

Machine Specifications

		Single table	2 pallet changer (option)
Stroke	X-axis (saddle left / right)	500 mm	
	Y-axis (column back / forth)	400 mm	
	Z-axis (spindle head up / down)	350 mm	
Table	Distance from spindle face to table	275 mm ~ 625 mm	225 mm ~ 575 mm
	Table size	600 mm × 400 mm	600 mm × 410 mm
	Max. load capacity (evenly distributed)	300 kg	200 kg
Spindle	Table surface configuration	T-slot width 14 mm	M16
	Max. speed	12000 min ⁻¹ (rpm)	
	Spindle taper	No.30	
Feedrate	Rapid traverse rate (X, Y, Z axes)	60 m/min	
Automatic tool changer	Tool shank	BT-30	
	Tool storage capacity	14	
	Max. tool diameter / length (from gauge line) / weight	Φ80 mm / 250 mm / 3 kg	Φ80 mm / 245 mm / 3 kg
	Max. tool diameter with adjacent tool pockets empty	Φ125 mm	
Motors	Tool selection method	Random selection / shortest path	
	Spindle motor (25 % ED / cont. rating)	9.0 kW / 6.0 kW (12 HP / 8.0 HP)	
Machine size	Machine height (from floor)	2650 mm	
	Floor space requirement* MAZATROL SmoothC Mazak FZ	1280 mm × 2753.7 mm	1561.7 mm × 3276.3 mm
	Machine weight	1280 mm × 2770 mm	1525.6 mm × 3276.3 mm
		3800 kg	5000 kg

*Chip pan not included

Standard and Optional Equipment

		Single table	2 pallet changer (option)			Single table	2 pallet changer (option)
Spindle	12000 min ⁻¹ (rpm)	●	●	Automation	Automatic power off	○	○
	12000 min ⁻¹ (rpm) High torque	○	○		Calendar-type automatic power ON / OFF	○	○
	20000 min ⁻¹ (rpm) High speed	○	○		Coolant	Coolant through spindle 0.5 MPa	○
Tool shank	BT-30	●	●	High-pressure coolant through spindle 1.5 MPa		○	○
	HSK-A50	○	○	Base coolant		●	●
	BBT-30	○	○	Flood coolant	●	●	
Table	T-slot table	●	○	Shower coolant	○	●	
	M16 tapped table	○	●	Work air blast	○	○	
	Raised table (+100 mm)	○	—	Coolant tank 250 L	●	—	
	Wide table (1000 mm)	○	—	Coolant tank 350 L (for chip conveyor)	○	○	
Tool magazine	14 tools	●	●	Rear discharge chip conveyor (scraper)	○	○	
	19 tools	○	○	Rear discharge chip conveyor (hinge)	○	○	
	21 tools (tool diameter up to Φ75 mm, BT-30 only)	○	○	Manual coolant nozzle	○	○	
Automation	2 pallet changer preparation for hydraulic / pneumatic fixture	—	○	Mist collector	○	○	
	Manual door	●	●	Preparation for mist collector	○	○	
	Automatic open / close door	○	—	Top cover (fixed)	○	○	
	Index table	○	○	Lubrication	Oil lubrication	●	●
	NC rotary table	○	○		Grease lubrication	○	○
	Automatic tool length measurement system	○	○	Others	Work lights	○	○
Touch sensor (OMP40)	○	○	Foundation kit		●	●	
Preparation for touch sensor	○	○	Set of manuals	●	●		

Mazak

YAMAZAKI MAZAK (CHINA) CO., LTD.

No.5131, Jindu Road, Minhang District, Shanghai, P.R.C.
T: +86-21-54832688 F: +86-21-54832388

www.mazak.com.cn

- 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.)



VC-PRIMOS 400 L 19.01.0 G 99J288219E0

VC-PRIMOS 400 L

Mazak

VC-PRIMOS 400 L

[Compact, high performance vertical machining center]

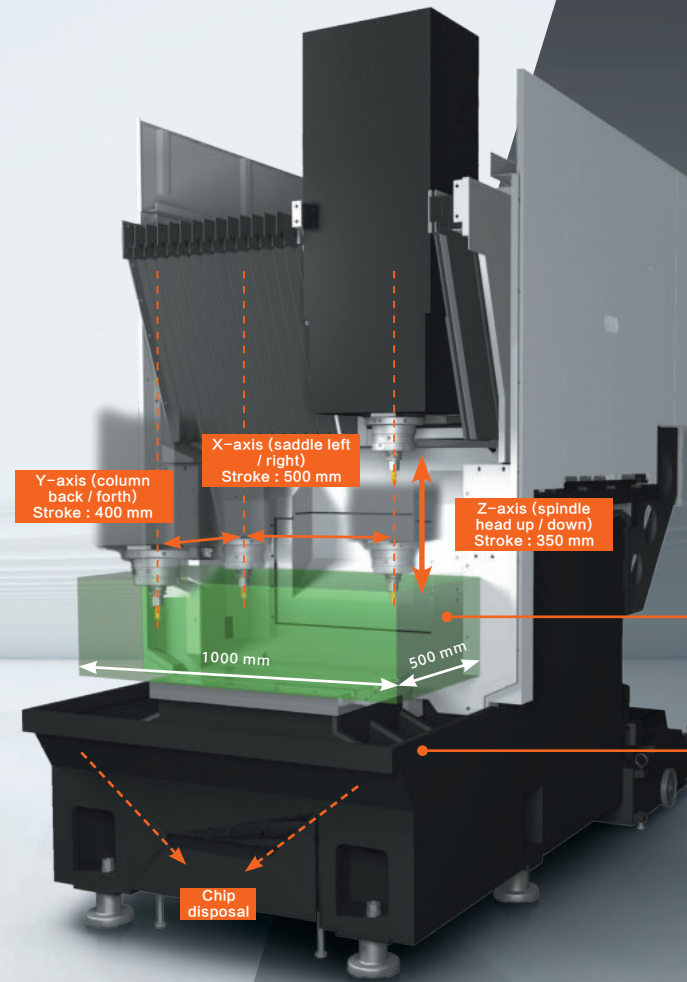


Compact, high performance vertical machining center with unsurpassed productivity

- Stationary machine table with all drive elements above machining area ensures smooth chip disposal
- Equipped with high speed, high accuracy, compact BT-30 spindle for small parts machining
- Wide variety of available table specifications and automation equipment thanks to fixed table design
- Designed for ease of operation and maintenance
- Available with MAZATROL SmoothC / Mazak FZ CNC



(MAZATROL SmoothC shown)



Fixtures can be located in large 1000 mm × 500 mm area with 600 mm × 400 mm table

X, Y, Z axes ball screws and servo motors are located on top of machine to provide smooth chip disposal (Machined chips are smoothly disposed from both sides of the table into the chip pan)

High performance vertical machining center

VC-PRIMOS 400 L

Applications

Mass production of automobile and bicycle parts
Also applications in various industrial fields including medical equipment, mold parts, general mechanical parts

Valve body for automobile automatic transmission

Alternator component

Valve body

Transmission case

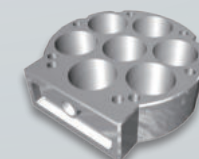


Air conditioner cylinder block

Connecting rod

Cylinder head

Casing



Large production line in minimum space

By eliminating maintenance requirements from either machine side and having chip disposal to the chip pan under the machine table, machines can be installed in a line very close to each other. Together with the smallest machine width in its class (1280 mm), this results in very compact production lines for increased ease of operation.



Higher Productivity

Compact No.30 taper spindle vertical machining center designed to perform a wide variety of machining

The compact spindle can perform a wide variety of machining efficiently - from aluminum die castings to other materials.

Compact, High performance spindle

Standard spindle 12000 min⁻¹
High speed spindle 20000 min⁻¹, high torque spindle 12000 min⁻¹ are optionally available.

High speed armless tool changer

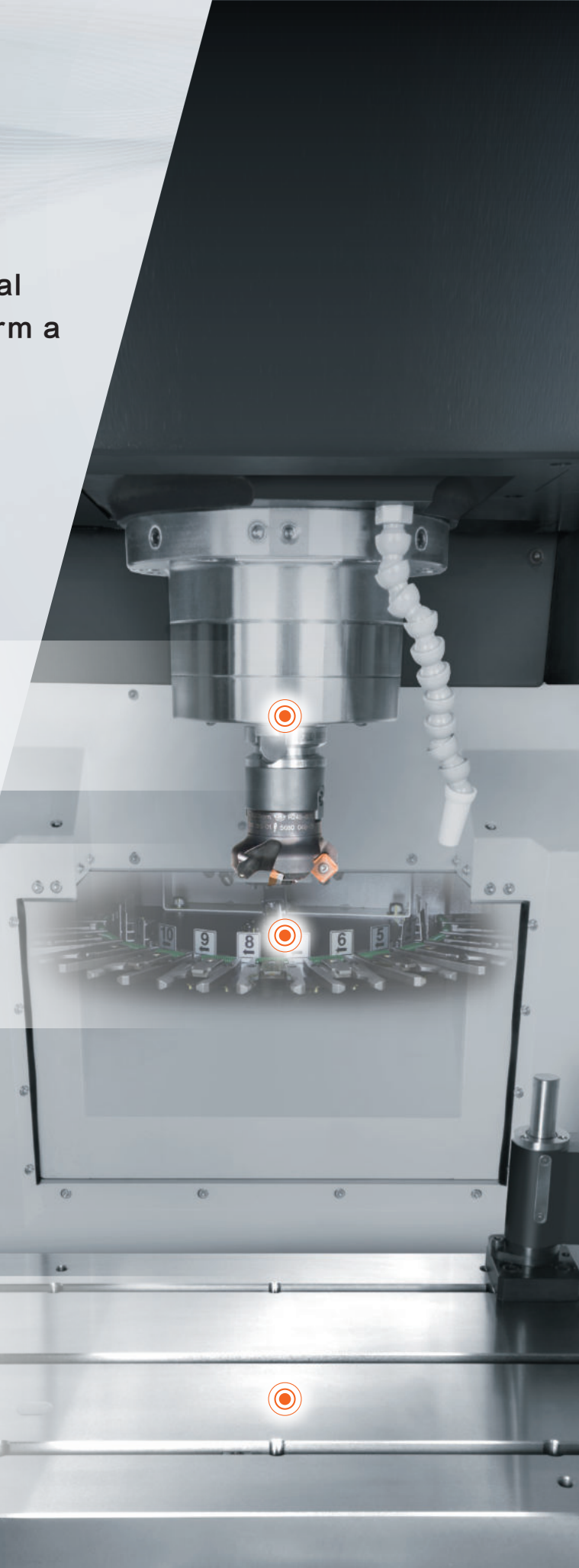
Tool change time (chip-to-chip) :2.6 sec ~ 3.6 sec
The standard tool magazine has a storage capacity of 14 tools. 19 and 21 tool magazines are optionally available.

High speed positioning

The rapid traverse rate of the X-, Y-, Zaxes is 60 m/min for minimum workpiece cycle times

Table

Thanks to the fixed table design, NC rotary tables and hydraulic / pneumatic fixtures can easily be mounted to meet the machining requirements of a wide variety of workpieces.



Spindle specifications for a variety of applications

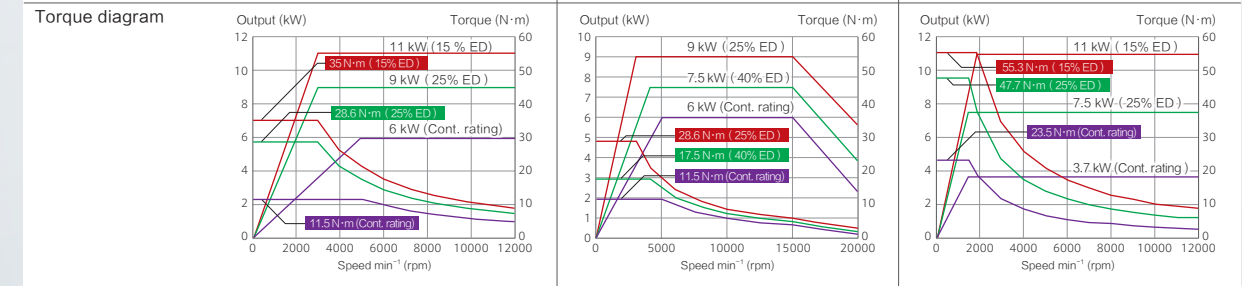
The standard spindle is suitable for nonferrous materials such as aluminum. The optional high speed 20000 min⁻¹ spindle is effective for die machining, and the optional high torque 12000 min⁻¹ spindle is suitable for large diameter taps, steel, and cast iron machining. The standard spindle interface is BT-30 with BBT30 and HSK-A50 optionally available.

The spindle and spindle motor are connected by a high efficiency flexible coupling that features low vibration to ensure exceptional surface finishes and machined surface accuracy.

Standard 12000 min ⁻¹ (rpm) spindle	High speed 20000 min ⁻¹ (rpm) spindle (option)	High torque 12000 min ⁻¹ (rpm) spindle (option)
--	---	--

Spindle features

Max. speed	12000 min ⁻¹ (rpm)	20000 min ⁻¹ (rpm)	12000 min ⁻¹ (rpm)
Spindle acceleration time to top speed	0.79 sec (0→12000)	0.63 sec (0→12000) , 1.96 sec (0→20000)	1.07 sec (0→12000)
Output	11.0 kW (15% ED) , 6.0 kW (cont. rating)	9.0 kW (25% ED) , 6.0 kW (cont. rating)	11.0 kW (15% ED) , 3.7 kW (cont. rating)
Max. torque	35.0 N·m (15% ED)	28.6 N·m (25% ED)	55.3 N·m (15% ED)



A5052 machining

		Φ50 mm face mill	
Radial depth of cut	37.5 mm	37.5 mm	37.5 mm
Depth of cut	3.5 mm	3.3 mm	3.25 mm
Spindle speed	12000 min ⁻¹ (rpm)	12730 min ⁻¹ (rpm)	12000 min ⁻¹ (rpm)
Feedrate	7200 mm/min	7640 mm/min	7200 mm/min
Material removal rate	945 cm ³ /min	945 cm ³ /min	878 cm ³ /min
		Φ30 mm indexable insert drill	
Spindle speed	4244 min ⁻¹ (rpm)	4244 min ⁻¹ (rpm)	4244 min ⁻¹ (rpm)
feedrate	0.10 mm/rev	0.10 mm/rev	0.12 mm/rev
Max. tapping capability	M27 × P3.0	M20 × P2.5	M30 × P3.0
Speed	1326 min ⁻¹ (rpm)	1400 min ⁻¹ (rpm)	1061 min ⁻¹ (rpm)
Feedrate	3978 mm/min	3500 mm/min	3714 mm/min

S45C machining

		Φ50 mm face mill	
Radial depth of cut	37.5 mm	37.5 mm	37.5 mm
Depth of cut	2.25 mm	1.75 mm	2.5 mm
Spindle speed	1528 min ⁻¹ (rpm)	1528 min ⁻¹ (rpm)	1528 min ⁻¹ (rpm)
Feedrate	917 mm/min	917 mm/min	917 mm/min
Material removal rate	77 cm ³ /min	60 cm ³ /min	86 cm ³ /min
Drill	Φ30 mm indexable insert drill	Φ25 mm indexable insert drill	Φ30 mm indexable insert drill
Speed	2122 min ⁻¹ (rpm)	2546 min ⁻¹ (rpm)	2122 min ⁻¹ (rpm)
Feedrate	0.10 mm/rev	0.10 mm/rev	0.12 mm/rev
Max. tapping capability	M16 × P2.0	M16 × P2.0	M22 × P2.5
Speed	796 min ⁻¹ (rpm)	796 min ⁻¹ (rpm)	434 min ⁻¹ (rpm)
Feedrate	1592 mm/min	1592 mm/min	1085 mm/min

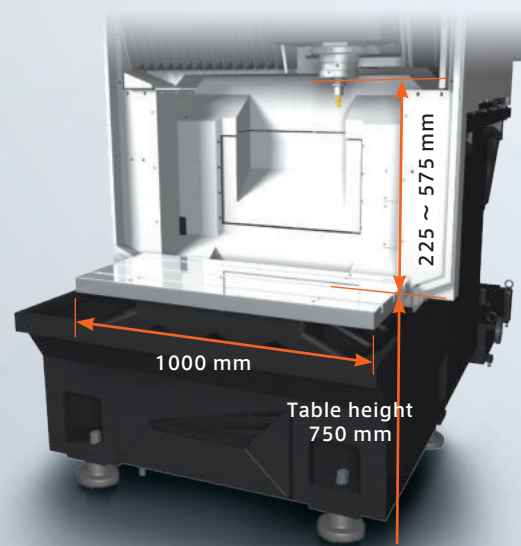
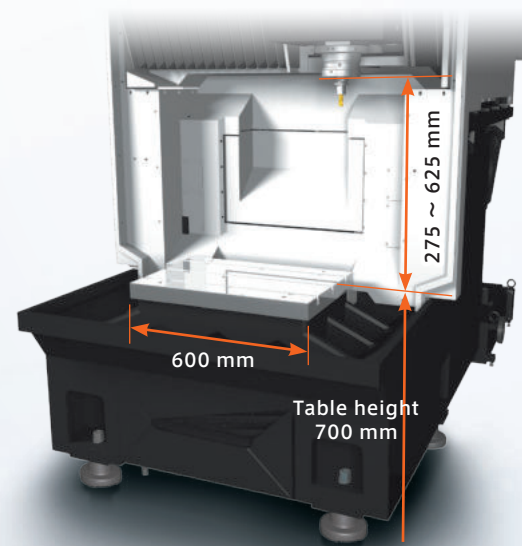
Flexibility

Table Variation

Different tables can be offered because table is fixed type

Standard table

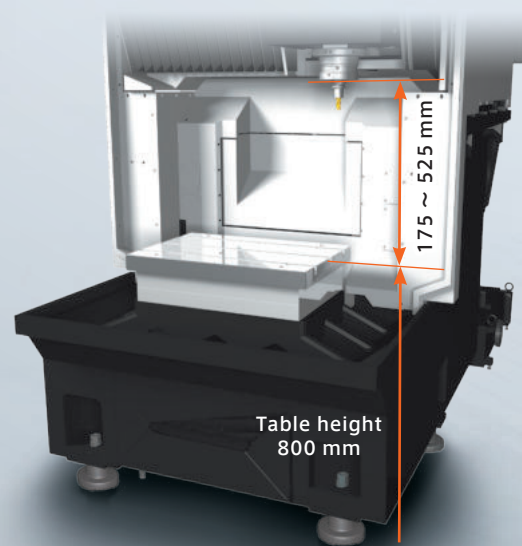
600 mm × 400 mm
Sufficient space for tall fixtures



Wide table (1000 mm)

option

400 mm wider than standard table



High table

option

100 mm taller than standard table - allows the machining of thin parts without requiring the use of long tools

Automation

2 pallet changer

OPTION

Next workpiece can be set up during machining

605 mm wide opening allows convenient overhead crane access for changing of heavy fixtures.

Layout example of mirror-image machine

Thanks to compact size, operator's movement is minimized.



2 pallet changer

Pallet size : 600 mm × 410 mm
Max. load: 200 kg
Pallet change time: 3.2sec

Robot cell

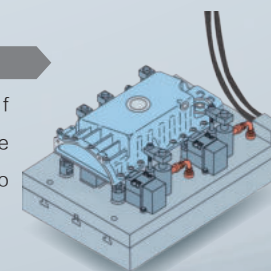
The VC-PRIMOS 400 L can be integrated in a cell that has workpieces automatically loaded / unloaded by robots. By integrating the QT-PRIMOS series, a large production line performing both turning and milling can be designed with minimum floor space requirements.



Hydraulic fixture

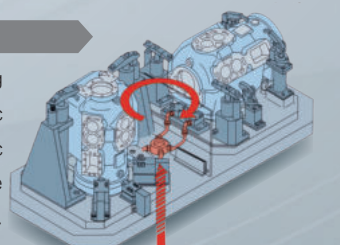
Standard single table

Wiring and mounting of hydraulic power supply can be conveniently done thanks to the stationary machine table



2 pallet changer with rotary joint

Setup changes can be performed during machining to minimize idle time. Hydraulic / pneumatic power supply for automatic fixture clamping can be from beneath the table for increased ease of operation. (Rotary joint is optionally available)



Operator Friendly



Ergonomic design for ease of operation

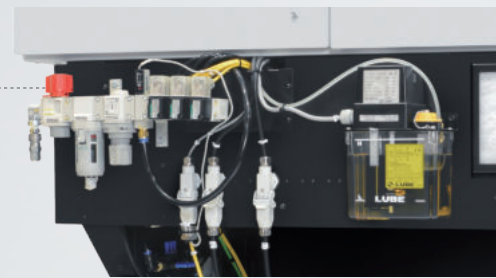
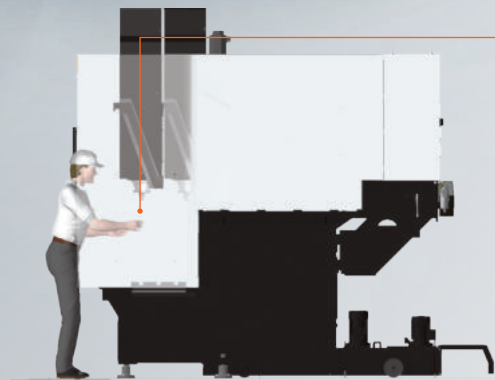
Units requiring access for maintenance are located on the front and back of the machine. As a result, multiple machines can be placed extremely close to each other to comprise a very compact production line. Thanks to the small machine width, one operator can handle multiple machines.

Small, lightweight front door

The front door is designed for easy opening and closing to reduce the load on the operator when loading and unloading workpieces.

Excellent access to table and spindle

Workpiece loading / unloading, fixture changing, and checking the tool in the spindle can all be done conveniently.



Backside of the machine

Designed for convenient maintenance

The pneumatic unit and lubrication inlets are in a central location for easy maintenance.

Higher Accuracy

Unique Mazak heat displacement compensation system

Heat Displacement Control THERMAL SHIELD

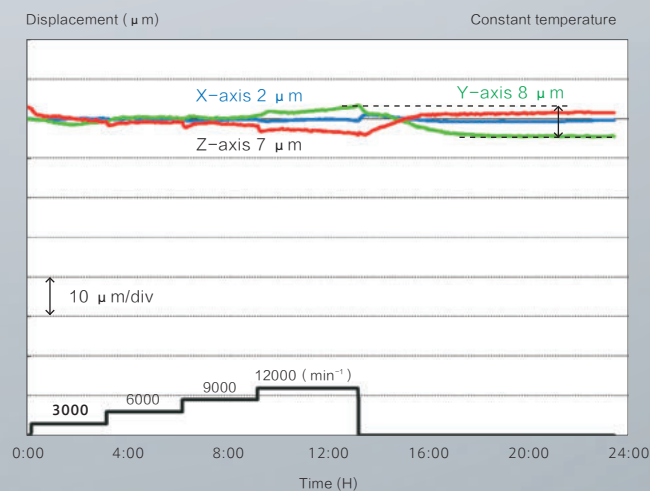
The VC-PRIMOS 400 L is equipped with automatic compensation for room temperature changes, the THERMAL SHIELD, to realize enhanced continuous machining accuracy. MAZAK has performed extensive testing in a variety of environments in a temperature controlled room and has used the results to

develop a control system that automatically compensates for temperature changes in the machining area.

THERMAL SHIELD heat displacement

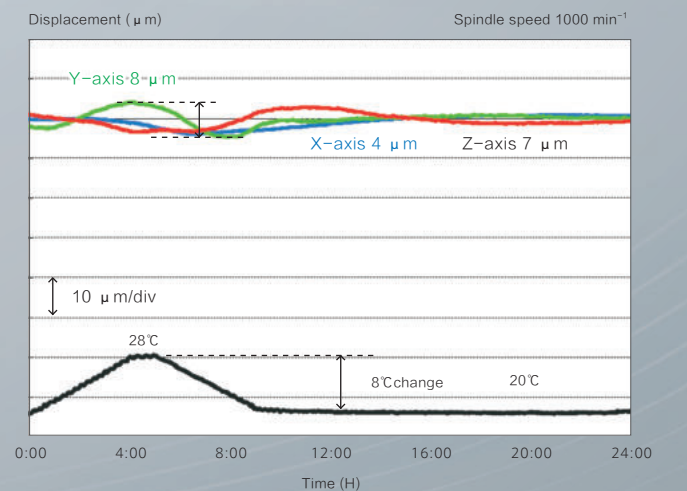
Spindle speed change

High accuracy correction is realized for spindle expansion and contraction due to heat generated during operation.



Room temperature change (8° C)

High precision correction is realized for changes in the room temperature.



MAZATROL CNC System



Simplified display and key input operation

Following traditional conversational MAZATROL programming, this new system is designed for ease of operation by simplified key operation.

USB interface

Transfer program and tool data

SD card slot

Transfer program and tool data

Menu keys under the display can be pressed to go to other pages for program data input and editing

Compact keypad with unique design for ease of input

Home screen key goes to the home screen from any display

Home screen

Comprehensive status display on one screen

The home screen displays overall process status in an easy to understand manner.

Programming

Displays the simulation time and machining time.

Tool data

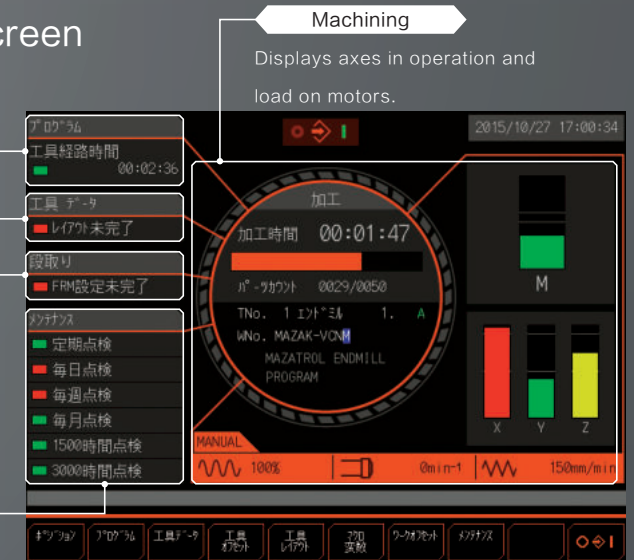
Displays status of tool layout.

Set up

Displays status of workpiece coordinate setting.

Maintenance

Overview of the status of items requiring maintenance.



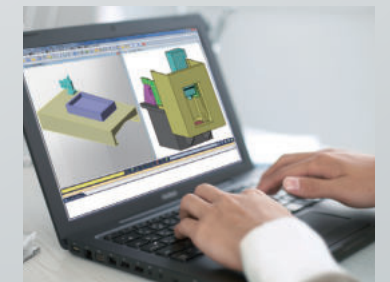
MAZATROL conversational programming

MAZATROL interactive programming uses conversational language and automatically determines cutting conditions, M codes, and G codes. Even a beginner operator can quickly make programs.



3D machine model

A 3D machine model is available to perform program interference checks with other CAD / CAM simulation software.



4-axes simultaneous CNC

MAZATROL SMOOTHC

MAZATROL SmoothC Specifications



Number of controlled axes	MAZATROL	EIA
Least input increment	Simultaneous 4 axes	
High speed, high precision	0.0001 mm , 0.00001 inch , 0.0001°	
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, 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, Program storage expansion : 32 MB	
Control display	Display : 10.4", Resolution : VGA	
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	—	Shaping function*, Dynamic compensation**
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	
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*	Automatic tool length measurement*, Sensor calibration, Tool breakage detection*
MDI measurement	Partial auto tool length measurement, Auto tool length measurement, Coordinate measurement	
Interface	PROFIBUS-DP*, EtherNet I/P*, CC-Link*, USB	
Card interface	SD card interface	
EtherNet	10 M / 100 M / 1 Gbps	

*Option

Mazak FZ Specifications



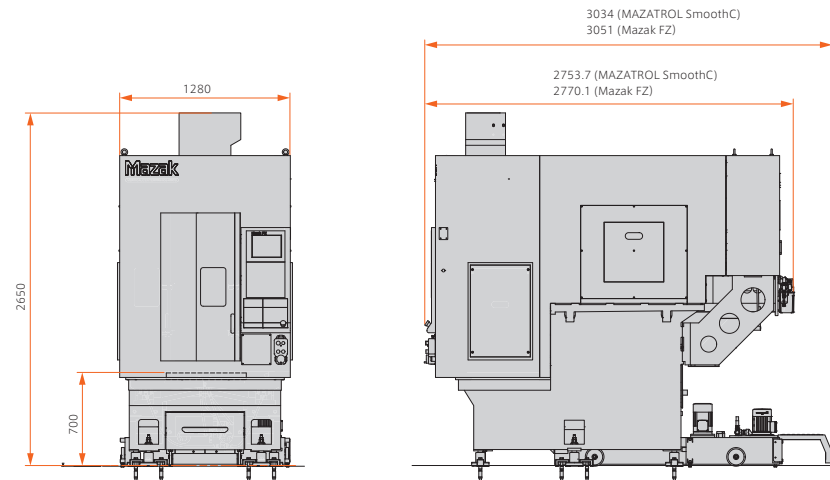
	Mazak FZ
Number of controlled axes	Max. 5 axes (simultaneous 4 axes)
Least input increment	0.0001 mm , 0.00001 inch , 0.0001°
Max. programmable value	± 99999.9999 mm , ± 9999.9999 inch , ± 99999.9999°
High precision control	Nano interpolation, Absolute position detection, AI look-ahead control, AI contour
Interpolation	Positioning (Independent axes control, Linear interpolation), Linear interpolation, Circular interpolation, Cylindrical coordinate interpolation, Polar coordinate interpolation, Thread cutting (equal pitch, variable pitch), synchronized tapping
Feedrate	Rapid traverse, Cutting feed (per revolution, per minute), Feedrate clamp, Override (Rapid traverse, Cutting feed, External override, Override cancel), Automatic acceleration / deceleration feedrate, Constant tangential speed control, Dry run
Program storage capacity	400 registered programs 512 KB
Display	10.4" LCD
NC display languages	English, German, French, Italian, Spanish, Dutch, Swedish, Danish, Portuguese, Turkish, Polish, Czech, Chinese simplified form, Chinese traditional form, Korean, Russian, Hungarian, Japanese
Data input / output	CF card, USB
Interface	EtherNet (100 BASE-TX)
Spindle function	S code output, Spindle revolution control (RPM clamp, high speed indication / speed change detection, Rotary speed display), Spindle override (0-150%), Constant surface speed, Multiple orient*
Tool function	T code output (8-digit binary data), Spare tool exchange
Tool compensation	Tool position compensation, Tool length compensation, Tool diameter compensation
Tool offset pairs	Max. 400
Miscellaneous functions	M code output (Max.8-digit), Second miscellaneous functions (Max 8-digit output)
Coordinate system control	Machine coordinate system (Machine coordinate system, Machine coordinate system shift), Work coordinate system (Work coordinate system, Work coordinate system shift)
Manual operation	Rapid traverse, Cutting feed, Handle feed, Zero-point return, Manual control (machine lock, Manual spindle control (spindle start, stop, reverse, jogging))
Automatic operation	Memory operation, MDI operation, DNC operation, NC reset, Single block, Feed hold, Optional block skip, Optional stop, Machine lock, Feed override, Spindle control, Dry run, Manual handle control, Data server*
Background functions	During automatic operation (Programming, Data input / output)
Machine compensation	Backlash compensation, Thermal displacement compensation
Protection functions	Emergency stop, Over travel, Interlock (cutting start, axis interlock), Alarm
Measuring functions	Manual measurement (Tool length measurement)*, Automatic measurement (coordinate measurement)*

*Option

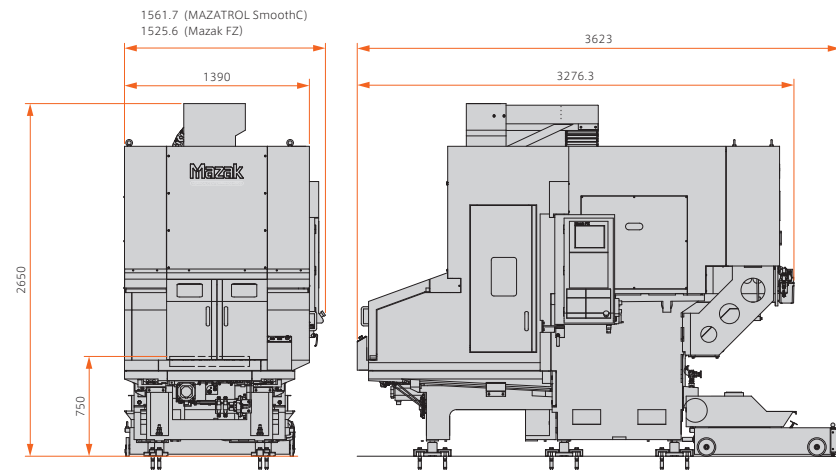
Machine Dimensions

Unit : mm

□ Single table (standard)



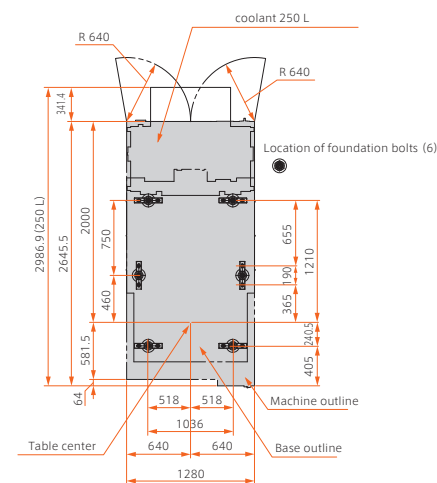
□ 2 pallet changer (option)



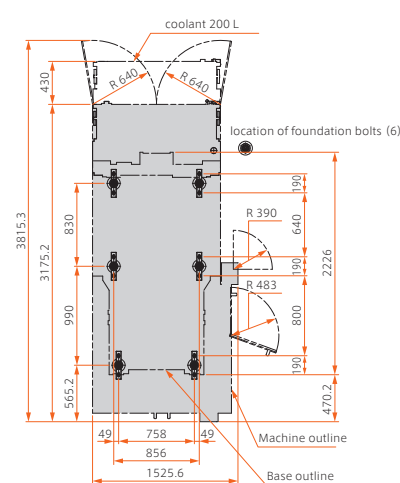
Floor Space

Unit : mm

□ Single table



□ 2 pallet changer



Pull Stud Bolt Dimensions

Unit : mm

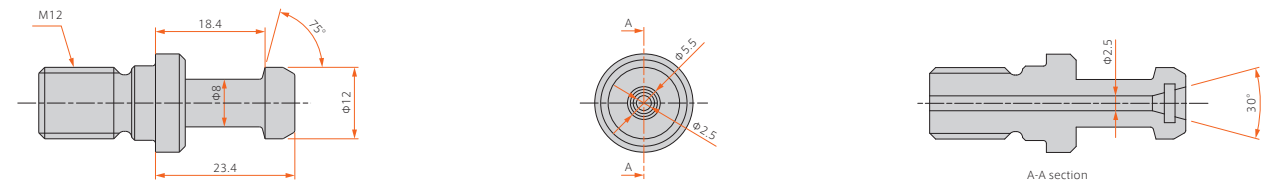
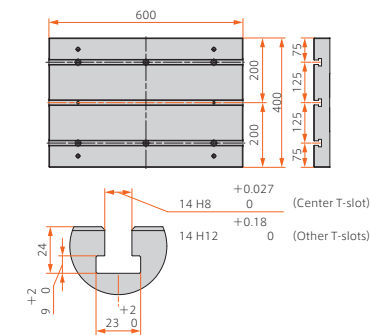


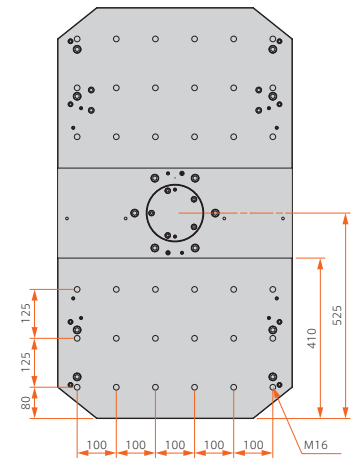
Table Top Dimensions

Unit : mm

□ Single table (standard)



□ 2 pallet changer (option)



□ 2 pallet changer table interference

