Mazak

INTEGREX i-H

SERIES

INTEGREX i-H Series

Multi-Tasking transforms manufacturing with AI, digital twin technology and automation

As data and digital technology rapidly transform production processes in manufacturing, Mazak's INTEGREX i-H Series raises productivity to new heights. These Multi-Tasking machines incorporate AI and digital twin technology to provide highly efficient digital manufacturing solutions that respond quickly to ever-changing production demands.

INTEGREX i-200H S

Shown with optional equipment

INTEGREX i-450H S

Shown with optional equipment

MAZATROL SMOOTH Ai

Shown with optional MAZATROL SmoothAi dual monitor

Ai

- AI analysis for optimum programming
- Ensures high-quality, high-accuracy machining

Digital Twin

- Perform digital setup on an office PC with digital twin technology using MAZATROL TWINS software
- Reduce machine setup time and improve efficiency on initial products and prototypes

Mazak AUTO FLEX CELL (option)

Automation

- The latest automated system with articulated robots

Next-Generation Multi-Tasking Machines

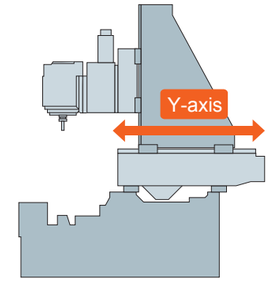
Enhanced mechanical performance and easy automation integration

Improved machine performance

- Flat machine front for easy incorporation of automation systems
- Large Y-axis strokes for expanded machining capability
- Wide variety of turning and milling spindle specifications available
- Available with second spindle and lower turret for process integration
- Compact 20000 rpm high-speed spindle (option) with improved output and torque for high-speed machining of aluminum
- Factory automation equipment – gantry loader, bar feeders and automatic jaw changer – for enhanced productivity

High-accuracy production with the capabilities of a turning center and machining center in one machine

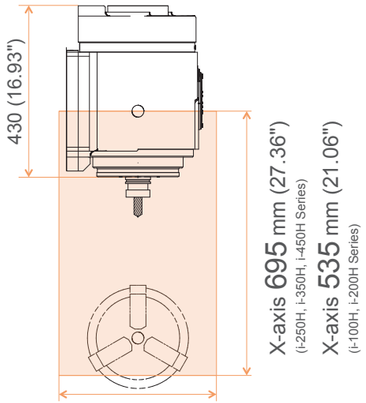
Redesigned based on structural analysis to provide the ideal combination of turning and machining for long-term, stable high precision with accurate positioning and performance over the entire Y-axis stroke.



Compact milling spindle and large machining area with minimal interference

The newly designed standard compact milling spindle measures 17% shorter than a conventional milling spindle, expanding the machining area with minimal interference for a large Y and Y-axis stroke to enhance conventional milling. The large machining area provides excellent performance over a wide range of applications and workpieces, as well as with special tools that require a large stroke.

	i-100H, i-200H Series	i-250H, i-350H, i-450H Series
Large Y-axis stroke	210 mm (8.27")	300 mm (11.81") (15% larger than conventional models)
Large machining area Max. swing/ max. machining diameter	ø600 mm (23.62")	ø670 mm (26.38")
Large tool size	300 mm (11.81")	400 mm (15.75")



Y-axis 300 mm (11.81")
(i-250H, i-350H, i-450H Series)
Y-axis 210 mm (8.27")
(i-100H, i-200H Series)

INTEGREX: Increased Multi-Tasking versatility through design evolution

The INTEGREX Series has evolved with a focus on reducing lead times and meeting diverse production requirements, from machining long, large-diameter workpieces to mastering difficult materials.

INTEGREX i-H HISTORY

1983 SLANT TURN 40N ATC

MAZATROL CAM T-3 CNC

1988 INTEGREX 40 ATC

Milling capacity
11 kW (15 hp) (30-min. rating)
MAZATROL T-32-3 CNC

1997 INTEGREX 200Y

Spindle turret
B axis
MAZATROL FUSION640MT
CNC (since 1998)

2000 INTEGREX 200-IISY

10000 rpm milling spindle
C-axis contouring

2002 INTEGREX 200-III

12000 rpm milling spindle
B-axis and C-axis contouring
MAZATROL FUSION640MT Pro
CNC

2005 INTEGREX 200-IV

MAZATROL MATRIX CNC

2010 INTEGREX i-200

Long Y-axis stroke
B-axis 0.0001° indexing
MAZATROL MATRIX CNC

2014 INTEGREX i-200

MAZATROL SmoothX CNC

2019 INTEGREX i-200H
Next-generation
Multi-Tasking machine


MAZATROL SmoothAi CNC

Higher Accuracy

Ai Thermal Shield

To ensure even higher machining accuracy, new algorithms monitor temperature changes and automatically determine the amount of compensation to apply.

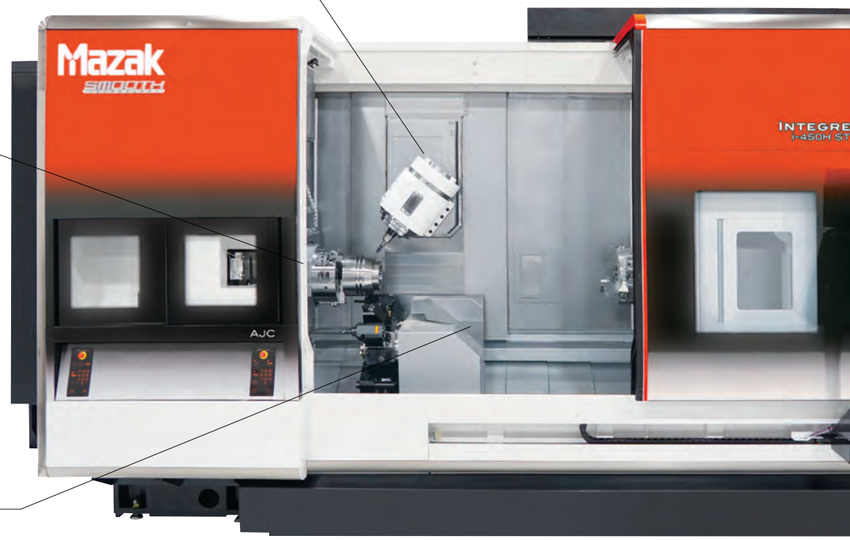
Designed for higher speed and higher accuracy

Highly rigid, high-accuracy C-axis disk brake

C-axis disk brake ensures high-accuracy machining with powerful, evenly distributed force. Index the main spindle and perform compensation in 0.0001° degree increments.

B-axis roller gear cam

Roller gear cam on the B-axis eliminates backlash for high rigidity and high-power cutting. For high-accuracy B-axis positioning, the minimum indexing increment is 0.0001°. B-axis scale feedback is standard equipment.



Linear roller guides

For improved positioning accuracy with lower friction, the INTEGREX i-H Series uses rigid linear roller guides on all linear axes.

Heat displacement control

Spindle temperature control

For high-accuracy machining, temperature-controlled cooling oil circulates around the spindle bearings and headstock to minimize any thermal changes to the spindle.

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

Milling Spindle

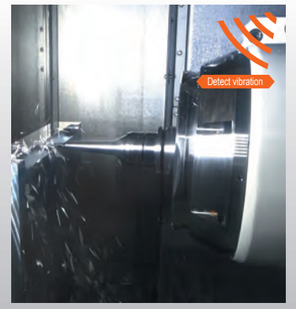
The compact milling spindle with automatic tool changer enlarges the machining area and minimizes interference. A wide variety of spindle specifications meets a comprehensive range of production requirements. The standard 12000 rpm spindle performs high-efficiency machining of steel and castings, while the optional 20000 rpm spindle is designed for high-speed machining of aluminum and small-diameter machining.

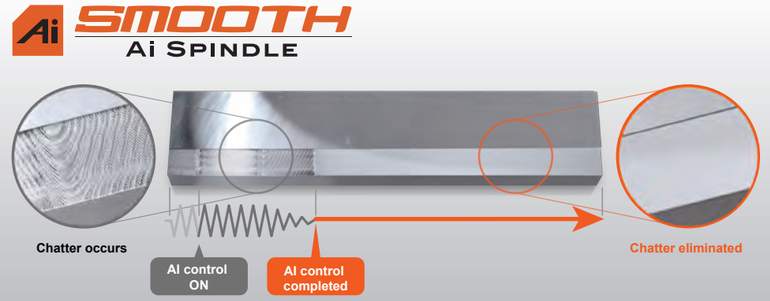
■ Milling spindle speed

12000 rpm STANDARD High-performance spindle suitable for a wide range of machining applications	12 kW (16 hp) (40% ED; 30-min. rating)	i-100H, i-200H Series
	24 kW (32 hp) (40% ED; 30-min. rating)	i-250H, i-350H, i-450H Series
12000 rpm high-output spindle OPTION High-torque spindle ideal for machining difficult-to-cut materials that require high torque	24 kW (32 hp) (40% ED; 30-min. rating)	i-100H, i-200H Series
20000 rpm high-speed spindle OPTION High-output, high-speed spindle ideal for machining aluminum and drilling small diameters	24 kW (32 hp) (40% ED; 30-min. rating)	i-100H, i-200H, i-250H, i-350H, i-450H Series

SMOOTH Ai Spindle — OPTION

Even without a skilled operator, AI quickly detects milling-spindle vibration and automatically changes machining conditions to produce unsurpassed surface finishes and high productivity.

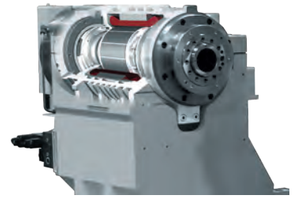




Main Spindle

Powerful turning spindle

With no gears or belts to cause vibration, the powerful, high-torque INTEGREX i-H Series integral spindle motor ensures excellent surface finishes and high reliability along with fast machining cycle times.



INTEGREX i-100H, i-100H S, i-100H ST

Spindle speed	6000 rpm
Spindle output [40% ED (30-min. rating)/cont. rating]	11 kW (15 hp)/7.5 kW (10 hp)
Max. torque [40% ED (30-min. rating)]	143 N·m (105 ft·lbs)

INTEGREX i-200H, i-200H S, i-200H ST
INTEGREX i-250H, i-250H S, i-250H ST

Spindle speed	5000 rpm
Spindle output [40% ED (30-min. rating)/cont. rating]	22 kW (30 hp)/15 kW (20 hp)
Max. torque [40% ED (30-min. rating)]	350 N·m (258 ft·lbs)

INTEGREX i-350H, i-350H S, i-350H ST

Spindle speed	4000 rpm
Spindle output [40% ED (30-min. rating)/cont. rating]	30 kW (40 hp) / 22 kW (30 hp)
Max. torque [40% ED (30-min. rating)]	724 N·m (534 ft·lbs)

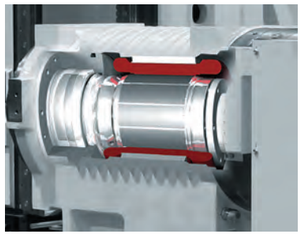
INTEGREX i-450H, i-450H S, i-450H ST

Spindle speed	3300 rpm
Spindle output [40% ED (30-min. rating)/cont. rating]	37 kW (50 hp)/30 kW (40 hp)
Max. torque [40% ED (30-min. rating)]	1200 N·m (885 ft·lbs)

Second Spindle

High-speed integral/spindle motor

Perform continuous machining of first and second processes. Synchronize the rotation of the first and second spindles for in-phase radial positioning of a workpiece feature in the first and second processes.



INTEGREX i-100H S, i-100H ST

Spindle speed	6000 rpm
Spindle output [40% ED (30-min. rating)/cont. rating]	11 kW (15 hp)/7.5 kW (10 hp)
Max. torque [40% ED (30-min. rating)]	143 N·m (105 ft·lbs)

INTEGREX i-200H S, i-200H ST
INTEGREX i-250H S, i-250H ST

Spindle speed	5000 rpm
Spindle output [40% ED (30-min. rating)/cont. rating]	18.5 kW (25 hp)/15 kW (20 hp)
Max. torque [40% ED (30-min. rating)]	325 N·m (240 ft·lbs)

INTEGREX i-350H S, i-350H ST
INTEGREX i-450H S, i-450H ST

Spindle speed	4000 rpm
Spindle output [40% ED (30-min. rating)/cont. rating]	26 kW (35 hp)/22 kW (30 hp)
Max. torque [40% ED (30-min. rating)]	500 N·m (369 ft·lbs)

Higher Productivity

NC Tailstock

The operator can use menu keys or M-code to set tailstock position on the setup screen and move the tailstock to another position.

i-100H	Tailstock center (live center): MT No.4 Max. thrust: 2 kN (203 kgf) (450 lbs)
i-200H	Tailstock center (live center): MT No.5 Max. thrust: 7 kN (713 kgf) (1574 lbs)
i-250H	Tailstock center (built-in center): MT No.5 Max. thrust: 7 kN (713 kgf) (1574 lbs)
i-350H i-450H	Tailstock center (built-in center): MT No.5 Max. thrust: 10 kN (1019 kgf) (2248 lbs)

Tool Magazine

Located at the rear of the machine, the tool magazine stores 38 tools (optional: 74 or 112 tools). Standard HSK-A63 (T63) connection and optional CAPTO C6 and KM4X63 tool connections are available.

Tool holder connection
HSK-A63 (T63) (option: CAPTO C6, KM4X63)

Convenient tool magazine access at the front of the machine

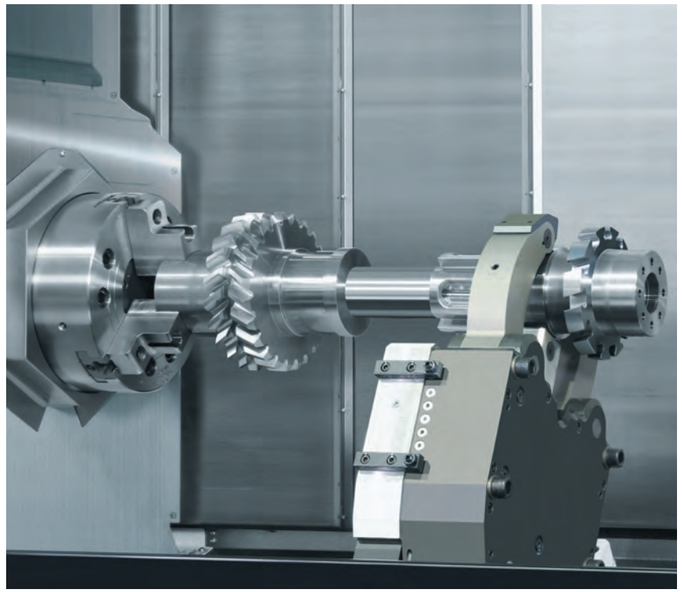
For higher efficiency, front access to the tool magazine eliminates time-consuming trips to the rear of the machine. Shortening the operator's walking distance increases safety and work efficiency.

	i-100H, i-200H Series	i-250H, i-350H, i-450H Series
Max. tool length	300 mm (11.81")	400 mm (15.75")
Max. tool diameter	ø90 mm (ø3.54") ø130 mm (ø5.12") (when adjacent pockets empty)	ø90 mm (ø3.54") ø130 mm (ø5.12") (when adjacent pockets empty)
Max. tool weight	5 kg (11 lbs)	12 kg (26 lbs)

Automatic Steady Rest

OPTION

Numerous steady rests are available for high accuracy and efficient machining of long-shaft workpieces.



i-250H, i-250H S (1500U)

Steady rest	Gripping diameter
SMW SLU-X2	ø8~ø101 mm (ø0.31"~ø3.98")

i-350H, i-350H S, i-450H, i-450H S (1500U)

Steady rest	Gripping diameter
SMW SLU-X2	ø8~ø101 mm (ø0.31"~ø3.98")
SMW SLU-X3	ø12~ø152 mm (ø0.47"~ø5.98")
SMW SLU-X3.1	ø20~ø165 mm (ø0.79"~ø6.50")
SMW SLU-X3.2	ø50~ø200 mm (ø1.97"~ø7.87")
SMW K4	ø52~ø280 mm (ø2.05"~ø11.02")

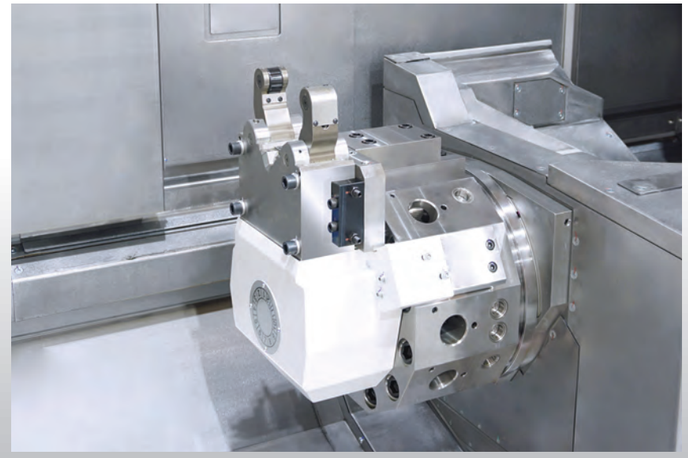
i-350H, i-350H S, i-450H, i-450H S (2500U)

Steady rest	Gripping diameter
SMW SLU-X2	ø8~ø101 mm (ø0.31"~ø3.98")
SMW SLU-X3	ø12~ø152 mm (ø0.47"~ø5.98")
SMW SLU-X3.1	ø20~ø165 mm (ø0.79"~ø6.50")
SMW SLU-X3.2	ø50~ø200 mm (ø1.97"~ø7.87")
SMW K4	ø52~ø280 mm (ø2.05"~ø11.02")
SMW K4.1	ø90~ø330 mm (ø3.54"~ø12.99")

Orthogonal Lower Turret Steady Rest

OPTION

The steady rest is mounted on the orthogonal lower turret to expand machining versatility and increase setup efficiency.

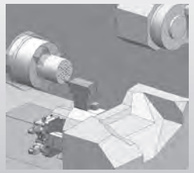


i-100H ST, i-200H ST
i-250H ST, i-350H ST, i-450H ST

Steady rest	Gripping diameter
SMW SLU-X1	ø6~ø70 mm (ø0.24"~ø2.76")

i-250H ST, i-350H ST, i-450H ST

Steady rest	Gripping diameter
SMW SLU-X2	ø8~ø101 mm (ø0.31"~ø3.98")



Perform turret rotation with the steady rest (limited number of mounting tools)

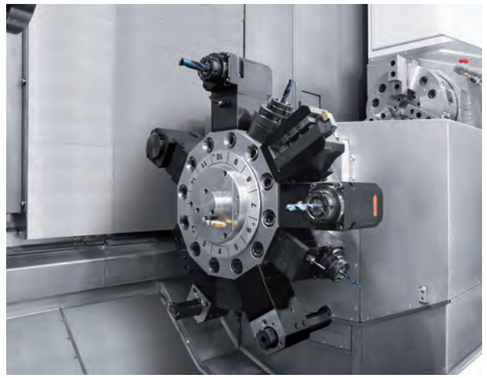
Higher Productivity

Two types of lower turrets meet a wide variety of production requirements. The high-rigidity lower turret performs turning and milling, while continuous machining on the main and second spindle reduces cycle time.

Orthogonal Lower Turret

Selectable

The orthogonal lower turret handles a wide range of applications, such as balance cutting for improved surface finishes and machining with a long boring bar and steady rest. Mount up to 12 rotary tools on the lower turret and perform 10000 rpm high-speed machining. The turret reduces chip accumulation during automated operation over extended time periods.



Lower turret standard specifications

12-position drum turret for expanded range of machining

Turret type		12-position drum turret
Number of tools		12 tools
Tool size	i-100H ST i-200H ST	Turning tool □20 mm (0.79") Boring bar ø32 mm (1.26")
	i-250H ST i-350H ST i-450H ST	Turning tool □25 mm (1") Boring bar ø32 mm (1.26")
Turret indexing		0.19 sec./1 step

Lower turret with rotary tools

OPTION

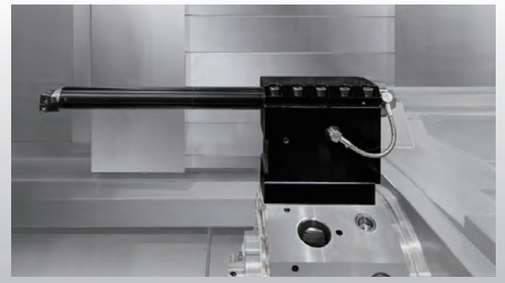
New rotary tools improve productivity

Number of tools		12 tools (Max. 12 rotary tools)
Max. milling spindle speed		10000 rpm
Milling spindle power (25% ED)	i-100H ST i-200H ST	AC 5.5 kW (7.5 hp)
Milling spindle power [40% ED (30-min. rating)]	i-250H ST i-350H ST i-450H ST	AC 7.5 kW (10 hp)
Max. torque (25% ED)	i-100H ST i-200H ST	30 N•m (22 ft•lbs)
Max. torque (10% ED)	i-250H ST i-350H ST i-450H ST	47.7 N•m (35 ft•lbs)
Tool size	i-100H ST i-200H ST	Drill ø16 mm (0.63") Tap M16 (5/8 UNC)
	i-250H ST i-350H ST i-450H ST	Drill ø20 mm (0.79") Tap M20 (3/4 UNC)

Application Examples With Orthogonal Lower Turret

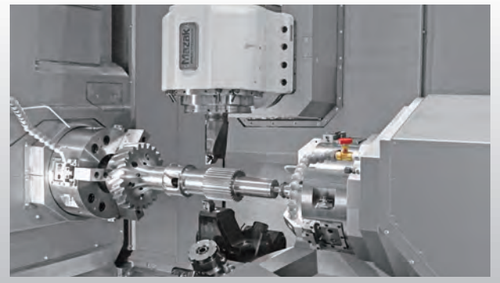
Long boring bar

Effective at boring deep holes in large workpieces.



Balance cut

Ensure reduced machining time, high-accuracy machining and improved surface finishes.



Slant Lower Turret

Selectable

The unique turret design reduces the required number of tools, enabling the same tool mounted on the lower turret to machine on both the main and second spindles. In addition, the INTEGREX i Series can use the same machining programs as the INTEGREX i-H Series.

Lower turret standard specifications

[i-100H ST, i-200H ST, i-250H ST, i-350H ST, i-450H ST]

9-position drum turret for expanded machining versatility

Turret type		9-position drum turret
Number of tools		9 tools
Tool size	i-100H ST i-200H ST	Turning tool □20 mm (0.79") Boring bar ø32 mm (1.26")
	i-250H ST i-350H ST i-450H ST	Turning tool □25 mm (1") Boring bar ø32 mm (1.26")
Turret indexing		0.14 sec. / 1 step

Lower turret with rotary tools

OPTION

[i-250H ST, i-350H ST, i-450H ST]

Mount rotary tools on the lower turret

Number of tools	9 tools (Max. 6 rotary tools)
Max. milling spindle speed	6000 rpm
Milling spindle power (40% ED (30-min. rating)]	AC 1.4 kW (2 hp)
Max. torque (10% ED)	18 N·m (13 ft·lbs)
Tool size	Drill ø14 mm (0.55") Tap M12 (7/16 UNC)

Application Example With Slant Lower Turret

Simultaneous machining

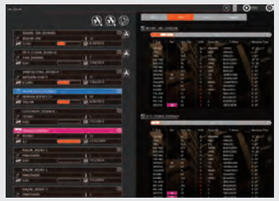
Perform simultaneous machining with two tools using the milling spindle and lower turret. This is effective for unattended operation with either a gantry loader or gantry robot.

Automation

Mazak AUTO FLEX CELL — OPTION

The compact, self-propelled articulated robot and stockers in front of the machine automate various setup operations, such as loading and unloading workpieces, supplying chuck jaws and exchanging special tools. The Mazak AUTO FLEX CELL can be added even after the machine has been installed.

SMOOTH RCC



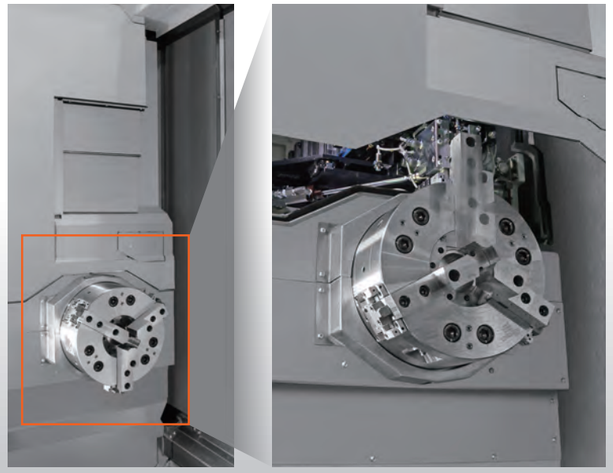
SMOOTH Robot Cell Controller (RCC) management software simplifies using the AUTO FLEX CELL in high-mix, low-volume production. This gives the operator a convenient display of programming operations, operation status and production scheduling, all on the optional CNC dual monitor.

Auto Jaw Changer — OPTION

The new auto jaw changer automatically changes chuck jaws for the main and second spindles. During machining, the operator or an automation process can change the chuck jaws at the auto jaw changer magazine door at the front of the machine.

Applicable spindles	Main and second spindles
Number of stored chucks	10 sets each

* Not applicable to INTEGREX i-100H and i-200H Series



Gantry Loader System — OPTION

The compact overall height of the unique gantry loader system reduces work loading/unloading time and enables automatic operation over extended periods of time. For greater flexibility, install the workpiece conveyor on the right or left side of the machine, and even connect multiple machines. Many workpiece hands and conveyors are available to meet production requirements. Add a gantry loader system even after INTEGREX i-H installation.

Workpiece conveyor

Gantry loader

Bar Feeder — OPTION

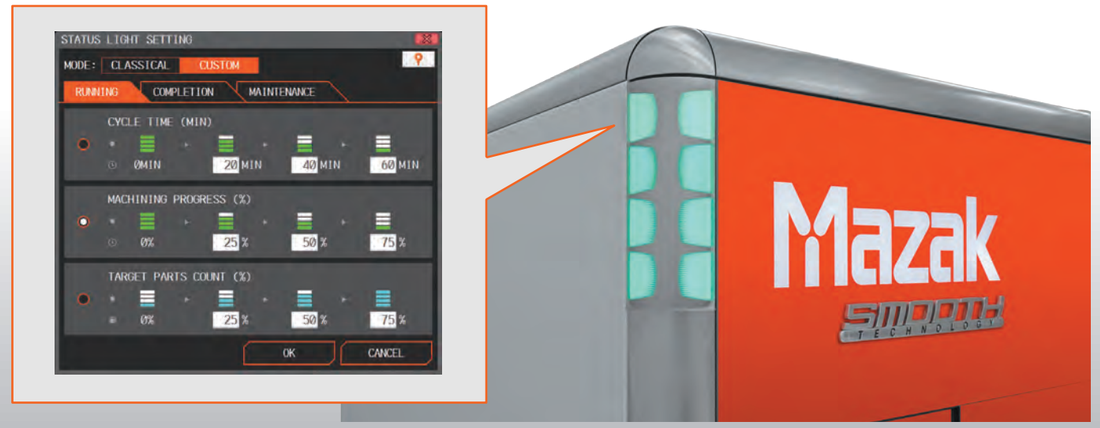
The INTEGREX i-H Series easily accepts most popular bar feeders. Optional bar-feeder scheduling accommodates both high-mix, low-volume production and set production.

Ergonomics

An ongoing focus on machine ergonomics provides unsurpassed ease of operation and maintenance

Machine Lights to Monitor Machining Status

Four built-in status lights on the left side corner display machining completion and alarms. On the CNC display, operators can customize the illumination of these 4 lights to indicate machine status and machining progress.



Designed for Ease of Operation

Center-line height and the distance from the front cover to the machine center line provide convenient workpiece loading and unloading.

Minimum Spindle Center Line Height

Easily load and unload workpieces and set up the machine.

Wide Door Opening/Overhead-Crane Access

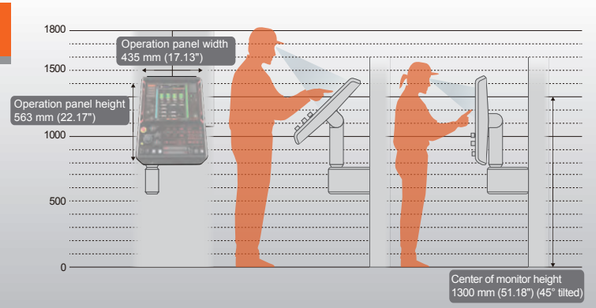
For ease of operation when loading and unloading workpieces, the wide door opening provides excellent access with an overhead crane.

Adjustable CNC Touch Panel

Tilt the operation touch panel to the optimal angle for any operator's height and position it along the length of the machine for ease of operation.

Large Window/Interior Lighting

The large front door window and interior lighting enable the operator to monitor workpiece machining easily.



Innovation for Higher Productivity

MAZATROL SMOOTH Ai

New MAZATROL SmoothCNC

Designed to provide unsurpassed productivity through even faster and higher-precision control while elevating your production to the next level with AI and digital twin technology

- Touch screen operation — similar to using your smartphone/tablet
- MAZATROL Smooth graphical user interface for unsurpassed ease of operation
- CNC system integrates with your Windows® PC
- Latest hardware and software for unprecedented speed and precision
- Higher machining speed for high-accuracy 5-axis machining
- Fine-tuning function – Easy machining parameter setting for various workpieces
- MAZATROL TWINS – Software that enables real-time sharing and centralized management of various data for increased productivity

■ AI

Increase your productivity with AI technology

■ Digital Twin

Create a virtual machine on your office PC for efficient setup and improved productivity

■ Automation

Advanced automation with robot and SMOOTH Robot Cell Controller (RCC)

Shown with optional dual monitor

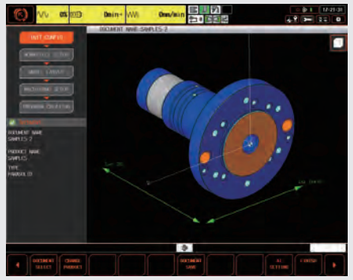
Innovative Functions for Higher Productivity

Improve productivity from programming to machining

Automatic programming

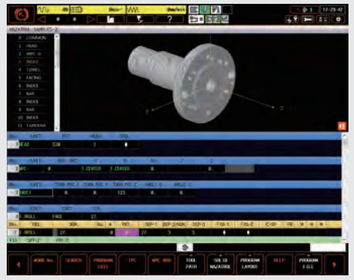
Solid MAZATROL

Generate programs automatically from 3D CAD data. AI learning takes advantage of machining know-how from programs created in the past and automatically calculates the optimal machiningprogram.



Import 3D CAD model

Required time for programming 2.5 min.



MAZATROL programming completed

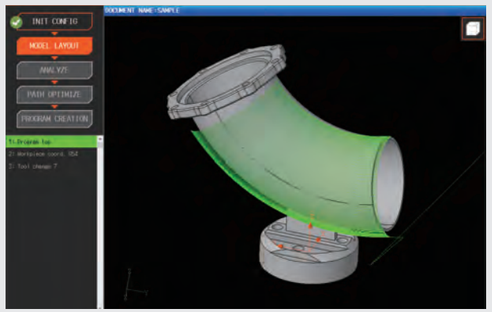
Machining Analysis, Simulation and Optimization

Cutting Adviser

Cutting adviser optimizes machining conditions through machining simulation and visualization of the machining process from accumulated machining results.

SMC PLUS OPTION

Compares the cutting point of the EIA program with the 3D model so the command point can be changed to ensure the correct tool path and high-accuracy surface finishes.



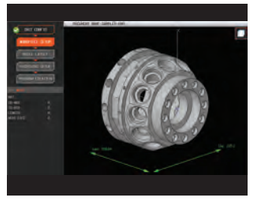
Advanced digital technology for manufacturing

MAZATROL TWINS software for enhanced productivity OPTION

Virtual machines in your office accurately duplicate the operation of machines on your factory floor. Substantially increase your production efficiency with available software and machines equipped with the MAZATROL SmoothAi CNC.

SMOOTH CAM Ai

Make and edit programs and perform simulation and analysis on the SMOOTH CAM Ai for multiple machines.



AI programming

Fast simulation

Analysis/Optimization

SMOOTH Project Manager

SMOOTH Project Manager manages data for the entire factory. These data can be synchronized between machines in the factory and PCs in the office.

SMOOTH Tool Management

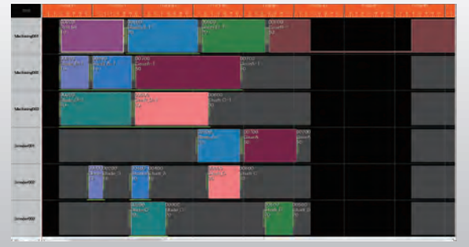
For higher productivity, SMOOTH Tool Management software manages data from the large number of tools in use by a factory.

SMOOTH Monitor AX • Smooth Link

For production results and analysis, the system accumulates machine status information from the entire plant.

SMOOTH Scheduler

SMOOTH Scheduler software uses production data to create effective machining schedules. An intuitive chedule display provides convenient monitoring of production progress.

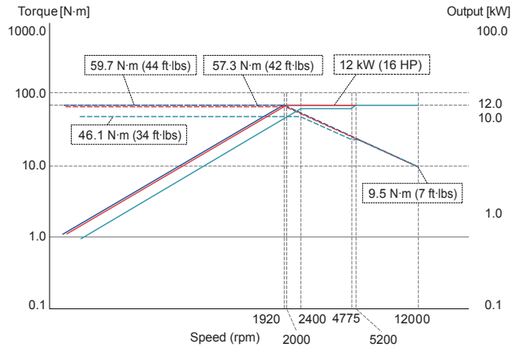


■ Milling spindle output/torque diagrams

Output [kW] (15% ED) — Output [kW] (40% ED) — Output [kW] (con. rating) -- Torque [N•m] (15% ED) -- Torque [N•m] (40% ED) -- Torque [N•m] (con. rating)

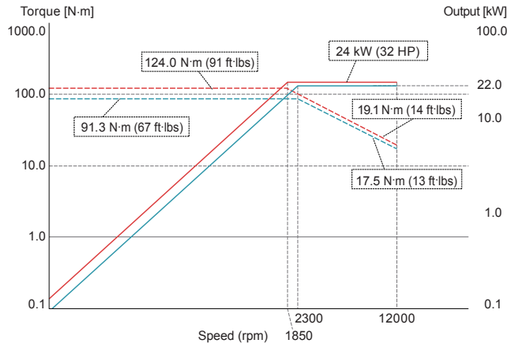
12000 rpm spindle

INTEGREX i-100H, i-200H Series



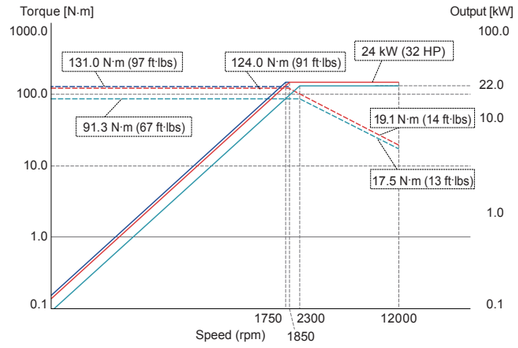
12000 rpm high-output spindle OPTION

INTEGREX i-100H, i-200H Series



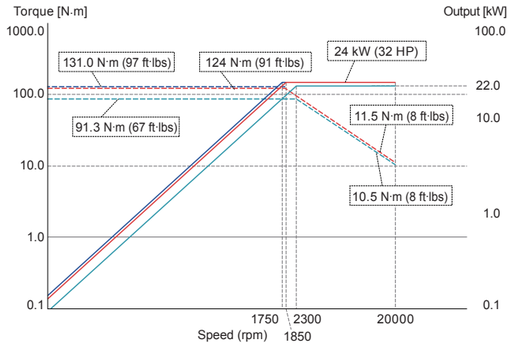
12000 rpm spindle

INTEGREX i-250H, i-350H, i-450H Series



20000 rpm high-speed spindle OPTION

INTEGREX i-100H, i-200H, i-250H, i-350H, i-450H Series



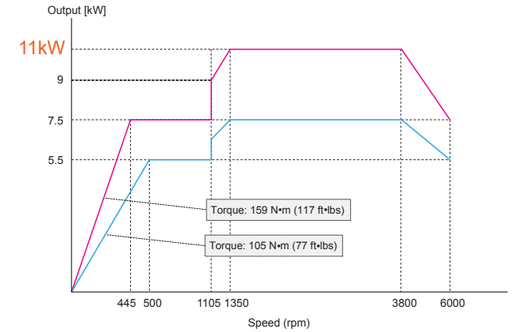
■ Main • Second spindle output/torque diagrams

Output [kW] (con.rating) — Output [kW] (40% ED)

Main spindle

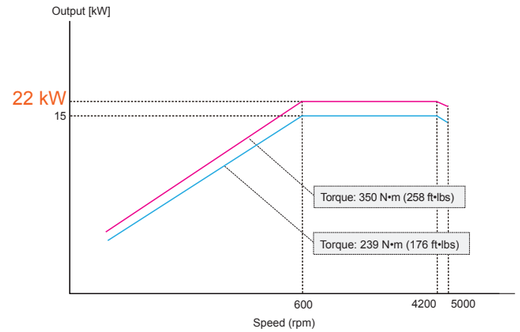
INTEGREX i-100H, 100H S, 100H ST

Main spindle speed: 6000 rpm
Main spindle power: 11 kW (15 hp) [40% ED (30-min. rating)] 7.5 kW (10 hp; cont. rating)
Max. torque: 159 N•m (117 ft•lbs) [40% ED (30-min. rating)]



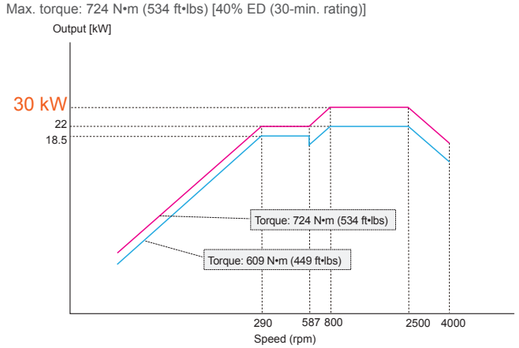
INTEGREX i-200H, 200H S, 200H ST
INTEGREX i-250H, 250H S, 250H ST

Main spindle speed: 5000 rpm
Main spindle power: 22 kW (30 hp) [40% ED (30-min. rating)] 15 kW (20 hp; cont. rating)
Max. torque: 350 N•m (258 ft•lbs) [40% ED (30-min. rating)]



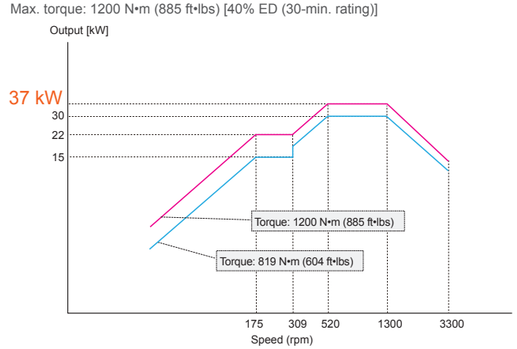
INTEGREX i-350H, 350H S, 350H ST

Main spindle speed: 4000 rpm
Main spindle power: 30 kW (40 hp) [40% ED (30-min. rating)] 22 kW (30 hp; cont. rating)
Max. torque: 724 N•m (534 ft•lbs) [40% ED (30-min. rating)]



INTEGREX i-450H, 450H S, 450H ST

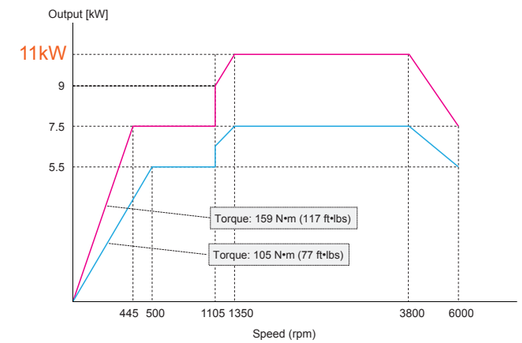
Main spindle speed: 3300 rpm
Main spindle power: 37 kW (50 hp) [40% ED (30-min. rating)] 30 kW (40 hp; cont. rating)
Max. torque: 1200 N•m (885 ft•lbs) [40% ED (30-min. rating)]



Second spindle

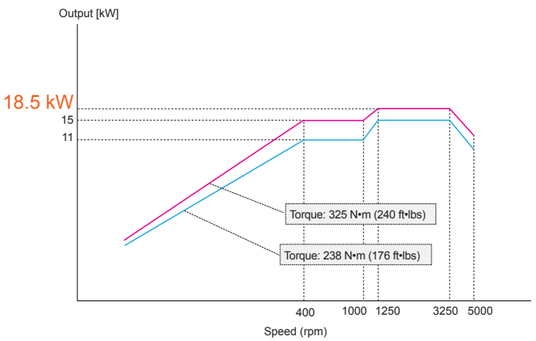
INTEGREX i-100H S, 100H ST

Second spindle speed: 6000 rpm
Second spindle power: 11 kW (15 hp) [40% ED (30-min. rating)] 7.5 kW (10 hp; cont. rating)
Max. torque: 159 N•m (117 ft•lbs) [40% ED (30-min. rating)]



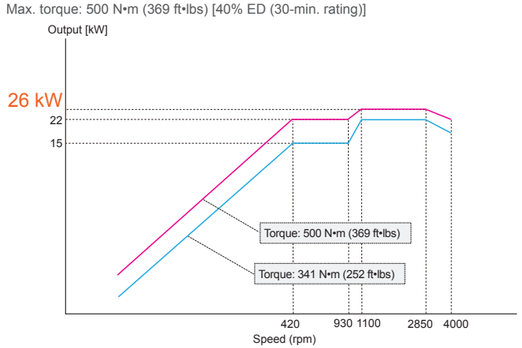
INTEGREX i-200H S, 200H ST
INTEGREX i-250H S, 250H ST

Second spindle speed: 5000 rpm
Second spindle power: 18.5 kW (25 hp) [40% ED (30-min. rating)] 15 kW (20 hp; cont. rating)
Max. torque: 325 N•m (240 ft•lbs) [40% ED (30-min. rating)]



INTEGREX i-350H S, 350H ST
INTEGREX i-450H S, 450H ST

Second spindle speed: 4000 rpm
Second spindle power: 26kW (35 hp) [40% ED (30-min. rating)] 22 kW (30 hp; cont. rating)
Max. torque: 500 N•m (369 ft•lbs) [40% ED (30-min. rating)]



■ Standard Machine Specifications

		i-100H	i-100H S	i-100H ST
		590U	850U	850U
Capacity	Max. swing	ø600 mm (ø23.62")		
	Max. machining diameter (upper turret)	ø600 mm (ø23.62")		
	(lower turret)	—		ø400 mm (ø15.75")
	Max. machining length*1	590 mm (23.23")	850 mm (33.46")	
	Max. bar work capacity*1	ø52 mm (ø2.05")		
Travel	X axis	535 mm (21.06")		
	Z axis	640 mm (25.20")	900 mm (35.43")	
	Y axis	210 mm (8.27")		
	X2 axis (lower turret)	—		210 mm (8.27")
	Z2 axis (lower turret)	—		900 mm (35.43")
	B-axis indexing range	-30° ～ +210°		
Main spindle	Chuck size	6"		
	Main spindle speed*1	6000 rpm		
	Main spindle nose	A2-5		
	Main spindle bore	ø61 mm (ø2.40")		
	Bearing ID	ø90 mm (ø3.54")		
	Min. indexing increment	0.0001°		
Second spindle	Chuck size	—	6"	
	Speed*1	—	6000 rpm	
	Travel (W axis)	—	ø900 mm (35.43")	
	Spindle nose	—	A2-5	
	Spindle bore	—	ø61 mm (ø2.40")	
	Bearing ID	—	ø90 mm (ø3.54")	
	Min. indexing increment	—	0.0001°	
Milling spindle	Type	Spindle turret with ATC		
	Speed	12000 rpm		
	Max. torque [40% ED (30-min. rating)]	57.3 N·m (42 ft·lbs)		
	Turning tool shank height	25 mm (1")		
	Boring bar shank diameter	ø40 mm (1.57")		
	Min. B-axis indexing increment	0.0001°		
Lower turret*2	Type	—		12 position drum turret
	Number of tools	—		12
	Turning tool shank height	—		20 mm (0.79")
	Boring bar shank diameter	—		ø32 mm (ø1.26")
Rapid traverse rates	X axis	48 m/min (1890 ipm)		
	Z axis	40 m/min (1575 ipm)		
	Y axis	40 m/min (1575 ipm)		
	X2 axis	—		40 m/min (1575 ipm)
	Z2 axis	—		40 m/min (1575 ipm)
	W axis	8 m/min (315 ipm)	30 m/min (1181 ipm)	
Automatic tool changer system	Tool holder shank	HSK-A63 (T63)		
	Tool storage capacity	38 tools		
	Max. tool diameter/length (from gauge line)	ø90 mm (ø3.54") [when adjacent pockets empty: ø130 mm (ø5.12")]/300 mm (11.81")		
	Max. tool weight	5 kg (11 lbs)		
	Tool selection method	Random selection, shortest path (fixed pocket assignment)		
Motors	Spindle motor [40% ED (30-min. rating)/cont. rating]	11 kW (15 hp)/7.5 kW (10 hp)		
	Second spindle motor [40% ED (30-min. rating)/cont. rating]	—	11 kW (15 hp)/7.5 kW (10 hp)	
	Milling spindle motor [40% ED (30-min. rating)/cont. rating]	12 kW (16 hp)/11 kW (15 hp)		
Power requirement	Required power capacity (cont. rating)	27.50 kVA	33.27 kVA	41.29 kVA
	Air source	0.5 MPa (73 psi), 500 L (17.66 ft^3)/min	0.5 MPa (73 psi), 510 L (18.01 ft^3)/min	0.5 MPa (73 psi), 830 L (29.31 ft^3)/min
Coolant	Tank capacity	270 L (71 gal)		300 L (79 gal)
Machine size	Height	2250 mm (88.58")		2500 mm (98.43")
	Width × length	3415 mm × 2170 mm (134.45" × 85.43")		
	Weight	9930 kg (21892 lbs)	10830 kg (23876 lbs)	11530 kg (25419 lbs)

*1 Depends on chuck specifications
*2 Orthogonal lower turret specification

		i-200H	i-200H S	i-200H ST
		590U	850U	850U
Capacity	Max. swing	ø600 mm (ø23.62")		
	Max. machining diameter (upper turret)	ø600 mm (ø23.62")		
	(lower turret)	—		ø400 mm (ø15.75")
	Max. machining length*1	590 mm (23.23")	850 mm (33.46")	
	Max. bar work capacity*1	ø65 mm (ø2.56")		
Travel	X axis	535 mm (21.06")		
	Z axis	640 mm (25.20")	900 mm (35.43")	
	Y axis	210 mm (8.27")		
	X2 axis (lower turret)	—		210 mm (8.27")
	Z2 axis (lower turret)	—		900 mm (35.43")
	B-axis indexing range	-30° ～ +210°		
Main spindle	Chuck size	8"		
	Main spindle speed*1	5000 rpm		
	Main spindle nose	A2-6		
	Main spindle bore	ø76 mm (ø2.99")		
	Bearing ID	ø120 mm (ø4.72")		
	Min. indexing increment	0.0001°		
Second spindle	Chuck size	—	8"	
	Speed*1	—	5000 rpm	
	Travel (W axis)	—	ø900 mm (35.43")	
	Spindle nose	—	A2-6	
	Spindle bore	—	ø76 mm (ø2.99")	
	Bearing ID	—	ø120 mm (ø4.72")	
	Min. indexing increment	—	0.0001°	
Milling spindle	Type	Spindle turret with ATC		
	Speed	12000 rpm		
	Max. torque [40% ED (30-min. rating)]	57.3 N·m (42 ft·lbs)		
	Turning tool shank height	25 mm (1")		
	Boring bar shank diameter	ø40 mm (ø1.57")		
	Min. B-axis indexing increment	0.0001°		
Lower turret*2	Type	—		12-position drum turret
	Number of tools	—		12
	Turning tool shank height	—		20 mm (0.79")
	Boring bar shank diameter	—		ø32 mm (ø1.26")
Rapid traverse rates	X axis	48 m/min (1890 ipm)		
	Z axis	40 m/min (1575 ipm)		
	Y axis	40 m/min (1575 ipm)		
	X2 axis	—		40 m/min (1575 ipm)
	Z2 axis	—		40 m/min (1575 ipm)
	W axis	8 m/min (315 ipm)	30 m/min (1181 ipm)	
Automatic tool changer system	Tool holder shank	HSK-A63 (T63)		
	Tool storage capacity	38 tools		
	Max. tool diameter/length (from gauge line)	ø90 mm (ø3.54") [when adjacent pockets empty: ø130 mm (ø5.12")]/300 mm (11.81")		
	Max. tool weight	5 kg (11 lbs)		
	Tool selection method	Random selection, shortest path (fixed pocket assignment)		
Motors	Spindle motor [40% ED (30-min. rating)/cont. rating]	22 kW (30 hp)/15 kW (20 hp)		
	Second spindle motor [40% ED (30-min. rating)/cont. rating]	—	18.5 kW (25 hp)/15 kW (20 hp)	
	Milling spindle motor [40% ED (30-min. rating)/cont. rating]	12 kW (16 hp)/11 kW (15 hp)		
Power requirement	Required power capacity (cont. rating)	33.23 kVA	54.41 kVA	57.42 kVA
	Air source	0.5 MPa (73 psi), 500 L (17.66 ft^3)/min	0.5 MPa (73 psi), 510 L (18.01 ft^3)/min	0.5 MPa (73 psi), 830 L (29.31 ft^3)/min
Coolant	Tank capacity	270 L (71 gal)		300 L (79 gal)
Machine size	Height	2250 mm (88.58")		2500 mm (98.43")
	Width × length	3505 mm × 2170 mm (137.99" × 85.43")		
	Weight	10780 kg (23765 lbs)	11130 kg (24537 lbs)	11830 kg (26080 lbs)

*1 Depends on chuck specifications
*2 Orthogonal lower turret specification

■ Standard Machine Specifications

		i-250H		i-250H S		i-250H ST
		1000U	1500U	1000U	1500U	1500U
Capacity	Max. swing	ø670 mm (ø26.38")				
	Max. machining diameter (upper turret)	ø670 mm (ø26.38")				
	(lower turret)	—				ø 420 mm (ø16.54")
	Max. machining length*1	1011 mm (39.80")	1519 mm (59.80")	1011 mm (39.80")	1519 mm (59.80")	
	Max. bar work capacity*1	ø65 mm (ø2.56")				
Travel	X axis	695 mm (27.36")				
	Z axis	1077 mm (42.40")	1585 mm (62.40")	1077 mm (42.40")	1585 mm (62.40")	
	Y axis	300 mm (11.81")				
	X2 axis (lower turret)	—				220 mm (8.66")
	Z2 axis (lower turret)	—				1539 mm (60.59")
	B-axis indexing range	-30° ～ +210°				
Main spindle	Chuck size	8"				
	Main spindle speed*1	5000 rpm				
	Main spindle nose	A2-6				
	Main spindle bore	ø76 mm (ø2.99")				
	Bearing ID	ø120 mm (ø4.72")				
	Min. indexing increment	0.0001°				
Second spindle	Chuck size	—		8"		
	Speed*1	—		5000 rpm		
	Travel (W axis)	—		1061 mm (41.77")	1569 mm (61.77")	1539 mm (60.59")
	Spindle nose	—		A2-6		
	Spindle bore	—		ø76 mm (ø2.99")		
	Bearing ID	—		ø120 mm (ø4.72")		
	Min. indexing increment	—		0.0001°		
Milling spindle	Type	Spindle turret with ATC				
	Speed	12000 rpm				
	Max. torque [40% ED (30-min. rating)]	124 N·m (91 ft·lbs)				
	Turning tool shank height	25 mm (1")				
	Boring bar shank diameter	ø40 mm (ø1.57")				
	Min. B-axis indexing increment	0.0001°				
Lower turret*2	Type	—				12-position drum turret
	Number of tools	—				12
	Turning tool shank height	—				25 mm (1")
	Boring bar shank diameter	—				ø32 mm (ø1.26")
Rapid traverse rates	X axis	50 m/min (1969 ipm)				
	Z axis	50 m/min (1969 ipm)				
	Y axis	40 m/min (1575 ipm)				
	X2 axis	—				40 m/min (1575 ipm)
	Z2 axis	—				40 m/min (1575 ipm)
	W axis	8 m/min (315 ipm)		30 m/min (1181 ipm)		
Automatic tool changer system	Tool holder shank	HSK-A63 (T63)				
	Tool storage capacity	38 tools				
	Max. tool diameter/length (from gauge line)	ø90 mm (ø3.54") [when adjacent pockets empty: ø130 mm (ø5.12")]/400 mm (15.75")				
	Max. tool weight	12 kg (26 lbs)				
	Tool selection method	Random selection, shortest path (fixed pocket assignment)				
Motors	Spindle motor [40% ED (30-min. rating)/cont. rating]	22 kW (30 hp)/15 kW (20 hp)				
	Second spindle motor [40% ED (30-min. rating)/cont. rating]	—		18.5 kW (25 hp)/15 kW (20 hp)		
	Milling spindle motor [40% ED (30-min. rating)/cont. rating]	24 kW (32 hp)/22 kW (30 hp)				
Power requirement	Required power capacity (cont. rating)	48.04 kVA		60.57 kVA		74.60 kVA
	Air source	0.5 MPa (73 psi), 400 L (14.13 ft³)/min				
Coolant	Tank capacity	395 L (104 gal)	490 L (129 gal)	395 L (104 gal)	490 L (129 gal)	
Machine size	Height	2715 mm (106.89")				
	Width × length	4175 mm × 2700 mm (164.37"×106.30")	4995 mm × 2700 mm (196.65"×106.30")	4175 mm × 2700 mm (164.37"×106.30")	4995 mm × 2700 mm (196.65"×106.30")	
	Weight	13150 kg (28990 lbs)	13450 kg (29652 lbs)	13450 kg (29652 lbs)	13750 kg (30313 lbs)	16500 kg (36376 lbs)

*1 Depends on chuck specifications
*2 Orthogonal lower turret specification

		i-350H			i-350H S		i-350H ST
		1000U	1500U	2500U	1500U	2500U	1500U
Capacity	Max. swing	ø670 mm (ø26.38")					
	Max. machining diameter (upper turret)	ø670 mm (ø26.38")					
	(lower turret)	—					ø420 mm (ø16.54")
	Max. machining length*1	1011 mm (39.80")	1519 mm (59.80")	2500 mm (98.43")	1519 mm (59.80")	2500 mm (98.43")	1519 mm (59.80")
	Max. bar work capacity*1	ø80 mm (ø3.15")					
Travel	X axis	695 mm (27.36")					
	Z axis	1077 mm (42.40")	1585 mm (62.40")	2566 mm (101.02")	1585 mm (62.40")	2566 mm (101.02")	1585 mm (62.40")
	Y axis	300 mm (11.81")					
	X2 axis (lower turret)	—					220 mm (8.66")
	Z2 axis (lower turret)	—					1539 mm (60.59")
	B-axis indexing range	-30° ～ +210°					
Main spindle	Chuck size	10"					
	Main spindle speed*1	4000 rpm					
	Main spindle nose	A2-8					
	Main spindle bore	ø91 mm (ø3.58")					
	Bearing ID	ø130 mm (ø5.12")					
	Min. indexing increment	0.0001°					
Second spindle	Chuck size	—			10"		
	Speed*1	—			4000 rpm		
	Travel (W axis)	—			1569 mm (61.77")	2175 mm (85.63")	1539 mm (60.59")
	Spindle nose	—			A2-8		
	Spindle bore	—			ø91 mm (ø3.58")		
	Bearing ID	—			ø130 mm (ø5.12")		
	Min. indexing increment	—			0.0001°		
Milling spindle	Type	Spindle turret with ATC					
	Speed	12000 rpm					
	Max. torque [40% ED (30-min. rating)]	124 N·m (91 ft·lbs)					
	Turning tool shank height	25 mm (1")					
	Boring bar shank diameter	ø40 mm (ø1.57")					
	Min. B-axis indexing increment	0.0001°					
Lower turret*2	Type	—					12-position drum turret
	Number of tools	—					12
	Turning tool shank height	—					25 mm (1")
	Boring bar shank diameter	—					ø32 mm (ø1.26")
Rapid traverse rates	X axis	50 m/min (1969 ipm)					
	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)
	Y axis	40 m/min (1575 ipm)					
	X2 axis	—					40 m/min (1575 ipm)
	Z2 axis	—					40 m/min (1575 ipm)
	W axis	8 m/min (315 ipm)			30 m/min (1181 ipm)	18 m/min (709 ipm)	30 m/min (1181 ipm)
Automatic tool changer system	Tool holder shank	HSK-A63 (T63)					
	Tool storage capacity	38 tools					
	Max. tool diameter/length (from gauge line)	ø90 mm (ø3.54") [when adjacent pockets empty: ø130 mm (ø5.12")]/400 mm (15.75")					
	Max. tool weight	12 kg (26 lbs)					
	Tool selection method	Random selection, shortest path (fixed pocket assignment)					
Motors	Spindle motor [40% ED (30-min. rating)/cont. rating]	30 kW (40 hp)/22 kW (30 hp)					
	Second spindle motor [40% ED (30-min. rating)/cont. rating]	—			26 kW (35 hp)/22 kW (30 hp)		
	Milling spindle motor [40% ED (30-min. rating)/cont. rating]	24 kW (32 hp)/22 kW (30 hp)					
Power requirement	Required power capacity (cont. rating)	48.04 kVA		49.43 kVA	80.24 kVA	81.04 kVA	84.74 kVA
	Air source	0.5 MPa (73 psi), 400 L (14.13 ft³)/min					
Coolant	Tank capacity	395 L (104 gal)	490 L (129 gal)	624 L (165 gal)	490 L (129 gal)	624 L (165 gal)	490 L (129 gal)
Machine size	Height	2715 mm (106.89")					
	Width × length	4175 mm × 2700 mm (164.37"×106.30")	4995 mm × 2700 mm (196.65"×106.30")	6070 mm ×2700 mm (238.98"×106.30")	4995 mm × 2700 mm (196.65"×106.30")	6070 mm ×2700 mm (238.98"×106.30")	4995 mm × 2700 mm (196.65"×106.30")
	Weight	13450 kg (29652 lbs)	13750 kg (30313 lbs)	17100 kg (37698 lbs)	14050 kg (30974 lbs)	17400 kg (38360 lbs)	16800 kg (37037 lbs)

*1 Depends on chuck specifications
*2 Orthogonal lower turret specification

■ Standard Machine Specifications

		i-450H			i-450H S		i-450H ST
		1000U	1500U	2500U	1500U	2500U	1500U
Capacity	Max. swing	ø670 mm (ø26.38")					
	Max. machining diameter (upper turret)	ø670 mm (ø26.38")					
	(lower turret)	—					ø 420 mm (ø16.54")
	Max. machining length*1	1011 mm (39.80")	1519 mm (59.80")	2500 mm (98.43")	1519 mm (59.80")	2500 mm (98.43")	1519 mm (59.80")
	Max. bar work capacity*1	ø102 mm (ø4.02")					
Travel	X axis	695 mm (27.36")					
	Z axis	1077 mm (42.40")	1585 mm (62.40")	2566 mm (101.02")	1585 mm (62.40")	2566 mm (101.02")	1585 mm (62.40")
	Y axis	300 mm (11.81")					
	X2 axis (lower turret)	—					220 mm (8.66")
	Z2 axis (lower turret)	—					1539 mm (60.59")
	B-axis indexing range	-30° ～ +210°					
Main spindle	Chuck size	12"					
	Main spindle speed*1	3300 rpm					
	Main spindle nose	A2-11					
	Main spindle bore	ø112 mm (ø4.41")					
	Bearing ID	ø150 mm (ø5.91")					
	Min. indexing increment	0.0001°					
Second spindle	Chuck size	—			10"		
	Speed*1	—			4000 rpm		
	Travel (W axis)	—			1569 mm (61.77")	2175 mm (85.63")	1539 mm (60.59")
	Spindle nose	—			A2-8		
	Spindle bore	—			ø91 mm (ø3.58")		
	Bearing ID	—			ø130 mm (ø5.12")		
	Min. indexing increment	—			0.0001°		
Milling spindle	Type	Spindle turret with ATC					
	Speed	12000 rpm					
	Max torque: [40% ED (30-min. rating)]	124 N·m (91 ft·lbs)					
	Turning tool shank height	25 mm (1")					
	Boring bar shank diameter	ø40 mm (ø1.57")					
	Min. B-axis indexing increment	0.0001°					
Lower turret*2	Type	—					12-position drum turret
	Number of tools	—					12
	Turning tool shank height	—					25 mm (1")
	Boring bar shank diameter	—					ø32 mm (ø1.26")
Rapid traverse rates	X axis	50 m/min (1969 ipm)					
	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)
	Y axis	40 m/min (1575 ipm)					
	X2 axis	—					40 m/min (1575 ipm)
	Z2 axis	—					40 m/min (1575 ipm)
	W axis	8 m/min (315 ipm)			30 m/min (1181 ipm)	18 m/min (709 ipm)	30 m/min (1181 ipm)
Automatic tool changer system	Tool holder shank	HSK-A63 (T63)					
	Tool storage capacity	38 tools					
	Max. tool diameter/length (from gauge line)	ø90 mm (ø3.54") [when adjacent pockets empty: ø130 mm (ø5.12")]/400 mm (15.75")					
	Max. tool weight	12 kg (26 lbs)					
	Tool selection method	Random selection, shortest path (fixed pocket assignment)					
Motors	Spindle motor [40% ED (30-min. rating)/cont. rating]	37 kW (50 hp)/30 kW (40 hp)					
	Second spindle motor [40% ED (30-min. rating)/cont. rating]	—			26 kW (35 hp)/22 kW (30 hp)		
	Milling spindle motor [40% ED (30-min. rating)/cont. rating]	24 kW (32 hp)/22 kW (30 hp)					
Power requirement	Required power capacity (cont. rating)	59.15 kVA		60.81 kVA	91.33 kVA	92.40 kVA	95.91 kVA
	Air source	0.5 MPa (73 psi), 400 L (14.13 ft³)/min					
Coolant	Tank capacity	395 L (104 gal)	490 L (129 gal)	624 L (165 gal)	490 L (129 gal)	624 L (165 gal)	490 L (129 gal)
Machine size	Height	2715 mm (106.89")					
	Width × length	4175 mm × 2700 mm (164.37"×106.30")	4995 mm × 2700 mm (196.65"×106.30")	6070 mm ×2700 mm (238.98"×106.30")	4995 mm × 2700 mm (196.65"×106.30")	6070 mm ×2700 mm (238.98"×106.30")	4995 mm × 2700 mm (196.65"×106.30")
	Weight	13750 kg (30313 lbs)	14050 kg (30974 lbs)	17400 kg (38360 lbs)	14350 kg (31636 lbs)	17700 kg (39021 lbs)	17100 kg (37698 lbs)

*1 Depends on chuck specifications
*2 Orthogonal lower turret specification

■ MAZATROL SmoothAi Specifications

	MAZATROL	EIA
Number of controlled axes	Simultaneous 2 ~ 4 axes	Simultaneous 5 axes*
Minimum 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*, Path error suppression control*, Tool path optimization*
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 lead 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: 2MB, Program memory expansion: 8MB*, Program memory expansion: 32MB*	
Control display	Display: 19" touch panel, Resolution: SXGA	
Spindle function	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, Thermal shield, 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, MDI interruption, TPS, Restart, Single process, Machine lock	Optional block skip, Optional stop, Dry run, Manual handle interruption, MDI interruption, TPS, Restart, Restart 2, Collation stop, Machine lock
Manual measuring functions	Tool-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	
Peripheral network	PROFIBUS-DP*, EtherNet/IP*, CC-Link*	
Memory	SD card interface, USB	
EtherNet	10M/100M/1Gbps	

*Option

■ Standard and Optional Equipment

INTEGREX i-100H Series
INTEGREX i-200H Series

●: Standard ○: Option -: N/A

		i-100H			i-200H		
			S	ST		S	ST
Machine	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	—	○	○	—	○	○
	12D orthogonal lower turret*1	—	—	●	—	—	●
	Lower turret with rotary tools	—	—	○	—	—	○
	Main spindle hydraulic chuck (6" non-through-hole chuck)	●	○	○	—	—	—
	Main spindle hydraulic chuck (6" through-hole chuck)	○	●	●	—	—	—
	Main spindle hydraulic chuck (6" through-hole chuck with 5 jaws)	○	○	○	—	—	—
	Main spindle hydraulic chuck [ø100mm (ø3.94") collect chuck]	○	○	○	—	—	—
	Second spindle hydraulic chuck (6" through-hole chuck + non-through-hole cylinder)	—	●	●	—	—	—
	Main spindle hydraulic chuck (8" non-through-hole chuck)	—	—	—	●	○	○
	Main spindle hydraulic chuck (8" through-hole chuck)	—	—	—	○	●	●
	Main spindle hydraulic chuck (10" non-through-hole chuck)	—	—	—	○	○	○
	Main spindle hydraulic chuck (10" through-hole chuck)	—	—	—	○	○	○
	Second spindle hydraulic chuck (8" through-hole chuck + non-through-hole cylinder)	—	—	—	—	●	●
	Second spindle hydraulic chuck (10" through-hole chuck + non-through-hole cylinder)	—	—	—	—	○	○
	Workpiece stopper inside spindle (i-100)	○	○	○	○	○	○
	Y-axis control	●	●	●	●	●	●
	B-axis 0.0001° indexing/contouring (EIA)	●	●	●	●	●	●
	Milling spindle 12000 rpm (HSK-A63)	●	●	●	●	●	●
	Milling spindle 12000 rpm (CAPTO C6/KM4X-63)	○	○	○	○	○	○
	Milling spindle 20000 rpm (HSK-A63)	○	○	○	○	○	○
	High-output milling spindle 12000 rpm (HSK-A63/CAPTO C6/KM4X-63)	○	○	○	○	○	○
	38-tool magazine (HSK)	●	●	●	●	●	●
	38 tool magazine (CAPTO/KM4X)	○	○	○	○	○	○
	74 tool magazine (HSK/CAPTO/KM4X)	○	○	○	○	○	○
	112 tool magazine (HSK/CAPTO/KM4X)	○	○	○	○	○	○
	Tailstock MT No. 4 (dead center)	●	—	—	—	—	—
	Tailstock MT No. 5 (dead center)	—	—	—	●	—	—
	Tailstock MT No. 4 (built in)	—	—	—	○	—	—
	Work light	●	●	●	●	●	●
	High/Low chuck pressure (main spindle)	○	○	○	○	○	○
	High/Low chuck pressure (second spindle)	—	○	○	—	○	○
	Double foot pedal switch	○	○	○	○	○	○
	Status light (built in)	●	●	●	●	●	●
	3-color machine status light (square)	○	○	○	○	○	○
	1-color machine status light (yellow: operation end/square)	○	○	○	○	○	○
	1 color machine status light (red: alarm/square)	○	○	○	○	○	○
High accuracy	X-axis, Y-axis, 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 axis for lower turret)	—	—	●	—	—	●
	Scale feedback (Z2 axis for lower turret)	—	—	○	—	—	○
	Absolute position detection (linear axis)	●	●	●	●	●	●
Safety equipment	Hydraulic pressure interlock	●	●	●	●	●	●
	Operator door interlock	●	●	●	●	●	●
	Overload detection system	○	○	○	○	○	○
	Tool breakage detection on magazine side	○	○	○	○	○	○
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 end buzzer	○	○	○	○	○	○
	Preparation for visual tool ID/data management	○	○	○	○	○	○
	Robot interface	○	○	○	○	○	○
Coolant/ Chip disposal	Cover coolant	●	●	●	●	●	●
	Flood coolant	●	●	●	●	●	●
	Simultaneous discharge of 0.5 MPa (73 psi) coolant through spindle and flood coolant (upper turret)	●	●	●	●	●	●
	Simultaneous discharge of 1.5 MPa (218 psi) high-pressure coolant through spindle and flood coolant (upper turret)	○	○	○	○	○	○
	Simultaneous discharge of 7.0MPa (1015 PSI) SUPERFLOW coolant system and 0.5 MPa (73 PSI) flood coolant (upper turret)	○	○	○	○	○	○
	Flood coolant for lower turret	—	—	●	—	—	●
	Shower coolant (main spindle)	○	○	○	○	○	○
	Shower coolant (second spindle)	○	○	○	○	○	○
	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	Manuals (CD)	●	●	●	●	●	●
	Additional manuals (CD or paper)	○	○	○	○	○	○
	MAZATROL SmoothAi dual monitor	○	○	○	○	○	○

*1 9D lower turret (slant type) available

INTEGREX i-250H Series

●: Standard ○: Option -: N/A

		i-250H		
			S	ST
Machine	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	—	○	○
	12D orthogonal lower turret*1	—	—	●
	Lower turret with rotary tools	—	—	○
	Main spindle hydraulic chuck (8" through-hole chuck)	●	●	●
	Main spindle hydraulic chuck (10" through-hole chuck)	○	○	○
	Second spindle hydraulic chuck (8" through-hole chuck + non-through-hole cylinder)	—	●	●
	Second spindle hydraulic chuck (10" through-hole chuck + non-through-hole cylinder)	—	○	○
	Workpiece stopper inside spindle	○	○	○
	Y-axis control	●	●	●
	B-axis 0.0001° indexing contouring (EIA)	●	●	●
	Milling spindle 12000 rpm (HSK-A63)	●	●	●
	Milling spindle 12000 rpm (CAPTO C6 / KM4X-63)	○	○	○
	Milling spindle 20000 rpm (HSK-A63)	○	○	○
	38-tool magazine (HSK)	●	●	●
	38-tool magazine (CAPTO/KM4X)	○	○	○
	74-tool magazine (HSK/CAPTO/KM4X)	○	○	○
	112-tool magazine (HSK/CAPTO/KM4X)	○	○	○
	Tailstock MT No. 5 (built in)	●	—	—
	Work light	●	●	●
	High/Low chuck pressure (main spindle)	○	○	○
	High/Low chuck pressure (second spindle)	—	○	○
	Double foot pedal switch	○	○	○
	Status light (built in)	●	●	●
	3-color machine status light (square)	○	○	○
	1-color machine status light (yellow: operation end/square)	○	○	○
	1-color machine status light (red: alarm/square)	○	○	○
High accuracy	X-axis, Y-axis, 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 axis for lower turret)	—	—	●
	Scale feedback (Z2 axis for lower turret)	—	—	○
	Absolute position detection (linear axis)	●	●	●
Safety equipment	Hydraulic pressure interlock	●	●	●
	Operator door interlock	●	●	●
	Overload detection system	○	○	○
	Tool breakage detection on magazine side	○	○	○

		i-250H		
			S	ST
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 end buzzer	○	○	○
	Preparation for visual tool ID/data management	○	○	○
	Robot interface	○	○	○
Coolant/ Chip disposal	Cover coolant	●	●	●
	Flood coolant	●	●	●
	Simultaneous discharge of 0.5 MPa (73 psi) coolant through spindle and flood coolant (upper turret)	●	●	●
	Simultaneous discharge of 1.5 MPa (218 psi) high-pressure coolant through spindle and flood coolant (upper turret)	○	○	○
	Simultaneous discharge of 7.0MPa (1015 PSI) SUPERFLOW coolant system and 0.5 MPa (73 PSI) flood coolant (upper turret)	○	○	○
	Flood coolant for lower turret	—	—	●
	Shower coolant (main spindle)	○	○	○
	Shower coolant (second spindle)	—	○	○
	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	Manuals (CD)	●	●	●
	Additional manuals (CD or paper)	○	○	○
	MAZATROL SmoothAi dual monitor	○	○	○

*1 9D lower turret (slant type) available

■ Standard and Optional Equipment

INTEGREX i-350H Series

●: Standard ○: Option -: N/A

		i-350H		
			S	ST
Machine	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	—	○	○
	12D orthogonal lower turret*1	—	—	●
	Lower turret with rotary tools	—	—	○
	Main spindle hydraulic chuck (10" through-hole chuck)	●	●	●
	Main spindle hydraulic chuck (12" through-hole chuck)	○	○	○
	Second spindle hydraulic chuck (10" through-hole chuck + non-through-hole cylinder)	—	●	●
	Second spindle hydraulic chuck (12" through-hole chuck + non-through-hole cylinder)	—	○	○
	Workpiece stopper inside spindle	○	○	○
	Y-axis control	●	●	●
	B-axis 0.0001° indexing/contouring (EIA)	●	●	●
	Milling spindle 12000 rpm (HSK-A63)	●	●	●
	Milling spindle 12000 rpm (CAPTO C6/KM4X-63)	○	○	○
	Milling spindle 20000 rpm (HSK-A63)	○	○	○
	38 tool magazine (HSK)	●	●	●
	38 tool magazine (CAPTO/KM4X)	○	○	○
	74 tool magazine (HSK/CAPTO/KM4X)	○	○	○
	112 tool magazine (HSK/CAPTO/KM4X)	○	○	○
	Tailstock MT No. 5 (built in)	●	—	—
	Work light	●	●	●
	High/Low chuck pressure (main spindle)	○	○	○
	High/Low chuck pressure (second spindle)	—	○	○
	Double foot pedal switch	○	○	○
	Status light (built in)	●	●	●
	3 color machine status light (square)	○	○	○
	1 color machine status light (yellow: operation end/square)	○	○	○
	1 color machine status light (red: alarm/square)	○	○	○
High accuracy	X-axis, Y-axis, 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 axis for lower turret)	—	—	●
	Scale feedback (Z2 axis for lower turret)	—	—	○
	Absolute position detection (linear axis)	●	●	●
Safety equipment	Hydraulic pressure interlock	●	●	●
	Operator door interlock	●	●	●
	Overload detection system	○	○	○
	Tool breakage detection on magazine side	○	○	○

*1 9D lower turret (slant type) available

		i-350H		
			S	ST
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 end buzzer	○	○	○
	Preparation for visual tool ID/data management	○	○	○
	Robot interface	○	○	○
Coolant/ Chip disposal	Cover coolant	●	●	●
	Flood coolant	●	●	●
	Simultaneous discharge of 0.5 MPa (73 psi) coolant through spindle and flood coolant (upper turret)	●	●	●
	Simultaneous discharge of 1.5 MPa (218 psi) high-pressure coolant through spindle and flood coolant (upper turret)	○	○	○
	Simultaneous discharge of 7.0MPa (1015 PSI) SUPERFLOW coolant system and 0.5 MPa (73 PSI) flood coolant (upper turret)	○	○	○
	Flood coolant for lower turret	—	—	●
	Shower coolant (main spindle)	○	○	○
	Shower coolant (second spindle)	—	○	○
	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	Manuals (CD)	●	●	●
	Additional manuals (CD or paper)	○	○	○
	MAZATROL SmoothAi dual monitor	○	○	○

INTEGREX i-450H Series

●: Standard ○: Option -: N/A

		i-450H		
			S	ST
Machine	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	—	○	○
	12D orthogonal lower turret*1	—	—	●
	Lower turret with rotary tools	—	—	○
	Main spindle hydraulic chuck (12" through-hole chuck)	●	●	●
	Main spindle hydraulic chuck (15" through-hole chuck)	—	○	○
	Second spindle hydraulic chuck (10" through-hole chuck + non-through-hole cylinder)	—	●	●
	Second spindle hydraulic chuck (12" through-hole chuck + non-through-hole cylinder)	—	○	○
	Workpiece 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 A-63)	○	○	○
	38 tool magazine (HSK)	●	●	●
	38 tool magazine (CAPTO/KM4X)	○	○	○
	74 tool magazine (HSK/CAPTO/KM4X)	○	○	○
	112 tool magazine (HSK/CAPTO/KM4X)	○	○	○
	Tailstock MT No. 5 (built in)	●	—	—
	Work light	●	●	●
	High/Low chuck pressure (main spindle)	○	○	○
	High/Low chuck pressure (second spindle)	—	○	○
	Double foot pedal switch	○	○	○
	Status light (built in)	●	●	●
	3-color machine status light (square)	○	○	○
	1-color machine status light (yellow: operation end/square)	○	○	○
	1-color machine status light (red: alarm/square)	○	○	○
High accuracy	X-axis, Y-axis, 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 axis for lower turret)	—	—	●
	Scale feedback (Z2 axis for lower turret)	—	—	○
	Absolute position detection (linear axis)	●	●	●
Safety equipment	Hydraulic pressure interlock	●	●	●
	Operator door interlock	●	●	●
	Overload detection system	○	○	○
	Tool breakage detection on magazine side	○	○	○

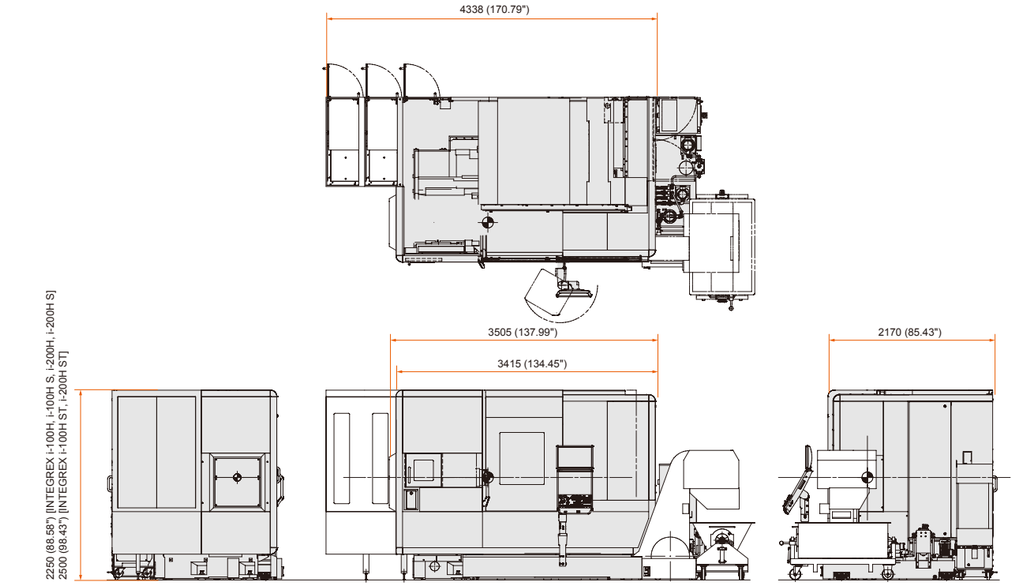
*1 9D lower turret (slant type) available

		i-450H		
			S	ST
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 end buzzer	○	○	○
	Preparation for visual tool ID/data management	○	○	○
	Robot interface	○	○	○
Coolant/ Chip disposal	Cover coolant	●	●	●
	Flood coolant	●	●	●
	Simultaneous discharge of 0.5 MPa (73 psi) coolant through spindle and flood coolant (upper turret)	●	●	●
	Simultaneous discharge of 1.5 MPa (218 psi) high-pressure coolant through spindle and flood coolant (upper turret)	○	○	●
	Simultaneous discharge of 7.0MPa (1015 PSI) SUPERFLOW coolant system and 0.5 MPa (73 PSI) flood coolant (upper turret)	○	○	○
	Flood coolant for lower turret	—	—	●
	Shower coolant (main spindle)	○	○	○
	Shower coolant (second spindle)	—	○	○
	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	Manuals (CD)	●	●	●
	Additional manuals (CD or paper)	○	○	○
	MAZATROL SmoothAi dual monitor	○	○	○

Machine Dimensions

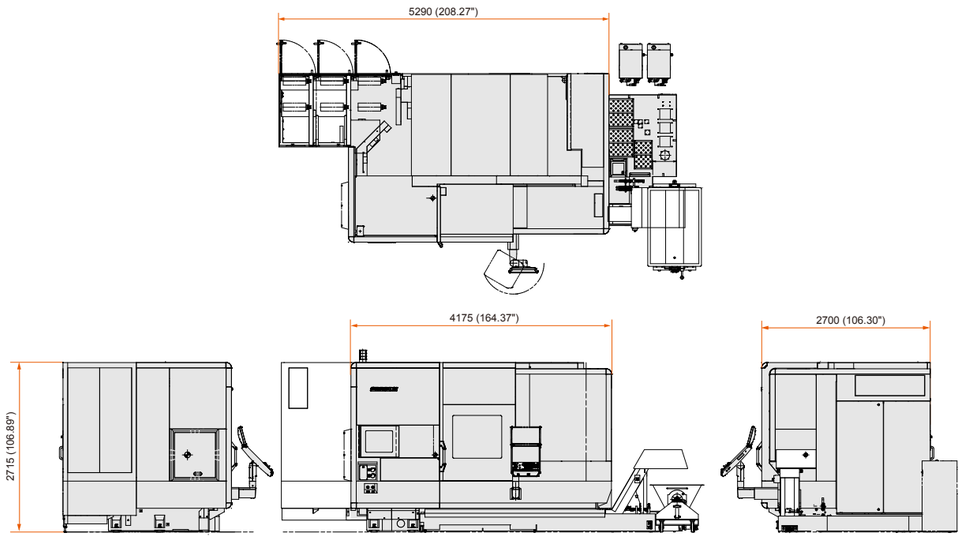
Unit: mm (inch)

INTEGREX i-100H, i-100H S, i-100H ST, i-200H, i-200H S, i-200H ST



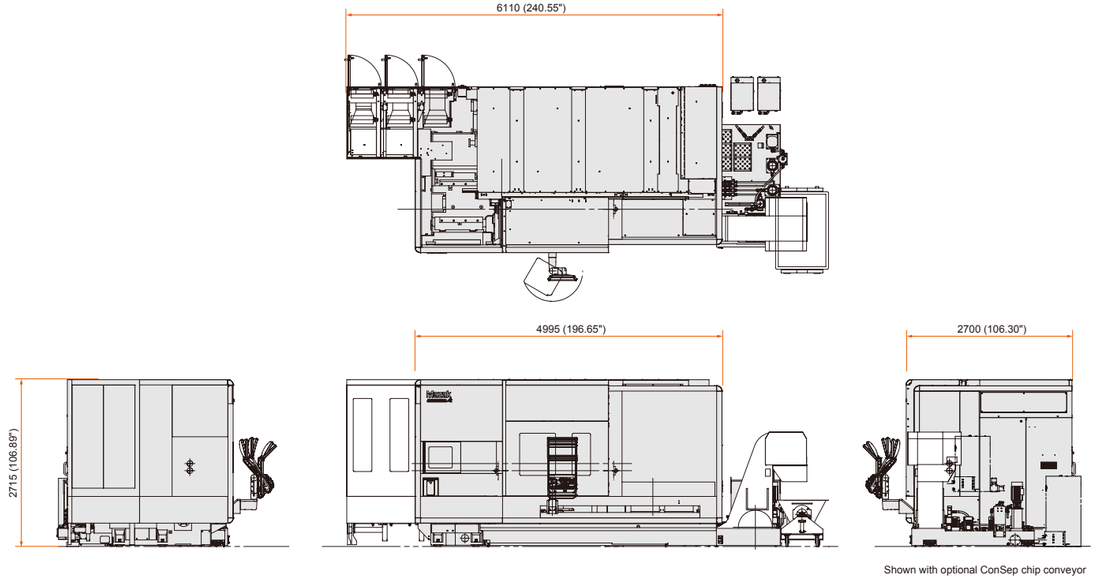
Shown with optional ConSep chip conveyor

INTEGREX i-250H, i-250H S, i-350H, i-450H (1000U)



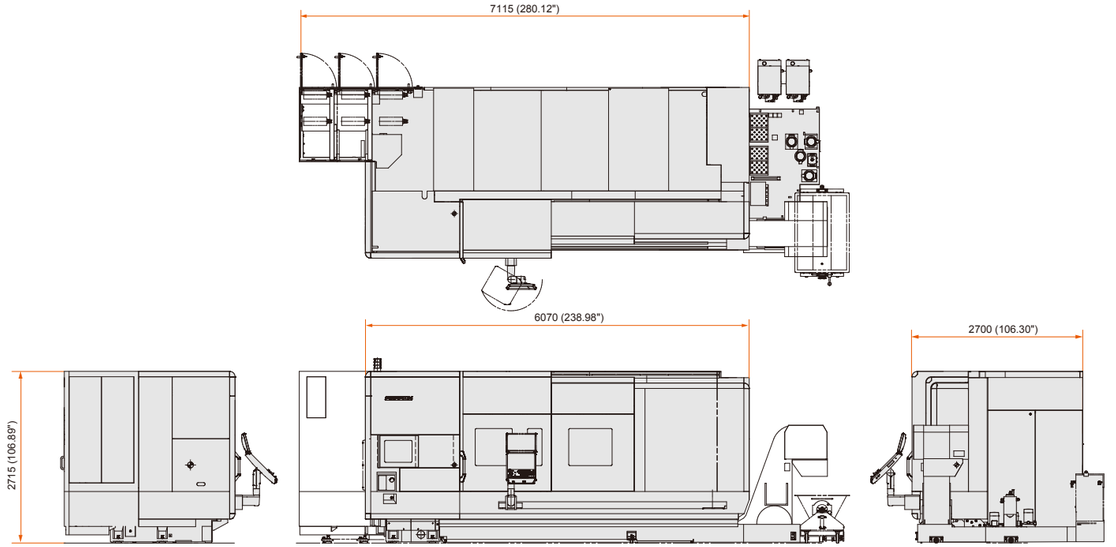
Shown with optional chip conveyor (hinge)

INTEGREX i-250H, i-250H S, i-250H ST, i-350H, i-350H S, i-350H ST, i-450H, i-450H S, i-450H ST (1500U)



Shown with optional ConSep chip conveyor

INTEGREX i-350H, i-350H S, i-450H, i-450H S (2500U)



Shown with optional ConSep chip conveyor

Mazak

YAMAZAKI MAZAK CORPORATION
1-131 Takeda, Oguchi-cho, Niwa-gun, Aichi-pref., Japan
TEL : +(81)587-95-1131
www.mazak.com

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