

Mazak

FJW-100/160

[Five Face Double Column Machining Center]

FJW-100/160

Mazak

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FJW-100/160 24.03.0 G 99J296724E0



FJW-100/160

Line up of 5 face machining center

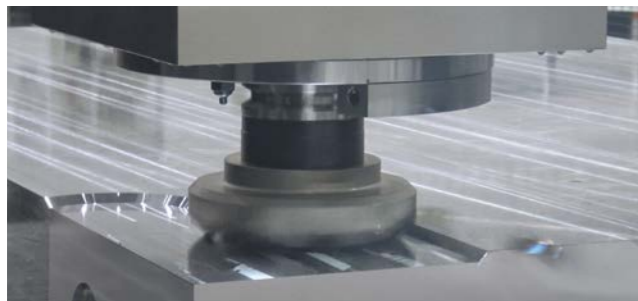
Process integration by 5 face machining / Large workpiece capacity / High-power machining

90° angle attachment tool for four face machining –standard equipment (5° indexing machining performed by EIA / ISO program)

6000 rpm spindle, 26 kW and 828 N·m (611 ft·lbs) for high-power machining

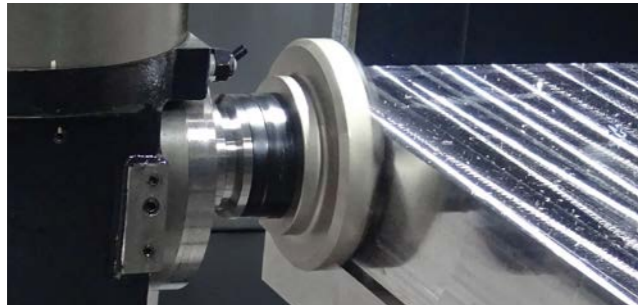
Column height 1650 mm (64.96") by utilizing W-axis control cross rail

Powerful machining



Top face machining	Material : C50	
Tool	Φ200 mm (Φ7.87") Face mill (10 teeth)	Φ160 mm (Φ6.3") Face mill (8 teeth)
Cutting speed	189 m/min (620 SFM)	220 m/min (722 SFM)
D.O.C × Cutting width	5 mm × 160 mm (0.2" × 6.3")	5 mm × 120 mm (0.2" × 4.72")
Feedrate	1053 mm/min (41 IPM)	1225 mm/min (48 IPM)
Z-axis extension	800 mm (31.5")	800 mm (31.5")

Φ160 mm (6.3") face mill



Side surface machining	Material : C50	
Tool	Φ200 mm (Φ7.87") Face mill (10 teeth)	Φ160 mm (Φ6.3") Face mill (8 teeth)
Cutting speed	189 m/min (620 SFM)	220 m/min (722 SFM)
D.O.C × Cutting width	5 mm × 145 mm (0.2" × 5.71")	4.1 mm × 120 mm (0.16" × 4.72")
Feedrate	1053 mm/min (41 IPM)	1225 mm/min (48 IPM)
Z-axis extension	800 mm (31.5")	800 mm (31.5")

Φ160 mm (6.3") face mill



5 face machining



Angle head attachment



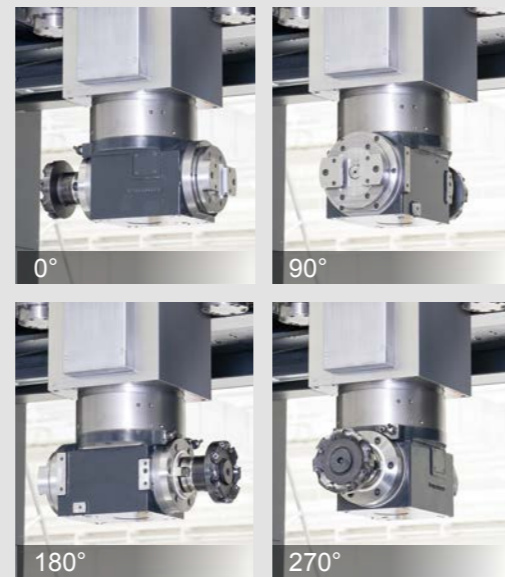
5 face machining system

Angle head attachment

Automatic load / unload of angle head attachment, as well as automatic tool change (index 72 positions, every 5°) can be performed, allowing for automatic continuous machining as well as top face machining.
(72 position indexing per 5° performed by EIA / ISO program)



90° index angle



Automatic attachment changer

Automatic attachment changer located next to column on the side of CNC operation panel performing automatic change of angle head attachment and V tool cover.

(V tool cover: Attached to the spindle at top-surface machining)



Automatic tool changer

Automatic tool changer exchanges tool for both spindle and angle head attachment from 50 tool storage magazine.

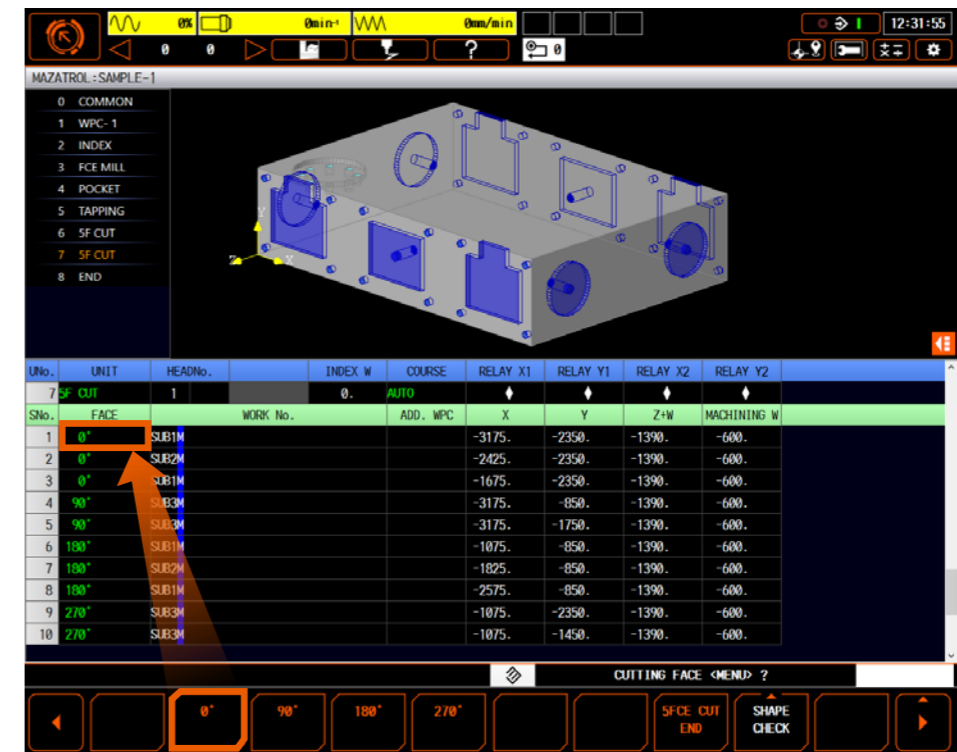
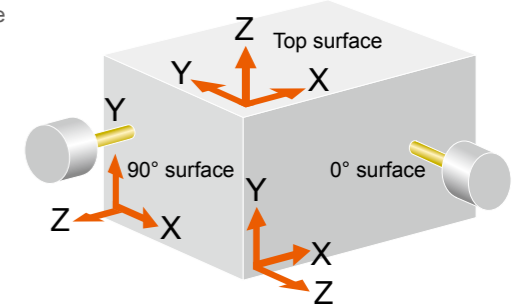


Program functions for 5 face machining and 5° index machining

Convenient programming even for 5 face machining

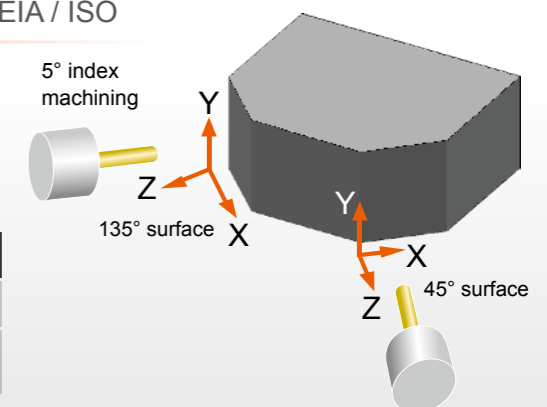
Can be performed by both MAZATROL and EIA programs. Side-surface machining is easily programmed using the conversational MAZATROL format. All that is required is to enter which surface is to be machined followed by normal data entry.

Coordinate system and machining surface



Program for 5 face machining and 5° indexing machining by EIA / ISO

Programs for 5 face machining can be made by G code. MAZATROL conversational program and G code automatically converse coordination for ease of operation. Additionally, machining by angle head attachment every 5° indexing can be performed.



5-face machining / 5° index machining preparation functions G code	
Attachment indexing	G301C□□□ (□□□ : Attachment indexing angle)
Attachment coordinates conversion / tool length offset	G680C◇◇◇◇ (◇◇◇◇ : Angle of machining surface)

Structure and function for large-sized workpieces

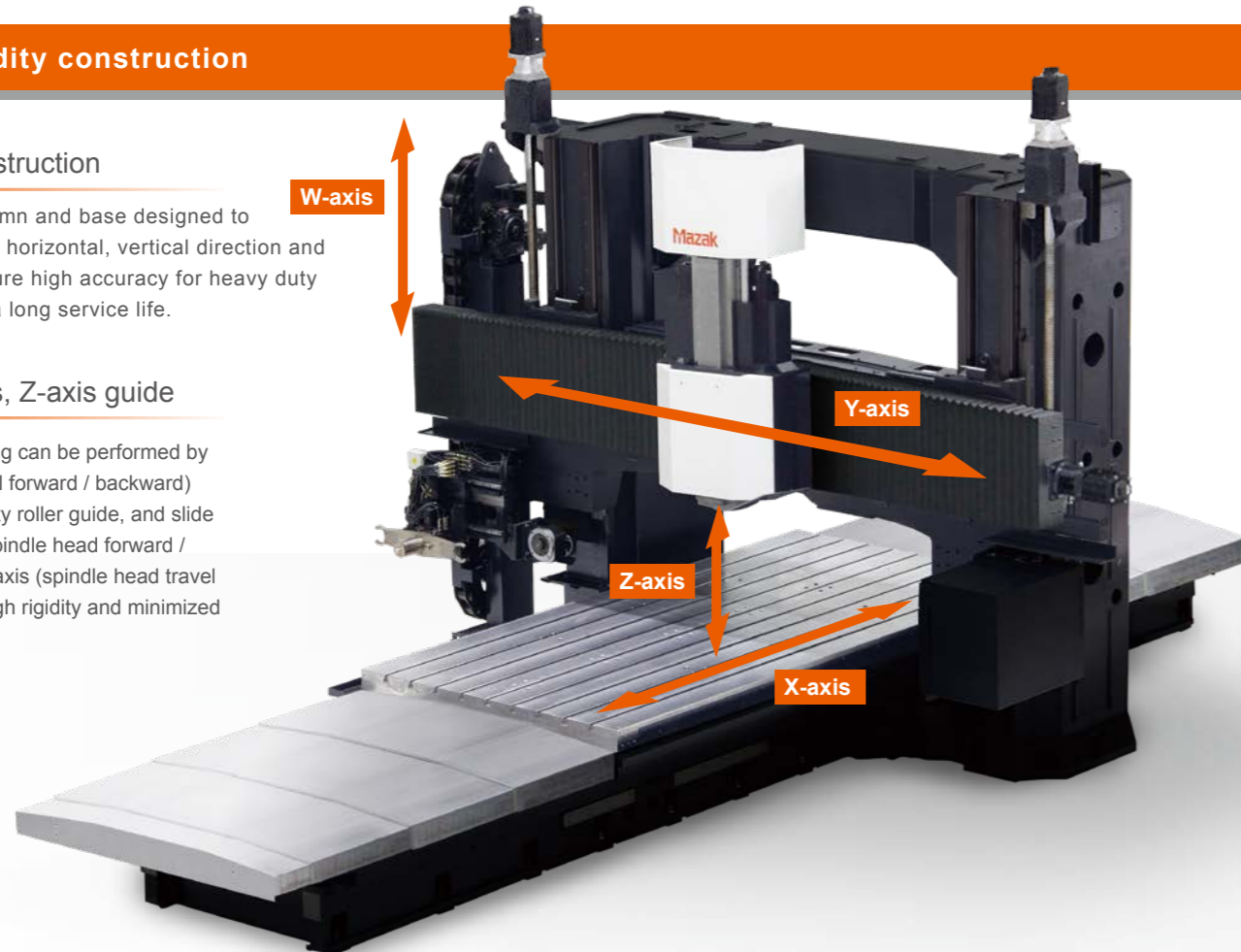
High rigidity construction

Machine construction

High rigidity column and base designed to withstand load in horizontal, vertical direction and distortion to ensure high accuracy for heavy duty machining over a long service life.

X-axis, Y-axis, Z-axis guide

Powerful machining can be performed by X-axis (table travel forward / backward) utilizing high rigidity roller guide, and slide ways on Y-axis (spindle head forward / backward) and Z-axis (spindle head travel up / down) with high rigidity and minimized vibration.



High rigidity ram

The ram of the spindle unit has a structure with a large cross-sectional area of 350 mm (13.78"), which reduces the displacement of the ram to 54% compared to conventional models.



High rigidity by strong cross beam

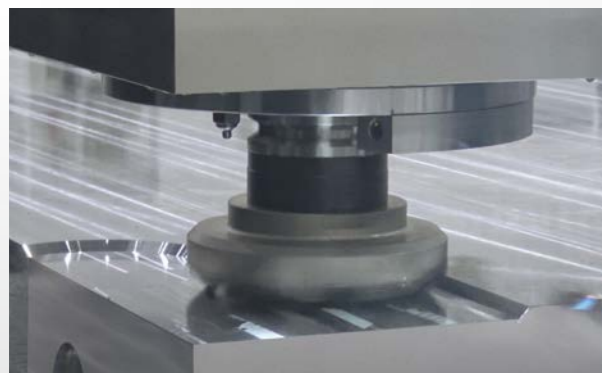
The double column structure actualizes high rigidity by connecting the columns with the cross beam.



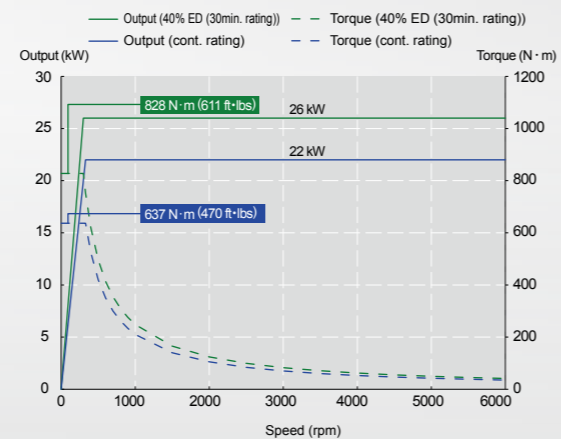
Spindle

High torque 6000 rpm spindle

6000 rpm high torque 828 N.m (611 ft.lbs) (40% ED (30min. rating)) spindle for the heavy duty machining of steel or cast iron material.



6000 rpm spindle output / torque diagram



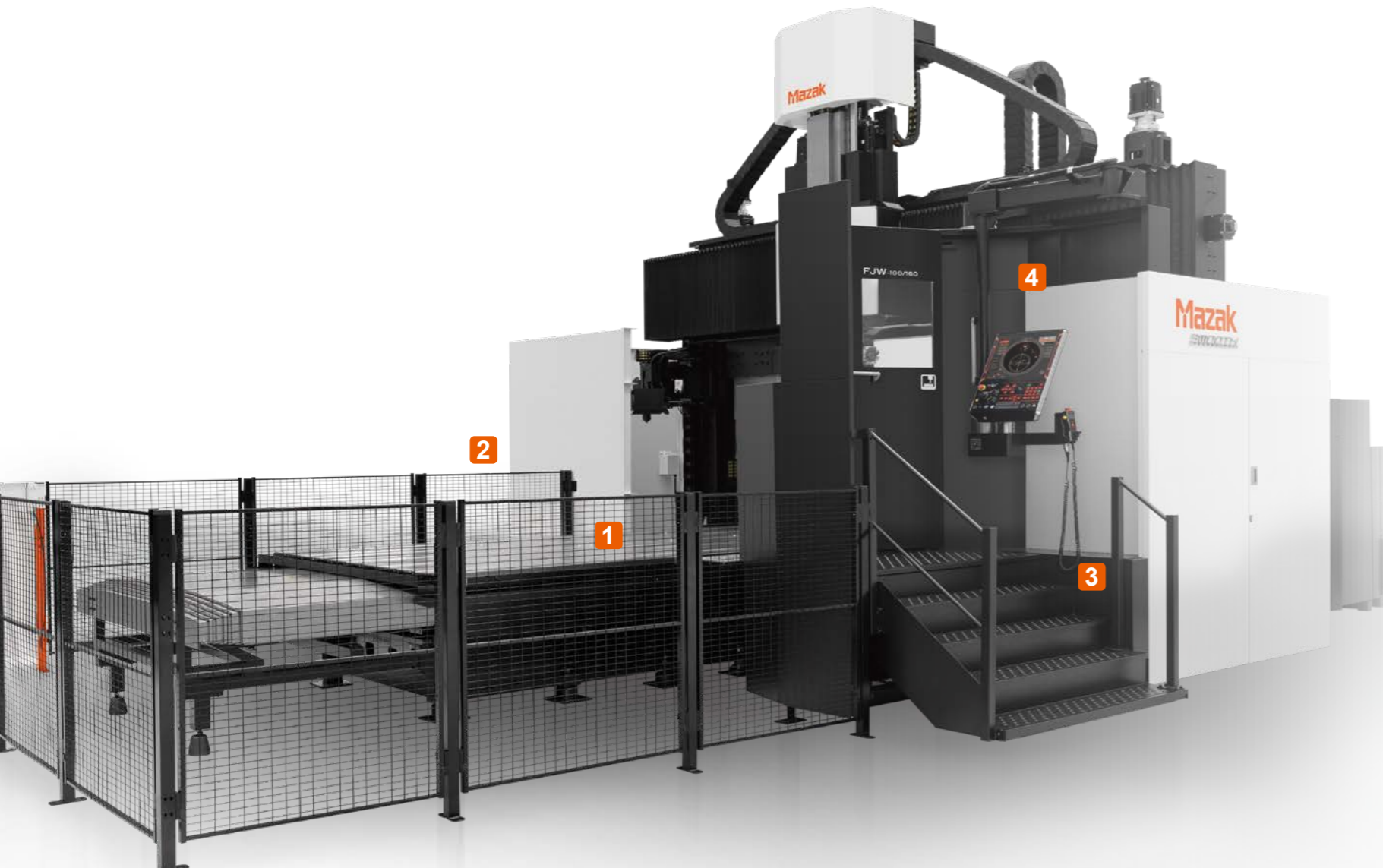
W-axis

Cross rail lift

Column height 1.65 m (64.96") by simultaneous operation of ram (Z-axis stroke of 0.8 m (31.5")) and cross rail (W-axis) for tall workpiece machining.



Ease of operation



1 Table height : 910 mm (35.83")

Designed for convenient setup of fixtures and loading / unloading of workpieces.

2 Superior crane accessibility

The safety fence structure separates the worker from the moving parts of the machine. The crane can be moved to the table from any direction, excluding the column side, making it easy to load and unload large workpieces

3 Easy in and out access to the machine

The optional outside deck eliminates the height difference between the inside and outside of the work floor to improve workability.

4 Movable operation panel

The MAZATROL SmoothG panel can be moved from outside to inside of the machine and operated in the same way, even during set-up on the table.

Remote manual pulse generator

The remote manual pulse generator provides convenient operation when the operator is not close to the CNC operation panel. Its display shows the position display and the machine coordinate values. 4 different positions can be registered in memory by the remote manual pulse generator.

Fastest CNC in the world

Latest hardware and software for unprecedented speed and precision

Smooth graphical user interface

Integrates with Windows PC
MAZATROL Smooth graphical user interface for unsurpassed ease of operation
Touch screen operation — operate similar to your smart phone / tablet
Windows are a trademark of Microsoft Corporation

Ease of operation

Designed for unsurpassed ease of operation



4 axes simultaneous CNC

MAZATROL **SMOOTHG**

Process home screens

Five different home process screens — each home screen displays the appropriate data in an easy-to-understand manner. Icons can be touched in each process display for additional screen displays.

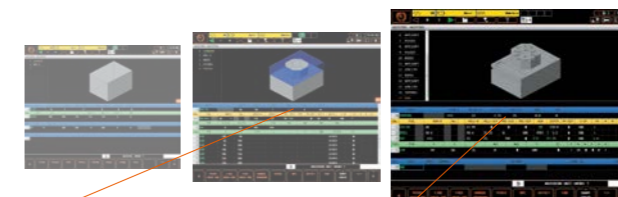


Programming screen links tool path, workpiece shape and programming to reduce programming time.

QUICK MAZATROL

Reduced time for conversational programming

MAZATROL program, unit list and 3D workpiece shape are linked to each other. After defining a machining unit in a MAZATROL program, the 3D shape is immediately displayed to easily and quickly check for any programming error.



Quickly move to the corresponding section in the MAZATROL program by touching a feature in the 3D model.

3D model in the process list is displayed with updated programming in real time.

3D ASSIST

Making a program directly from 3D CAD data

Workpiece and coordinate data can be imported from 3D CAD data to a MAZATROL program. No coordinate value inputs are required. Can reduce input errors and time for program checking.



CAD model importing

Shape selection

Automatically input to MAZATROL program

QUICK EIA

EIA program Visualization

Program, process list and 3D tool path display are linked to each other. Visible search on touch screen can reduce the time for program checking.



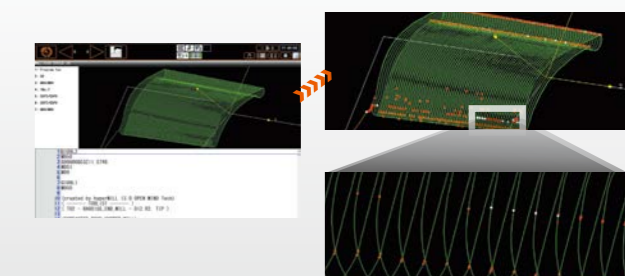
Selecting tool path by touching the screen.

Moving to the corresponding EIA program line.

VIEW SURF

Analyzing EIA programs

By analyzing tool path, any predictable failure on the finished surface can be visualized. Program modification can be done before machining to minimize the time for test cutting.



Standard and Optional Equipment

Safety fence

Safety fence prevents operator from entering into machining area.

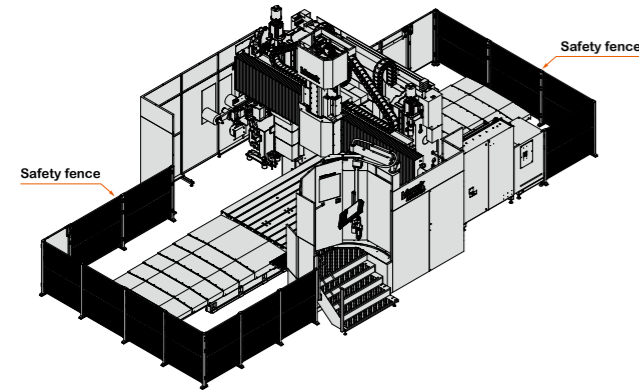


Table chip pan

Installation of a chip pan on the outer circumference of the table prevents the chips from falling onto the floor, reducing cleaning time.

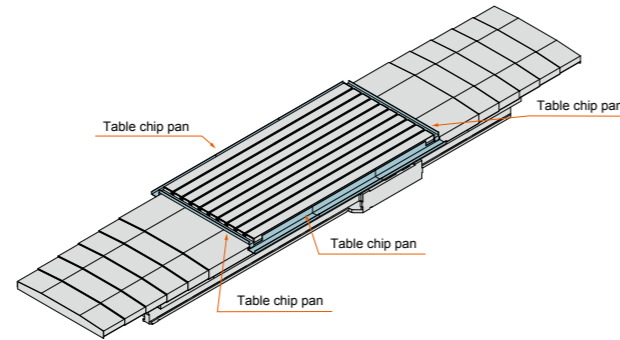
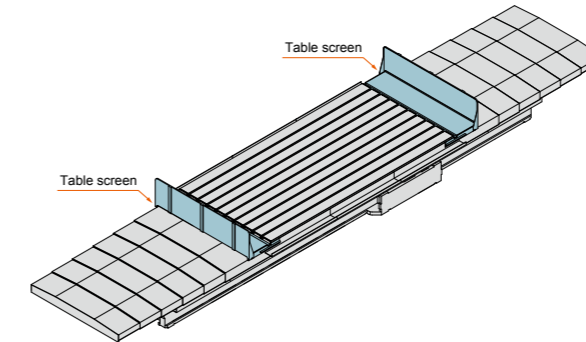


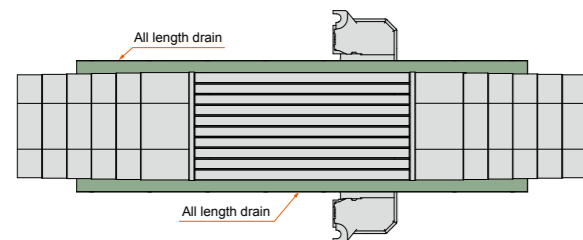
Table screen OPTION

Reduce the amount of chip diffusing to the front/back of the table at machining to improve disposal efficiency.



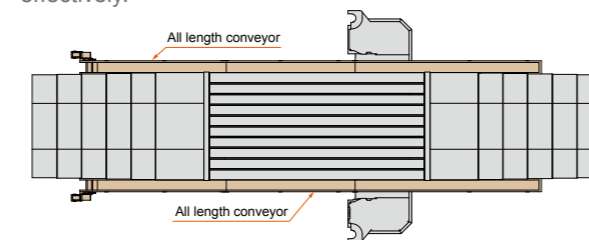
All length drain OPTION

Chips falling from the table are accumulated in a drain which is placed over full range of machine motion for ease of chip removal.



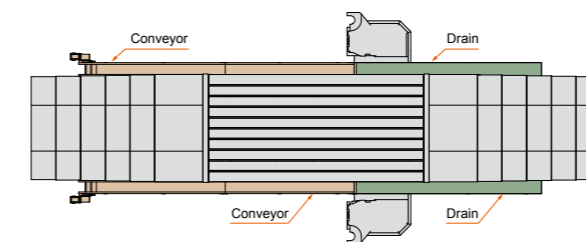
All length conveyor OPTION

Chips fall into chip conveyor which is placed over full range of table motion. Accumulated chips are discharged to single location to remove chips effectively.



Half conveyor OPTION

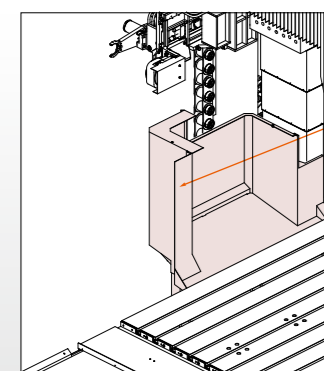
Half conveyor is composed of chip conveyor and drain. Drain is equipped in front of the spindle where large amount of chips are accumulated to remove chips easily. Power consumption and required maintenance time can be reduced.



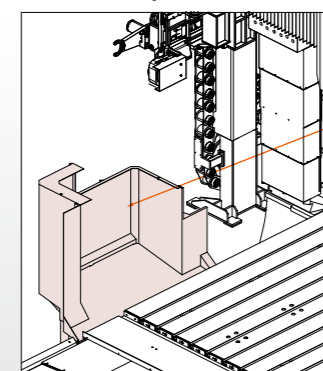
ATC door & AAC cover OPTION

ATC (Automatic tool changer) door and AAC (Automatic attachment changer) cover prevent chips and coolant from going out of the machine.

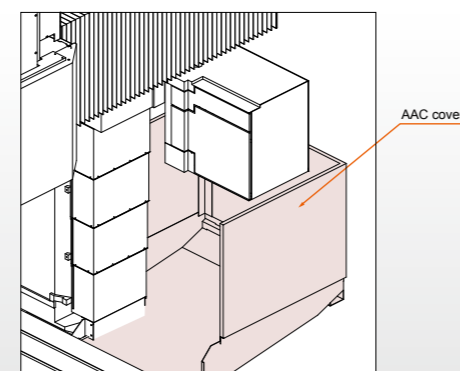
ATC door Close



ATC door Open

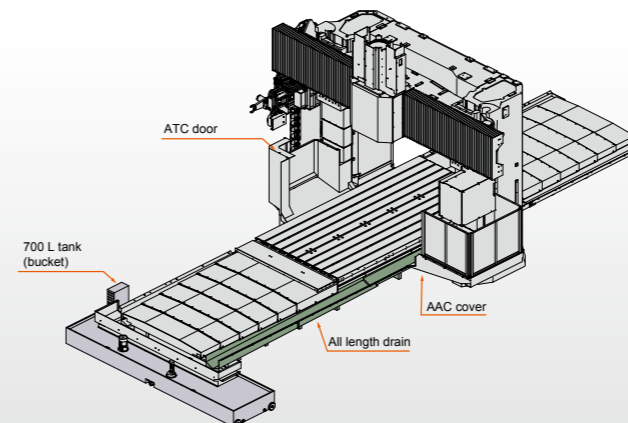


AAC cover



Coolant package A OPTION

Package option: All length drain, 700 L (132.1 gal) tank (bucket), flood coolant, ATC door & AAC cover



● : Standard ○ : Option

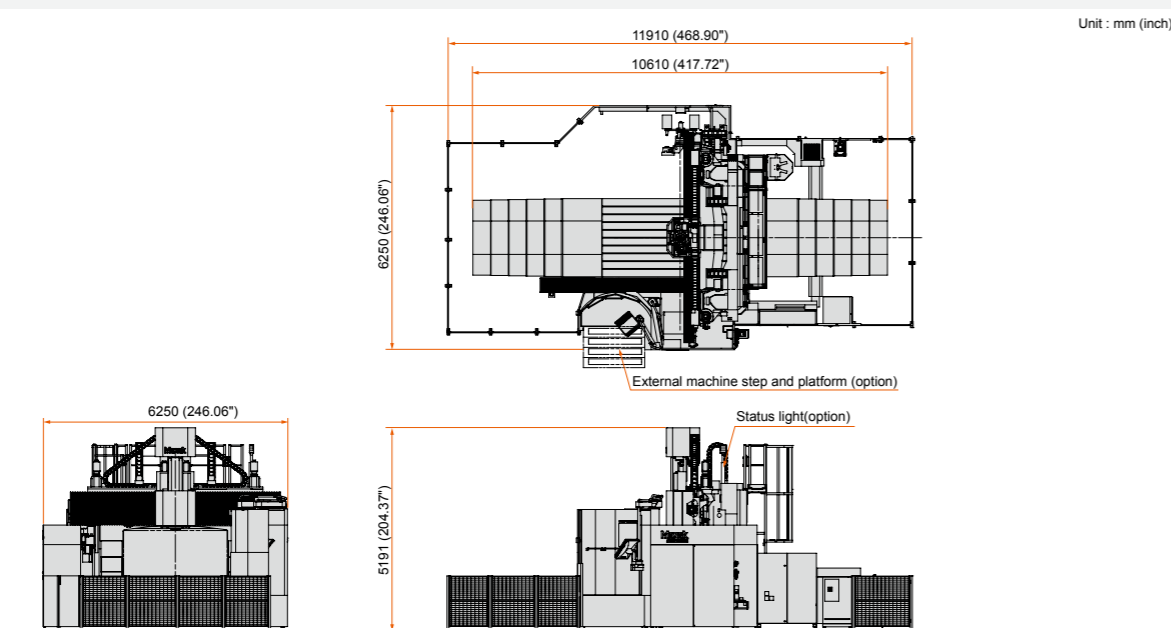
Spindle	6000 rpm (No.50)	●
Table	Y-axis reference slot	○
Factory automation	Tool magazine 50 tools	●
	Tool magazine 80 tools	○
	Tool magazine 120 tools	○
	Automatic attachment changer	●
	Angle head attachment	●
	V tool cover	●
	Print out function for workpiece measuring (without printer)	○
Setup	Automatic power ON / OFF + warm-up operation	●
	Absolute position detection	●
	Remote manual pulse generator (wired)	○
	Automatic tool length measurement & tool breakage detection	○
	Mazak monitoring system B (RMP 60)	○
Safety equipment	External step and platform	○
	Work light	●
	Safety fence	●
	ATC automatic recover function	●
High accuracy	Operator door interlock	●
	Spindle chiller unit	●
	Ball screw core cooling (X-, Y-, Z-axis)	○
	Scale feedback (X-, Y-, Z-axis)	○
Coolant / Chip disposal	Scale feedback (W-axis)	●
	Table chip pan	●
	Table screen	○
	All length drain	○
	Half drain + Half conveyor	○
	All length conveyor	○
	Table screen + All length drain	○
	Table screen + Half drain + Half conveyor	○
	Table screen + All length conveyor	○
	700 L (132.1gal) tank: Bucket	○
700 L (132.1gal) tank: Chip conveyor (hinge)	○	
Large capacity tank: Bucket	○	
Large capacity tank: Chip conveyor (hinge)	○	
Flood coolant	○	
Coolant through spindle	○	
Workpiece air blast	○	
ATC door & AAC cover	○	
Coolant package A	○	

Standard Machine Specifications

Stroke	X-axis (table right / left)	4250 mm (167.32")
	Y-axis (spindle head forward / backward)	3200 mm (125.98")
	Z-axis (spindle head up / down)	800 mm (31.5")
	W-axis (cross rail up / down)	1000 mm (39.37")
	Distance between spindle face and table top	0 ~ 1681 mm (0 ~ 66.18")
Table	Column height	1650 mm (64.96")
	Effective width between columns	2650 mm (104.33")
	Table size	2000 mm × 4000 mm (78.74" × 157.48")
	Table load capacity (evenly distributed)	22000 kg(48501 lbs)
	Table surface configuration	24 mm (0.94") T-slot × 9,200 mm (7.87") pitch
Spindle	Spindle speed	35 ~ 6000 rpm
	Angle head rotation speed	35 ~ 3000 rpm
	Gear ranges	2-step (electric)
	Spindle taper	7/24 taper No.50
	Spindle bearing ID	Φ100 (3.94")
Feedrate	Spindle acceleration time to top speed	5.25 s (0 → 6000 rpm)
	Rapid traverse rate (X-, Y-, and Z-axes)	30 m/min, 32 m/min, 20 m/min (1181, 1260, 787 IPM)
	Rapid traverse rate (W-axis)	3 m/min (118 IPM)
	Cutting feedrate (X-, Y-, Z-axes)	10 m/min (394 IPM)
Automatic tool changer	Tool shank	CAT No.50
	Tool magazine capacity	50
	Max. tool diameter / length (from gauge line) / weight	Φ125 mm / 400 mm / 25 kg (Φ4.92" / 15.75" / 55 lbs)
	Max. tool diameter when adjacent pockets empty ^{1,2}	Φ250 mm (9.84")
	Tool selection method	Random selection / shortest path (fixed pocket assignment)
Motors	Tool change time (chip-to-chip)	25 s (V tool), 24 s (H tool)
	Spindle motor (40% ED (30 min.rating) / cont. rating)	26 kW (35 HP) / 22 kW (30 HP)
Power requirement	Electrical power supply (40% ED (30 min.rating) / cont. rating)	67.44 kVA / 63.82 kVA
	Air source	More than 0.5 MPa (73 PSI) / 650 NL/min (24.76 ft ³ /min)
Machine size	Machine height	5191 mm (204.37")
	Floor space requirement	6250 mm × 10610 mm (246.06" × 417.72")
	Machine weight	43000 kg (94797 lbs)
CNC system	MAZATROL SmoothG	

¹ Face mill is up to 8".
² When attaching the Φ250 mm (Φ9.84") tool, the adjacent tool diameter is Φ230 mm (Φ9.06") or less.

Machine dimensions

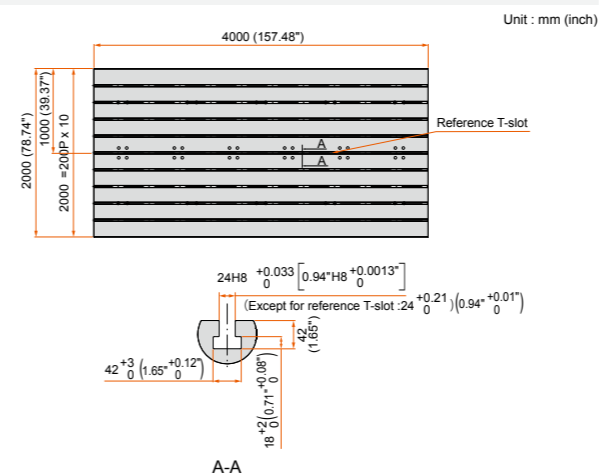


MAZATROL SmoothG Specifications

	MAZATROL	EIA
Number of controlled axes	Simultaneous 2 ~ 4 axes	
Least input increment	0.0001 mm, 0.00001 inch, 0.0001 deg	
High speed, high precision control	Shape compensation, Smooth corner control, Rapid traverse overlap, Rotary axis shape compensation	Shape compensation, Smooth corner control, Rapid traverse overlap, Rotary axis shape compensation, High-speed machining mode, High-speed smoothing control
Interpolation	Positioning (interpolation), Positioning (non-interpolation), Linear interpolation, Circular interpolation, Synchronous tapping*	Positioning (interpolation), Positioning (non-interpolation), Linear interpolation, Circular interpolation, Spiral interpolation, Helical interpolation, Cylindrical interpolation*, Fine spline interpolation*, NURBS interpolation*, Polar coordinate interpolation*, Synchronous tapping*
Feedrate	Rapid traverse, Cutting feed, Cutting feed (per minute), Cutting feed (per revolution), Dwell (time / rotation), Rapid traverse override, Cutting feed override, G0 speed variable control, Feedrate limitation, Variable acceleration control, G0 slope constant*	Rapid traverse, Cutting feed, Cutting feed (per minute), Cutting feed (per revolution), Inverse time feed, Dwell (time / rotation), Rapid traverse override, Cutting feed override, G0 speed variable control, Feedrate limitation, Time constant changing for G1, Variable acceleration control, G0 slope constant*
Program registration	Number of programs : 256 (Standard) / 960 (Max.), Program memory : 2 MB, Program memory expansion : 8 MB*, Program memory expansion : 32 MB*	
Control display	Display : 19" touch panel, Resolution : SXGA	
Spindle functions	S code output, Spindle speed limitation, Spindle speed override, Spindle speed reaching detection, Multiple position orient, Constant surface speed, Spindle speed command with decimal digits, Synchronized spindle control, Spindle speed range setting	
Tool functions	Number of tool offset : 4000, T code output for tool number, Tool life monitoring (time), Tool life monitoring (number of machined workpieces)	Number of tool offset : 4000, T code output for tool number, T code output for group number, Tool life monitoring (time), Tool life monitoring (number of machined workpieces)
Miscellaneous functions	M code output, Simultaneous output of multiple M codes	
Tool offset functions	Tool position offset, Tool length offset, Tool diameter / tool nose R offset, Tool wear offset	
Coordinate system	Machine coordinate system, Work coordinate system, Local coordinate system, Additional work coordinates (300 set)	
Machine functions	-	Tilted working plane ¹ , Shaping function*, Dynamic compensation II*, Tool center point control ^{1,1} , Workpiece positioning error compensation ^{1,1}
Machine compensation	Backlash compensation, Pitch error compensation, Ai Thermal shield	
Protection functions	Emergency stop, Interlock, Pre-move stroke check, SAFETY SHIELD (manual mode), SAFETY SHIELD (automatic mode)*, VOICE ADVISER	
Automatic operation mode	Memory operation	Memory operation, Tape operation, MDI operation, EtherNet operation*
Automatic operation control	Optional stop, Dry run, Manual handle interruption, MDI interruption, TPS, Restart, Single process, Machine lock	Optional block skip, Optional stop, Dry run, Manual handle interruption, MDI interruption, TPS, Restart, Restart 2, Collation stop, Machine lock
Manual measuring functions	Tool length teach, Touch sensor coordinates measurement, Workpiece offset measurement, WPC coordinate measurement, Measurement on machine	Tool length teach, Tool offset teach, Touch sensor coordinates measurement, Workpiece offset measurement, Measurement on machine
Automatic measuring functions	WPC coordinate measurement, Automatic tool length measurement, Sensor calibration, Tool breakage detection, External tool breakage detection*	Automatic tool length measurement, Sensor calibration, Tool breakage detection, External tool breakage detection*
MDI measurement	Semi automatic tool length measurement, Full automatic tool length measurement, Coordinate measurement	
Interface	PROFIBUS-DP*, EtherNet/IP*, CC-Link*, CC-Link IE Field Basic	
Card interface	SD card interface, USB	
EtherNet	10 M / 100 M / 1 Gbps	
Security	Security software*	

* Option
¹ Simultaneous 4-axis control

Table dimensions



Max. tool dimensions

