



# PreciMill 5X

Compact, precise, innovative, and high-performance machining center for maximum productivity



SWISS  MADE

# Key features and applications

A cutting-edge technological solution for demanding industries

EMISSA designed the PreciMill to meet the increasing demands of the industry. A true concentration of advanced technologies, it is perfectly suited for high-precision applications such as watchmaking, micromechanics, connectors, and the MedTech sector. Compact, precise, and high-performance, the PreciMill has been developed with the same level of rigor and innovation as all our tailor-made machines, delivering optimal performance without compromising on technical specifications.



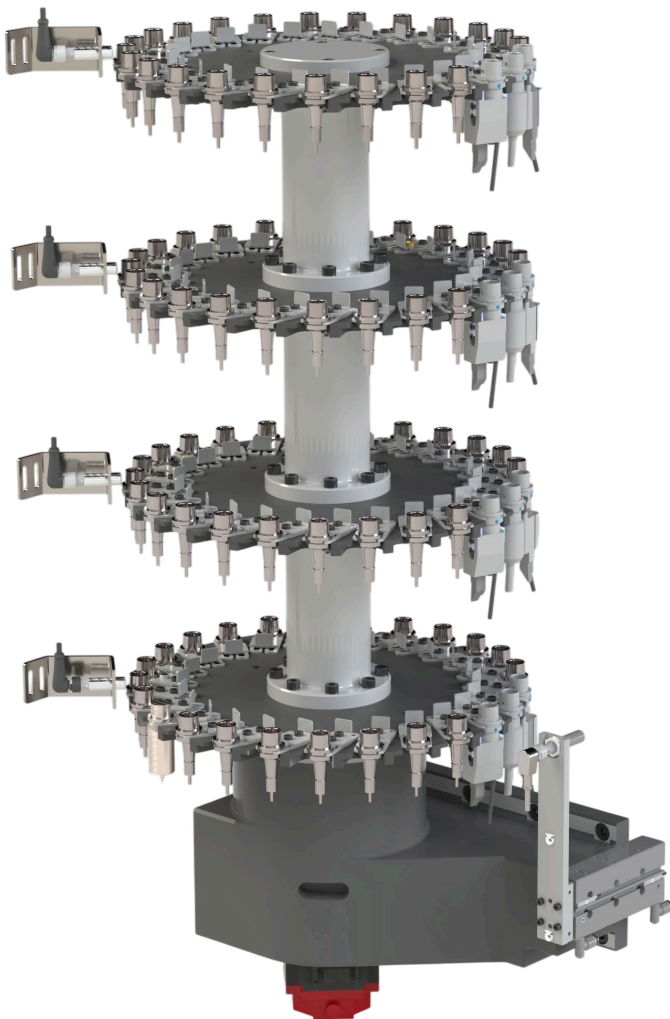
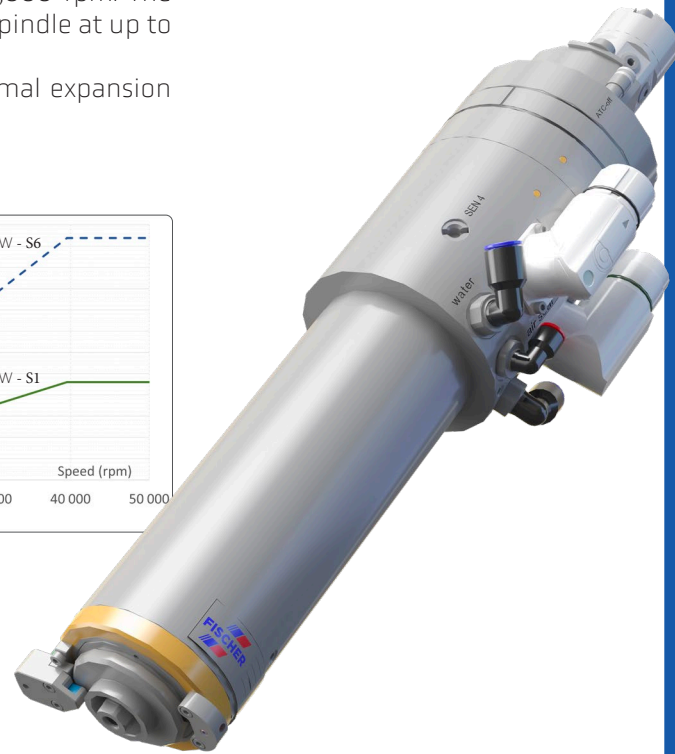
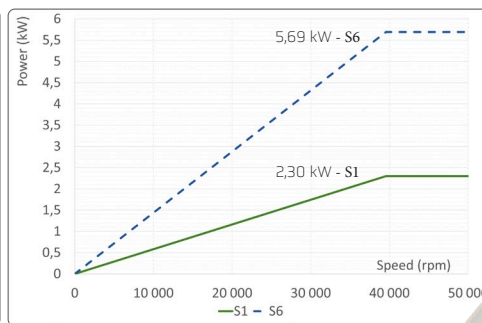
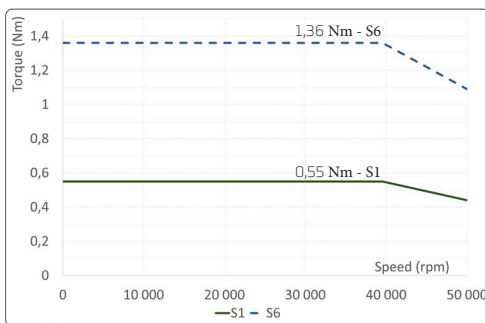
- Tool magazine: 100 tools
- Spindle: HSK-E25, 50,000 rpm
- CNC control: Fanuc 31i-B5 Plus
- 5-Axis simultaneous
- C-Axis turning: Up to 4,200 rpm
- Machining capacity: 120 × 120 × 120 mm
- Linear motors and torque motors
- Optical encoders
- Axis temperature control
- Ergonomic design
- Integrated chip and fluid management
- Low maintenance
- Cooling Through Spindle 120 bar
- Compatible with supercritical CO<sub>2</sub>
- Automation-ready



# Spindle and tool magazine

## High-speed spindle for challenging machining applications

The PreciMill is equipped with a tailor-made Fischer high-frequency spindle featuring an HSK-E25 tool interface, reaching speeds of up to 50,000 rpm. The spindle includes a rotary union for high-pressure cooling through spindle at up to 120 bar, optimizing drilling speed, machining quality, and tool life. It also features a stop block for locking turning tools, an axial thermal expansion sensor, and an anti-static brush, ensuring maximum precision.



## High-capacity tool magazine — fast, precise, and robust

The PreciMill's stepped-column tool magazine is entirely designed by EMISSA's engineers. It can hold up to 100 tools and switch between them in under one second thanks to its dual-arm changer. Optionally, the tool library can be managed using RFID technology, enabling smart management, increased productivity, and full tool traceability.

- Capacity: 100 tools
- Precise, robust, and reliable system
- Tool change time: under 3 seconds
- Tool interface: HSK-E25
- Tool diameter up to 40 mm
- Adjacent slot spacing of 70 mm
- Tool length up to 105 mm
- RFID management (optional)

# Mechanical concept and machining area

## A high-performance design for uncompromising precision

The design of the PreciMill machining center guarantees excellent precision and outstanding dynamics. Its mechanical structure has been carefully studied to achieve an optimum balance between static mass, which ensures a rigid and stable base for maximum precision, and moving mass, optimized thanks to a honeycomb cast-iron design, which considerably improves the machine's responsiveness and dynamic performances.

The precision and repeatability of the PreciMill machining center are also guaranteed by its axis system, equipped with direct-drive linear and torque motors. The axes are thermally regulated to minimize expansion and are equipped with optical encoders. Strokes of 180 x 140 x 160 mm enable machining of mechanical parts up to 120 x 120 x 120 mm.

### Linear axes

- X stroke: 180mm
- Y stroke: 140mm
- Z stroke: 160mm
- Max. speed: 60m/min
- Max. acceleration: 1G
- Linear motors
- Optical linear encoders

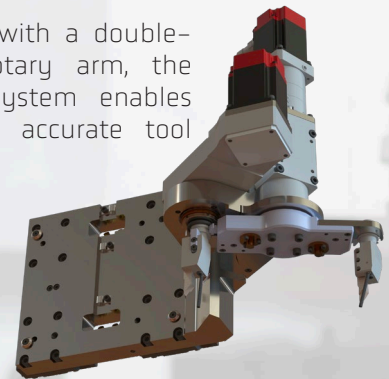
### B-Axis

- Stroke: +40° / -110°
- Max. speed: 250 rpm
- Max. acceleration: 160 rad/s<sup>2</sup>
- Torque motor
- Optical angle encoders

### C-Axis

- Max. speed: 4'200 tr/min
- Max. acceleration: 1'600 rad/s<sup>2</sup>
- Torque motor
- Optical angle encoders
- Integrated rotary union

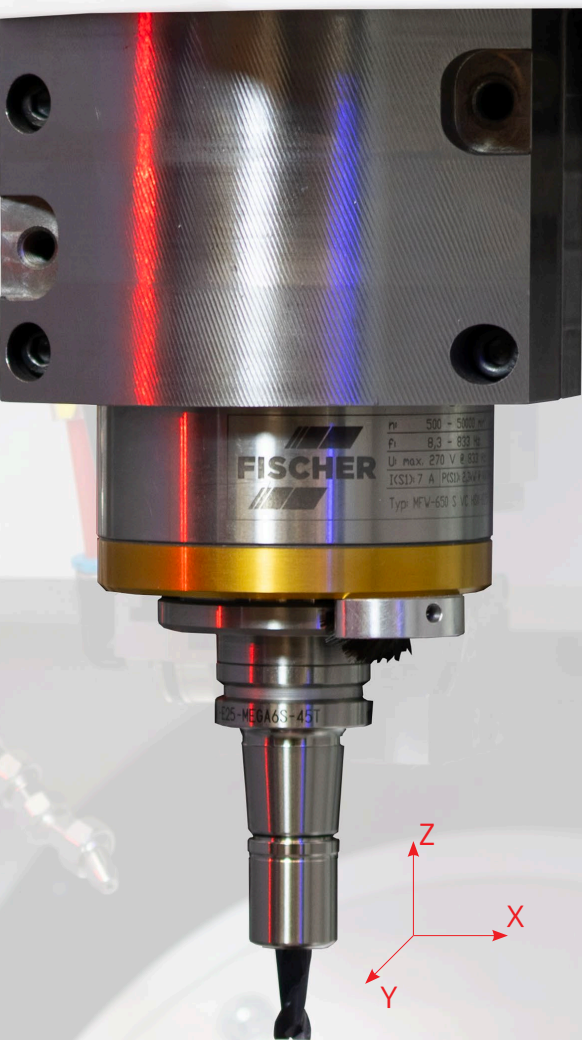
Equipped with a double-gripper rotary arm, the changer system enables rapid and accurate tool exchanges.



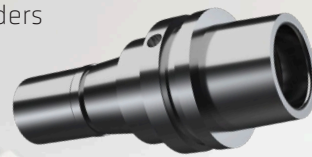
PreciMill features a laser tool measurement system to guarantee high machining accuracy and consistent process repeatability.



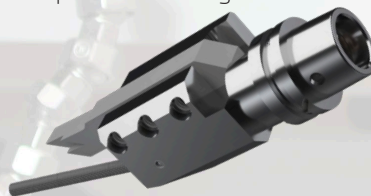




PreciMill is compatible with industry-standard milling and drilling tool holders

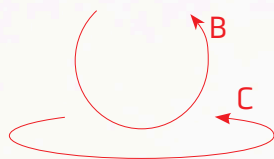
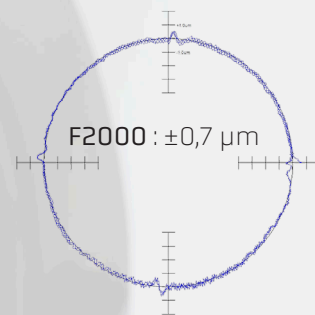
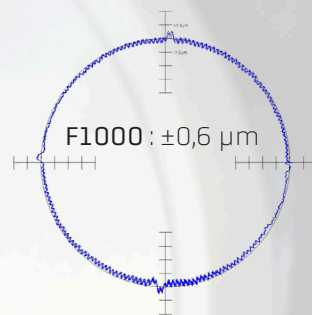
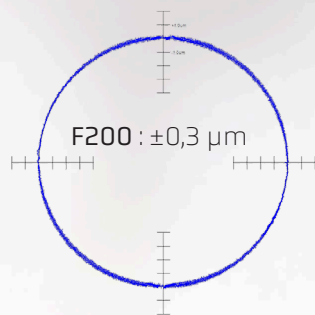


For turning, the tool holders are specific. They are indexed and locked using a stop-block mounted under the spindle housing.



#### Circularity XY R10mm

Circularity tests show PreciMill's excellent dynamic behaviour.



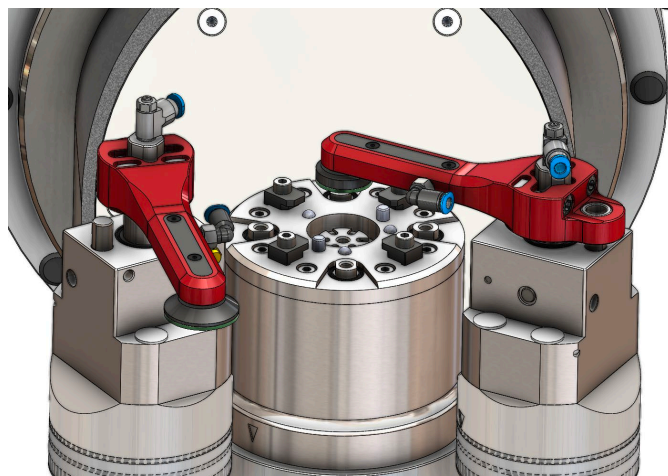
# Modules, options and specific adaptations

## Clamping solutions to suit every need

The PreciMill machining center is based on an architecture of stacked linear axes [X, Y, Z], allowing for great integration flexibility.

Available in 3, 4 or 5 continuous axis configurations, it adapts to a wide variety of machining strategies. The clamping system is designed to meet the dimensional and geometric constraints of the workpieces to be machined.

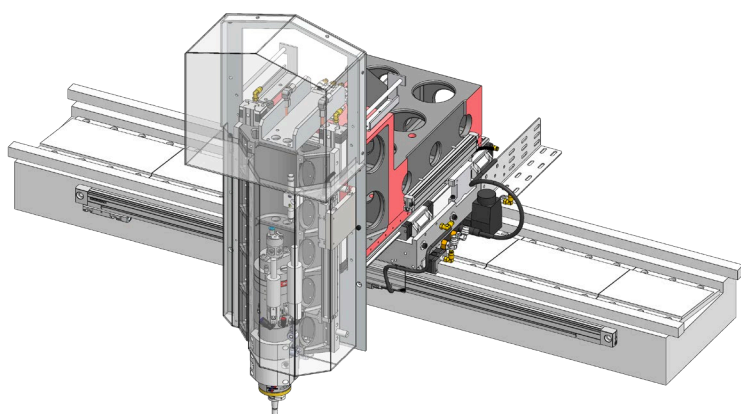
Different clamping technologies are compatible: standardized pallets, collets, mechanical or hydraulic vices, or retractable clamping devices. Each solution is selected on the basis of machining strategy, repeatability, precision and production rate requirements.



## A customized solution

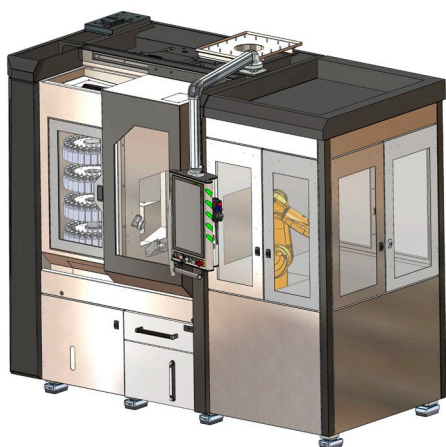
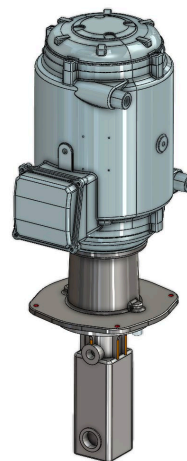
Thanks to its expertise in the design of special machines, EMISSA is able to specifically adapt certain parts or components of the machining center to perfectly match the production constraints of each customer.

In addition to the type of clamping used or the capacity of the tool magazine, more advanced adjustments can be made, such as increasing the stroke of an axis to meet specific dimensional requirements.



## High-pressure unit for spindle center coolant

The PreciMill is fitted with a liquid-cooled high-pressure unit [120 bar] for the cooling through spindle system. This device optimizes machining quality and speed, as well as cutting tool life.



## Automation

The addition of a high-performance 6-axis robot, fully integrated by EMISSA, gives the PreciMill unrivalled autonomy of movement: loading, unloading, parts flipping, deburring and vision control. The result is a high degree of production autonomy and, consequently, lower manufacturing costs.

# Technical specifications

## Axis structure

Motorisation	Fanuc linear motors	
X / Y / Z stroke	180 / 140 / 160	mm
Max. speed	60	m/min
Max. Acceleration	1	G
Optical linear coders	Heidenhein	
Accuracy	+/- 2	µm
Locking brake	On all axis	

## Spindle

Diameter	61,91	mm
Interface	HSK-E25	
Nominal / max. speed	40'000 / 50'000	rpm
Power S1 / S6	2,30 / 5,69	kW
Torque S1 / S6	0,55 / 1,36	Nm
Weight	5	kg
Dilatation sensor	Integrated	
Stop block for turning tool	Integrated	

## B-Axis

Motor	Torque motor ETEL	
Stroke	-110 à +40	°
Max. speed	250	rpm
Max. acceleration	160	rad/s <sup>2</sup>
Optical angle coder	Heidenhein	

## C-Axis

Motor	Torque motor ETEL	
Max. speed	4'200	rpm
Max. acceleration	1'600	rad/s <sup>2</sup>
Optical angle coder	Heidenhein	
Rotary union	Integrated	
Workpiece blowing	Integrated	

## Numerical control

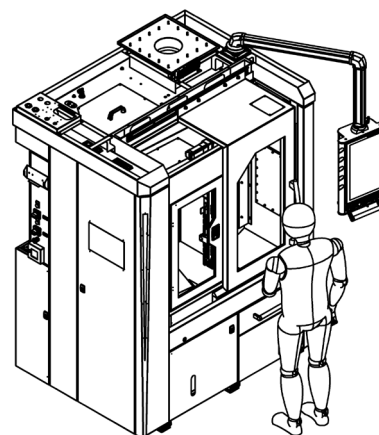
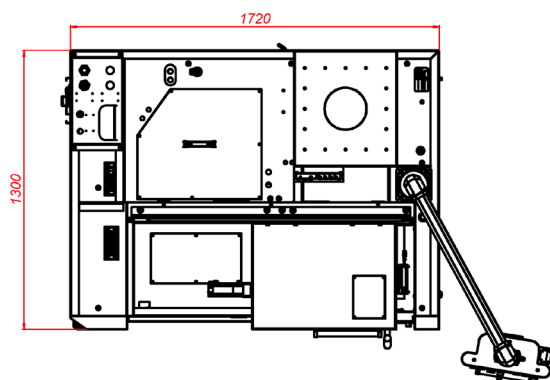
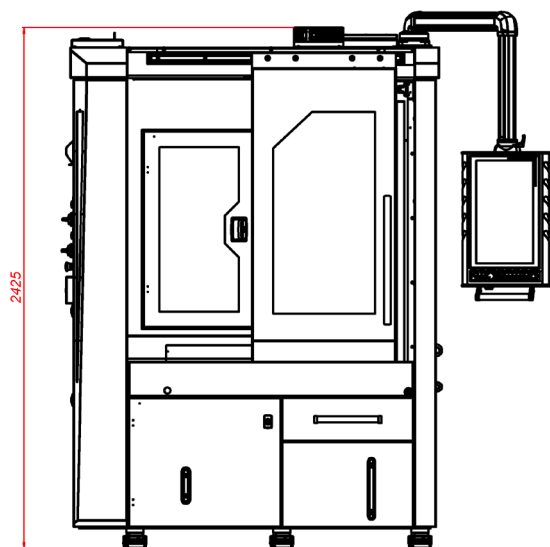
Numerical control	Fanuc 31i-B5 Plus	
Simultaneous axis	Up to 5	
Rigid tapping	From S0.6 to M5	
Micro rigid tapping	From S0.3 to S0.6	

## Tool magazine and changer

Tools quantity	100	
Tools diameter	40	mm
Max. tool diameter	70	mm
Max. tool length	105	mm
Max. tool weight	2	kg
Tool-to-tool changeover time	2,6	s
Chip-to-chip changeover time	3,8	s

## General features

Width x Depth x Height	1'720 x 1'300 x 2'450	mm
Floor surface	2,24	m <sup>2</sup>
Weight	2'500	kg



# EMISSA

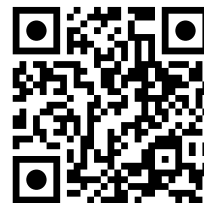
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