

Mazak

VERSATECH

SERIES



Advanced features of the MAZATROL SmoothX CNC

Touch screen operation—Operates similar 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

High precision machining of complex contours at high speed feedrates

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

Easily configure machine parameters for different workpiece materials and applications 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 SMOOTHX

Machine very large workpieces with unsurpassed versatility

VERSATECH SERIES V-100N, V-140N

- Machine multiple surfaces in just one workpiece setup
- High speed, X,Y axes feedrate
- Specifications available to meet a wide range of production requirements



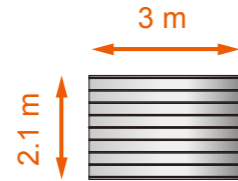
VERSATECH V-140N 280 shown with optional cover and cameras

Higher Productivity

Large workpiece capacity thanks to the machine table length up to 10 m

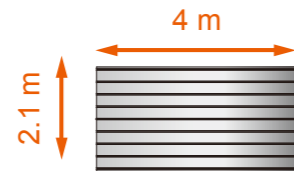
VERSATECH V-100N 160

Table size : 2100 mm × 3000 mm
Table load capacity : 43000 kg



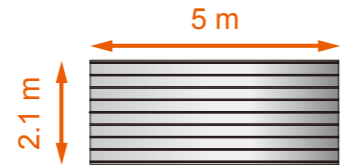
VERSATECH V-100N 200

Table size : 2100 mm × 4000 mm
Table load capacity : 43000 kg



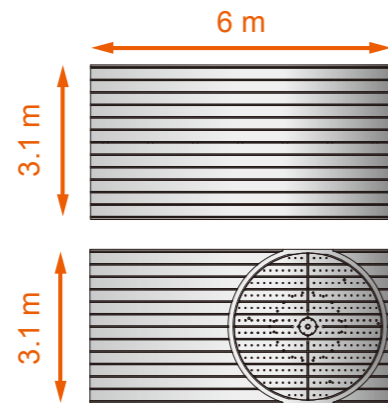
VERSATECH V-100N 240

Table size : 2100 mm × 5000 mm
Table load capacity : 43000 kg



VERSATECH V-140N 280

Table size : 3100 mm × 6000 mm
Table load capacity : 43000 kg

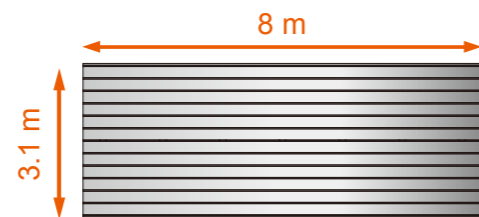


Turning table specifications **OPTION**

Table size : Φ 2950 mm
Maximum workpiece size : Φ 3500 mm × 1750 mm

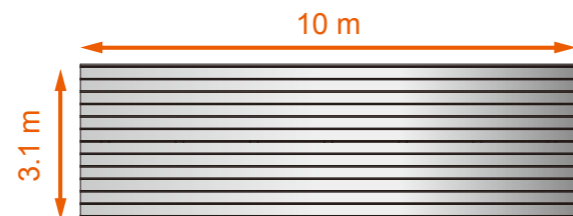
VERSATECH V-140N 360

Table size : 3100 mm × 8000 mm
Table load capacity : 43000 kg



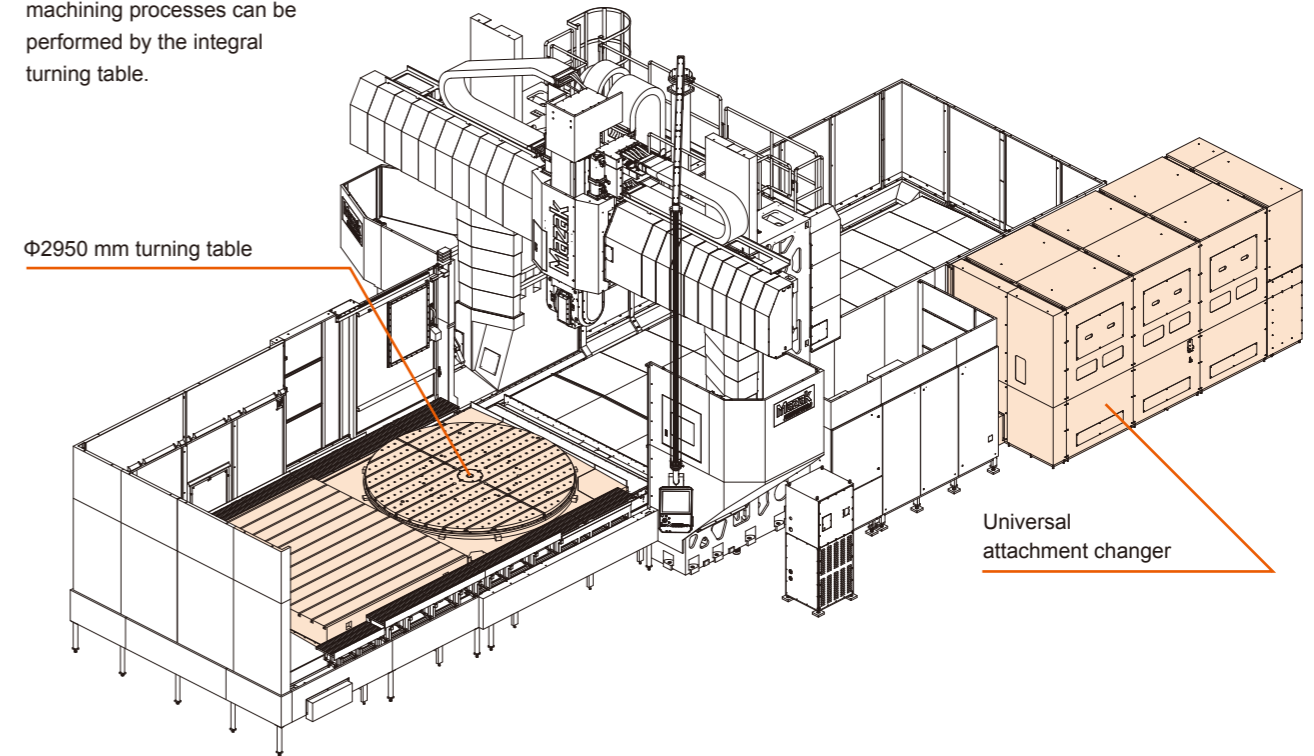
VERSATECH V-140N 440

Table size : 3100 mm × 10000 mm
Table load capacity : 43000 kg



V-140N with turning table **OPTION**

A wide variety of large workpiece machining processes can be performed by the integral turning table.

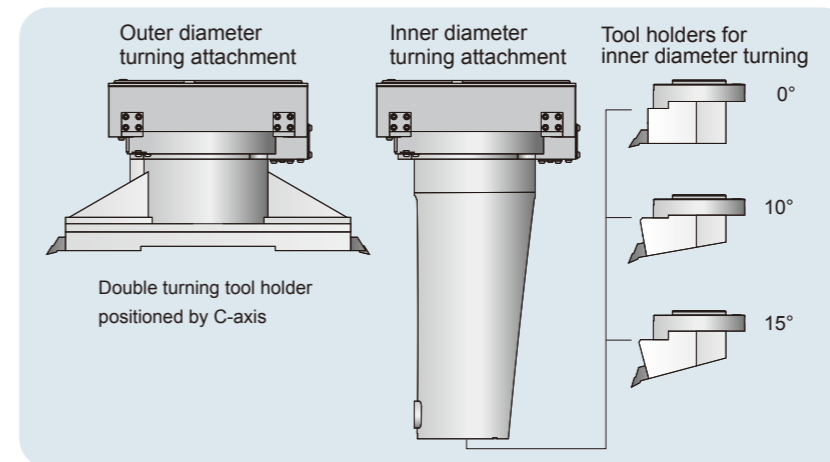


Turning attachment **OPTION**

Optional inner diameter and outer diameter turning attachments are available for increased versatility. The attachments have a coolant through spindle system for the machining of difficult-to-cut material. The attachments can be automatically changed by the universal attachment changer.

Universal attachment changer **OPTION**

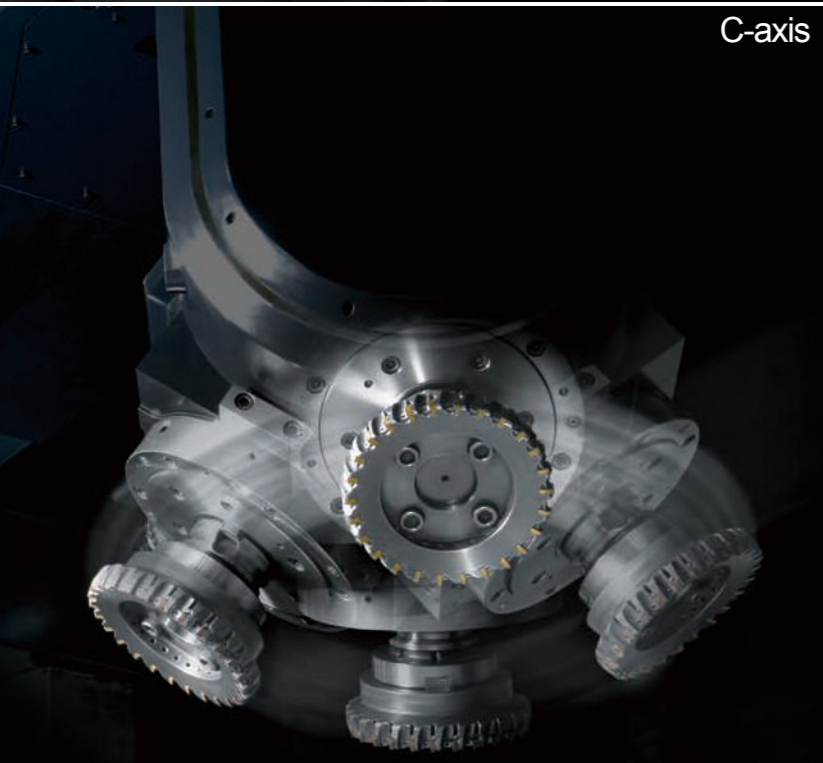
The attachments are stored in the stocker outside of the machining area. The number of attachments that can be stored ranges from 1, 2, 4 and 6 – this number can be increased after the initial installation.



Higher Productivity



B-axis



C-axis

Simultaneous 5-axis machining specification

OPTION

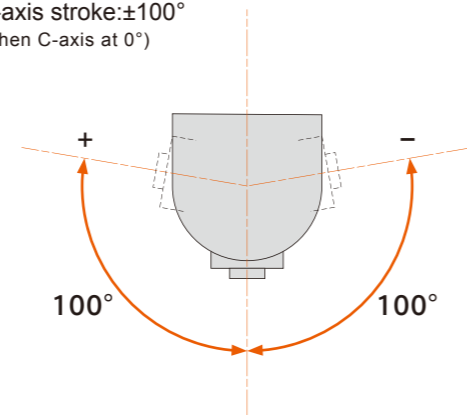
Since the VERSATECH does not require a head changer thanks to the B and C axes, non-cutting time is greatly reduced. The simultaneous 5-axis machining specification is optionally available for the machining of complex surfaces such as those found in components for the die and mold and aerospace industries.

B, C-axis specification (Optional simultaneous 5-axis)

B-axis		
Stroke		±100°
Rapid traverse rate		21600°/min
Max. torque		1500 N·m
Continuous torque		630 N·m
Stall torque		520 N·m
C-axis		
Stroke		Unlimited
Rapid traverse rate		21600°/min
Max. torque		3000 N·m
Continuous torque		800 N·m
Stall torque		660 N·m

*Rapid traverse rate is 5400°/min when attachment is mounted

B-axis stroke: ±100° (when C-axis at 0°)

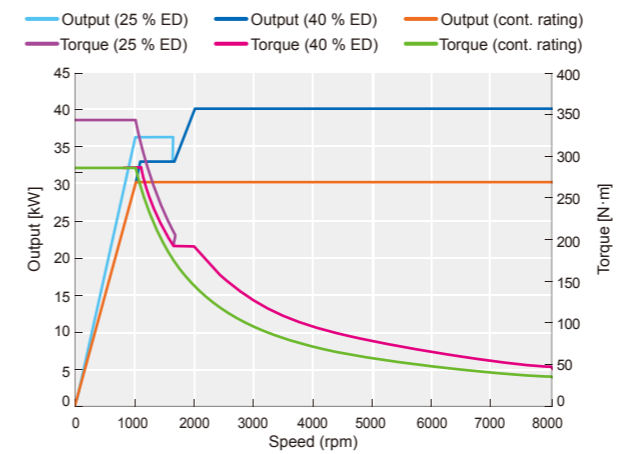


Selectable 8000 rpm and 12000 rpm spindle specification

8000 rpm spindle

No.50 taper 8000 rpm, 40 kW (54 HP) (40 % ED) spindle, maximum torque 334 N·m for the machining of steel workpieces.

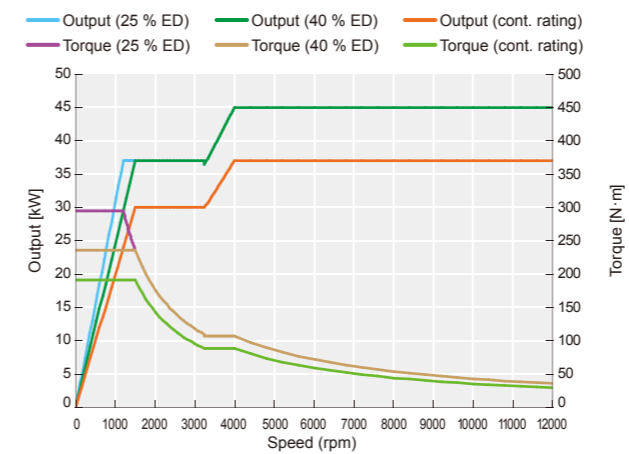
8000 rpm spindle output and torque diagram



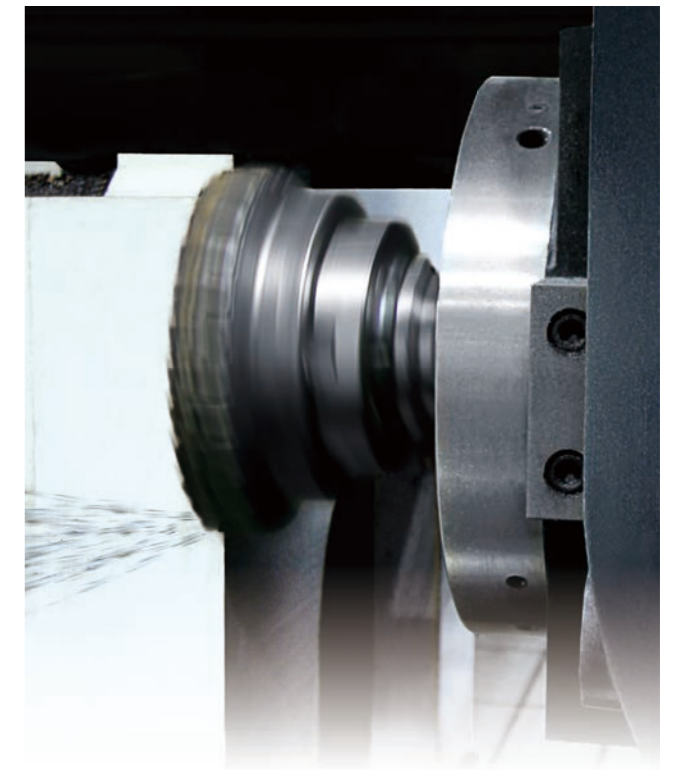
12000 rpm high speed spindle

A 12000 rpm spindle with output of 45 kW (60 HP) (40 % ED) is available for aluminum machining

12000 rpm spindle output and torque diagram



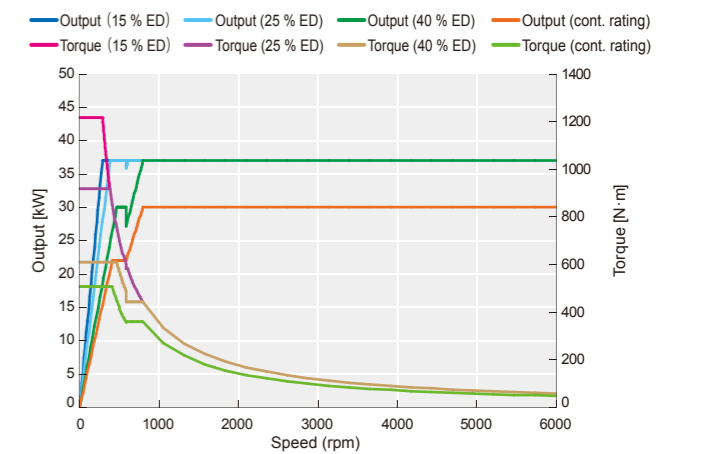
Note: Spindle is 155 mm longer than 8000 rpm spindle which limits stroke. Universal attachment is not available.



6000 rpm high torque spindle **OPTION**

A 6000 rpm spindle with maximum torque of 1218 N·m is optionally available for heavy-duty machining.

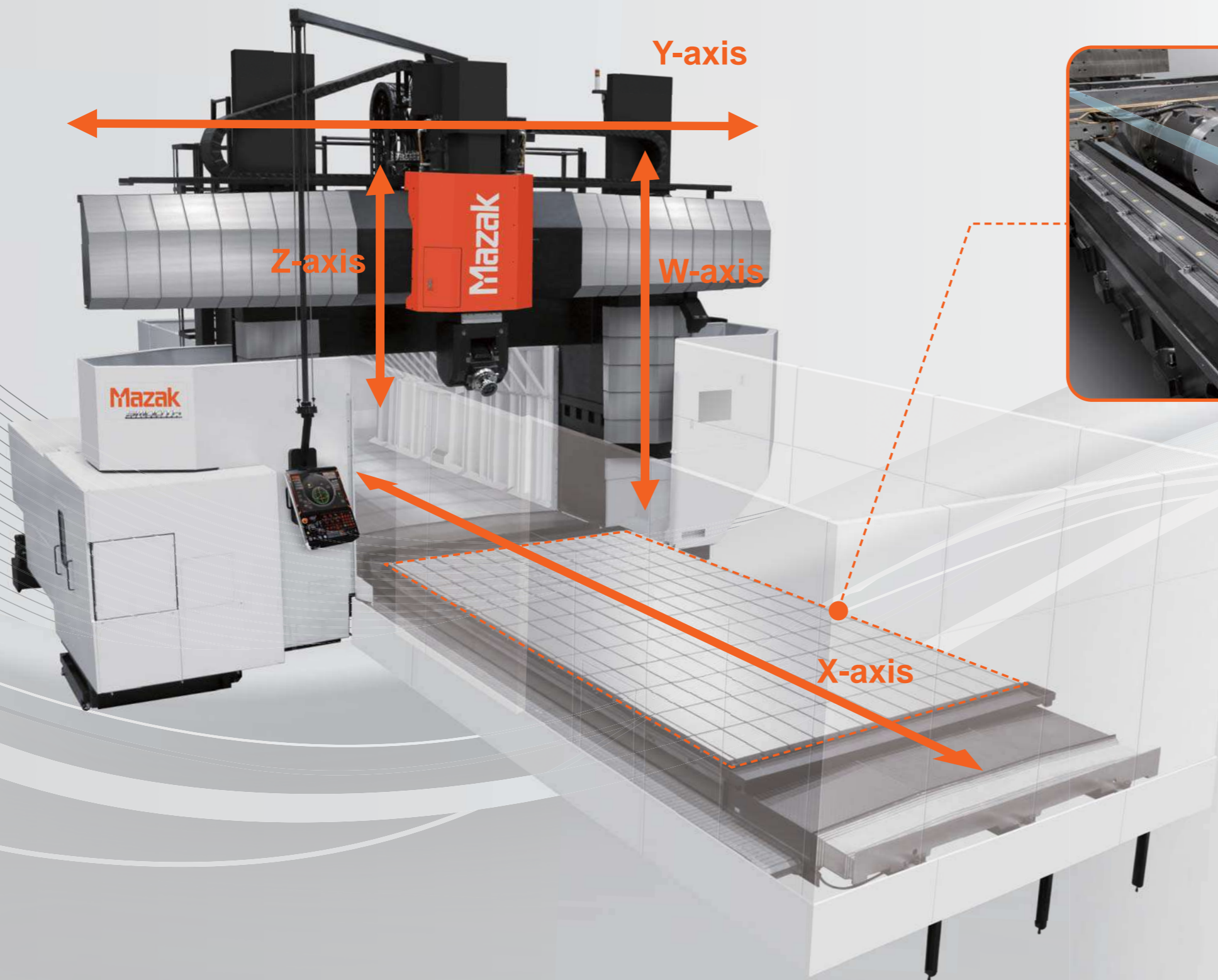
6000 rpm spindle output and torque diagram



Note: Spindle is 135 mm longer than 8000 rpm spindle which limits stroke.

Higher Productivity

High-speed, high-accuracy X,Y,Z-axes feed system



High speed

The maximum feedrate of the X-and Y-axes is 30 m/min thanks to the stationary ball screw.

*Rapid traverse rate (X-axis) for V-140N 360, V-140N 440 is 15 m/min.

High accuracy

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

Machine	VERSATECH V -100N			VERSATECH V -140N			
	160	200	240	280	360	440	
Stroke	X-axis	4000 mm	5000 mm	6000 mm	7000 mm	11000 mm	
	Y-axis	3600 mm			4600 mm		
	Z-axis	710 mm			710 mm		
	W-axis	1250 mm			1250 mm		
Table size	2.1 m x 3 m	2.1 m x 4 m	2.1 m x 5 m	3.1 m x 6 m	3.1 m x 8 m	3.1 m x 10 m	
Max. table loading capacity	43000 kg *			43000 kg *			

*2 table changer :28000 kg

Volumetric compensation OPTION

This function compensates error in the entire machining envelope by inputting measurement position errors (linear, pitch, yaw, roll, etc.) into the CNC which is obtained by a laser tracer.

Factory Automation

Attachments designed for increased versatility and less interference

Angle attachment OPTION

Can machine areas that cannot be reached by the standard spindle

Tools from the magazine are automatically changed the same as tools for the standard spindle

In addition to flood coolant, the coolant through spindle system is optionally available

Snout attachment OPTION

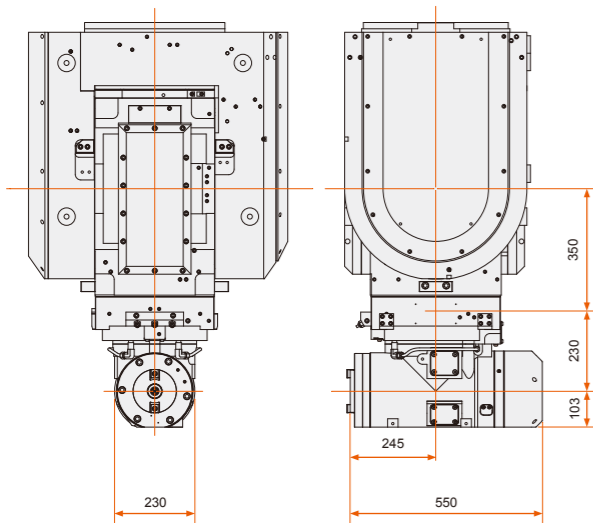
Can perform deep boring that cannot be done by the standard spindle

Tools from the tool magazine are automatically changed the same as tools for the standard spindle

In addition to flood coolant, the coolant through spindle system is optionally available

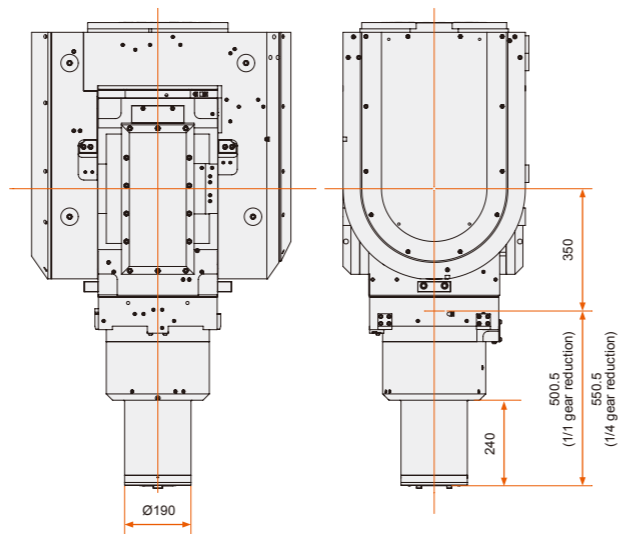
Dimensions

Unit : mm



Dimensions

Unit : mm



Specifications

Spindle taper	No.50
Spindle speed	50 ~ 1500 rpm
Gear reduction	1/2
Spindle bearing ID	100 mm
Max. tool diameter	Ø125 mm
Max. tool diameter (adjacent pockets empty)	Ø210 mm
Max. tool diameter (from gauge line)	500 mm
Max. tool weight	15 kg

Specifications

Spindle taper	No.50
Spindle speed	50 ~ 1500 rpm (1/4) 50 ~ 5000 rpm (1/1)
Gear reduction	1/4, 1/1
Spindle bearing ID	100 mm
Max. tool diameter	Ø125 mm
Max. tool diameter (adjacent pockets empty)	Ø210 mm
Max. tool diameter (from gauge line)	500 mm
Max. tool weight	15 kg

Angle / snout attachment is only available for the 8000 rpm spindle



PALLETECH MANUFACTURING CELL

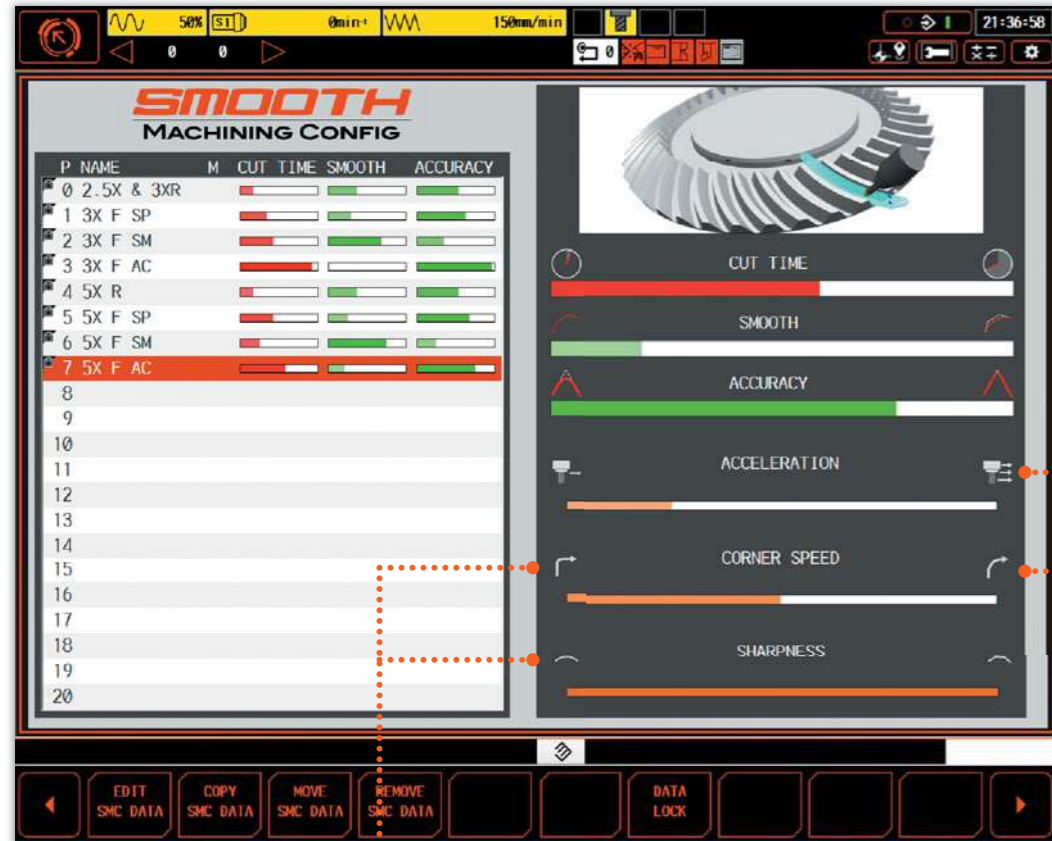
The VERSATECH can be integrated into a PALLETECH SYSTEM designed with the flexibility required for shorter product life cycles, reduced in-process inventory, just-in-time production and other demands of today's manufacturing environment. Additionally, the production schedule can be easily set or edited by just inputting the work flow of the pallets into the scheduler software of the FMS computer.

	Minimum	Maximum
Machine(s)	1	16
Number of pallets	6	240
Loading station(s)	1	8
Loading robot	1	1

Higher Productivity & Higher Accuracy

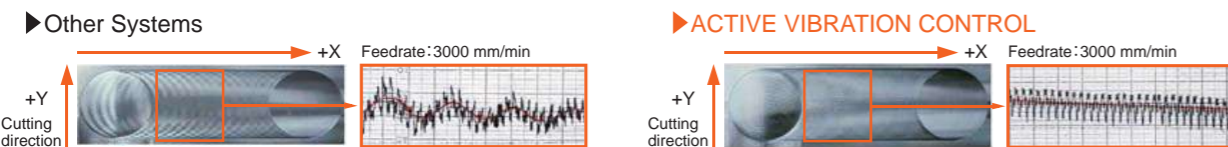
SMOOTH MACHINING CONFIGURATION

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



ACTIVE VIBRATION CONTROL

Minimized vibration function for high-speed, high-accuracy machining and longer tool life.

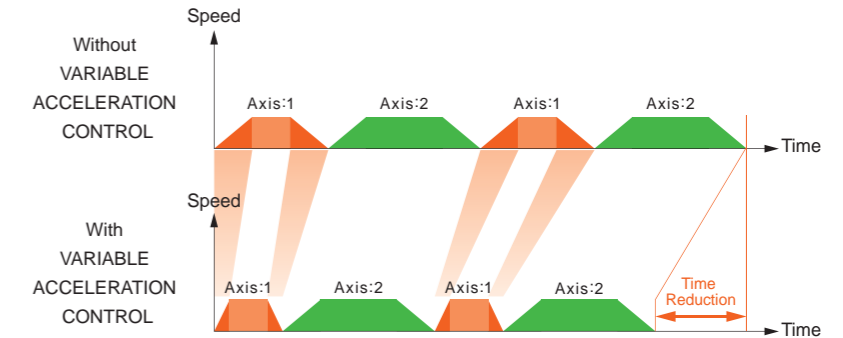


Machining time for an aluminum impeller was reduced approximately 10-20% by using this function
(test results for reference only)



VARIABLE ACCELERATION CONTROL

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

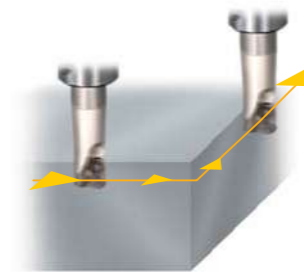


SMOOTH CORNER CONTROL

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

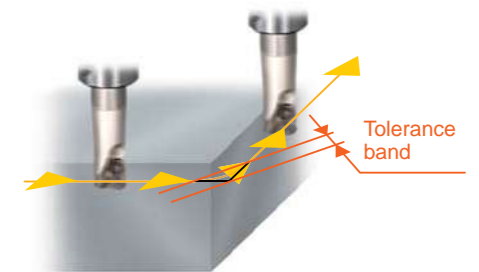
Other systems

Move to next command position after reaching current command position



SMOOTH CORNER CONTROL

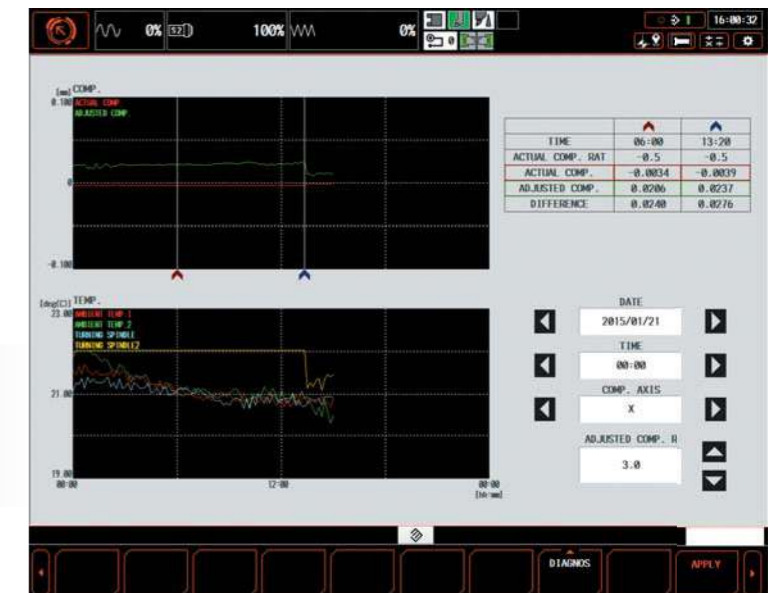
Move to next command position within tolerance band



THERMAL SHIELD

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

Temperature and compensation is displayed on screen.
Operator can adjust compensation by looking at the data



Ease of operation

Ease of set up



Tool magazine operation panel

The tool magazine operation panel is designed for increased ease of operation. Instead of having just a forward / reverse button for indexing the tool magazine and manually positioning the desired tool pocket, the pocket number or tool number can be input into the operation panel numeric keyboard and the desired pocket will be automatically brought into position.

SAFETY SHIELD

When an operator manually moves the machine axes for setup, tool measurement or changing inserts, the CNC shows a synchronized 3D model on the display for checking machine interference. If any machine interference occurs, the machine motion automatically stops. This function is also effective during automatic operation.



MAZAK VOICE ADVISER

Verbal support for machine setup and safe conditions confirmation.



Ease of Maintenance

MAZA-CHECK OPTION

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

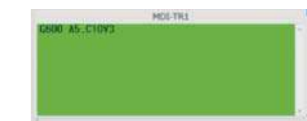
Measurement item selection



Measurement information setting



Automatic measurement program generation



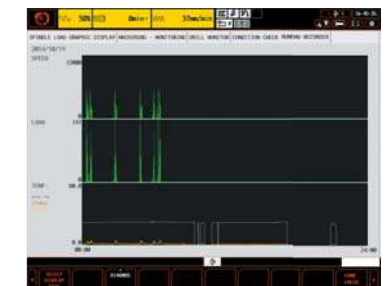
Convenient screen display assists measurement operation.

PERFORMANCE SPINDLE

The PERFORMANCE SPINDLE monitors a variety of properties such as temperature with sensors housed in the spindle and provides useful information to the operator. Thanks to this monitoring, production loss due to machine down time can be minimized.



Condition check
Temperature as well as the motor load can be displayed.



Running recorder
Operation status of milling spindle (rpm, % motor load and temperature) can be recorded up to one year

MAINTENANCE SUPPORT

Useful information for improved preventative maintenance to prevent unexpected machine downtime



MAZATROL Smooth CNC

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

MAZATROL *SMOOTHX*

From setup to machining
— designed for unsurpassed ease of operation



Three color status indicator

Machining status is indicated by three colors :
Green: automatic operation mode
Yellow: Machining completion
Red: Alarm

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

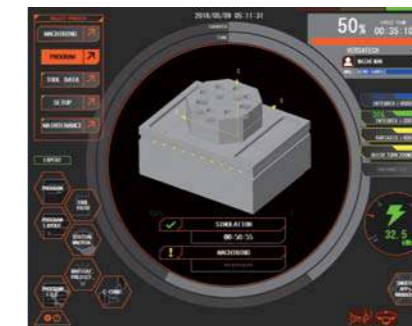
For frequently-used axes selection and feedrate changes.

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

Process home screens

Five different home process 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.

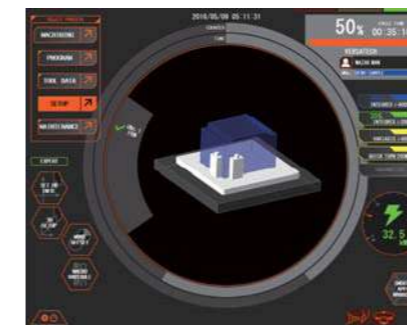
Programming



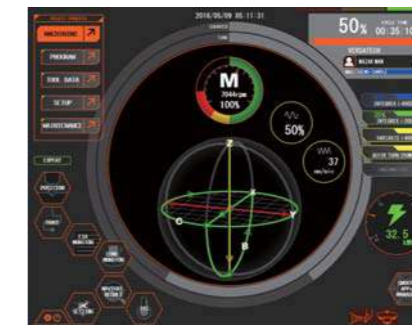
Tool data



Setup



Machining



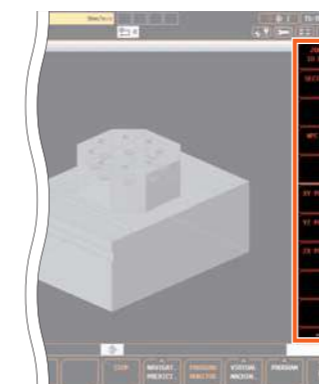
Maintenance



Pop-up windows

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

Side menu



List menu



Screen keyboard

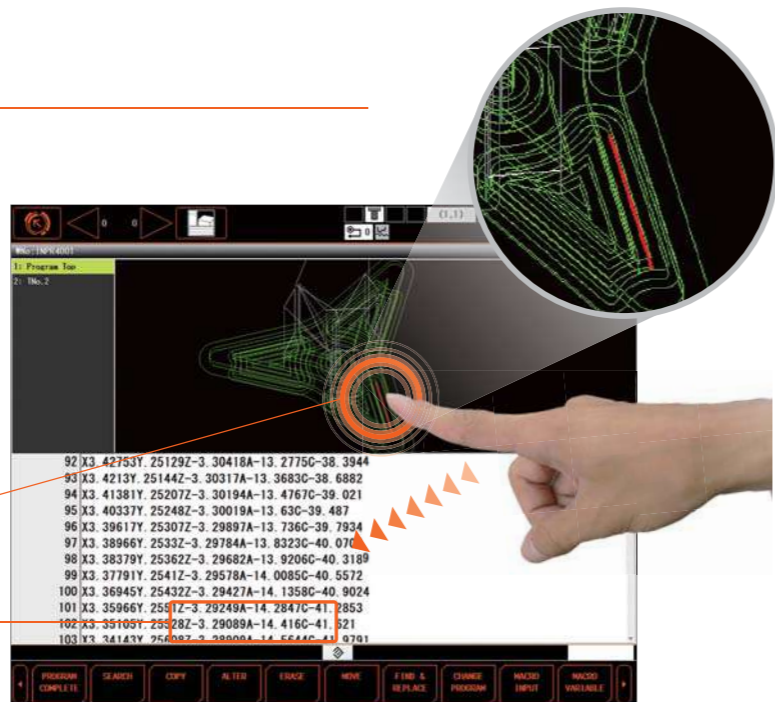


Ease of Programming

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.



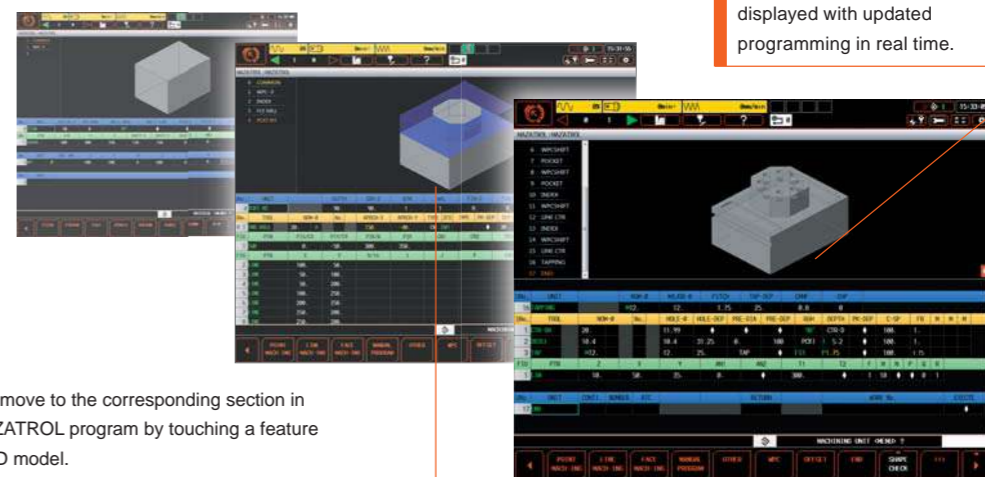
Selecting tool path by touching the screen.

Moving to the corresponding EIA program line.

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.

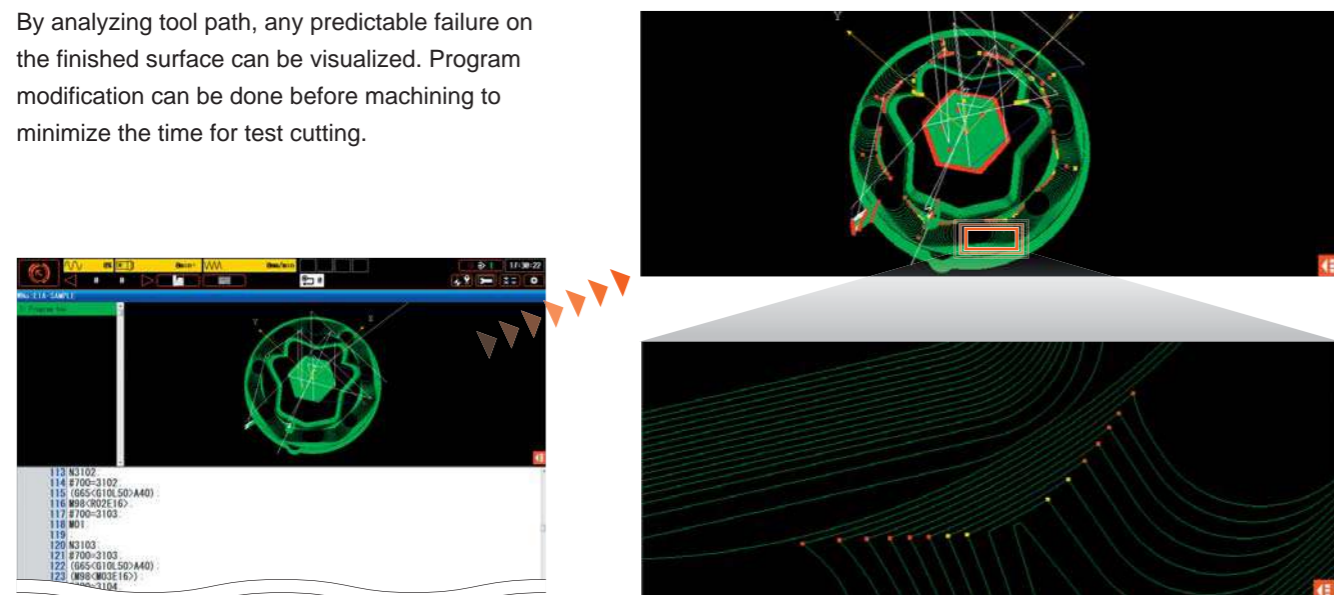
3D model in the process list is displayed with updated programming in real time.



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

VIEW SURF

By analyzing 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.



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.

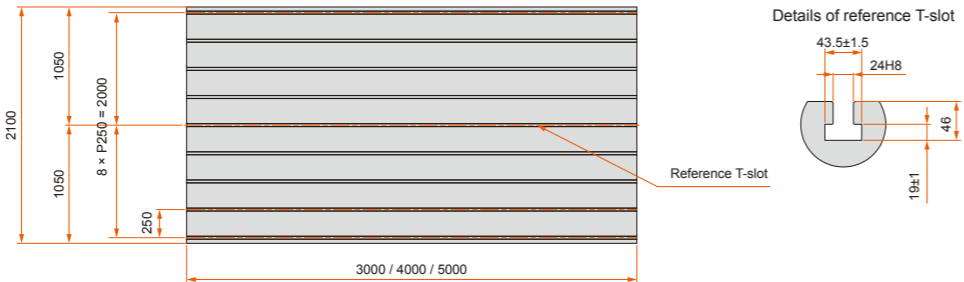
Automatically input to MAZATROL program



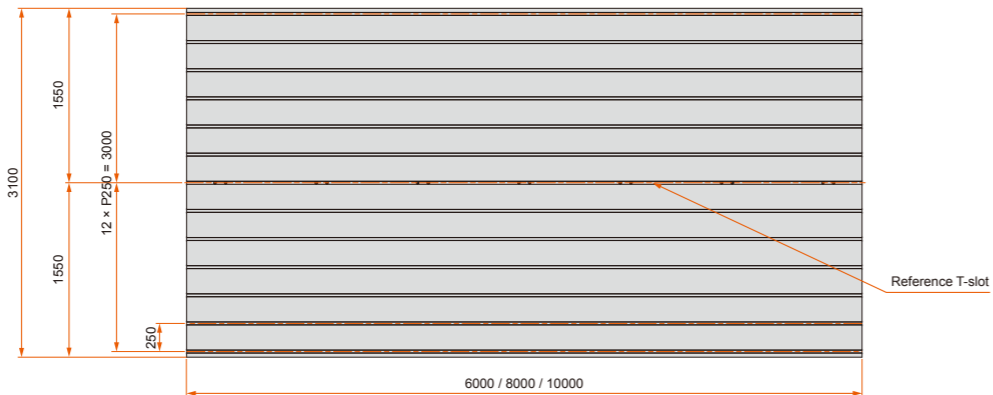
Table Dimensions

Unit : mm

VERSATECH V-100N



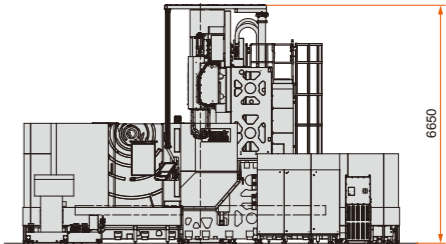
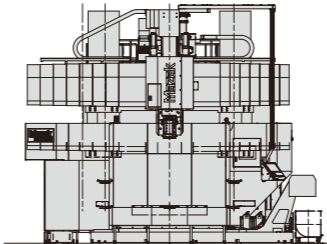
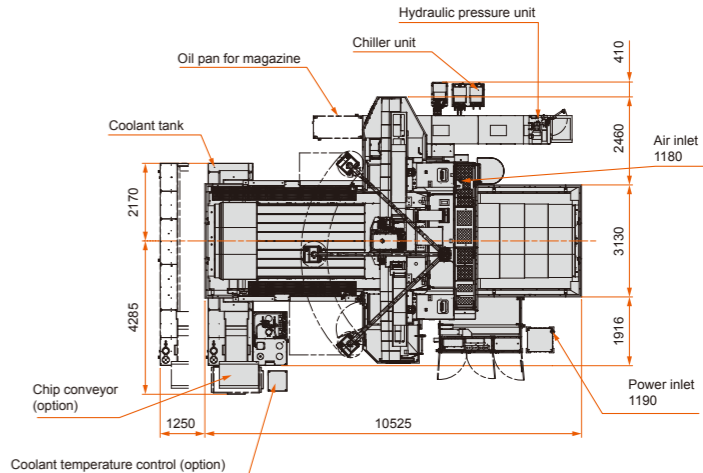
VERSATECH V-140N



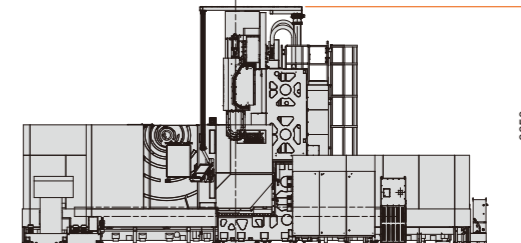
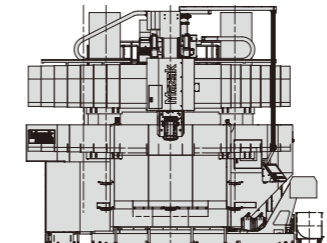
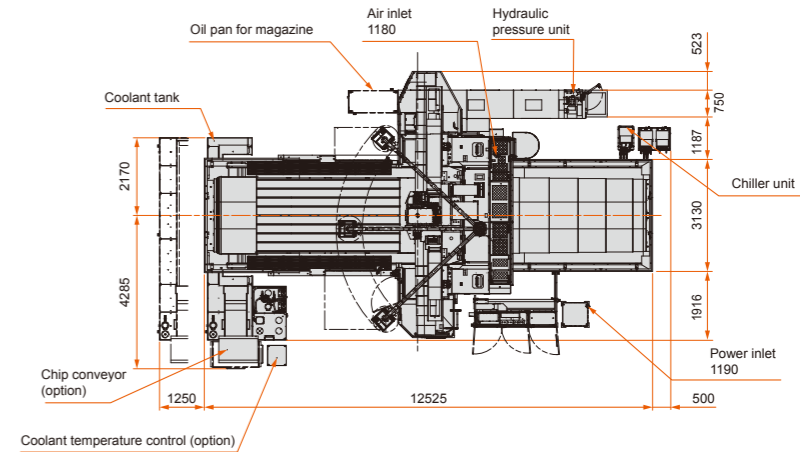
Machine Dimensions

Unit : mm

VERSATECH V-100N 160



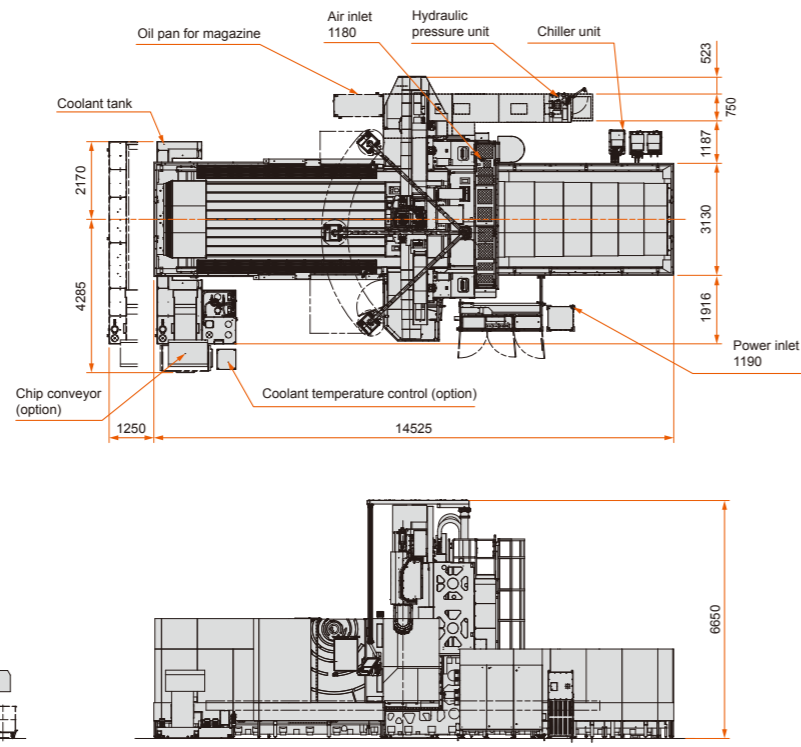
VERSATECH V-100N 200



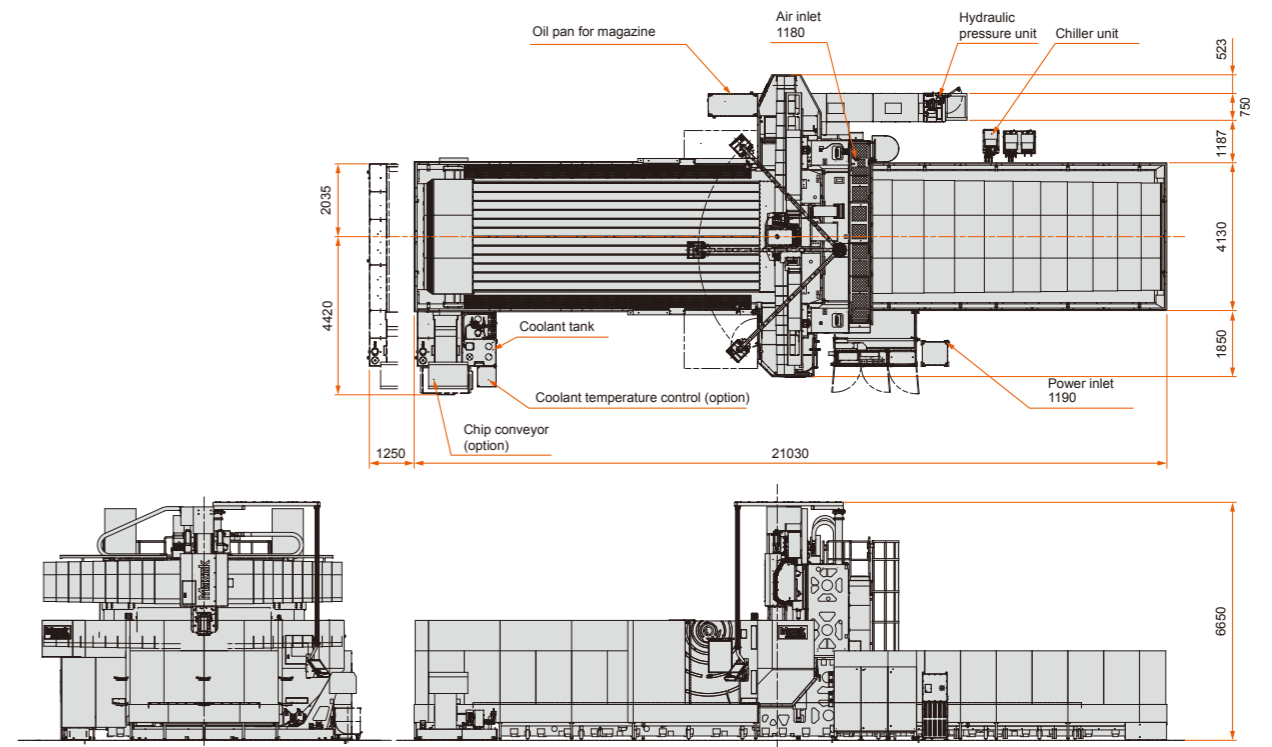
Machine Dimensions

Unit : mm

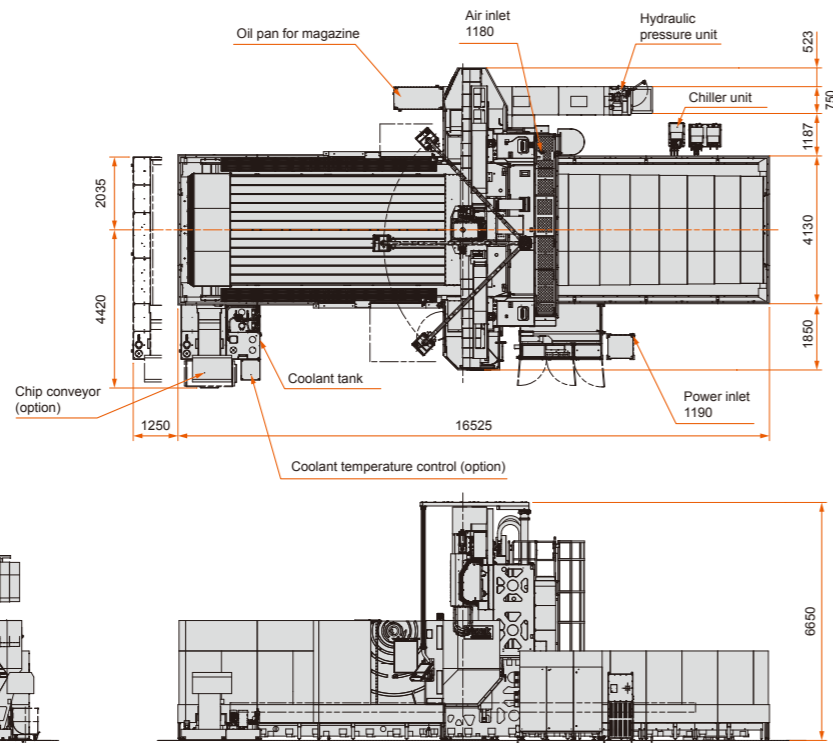
VERSATECH V-100N 240



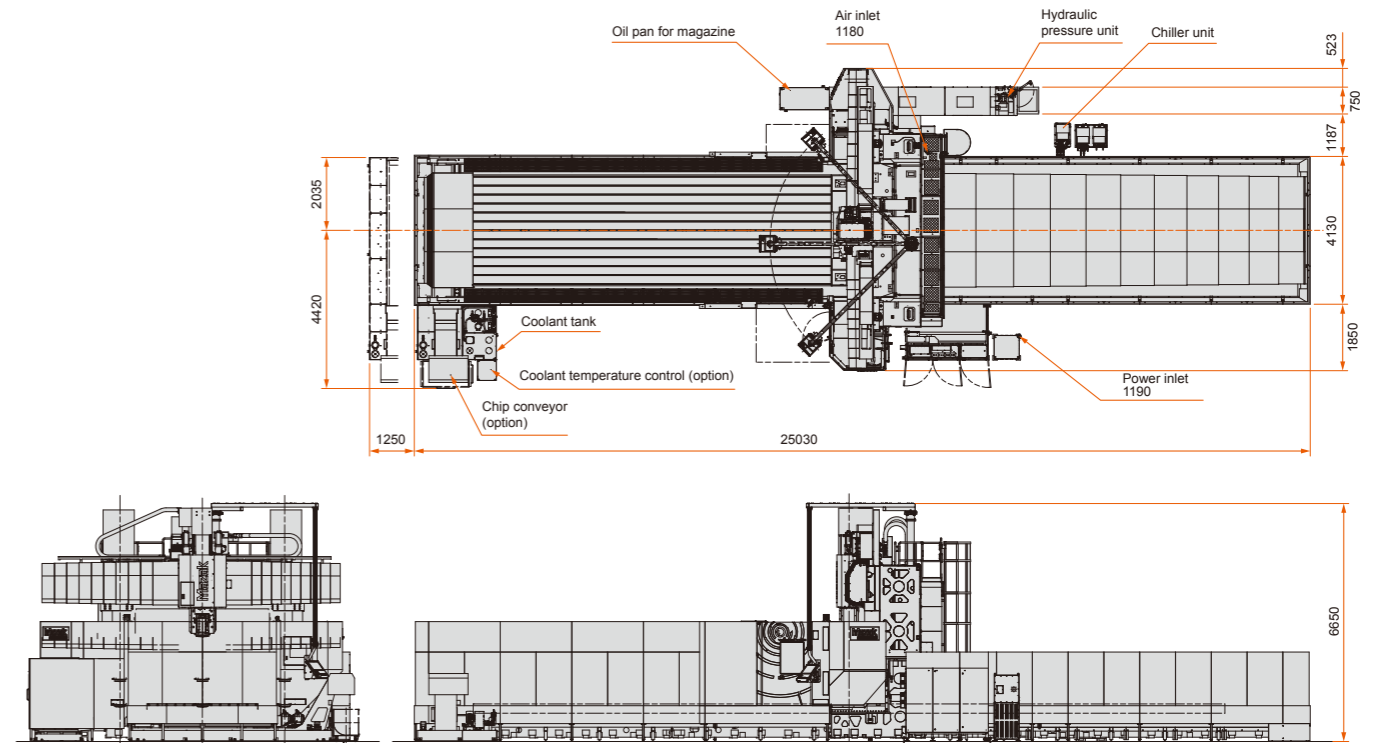
VERSATECH V-140N 360



VERSATECH V-140N 280



VERSATECH V-140N 440



Standard Machine Specifications

	V-100N 160	V-100N 200	V-100N 240	V-140N 280	V-140N 360	V-140N 440
Column	Distance between columns			2750 mm		
Stroke	X-axis (table forward / backward)	4000 mm	5000 mm	6000 mm	7000 mm	9000 mm
	Y-axis (spindle head travel right / left)	3600 mm			4600 mm	
	Z-axis travel (ram travel up / down)	710 mm				
	W-axis (cross rail up / down)	1250 mm				
	B-axis (positioning only)	-100°~100°				
	C-axis (positioning only)	±180°				
	Distance between spindle face and table top (B-axis : 0°)	1880 mm				
Table	Table size	2100 mm × 3000 mm	2100 mm × 4000 mm	2100 mm × 5000 mm	3100 mm × 6000 mm	3100 mm × 8000 mm
	Table load capacity (evenly distributed)	43000 kg				
	Table surface configuration	24 mm T-slot × 9 250 mm pitch			24 mm T-slot × 13 250 mm pitch	
Spindle	Max. spindle speed	8000 rpm, 12000 rpm (selectable)				
	Spindle	8000 rpm No.50 / 12000 rpm HSK-A100				
	Ram size	□450 mm				
	Ram guide face	Rollar guide				
	Min. indexing increment (B-axis, C-axis)	0.0001°				
	Indexing time (B-axis)	2.3 s (90°)				
	Indexing time (C-axis)	3.0 s (180°)				
Feedrate	Rapid traverse rate (X-, Y-, and Z-axes)	30, 30, 30 m / min			15, 30, 30 m / min	
	Rapid traverse rate (W-axis)	3 m / min				
	Cutting feedrate (X-, Y-, Z-axes)	8 m / min				
Automatic tool changer	Tool magazine capacity	30				
	Max. tool diameter / length (from gauge line) / weight	Ø125 mm / 500 mm / 25 kg				
	Max. tool diameter when adjacent pockets empty	Ø210 mm				
	Tool selection method	Random selection / shortest path				
	Tool change time (chip-to-chip)	16.5 sec.				
Motors	Spindle motor (40 % ED / cont. rating)	8000 rpm (40 kW (54 HP) / 30 kW (40 HP)) , 12000 rpm (45 kW (60 HP) / 37 kW (50 HP))				
Power requirement	Electrical power supply (40 % ED / cont. rating)	105 kVA / 96 kVA				
Machine size	Height	6650 mm				
	Floor space requirement *	7916 mm × 10525 mm	7506 mm × 13025 mm	7506 mm × 14525 mm	8440 mm × 16525 mm	8440 mm × 21030 mm
	Machine weight	59700 kg	65200 kg	70800 kg	86300 kg	106500 kg
Sound	Equivalent continuous sound pressure level at operator position (depend on equipment options)	Less than 80 dB(A)				

* When ATC 60 tool magazine is equipped

V-140N turning table specifications OPTION

	V-140N 280	
Column	Distance between columns	3750 mm
Stroke	X-axis (table forward / backward)	7000 mm
	Y-axis (spindle head travel right / left)	4600 mm
	Z-axis travel (ram travel up / down)	710 mm
	W-axis (cross rail up / down)	1250 mm
	B-axis (positioning only)	-100°~100°
	C-axis (positioning only)	±180°
	U-axis (turning table-positioning only)	360°
	Distance between spindle end and pallet top face (B-axis : 0°)	1980 mm
Turning table	Table size	Ø2950 mm
	Max. workpiece size	Ø3500 mm × 1750 mm
	Table load capacity (evenly distributed)	10000 kg
	Table surface configuration	24 mm T-slot × 11 250 mm pitch M20 × 200
Machine table	Table size	3100 × 6000 mm
	Table load capacity (evenly distributed)	30000 kg
	Table surface configuration	24 mm T-slot × 13 250 mm pitch
Ram spindle	Max. spindle speed	8000 rpm
	Spindle	8000 rpm No.50
	Ram size	□450 mm
	Ram guide face	Rollar guide
	Min. indexing increment (B-axis, C-axis)	0.0001°
	Indexing time (B-axis)	2.3 s (90°)
	Indexing time (C-axis)	3.0 s (180°)
Turning table	Max. speed	60 rpm
	Torque (Cont. rating)	10470 N·m
	Min. indexing increment (U-axis)	0.0001°
	Max. positioning speed (U-axis)	10.5 rpm
	Clamping torque	42500 N·m
Feedrate	Rapid traverse rate (X-, Y-, and Z-axes)	30, 30, 30 m / min
	Rapid traverse rate (W-axis)	3 m / min
	Cutting feedrate (X-, Y-, Z-axes)	8 m / min
Automatic tool changer	Tool magazine capacity	30
	Max. tool diameter / length (from gauge line) / weight	Ø125 mm / 500 mm / 25 kg
	Max. tool diameter when adjacent pockets empty	Ø210 mm
	Tool selection method	Random selection / shortest path
	Tool change time (chip-to-chip)	16.5 sec.
Motors	Spindle motor (40 % ED / cont. rating)	8000 rpm (40 kW (54 HP) / 30 kW (40 HP))
	Turning table motor (cont. rating)	45 kW (60 HP)
Power requirement	Electrical power supply (40 % ED / cont. rating)	184.41 kVA / 176.02 kVA
Machine size	Height	7000 mm
	Floor space requirement	8550 × 16525 mm
	Machine weight	101700 kg
Sound	Equivalent continuous sound pressure level at operator position (depend on equipment options)	Less than 80 dB(A)

8000rpm standard spindle is only available.
0.0001° indexing function for turning table (No contouring)

MAZATROL SmoothX Specifications

	MAZATROL	EIA
Number of controlled axes	Simultaneous 2 ~ 4 axes	Simultaneous 2 ~ 4 axes, Simultaneous 5 axes *
Least input increment	0.0001 mm, 0.00001", 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, 5-axis spline *
Interpolation	Positioning (Linear interpolation), Positioning (Independent interpolation), Linear interpolation, Circular interpolation, Cylindrical 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 *
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, 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 *	
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	Rotary axis pre-filter, Angled surface cutting, Shaping function *, Tool nose point control *, Tool diameter compensation for 5-axis machining *, Workpiece positioning error compensation *, Parallel shaft synthesis *, Tool axis direction / tool length compensation *	
Machine compensation	G0 / G1 independent backlash compensation, Pitch error compensation, Geometric deviation compensation, Volumetric compensation *	
Protection functions	Emergency stop, Interlock, Stroke check before travelling, Retraction function for the vertical axis, SAFETY SHIELD (manual mode), 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, 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	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 Gbps	

* Option

Standard and Optional Equipment

		● : Standard ○ : Option - : N/A					
		V-100N 160	V-100N 200	V-100N 240	V-140N 280	V-140N 360	V-140N 440
Machine	8000 rpm / 12000 rpm spindle (selectable)	●	●	●	●	●	●
	High-torque 6000 rpm spindle / 1218 N·m	○	○	○	○	○	○
	Simultaneous 5-axis	○	○	○	○	○	○
	30-tool magazine (chain)	●	●	●	●	●	●
	60-tool magazine (chain)	○	○	○	○	○	○
	120-tool magazine (chain)	○	○	○	○	○	○
	High-column specification (250 mm or 350 mm)	○	○	○	○	○	○
Factory automation	2 table changer	○	○	○	○	○	○
	Universal attachment interface (8000 rpm spindle only)	○	○	○	○	○	○
	Angle attachment	○	○	○	○	○	○
	Angle attachment (coolant through spindle)	○	○	○	○	○	○
	Snout attachment (gear reduction 1/4)	○	○	○	○	○	○
	Snout attachment (gear reduction 1/1)	○	○	○	○	○	○
	Universal attachment changer (1, 2, 4, 6)	○	○	○	○	○	○
	Automatic power on / off + warm-up operation	●	●	●	●	●	●
	Operation end buzzer	○	○	○	○	○	○
	3-color machine status light	○	○	○	○	○	○
	Status light (machining completion indicator/yellow) (alarm indicator / red)	○	○	○	○	○	○
High accuracy	Ball screw core cooling (X, Y, Z-axis)	●	●	●	●	-	-
	Ball screw core cooling (Y, Z-axis)	-	-	-	-	●	●
	Scale feedback (X, Y, Z, W-axis)	○	○	○	○	○	○
	Scale feedback (W-axis)	○	○	○	○	○	○
	Coolant temperature control	○	○	○	○	○	○
Setup support	Auto tool length measurement and tool breakage detection	○	○	○	○	○	○
	Mazak monitoring system B (RMP 60)	○	○	○	○	○	○
	Magazine operation panel for tool ID (touch panel)	○	○	○	○	○	○
	Pull stud with tool ID (# 50 EUCHNER)	○	○	○	○	○	○
	Manual pulse generator (wireless)	○	○	○	○	○	○
	Manual pulse generator (wired)	○	○	○	○	○	○
	Work light	●	●	●	●	●	●
Coolant / Chip disposal	Flood coolant	●	●	●	●	●	●
	Work air blast	○	○	○	○	○	○
	Coolant through spindle system (1.5 Mpa or 3.5 Mpa)	○	○	○	○	○	○
	Side coolant cover	●	●	●	●	●	●
	Internal chip conveyor (hard type)	○	○	○	○	○	○
	Internal chip conveyor	●	●	●	●	●	●
	Chip conveyor (right side discharge or left side discharge) (ConSep)	○	○	○	○	○	○
Chip bucket (rotary or fixed)	○	○	○	○	○	○	
Large capacity chip bucket (rotary)	○	○	○	○	○	○	
Chip conveyor (right side discharge or left side discharge) (ConSep)	○	○	○	○	○	○	
Safety equipment	Operator door interlock	●	●	●	●	●	●
Others	Manuals	●	●	●	●	●	●
	Additional manuals	○	○	○	○	○	○
	Disassembly and adjustment tools	●	●	●	●	●	●

Above specifications are for European market. Standard and optional equipment vary by market.

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