

Mazak

INTEGREX e-H

SERIES

INTEGREX e-H SERIES

Mazak



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INTEGREX e-H SERIES 19.07. 0 D 99J194715E5

Multi-tasking machines

INTEGREX e-H SERIES

DONE IN ONE processing of large workpieces



INTEGREX e-670H (4000U)
Shown with optional equipment

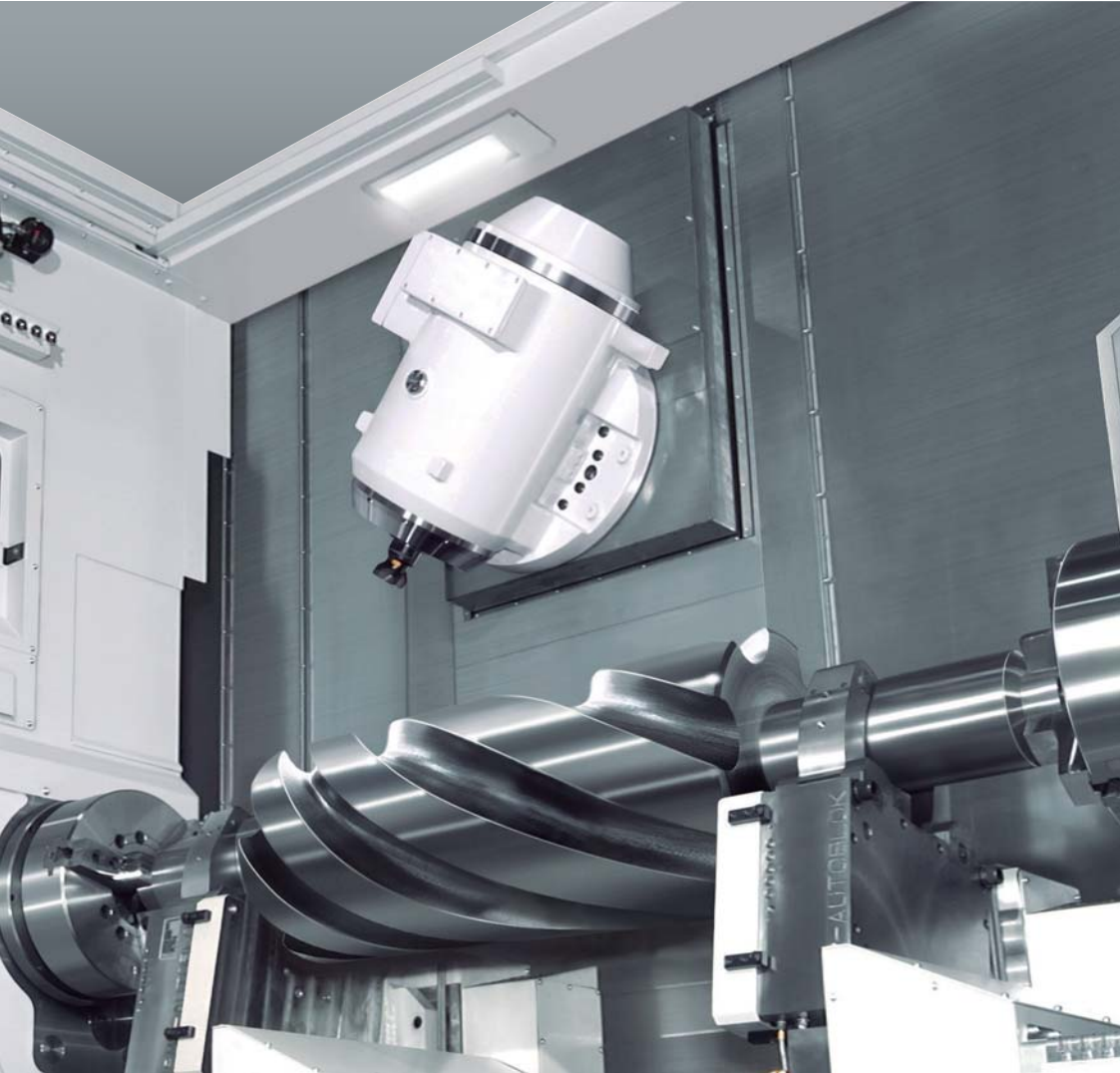
Large swing and Y-axis stroke for large workpieces

Powerful turning and milling spindles plus rigid machine construction provide unsurpassed productivity

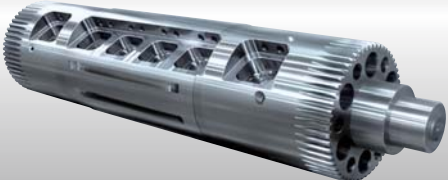
Wide variety of optional equipment available for enhanced versatility

Process integration

The INTEGREX e-H series incorporates all machining processes from raw material input through final machining — in just one machine. It provides the ability to reduce production lead time, improve machining accuracy, reduce floor space and initial cost, lower operating expenses, reduce operator requirements and improve the work environment.



This example printing machinery roll component with its high accuracy machining requirements was previously processed by several different machine tools requiring multiple machine setups and workpiece handlings. It is now produced by INTEGREX "DONE IN ONE" processing and has realized the benefits as shown below as well as substantially reduced in-process time and in-process inventory.



workpiece length : 2500 mm



Applications



Aerospace



Construction machinery



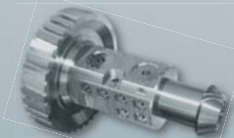
Marine



Oil



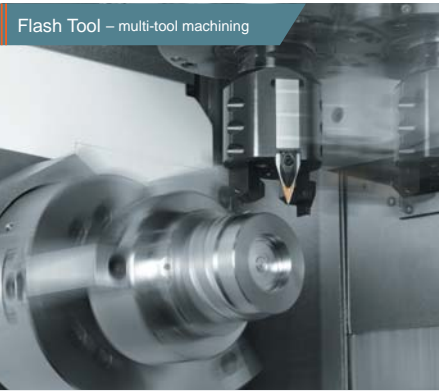
Energy



Advanced machining capabilities of the INTEGREX e-H series



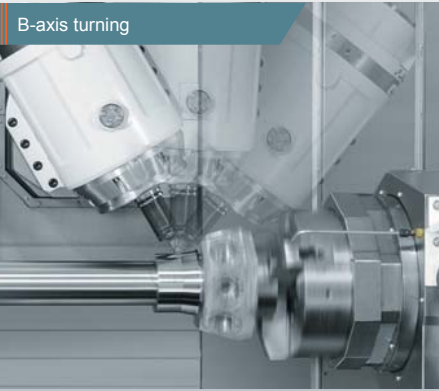
Gear hobbing



Flash Tool – multi-tool machining



Shaping



B-axis turning



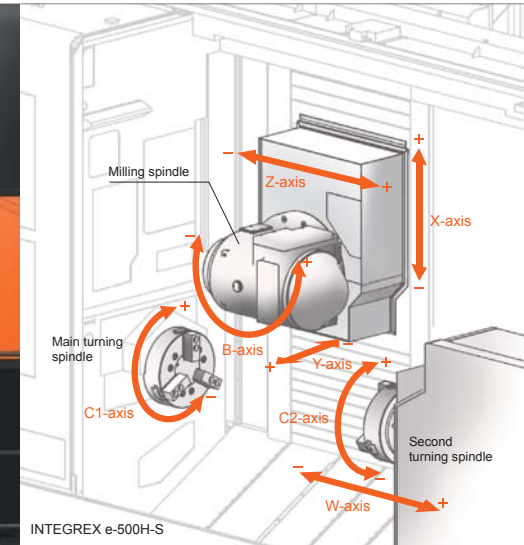
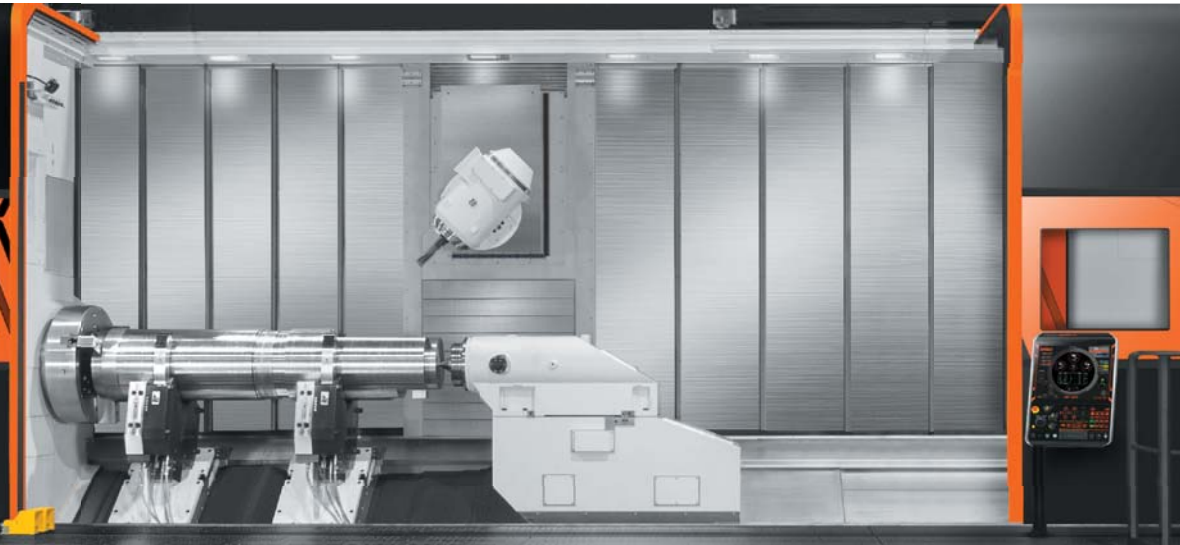
Mill turning

Mill-turning: rotation of both workpiece and milling tool, for high-efficiency turning of difficult to cut workpiece materials. Note: Optional mill-turning CNC function required




INTEGREX e-H series

Designed for large workpieces —
Incorporating experience
accumulated in the production of
multi-tasking machines for more
than 30 years

- Powerful milling performance
- Largest Y-axis stroke in this class
- Long boring bar system optionally available



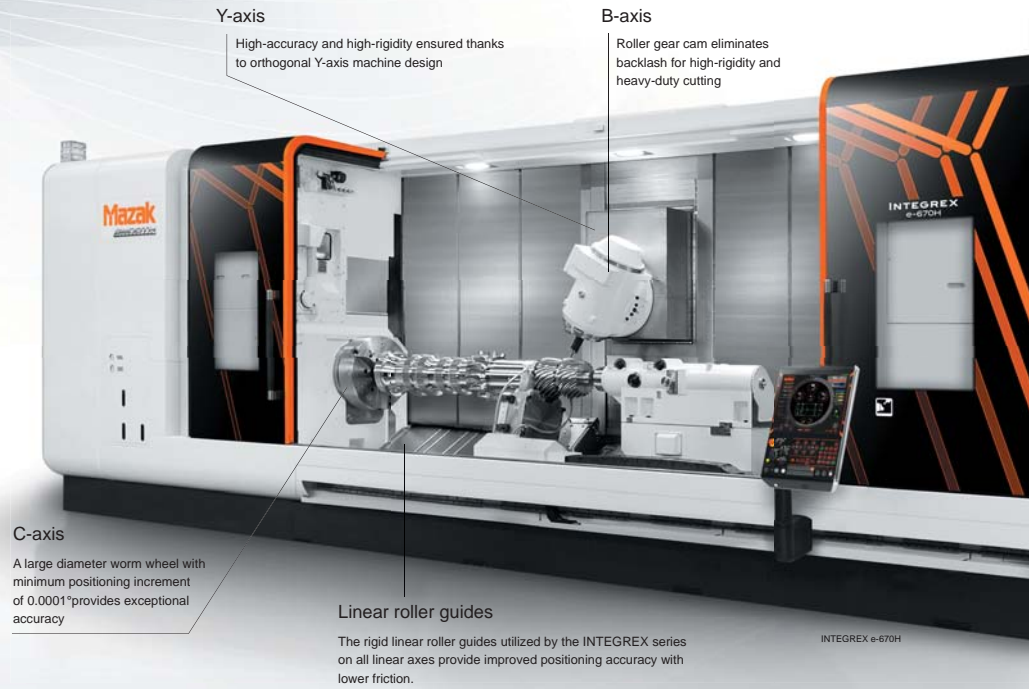
INTEGREX e-500H-S

			Milling spindle		Y-axis stroke	Chuck size (Main turning spindle)	Tailstock / Max. supported weight**	Chuck size (Second turning spindle)
 INTEGREX e-500H series	e-500H	1500U 3000U 4000U	10000 rpm [standard] 37 kW(50 HP) 260 N·m(40% ED) 5000 rpm High torque [option] 37 kW(50 HP) 667 N·m (50% ED)		500 mm	15" ~ 21"	NC tailstock MT No.5 (1500U / 3000U / 4000U) 1.5 t MT No.6 (3000U / 4000U)[option] 3 t	
	e-500H-S	1500U 3000U	37 kW(50 HP) 667 N·m (50% ED)					15" ~ 21"
 INTEGREX e-670H series	e-670H	3000U 4000U 6000U	10000 rpm [standard] 37 kW(50 HP) 260 N·m(40% ED) 5000 rpm High torque [option] 37 kW(50 HP) 667 N·m (50% ED)		670 mm	18" ~ 32"	NC tailstock MT No.6 (3000U / 4000U) 3 t #80 Metric center (4000U)[option] 7 t #80 Metric center (6000U) 7 t	
	e-670H-S	2000U 3000U 4000U	37 kW(50 HP) 667 N·m (50% ED)					18" ~ 24"
 INTEGREX e-800H	e-800H	4000U 6000U 8000U	10000 rpm [standard] 37 kW(50 HP) 260 N·m(40% ED) 5000 rpm High torque [option] 37 kW(50 HP) 667 N·m (50% ED)		800 mm	24" ~ 50"	NC tailstock #100 Metric center 15 t**	

** Chuck included ** Max. weight when using supportive device

Higher Productivity & Higher Accuracy

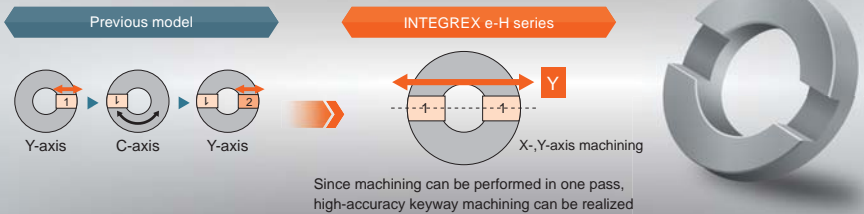
Orthogonal design provides large operation area and high-accuracy machining



Large operation area

Expanded machining versatility thanks to longer X-, and Y-axis stroke.

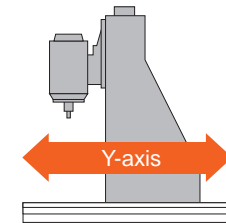
Since machining is performed without C-axis rotation, the machining pitch and advancing accuracy can be improved



Y-axis

High rigidity construction

The INTEGREX e-H series features a traveling column with orthogonal 2 axes design. The Y-axis column utilizes linear roller guides to provide the high rigidity required for heavy duty machining.



High accuracy Y-axis design

Since the Y-axis column itself moves, the configuration is the same for every position on the Y-axis to ensure high accuracy machining.

B-axis

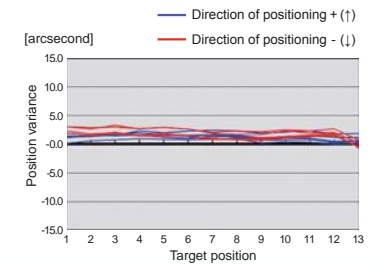
Roller gear cam on B-axis eliminates backlash

Minimum indexing increment : 0.0001°

B-axis indexing accuracy 2 times better than the ISO standard.

	ISO tolerance	INTEGREX e-H series		
		MAZAK STD.	Example results	
B-axis	Accuracy of positioning both directions	28 sec	14 sec	4.88 sec
	Repeatability of positioning one direction (+)	8 sec	4 sec	2.77 sec
	Repeatability of positioning one direction (-)	8 sec	4 sec	2.46 sec

Note : Above figures are the machine accuracies according to the MAZAK PRECISION STANDARD that is certified before shipment. The inspection is conducted according to ISO-230 on a recommended foundation with room temperature controlled to 22° C ± 1°C after machine has reached operation temperature.



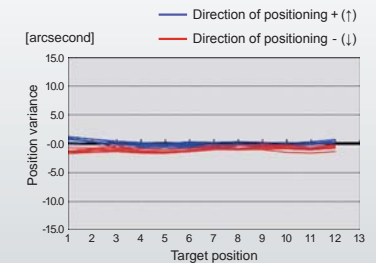
C-axis

C-axis indexing increment : 0.0001°

The C-axis has positioning accuracy 2 times better than ISO and is driven by a large diameter worm wheel with a minimum positioning increment of 0.0001°.

	ISO tolerance	INTEGREX e-H series		
		MAZAK STD.	Example results	
C-axis	Accuracy of positioning both directions	28 sec	14 sec	3.4 sec
	Repeatability of positioning one direction (+)	8 sec	4 sec	0.5 sec
	Repeatability of positioning one direction (-)	8 sec	4 sec	1.0 sec

Note : Above figures are the machine accuracies according to the MAZAK PRECISION STANDARD that is certified before shipment. The inspection is conducted according to ISO-230 on a recommended foundation with room temperature controlled to 22° C ± 1°C after machine has reached operation temperature.



Ball screw core cooling X-, Y-, Z-axis ball screw – standard equipment

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

Note : Not available for INTEGREX e-800H Z-axis.



Higher Productivity & Higher Accuracy

Milling spindle

Powerful milling spindle for faster cycle times

High-output, high-torque milling spindle provides performance comparable to machining center.

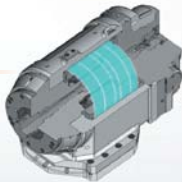


Integral spindle / motor

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

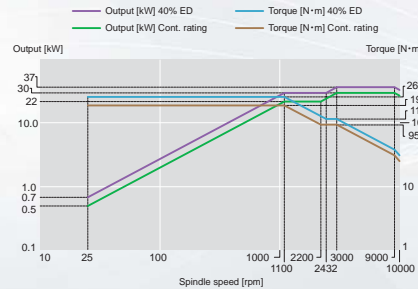
Spindle temperature control

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



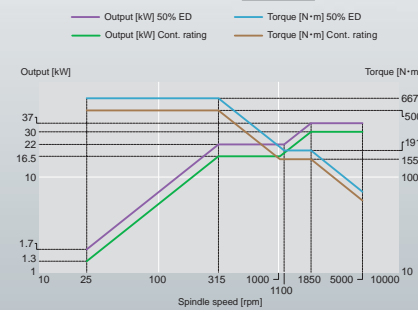
INTEGREX e-500H series

10000 rpm milling spindle



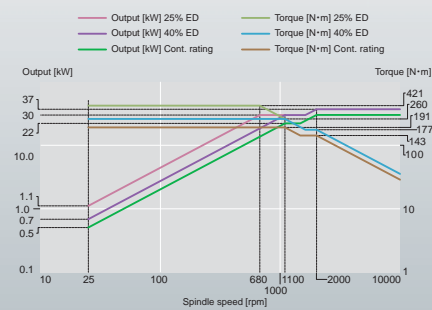
INTEGREX e-500H series, e-670H series, e-800H

5000 rpm High-torque spindle



INTEGREX e-670H series, e-800H

10000 rpm milling spindle



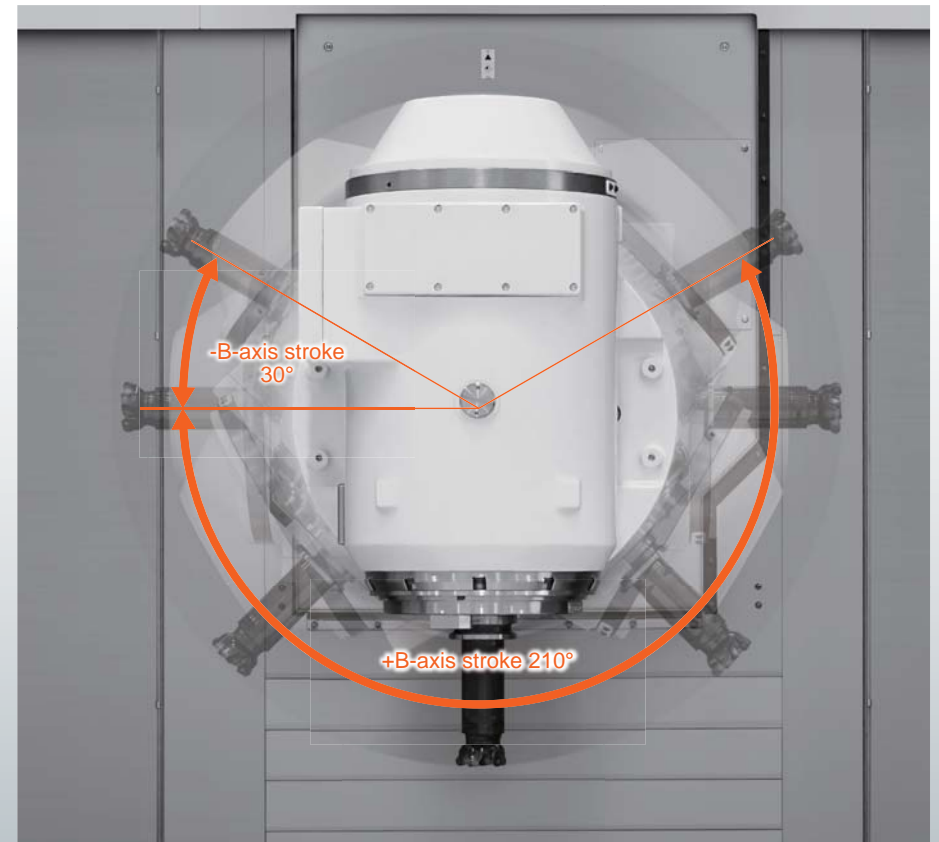
High-rigidity, high-accuracy B-axis

Rigid roller gear cam on B-axis

For high-rigidity, heavy-duty cutting, this positive drive mechanism virtually eliminates backlash to ensure high-accuracy positioning.

Large machining area

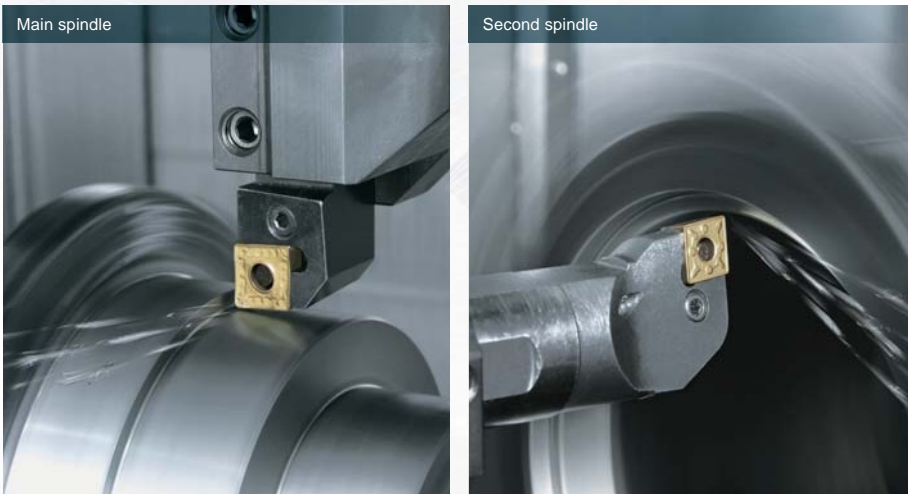
The single spindle turret with automatic tool changer simplifies tool setup with minimum interference. The milling spindle provides excellent performance over a wide range of applications, from steel machining to high speed machining of aluminum.



Higher Productivity & Higher Accuracy

Main spindle / Second spindle

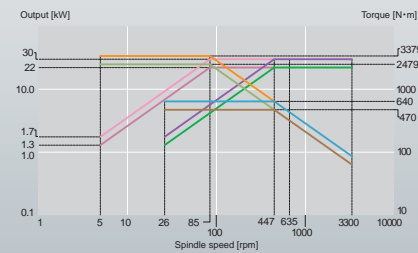
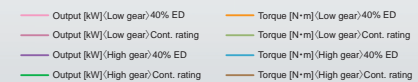
The spindles feature high-output integral spindle / motors with two gear ranges for a wide range of heavy-duty machining. The C-axis (0.0001° program increment) is driven by a worm wheel system with high positioning accuracy — the same as machining center rotary tables.



INTEGREX e-500H series

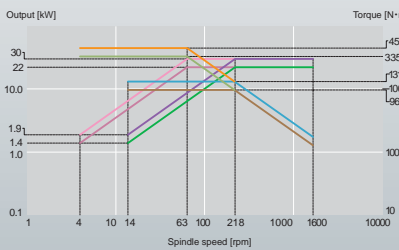
3300 rpm spindle Spindle bore $\Phi 104$ mm

e-500H, e-500H-S Main spindle (standard)
e-500H-S Second spindle (standard)



1600 rpm High-torque spindle Spindle bore $\Phi 185$ mm

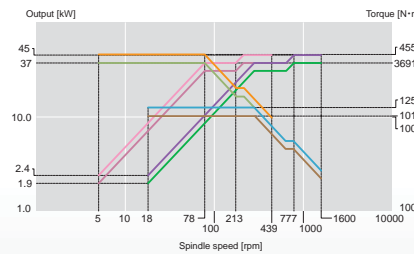
e-500H, e-500H-S Main spindle (option)



INTEGREX e-670H series

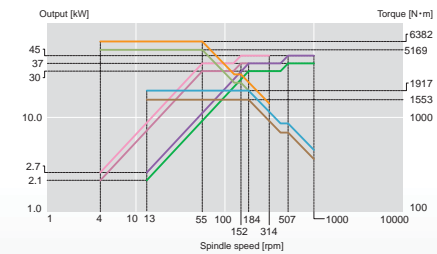
1600 rpm spindle Spindle bore $\Phi 170$ mm

e-670H [3000U·4000U], e-670H-S Main spindle (standard)
e-670H-S Second spindle (standard)



1000 rpm spindle Spindle bore $\Phi 260$ mm

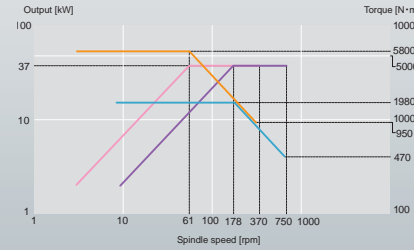
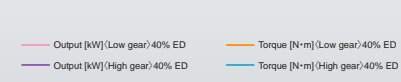
e-670H [6000U] Main spindle (standard)
e-670H [3000U·4000U], e-670H-S Main spindle (option)



INTEGREX e-670H series

750 rpm spindle Spindle bore $\Phi 320$ mm

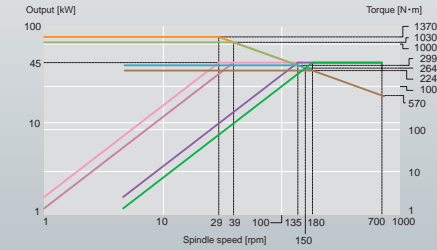
e-670H, e-670H-S Main spindle (option)



INTEGREX e-800H

700 rpm spindle Spindle bore $\Phi 275$ mm

e-800H Main spindle (standard)



Higher Productivity & Higher Accuracy

NC Tailstock

Controlling the movement and setting the thrust force of the tailstock is a simple operation using the CNC. The operator can set the tailstock thrust by 0.1 kN on the setup screen and move the tailstock to the desired position by menu-key or M-code. This allows a workpiece to be machined with the optimum thrust force from rough machining to finish machining. The motion of the tailstock body is much faster when compared to that of conventional system with the tailstock pulled by the machine carriage.

e-500H	MT No.5 Built-in center	Max. thrust 1.5 t	
	MT No.6 Built-in center	Max. thrust 3.0 t	OPTION (3000U / 4000U)
e-670H	MT No.6 Built-in center	Max. thrust 3.0 t	(3000U / 4000U)
	Metric center # 80	Max. thrust 7.0 t	(600U) OPTION (4000U)
e-800H	Metric center # 100	Max. thrust 7.5 t	

OPTION

Two position tailstock quill (manual quill positioning) for supporting short workpieces **INTEGREX e-670H**

The tailstock quill can extend a stroke of 250 mm making it possible to support both short and long shaft workpieces.



Tool Magazine

Different tool magazine capacities (40 tools – standard, 80 tools and 120 tools – optional) are available to meet the machining requirements of a wide variety of workpieces.

The INTEGREX e-H series is available with four tool holder specifications

• Tool system

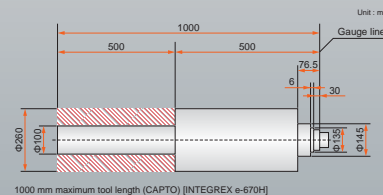
					Max. tool length
e-500H series					500 mm
e-670H series	MAS BT-50	MAS BBT-50	CAPTO C8	HSK-T100	650 mm
e-800H					650 mm



OPTION

Maximum automatic tool changer tool length : 650 mm / 1000 mm

The e-500H is optionally available with a maximum tool length of 650mm that can be handled by the automatic tool changer and tool magazine, 1000 mm is optionally available for the e-670H and the e-800H.



1000 mm maximum tool length (CAPTO) [INTEGREX e-670H]

Steady Rests

Variety of steady rests are available for high-accuracy and efficient machining.

The INTEGREX e-800H (6000U) can be equipped with up to 3 steady rests, the 8000U can be equipped with up to 4 steady rests.

Automatic steady rest

Positioning time is considerably reduced thanks to operation by the CNC.

Machine model	INTEGREX e-500H series INTEGREX e-670H series INTEGREX e-800H
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Large workpiece diameter capacity steady rest

Machine model	INTEGREX e-670H series / e-800H
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Two NC steady rests

Machine model	INTEGREX e-670H series / e-800H
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e-500H series

Steady rest manufacturer / model	Gripping diameter
SMW SLU-X5M,SR5M	Φ45 mm ~ Φ310 mm
SMW SLU-X5.1M,SR5.1M	Φ85 mm ~ Φ350 mm
SMW K5M	Φ80 mm ~ Φ390 mm
SMW K5.1M	Φ100 mm ~ Φ410 mm

e-670H series

Steady rest manufacturer / model	Gripping diameter
SMW SLU-X5Z,SR5Z	Φ45 mm ~ Φ310 mm
SMW SLU-X5.1Z,SR5.1Z	Φ85 mm ~ Φ350 mm
SMW K5Z	Φ80 mm ~ Φ390 mm
SMW K5.1Z	Φ100 mm ~ Φ410 mm
SMW K6Z	Φ135 mm ~ Φ460 mm
SMW K6.1Z	Φ215 mm ~ Φ510 mm

e-800H

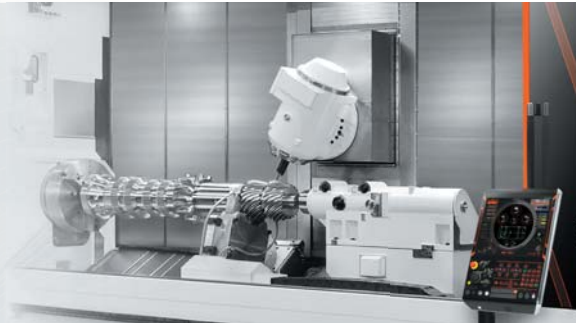
Steady rest manufacturer / model	Gripping diameter
SMW K6Z	Φ135 mm ~ Φ460 mm
SMW K6.1Z	Φ215 mm ~ Φ510 mm
SMW KA7Z	Φ340 mm ~ Φ660 mm
SMW KA7.1Z	Φ650 mm ~ Φ910 mm

Higher Productivity

Wide variety of optional equipment available to reduce machining processes and improve machining capability

Special tool holders are optionally available for the INTEGREX e-H series to further expand versatility

Special tool holders are automatically loaded/unloaded to/from the milling spindle which can be used for 5-axis machining. Long boring bars can be automatically loaded for pipe machining such as that found in the oil industry.



Long boring bar system

INTEGREX e-500H / e-670H / e-800H

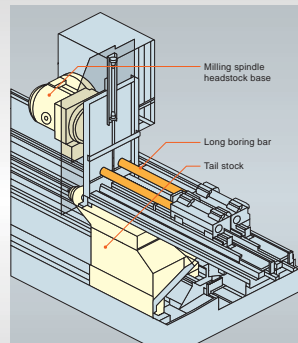
Higher productivity for the deep machining of inner diameters of large workpieces

- Max. tool length : 1000 mm, 1500 mm (6000U, 8000U)
- Tools can be stored in the long boring bar stocker
 - Two tools for e-500H -Three tools for e-670H
 - Four tools for e-800H
- Tool head is stored in the tool magazine and changed by the automatic tool changer

Note : ATC max. length : 1000 mm (e-670H, e-800H)



The unique long boring bar system is extremely effective for the inner diameter and deep hole machining of large workpieces which cannot be performed by conventional turning centers. Boring bars are stored in the stocker located over the tailstock. The INTEGREX e-670H·e-800H automatically change the boring bar heads which are stored in the standard tool magazine.



Specifications

Machine model	e-500H	e-670H		e-800H
Universal	3000U / 4000U	3000U / 4000U	6000U	4000U / 6000U / 8000U
Max. tool diameter	Φ100 mm	Φ120 mm* (Boring bar head ATC)	Φ120 mm* (Boring bar head ATC)	Φ120 mm* (Boring bar head ATC)
Max. tool length	1000 mm	1000 mm	1500 mm	1500 mm
Max. tool length (Boring bar head ATC)	-	1000 mm	1000 mm	1000 mm
Max. tool weight	170 kg	180 kg	180 kg	240 kg
Max. storage capacity	2 Tools	3 Tools	3 Tools	4 Tools

Note : When performing automatic tool change of boring bar head, maximum swing is restricted to Φ920 mm.
Only BT and CAPTO boring bar heads can be automatically changed.

U-axis tool

INTEGREX e-670H / e-670H-S / e-800H

A D'andrea TA-C 160 U-axis facing tool is optionally available to machine complex workpiece features.

Note : Max. swing of U-axis : Φ1050 mm (e-670H series)



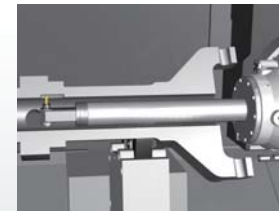
Rigid tool holder system with four clamping units

INTEGREX e-670H / e-670H-S / e-800H

Special tool holders further increase the range of applications that can be performed. They are rigidly clamped by the four clamping units. Since they are loaded from a special stocker in the same manner as standard tools, the number of machining processes is reduced for higher productivity.

Long angle mill holder

The long angle mill holder can be used for rotary tool machining deep in the bores of workpieces.



Long drill holder

The long drill holder (Max. speed of 400 rpm with max. torque of 191 N·m) can perform deep hole drilling up to a maximum depth of 800 mm. Since they are loaded from a special stocker in the same manner as standard tools, the number of machining processes is reduced for higher productivity.



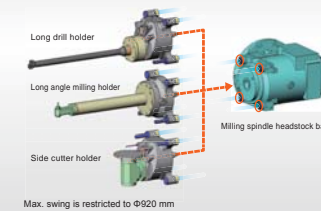
Side cutter holder

The 90° side cutter provides a convenient method of high accuracy groove cutting. The high rigidity clamping system with the milling spindle ensures high performance cutting.



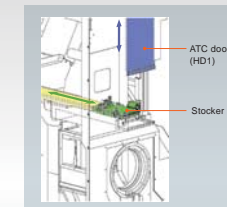
Rigid tool holder system with four clamping units enables drilling of small diameter holes located deep in large bores, and high-torque groove cutting with excellent access to the workpiece.

In addition, special stockers are equipped on the top surface of the main / second spindle. A maximum of two of these milling holders can be stored.

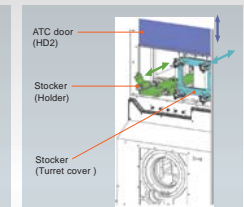


Max. swing is restricted to Φ920 mm

Stocker on HD1 side



Stocker on HD2 side



Specifications (HD1 / HD2 stocker)

	HD1 stocker	HD2 stocker
Max. storage capacity	1 tool	1 tool
Type of milling holder	Long drill holder Long angle milling holder	Long drill holder Side cutter holder

Note : When machine is equipped with 4-clamping unit rigid tool system, the number of long boring bars that can be stored is limited.

Ergonomics

Unsurpassed ease of operation and maintenance thanks to machine design focused on ergonomic considerations

1 Minimum spindle center line height

For ease of loading / unloading workpieces and machine setup.



4 Wide door opening and convenient access for overhead crane

For ease of operation when loading / unloading workpieces when using overhead crane.



2 Movable CNC operation panel

For ease of operation during setup and automatic operation.



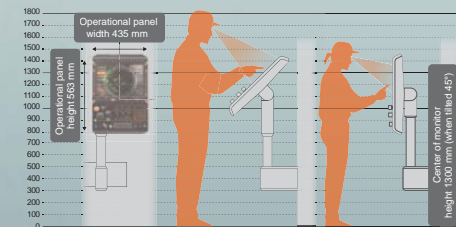
3 Large window

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



5 Adjustable CNC touch panel

Operation touch panel can be tilted to the optimum position for any operator's height to ensure ease of operation.



MAZATROL CNC System



Three color status indicator

19" touch panel

USB port

SD card slot

Operation switches

Dials

From setup to machining — designed for unsurpassed ease of operation

MAZATROL *SMOOTHX*

Process home screens

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



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.

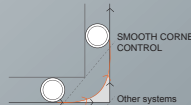


Variable Acceleration Control Function ● VARIABLE ACCELERATION CONTROL

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 Function ● SMOOTH CORNER CONTROL

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



Cycle time reduced by 10 to 20%

(Test results for reference only)



Ease of Programming

Visible programming screen

QUICK EIA

By touching the tool path on the screen, it is possible to move to the corresponding EIA program, and check the program details.



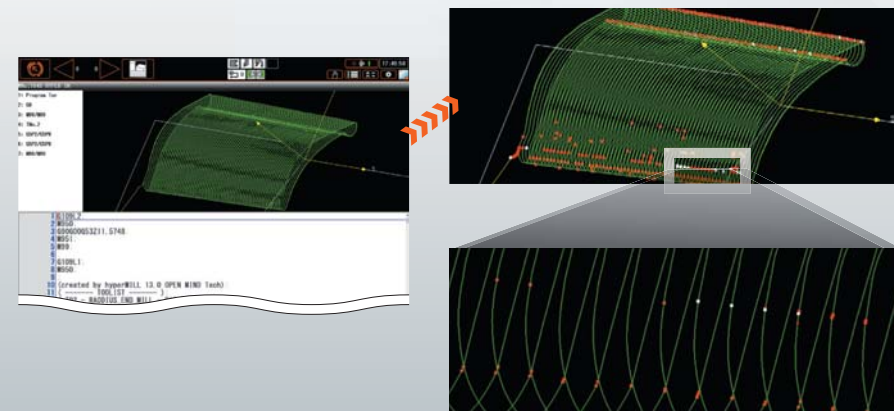
QUICK MAZATROL

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



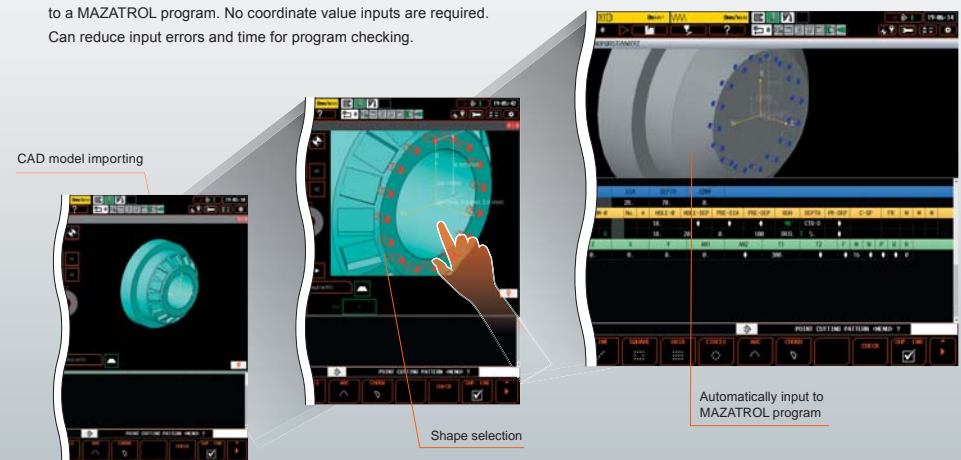
VIEW SURF

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



3D ASSIST

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



Standard Machine Specifications

INTEGREX e-500H series

		INTEGREX e-500H			INTEGREX e-500H-S		
		1500U	3000U	4000U	1500U	3000U	
Capacity	Max. swing	Φ820 mm			Φ820 mm		
	Max. supported weight (including chuck weight)	Shaft workpiece : 1500 kg			Chuck workpiece : 710 kg		
	Max. machining diameter	Φ820 mm			Φ820 mm		
Travel	X-axis travel	870 mm			870 mm		
	Z-axis travel	1598 mm	3122 mm	4138 mm	1598 mm	3122 mm	
	Y-axis travel	500 mm			500 mm		
	W-axis travel	1466 mm	2990 mm	3528 mm	1529 mm	2463 mm (Equipped with one steady rest)	
	B-axis travel	-30° ~ 210°			-30° ~ 210°		
	C-axis travel	360°			360°		
Spindle	Max. spindle speed ¹	3300 rpm			3300 rpm		
	Spindle nose	JIS A2-11			JIS A2-11		
	Spindle bore	Φ104 mm			Φ104 mm		
	Bearing ID	Φ150 mm			Φ150 mm		
	Min. spindle indexing increment	0.0001°			0.0001°		
Second spindle	Max. spindle speed ¹	—			3300 rpm		
	Min. spindle indexing increment	—			0.0001°		
Milling spindle	Milling spindle type	Single spindle turret with ATC			Single spindle turret with ATC		
	Max. spindle speed	10000 rpm			10000 rpm		
	Min. spindle indexing increment	0.0001°			0.0001°		
	Tool shank height	25 mm			25 mm		
	Boring bar shank diameter	Φ50 mm			Φ50 mm		
Feedrate	Rapid traverse rate : X-axis	40 m/min			40 m/min		
	Rapid traverse rate : Z-axis	40 m/min	30 m/min		40 m/min		
	Rapid traverse rate : Y-axis	40 m/min			40 m/min		
	Rapid traverse rate : B-axis	30 rpm			30 rpm		
	Rapid traverse rate : C-axis	20 rpm			20 rpm		
	Rapid traverse rate : W-axis	6 m/min			12 m/min		
	Automatic tool changer system	Tool shank taper	No.50			No.50	
	Tool storage capacity	40 tools			40 tools		
	Max. tool diameter / Length (from gauge line) / Weight	Φ135 mm (when adjacent pockets empty : Φ260 mm) / 500 mm / 30 kg			Φ135 mm (when adjacent pockets empty : Φ260 mm) / 500 mm / 30 kg		
	Tool selection method / Tool change time (tool to tool)	Short distance / random scheme / 1.8 sec			Short distance / random scheme / 1.8 sec		
Tailstock	Tailstock center	MT No.5			—		
	Travel	1466 mm	2990 mm	3528 mm	—		
	Feedrate	6 m/min			—		
	Max. thrust force	15.0 kN			—		
Motors	Spindle motor (40% ED) ²	30 kW (40 HP)			30 kW (40 HP)		
	Second spindle motor (40% ED)	—			30 kW (40 HP)		
	Milling spindle motor (40% ED)	37 kW (50 HP)			37 kW (50 HP)		
Power requirements	Electrical power supply (Cont. rating)	98.2 kVA			102.0 kVA		
	Air supply	0.5 MPa (5 kgf/cm ²), 460 L/min			0.5 MPa (5 kgf/cm ²), 550 L/min		
Tank capacity	Coolant tank capacity	620 L	800 L	1165 L	700 L	1020 L	
Machine size (with 40-tool magazine)	Machine height	3220 mm			3220 mm		
	Floor space requirement ²	6540 mm × 4600 mm	8040 mm × 4600 mm	9594 mm × 4600 mm	7140 mm × 4600 mm	8640 mm × 4600 mm	
	Weight	22600 kg	28600 kg	32600 kg	23800 kg	29800 kg	
Sound	Equivalent continuous sound pressure level at operator position (dependant on equipment options)	Less than 80 dB (A)					

¹ Max. spindle speed and Max. turning length depend on chuck specifications.
² Chip conveyor not included.

INTEGREX e-670H series

		INTEGREX e-670H			INTEGREX e-670H-S		
		3000U	4000U	6000U	2000U	3000U	4000U
Capacity	Max. swing	Φ1070 mm ³			Φ1070 mm		
	Max. supported weight (including chuck weight)	Shaft workpiece : 3000 kg		Shaft workpiece : 700 kg	Shaft workpiece : 3000 kg		
	Max. machining diameter	Φ1070 mm ³			Φ1070 mm		
Travel	X-axis travel	1025 mm			1025 mm		
	Z-axis travel	3122 mm	4138 mm	6170 mm	2106 mm	3122 mm	4138 mm
	Y-axis travel	670 mm			670 mm		
	W-axis travel	2879 mm	3890 mm	5054 mm (Equipped with one steady rest)	2032 mm (without steady rest)	3053 mm (without steady rest)	3214 mm (Equipped with one steady rest)
	B-axis travel	-30° ~ 210°			-30° ~ 210°		
	C-axis travel	360°			360°		
Spindle	Max. spindle speed ¹	1600 rpm		1000 rpm	1600 rpm		
	Spindle nose	JIS A2-11		Previous JIS A2-15	JIS A2-11		
	Spindle bore	Φ170 mm		Φ260 mm	Φ170 mm		
	Bearing ID	Φ240 mm		Φ330.2 mm	Φ240 mm		
	Min. spindle indexing increment	0.0001°			0.0001°		
Second spindle	Max. spindle speed ¹	—			1600 rpm		
	Min. spindle indexing increment	—			0.0001°		
Milling spindle	Milling spindle type	Single spindle turret with ATC			Single spindle turret with ATC		
	Max. spindle speed	10000 rpm			10000 rpm		
	Min. spindle indexing increment	0.0001°			0.0001°		
	Tool shank height	25 mm			25 mm		
	Boring bar shank diameter	Φ50 mm			Φ50 mm		
Feedrate	Rapid traverse rate : X-axis	40 m/min			40 m/min		
	Rapid traverse rate : Z-axis	40 m/min	30 m/min	18 m/min	40 m/min	40 m/min	30 m/min
	Rapid traverse rate : Y-axis	40 m/min			40 m/min		
	Rapid traverse rate : B-axis	30 rpm			30 rpm		
	Rapid traverse rate : C-axis	20 rpm			20 rpm		
	Rapid traverse rate : W-axis	11 ~ 12 m/min	6 ~ 12 m/min	3 ~ 6 m/min	12 m/min	12 m/min	10 m/min
	Automatic tool changer system	Tool shank taper	No.50			No.50	
	Tool storage capacity	40 tools			40 tools		
	Max. tool diameter / Length (from gauge line) / Weight	Φ135 mm (when adjacent pockets empty : Φ260 mm) / 500 mm / 30 kg			Φ135 mm (when adjacent pockets empty : Φ260 mm) / 500 mm / 30 kg		
	Tool selection method / Tool change time (tool to tool)	Short distance / random scheme / 1.8 sec			Short distance / random scheme / 1.8 sec		
Tailstock	Tailstock center	MT No.6		No.80 metric center	—		
	Max. thrust force	30.0 kN		70.0 kN	—		
	Motors	Spindle motor (40% ED)	45 kW (60 HP)		45 kW (60 HP)		
	Second spindle motor (40% ED)	—		45 kW (60 HP)			
	Milling spindle motor (40% ED)	37 kW (50 HP)		37 kW (50 HP)			
Power requirements	Electrical power supply (Cont. rating)	103.6 kVA		109.9 kVA	104.6 kVA		
	Air supply	0.5 MPa (5 kgf/cm ²), 590 L/min			0.5 MPa (5 kgf/cm ²), 660 L/min		
Tank capacity	Coolant tank capacity	960 L	1110 L	1560 L	910 L	1060 L	1260 L
Machine size (with 40-tool magazine)	Machine height	3886 mm			3886 mm		
	Floor space requirement ²	8405 mm × 5100 mm	9481 mm × 5100 mm	12173 mm × 5100 mm	8125 mm × 5100 mm	9125 mm × 5100 mm	10141 mm × 5100 mm
	Weight	31000 kg	36000 kg	42500 kg	28000 kg	33000 kg	38000 kg
Sound	Equivalent continuous sound pressure level at operator position (dependant on equipment options)	Less than 80 dB (A)					

¹ Max. spindle speed and Max. turning length depend on chuck specifications.
² Chip conveyor not included.
³ When performing automatic tool change of boring bar head, maximum swing is restricted to Φ920 mm

Standard Machine Specifications

INTEGREX e-800H

		INTEGREX e-800H		
		4000U	6000U	8000U
Capacity	Max. swing	Φ1300 mm		
	Max. supported weight (including chuck weight) ¹⁾	Shaft workpiece : 15000 kg		
	Max. machining diameter	Φ1300 mm		
Travel	X-axis travel	1300 mm		
	Z-axis travel	4380 mm	6380 mm	8380 mm
	Y-axis travel	800 mm		
	W-axis travel	4140 mm	6055 mm (Equipped with one steady rest)	6870 mm (Equipped with two steady rests)
	B-axis travel	-30° ~ 210°		
	C-axis travel	360°		
Spindle	Max. spindle speed ²⁾	700 rpm		
	Spindle nose	JIS A2-20		
	Spindle bore	Φ275 mm		
	Bearing ID	Φ355.6 mm		
	Min. spindle indexing increment	0.0001°		
Milling spindle	Milling spindle type	Single spindle turret with ATC		
	Max. spindle speed	10000 rpm		
	Min. spindle indexing increment	0.0001°		
	Tool shank height	25 mm		
	Boring bar shank diameter	Φ50 mm		
Feedrate	Rapid traverse rate : X-axis	18 m/min		
	Rapid traverse rate : Z-axis	24 m/min	18 m/min	18 m/min
	Rapid traverse rate : Y-axis	18 m/min		
	Rapid traverse rate : B-axis	30 rpm		
	Rapid traverse rate : C-axis	12.5 rpm		
	Rapid traverse rate : W-axis	6 m/min	3 ~ 6 m/min	2 ~ 6 m/min
Automatic tool changer system	Tool shank taper	No.50		
	Tool storage capacity	40 tools		
	Max. tool diameter / Length (from gauge line) / Weight	Φ135 mm (when adjacent pockets empty Φ260 mm) / 650 mm / 30 kg		
	Tool selection method / Tool change time (tool to tool)	Short distance / random scheme / 1.8 sec		
Tailstock	Tailstock center	No.100 metric center		
	Max. thrust force	75.0 kN		
Motors	Spindle motor (40% ED)	45 kW (60 HP)		
	Milling spindle motor (40% ED)	37 kW (50 HP)		
	Electrical power supply (Cont. rating)	125.6 kVA	131.4 kVA	
Power requirements	Air supply	0.5 MPa (5 kgf/cm ²), 510 L/min		
Tank capacity	Coolant tank capacity	1800 L	2400 L	
Machine size (with 40-tool magazine)	Machine height	4650 mm		
	Floor space requirement	12000 mm × 6000 mm	14000 mm × 6000 mm	16000 mm × 6000 mm
	Weight	78600 kg	87300 kg	96500 kg
Sound	Equivalent continuous sound pressure level at operator position (dependant on equipment options)	Less than 80 dB (A)		

¹⁾ Max. supported weight when using supportive device such as steady rest, etc.
²⁾ Max. spindle speed and max. turning length depend on chuck specifications.

Standard and Optional Equipment

		e-500H	e-500H-S	e-670H	e-670H-S	e-800H
		●	○	—	—	—
Machine	Main spindle bore Φ104 mm 3300 rpm	●	●	—	—	—
	Main spindle bore Φ170 mm 1600 rpm	—	—	● ¹⁾	●	—
	Main spindle bore Φ185 mm 1600 rpm	○	○	—	—	—
	Main spindle bore Φ260 mm 1000 rpm	—	—	○	○	—
	Main spindle bore Φ275 mm 700 rpm	—	—	—	—	●
	Main spindle bore Φ320 mm 750 rpm	—	—	○	○	—
	Variety of chucks / chuck cylinders (Main spindle side)	○	○	○	○	○
	High / low chuck pressure	○	○	○	○	—
	40 tool magazine	●	●	●	●	●
	80 tool magazine	○	○	○	○	○
	120 tool magazine	○	○	○	○	○
	Automatic steady rest	○	○	○	○	○
	Variety of chucks / chuck cylinders (Second spindle side)	—	○	—	○	—
	Automatic tailstock	●	—	●	—	●
	Extended tailstock center 150 mm	○	—	—	—	—
Two position tailstock quill	—	—	○	—	—	
Three-color machine status light	○	○	○	○	○	
High Accuracy	Absolute position detection (linear axes)	●	●	●	●	●
	X-, Y-, Z-axis pitch error compensation input	●	●	●	●	●
	Scale feedback (X-, Y-, Z-axis) ¹⁾	○	○	○	○	○
	Hydraulic fluid temperature control system	○	○	○	○	○
	Coolant temperature control system	○	○	○	○	○
	Preparation for Mazak monitoring systemB (RMP600)	●	●	●	●	●
	MAZA-CHECK (software, reference sphere) ²⁾	●	●	●	●	●
Safety Equipment	Operator door interlock	●	●	●	●	●
	Overload detection system	○	○	○	○	○
	Front door open / close	○	○	○	○	●
	Machining completion buzzer	○	○	○	○	○
Automation	Automatic tool eye	○	○	○	○	○
	Laser milling tool measurement system	○	○	○	○	○
	Long boring bar system	○	—	○	—	○
	Chuck open / close confirmation	●	●	●	●	●
	Automatic chuck open / close	○	○	○	○	○
	Chuck double foot pedal switch	○	○	○	○	○
	Tailstock body positioning by foot switch	○	—	○	—	○
	Visual tool ID	○	○	○	○	○
	Automatic workpiece measurement (RMP600)	○	○	○	○	○
	Auto power on / off + warm-up	●	●	●	●	●
	Rigid tool holder system with four clamping units ³⁾	—	—	○	○	○
Coolant / Chip Disposal	Turret air blast (flood coolant nozzle)	○	○	○	○	○
	Spindle internal air blast	○	○	○	○	○
	Chuck jaw air blast	○	●	○	●	○
	Side discharge chip conveyor (ConSep2000)	○	○	○	○	○
	Chip conveyor (abrasion resistant) ConSep2000	○	○	○	○	○
	Chip bucket	○	○	○	○	○
	Mist collector	○	○	○	○	○
Other	Oil skimmer	○	○	○	○	○
	Coolant through milling spindle	●	●	●	●	—
	High pressure coolant 1.5 MPa (15 kgf/cm ²)	○	○	○	○	●
	Coolant tank (separate)	—	—	—	—	●
	Magnum Coolant 7.0 MPa (70 kgf/cm ²)	○	○	○	○	○
Platform	Steps (inside of the machine)	—	—	—	—	●
	Platform	—	—	—	—	●

¹⁾ Z-axis scale feedback is standard equipment for the INTEGREX e-670H(6000U) and e-800H

²⁾ The optional wireless touch probe RMP600 is required for the MAZA-CHECK inspection procedure.

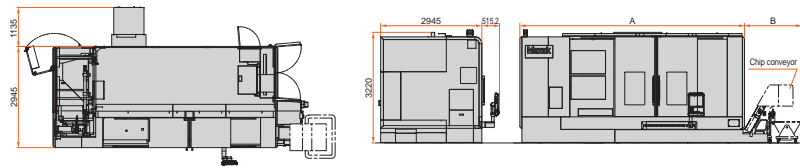
³⁾ Tool storage capacity is restricted when equipped with both long boring bar system and rigid tool holder system with four clamping units

⁴⁾ Φ260mm (1000rpm) is standard for INTEGREX e-670H (6000U)

Machine Dimensions

INTEGREX e-500H series

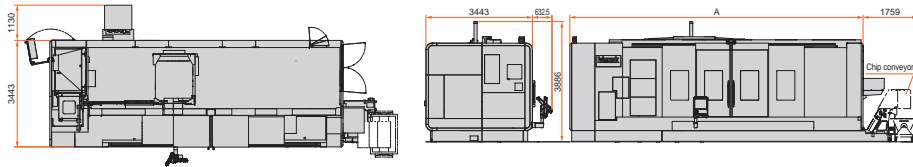
Unit:mm



e-500H				e-500H-S		
	1500U	3000U	3000U with LBB	4000U	1500U	3000U
A	6540	8040	8040	9594	7140	8540
B	1672.1	1696	2254.8	2001	1682.1	1655

INTEGREX e-500H (1500U) with 40-tool magazine and chip conveyor ConSep2000 (option) shown

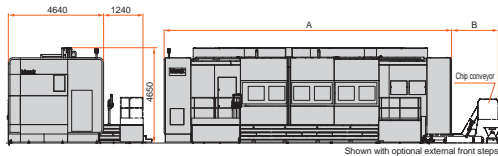
INTEGREX e-670H series



e-670H			e-670H-S			
	3000U	4000U	6000U	2000U	3000U	4000U
A	8465	9481	12173	8125	9125	10141

INTEGREX e-670H (4000U) with 40-tool magazine and chip conveyor ConSep2000 (option) shown

INTEGREX e-800H



e-800H			
	4000U	6000U	8000U
A	12000	14000	16000
B	2376.7	2282	2250

INTEGREX e-800H (6000U) with 40-tool magazine and chip conveyor ConSep2000 (option) shown

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, 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 : 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 function	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	
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, Collision stop, Machine lock
Manual measuring function	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 function	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	
Interface	SD card interface, USB	
EtherNet	10 M / 100 M / 1 Gbps	

* Option