Mazak

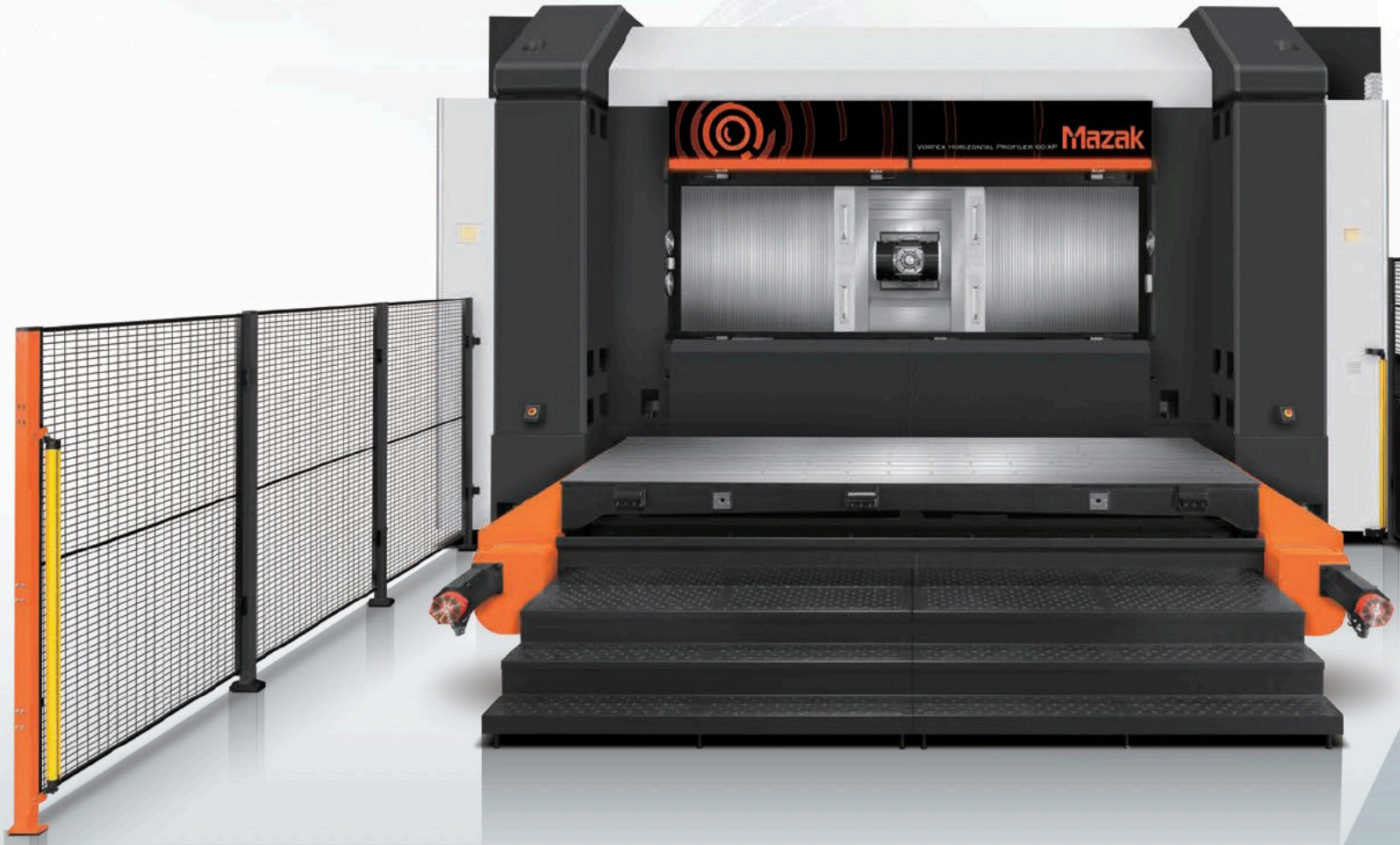
VORTEX HORIZONTAL PROFILER 160 XP

[Simultaneous 5-axis horizontal machining center]

Designed for unsurpassed productivity

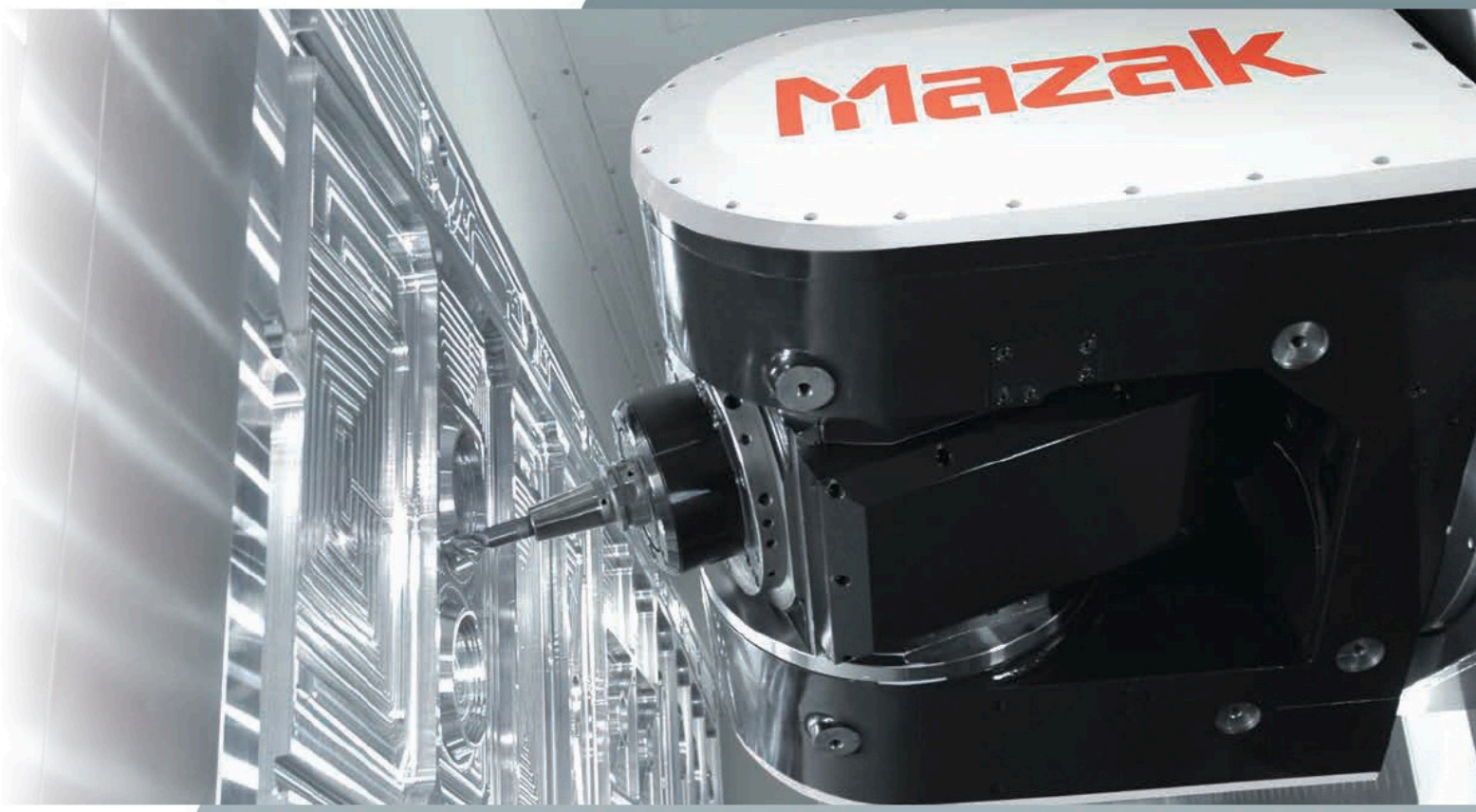
High-accuracy, stable machining performance

Box construction integrating the base, column, and table and thermally symmetrical spindle/column construction ensures high-accuracy machining.



Simultaneous 5-axis horizontal machining center

VORTEX HORIZONTAL PROFILER 160 XP



30000 min^{-1} (rpm)
120 kW (cont. rating)
HSK-A63/80mz

High productivity thanks to powerful, high-speed integral spindle/motor

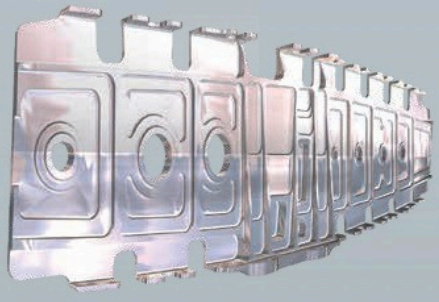
35 m/min (1378 ipm) (X axis)
30 m/min (1181 ipm) (Y, Z axis)
50 min^{-1} (rpm) (A, C axis)

High-speed simultaneous 5-axis machining for high-efficiency production

4000 mm × 1600 mm (157.48" × 62.99")

Workpiece capacity for large aerospace components

Example workpiece



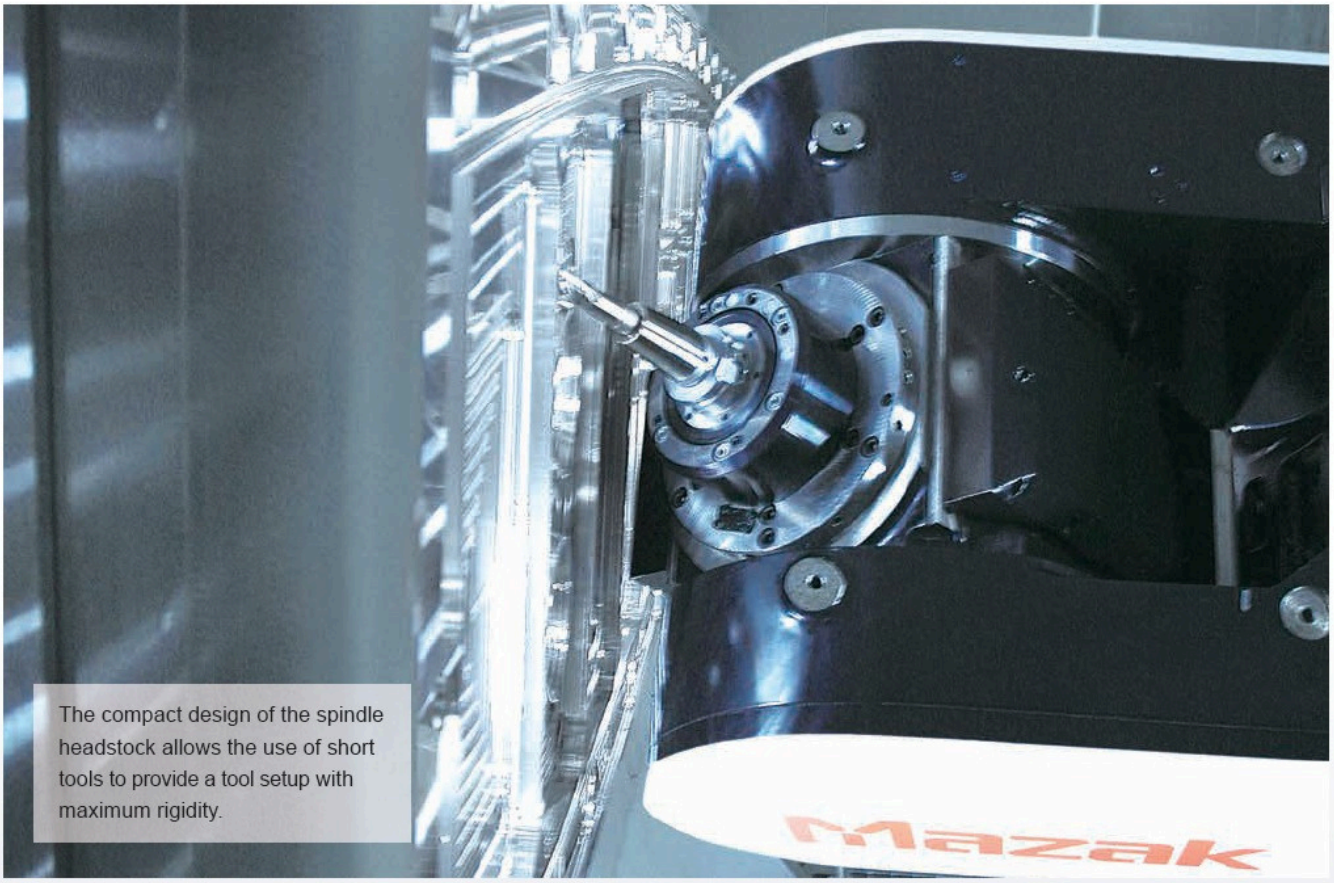
Higher Productivity

Efficient 5-axis simultaneous machining of large aerospace components

High-speed, high-output spindle for high-efficiency machining of aluminum components

30000 min⁻¹ (rpm) 120 kW integral spindle/motor

Thanks to the integral spindle/motor design, vibration is minimized during high-speed operation to ensure exceptional surface finishes and maximum tool life.

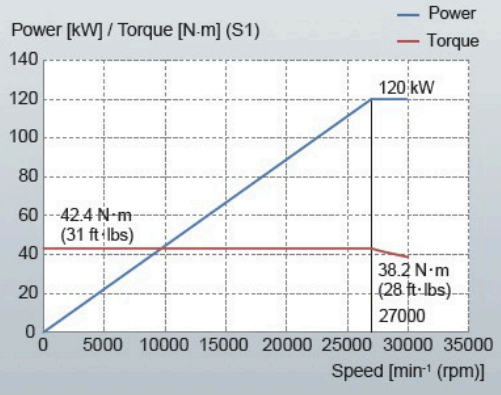


The compact design of the spindle headstock allows the use of short tools to provide a tool setup with maximum rigidity.

Spindle output/torque diagram

Output (cont. rating): 120 kW

Torque (cont. rating): 42.4 N·m (31 ft·lbs)

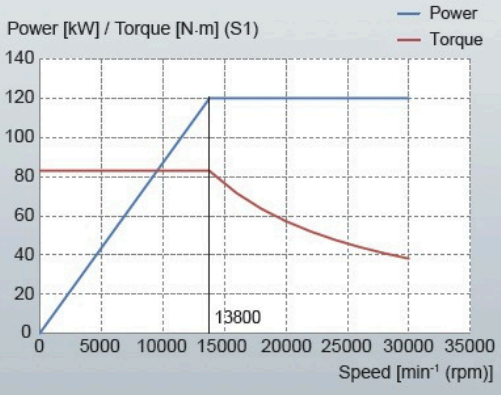


High-torque spindle output/torque diagram

OPTION

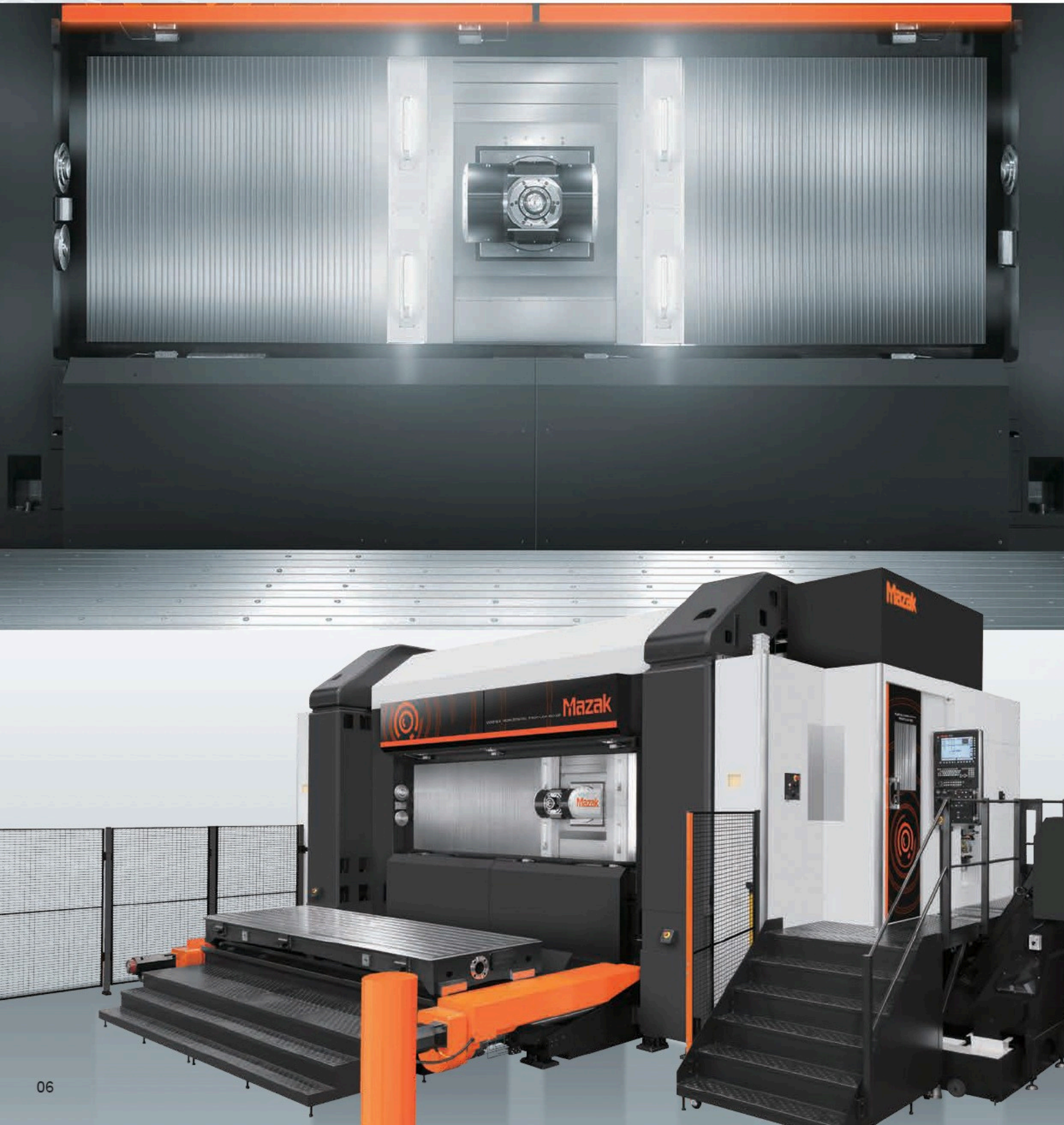
Output (cont. rating): 120 kW

Torque (cont. rating): 83 N·m (61 ft·lbs)



Higher Accuracy

Designed for high-speed, high-accuracy simultaneous 5-axis machining

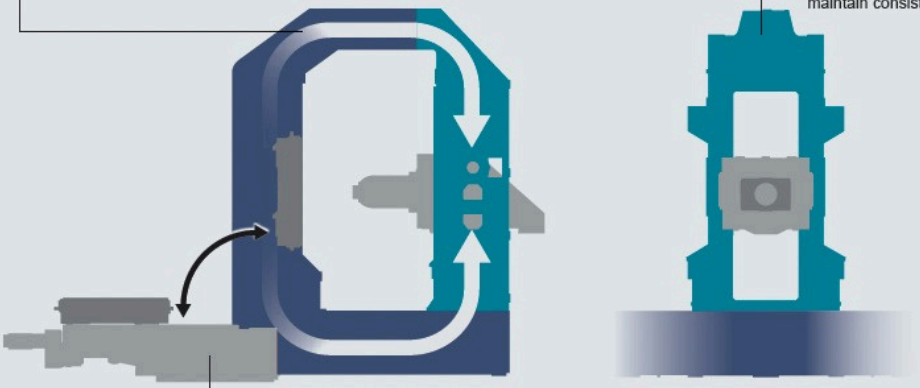


Box construction integrating the base, column and table

Fully closed force loop construction and integrated robust table provide exceptional rigidity to ensure stable high-accuracy machining.

Thermally symmetrical spindle/column

Different from unstable cantilever construction, the thermally symmetrical spindle/column holds the headstock on both the right and left sides to maintain consistently high machining accuracy.



Tilting table for large workpieces

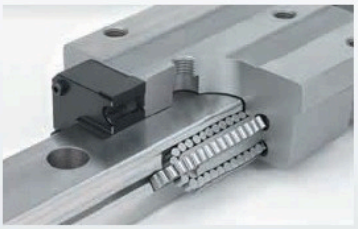
For convenient workpiece loading/unloading, the table is horizontal for workpiece setup and tilted 90 degrees for machining.

High-accuracy table positioning

Tilting table repeatability is within 13 µm (X/Y/Z directions).

Linear roller guides utilized on the X, Y and Z axis

Linear roller guides on the X, Y, and Z axis are utilized to provide high-accuracy machining.



Ball screw core cooling (X, Y, Z axis)

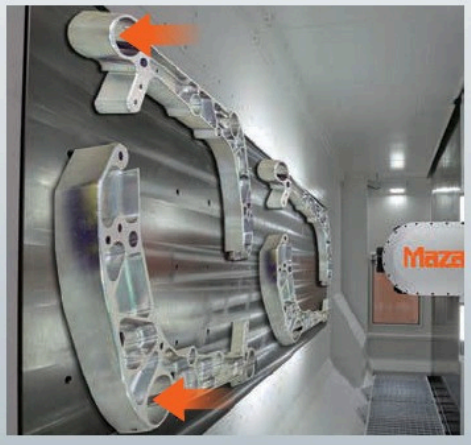
Temperature-controlled cooling oil circulates through the ballscrew cores to ensure stable machining accuracy over extended periods of high-speed operation.

X-axis scale feedback

Linear scale measures the column´s actual travel for high-accuracy positioning over extended periods of operation. Scale feedback on Y and Z axis is optionally available.

Machine construction ensures stable machining accuracy in the X-axis direction from the bottom to top of the machine table

The large table capacity allows the machining of large right and left-hand components in the same machine setup.



Operator Friendly

Ergonomic design for ease of operation

Horizontal workpiece/fixture setup

Setup station

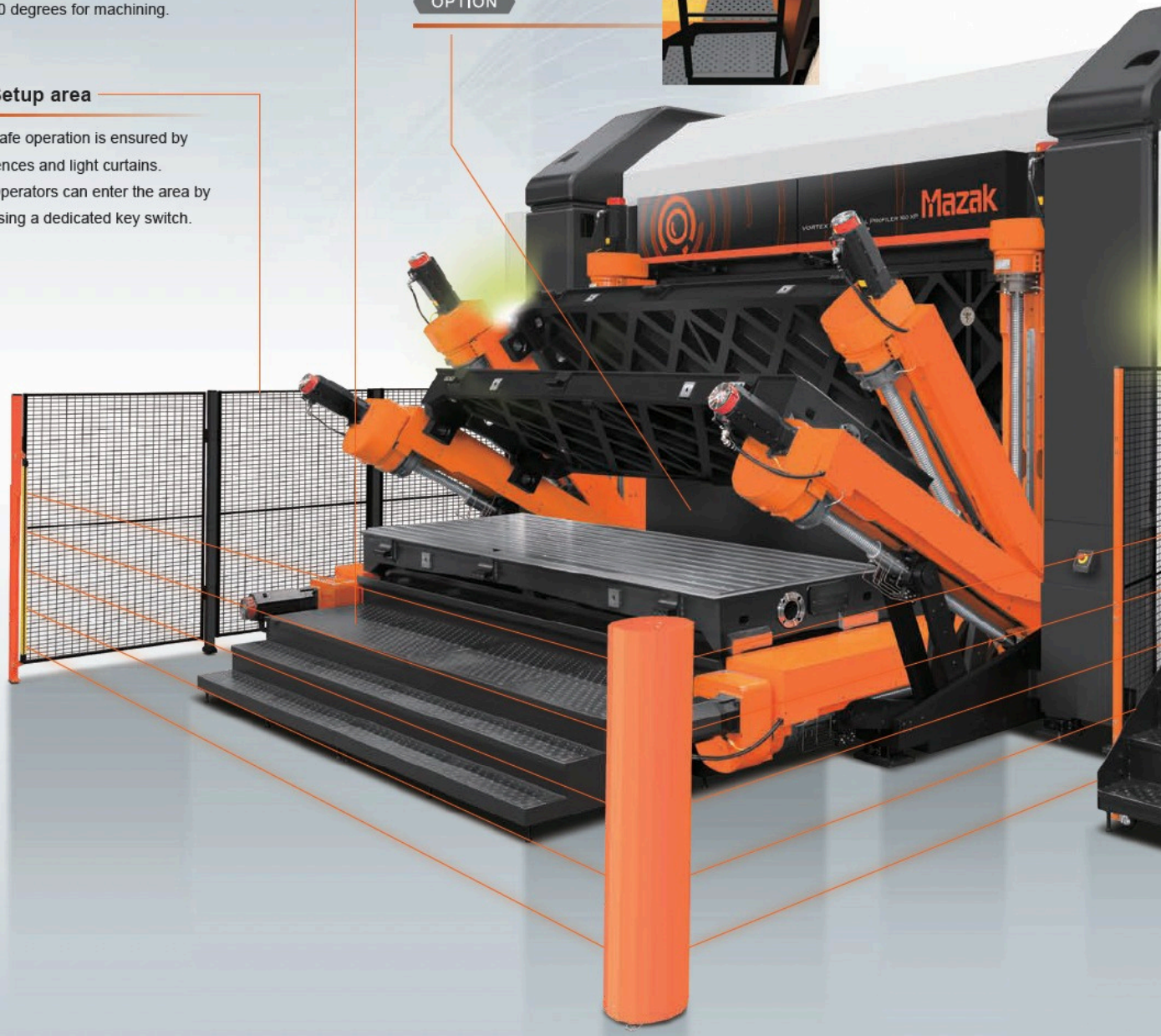
For convenient workpiece loading/unloading, the table is horizontal for workpiece setup and tilted 90 degrees for machining.

Setup area

Safe operation is ensured by fences and light curtains. Operators can enter the area by using a dedicated key switch.

Access rear of workpiece when table is in horizontal position

OPTION



Access deck

Tool magazine

The tool magazine is conveniently located near the operator and has a wide opening for smooth tool changes.

Operator door/window

Machining can be monitored easily through the large window.

CNC operation panel

The CNC operation panel swivels for convenient operation.

Central maintenance panel

Units that require frequent access are centrally located near the operator area.

Coolant/chip disposal

Chip conveyor

The chip conveyor is located below the entire machining area to remove machined chips smoothly for disposal.

Coolant tank

The coolant tank can be pulled out from the machine for cleaning.

Factory Automation

Advanced coolant/chip disposal technology

1.5 MPa (218 psi) high-pressure coolant through spindle

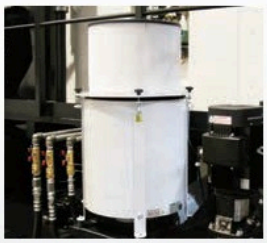
High-pressure coolant through the spindle is supplied through tool passages directly to the tip of the cutting tool. Higher-pressure coolant systems (3.5 MPa (508 psi)/7.0 MPa (1015 psi)) are optionally available.

Headstock cleaning coolant

The standard coolant nozzles on the top cover remove chips from the headstock during machining.

Mist collector OPTION

Coolant mist is removed from the machining area to maintain a safe and clean working environment.



Cover coolant

Coolant is discharged from below the cover along the entire table to prevent chip accumulation.

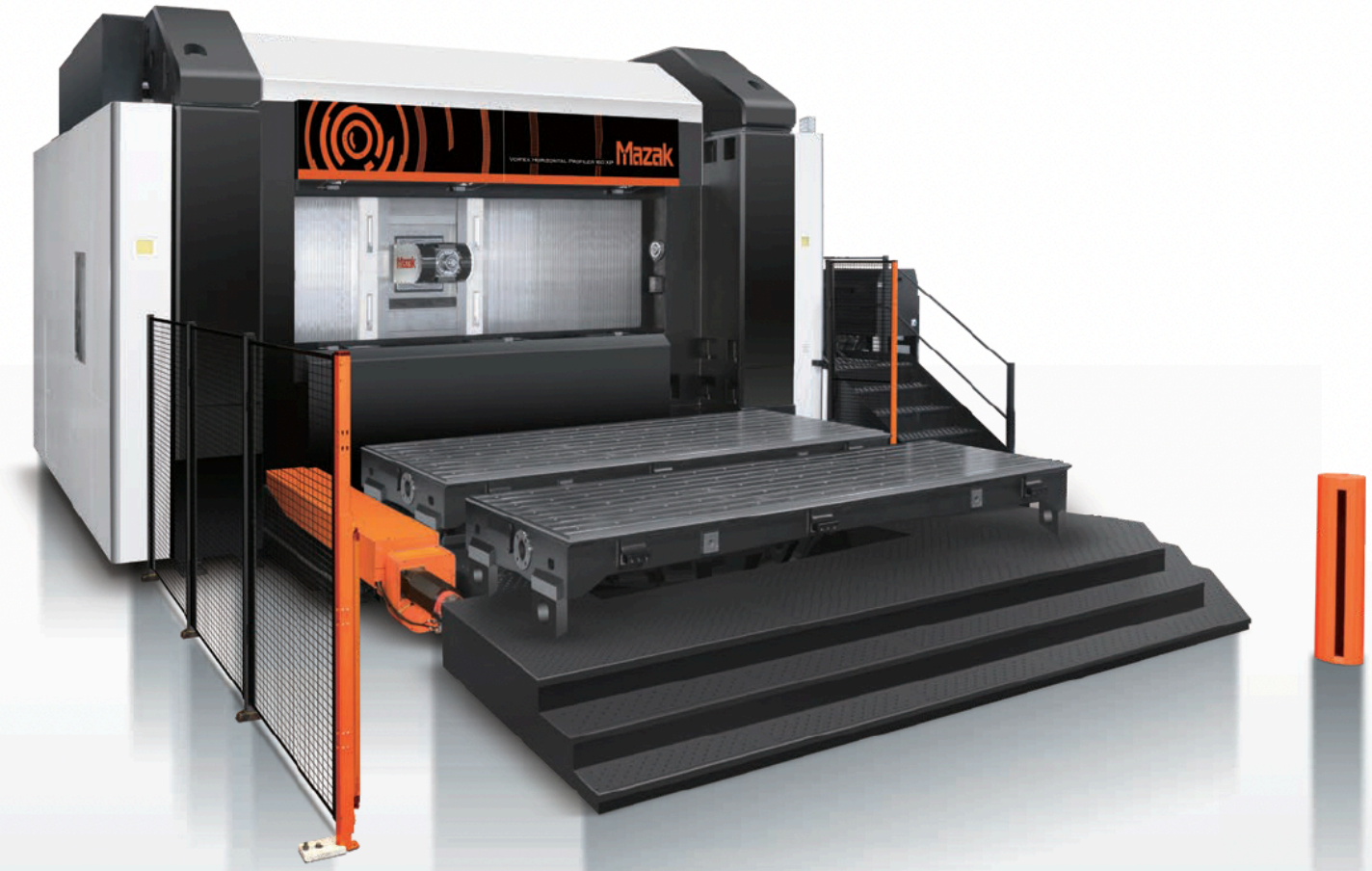
Operator platform in machining area

Operators can access the entire workpiece easily and safely thanks to the platform inside the machining area.

Oil skimmer OPTION

The belt-type oil skimmer mounted on the coolant tank removes oil from the coolant.

Factory automation options



Touch sensor OPTION

A workpiece reference surface can be probed by the touch sensor (RMP60) and the coordinate values can be automatically shifted accordingly.

2-table changer OPTION

The rotary-type compact 2-table changer allows the next workpiece to be set up during the machining of the current workpiece. The 2-table changer can be added after initial machine installation.

Laser automatic tool length measurement OPTION

Tool length and diameter, as well as tool-breakage detection, are measured automatically with high accuracy.

Tool magazine

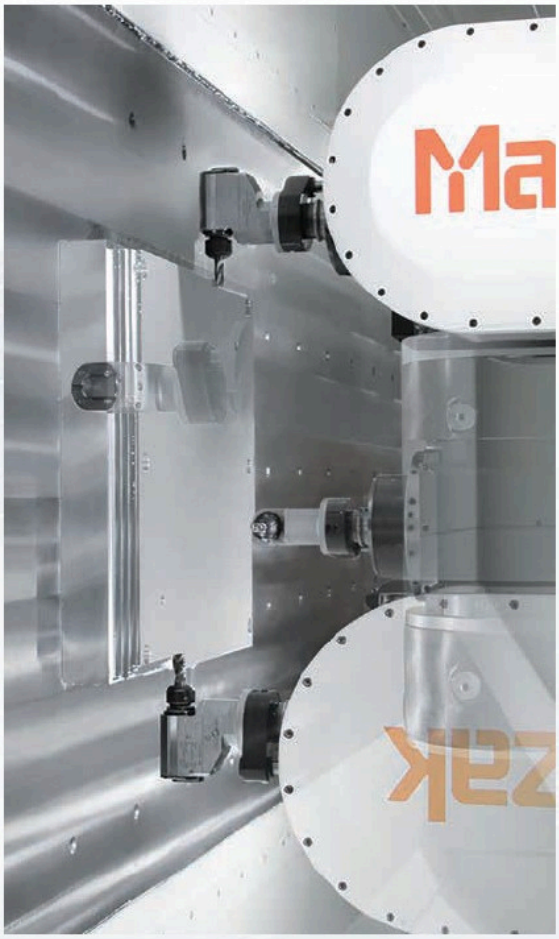
The standard 60-tool magazine and optional 96-tool magazine meet the requirements of a wide variety of workpieces.

Factory Automation

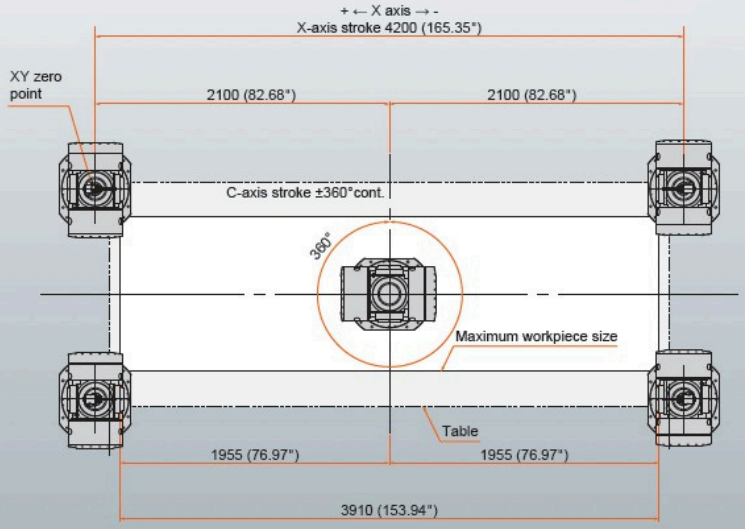
Angle holder for side cutting

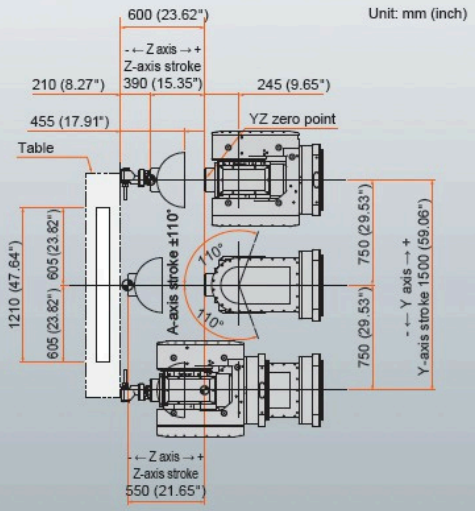
The angle holder can be used to machine the side surfaces of a workpiece with the A axis at 0°.
(Requires optional attachment block for angle holder)

Angle holder with A axis at 0°



Workpiece size with maximum-length tool mounted in angle holder: **3910 mm × 1210 mm** (153.94" × 47.64")





Environmentally Friendly

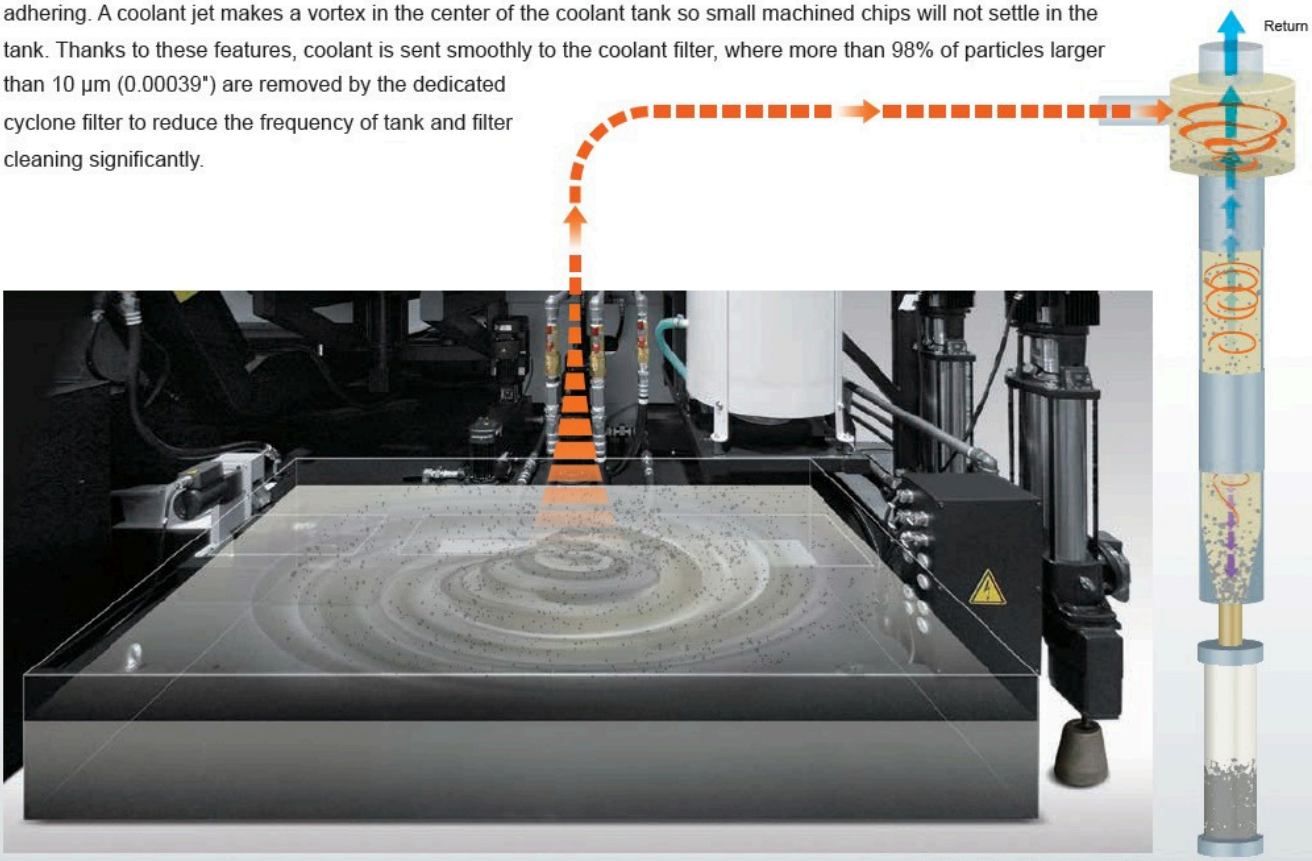
Designed with environmental considerations by employing the latest coolant/chip disposal technologies

LED worklights

The long-life, energy-saving LED lights brightly illuminate the interior of the machine for convenient setup and machining monitoring.

Clean coolant system

The internal wall surfaces of the large-volume coolant tank have a coating that prevents small machined chips from adhering. A coolant jet makes a vortex in the center of the coolant tank so small machined chips will not settle in the tank. Thanks to these features, coolant is sent smoothly to the coolant filter, where more than 98% of particles larger than 10 µm (0.00039") are removed by the dedicated cyclone filter to reduce the frequency of tank and filter cleaning significantly.



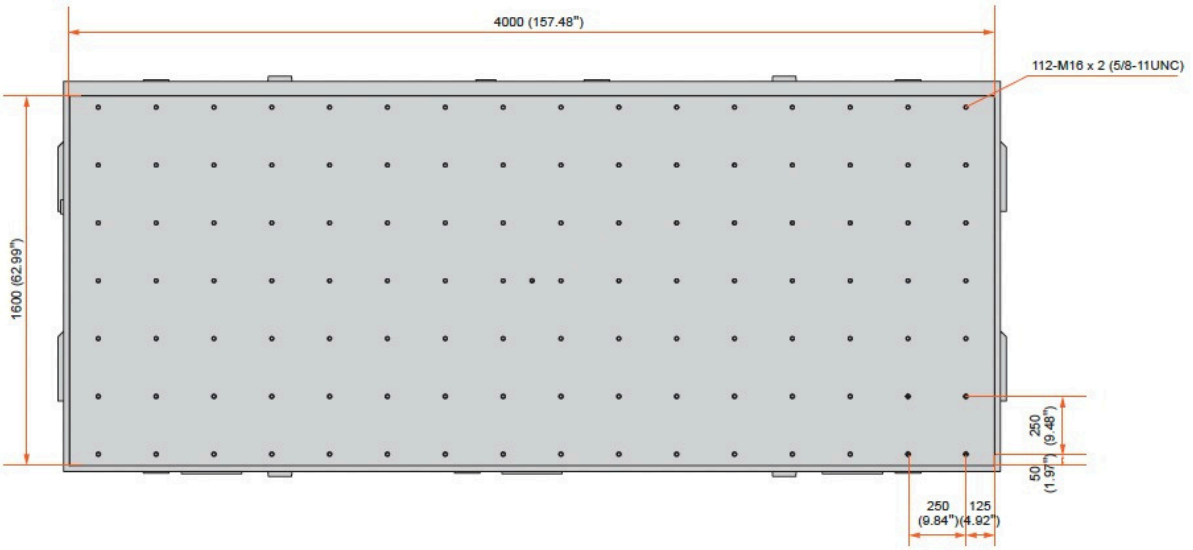
Sludge settled in the collecting drain cup is removed.

Tank separated from conveyor

The tank is located below the right side of the conveyor. Machined chips are removed smoothly by the chip conveyor.
The tank can be removed easily from the machine for maintenance.

Table dimensions

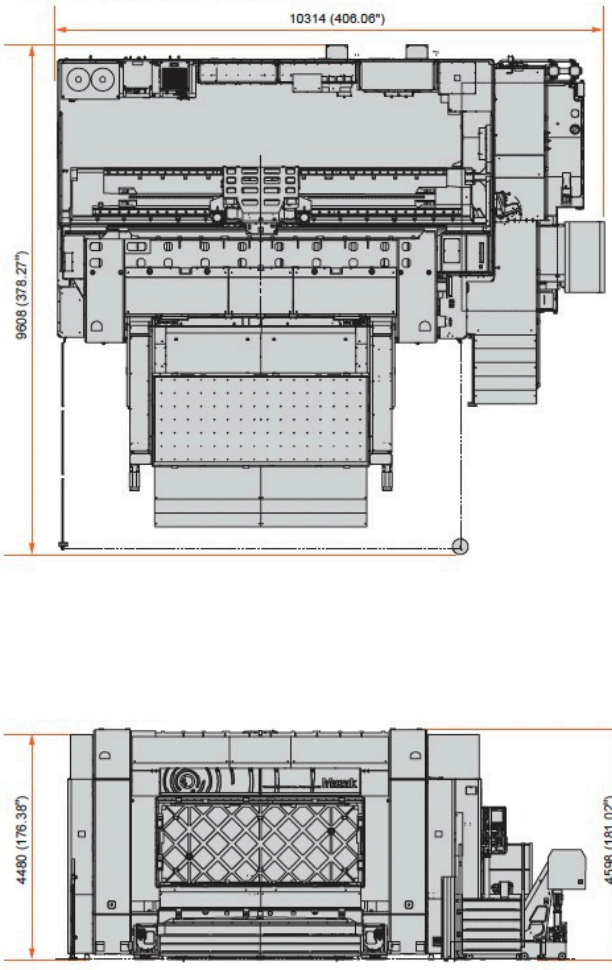
Unit: mm (inch)



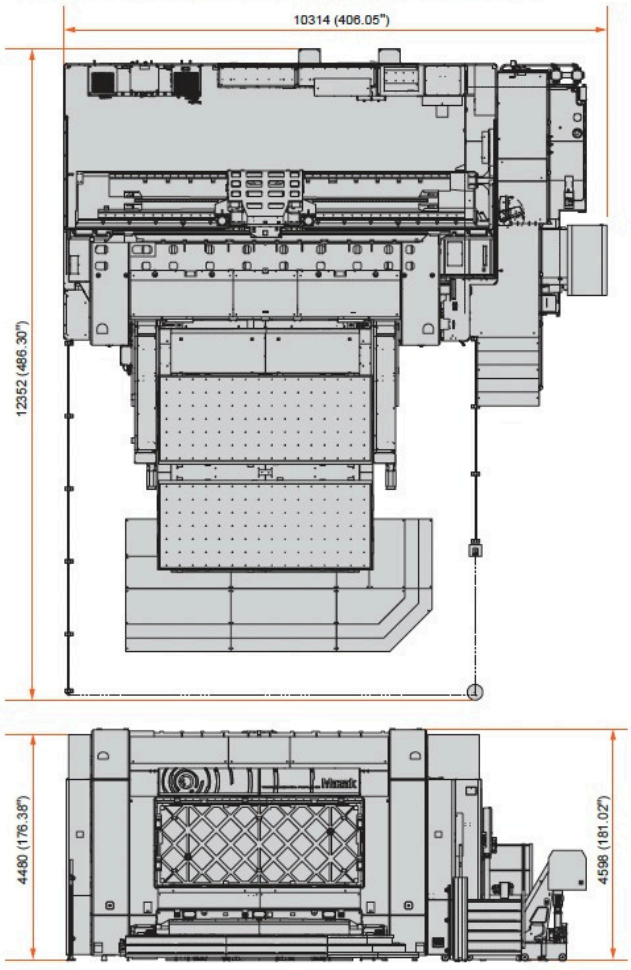
Machine dimensions

Unit: mm (inch)

Standard specifications



2-table changer specifications (option)



MAZAK FX standard specifications

Number of controlled axes	5 (X, Y, Z, A, C)
Number of simultaneously controlled axes	5
Minimum input increment	0.0001 mm/0.00001 inch/0.0001 deg
Minimum command increment	0.0001 mm/0.00001 inch/0.0001 deg
Interlock	Axes, cutting block start
Axis control	Machine lock, emergency stop, over travel, absolute position detection
Operation	Automatic operation (memory operation), MDI operation, dry run, single block, manual reference point return, manual handle feed (manual pulse generator)
Interpolation	Positioning, exact stop, linear/circular interpolation, dwell, helical interpolation, reference point return, cylindrical interpolation*, normal direction control*
Feed	Rapid traverse, rapid traverse rate override, feed per minute/revolution, tangential velocity constant control, cutting feedrate clamp automatic acceleration/deceleration, rapid traverse bell-shaped acceleration/deceleration, feedrate override, override cancel, AI contour control Ⅱ, machining condition selector function
Program code	Automatic EIA/ISO recognition
Optional block skip	1
Additional optional block skip*	9
Maximum command value	±99999.9999 mm/±9999.99999 inch/±99999.9999 deg
Absolute/incremental command	Simultaneous use in a block is possible
Work coordinate system	G52 - G59
Additional set of work coordinate system*	G54.1, 48 sets, 300 sets
Sub-program call	10 fold nested
Custom macro	Common variable: 600 (#100 - #199, #500 - #999)
M function	M8 digit
M function multiple commands	3
S function	S5 digit, binary output
	Spindle override, spindle orientation, rigid tap*
T function	T8 digit
Number of tool offset data	64, 99*, 200*, 400* 999*, 2000*
Tool offset	Tool length compensation, tool radius/tool nose radius compensation
Tool management function	Tool management function, tool life management
Accuracy	Backlash compensation, pitch error compensation, thermal displacement compensation
Program storage size	1Mb, 2Mb*, 4Mb*, 8Mb*
Number of registered programs	1000
Expansion of number of registered programs*	Max. 4000
Editing	Background editing
Display	15-inch color TFT
Display language	English, Japanese, German, French, Traditional Chinese, Simplified Chinese, Italian, Korean, Spanish, Dutch, Danish, Portuguese, Polish, Swedish, Czech, Hungarian, Russian, Turkish, Bulgarian, Romanian, Slovakian, Finnish
FAST Data Server*	FAST Data Server, FAST Ethernet
Data I/O	Memory card I/O, USB memory I/O

*Option

Standard machine specifications

Stroke	X axis (column travel left/right)	4200 mm (165.35")
	Y axis (spindle head travel up/down)	1500 mm (59.06")
	Z axis (spindle travel forward/backward)	550 mm (21.65")
	A axis (tilting)	±110°
	C axis (rotating)	±360° (cont.)
	Distance from table top to spindle nose	50 - 600 mm (1.97" - 23.62")
Table	Size	4000 × 1600 mm (157.48" × 62.99")
	Maximum load	3000 kg (6614 lbs)
	Surface	112-M16 × 2 (5/8-11UNC)
Spindle	Max. speed	30000 min⁻¹ (rpm)
	Output (cont. rating)	120 kW
	Max. torque (cont. rating)	42.4 N·m (31 ft·lbs)
Feedrate	X/Y/Z axis	35000/30000/30000 mm/min (1378/1181/1181 IPM)
	A/C axis	50/50 min⁻¹ (rpm)
	Minimum indexing increment	0.0001°
Tool magazine/ automatic tool changer	Tool shank	HSK-A63/80mz*1
	Max. tool diameter/length (from gauge line)/weight	ø75 mm/200 mm/5 kg (ø2.95"/7.87"/11.02 lbs)
	Tool storage capacity	60 tools
Electrical and air requirement	Electric power supply	277 kVA (cont. rating)
	Air requirement	1300 NL/min (45.9 ft³/min) 1500 NL/min (52.7 ft³/min) (with optional flood air blast, air through spindle and laser tool length measurement)
Machine size	Height	4598 mm (181.02")
	Floor space requirement	10314 × 9608 mm (406.06" × 378.27")
	Weight	70000 kg (154321 lbs)

*1 HSK-A63/80mz is Mazak original standard.

Standard and optional equipment

●: Standard ○: Option

Spindle (cont. rating)	HSK-A63/80mz 30000 min⁻¹ (rpm) 120 kW, 42.4 N·m (31 ft·lbs)	●
	HSK-A63/80mz 30000 min⁻¹ (rpm) 120 kW, 83.0 N·m (61 ft·lbs)	○
Tilt/rotary axis	A-axis ±110°/C-axis ±360° cont.	●
Table	4000 × 1600 mm (157.48" × 62.99") tapped table	●
	4000 × 1600 mm (157.48" × 62.99") with preparation for vacuum fixture	○
Tool magazine	60 tools	●
	96 tools	○
Accuracy	Scale feedback system (X axis)	●
	Scale feedback system (Y, Z axes)	○
Automatic operation	Single table	●
	2-table changer	○
Factory automation	Automatic laser tool length measurement (RENISHAW)	○
	Touch sensor	○
Coolant/chip disposal	Clean coolant system	●
	High-pressure coolant through spindle (1.5 MPa (218 psi))	●
	High-pressure coolant through spindle (3.5 MPa (508 psi))	○
	High-pressure coolant through spindle (7.0 MPa (1015 psi))	○
	Oil skimmer	○
	Cover coolant	●
	Mist collector	○
	Chip conveyor	●
Others	Status light	○
	LED worklights (5)	●
	Additional LED worklight (1)	○
CNC	MAZAK FX (FANUC 31i-B5)	●

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Mazak

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