Mazak

VC
SERIES

[300A | 300A/5X | 500A/5X | VC-500C/2PC]

Mazak
SMOOTH TECHNOLOGY

VC-500A/5X

VC SERIES

Quality, Innovation and Value
Without Sacrificing Performance

The Kentucky-built VC Series of Vertical Machining Centers combines high-quality, innovation and extreme cost-effectiveness without sacrificing machine performance. Then, to ensure full customer satisfaction, Mazak backs these machines with the industry's most acclaimed and comprehensive service and support program.

Machine Configurations:

- VC-300A
  Process small parts accurately in a small footprint with a 3-axis table and the touchscreen control of a MAZATROL SmoothG CNC.

- VC-300A/5X
  Apply the powerful flexibility of a MAZATROL SmoothX CNC and 5-axis rotary/tilt table to create small, complex workpieces.

- VC-500A/5X
  Build small workpieces with complex geometries through the advanced capabilities of a MAZATROL SmoothX CNC and full 5-axis machining on a trunnion-style rotary/tilt table.

- VC-500C/2PC
  Process small to medium-sized parts through the powerful flexibility of a MAZATROL SmoothG CNC and 3-axis machining with an inline two-pallet changer.

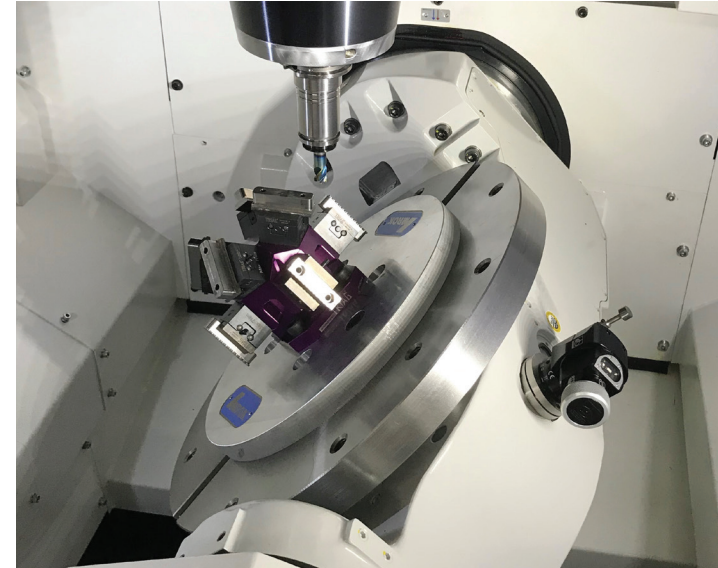VC-300A

High Productivity

The VC Series provides the perfect balance of advanced technology and minimized operational costs. The machines feature several new and innovative technologies that deliver increased productivity, precision, performance and value to today's shops.

Top 10 Technological Advantages of the VC Series

1. Innovative small footprint conserves valuable shop floor space and allows for fast and easy machine installation.

2. Extremely rigid base for stability and vibration damping.

3. Robust high-performance spindles offered in various speed/torque configurations.

4. Mazak MX Hybrid Roller Guide System delivers durability, reliability and long-term accuracy.

5. Mazak MAZATROL Smooth CNCs provide fast and easy MAZATROL conversational and EIA/ISO programming.

6. Affordable 5-axis capability for contoured part machining and five-face machining.

7. Two-pallet changer further boosts machine utilization and efficiency.

8. Large-capacity tool magazines with automatic tool changers extend uninterrupted, continuous machine operation.

9. Simple and efficient chip management helps reduce downtime.

10. Seamless automation integration options increase uptime and lights-out production.

VC-500A/5X

VC-500A/5X

SmoothX Control

VC-300A/5X

VC-500C/2PC

Machine Design

The Mazak Kentucky factory uses a production-on-demand approach for manufacturing agility to quickly react to current market trends, which means machines are all built to incorporate the latest, most innovative technology.

The VC Series machines easily fit into most shops and can be up and running quickly and with very little initial setup effort. Most vertical machining centers require large amounts of floor space, even if the parts they are cutting are relatively small; the VC Series machines handle the same range of part sizes while conserving valuable shop floor real estate and boosting a shop's productivity.

Extremely rigid and stable cast iron base components – with a design verified by FEA analysis results – yield superior base casting for VC model machines. The series encompasses several configurations, including 3-axis, 3-axis with pallet changer and 5-axis rotary/tilt table.

The VC Series **3-axis machine configuration** is ideal for basic workpiece geometries and provides effective part processing with quick, simple job setups.

The VC Series models with a **5-axis rotary/tilt table** provide affordable full simultaneous 5-axis machining and five-face machining capability to cost-effectively process complex parts.

The **2-pallet changer** on the VC-500C increases spindle utilization and enables continuous uninterrupted production. As a form of simple and efficient automation, turntable-style pallet changing capability enhances productivity by allowing operators to load, unload and inspect parts on one pallet while the machine continues to work uninterrupted on parts fixtured on the other pallet.


VC-500C/2PC

VC-500C/2PC Section

TRUNNION TABLES

The VC-500A/5X full simultaneous 5-axis machine features a trunnion-style tilt/rotary table that delivers fast and accurate positioning. The table uses high-precision roller gears that further enhance speed, strength and reliability.

**Key specifications for the trunnion-style table include:**
- Rotation range of +110/-110 degrees in the B axis and 360 degrees in the C axis
- Maximum workpiece sizes up to 19.68" (500 mm) in diameter and 12" (305 mm) high and weighing as much 441 lb (200 kg)
- Indexing accuracy of ±4 seconds in B and C axes
- Repeatability of ±1 second in B and C axes
- Positioning speeds up to 50 min[1] (300 deg/sec) in the B axis and 40 min[1] (240 deg/sec) in C
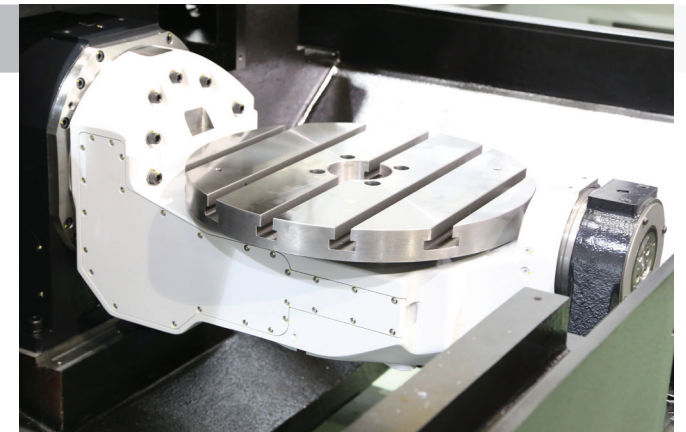
ROLLER GUIDE SYSTEM

The Mazak MX Hybrid Roller Guide System featured on the VC Series machines allows for faster speeds and higher accuracy, leading to improvements in overall machine productivity and profitability. When compared with traditional ball guides and boxways, the advantages of the Mazak MX Hybrid Roller Guide System are clear:

- More surface contact for large load capacities and better dampening
- Better distribution load points via an X-shaped design that allows load to be applied in four directions
- Higher positioning accuracy than boxways due to no stick and slip
- Faster and greener than boxways with nearly twice the rapid traverse rate and less risk of contamination in the machine's coolant system
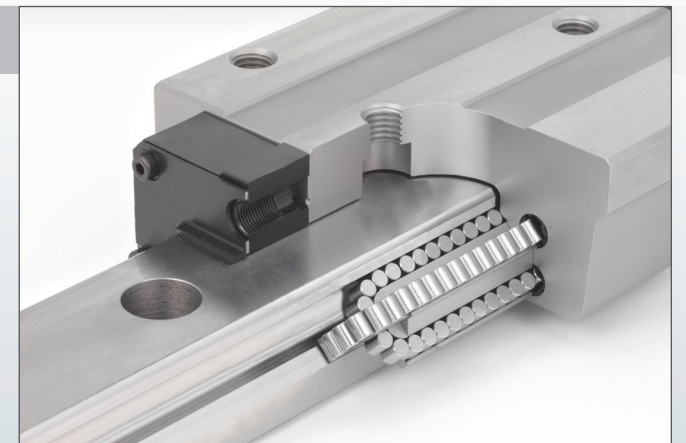
MX Hybrid Roller Guide

Machine Design

SPINDLE POWER AND SPEEDS

With powerful, rigid spindles, VC Series machines let shops achieve high productivity and maintain exceptional accuracy. Standard machine spindles deliver unbeatable metal removal rates for all common materials, including steels, aluminums and cast irons. Mazak also offers other maximum spindle speeds so shops can effectively match spindle performance to specific part-machining needs.
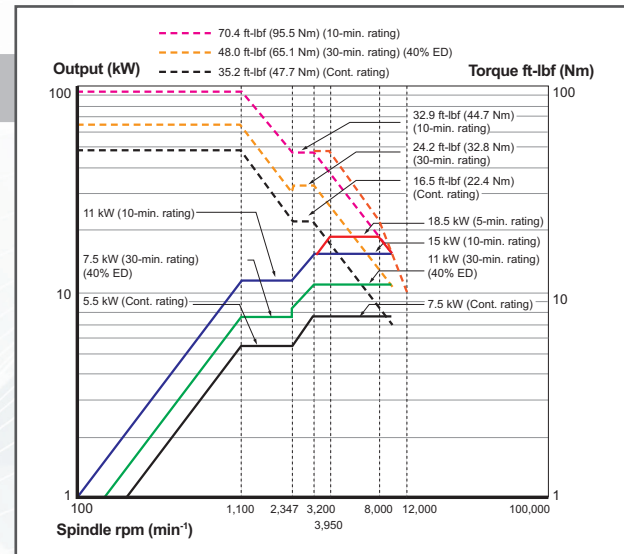
Spindle Options

• 12,000 rpm standard on all models
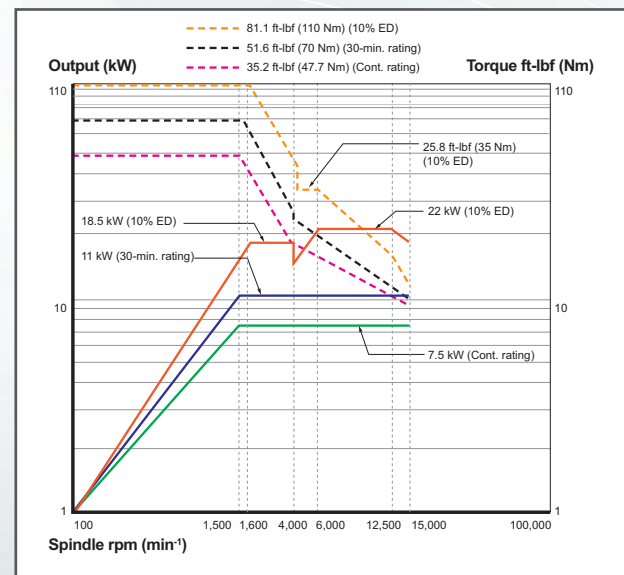• 15,000 rpm option on VC-500 models
• 20,000 rpm option on all models
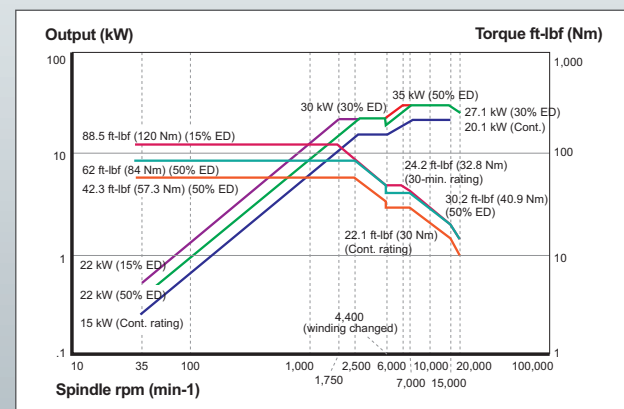
Spindle

Output-torque diagram 40-12,000 min-1

Output (kW) — Torque ft-lbf (Nm)

- - - 70.4 ft-lbf (95.5 Nm) (10-min. rating)
- - - 48.0 ft-lbf (65.1 Nm) (30-min. rating) (40% ED)
- - - 35.2 ft-lbf (47.7 Nm) (Cont. rating)

32.9 ft-lbf (44.7 Nm) (10-min. rating)
24.2 ft-lbf (32.8 Nm) (30-min. rating)
16.5 ft-lbf (22.4 Nm) (Cont. rating)
11 kW (10-min. rating)
18.5 kW (5-min. rating)
15 kW (10-min. rating)
7.5 kW (30-min. rating) (40% ED)
11 kW (30-min. rating) (40% ED)
5.5 kW (Cont. rating)
7.5 kW (Cont. rating)

Spindle rpm (min⁻¹): 100, 1,100, 2,347, 3,200, 3,950, 8,000, 12,000, 100,000

(FOR REFERENCE ONLY)

Output-torque diagram 40-15,000 min-1

Output (kW) — Torque ft-lbf (Nm)

- - - 81.1 ft-lbf (110 Nm) (10% ED)
- - - 51.6 ft-lbf (70 Nm) (30-min. rating)
- - - 35.2 ft-lbf (47.7 Nm) (Cont. rating)

25.8 ft-lbf (35 Nm) (10% ED)
22 kW (10% ED)
18.5 kW (10% ED)
11 kW (30-min. rating)
7.5 kW (Cont. rating)

Spindle rpm (min⁻¹): 100, 1,500, 1,600, 4,000, 6,000, 12,500, 15,000, 100,000

(FOR REFERENCE ONLY)

Output-torque diagram 40-20,000 min-1

Output (kW) — Torque ft-lbf (Nm)

35 kW (50% ED)
30 kW (30% ED)
27.1 kW (30% ED)
20.1 kW (Cont.)
88.5 ft-lbf (120 Nm) (15% ED)
24.2 ft-lbf (32.8 Nm) (30-min. rating)
62 ft-lbf (84 Nm) (50% ED)
42.3 ft-lbf (57.3 Nm) (50% ED)
30.2 ft-lbf (40.9 Nm) (50% ED)
22.1 ft-lbf (30 Nm) (Cont. rating)
22 kW (15% ED)
22 kW (50% ED)
15 kW (Cont. rating)
4,400 (winding changed)

Spindle rpm (min-1): 10, 35, 100, 1,000, 1,750, 2,500, 6,000, 7,000, 10,000, 15,000, 20,000, 100,000

(FOR REFERENCE ONLY)

AUTOMATIC TOOL CHANGERS AND TOOL STORAGE

For part-production versatility, VC Series machines feature servo-driven automatic tool changers (ATC) that significantly reduce non-cut time by quickly exchanging tools and getting back in the cut in the shortest times possible.

• 30-tool ATC standard on all models
• 40 and 60-tool ATC options on VC-500C/2PC and VC-500A/5X

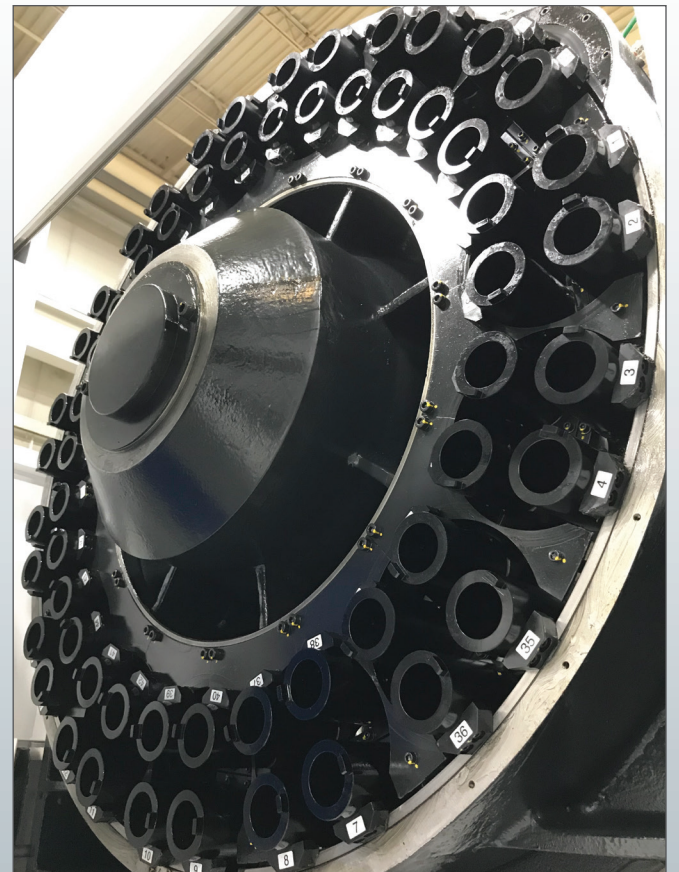30-Tool Magazine

TURRET-STYLE 60-TOOL MAGAZINE OPTION

Mazak's unique turret-style tool magazine incorporates 15 four-position tool units for a 60-tool storage capacity. The ample capacity allows for continuous production, helps reduce setup time and ensures enough tooling to process complex workpieces or stock redundant tooling.
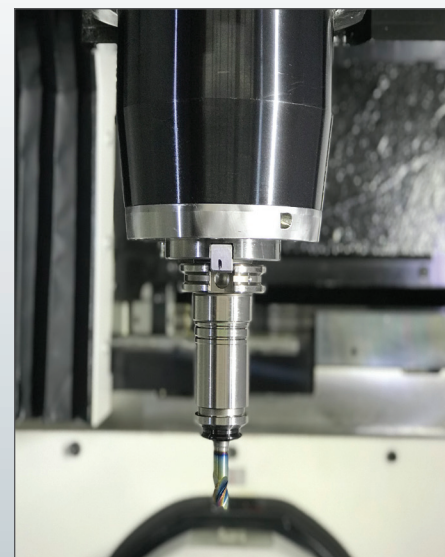
Spindle

60-Tool Magazine

High Accuracy

Mazak's rigid machine base structure, advanced spindle/motor design and MAZATROL Smooth CNC submicron machine movement gives VC Series machines extremely high part-accuracy and surface-finish capabilities. As with all the machines built at the Mazak Kentucky iSMART Factory™, Mazak closely monitors the manufacture and assembly of each and every VC Series machine to guarantee their consistent precision and performance.

To further ensure the highest precision possible over extended hours of operation, Intelligent Machine functions minimize detrimental vibration and heat when machining.

ACTIVE VIBRATION CONTROL

Mazak's ACTIVE VIBRATION CONTROL function effectively reduces vibration for high-accuracy positioning in all axes and shorter machining cycle times. It also curbs the effects such vibration has on the cutting tool for longer tool life and exceptional part surface finishes.

INTELLIGENT THERMAL SHIELD

Mazak designs its machine tools to create the least amount of heat possible. The THERMAL SHIELD FUNCTION was designed to account for any thermal change within the machine or any ambient changes within the manufacturing environment that could influence the machine.

Mazak iSMART Factory

The Mazak iSMART Factory encompasses the complete digital integration of the factory with state-of-the-art equipment, automation and advanced manufacturing practices. It hinges on the free flow and sharing of data in terms of process control and operation monitoring to ensure the highest quality standards and the utmost production consistency from one machine to the next.
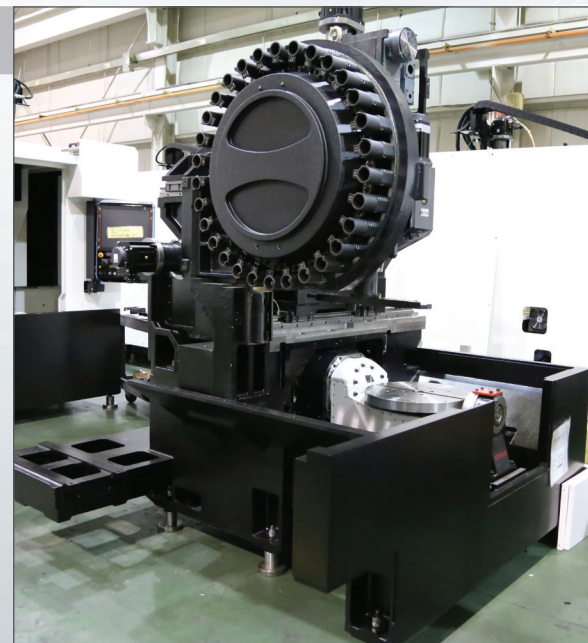
Ergonomics

DESIGNED FOR UNSURPASSED EASE OF OPERATION

OUTSTANDING ACCESSIBILITY

Operators have excellent access to the table from the front of the machine thanks to large door openings that enable convenient workpiece loading/unloading and machine setup.

WELL-LIT WORKING ENVIRONMENT

Multi-LED lighting deployed strategically throughout the work envelope allows operators to easily see the entirety of the cutting area.

EASE OF MAINTENANCE

The single external maintenance panel for the VC Series machines is easy to access, and cables are easy to identify by color, which reduces time required for maintenance.

ERGONOMIC ATC LOADING

The high-capacity tool magazines used in the automatic tool changer (ATC) feature a carousel design to put every tool pocket well within the operator's reach for fast, easy loading.

MAZATROL SmoothG Control

The MAZATROL SmoothG CNC optimizes programming and makes it easy to generate programs for processing complex parts through off-centerline machining as well as angled drilling, milling and tapping. The control incorporates a wide variety of advanced programming functions that allow it to offer complete ease of use and ensure high-speed, high-accuracy machining performance.

Features and functions of the MAZATROL SmoothG control include:

- **Virtual Machining** allows operators to perfect part programs prior to initiating cutting
- **High Gain Feed Forward Control** boosts machining speed and accuracy
- **Fast Rotary Axis Speeds** optimize gear skiving and rotary axis threading
- **Variable Acceleration Control** calculates optimal acceleration for a combination of axes
- **Real Time Tuning** ensures optimal machining balance as workpiece weight changes
- **Quick MAZATROL** makes it possible to directly import 3D CAD models into the control and automatically extract coordinates from them to simplify machine programming
- **Quick EIA** plots toolpaths prior to running programs and checks for any interferences in those paths
- **EIA/ISO and Conversational Programming Capabilities**

SmoothG CONTROL SPECIFICATIONS

	MAZATROL	EIA
Number of controlled axes	Simultaneous 2 ~ 4 axes	
Least input increment	0.00001 inch, 0.0001 mm, 0.0001°	
High-speed, high-precision control	Shape error designation, Smooth corner control, Rapid traverse overlap, Rotary axis shape compensation	Shape error designation, Smooth corner control, Rapid traverse overlap, Rotary axis shape compensation, High-speed machining mode, High-speed smoothing control function
Interpolation	Positioning (Linear interpolation), Positioning (Independent interpolation), Linear interpolation, Circular interpolation, Cylindrical coordinate interpolation, Polar coordinate interpolation, Synchronized milling spindle tapping*	Positioning (Linear interpolation), Positioning (Independent interpolation), Linear interpolation, Circular interpolation, Spiral interpolation, Helical interpolation, Cylindrical coordinate interpolation*, Fine spline interpolation*, NURBS interpolation*, Polar coordinate interpolation*, Synchronized milling spindle tapping*
Feed rate	Rapid traverse, Cutting feed, Cutting feed (per minute), Cutting feed (per revolution),Dwell (specified time, specified number of rotation), Rapid traverse override, Cutting feed override, G0 speed variable control, Feedrate clamp, Variable acceleration/deceleration control, Constant control for G0 tilting*	Rapid traverse, Cutting feed, Cutting feed (per minute), Cutting feed (per revolution), Inverse time feed, Dwell (specified time, specified number of rotation), Rapid traverse override, Cutting feed override, G0 speed variable control, Feedrate clamp,Time constant changing for G1, Variable acceleration/deceleration control, Constant control for G0 tilting*
Program registration	Max. number of programs: 960, Program storage: 2 MB, Program storage expansion: 8 MB*, Program storage expansion: 32 MB*	
Control display	Display: 19" touch panel, Resolution: SXGA	
Spindle functions	S code output, Spindle speed clamp, Spindle speed override, Spindle speed reaching detection, Multiple position orient, Constant surface speed, Spindle speed command with decimal digits, Synchronized spindle control, Max. speed control for spindle	
Tool functions	Tool offset pairs: 4000, T code output for tool number, Tool life monitoring (time), Tool life monitoring (number of machined workpieces)	Tool offset pairs : 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	—	Hobbing*, Shaping function*, Dynamic compensation II*
Machine compensation	G0/G1 independent backlash compensation, Pitch error compensation, Volumetric compensation*	
Protection functions	Emergency stop, Interlock, Stroke check before travelling, Retraction function for the vertical axis, INTELLIGENT SAFETY SHIELD (manual mode), INTELLIGENT SAFETY SHIELD (automatic mode)*, MAZAK VOICE ADVISER	
Automatic operation mode	Memory operation	Memory operation, Tape operation, MDI operation, EtherNet operation*
Automatic operation control	Optional stop, Dry run, Automatic handle control, MDI control, TPS, Restart, Machine lock	Optional block skip, Optional stop, Dry run, Automatic handle control, MDI control, TPS, Restart, Restart 2, Collation stop, Machine lock
Manual measuring functions	Tool length and tip teach, Touch sensor coordinates measurement, Workpiece offset measurement, WPC coordinate measurement, Measurement on machine	Tool length and tip teach, Tool offset teach, Touch sensor coordinates measurement, Workpiece offset measurement, WPC coordinate measurement, Measurement on machine
Automatic measuring functions	WPC coordinate measurement, Auto tool length measurement, Sensor calibration, Tool eye auto tool measurement, Tool breakage detection, External tool breakage detection*	Auto tool length measurement, Sensor calibration, Tool breakage detection, External tool breakage detection*
MDI measurement	Partial auto tool length measurement, Auto tool length measurement, Coordinate measurement	
Interface	PROFIBUS-DP*, EtherNet I/P*, CC-Link*	
Card interface	SD card interface, USB	
EtherNet	10 M / 100 M / 1 G bps	

* Option

MAZATROL SmoothX Control

For highly advanced programming, the MAZATROL SmoothX CNC is the most progressive control available and significantly reduces cycle times, especially in fine-increment programs for full simultaneous 5-axis machining on applicable VC Series machines.

Features and functions of the MAZATROL SmoothX include:

- **VARIABLE ACCELERATION CONTROL** calculates optimal acceleration for a combination of axes.
- **Virtual Machining** allows an operator to verify part programs prior to initiating cutting.
- **SMOOTH Monitor** for equipment monitoring and utilization analysis.
- **Quick EIA** plots toolpaths prior to running programs and checks for any interferences in those paths.
- **Quick MAZATROL** allows for the direct importation of 3D CAD models into the CNC and extracts coordinates from the model to simplify machine programming.
- **3D Assist** lets operators import workpiece coordinate data from 3D CAD data to a MAZATROL program without having to input coordinate values to reduce errors and time spent checking programs.
- **High-Gain Feed Forward Control** boosts machining speed and accuracy.
- **Rapid Overlap** uses arcing motion between programmed stopping points to shorten cycle times.
- **SMOOTH CAM RS** simulates SMOOTH controls on a remote PC.
- **INTELLIGENT POCKET MILLING** engages a high-efficiency toolpath when milling part cavities.
- **SMOOTH CORNER CONTROL** makes cutter path adjustments to help shorten cycle times.
- **EIA/ISO and conversational programming capabilities**.

SmoothX CONTROL SPECIFICATIONS

	MAZATROL	EIA
Number of controlled axes	Simultaneous 2 ~ 4 axes	2 ~ 4 axes, Simultaneous 5 axes[1]
Least input increment	0.00001 inch, 0.0001 mm, 0.0001º	
High-speed, high-precision control	Shape error designation, SMOOTH CORNER CONTROL, Rapid traverse overlap, Rotary axis shape compensation	Shape error designation, SMOOTH CORNER CONTROL, Rapid traverse overlap, Rotary axis shape compensation, High-speed machining mode, High-speed smoothing control function, 5-axis spline[1]
Interpolation	Positioning (Linear interpolation), Positioning (Independent interpolation), Linear interpolation, Circular interpolation, Cylindrical coordinate interpolation, Polar coordinate interpolation, Equal pitch threading[2], Re-threading[1,2], Override threading[1,2], Override variable threading[1,2], Synchronized milling spindle tapping[1]	Positioning (Linear interpolation), Positioning (Independent interpolation), Linear interpolation, Circular interpolation, Spiral interpolation, Helical interpolation, Equal pitch threading[2], Variable pitch threading[2], Threading (C-axis interpolation type)[2], Cylindrical coordinate interpolation[1], Fine spline interpolation[1], NURBS interpolation[1], Polar coordinate interpolation*, Re-threading[1,2], Override threading[1,2], Override variable threading[1,2], Synchronized milling spindle tapping[1]
Feed rate	Rapid traverse, Cutting feed, Cutting feed (per minute), Dwell (specified time, specified number of rotation), Rapid Cutting feed (per revolution), Dwell (specified time, specified number of rotation), Rapid traverse override, Cutting feed override, G0 speed variable control, Feed rate clamp, Variable acceleration/deceleration control, Constant control for G0 tilting[1]	Rapid traverse, Cutting feed, Cutting feed (per minute), Cutting feed (per revolution), Inverse time feed, Dwell (specified time, specified number of rotation), Rapid traverse override, Cutting feed override, G0 speed variable control, Feed rate clamp, Time constant changing for G1, Variable acceleration/deceleration control, Constant control for G0 tilting[1]
Program registration	Max. number of programs: 960, Program storage: 2MB, Program storage expansion[1]: 8MB	
Control display	Display: 19" touch panel, Resolution: SXGA	
Spindle functions	S code output, Spindle speed clamp, Spindle speed override, Spindle speed reaching detection, Multiple position orient, Constant surface speed, Spindle speed command with decimal digits, Synchronized spindle control, Max. speed control for spindle	
Tool functions	Tool offset pairs: 4000, T code output for tool number, Tool life monitoring (time), Tool life monitoring (number of machined workpieces)[2]	Tool offset pairs: 4000, T code output for tool number, T code output for group number, Tool life monitoring (time), Tool life monitoring (number of machined workpieces)[2]
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[2], Tool wear offset, Fixed amount offset[2], Simple wear offset[2]	Tool position offset, Tool length offset, Tool diameter/tool nose R offset, Tool wear offset, Fixed amount offset[2], Simple wear offset[2]
Coordinate system	Machine coordinate system, Work coordinate system, Local coordinate system, Additional work coordinates (300 set)	
Machine functions	—	Rotary axis pre-filter, Angled surface cutting, Hobbing[1], Shaping function[1], Dynamic compensation II[1], Tool nose point control[1], Tool diameter compensation for 5-axis machining[1], Workpiece positioning error compensation[1]
Machine compensation	G0/G1 independent backlash compensation, Pitch error compensation, Geometric deviation compensation, Volumetric compensation[1]	
Protection functions	Emergency stop, Interlock, Stroke check before travelling, Retraction function for the vertical axis, INTELLIGENT SAFETY SHIELD (manual mode), INTELLIGENT SAFETY SHIELD (automatic mode), MAZAK VOICE ADVISER	
Automatic operation mode	Memory operation	Memory operation, Tape operation, MDI operation, EtherNet operation[1]
Automatic operation mode	Optional stop, Dry run, Automatic handle control, MDI control, TPS, Restart, Machine lock	Optional block skip, Optional stop, Dry run, Automatic handle control, MDI control, TPS, Restart, Restart 2, Collation stop, Machine lock
Manual measuring functions	Tool length and tip teach, Touch sensor coordinates measurement, Workpiece offset measurement, WPC coordinate measurement, Measurement on machine, Tool eye measurement[2]	Tool length and tip teach, Tool offset teach, Touch sensor coordinates measurement, Workpiece offset measurement, WPC coordinate measurement, Measurement on machine, Tool eye measurement[2]
Automatic measuring functions	WPC coordinate measurement, Automatic tool length measurement, Workpiece measurement[2], Sensor calibration, Tool eye auto tool measurement[2], Tool breakage detection, External tool breakage detection[1]	Automatic tool length measurement, Workpiece measurement[2], Sensor calibration, Tool eye auto tool measurement[2], Tool breakage detection, External tool breakage detection[1]
MDI measurement	Partial auto tool length measurement, Auto tool length measurement, Coordinate measurement	
Interface	PROFIBUS-DP[1], EtherNet I/P[1], CC-Link[1], USB	
Card interface	SD card interface	
EtherNet	10 M/100M/1Gbps	

[1] Option   [2] Machines with turning only

Fast, Easy and Efficient Programming

The continuously innovative Mazak MAZATROL Smooth controls make programming VC Series machines easy, fast and efficient. The highly versatile controls allow for both EIA/ISO and conversational programming, while other features and capabilities boost power and functionality.

EIA/ISO COMPATIBILITY

MAZATROL Smooth control G-codes are the same as those used in conventional EIA CNC machines. This allows VC Series machine users to run programs made for other different machine brands.

CONVERSATIONAL PROGRAMMING

MAZATROL conversational programming, part of the Smooth control platform, makes it possible for inexperienced operators to quickly and easily develop programs for VC Series machines. Operators answer conversationally displayed questions concerning the intended workpiece. These include queries about material type, workpiece dimensions and part lengths, among others. Then, according to the input data, MAZATROL Smooth CNCs automatically calculate intersection coordinates and tool index positioning in addition to optimized cutting conditions and machining processes.

Number of program lines
89% REDUCTION

EIA / ISO language   MAZATROL language
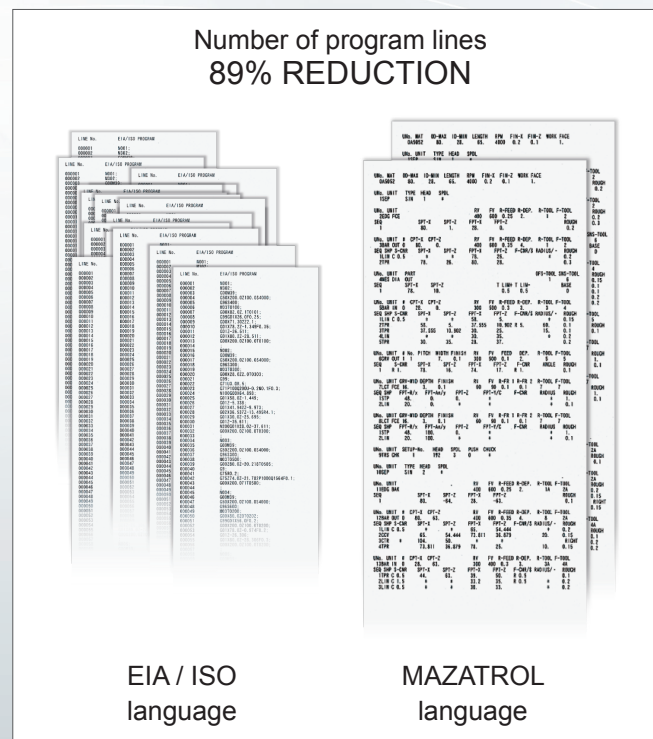
PROCESS HOME SCREENS

MAZATROL Smooth CNCs streamline data entry and minimize the number of displays to reduce programming times for VC Series machines. Five different home process screens each display the appropriate data in an easy-to-understand manner. Operators can quickly navigate to additional screen displays.

SmoothX Programming Screen

SmoothX Tool Data Screen

Process home screens include:

- Programming
- Tool data
- Setup
- Machining
- Maintenance

SmoothX Setup Screen
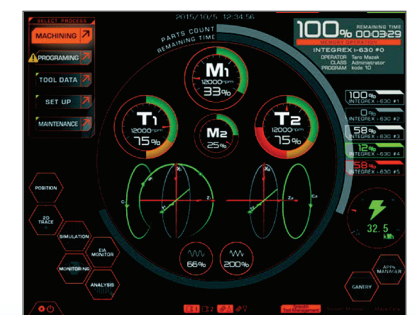
SmoothX Machining Screen

SmoothX Maintenance Screen

Machine Layout – VC-300A & VC-300A/5X
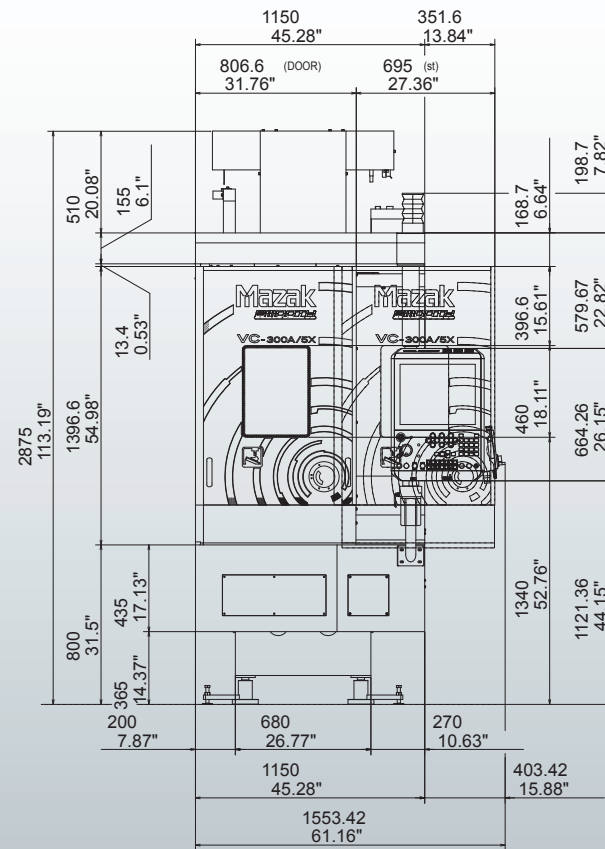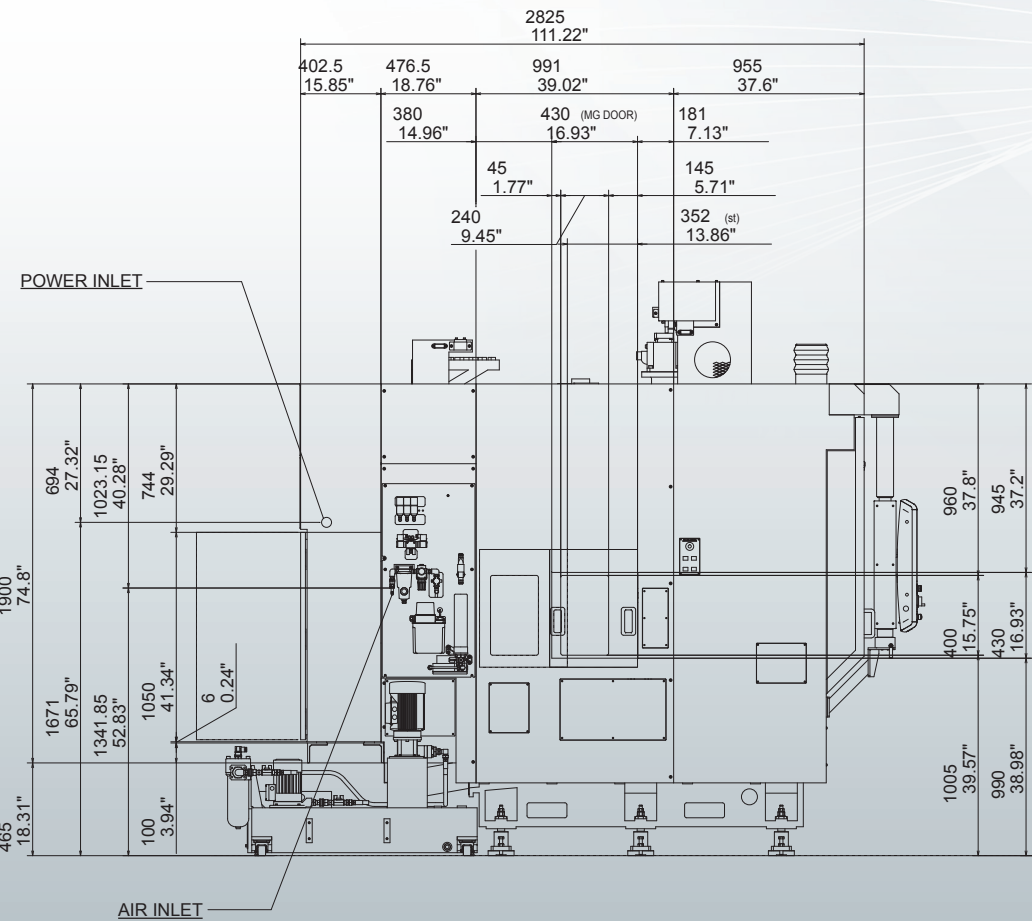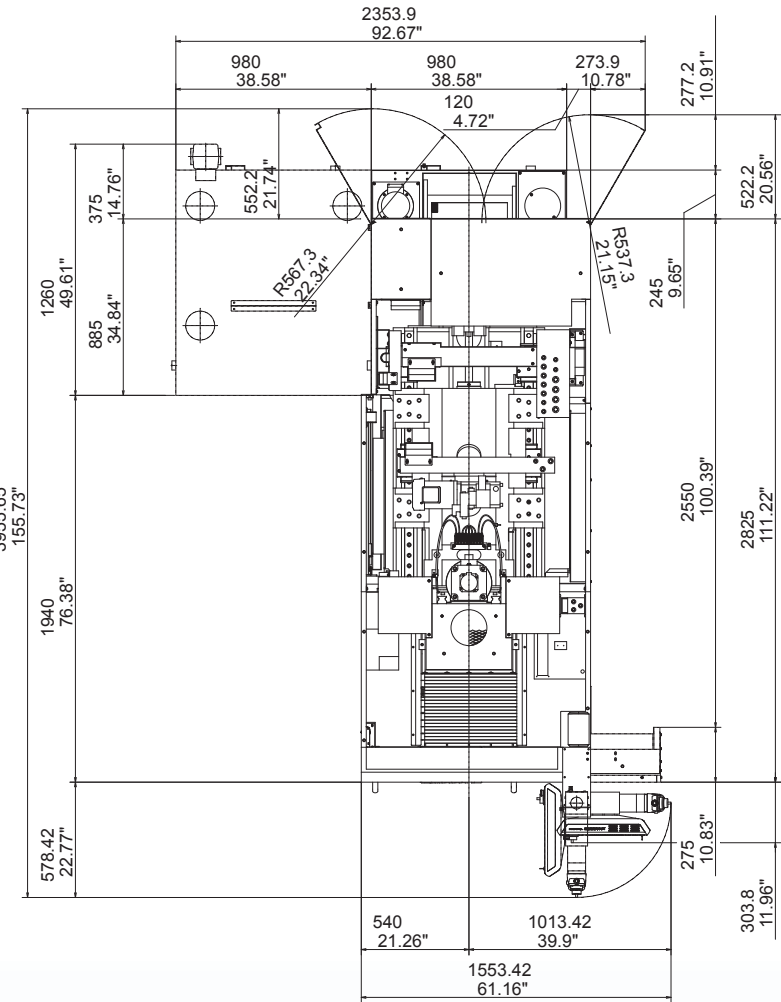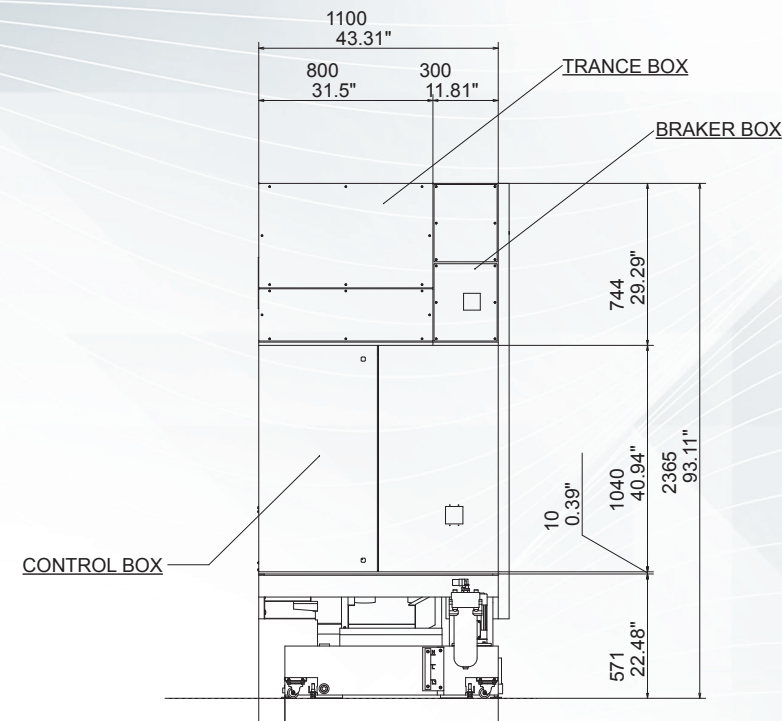## (FOR REFERENCE ONLY)

Unit: mm (inch)

Top-left view labels and dimensions:

- 1100 / 43.31"
- 800 / 31.5"
- 300 / 11.81"
- TRANCE BOX
- BRAKER BOX
- 744 / 29.29"
- 10 / 0.39"
- 1040 / 40.94"
- 2365 / 93.11"
- CONTROL BOX
- 571 / 22.48"

Top-right view dimensions:

- 2353.9 / 92.67"
- 980 / 38.58"
- 980 / 38.58"
- 273.9 / 10.78"
- 277.2 / 10.91"
- 120 / 4.72"
- 375 / 14.76"
- 552.2 / 21.74"
- 522.2 / 20.56"
- 1260 / 49.61"
- 885 / 34.84"
- R667.3 / 22.34°
- R537.3 / 21.15°
- 245 / 9.65"
- 3955.65 / 155.73"
- 1940 / 76.38"
- 2550 / 100.39"
- 2825 / 111.22"
- 578.42 / 22.77"
- 275 / 10.83"
- 303.8 / 11.96"
- 540 / 21.26"
- 1013.42 / 39.9"
- 1553.42 / 61.16"

Bottom-left view dimensions:

- 2825 / 111.22"
- 402.5 / 15.85"
- 476.5 / 18.76"
- 991 / 39.02"
- 955 / 37.6"
- 380 / 14.96"
- 430 (MG DOOR) / 16.93"
- 181 / 7.13"
- 45 / 1.77"
- 145 / 5.71"
- 240 / 9.45"
- 352 (st) / 13.86"
- POWER INLET
- 694 / 27.32"
- 1023.15 / 40.28"
- 744 / 29.29"
- 960 / 37.8"
- 945 / 37.2"
- 1900 / 74.8"
- 1671 / 65.79"
- 1341.85 / 52.83"
- 1050 / 41.34"
- 6 / 0.24"
- 400 / 15.75"
- 430 / 16.93"
- 1005 / 39.57"
- 990 / 38.98"
- 465 / 18.31"
- 100 / 3.94"
- AIR INLET

Bottom-middle view dimensions:

- 1150 / 45.28"
- 351.6 / 13.84"
- 806.6 (DOOR) / 31.76"
- 695 (st) / 27.36"
- 510 / 20.08"
- 155 / 6.1"
- 198.7 / 7.82"
- 168.7 / 6.64"
- 396.6 / 15.61"
- 579.67 / 22.82"
- 13.4 / 0.53"
- 460 / 18.11"
- 664.26 / 26.15"
- 2875 / 113.19"
- 1396.6 / 54.98"
- Mazak VC-300A/5X
- Mazak VC-300A/5X
- 435.5 / 17.13"
- 1340 / 52.76"
- 1121.36 / 44.15"
- 800.5 / 31.5"
- 365 / 14.37"
- 200 / 7.87"
- 680 / 26.77"
- 270 / 10.63"
- 1150 / 45.28"
- 403.42 / 15.88"
- 1553.42 / 61.16"

Bottom-right view dimensions:

- FOR MIST COLLECTOR
- 265 / 10.43"
- 273 / 10.75"
- 2462 / 96.93"
- 175 / 6.89"
- 865 / 34.06"
- 946 / 37.24"
- 521.5 / 20.53"
- 402.5 / 15.85"
- 90 / 3.54"
- 80 / 3.15"
- 10 / 0.39"
- 457 / 17.99"
- Mazak
- 440 / 17.32"
- 304 / 11.97"
- 2230 / 87.8"
- 2000 / 78.74"
- 1543 / 60.75"
- 370 / 14.57"
- 1256 / 49.45"
- 135 / 5.31"
- 190 / 7.48"
- 365 / 14.37"

18

19

Machine Layout – VC-500A/5X
(FOR REFERENCE ONLY)

Unit: mm (inch)

CHILLER

TRANCE BOX

(FLOOR REQUIRED FOR OILPAN REMOVAL)

338
13.3"

1149.5
45.3"

2365
93.1"

2330
91.7"

35
1.4"

2930
115.3"

3623.5
142.7"

1555
61.2"

145
5.7"

78.8
3.1"

80
3.1"

4515
177.7"

355.7
14"

R475.7
18.7"

CONTROL BOX

630
24.8"

60
2.4"

100
3.9"

530
20.9"
(DOOR st.)

190
7.5"

200
7.9"

240
9.4"

245
9.6"

146
5.7"

1014.2
39.9"

1159.2
45.6"

2050
80.7"

352
13.9"

798
31.4"

338
13.3"

1150
45.3"

1555
61.2"

215
8.5"

923.4
36.4"

691.6
27.1"

535
21.1"

182.8
7.2"

890
35"

725
28.5"
(DOOR st.)

199
7.8"
(573)
(22.6")

460
18.1"

470
18.5"

697
27.4"

2265
89.1"

(2838)
(111.7")

1335
52.5"

1568
61.7"

1095
43.1"

350
13.8"

370.3
14.6"

2150
84.6"

2520.3
99.2"

Mazak VC-500A/5X

700
27.5"

1450
57.1"

100
3.9"

880
34.6"

107.2
4.2"

85
3.3"

400
15.7"

350
13.7"

1635
64.4"

1985
78.1"

2435
95.9"

1105
43.5"

280
11"

637.9
25.1"

F.L

AIR INLET

Z VIEW

1962
77.2"

968
38.1"

140
5.5"

310
12.2"

145
5.7"

1425
56.1"

880
34.6"

1105
43.5"

310
12.2"

250
9.8"

F.L

Machine Layout – VC-500C/2PC
(FOR REFERENCE ONLY)

Unit: mm (inch)

TRANS BOX

CONTROL BOX

AIR INLET

Z VIEW

Machine Specifications - VC Series

			VC-300A	VC-300A/5X
Travel	X-axis travel	in (mm)	11.81 (300)	11.81 (300)
	Y-axis travel	in (mm)	11.81 (300)	11.81 (300)
	Z-axis travel	in (mm)	20.078 (510)	20.078 (510)
	B-axis travel	degree	—	+20~-120
	C-axis travel	degree	—	±360
Table	Spindle nose to table top — Min.	in (mm)	4.52 (115)	4.52 (115)
	Spindle nose to table top — Max.	in (mm)	24.60 (625)	24.60 (625)
	Pallet size	in (mm)	15.748 x 11.81 (400 x 300)	ø100 mm
	Max. workpiece size	in (mm)	13.77 x 11.81 x 12 (350 x 300 x 305)	ø3.9 x 6.1 (ø100 x 155)
	Max. workpiece weight	lb (kg)	440 (200)	341.7 (155)
	Table surface height (From the surface of machine base)	in (mm)	31.5 (800)	39.1 (992)
Spindle	Spindle taper bore		CAT 40	CAT 40
	Spindle speed standard	min	12,000	12,000
	Spindle motor output — 5 min. rating	hp (kW)	25 (18.5)	25 (18.5)
	Spindle motor output — 30 min. rating	hp (kW)	15 (11)	15 (11)
	Spindle motor output — Cont. rating	hp (kW)	10 (7.5)	10 (7.5)
	Option 15,000 rpm — 10% ED	hp (kW)		
	Option 15,000 rpm — 30 min. rating	hp (kW)		
	Option 15,000 rpm — Cont. rating	hp (kW)		
	Option 20,000 rpm — 15 min. rating	hp (kW)	47 (35)	47 (35)
	Option 20,000 rpm — Cont. rating	hp (kW)	35 (26)	35 (26)
Rapid traverse	X/Y/Z	ipm (m/min)	945 (24)	
	a/c	degree° min	—	11,880/22,500
ATC & magazine	Magazine capacity — Standard	tool	30	30
	Magazine capacity — Optional	tool	—	—
	Max. tool diameter — With adjacent pockets occupied	in (mm)	3.15 (80)	3.15 (80)
	Max. tool diameter — With adjacent pockets empty	in (mm)	3.94 (100)	3.94 (100)
	Max. tool length (from the guage line)	in (mm)	10.23 (260)	10.23 (260)
	Tool shank type		CAT 40	CAT 40
Machine size	W x L x H	in (mm)	38.58 x 96.46 x 104.33 (980 x 2,450 x 2,650)	38.58 x 96.46 x 104.33 (980 x 2,450 x 2,650)
PC	Pallet change time	sec	—	—

|			VC-500A/5X	VC-500C/2PC
Travel	X-axis travel	in (mm)	21.85 (555)	39.37 (1,000)
	Y-axis travel	in (mm)	19.88 (505)	19.88 (505)
	Z-axis travel	in (mm)	20.07 (510)	20.08 (510)
	B-axis travel	degree	+110~-110	—
	C-axis travel	degree	±360	—
Table	Spindle nose to table top — Min.	in (mm)	4.53 (115) to 24.61 (625)	4.52 (115)
	Spindle nose to table top — Max.	in (mm)	19.69 (500)	24.60 (625)
	Pallet size	in (mm)	ø19.69 (500)	19.69 x 41.33 (1,050 x 500)
	Max. workpiece size	in (mm)	ø19.69 x 12 (ø500 x 305)	19.69 x 39.37 x 12 (500 x 1,000 x 510)
	Max. workpiece weight	lb (kg)	441 (200)	1,322 (600)
	Table surface height (From the surface of machine base)	in (mm)	26.97 (685)	26.96 (685)
Spindle	Spindle taper bore		CAT 40	CAT 40
	Spindle speed standard	min	12,000	12,000
	Spindle motor output — 5 min. rating	hp (kW)	25 (18.5)	25 (18.5)
	Spindle motor output — 30 min. rating	hp (kW)	15 (11)	15 (11)
	Spindle motor output — Cont. rating	hp (kW)	10 (7.5)	10 (7.5)
	Option 15,000 rpm — 10% ED	hp (kW)	30(18.5)	30(18.5)
	Option 15,000 rpm — 30 min. rating	hp (kW)	15(11)	15(11)
	Option 15,000 rpm — Cont. rating	hp (kW)	10(7.5)	10(7.5)
	Option 20,000 rpm — 15 min. rating	hp (kW)	47 (35)	47 (35)
	Option 20,000 rpm — Cont. rating	hp (kW)	35 (26)	35 (26)
Rapid traverse	X/Y/Z	ipm (m/min)	1,181 (30)	
	a/c	degree° min	10,800	—
ATC & magazine	Magazine capacity — Standard	tool	30	30
	Magazine capacity — Optional	tool	40, 60	40, 60
	Max. tool diameter — With adjacent pockets occupied	in (mm)	3.15 (80)	3.15 (80)
	Max. tool diameter — With adjacent pockets empty	in (mm)	4.92 (125)	4.92 (125)
	Max. tool length (from the taper guage line)	in (mm)	10.23 (260)	10.23 (260)
	Tool shank type		CAT BT40, HSK-A63	CAT 40
Machine size	W x L x H	in (mm)	99.2 x 118.45 x 118.11 (2,620 x 3,008 x 3,000)	120.87 x 153.54 x 117.48 (3,070 x 3,900 x 2,984)
PC	Pallet change time	sec	—	9

Optional Equipment

Mazak offers a wide array of options from which to choose for the VC Series that further enhance machine performance, increase uptime and boost overall operational efficiency.

- **Chip conveyors** are available for a wide variety of workpiece materials.
- **Rotary table units** provide a 4th axis for a wide variety of workpiece processing strategies.
- **Through-pallet hydraulics** ensure fixture integration.
- **T-slot pallets** increase workholding versatility.
- **Part and tool probe packages** provide in-process workpiece measurement and automatically measure tool tip positions as well as detect wear/damage.
- **High-power coolant** delivers efficient chip evacuation for longer tool life.
- **Mist collector** ensures that any mist made within the machine is removed to maintain a safe work environment.
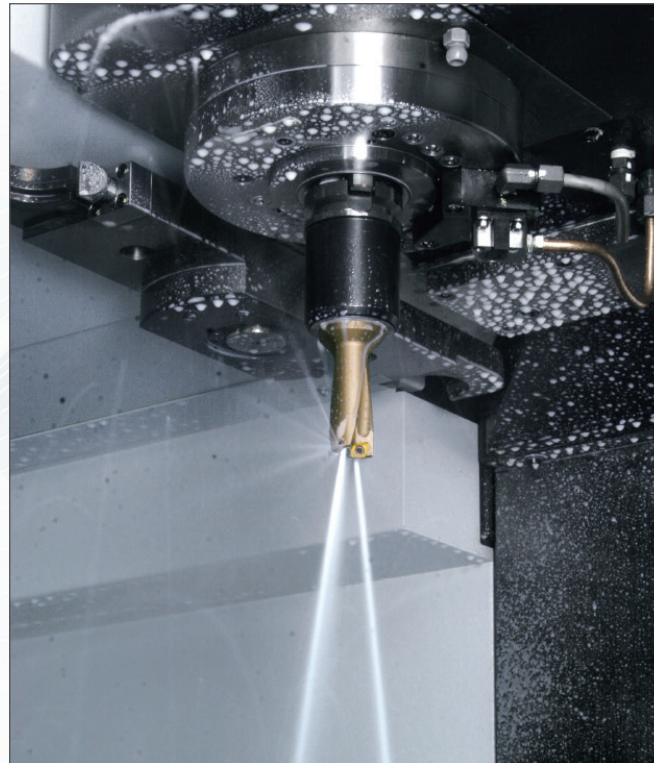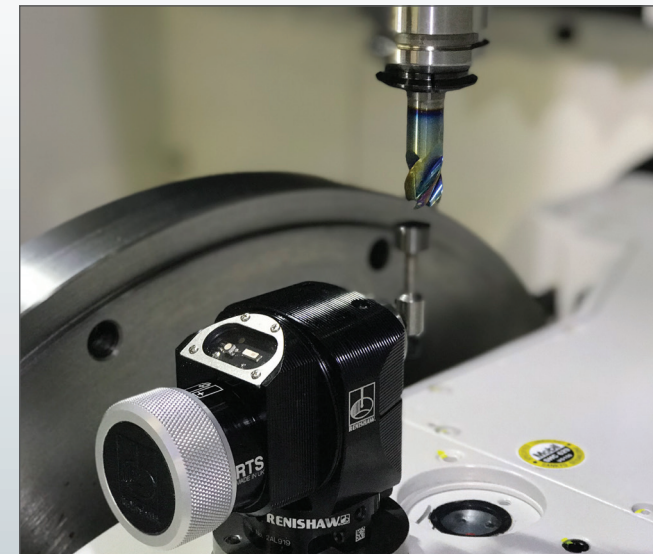
Through-spindle coolant
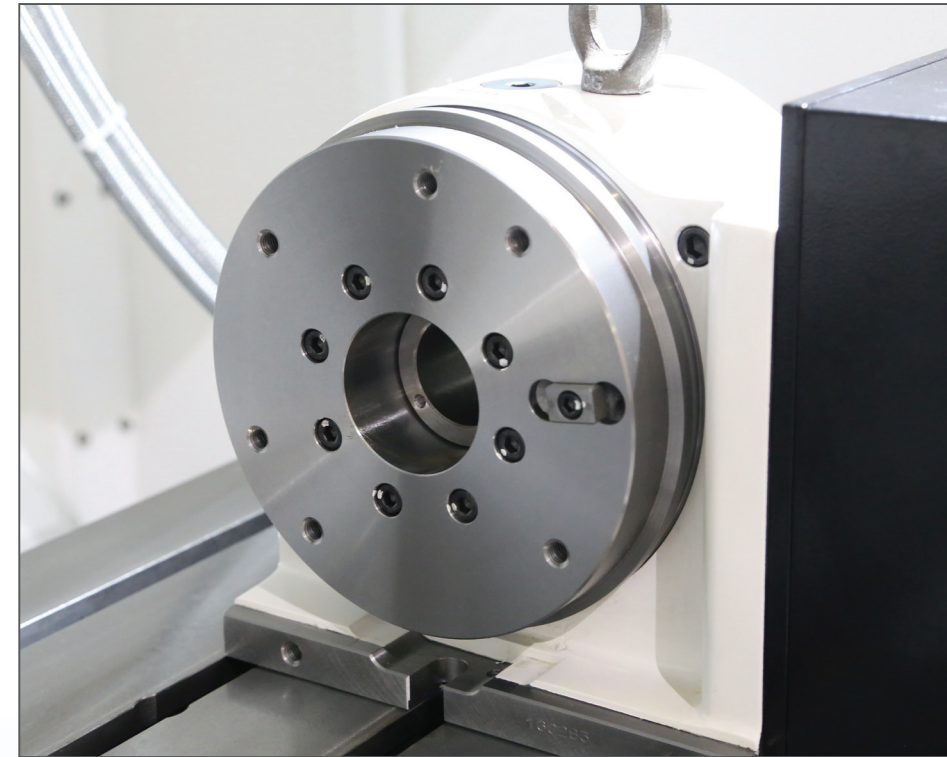
Fourth-axis rotary table

Chip conveyor

Mist collector

Part probe

Part probe

Mazak

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