Mazak

VARIAXIS C-600
VARIAXIS C-700

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VARIAXIS C-600
VARIAXIS C-700

[Simultaneous 5-axis vertical machining center]

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SE

VARIAXIS C-600, VARIAXIS C-700 24.10.0 G 99J297824E0

VARIAXIS C-600
VARIAXIS C-700

Enhanced productivity through process integration and extensive automation, with an economical simultaneous 5-axis vertical machining center

High productivity

Wide variety of high-performance spindles and flexible automation equipment

Cost-effective

Entry-level 5-axis machining center with excellent cost performance

Environmental performance

Visualization of energy consumption and regenerative power, energy-efficient control of equipment

VARIAXIS C-600
Shown with optional equipment

VARIAXIS C-700
Shown with optional equipment

- Large B-axis tilt angle and long X- and Z-axis stroke for multi-surface and 5-axis machining
- High-accuracy machining with a highly rigid table supported on both ends and advanced compensation technology
- Spindle specifications to meet a wide variety of machining requirements
- Automation systems for mass production and multi-variety processing, with a wide range of options

■ VARIAXIS C series

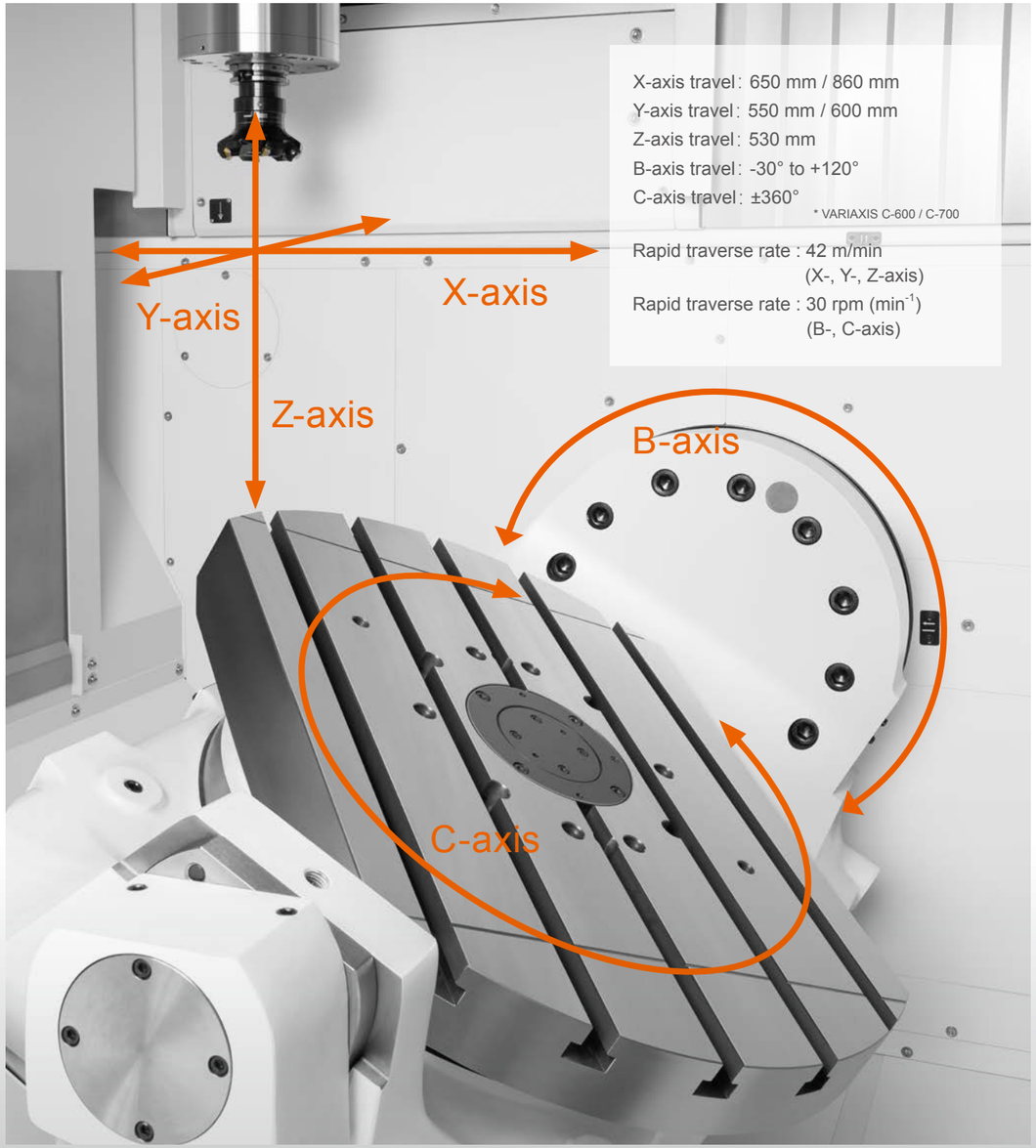
● : Standard ○ : Option

Model	Spindle				Table	Tool magazine			
	12000 rpm (min^{-1})	15000 rpm (min^{-1})	18000 rpm (min^{-1})	20000 rpm (min^{-1})		30	60	90	120
VARIAXIS C-600	●	○	○	○	Φ600 mm × 500 mm	●	○	○	○
VARIAXIS C-700	●	○	○	○	Φ700 mm × 500 mm	●	○	○	○

Machine Design

Long stroke for multi-surface and 5-axis machining

A wide stroke range of the X- and Z-axis allows the tool to approach the tip and lower part of the workpiece in multi-surface and 5-axis machining, where the B-axis is tilted significantly. It ensures vibration-free machining with short tool projection.
The high feed rates significantly reduce non-cutting time in simultaneous 5-axis machining, achieving high productivity.



Tool magazine

The standard tool magazine has a storage capacity of 30 tools - 60, 90, 120 tools are optionally available

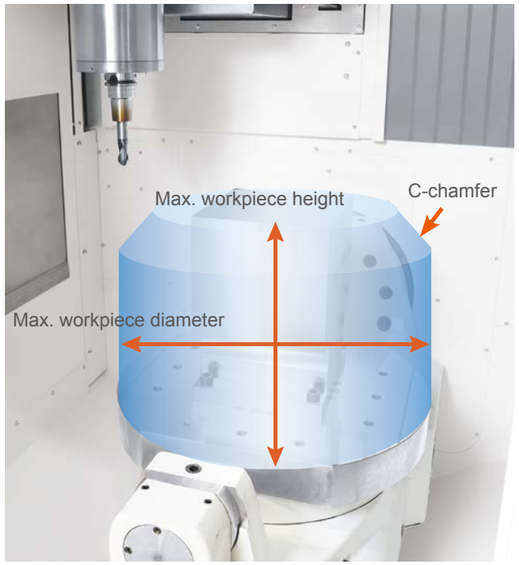
- Max. tool length (from tool tip to gauge line) 300 mm
- Tool diameter 80 mm (with adjacent pockets empty 130 mm)
- Max. tool weight 8 kg (120 kg total weight of tools in magazine)

30 tool magazine

60 tool magazine (option)

High rigidity table

The tilting rotary table is rigidly supported on both ends to ensure high-speed, high-accuracy machining. The B-axis and C-axis both utilize a roller gear cam to eliminate backlash.



Model	VARIAXIS C-600	VARIAXIS C-700
Max. workpiece diameter	Φ730 mm	Φ850 mm
Max. workpiece height	450 mm	500 mm
Max. workpiece weight	500 kg	700 kg
C-chamfer	C110 mm	C90 mm

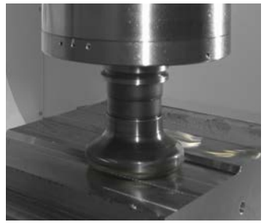
High-speed automatic tool changer

Cam-driven double arm automatic tool changer is designed to drastically reduce chip-to-chip time. Chip-to-chip is 4.5 / 4.8 seconds*.

* VARIAXIS C-600 / C-700

Machining example (test results)

VARIAXIS C-600
15000 rpm (min^{-1}) high torque spindle Φ80 mm face mill (6 teeth)



Speed : 995 rpm (min^{-1})
Feedrate : 1552 mm/min
Depth of cut : 5.8 mm
Material : C45
Material removal rate : **581 cm³/min**

Spindle specifications to meet a wide variety of machining requirements

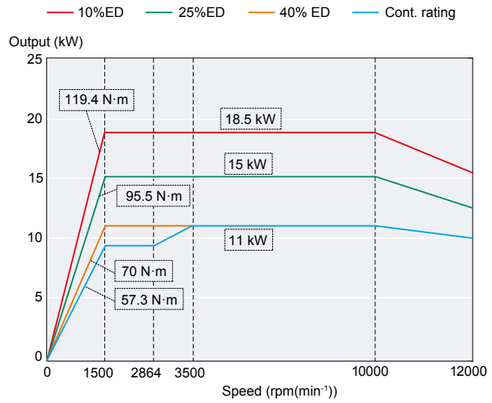
The high rigidity spindle can perform heavy duty machining of steel as well as high speed machining of non-ferrous materials such as aluminum. High speed and high torque specifications are optionally available.

Speed	Standard	High-torque OPTION	High-speed OPTION	
	12000 rpm (min^{-1})	15000 rpm (min^{-1})	18000 rpm (min^{-1})	20000 rpm (min^{-1})
Output (40% ED)	11 kW (15 HP)	46 kW (62 HP)	30 kW (40 HP)	42 kW (56 HP)
Max. torque (40% ED)	70 N·m	200 N·m	105 N·m	161 N·m
Tool shank	BT40 / BIG-PLUS No.40* / HSK-A63*	BT40 / BIG-PLUS No.40 / HSK-A63	BT40 / BIG-PLUS No.40 / HSK-A63	BT40 / BIG-PLUS No.40 / HSK-A63

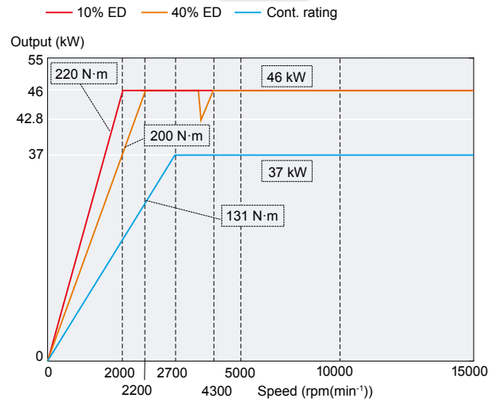
*Option

Spindle output·Torque diagram

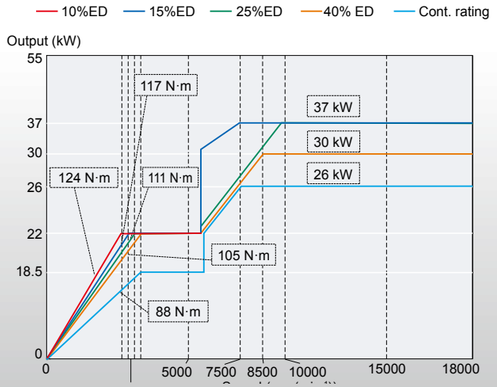
12000 rpm (min^{-1}) spindle



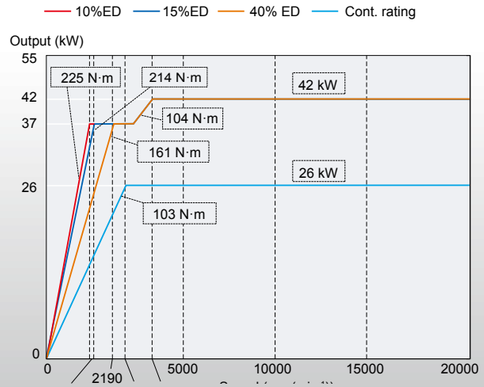
15000 rpm (min^{-1}) spindle OPTION



18000 rpm (min^{-1}) spindle OPTION



20000 rpm (min^{-1}) spindle OPTION



Higher Accuracy

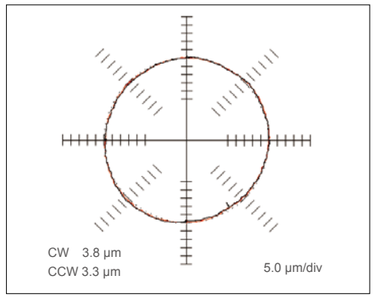
Stable high accuracy machining with a high-rigidity construction and MAZATROL SmoothAi

DBB (test results)

X-Y plane measured results

3.8 µm (CW)
3.3 µm (CCW)

Model	VARIAXIS C-600
Diameter	200 mm
Feedrate	560 mm/min



Positioning accuracy and positioning repeatability (test results of VARIAXIS C-600)

Mazak precision results

Positioning accuracy	X-axis	1.17 µm
	Y-axis	1.56 µm
	Z-axis	1.15 µm

Positioning repeatability	X-axis	0.99 µm
	Y-axis	1.52 µm
	Z-axis	0.68 µm

Note : The inspection is conducted according to ISO-230 on a recommended foundation with room temperature controlled to 22°C±1°C after the machine has reached operation temperature.

Ai Thermal Shield

Based on spindle speed and temperature of the machine, Ai Thermal Shield suppresses changes in the cutting edge position. It stabilizes continuous machining accuracy through meticulous machine control that takes into account temperature changes, machine position, coolant ON/OFF, and other factors. Furthermore, by accumulating and analyzing data from subsequent measurements, thermal displacement compensation can be optimized for each machining environment.

Machine design and specification for high accuracy 5-axis machining

High accuracy 5-axis calibration - MAZA-CHECK

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

Wireless touch probe RMP600 is optional equipment.

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

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

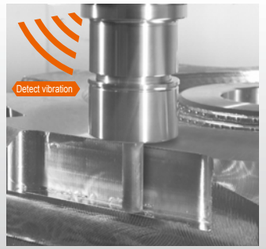
Linear roller guides utilized on all axes

Roller guides with excellent speed and durability are used on all axes. The repeatable positioning accuracy is superior compared to slide way, ensuring stable accuracy over extended periods of operation.

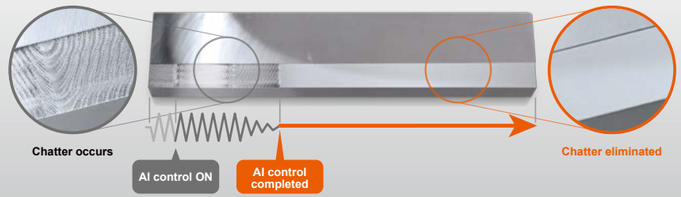
Scale feedback — OPTION

By measuring and compensating for errors between the command value and the actual feed axis movement, stable high accuracy can be maintained over extended periods.

Smooth Ai Spindle — OPTION



Mazak's unique AI adaptive control improves productivity and machined surface quality.
If chatter vibration occurs during machining, the vibration sensor and AI adaptive control automatically change the machining conditions to surpass chatter vibration.



Support functions for achieving high-precision setup tasks

Tool measurement

Automatic tool length measurement and tool breakage detection

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

Laser tool measurement system

OPTION

Designed for tool-length measurement and tool-breakage detection with small diameter tools. Non-contact NC4 measures tool length and diameter with laser at production speeds for stable machining accuracy.

Tool length measurement

High-accuracy laser tool measurement system

Coordinate value / workpiece measurement

Smooth OMM (on machine measurement software)

OPTION

Moves the touch probe manually to a measurement point and create a measurement program after the point is registered. Automatically updates work coordinates and tool compensation using measurement results, and measures geometric tolerances of workpiece features.

Note: The touch probe and reference sphere are required for on-machine measurement.

Smooth Set and Inspect (on-machine measurement software)

OPTION

Makes inspection programs easily. Automatically updates work coordinates and tool compensation using measurement results.

Note: The touch probe and reference sphere are required for on-machine measurement.

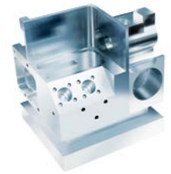
Mazak monitoring system B RMP600

OPTION

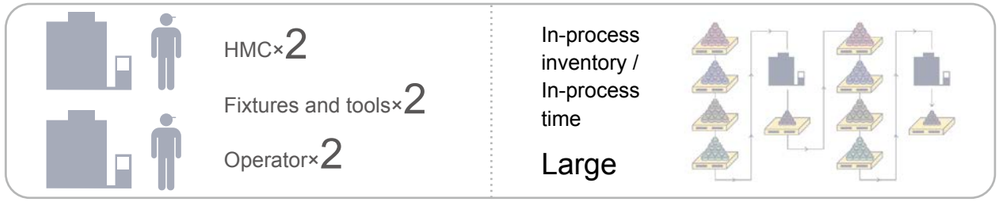
Coordinate values automatically shift based on workpiece probing results from a touch sensor mounted in the machine spindle.

Process integration leads to a significant reduction in total production time

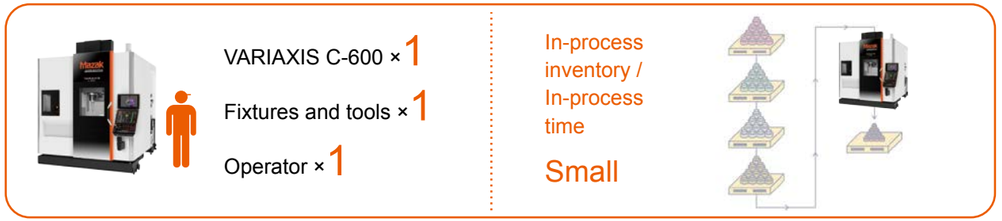
The machine integrates all machining processes, from raw material input to final machining, into a single unit. This enables a reduction in production lead time by minimizing setup processes, incorporating automation, saving costs on fixtures, equipment, and machine installation space, enhancing machining accuracy, improving energy efficiency, and offering various other benefits.



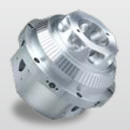
Previous production method



VARIAXIS C-600



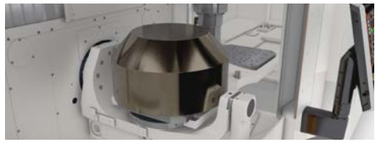
Efficient machining of complex-shaped components across various industries through simultaneous 5-axis machining

Aerospace	Automotive	Semiconductor	Construction
			
Material : Stainless steel Part : Flapping hinge	Material : Aluminum Part : Control arm	Material : Aluminum Part : Vacuum chamber	Material : Stainless steel Part : Housing
			
Material : Aluminum Part : Joint	Material : Aluminum Part : Inverter case	Material : Aluminum Part : Optical device component	Material : S45C Part : Industrial camera body

2-pallet changer

OPTION

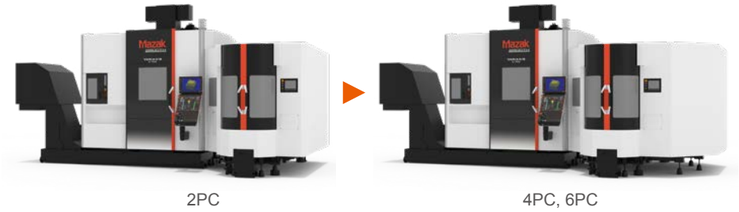
The next workpiece can be setup during the machining of the current workpiece for higher productivity.



	VARIAXIS C-600	VARIAXIS C-700
Pallet size	500 mm × 500 mm	500 mm × 500 mm
Max. workpiece size	Φ730 mm × 450 mm	Φ730 mm × 500 mm
Max. load	500 kg	600 kg

Expandable multi-pallet changer system

* Only compatible with VARIAXIS C-700



2PC　　4PC, 6PC

By setting up materials to multiple pallets, the machine can run unmanned for longer periods of time, thus increasing machine availability.

* The pallet size, maximum workpiece size, and load are the same as those of the 2-pallet changer specification.

Compatible with robots and automation systems

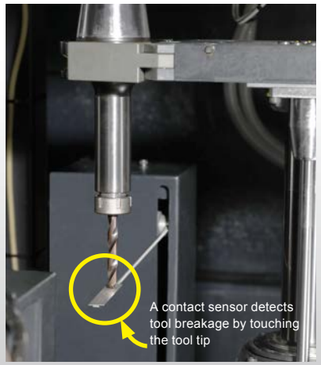
OPTION

Optionally prepared automatic doors, robot interfaces, and hydraulic/pneumatic fixture piping with up to 4 ports facilitate the easy installation of robots and automation systems, which are prepared by the customer.

Tool breakage detection in ATC area

OPTION

During tool return or retrieval operations in the ATC area, the machine detects tool breakage. In case of detection, the machine automatically switches to a spare tool, enabling uninterrupted operation without stopping the machining process.



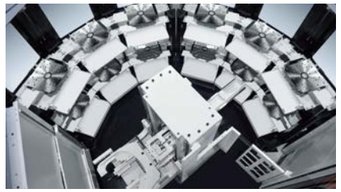
MPP (MULTI PALLET POOL)

OPTION

MPP (MULTI PALLET POOL) is a space-saving multi-level pallet storage system that increases machine utilization and significantly enhances productivity, making it ideal for high-mix, low-volume production. Mounted on the side of the machine, the system enables workpiece access from two locations: the operator door and the loading station.

Flexible pallet stocker capacity

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



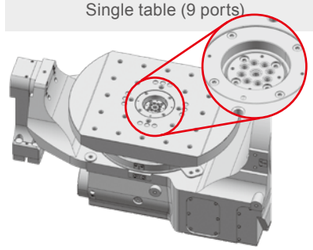
	VARIAXIS C-600	VARIAXIS C-700
Pallet storage capacities	6 / 12 / 18	6 / 12 / 18
Pallet size	500 mm × 500 mm	500 mm × 500 mm
Max. load (without pallet)	500 kg	600 kg
Max. workpiece size (without pallet)	Φ730 mm × 450 mm	Φ730 mm × 500 mm

Preparation for hydraulic and pneumatic fixtures

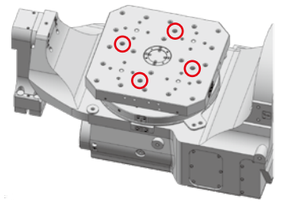
OPTION

Continuous power is supplied through the pallet for hydraulic and pneumatic fixtures. The maximum number of ports is as follows.

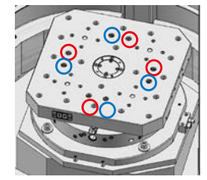
Single table (9 ports)



2-pallet changer (4 ports inside the machine)



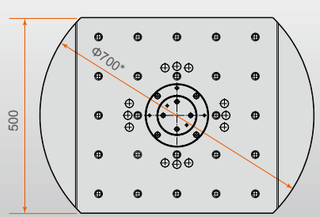
2-pallet changer (8 ports on workpiece setup station)



○ Pressure supply port (retain continuously)　○ Pressure supply port (retain only at setup station)

Unit : mm

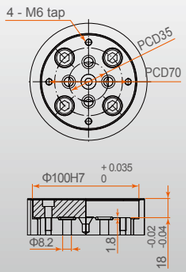
■ Dimensions of hydraulic fixture connections (single table)



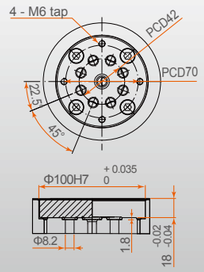
* The value for VARIAXIS C-600 is Φ600 mm

Connection details

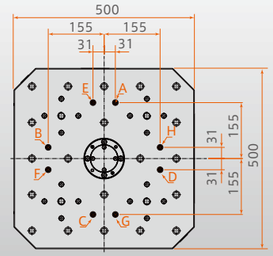
4 ports



9 ports



■ Dimensions of hydraulic fixture connections (2-pallet changer)



Unsurpassed ease of operation through ergonomic design

Effortless setup operations

1 Tool setup at the front

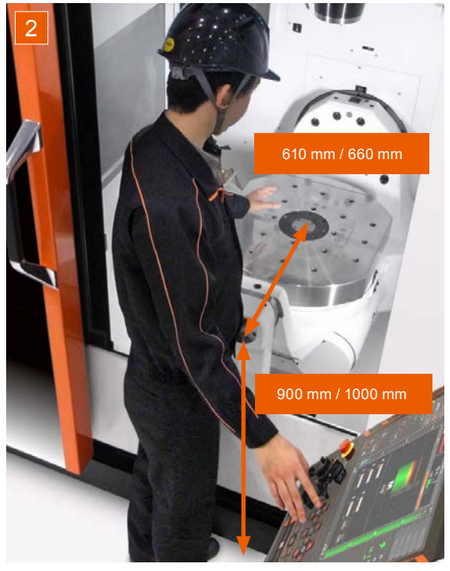
Positioning the access door of the tool magazine at the front of the machine eliminates the need to go around to the back, thereby improving work efficiency. Operator can setup tools using the tool magazine control panel even during machining.

2 Excellent accessibility

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

Height from floor to table top : 900 mm / 1000 mm

Distance from table center to the operator: 610 mm / 660 mm



* VARIAXIS C-600 / C-700

3 Excellent visibility

The large window provides excellent visibility, making it easier to monitor the machining process.

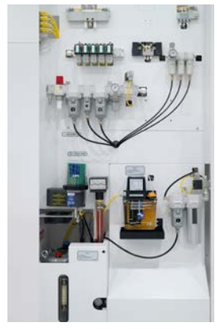
4 Convenient loading by crane

The large front door opening ensures excellent access to the machine table for convenient loading and unloading of workpieces.

* VARIAXIS C-600 / C-700

5 Maintenance area

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



6 Front pull-out coolant tank

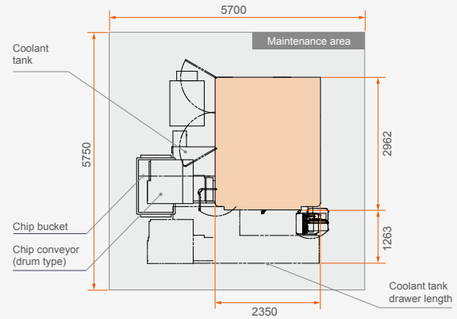
The front pull-out coolant tank facilitates easy maintenance.

7 Space-saving floor area and maintenance area

The compact design minimizes the machine floor space and equipment space in the maintenance area.

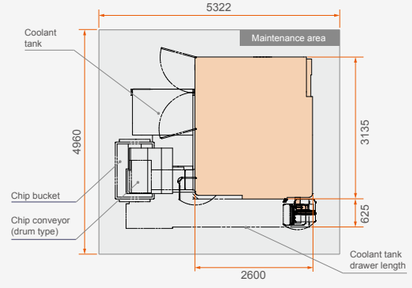
VARIAXIS C-600
30/60 tool magazine
Chip conveyor side discharge

Floor area 7.0 m²
Maintenance area 32.8 m²



VARIAXIS C-700
30/60 tool magazine
Chip conveyor side discharge

Floor area 8.2 m²
Maintenance area 26.4 m²



Coolant & Chip Disposal

Coolant

Flood coolant (standard)

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

Workpiece washing coolant OPTION

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

SUPERFLOW coolant system OPTION

The SUPERFLOW coolant system features improved chip-control and lubrication, along with lower tool-tip temperatures.
· High-performance cyclone filter with minimum maintenance requirements
· Easily set coolant pressure by M-code (pressure range from 0 to 7 MPa (0 to 70 kgf/cm^2))

Coolant through spindle OPTION

Coolant is fed to the tool tip by passages through the tool for lower tool tip temperatures, improved chip-control and lubrication. 2 pump pressure specifications are available : 0.5 MPa (5 kgf/cm^2) and 1.5 MPa (15 kgf/cm^2).

Coolant temperature control OPTION

Control coolant temperature to prevents heat displacement for higher machining accuracy. Energy-saving inverter control* method is adopted.

Quick coolant stop OPTION

Quick coolant stop prevents leakage of residual coolant in the tool magazine area during tool exchange to improve the working environment.

Mist collector OPTION

Remove coolant mist generated by machining from the machining area to maintain a safe and clean working environment.

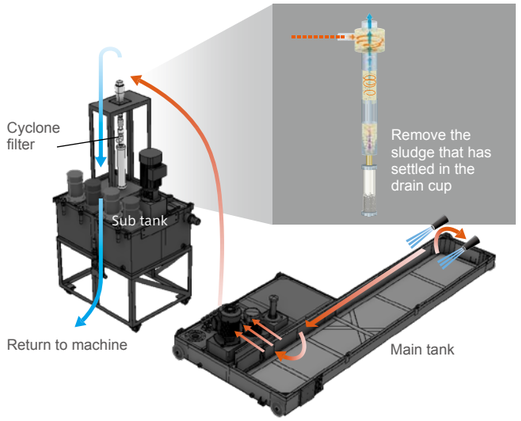
Oil skimmer OPTION

Oil skimmer collects the oil content, such as floating working oil and lubricating oil, mixed in water-soluble coolant. This will maintain machining accuracy and extend the coolant's lifespan.

Coolant system (Cyclone filtered sub tank) OPTION

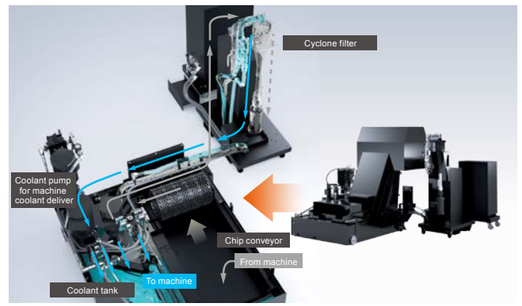
Convection induced by nozzles installed in the main tank prevents the accumulation of chips and sludge. Chips are collected with a dedicated pump along with the coolant and separated using a cyclone filter to remove over 95% of particles larger than 20μm. This maintains the cleanliness of the tank, resulting in an extended lifespan for the coolant and improved ease of maintenance.

* Only available with VARIAXIS C-600



Smooth coolant system OPTION

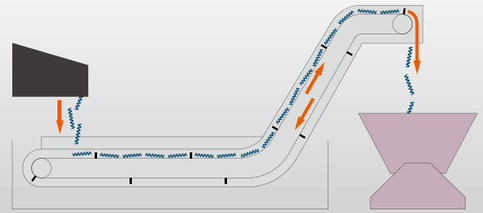
Smooth coolant system collects sludge and saves energy. By adopting a high-performance filter, it can recover 99% of the sludge, keep the tank clean, and achieve extended coolant lifespan and improved maintainability. In collaboration with the Energy saver in the CNC system, it can control the optimal coolant discharge amount according to the machining requirements, enabling energy-efficient machining. For more details, please refer to page 23.



Chip Disposal

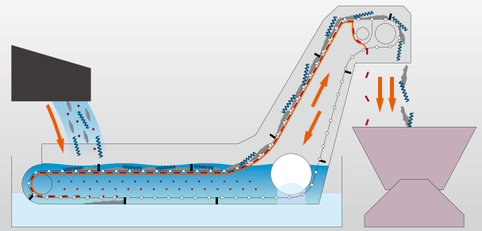
Chip conveyor (hinge) OPTION

Chips are removed by hinge-plate belt and discharged from the rear side of the machine. Very suitable for curly shaped steel chips from 30 mm to 150 mm long.



Chip conveyor (drum) OPTION

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



High-speed and high-precision control CNC system

MAZATROL SMOOTHAi

Shown with optional dual monitor

Innovation with latest features

Smooth graphical user interface

MAZATROL Smooth graphical user interface is operable similar to smart phone / tablet, allowing for easy and intuitive control.

Ease of operation

Designed for unsurpassed ease of operation with advanced intelligent functions.

Unparalleled high-speed, high-precision control

Latest hardware and software for unprecedented speed and precision.

High-precision 5-axis machining programming

High-precision 5-axis machining programming and high-speed simulation provide extensive support at every step of the process, from programming to machining.

AI

Vibration control and heat displacement compensation with AI ensure improved machining surfaces as well as stable high-accuracy machining.

Digital Twin

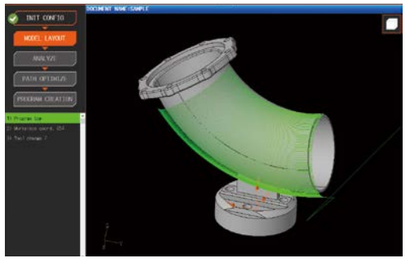
Virtual machines are created on an office PC for efficient setup and further enhanced productivity.

Cutting adviser

Optimize machining conditions through simulation and visualization of machining processes from accumulated machining results.

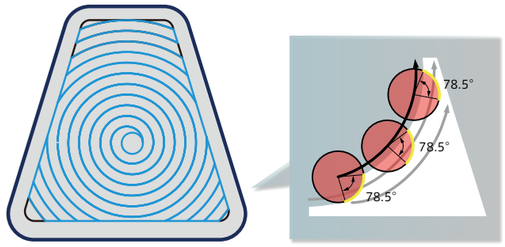
SMC PLUS OPTION

Compares the cutting point of the EIA program with the 3D model to change the correct command point for correct tool paths and high-accuracy finished surfaces.



Pocket milling

Pocket Milling is a new pocketing cycle for MAZATROL programming. This function maintains a constant angle of engagement between the cutter and material to create a high efficiency tool path, reduces chip load variation, extends tool life and allows tools to be used to their full potential.



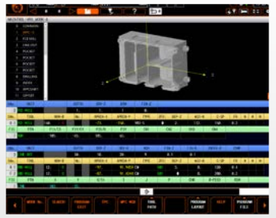
Convenient Parameter Setting and Fine Tuning Function

SMOOTH MACHINING CONFIGURATION

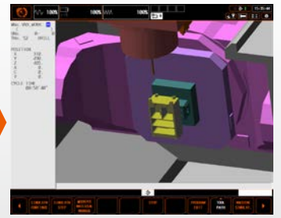
Machining features including cycle time, finished surface, and machining shape can be adjusted by slider switches on the display according to material requirements and machining methods. With MAZATROL SmoothAi, rotary axis can be adjusted as well as linear axis, allowing for optimal adjustments for 5-axis machining.

Smooth CAM Ai OPTION

Programs can be made and edited, as well as performing simulation and analysis in the office for multiple machines.



Programming



Fast simulation

Machining analysis · Optimization

Ease of Programming

Easy programming

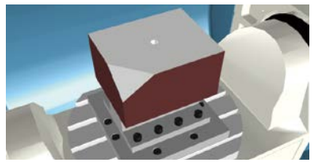
Multiple-surface machining

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

Setting Coordinate

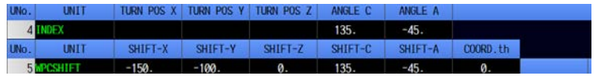
Setting Index Angle

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



Program origin automatic calculation workpiece coordinate shift

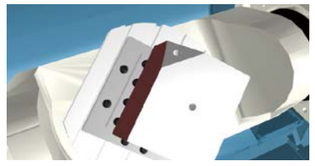
Program origin automatic calculation workpiece coordinate shift.



Setting Index Angle

Coordinate Shift

No complicated calculations required when changing program coordinate system.

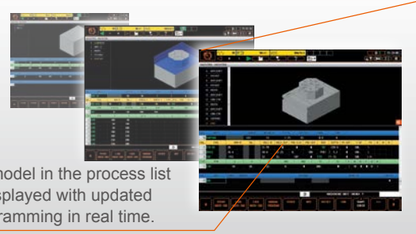


QUICK MAZATROL

Reduced time for conversational programming

Programs can be easily created and checked by displaying the 3D model of the workpiece. Can reduce input errors and time for program checking.

Quickly move to the corresponding section in the MAZATROL program by touching a feature in the 3D model.



3D model in the process list is displayed with updated programming in real time.

3D ASSIST

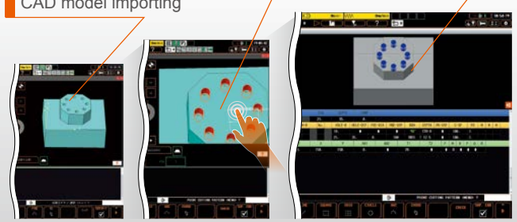
Making a program directly from 3D CAD data

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

Automatically input to MAZATROL program

Shape selection

CAD model importing



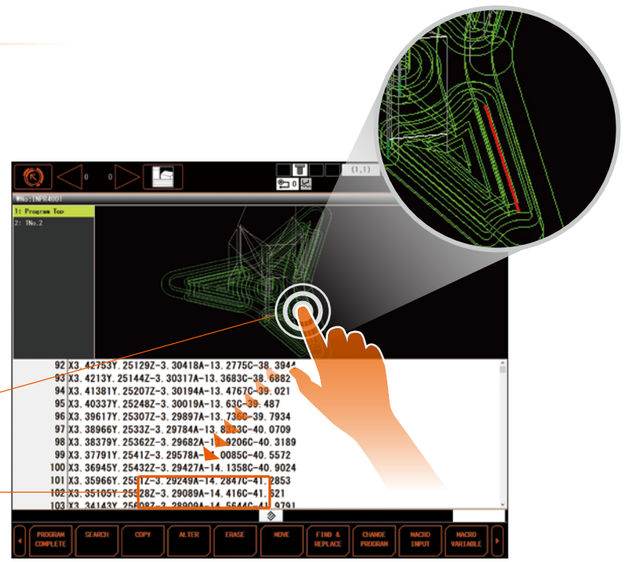
QUICK EIA

EIA program visualization

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

Selecting tool path by touching the screen.

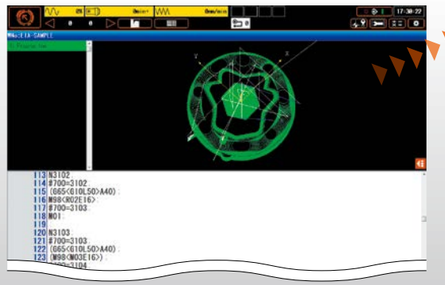
Moving to the corresponding EIA program line.

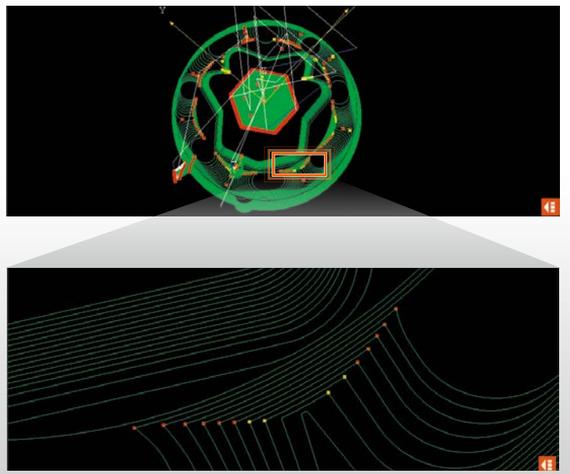


VIEW SURF

Analyzing EIA programs

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



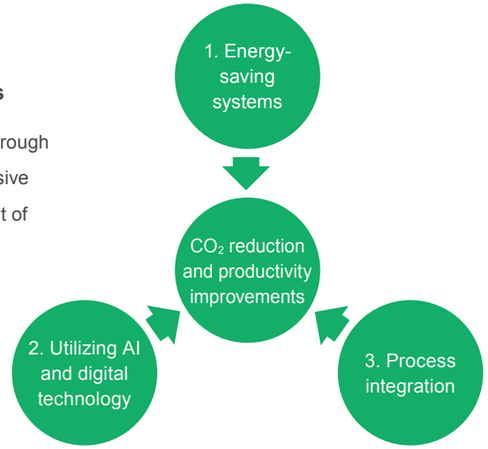


Environmentally Friendly

Mazak Go GREEN

Decarbonization-related technology for Mazak products

We are committed to developing technology for decarbonization through productivity improvements. Mazak promotes the three comprehensive approaches to the reduction of our environmental impact in support of achieving a sustainable society.

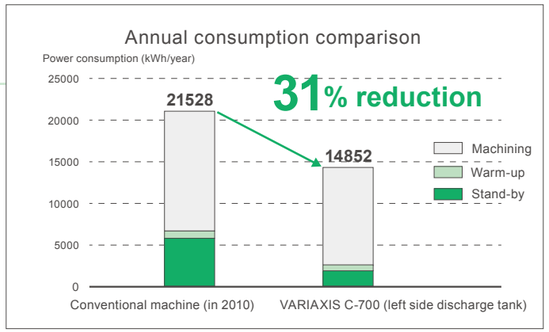


Energy-saving equipment reduces power consumption

◎Hydraulic unit utilizing accumulator

◎Inverter type chiller unit

Annual power consumption
31% reduction



Energy saver

Energy consumption and the regenerative power produced through the energy saving equipment can be viewed visually on the CNC system - control/ management of coolant and other equipment.

Graphical display

Display instantaneous power / consumed power / regenerated power / actual power graphically.

Trend display

Display power consumption by hour / day / week / month.

Optimal control function

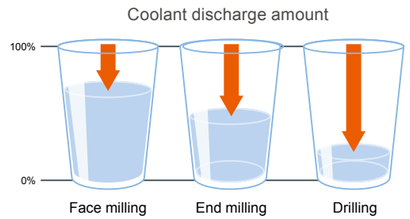
Displays the energy-saving status of each piece of equipment.
Energy-saving level can be adjusted.

Smooth coolant system OPTION

Optimal control of coolant discharge amount

Energy saver automatically determines the optimal coolant discharge for energy-saving machining.

◎The cutting volume is calculated by simulation
◎The optimal discharge amount is automatically determined



Energy-saving coolant system with sludge removal performance

No need to frequently clean the tank

The coolant tank has a coolant jet that makes a vortex in the center so that small machined chips will not settle in the tank. Thanks to this feature, the coolant tank stays clean and the service life of the coolant is extended. Ease of maintenance is also ensured.
The frequency of coolant changes is reduced as well as CO_2 emissions at coolant disposal

High performance filter removes 99% of sludge

The high-performance filter suctions the chips along with the coolant, separates them, and removes 99% of the sludge.

Sludge removal rate
99%

Reduced running cost / environmental impact

Reduced tank cleaning, optimal control of coolant discharge and the efficient pump operation with inverters, reduces power consumption and CO_2 emissions.

Smooth coolant system deployment

Standard Machine Specifications

		VARIAXIS C-600	VARIAXIS C-700
Stroke	X-axis travel (spindle head left / right)	650 mm	860 mm
	Y-axis travel (spindle head back / forth)	550 mm	600 mm
	Z-axis travel (spindle head up / down)	530 mm	
	B-axis travel (table tilt)	-30° to +120°	
	C-axis travel (table rotation)	±360°	
Table	Distance from table top to spindle nose	50 to 580 mm (table horizontal)	100 to 630 mm (table horizontal)
	Table size	Φ600 mm × Width 500 mm	Φ700 mm × Width 500 mm
	Max. workpiece size	Φ730 mm × 450 mm	Φ850 mm × 500 mm
	Table load capacity (evenly distributed)	500 kg	700 kg
	Table surface configuration	M16 × P2 (5/8-11 UNC) tap 20	M16 × P2 (5/8-11 UNC) tap 24
Milling Spindle	Max. spindle speed	12000 rpm (min^{-1})	
	Spindle taper	7 / 24 taper No.40	
	Spindle bearing I.D.	Φ70 mm	
Feedrate	Rapid traverse rate (X-, Y-, Z-axis)	42 m/min	
	Rapid traverse rate (B-, C-axis)	30 rpm (min^{-1})	
	Simultaneously controlled axes	5-axis	
	Min. indexing increment (B-, C-axis)	0.0001°	
Automatic tool changer	Tool shank configuration	BT40	
	Tool storage capacity	30 tools	
	Max. tool diameter / length (from gauge line) / weight	Φ80 mm / 300 mm / 8 kg	
	Max. tool diameter with adjacent tool pockets empty	Φ130 mm	
	Tool selection method	MAZATROL random memory (random pocket assignment)	
	Tool change time (chip-to-chip)	4.5 sec.	4.8 sec.
Motors	Spindle motor (40% ED (30 min.rating) / cont.rating)	11 kW (15 HP) / 11 kW (15 HP)	
	Electrical power requirement (40% ED (30 min.rating) / cont.rating)	33.02 kVA / 33.02 kVA	33.02 kVA / 33.02 kVA
Coolant	Coolant tank capacity	200 L	270 L
Machine size	Height	3039 mm	3189 mm
	Width	2350 mm	2600 mm
	Length	2962 mm	3135 mm
	Machine weight	10000 kg	11200 kg

Standard and Optional Equipment

● : Standard ○ : Option - : N/A

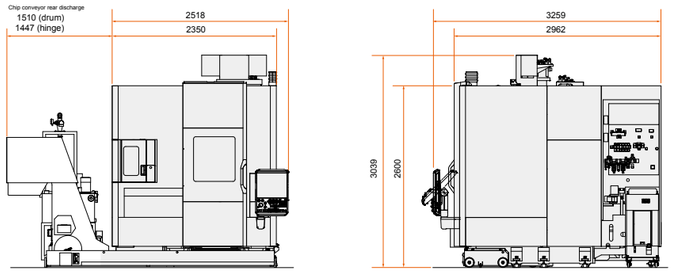
		VARIAXIS C-600	VARIAXIS C-700
Table	Φ600 mm × 500 mm tapped table	●	-
	Φ600 mm × 500 mm T-slot table	○	-
	Φ700 mm × 500 mm tapped table	-	●
	Φ700 mm × 500 mm T-slot table	-	○
Machine	Work light	●	●
	Ai THERMAL SHIELD	●	●
	12000 rpm (min^{-1})	●	●
	15000 rpm (min^{-1}) high torque spindle	○	○
	18000 rpm (min^{-1})	○	○
	20000 rpm (min^{-1})	○	○
Factory Automation	Automatic tool length measurement and tool breakage detection (PRIMO LTS)	●	●
	Laser tool measurement system (NC4)	○	○
	30 tool magazine	●	●
	60 tool magazine	○	○
	90 tool magazine	○	○
	120 tool magazine	○	○
	Work measurement printout (printer not included)	○	○
	Absolute positioning system	●	●
	Remote manual pulse generator	○	○
	Front door automatic open / close	○	○
	Automatic power ON / OFF + warm-up operation	●	●
	Operation end buzzer	○	○
	Status light (3 colors)	○	○
	2-pallet changer	○	○
	4-pallet, 6-pallet changer	-	○
	Wireless touch probe RMP600	○	○
	Preparation for hydraulic fixtures	○	○
	Robot interface	○	○
	Hydraulic/pneumatic fixture 4 ports	○	○
	Right side door automatic open / close	○	○
Safety Equipment	Operator door interlock	●	●
High Accuracy	MAZA-CHECK (software, reference sphere)*1	●	●
	Ball screw core cooling (X-, Y-, Z-axis)	●	●
	Scale feedback (X-, Y-, Z-axis)	○	○
	Scale feedback (B-, C-axis)	○	○
Coolant / Chip Disposal	Coolant system	●	●
	Work air blast	○	○
	Oil skimmer	○	○
	Mist collector	○	○
	Coolant temperature control	○	○
	Hand held coolant nozzle	○	○
	Coolant through spindle system 0.5 MPa (5 kgf/cm²)	○	○
	Workpiece washing coolant	○	○
	High pressure coolant through spindle 1.5 MPa (15 kgf/cm²)	○	○
	SUPERFLOW coolant system 7.0 MPa (70 kgf/cm²)	○	○
	Flood coolant 0.45 MPa (4.5 kgf/cm²) 30 L/min	●	●
	Coolant through spindle pressure switch	○	○
	Coolant tank with secondary filter	○	○
	Smooth coolant system	○	○
	Chip conveyor (hinge) side discharge	○	○
	Chip conveyor (drum type) side discharge	○	○
	Chip conveyor (hinge) rear discharge	○	○
	Chip conveyor (drum type) rear discharge	○	○
	Chip bucket (swing type)	○	○
	Chip bucket (fixed type)	○	○
Tooling	Pull stud bolt	○	○
Others	Manual (CD)	●	●
	Additional manuals	○	○
	MAZATROL SmoothAi dual monitor	○	○

*1 MAZA-CHECK requires RMP600 wireless touch probe.

Machine Dimensions

Unit : mm

VARIAXIS C-600



VARIAXIS C-700

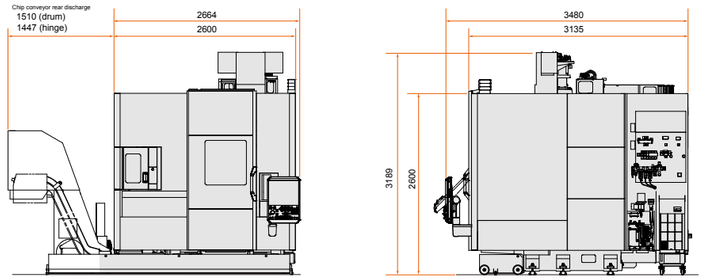
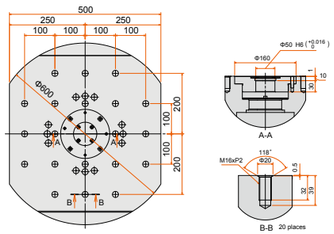


Table Dimensions

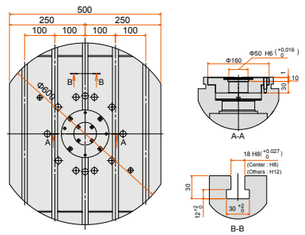
Unit : mm

VARIAXIS C-600

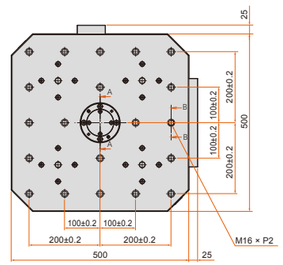
Tapped pallet (standard)



T-slot pallet (option)

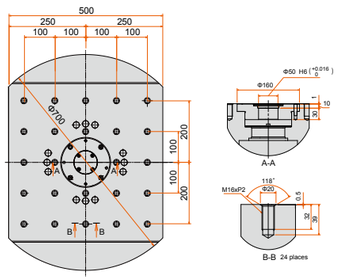


2-pallet changer pallet(option)

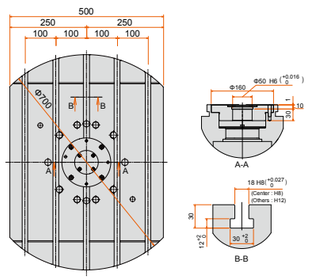


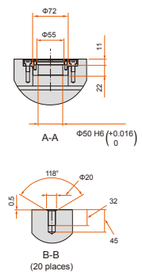
VARIAXIS C-700

Tapped pallet (standard)



T-slot pallet (option)





MAZATROL SmoothAi Specifications

	MAZATROL	EIA
Number of controlled axes	Simultaneous 2 to 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, Synchronous tapping*	Positioning (interpolation), Positioning (non-interpolation), Linear interpolation, Circular interpolation, Spiral interpolation, Helical interpolation, Cylindrical interpolation*, Involute interpolation*, Fine spline interpolation*, NURBS interpolation*, Polar coordinate interpolation*, 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)	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)
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 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, 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, Ai Thermal shield, 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, Single process, Machine lock	Optional block skip, Optional stop, Dry run, Manual handle interruption, MDI interruption, TPS, Restart, Restart 2, Collation stop, Machine lock
Manual measuring functions	Tool length teach, Touch sensor coordinates measurement, Workpiece offset measurement, WPC coordinate measurement, Measurement on machine	Tool length teach, Tool offset teach, Touch sensor coordinates measurement, Workpiece offset measurement, Measurement on machine
Automatic measuring functions	WPC coordinate measurement, Automatic tool length measurement, Sensor calibration, Tool breakage detection, External tool breakage detection*	Automatic tool length measurement, Sensor calibration, Tool breakage detection, External tool breakage detection*
MDI measurement	Semi automatic tool length measurement, Full automatic tool length measurement, Coordinate measurement	
Interface	PROFIBUS-DP*, EtherNet/IP*, CC-Link*, CC-Link IE Field Basic	
Card interface	SD card interface, USB	
EtherNet	10 M / 100 M / 1 Gbps	
Security	Security software	

*Option