

FJV
S E R I E S

35/60	5 Face 35/60
35/80	5 Face 35/80
35/120	5 Face 35/120
60/80	5 Face 60/80
60/120	5 Face 60/120
60/160	5 Face 60/160
100/120	5 Face 100/120
100/160	5 Face 100/160

Advanced features of the MAZATROL SmoothG CNC

Touch screen operation similar to your smartphone/tablet

PC with Windows® 8 embedded OS

Fastest CNC in the world with latest hardware and software for unprecedented speed and precision

Easy conversational programming of multiple-surface machining

Smooth graphical user interface and support functions for unsurpassed ease of operation

MTConnect® ready for convenient networking

Easily configure machine parameters for different workpiece materials and application requirements

Windows is a registered trademark of Microsoft Corporation in the United States and other countries.

MTConnect is a registered trademark of AMT in the United States and other countries.



MAZATROL
SMOOTHG
2000iHE

MAZATROL SmoothC is optionally available



Designed for high-accuracy and high-efficiency machining of large workpieces

High-accuracy, high-productivity double-column machining centers

FJV SERIES

FJV-60/80

Shown with optional equipment



5-face high-accuracy, double-column vertical machining centers

FJV 5 Face SERIES

FJV 5 FACE 60/80

Shown with optional equipment



Extensive Series Range

Vertical machining centers featuring No. 50 taper spindles
for large workpieces

FJV SERIES



FJV - 35/60



FJV - 60/80



FJV - 100/160

FJV 5 FACE SERIES



FJV 5 FACE - 35/60



FJV 5 FACE - 60/80



FJV 5 FACE - 100/160

	35/60	35/80	35/120
Length	1740 mm (68.5")	2240 mm (88.19")	3240 mm (127.56")
Table Width		750 mm (29.53")	
Load capacity	2500 kg (5512 lbs)	3000 kg (6614 lbs)	
Travel X axis	1500 mm (59.06")	2000 mm (78.74")	3000 mm (118.11")
Y axis		800 mm (31.5")	
Z axis		660 mm (25.98")	
Effective width between columns		860 mm (33.9")	

	60/80	60/120	60/160
Length	2240 mm (88.19")	3000 mm (118.11")	4000 mm (157.48")
Table Width		1250 mm (48.21")	
Load capacity	4000 kg (8818 lbs)	5000 kg (11023 lbs)	
Travel X axis	2000 mm (78.74")	3200 mm (125.98")	4200 mm (165.35")
Y axis		1400 mm (55.12")	
Z axis		660 mm (25.98")	
Effective width between columns		1500 mm (59.06")	

	100/120	100/160
Length	3000 mm (118.11")	4000 mm (157.48")
Table Width		2000 mm (78.74")
Load capacity	5000 kg (11023 lbs)	10000 kg (22046 lbs)
Travel X axis	3200 mm (125.98")	4200 mm (165.35")
Y axis		2450 mm (96.46")
Z axis		660 mm (25.98")
Effective width between columns		2500 mm (98.43")

Higher Accuracy

High-rigidity construction for high-accuracy machining

Mazak has produced double-column vertical machining centers like the VQC, AJV and FJV Series since 1982. This extensive experience is incorporated in every vertical machining center manufactured today.

The FJV Series features symmetrical machine design, integral spindle/motors, linear roller guides, ballscrew core cooling and the THERMAL SHIELD heat displacement control to ensure high accuracy.

High-accuracy machine construction

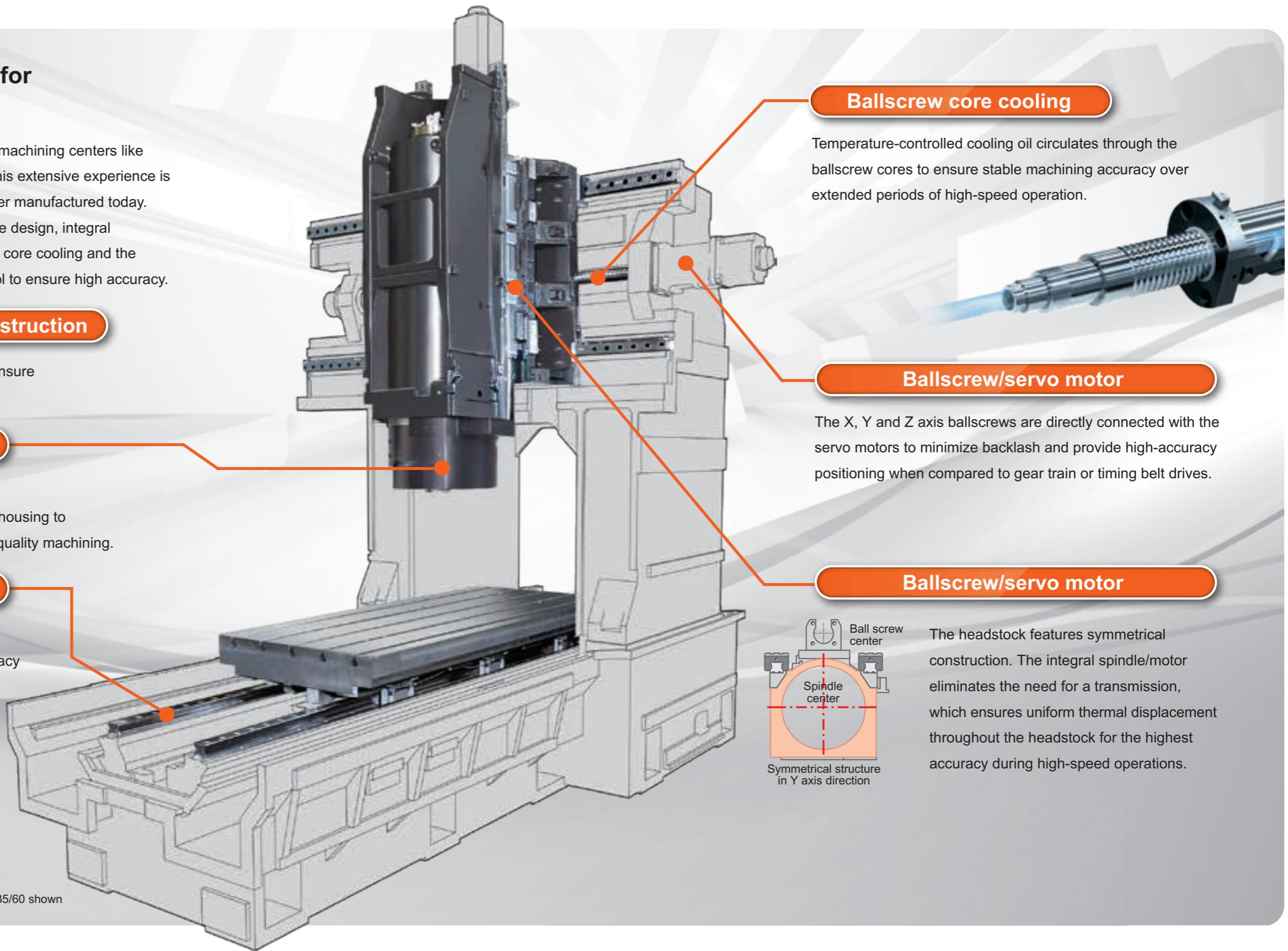
The high rigidity machine base and column ensure high accuracy over a long service life.

Headstock cooling system

Temperature-controlled cooling oil circulates through the outside of the spindle and motor housing to eliminate thermal distortion and ensure high-quality machining.

Linear roller guides

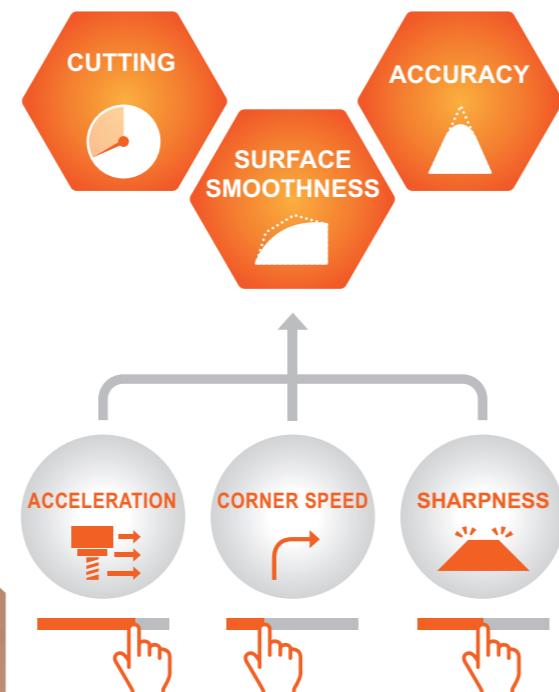
Linear roller guides on the X, Y and Z axes utilized by the FJV Series provide high-accuracy positioning. Additionally, with their high rigidity and considerably lower friction, high-speed feedrates can be used over a wide range of applications, from heavy-duty to high-speed cutting.



Higher Accuracy, Higher Productivity

SMOOTH Machining Configuration

Optimize programs with just a touchscreen slider



Machining time comparison

I Previous machining center model

Standard setting

I SMOOTH Machining Configuration setting

Smoothness priority



15% reduction

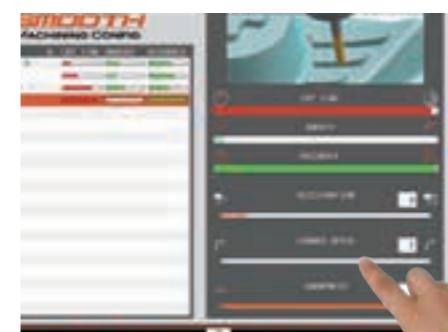
When a machine tool is shipped from the factory, all of the CNC parameters are set for general-purpose machining. In most cases, these settings work for the majority of users and will rarely need to be changed.

However, for aerospace workpieces or workpieces with complex surfaces, such as dies and molds, these machine parameter settings must be manually changed in order to produce workpieces with the required accuracy in the shortest possible cycle time. To optimize these settings, they must be changed according to the type of material, the type of tooling and the type of machining process. This is a complex procedure that requires a skilled technician to perform efficiently.

As the settings are changed, the default settings for acceleration, electrical gain and tolerances, as well as numerous other factors, will be modified. For instance, if acceleration is increased in order to reduce the cycle time, the accuracy and surface finish may be impacted – corners may not be sharp and gouges may occur in surfaces.

One must know which settings to change, how much to change each setting and the corresponding effect on other settings for each change to tune a machine efficiently. After the workpiece is completed, all settings must then be returned to their default values.

These complicated procedures are eliminated with SMOOTH Machining Configuration



While watching the machining of a complex surface, use the touchscreen slider to change the settings for accuracy, speed or smoothness. As changes in one factor are made, the others will automatically change. For example, if accuracy is increased, there will be a corresponding decrease in speed.

When the optimal cutting conditions are obtained, these settings can be easily stored in the CNC's memory. The next time the same type of material is machined with the same type of tool, these settings can be easily called up by M/G code. Several different settings can be used in a single program. Conventionally, the same parameter settings are used for the entire program. Seven different settings are registered in the control's memory at the factory (shown to the left). You are able to add up to 20 settings in total.

High Productivity

Spindle specifications available to meet a wide variety of production requirements

Powerful, high-speed integral spindle/motor

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



Minimum interference

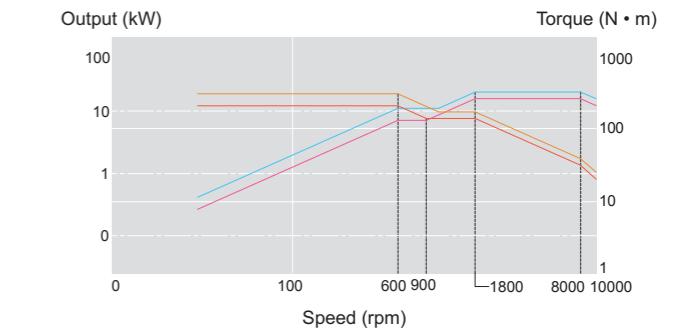
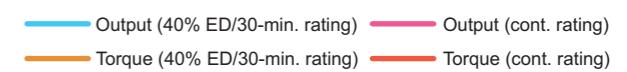
The compact spindle cartridge is designed for minimal interference. This provides a wider machining area as well as the ability to use shorter tools for improved machining performance and accuracy.



Standard 10000 rpm spindle

The standard 10000 rpm spindle has the speed and power for the machining of a wide variety of workpiece materials, from cast iron and steel to aluminum and other nonferrous materials.

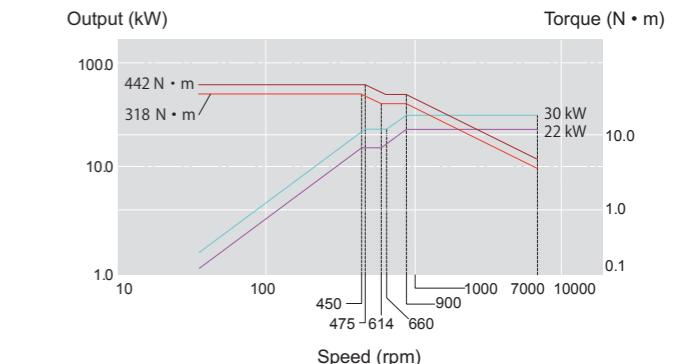
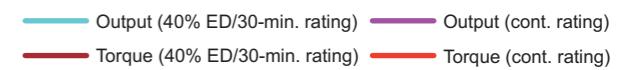
Max. speed	10000 rpm
Motor output	40% ED (30-min. rating) cont. rating
Tool shank	No. 50



High-torque 7000 rpm spindle FJV Series FJV 5 Face Series OPTION

Optional 7000 rpm high-torque (442 Nm (326 ft lbs) (40% ED/30-min. rating)) spindle for the heavy-duty machining of steel or cast iron material.

Max. speed	7000 rpm
Motor output	40% ED (30-min. rating) cont. rating
Tool shank	No. 50

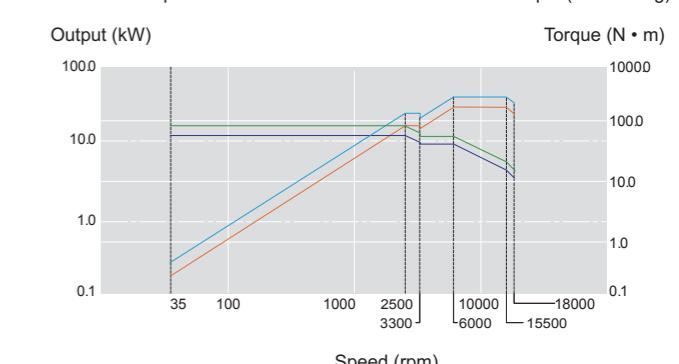


High-speed 18000 rpm No. 40 spindle FJV Series OPTION

The high-speed 18000 rpm No. 40 spindle performs high-speed machining of aluminum and other nonferrous materials for enhanced efficiency.

Max. speed	18000 rpm
Motor output	50% ED cont. rating
Tool shank	No. 40

Note: Cannot be used with multi-surface machining attachment



Higher Productivity

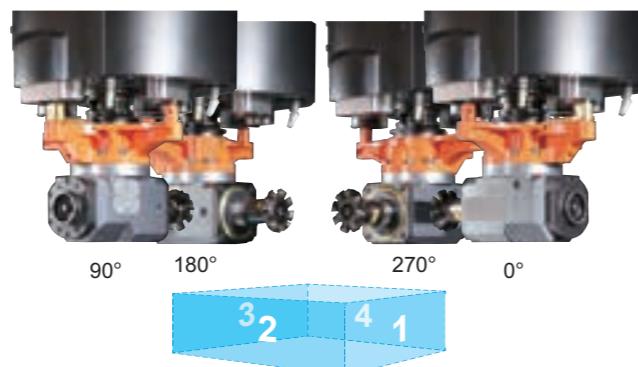
FJV 5 Face Series

5 Face machining system for FJV 5 Face Series

MAZAK 5 Face Angle Head

Four face machining with one angle tool

The MAZAK angle head is tightly clamped by four hydraulic clamping units on the spindle housing surface. The angle head can be indexed to four positions to minimize the number of required tools.



High-efficiency cutting of 4 side surfaces

Unlike conventional anfle tools, the angle head is strongly clamped by three of the clamping units. Heavy-duty cutting can be performed thanks to this rigid construction

Max. speed: 2000 rpm

Max. input power: 12 kW (16 HP)

Material removal rate: 418 cc/min
(25 in³/min)

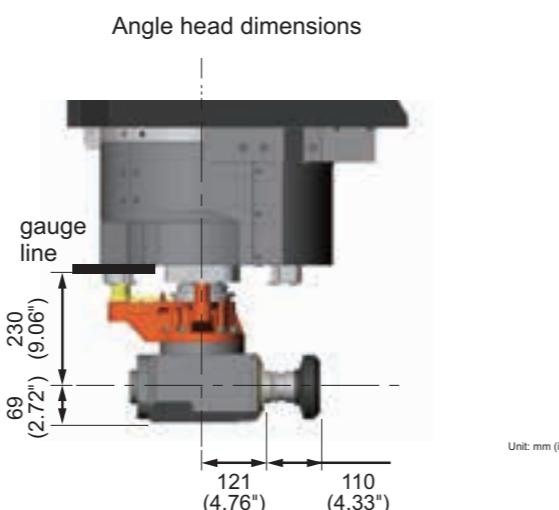
(Workpiece material: S45C)

Cutting conditions	Depth of cut	5 mm (0.197")
	Feedrate (per tooth)	0.30 mm/tooth (0.0118 inch/tooth)
	Cutting width	70 mm (2.76")

Cutting tool	Tool diameter	ø100 mm (3.94")
	Number of teeth	5 teeth
	Holder type	A63-FMA31.75-60
	Tool type	HSG45-5100R
	Insert	SGHN1504AZN-44

Wide angle head cutting range

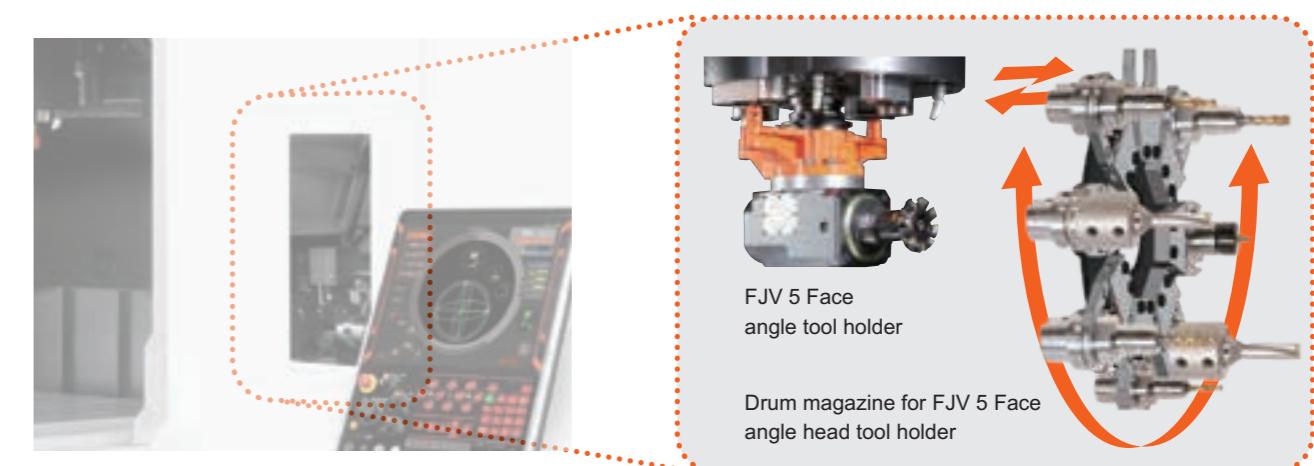
The compact angle head reduces interference and creates large machining area.



Dedicated magazine for angle head tool

Enhanced versatility

The dedicated magazine for angle tools has a storage capacity of eight tools, eliminating the need for multiple angle tools.



Tool shank: HSK-A63
Capacity: 8 tools

Max. tool size (face mill): ø125 mm x 207 mm (ø4.92" x 8.15")
Max. tool size (drill): ø40 mm x 250 mm (ø1.57" x 9.84")

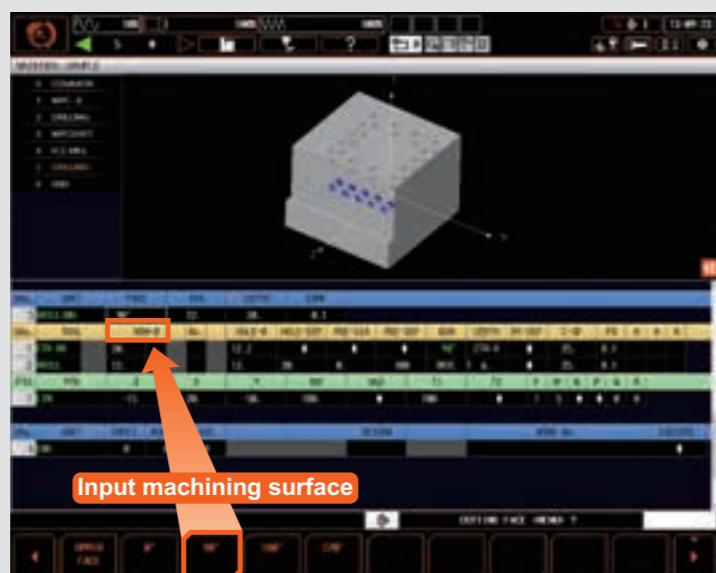
Higher Productivity

FJV 5 Face Series

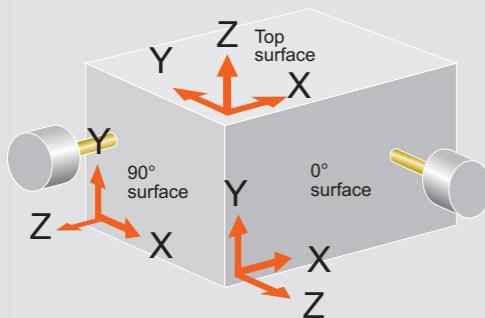
Simplified programming for angle head machining

Convenient programming even for five face machining

Can be performed using both MAZATROL and EIA programs. Side-surface machining is easily programmed using the conversational MAZATROL format, by simply entering which surface to machine prior to normal data entry.



Coordinate system and machining surface



EIA/ISO program format

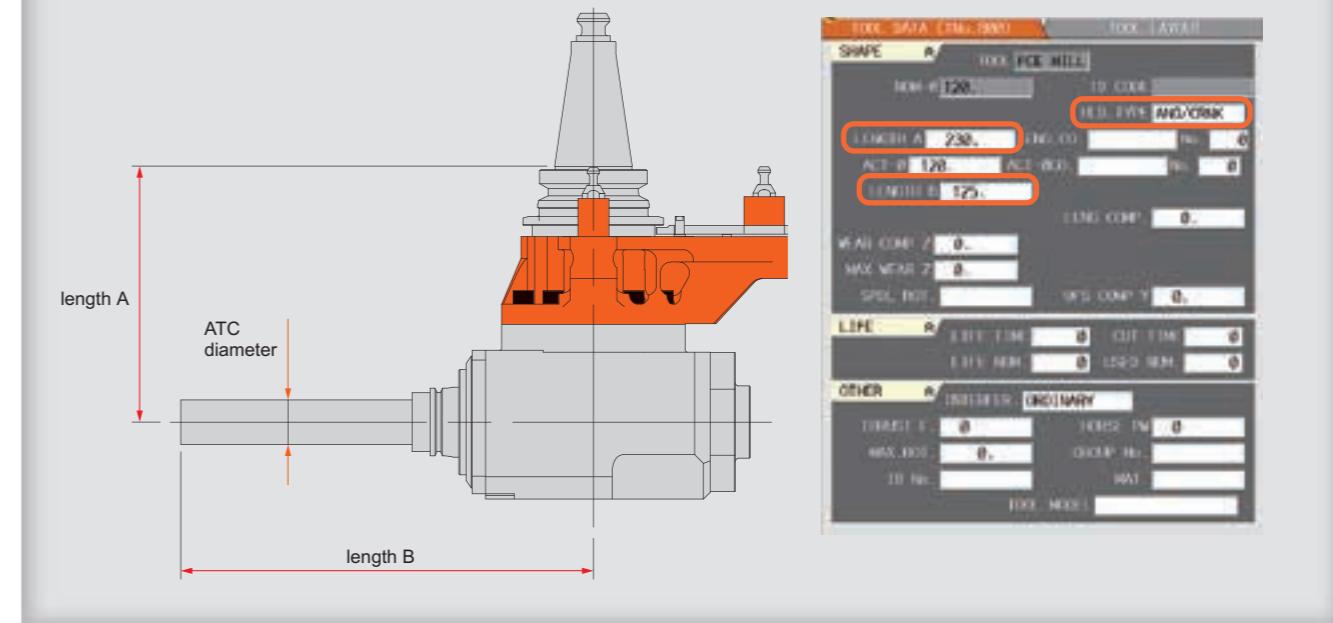
G-code coordinate conversion is used for EIA/ISO programs.

G-code for five face programming

Top surface mode	G17.1
0° surface mode	G17.2
90° surface mode	G17.3
180° surface mode	G17.4
270° surface mode	G17.5
Cancel	G17.9

Tool data entry for angle head

Data for tools used with the angle head are input the same way as data for other tools.

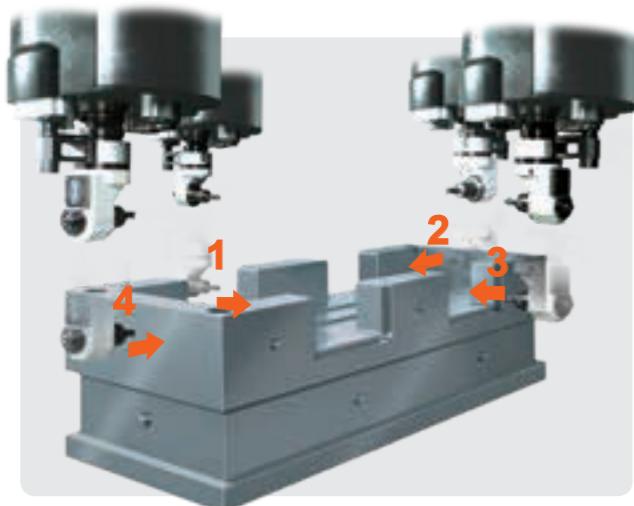


Higher Productivity

FJV Series

Multi-surface attachment

OPTION



Side-surface machining can be performed by changing the spindle index angle of the special clamping unit and angle tool mounted on the machine spindle. The ability to machine multiple surfaces of large workpieces in a single setup allows for the highest levels of productivity.

*Option for 10000 rpm and 7000 rpm No. 50 spindle

Angle holder for multi-surface machining attachment

Standard angle holder

OPTION



The maximum speed of the standard angle tool is 3000 rpm. The angle tool can be stored in the 30-tool and 60-tool magazines.

High-speed angler holder

OPTION



The top speed of the high-speed angle toll is 5000 rpm. The high-speed angle tool can be stored in the 30-tool and 60-tool magazines.

Heavy-duty angle holder

OPTION



The heavy-duty angle tool has a top speed of 2000 rpm. The angle tool can be stored in a special tool magazine for heavy-duty tools.

A

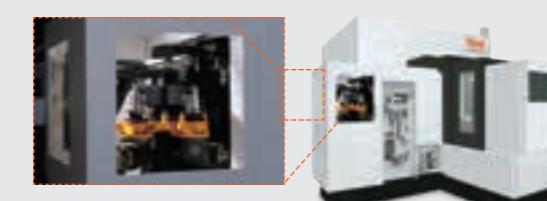


**A-type
(long)**

Special tool magazine for heavy-duty angle holders

OPTION

The magazine has a storage capacity of three heavy-duty angle holders which can be automatically loaded/unloaded to/from the spindle.



Automatic tool changer

Automatic tool changer

[*]: Option

Machine model	FJV-35	FJV-60	FJV-100
Tool change time (chip-to-chip)	5.0 s	6.2 s	8.5 s
Tool storage capacity	30 tools [60 tools]	30 tools [60 tools]	60 tools
Max. tool diameter		ø125 mm (ø4.92")	
Max. tool diameter with adjacent pockets empty		ø210 mm (ø8.27")	
Max. tool length		380 mm (14.96")	
Max. tool weight		20 kg (44 lbs)	

2-pallet changer

OPTION

The next workpiece can be loaded during the machining of the current workpiece for increased productivity.

2-pallet changer

Machine model	FJV-35/60	FJV-35/80	FJV-60/80	FJV-60/120	FJV-60/160
Pallet change time	45 s	51 s	65 s	73 s	90 s
Max. workpiece size (X axis)	1740 mm (68.5")		2240 mm (88.19")	3000 mm (118.11")	4000 mm (157.48")
Max. workpiece size (Y axis)		750 mm (29.53")		1250 mm (49.21")	
Max. workpiece size (Z axis)			650 mm (25.59")		
Max. workpiece weight	1600 kg (3527 lbs)	3000 kg (6614 lbs)	4000 kg (8818 lbs)	5000 kg (11023 lbs)	

NC Rotary Table

OPTION

The optional NC rotary table and additional axis provide the ability to machine complex contours by interpolating the linear and rotary axes.

Ergonomics

A design focused on ergonomics provides unsurpassed ease of operation

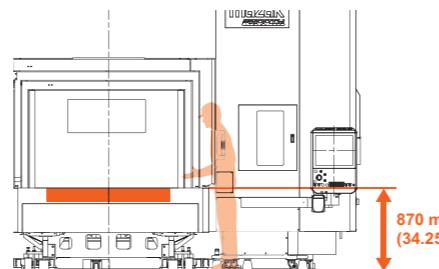
Large door opening

The telescoping front cover provides an extremely wide opening for the convenient loading and unloading of large workpieces.

Table height: 870 mm (34.25")*

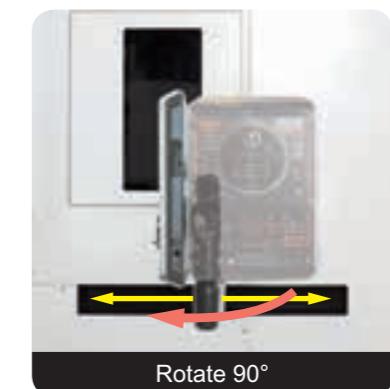
Designed for the convenient setup of fixtures and loading/unloading of workpieces.

*970 mm (37.01") for FJV-100, FJV 5 Face-100



Adjustable CNC operation panel

The operation touch panel can be tilted to the optimal position to ensure ease of operation.

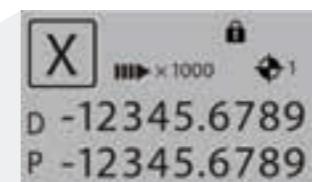


Remote manual pulse generator

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. Four different positions can be registered in memory by the remote manual pulse generator. A wireless version is available as an option.

Tool magazine operation panel

The tool magazine operation panel is designed for increased ease of operation. Instead of having just a forward/reverse button for indexing the tool magazine and manually positioning the desired tool pocket, the pocket number or tool number can be input into the operation panel's numeric keyboard and the desired pocket will automatically come into position.



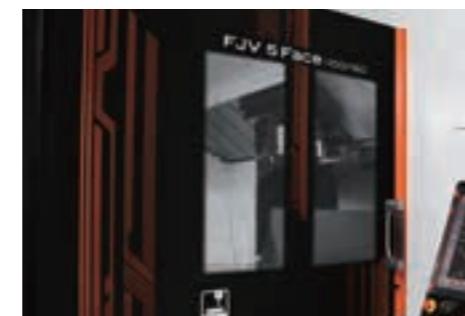
End cover window*

The windows on the end cover allow the operator to easily monitor machining.

*Option for FJV-35 series, FJV 5 Face-35 series

Large window

The large window on the operator door allows workpiece machining to be easily monitored by the operator.



Ease of Maintenance

Simplified daily checking for convenient maintenance to minimize machine down-time

1 Central maintenance area

Items requiring frequent access for machine maintenance are conveniently located on a single panel.



2 Large capacity spiral conveyors

Spiral conveyors on both sides of the machine table smoothly remove machined chips. If a higher removal capacity is required, hinge-type chip conveyors on both sides of the machine table can optionally be placed.



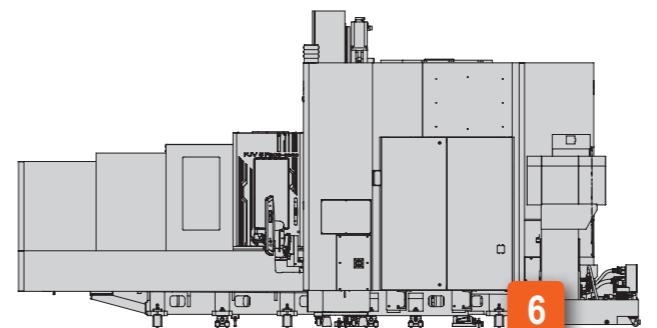
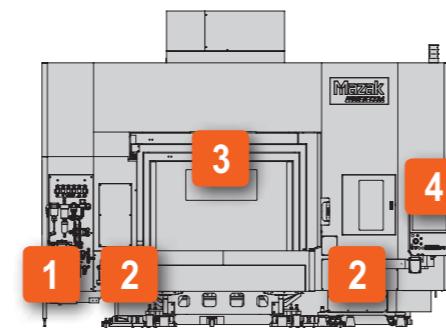
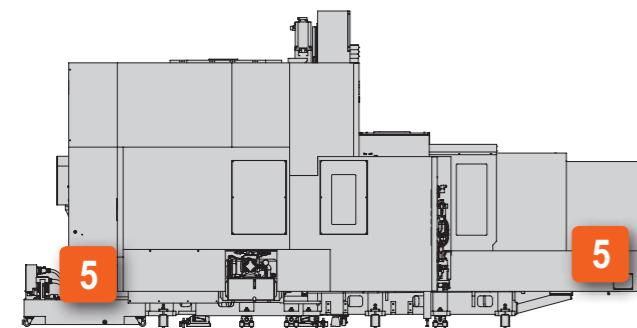
3 Automatic Z axis retraction

The Z axis retraction functionality automatically pulls the spindle up from the machining surface to prevent workpiece damage in the case of sudden electrical power loss.



4 Maintenance screen

A graphical display shows the status of consumables such as coolant, lubrication oil and filters, as well as the time remaining before refilling or changing is necessary. Ensures machine operation by providing a convenient maintenance schedule.



5 Designed for the smooth flow of machined chips.

The inner walls of the machine coolant cover are angled more than 45 degrees to prevent the accumulation of machined chips, considerably reducing the time required for cleaning the machining area.



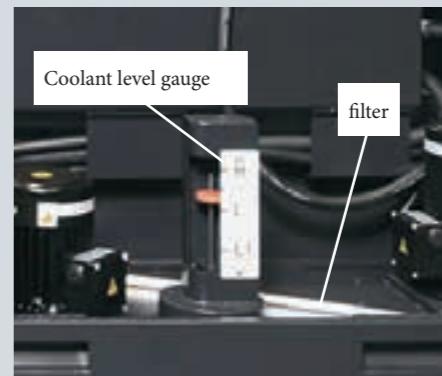
Inner wall cover



Enlarged chip ducts for smooth chip disposal

6 Coolant level gauge and filter designed for convenient checking.

A white float-type level gauge is used to indicate the amount of coolant in the tank. Additionally, the coolant hoses are easily removed for maintenance thanks to quick connect/disconnect couplings.



MAZATROL CNC System

MAZATROL ***SMOOTHG*** 4-axis simultaneous CNC



Fastest CNC in the world

- Latest hardware and software for unprecedented speed and precision

Smooth graphical user interface

- PC with Windows® 8 embedded OS
- MAZATROL Smooth graphical user interface for unsurpassed ease of operation
- Touch screen operation

Process home 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



Tool data



Set up



Machining



Maintenance

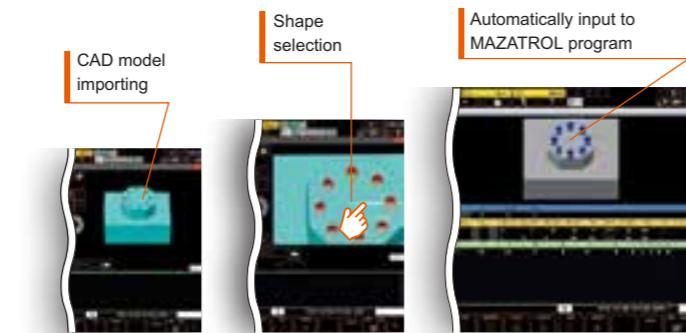
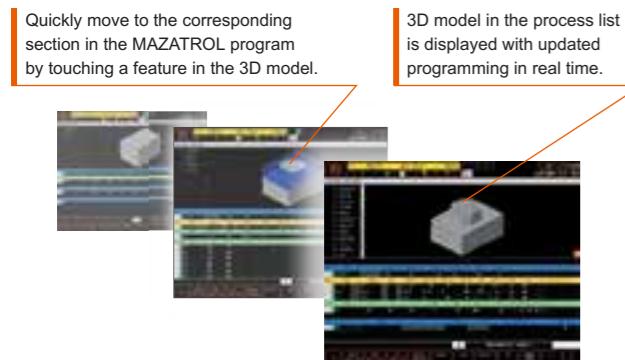
Programming screen links tool path, workpiece shape and programming to reduce programming time.

QUICK MAZATROL

The 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 so an operator may easily and quickly check for any programming error.

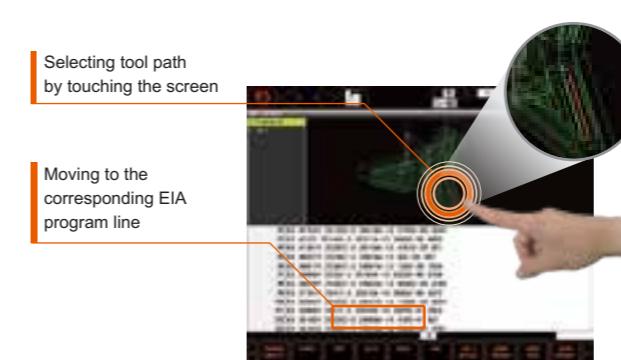
3D ASSIST

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



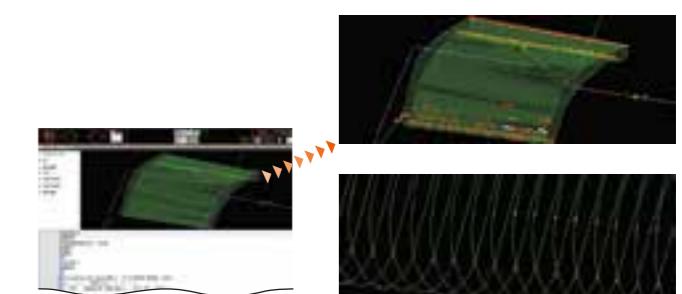
QUICK EIA

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



VIEW SURF

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.

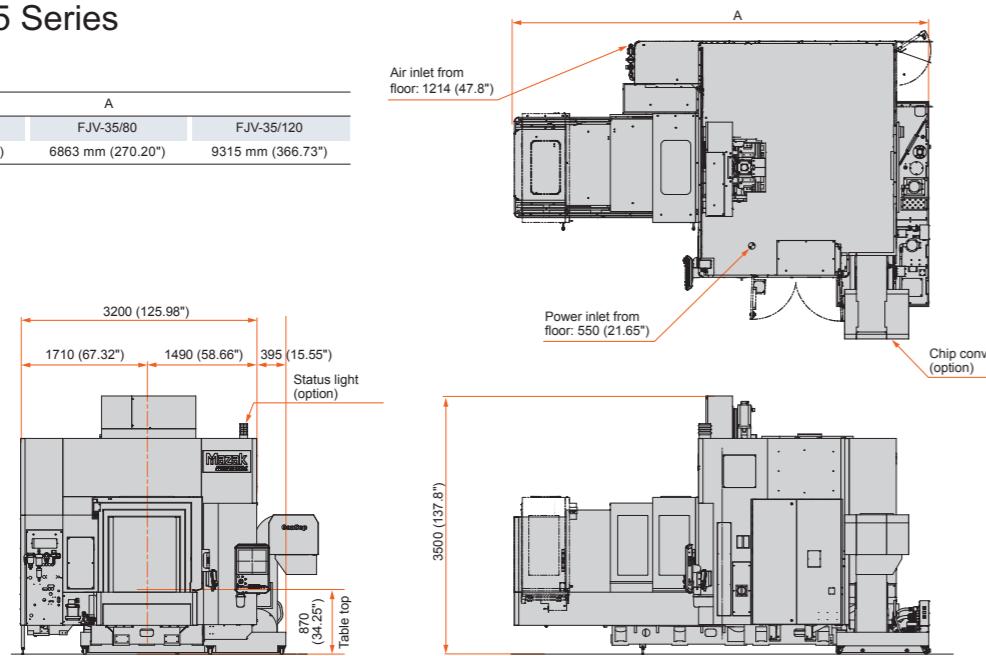


FJV Series Machine Dimensions

Unit: mm (inch)

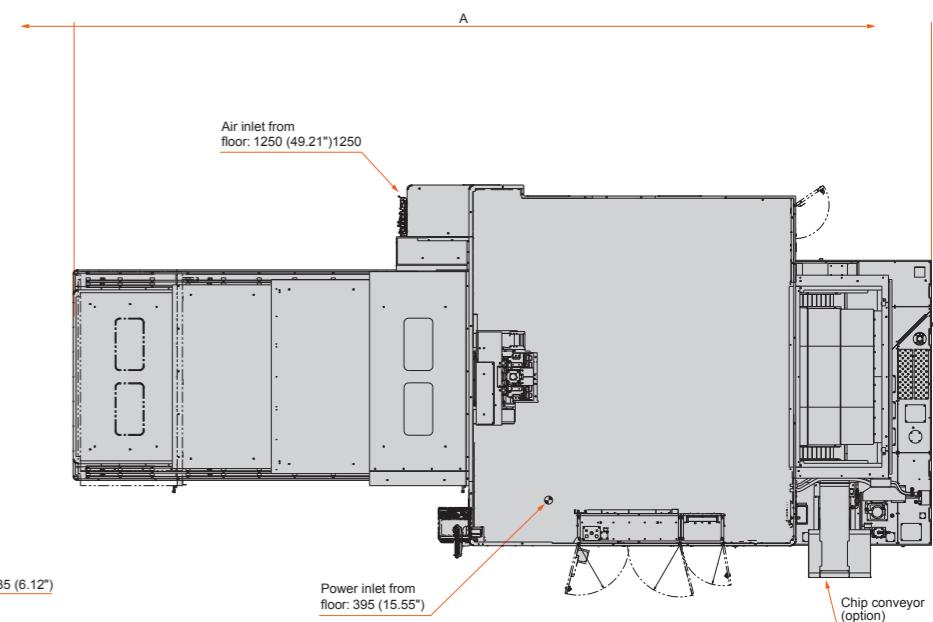
FJV-35 Series

A	FJV-35/60	FJV-35/80	FJV-35/120
	5637 mm (221.93")	6863 mm (270.20")	9315 mm (366.73")



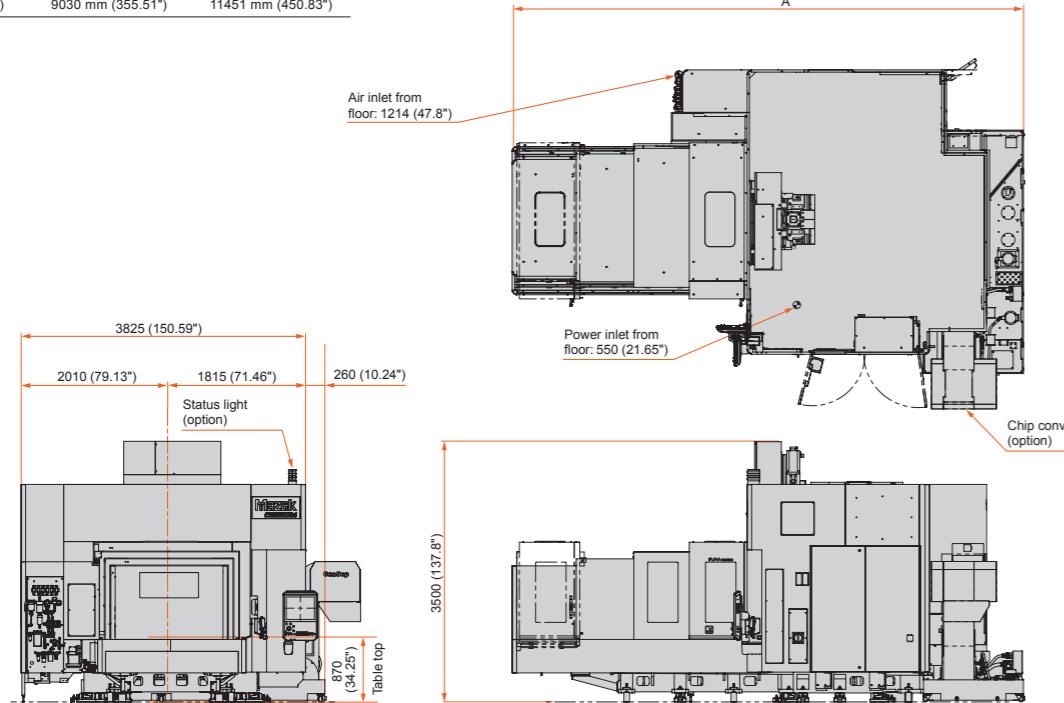
FJV-100 Series

A	FJV-100/120	FJV-100/160
	9372 mm (368.98")	12044 mm (474.17")



FJV-60 Series

A	FJV-60/80	FJV-60/120	FJV-60/160
	6895 mm (271.46")	9030 mm (355.51")	11451 mm (450.83")

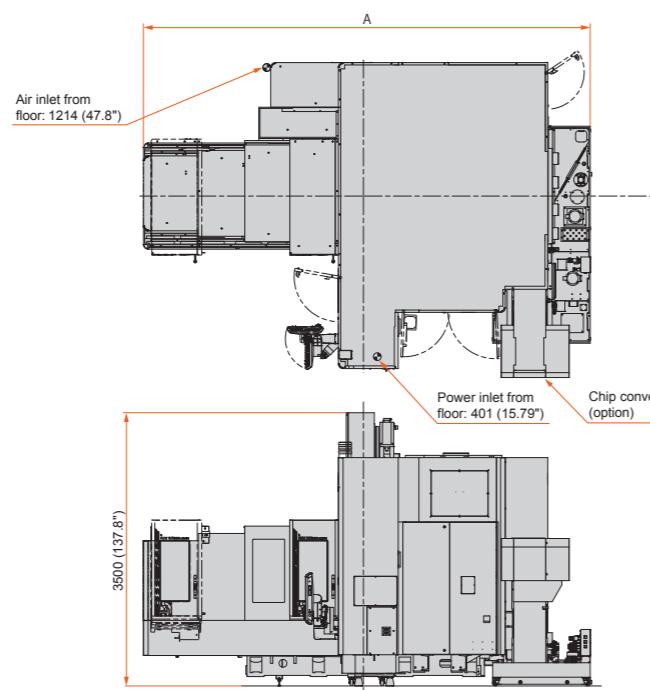
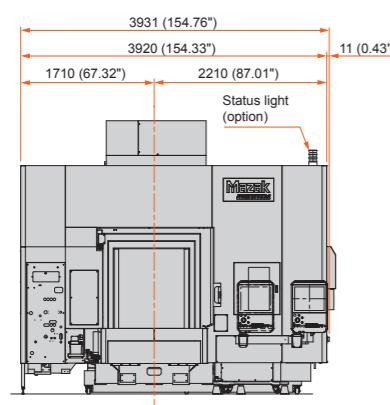


FJV 5 Face Series Machine Dimensions

Unit: mm (inch)

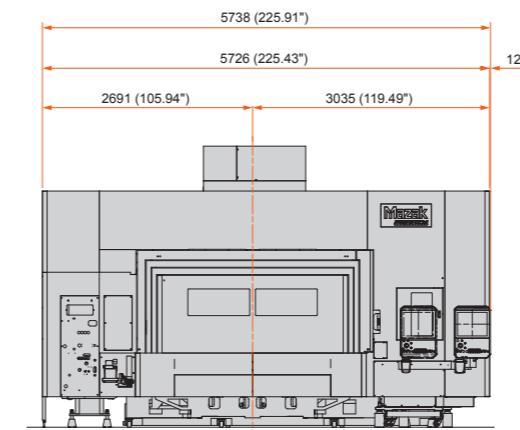
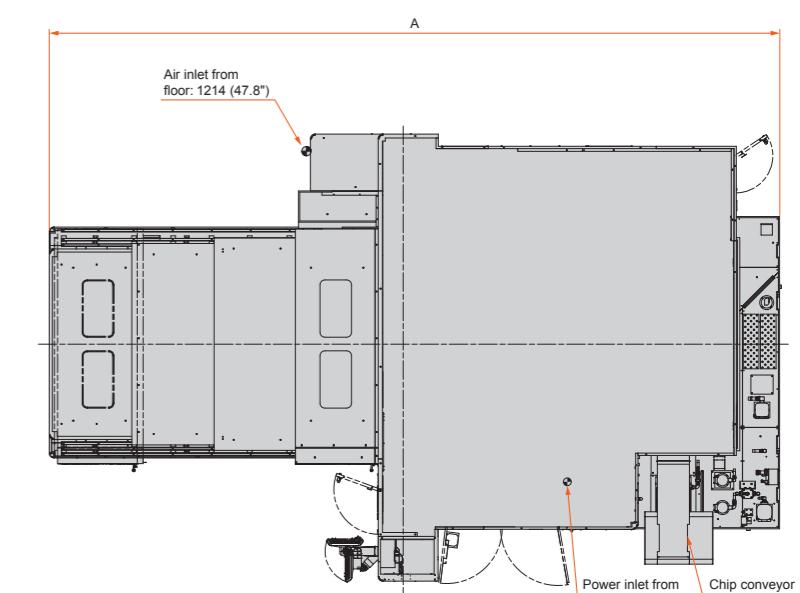
FJV 5 Face-35 Series

A		
FJV 5 Face-35/60	FJV 5 Face-35/80	FJV 5 Face-35/120
5742 mm (226.06")	6863 mm (270.2")	9315 mm (366.73")



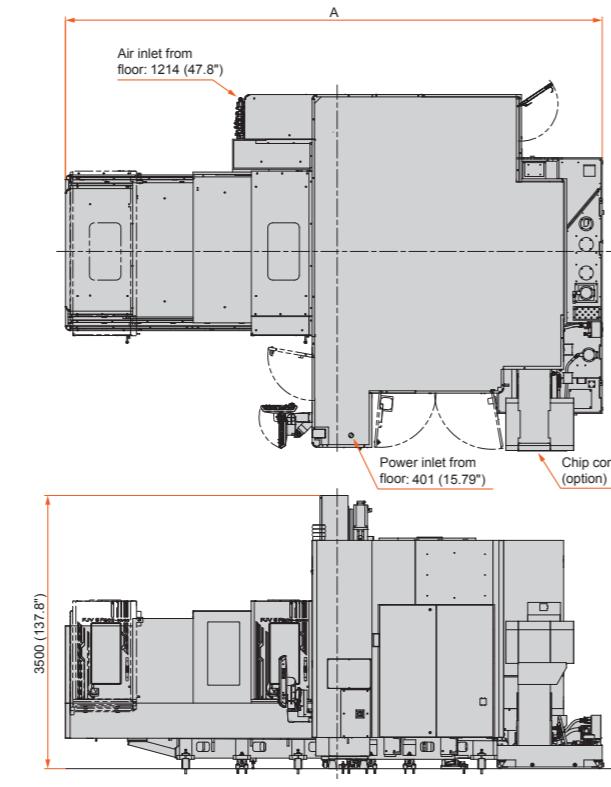
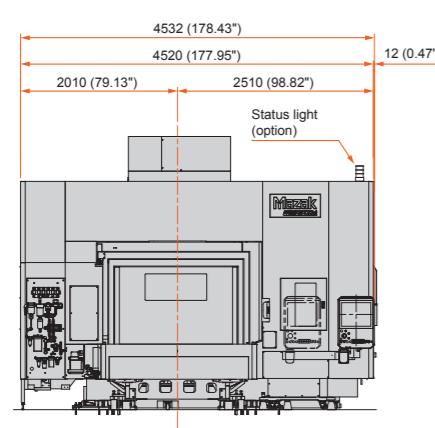
FJV 5 Face-100 Series

A	
FJV 5 Face-100/120	FJV 5 Face-100/160
9372 mm (368.98")	12044 mm (474.17")



FJV 5 Face-60 Series

A		
FJV 5 Face-60/80	FJV 5 Face-60/120	FJV 5 Face-60/160
6895 mm (271.46")	9030 mm (355.51")	11451 mm (450.83")



FJV Series Standard Machine Specifications

Unit: mm (inch)

	FJV-35/60	FJV-35/80	FJV-35/120	FJV-60/80	FJV-60/120	FJV-60/160	FJV-100/120	FJV-100/160
Stroke	X axis (table left/right) Y axis (spindle head back/forth)	1500 mm (59.06") 800 mm (31.5")	2000 mm (78.74") 660 mm (25.98")	3000 mm (118.11")	2000 mm (78.74") 1400 mm (55.12") 660 mm (25.98")	3200 mm (125.98") 160 ~ 820 mm (6.3" ~ 32.28") 1500 mm (59.06")	4200 mm (165.35") 160 ~ 820 mm (6.3" ~ 32.28") 1500 mm (59.06")	3200 mm (125.98") 2450 mm (96.46") 660 mm (25.98")
	Z axis (spindle head up/down)	660 mm (25.98")				660 mm (25.98")		660 mm (25.98")
	Distance from table top to spindle nose	160 ~ 820 mm (6.3" ~ 32.3")				160 ~ 820 mm (6.3" ~ 32.28")		160 ~ 820 mm (6.3" ~ 32.28")
Table	Effective width between columns	860 mm (33.9")				1500 mm (59.06")		2500 mm (98.43")
	Table size	1740 mm × 750 mm (68.5" × 29.53")	2240 mm × 750 mm (88.19" × 29.53")	3240 mm × 750 mm (127.56" × 29.53")	2240 mm × 1250 mm (88.19" × 49.21")	3000 mm × 1250 mm (118.11" × 49.21")	4000 mm × 1250 mm (157.48" × 49.21")	3000 mm × 2000 mm (118.11" × 78.74")
	Table load capacity (evenly distributed)	2500 kg (5512 lbs)	3000 kg (6614 lbs)		4000 kg (8818 lbs)	5000 kg (11023 lbs)		5000 kg (11023 lbs)
	Table top surface	18 mm (0.71") T-slot × 5, 150 mm (5.91") pitch			22 mm (0.87") T-slot × 9, 140 mm (5.51") pitch		22 mm (0.87") T-slot × 9, 200 mm (7.87") pitch	
Spindle	Spindle speed	35 ~ 10000 rpm			35 ~ 10000 rpm		35 ~ 10000 rpm	
	Gear ranges	2-step (electric)			2-step (electric)		2-step (electric)	
	Spindle taper	No. 50			No. 50		No. 50	
	Spindle bearing ID	ø100 mm (ø3.94")			ø100 mm (ø3.94")		ø100 mm (ø3.94")	
	Spindle acceleration time to top speed	3.0 s (0 → 10000 rpm)			3.0 s (0 → 10000 rpm)		3.0 s (0 → 10000 rpm)	
Feedrate	Rapid traverse rate (X axis)	40000 mm/min (1575 IPM)	32000 mm/min (1260 IPM)		40000 mm/min (1575 IPM)	32000 mm/min (1260 IPM)	22000 mm/min (866 IPM)	30000 mm/min (1181 IPM)
	Rapid traverse rate (Y, Z axis)	40000 mm/min/30000 mm/min (1575/1181 IPM)			40000 mm/min/30000 mm/min (1575/1181 IPM)			40000 mm/min/30000 mm/min (1575/1181 IPM)
	Rapid traverse rate (X, Y, Z axis)	1 ~ 30000 mm/min (0.03 ~ 1181 IPM)	1 ~ 20000 mm/min (0.03 ~ 787 IPM)		1 ~ 30000 mm/min (0.03 ~ 1181 IPM)	1 ~ 30000 mm/min (0.03 ~ 1181 IPM)	1 ~ 11000 mm/min (0.03 ~ 433 IPM)	1 ~ 19000 mm/min (0.03 ~ 748 IPM)
Automatic tool changer	Tool shank	No. 50			No. 50		No. 50	
	Tool storage capacity	30			30		60	
	Max. tool diameter/length (from gauge line)/weight	ø125 mm/380 mm/20 kg (ø4.92"/14.96"/44 lbs)			ø125 mm/380 mm/20 kg (ø4.92"/14.96"/44 lbs)		ø125 mm/380 mm/20 kg (ø4.92"/14.96"/44 lbs)	
	Max. tool diameter with adjacent pockets empty	ø210 mm (ø8.27")			ø210 mm (ø8.27")		ø210 mm (ø8.27")	
	Tool selection method	Random selection, shortest path			Random selection, shortest path		Random selection, shortest path	
	Tool change time (chip-to-chip)	5.0 s			6.2 s		8.5 s	
Motors	Spindle motor (40% ED (30-min. rating)/cont. rating)	AC37 kW (50 HP)/30 kW (40 HP)			AC 37 kW (50 HP)/30 kW (40 HP)		AC37 kW (50 HP)/30 kW (40 HP)	
	Flood coolant pump motor (50 Hz/60 Hz)	730 W/1210 W			730 W/1210 W		730 W/1210 W	
Power requirement	Required power capacity (30-min./cont. rating)	75.59 kVA/65.84 kVA	76.29 kVA/66.54 kVA		75.65 kVA/65.90 kVA	76.29 kVA/66.54 kVA	79.72 kVA/69.80 kVA	73.73 kVA/63.99 kVA
	Air source	More than 0.5 MPa (73 psi)/1200 NL/min (42.4 ft³/min)			More than 0.5 MPa (73 psi)/1200 NL/min (42.4 ft³/min)		More than 0.5 MPa (73 psi)/1200 NL/min (42.4 ft³/min)	
Machine size	Machine height	3500 mm (137.8")			3500 mm (137.8")		3600 mm (141.73")	
	Floor space requirement	3595 mm × 5637 mm (141.54" × 221.93")	3595 mm × 6863 mm (141.54" × 270.20")	3595 mm × 9315 mm (141.54" × 366.73")	4085 mm × 6895 mm (160.83" × 271.46")	4085 mm × 9030 mm (160.83" × 355.51")	3595 mm × 9315 mm (141.54" × 366.73")	5217.35 mm × 9372 mm (205.41" × 368.98")
	Machine weight	17600 kg (38800 lbs)	19100 kg (42110 lbs)	23100 kg (56926 lbs)	26000 kg (57320 lbs)	31000 kg (68340 lbs)	35000 kg (77160 lbs)	44600 kg (98325 lbs)

FJV 5 Face Series Standard Machine Specifications

Unit: mm (inch)

	FJV 5 Face-35/60	FJV 5 Face-35/80	FJV 5 Face-35/120	FJV 5 Face-60/80	FJV 5 Face-60/120	FJV 5 Face-60/160	FJV 5 Face-100/120	FJV 5 Face-100/160
Stroke	X axis (table left/right)	1500 mm (59.06")	2000 mm (78.74")	3000 mm (118.11")	2000 mm (78.74")	3200 mm (125.98")	4200 mm (165.35")	3200 mm (125.98")
	Y axis (spindle head back/forth)		800 mm (31.5")		1400 mm (55.12")			2450 mm (96.46")
	Z axis (spindle head up/down)		660 mm (25.98")		660 mm (25.98")		660 mm (25.98")	
Table	Distance from table top to spindle nose		160 ~ 820 mm (6.3" ~ 32.3")		160 ~ 820 mm (6.3" ~ 32.28")		160 ~ 820 mm (6.3" ~ 32.28")	
	Effective width between columns		860 mm (33.9")		1500 mm (59.06")		10000 kg (22046 lbs)	
	Table size	1740 mm × 750 mm (68.5" × 29.53")	2240 mm × 750 mm (88.19" × 29.53")	3240 mm × 750 mm (127.56" × 29.53")	2240 mm × 1250 mm (88.19" × 49.21")	3000 mm × 1250 mm (118.11" × 49.21")	4000 mm × 1250 mm (157.48" × 49.21")	3000 mm × 2000 mm (118.11" × 78.74")
	Table load capacity (evenly distributed)	2500 kg (5512 lbs)		3000 kg (6614 lbs)	4000 kg (8818 lbs)	5000 kg (11023 lbs)	5000 kg (11023 lbs)	10000 kg (22046 lbs)
Spindle	Table top surface		18 mm (0.71") T-slot × 5, 150 mm (5.91") pitch		22 mm (0.87") T-slot × 9, 140 mm (5.51") pitch		22 mm (0.87") T-slot × 9, 200 mm (7.87") pitch	
	Spindle speed		35 ~ 10000 rpm		35 ~ 10000 rpm		35 ~ 10000 rpm	
	Gear ranges		2-step (electric)		2-step (electric)		2-step (electric)	
	Spindle taper		No. 50		No. 50		No. 50	
	Spindle bearing ID		ø100 mm (ø3.94")		ø100 mm (ø3.94")		ø100 mm (ø3.94")	
Feedrate	Spindle acceleration time to top speed		3.0 s (0 → 10000 rpm)		3.0 s (0 → 10000 rpm)		3.0 s (0 → 10000 rpm)	
	Rapid traverse rate (X axis)	40000 mm/min (1575 IPM)		32000 mm/min (1260 IPM)	40000 mm/min (1575 IPM)	32000 mm/min (1260 IPM)	22000 mm/min (866 IPM)	30000 mm/min (1181 IPM)
	Rapid traverse rate (Y, Z axis)		40000 mm/min/30000 mm/min (1575/1181 IPM)		40000 mm/min/30000 mm/min (1575/1181 IPM)		40000 mm/min/30000 mm/min (1575/1181 IPM)	
Automatic tool changer	Rapid traverse rate (X, Y, Z axis)	1 ~ 30000 mm/min (0.03 ~ 1181 IPM)		1 ~ 20000 mm/min (0.03 ~ 787 IPM)	1 ~ 30000 mm/min (0.03 ~ 1181 IPM)	1 ~ 19000 mm/min (0.03 ~ 748 IPM)	1 ~ 11000 mm/min (0.03 ~ 433 IPM)	1 ~ 19000 mm/min (0.03 ~ 748 IPM)
	Tool shank		No. 50		No. 50		No. 50	
	Tool storage capacity		30		30		60	
	Max. tool diameter/length (from gauge line)/weight		ø125 mm/380 mm/20 kg (ø4.92"/14.96"/44 lbs)		ø125 mm/380 mm/20 kg (ø4.92"/14.96"/44 lbs)		ø125 mm/380 mm/20 kg (ø4.92"/14.96"/44 lbs)	
	Max. tool diameter with adjacent pockets empty		ø210 mm (ø8.27")		ø210 mm (ø8.27")		ø210 mm (ø8.27")	
	Tool selection method		Random selection, shortest path		Random selection, shortest path		Random selection, shortest path	
Automatic tool changer for 5 Face Angle Tool	Tool change time (chip-to-chip)		5.0 s		6.2 s		8.5 s	
	Tool shank		HSK-A63		HSK-A63		HSK-A63	
	Tool storage capacity		8		8		8	
	Max. tool diameter/length (from gauge line)/weight		ø125 mm/*207 mm/8 kg (ø4.92"/*8.15/17.6 lbs)		ø125 mm/*207 mm/8 kg (ø4.92"/*8.15/17.6 lbs)		ø125 mm/*207 mm/8 kg (ø4.92"/*8.15/17.6 lbs)	
	Tool selection method		Random selection, shortest path		Random selection, shortest path		Random selection, shortest path	
	Tool change time		32 s		32 s		32 s	
	5 Face Angle Head		1		1		1	
Motors	Magazine capacity/Tool change time (V-tool to 5 Face Angle Head)		27 s		27 s		27 s	
	Spindle motor (40% ED (30-min. rating)/cont. rating)		AC37 kW (50 HP)/30 kW (40 HP)		AC 37 kW (50 HP)/30 kW (40 HP)		AC37 kW (50 HP)/30 kW (40 HP)	
	Flood coolant pump motor (50 Hz/60 Hz)		730 W/1210 W		730 W/1210 W		730 W/1210 W	
Power requirement	Required power capacity (30-min./cont. rating)	75.59 kVA/65.84 kVA		76.29 kVA/66.54 kVA	75.65 kVA/65.90 kVA	76.21 kVA/66.46 kVA	79.72 kVA/69.80 kVA	73.73 kVA/63.99 kVA
	Air source		More than 0.5 MPa (73 psi)/1200 NL/min (42.4 ft³/min)		More than 0.5 MPa (73 psi)/1200 NL/min (42.4 ft³/min)		More than 0.5 MPa (73 psi)/1200 NL/min (42.4 ft³/min)	
Machine size	Machine height		3500 mm (137.8")		3500 mm (137.8")		3600 mm (141.73")	
	Floor space requirement	3931 mm × 5742 mm (154.76" × 226.06")	3931 mm × 6868 mm (154.76" × 270.39")	3931 mm × 9320 mm (154.76" × 366.93")	4532 mm × 6895 mm (178.43" × 271.46")	4532 mm × 9030 mm (178.43" × 355.51")	4532 mm × 11451 mm (178.43" × 450.83")	5726 mm × 9372 mm (225.43" × 368.98")
	Machine weight	18700 kg (41226 lbs)	20200 kg (44533 lbs)	24200 kg (53351 lbs)	27100 kg (59744 lbs)	32100 kg (70767 lbs)	36100 kg (79586 lbs)	45700 kg (100750 lbs)
								47000 kg (103616 lbs)

FJV Series Standard and Optional Equipment

Machine Model		35/60	35/80	35/120	60/80	60/120	60/160	100/120	100/160	
		● : Standard	○ : Optional	- : N/A						
Spindle	10000 rpm (No.50)	●	●	●	●	●	●	●	●	
	10000 rpm (BBT-50, HSK-A100)	○	○	○	○	○	○	○	○	
	7000 rpm (No.50, BBT-50, HSK-A100)	○	○	○	○	○	○	○	○	
	18000 rpm (No.40, BBT-40, HSK-A63)	○	○	○	○	○	○	○	○	
Table	Y-axis reference slot	○	○	○	○	○	○	○	○	
	Auxiliary table	○	○	○	○	○	-	-	-	
Factory automation	30-tool chain-type magazine	●	●	●	●	●	●	-	-	
	60-tool chain-type magazine	○	○	○	○	○	○	●	●	
	Multi-surface machining attachment ^{**}	○	○	○	○	○	○	○	○	
	Multi-surface machining angle tool holder (heavy duty) ^{**}	○	○	○	○	○	○	○	○	
	Multi-surface machining angle tool holder (standard) ^{**}	○	○	○	○	○	○	○	○	
	Multi-surface machining angle tool holder (high speed) ^{**}	○	○	○	○	○	○	○	○	
	2-pallet changer (with safety cover)	○	○	-	○	○	○	-	-	
	Preparation for hydraulic fixtures 2 ports × 2 M code (one side)	○	○	○	○	○	○	○	○	
	Preparation for hydraulic fixtures 2 ports × 4 M code (both sides)	○	○	○	○	○	○	○	○	
	Preparation for pneumatic fixtures 2 ports × 2 M code (one side)	○	○	○	○	○	○	○	○	
	Preparation for pneumatic fixtures 2 ports × 4 M code (both sides)	○	○	○	○	○	○	○	○	
	Fixture seating confirmation 1 port × M code	○	○	○	○	○	○	○	○	
	One additional axis (including servo motor amplifier)	○	○	○	○	○	○	○	○	
	2-pallet changer preparation for pneumatic 2 ports × 2 M code (one side)	○	○	-	○	○	○	-	-	
	2-pallet changer preparation for pneumatic 2 ports × 4 M code (both sides)	○	○	-	○	○	○	-	-	
	2-pallet changer preparation for hydraulic 2 ports × 2 M code (one side)	○	○	-	○	○	○	-	-	
	2-pallet changer preparation for hydraulic 2 ports × 4 M code (both sides)	○	○	-	○	○	○	-	-	
	One additional axis for 2-pallet changer (including servo motor amplifier)	○	○	-	○	○	○	-	-	
	Print out function for workpiece measuring (without printer)	○	○	○	○	○	○	○	○	
	Automatic power ON/OFF + warm-up operation	●	●	●	●	●	●	●	●	
Setup	Automatic tool length measurement & tool breakage detection	●	●	●	●	●	●	●	●	
	Laser tool measurement (up to ø210 mm (ø8.27"))	○	○	○	○	○	○	○	○	
	Mazak monitoring system B (option) OMP60	○	○	○	○	○	○	○	○	
	Preparation for Mazak monitoring system B	○	○	○	○	○	○	○	○	
	Absolute position detection	●	●	●	●	●	●	●	●	
	End cover window	○	○	○	●	●	●	●	●	
	Remote manual pulse generator (wired)	○	○	○	●	●	●	●	●	
	Remote manual pulse generator (wireless)	○	○	○	○	○	○	○	○	
	Float-type coolant level gauge	●	●	●	●	●	●	●	●	

^{**} Option for 10000 rpm (No.50) and 7000 rpm (No.50) spindle.

Above specifications are for North American market.

Standard and optional specifications vary by market.

Machine Model		35/60	35/80	35/120	60/80	60/120	60/160	100/120	100/160	
		● : Standard	○ : Optional	- : N/A						
Safety equipment	ATC automatic recover function	●	●	●	●	●	●	●	●	
	Automatic fire extinguisher	○	○	○	○	○	○	○	○	
	Pressure switch for coolant through spindle	○	○	○	○	○	○	○	○	
	Operator door interlock	●	●	●	●	●	●	●	●	
	Fully enclosed cover	○	○	○	○	○	○	○	○	
High accuracy	Ballscrew core cooling (X, Y, Z axis)	●	●	●	●	●	●	●	●	
	Spindle chiller unit	●	●	●	●	●	●	●	●	
	Scale feedback (X, Y axis)	○	○	○	○	○	○	○	○	
	Scale feedback (X, Y, Z axis)	○	○	○	○	○	○	○	○	
	Coolant temperature control	○	○	○	○	○	○	○	○	
Coolant/Chip disposal	Flood coolant	●	●	●	●	●	●	●	●	
	Coolant for angle tool	○	○	○	○	○	○	○	○	
	Preparation for chip conveyor (rear discharge)	●	●	●	●	●	●	●	●	
	Coolant tank (550 L) (145 gal.)	●	●	●	-	-	-	-	-	
	Coolant tank (700 L) (184 gal.)	-	-	-	●	●	●	-	-	
	Large capacity coolant tank (900 L) (237 gal.)	○	○	○	-	-	-	-	-	
	Large capacity coolant tank (1000 L) (264 gal.)	-	-	-	○	○	○	-	-	
	Coolant tank (1100 L) (290 gal.)	-	-	-	-	-	-	●	●	
	Niagara coolant ^{**}	○	○	○	○	○	○	○	○	
	Cover coolant [†]	○	○	○	○	○	○	●	●	
	Coolant through spindle 0.5 MPa (73 psi) with cyclone filter	●	●	●	●	●	●	●	●	
	Coolant through spindle 1.5 MPa (218 psi) with cyclone filter	○	○	○	○	○	○	○	○	
	SUPERFLOW coolant system (7.0 MPa (1015 psi))	○	○	○	○	○	○	○	○	
	Hand-held coolant nozzle	○	○	○	○	○	○	○	○	
	Workpiece air blast	●	●	●	●	●	●	●	●	
	Air through spindle (available during spindle rotation) ^{**}	○	○	○	○	○	○	○	○	
	Oil skimmer	○	○	○	○	○	○	○	○	
	Mist collector (fully enclosed cover recommended)	○	○	○	○	○	○	○	○	
	Internal spiral conveyor (inverter system)	●	●	●	●	●	●	●	●	
	Internal chip conveyor (hinge)	○	○	○	○	○	○	●	●	
	Inverter system for internal hinge-type chip conveyor	○	○	○	○	○	○	○	○	
	Chip conveyor (rear discharge, Consep)	○	○	○	○	○	○	○	○	
	Chip conveyor (rear discharge, hinge, abrasion resistant)	○	○	○	○	○	○	○	○	
	Inverter system for chip conveyor	○	○	○	○	○	○	○	○	
	Chip pan	○	○	○	○	○	○	○	○	

^{**} With multi-face machining attachment, coolant nozzles will be equipped below column.[†] Large coolant tank required for all machines except FJV-100.^{**} Not available with angle head and angle tool.

Above specifications are for North American market. Standard and optional specifications vary by market.

FJV 5 Face Series Standard and Optional Equipment

Machine Model									
		35/60	35/80	35/120	60/80	60/120	60/160	100/120	100/160
Spindle	10000 rpm (No.50)	●	●	●	●	●	●	●	●
	7000 rpm (No.50)	○	○	○	○	○	○	○	○
Table	Y-axis reference slot	○	○	○	○	○	○	○	○
	Auxiliary table	○	○	○	○	○	-	-	-
Factory automation	30-tool chain-type magazine	●	●	●	●	●	●	-	-
	60-tool chain-type magazine	○	○	○	○	○	○	●	●
8-tool drum-type magazine for Mazak 5 Face Angle Tool Holder (HSK-63)	●	●	●	●	●	●	●	●	●
	Multi-surface machining attachment	●	●	●	●	●	●	●	●
Mazak 5 Face angle holder and tool magazine	●	●	●	●	●	●	●	●	●
	Multi-surface machining angle tool holder (standard)	○	○	○	○	○	○	○	○
Multi-surface machining angle tool holder (high speed)	○	○	○	○	○	○	○	○	○
	2-pallet changer (with safety cover)	○	○	-	○	○	○	-	-
Preparation for hydraulic fixtures 2 ports × 2 M code (one side)	○	○	○	○	○	○	○	○	○
	Preparation for hydraulic fixtures 2 ports × 4 M code (both sides)	○	○	○	○	○	○	○	○
Preparation for pneumatic fixtures 2 ports × 2 M code (one side)	○	○	○	○	○	○	○	○	○
	Preparation for pneumatic fixtures 2 ports × 4 M code (both sides)	○	○	○	○	○	○	○	○
Fixture seating confirmation 1 port × M code	○	○	○	○	○	○	○	○	○
	One additional axis (including servo motor amplifier)	○	○	○	○	○	○	○	○
2-pallet changer preparation for pneumatic 2 ports × 2 M code (one side)	○	○	-	○	○	○	-	-	-
	2-pallet changer preparation for pneumatic 2 ports × 4 M code (both sides)	○	○	-	○	○	○	-	-
2-pallet changer preparation for hydraulic 2 ports × 2 M code (one side)	○	○	-	○	○	○	-	-	-
	2-pallet changer preparation for hydraulic 2 ports × 4 M code (both sides)	○	○	-	○	○	○	-	-
One additional axis for 2 pallet changer (including servo motor amplifier)	○	○	-	○	○	○	-	-	-
	Print out function for workpiece measuring (without printer)	○	○	○	○	○	○	○	○
Setup	Automatic power ON/OFF + warm-up operation	●	●	●	●	●	●	●	●
	Automatic tool length measurement & tool breakage detection	●	●	●	●	●	●	●	●
	Laser tool measurement (up to Ø210 mm (Ø8.27"))	○	○	○	○	○	○	○	○
	Mazak monitoring system B (option) OMP60	○	○	○	○	○	○	○	○
	Preparation for Mazak monitoring system B	○	○	○	○	○	○	○	○
	Absolute position detection	●	●	●	●	●	●	●	●
	End cover window	○	○	○	●	●	●	●	●
	Remote manual pulse generator (wired)	○	○	○	●	●	●	●	●
	Remote manual pulse generator (wireless)	○	○	○	○	○	○	○	○
	Float-type coolant level gauge	●	●	●	●	●	●	●	●
Safety equipment	ATC automatic recover function	●	●	●	●	●	●	●	●
	Automatic fire extinguisher	○	○	○	○	○	○	○	○
	Pressure switch for coolant through spindle	○	○	○	○	○	○	○	○

Above specifications are for North American market.
Standard and optional specifications vary by market.

Machine Model									
		35/60	35/80	35/120	60/80	60/120	60/160	100/120	100/160
Safety Equipment	Operator door interlock	●	●	●	●	●	●	●	●
	Fully enclosed cover	○	○	○	○	○	○	○	○
High accuracy	Ballscrew core cooling (X, Y, Z axis)	●	●	●	●	●	●	●	●
	Spindle chiller unit	●	●	●	●	●	●	●	●
Scale feedback (X, Y axis)	○	○	○	○	○	○	○	○	○
	Scale feedback (X, Y, Z axis)	○	○	○	○	○	○	○	○
Coolant/ Chip disposal	Coolant temperature control	○	○	○	○	○	○	○	○
	Flood coolant	●	●	●	●	●	●	●	●
	Coolant for angle tool	○	○	○	○	○	○	○	○
	Preparation for chip conveyor (rear discharge)	●	●	●	●	●	●	●	●
	Coolant tank (550 L) (145 gal.)	●	●	●	-	-	-	-	-
	Coolant tank (700 L) (184 gal.)	-	-	-	●	●	●	-	-
	Large capacity coolant tank (900 L) (237 gal.)	○	○	○	-	-	-	-	-
	Large capacity coolant tank (1000 L) (264 gal.)	-	-	-	○	○	○	-	-
	Coolant tank (1100 L) (290 gal.)	-	-	-	-	-	-	●	●
	Niagara coolant* ¹	○	○	○	○	○	○	○	○
	Cover coolant* ²	○	○	○	○	○	○	●	●
	Coolant through spindle 0.5 MPa (73 psi) with cyclone filter	●	●	●	●	●	●	●	●
	Coolant through spindle 1.5 MPa (218 psi) with cyclone filter	○	○	○	○	○	○	○	○
	SUPERFLOW coolant system (7.0 MPa (1015 psi))	○	○	○	○	○	○	○	○
	Hand-held coolant nozzle	○	○	○	○	○	○	○	○
	Workpiece air blast	●	●	●	●	●	●	●	●
	Air through spindle (available during spindle rotation)* ³	●	●	●	●	●	●	●	●
	Oil skimmer	○	○	○	○	○	○	○	○
	Mist collector (fully enclosed cover recommended)	○	○	○	○	○	○	○	○
	Internal spiral conveyor (inverter system)	●	●	●	●	●	●	-	-
	Internal chip conveyor (hinge)	○	○	○	○	○	○	●	●
	Inverter system for internal hinge-type chip conveyor	○	○	○	○	○	○	○	○
	Chip conveyor (rear discharge, Consep)	○	○	○	○	○	○	○	○
	Chip conveyor (rear discharge, hinge, abrasion resistant)	○	○	○	○	○	○	○	○
	Inverter system for chip conveyor	○	○	○	○	○	○	○	○
	Chip pan	○	○	○	○	○	○	○	○

*² With multi-face machining attachment, coolant nozzles will be equipped below column.

*³ Large coolant tank required for all machines except FJV-100

*⁴ Not available with angle head and angle tool

Above specifications are for North American market. Standard and optional specifications vary by market.

FJV 5 Face Series Standard and Optional Equipment

	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, G00 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, G0 speed variable control, G00 slope constant
Program registration	Number of programs: 256 (Standard)/960(Max.), Program memory: 2MB, Program memory expansion: 8MB, Program memory expansion: 32MB	
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	—	Shaping function*, Dynamic compensation II*
Machine compensation	Backlash compensation, Pitch error compensation	
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 mode	Optional stop, Dry run, Manual handle interruption, MD interruption, TPS, Restart, Machine lock	Optional block skip, Optional stop, Dry run, Manual handle interruption, MD 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 and tip teach, Tool offset teach, Touch sensor coordinates measurement, Workpiece offset measurement, WPC coordinate 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*	
Card interface	SD card interface, USB	
Ethernet	10M/100M/1Gbps	

*: Option

Environmentally Friendly

Designed with environmental considerations

The environment and our impact on it have always been important concerns for Mazak. All Mazak factories in Japan where machine tools are produced are ISO 14001 certified, an international standard confirming that the operation of our production facilities does not adversely affect the environment.

Reduction of electrical power consumption

Automatic-off LED worklight and CNC screen are standard equipment. The optional chip conveyor automatically stops operation after cycle completion.

Energy Dashboard Plus

⚡ Electrical consumption display



Displays electrical consumption data on process home screen.



Reduction of lubricant consumption

High-efficiency lubrication system delivers the optimal amount of grease to the linear roller guides and ballscrew with lower lubricant consumption.

⚡ Electrical consumption statistics analysis display



Extended coolant service life

The grease lubrication system eliminates tramp oil to extend the service life of the coolant.

Mazak

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- Specifications are subject to change without notice.
 - This product is subject to all applicable export control laws and regulations.
 - The accuracy data and other data presented in this catalogue were obtained under specific conditions. They may not be duplicated under different conditions (room temperature, workpiece materials, tool material, cutting conditions, etc.).

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