REIDEN SWISS
HIGH PERFORMANCE MACHINE TOOLS

e

RX14
RX18

5-axis machining center
a system developed for high performance

MACHINE TOOL MANUFACTURER

Machine bed

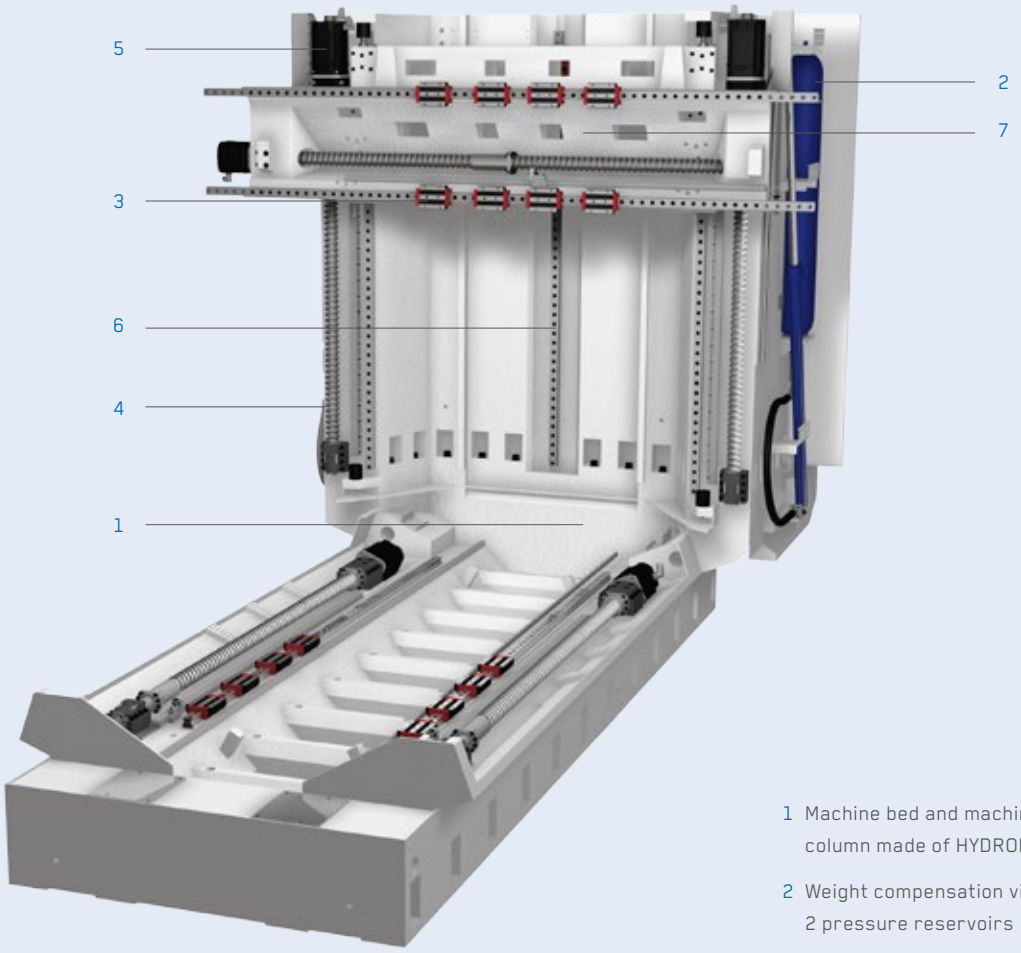
The machine bed and machine column consist of two separate parts and are bolted together. Basic stability is created by the mass of both parts.

Machine bed

RX14	9.5 tonnes
RX18	12 tonnes

Machine column

RX14	9.5 tonnes
RX18	16 tonnes



1 Machine bed and machine column made of HYDROPOL®

2 Weight compensation via 2 pressure reservoirs

3 Linear guide ways with 4 roller shoes each

4 Ball screws

5 Synchronous inline drive motors, Z-axis

6 Central guide rail with 2 carriages

7 Strongly ribbed cross slide

HYDROPOL® – VIBRATION ABSORBING AND INHERENTLY RIGID – FOR HIGH STANDARDS IN MACHINING

To meet the highest standards in the mechnical industry, machine bed and machine column are made of HYDROPOL®, a composite material of special concrete and steel. Together they form a unit with enormous inherent stability, excellent vibration absorbing behaviour and a high dynamic rigidity, ideal for extreme loads.

Spindle versions

Compactly built and fitted with high-end spindles from “Fischer Precise”. The patented “DDT” drive technology from Reiden Technik AG can be chosen as an option.

Horizontal – vertical

At a speed of 40 min^{-1} the worm drive turns the axis in a second from the vertical to the horizontal spindle position.

A-axis

The A-axis pivots standardly from -15° up to +105° by means of a pre-stressed, backlash-free worm drive. The NC-axis is designed for positioning and simultaneous operation.

Under the table edge

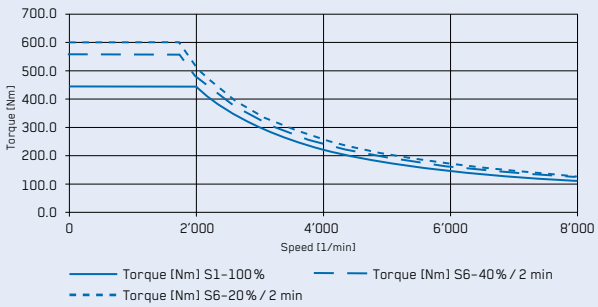
In the horizontal spindle position the spindle center can be driven up to 10 mm under the edge of the table. Work pieces are clamped directly to the table and do not lose any stability by construction using fixtures.

THE MILLING HEAD
RIGIDE AND EXTREMELY FLEXIBLE

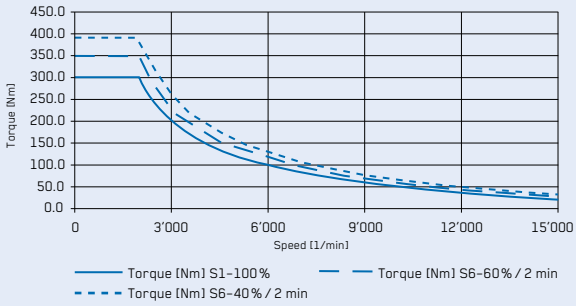
Whether in the standard or trigonal version the milling head is perfectly handscraped to the machine's geometry.
This is the basis for the high precision which can eventually be measured on the machined work piece.

Torque diagrams

Spindle 8'000 min^{-1}



Spindle 15'000 min^{-1}

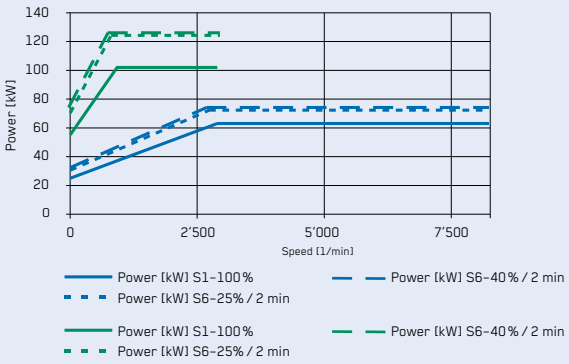


A proven concept

The proven rotary head concept guarantees a high level of universality for multi-sided machining and is designed for simultaneous milling with up to five axes. This key technology has been deployed successfully at Reiden Technik AG for years.

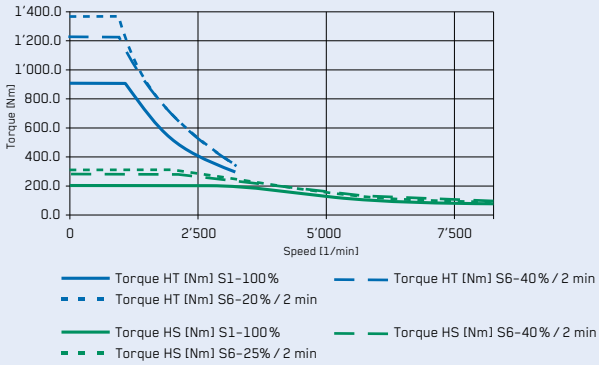
DDT performance diagram

Spindle DDT 8'000 min^{-1}



DDT torque diagram

Spindle DDT 8'000 min^{-1}

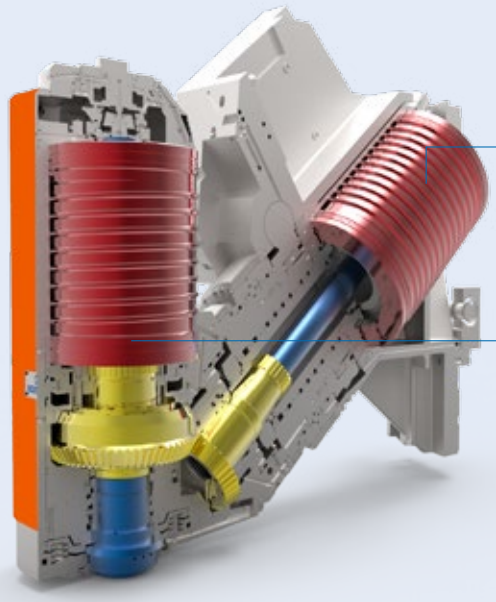


DDT – DOUBLE DRIVE TECHNOLOGY

UNIQUE AND PATENTED

The clever dual drive system, already tried and tested on other REIDEN machine families, is also used on the RX14 / RX18.

Roughing work is mastered with a high-torque motor having a maximum spindle speed of 3'000 min^{-1} and a torque of 1'202 Nm. If higher speeds are required, the high-torque motor decouples and the high-speed spindle integrated in the milling head reaches a maximum speed of 8'000 min^{-1}.



HIGH TORQUE

3'000 min^{-1}

1'202 Nm

125 kW

HIGH SPEED

8'000 min^{-1}

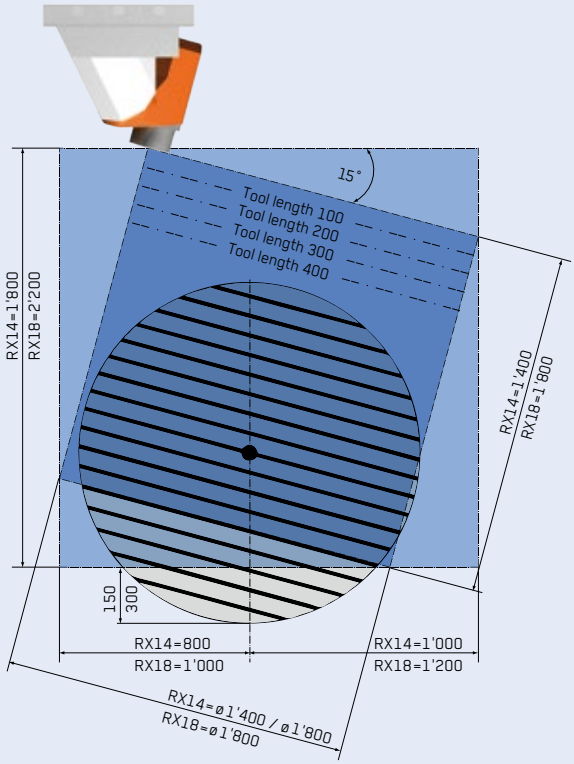
275 Nm

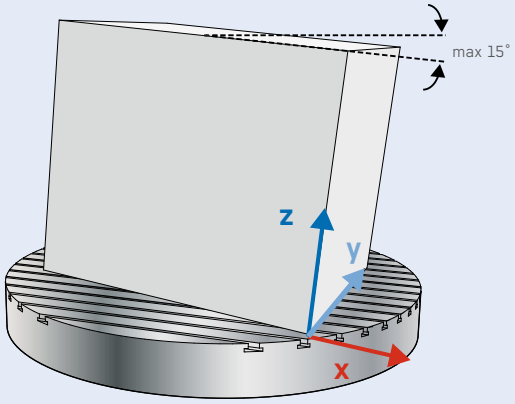
75 kW

Dihedral angle redefined

The view of the tool and workpiece always stays perfect no matter whether the head position is vertical or horizontal. The view is still very good for the underequatorial head position of -15°. The spindle is lent towards the user by 15° for the horizontal head position.

Travel area with trigonal milling head





3D basic rotation

The work piece no longer has to be clamped compulsorily horizontally on to the rotary table. The plane of the work piece is determined by the probe and rotated into the plane with the appropriate cinematics.

TRIGONAL MILLING HEAD

SIMPLY FUNKY AND INGENIOUS

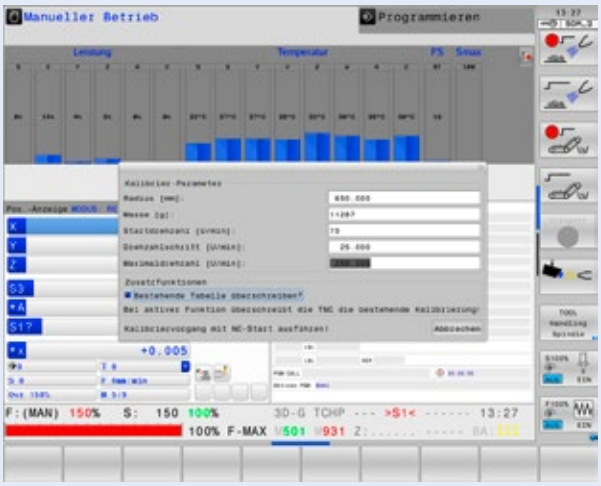
Via the special arrangement of the A-axis dihedral angles from -15° to +105° can be machined with only one axis. Today in modern machine tools all feed axes are in permanent control. Milling with the trigonal head in the horizontal spindle position has the great advantage that the X and Y axes are continually loaded in the same direction. This reduces cross-stresses to a minimum.

Combined milling and turning

A powerful and dynamic torque motor also enables complex turning operations to be performed. There is no conversion of workpieces between milling and turning operations. This means bigger parts can also be machined to completion in one clamping operation, thereby saving time.

Max. speed

RX14	400 min^{-1}
RX18	250 min^{-1}

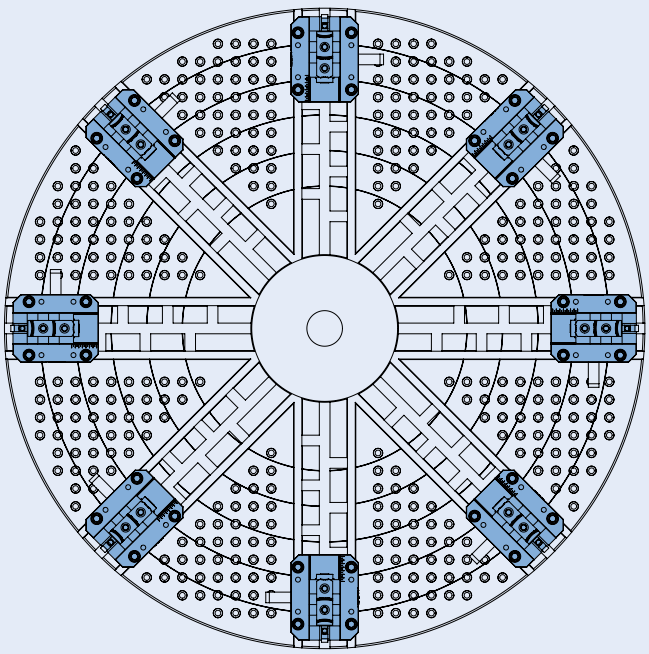


Automatic balancing of workpieces

The direct-drive circular table has automatic imbalance detection. The CNC controller specifies where on the circular table the imbalance is. Counter-weights ensure low-vibration machining even at the maximum speed.

TURNING
FOR EXACTING DEMANDS

The spindle load relief mechanism, designed specially for demanding turning work, protects the DDT milling spindle from forces applied. All the pressure is taken off all bearings by the system developed by Reiden Technik AG. The turning tool is kept in position using a hydraulic clamp.



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 individual custom-er requirements.

Clear at a glance

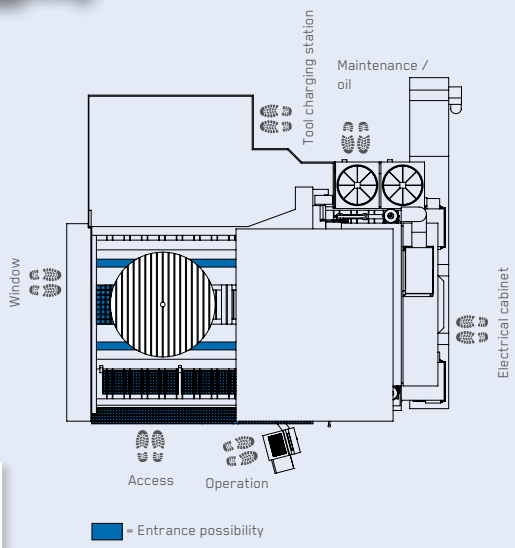
Large viewing windows made of safety glass guarantee a safe and good view into the machine. Access to the work table is fitted with running boards and folding footboards.

Door opening

RX14: 2’200 mm
RX18: 2’300 mm

Full-space protection casing

The double-walled protective casing offers a complete inner casing made of chromium stainless steel, safety windows made of mineral glass and a light illuminated work space. The automatic angle door can be opened by up to 2’200 / 2’300 mm and offer enough space for loading with the crane.



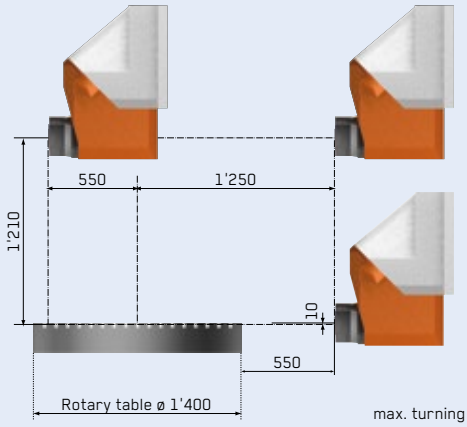
ERGONOMICALLY OPTIMISED
AND EXTRAORDINARILY ACCESSIBLE

The whole ergonomics of the machine have been customized to the needs of the operator. The control panel can be moved in order to be as close to the work piece as possible. The automatic machine door increased the comfort and safety of the operator. The loading and unloading of large work pieces with the lifting crane is made possible at any time by the large loading door, freely accessible from above.

The shelf magazine

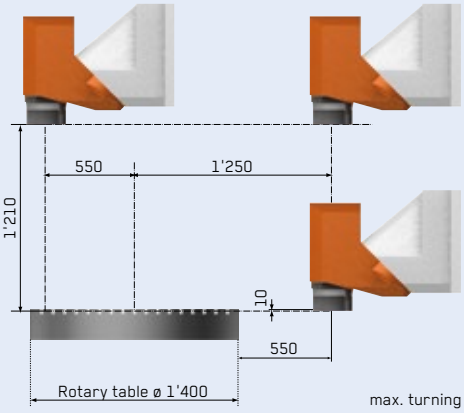
The compact execution of our own design offers space for many tools without the external dimensions of the machine becoming larger.
Time-concurrent loading and unloading takes place via the 7-way loading station.

Work area RX14 horizontal



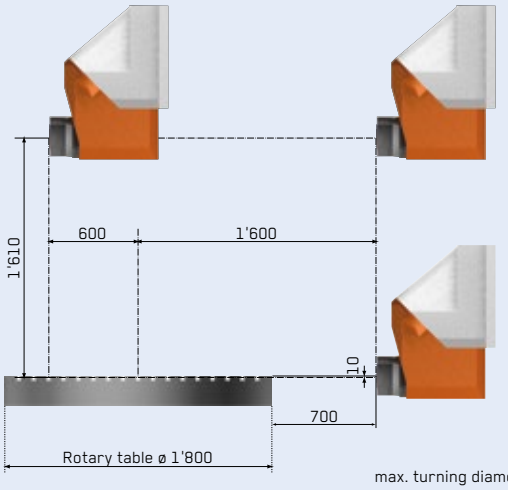
max. turning diameter on the rotary table by closed doors = ø 2'200 (limited ø 1'900)

Work area RX14 vertical



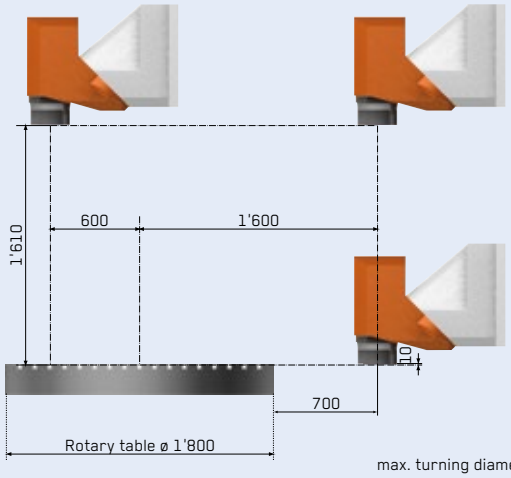
max. turning diameter on the rotary table by closed doors = ø 2'200 (limited ø 1'900)

Work area RX18 horizontal



max. turning diameter on the rotary table by closed doors = ø 2'600 (limited ø 2'200)

Work area RX18 vertical



max. turning diameter on the rotary table by closed doors = ø 2'600 (limited ø 2'200)

LARGE WORK SPACE

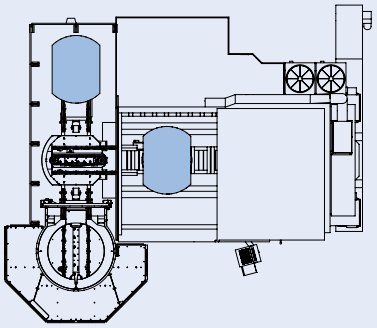
THANKS TO OPTIMALLY UTILISED SPACE

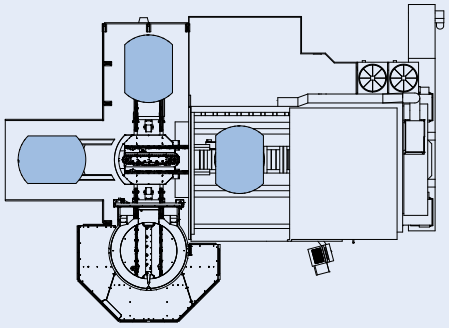
Compact design allows the machine, in spite of a large working space, to be built on a minimum area. The travel areas of the machine are so designed that as many universal machinings as possible are possible without changing the setup of the workpiece.

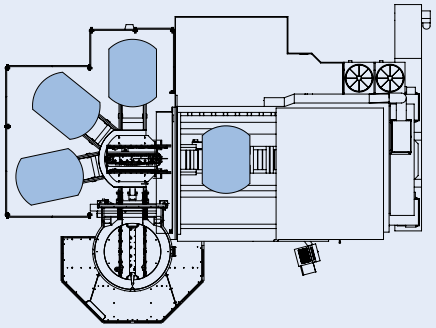
Tool loading station

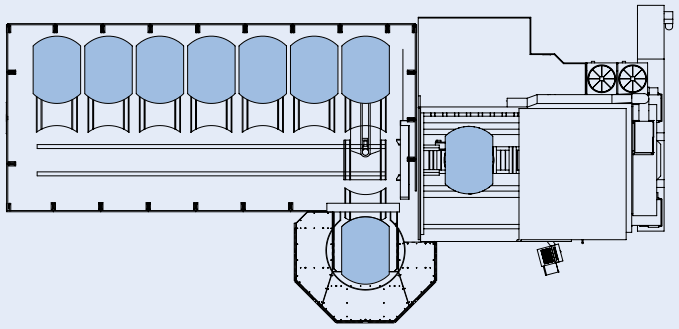
Pallet base table

The pallet is pushed over bearing rollers with a gap of 0.5 mm on to the base table. The pallets are then clamped over 4 zero-point clamping systems. Repeat accuracy is +/- 0.01 mm.









Modular design

Via its modular construction the machine can be extended from the standard version with 2 pallets up to a linear storage unit. User friendliness and machine handling are not affected in the process.

REIDEN RX14 / RX18, 5-axis machining center with REIDEN PCS (Pallet Changing System)

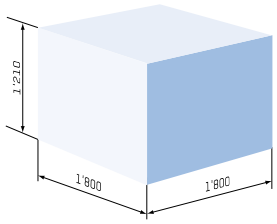
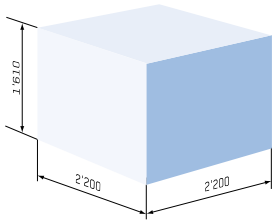
		RX14	RX18
Pallet size	mm	ø 1'400 × 1'200 ø 1'800 × 1'400	ø 1'800 × 1'400
Max. transfer weight	kg	4'000	4'000
Number of pallets, standard		2 / 3 / 4	2 / 3 / 4
optional		up to linear storage unit	up to linear storage unit

AUTOMATION DESIGN
MATCHED TO THE MACHINE

The PCS automation design is based on years of experience from our own production portfolio. The solutions are compact and do not require an additional host computer. The interface with the machine is so designed that even an extension to a pallet system of well-known manufacturers is possible.

Die REIDEN RX14 / RX18 series is equipped even in the basic model with innovative technology for commercial complete machining.

	Basic features	Additional features
Control and operation		
Control	Heidenhain TNC640	Siemens 840 D sl
Portable electronic hand wheel	●	
2 sets of operating and programming instructions (including wiring diagram)	●	
Drive and spindle		
Spindle speed range	20–15'000 min^{-1}	20–8'000 / DDT 8'000 min^{-1}
Spindle taper	HSK100	SK50
Automatic pivoting head trigonal	●	
Milling head cooling system	●	
Airshield system in milling head	●	
C-axis (continuous) with worm gear drive	●	
C-axis (continuous) with gearless drive		●
Software expansion, turning		●
A-axis 0° to +90° (continuous)		●
A-axis -15° to +105° (continuous), trigonal milling head	●	
Blowing air through spindle center		●
Minimal quantity lubrication system		●
Work space and travelling distances		
Full space protection casing, internal space made of chromium stainless steel	●	
Automatic opening and closing of working doors	●	
Mineral glass windows	●	
Machine interior lighting	●	
Angled door for loading by crane	●	
Peripherals		
Cone cleaning station		●
4 chip conveyors, 3x along and 1x transverse to the 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		●
Camera in machining area		●
Pallet exchange system		●
Levellers	●	
Colouring	Light grey RAL7035 / Violet blue RAL5000	upon request

Specifications		RX14	RX18
			
Cutting area			
X-axis (longitudinal axis)	mm	1'800	2'200
X-axis (longitudinal axis) with trigonal milling head	mm	1'400	1'800
Y-axis (transverse axis)	mm	1'800	2'200
Z-axis (vertical axis)	mm	1'210	1'610
C-axis (rotary table)	mm	ø 1'400 / ø 1'800	ø 1'800
Max. rotary diameter	mm	ø 1'900 (ø 2'200)	ø 2'200 (ø 2'600)
Max. table load	kg	5'000 / 8'000 at appropriate speed	
Main drive			
Spindle taper		HSK100 / SK50	HSK100 / SK50
Spindle speed, power, torque		15'000 min^{-1}, 63 kW / 73 kW (100 / 40% duty ratio), 300 Nm / 348 Nm (100 / 40% duty ratio)	
Spindle speed, power, torque		8'000 min^{-1}, 93 kW / 102 kW (100 / 40% duty ratio), 445 Nm / 557 Nm (100 / 40% duty ratio)	
Spindle speed, power, torque		20'000 min^{-1}, 150 kW / 187 kW (100 / 40% duty ratio), 95 Nm / 102 Nm (100 / 40% duty ratio)	
Spindle speed, power, torque	DDT	3'000 min^{-1}, 105 kW / 125 kW (100 / 40% duty ratio), 884 Nm / 1'202 Nm (100 / 40% duty ratio)	
Spindle speed, power, torque	DDT	8'000 min^{-1}, 63 kW / 75 kW (100 / 40% duty ratio), 200 Nm / 275 Nm (100 / 40% duty ratio)	
Feed motor			
Rapid feed X-/ Y-/ Z-axis		40	
Tool changer			
Places		92 / 204	92 / 200 / 304 / 400
Max. tool length	mm	600	
Max. tool diameter	mm	125 / 250	
Machine specifications			
Machine weight (400 mm base required)	kg	42'000	51'000
Dimensions length × width × height	mm	6'886 × 7'001 × 3'871	7'291 × 7'355 × 4'267

Optional, subject to technical alterations. Base in accordance with manufacturer information.

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

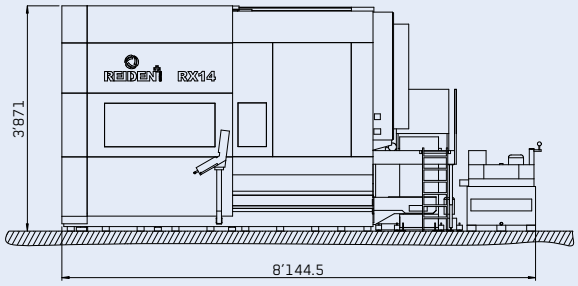
Position error P	8 µm
Position deviation Pa	5 µm
Repeatability Ps_{mit}	5 µm
Repeatability Ps_{max}	5 µm
Reversal error Ps_{mit}	4 µm
Reversal error U_{max}	6 µm

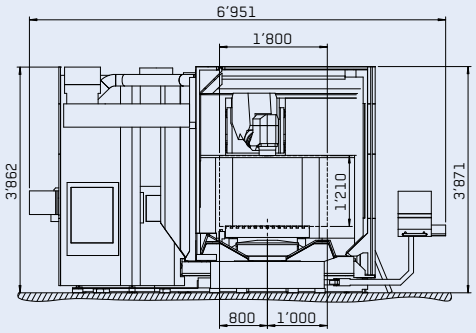
Rotary table C-axis

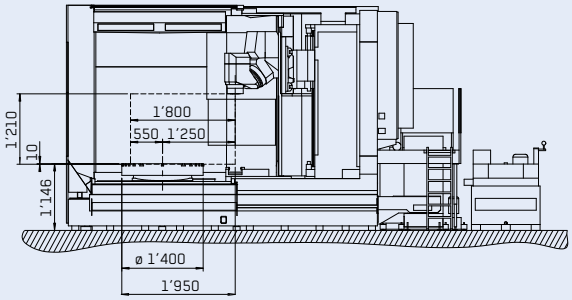
Positioning error P	7 ws
Position deviation Pa	5 ws
Repeatability Ps_{mit}	3 ws
Repeatability Ps_{max}	5 ws
Reversal error U_{mit}	2 ws
Reversal error U_{max}	2 ws
Axial runout, rotary table	0.015 mm (ø 1'000)
Concentric run-out, alignment	0.01 mm

Dimensions

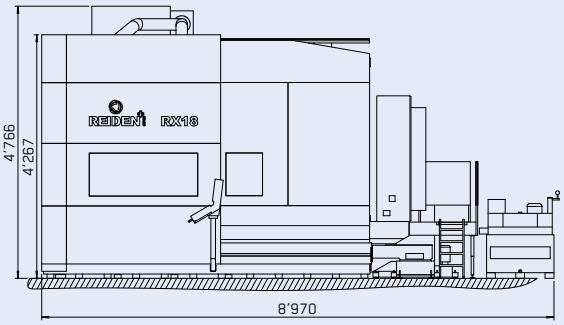
RX14

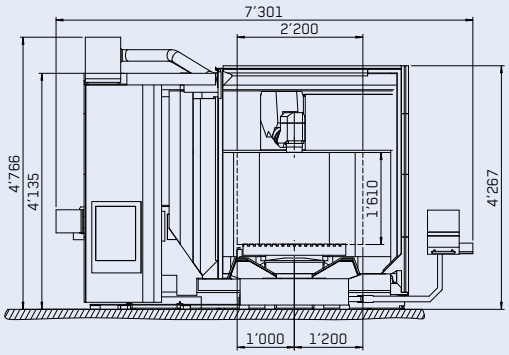


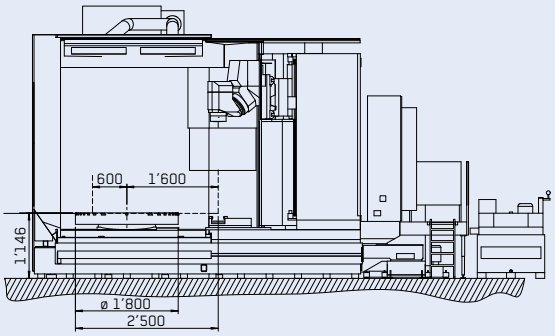




RX18







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