Mazak

INTEGREX i-500

Mazak

INTEGREX i-500

[Multi-tasking Machine]

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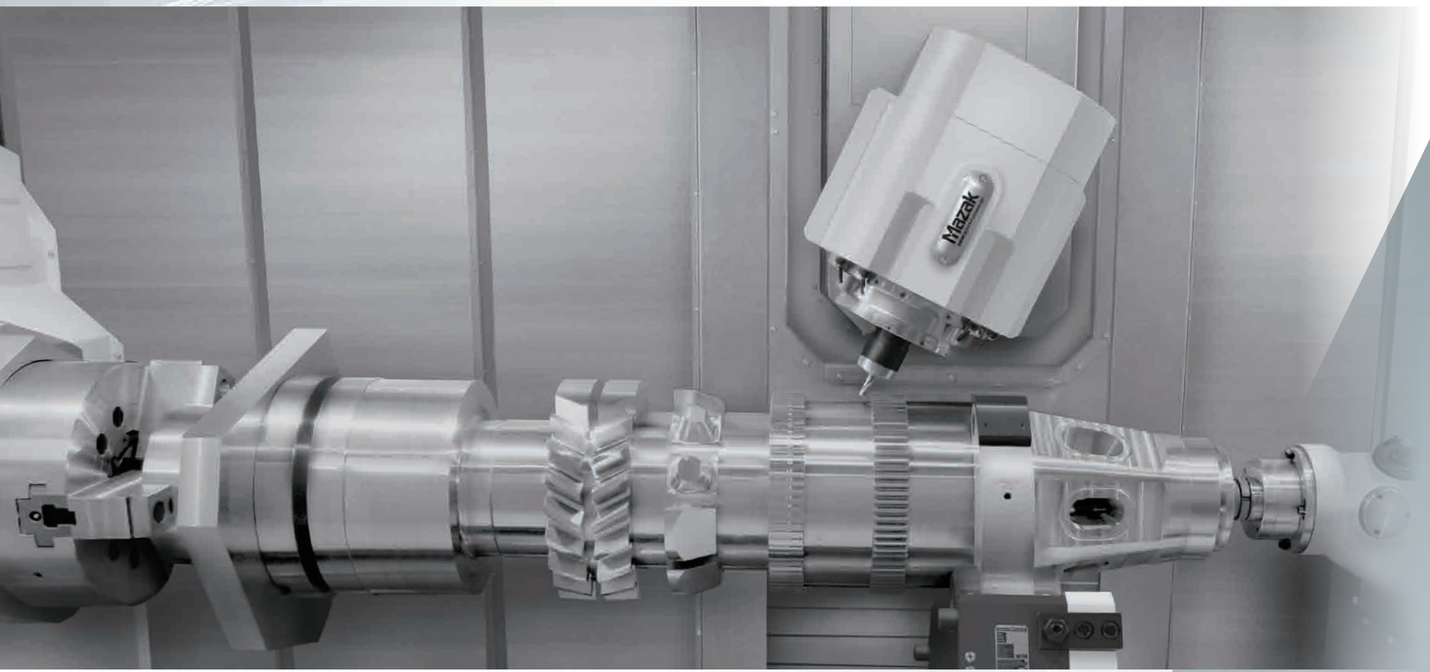
INTEGREX i-500 18.08.0 T 99J1A5918E0

Advanced INTEGREX with exceptional multi-tasking performance



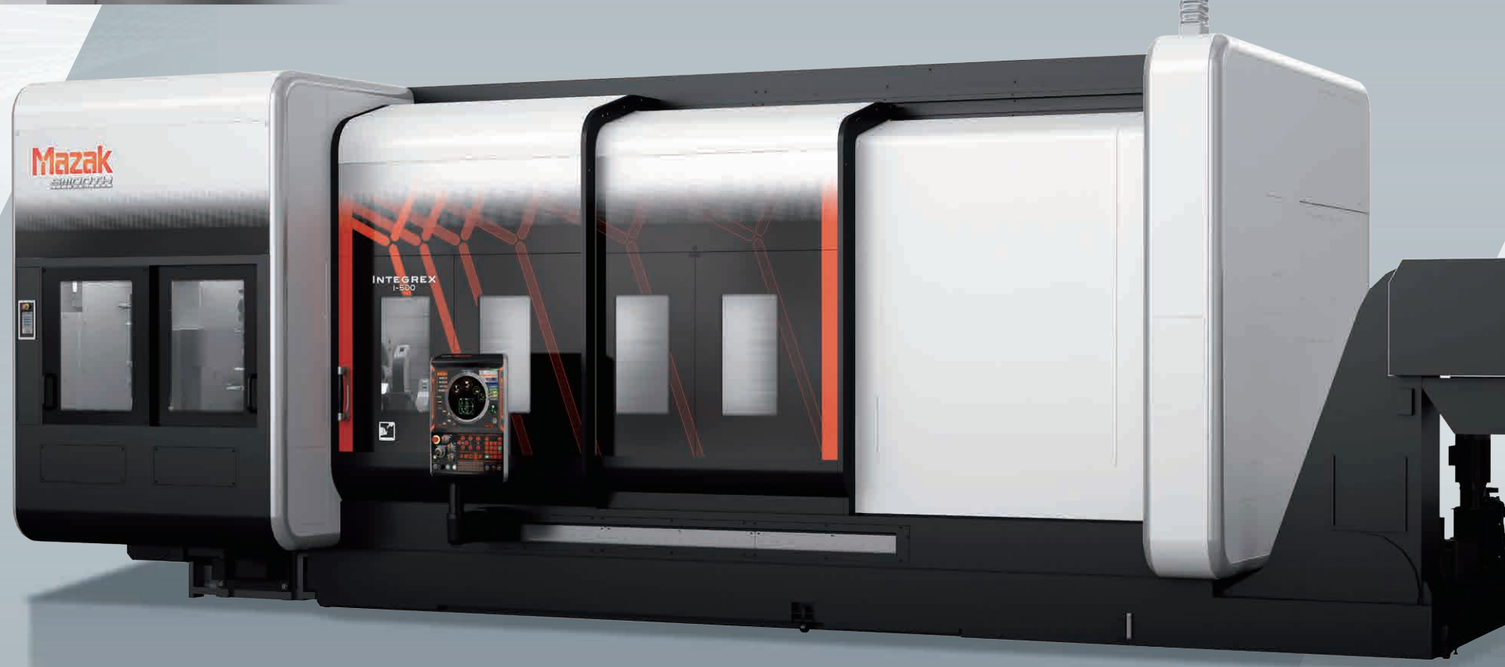
Wide variety of specifications to meet any production requirement

Universal	Main spindle	Milling spindle	Second spindle	Tailstock	Lower turret
1500U	4000 rpm 30 kW (40 HP) Φ91 mm	12000 rpm 24 kW (32 HP) #40 spindle	4000 rpm 30 kW (40 HP) Φ91 mm	MT No.5 Built-in center	9D Turning / milling
2500U	3300 rpm 37 kW (50 HP) Φ112 mm	12000 rpm 37 kW (50 HP) #40 high output spindle	3300 rpm 37 kW (50 HP) Φ112 mm		
3000U	2500 rpm 37 kW (50 HP) Φ132 mm	20000 rpm 24 kW (32 HP) #40 high speed spindle	2500 rpm 37 kW (50 HP) Φ132 mm		
	2000 rpm 37 kW (50 HP) Φ185 mm	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



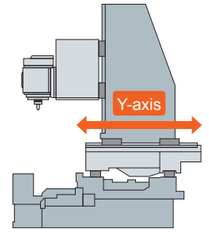
INTEGREX i-500 (2500U)
Shown with optional status light and steady rest

Higher Accuracy

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

Orthogonal machine design for high-accuracy machining

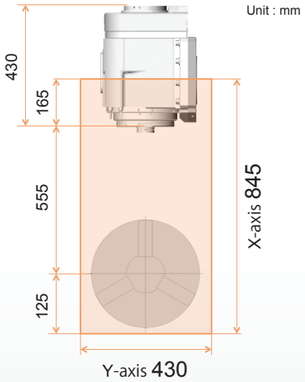
All axes are at 90° to each other for a large machining area with excellent operator access.



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
Large machining area Max. swing / max. machining diameter	Φ700 mm
Max. tool length	500 mm



High accuracy rotary axes

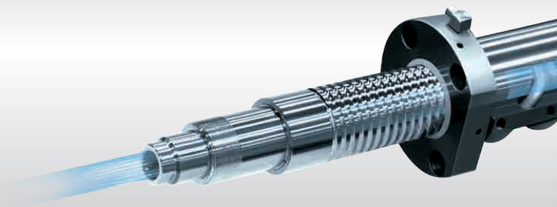
A roller gear cam on the B-axis eliminates backlash.
The C-axis is equipped with a full circumference disk brake to ensure higher accuracy.

B-axis min. indexing increment 0.0001°

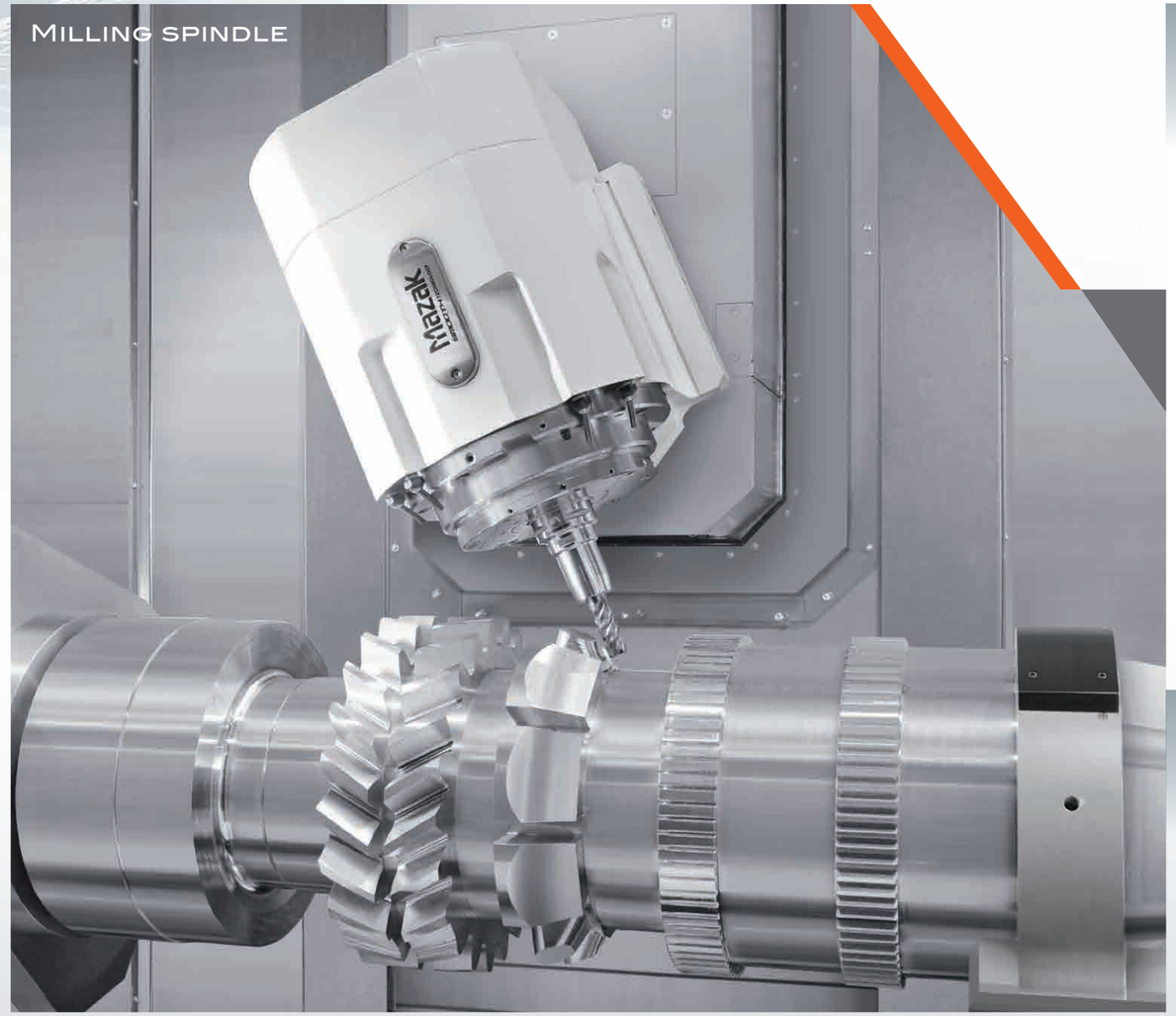
C-axis min. indexing increment 0.0001°

X-, Y-, Z-axis ball screw core cooling

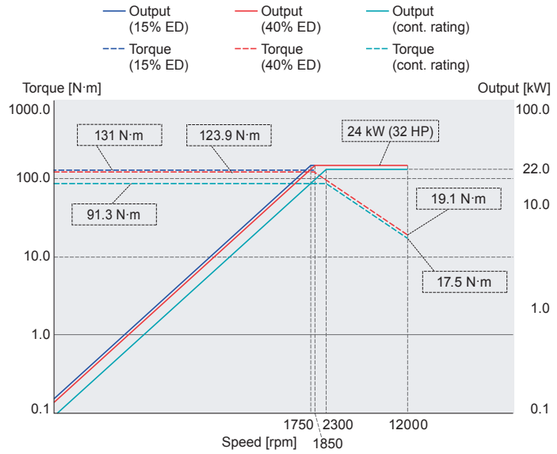
Temperature controlled cooling oil circulates through the ball screw cores to ensure stable machining accuracy over extended periods of high speed operation.



Higher Productivity & Higher Accuracy

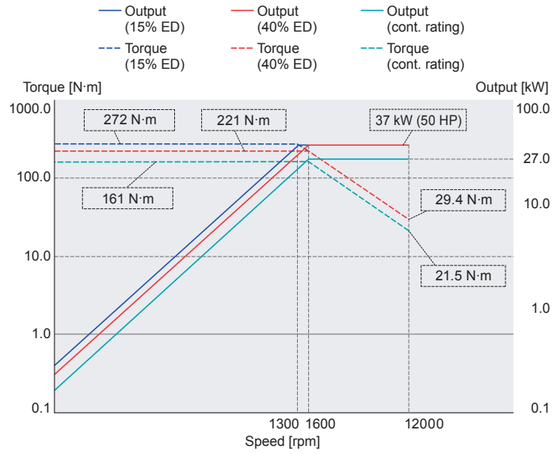


12000 rpm milling spindle



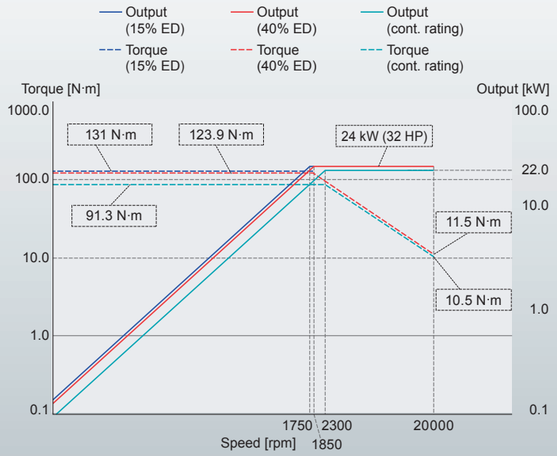
12000 rpm high output milling spindle

OPTION



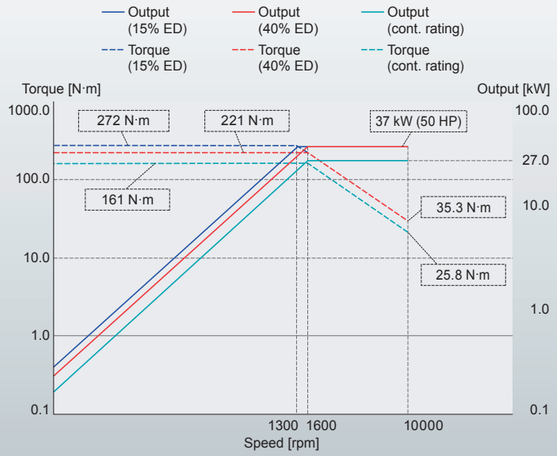
20000 rpm high speed milling spindle

OPTION



10000 rpm No.50 taper milling spindle

OPTION



Wide range of available milling spindle specifications

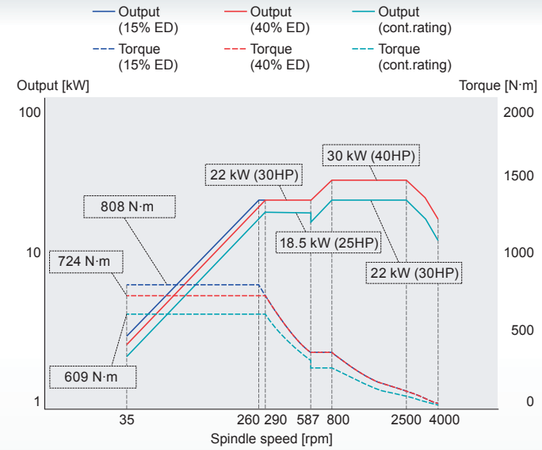
The milling spindle is equipped with a high output, high torque integral spindle / motor.
In addition to the standard No.40 taper spindle, high output and high speed specifications as well as a No.50 taper spindle are optionally available to meet a wide range of machining requirements.

Higher Productivity & Higher Accuracy

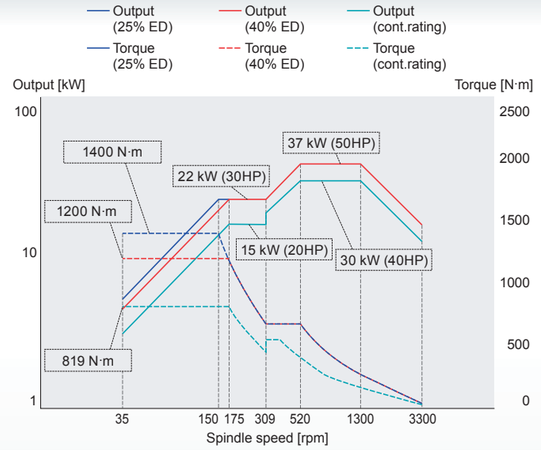
Turning spindle (main spindle, second spindle)

- 4 sizes of spindle bores are available to meet your 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°)

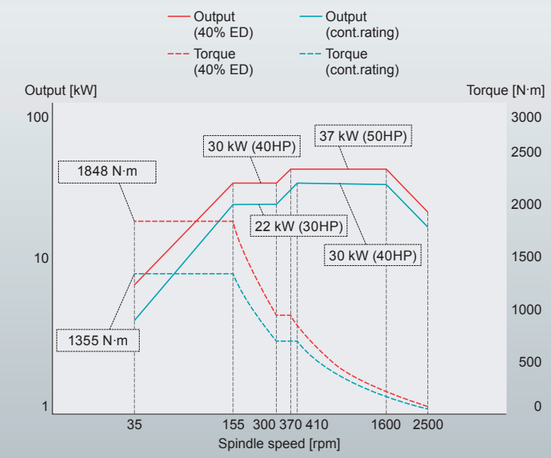
4000 rpm spindle, Φ91 mm bore



3300 rpm spindle, Φ112 mm bore OPTION

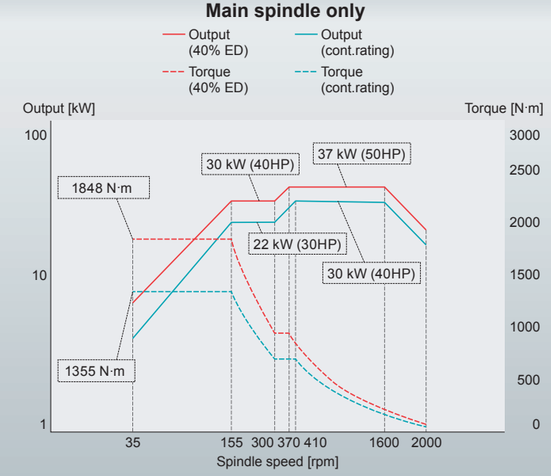


2500 rpm high torque spindle, Φ132 mm bore OPTION



2000 rpm high torque spindle, Φ185 mm bore OPTION

Main spindle only



Higher Productivity

Lower turret

The lower turret makes it possible to have two tools cutting 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 : □25 mm Boring bar : Φ40 mm

Lower turret with rotary tools OPTION

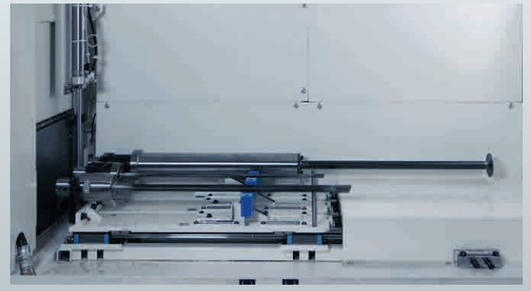
Improved productivity thanks to new heavy-duty rotary tools.

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
Tool size	Drill Φ20 mm
	Tap M20 (3/4 UNC)

Long drill stocker OPTION [2500U, 3000U]

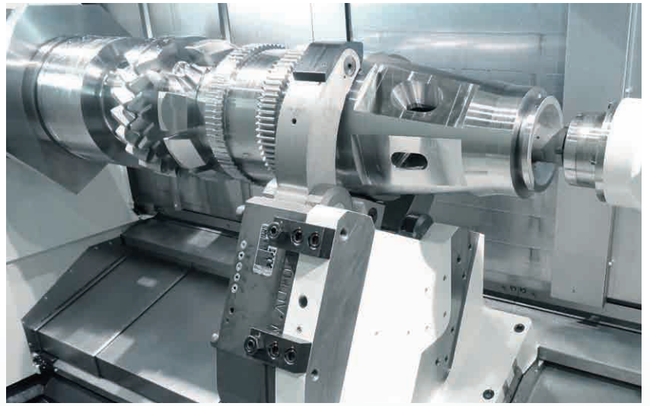
The long drill stocker is located over the tailstock / second spindle and is available for 2500U and 3000U models only. By loading a long drill in the milling spindle and rotating the B-axis, deep hole drilling can be performed.

Max. tool diameter (#40 / #50)	Φ80 mm / Φ102 mm
Max. tool length	1000 mm
Tool weight	12 kg
Tool storage capacity (#40 / #50)	3 / 2



Automatic steady rest OPTION

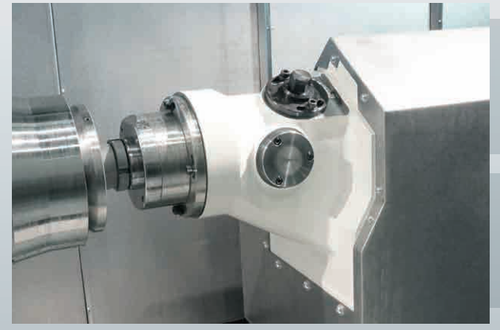
A variety of steady rests is available for high-accuracy and efficient machining of long shaft workpieces. The maximum workpiece diameter that can be supported is Φ410 mm . Positioning of the steady rests can be done by the CNC program.



Steady rest manufacturer / model	Gripping diameter
SMW K5.1Z	Φ100 mm~Φ410 mm
SMW K5Z	Φ80 mm~Φ390 mm
SMW K4Z	Φ52 mm~Φ280 mm
SMW SLU-X5.1Z	Φ85 mm~Φ350 mm
SMW SLU-X5Z	Φ45 mm~Φ310 mm
SMW SLU-X4Z	Φ30 mm~Φ245 mm

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)

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

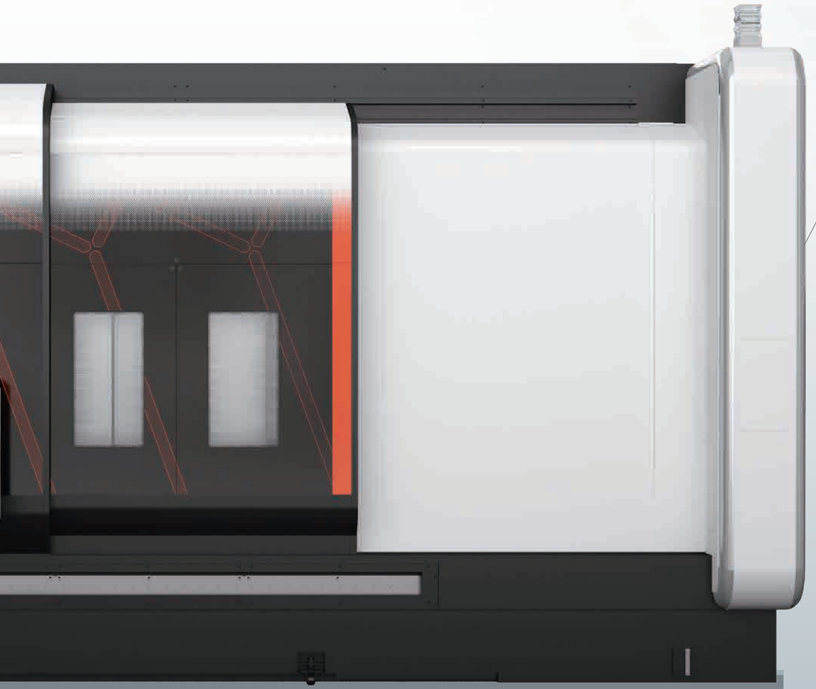
(Requires spindle bore Φ112 mm, Φ132 mm or Φ185 mm)

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 are opened by sliding left / right to not interfere with the operation area around the machine.

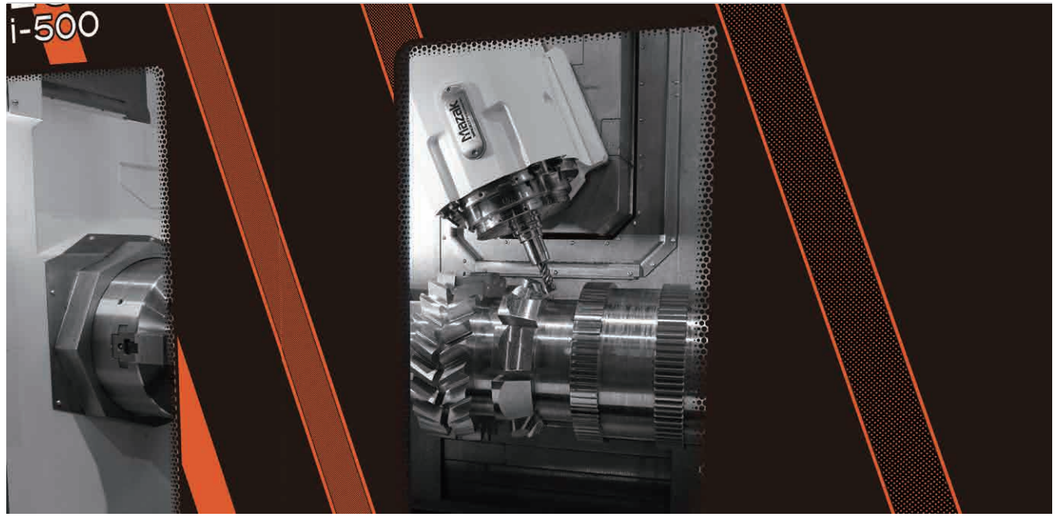


Maintenance area

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

Large window

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



Front cover height

To ensure ease of loading / unloading heavy workpieces, the height of the machine cover in front of the chuck is a low 605 mm.

MAZATROL CNC System

Unsurpassed ease of operation with touch screen

MAZATROL SMOOTH X

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 that they can be easily used again in the future.

Variable Acceleration Control Function

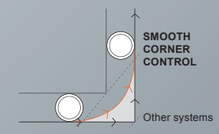
● VARIABLE ACCELERATION CONTROL

Variable acceleration control is a new function which 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

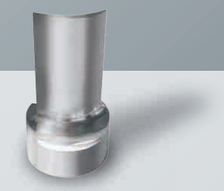
● SMOOTH CORNER CONTROL

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



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

(Test results for reference only)



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	Φ700 mm							
	Max. machining diameter (upper turret)	Φ700 mm							
	(lower turret)	-						Φ490 mm	
	Max. machining length*1	1574 mm	2594 mm	3074 mm	1574 mm	2594 mm	3074 mm	1574 mm	2594 mm
Travel	X-axis travel	845 mm							
	Z-axis travel	1640 mm	2660 mm	3140 mm	1640 mm	2660 mm	3140 mm	1640 mm	2660 mm
	Y-axis travel	430 mm							
	X2-axis travel (lower turret)	-						267 mm	
	Z2-axis travel (lower turret)	-						1373 mm	2393 mm
	B-axis travel	-30° ~ 210°							
Main spindle	Chuck size	10"							
	Main spindle speed*1	4000 rpm							
	Main spindle nose	A2-8							
	Main spindle bore	Φ91 mm							
	Bearing ID	Φ130 mm							
	Max. bar work capacity*1	Φ77 mm							
	Minimum main spindle indexing increment	0.0001°							
Second spindle	Chuck size	-			10"				
	Main spindle speed*1	-			4000 rpm				
	Second spindle nose	-			A2-8				
	Second spindle bore	-			Φ91 mm				
	Bearing ID	-			Φ130 mm				
	Minimum second spindle indexing increment	-			0.001°				
Milling spindle	Milling spindle type	Spindle turret with ATC							
	Milling spindle speed	12000 rpm							
	Max. milling spindle torque	131 N·m							
	Turning tool shank height	25 mm							
	Boring bar shank diameter	Φ40 mm							
	B-axis minimum indexing increment	0.0001°							
Lower turret	Turret type	-						9 position drum turret	
	Number of tools	-						9	
	Turning tool shank height	-						25 mm	
	Boring bar shank diameter	-						Φ40 mm	
Feedrate	Rapid traverse rate : X-axis	50 m/min							
	Rapid traverse rate : Z-axis	50 m/min		40 m/min	50 m/min		40 m/min	50 m/min	
	Rapid traverse rate : Y-axis	50 m/min							
	Rapid traverse rate : X2-axis (lower turret)	-						40 m/min	
	Rapid traverse rate : Z2-axis (lower turret)	-						40 m/min	32 m/min
	Rapid traverse rate : W-axis	8 m/min		4.5 m/min	30 m/min	18 m/min	12 m/min	30 m/min	18 m/min
Automatic tool changer system	Tool holder shank*2	HSK-A63 (T63)							
	Tool storage capacity	36							
	Max. tool diameter / length (from gauge line)	Φ90 mm (when adjacent pockets empty : Φ150 mm) / 500 mm							
	Max. tool weight	12 kg							
	Tool selection method	Random selection / shortest path							
Tailstock	Center	MT No. 5			-				
	Travel (W-axis)	1610 mm	2630 mm	3110 mm	-				
Motors	Main spindle motor (40% ED / cont. rating)	30 kW (40 HP) / 22 kW (30 HP)							
	Second spindle motor (40% ED / cont. rating)	-			30 kW (40 HP) / 22 kW (30 HP)				
	Milling spindle motor (40% ED / cont. rating)	24 kW (32 HP) / 22 kW (30 HP)							
Power requirement	Required power capacity (cont. rating)	56.95 kVA			86.09 kVA			88.49 kVA	
	Air source	0.5 MPa (5 kgf/cm²), more than 400 L / min			0.5 MPa (5 kgf/cm²), more than 460 L / min			0.5 MPa (5 kgf/cm²), more than 460 L / min	
Coolant	Tank capacity	510 L	665 L	645 L	510 L	665 L	715 L	510 L	665 L
Machine size	Machine height	2950 mm							
	Width × length	5595 mm × 3400 mm	6980 mm × 3400 mm	7280 mm × 3400 mm	5595 mm × 3400 mm	6980 mm × 3400 mm	7775 mm × 3400 mm	5595 mm × 3400 mm	6980 mm × 3400 mm
	Weight	21300 kg	23500 kg	24200 kg	21900 kg	24100 kg	25500 kg	22300 kg	24500 kg
Sound	Equivalent continuous sound pressure level at operator position (depend on equipment options)	less than 80 db (A)							

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

Standard and Optional Equipment

● : Standard ○ : Option - : N/A

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

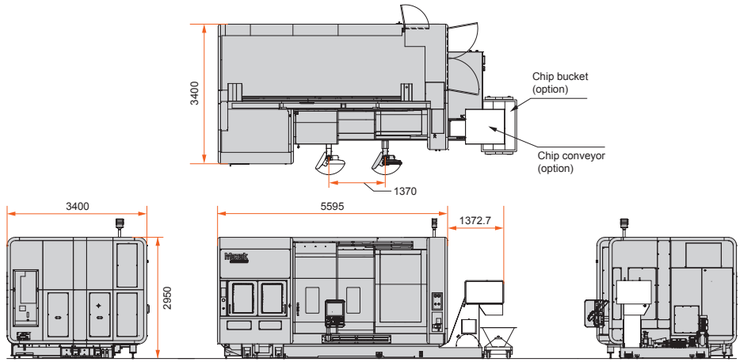
		i-500	S	ST
Safety equipment	Hydraulic pressure interlock	●	●	●
	Operator door interlock	●	●	●
	Overload detection system	○	○	○
Factory automation	Tool eye (upper turret / automatic)	●	●	●
	Tool eye (lower turret / automatic)	-	-	●
	Automatic chuck jaw open / close	●	●	●
	Chuck jaw open / close confirmation	●	●	●
	Automatic opening / closing front door	○	○	○
	Automatic power ON / OFF + warm-up system	●	●	●
	Machining finish buzzer	○	○	○
	Preparation for visual tool management / tool ID	○	○	○
	Robot interface	○	○	○
Coolant / Chip disposal	Cover coolant	●	●	●
	Flood coolant	●	●	●
	Simultaneous discharge of 0.5 MPa coolant through spindle and flood coolant (milling spindle)	●	●	●
	Simultaneous discharge of 1.5 MPa high-pressure coolant through spindle and flood coolant (milling spindle)	○	○	○
	SUPERFLOW coolant system-simultaneous discharge of 7 MPa high-pressure coolant through spindle and 0.5 MPa coolant	○	○	○
	Flood coolant for lower turret	-	-	●
	Shower coolant	○	●	●
	Oil skimmer	○	○	○
	Coolant temperature control	○	○	○
	Mist collector	○	○	○
	Coolant & air blast for chuck jaws (main spindle)	○	○	○
	Air blast through spindle	○	○	○
	Air blast for chuck jaws (main spindle)	○	○	○
	Air blast for chuck jaws (second spindle)	-	●	●
	Preparation for chip conveyor (side disposal・hinge)	●	●	●
	Preparation for chip conveyor (side disposal・ConSep)	○	○	○
	Chip conveyor (side disposal・hinge)	○	○	○
	Chip conveyor (side disposal・ConSep)	○	○	○
	Chip bucket (rotating)	○	○	○
	Chip bucket (fixed)	○	○	○
Others	Grease cartridge	○	○	○
	1 set of CD manuals	●	●	●
	Additional manuals (CD or paper)	○	○	○

Standard and optional equipment vary by market.

Machine Dimensions

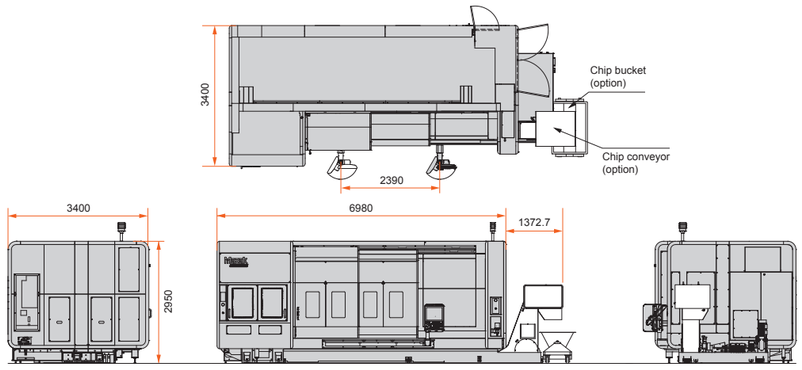
Unit : mm

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



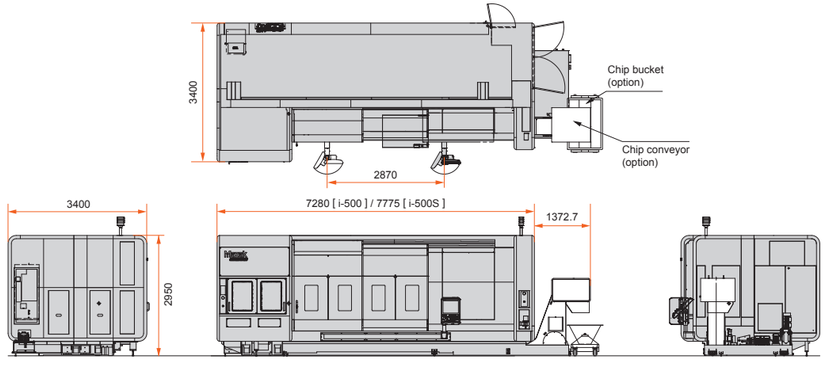
Shown with optional status light, 72 tool magazine and chip conveyor ConSep2000.

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	10 M / 100 M / 1 Gbps	

*Option