

Mazak

INTEGREX e-H

SERIES

Mazak

INTEGREX e-H SERIES

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INTEGREX e-H SERIES MAZATROL SmoothAi 21.07.0 G 99J1B0021E0



INTEGREX e-H SERIES

Advanced horizontal multi-tasking machine that can perform all processes from turning to milling of large workpieces in a single setup

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

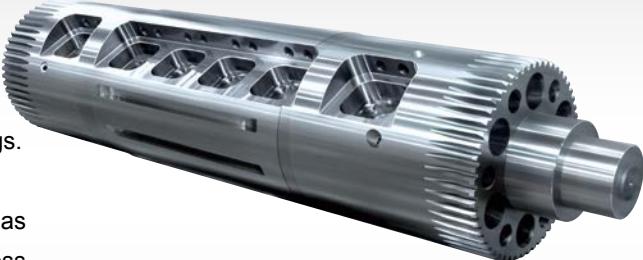


INTEGREX e-670H (4000U)
Shown with optional equipment

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.

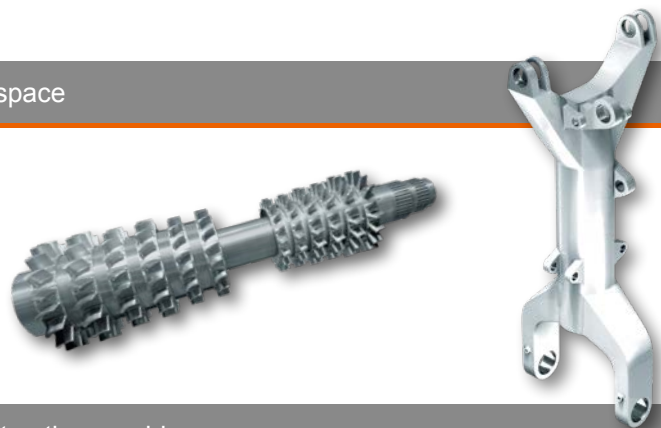


workpiece length : 2500 mm

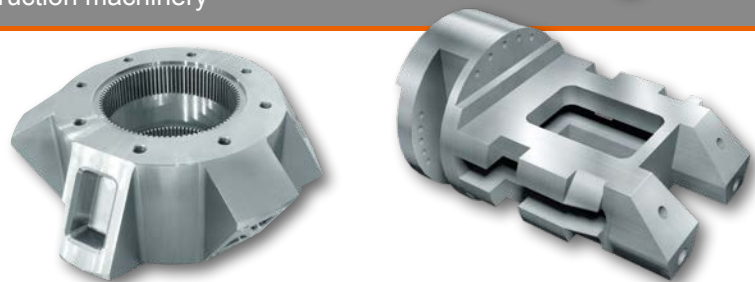
Previous Production Process		INTEGREX e-H	
Number of Operators	 Four	 One	
Number of Machines	•Large turning center : One •Large vertical machining center + rotary table : One •Large horizontal boring mill : One •Large vertical machining center : One  Four	 One INTEGREX e-670H	
Number of Programs	 Eight	 One	
Number of Machine Setups (Loading and positioning workpieces)	Eight	One	
Cutting Tools	 Four	 One	
Fixtures	 Three	None	



Aerospace



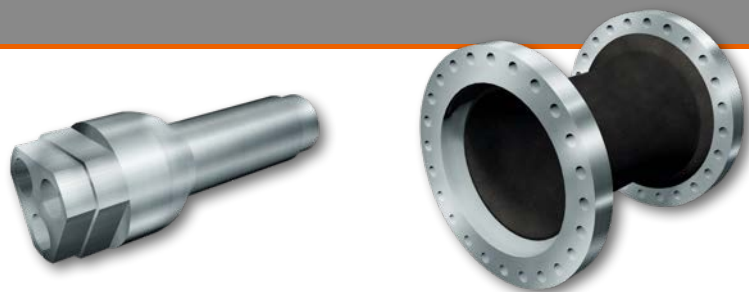
Construction machinery



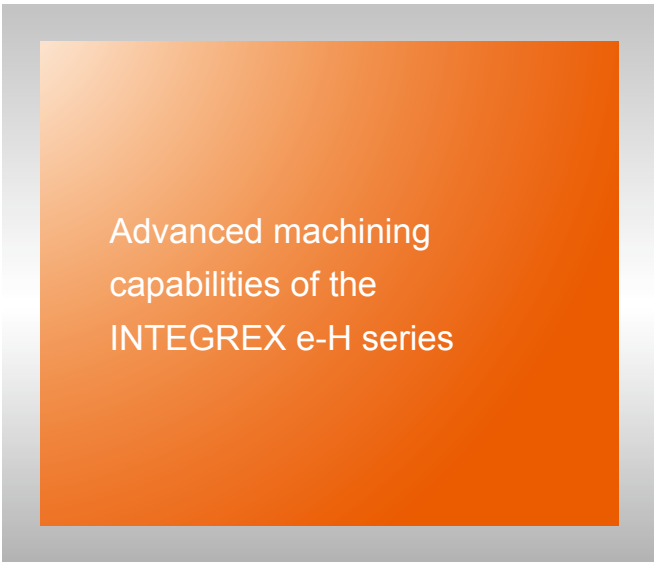
Marine



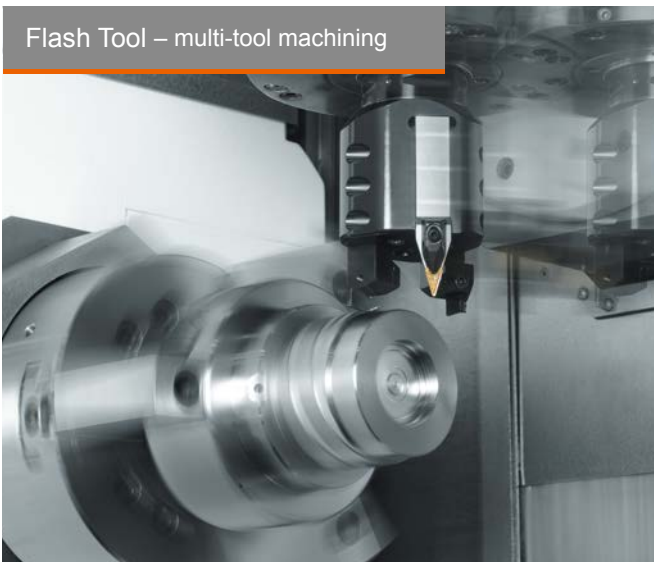
Oil



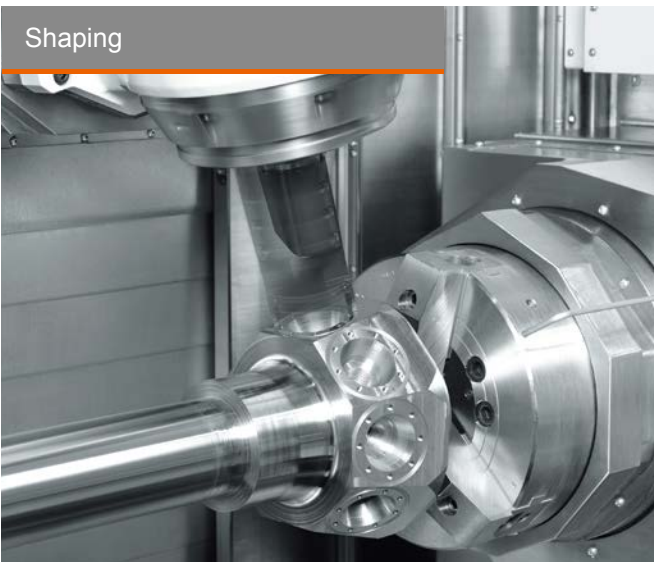
Energy



Gear hobbing



Flash Tool – multi-tool machining



Shaping



B-axis turning



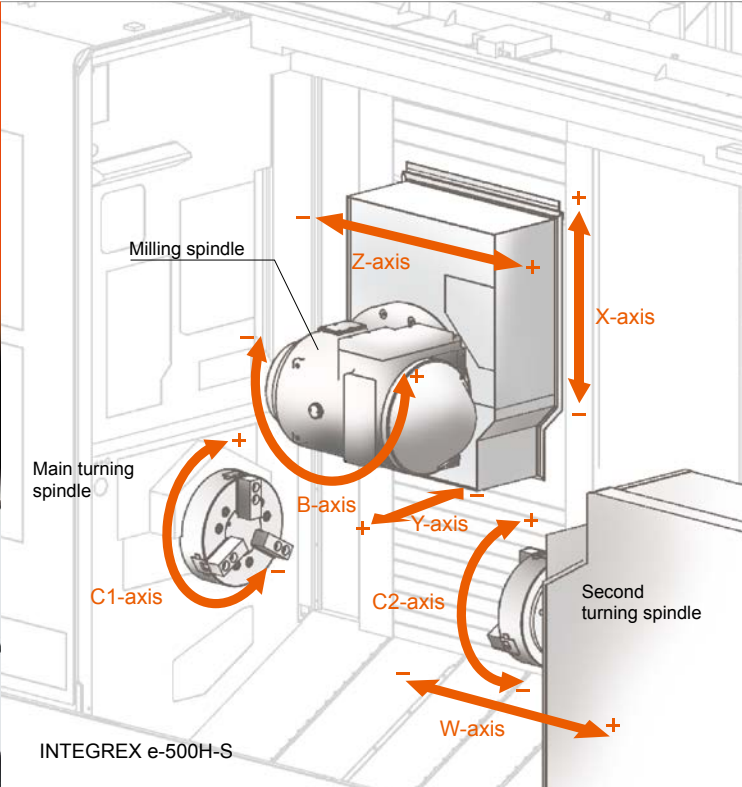
Mill turning

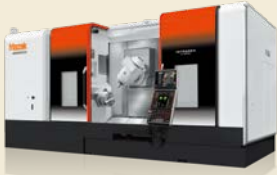
Mill-turning: rotation of both workpiece and milling tool, for high- efficiency turning of difficult to cut workpiece materials.
Note: Optional mill-turning CNC function required

INTEGREX e-H series

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

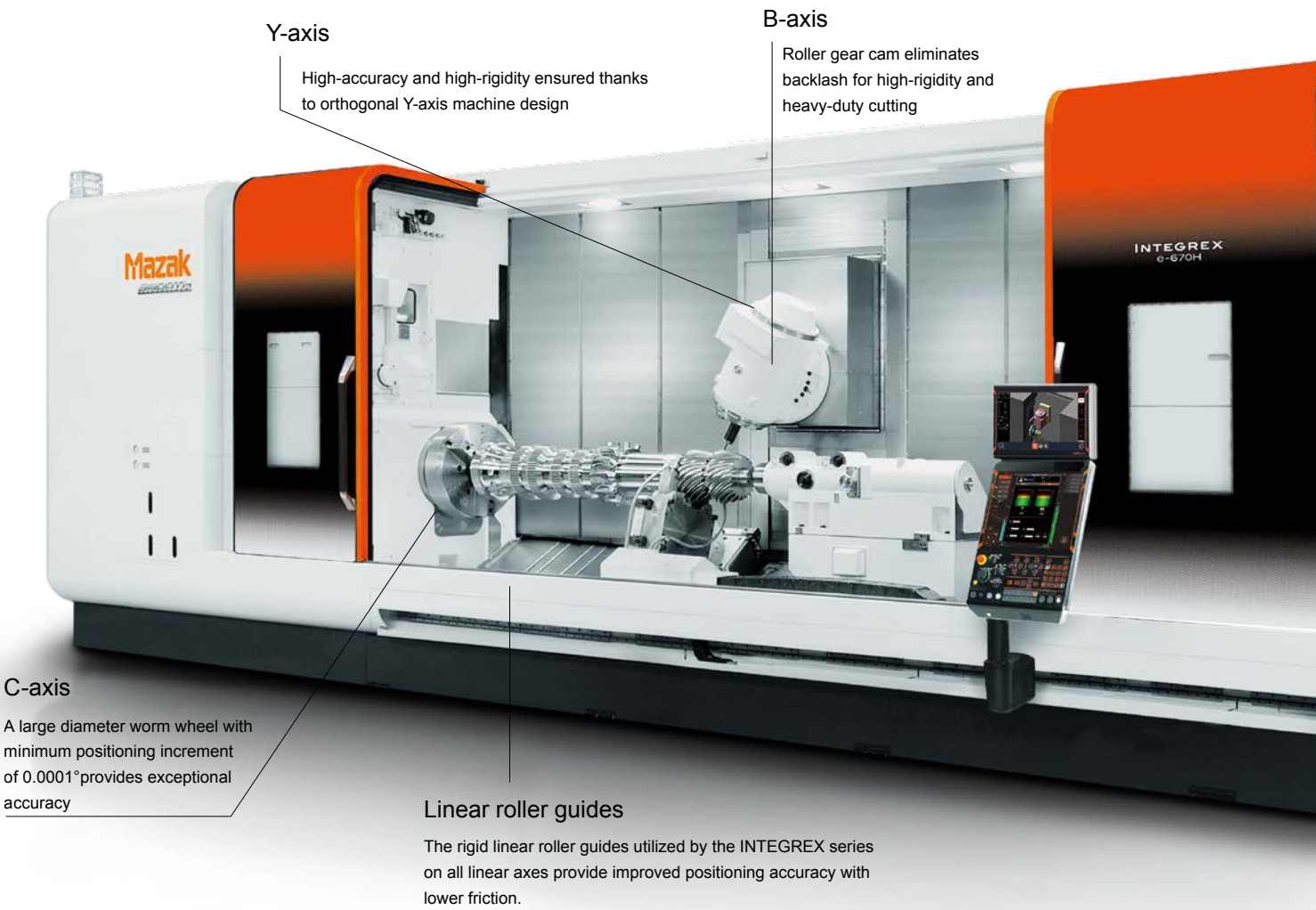
- Powerful milling performance comparable to that of machining centers
- Largest Y-axis stroke in the class
- Wide range of options available, such as long boring bar system and rigid tool holder system with four clamping units



			Milling spindle		Y-axis stroke	Chuck size (Main turning spindle)	Tailstock / Max. supported weight*1	Chuck size (Second turning spindle)
 INTEGREX e-500H series	e-500H	1500U 3000U 4000U	10000 min ⁻¹ (rpm) [standard] 37 kW (50 HP) 260 N·m (40% ED) 5000 min ⁻¹ (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						15"~21"
 INTEGREX e-670H series	e-670H	3000U 4000U 6000U	10000 min ⁻¹ (rpm) [standard] 37 kW (50 HP) 260 N·m (40% ED) 5000 min ⁻¹ (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	3000U 4000U						18"~24"
 INTEGREX e-800H	e-800H	4000U 6000U 8000U	10000 min ⁻¹ (rpm) [standard] 37 kW (50 HP) 260 N·m (40% ED) 5000 min ⁻¹ (rpm) High torque [option] 37 kW (50 HP) 667 N·m (50% ED)		800 mm	24"~50"	NC tailstock #100 Metric center 15 t*2	

*1 Chuck included *2 Maximum weight when using supportive device

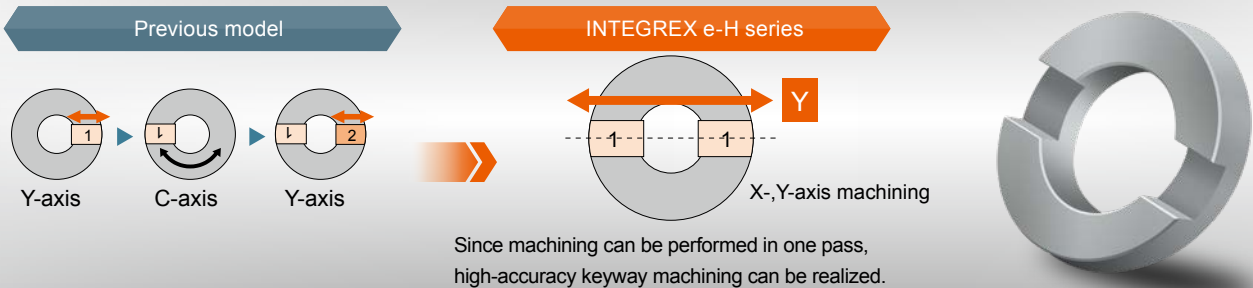
Orthogonal design provides large operation area and high-accuracy machining



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



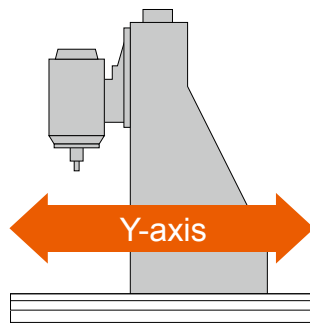
Y-axis

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.



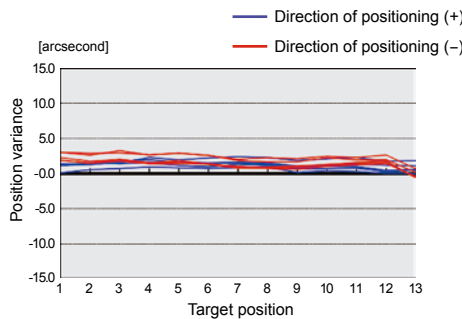
B-axis

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.



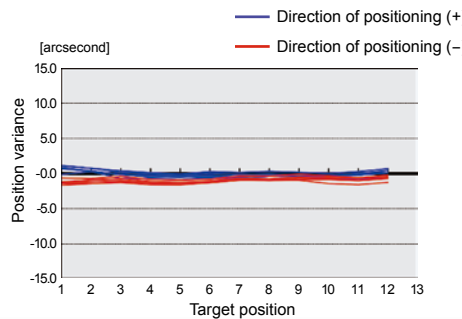
C-axis

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.

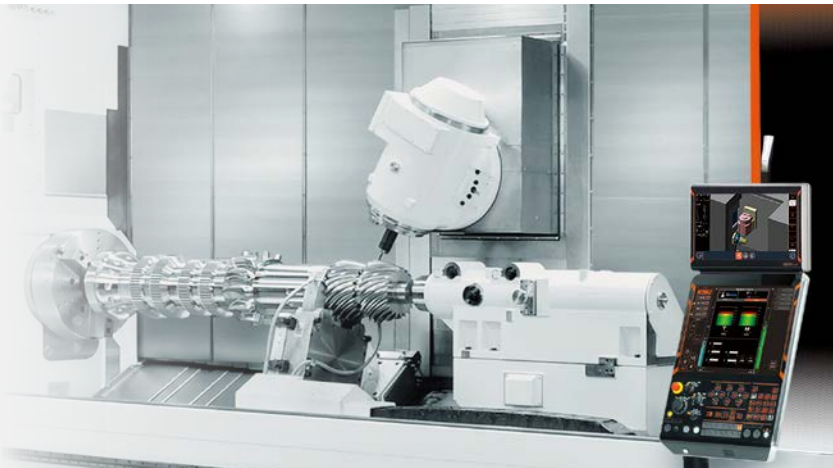


Higher Productivity

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.



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

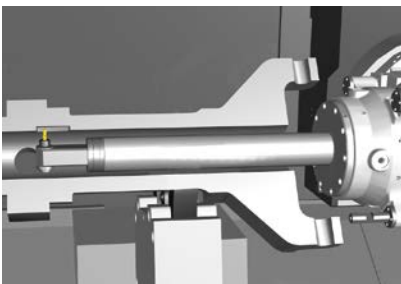
The long angle mill holder can be used for rotary tool machining deep in the bores of workpieces.

Long drill holder

The long drill holder (Max. speed of 400 min⁻¹ (rpm) with max. torque of 191 N·m (19.48 kgf·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.



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)

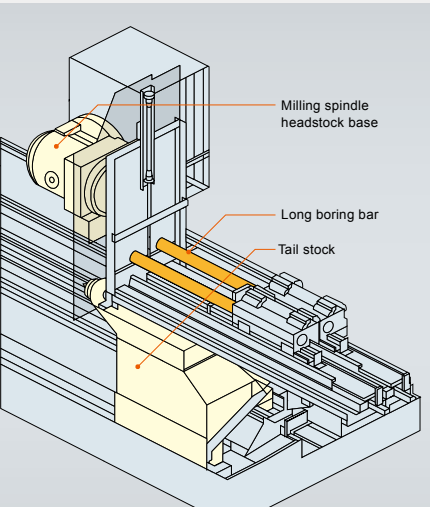


The unique long boring bar system is extremely effective for the inner diameter and deep hole machining of large workpieces which cannot be performed by conventional turning centers. Boring bars are stored in the stocker located over the tailstock. The INTEGREX e-670H · e-800H automatically change the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

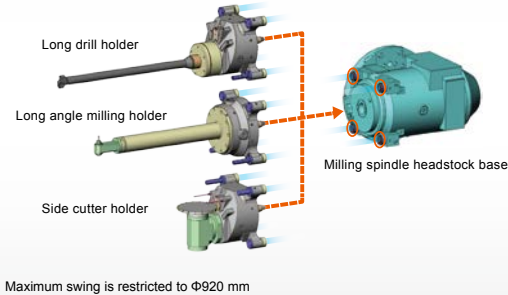
Specifications

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	3tools	3tools	4tools

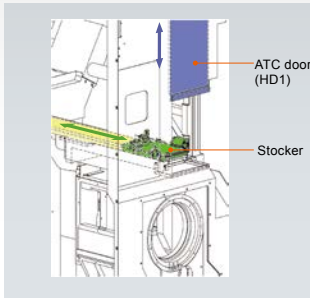
Note : When performing automatic tool change of boring bar head, maximum swing is restricted to Φ920 mm. Only BT and CAPTO boring bar heads can be automatically changed.



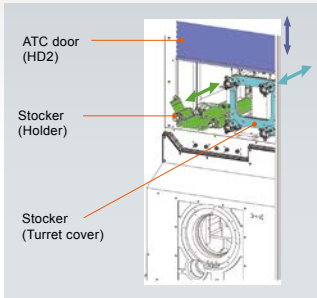
Rigid tool holder system with four clamping units enables drilling of small diameter holes located deep in large bores, and high-torque groove cutting with excellent access to the workpiece. In addition, special stockers are equipped on the top surface of the main / second spindle. A maximum of two of these milling holders can be stored.



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.

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.

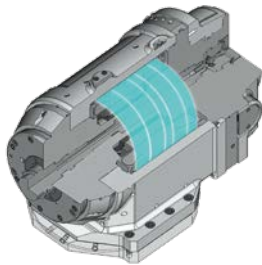


Integral spindle / motor

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

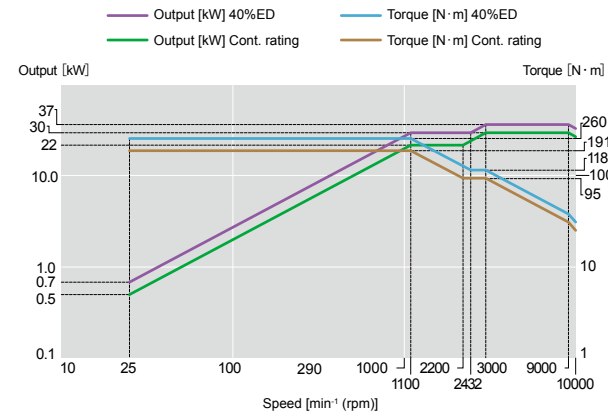
Spindle temperature control

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



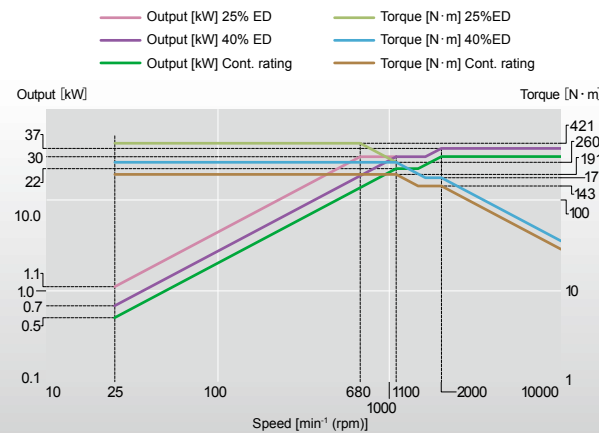
■ INTEGREX e-500H series

10000 min⁻¹ (rpm) milling spindle



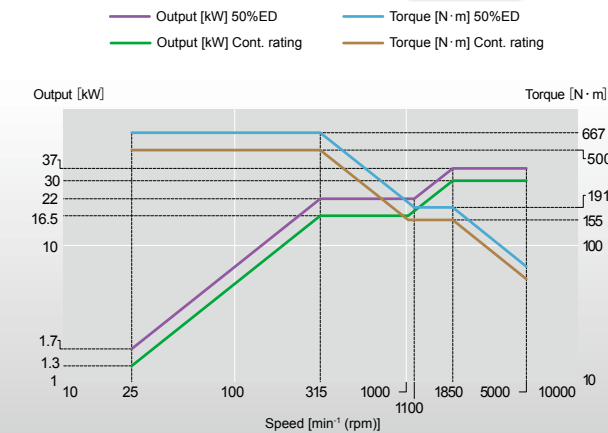
■ INTEGREX e-670H series, e-800H

10000 min⁻¹ (rpm) milling spindle



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

5000 min⁻¹ (rpm) High-torque spindle **OPTION**



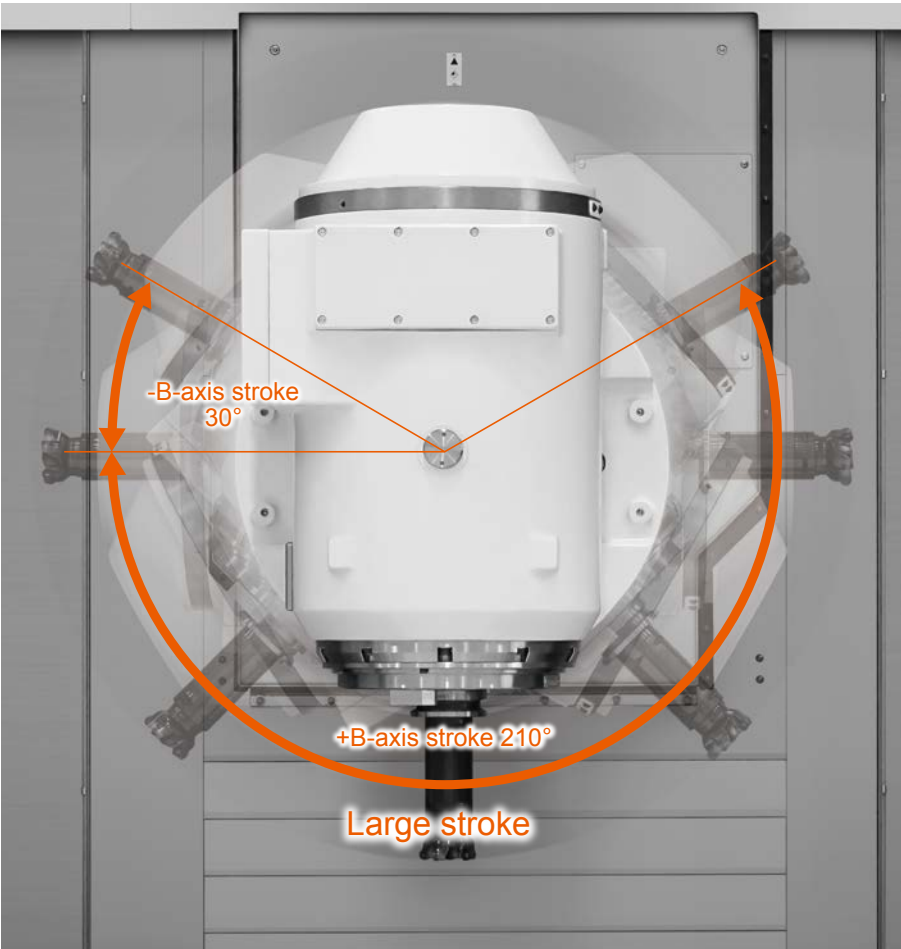
High-rigidity, high-accuracy B-axis

Rigid roller gear cam on B-axis

The B-axis adopts a roller gear cam for high-rigidity, heavy-duty cutting. In addition to minimizing the friction coefficient and heat generation, it eliminates backlash to ensure high-accuracy positioning.

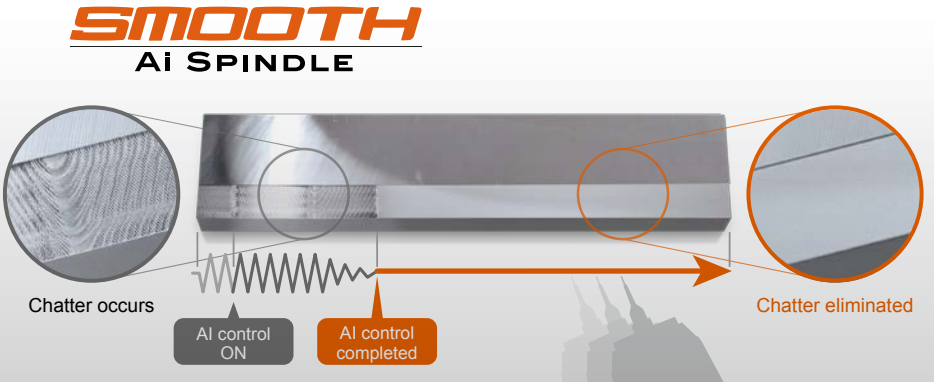
Large machining area

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.



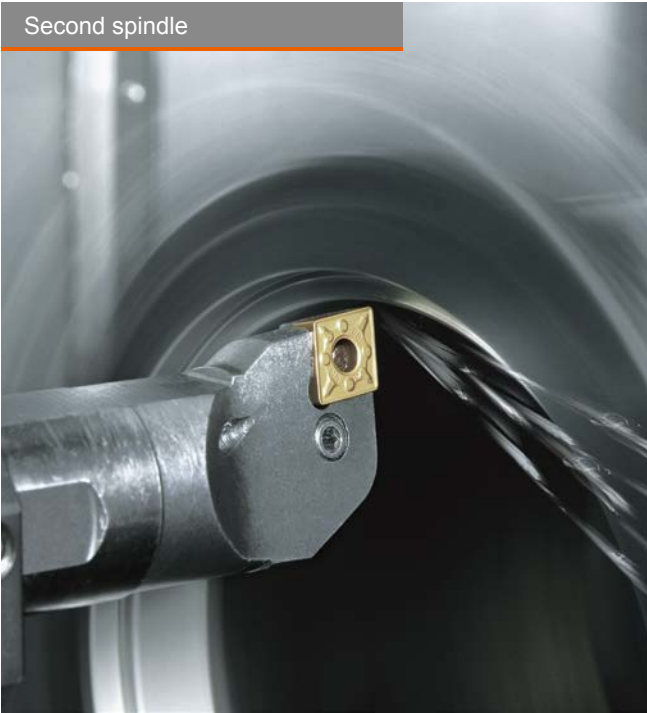
Smooth Ai Spindle **OPTION**

Using AI, milling spindle vibration is detected and machining conditions are automatically changed to produce unsurpassed surface finishes and high productivity. Thanks to AI, adjustments can be easily made in a short time without a skilled operator.



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.

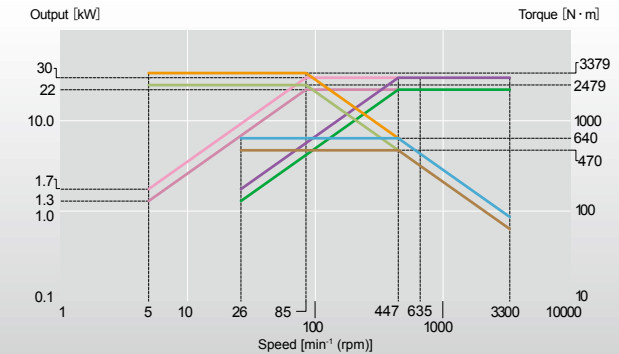


INTEGREX e-500H series

3300 min⁻¹ (rpm) spindle Spindle bore Φ104 mm

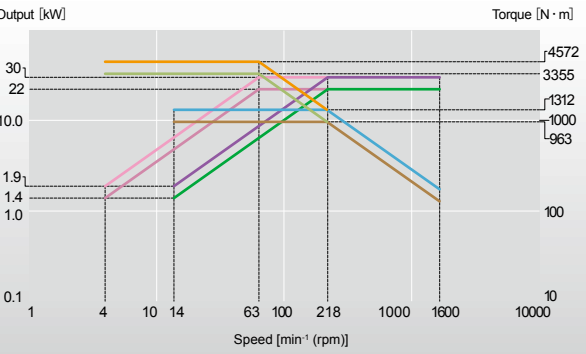
e-500H, e-500H-S Main spindle (standard)

e-500H-S Second spindle (standard)



1600 min⁻¹ (rpm) High-torque spindle Spindle bore Φ185 mm

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

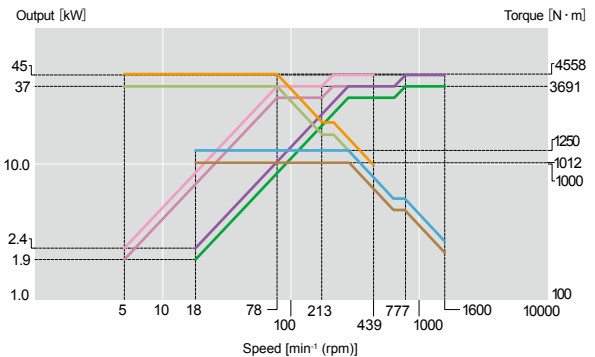


INTEGREX e-670H series

1600 min⁻¹ (rpm) spindle Spindle bore Φ170 mm

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

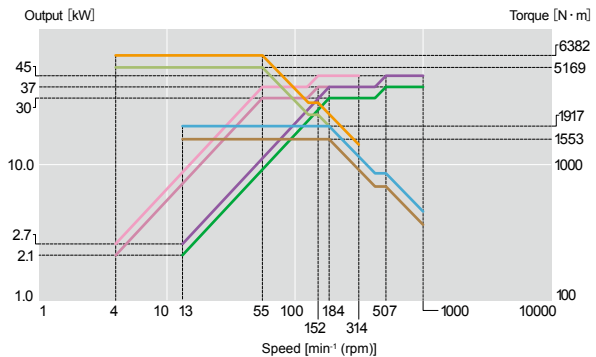
e-670H-S Second spindle (standard)



1000 min⁻¹ (rpm) spindle Spindle bore Φ260 mm

e-670H [6000U] Main spindle (standard)

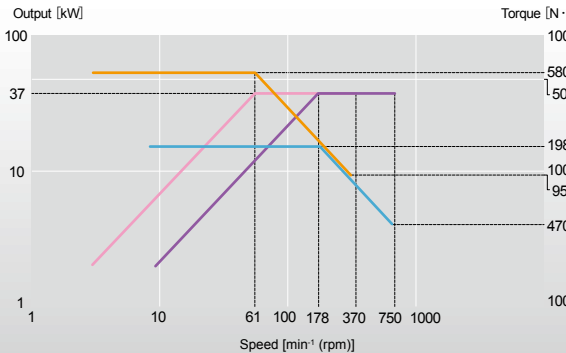
e-670H [3000U · 4000U], e-670H-S Main spindle (option)



INTEGREX e-670H series

750 min⁻¹ (rpm) spindle Spindle bore Φ320 mm

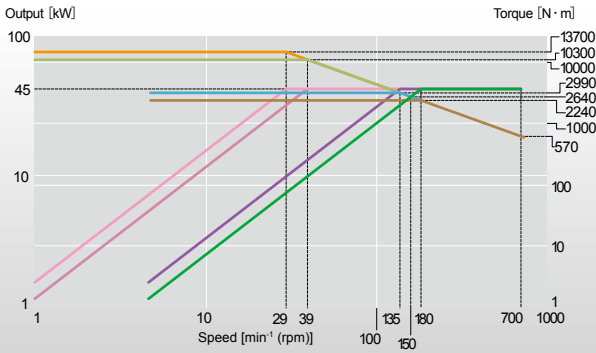
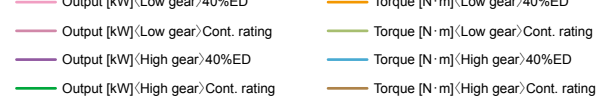
e-670H, e-670H-S Main spindle (option)



INTEGREX e-800H

700 min⁻¹ (rpm) spindle Spindle bore Φ275 mm

e-800H Main spindle (standard)



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.

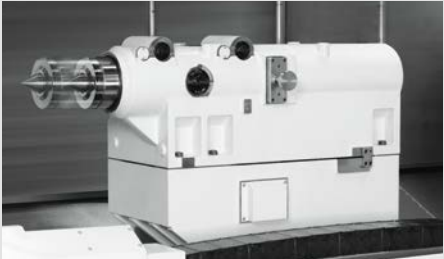
e-500H	MT No.5 Built-in center	Max. thrust 1.5 t	1500U / 3000U / 4000U
	MT No.6 Built-in center	Max. thrust 3.0 t	3000U OPTION / 4000U OPTION
e-670H	MT No.6 Built-in center	Max. thrust 3.0 t	3000U / 4000U
	Metric center # 80	Max. thrust 7.0 t	4000U OPTION / 6000U
e-800H	Metric center # 100	Max. thrust 7.5 t	4000U / 6000U / 8000U

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

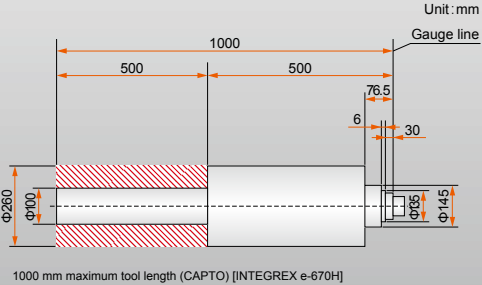


OPTION

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.



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

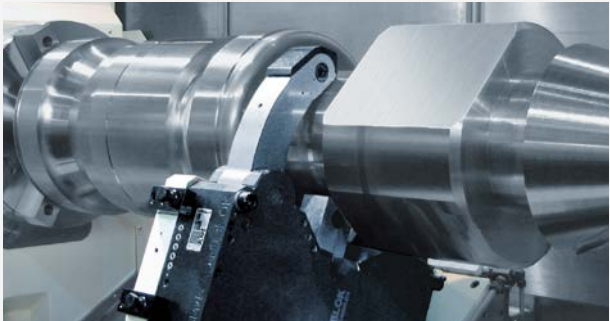
Positioning time is considerably reduced thanks to operation by the CNC.

Machine model	INTEGREX e-500H INTEGREX e-670H INTEGREX e-800H
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e-500H	
Steady rest manufacturer / model	Gripping diameter
SMW SLU-X5M, SR5M	Φ45 mm ~ Φ310 mm
SMW SLU-X5.1M, SR5.1M	Φ85mm ~ Φ350 mm
SMW K5M	Φ80mm ~ Φ390 mm
SMW K5.1M	Φ100mm ~ Φ410 mm

Large workpiece diameter capacity steady rest

Machine model	INTEGREX e-670H series / e-800H
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e-670H	
Steady rest manufacturer / model	Gripping diameter
SMW SLU-X5Z, SR5Z	Φ45mm ~ Φ310 mm
SMW SLU-X5.1M, SR5.1M	Φ85mm ~ Φ350 mm
SMW K5M	Φ80mm ~ Φ390 mm
SMW K5.1M	Φ100mm ~ Φ410 mm
SMW K6Z	Φ135mm ~ Φ460 mm
SMW K6.1Z	Φ215mm ~ Φ510 mm

Two NC steady rests

Machine model	INTEGREX e-670H series / e-800H
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e-800H	
Steady rest manufacturer / model	Gripping diameter
SMW K6Z	Φ135mm ~ Φ460 mm
SMW K6.1Z	Φ215mm ~ Φ510 mm
SMW KA7Z	Φ340mm ~ Φ660 mm
SMW KA7.1Z	Φ650mm ~ Φ910 mm

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

1

Minimum spindle center line height

The height from the floor to the center of the spindle is designed for ease of loading / unloading workpiece 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

As the CNC operation panel is movable in the Z-axis direction, easy operation is possible 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.

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 increase 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 utilizing robot and software



Shown with optional MAZATROL SmoothAi dual monitor

Innovative functions for higher productivity

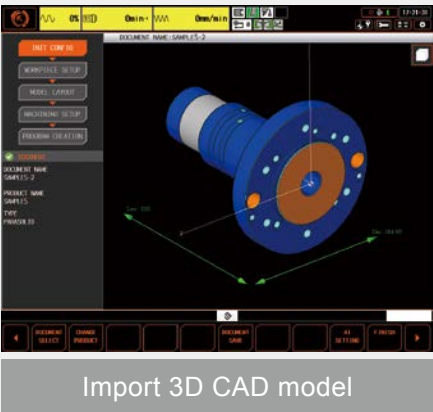
Advanced digital technology

Innovative functions to improve productivity from programming to machining

Automatic programming

Solid MAZATROL

A program is automatically generated from 3D CAD data. AI learning utilizes the machining know-how from the programs created in the past, automatically calculates the machining process, generating the optimal program.



Required time for programming
2.5 min.



Simulation, Test cutting (machining analysis, optimization)

Cutting Adviser

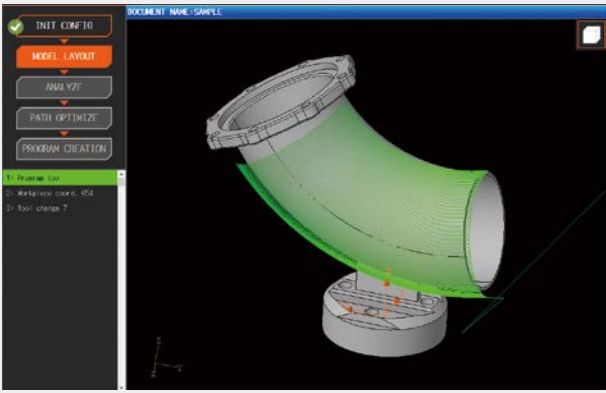
Cutting adviser optimizes machining conditions by MAZATROL SmoothAi CNC and Smooth CAM Ai simulation (optional software).



SMC PLUS

OPTION

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



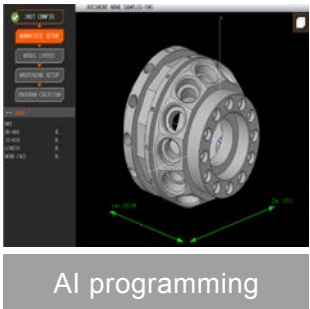
MAZATROL TWINS (software) for high productivity

OPTION

Virtual machines in your office accurately duplicate the operation of machines on your factory floor. Available software can be used together with machines equipped with the MAZATROL SmoothAi CNC to substantially increase the efficiency of your production.

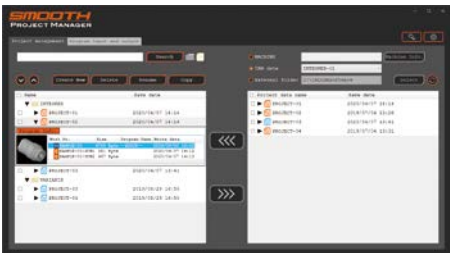
Smooth CAM Ai

Programs can be made and edited, as well as performing simulation and analysis on the Smooth CAM Ai for multiple machines. This data is sent to machines in the factory for fast and accurate machine setups.



Smooth Project Manager

Smooth Project Manager is used to manage the project data of the entire factory. The data can be synchronized between the machine in the factory and the PC in the office.



Smooth Tool Management

The Smooth Tool Management software manages data of the large number of tools in use by a factory for higher productivity.



Smooth Monitor AX・Smooth Link

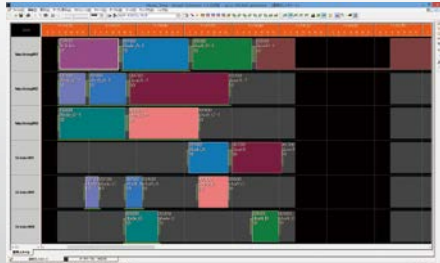
Smooth Monitor AX is software to monitor operational status and analyze accumulated manufacturing data for factory productivity improvement.

Smooth Link is software to view operational status and machining programs on tablets and smartphones, so the operator can instantly view necessary information while away from the machine.



Smooth Scheduler

Smooth Scheduler is software to create effective machining schedules utilizing production data. Schedules are displayed for convenient monitoring of production progress.



■ 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 min ⁻¹ (rpm)			3300 min ⁻¹ (rpm)	
	Spindle nose	A2-11			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 min ⁻¹ (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 min ⁻¹ (rpm)			10000 min ⁻¹ (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 min ⁻¹ (rpm)			30 min ⁻¹ (rpm)	
	Rapid traverse rate : C-axis	20 min ⁻¹ (rpm)			20 min ⁻¹ (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)	MAZATROL Random memory (random pocket assignment) / 1.8 sec			MAZATROL Random memory (random pocket assignment) / 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 ^{*3}	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

^{*1} Max. spindle speed and Max. turning length depend on chuck specifications.
^{*2} Even within the specifications, the machining with a standard outer diameter tool whose main cutting force exceeds 17658 N (1800 kgf) is restricted.
^{*3} Chip conveyor not included.

INTEGREX e-670H series

		INTEGREX e-670H			NTEGREX e-670H-S	
		3000U	4000U	6000U	3000U	4000U
Capacity	Max. swing	Φ1070 mm ^{*6}			Φ1070 mm	
	Max. supported weight (including chuck weight)	Shaft workpiece : 3000 kg		Shaft workpiece : 7000 kg	Shaft workpiece : 3000 kg	
	Max. machining diameter	Φ1070 mm ^{*6}			Φ1070 mm	
Travel	X-axis travel	1025 mm			1025 mm	
	Z-axis travel	3122 mm	4138 mm	6170 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)	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 min ⁻¹ (rpm)		1000 min ⁻¹ (rpm) ^{*7}	1600 min ⁻¹ (rpm)	
	Spindle nose	A2-11		Previous JIS A2-15 ^{*8}	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 min ⁻¹ (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 min ⁻¹ (rpm)			10000 min ⁻¹ (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	30 m/min
	Rapid traverse rate : Y-axis	40 m/min			40 m/min	
	Rapid traverse rate : B-axis	30 min ⁻¹ (rpm)			30 min ⁻¹ (rpm)	
	Rapid traverse rate : C-axis	20 min ⁻¹ (rpm)			20 min ⁻¹ (rpm)	
	Rapid traverse rate : W-axis ^{*2}	11~12 m/min	6~12 m/min	3~6 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)	MAZATROL Random memory (random pocket assignment) / 1.8 sec			MAZATROL Random memory (random pocket assignment) / 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 ^{*3}	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	1060 L	1260 L
Machine size (with 40-tool magazine)	Machine height ^{*4}	3886 mm			3886 mm	
	Floor space requirement ^{*5}	8465 mm × 5100 mm	9481 mm × 5100 mm	12173 mm × 5100 mm	9125 mm × 5100 mm	10141 mm × 5100 mm
	Weight	31000 kg	36000 kg	44500 kg	33000 kg	38000 kg

^{*1} Max. spindle speed and Max. turning length depend on chuck specifications.
^{*2} The range of the rapid traverse rate of the W-axis (tailstock feed axis) is based on variable speed control.
^{*3} Even within the specifications, the machining with a standard outer diameter tool whose main cutting force exceeds 17658 N (1800 kgf) is restricted.
^{*4} Distance from the floor to the counter-balance with the X-axis positioned at + O.T.
^{*5} Chip conveyor not included.
^{*6} When performing automatic tool change of boring bar head, maximum swing is restricted to Φ920 mm.
^{*7} When the tailstock is in the high thrust range (30.7 kN to 70.0 kN), the spindle speed is limited to 500 min⁻¹ (rpm) or less.
^{*8} When installing a chuck complying with the ISO702-1 standard, an adaptor needs to be added to the chuck due to the different tap size.

■ 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 min ⁻¹ (rpm)		
	Spindle nose	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 min ⁻¹ (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 min ⁻¹ (rpm)		
	Rapid traverse rate : C-axis	12.5 min ⁻¹ (rpm)		
	Rapid traverse rate : W-axis ³⁾	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)	MAZATROL Random memory (random pocket assignment) / 1.8 sec		
Tailstock	Tailstock	No.100 metric center		
	Max. thrust force	75.0 kN		
Motors	Spindle motor (40% ED) ⁴⁾	45 kW (60 HP)		
	Milling spindle motor (40% ED)	37 kW (50 HP)		
Power requirements	Electrical power supply (Cont. rating)	125.6 kVA	131.4 kVA	
	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 ⁵⁾	12000 mm × 6000 mm	14000 mm × 6000 mm	16000 mm × 6000 mm
	Weight	78600 kg	87300 kg	96500 kg

*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.

*³ The range of the rapid traverse rate of the W-axis (tailstock feed axis) is based on variable speed control.

*⁴ Even within the specifications, the machining with a standard outer diameter tool whose main cutting force exceeds 17658 N (1800 kgf) is restricted.

*⁵ Depth dimension includes the operation panel (for details, refer to the machine dimensions).

■ Standard and Optional Equipment

		● : Standard ○ : Option — : N/A				
		e-500H	e-500H-S	e-670H	e-670H-S	e-800H
Machine	Main spindle bore Φ104 mm 3300 min ⁻¹ (rpm)	●	●	—	—	—
	Main spindle bore Φ170 mm 1600 min ⁻¹ (rpm)	—	—	● ^{*4}	●	—
	Main spindle bore Φ185 mm 1600 min ⁻¹ (rpm)	○	○	—	—	—
	Main spindle bore Φ260 mm 1000 min ⁻¹ (rpm)	—	—	○	○	—
	Main spindle bore Φ275 mm 700 min ⁻¹ (rpm)	—	—	—	—	●
	Main spindle bore Φ320 mm 750 min ⁻¹ (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	—	—	○	—	—
	Status light (3 colors)	○	○	○	○	○
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	○	○	○	○	○
	Automatic opening / closing front door	○	○	○	○	●
	Machining completion buzzer	○	○	○	○	○
Automation	Automatic tool eye	○	○	○	○	○
	Laser milling tool measurement system	○	○	○	○	○
	Long boring bar system ^{*3}	○	—	○	—	○
	Chuck open / close confirmation	●	●	●	●	●
	Automatic chuck open / close	○	●	○	●	○
	Double foot pedal chuck 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	○	○	○	○	○
	Oil skimmer	○	○	○	○	○
	Coolant through milling spindle	●	●	●	●	●
	High pressure coolant 1.5 MPa (15 kgf/cm ²)	○	○	○	○	●
	Coolant tank (separate)	—	—	—	—	●
	SUPERFLOW coolant system	○	○	○	○	○
Other	Steps (inside of the machine)	—	—	—	—	●
	External platform	—	—	—	—	●
	External steps with handrails	—	—	—	—	○
	MAZATROL SmoothAi dual monitor	○	○	○	○	○

*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.

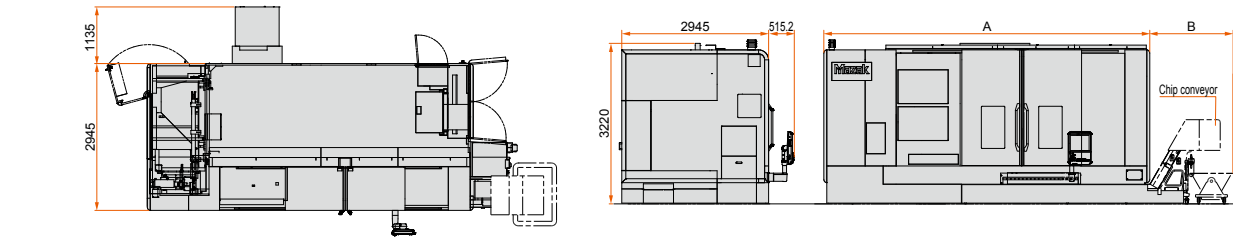
*³ Tool storage capacity is restricted when equipped with both long boring bar system and rigid tool holder system with four clamping units.

*⁴ Φ260mm (1000 min⁻¹ (rpm)) is standard for INTEGREX e-670H (6000U).

Machine Dimensions

INTEGREX e-500H series

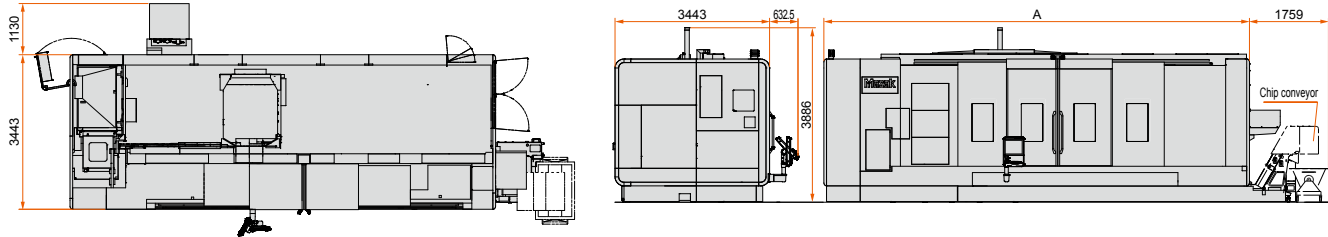
Unit : mm



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

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

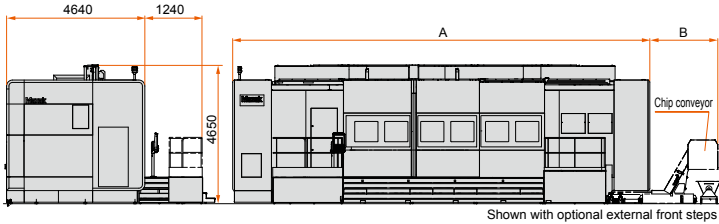
INTEGREX e-670Hseries



e-670H			e-670H-S	
	3000U	4000U	6000U	
A	8465	9481	12173	3000U
				4000U

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

INTEGREX e-800H



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 SmoothAi 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*, 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 : 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, Ai 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 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, 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	Automatic tool length measurement, Laser tool length / diameter measurement, Workpiece measurement, Sensor calibration, Tool eye auto tool measurement, Tool breakage detection
MDI measurement	Coordinate measurement, Laser measurement	
Peripheral network	PROFIBUS-DP*, EtherNet / IP*, CC-Link*, CC-Link IE Field Basic	
Interface	SD card interface, USB	
EtherNet	10 M / 100 M / 1 Gbps	

* Option