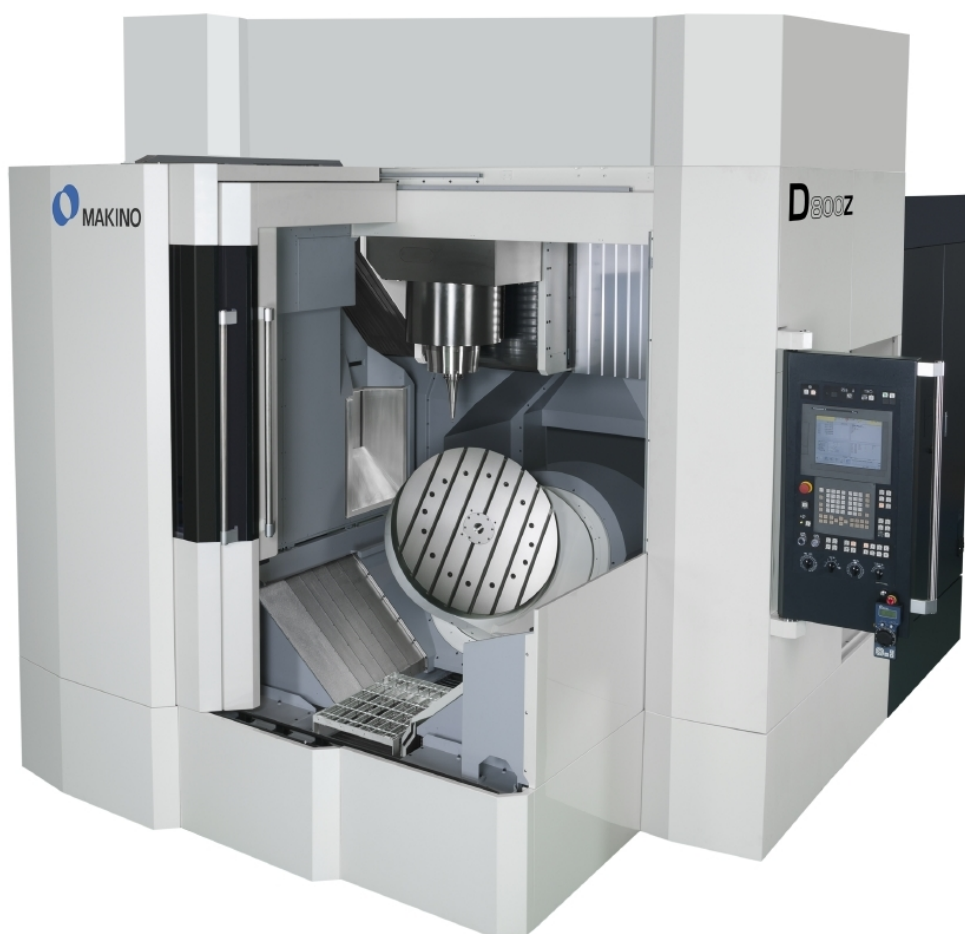


Vertical Machining Center

D800Z

Machine Description



MAKINO GmbH

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Director

Commercial Registry

VAT-Ident-Number.

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Outstanding precision

Regardless of the payload (up to 1,200 kg), the D800Z delivers outstanding accuracy thanks to a highly rigid structure and direct drive motors in the 4th and 5th axis that ensure smooth rotation. Moreover, the renowned thermal stability of Makino machines guarantees sustained accuracy over time.

High speed machining

The D800Z can be equipped with four different spindle combinations:

- 14,000 rpm (HSK-A63)
- 20,000 rpm (HSK-A63)
- 12,000 rpm (HSK-A100)
- 18,000 rpm (HSK A100)

With each Makino spindle ensuring vibration-free machining, this wide range of options ensures the D800Z can be customized to suit any precision part, die & mould or aerospace application. The feed rates are 36,000 mm/min on the X-, Y- and Z-axes and 18,000 deg/min (50 rpm) on the B- and C-axes.

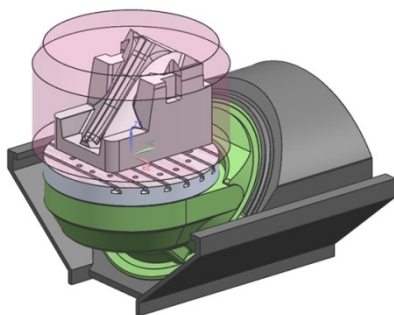


Z-Structure for B- and C-Axis

Several features contribute to the reassuring rigidity of the D800Z. The Z-shaped 4th and 5th axis slant table structure (as opposed to the conventional cantilever design) ensures that the center of gravity of the table and part is always between the two guides and hardly changes whatever the angle of tilt.

Ultra-high torque DD motor

Both axis are equipped with DD motors and the stability of the table support is enhanced by a large-diameter cross roller bearing. As a result the machine generates ultra high torque for both axis with a minimal table deflection.



Convenient and safe operation

The D800Z comes with a two-side front-door design for easy access to the spindle and table, and a large window for good visibility. Chip removal is an uncomplicated operation. What more, an anti-collision function prevents spindle and table interference to eliminate collisions caused by incorrect programming or machine settings.



is

Travels

X-axis-travel (table longitudinal)	1,200 mm
Y-axis-travel (spindle lateral)	1,100 mm
Z-axis-travel (spindle vertical)	650 mm
B-axis (table tilt)	-180° ~ 0°
C-axis (table rotation)	360° continuous
Angle between table surface and spindle nose	-93° – 0°

Table

Size of table	Ø 800 mm
Payload	1,200 kg
Table surface configuration	T-slots 7x 18H8 (100mm)
Max. workpiece size (Diameter x Height)	1,000 x 550 mm (with limitation)

Machine Description

Status: November 2015

Version: 1.0

Spindle 14,000 rpm (Standard)

Output characteristics (25% ED / 30 min /continuous)	30 kW / 26 kW / 18.5 kW
Speed range	50 – 14,000 rpm
Torque (Max. / 15% ED / 25% ED / 15 min / kont.)	250 / 214 / 171 / 118 / 96 Nm
Inner diameter of bearing	85 mm
Taper	HSK-A63

Optional Spindles

20,000 rpm with Core Cooling (HSK-A63)

Output characteristics (30min / cont.)	18.5 kW / 15 kW
Torque (10 min / cont.)	95.5 / 63 Nm

12,000 rpm with Core Cooling (HSK-A100)

Output characteristics (30 min / cont.)	22 kW / 18.5 kW
Torque (15 min. / cont.)	151 / 124 Nm

18,000 rpm with Core Cooling (HSK-A100)

Output characteristics (30 min / cont.)	22 kW / 18.5 kW
Torque (15 min. / cont.)	151 / 124 Nm

Feedrates

Rapid traverse (X, Y, Z)	36 m / min
Cutting feedrates (X, Y, Z)	36,000 mm / min
Rapid traverse (A, C)	18,000° / min
Cutting feedrates (A, C)	18,000° / min

Accuracies* and Feedback

Linear scales in X-, Y-, Z- axis is standard

Positioning

XYZ-Axis (full range scale feedback standard)	± 0.0020 mm
B-Axis (table tilt)	± 3.0 mm
C-Axis (table tilt)	± 3.0 mm

Repeatability

XYZ-Axis (full range scale feedback standard)	± 0.0015 mm
B-Axis (table tilt)	± 3.0 mm
C-Axis (table tilt)	± 2.0 mm

*JIS-standard, Tolerances at MAKINO's assembly plant with daily temperature change of ±1°C and proper foundation

Machine Description

Status: November 2015

Version: 1.0

Tool Magazine

HSK-A63

Tool storage capacity (std. / opt.)	40 / 80 tools
Maximum tool weight	8 kg
Maximum tool dimensions (without limitations)	Ø 70 mm, length = 350 mm
Taper	HSK-A63

Tool Magazine, optional

HSK-A100

Tool storage capacity (std. / opt.)	48 / 117 / 173 tools
Maximum tool weight	20 kg
Maximum tool dimensions (with/without limitations)	Ø 140 / 100 mm, length = 350 mm
Taper	HSK-A100

Feedback

Moire scale feedback, resolution (XYZ-axis)	0.05 µm
Closed loop B-, C-Axis	0.0001°

Coolant

Coolant and lubricating liquid	Emulsion
Tank capacity	750 l
Coolant through spindle	15 bar with 120 l/min
Nozzles at spindle nose, standard spindle	8

Power Sources / Air Supplies

Electricity	3 Phases AC 400 V ±10 %, 50 Hz
Main electrical power capacity	85 kVA
Breaker required	3 x 160 A inert
Air pressure	0,5 – 0,8 Mpa
Air consumption	800 l / min

Machine Description

Status: November 2015

Version: 1.0

Machine Installation

Dimensions:

Height	ca. 3,600 mm
Width	ca. 3,200 mm
Depth	ca. 4,990 mm
Weight	20,000 mm

Foundation:

10 points support

Levelling bolt 2,800 mm x 2,800 mm

Reinforced concrete thickness 600 mm

Painting color grey-blue / pearl-white

Machine Description

Status: November 2015

Version: 1.0

MAKINO Services – all around support

- Complete installation and start-up of the machine
- Central warehouse for spare parts in Europe
- Analyze of spindle and spindle repair center in Hamburg
- High number of service technicians situated both locally and close to the customer offering fast support on site
- Longtime experience of internal MAKINO service technicians
- High availability and high class support by MAKINO telephone support
- Maintenance of the machine during its complete life cycle

Summary of Standard

<input checked="" type="checkbox"/> 14,000 min ⁻¹ spindle	<input checked="" type="checkbox"/> Nozzle coolant	<input checked="" type="checkbox"/> Tool offset memory C
<input checked="" type="checkbox"/> HSK-A63	<input checked="" type="checkbox"/> Through spindle air	<input checked="" type="checkbox"/> Tool offset 400 pairs
<input checked="" type="checkbox"/> B- and C-Axis with DD-Motor	<input checked="" type="checkbox"/> Air blower	<input checked="" type="checkbox"/> 3D manual feed
<input checked="" type="checkbox"/> Rotary encoder B-, C-Axis	<input checked="" type="checkbox"/> Portable manual pulse generator	<input checked="" type="checkbox"/> 3D cutter compensation
<input checked="" type="checkbox"/> Scale feedback 0.05 micron	<input checked="" type="checkbox"/> User memory 2GB + 1GB	<input checked="" type="checkbox"/> High-speed smooth TCP
<input checked="" type="checkbox"/> Table with T-Slots	<input checked="" type="checkbox"/> Common macro variables 600	<input checked="" type="checkbox"/> Tool center point control
<input checked="" type="checkbox"/> 40-tool magazine	<input checked="" type="checkbox"/> Super G1.5 Control	<input checked="" type="checkbox"/> Titled working plane command
<input checked="" type="checkbox"/> Automatic grease supply unit	<input checked="" type="checkbox"/> Helical Interpolation	<input checked="" type="checkbox"/> Rotary table dynamic fixture offset
<input checked="" type="checkbox"/> Chip conveyor backt	<input checked="" type="checkbox"/> Rigid Tap	

Summary of Options

<input type="checkbox"/> 20,000 min ⁻¹ spindle (core cooling, HSK-A63)	<input type="checkbox"/> Washing gun	<input type="checkbox"/> Non-contact tool length measuring device
<input type="checkbox"/> 12,000 min ⁻¹ spindle (core cooling, HSK-A100)	<input type="checkbox"/> Coolant temperature controller	<input type="checkbox"/> Customer specified machine color
<input type="checkbox"/> 18,000 min ⁻¹ spindle (core cooling, HSK-A100)	<input type="checkbox"/> Through spindle coolant 70bar	<input type="checkbox"/> Oil mist collector
<input type="checkbox"/> Built-in hale function	<input type="checkbox"/> Minimum Quantity Lubrication (nozzle)	<input type="checkbox"/> Thermal guard
<input type="checkbox"/> Tool magazines available	<input type="checkbox"/> Automatic workpiece measuring device	