Five-axis machining center

+Fully optimized cooling system
+Comfortable operating experience
+High cost performance with the same specifications in Europe
+Powerful technical application support

Five-simultaneous-axis machining center equipped with GTRT gear drive

With the A-axis torque 4142Nm, the processing requirements of heavy cutting and high rigid materials are ensured.

Highlights

+Crane type gantry structure based on finite element analysis and dynamics optimization
+Highly rigid and stable bed
+Whole machine architecture with continuous stability
+High-performance spindle and rotary table technology coming from European
+Efficient/heavy milling operations
+Suitable for a wide range of material processing requirements
+Improve product processing efficiency and quality
+Innovative screw drive technology (nut rotation drives screw movement)
+High response speed

SUPER POWER spindle

+12000rmp inline spindle BT40
+18000rmp inline spindle HSK-A63
+18000rmp hybrid spindle HSK-A63
+24000rmp motorized spindle HSK-A63

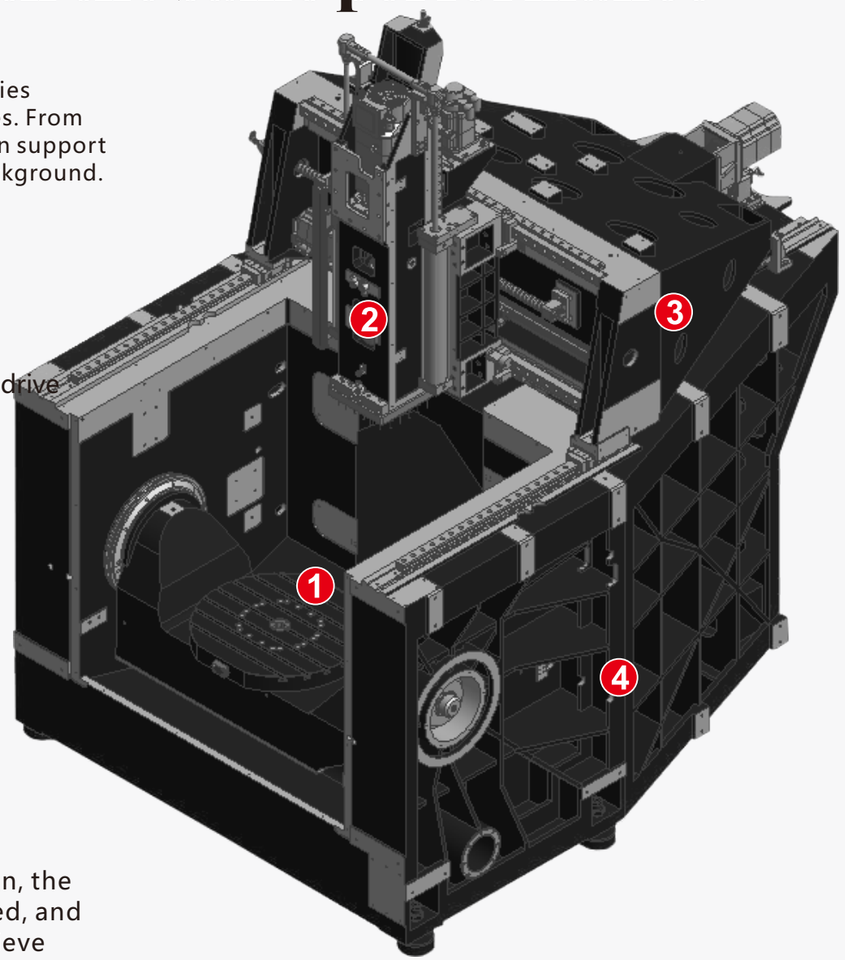
A/C Cradle Rotary Table

Worktable size:800mm
Load:800kg
A-axis swing:±120°
C-axis rotation: 360°

Five-axis machining center

High cost performance with the same performance

- High cost performance with the same performance
- From drawings to birth, the HMU800 five-simultaneous-axis series condenses European machine tool attainments and technologies. From core technology to complete machine production, to application support for end-user, all are devoted by our most powerful technical background.
- Undoubtedly, HMU800 is currently the most cost-effective five-simultaneous-axis machining center



1. A/C cradle worktable

Cradle rotary table technology equipped with GTRT gear drive

+Gear anti-backlash patented technology
+A/C axis comes standard with round grating
+A-axis torque 4142Nm, C-axis torque 1950Nm
+High torque, low energy consumption
+High precision, long life
+Maximum load 800kg

2 . Z axis

- Through heavyweight dynamic optimization design, the high response value of Z axis is effectively improved, and the spindle of European technology is used to achieve better dynamic response and contour processing accura

- +Using patented technology, and the spindle with inner and outer spacer cooling design thermal deformation and vibration caused by processing is effectively suppressed
  +Optional inline mechanical spindle of European technology with a maximum torque of 119Nm and water-cooled motor
  +The cylinder balance system is mounted to reduce the load of the ram on the screw rod, improve the response speed of the Z axis and the service life of the screw rod
  +The shortest distance between the spindle and the door is 390mm, which has the best accessibility

3 . Beam

Excellent dynamic performance and ultra-high precision

+One-piece beam with large span and strong support
+Four 45mm high rigidity ball guide rails for Y-axis
+High response screw drive technology, X/Y/Z acceleration 7m/S2
+Standard resolution 0.01μm grating ruler for X/Y/Z three-axis
+The screw rod can be equipped with hollow oil cooling technology, which effectively inhibits thermal elongation
+X/Y/Z three-axis motion parts are separated from the machining and cutting areas to ensure the accuracy and life of use

4 . Base

Integrated base with high rigidity, stability and high-efficiency vibration suppression

+High specification Meehanite cast iron, secondary tempering treatment, and aging treatment for more than half a year to ensure the stability of the casting material
Accurate finite element analysis and dynamic optimization technology
+The integrated base weighs 8 tons, ensuring the stability of the whole machine
+Multi-point lubrication with grease can effectively reduce the failure rate of linear motion parts and ensure the accuracy and life of the machine tool
+The vertical arm of the base strongly supports the A/C cradle axis to achieve stronger guiding accuracy and rigidity

Five-axis machining center

5-simultaneous-axis machining for heavy cutting

The HMU800 series is currently one of the few five-simultaneous-axis machining centers that can be used for heavy-duty milling. With German high-end spindle technology and high-rigidity high-torque gear transmission A/C cradle rotary table technology, and combined with accurate analysis and optimization of the bed structure , it is easy to cope with the high-speed, high-efficiency and high-precision processing requirements for various materials.

Applications | +Auto industry +Aviation industry +Industrial equipment +Mold industry

Work piece: fluid speed pump
Material: Aluminum alloy

Work piece: Human skeleton
Material: Titanium

Work piece: Blisk
Material: Stainless steel alloy

Work piece: Automotive structural parts
Material: Aluminum alloy

Work piece: Impeller
Material: Aluminum

Work piece: Simple tire mold
Material: A5052 (AL)

Work piece: Engine block
Material: Aluminum

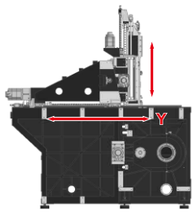
Work piece: Fairing lock
Material: stainless steel

Five-axis machining center

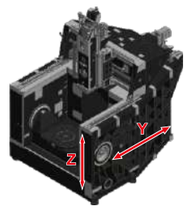
Finite element analysis and dynamic optimization are used to greatly improve the performance of the whole machine

With the design of finite element analysis and dynamic optimization, the static and dynamic characteristics of each part of the machine tool are greatly improved to ensure the overall rigidity/stability and dynamics of the machine tool

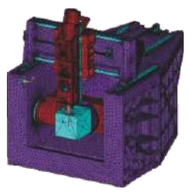
- Whole machine FEM
- The best dynamic rigidity under actual working conditions is accurately calculated
- The natural frequency and cut-off frequency of the feed drive system is improved, the positioning time and the hysteresis of the feed system are effectively reduced, and high-response dynamic performance and high-speed machining contour accuracy are achieved.



The beam on Y driven by a single servo greatly improves the synchronization of the double servo drive structure



The crossbeam adopts a four-linear-guide multi-point support design, and the front support point on Y effectively ensures the stability of the ram on the center of gravity of the ram



Finite element analysis FEA

The monolithic bed structure of the crane achieves outstanding rigidity, stability and accuracy and unparalleled dynamic response

+Movement on X/Y/Z linear axis is based on the base bed
- No worktable and workpiece load influence/high dynamic and high precision
- No cutting work environment impact/low failure, long life

+A/C rotary table is supported on the base bed
- High rigidity / high load capacity / high precision / heavy cutting

+Full support of 4 ball guide rails on Y-axis
- Large span/high rigidity/stability/convenient lifting operation

Each machine tool developed by us must undergo rigorous and precise system calculations, and the calculation results are finally presented through the mechanical properties of the machine tool.

This is the DNA of the machine tool and one of our core competitiveness.

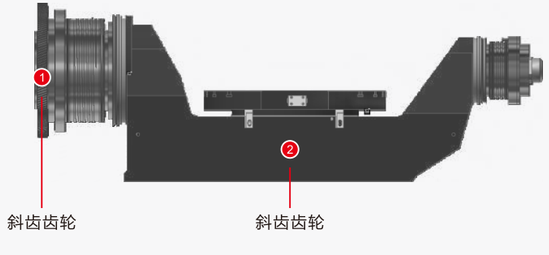
Five-axis machining center

GTRT Gear Driven Rotary Table Technology

HMU-800 cradle rotary table adopts European high-end mechanical transmission GTRT technology. Compared with conventional rotary table drives, it achieves stronger torque output, higher rigidity, stability, and better rotation accuracy.

- European gear driven design concept
- Gear anti-backlash patented technology
- The A/C rotary axis is supported on the the base, with strong guiding rigidity and high precision
- Can be used on five- simultaneous-axis machining for heavy milling
- Applicability of a wide range of processing materials, including the processing of high hardness and toughness materials such as steel and titanium alloys
- Round grating as standard for A/C axis
- Easier chip removal and cleaning
- Compared with DDR, worm gear, worm, and roller cam, it has the advantages of high torque, high precision, low energy consumption, and long life.

Drive mode	Torque	Speed	Precision	Life
DDR	△▲▲▲	▲▲▲▲	▲▲▲▲	▲▲▲▲
Worm gear, worm	△▲▲▲	△△▲▲	△△▲▲	△△▲▲
Roller cam	△▲▲▲	△▲▲▲	△△▲▲	△▲▲▲
Gear	▲▲▲▲	▲▲▲▲	▲▲▲▲	▲▲▲▲

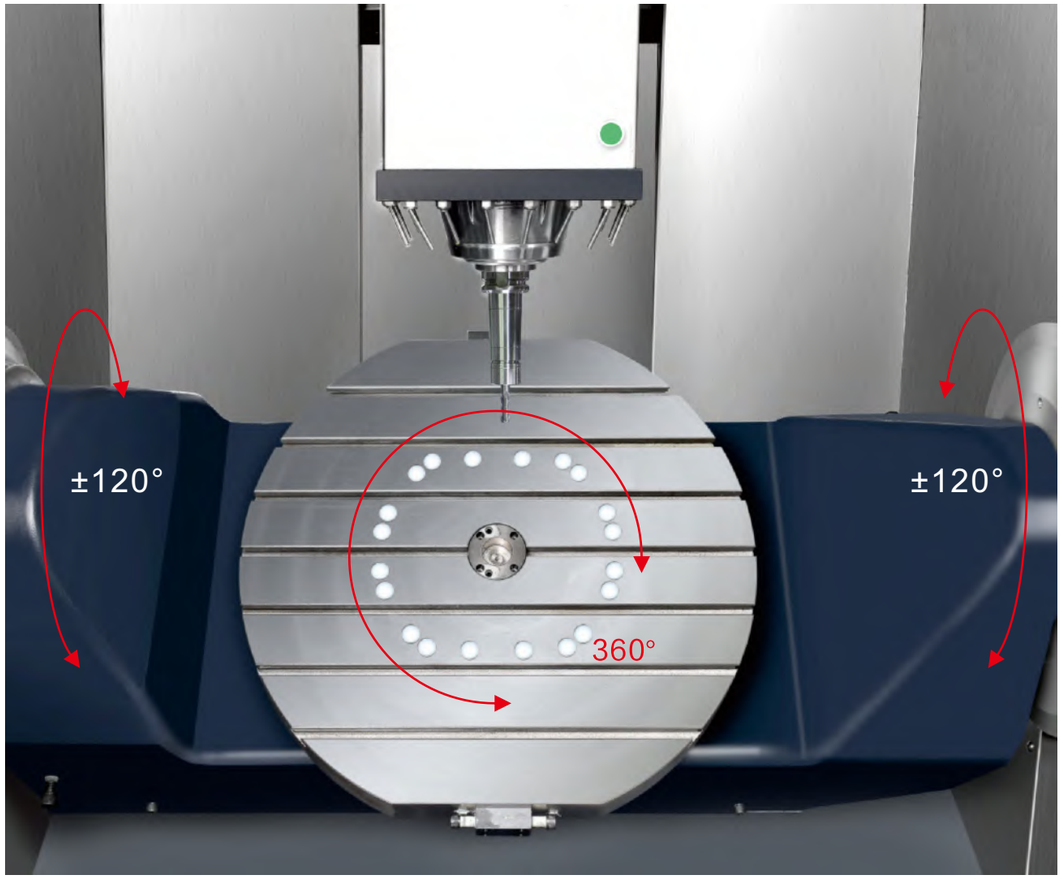


GTRT Gear Driven Rotary Table

1. A-axis
2. C-axis

servo motor + helical gear
(double-stage anti-backlash technology patent)

Travel:±120°/360°
Max. speed(A/C):20/30rpm
Max. torque(A/C):4142/1950N.m
Precision(A/C):12''/6''
Load capacity:800kg



Worktable	Φ800mm
A axis swing	±120°/140°(Option)
C axis rotation	360°
A/C axis torque	4142/1950 N.m
A/C axis rotation	20/30rpm/min
A/C positioning precision/repeatability	12/6ARCSEC

	HMU-800	HMU-800evo	HMU-800avi
X/Y/Z-axis travel	850/950/550	850/950/550	850/950/550
Worktable	Φ800	Φ800	Φ800
Max. load	600kg	800kg	800kg

Five-axis machining center

SUPER POWER Inline Spindle/Motorized Spindle

Equipped with three spindle options of 12000rpm, 18000rpm, and 24000rpm, taking full consideration of special processing conditions such as general machining, mold processing, aerospace, etc., to provide customers with tailor-made spindle solutions to expand the processing range and improve processing efficiency

+European high-end spindle technology
+With finite element analysis and optimized bearing span, high rigidity, stability and running accuracy of the spindle are realized
+ 24000rpm motorized spindle adopts oil-air lubrication cooling technology (optional)
+ The front section of the spindle adopts water throwing ring + combined labyrinth + air curtain sealing technology
+ The spindle is cooled by internal and external water jackets, which effectively inhibits the thermal elongation of the spindle combined with innovative cooling channels, ensuring the working performance, accuracy and life of the spindle. (Mechanical spindle)
+ Original 4 pieces of German Nubea high-elastic disc spring structure, which guarantees a long tool life of more than 2 million times. (Mechanical spindle)

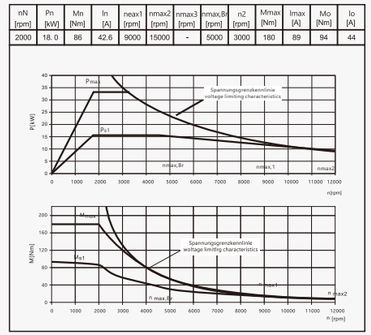
12000rmp inline spindle BT40

High rigidity and high torque spindle has excellent performance on heavy milling and effective machining

15.5/21.7 kW
Power(Max. output power S1/S6-40%)

85/119 N.m
Torque (Max. output torque S1/S6-40%)

nN [rpm]	Pn [kW]	Mn [Nm]	In [A]	neax1 [rpm]	nmax2 [rpm]	nmax3 [rpm]	nmax,Br [rpm]	n2 [rpm]	Mmax [Nm]	Imax [A]	Mo [Nm]	Io [A]
2000	18. 0	86	42.6	9000	15000	-	5000	3000	180	89	94	44



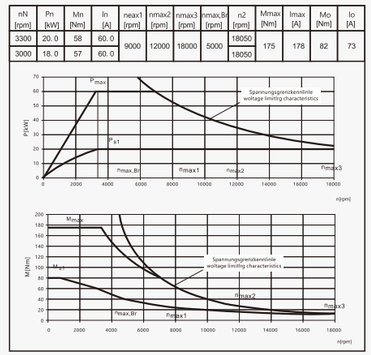
18000rmp inline spindle HSK-A63

Maximization of high speed and high rigidity.
It has a wide application range.

20/28 kW
Power(Max. output power S1/S6-40%)

58/81.2 N.m
Torque (Max. output torque S1/S6-40%)

nN [rpm]	Pn [kW]	Mn [Nm]	In [A]	neax1 [rpm]	nmax2 [rpm]	nmax3 [rpm]	nmax,Br [rpm]	n2 [rpm]	Mmax [Nm]	Imax [A]	Mo [Nm]	Io [A]
3300	20. 0	58	60. 0	9000	12000	18000	5000	18050	175	178	82	73
3000	18. 0	57	60. 0					18050				

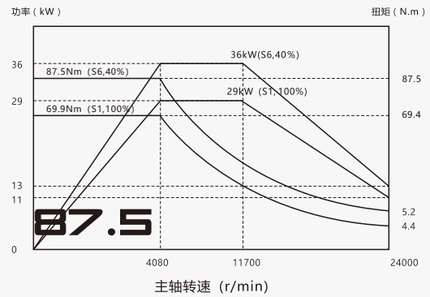


18000rmp hybrid spindle HSK-A63

It is suitable for the high speed machining of surface quality

29/36 kW
Power(Max. output power S1/S6-40%)

69.9 N.m
Torque (Max. output torque S1/S6-40%)

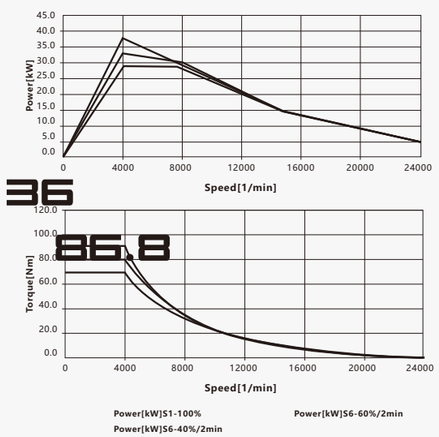


24000rmp motorized spindle HSK-A63

It is suitable for the high speed machining of surface quality

29/ kW
Power(Max. output power S1/S6-40%)

69.4/ N.m
Torque (Max. output torque S1/S6-40%)



Five-axis machining center

Precision Control

+High precision ball guide
- High-rigidity 45mm ball linear guide, with accuracy up to P grade, providing precise and stable linear feed motion characteristics

+Ball screw drive and hollow cooling technology (optional)
- Effectively suppress the thermal elongation of the ball screw to ensure stable and long-term processing accuracy
- Adopt innovative nut rotation screw drive technology to effectively reduce load inertia and achieve higher positioning accuracy and dynamic response

+Geared A/C rotary table
- DIN5 imported precision grinding gear
- Gear anti-backlash patented technology to ensure zero backlash, high efficiency, and ultra-high rigidity of precise gear transmission

+Motor and spindle cooling system
- Germany Siemens water-cooled spindle drive motor has more powerful power and better thermal elongation control than traditional air-cooled motors
- The built-in spindle structure minimizes thermal deformation and vibration, ensuring high-precision performance of high-speed machining
- The spindle is cooled by internal and external water jackets, which effectively inhibits the thermal elongation of the spindle combined with innovative cooling channels, ensuring the working performance, accuracy and life of the spindle. (Mechanical spindle)
- 24000rpm motorized spindle adopts oil-air lubrication cooling technology
- The HSK-A63 tool shank can achieve dynamic rotation accuracy during high-speed rotation, ensuring the surface finish and contour accuracy of the processed product

+Linear grating and circular grating are as standard
+Automatic tool measuring device (optional)
+Oil cooling, water cooling controller
+Other precision measures
- All parts have been precisely manufactured and tested, carefully adjusted and strictly assembled
- RCTP calibration
- Scraping technology
- Constant temperature workshop assembly

NAS parts precision check

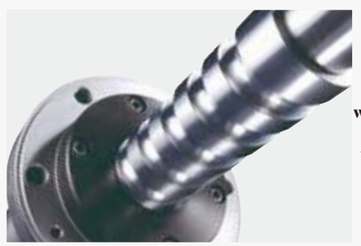
NAS parts	Circle precision	0.012mm	(X/Y feed 3.000mm/min and radius 100mm)
	Roundness	<0.006mm	(Conical simultaneous 5-axis
	Flatness	<0.01mm	(Φ80/300x400mm)
	Surface roughness	Ra1.6~0.8	(Φ80/300x400mm)

* Depending on the measured environment and processing conditions, there may be differences from the data recorded in the product catalog

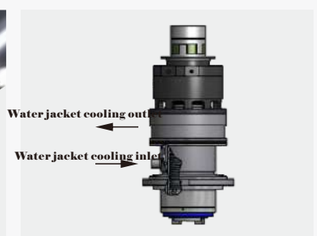
	HMU-800	HMU-800evo	HMU-800avi
X/Y/Z positioning precision	0.008/0.006mm	0.007/0.005mm	0.007/0.005mm
Repeatability	0.007/0.005mm	0.006/0.004mm	0.006/0.004mm
A/C	12/6 ARCSEC	8/5 ARCSEC	8/5 ARCSEC

Linear guide

Screw hollow cooling (optional)



Spindle double-water-jacket cooling



Grating ruler

Tool setter

Scraping technology

3D detection

Five-axis machining center

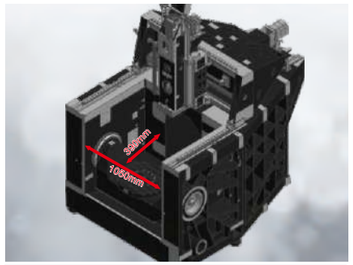
Ease of Use

Based on ergonomic design, it realizes extraordinary processing accessibility and visibility, achieving an incomparable user-friendly operating experience.

Ergonomic Design

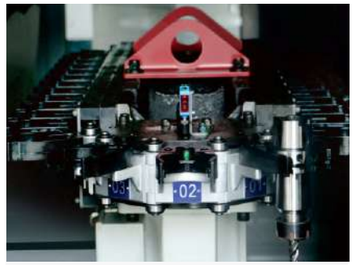
With the operating height of 1450mm, it is very easy for user to operate.
The use of the same keyboard type as the computer enhances the convenience of PC operation

19″	inck Display	180°	deg Rotation angle
1450″	mm Height of screen center		



Crane-type bed structure to achieve the best proximity to the processing area

- The minimum distance between the protective door and the spindle is only 390mm, making manual tool change or maintenance accessible
- The protective door is integrated with the ceiling of the machine tool to facilitate the free lifting of the workpiece
- The maximum opening distance of the protective door is 1050mm, with a spacious processing space and unobstructed view

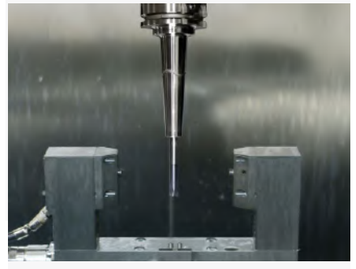


- 26-tool chain type magazine, with tool change time 12s
- Tool quantity is optional: 32T, 48T, 60T, expanding machining elasticity

The processing area is protected by stainless steel plate, which has powerful anti-scratch and is easy to clean, and the spray device is optional for the wall.

The base of the chip removal system is designed with a large 45° slope to facilitate the discharge of iron chips

- The chip removal rod is located under the rotary table, and it is matched with the large diameter chip removal for smooth chip removal
- The A/C rotary table can be turned over to dump most of the cutting waste slag into the chip removal channel beneath



- Contact/laser tool setter to achieve more intelligent and easier production (optional)
- 5-axis rotary center calibration (RTCP)

Equipped with up to 16 punching & blowing combination blow nozzles to meet multi-dimensional water blow or air blow during multi-face machining

CONTROL SYSTEM

High-end CNC Controller for safe machining and high precision

To transform engineering manufacturing capabilities into high-efficiency machining to achieve high-precision and convenient operation of workpieces, intelligent CNC systems are indispensable.

HNC-848Di-M 17-inch

HUAZHONGCNC

Wide application

CNC controller suitable for 5-axis machine, heavy-duty machine and lathe mill compo machining center

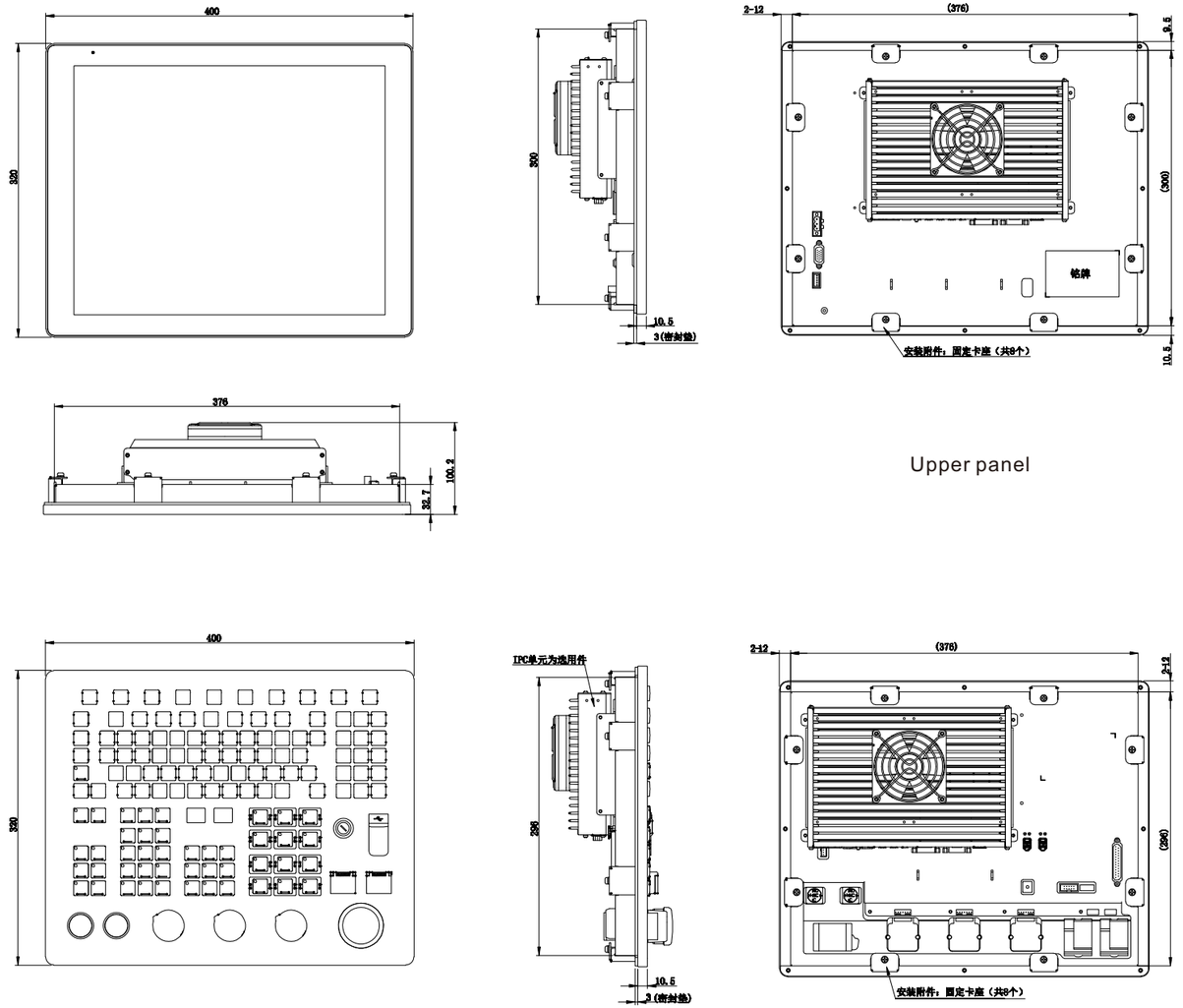
Basic parameter

- 17” color LCD screen (touch screen is optional)
- Single panel version and upper-lower panel version are supported
- Up to 9 feed axes and 4 spindles in each channel
- 9 simultaneously controlled axes at maximum (RTCP is not supported)
- Typical matching machine tool: mill lathe combo, 5-axis machine, cam grinder

Features

- High-speed high-precision control
- 5-simultaneously-axis control
  5-axis auto calibration
  5-axis RTCP function
  5-axis large circular interpolation Hyperbolic interpolation
  5-axis orientation machining
- Synchronization control
- Error compensation
- Direct drive
- Intelligent control
- Lathe-mill combination
- Multi-channel control
- Seamless integration of CAM software
- Touch screen is supported
- Backlash elimination for multiple motors

HNC-848Di series install dimensions

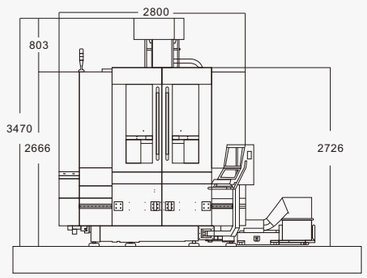


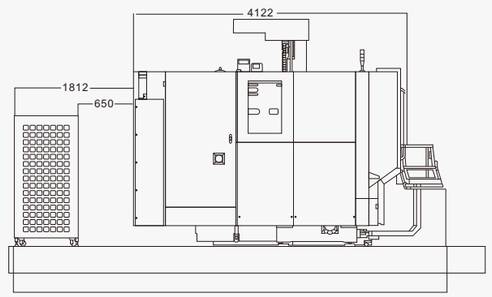
Upper panel

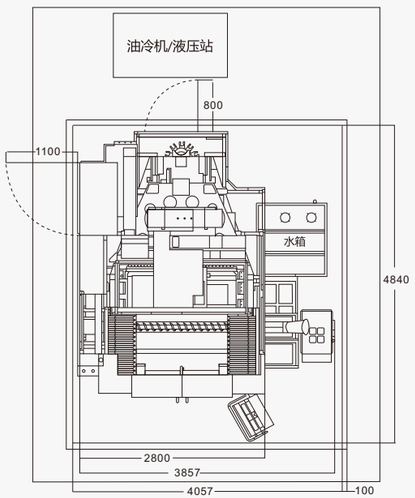
Lower panel

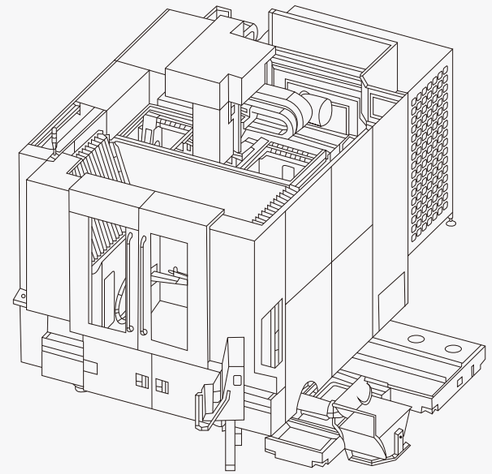
Five-axis machining center

Machine Layout

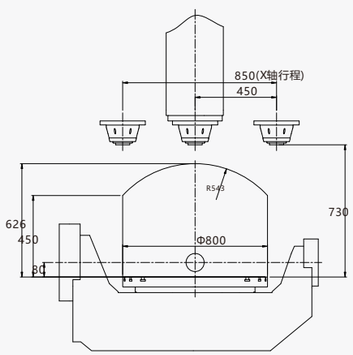


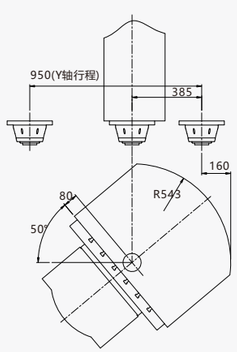


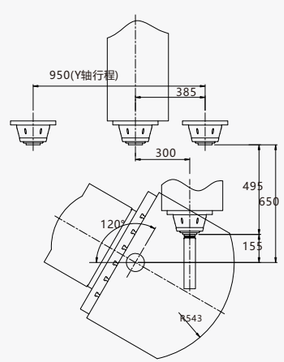




Interferogram of Processing Area







HMU-800 Machine Specifications

Name	Unit	HMU-800	HMU-800evo	HMU-800avi
System (Control unit)			HNC-848Di	
X/Y/Z-axis travel	mm	850/950/550	850/950/550	850/950/550
A/C-axis travel	Degree	±120/360	±120/360	±140/360
Distance from spindle end face to worktable (when A-axis is at 0 degree)	mm	180-730	180-730	180-730
Worktable size	mm	Φ800	Φ800	Φ800
Max. load	kg	600	800	800
Spindle				
Spindle (standard)				
Max. spindle speed/taper	rpm	18000HSK-A63	20000HSK-A63	12000BT40/HSK-A63
Spindle power (S1/S6-40%)	KW	20/28	29/36	15.5/21.7
Torque (S1/S6-40%)	N.m	58/81.2	69.9/87.5	85/119
Feed system				
X/Y/Z-axis rapid traverse	m/min	40/40/40	20/20/20	20/20/20
Max. cutting feedrate	m/min	20	10	10
A/C-axis rapid traverse speed	RPM/min	20/30	20/30	20/30
Positioning precision/Repeatability(GB17421.22000)				
X/Y	mm	0.008/0.006	0.007/0.005	0.007/0.005
Z	mm	0.007/0.005	0.006/0.004	0.006/0.004
A/C	ARCSEC	12/6	8/5	8/5
Automatic tool change system				
Number of tools	Pcs	26T	26T	26T
Tool change time (tool-tool)	sec	12s	12s	12s
Max. tool length	mm	300	300	300
Max. tool diameter (none adjacent)	mm	Φ80/Φ120	Φ80/Φ120	Φ80/Φ120
Max. tool weight	kg	8	8	8
Machine size				
Height	mm	3443	3443	3443
Area (L*W)	mm²	6452x3855	6452x3855	6452x3855
Net weight	kg	17000	17000	17000
Power	kw	60	70	60

Five-axis machining center

HMU-800 Standard Configurations/ Optional Configurations (Option)

● Standard Configurations ○ Optional configuration — None

		HMU-800	HMU-800evo	HMU-800avi
System	HCN-848Di	●	●	●
Spindle	12000rpm/BT-40、HSK-A63	○	○	●
	18000rpm/HSK-A63	●	●	○
	24000/HSK-A63	○	○	○
	Spindle cooler	●	●	●
	Water outlet system of spindle center	○	○	○
	Spindle air curtain dustproof system	●	●	●
Number of tools in magazine	26T umbrella type magazine	●	●	●
	32T chain magazine	○	○	○
	48T chain magazine	○	○	○
	60T chain magazine	○	○	○
High-precision response	Laser tool setter (automatic tool length measurement function & tool wear detection function)	○	○	○
	Contact tool setter	○	○	○
	Screw hollow cooling	○	○	○
	X, Y, Z-axis grating ruler	●	●	●
	A, C-axis grating ruler	●	●	●
	A-axis brake system	●	●	●
	A-axis swing ±140°	○	○	●
	Z-axis hard guide	○	○	●

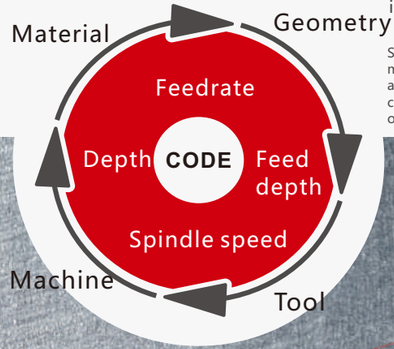
● Standard Configurations ○ Optional configuration — None

		HMU-800	HMU-800evo	HMU-800avi
Chip removal system	Screw chip conveyor	●	●	●
	Crawler chip conveyor	○	○	○
	Chip storage truck	●	●	●
	Machine cleaning water gun	●	●	●
	Machine cleaning air gun	●	●	●
	Protective cover at machine top	○	○	○
	Full cover sheet metal	●	●	●
	Cutting water system	●	●	●
	Air blowing	●	●	●
	Oil mist collector	○	○	○
	Oil-water separation system	○	○	○
Safety system	Safety switch of front door	○	○	○
Lubrication system	Automatic grease	●	●	●
Electrical part	Working light	●	●	●
	Warning light	●	●	●
	Air conditioning system of electrical box	●	●	●
others	Tool box	●	●	●
	Anchor bolt	●	●	●
	Operation manual	●	●	●

"Quite shocking!" This is the evaluation from customers, machine tool providers and tool providers. It is fully integrated in SolidWorks. The new module of SolidCAM enables your CNC machine tools to bring higher profits.

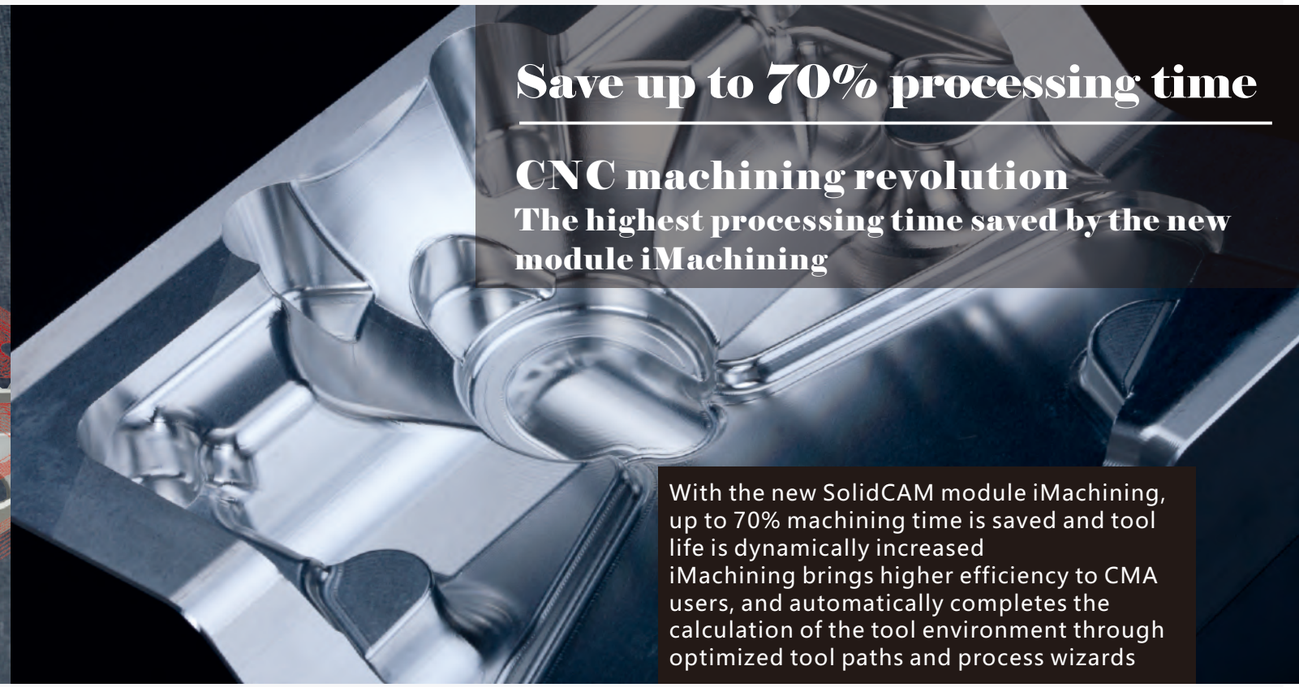
iMachining bring you a better tool path

- Reduce processing time
- Extend tool life
- Automatic feedrate and spindle speed
- Reduce programming time
- Variant spiral
- Intelligent segmentation
- User-friendly interface



iMachining advantage:

SolidCAM integrates the parameters of materials, geometric switches, tools and machine tools, and can generate codes for extremely rich CNC operations



Save up to 70% processing time

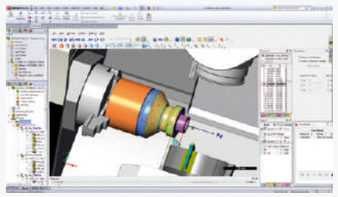
CNC machining revolution

The highest processing time saved by the new module iMachining

With the new SolidCAM module iMachining, up to 70% machining time is saved and tool life is dynamically increased
iMachining brings higher efficiency to CMA users, and automatically completes the calculation of the tool environment through optimized tool paths and process wizards

SolidCAM

iMachining is a brand-new CAM module of SolidCAM, which is fully integrated in the SolidWorks environment for manufacturing solutions and supports all CNC technologies

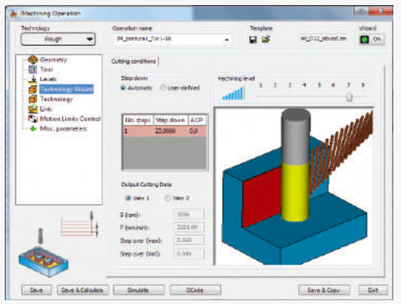


New function of SolidCAM: Advanced turning-milling, supports multiple spindles and multiple turrets

- iMachining
- 2.5D milling
- 3D high speed milling
- High-speed curved surface milling
- Multi-axis positioning milling
- 5—simultaneous-axis milling
- Turning and advanced turning and milling
- Wire cutting
- Turning and advanced turning and milling
  Wire cutting

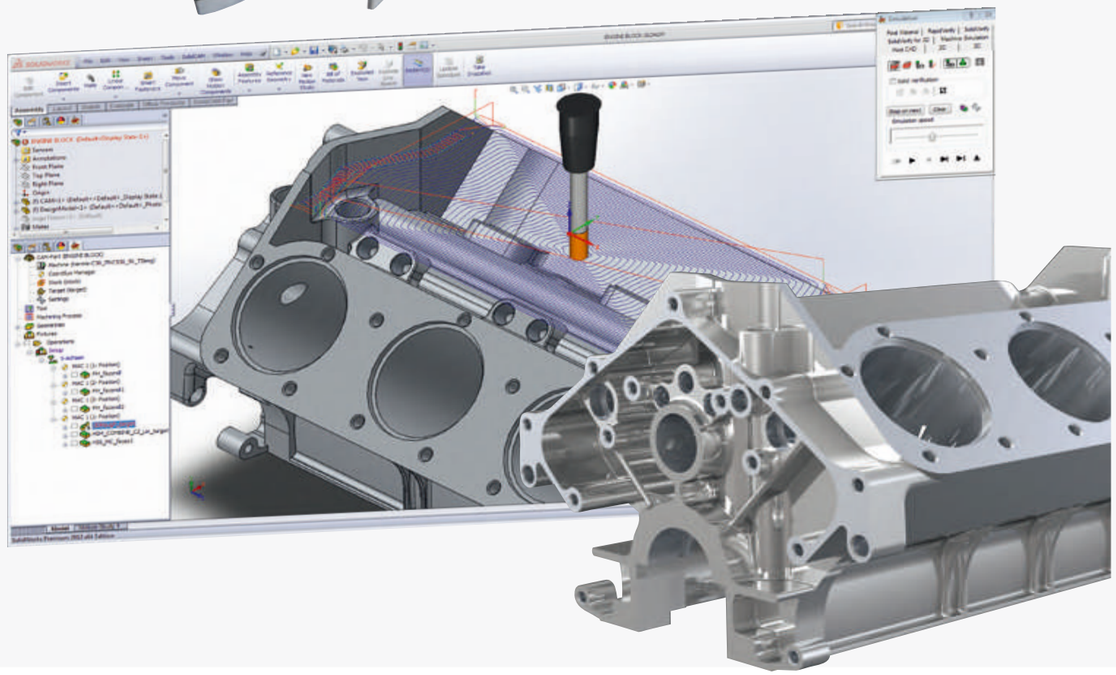
Patented "controllable step" technology of iMachining

- Reduce cycle time--up to 70% time is saved
- Tool life-tool life is extended by 2-3 times
- Process high hardness materials
- Outstanding machining performance of smaller tools
- 4-axis turning and milling with iMachining
  Very short learning cycle
  Very high programming efficiency



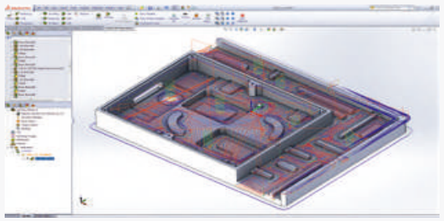
The exclusive machining process wizard makes the machining parameters optimized based on tools, parts switches, machine tools and materials, etc.

Complete CAM solutions and revolutionary iMachining efficient machining, seamlessly integrated in SOLIDWORKS



Box parts machining using iMachining 3D

You can also use iMachining 3D to process the entire box parts. The box parts include many bags and islands. The parts can be processed completely with one process. The software directly recognizes the processed blanks and shapes without the need to define the relevant Link to the image file. iMachining 3D can automatically calculate the relevant optimal toolpath-greatly reducing programming time.



Menes uses iMachining 3D to process steel products, which save 85% of processing time!

"I hope this is the result every day-using iMachining 3D will greatly save costs!"

Igor, Chief Programmer, Menes

In the actual machining, 75% machining time is saved with iMachining 3D compared with another CAM software:

"It takes 58 minute for processing with iMachining 3D, and 4 hours with the original CAM software. 75% machining time is saved with iMachining 3D!"

Galtronics, China

A.P.A uses SolidCAM iMachining 2D and 3D to process Aluminum products:

"It's amazing. I can't describe iMachining in words. I can't even imagine how much time it can save by in aluminum products processing!"

David Franko, Owner, A.P.A.