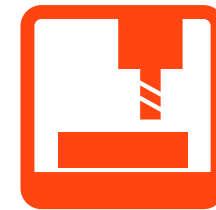


Mazak

VCN SERIES



430A
530C

SMOOTH
TECHNOLOGY

VCN SERIES

Mazak

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- Specifications are subject to change without notice.
- This product is subject to all applicable export control laws and regulations.
- The accuracy data and other data presented in this catalogue were obtained under specific conditions. They may not be duplicated under different conditions. (room temperature, workpiece materials, tool material, cutting conditions, etc.)

VCN - 430A, 530C 07.16 2000 S99J1207116E 0

Advanced Features of the Mazak SmoothG CNC

Touch screen operation – Operates similarly to your smart phone/tablet

PC with Windows®8 embedded OS

Fastest CNC in the world – Latest hardware and software for unprecedented speed and precision

Easy conversational programming of multiple surface machining

Smooth user graphical interface and support functions for unsurpassed ease of operation

Finetuning functions – Easily configure machine parameters for different workpiece materials and application requirements

MTConnect® ready – Convenient networking

Windows is a registered trademark of Microsoft Corporation in the United States and other countries. MTConnect is a registered trademark of AMT in the United States and other countries.



MAZATROL SMOOTHG

VCN SERIES

VCN-430A, VCN-530C

Highest productivity in this class of vertical machining centers.

Reduced cycle times thanks to high speed feedrate, acceleration/deceleration and tool change.

- **Feedrate: 42m/min** • **Spindle speed: 12000 rpm** • **Chip to chip: 2.8 seconds**
- Unique Mazak heat compensation system – INTELLIGENT THERMAL SHIELD
- Excellent accessibility due to two front doors providing wide opening – large window for convenient monitoring of machining
- Durable linear roller guides on all axes ensure stable machining



VCN-430A

Table size: 900mm x 430mm



VCN-530C

Table size: 1300mm x 550mm

ergonomics

Ease of operation

eco-friendly

Designed with environmental considerations

Higher Productivity

High accuracy machining and high productivity are realised thanks to the unique MAZAK mechanical and machine control technologies.

Designed for a wide variety of applications - from heavy duty machining to high speed machining.



Powerful No. 40 taper spindle

The VCN-430A/530C is equipped with a powerful high-rigidity No. 40 taper spindle designed for a wide range of applications from heavy-duty cutting of steel to high-speed cutting of aluminium and other nonferrous materials.

Max. spindle speed:	12000 rpm
Spindle output:	18.5 kW (5 min. rating) 11 kW (40% ED) 7.5 kW (Cont. rating)
Max. torque:	95.5 Nm (10 min. rating)
Feedrate:	42 m/min

High-speed spindle (option)

The 18000 rpm spindle ensures high accuracy and reduced machining cycle times when cutting materials such as aluminium at high-speed. The power and torque characteristics provide flexibility over a wide range of applications.

Max. spindle speed:	18000 rpm
Spindle output:	15 kW (40% ED) 11 kW (Cont. rating)
Max. torque:	59.7 Nm (40% ED)
Feedrate:	42 m/min

Note: includes ball screw cooling.

18000 rpm option includes ball screw core cooling (X-, Y- and Z-axes)

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

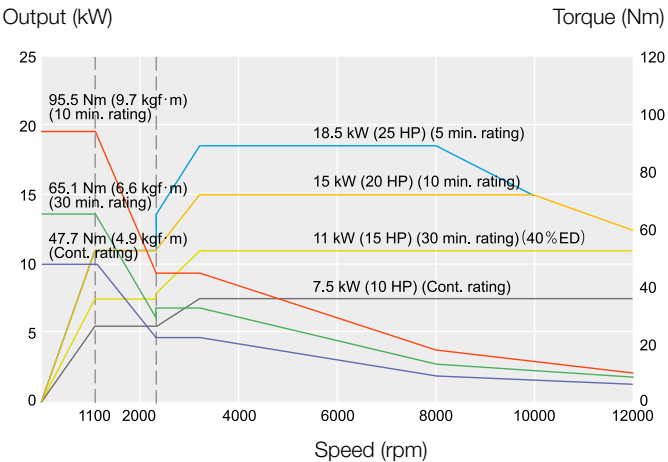


40 tool magazine option

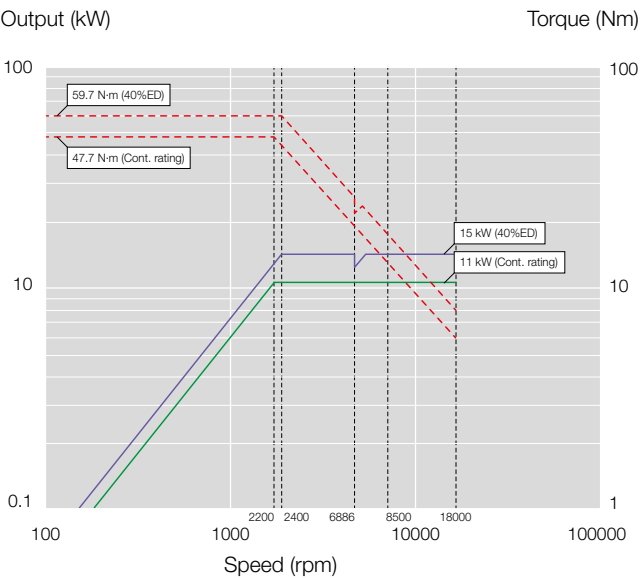
Extended tool capacity is provided by a 40 tool magazine (option).



12000 rpm spindle output/torque diagram

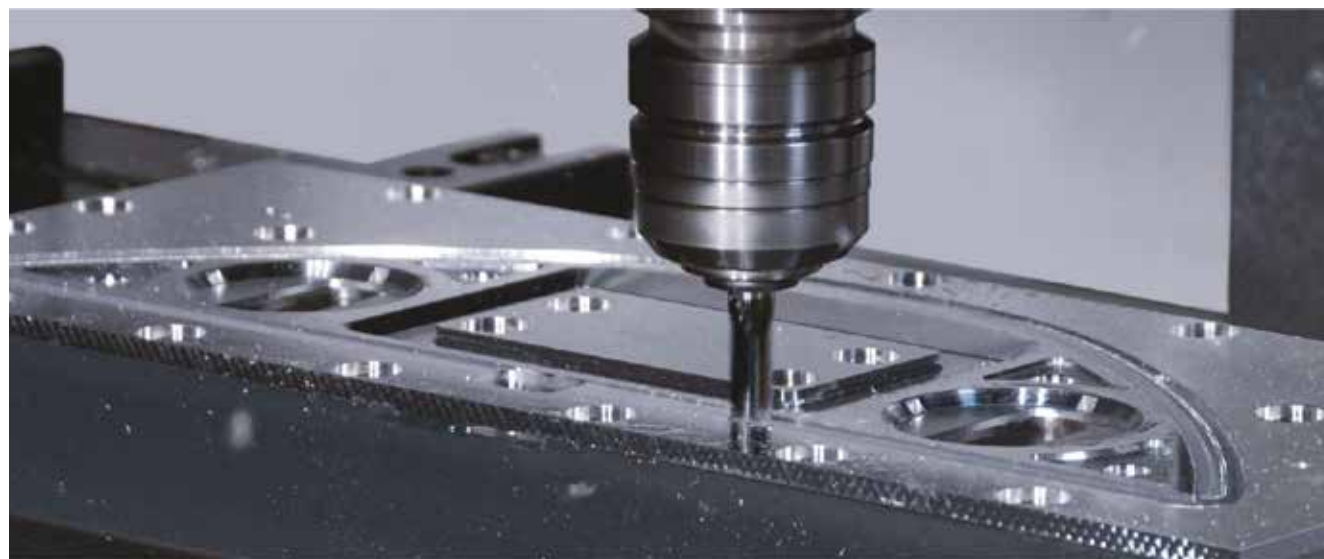


18000 rpm spindle output/torque diagram



Application

The VCN series provides high speed and high accuracy machining for a variety of applications thanks to advanced unique technologies.



Workpiece name:
Mold base



Workpiece name:
Robot arm



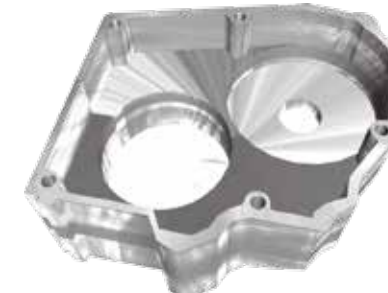
Workpiece name:
Industrial machinery component



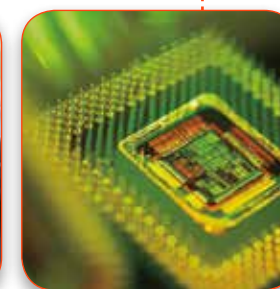
Workpiece name:
Electronic machinery component



Workpiece name:
Alternator component



Workpiece name:
Transmission case



Higher Accuracy

Rigid machine construction, machine control technology and Intelligent Functions all contribute to high accuracy machining.

Roller guides on all axes

Roller guides are utilised for all axes for high rigidity and minimum vibration to provide stable, higher accuracy machining.



Ergonomics

ergonomics

Designed for convenient maintenance and ease of operations.

Large front door opening

The front door has a large opening to provide excellent table access to the operator for convenient loading/unloading of workpieces.



Convenient tool loading/unloading

The tool clamp/unclamp switch next to the spindle allows tools to be easily removed for changing inserts during operation.



Large window

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

Operator door with top cover opening

The double door construction, with an opening section of 1320 mm, allows convenient machine table access when using an overhead crane for loading/unloading of heavy workpieces and fixtures.



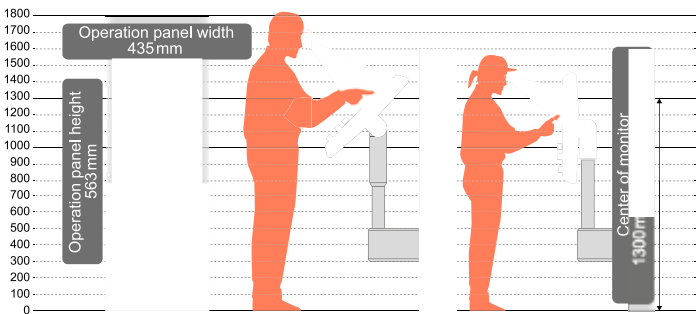
Maintenance area

Items requiring frequent access for machine maintenance are located on a single panel.



Adjustable CNC Touch Panel

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



Tool magazine operation panel/Tool ID

The operation panel for the tool magazine features a user friendly design for ease of operation. To minimise downtime, the magazine can be rotated manually during automatic cycle. The magazine door can then be opened, providing safe access to inspect or service cutting tools without stopping production.



Remote manual pulse generator

The remote manual pulse generator provides convenient operation when the operator is not close to the CNC operation panel. Its display shows the position and the machine coordinate values. 4 different positions can be registered in memory by the remote manual pulse generator.

OPTION

Tool data-switch display



Numeric keypad display



MAZATROL CNC System

The seventh generation MAZATROL CNC system
– the core of Smooth Technology

MAZATROL *SMOOTHG*

From setup to machining
– designed for unsurpassed ease of operation

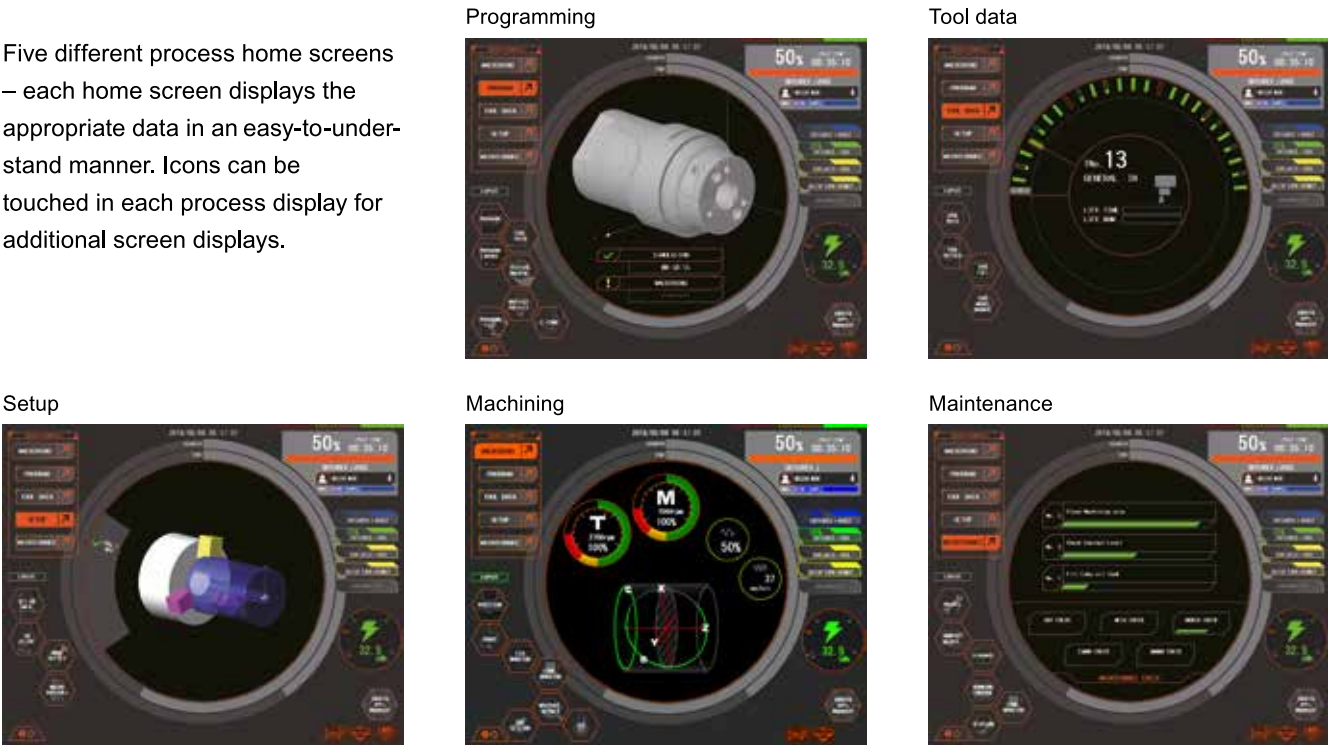


- 19" touch panel
Touch panel operation
– similar to your smartphone or tablet
- USB port
Interface for peripheral equipment
USB-1.0 + 2.0 standard
- SD card slot
Transfer program and tool data
- Operation switches
Large switches
– color changes from orange to green when turned on
- Dials
For frequently-used axes selection and feedrate changes

New interface with touch operation ensures convenient data processing
– programming, confirmation, editing, and tool data registration

Process home screens

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



Pop-up windows

Values and items can easily be input / selected on pop-up windows.



Ease of Programming

Visible programming screen

QUICK EIA

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.

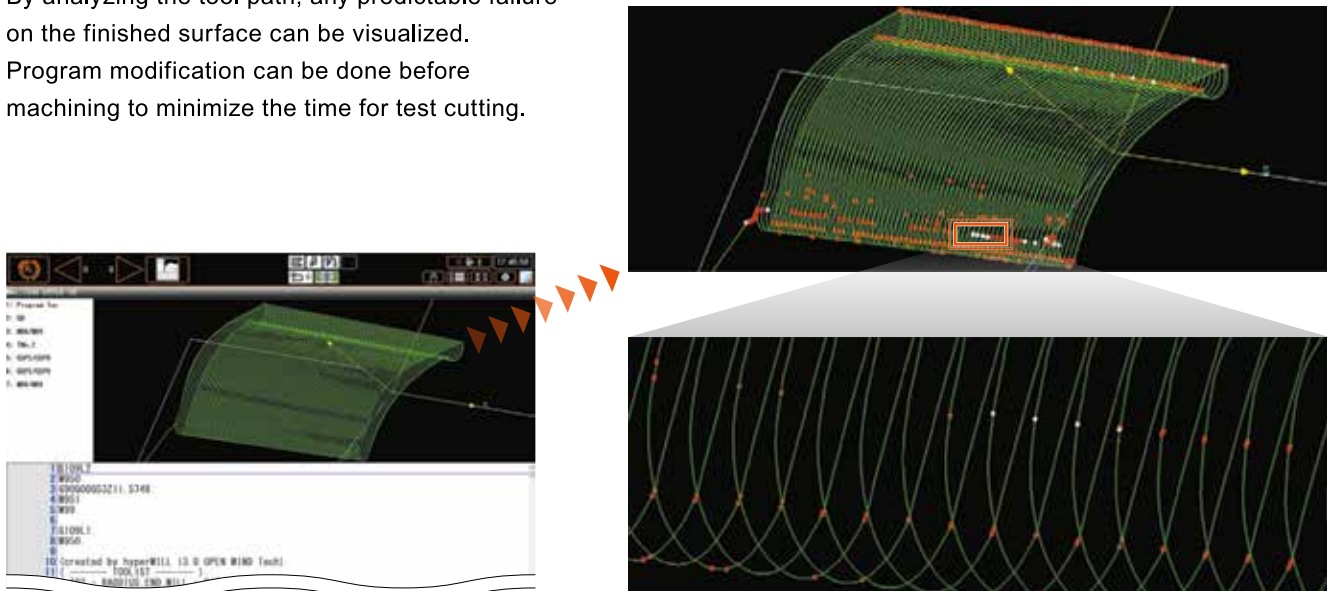


Selecting tool path by touching the screen

Moving to the corresponding EIA program line

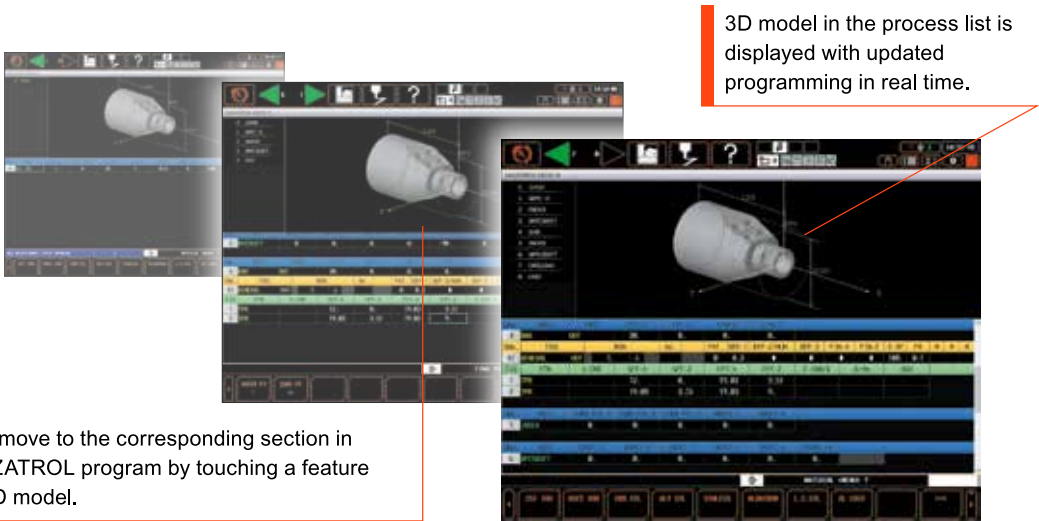
VIEW SURF

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.



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 immediately displayed to easily and quickly check for any programming error.



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

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

3D ASSIST

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



CAD model importing

Shape selection

Automatically input to MAZATROL program

Networking

Network integration

— convenient connection to automation equipment

Smooth Process Support Software for efficient factory management. (OPTION)

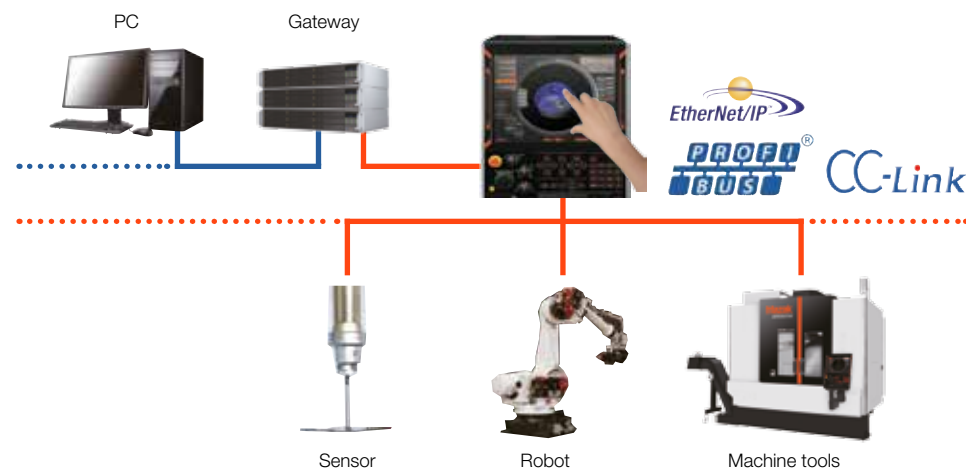
SMOOTH
PROCESS SUPPORT
SOFTWARE

Data sharing between
SmoothG CNC and office PCs
for improved production efficiency.



Networking to peripheral equipment (OPTION)

Convenient network
connection to peripheral
equipment thanks to
industrial network standards

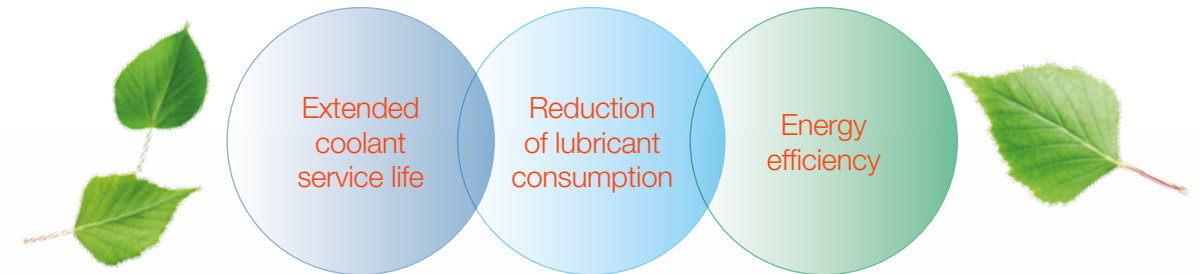


EtherNet/IP is a trademark of ODVA (Open Device Net Vendor Association).
PROFIBUS is a trademark of PROFIBUS User Organisation.
MTConnect is a registered trademark of AMT (Association for Manufacturing Technology).

Environmental Considerations

eco-friendly

The environment has always been important to Yamazaki Mazak. All of our factories where Mazak machine tools are produced are ISO 14001 certified, confirming that the operation of our production facilities does not adversely affect air, water or land.



The roller guides utilised by all linear axes are lubricated by a grease lubrication system instead of oil. (Spindle bearings are greased). With this system, tramp oil in the coolant is considerably reduced, resulting in a longer coolant service life. Additionally, the work light, the CNC display, and the optional chip conveyor are automatically shut off after a predetermined period for lower power consumption when the machine is in the stand-by state.

Grease lubrication system (standard equipment)

Linear axes are lubricated by a grease lubrication system instead of oil. With this system, tramp oil in the coolant is considerably reduced resulting in an extended service life of coolant for reduced frequency of disposal.

Power consumption display (optional equipment)

The electrical power meter displays the machine accumulated electrical power consumption.

Automatic power off CNC display (standard equipment)

The CNC display turns off automatically after a predetermined period has passed.

Chip conveyor/automatic power off (standard equipment)

The optional chip conveyor is automatically shut off after a predetermined period for lower power consumption when the machine is in the stand-by state.

LED lights (standard equipment)

These lights have lower power consumption and a service life 10 times longer than conventional fluorescent lamps.

RESOURCE SAVING
MACHINE OPERATION

MINIMUM POWER
CONSUMPTION IN STAND-BY

MINIMUM LUBRICANT
CONSUMPTION



		VCN-430A	VCN-530C
Stroke	X axis stroke (table right/left)	560 mm	1050 mm
	Y axis stroke (saddle back/forth)	430 mm	530 mm
	Z axis stroke (spindle up/down)	510 mm	
	Distance from table top to spindle nose	150~660 mm	
	Distance from column surface to spindle center	494 mm	586 mm
Table	Table size	900 mm × 430 mm	1300 mm × 550 mm
	Max. load capacity (evenly distributed)	500 kg	1200 kg
	Table surface configuration	18 mm T slot × 3, 125 mm pitch	18 mm T slot × 5, 100 mm pitch
Spindle	Max. spindle speed	12000 rpm	
	Spindle speed range	2-Step (Electric)	
	Spindle taper	No.40	
	Spindle bearing ID	ø 70 mm	
	Spindle acceleration	2.0 sec.	
Feedrate	Rapid traverse rate (X,Y,Z axes)	42 m/min	
	Cutting feedrate (X,Y,Z axes)	1 ~ 42000 mm/min	
Automatic tool changer	Tool shank	CAT No. 40	
	Tool storage capacity	30	
	Max. tool diameter/Length (from gauge line)/weight	ø 80 mm / 350 mm / 8 kg	
	Max. tool diameter with adjacent pockets empty	ø 125 mm	
	Tool selection method	MAZATROL random memory / Shortest pass	
	Tool change time (tool-to-tool)	1.3 sec	
Motor Electrical and air requirements	Spindle motor (5 min / 40% ED / cont. rating)	AC 18.5 / 11 / 7.5 kW	
	Electrical power supply (30 min./cont. rating)	30.21 / 25.10	30.72 / 25.61
	Air supply	0.5 MPa ~ 0.9 Mpa (5 kgf/cm2 ~ 9 kgf/cm2) / 200 NL	
Tank capacity	Coolant tank capacity	200 L	250 L
Machine size	Machine height (from floor)	2803 mm	2807 mm
	Floor spaces requirement	2075 x 2797 mm	2880 x 3102 mm
	Machine weight	4800 kg	6800 kg

●: Standard equipment ○: Optional equipment

Machine	LED light	●	Chip Disposal	Chip Pan (Left discharge)	●
	Additional Work Light	○		Chip Conveyor Hinge Type (Left discharge)	○
	Automatic Power ON/OFF and Warm Up	●		Chip Conveyor Hinge Type (Right discharge)	○
	12000 rpm spindle	●		LNS Turbo MH500 Chip Conveyor	○
	18000 rpm spindle	○		Chip Bucket (Fixed Type)	○
	Scale Feedback System	○		Chip Bucket (Swing Type)	○
Factory Automation	Automatic Tool Length Measurement system	●	Table	Sub Table	○
	30 tool magazine	●		Kitagawa MR200 Rotary Table	○
	40 tool magazine	○		Kitagawa MR250 Rotary Table	○
	Monitoring System B	○	Others	Manuals	●
	Status Light (3 colors)	○		Additional Manuals	○
	Automatic Front Door	○		Additional M-code	○
Additional Axis	○	Foundation Kit (anchor bolt)		●	
Coolant	Coolant System	●	Foundation Kit (dry-pit)	○	
	Top Cover	●			
	Mist Collector	○			
	Work Air Blast	○			
	Coolant Through Spindle System	●			
	High Pressure Coolant Through Spindle	○			
	Oil Mist Coolant	○			
	Cover Coolant System	○			
	Hand Held Coolant Nozzle	○			
	Coolant Temperature Control	○			

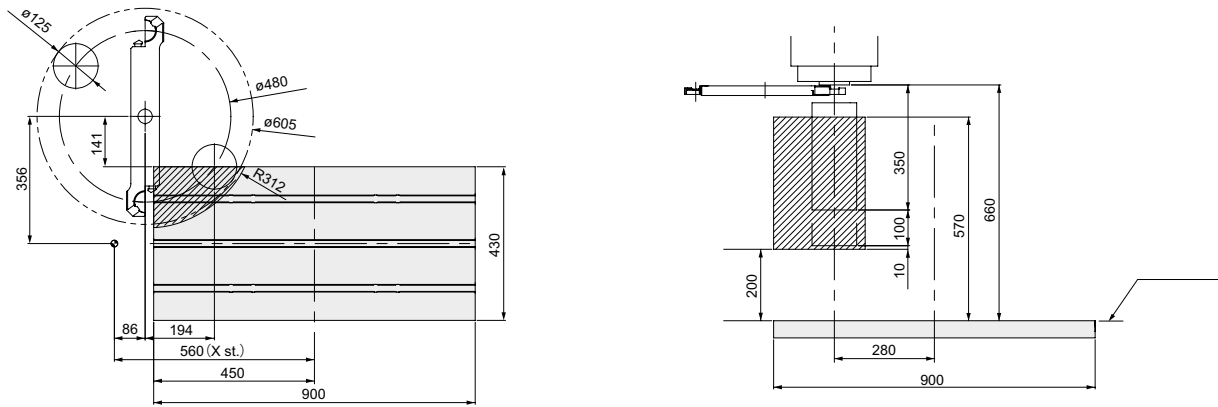
	MAZATROL	EIA
Number of controlled axes	Simultaneous 2-4 axes	
Least input increment	0.0001 mm, 0.00001°, 0.0001°	
High speed, high precision control	Shape error designation, Smooth corner control, Rapid traverse override	Shape error designation, Smooth corner control, Rapid traverse override, Rotational-shape correction, High-speed machining mode, High-speed smoothing control function
Interpolation	Positioning (Linear interpolation), Positioning (Independent interpolation), Linear interpolation, Circular interpolation, Synchronised 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*, synchronised milling spindle tapping*
Feedrate	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, Acceleration / deceleration after compensation, Acceleration / deceleration before compensation, Variable acceleration / deceleration control, Constant control for G0 tilting*	Rapid traverse, Cutting feed, Cutting feed (per minute), Cutting (per revolution), Inverse time feed, Dwell (specified time, specified number of rotation), Rapid traverse override, Cutting feed override, G0 speed variable control, Feedrate clamp, Acceleration / deceleration after compensation, Acceleration / deceleration before compensation, 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*	
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, Synchronised 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 nose shape offset, Tool wear offset	
Coordinate system	Machine coordinate system, Work coordinate system, Local coordinate system, Additional work coordinates (300 set)	
Machine functions	—	Shaping function*, Dynamic compensation II*
Machine compensation	G0 / G1 independent backlash compensation, Pitch error compensation	
Protection functions	Emergency stop, Interlock, Stroke check before travelling, Retraction function for the vertical axis, INTELLIGENT SAFETY SHEILD (manual 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, Automatic tool length measurement, Laser tool length / diameter measurement, Touch sensor orientation confirmation, Tool breakage detection, External tool breakage detection	Automatic tool length measurement, Laser tool length / diameter measurement, Touch sensor orientation confirmation, Tool breakage detection, External tool breakage detection
MDI measurement	Partial auto tool length measurement, auto tool length measurement, Coordinate measurement	
Interface	EtherNet, USB*, PROFIBUS-DP*, EtherNet I/P*, CC-Link*	
Card interface	SD card interface	

17

Interference of tools with workpiece when tools are changed

mm

VCN-430A



VCN-530C

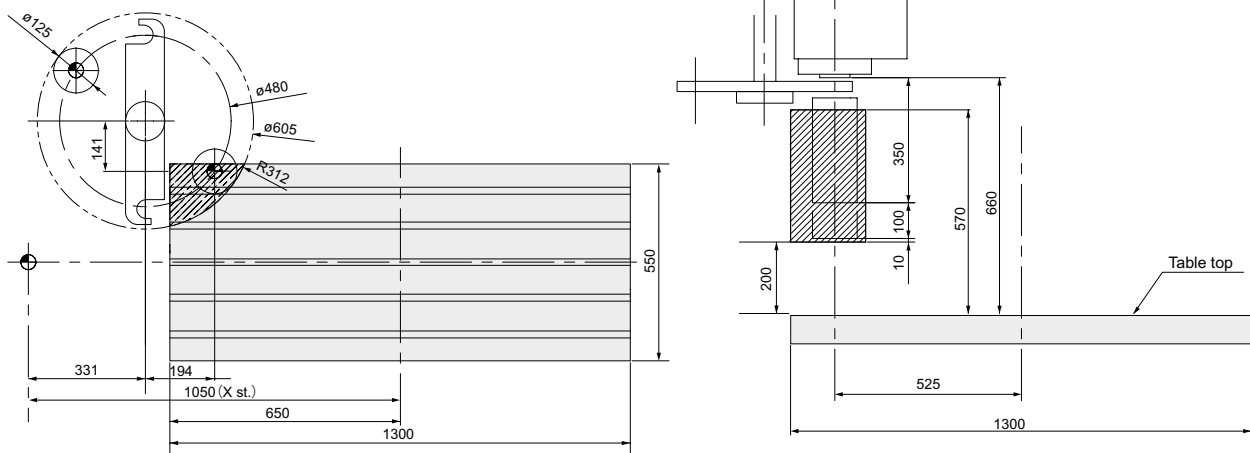
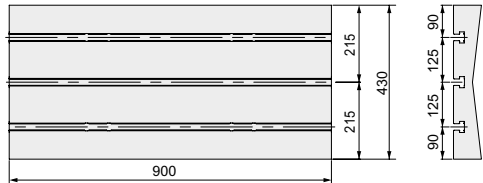


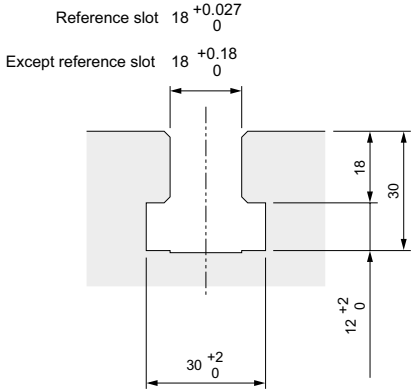
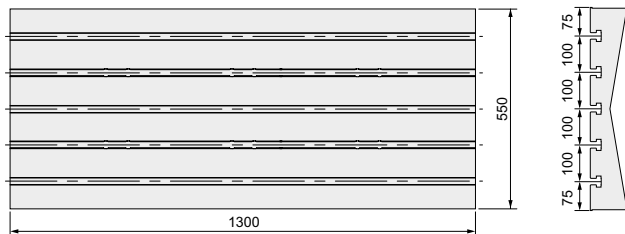
Table dimensions

mm

VCN-430A

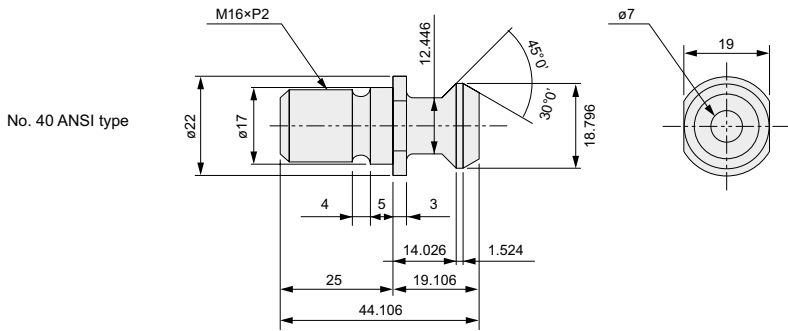


VCN-530C



Pull stud bolt

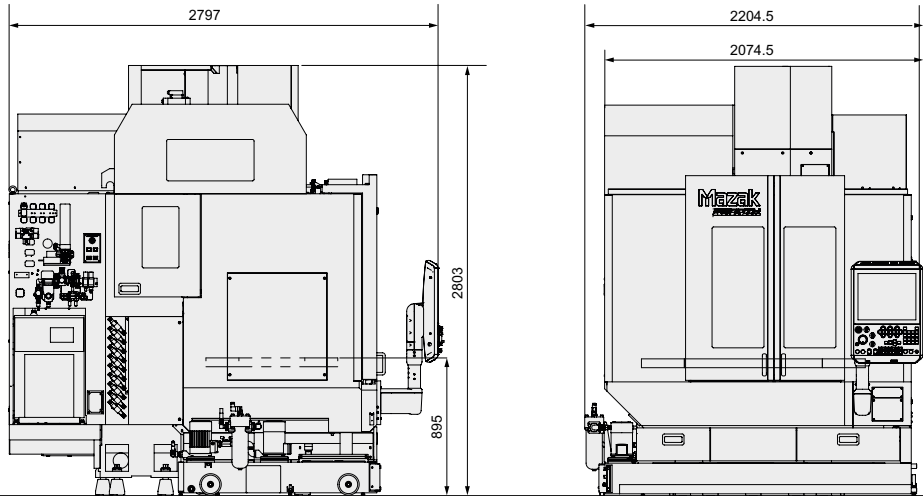
mm



Machine dimensions

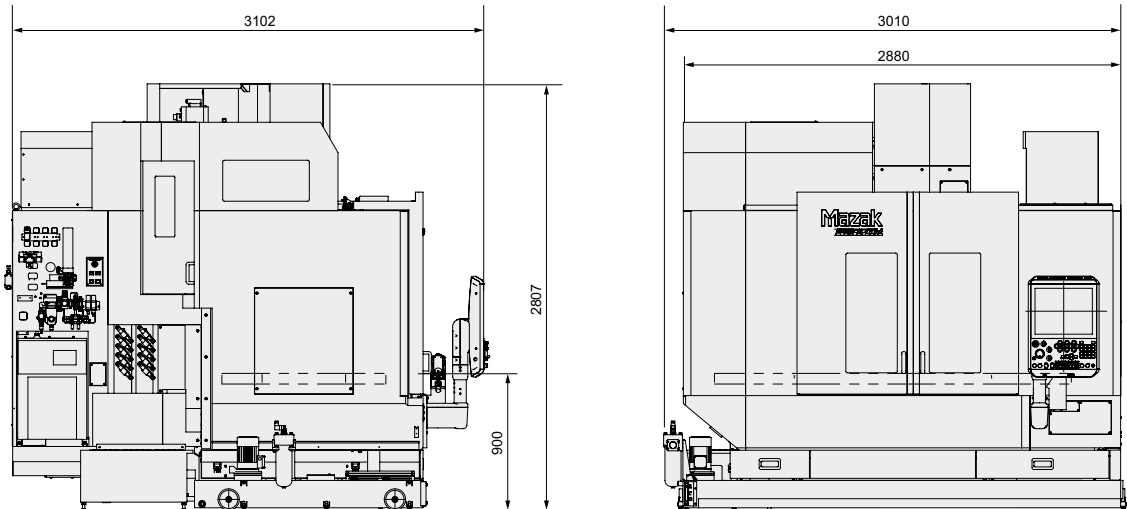
mm

VCN-430A



NOTE: 18000 rpm spindle option requires floor mounted chiller unit (allow additional 650 mm floor space at rear of machine).

VCN-530C



NOTE: 18000 rpm spindle option requires floor mounted chiller unit (allow additional 650 mm floor space at rear of machine).