



VELOS Series

TRAVELLING COLUMN MACHINES WITH LINEAR MOTOR
DRIVES FOR COMPLEX 5-AXIS MACHINING

- VELOS.2000
- VELOS.3000
- VELOS.4000
- VELOS.5000

VELOS Series

5-AXIS TRAVELLING COLUMN

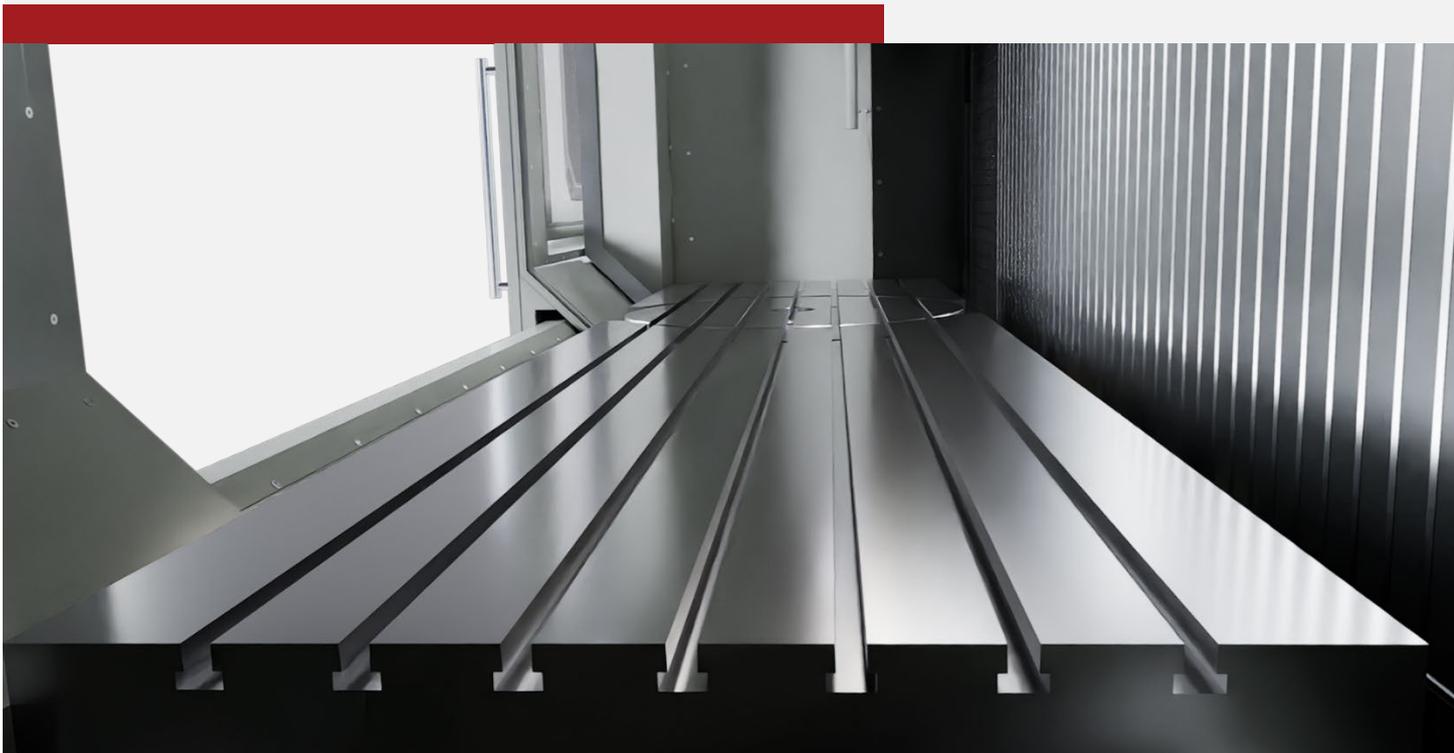
Quaser's 5-axis travelling column machine with linear motor drives in the X and Y axes for machining large components.

Compact machine concept with a 3,300 x 850 mm table, optional fully integrated C-axis with 800 mm diameter, and a tilting head (B-axis) with a $\pm 120^\circ$ swivel range enable up to full 5-axis simultaneous machining with highest precision.



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1. Quaser Group

The Quaser Group is a leading Taiwanese supplier of high-precision machine tools for the modern manufacturing industry. With decades of experience, continuous innovation and a worldwide service network, we offer our customers solutions at the highest technological level.



„Quaser believes focusing on detail is our attitude.”

Quaser CEO Startin Hsieh

Since 1991, Quaser has stood for:

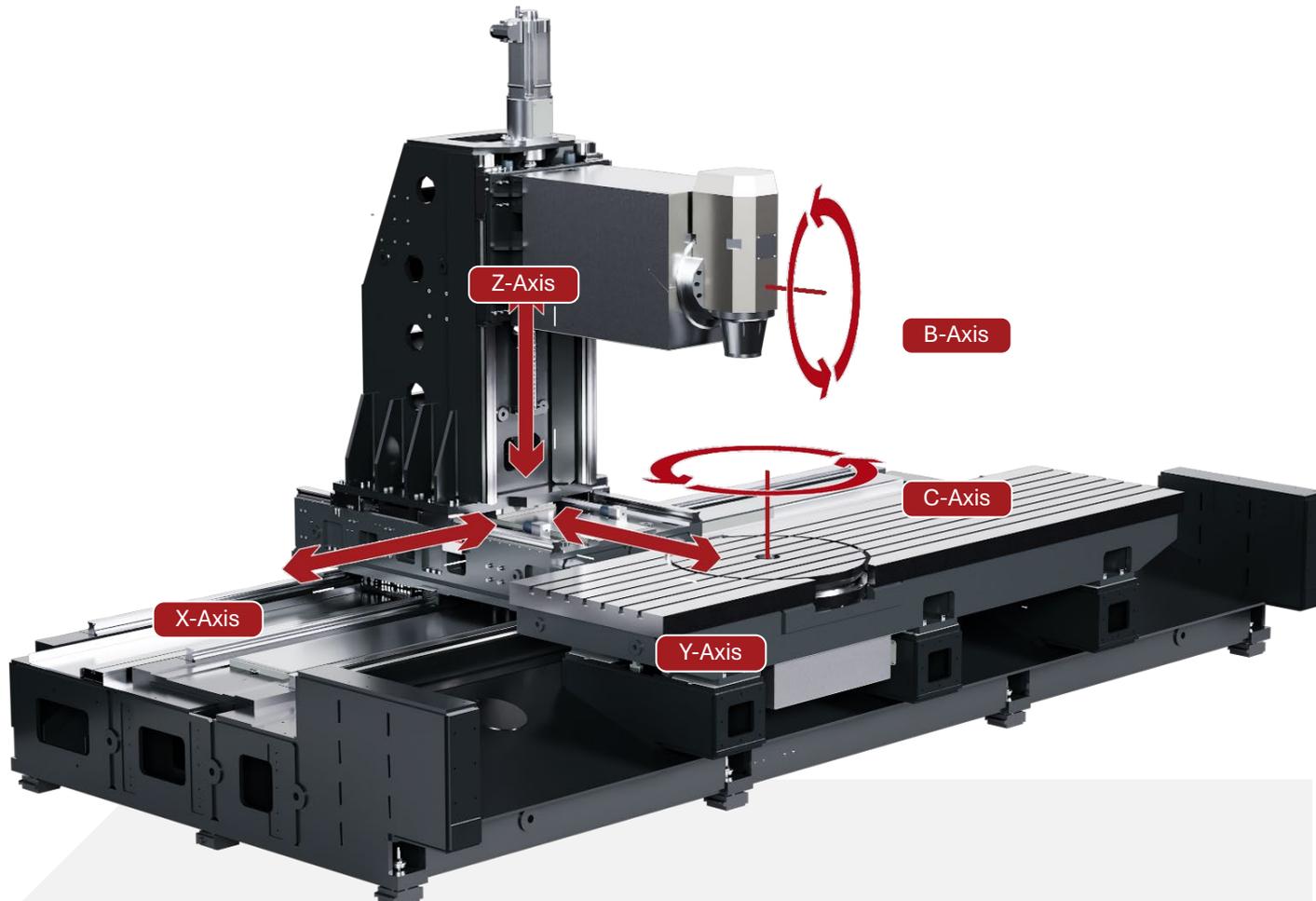
- Great innovative strength
- Highest precision and reliability
- Innovative technology and energy efficiency
- Long-term cost-effectiveness due to robust design
- First-class service and worldwide spare parts supply



quaser.com

2. Basic structure

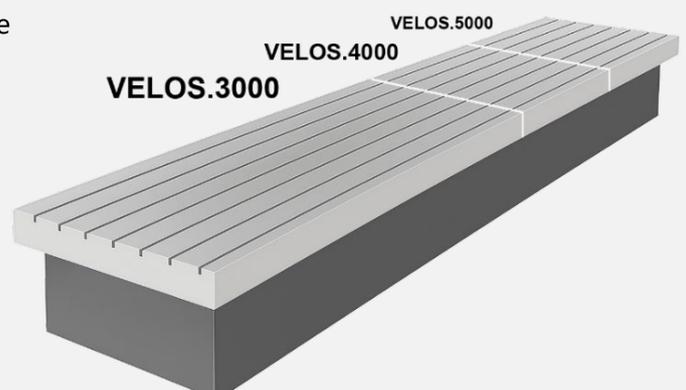
When machining heavy workpieces, the large mass to be moved can impair the dynamics of the machine tool. For this reason, it makes sense to move as many machining axes as possible into the stand for machines for such needs.



2.1 VELOS series

Four expansion stages with X 2,000 mm, 3,000 mm, 4,000 mm or 5,000 mm travel.

With its dynamic linear motor drives, large travel distances and the possibility of 5-axis machining, the Velos series offers highly productive travelling column machines that are used in many industries.



3. Assemblies and functionality

All precision-relevant components such as the tool spindle, B and C axes are EMC in-house designs. The Velos high-performance machine concept is completed by selected premium manufacturers for the linear drives and the guide system.

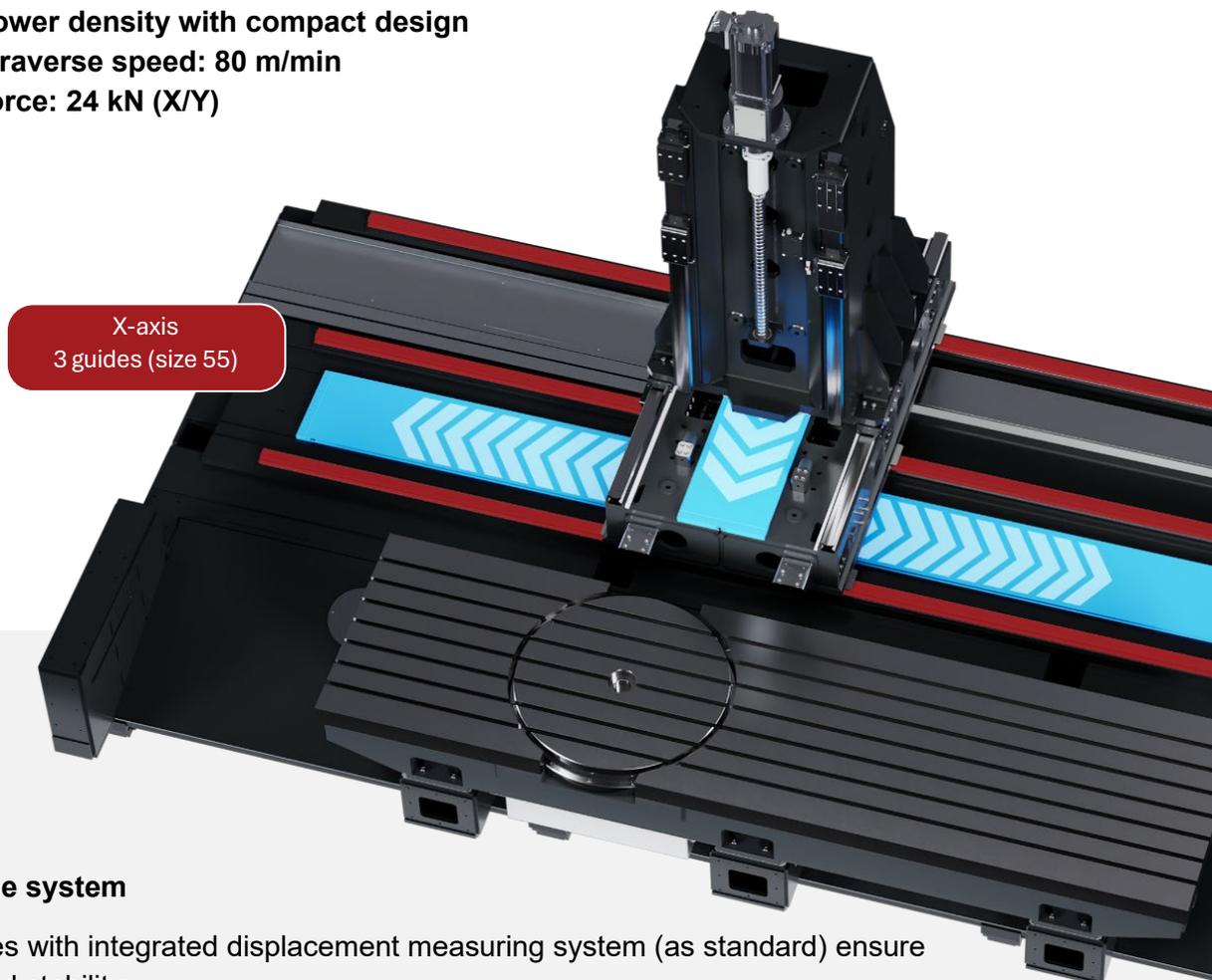
3.1 Drives and guides

Linear axes (X/Y)

Linear Direct Drive motors guarantee low energy consumption and high performance.

Since there is almost no wear parts, performance and accuracy is outstanding after many years in operation.

- High power density with compact design
- Rapid traverse speed: 80 m/min
- Feed force: 24 kN (X/Y)



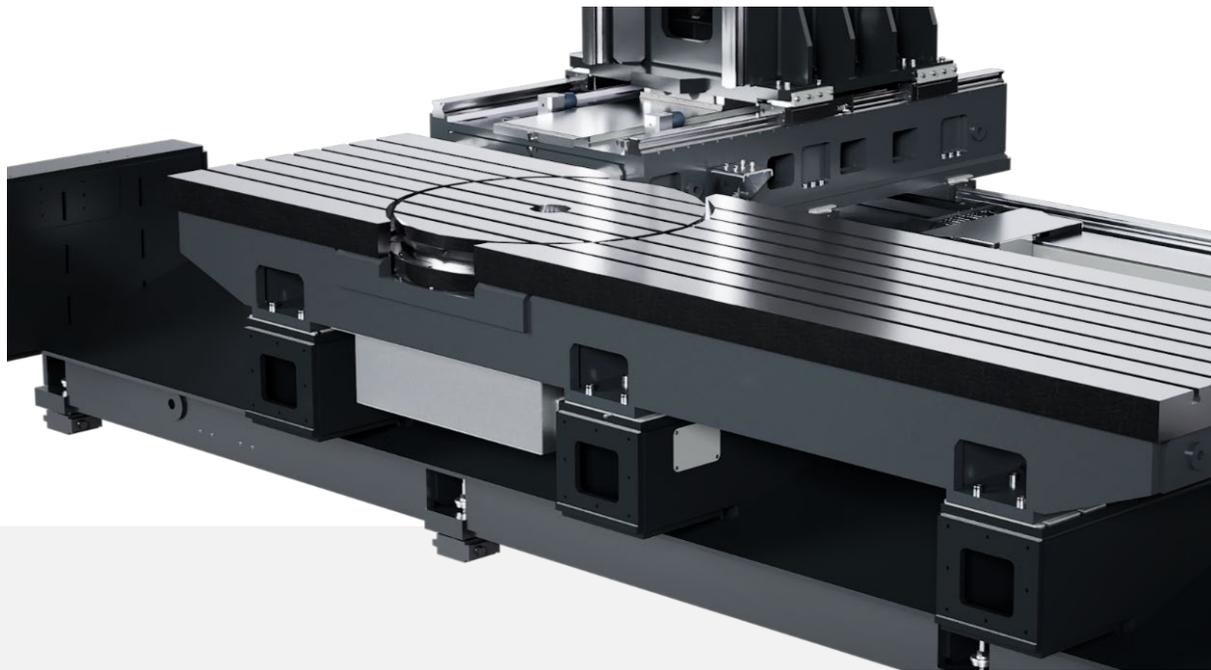
Stable guide system

Linear guides with integrated displacement measuring system (as standard) ensure precision and stability.

- Positioning accuracy (1,000 mm): 10 μm
- Linear guides (X): 3
- Linear guides (Y/Z): 2 each

3.2 Highly flexible machine table

Even in the standard version with a clamping surface of 3,300 x 850 mm and travel distances of X: 3,000 mm, Y: 800 mm, Z: 800 mm, the machine concept offers enormous flexibility for the machining of large and long workpieces.



Solutions for individual requirements

In particular, the extensive optional options for table configuration ensure flexibility for individual applications and complex machining tasks.



- **Standard table 3,300 x 850 mm**



- **Integrated C-axis (left or right)**



- **Integrated C-axes (double-sided)**

3.3 Application variants



■ Machine table (fixed)

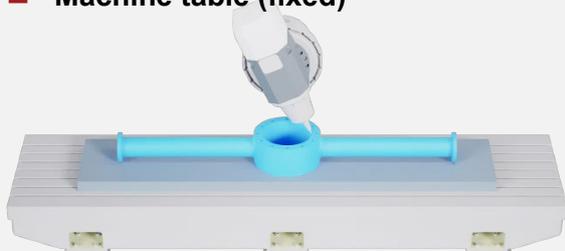


Table capacity: 4,200 kg (1,500 kg/m²)
Table size: 3,300 x 850 mm

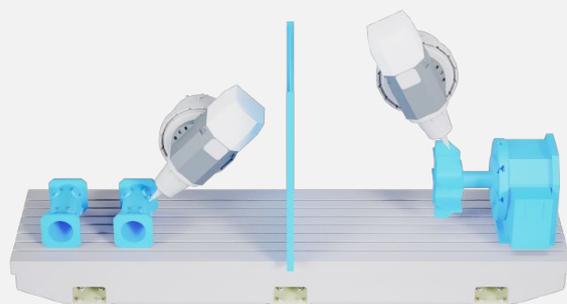
■ Table with 4th/5th axis (option)



Expansion of processing options with either one or two rotary table(s)

■ Partition wall (option)

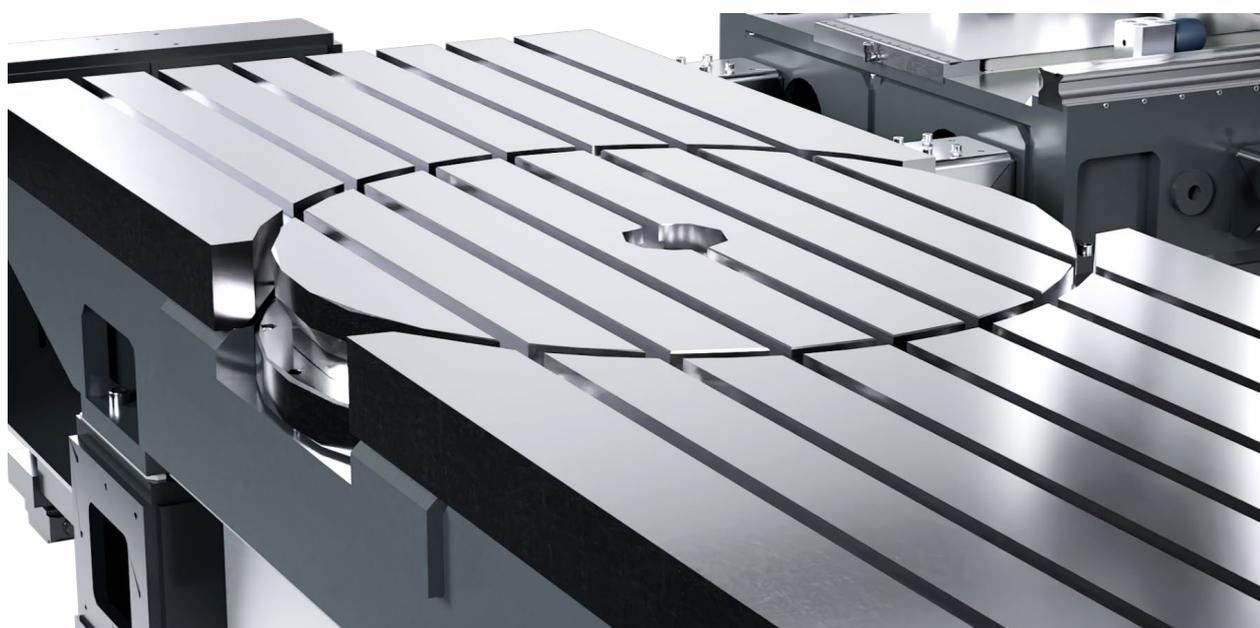
Separate work areas offer additional processing options. The simple installation and removal of the partition wall enables an uncomplicated and quick reaction to new machining tasks and can optimize the workflow.



3.4 Machine table with integrated C-axis

For simultaneous 5-axis machining, one or two C-axes can optionally be integrated into the machine table. The payload is 1,000 kg each.

The machine achieves maximum productivity through the use of a partition wall, which offers the possibility of pendulum machining.



■ Table with integrated C-axis



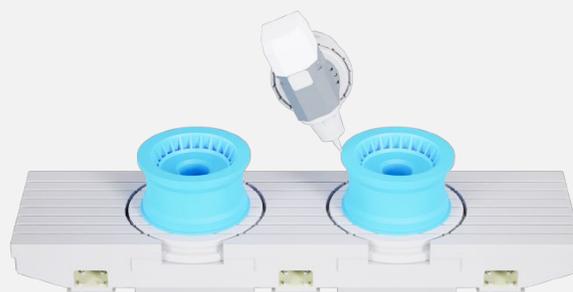
C-axis placement left or right

Diameter: 800 mm

Payload C-axis: 1,000 kg

Rapid traverse: 50 min⁻¹

■ Table with two integrated C-axes



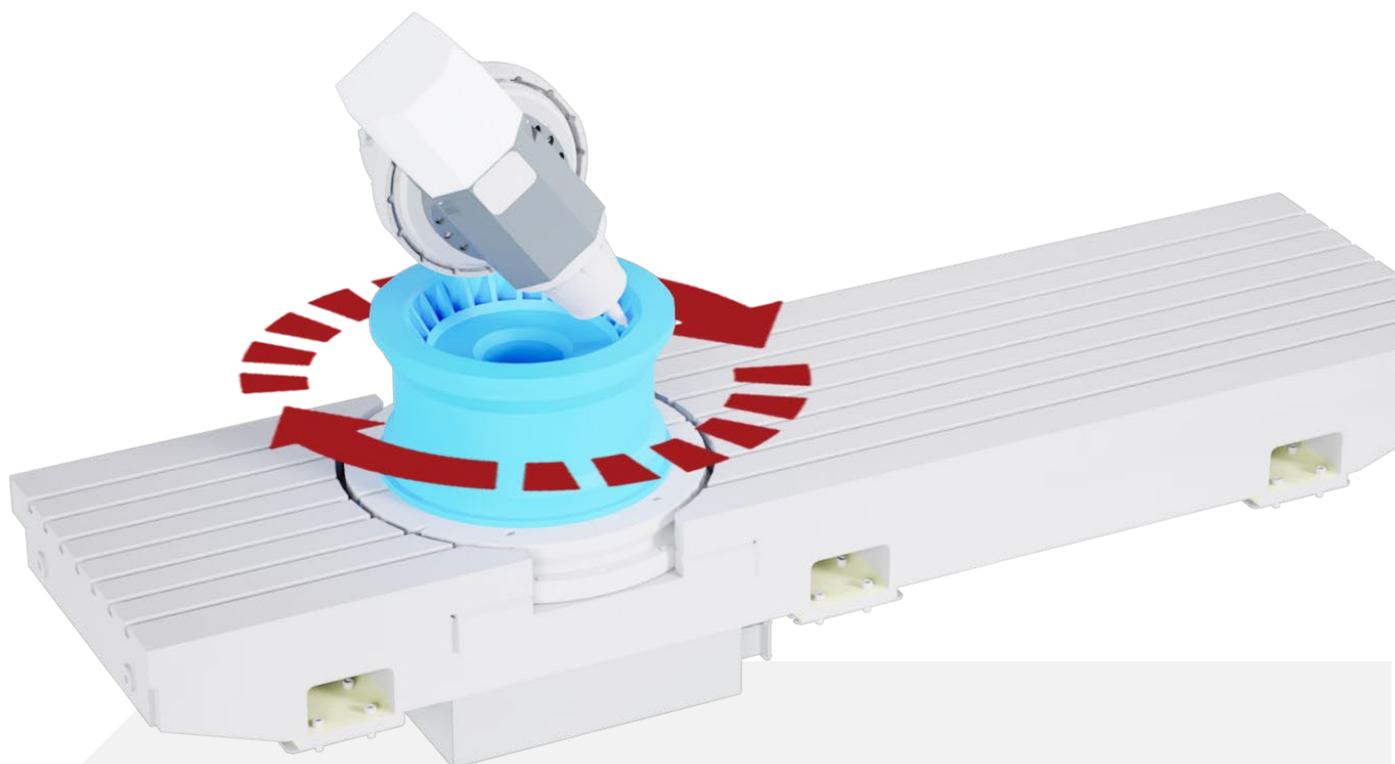
C-axis placement left and right

Diameter: 800 mm

Payload C-axis: each 1,000 kg

Rapid traverse: each 50 min⁻¹

3.5 C-axis (rotary table)



The rotary table is designed as a direct drive (torque motor) and offers high torques as well as precise positioning and clamping performance.

- **Large interference circle: 1,100 mm**
- **Direct drive peak torque: 3,751 Nm**
- **Continuous torque: 1,961 Nm**
- **Continuous operating speed: 50 min⁻¹**
- **Clamping torque: 6.000 Nm**
- **Positioning accuracy: ± 4 s**

3.6 C-axis (Turning function)

Optionally, the C-axis can also be equipped with Turning function.

- **Turning function with 500 min⁻¹ (1,000 kg) / 800 min⁻¹ (600 kg)**
- **Spindle with HSK-T interface**
- **Hydraulic brake in the tool spindle**

3.7 Spindle technology



The EMC spindle technology is designed to be robust and reliable and follows a modular concept that enables machining in different technologies such as milling, turning and grinding.

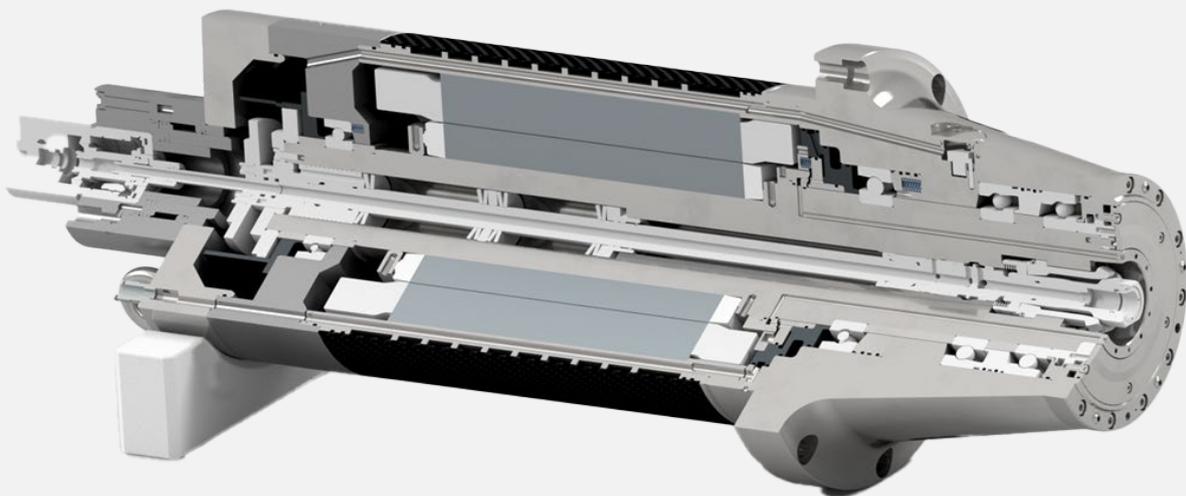
Tool Interface

The HSK tool interface is provided as standard. The Big Plus system with a double-contact interface is available as an option. This ensures increased rigidity during machining, higher machining accuracy, longer tool life and improved repeatability during automatic tool changes.

Spindle design

A high-precision, stable design. All spindles are designed as directly driven motor spindles (integrated motor).

- **Rated speed: 15,000 min⁻¹**
- **Spindle motor power: 43.5 kW**
- **Torque: 125 Nm**
- **Drive: Asynchronous motor**



EMC motorized spindles are suitable for both high-speed machining and the machining of difficult-to-machine materials. The use of tools with larger diameters is possible without any problems.

The innovative motor spindles of the new Velos series ensure maximum flexibility and performance in key industries such as tool and mold making, the aerospace industry and medical technology.



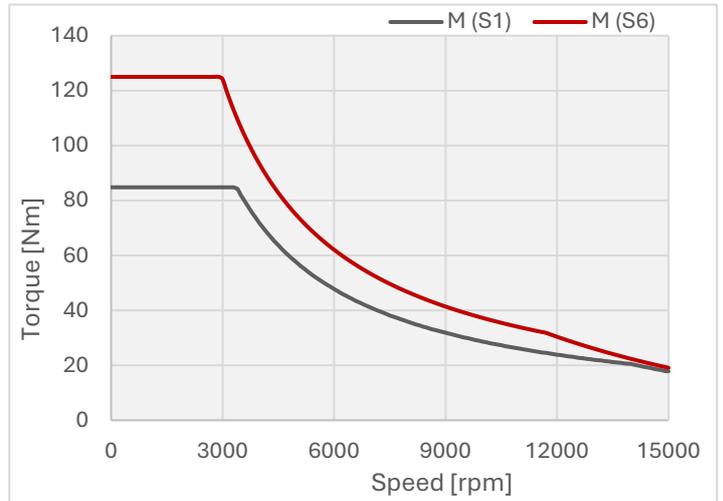
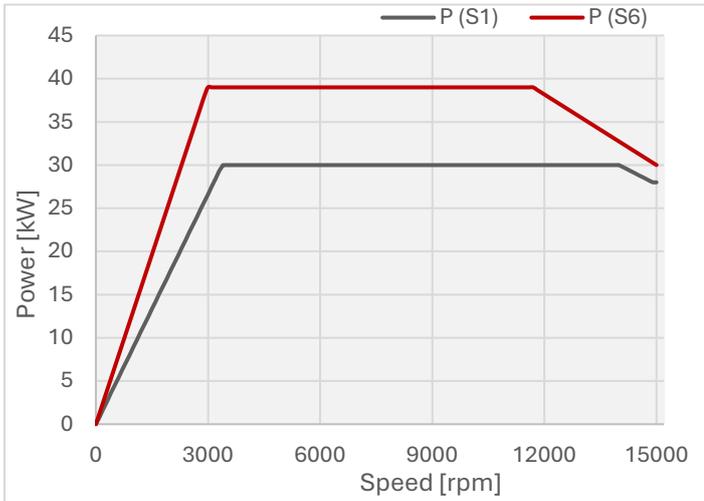
- Niche-based specifications
- Wide range of services
- Exclusive maintenance and repair service

Spindle Overview

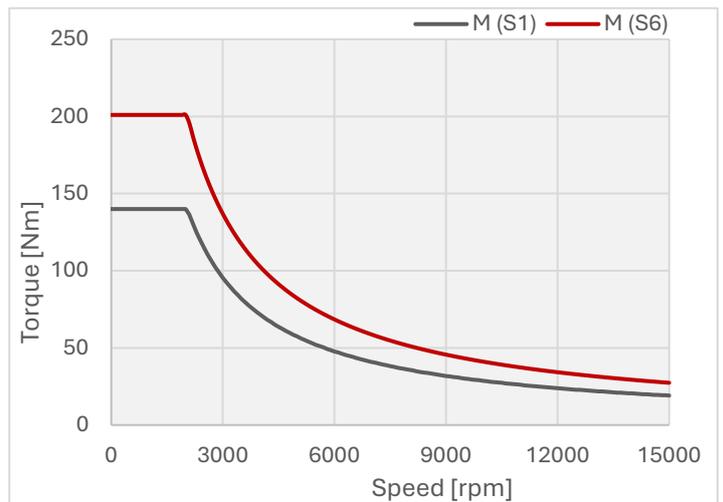
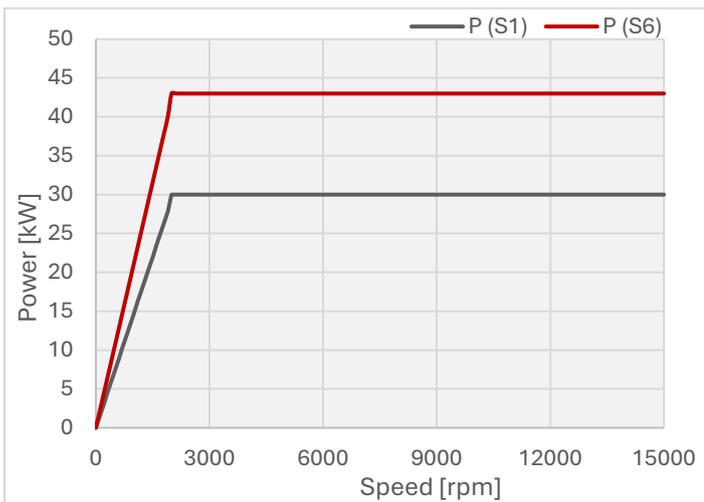
The extensive range of spindles offers maximum performance for many needs.

Variants		MS30as-15	MS30s-15	MS30as-20	MS30as-24	MS57s-10	MS57s-15
Interface	Type	HSK-A63 or SK/BT40				HSK-A100 or SK/BT50	
Max. speed	min ⁻¹	15.000	15.000	20.000	24.000	10.000	15.000
Power, S1	kW	30	30	30	30	56,5	56,5
Torque, S1	Nm	85	140	85	82	180	180
Power, S6-25%	kW	43,5	43,5	43,5	42	79	79
Torque, S6-25%	Nm	125	201	125	116	251	251
Drive	Type	Build In	Build In	Build In	Build In	Build In	Build In
Lubrication	Type	Grease	Grease	Oil/Air	Oil/Air	Grease	Oil/Air

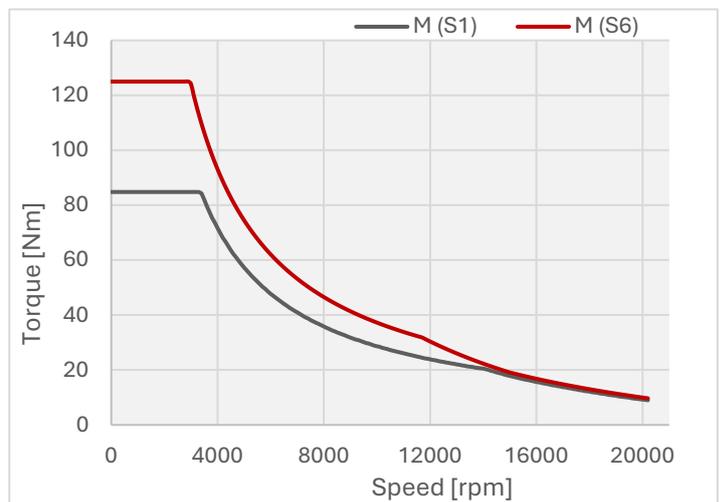
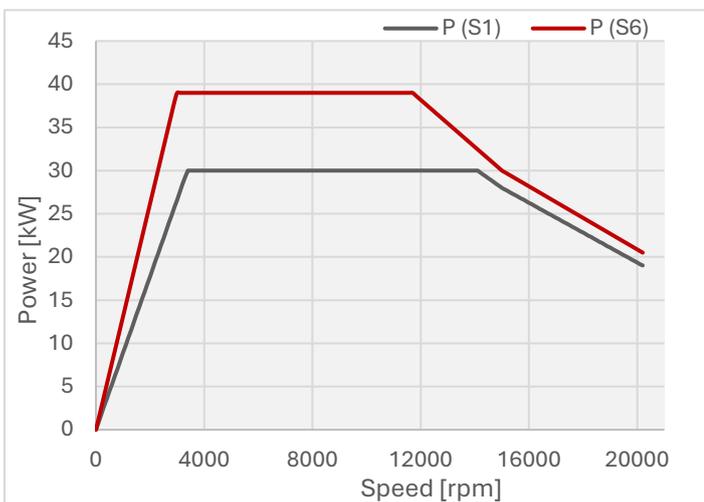
■ 15.000 min⁻¹ (HSK-A63) – 30/43,5 kW – 85/125 Nm – Typ: MS30as-15 – Standard



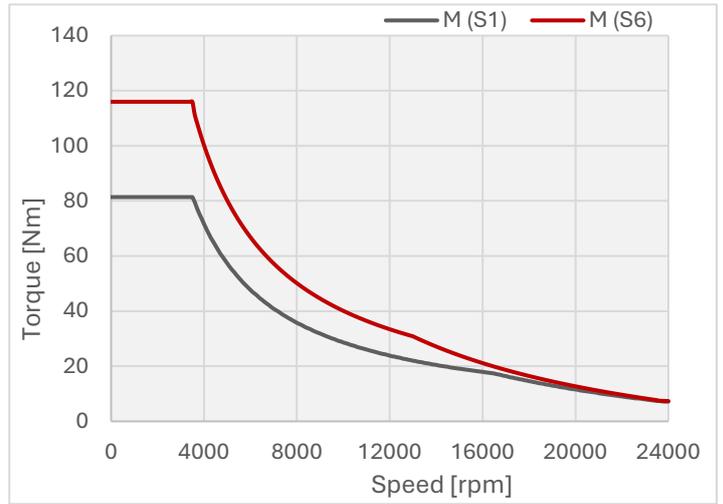
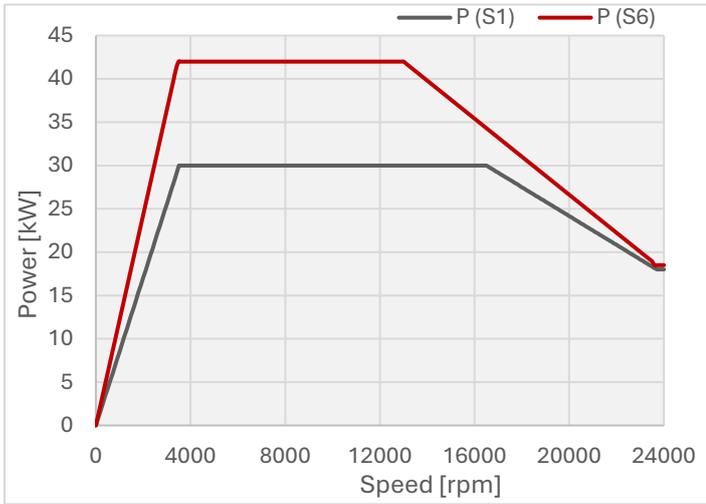
■ 15.000 min⁻¹ (HSK-A63) – 30/43,5 kW – 140/201 Nm – Typ: MS30s-15



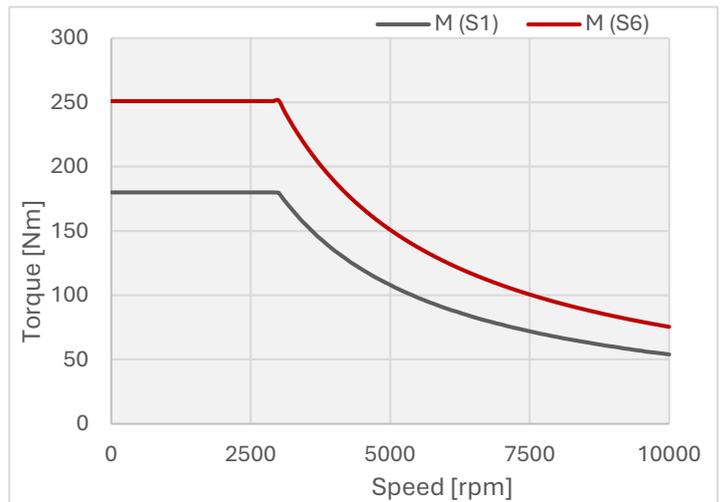
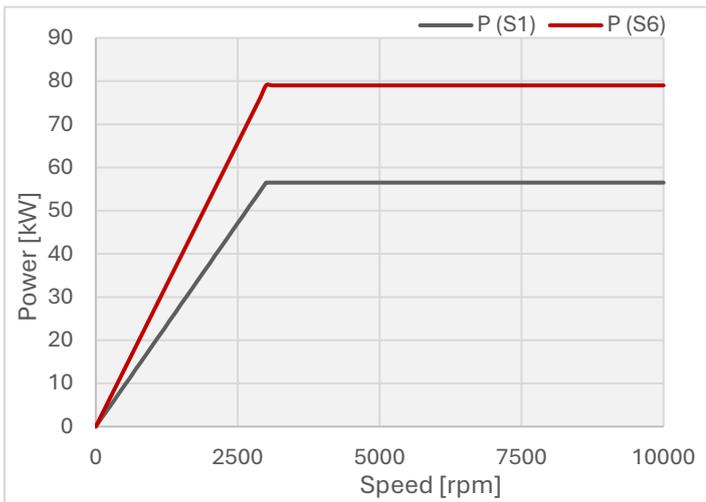
■ 20.000 min⁻¹ (HSK-A63) – 30/43,5 kW – 85/125 Nm – Typ: MS30as-20



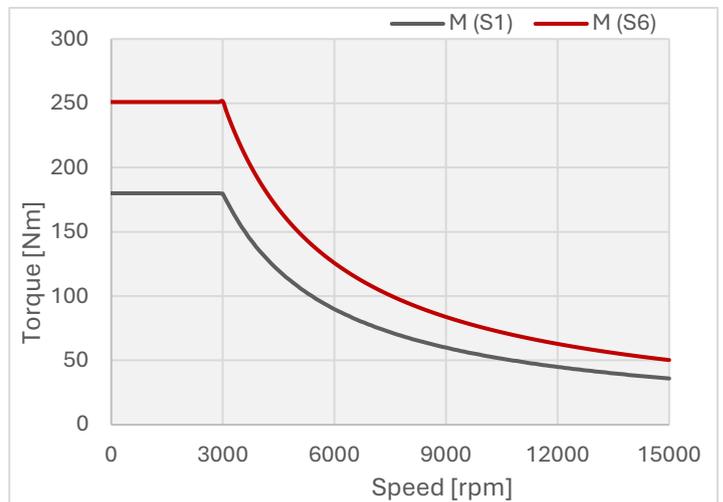
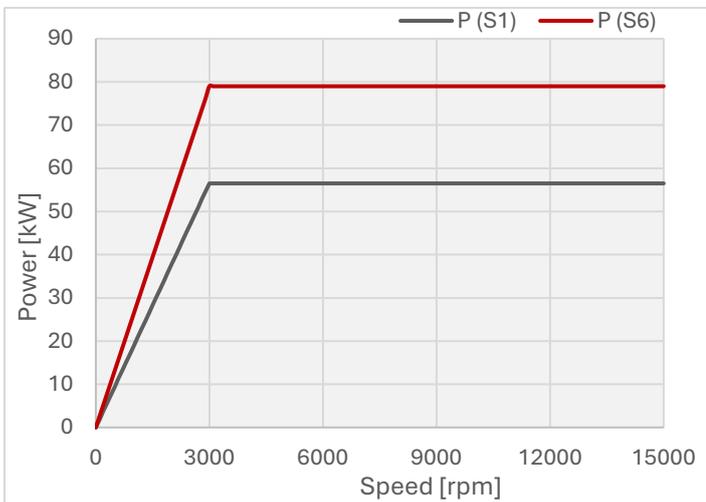
■ **24.000 min⁻¹ (HSK-A63) – 30/42 kW – 82/116 Nm – Typ: MS30as-24**



■ **10.000 min⁻¹ (HSK-A100) – 56,5/79 kW – 180/251 Nm – Typ: MS57s-10**



■ **15.000 min⁻¹ (HSK-A100) – 56,5/79 kW – 180/251 Nm – Typ: MS57s-15**



3.8 B-axis (tilting head spindle)

The tilting head spindle with B-axis enables highly flexible production in both vertical and horizontal machining directions. The direct drive (torque motor) delivers a peak torque of 1.032 Nm.

- Swivel angle: $\pm 120^\circ$
- Direct drive peak torque: 1,032 Nm
- Clamping torque: 6.000 Nm
- Minimum distance from spindle head to table (horizontal): 350 mm
- Positioning accuracy: ± 5 s



3.9 Tool magazine

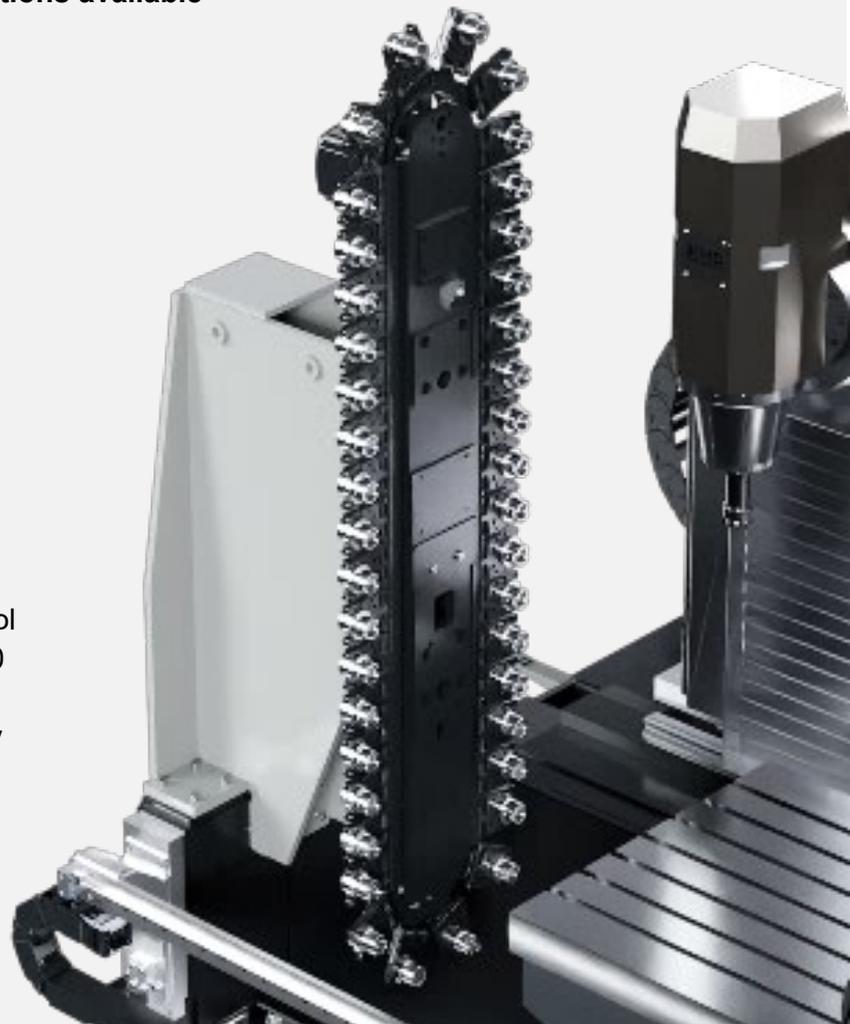
The Velos can be equipped with either single or double magazines (option). In both variants, the tool is changed according to the automatic pick-up principle. This means that the tools are changed directly and quickly from the magazine to the work spindle. Magazines are fixed on left or right side of the machine. This ensures energy efficiency (because of smaller moving mass) and no chips in the back side of the machine.

Since no tool change arm is required, the risk of collision in the machining area is reduced on the one hand and shorter changeover times on the other. This ensures reliability of the system because of less components.

- **Tool length: maximum 400 mm**
- **Tool diameter: up to Ø100 mm / Ø170 mm (for free secondary spaces)**
- **Chip-to-chip time: approx. 10 s**
- **Magazine slots: 40 (HSK-A63) / 30 (HSK-A100)**
- **Numerous magazine variations available**

Equipment

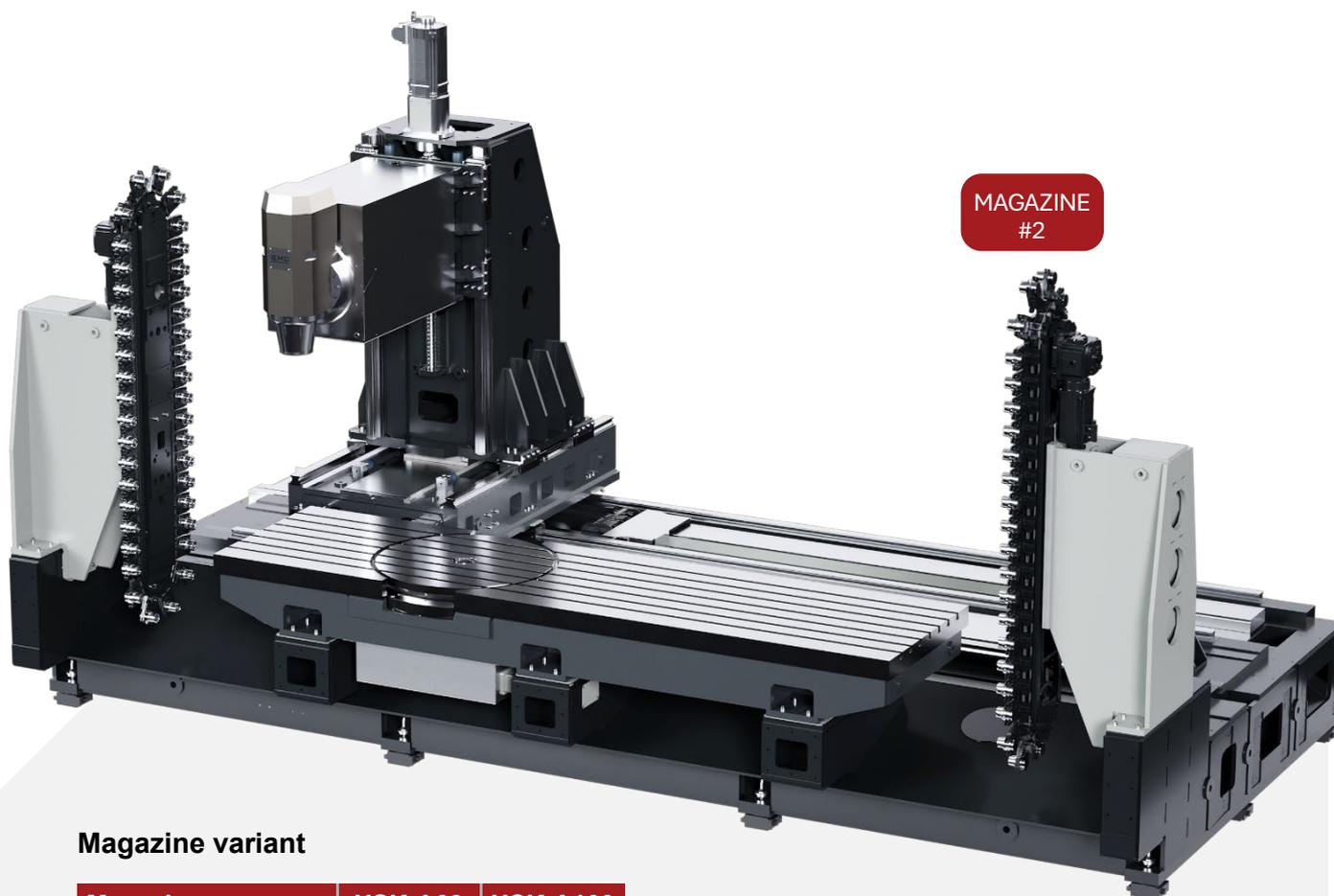
The standard magazine capacity is 40 tool positions for the HSK-A63 version and 30 positions for the HSK-A100 version. An expansion of up to 120 seats is optionally possible.



3.10 Double tool magazine

The double magazine is an efficient extension of the single magazine system to increase machine capacity. Tool magazines are installed on both sides of the machine table.

Especially when processing in separate workspaces, such as when using the optional partition wall, two magazines offer benefits in flexibility.



Magazine variant

Magazine spaces	HSK-A63	HSK-A100
	SK/BT40	SK/BT50
30	x	Standard
40	Standard	x
50	x	Option
60	Option	x
Double 30 = 60	x	Option
Double 40 = 80	Option	x
Double 50 = 100	x	Option
Double 60 = 120	Option	x

3.11 CNC control

High-end controls for safe processes and maximum accuracy. All machines in the Velos series are equipped with a Siemens SINUMERIK ONE control system as standard. Optionally, CNC controls of the latest generation from Heidenhain or Fanuc can also be offered.

SIEMENS



As standard, the machines of the VELOS series are with the Siemens **SINUMERIK ONE** control system Equips.

Functions:

- Intuitive and interactive programming
- Digital Twin Integration
- Reduced machine downtime and machining times
- User-friendly user interface (GUI)

 **HEIDENHAIN**



Optionally, the machine can be equipped with a **Heidenhain TNC7** control system.

Functions:

- Intuitive machine preparation and setup
- Graphically supported clamping device and workpiece alignment
- Very fast typesetting processing time: 0.5 ms

FANUC



In addition, a **Fanuc 31i Plus** control.

Functions:

- Optimized for complex, multi-axis machines
- Powerful CNC for high speed and precision
- Advanced functions, such as Manual Guide or Graphics Simulation

4. Technical data

■ Workroom			
Travel (X / Y / Z)	mm	3.000 / 800 / 800	
Distance spindle nose – table (vertical)	mm	50 - 850	
Distance between spindle center and table (horizontal)	mm	350 - 1.150	
■ Linear axes (X/Y/Z)			
Drive X/Y axis	Typ	Linear motor	
Drive Z-axis	Typ	Servomotor – Ball scr. 50	
Feed	m/min	30	
Eilgang	m/min	80	
Feed force	kN	24 / 24 / 10	
Positioning accuracy (1,000 mm)	µm	10	
■ Workbench			
Table size	mm	3.300 x 850	
Max. table load	kg	4.200 kg (1.500 kg/m ²)	
T-slots		18H7	
■ Swivel Head Spindle (B-Axis)			
Drive B-axis	Typ	Direct (torque motor)	
Pivoting range	°	± 120	
Torque	Nm	1.032	
Clamping force	Nm	6.000	
Min. distance from spindle nose to table (horizontal)	mm	350	
Positioning accuracy	s	± 5	
■ Integrated rotary table (C-axis), option			
C-axis drive	Typ	Direct (torque motor)	
Execution		T-slots	
Turning range	°	360	
Diameter	mm	800	
Speed	min ⁻¹	50	
Max. turntable load	kg	1.000	
Interference circle	mm	1.100	
Positioning accuracy	s	± 4	
Rotation function		Option	
Speed with optional rotation function	min ⁻¹	500 (800 at 600 kg)	
■ Tool Changer			
Magazine (left)	Places	40	
Magazine (left), optional	Places	60	
Additional magazine (right), optional	Places	40 or 60	
Execution	Typ	Pick-up	
Max. tool diameter	mm	100	
Max. tool diameter for free secondary positions	mm	170	
Max. tool weight	kg	10	
Chip to chip time	s	10	

■ Milling spindle, HSK-A63			
Speed	min ⁻¹	15.000	
Speed, optional	min ⁻¹	20.000, 24.000	
Execution	Typ	Motor Spindle (Build-in)	
Tool taper	Typ	HSK-A63 or SK/BT40	
Tool taper, optional	Typ	HSK-T63	
Performance S1 / S6	kW	30 / 43,5	
Torque S1 / S6	Nm	85 / 125	
Coolant supply, central	Typ	Up to 70 bar	
Coolant supply, side	Typ	Nozzles	
■ Milling Spindle, HSK-A100, Option			
Speed	min ⁻¹	10.000, 15.000	
Execution	Typ	Motor Spindle (Build-in)	
Tool taper	Typ	HSK-A100 or SK/BT50	
Performance S1 / S6	kW	56,5 / 79	
Torque S1 / S6	Nm	180 / 251	
Coolant supply, central	Typ	Up to 70 bar	
Coolant supply, side	Typ	Nozzles	
■ Chip conveyor/coolant system			
Conveyor	Scraper - belt		
Compressed air gun	at the work area		
Coolant system	Typ	Knoll, KF200/1400	
Pump pressure	bar	40	
Paper filter	μ	25	
■ Control			
Siemens, SINUMERIK	ONE	Standard	
FANUC	31i	Option	
HEIDENHAIN	TNC7	Option	
■ Connection			
Achievement	kW	150	
Volt	V	400 (50 Hz)	
Rated current	A	217	
Trunk	mm ²	95	
Fuse	A	224	
■ Other			
Dimensions (without chip conveyor)	mm	7.078 x 3.457	
Dimensions (with chip conveyor)	mm	9.034 x 3.457	
Height	mm	3.365	
Machine weight (approx.)	kg	30.000	

4.1 Machine layout

■ VELOS.3000

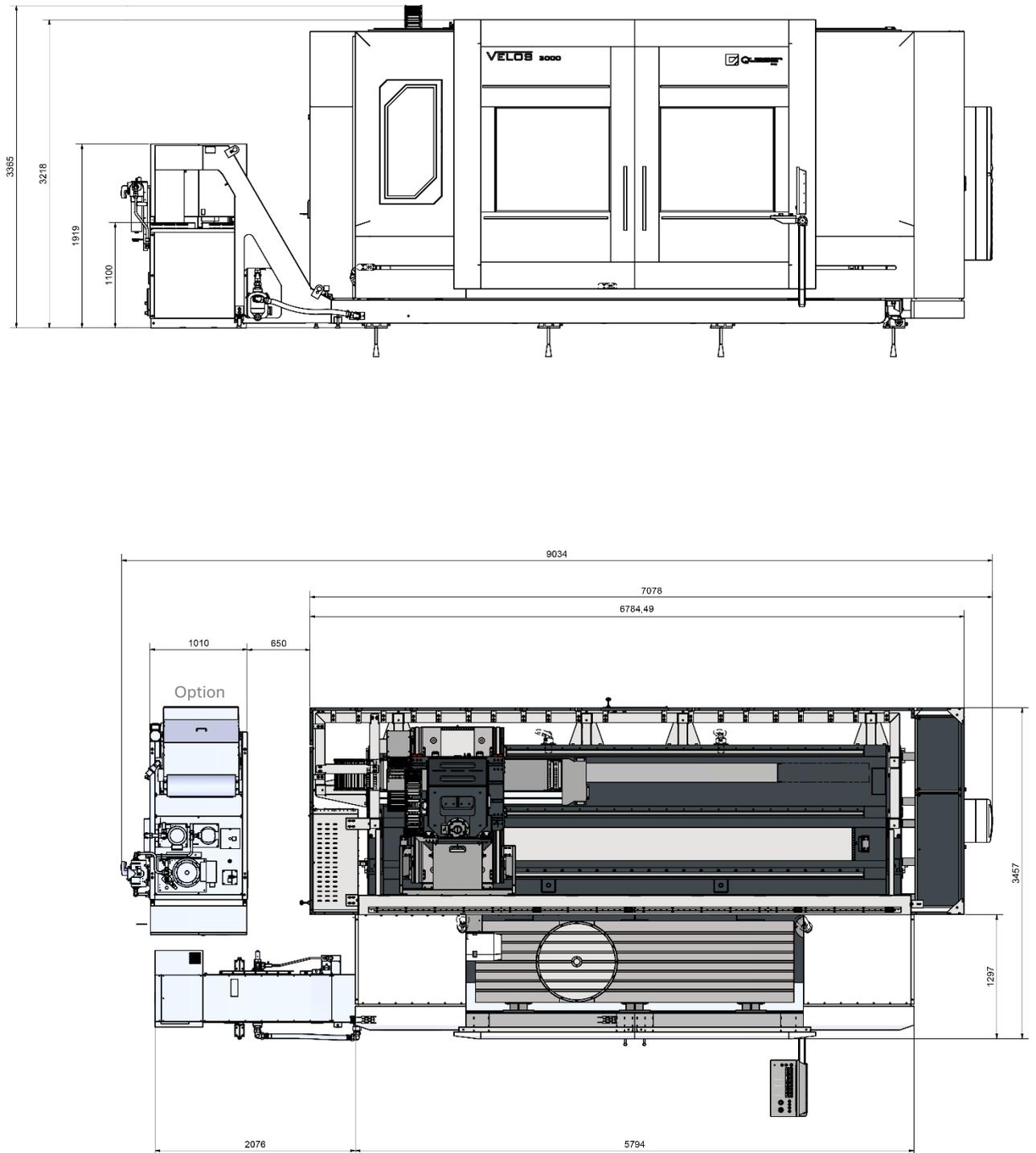
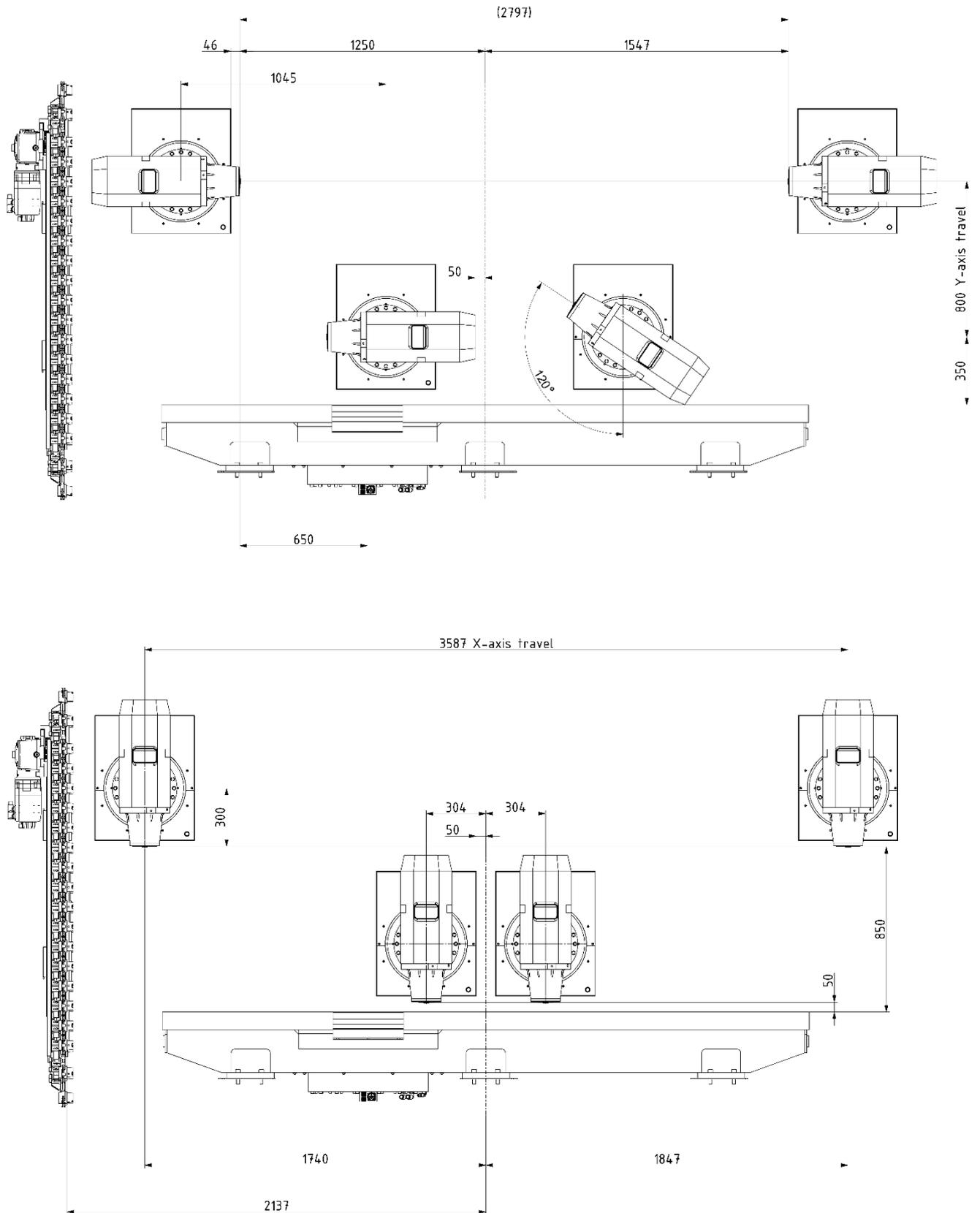


Figure with optional high-pressure coolant system.

4.2 Machining area

■ VELOS.3000



6. Terms & Conditions

Delivery period: approx. 12 months from receipt of order

Pricing: Euro (Net)

Payment terms: 30% after order confirmation; 70% before shipping.

Shipping Terms: EX-work EMC (Quaser Croatia)

Warranty: In accordance with VDW conditions, we assume the warranty for the scope of delivery for a period of 12 months with 1-shift operation. The warranty begins on the date of the signatures of your acceptance representative and our customer service technician on the acceptance report.