

**Mazak**

# INTEGREX i-500

[Multi-Tasking Machine]



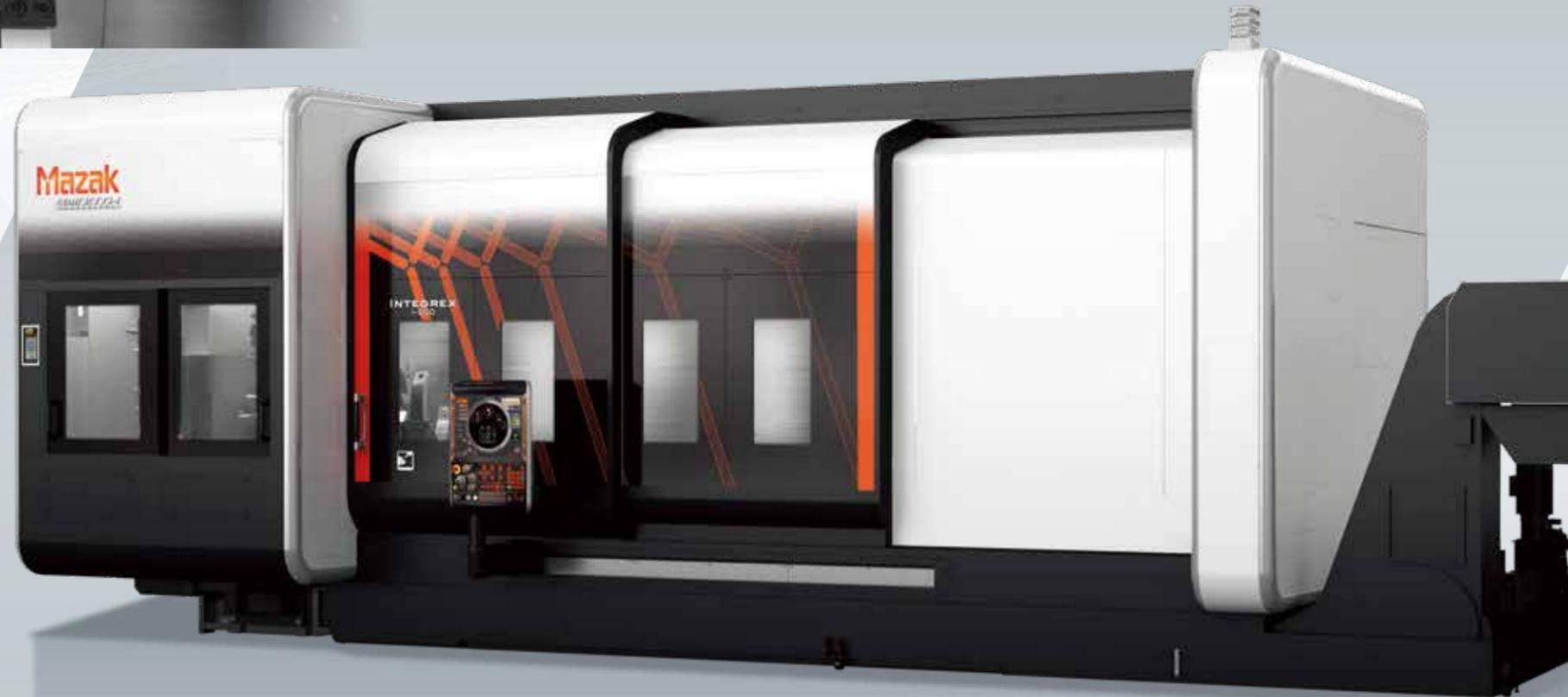
# Advanced INTEGREX machine with exceptional Multi-Tasking performance



## Wide variety of specifications to meet any production requirement

Universal	Main spindle	Milling spindle	Second spindle	Tailstock	Lower turret
1500U	4000 rpm 30 kW (40 HP) ø91 mm (ø3.58")	12000 rpm 24 kW (32 HP) #40 spindle	4000 rpm 30 kW (40 HP) ø91 mm (ø3.58")	MT No.5 Built-in center	9D Turning/milling
2500U	3300 rpm 37 kW (50 HP) ø112 mm (ø4.41")	12000 rpm 37 kW (50 HP) #40 high output spindle	3300 rpm 37 kW (50 HP) ø112 mm (ø4.41")		
3000U	2500 rpm 37 kW (50 HP) ø132 mm (ø5.20")	20000 rpm 24 kW (32 HP) #40 high speed spindle	2500 rpm 37 kW (50 HP) ø132 mm (ø5.20")		
	2000 rpm 37 kW (50 HP) ø185 mm (ø7.28")	10000 rpm 37 kW (50 HP) #50 spindle			

- Incorporating experience accumulated in the production of Multi-Tasking machines for more than 30 years
- Exceptional ease of operation, compact design, large machining area, high-power spindles and high-rigidity construction
- Exceptional performance versatility – gear milling, gear hobbing, deep drilling capability and many other advanced functions



# Advanced Multi-Tasking machine INTEGREX i-500

INTEGREX i-500 (2500U)  
Shown with optional status light and steady rest

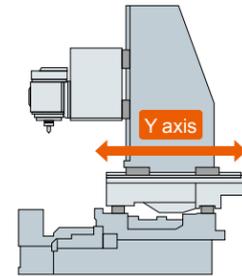
# Higher Accuracy

Components of the INTEGREX i-500, such as the machine bed, carriage and spindle headstocks, are designed for maximum rigidity.



## Orthogonal machine design for high-accuracy machining

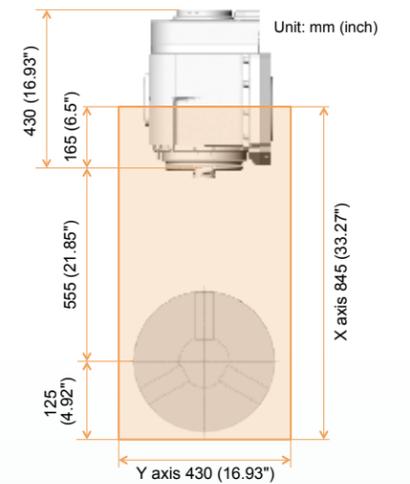
All axes are at 90° to each other for a large machining area with excellent operator access.



## Compact milling spindle headstock

The standard compact milling spindle is smaller than comparable machines to expand the machining area and reduce interference.

Large Y-axis stroke	430 mm (16.93")
Large machining area Max. swing / max. machining diameter	ø700 mm (ø27.56")
Max. tool length	500 mm (19.69")



## High-accuracy rotary axes

A roller gear cam on the B axis eliminates backlash. The C axis is equipped with a full circumference disk brake to ensure higher accuracy.

**B axis min. indexing increment 0.0001°**

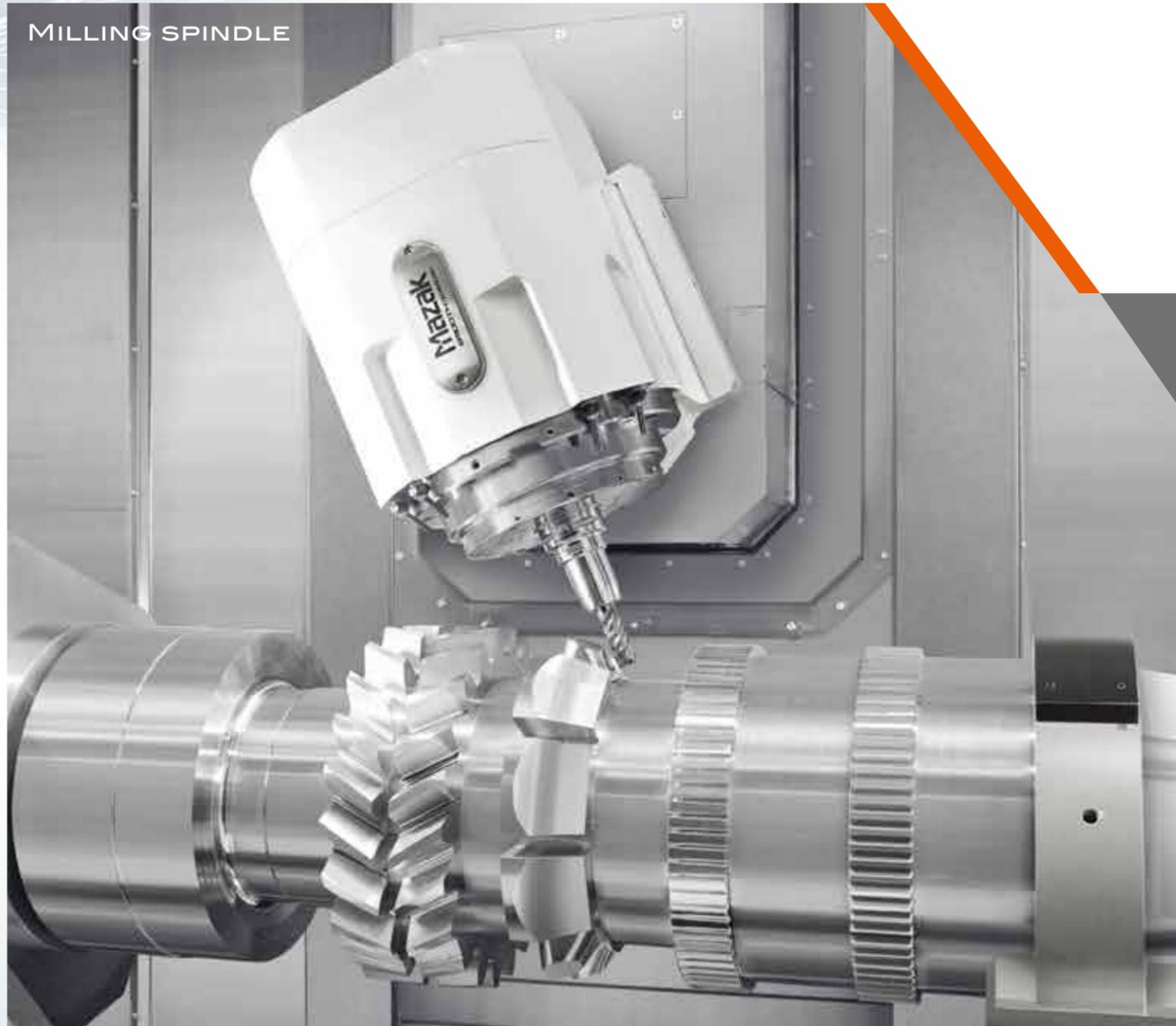
**C axis min. indexing increment 0.0001°**

## X, Y, Z axis ballscrew core cooling

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



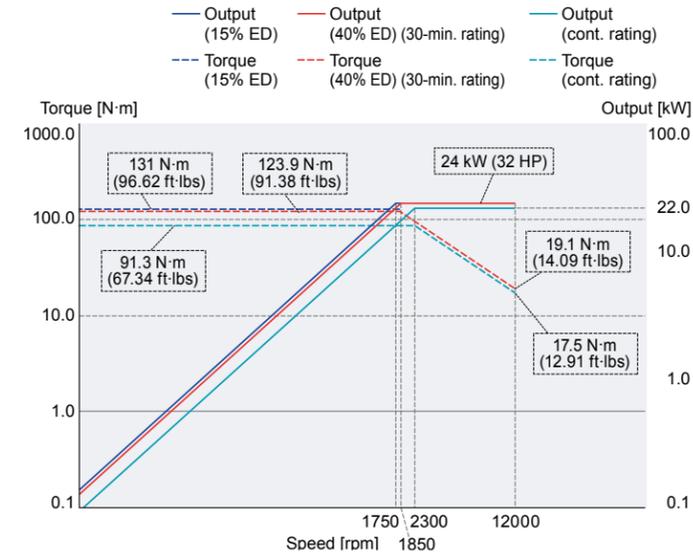
# Higher Productivity & Higher Accuracy



## Wide range of available milling spindle specifications

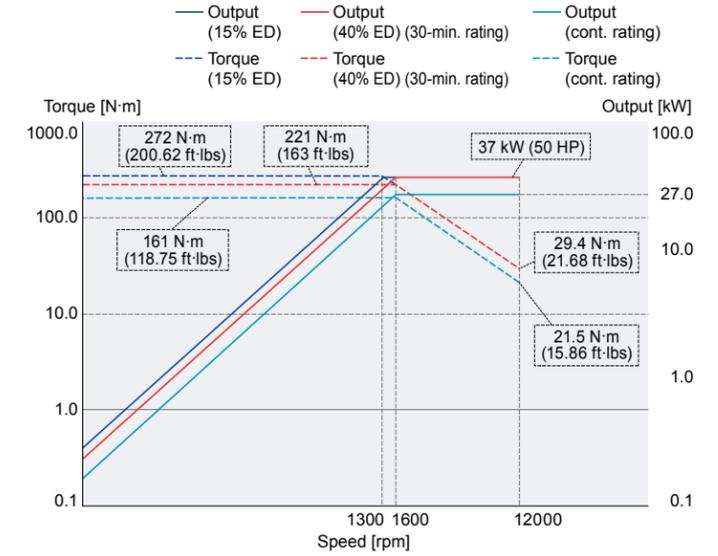
The milling spindle is equipped with a high-output, high-torque integral spindle/motor. In addition to the standard No.40 taper spindle, high-output and high-speed specifications, as well as a No.50 taper spindle, are available as options to meet a wide range of machining requirements.

### 12000 rpm milling spindle



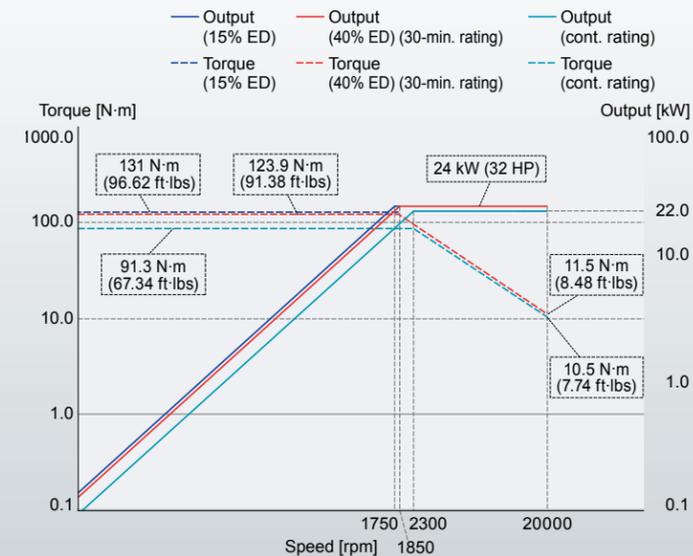
### 12000 rpm high output milling spindle

OPTION



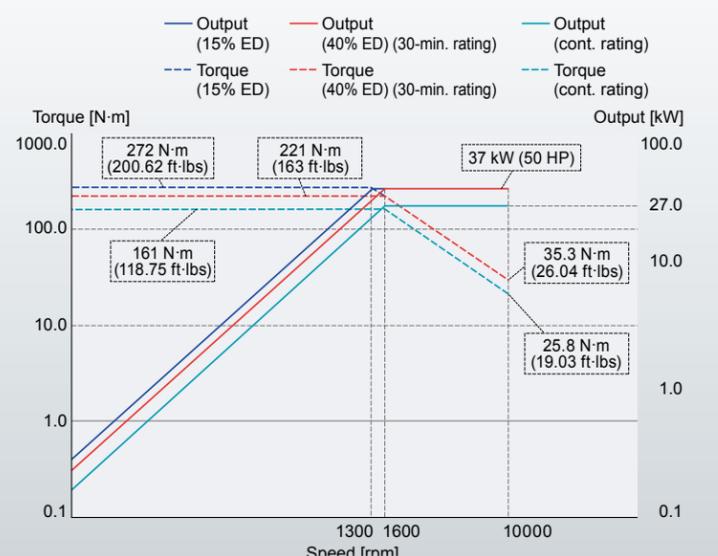
### 20000 rpm high speed milling spindle

OPTION



### 10000 rpm No.50 taper milling spindle

OPTION



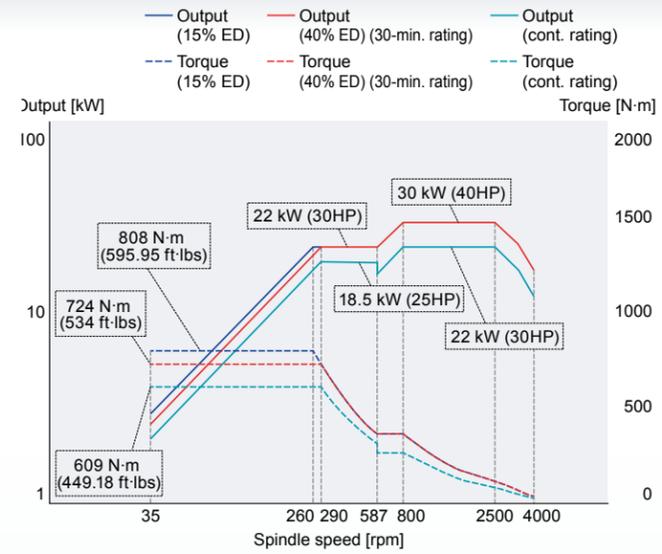
# Higher Productivity & Higher Accuracy



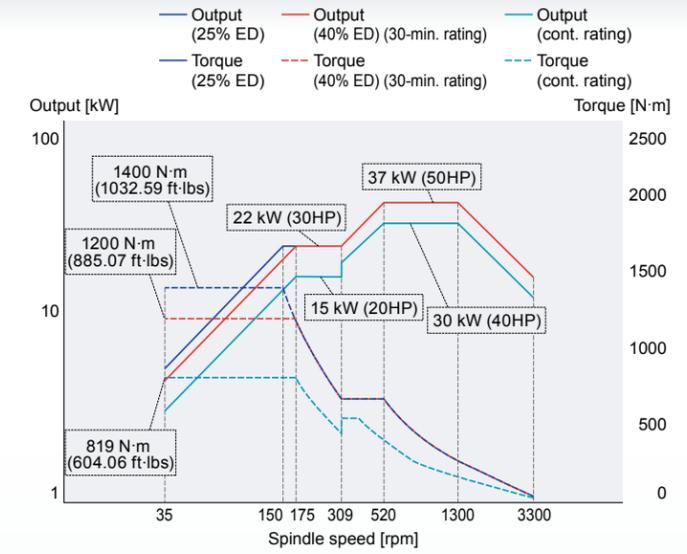
## Turning spindle (main spindle, second spindle)

- 4 sizes of spindle bores are available to meet production requirements.
- Thanks to the integral spindle/motor design, continuous machining of first and second operations can be performed on machines equipped with the second spindle.
- The C axis (minimum indexing increment: 0.0001°) is equipped with a full circumference disk brake and magnetic sensor to ensure higher accuracy. (Second spindle standard specification is 0.001°.)

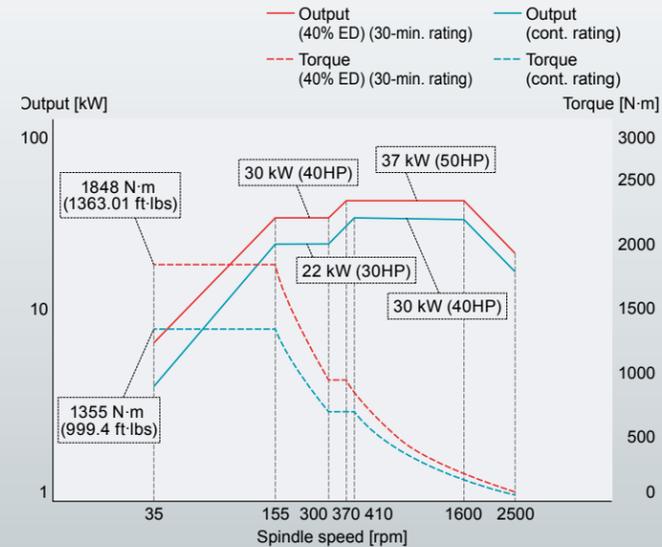
### 4000 rpm spindle, $\varnothing 91$ mm ( $\varnothing 3.58$ " ) bore



### 3300 rpm spindle, $\varnothing 112$ mm ( $\varnothing 4.41$ " ) bore OPTION

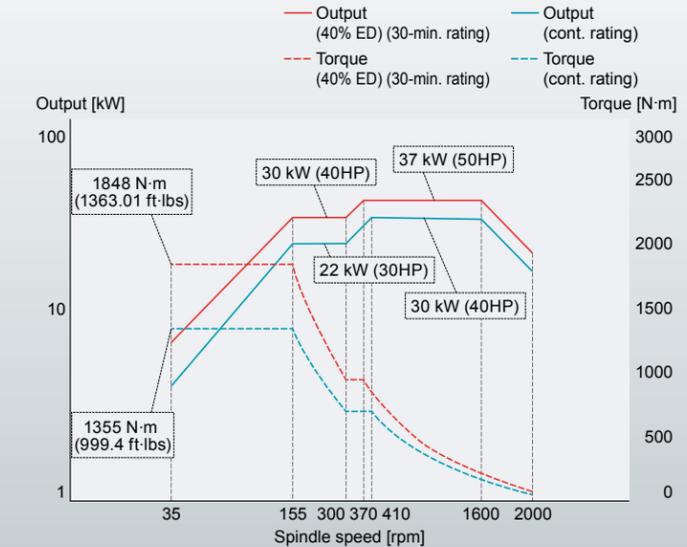


### 2500 rpm high torque spindle, $\varnothing 132$ mm ( $\varnothing 5.2$ " ) bore OPTION



### 2000 rpm high torque spindle, $\varnothing 185$ mm ( $\varnothing 7.28$ " ) bore OPTION

#### Main spindle only



# Higher Productivity

## Lower turret

The lower turret enables two tools to cut simultaneously for higher productivity. The same tool mounted on the lower turret can be used for machining on both the main and second spindles thanks to the unique turret design that reduces the required number of tools.



### Lower turret standard specification

9-position drum turret for an expanded range of machining.

Turret type	9-position drum turret
Number of tools	9 tools
Tool size	Turning tool: $\varnothing 25$ mm ( $\varnothing 1$ " Boring bar: $\varnothing 40$ mm ( $\varnothing 1.5$ "

### Lower turret with rotary tools OPTION

Improved productivity thanks to new heavy-duty rotary tools.

Number of tools	9 tools (Max. 6 rotary tools)
Max. milling spindle speed	10000 rpm
Milling spindle power (10% ED)	AC 7.5 kW (10 HP)
Max. torque (10% ED)	48 N·m (35.4 ft·lbs)
Tool size	Drill $\varnothing 20$ mm ( $\varnothing 0.79$ " Tap M20 (3/4 UNC)

## Automatic steady rest OPTION

A variety of steady rests is available for high accuracy and efficient machining of long-shaft workpieces. The maximum workpiece diameter that can be supported is  $\varnothing 410$  mm ( $\varnothing 16.14$ "). Positioning of the steady rests can be done by the CNC program.

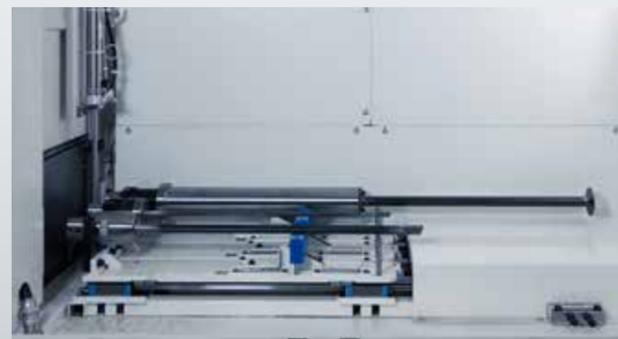


Steady rest manufacturer/model	Gripping diameter
SMW K5.1Z	$\varnothing 100$ mm ~ $\varnothing 410$ mm ( $\varnothing 3.94$ " ~ $\varnothing 16.14$ "
SMW K5Z	$\varnothing 80$ mm ~ $\varnothing 390$ mm ( $\varnothing 3.15$ " ~ $\varnothing 15.35$ "
SMW K4Z	$\varnothing 52$ mm ~ $\varnothing 280$ mm ( $\varnothing 2.05$ " ~ $\varnothing 11.02$ "
SMW SLU-X5.1Z	$\varnothing 85$ mm ~ $\varnothing 350$ mm ( $\varnothing 3.35$ " ~ $\varnothing 13.78$ "
SMW SLU-X5Z	$\varnothing 45$ mm ~ $\varnothing 310$ mm ( $\varnothing 1.77$ " ~ $\varnothing 12.2$ "
SMW SLU-X4Z	$\varnothing 30$ mm ~ $\varnothing 245$ mm ( $\varnothing 1.18$ " ~ $\varnothing 9.65$ "

## Long drill stocker OPTION [2500U, 3000U]

The long drill stocker is located over the tailstock/second spindle and is available for 2500U and 3000U models only. By loading a long drill in the milling spindle and rotating the B axis, deep hole drilling can be performed.

Max. tool diameter (#40/#50)	$\varnothing 80$ mm ( $\varnothing 3.15$ ")/ $\varnothing 102$ mm ( $\varnothing 4.02$ ")
Max. tool length	1000 mm (39.37")
Tool weight	12 kg (26 lbs)
Tool storage capacity (#40/#50)	3/2



## NC Tailstock

The operator can set the tailstock position on the setup screen and move the tailstock to the correct position by menu-key or M-code.



**MT No.5 Built-in Center**  
Max. thrust: 10 kN (1019 kgf) (2248 lbs)

**MT No.5 Built-in Center [2500U, 3000U]**  
Max. thrust: 15 kN (1530 kgf) (3372 lbs) OPTION

(Requires spindle bore  $\varnothing 112$  mm ( $\varnothing 4.41$ " ),  $\varnothing 132$  mm ( $\varnothing 5.2$ " ) or  $\varnothing 185$  mm ( $\varnothing 7.28$ " ))

# Ergonomics

## Unsurpassed ease of operation and maintenance thanks to ergonomic machine design

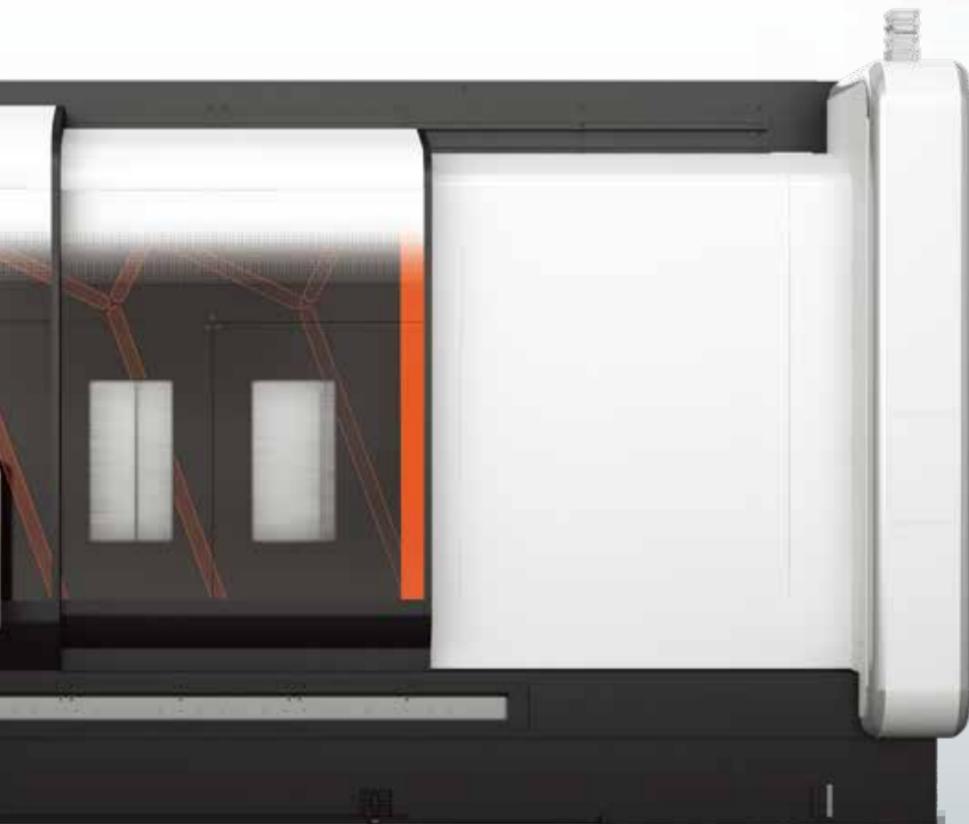
### Convenient tool magazine access

The tool magazine is located at the front of the machine, eliminating the time required for the operator to go back and forth to the rear of the machine. The tool magazine doors open by sliding left/right so they do not interfere with the operating area around the machine.



### Large window

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



### Maintenance area

Items that require frequent access for machine maintenance are arranged in one central location.



### Front cover height

To ensure ease of loading/unloading heavy workpieces, the height of the machine cover in front of the chuck is only 605 mm (23.82").



# MAZATROL CNC System



Three-color status indicator

19" touch panel

USB port

SD card slot

Operating switches

Dials

5 process home screens

Programming, confirmation, editing and tool data registration



Convenient Parameter Setting and Fine Tuning Function

## SMOOTH MACHINING CONFIGURATION

Machining features including cycle time, finished surface and machining shape can be adjusted by slider switches on the display according to material requirements and machining methods. This is especially effective for complex workpiece contours defined in small program increments. Once the desired results are obtained, the settings can be stored in memory so they can be reused easily.



Variable Acceleration Control Function

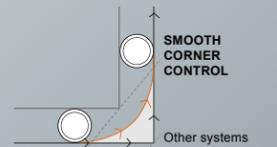
### • VARIABLE ACCELERATION CONTROL

Variable acceleration control is a new function that permits the faster acceleration capability of linear axes to be used whenever possible. The slower acceleration of the rotary axes is not used for all program commands, resulting in faster machining cycle times.

Seamless Corner Control

### • SMOOTH CORNER CONTROL

Improved finished surfaces and reduced cycle times from optimized acceleration/deceleration when machining corners



Unsurpassed ease of operation with touch screen

Cycle time reduced by **10 ~ 20%**

(Test results for reference only)



MAZATROL **SMOOTHX**

Standard Machine Specifications

		INTEGREX i-500			INTEGREX i-500S			INTEGREX i-500ST		
		1500U	2500U	3000U	1500U	2500U	3000U	1500U	2500U	
Capacity	Max. swing/swing over cross slide	ø700 mm (ø27.56")								
	Max. machining diameter (upper turret) (lower turret)	ø700 mm (ø27.56")							ø490 mm (ø19.29")	
Travel	Max. machining length**	1574 mm (61.97")	2594 mm (102.13")	3074 mm (121.02")	1574 mm (61.97")	2594 mm (102.13")	3074 mm (121.02")	1574 mm (61.97")	2594 mm (102.13")	
	X-axis travel	845 mm (33.27")								
Main spindle	Z-axis travel	1640 mm (64.57")	2660 mm (104.72")	3140 mm (123.62")	1640 mm (64.57")	2660 mm (104.72")	3140 mm (123.62")	1640 mm (64.57")	2660 mm (104.72")	
	Y-axis travel	430 mm (16.93")								
Second spindle	X2-axis travel (lower turret)	-							267 mm (10.51")	
	Z2-axis travel (lower turret)	-							1373 mm (54.06")	
Milling spindle	B-axis travel	-30° ~ 210°								
	Chuck size	10"								
Lower turret	Main spindle speed**	4000 rpm								
	Main spindle nose	A2-8								
Feedrate	Main spindle bore	ø91 mm (ø3.58")								
	Bearing ID	ø130 mm (ø5.12")								
Automatic tool changer system	Max. bar work capacity**	ø77 mm (ø3.03")								
	Minimum main spindle indexing increment	0.0001°								
Tailstock	Chuck size	-							10"	
	Main spindle speed**	-							4000 rpm	
Motors	Second spindle nose	-							A2-8	
	Second spindle bore	-							ø91 mm (ø3.58")	
Power requirement	Bearing ID	-							ø130 mm (ø5.12")	
	Minimum second spindle indexing increment	-							0.001°	
Coolant	Milling spindle type	Spindle turret with ATC								
	Milling spindle speed	12000 rpm								
Machine size	Max. milling spindle torque	131 N·m (96.62 ft·lbs)								
	Turning tool shank height	25 mm (1")								
High accuracy	Boring bar shank diameter	ø40 mm (ø1.5")								
	B-axis minimum indexing increment	0.0001°								
Machine size	Turret type	-							9 position drum turret	
	Number of tools	-							9	
Machine size	Turning tool shank height	-							25 mm (1")	
	Boring bar shank diameter	-							ø40 mm (ø1.5")	
Machine size	Rapid traverse rate: X axis	50 m/min (1969 IPM)								
	Rapid traverse rate: Z axis	50 m/min (1969 IPM)	40 m/min (1575 IPM)	50 m/min (1969 IPM)	40 m/min (1575 IPM)	50 m/min (1969 IPM)				
Machine size	Rapid traverse rate: Y axis	50 m/min (1969 IPM)								
	Rapid traverse rate: X2 axis (lower turret)	-							40 m/min (1575 IPM)	
Machine size	Rapid traverse rate: Z2 axis (lower turret)	-							40 m/min (1575 IPM)	
	Rapid traverse rate: W axis	8 m/min (315 IPM)	4.5 m/min (177 IPM)	30 m/min (1181 IPM)	18 m/min (709 IPM)	12 m/min (472 IPM)	30 m/min (1181 IPM)	18 m/min (709 IPM)		
Machine size	Tool holder shank**	HSK-A63 (T63)								
	Tool storage capacity	36								
Machine size	Max. tool diameter/length (from gauge line)	ø90 mm (ø3.54") (when adjacent pockets empty: ø150 mm (ø5.91")/500 mm (19.69"))								
	Max. tool weight	12 kg (26 lbs)								
Machine size	Tool selection method	Random selection/shortest path								
	Center	MT No. 5								
Machine size	Travel (W axis)	1610 mm (63.39")	2630 mm (103.54")	3110 mm (122.44")	-					
	Main spindle motor (40%ED (30-min. rating)/cont. rating)	30 kW (40 HP)/22 kW (30 HP)								
Machine size	Second spindle motor (40%ED (30-min. rating)/cont. rating)	-							30 kW (40 HP)/22 kW (30 HP)	
	Milling spindle motor (40%ED (30-min. rating)/cont. rating)	24 kW (32 HP) / 22 kW (30 HP)								
Machine size	Required power capacity (cont. rating)	56.95 kVA			86.09 kVA			88.49 kVA		
	Air source	0.5 MPa (73 PSI), more than 400 L (14.13 ft³)/min			0.5 MPa (73 PSI), more than 460 L (16.24 ft³)/min			0.5 MPa (73 PSI), more than 460 L (16.24 ft³)/min		
Machine size	Tank capacity	510 L	665 L	645 L	510 L	665 L	715 L	510 L	665 L	
	Machine height	2950 mm (116.14")								
Machine size	Width × length	5595 mm × 3400 mm (220.28" × 133.86")	6980 mm × 3400 mm (274.80" × 133.86")	7280 mm × 3400 mm (286.61" × 133.86")	5595 mm × 3400 mm (220.28" × 133.86")	6980 mm × 3400 mm (274.80" × 133.86")	7775 mm × 3400 mm (306.10" × 133.86")	5595 mm × 3400 mm (220.28" × 133.86")	6980 mm × 3400 mm (274.80" × 133.86")	
	Weight	21300 kg (46958 lbs)	23500 kg (51808 lbs)	24200 kg (53351 lbs)	21900 kg (48280 lbs)	24100 kg (53131 lbs)	25500 kg (56217 lbs)	22300 kg (49162 lbs)	24500 kg (54012 lbs)	

\*1 Depending on chuck specifications  
\*2 HSK A-63 DIN not available.

Standard and Optional Equipment

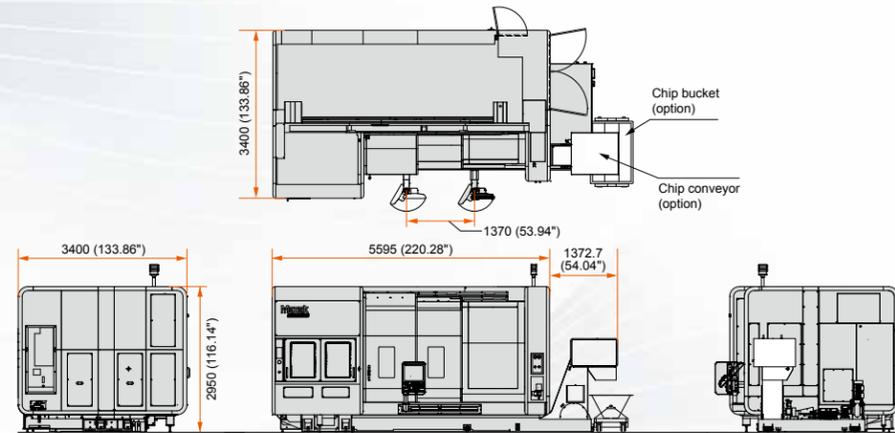
		i-500			i-500		
		S	ST	S	ST	S	ST
Machine	Main spindle 4000 rpm	●	●	●			
	Main spindle 3300 rpm	○	○	○			
Machine	Main spindle 2500 rpm	○	○	○			
	Main spindle 2000 rpm	○	○	○			
Machine	Second spindle 4000 rpm	-	●	●			
	Second spindle 3300 rpm	-	○	○			
Machine	Second spindle 2500 rpm	-	○	○			
	Main spindle 0.0001° indexing · C-axis control	●	●	●			
Machine	Second spindle 0.001° indexing (without C axis)	-	●	●			
	Second spindle 0.0001° indexing · C-axis control/synchronization function	-	○	○			
Machine	9D lower turret	-	-	●			
	Lower turret (rotary tools)	-	-	○			
Machine	Main spindle hydraulic chuck (10" through-hole chuck)	●	●	●			
	Main spindle hydraulic chuck (12", 15", 18" through-hole chuck)	○	○	○			
Machine	Second spindle hydraulic chuck (10" through-hole chuck)	-	●	●			
	Second spindle hydraulic chuck (12", 15" through-hole chuck)	-	○	○			
Machine	Work stopper inside spindle	○	○	○			
	Y axis control	●	●	●			
Machine	B axis 0.0001° indexing/contouring (EIA)	●	●	●			
	Milling spindle 12000 rpm (HSK-A63)	●	●	●			
Machine	Milling spindle 12000 rpm (PSC-63 (CAPTO C6)/KM4X-63)	○	○	○			
	Milling spindle 20000 rpm (HSK-A63)	○	○	○			
Machine	High output milling spindle 12000 rpm (HSK-A63/PSC-63 (CAPTO C6)/KM4X-63)	○	○	○			
	High output milling spindle 10000 rpm (HSK-A100/PSC-80 (CAPTO C8)/KM4X-100)	○	○	○			
Machine	36 tool magazine	●	●	●			
	72 tool magazine	○	○	○			
Machine	110 tool magazine	○	○	○			
	Long drill stocker (#40: 3, #50: 2) 2500U, 3000U only	○	○	○			
Machine	NC tailstock	●	-	-			
	Programmable tailstock thrust	●	-	-			
Machine	Steady rest (includes shower coolant)	○	○	-			
	Work light	●	●	●			
Machine	Chuck clamping pressure program management (main spindle)	○	○	○			
	Chuck clamping pressure program management (second spindle)	-	○	○			
Machine	Double foot pedal chuck switch	○	○	○			
	3-color machine status light	○	○	○			
Machine	1-color machine status light (yellow: operation end)	○	○	○			
	1-color machine status light (red: alarm)	○	○	○			
Machine	X, Y, Z axis ball screw core cooling	●	●	●			
	Mazak monitoring system B (RMP 60)	○	○	○			
Machine	Preparation for Mazak monitoring system B (RMP 60)	○	○	○			
	Scale feedback (B axis)	●	●	●			
Machine	Scale feedback (X, Y, Z axis)	○	○	○			
	Scale feedback (X2/Z2 axis for lower turret)	-	-	○			
Machine	Absolute position detection (linear axes)	●	●	●			
	X, Y, Z axis pitch error compensation input	●	●	●			

Standard and optional equipment vary by market.

Machine Dimensions

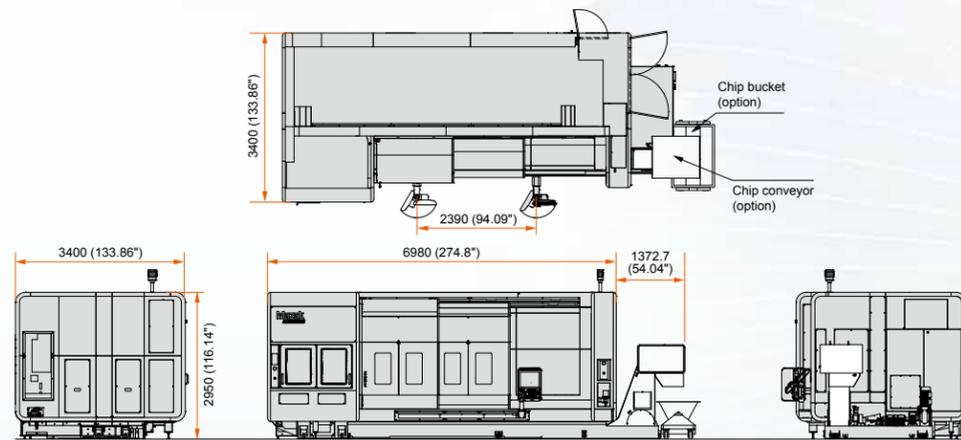
Unit: mm (inch)

INTEGREX i-500, i-500S, i-500ST (1500U)



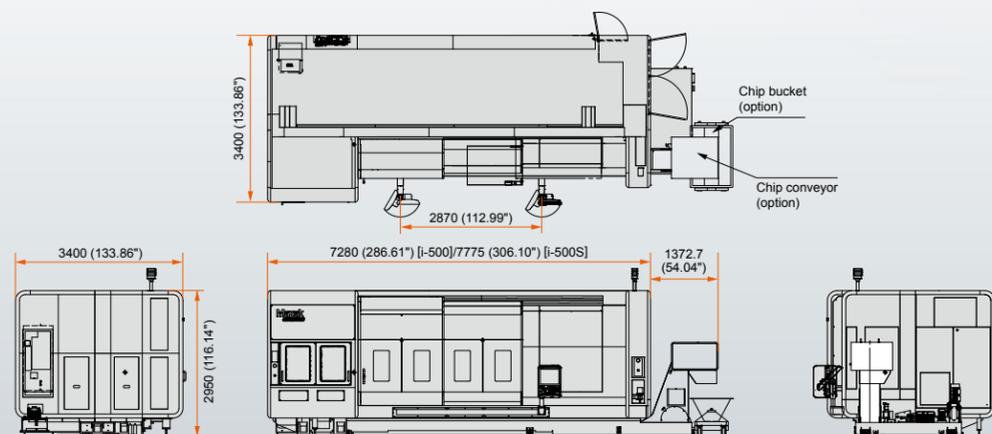
Shown with optional status light, 72-tool magazine and chip conveyor ConSep2000.

INTEGREX i-500, i-500S, i-500ST (2500U)



Shown with optional status light, 72-tool magazine and chip conveyor ConSep2000.

INTEGREX i-500, i-500S (3000U)



Shown with optional status light, 72-tool magazine and chip conveyor ConSep2000.

MAZATROL SmoothX Specifications

	MAZATROL	EIA
Number of controlled axes	Simultaneous 2 ~ 4 axes	Simultaneous 5 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, 5-axis spline*
Interpolation	Positioning (interpolation), Positioning (non-interpolation), Linear interpolation, Circular interpolation, Cylindrical interpolation, Polar coordinate interpolation, Constant lead threading, Re-threading*, Thread start point compensation*, Thread cut-speed override*, Synchronous tapping*	Positioning (interpolation), Positioning (non-interpolation), Linear interpolation, Circular interpolation, Spiral interpolation, Helical interpolation, Constant lead threading, Variable pitch threading, Threading (C-axis interpolation type), Cylindrical interpolation*, Involute interpolation*, Fine spline interpolation*, NURBS interpolation*, Polar coordinate interpolation*, Re-threading*, Thread start point compensation*, Thread cut-speed override*, 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), Tool life monitoring (wear)	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), Tool life monitoring (wear)
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 nose shape offset, Tool wear offset, Fixed amount offset, Simple wear offset	Tool position offset, Tool length offset, Tool diameter/tool nose R offset, Tool wear offset, Fixed amount offset, Simple wear offset
Coordinate system	Machine coordinate system, Work coordinate system, Local coordinate system, Additional work coordinates (300 set)	
Machine functions	Rotary axis prefilter, Tilted working plane, Polygonal machining*, Hobbing II*, Shaping function*, Dynamic compensation II*, Tool center point control*, Tool radius compensation for 5-axis machining*, Workpiece positioning error compensation*, 5-axis tool length compensation*, 5-axis parameter select*	
Machine compensation	Backlash compensation, Pitch error compensation, Geometric deviation compensation, Volumetric compensation*	
Protection functions	Emergency stop, Interlock, Pre-move Stroke Check, Barrier, 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, MD interruption, TPS, Restart, Single process, 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-setting data teach, Tool length teach, Touch sensor coordinates measurement, Workpiece offset measurement, WPC coordinate measurement, Measurement on machine, Tool eye measurement	Tool-setting data teach, Tool length teach, Tool offset teach, Touch sensor coordinates measurement, Workpiece offset measurement, WPC coordinate measurement, Measurement on machine, Tool eye measurement
Automatic measuring functions	WPC coordinate measurement, Automatic tool length measurement, Laser tool length/diameter measurement, Workpiece measurement, Sensor calibration, Tool eye auto tool measurement, Tool breakage detection, External tool breakage detection*	Automatic tool length measurement, Laser tool length/diameter measurement, Workpiece measurement, Sensor calibration, Tool eye auto tool measurement, Tool breakage detection, External tool breakage detection*
MDI measurement	Coordinate measurement, Laser measurement	
Interface	PROFIBUS-DP*, EtherNet/IP*, CC-Link*	
Card interface	SD card interface, USB	
EtherNet	10M/100M/1Gbps	

\*Option

# Mazak

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