Mazak

VARIAXIS i

SERIES

Exceptional versatility thanks to high-accuracy machining of multiple surfaces plus simultaneous 5-axis machining

VARIAXIS i-700
Shown with optional equipment

VARIAXIS i-800T
Shown with optional equipment

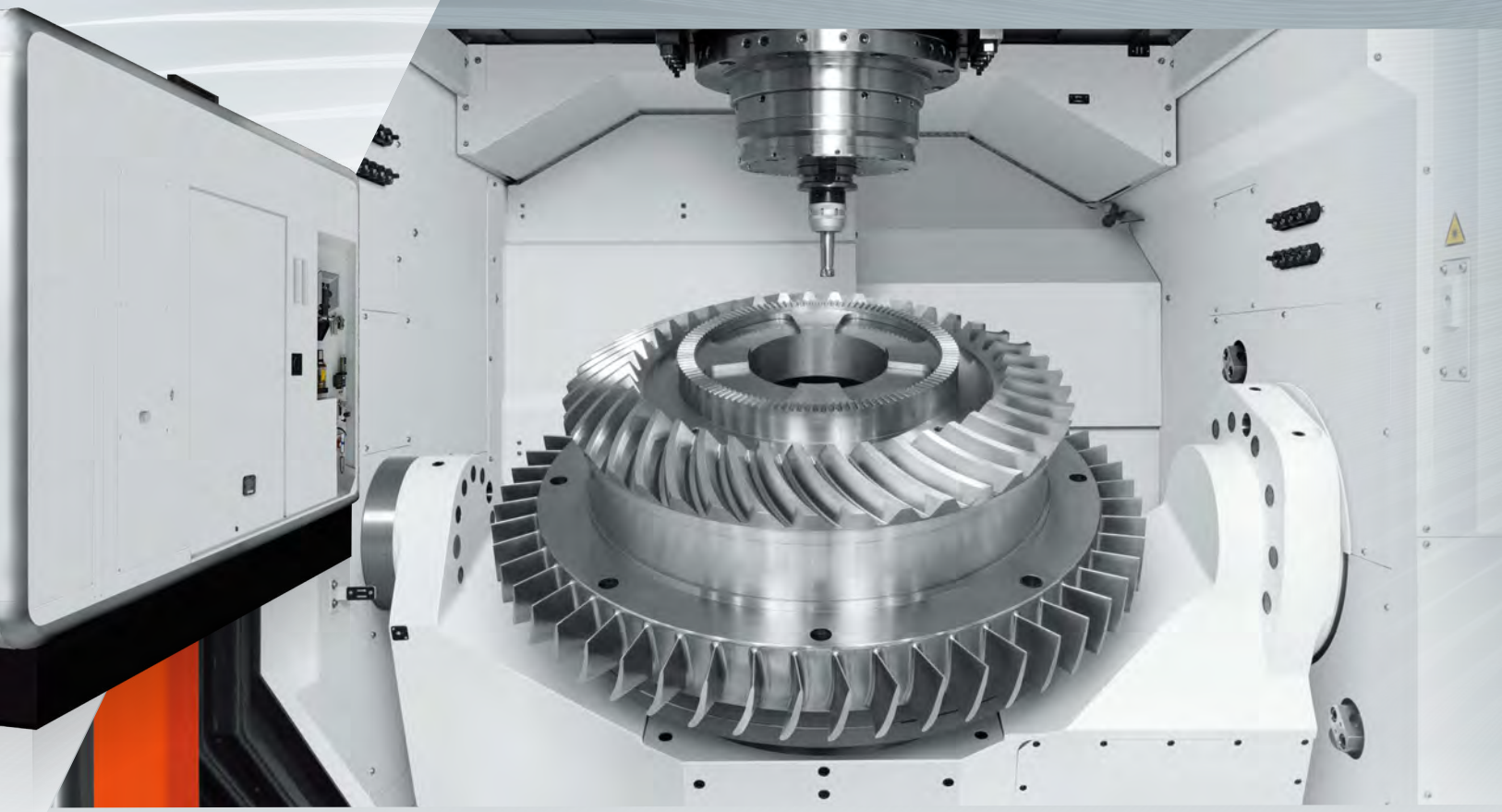
Simultaneous 5-Axis Machining Center

VARIAXIS i SERIES

Tilting/rotary table plus high-rigidity machine construction ensures high-accuracy machining of complex workpiece contours

Variety of spindle specifications available for high-speed machining of aluminum or machining of difficult-to-cut materials such as stainless steel, nickel alloys and titanium

For increased versatility, models are available with turning capability in addition to simultaneous 5-axis machining



VARIAXIS i-T series adds turning operation to the simultaneous 5-axis performance of the VARIAXIS i series

	Simultaneous 5-axis	Simultaneous 5-axis + turning
VARIAXIS i-500	●	—
VARIAXIS i-600	●	—
VARIAXIS i-700	●	—
VARIAXIS i-700T	●	●

	Simultaneous 5-axis	Simultaneous 5-axis + turning
VARIAXIS i-800	●	—
VARIAXIS i-800T	●	●
VARIAXIS i-1050	●	—
VARIAXIS i-1050T	●	●

Extensive Series Range

Compact model for small complex workpieces

VARIAXIS i-500

Table size: ø500 mm (ø19.69") × Width 400 mm (15.75")
Max. workpiece size: ø500 mm × 350 mm (ø19.69" × 13.78")
Max. load: 300 kg (661 lbs)

Spindle	Tool storage capacity
12000 rpm [Standard]	30 tool [Standard]
12000 rpm High torque [Option]	40, 60, 80, 120 tools [Option]
18000 rpm [Option]	
25000 rpm [Option]	
30000 rpm [Option]	

High-accuracy, high-speed machining of multiple surfaces

VARIAXIS i-600

Table size: ø600 mm (ø23.62") × Width 500 mm (19.69")
Max. workpiece size: ø700 mm × 450 mm (ø27.56" × 17.72")
Max. load: 500 kg (1102 lbs)

Spindle	Tool storage capacity
12000 rpm [Standard]	30 tool [Standard]
12000 rpm High torque [Option]	40, 80, 120 tools [Option]
18000 rpm [Option]	
25000 rpm [Option]	
30000 rpm [Option]	

High-accuracy, high-speed machining of multiple surfaces

VARIAXIS i-700

Table size: ø700 mm (ø27.56") × Width 500 mm (19.69")
Max. workpiece size: ø850 mm × 500 mm (ø33.46" × 19.69")
Max. load: 700 kg (1543 lbs)

Spindle	Tool storage capacity
12000 rpm [Standard]	30 tool [Standard]
12000 rpm High torque [Option]	40, 80, 120 tools [Option]
18000 rpm [Option]	
25000 rpm [Option]	
30000 rpm [Option]	

Turning capability for additional process integration

VARIAXIS i-700T *Multi-Tasking*

Table size: ø630 mm (ø24.80")
Max. workpiece size: ø850 mm × 500 mm (ø33.46" × 19.69")
Max. load: 700 kg (1543 lbs)

Spindle	Tool storage capacity
18000 rpm [Standard]	30 tool [Standard]
VARIAXIS i-700 18000 rpm spindle specifications differ - see pages 12 and 32 for details.	40, 80, 120 tools [Option]

No. 50 taper spindle for heavy duty machining of large/heavy workpieces

VARIAXIS i-800

Table size: ø800 mm (ø31.50") × Width 630 mm (24.80")
Max. workpiece size: ø1000 mm × 375 mm (ø39.37" × 14.76")
ø800 mm × 500 mm (ø31.50" × 19.69")
Max. load: 1000 kg (2205 lbs)

Spindle	Tool storage capacity
10000 rpm [Standard]	30 tool [Standard]
18000 rpm [Option]	40, 80, 120 tools [Option]
7000 rpm High torque [Option]	
18000 rpm (HSK-A63) [Option]	
25000 rpm (HSK-A63) [Option]	

No. 50 taper spindle for large/heavy workpieces

VARIAXIS i-1050

Table size: ø1050 mm (ø41.34") × Width 800 mm (31.50")
Max. workpiece size*: ø1250 mm × 900 mm (ø49.21" × 35.43")
Max. load: 2000 kg (4409 lbs)

Spindle	Tool storage capacity
10000 rpm [Standard]	30 tool [Standard]
18000 rpm [Option]	40, 80, 120 tools [Option]
7000 rpm High torque [Option]	
18000 rpm (HSK-A63) [Option]	
25000 rpm (HSK-A63) [Option]	

5-axis machining center with No. 50 taper spindle plus turning

VARIAXIS i-800T *Multi-Tasking*

Table size: ø800 mm (ø31.50")
Max. workpiece size: ø1000 mm × 375 mm (ø39.37" × 14.76")
ø800 mm × 500 mm (ø31.50" × 19.69")
Max. load: 1000 kg (2205 lbs)

Spindle	Tool storage capacity
10000 rpm [Standard]	30 tool [Standard]
15000 rpm [Option]	40, 80, 120 tools [Option]
5000 rpm High torque [Option]	

No. 50 taper spindle for large/heavy workpieces with turning requirements

VARIAXIS i-1050T *Multi-Tasking*

Table size: ø1050 mm (ø41.34")
Max. workpiece size*: ø1250 mm × 900 mm (ø49.21" × 35.43")
Max. load: 2000 kg (4409 lbs)

Spindle	Tool storage capacity
10000 rpm [Standard]	30 tool [Standard]
15000 rpm [Option]	40, 80, 120 tools [Option]
5000 rpm High torque [Option]	

*Max. workpiece size is limited by A-axis angle

Applications

Advanced process integration

Tools are changed to/from the spindle with minimum interference. Because the same tool can be used to machine top, side and angled surfaces, a wide range of machining can be performed using a small number of tools. Additionally, the large machining area further enhances the versatility of the VARIAXIS.

Smooth Gear Milling

Thanks to conversational input, gear machining programs can be made easily without expensive CAD/CAM software. Gear machining can be performed with standard endmills; expensive gear tooling is not required. Machining time and cost are reduced considerably for the production of gears in small lots.

Smooth Gear Hobbing

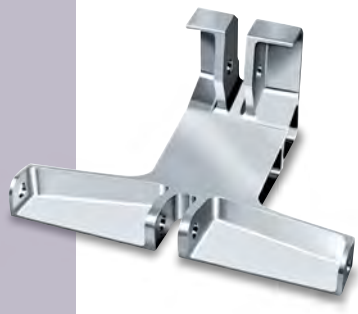
Through simultaneous control of the tool axis and workpiece axis rotation, gear hobbing can be performed. Gear hobbing programs are quick and easy to make with conversational programming. In addition, hob shifting, as well as tool retraction, increases safety and ensures longer tool life, which is very important for large-volume gear production.

VARIAXIS i series designed for multiple-surface machining in a single setup

Multiple surface machining

Simultaneous 5-axis machining

Transportation industry component
Workpiece: Bracket
Machine: VARIAXIS i-600



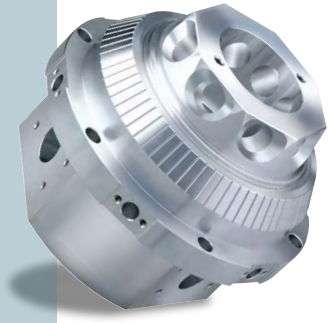
Automotive component
Workpiece: Control arm
Machine: VARIAXIS i-700

Aerospace component
Workpiece: Impeller
Machine: VARIAXIS i-700

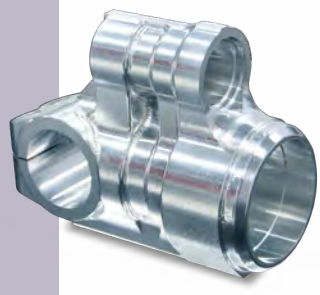
Automotive component
Workpiece: Arm
Machine: VARIAXIS i-500

Aerospace component
Workpiece: Air duct
Machine: VARIAXIS i-600

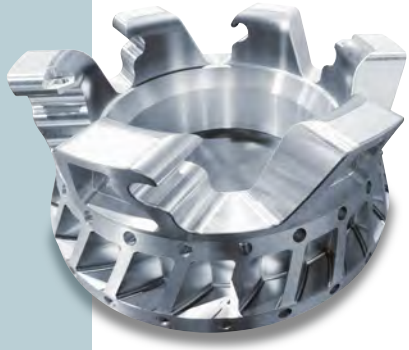
Industrial machinery
Workpiece: Optical device component
Machine: VARIAXIS i-700T



Motorcycle component
Workpiece: Caliper support bracket
Machine: VARIAXIS i-500



Aerospace component
Sample workpiece
Machine: VARIAXIS i-800



Aerospace component
Sample workpiece
Machine: VARIAXIS i-1050T

Process Integration

The VARIAXIS i 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.

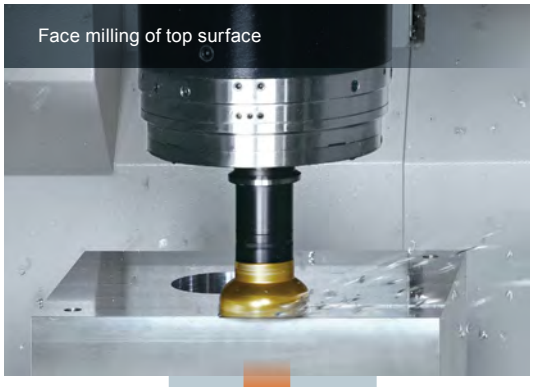
Machining example of gear box by VARIAXIS i-T series

Raw material

Material: Aluminium (A5052)
Dimensions: 350 mm × 300 mm × 180 mm
(13.78" × 11.81" × 7.09")

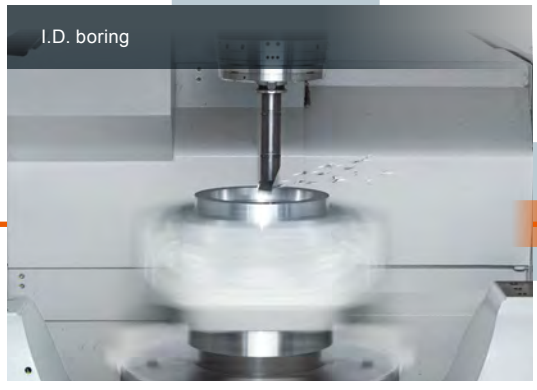
Finished component

1 Face milling of top surface

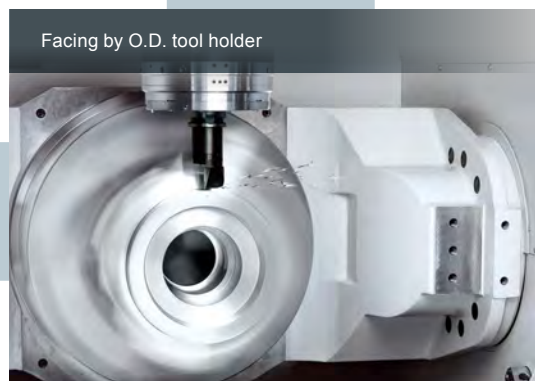


2 Face milling of side surfaces

3 I.D. boring



4 Facing by O.D. tool holder



5 Drilling of side surfaces

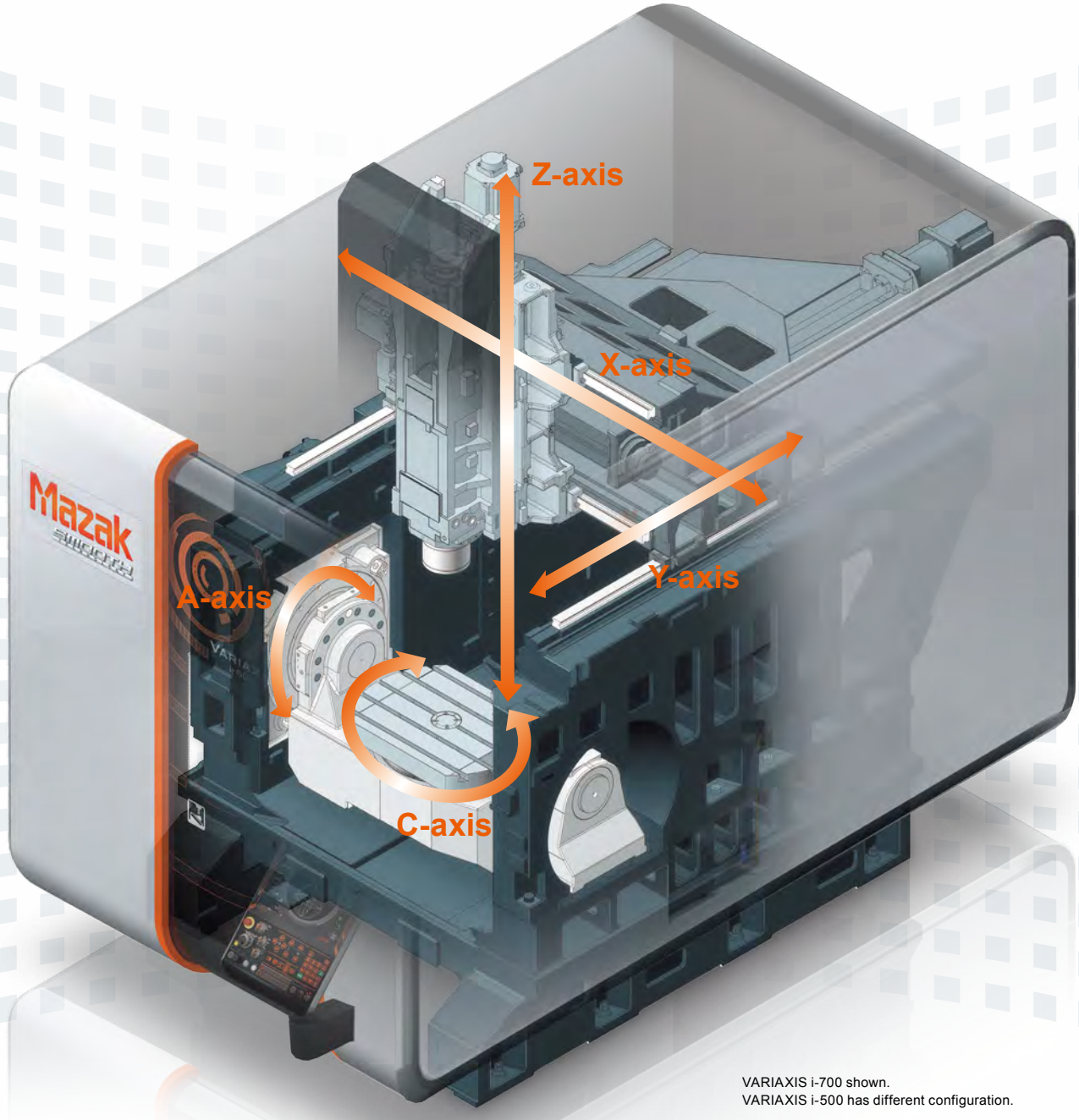
6 Pocket end milling

Machine Design

High-rigidity construction ensures high-speed machining with high accuracy over extended periods of operation

Full gantry construction without overhang

Machine construction was designed utilizing FEM analysis. Vibration is minimized during acceleration/deceleration to ensure high-accuracy machining stability.



VARIAXIS i-700 shown.
VARIAXIS i-500 has different configuration.

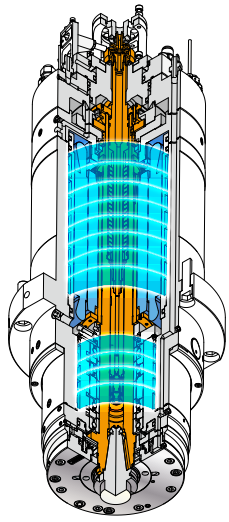
Spindle

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.



High-rigidity table

The A axis features a trunnion design to provide high rigidity for high-accuracy machining.

Ballscrew core cooling

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

Linear roller guides

The linear roller guides on the X, Y and Z axis utilized by the VARIAXIS i series provide high-accuracy positioning. Additionally, with their high rigidity and considerably lower friction, high-speed feedrates can be used over a wide range of machining, from heavy duty to high-speed cutting.

Higher Productivity

Spindle specifications to meet a wide variety of machining requirements

The high-rigidity spindle can perform heavy-duty machining of steel as well as high-speed machining of non-ferrous materials such as aluminum. High-speed, high-torque and turning specifications are available.

VARIAXIS i-500, i-600, i-700

Speed	Standard	High torque OPTION	High speed OPTION		
	12000 rpm	12000 rpm	18000 rpm	25000 rpm	30000 rpm
Output (40% ED/30-min. rating)	22 kW (30 HP)	22 kW (30 HP)	35 kW (47 HP)	23 kW (31 HP)	23 kW (31 HP)
Max. torque (40% ED/30-min.rating)	71.6 N·m (53 ft·lbs)	118 N·m (87 ft·lbs)	134 N·m (99 ft·lbs)	22 N·m (16 ft·lbs)	22 N·m (16 ft·lbs)
Tool shank	CAT No. 40/BBT-40/ HSK-A63	CAT No. 40/BBT-40/ HSK-A63	CAT No. 40/BBT-40/ HSK-A63	HSK-A63	HSK-F63

VARIAXIS i-800, i-1050

Speed	Standard	High torque OPTION	High speed OPTION		
	10000 rpm	7000 rpm	18000 rpm	18000 rpm	25000 rpm
Output (40% ED/30-min. rating)	37 kW (50 HP)	30 kW (40 HP)	55 kW (74 HP)	35 kW (47 HP)	23 kW (31 HP)
Max. torque (40% ED/30-min.rating)	350 N·m (258 ft·lbs)	442 N·m (326 ft·lbs)	105 N·m (77 ft·lbs)	134 N·m (99 ft·lbs)	22 N·m (16 ft·lbs)
Tool shank	CAT No. 50/BBT-50/ HSK-A100	CAT No. 50/BBT-50/ HSK-A100	HSK-A100	HSK-A63	HSK-A63

VARIAXIS i-700T (turning)

Speed	Standard
	18000 rpm
Output (40% ED/30-min. rating)	30 kW (40 HP)
Max. torque (40% ED/30-min.rating)	122 N·m (90 ft·lbs)
Tool shank	CAT No. 40/BBT-40/ HSK-T63/CAPTO C6

VARIAXIS i-800T, i-1050T (turning)

Speed	Standard	High torque OPTION	High speed OPTION
	10000 rpm	5000 rpm	15000 rpm
Output (40% ED/30-min. rating)	37 kW (50 HP)	37 kW (50 HP)	56 kW (75 HP)
Max. torque (40% ED/30-min.rating)	302 N·m (223 ft·lbs)	715 N·m (527 ft·lbs)	142 N·m (105 ft·lbs)
Tool shank	CAT No. 50/BBT-50/ HSK-T100/CAPTO C8	CAT No. 50/BBT-50/ HSK-T100/CAPTO C8	HSK-T100

See P31, 32 and 33 for spindle output/torque diagram

Compact spindle cartridge

The spindle is designed to provide an increased machining area and features a compact spindle cartridge for excellent workpiece accessibility with minimum interference. Additionally, the compact spindle cartridge allows workpieces to be machined efficiently under optimum cutting conditions.

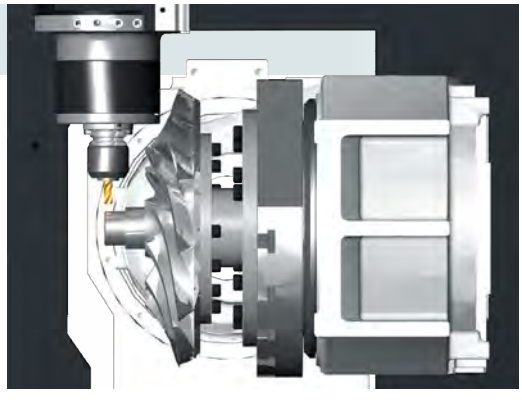
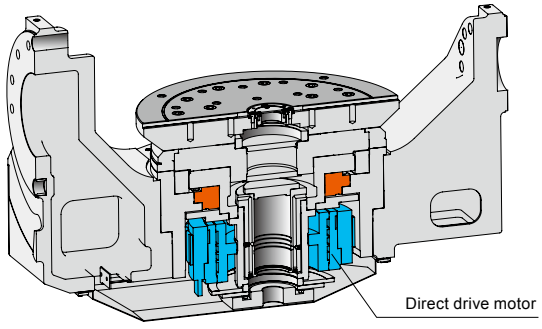


Table (VARIAXIS i-700T, i-800T, i-1050T)

Table rotation speed	
VARIAXIS i-700T	1100 rpm
VARIAXIS i-800T	800 rpm
VARIAXIS i-1050T	500 rpm

Direct-drive motor

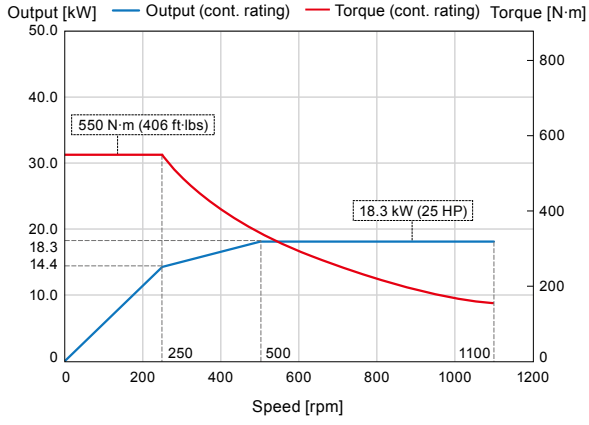
The rotary table (C axis) is driven by a direct-drive motor for both C-axis positioning and turning operation. Turning is performed with the A axis in the 0-degree or 90-degree position. Because the A-axis is rigidly clamped on a coupling in the 0 or 90-degree position for turning operations, high-accuracy machining over extended periods of operation is ensured.



Direct drive motor table

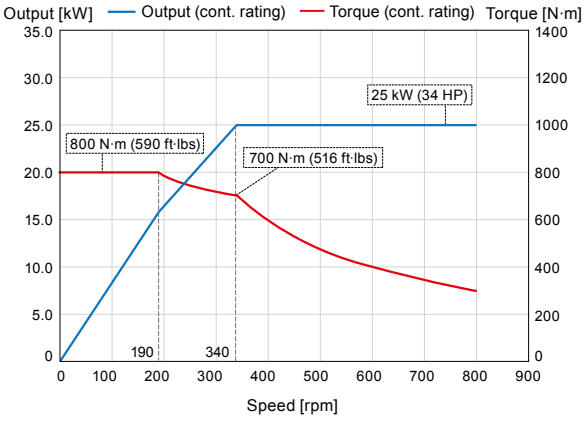
VARIAXIS i-700T

1100 rpm direct-drive motor output/torque diagram



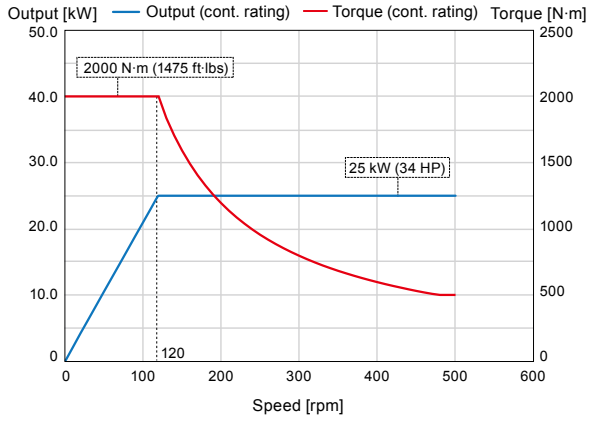
VARIAXIS i-800T

800 rpm direct-drive motor output/torque diagram



VARIAXIS i-1050T

500 rpm direct-drive motor output/torque diagram

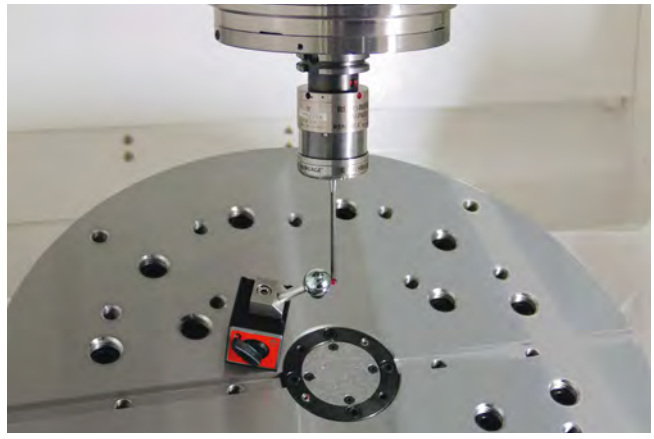


Higher Accuracy

For high-accuracy 5-axis machining

High-accuracy 5-axis calibration - MAZACHECK

Position misalignment and incline of the rotary axes can be measured and compensated automatically to realize high-accuracy 5-axis machining. The centers of rotation of both the C and B axes can be measured and compensated automatically.



Wireless touch probe RMP600 is optional equipment.

Measurement item selection

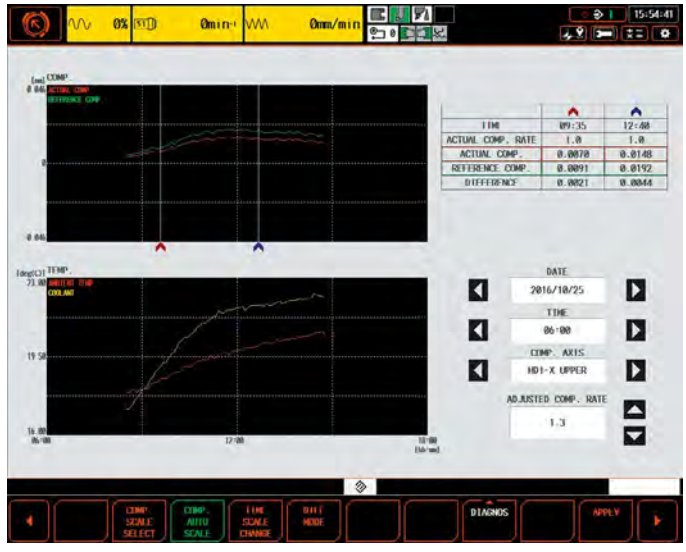
Measurement information setting

Automatic measurement program generation

Convenient screen display assists measurement operation.

Heat displacement control - THERMAL SHIELD

The THERMAL SHIELD automatically compensates for room temperature changes to realize enhanced continuous machining accuracy. Mazak has performed extensive testing in a variety of temperature-controlled environments and has used the results to develop a control system that automatically compensates for temperature changes in the machining area. Changes in room temperature and compensation data are shown visually.



Temperature and compensation are displayed on MAZATROL SmoothX screen. Operator can adjust compensation by looking at the data.

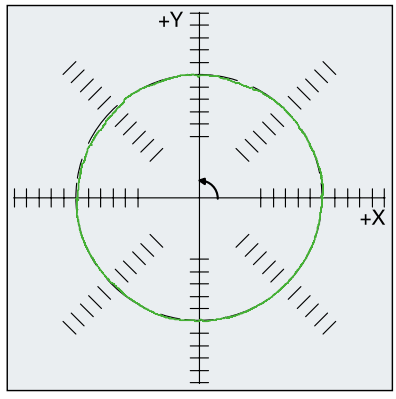
High-rigidity construction and the MAZATROL SmoothX ensure high-accuracy machining

DBB of VARIAXIS i-700

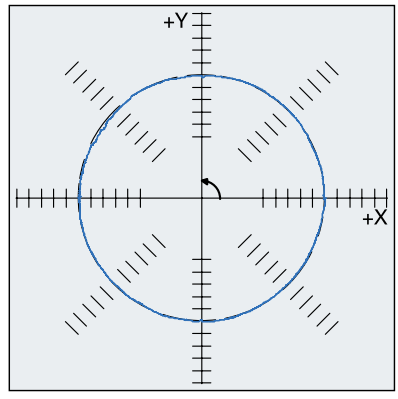
X-Y plane measured results

3.0 µm (0.00011811") (CW)
2.6 µm (0.000102362") (CCW)

Machine	VARIAXIS i-700
Diameter	200 mm (7.87")
Feedrate	560 mm/min (22 IPM)



CW 3.0 µm 5.0 µm/div



CCW 2.6 µm 5.0 µm/div

Positioning accuracy and repeatability of VARIAXIS i-700

Mazak precision results

Positioning accuracy	X axis	4.01 µm (0.000157874")
	Y axis	4.62 µm (0.00018189")
	Z axis	3.81 µm (0.00015")

Positioning repeatability	X axis	1.41 µm (0.0000555118")
	Y axis	2.27 µm (0.0000893701")
	Z axis	1.45 µm (0.0000570866")

Note: 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 operating temperature.

A- and C-axis roller gear cam

High-accuracy and high-efficiency machining without backlash.
(VARIAXIS i-700T, i-800T, i-1050 and i-1050T C axis use direct-drive motor)

Sub-micron control

Both A-axis and C-axis table can be programmed in 0.0001° increments for 5-axis machining of complex and multiple surfaces.

Scale feedback OPTION

Positioning accuracy is improved for high-accuracy machining.

Ergonomics

Design focus on ergonomics provides unsurpassed ease of operation

Excellent Accessibility

The operator has excellent access to the table from the front of the machine for convenient workpiece loading/unloading and machine setup.

Convenient operation when using an overhead crane

The VARIAXIS i series has unsurpassed access to the machine table for convenient workpiece loading/unloading. An overhead crane is easy to use for loading/unloading heavy workpieces and fixtures thanks to the automatic retractable top cover.

(Note: VARIAXIS i-500 top cover opens separately)

Large window

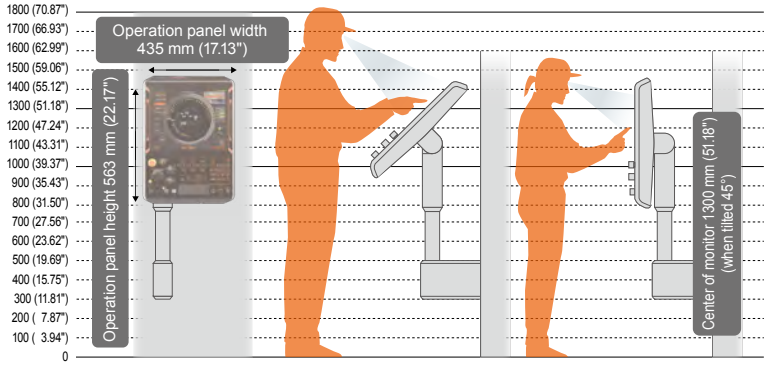
The large front window allows the operator to monitor machining easily.

Maintenance area

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

Adjustable CNC touch panel

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



Automation

2-pallet changer OPTION

For higher productivity, the next workpiece can be set up during the machining of the current workpiece.

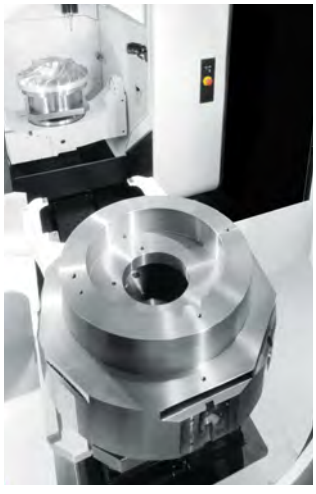
The 2-pallet changer system for the VARIAXIS i-600/i-700/i-700T/i-800T/i-1050/i-1050T provides excellent operator working space inside the 2-pallet changer.

VARIAXIS i-500 (2-pallet changer)

VARIAXIS i-700 (2-pallet changer)

VARIAXIS i-800 (2-pallet changer)

VARIAXIS i-1050 (2-pallet changer)



	VARIAXIS i-500 (2 pallet changer)	VARIAXIS i-600 (2 pallet changer)	VARIAXIS i-700 (2 pallet changer)	VARIAXIS i-700T (2 pallet changer)
Pallet size	□400 mm (□15.75")	□400 mm (□15.75")	□500 mm (□19.69")	ø610 mm (Ø24.02")
Max. workpiece size	ø500 mm × 350 mm (ø19.69" × 13.78")	ø600 mm × 425 mm (ø23.62" × 16.73")	ø730 mm × 500 mm (ø28.74" × 19.69")	ø730 mm × 500 mm (ø28.74" × 19.69")
Max. load	300 kg (661 lbs)	300 kg (661 lbs)	600 kg (1323 lbs)	600 kg (1323 lbs)

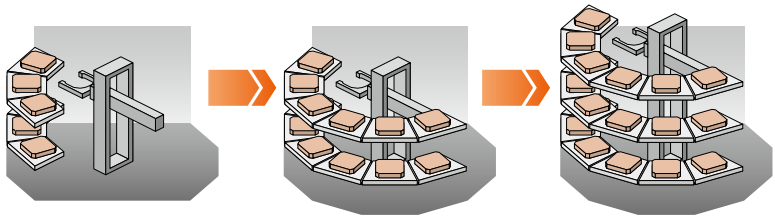
	VARIAXIS i-800 (2 pallet changer)	VARIAXIS i-800T (2 pallet changer)	VARIAXIS i-1050 (2 pallet changer)	VARIAXIS i-1050T (2 pallet changer)
Pallet size	□500 mm (□19.69")	ø610 mm (ø24.02")	□800 mm (□31.50")	ø1000 mm (ø39.37")
Max. workpiece size	ø730 mm × 500 mm (ø28.74" × 19.69")	ø730 mm × 500 mm (ø28.74" × 19.69")	ø1250 mm × 700 mm (ø49.21" × 27.56")	ø1250 mm × 700 mm (ø49.21" × 27.56")
Max. load	500 kg (1102 lbs)	600 kg (1323 lbs)	1500 kg (3307 lbs)	1500 kg (3307 lbs)

MPP (MULTI PALLET POOL)

The MPP (MULTI PALLET POOL) is a new system to meet increasing worldwide demand for automation. It is designed to provide high productivity while machining a wide variety of parts in small lots.

Flexible pallet stocker capacity

6, 12 and 18 pallet storage capacities are available after initial installation.



3 pallets × 2 levels
6PC

6 pallets × 2 levels
12PC

6 pallets × 3 levels
18PC

MPP (VARIAXIS i-600, i-700, i-700T)

	VARIAXIS i-600	VARIAXIS i-700	VARIAXIS i-700T
Number of pallets	6/12/18		
Pallet size	400 mm × 400 mm (15.75" × 15.75")	500 mm × 500 mm (19.69" × 19.69")	ø610 mm (ø24.02")
Max. load (without pallet)	300 kg (661 lbs)	600 kg (1323 lbs)	
Max. workpiece size (without pallet)	ø600 mm × H425 mm (ø23.62" × H16.73")	ø730 mm × H500 mm (ø28.74" × H19.69")	

SMOOTH MPP

Once the production schedule is input, operations will be performed automatically. Production results, system utilization and other data can be checked on the MAZATROL SmoothX and SmoothG CNC. If connected to a network (set up by the user), system data are accessible on office PCs, tablets and smart phones.

Automation

PALLETECH SYSTEM
The automation system designed for higher productivity

The PALLETECH MANUFACTURING CELL has a single-level pallet stocker. The PALLETECH HIGH-RISE SYSTEM features a two-level or three-level pallet stocker. This system also can include an integrated HCN horizontal machining center series. Additionally, the system is designed for future expansion after the initial installation in response to increased production requirements.

		Minimum	Maximum
Machine(s)		1	16
Number of pallets	1 level	6	240
	2 levels	12	240
	3 levels	18	240
Loading station(s)		1	8
Loading robot		1	1

PALLETECH HIGH-RISE SYSTEM
(3-level stocker with 18 pallets and one loading station)

SMOOTH PMC

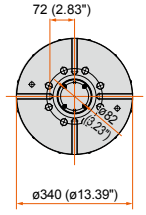
FMS control/management software: unsurpassed ease of system operation to meet sudden changes in schedule.

Preparation for hydraulic fixtures OPTION

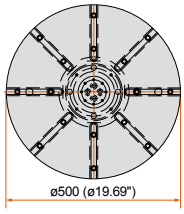
For a hydraulic power supply from the machine to hydraulic fixtures.

Single table

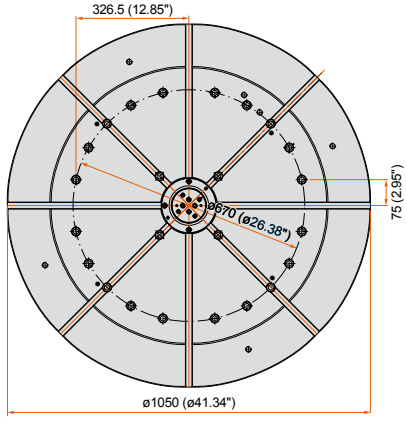
VARIAXIS i-500
ø340 mm (ø13.39") table



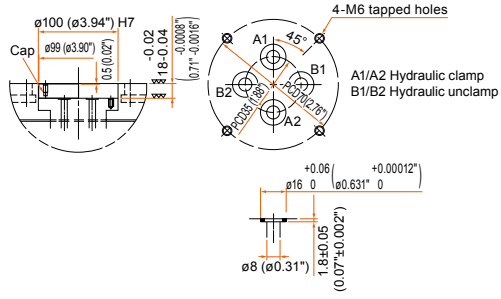
VARIAXIS i-600
VARIAXIS i-700
VARIAXIS i-800
ø500 mm (ø19.69") table



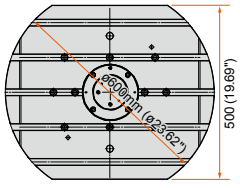
VARIAXIS i-1050
ø1050 mm (ø41.34") table



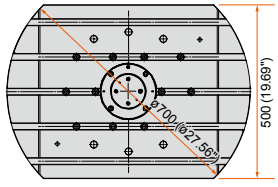
Details



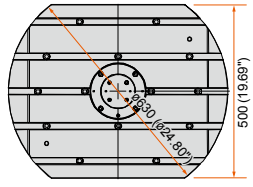
VARIAXIS i-600
ø600 mm × 500 mm (ø23.62" × 19.69") table



VARIAXIS i-700
ø700 mm × 500 mm (ø27.56" × 19.69") table



VARIAXIS i-800
ø630 mm × 500 mm (ø24.80" × 19.69") table

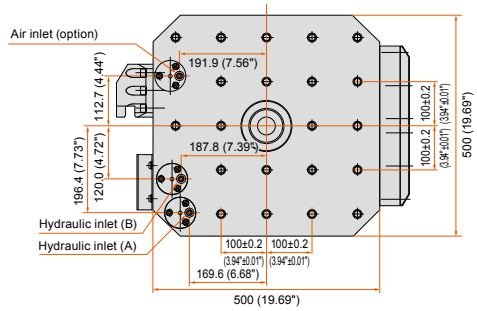


Unit: mm (inch)

2-pallet changer

For machines equipped with the 2-pallet changer, hydraulic power is available only at the setup position.

VARIAXIS i-800 pallet dimension with hydraulic power supply



Unit: mm (inch)

MAZATROL CNC System

Unsurpassed ease of operation with touch screen

MAZATROL SMOOTH X

5 process home screens

Programming, confirmation, editing and tool data registration

Convenient Parameter Setting and Fine Tuning Function

SMOOTH MACHINING CONFIGURATION

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

Variable Acceleration Control Function

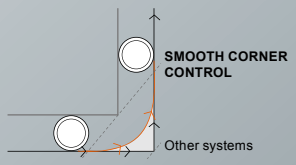
- VARIABLE ACCELERATION CONTROL

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

Seamless Corner Control

- SMOOTH CORNER CONTROL

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



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

(Test results for reference only)

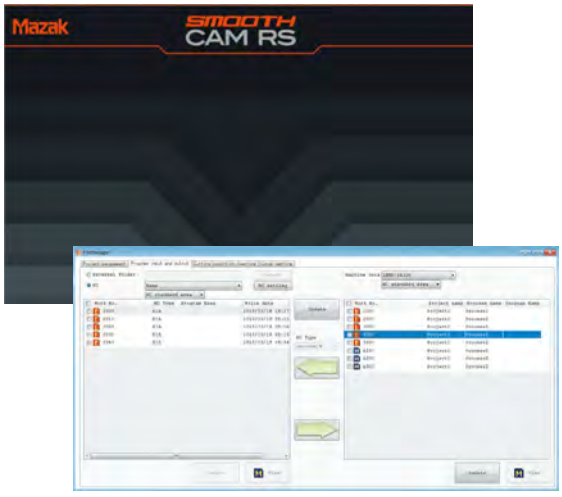
Ease of Programming

Easy programming of 5-axis machining

A variety of programming and simulation functions provides support from programming to finished component.

Smooth CAM RS OPTION

- Tool path check (VIEW SURF)
- Interference check, time study (virtual machining)



Send program over network

- File manager

[Data transfer to CNC on network]
Program made with Smooth CAM RS can be sent to the machine.

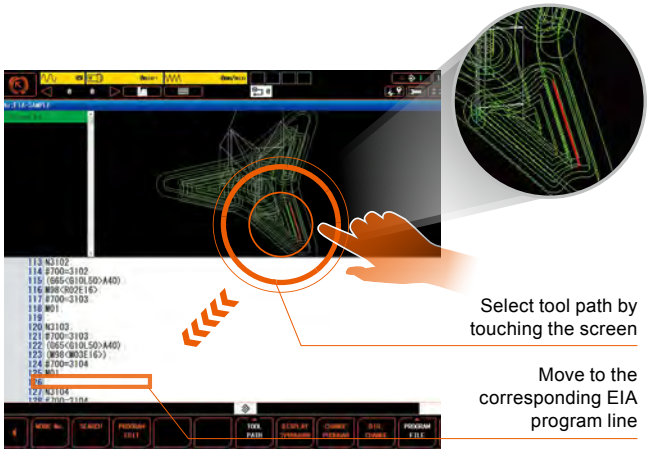
(QUICK EIA, VIEW SURF and virtual machining can be used on the machine CNC operation panel and on Smooth CAM RS.)

CNC operating panel on machine

- Check and edit program (QUICK EIA)

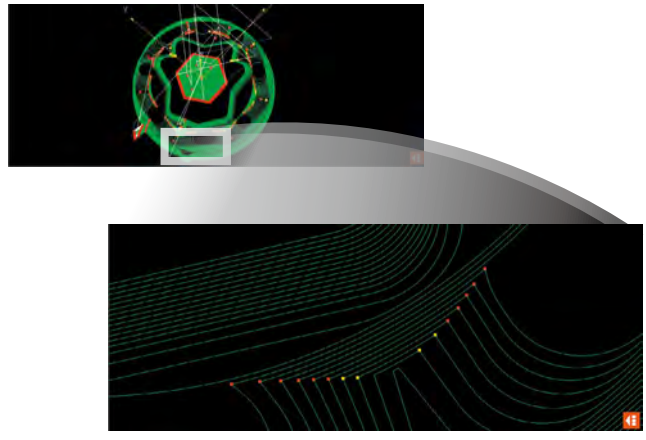
QUICK EIA

Program, process list and 3D tool path display are linked to each other. Visible search on touch screen reduces time for program checking.



VIEW SURF

By analyzing the tool path, any predictable failure on the funished surface can be visualized. Programs can be modified before machining to minimize test-cutting time.



MAZATROL conversational programming

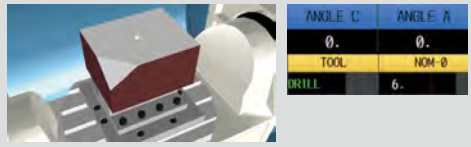
In MAZATROL conversational programming, machining programs are easy to make and edit by inputting data in response to questions on the CNC display.

Easy programming

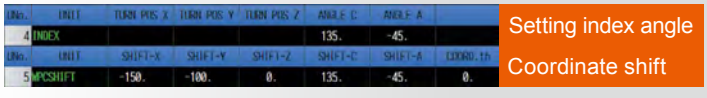
- Multiple-surface machining

Easy programming of multiple-surface machining, which otherwise requires complex machining programs.

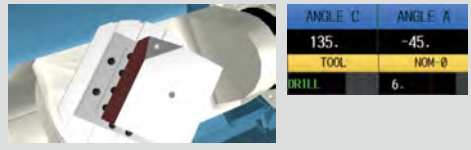
The same home position and coordinate system can be used for the top surface and angled surfaces without any complicated programming for the angled surfaces.



- Program origin automatic calculation workpiece coordinate shift

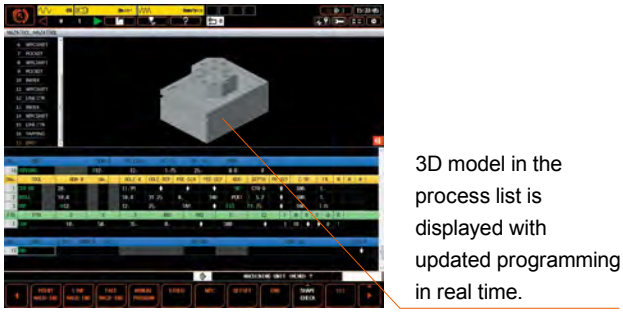


No complicated calculations required when changing program coordinate system.



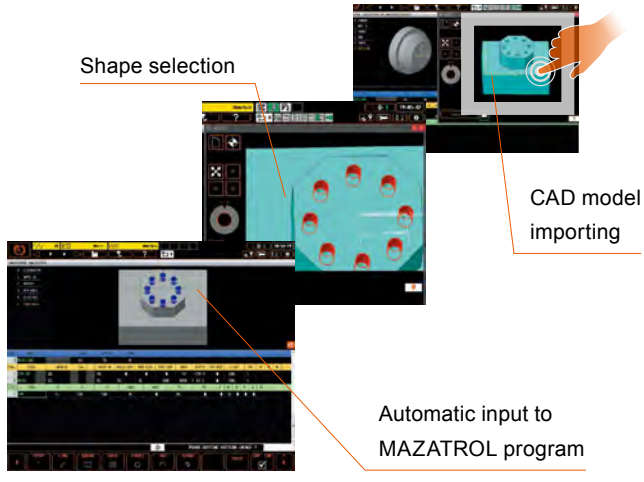
QUICK MAZATROL

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



3D ASSIST

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



Standard and Optional Equipment

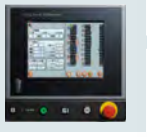
Automation

TOOL HIVE

The TOOL HIVE can store more than 180 tools in a small space. Operating and tool-data editing can be performed on the TOOL HIVE TERMINAL control panel to reduce the time required for tool setup. The TOOL HIVE tool storage capacity can be expanded after initial installation.

Tool storage	CAT No.40	160, 200, 240, 280, 320, 360 tools
	CAT No.50	180, 216, 252, 288, 324, 360, 396, 432 tools
Magazine	Rack type	
Tool selection method	Random selection, shortest path	

TOOL HIVE TERMINAL



240 tool TOOL HIVE magazine

Scale feedback system

Detects absolute machine position; especially suitable for high-speed operation over extended periods.

Remote manual pulse generator

Manual pulse generator, axis-selection switch and emergency stop button are on remote operation panel for more convenient machine setup.

Automatic tool length measurement & tool breakage detection

Tool length is automatically measured and registered in the CNC system. Tool breakage can be detected during automatic operation.

Laser type tool length measurement

Tool length measurement can be performed on extremely small tools which can not be measured with touch type tool length measurement. Thanks to non-contact measurement by laser beam, tool length and diameter can be measured with the tool rotating to provide stable accuracy.

Automatic power ON/OFF + warm-up operation

The setting of a self-timer is used to automatically turn on and turn off the machine.

Status light (3 colors) (square)

Indicates operational status.
Red: alarm
Yellow: operation end
Green: in automatic operation

Tool ID

Tool ID allows automatic input and update of tool data into the CNC for machines in a network. It eliminates mistakes when loading tools into the magazine and entering tool data, reducing setup time. Requires retention bolt with tool ID and tool presetter.

Coolant

Automatic workpiece washing

By discharging a large volume of coolant from nozzles, machined chips are removed from the workpiece and fixture efficiently. This option is effective for machines equipped with the pallet changer or robot to minimize the accumulation of machined chips during automatic operation.

Flood coolant (standard)

Coolant is discharged from nozzles on the spindle housing to cool the workpiece and remove chips.

Coolant through spindle

Coolant is fed to the tool tip by passages through the tool. 3 pump pressure specifications are available: 0.5 MPa (73 PSI), 1.5 MPa (218 PSI) and 7.0 MPa (1015 PSI).

SUPERFLOW coolant system

The SUPERFLOW coolant system features improved chip control, lower tool-tip temperatures, and longer tool life with faster spindle speeds and feedrates to realize higher productivity.

- Diaphragm pump with exceptional energy efficiency.
- Coolant pressure easily set by M-code (pressure range from 0 to 7 MPa (0 to 1015 PSI))

Coolant temperature control

Maintains the coolant temperature to match room temperature to prevent thermal displacement, which can affect machining accuracy.

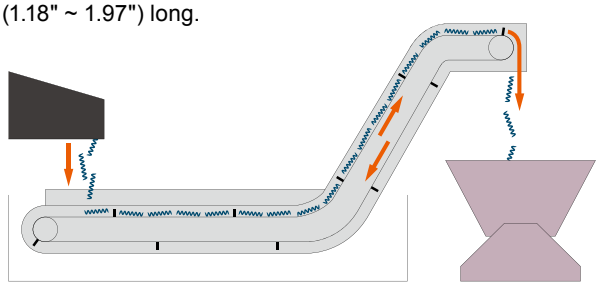
Mist collector

Coolant mist generated by machining is removed from the machining area to maintain a safe, clean working environment.

Chip disposal

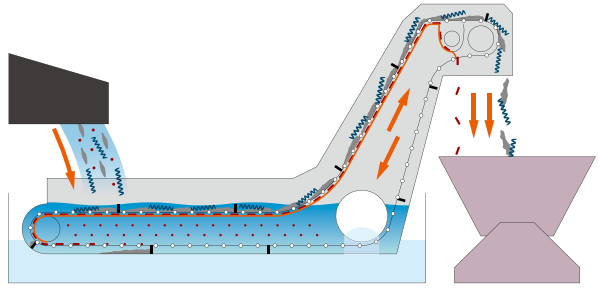
Chip conveyor (HINGE)

Chips are removed by a hinge-plate belt and discharged from the rear or side of the machine. Very suitable for curly shaped steel chips from 30 mm ~ 50 mm (1.18" ~ 1.97") long.



Chip conveyor (ConSep 2000 II WS)

Chip conveyor with internal coolant filtration is effective for removing small chips as well as long, curly chips.



	ConSep 2000 II WS	Hinge
Sludge-like chips (0.25 mm ~ 1 mm) (0.01" ~ 0.04")	○	×
Needle-like chips (~0.5 mm) (~0.02")	○	×
1 - 5 mm (0.04" - 0.2")	○	×
5 - 30 mm (0.2" - 1.18") (max. 30 mm (1.18"))	○	△ (Not recommended)
30 - 70 mm (1.18" - 2.76") (max. 70 mm (2.76"))	○	○
70 mm - (2.76" -)	○	○

Standard and Optional Equipment

●: Standard ○: Option —: N / A

		i-500	i-600	i-700	i-700T
Table	ø500 mm × 400 mm (ø19.69" × 15.75") T-slot table	●	—	—	—
	ø600 mm × 500 mm (ø23.62" × 19.69") T-slot table	—	●	—	—
	ø700 mm × 500 mm (ø27.56" × 19.69") T-slot table	—	—	●	—
	ø630 mm (ø24.80") table	—	—	—	●
Machine	Work light	●	●	●	●
	THERMAL SHIELD	●	●	●	●
	12000 rpm	●	●	●	—
	12000 rpm high torque spindle	○	○	○	—
	18000 rpm	○	○	○	●*4
	25000 rpm	○	○	○	—
	30000 rpm*1	○	○	○	—
Factory Automation	Tool length measurement & tool breakage detection	○	○	○	—
	Laser tool measurement system	○	○	○	○
	Ball screw core cooling (X, Y, Z axis)	●	●	●	●
	30-tool magazine	●	●	●	●
	40-tool magazine	○	○	○	○
	60-tool magazine	○	—	—	—
	80-tool magazine	○	○	○	○
	120-tool magazine	○	○	○	○
	Work measurement printout (printer not included)	○	○	○	○
	Scale feedback	○	○	○	○*5
	Absolute positioning system	●	●	●	●
	Remote manual pulse generator	○	○	○	○
	Automatic front door	○	○	○	○
	Automatic power ON/OFF + warm-up operation	●	●	●	●
	Operation end buzzer	○	○	○	○
	Status light (3 colors)	○	○	○	○
	2-pallet changer	○	○	○	○
	Wireless touch probe RMP600	○	○	○	○
	Tool eye (manual)	—	—	—	●
	Preparation for hydraulic fixtures	○	○	○	○
Safety Equipment	Operator door interlock	●	●	●	●
High Accuracy	MAZA-CHECK (software, reference sphere)*2	●	●	●	●
Coolant/ Chip Disposal	Coolant system	●	●	●	●
	Work air blast	○	○	○	○
	Oil skimmer (RB-200)	○	○	○	○
	Mist collector	○	○	○	○
	Coolant temperature control	○	○	○	○
	Hand held coolant nozzle*3	○	○	○	○
	Coolant through spindle system (5 kgf/cm²) (71 PSI)	○	○	○	○
	Work washing coolant	○	○	○	○
	High-pressure coolant through spindle (15 kgf/cm²) (213 PSI)	○	○	○	○
	High-pressure coolant through spindle (70 kgf/cm²) (995 PSI)	○	○	○	○
	SUPERFLOW coolant system	○	○	○	○
	Flood coolant (1.5 kgf/cm² 30 L/min) (7.92 gal/min)	●	—	—	—
	Flood coolant (4.5 kgf/cm² 30 L/min) (7.92 gal/min)	○	●	●	●
	Coolant through spindle pressure switch	○	○	○	○
	Top cover	●	●	●	●
	Chip conveyor (Hinge) side discharge	○	—	—	—
	Chip conveyor (ConSep II WS) side discharge	○	—	—	—
	Chip conveyor (Hinge) rear discharge	○*6	○	○	○
	Chip conveyor (ConSep II WS) rear discharge	○*6	○	○	○
	Chip bucket (swing type)	○	○	○	○
	Chip bucket (fixed type)	○	○	○	○
Tooling	Pull stud bolt	○	○	○	○
Others	Manual	●	●	●	●
	Additional manuals	○	○	○	○

*1 30000 rpm spindle not available with coolant through spindle and air through spindle system.
*2 MAZACHECK requires optional RMP600 wireless touch probe.
*3 Not available with the 2-pallet changer i-600, i-700 and i-700T.
*4 Different specification for 18000 rpm (option) spindle for VARIAXIS i-700. See pages 12 and 40 for details.
*5 Standard for C axis
*6 Rear discharge chip conveyor not available for machines with 2-pallet changer.

●: Standard ○: Option —: N / A

		i-800	i-800T	i-1050	i-1050T
Table	ø800 mm × 630 mm (ø31.50" × 24.80") T-slot table	●	—	—	—
	ø800 mm (ø31.50") tapped table	—	●	—	○
	ø1050 mm × 800 mm (ø41.34" × 31.50") T-slot table	—	—	●	—
	ø1050 mm (ø41.34") tapped table	—	—	—	●
Machine	Work light	●	●	●	●
	THERMAL SHIELD	●	●	●	●
	5000 rpm high torque spindle	—	○	—	○
	7000 rpm high torque spindle	○	—	○	—
	10000 rpm	●	●	●	●
	15000 rpm	—	○	—	○
	18000 rpm (HSK-A100)	○	—	○	—
	18000 rpm (HSK-A63)	○	—	○	—
	25000 rpm (HSK-A63)	○	—	○	—
Factory Automation	Tool length measurement & tool breakage detection	○	—	○	—
	Laser tool measurement system	○	○	○	○
	Ball screw core cooling (X, Y, Z axis)	●	●	●	●
	30-tool magazine	●	●	●	●
	40-tool magazine	○	○	○	○
	80-tool magazine	○	○	○	○
	120-tool magazine	○	○	○	○
	Work measurement printout (printer not included)	○	○	○	○
	Scale feedback (A, C axis)	○	○*2	●	●
	Scale feedback (X, Y, Z axis)	○	○	○	○
	Absolute positioning system	●	●	●	●
	Remote manual pulse generator	○	○	○	○
	Automatic front door	○	○	○	○
	Automatic power ON/OFF + warm-up operation	●	●	●	●
	Operation end buzzer	○	○	○	○
	Status light (3 colors)	○	○	○	○
	2-pallet changer	○	○	○	○
	Automatic workpiece measurement	○	○	○	○
	Tool eye (manual)	—	●	—	●
	Preparation for hydraulic fixtures	○	○	○	—
Safety Equipment	Operator door interlock	●	●	●	●
High Accuracy	MAZA-CHECK (software, reference sphere)*1	●	●	●	●
Coolant/ Chip Disposal	Coolant system	●	●	●	●
	Work air blast	○	○	○	○
	Oil skimmer (RB-200)	○	○	○	○
	Mist collector	○	○	○	○
	Coolant temperature control	○	○	○	○
	Hand held coolant nozzle	○	○	○	○
	Coolant through spindle system (5 kgf/cm²) (71 PSI)	○	○	○	○
	Work washing coolant	○	○	○	○
	High-pressure coolant through spindle (15 kgf/cm²) (213 PSI)	○	○	○	○
	High-pressure coolant through spindle (70 kgf/cm²) (995 PSI)	○	○	○	○
	SUPERFLOW coolant system	○	○	○	○
	Flood coolant (4.5 kgf/cm² 30 L/min) (7.92 gal/min)	●	●	●	●
	Coolant through spindle pressure switch	○	○	○	○
	Top cover	●	●	●	●
	Chip conveyor (Hinge) side discharge	○	○	○	○
	Chip conveyor (ConSep) side discharge	○	—	—	—
	Chip conveyor (ConSep II WS) side discharge	—	○	○	○
	Chip bucket (swing type)	○	○	○	○
	Chip bucket (fixed type)	○	○	○	○
Tooling	Pull stud bolt	○	○	○	○
Others	Manual	●	●	●	●
	Additional manuals	○	○	○	○

*1 MAZACHECK requires optional RMP600 wireless touch probe.
*2 Standard for C axis

Environmentally Friendly

Designed with environmental considerations

The environment and our impact on natural surroundings have always been important concerns for Mazak. All factories in Japan that produce Mazak machine tools are ISO 14001 certified, an international standard confirming that the operation of our production facilities does not adversely affect air, water or land.

Extended coolant service life

Reduction of lubrication consumption

Reduction of electrical power consumption

Auto power off

When the machine is not operated for a pre-registered period of time, the machine worklights and CNC backlight turn off automatically. They automatically turn on when the motion sensor detects the operator's return.

Chip conveyor stop

Once a pre-registered period of time passes after automatic machine operation stops, the chip conveyor automatically stops to reduce electrical power consumption. (Chip conveyor is optional equipment.)

Grease lubrication

The linear roller guides and ball screws are lubricated by grease, which eliminates tramp oil in the coolant and extends coolant service life.

Energy Dashboard OPTION

The Energy Dashboard provides convenient visual monitoring of energy consumption and analysis.

Process screen display

- Total energy consumption (of workpiece in operation)
- Current energy consumption

Energy consumption displayed on graph

Energy consumption by workpieces

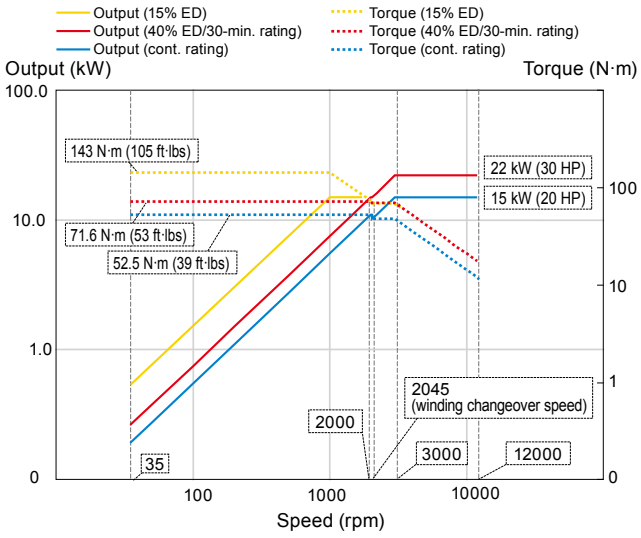
Approximate CO_2 emission and electrical power cost

Spindle Output / Torque Diagram

VARIAXIS i-500, i-600, i-700

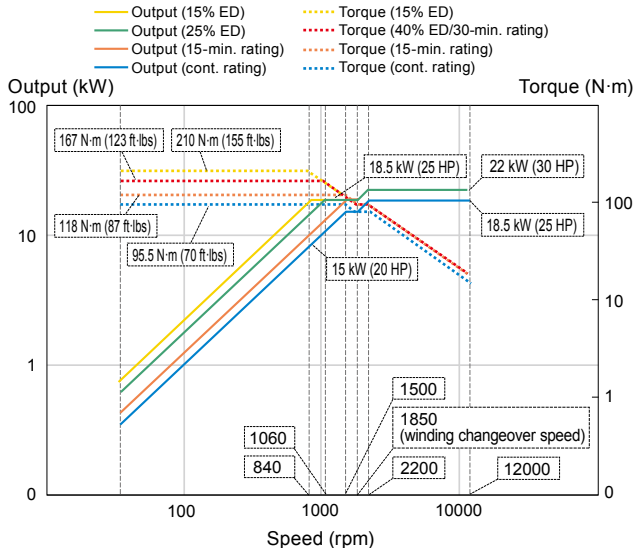
12000 rpm spindle

Output	Torque
AC 22 kW (30 HP) (40% ED/30-min. rating)	71.6 N·m (53 ft·lbs) (40% ED/30-min. rating)
	52.5 N·m (39 ft·lbs) (cont. rating)



12000 rpm High torque spindle OPTION

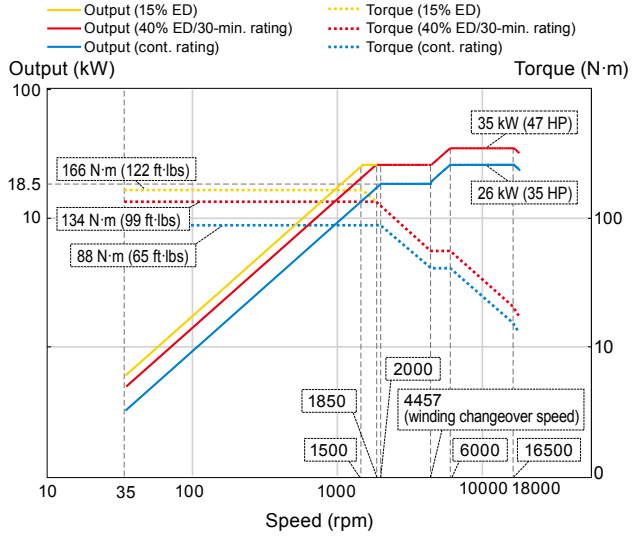
Output	Torque
AC 22 kW (30 HP) (40% ED/30-min. rating)	118 N·m (87 ft·lbs) (40% ED/30-min. rating)
	95.5 N·m (70 ft·lbs) (cont. rating)



VARIAXIS i-500, i-600, i-700, i-800 (HSK-A63), i-1050 (HSK-A63)

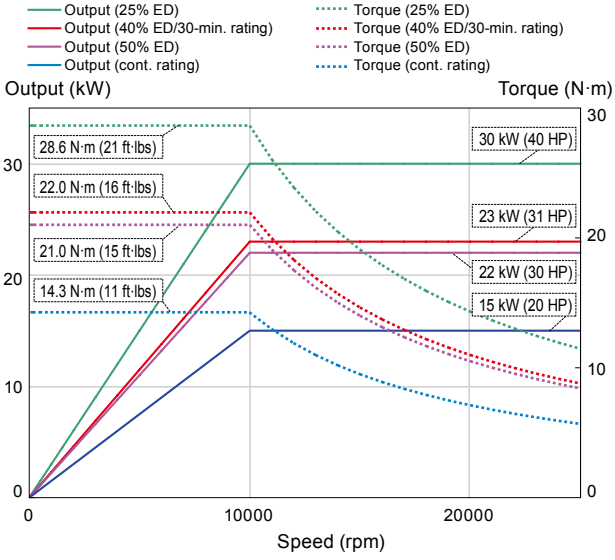
18000 rpm spindle OPTION

Output	Torque
AC 35 kW (47 HP) (40% ED/30-min. rating)	134 N·m (99 ft·lbs) (40% ED/30-min. rating)
	88 N·m (65 ft·lbs) (cont. rating)



25000 rpm spindle OPTION

Output	Torque
AC 23 kW (31 HP) (40% ED/30-min. rating)	22 N·m (16 ft·lbs) (40% ED/30-min. rating)
	14.3 N·m (11 ft·lbs) (cont. rating)

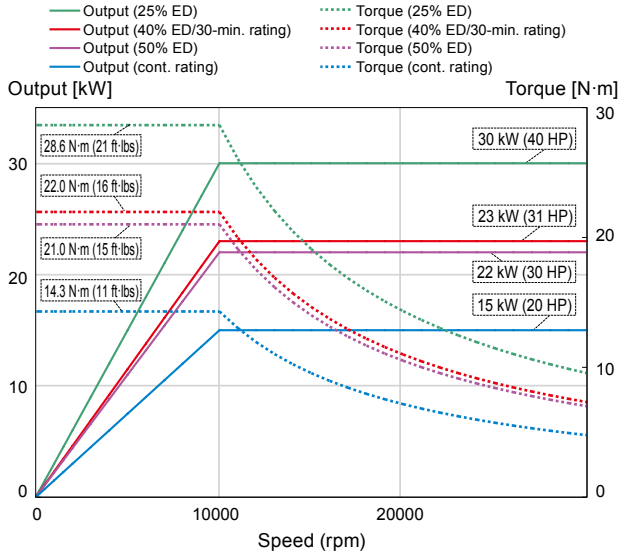


Spindle Output / Torque Diagram

VARIAXIS i-500, i-600, i-700

30000 rpm spindle OPTION

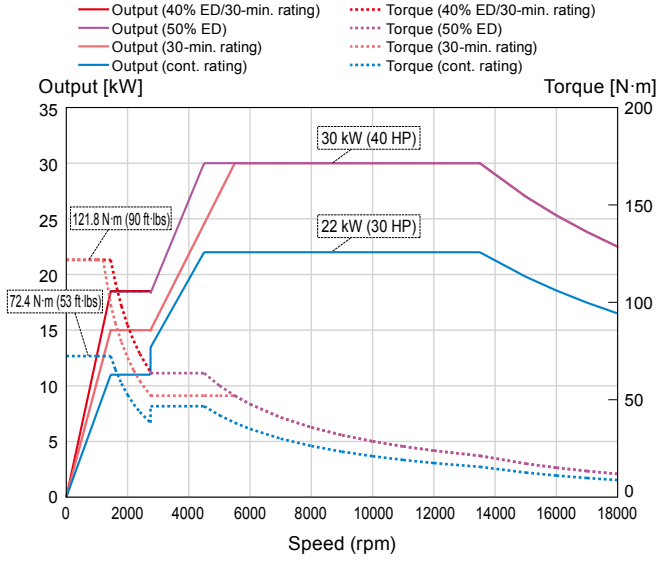
Output	Torque
AC 23 kW (31 HP) (40% ED/30-min. rating)	22 N·m (16 ft·lbs) (40% ED/30-min. rating)
	14.3 N·m (11 ft·lbs) (cont. rating)



VARIAXIS i-700T

18000 rpm spindle

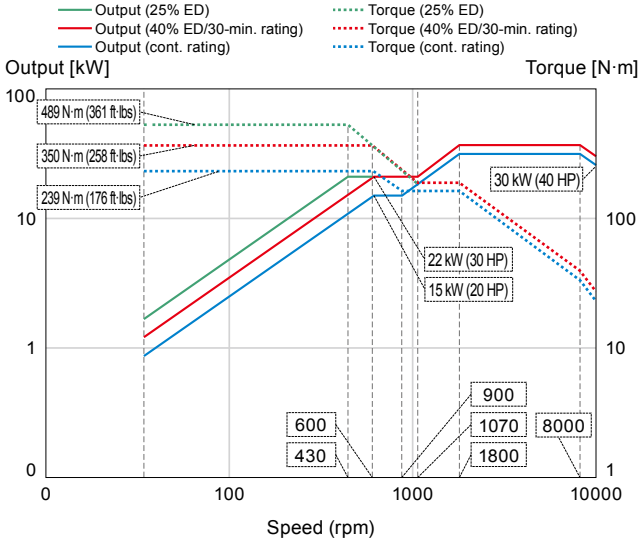
Output	Torque
AC 30 kW (40 HP) (40% ED/30-min. rating)	122 N·m (90 ft·lbs) (40% ED/30-min. rating)
	72.4 N·m (53 ft·lbs) (cont. rating)



VARIAXIS i-800, i-1050

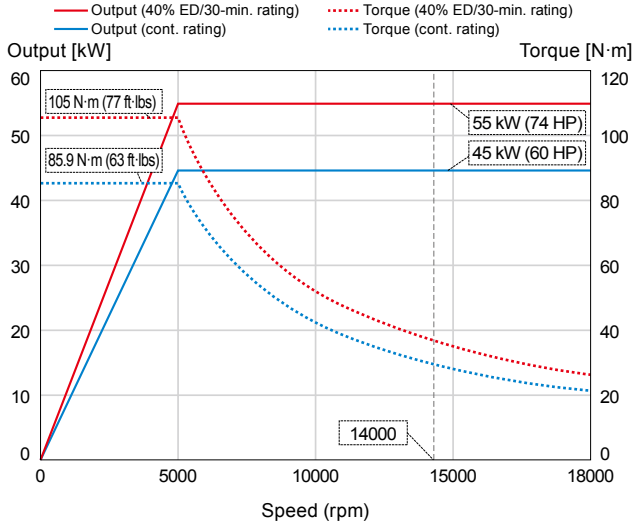
10000 rpm spindle

Output	Torque
AC 37 kW (50 HP) (40% ED/30-min. rating)	350 N·m (258 ft·lbs) (40% ED/30-min. rating)
	239 N·m (176 ft·lbs) (cont. rating)



18000 rpm spindle OPTION

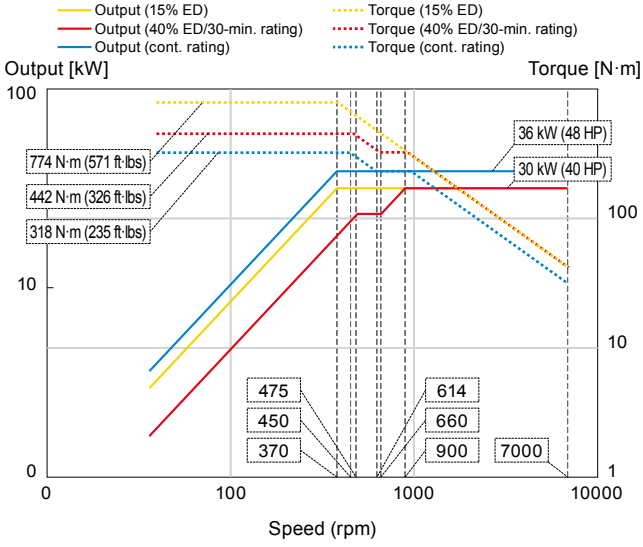
Output	Torque
AC 55 kW (74 HP) (40% ED/30-min. rating)	105 N·m (77 ft·lbs) (40% ED/30-min. rating)
	85.9 N·m (63 ft·lbs) (cont. rating)



VARIAXIS i-800, i-1050

7000 rpm High torque spindle OPTION

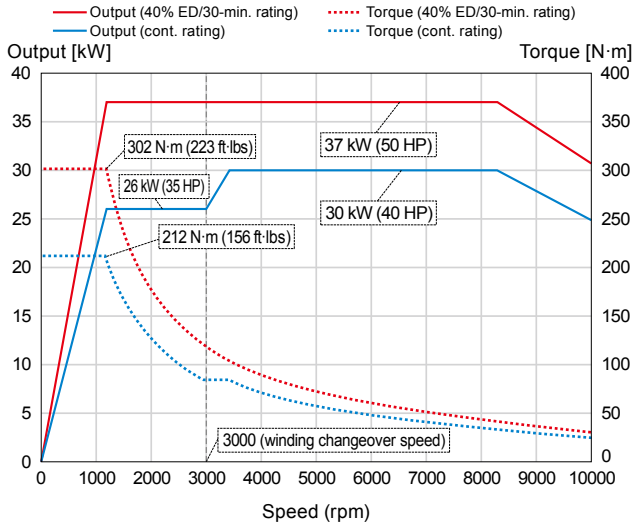
Output	Torque
AC 30 kW (40 HP) (40% ED/30-min. rating)	442 N·m (326 ft·lbs) (40% ED/30-min. rating)
	318 N·m (235 ft·lbs) (cont. rating)



VARIAXIS i-800T, i-1050T

10000 rpm spindle

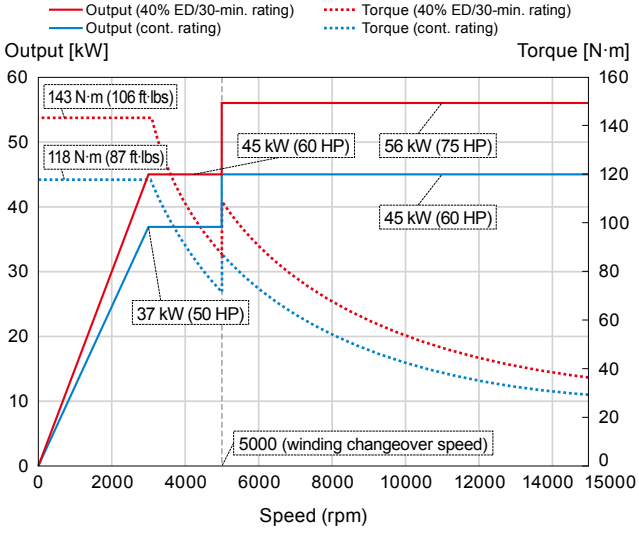
Output	Torque
AC 37 kW (50 HP) (40% ED/30-min. rating)	302 N·m (223 ft·lbs) (40% ED/30-min. rating)
	212 N·m (156 ft·lbs) (cont. rating)



VARIAXIS i-800T, i-1050T

15000 rpm spindle OPTION

Output	Torque
AC 56 kW (75 HP) (40% ED/30-min. rating)	143 N·m (106 ft·lbs) (40% ED/30-min. rating)
	118 N·m (87 ft·lbs) (cont. rating)



5000 rpm High torque spindle OPTION

Output	Torque
AC 37 kW (50 HP) (40% ED/30-min. rating)	715 N·m (527 ft·lbs) (40% ED/30-min. rating)
	525 N·m (387 ft·lbs) (cont. rating)

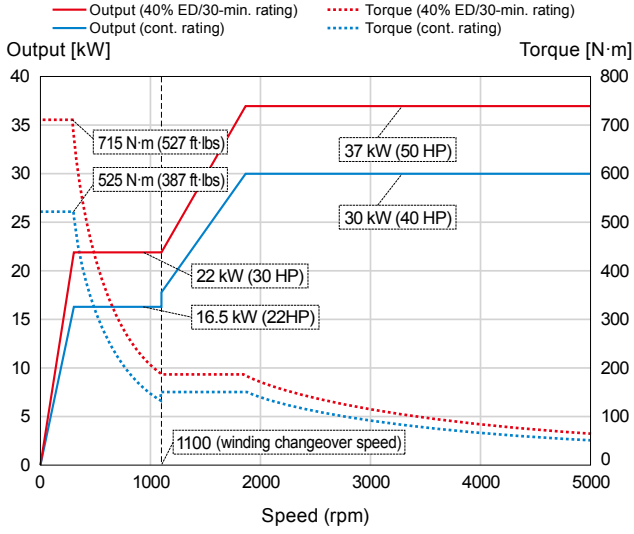
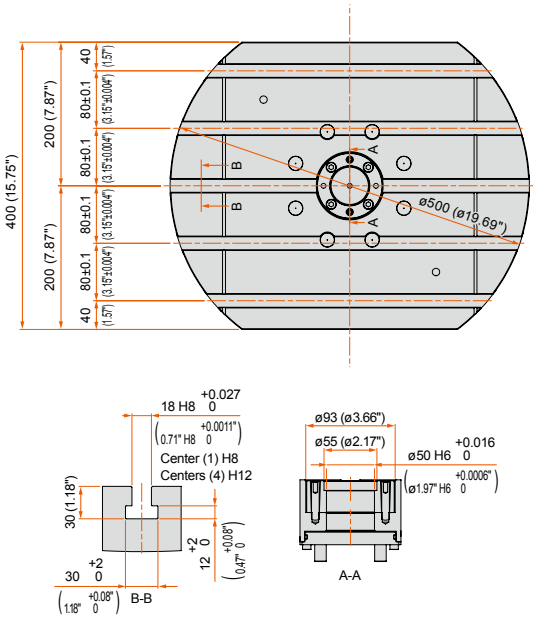
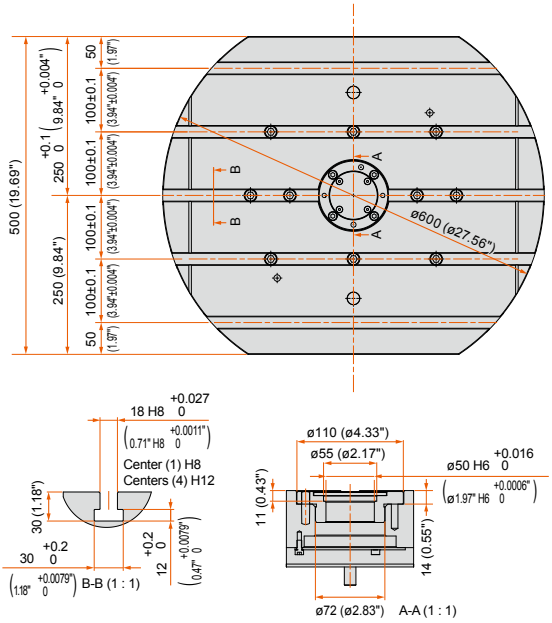


Table Dimensions

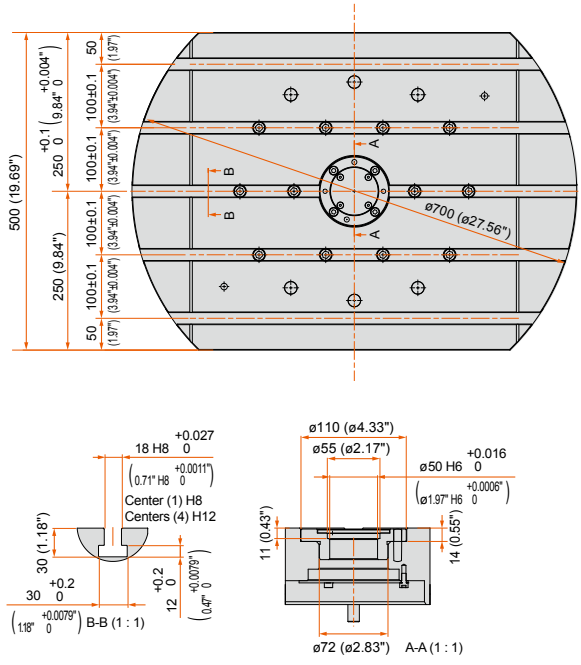
VARIAXIS i-500



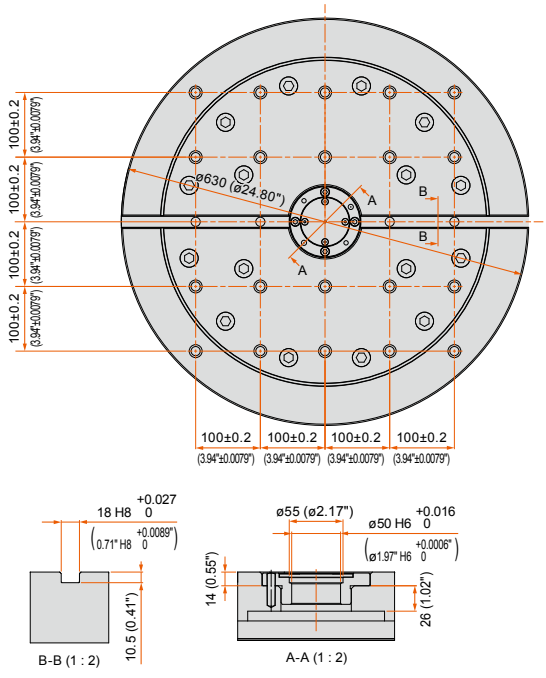
VARIAXIS i-600



VARIAXIS i-700

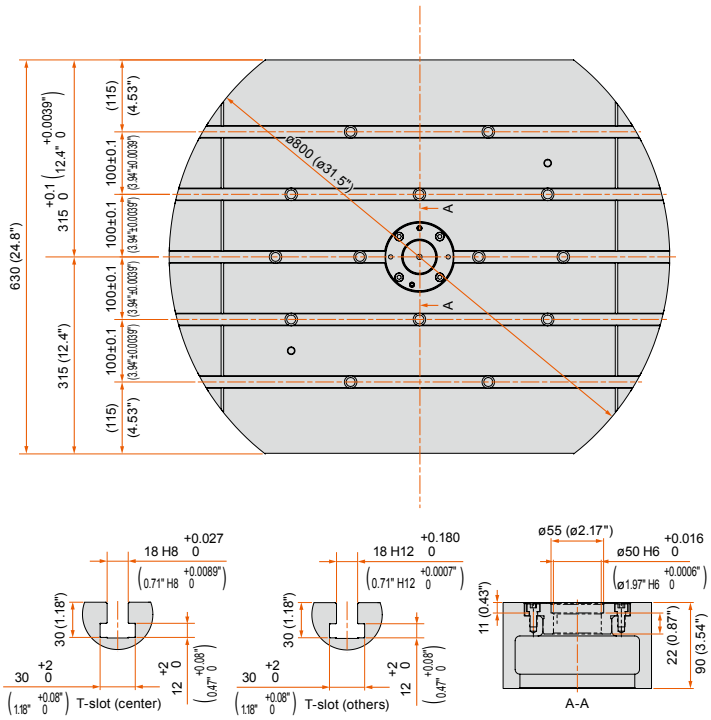


VARIAXIS i-700T

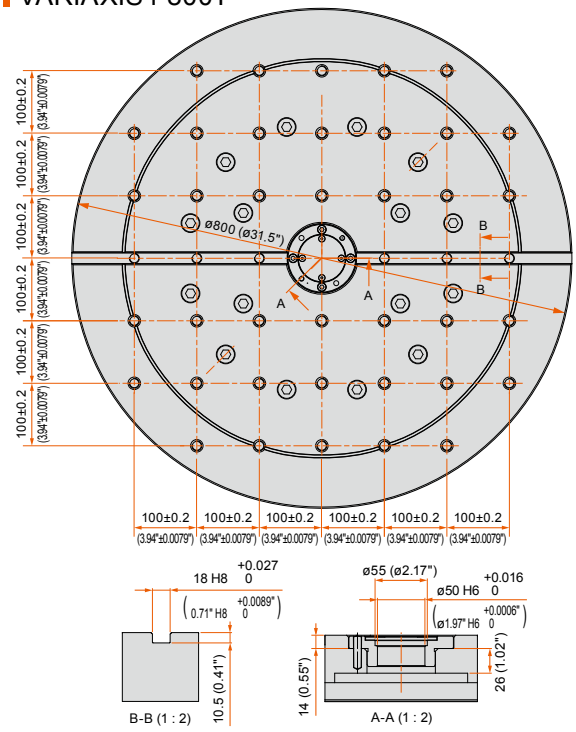


Unit : mm (inch)

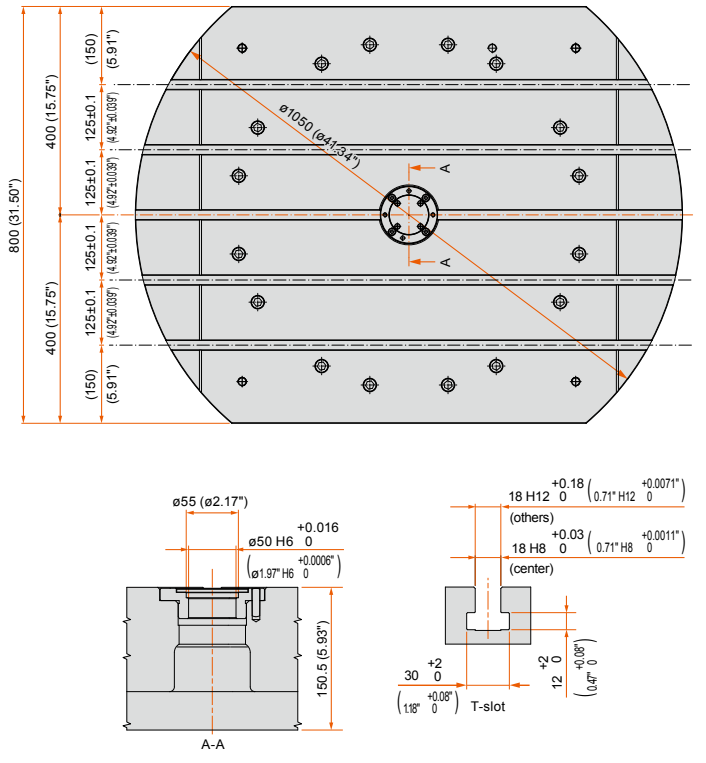
VARIAXIS i-800



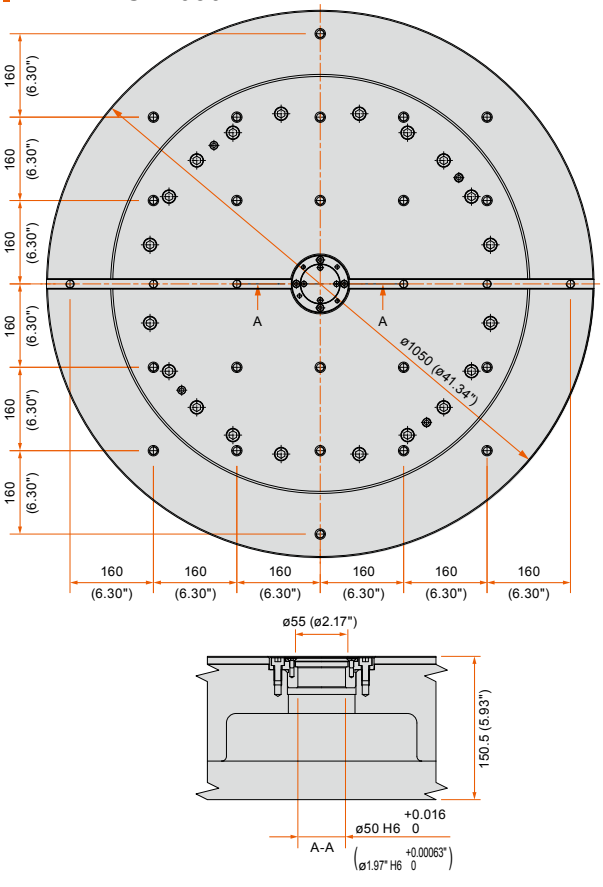
VARIAXIS i-800T



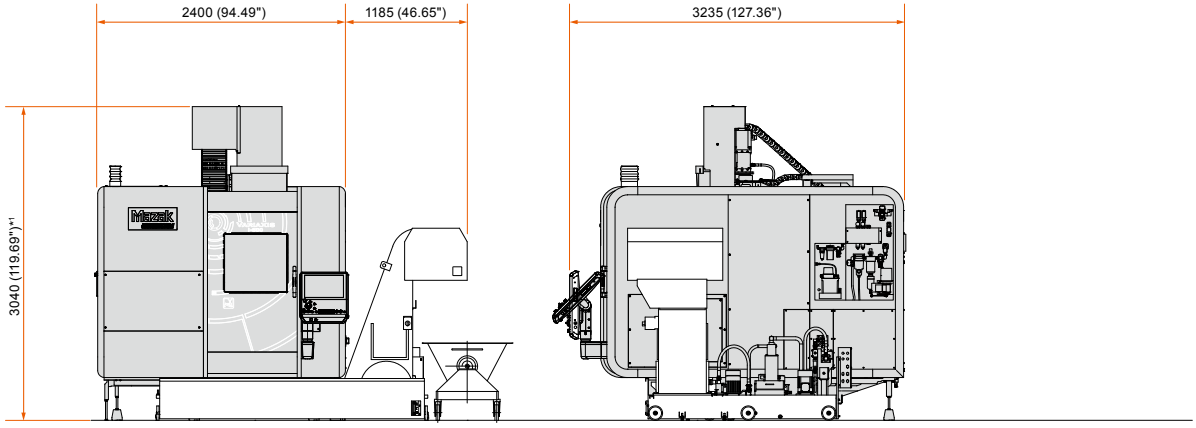
VARIAXIS i-1050



VARIAXIS i-1050T

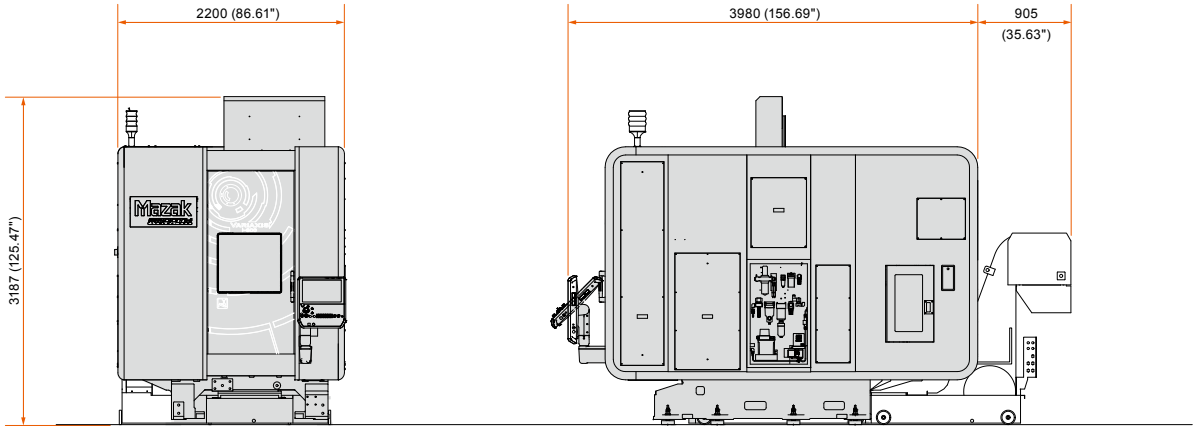


VARIAXIS i-500



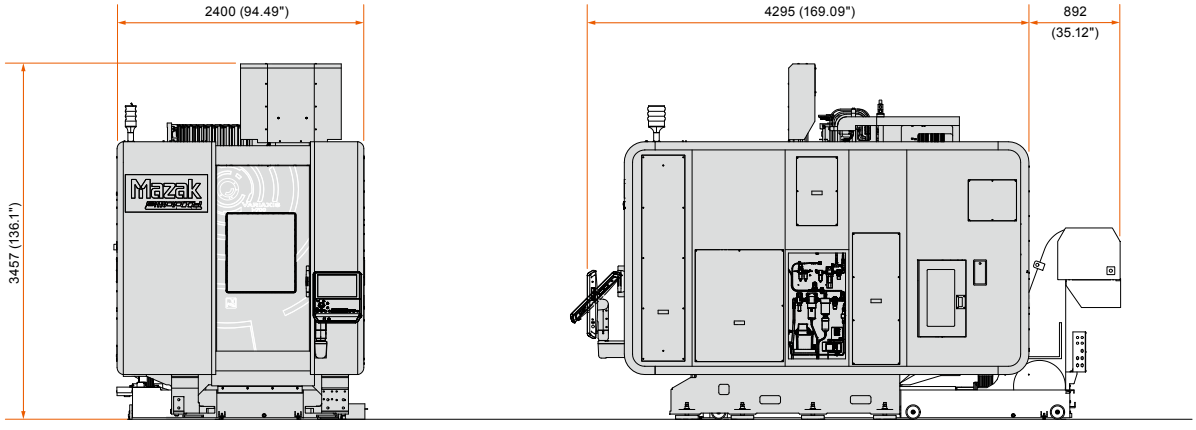
* Shown with optional ConSep II WS chip conveyor and status light
*1 Standard specification is 2975 mm (117.13")

VARIAXIS i-600



* Shown with optional ConSep II WS chip conveyor and status light

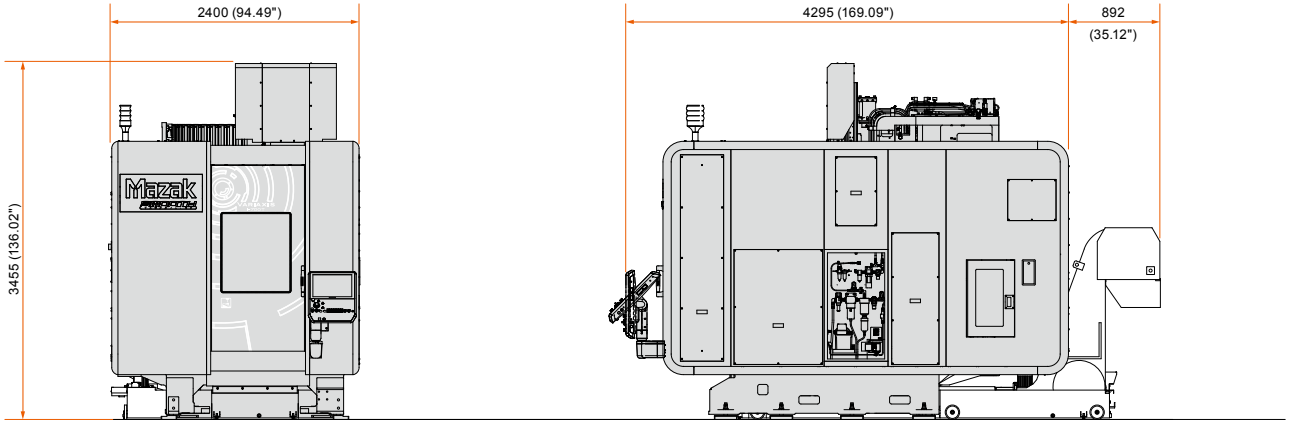
VARIAXIS i-700



* Shown with optional ConSep II WS chip conveyor and status light

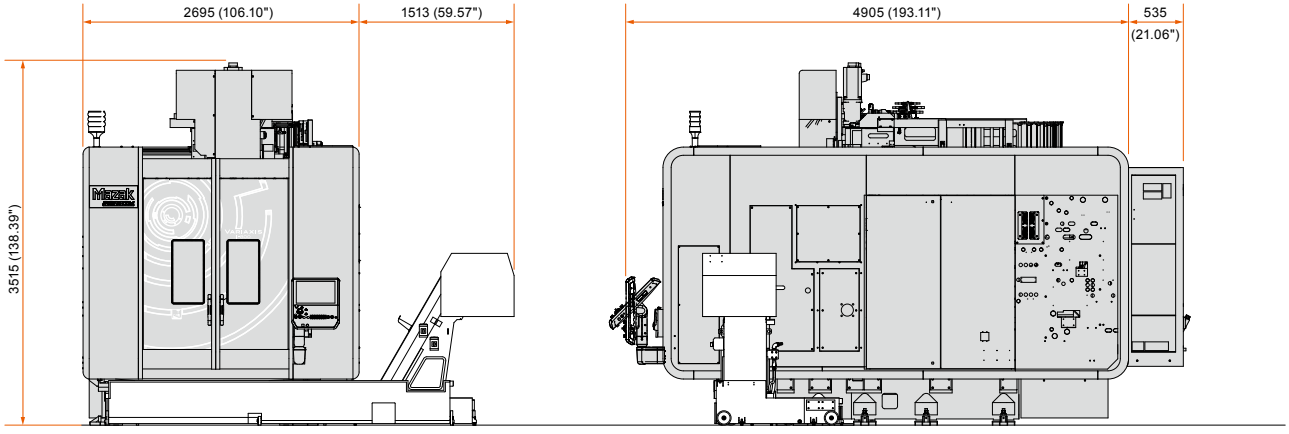
Unit: mm (inch)

VARIAXIS i-700T



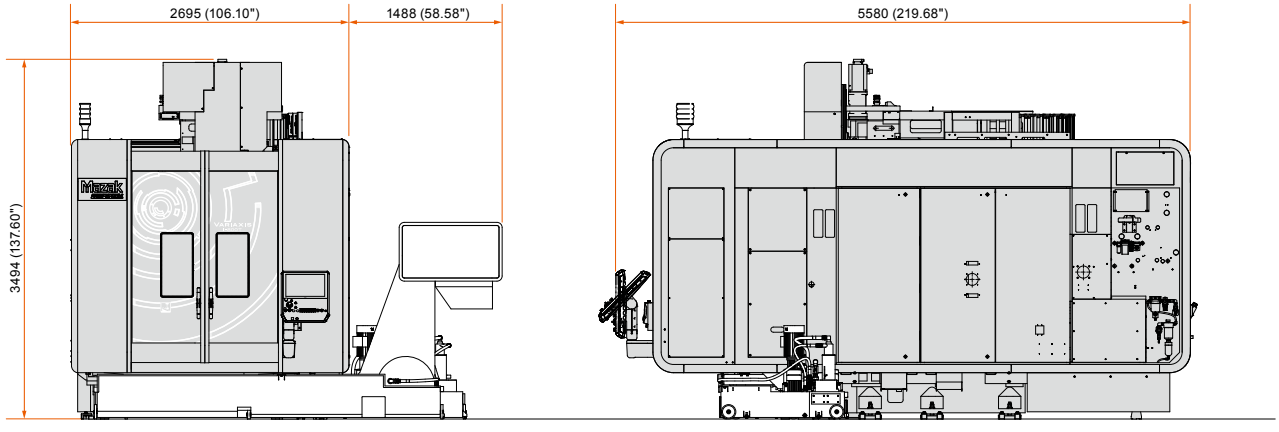
* Shown with optional ConSep II WS chip conveyor and status light

VARIAXIS i-800



* Shown with optional ConSep chip conveyor and status light

VARIAXIS i-800T

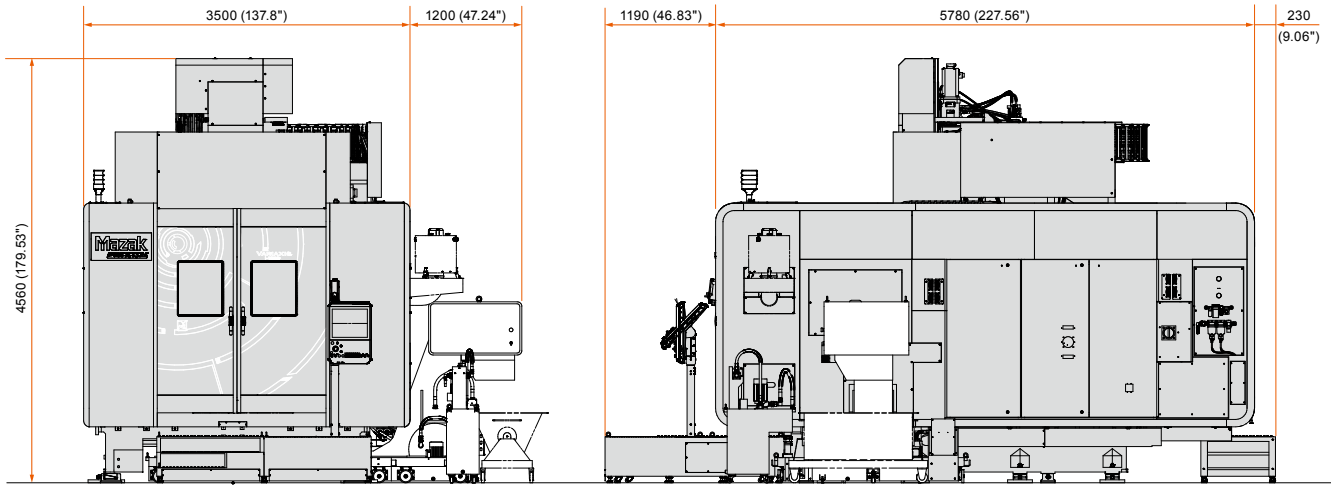


* Shown with optional ConSep II WS chip conveyor and status light

Machine Dimensions

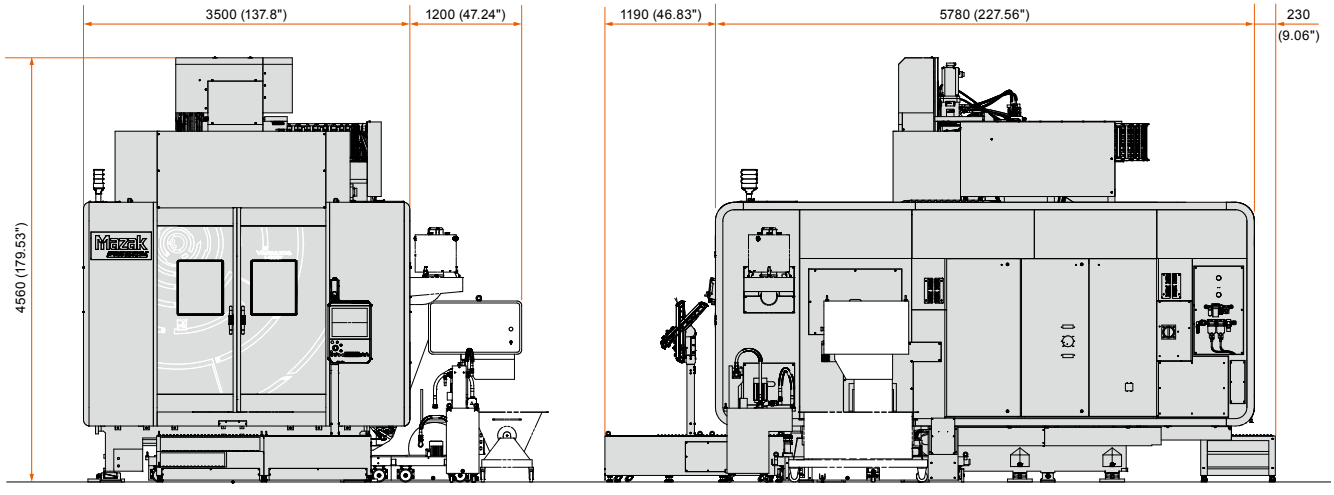
Unit: mm (inch)

VARIAXIS i-1050



* Shown with optional ConSep II WS chip conveyor and status light

VARIAXIS i-1050T



* Shown with optional ConSep II WS chip conveyor and status light

Standard Machine Specifications

		VARIAXIS i-500	VARIAXIS i-600
Stroke	X-axis travel (spindle head left/right)	350 mm (13.78")	510 mm (20.08")
	Y-axis travel (spindle head back/forth)	550 mm (21.65")	910 mm (35.83")
	Z-axis travel (spindle head up/down)	510 mm (20.08")	
	A-axis travel (table tilt)	−120° ~ +30°	
	C-axis travel (table rotation)	±360°	
Table	Distance from table top to spindle nose	50 mm ~ 560 mm (1.97" ~ 22.05") (table horizontal)	70 mm ~ 580 mm (2.76" ~ 22.83") (table horizontal)*1
	Table size	ø500 mm (ø19.69") × Width 400 mm (15.75")	ø600 mm (ø23.62") × Width 500 mm (19.69")
	Max. workpiece size	ø500 mm × 350 mm (ø19.69" × 13.78")	ø700 mm × 450 mm (ø27.56" × 17.72")
	Table load capacity (evenly distributed)	300 kg (661 lbs)	500 kg (1102 lbs)
	Table surface configuration	18 mm (0.71") T-slot × 5 80 mm (3.15") pitch	18 mm (0.71") T-slot × 5 100 mm (3.94") pitch
Milling spindle	Max. spindle speed	12000 rpm	
	Spindle taper	7/24 taper No. 40	
	Spindle bearing I.D.	ø80 mm (ø3.15")	
Feedrate	Rapid traverse rate (X, Y axis/Z axis)	60 m/min / 56 m/min (2362 IPM/2205 IPM)	
	Rapid traverse rate (A, C axis)	18000°/min	
	Cutting feedrate*2 (X, Y, Z axis)	56 m/min (2205 IPM)	
	Cutting feedrate*2 (A, C axis)	18000°/min	
	Simultaneously controlled axes	5	
	Min. indexing increment (A, C axis)	0.0001°	
	Indexing time (A axis) (clamp/unclamp time not included)	0.50 sec./90°	0.55 sec./90°
Automatic tool changer	Tool shank configuration	CAT No. 40	
	Tool storage capacity	30	
	Max. tool diameter/length (from gauge line)/weight	ø90 mm/300 mm/8 kg (ø3.54"/11.81"/17.64 lbs)	
	Max. tool diameter with adjacent tool pockets empty	ø130 mm (ø5.12")	
	Tool selection method	Random selection, shortest path	
	Tool change time (chipt to chip)	4.5 sec.	3.4 sec.
Motors	Spindle motor (40% ED/30-min/cont. rating)	22 kW (30 HP)/15 kW (20 HP)	
	Electrical power requirement (40% ED/30-min/cont. rating)	56.98 kVA/47.02 kVA	61.04 kVA/51.30 kVA
	Air supply	200 NL/min (7.06 ft^3/min)	360 NL/min (12.7 ft^3/min)
Coolant	Coolant tank capacity	300 L (79 gal)	500 L (132 gal)
Machine size	Height	2975 mm (117.13")	3187 mm (125.47")
	Width	2400 mm (94.49")	2200 mm (86.61")
	Length	3235 mm (127.36")	3980 mm (156.69")
	Machine weight	8000 kg (17637 lbs)	13000 kg (28660 lbs)

*1 Specifications are different for 2-pallet changer
*2 Limited feedrate with continuous movement

Standard Machine Specifications

		VARIAXIS i-700	VARIAXIS i-700T
Stroke	X-axis travel (spindle head left/right)	630 mm (24.80")	
	Y-axis travel (spindle head back/forth)	1100 mm (43.31")	
	Z-axis travel (spindle head up/down)	600 mm (23.62")	
	A-axis travel (table tilt)	−120° ~ +30°	
	C-axis travel (table rotation)	±360°	
Table	Distance from table top to spindle nose	100 mm ~ 700 mm (3.94" ~ 27.56") (table horizontal)	
	Table size	ø700 mm (ø27.56") × Width 500 mm (19.69")	ø630 mm (Φ24.80")
	Max. workpiece size	ø850 mm × 500 mm (ø33.46" × 19.69")	
	Table load capacity (evenly distributed)	700 kg (1543 lbs)	
	Table surface configuration	18 mm (0.71") T-slot × 5 100 mm (3.94") pitch	M16 × P2 tapped holes
Turning spindle	Turning table speed	—	1100 rpm
Milling spindle	Max. spindle speed	12000 rpm	18000 rpm
	Spindle taper	7/24 taper No. 40	
	Spindle bearing I.D.	ø80 mm (ø3.15")	ø70 mm (ø2.76")
Feedrate	Rapid traverse rate (X, Y axis/Z axis)	60 m/min/56 m/min (2362 IPM/2205 IPM)	60 m/min/56 m/min (2362 IPM/2205 IPM)
	Rapid traverse rate (A/C axis)	18000°/min/18000°/min	18000°/min/36000°/min
	Cutting feedrate[*1] (X, Y, Z axis)	56 m/min (2362 IPM)	56 m/min (2362 IPM)
	Cutting feedrate[*1] (A/C axis)	18000°/min/18000°/min	18000°/min/36000°/min
	Simultaneously controlled axes	5	
	Min. indexing increment (A, C axis)	0.0001°	
	Indexing time (A axis) (clamp/unclamp time not included)	0.55 sec./90°	0.75 sec./90°
Automatic tool changer	Tool shank configuration	CAT No. 40	
	Tool storage capacity	30	
	Max. tool diameter/length (from gauge line)/weight	ø90 mm/360 mm/8 kg (ø3.54"/14.17"/17.64 lbs)	
	Max. tool diameter with adjacent tool pockets empty	ø130 mm (ø5.12")	
	Tool selection method	Random selection, shortest path	
	Tool change time (chip to chip)	3.6 sec.	4.1 sec.
Motors	Spindle motor (40% ED/30-min/cont. rating)	22 kW (30 HP)/15 kW (20 HP)	30 kW (40 HP)/22 kW (30 HP)
	Electrical power requirement (40% ED/30-min/cont. rating)	62.70 kVA/52.95 kVA	78.9 kVA/67.6 kVA
	Air supply	360 NL/min (12.7 ft^3/min)	450 NL/min (15.89 ft^3/min)
Coolant	Coolant tank capacity	500 L (132 gal)	
Machine size	Height	3457 mm (136.10")	3455 mm (136.02")
	Width	2400 mm (94.49")	
	Length	4295 mm (169.09")	
	Machine weight	15000 kg (33069 lbs)	16000 kg (35273 lbs)

[*1] Limited feedrate with continuous movement

		VARIAXIS i-800	VARIAXIS i-800T
Stroke	X-axis travel (spindle head left/right)	730 mm (28.74")	
	Y-axis travel (spindle head back/forth)	850 mm (33.46")	
	Z-axis travel (spindle head up/down)	560 mm (22.05")	
	A-axis travel (table tilt)	−120° ~ +30°	−130° ~ +30°
	C-axis travel (table rotation)	±360°	
Table	Distance from table top to spindle nose	230 mm ~ 790 mm (9.06" ~ 31.10") (table horizontal)	
	Table size	ø800 mm (ø31.50") × Width 630 mm (24.80")	ø800 mm (ø31.50")
	Max. workpiece size	ø1000 mm × 375 mm (ø800 mm × 500 mm) (ø39.37" × 14.76" (ø31.50" × 19.69"))	
	Table load capacity (evenly distributed)	1000 kg (2205 lbs)	
	Table surface configuration	18 mm (0.71") T-slot × 5 100 mm (3.94") pitch	M16 × P2 tapped holes
Turning spindle	Turning table speed	—	800 rpm
Milling spindle	Max. spindle speed	10000 rpm	
	Spindle taper	7/24 taper No. 50	
	Spindle bearing I.D.	ø100 mm (ø3.94")	
Feedrate	Rapid traverse rate (X, Y, Z axis)	42 m/min (1654IPM)	42 m/min (1654IPM)
	Rapid traverse rate (A/C axis)	18000°/min/18000°/min	10800°/min/36000°/min
	Cutting feedrate*1 (X, Y, Z axis)	42 m/min (1654IPM)	42 m/min (1654IPM)
	Cutting feedrate*1 (A, C axis)	9000°/min	10800°/min
	Simultaneously controlled axes	5	
	Min. indexing increment (A-, C-axis)	0.0001°	
	Indexing time (A axis) (clamp/unclamp time not included)	0.76 sec./90°	0.72 sec./90°
Automatic tool changer	Tool shank configuration	CAT No. 50	
	Tool storage capacity	30	
	Max. tool diameter/length (from gauge line)/weight	ø125 mm/400 mm/20 kg (ø4.92"/15.75"/44.09 lbs)	
	Max. tool diameter with adjacent tool pockets empty	ø210 mm (ø8.27")	
	Tool selection method	Random selection, shortest path	
	Tool change time (chip to chip)	4.5 sec.	5.1 sec.
Motors	Spindle motor (40% ED/30-min/cont. rating)	37 kW (50 HP)/30 kW (40 HP)	
	Electrical power requirement (40% ED/30-min/cont. rating)	89.27 kVA/78.07 kVA	106.8 kVA/96.88 kVA
	Air supply	300 NL/min (10.59 ft^3/min)	500 NL/min (17.66 ft^3/min)
Coolant	Coolant tank capacity	400 L (106 gal)	
Machine size	Height	3515 mm (138.39")	3494 mm (137.60")
	Width	2695 mm (106.10")	2695 mm (106.10")
	Length	5440 mm (214.17")	5580 mm (219.69")
	Machine weight	19600 kg (43210 lbs)	20000 kg (44092 lbs)

*1 Limited feedrate with continuous movement

Standard Machine Specifications

		VARIAXIS i-1050	VARIAXIS i-1050T
Stroke	X-axis travel (spindle head left/right)	1200 mm (47.24")	
	Y-axis travel (spindle head back/forth)	1385 mm (54.53")	
	Z-axis travel (spindle head up/down)	900 mm (35.43")	
	A-axis travel (table tilt)	−150° ~ +130°	
	C-axis travel (table rotation)	±360°	
Table	Distance from table top to spindle nose	180 mm ~ 1080 mm (7.09" ~ 42.52") (table horizontal)	
	Table size	ø1050 mm (ø41.34") × Width 800 mm (31.50")	ø1050 mm (ø41.34")
	Max. workpiece size[*1]	ø1250 mm × 900 mm (ø49.21" × 35.43")	
	Table load capacity (evenly distributed)	2000 kg (4409 lbs)	
	Table surface configuration	18 mm (0.71") T-slot × 5 125 mm (4.92") pitch	M16 × P2 tapped holes
Turning spindle	Turning table speed	—	500 rpm
Milling spindle	Max. spindle speed	10000 rpm	
	Spindle taper	7/24 taper No. 50	
	Spindle bearing I.D.	ø100 mm (ø3.94")	
Feedrate	Rapid traverse rate (X, Y, Z axis)	40 m/min (1575 IPM)	
	Rapid traverse rate (A/C axis)	5400°/min/10800°/min	
	Cutting feedrate[*2] (X, Y, Z axis)	40 m/min (1575 IPM)	
	Cutting feedrate[*2] (A, C axis)	5400°/min	
	Simultaneously controlled axes	5	
	Min. indexing increment (A, C axis)	0.0001°	
	Indexing time (A axis) (clamp/unclamp time not included)	1.09 sec./90°	
Automatic tool changer	Tool shank configuration	CAT No. 50	
	Tool storage capacity	30	
	Max. tool diameter/length (from gauge line)/weight	ø125 mm/500 mm/20 kg (ø4.92"/19.69"/44.09 lbs)	
	Max. tool diameter with adjacent tool pockets empty	ø210 mm (ø8.27")	
	Tool selection method	Random selection, shortest path	
	Tool change time (chip to chip)	7.0 sec.	
Motors	Spindle motor (40% ED/30-min/cont. rating)	37 kW (50 HP)/30 kW (40 HP)	
	Electrical power requirement (40% ED/30-min/cont. rating)	111.04 kVA/101.11 kVA	111.71 kVA/101.79 kVA
	Air supply	480 NL/min (16.95 ft^3/min)	500 NL/min (17.66 ft^3 / min)
Coolant	Coolant tank capacity	580 L (132 gal)	
Machine size	Height	4560 mm (179.53")	
	Width	3500 mm (137.8")	
	Length	7200 mm (283.46")	
	Machine weight	31000 kg (68343 lbs)	

[*1] Limited by A axis angle
[*2] Limited feedrate with continuous movement

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*1, Re-threading**1, Thread start point compensation**1, Thread cut-speed override**1, Synchronous tapping*	Positioning (interpolation), Positioning (non-interpolation), Linear interpolation, Circular interpolation, Spiral interpolation, Helical interpolation, Constant lead threading*1, Variable lead threading*1, Threading (C-axis interpolation type)*1, Cylindrical interpolation*, Involute interpolation*, Fine spline interpolation*, NURBS interpolation*, Polar coordinate interpolation*, Re-threading**1, Thread start point compensation**1, Thread cut-speed override**1, 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)*1, Tool life monitoring (wear)*1	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)*1, Tool life monitoring (wear)*1
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*1, Tool wear offset, Fixed amount offset*1, Simple wear offset*1	Tool position offset, Tool length offset, Tool diameter/tool nose R offset, Tool wear offset, Fixed amount offset*1, Simple wear offset*1
Coordinate system	Machine coordinate system, Work coordinate system, Local coordinate system, Additional work coordinates (300 set)	
Machine functions	—	Rotary axis prefilter, Tilted working plane, Hobbing II*, Shaping function*, Dynamic compensation II*, Tool center point control*, Tool radius compensation for 5-axis machining*, Workpiece positioning error compensation*
Machine compensation	Backlash compensation, Pitch error compensation, Geometric deviation compensation, Volumetric compensation*	
Protection functions	Emergency stop, Interlock, Pre-move stroke check, 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, 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 length teach, Touch sensor coordinates measurement, Workpiece offset measurement, WPC coordinate measurement, Measurement on machine, Tool eye measurement*1	Tool length teach, Tool offset teach, Touch sensor coordinates measurement, Workpiece offset measurement, WPC coordinate measurement, Measurement on machine, Tool eye measurement*1
Automatic measuring function	WPC coordinate measurement, Automatic tool length measurement, Workpiece measurement*1, Sensor calibration, Tool eye auto tool measurement*1, Tool breakage detection	Automatic tool length measurement, Workpiece measurement*1, Sensor calibration, Tool eye auto tool measurement*1, Tool breakage detection
MDI measurement	Semi-automatic tool length measurement, Full automatic tool length measurement, Coordinate measurement	
Peripheral network	PROFIBUS-DP*, EtherNet/IP*, CC-Link*	
Memory	SD card interface, USB	
EtherNet	10M/100M/1Gbps	

* Option
*1 Turning only

VARIAXIS i SERIES

Mazak

YAMAZAKI MAZAK CORPORATION

1-131 Takeda, Oguchi-cho, Niwa-gun, Aichi-pref., Japan
TEL : +(81)587-95-1131

www.mazak.com

EA

VARIAXIS i SERIES 18.07.0 T 99J287618E0