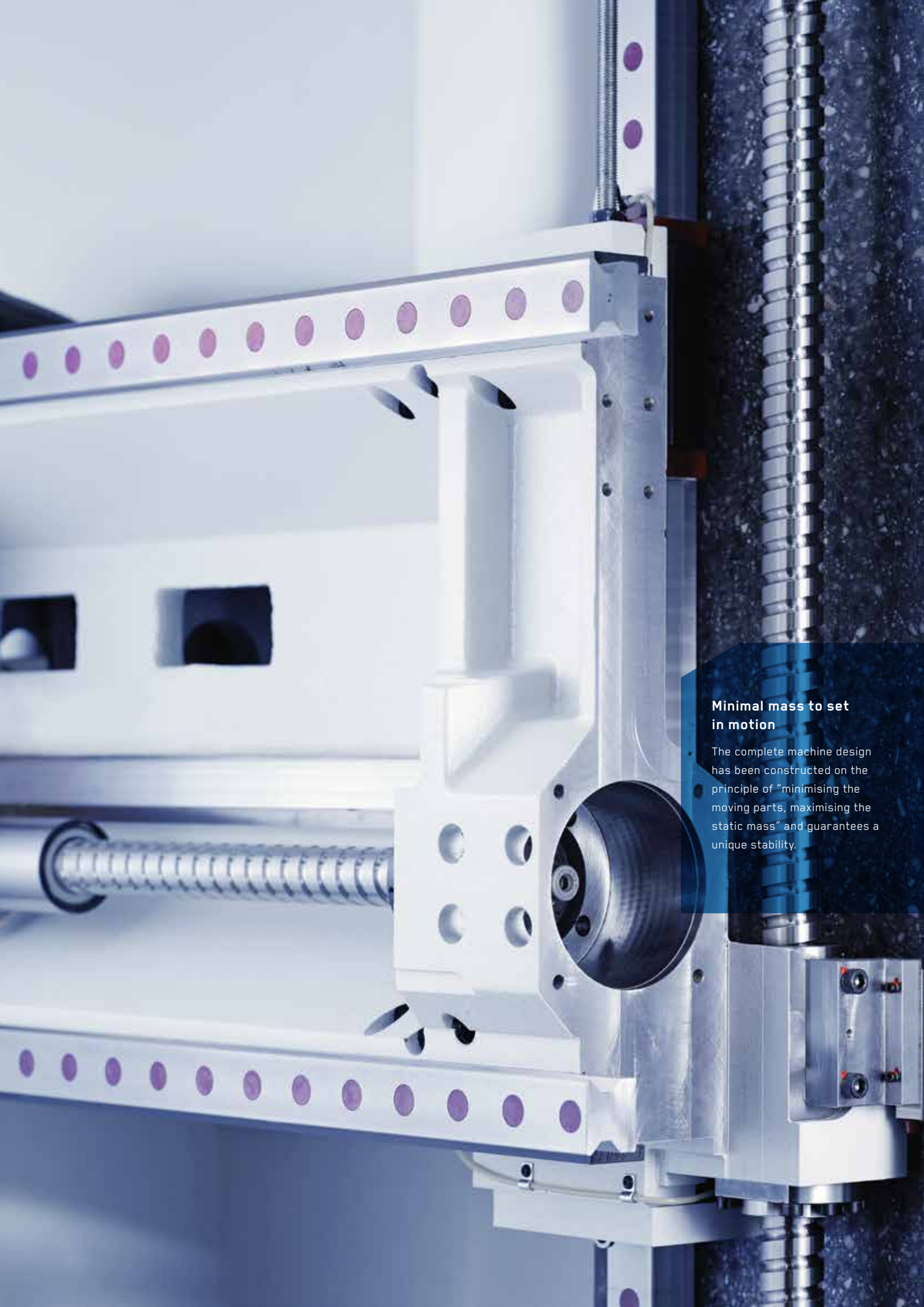


MACHINE TOOL MANUFACTURER

e

# RX10

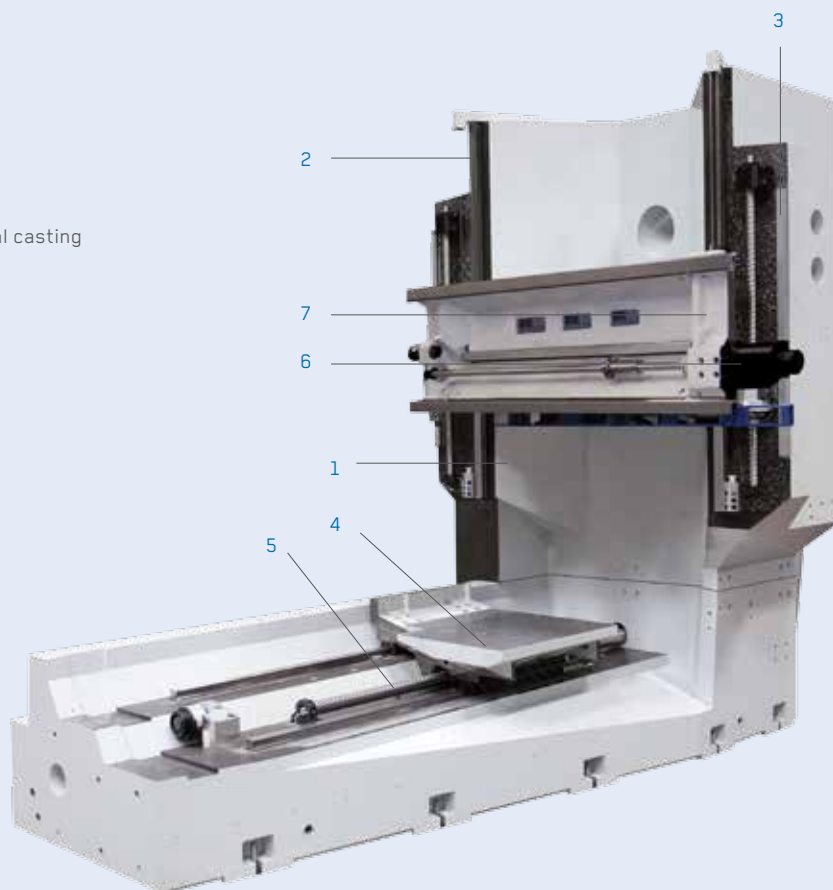
5-axis machining center  
a system developed for high performance



### **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.

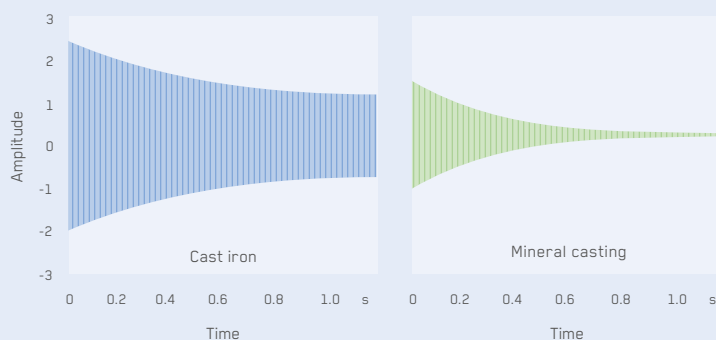
- 1 Machine column and machine bed made of mineral casting
- 2 Linear roller guide ways
- 3 Direct measuring system (glass scales)
- 4 Rotary table support
- 5 Ball screws
- 6 Feed motors
- 7 Strongly ribbed cross slide



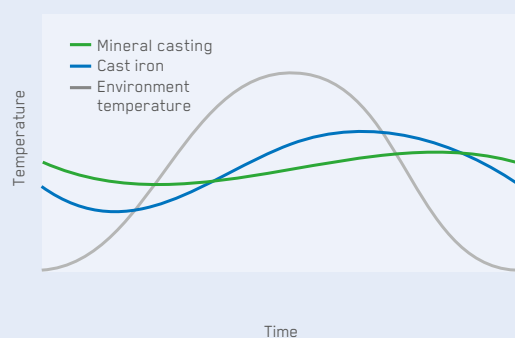
## RIGID CONSTRUCTION

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

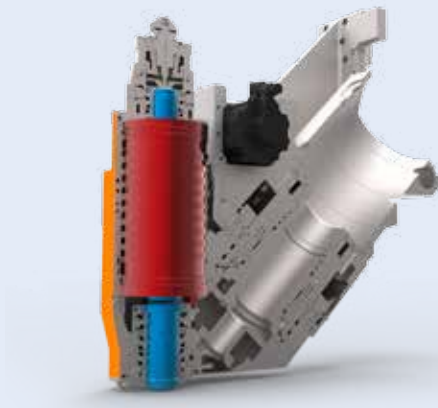
In the horizontal spindle position the spindle center can be driven up to 10 mm below the edge of the table. Work pieces are clamped directly to the table and do not lose any stability by construction using fixtures.



### A axis, continuous programmable

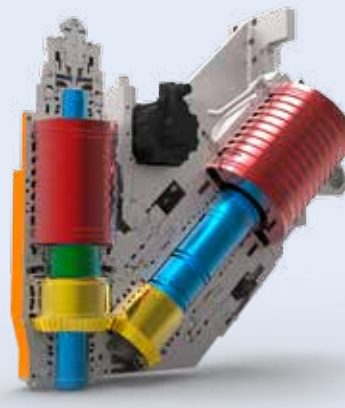
The A axis rotates continuous from  $-1^\circ$  up to  $90^\circ$ . The NC axis is designed for positioning and simultaneous operations.

## Standard motor spindle



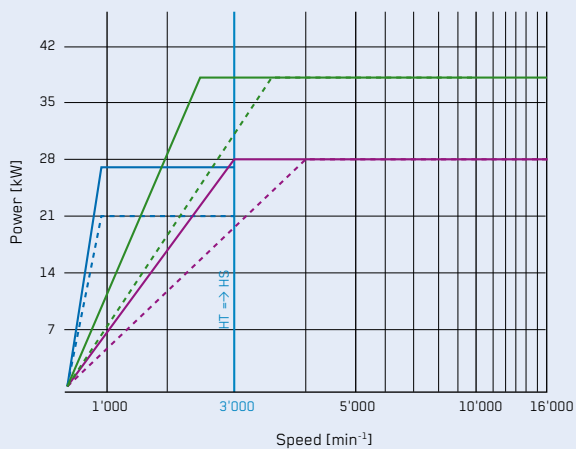
20–16'000 min<sup>-1</sup>  
max. 135 Nm

## DDT Double Drive Technology



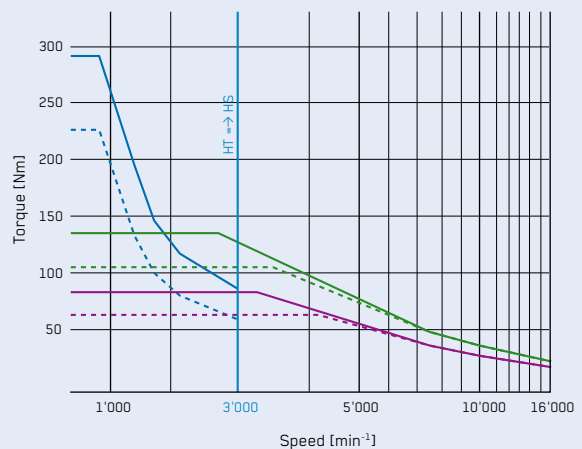
<b>High-Speed</b>	<b>+ High-Torque</b>
20–16'000 min <sup>-1</sup>	20–3'000 min <sup>-1</sup>
max. 83 Nm	max. 291 Nm

## Performance diagram



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

## Torque diagram



— High Speed 135 Nm 40% ED (38 kW)
- - - High Speed 105 Nm 100% ED (38 kW)

## 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.

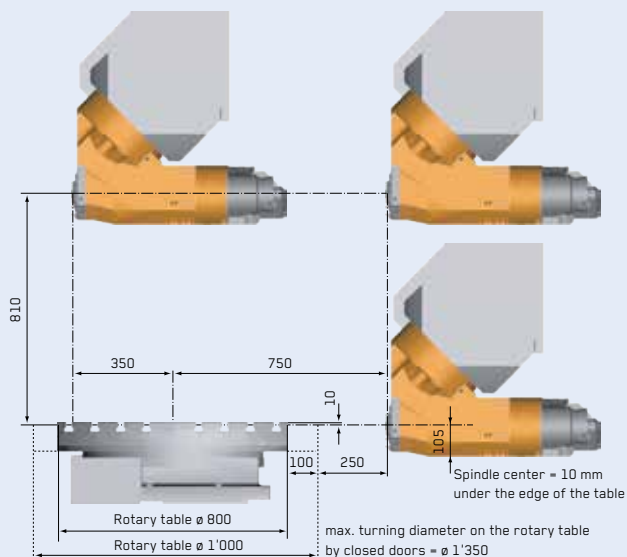
# DDT – DOUBLE DRIVE TECHNOLOGY

## UNIQUE AND PATENTED

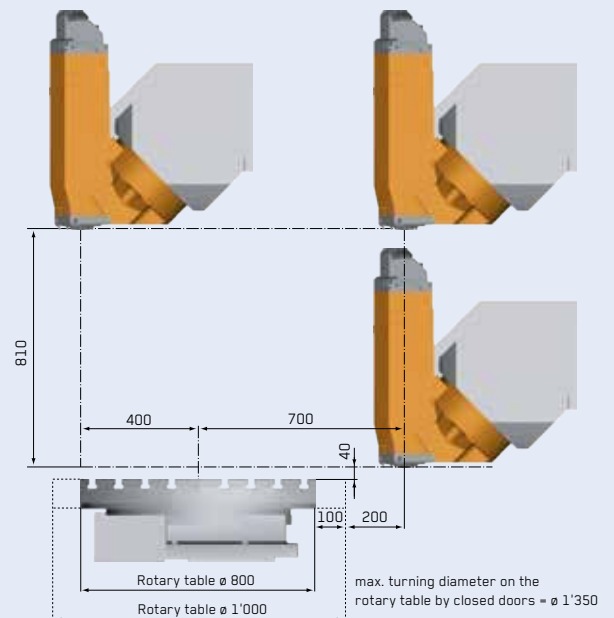
As standard the RX10 is delivered with a motor spindle version of 16'000 min<sup>-1</sup> and a maximum torque of 135 Nm. The Double Drive design patented by Reiden Technik AG is available as an option.

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 16'000 min<sup>-1</sup> reached via the built in motor spindle in the head.

### Movement diagrams



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.

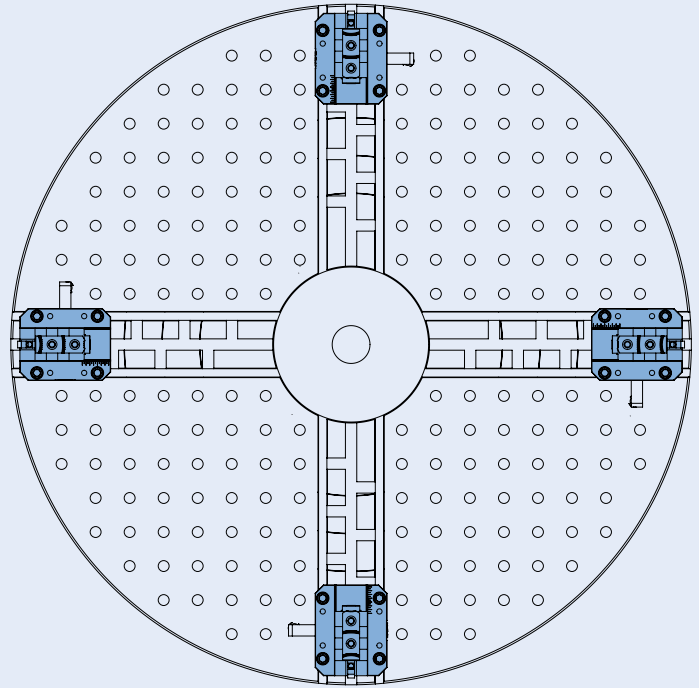


#### **Additional stability**

The HSK100 variant of the milling head also masters high machining forces with flying colours. Two speed variants and pneumatic spindle clamping ensure best possible set-up, even in milling-turning mode.

### 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.

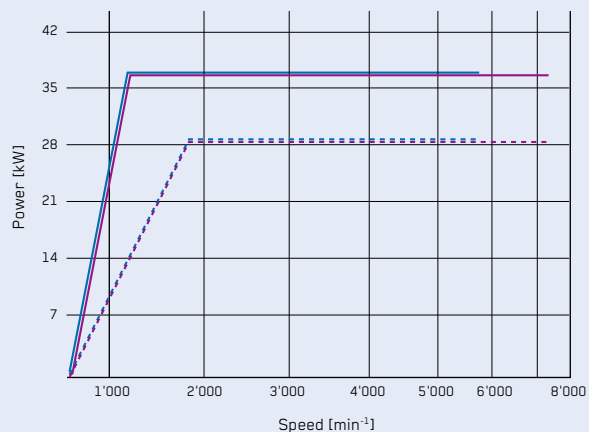


## MILLING AND TURNING IN ONE SETUP

The direct-drive circular table has automatic imbalance detection. Counterweights ensure low-vibration machining even at a maximum speed of  $400 \text{ min}^{-1}$ . Workpieces need no longer be converted between milling and turning operations.

### Performance diagram

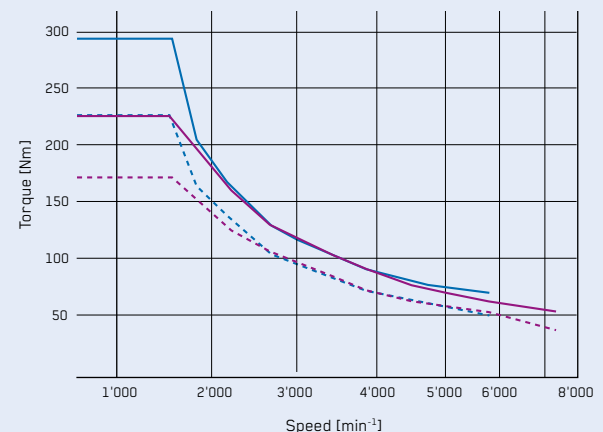
Spindle  $5'700$  and  $7'300 \text{ min}^{-1}$



— High Torque  $5'700 \text{ min}^{-1}$  293 Nm 40% ED (29 kW)      — High Torque  $7'300 \text{ min}^{-1}$  229 Nm 40% ED (29 kW)  
 - - - High Torque  $5'700 \text{ min}^{-1}$  226 Nm 100% ED (29 kW)      - - - High Torque  $7'300 \text{ min}^{-1}$  176 Nm 100% ED (29 kW)

### Torque diagram

Spindle  $5'700$  and  $7'300 \text{ min}^{-1}$

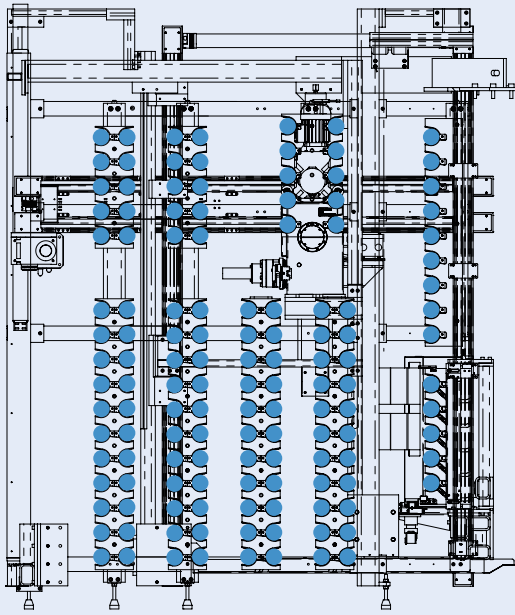




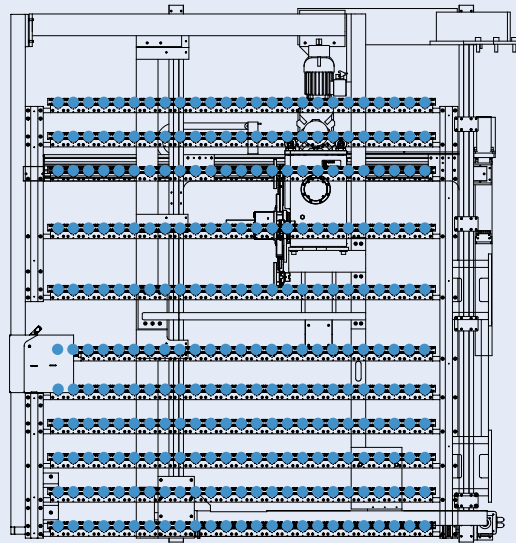
### Loading methods

Two different loading methods can be used to pass tools to the magazine. On the HSK63 / SK40 it is a single tool drawer and on the HSK100 / SK50 a swing door for five tools that can be loaded together.

HSK100 / SK50 Tool magazine



HSK63 / SK40 Tool magazine



#### Tool changer

The shelf magazine is arranged to the side of the lateral work space. The tool is prepared via 2 independent NC axes and exchanged using a dual tool gripper.

HSK63 / SK40: 73 / 173 / 273 places

HSK100 / SK50: 95 / 127 / 147 / 191 places

## TOOL HANDLING

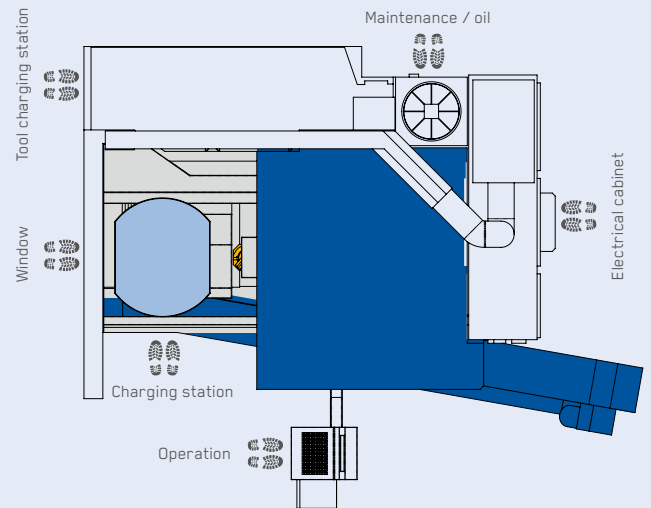
### QUICK, RELIABLE AND CONVENIENT

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.



### 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 work piece. The CNC controllers used, from HEIDENHAIN and SIEMENS, are amongst the best in the world.



## 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.

### 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.

### Door opening

1'140 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 1'140 mm when loading or unloading with the hoisting crane and thus allows maximum accessibility.



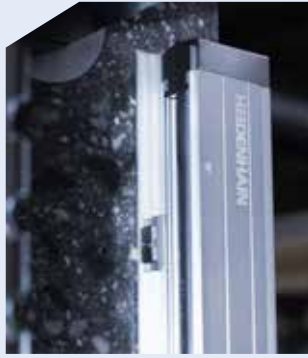
#### **Linear roller guide ways**

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



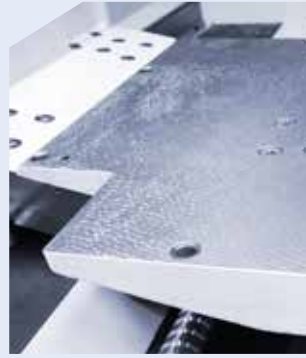
### Axis drives

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

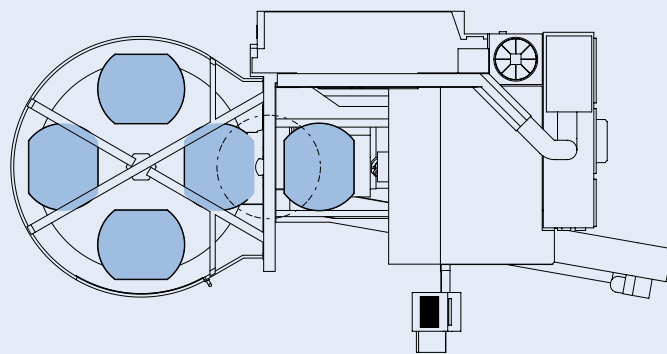
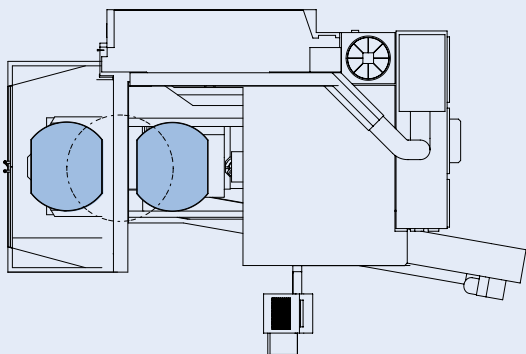
**Anyone wanting to produce precise work pieces must be able to rely on the machine. What our customers require of us is what we require of our suppliers. We guarantee that only the highest quality components are used in all our machines.**





#### **Pallet base table**

The pallet table is clamped to the pallet base table via four zero point clamping systems. A repeat accuracy of 0.01 mm is ensured at all times.



### REIDEN RX10 PCS (Pallet Changing System)

Pallet size	mm	1'000 × 800
Max. transfer weight	kg	1'600 / 800
Number of pallets		2 / 5
optional		up to linear storage unit

\* At 5-fold pallet changing system



## MODULAR AUTOMATION DESIGN IN A SMALL SPACE

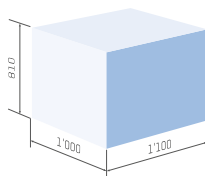
Clamping and setup during running time. Thanks to the ingenious automation design nonproductive time can be reduced to a minimum. The RX10 can be expanded to various levels up to a linear storage unit. User friendliness and access are not affected in the process.

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	●	
2 sets of operating and programming instructions (incl. wiring diagram)	●	
<b>Drive and spindle</b>		
Spindle speed range	20-16'000 min <sup>-1</sup> (135 Nm)	DDT 16'000 min <sup>-1</sup> (291 Nm)
Spindle taper	HSK63	SK40 / HSK100 / SK50*
Automatic pivoting head horizontal / vertical	●	
Milling head cooling system	●	
Airshield system in milling head	●	
C axis 360° (continuous)	●	
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)	73 (shelf magazine)	173 / 273 (shelf magazine)
Tool changer, places (HSK100 / SK50)	95 (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	●	
Endless 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

\* With HSK100 and SK50 is the spindle speed 5'700 / 7'300 min<sup>-1</sup>

## 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 16'000 min <sup>-1</sup> *	kW	28 kW at 100% duty ratio / 28 kW at 40% duty ratio
Spindle power 5'700 min <sup>-1</sup> *	kW	29 kW at 100% duty ratio / 37 kW at 40% duty ratio
Spindle power 7'300 min <sup>-1</sup> *	kW	29 kW at 100% duty ratio / 37 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 5'700 min <sup>-1</sup> *	Nm	291
Max spindle torque 7'300 min <sup>-1</sup> *	Nm	227

### 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
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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

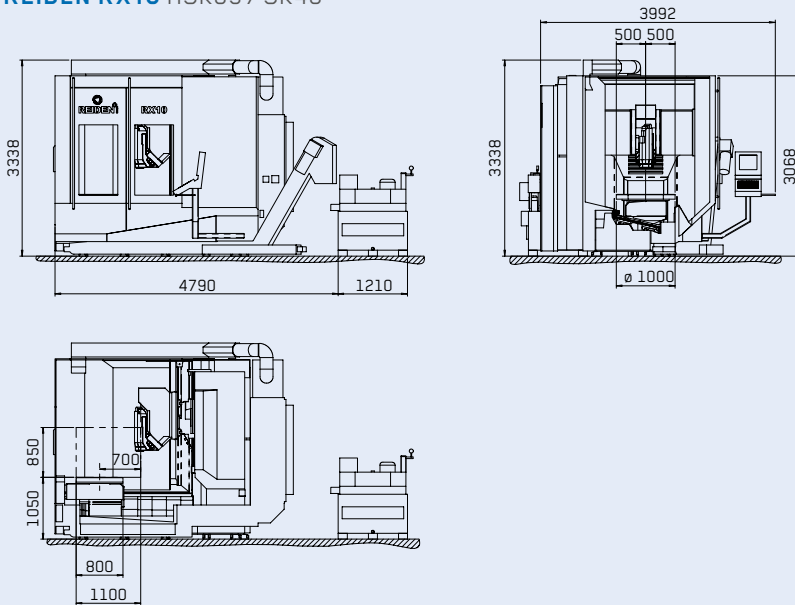
Position error P	5 µm
Position deviation Pa	3 µm
Repeatability Ps <sub>mit</sub>	3 µm
Repeatability Ps <sub>max</sub>	4 µm
Reversal error Ps <sub>mit</sub>	1 µm
Reversal error U <sub>max</sub>	2 µm

### Rotary table C axis

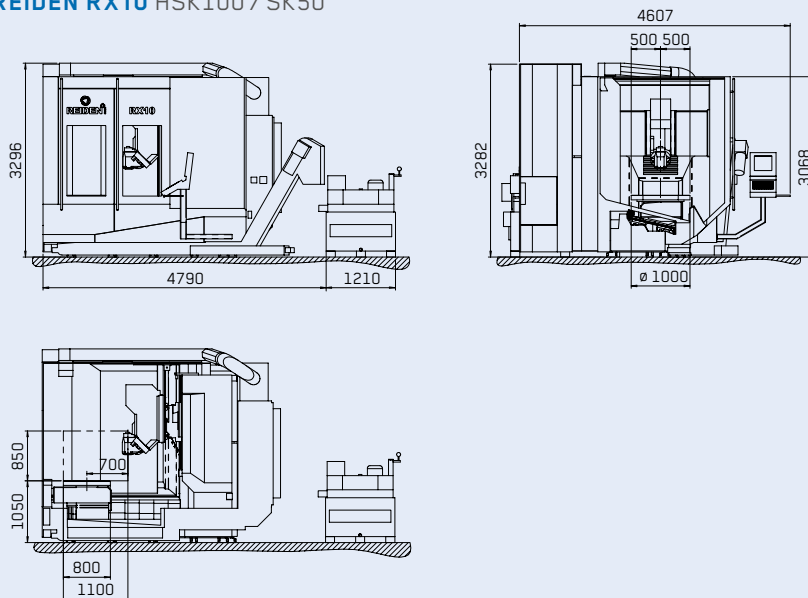
Positioning error P	5 ws
Position deviation Pa	2 ws
Repeatability Ps <sub>mit</sub>	2 ws
Repeatability Ps <sub>max</sub>	3 ws
Reversal error U <sub>mit</sub>	2 ws
Reversal error U <sub>max</sub>	2 ws
Axial runout, rotary table	0.01 mm
Concentric run-out, alignment	0.005 mm

## RX10 dimensions

### REIDEN RX10 HSK63 / SK40



### REIDEN RX10 HSK100 / SK50



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