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*The all products in this catalogue include the optional specifications and equipment.

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M482Ea 1707 (V-T-D)

5-Axis Vertical Machining Center

D200Z



MAKINO

Simultaneous 5-axis machining for mold finishing

Outstanding high-response motion provides excellent surface quality comparable to 3-axis machining.



Conventional machine



D200Z

Corner machining with
R0.2 ball end mill

Pocket size 20 × 20 × 20 mm

New
30000 min^{-1} spindle

Deflection and vibration, during high-speed rotation, are thoroughly reduced. The spindle provides superior machining surface and long tool-life. Cooling system of spindle-core and jacket suppresses thermal distortion to the minimum, even at high-speed rotation. Its simple oil-air lubrication system contributes to trouble-free continuous operation.

◎Speed range
300 - 30000 min^{-1}

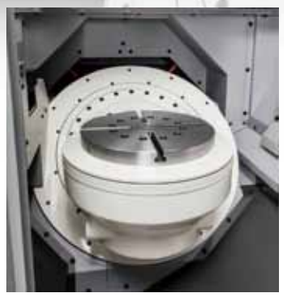
◎Interface
HSK-E50

Agile, minimal-interference table

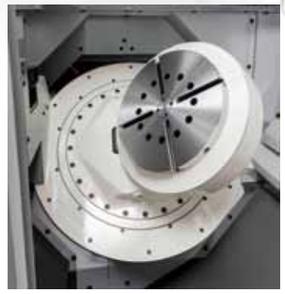
D200Z has adopted a light-weight B-axis structure, which supports C-axis with inclined face. DD (direct drive) motors provide highly responsive agile motion of B- and C-axes.
Operator can access easily to workpiece on the 300 mm diameter table due to its interference-free design. Furthermore, its axis-configuration simplifies programming, as operator can clearly grasp motion of fixtures.
The spindle head is so compact that it can come close to the table surface.



B axis: 91°



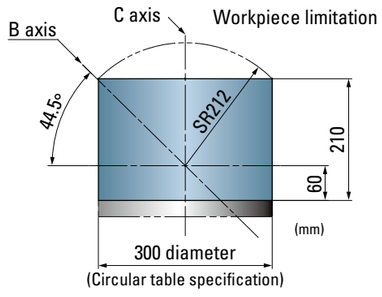
B axis: 0°



B axis: 45°

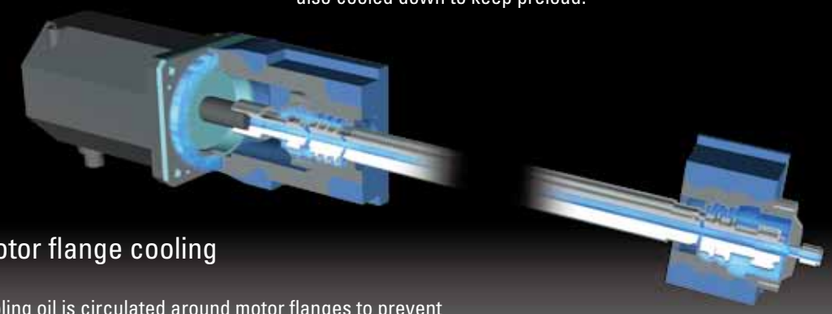
◎Rapid traverse
XYZ axes : 60000 mm/min
B axis : 36000°/min
C axis : 54000°/min

◎Maximum payload 75 kg



Ball screw core cooling

Cooling oil, whose temperature is synchronized with machine temperature, is circulated inside ball screws to prevent heat generation during high-speed movement. Support bearings are also cooled down to keep preload.



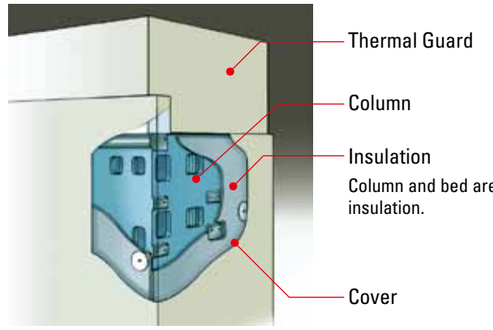
Motor flange cooling

Cooling oil is circulated around motor flanges to prevent heat transfer from motors to machine body.

* D200Z has a temperature controller of feed axis cooling oil for exclusive use.

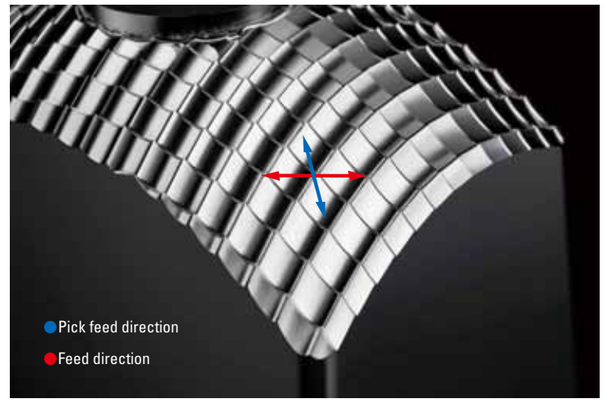
Thermal Guard

Thermal Guard covers the entire machine to keep out ambient air and thereby minimize machine attitude changes due to ambient temperature.



Mirror surface finish with PCD tools





Material: Stainless steel (STAVAX, 52HRC) Workpiece size: 90×70×125 mm

Compact machine

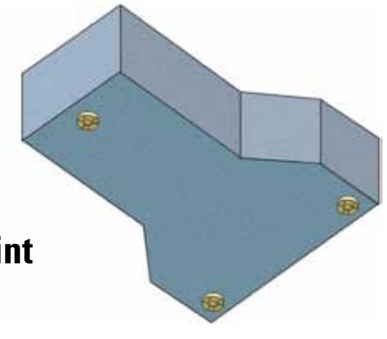
Width of machine is only 1500 mm.
Peripheral equipment – such as hydraulics, pneumatics, etc. – is mounted on the rear part of machine body.

Tool setting work is performed with the double sliding door open.
All works, including workpiece setting, can be done at the front side of machine.





◎Machine size
H Height: 2300 mm W Width: 1500 mm D Depth: 2220 mm



Three-point support

Machine installation is smooth and easy. Relocation for factory layout change can be done in a short time.

Excellent accessibility

Its accessibility is like a 3-axis machine.
Distance from machine front to the spindle is 530 mm.
Manual tool change work is easy.
Distance from machine front to the table center is only 400 mm.
Compared to a trunnion type table, the table structure is simple.



Workpiece loading is easy, thanks to the full overhead clearance for crane.





Photo: 21 tools magazine

Automation

Tool magazine

21 tools magazine is standard. Retrofit to 40 tools magazine is easy. Machine space for 40 tools magazine is same as 21 tools magazine, and only "option kit" is necessary.
Large capacity tool magazine, which is modularized, can be also selected.



- 21 tools magazine (standard)
- 40, 100, and 300 tools magazine (optional equipment)

Photo: 40 tools magazine

Specifications for automation

(optional specification)

- Robot shutter
- Loader interface
- EROWA chuck specification
- System 3R chuck specification



100 tools magazine



Work changer

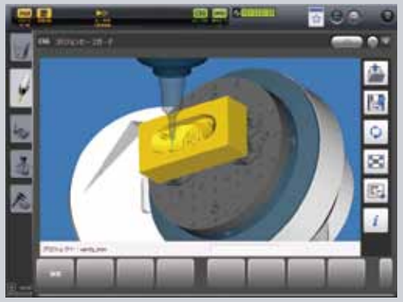
The controller, maximizing machine performance

Professional 6

Avoids Spindle Crash

Crash avoidance function "Collision Safeguard"





No More Scratch



Intuitive Operation

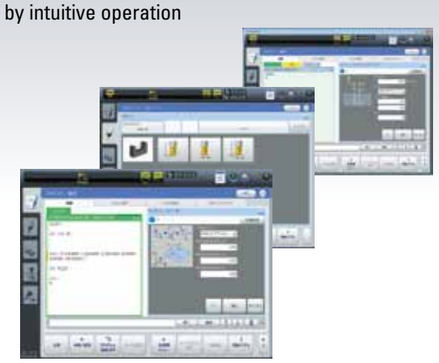
i Setup (optional equipment)

◎ Quick and easy measuring by intuitive operation

◎ Code-free dialog screens



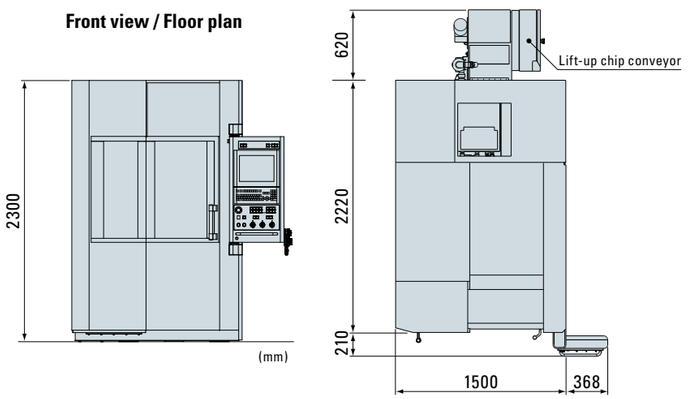




Specifications (Standard Specifications)

Axis travels	X × Y × Z		350 × 300 × 250 mm
	B / C		91° (0° to +91°) / 360° (continuous rotation)
Table	Size (diameter)		300 mm
	Maximum workpiece size (diameter × height)		300 × 210 mm
	Maximum payload		75 kg
	Surface configuration		T-slot, 12H8 × 4 slots (radial)
Spindle	Speed range		300 - 30000 min^{-1}
	Motor power		15 / 11 kW (25%ED / cont.)
	Torque		23.8 / 21.0 N·m (25%ED / cont.)
	Interface		HSK-E50
	Bearing diameter (inner)		60 mm
	Cooling / Lubrication		Spindle core & jacket cooling / Oil air
Feedrate	Rapid traverse	X, Y, Z axis	60000 mm/min
		B axis	36000 deg/min
		C axis	54000 deg/min
	Cutting feedrate	X, Y, Z axis	1 - 60000 mm/min
		B axis	1 - 36000 deg/min
		C axis	1 - 54000 deg/min
Automatic tool changer	Tool storage capacity		21
	Maximum tool diameter (with adjacent tools / without adjacent tools)		50 / 80 mm
	Maximum tool length		200 mm
	Maximum tool weight (without limitation / with limitation)		3 / 5 kg
Machine size	Height		2300 mm
	Width × Depth		1868 × 3050 mm
	Weight (including NC unit)		4600 kg
Floor space	Width × Depth		2733 × 3770 mm

Front view / Floor plan



* The space for the movable parts and maintenance in addition to the space for the machine main body are required. For the details, please refer to the specification.

Standard Specifications

- 30000 min^{-1} spindle
- Spindle temperature controller
- 300 mm diameter T-slot circular table
- 21 tools magazine
- Base coolant
- Nozzle coolant
- Lift-up chip conveyor H1050 (scraper type)
- Air blower
- Through spindle air
- Operator door lock (operation mode)
- Lighting device for machining area
- Portable manual pulse generator (with the handle enable button)
- Scale feedback X, Y, Z axis 0.0125 µm
- Tilted working plane indexing command
- High-Speed Smooth TCP
- 3-dimensional cutter compensation
- Standard tool length function
- Super GI.5 control
- ECO mode functions
- Collision Safeguard (Pro. 6 screen display) specification
- Automatic power-off
- Automatic fire extinguisher interface

Optional Specifications (◎) / Optional Equipment (★)

★ Tool magazine (40, 100, 300 tools)
◎ EROWA /System 3R chuck specification
◎ Additional pneumatic piping
◎ Coolant temperature controller
◎ Chip conveyor in splash guard
★ Shower coolant system
★ Mist collector (including connection port)
★ MQL unit
★ Air dryer
◎ Robot shutter (Requires robot interface)
◎ Loader interface (System 3R type)
◎ Loader interface (EROWA L type)
◎ Loader interface (EROWA A type)
★ i Setup
★ Automatic non-contact tool measuring device
★ Automatic workpiece measuring device (Wireless type)
★ Circuit breaker
★ Portable manual pulse generator with position display function
★ 3-dimensional coordinate conversion
★ Signal light 3 layer
★ Booster transformer