



Selection manual

High-end CNC machine tools



CTB 超同步股份有限公司
CTB Co., Ltd.

CTB-PI-S-2403-01-01

COMPANY PROFILE

CTB Co., Ltd. was established in 2008, focusing on the field of intelligent manufacturing, providing core components such as servo motors, torque motors, motorized spindles, and professional automation servo control solutions. The company has two wholly-owned subsidiaries, Beijing CTB technology Co., Ltd. (established in 2000) and Shandong CTB Intelligent Equipment Co., Ltd. (established in 2017).

The company is a national high-tech enterprise, a national specialized and innovative "little giant" enterprise, and a listed enterprise on the New Third Board. The company has been recognized as a "National Green Factory" and a "Smart Factory" in Beijing. It is a Beijing patent demonstration unit, a Beijing enterprise technology research and development institution, and a Beijing enterprise technology center.

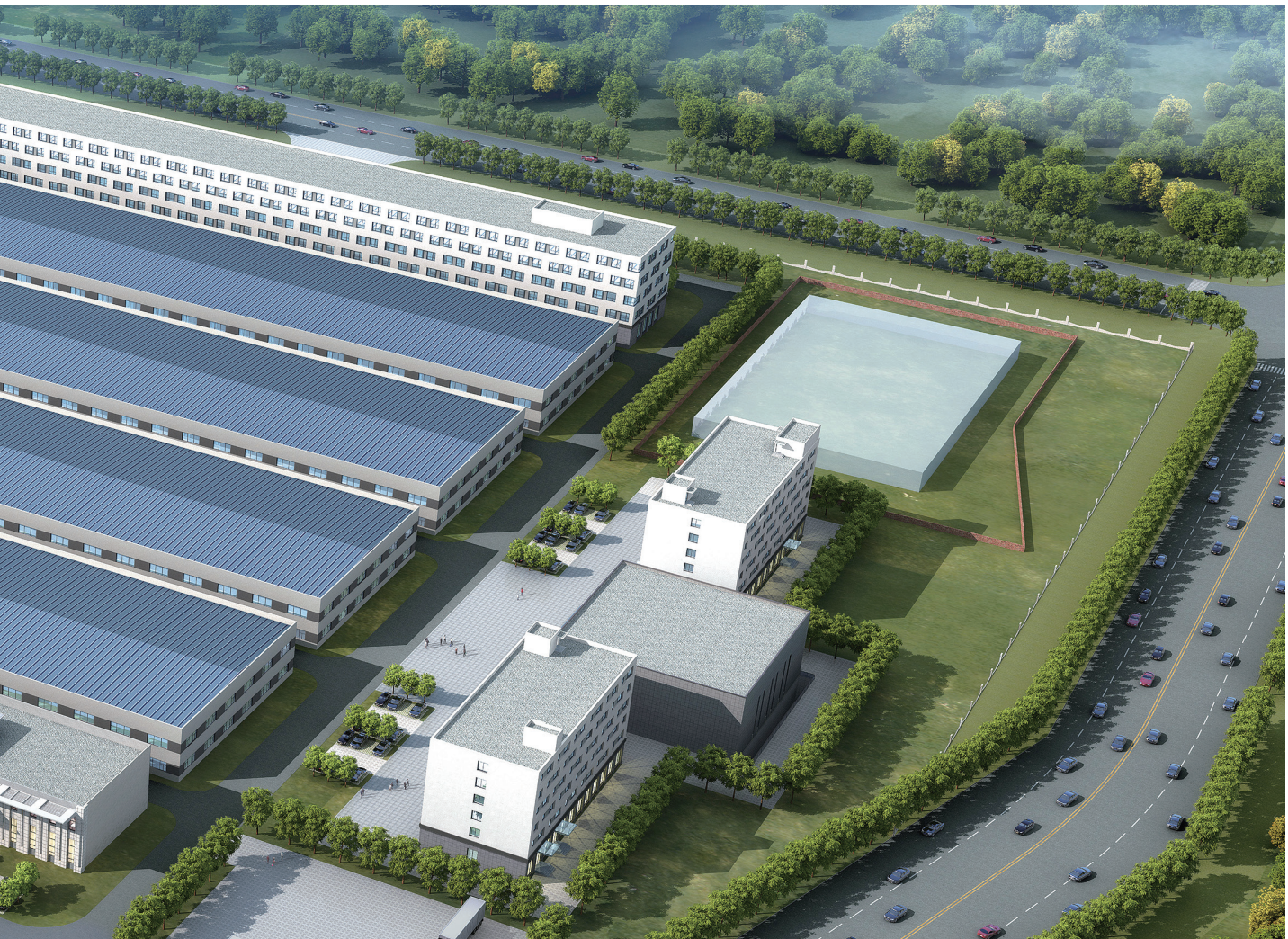
The company's products include a full range of industrial automation products such as AC servo motors, AC servo drives, PLC, motion controllers, core functional components such as torque motors, motorized spindles, direct drive turntables, and high-end intelligent equipment such as



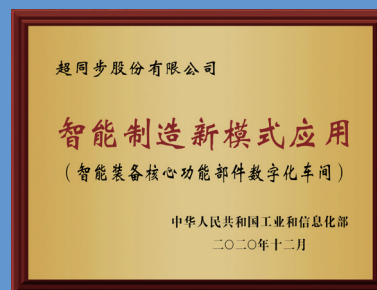
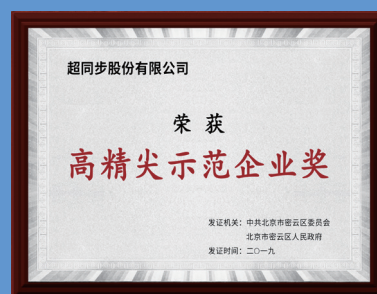
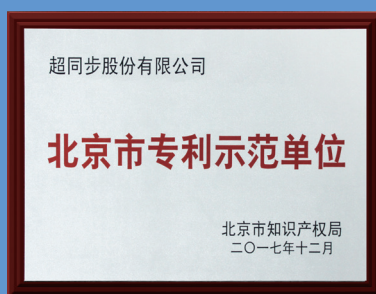
five axis vertical machining centers. The core technology has reached the international advanced level, and key products can replace imported similar products, widely used in CNC machine tools, industrial robots, industrial automation and other fields.

The company has core technologies with independent intellectual property rights, over 300 patents and software copyrights, including more than 30 invention patents. Its servo control system technology is at the leading level in China, and it has mastered core technologies such as servo control space vector algorithm, control software development, servo drive design, servo motor electromagnetic design, and manufacturing processes.

The company has two intelligent equipment industrial parks in Beijing and Shandong, with a business area of 100000 square meters. Advanced equipment, strict management, sufficient production capacity, and strong production and supply capabilities. There are 30 offices nationwide, with a sales and service network covering the north and south of China, providing efficient and professional pre-sales, in sales, and after-sales services for our customers.



QUALIFICATIONS & HONORS



INTELLIGENT PRODUCTION LINES



SALES SERVICE NETWORK



9 core regions

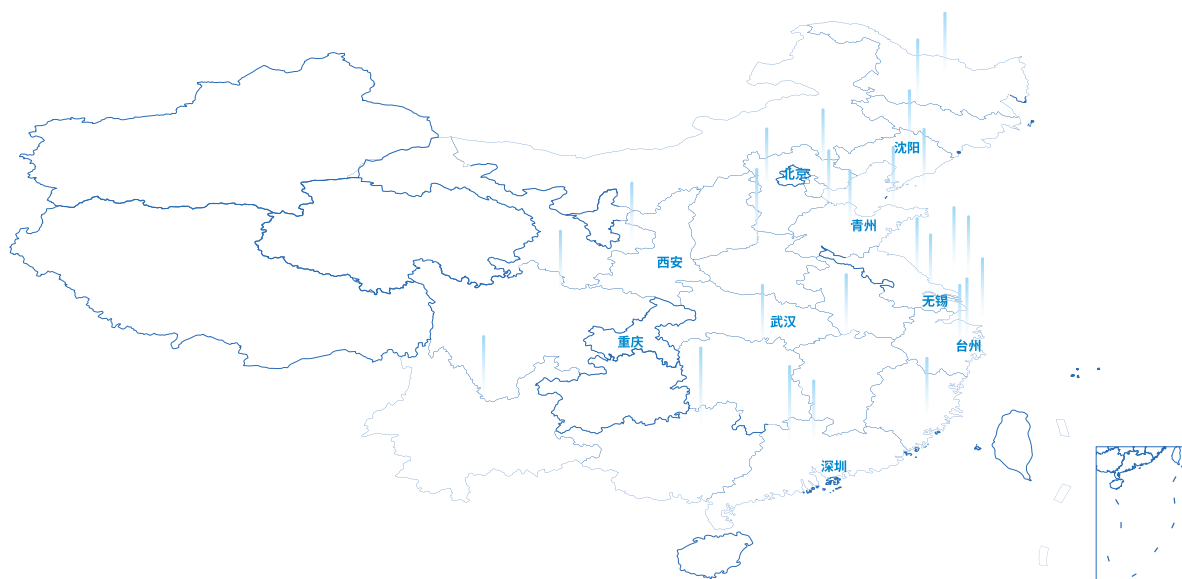


30 offices



100 top sales staff

Northeast China / East China / Southwest China / North China / South China / Shandong / Central China / Northwest China / Zhejiang



Service philosophy: Our Own Satisfaction & Customer Satisfaction
Service time: Respond in 24 h

 **24h service hotline**

400-888-9055



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V5-320B

Five-axis Vertical Machining Center

- ◇ High-speed high-precision motorized spindle
- ◇ Direct driven rotary table with high dynamic responsiveness
- ◇ High-end CNC controller
- ◇ High-efficiency hybrid machining





V5-320B

Five-axis Simultaneous Machining With **High Cost Performance Ratio**

Classic C-shaped construction, independently developed high-precision motorized spindle, rotary table with direct drive and a high-end CNC controller jointly contribute to its excellent quality performance. It also supports various sizes of motorized spindles and turning-milling rotary tables.



Applications

+ 3C Industry
Mobile Phone Parts



+ Engraving & Milling Industry
Ornaments

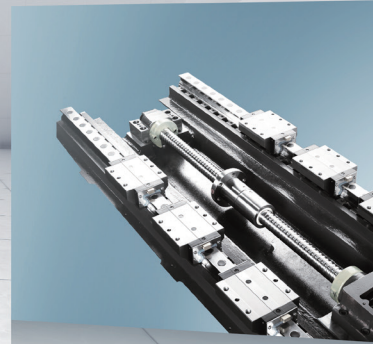
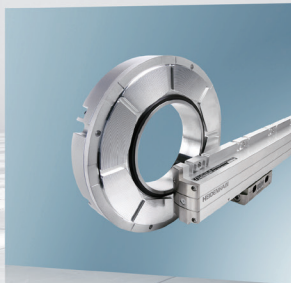


+ Medical Devices
Bridge Plating



V5-320B

Functional Components



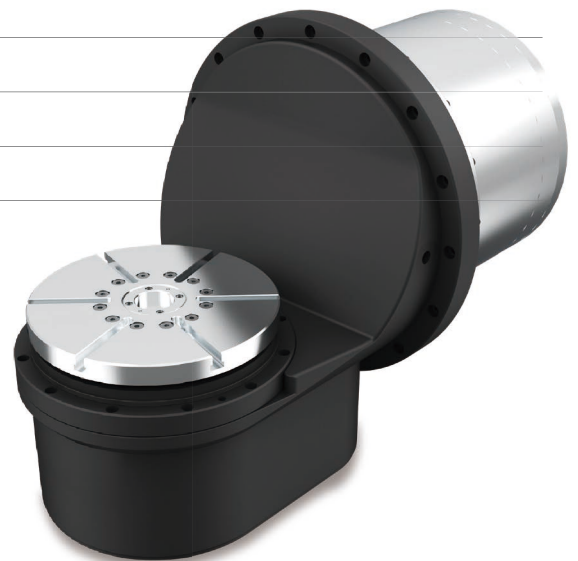
BC320 Rotary Table with Direct Drive

The independently developed rotary table with direct drive is provided with a high-precision torque motor featuring zero drive clearance and zero wear. A high-precision angle encoder and a high-end CNC controller are installed to realize high dynamic accuracy control.

The rotary tilt table allows five-axis simultaneous machining and a maximum workpiece weight of 150 kg. It can fulfill negative angle machining.

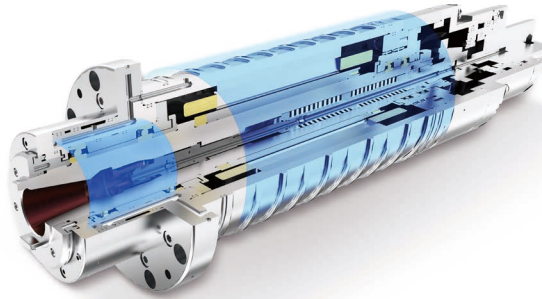
Product Features

- ◇ Torque motor: B axis: 656 Nm C axis: 172 Nm
- ◇ Positioning accuracy: 6"
- ◇ YRT bearing for high-rigidity rotary table
- ◇ Hydraulic clamping: B axis: 1,500 Nm C axis: 500 Nm



HSKE40/BT30/BT40 Motorized Spindle

The motorized spindle adopts a built-in permanent magnet synchronous motor and high precision ceramic bearing. There are also such options as vibration sensor, temperature sensor and tool internal cooling.

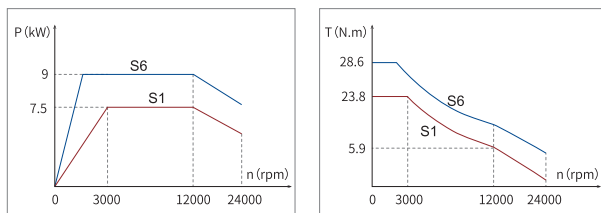


Product Features

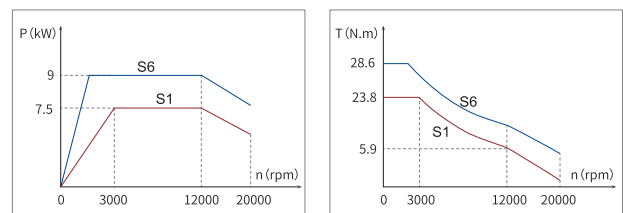
- ◇ Built-in permanent magnet synchronous motor with high power density
- ◇ Bearing preloading at fixed pressure to realize ultrahigh speed
- ◇ Dynamically balanced to G1
- ◇ Little noise and thermal deformation
- ◇ High dynamic rotational accuracy

Performance Curves

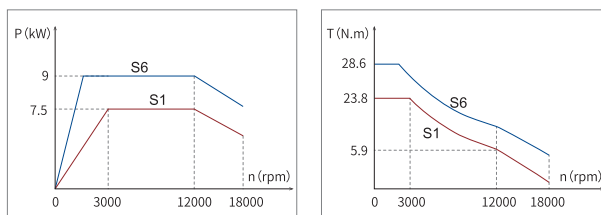
HSKE40



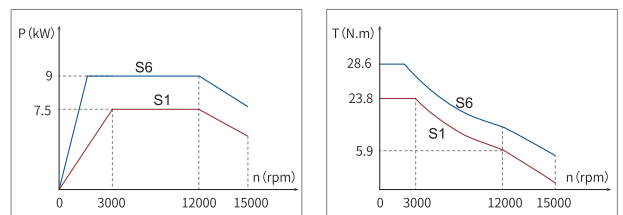
HSKA63



BT30*



BT40



V5-320B Technical Data

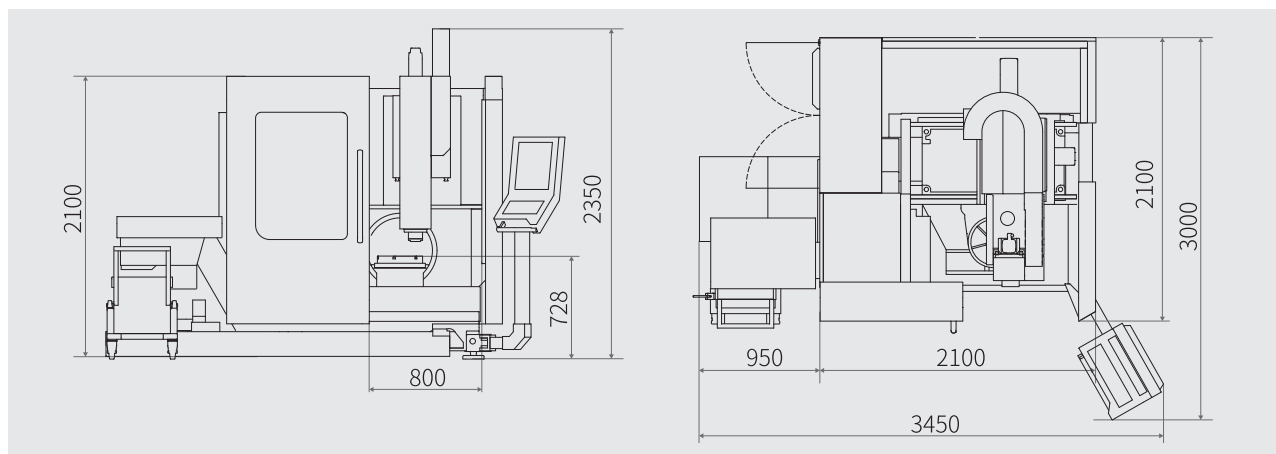
		Unit	Spec.			
Table						
Diameter		mm	320			
Max horizontal load		kg	150			
Max vertical load			100			
T slots (number×width)		No. × mm	6×10H8			
Machining range						
Distance from spindle nose to table surface	Max	mm	430			
	Min.		100			
X axis		mm	450			
Y axis		mm	320			
Z axis		mm	330			
B axis		°	-35~+110			
C axis		°	n×360			
Spindle						
Tool holder			BT30	BT40	HSKE40	HSKA63
Pull stud			MAS403 BT30 - I	MAS403 BT40 - I		
Rated speed		rpm	3000			
Max speed			18000	15000	24000	20000
Motorized spindle output torque (S1/S6)		N · m	23.8/28.6			
Motorized spindle output power (S1/S6)		kW	7.5/9			
Coordinate axes						
Rapid traverse	X axis	m/min	36			
	Y axis		36			
	Z axis		36			
Max speed	B axis	rpm	100			
	C axis		130			
Automatic tool changer						
Type			Disk type			
Tool selection			Bidirectional proximity principle			
Capacity		T	24/30			
Max tool length		mm	200			
Max tool weight		kg	3.5			
Max disk diameter	Full	mm	65			
	Adjacent positions empty		125			
Accuracy						
Standard			ISO10791-4			
Positioning accuracy	X/Y/Z axis	mm	0.006			
	B/C axis	"	6			
Repeatability	X/Y/Z axis	mm	0.004			
	B/C axis	"	4			
Weight		kg	4000			
Capacity		KVA	45			
Overall dimensions (L×W×H)		mm	3450×3000×2350			

V5-320B Configuration Options

● Standard ○ Optional

CNC controller	
SIEMENS SINUMERIK 828D	○
SIEMENS SINUMERIK 840D	●
HEIDENHAIN TNC640	○
HUAZHONG HNC848D	○
Motorized spindle	
BT30: Max speed 18000rpm, 23.8Nm/28.6Nm, 7.5KW/9kW	●
BT40: Max speed 15000rpm, 23.8Nm/28.6Nm, 7.5kW/9kW	○
HSKE40: Max speed 24000rpm, 23.8Nm/28.6Nm, 7.5KW/9kW	○
HSKA63: Max speed 20000rpm, 23.8Nm/28.6Nm, 7.5KW/9KW	○
Tool center cooling	○
Rotary table	
Ø320	●
Ø380	○
Encoder	
Absolute encoder	○
Probe	
Optical probe	●
Radio probe	○
Tool setter	
Optical tool setter	●
Radio tool setter	○
Laser tool setter	○
Automation	
Automatic hydraulic connection	○
Automatic door	○
Intelligent functions	
5-axis accuracy calibration	●
Spindle thermal expansion compensation	○
Intelligent industrial screen	○

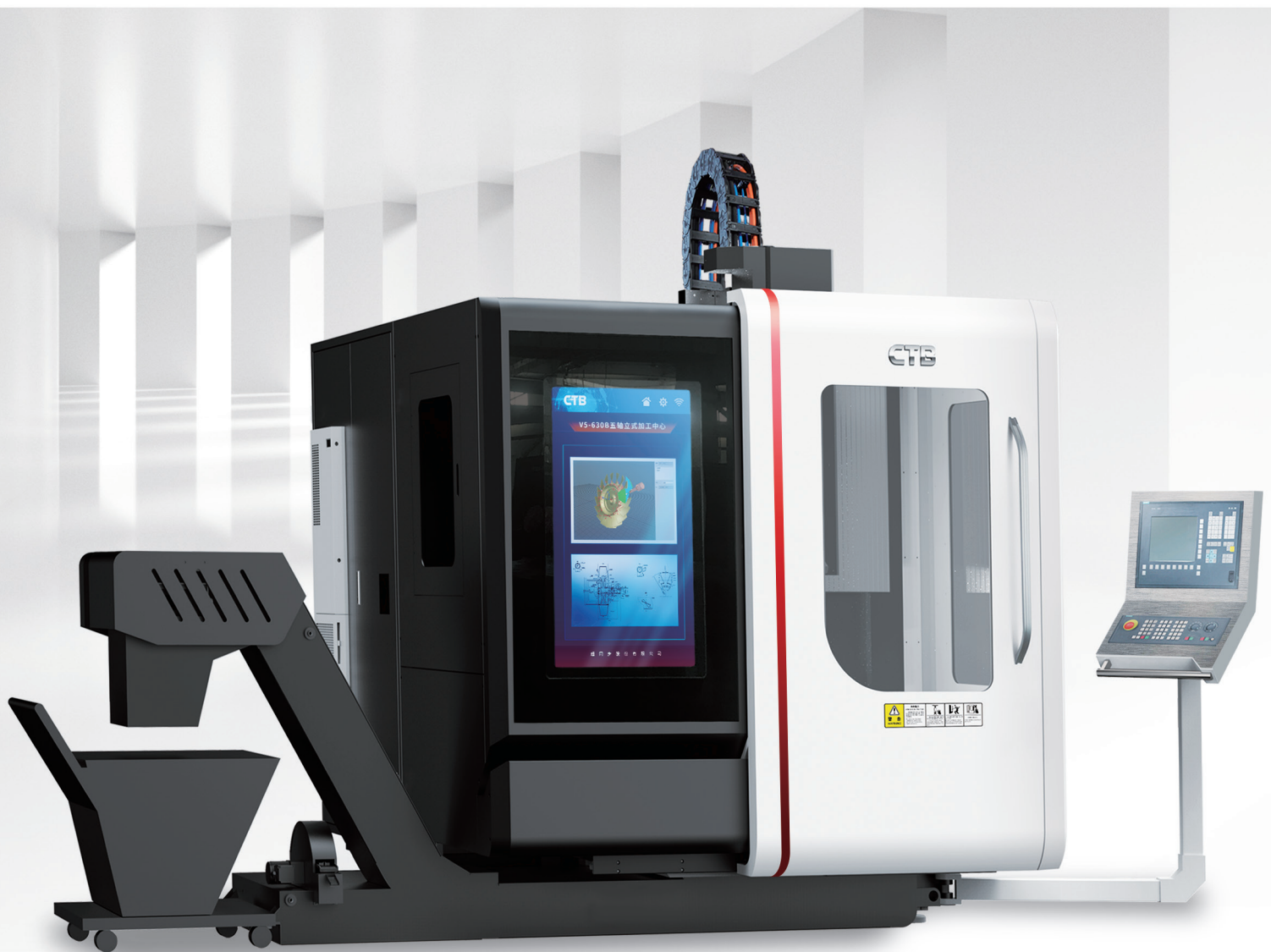
V5-320B Outline Drawing



V5-630B

Five-axis Vertical Machining Center

- ◇ High-speed high-precision motorized spindle
- ◇ Direct driven rotary table with high dynamic responsiveness
- ◇ High-end CNC controller
- ◇ High-efficiency hybrid machining





V5-630B

Five-axis Simultaneous Machining With **High Cost Performance Ratio**

Classic C-shaped construction, independently developed high-precision motorized spindle, rotary table with direct drive, and a high-end CNC controller jointly contribute to its excellent quality performance. It also supports various sizes of motorized spindles and turning-milling rotary tables.



Applications

+ **Mechanical manufacturing**
Aluminum rotor shaft



+ **Automobile**
Impellers

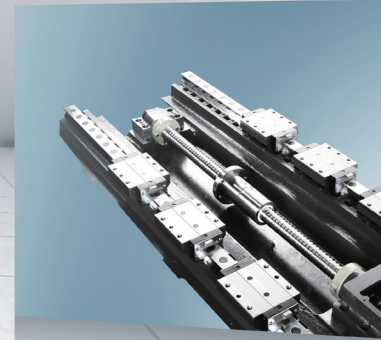
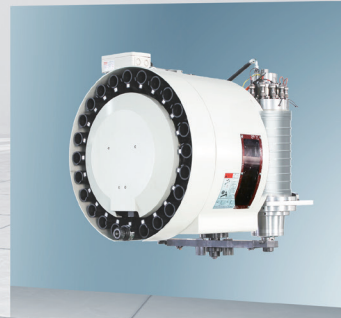
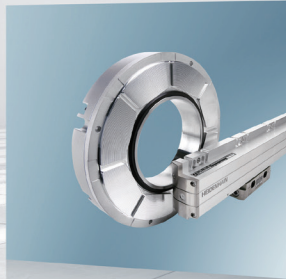


+ **Hydraulics**
Valve Bodies



V5-630B

Functional Components



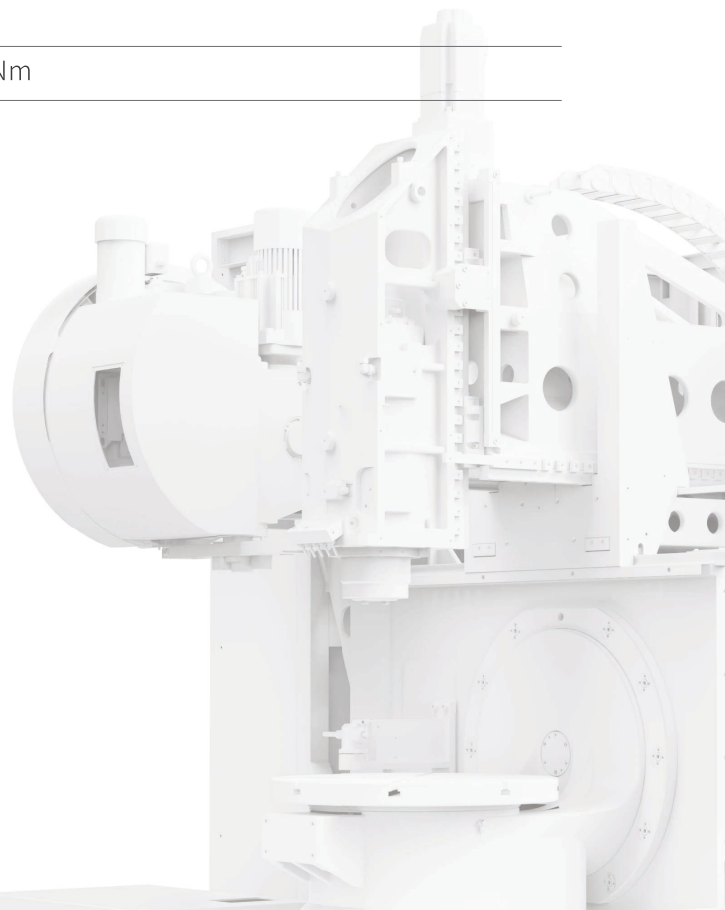
BC630 Rotary Table with Direct Drive

The independently developed rotary table with direct drive is provided with a high-precision torque motor featuring zero drive clearance and zero wear. A high-precision angle encoder and a high-end CNC controller are installed to realize high dynamic accuracy control.

The rotary tilt table allows five-axis simultaneous machining and a maximum workpiece weight of 500 kg. It can fulfill negative angle machining. The B axis is provided with an auxiliary support which is highly rigid.

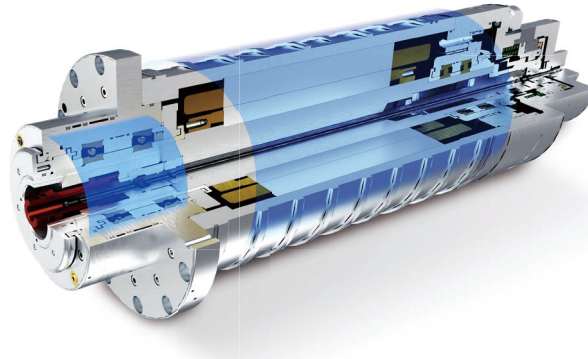
Product Features

- ◇ Torque motor: B axis: 2,540 Nm C axis: 700 Nm
- ◇ Positioning accuracy: 6"
- ◇ YRT bearing for high-rigidity rotary table
- ◇ Hydraulic clamping: B axis: 4,000 Nm C axis: 1,400 Nm



HSKA63/BT40 Motorized Spindle

The motorized spindle adopts a high-efficiency built-in asynchronous motor and high precision ceramic bearing. There are also such options as vibration sensor, temperature sensor and tool internal cooling.



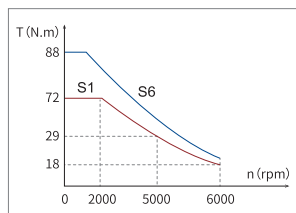
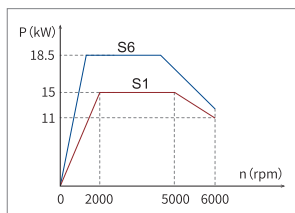
Product Features

- ◇ High-efficiency built-in asynchronous motor with copper rotor
- ◇ Bearing preloading at fixed pressure to realize ultrahigh speed
- ◇ Dynamically balanced to G1
- ◇ Little noise and thermal deformation
- ◇ High dynamic rotational accuracy

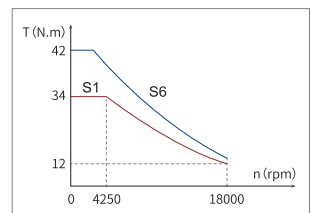
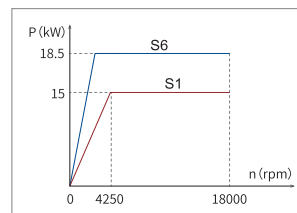
Performance Curves

HSKA63

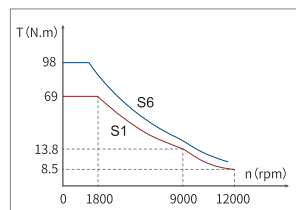
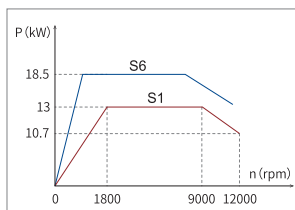
Y connection



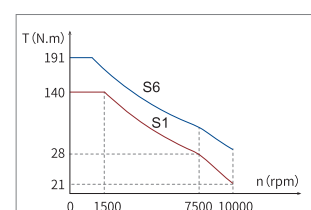
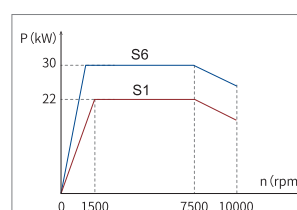
D connection



BT40



BT40



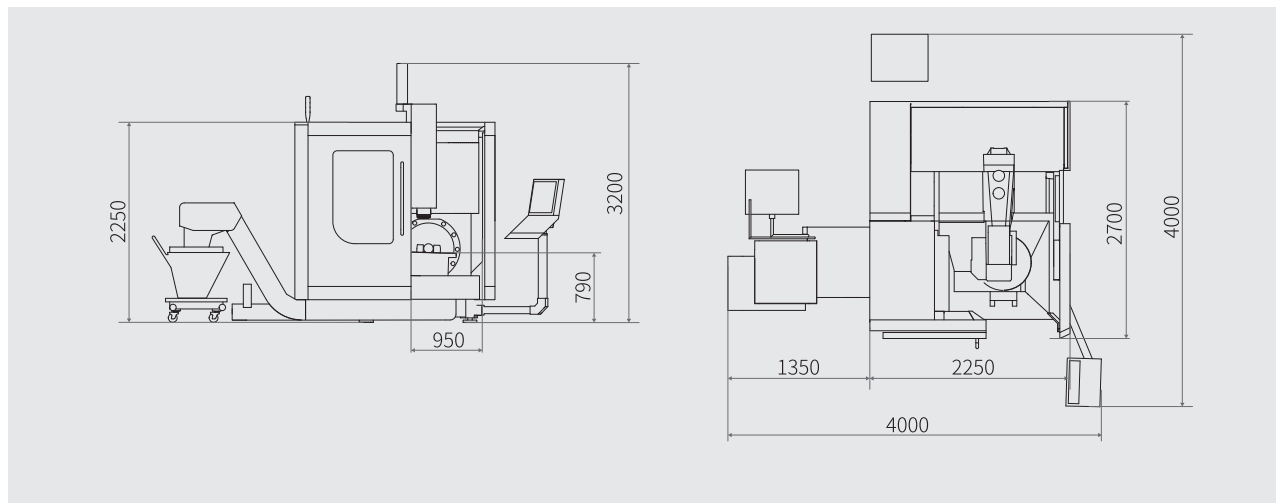
V5-630B Technical Data

		Unit	Spec.		
Table					
Diameter		mm	630		
Max horizontal load		kg	500		
Max vertical load			300		
T slots (number×width)		No.×mm	8×14H8		
Machining range					
Distance from spindle nose to table surface	Max	mm	550 (490*)		
	Min.		150 (90*)		
X axis		mm	600		
Y axis		mm	450		
Z axis		mm	400		
B axis		°	-35~+110		
C axis		°	n×360		
Spindle					
Tool holder			BT40		HSKA63
Pull stud			MAS403 BT40-I		
Rated speed		rpm	1800	1500	2000
Max speed			12000	10000	18000
Motorized spindle output torque (S1/S6)		N·m	69/98	140/191	72/88
Motorized spindle output power (S1/S6)		kW	13/18.5	22/30	15/18.5
Coordinate axes					
Rapid traverse	X axis	m/min	36(60)		
	Y axis		36(60)		
	Z axis		36(60)		
Max speed	B axis	rpm	80		
	C axis		80		
Automatic tool changer					
Type			Disk type		
Tool selection			Bidirectional proximity principle		
Capacity		T	24/30		
Max tool length		mm	300		
Max tool weight		kg	8		
Max disk diameter	Full	mm	80/75		
	Adjacent positions empty		150		
Accuracy					
Standard			ISO10791-4		
Positioning accuracy	X/Y/Z axis	mm	0.007		
	B/C axis	"	6		
Repeatability	X/Y/Z axis	mm	0.005		
	B/C axis	"	4		
Weight		kg	7500		
Capacity		KVA	45		
Overall dimensions (L×W×H)		mm	4000×4000×3200		

V5-630B Configuration Options

	● Standard	○ Optional
CNC controller		
SIEMENS SINUMERIK 828D		○
SIEMENS SINUMERIK 840D	●	
SIEMENS SINUMERIK ONE		○
HEIDENHAIN TNC640		○
HUAZHONG HNC848D		○
Motorized spindle		
BT40: Max speed 12,000 rpm, 69 Nm/98 Nm, 13 kW/18.5 kW		○
BT40*: Max speed 10,000 rpm, 140 Nm/191 Nm, 22 kW/30 kW		○
HSKA63: Max speed 18,000 rpm, 72 Nm/88 Nm, 15 kW/18.5 kW	●	
Tool center cooling		○
Rotary table		
Ø630: Max speed: 80 rpm	●	
Ø630: Max speed: 1200 rpm		○
Encoder		
Absolute encoder	●	
Probe		
Optical probe	●	
Radio probe		○
Tool setter		
Optical tool setter	●	
Radio tool setter		○
Laser tool setter		○
Automation		
Automatic hydraulic connection		○
Pneumatic roof		○
Electric side window		○
Automatic door		○
Intelligent functions		
5-axis accuracy calibration	●	
Spindle thermal expansion compensation		○
Intelligent industrial screen		○
Environment protection		
Full enclosure		○
Oil mist collector		○

V5-630B Outline Drawing

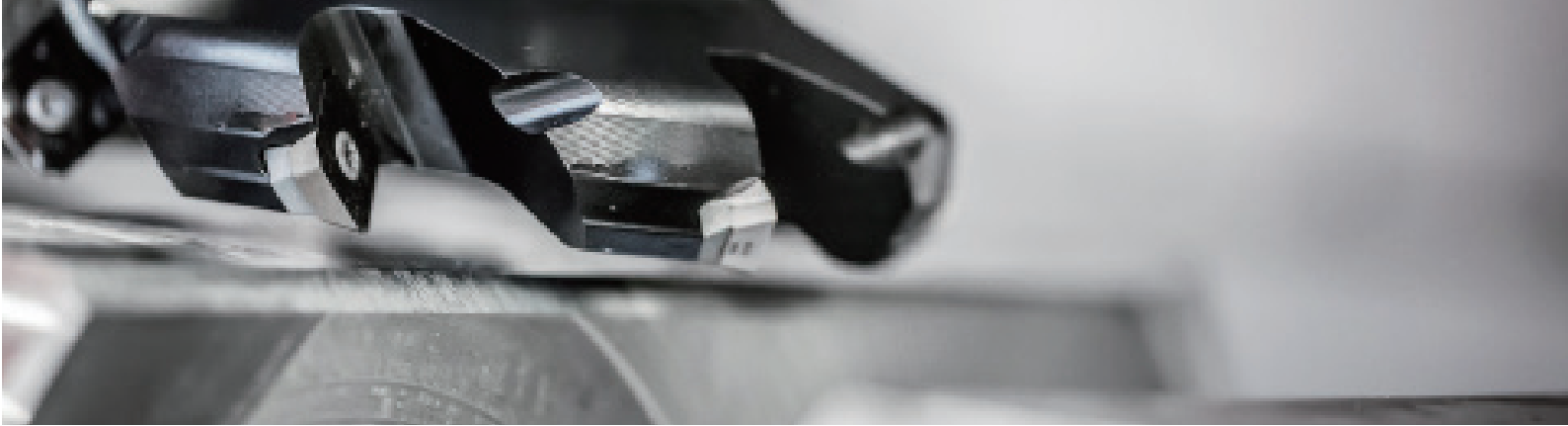


V5-700B

Five-axis Vertical Machining Center

- ◇ High-speed high-precision motorized spindle
- ◇ Direct driven rotary table with high dynamic responsiveness
- ◇ High-end CNC controller
- ◇ High-efficiency hybrid machining

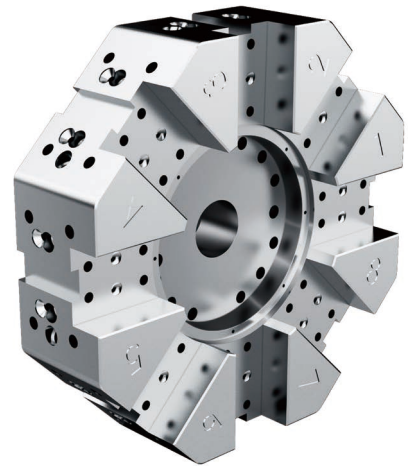




V5-700B

Five-axis Simultaneous Machining With **High Cost Performance Ratio**

Classic C-shaped construction, independently developed high-precision motorized spindle, rotary table with direct drive, and a high-end CNC controller jointly contribute to its excellent quality performance. It also supports various sizes of motorized spindles and turning-milling rotary tables.



Applications

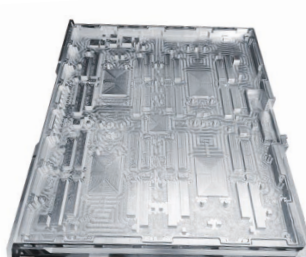
+ **Drilling and mining**

Mining drill bit



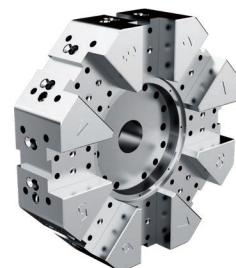
+ **Electronics**

Circuit board mold



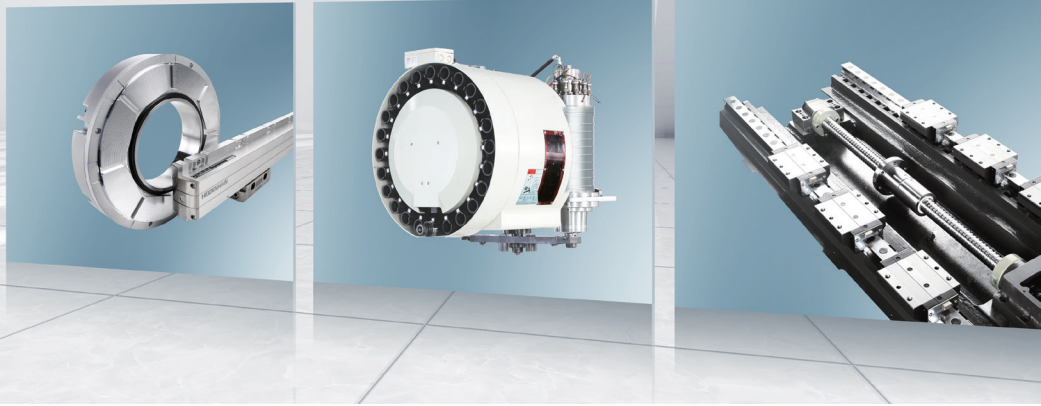
+ **Machine processing tools**

Turret



V5-700B

Functional Components



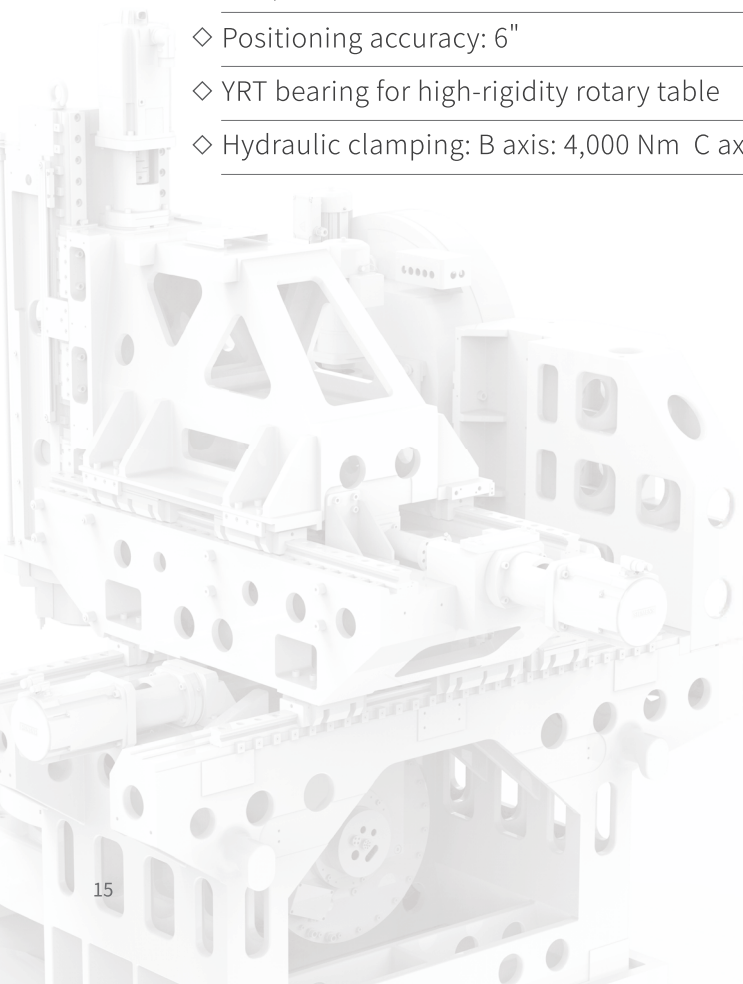
BC700 Rotary Table with Direct Drive

The independently developed rotary table with direct drive is provided with a high-precision torque motor featuring zero drive clearance and zero wear. A high-precision angle encoder and a high-end CNC controller are installed to realize high dynamic accuracy control.

The rotary tilt table allows five-axis simultaneous machining and a maximum workpiece weight of 500 kg. It can fulfill negative angle machining. The B axis is provided with an auxiliary support which is highly rigid.

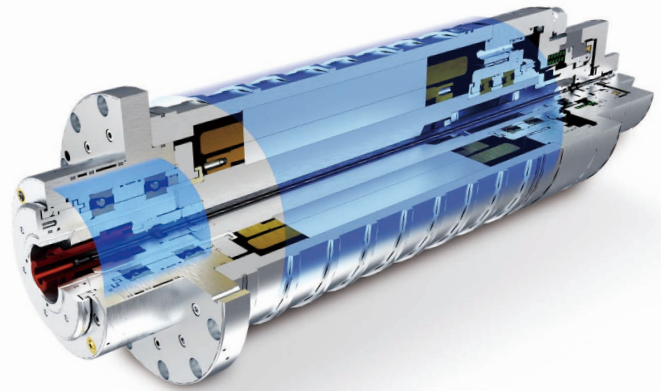
Product Features

- ◇ Torque motor: B axis: 2,540 Nm C axis: 700 Nm
- ◇ Positioning accuracy: 6"
- ◇ YRT bearing for high-rigidity rotary table
- ◇ Hydraulic clamping: B axis: 4,000 Nm C axis: 1,400 Nm



HSKA63/BT40 Motorized Spindle

The motorized spindle adopts a high-efficiency built-in asynchronous motor and high precision ceramic bearing. There are also such options as vibration sensor, temperature sensor and tool internal cooling.



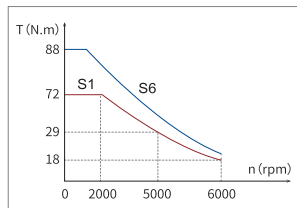
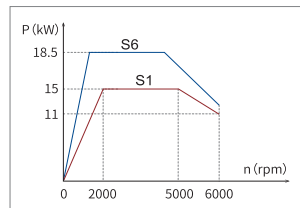
Product Features

- ◇ High-efficiency built-in asynchronous motor with copper rotor
- ◇ Bearing preloading at fixed pressure to realize ultrahigh speed
- ◇ Dynamically balanced to G1
- ◇ Little noise and thermal deformation
- ◇ High dynamic rotational accuracy

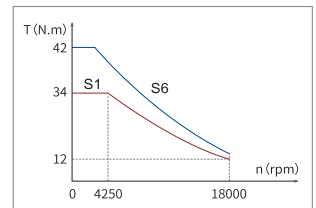
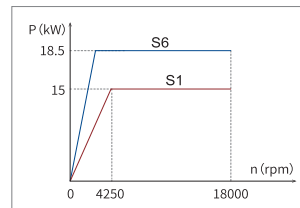
Performance Curves

HSKA63*

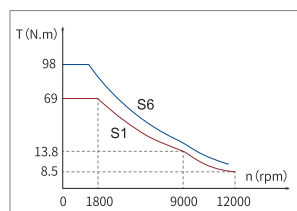
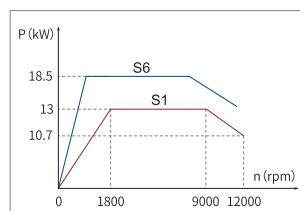
Y connection



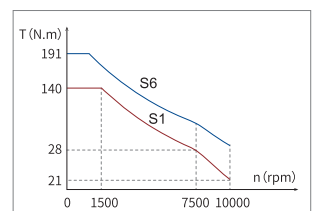
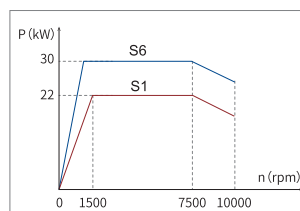
D connection



BT40



BT40



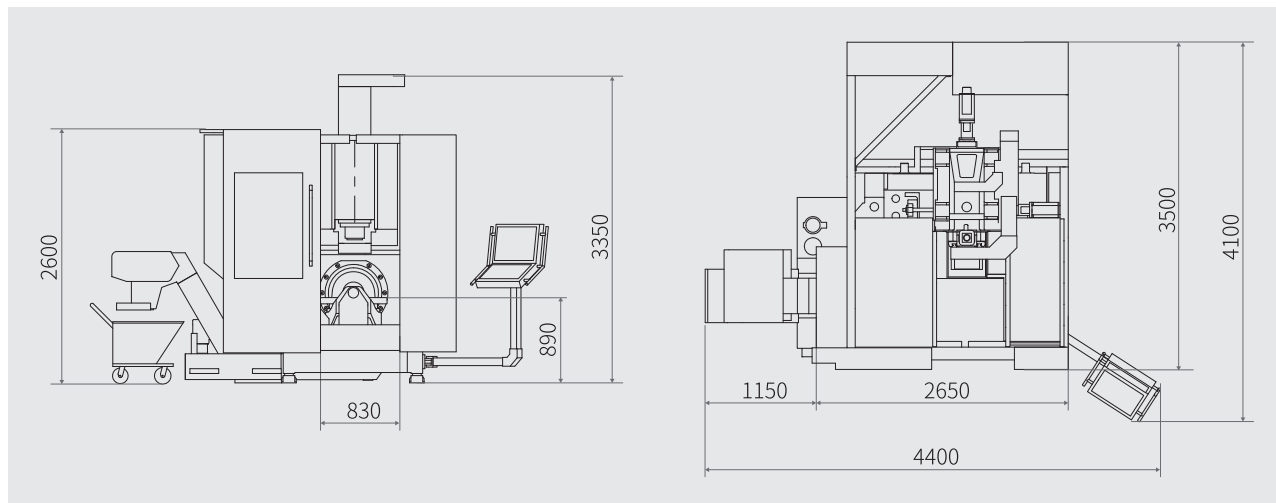
V5-700B Technical Data

		Unit	Spec.		
Table					
Diameter		mm	700		
Max horizontal load		kg	500		
Max vertical load			300		
T slots (number×width)		↑ × mm	8×14H8		
Machining range					
Distance from spindle nose to table surface	Max	mm	650		
	Min.		150		
X axis		mm	700		
Y axis		mm	600		
Z axis		mm	500		
B axis		°	-35 ~ +110		
C axis		°	n×360		
Spindle					
Tool holder			BT40		HSKA63
Pull stud			MAS403 BT40 - I		
Rated speed		rpm	1800	1500	2000
Max speed			12000	10000	18000
Motorized spindle output torque (S1/S6)		N.m	69/98	140/191	72/88
Motorized spindle output power (S1/S6)		kW	13/18.5	22/30	15/18.5
Coordinate axes					
Rapid traverse	X axis	m/min	36(60)		
	Y axis		36(60)		
	Z axis		36(60)		
Max speed	B axis	rpm	80		
	C axis		80		
Automatic tool changer					
Type			Disk type		
Tool selection			Bidirectional proximity principle		
Capacity		T	24/30		
Max tool length		mm	300		
Max tool weight		kg	8		
Max disk diameter	Full	mm	80/75		
	Adjacent positions empty		150		
Accuracy					
Standard			ISO10791-4		
Positioning accuracy	X/Y/Z axis	mm	0.007		
	B/C axis	"	6		
Repeatability	X/Y/Z axis	mm	0.005		
	B/C axis	"	4		
Weight		kg	10500		
Capacity		KVA	55		
Overall dimensions (L×W×H)		mm	4400×4100×3200		

V5-700B Configuration Options

	● Standard	○ Optional
CNC controller		
SIEMENS SINUMERIK 828D		○
SIEMENS SINUMERIK 840D	●	
SIEMENS SINUMERIK ONE		○
HEIDENHAIN TNC640		○
HUAZHONG HNC848Di		○
Motorized spindle		
BT40: Max speed 12000rpm, 69Nm/98Nm, 13kW/18.5kW		○
BT40: Max speed 10000rpm, 140Nm/191Nm, 22kW/30kW		○
HSKA63: Max speed 18000rpm, 72Nm/88Nm, 15kW/18.5kW	●	
Tool center cooling		○
Rotary table		
Ø700: Max speed: 80rpm	●	
Ø700: Max speed: 1000rpm		○
Encoder		
Absolute encoder	●	
Probe		
Optical probe	●	
Radio probe		○
Tool setter		
Optical tool setter	●	
Radio tool setter		○
Laser tool setter		○
Automation		
Automatic hydraulic connection		○
Pneumatic roof	●	
Electric side window		○
Automatic door		○
Intelligent functions		
5-axis accuracy calibration	●	
Spindle thermal expansion compensation		○
Intelligent industrial screen		○
Environment protection		
Full enclosure	●	
Oil mist collector		○

V5-700B Outline Drawing



MT63

Vertical Turning-Milling Center

- ◇ High-speed high-precision motorized spindle
- ◇ Direct driven rotary table with high dynamic responsiveness
- ◇ High-efficiency hybrid machining





MT63

Turning and Milling With **High Cost Performance Ratio**



With classic construction with T column and dual rams, compact design, independently developed high-precision motorized spindle for milling, high-torque motorized spindle for turning, and standard six-station electric turret, it realizes turning and milling operations in an efficient manner.

Applications

+ **Motor**

Flanges & End Caps



+ **Automobile**

Hubs



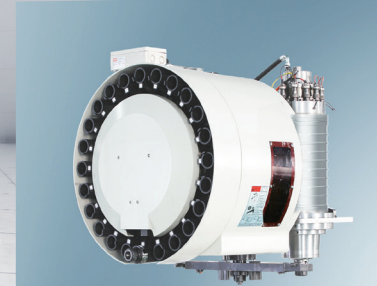
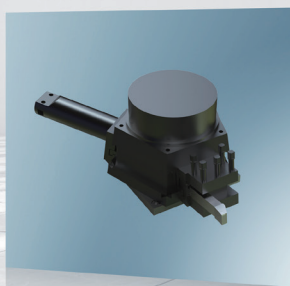
+ **Transmission**

Pulleys



MT63

Functional Components



A215 Motorized Spindle for Vertical Lathes

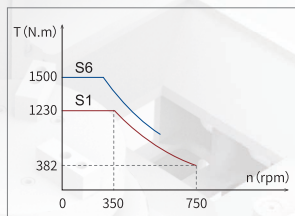
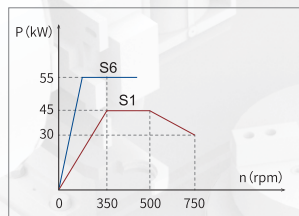
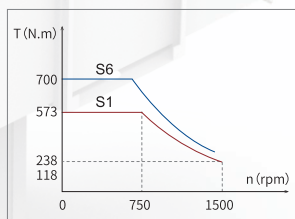
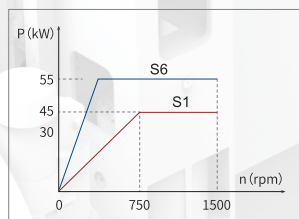
The high-efficiency built-in asynchronous motor, thus realizing low speed high torque and high speed precision machining. There is a built-in radial hydraulic brake with great braking force and a built-in high-precision angle coder. It can easily fulfill combined turning and milling operations.

Product Features

- ◇ High-efficiency built-in asynchronous motor
- ◇ Built-in high-precision angle encoder
- ◇ Built-in radial hydraulic brake with great braking force
- ◇ High dynamic responsiveness

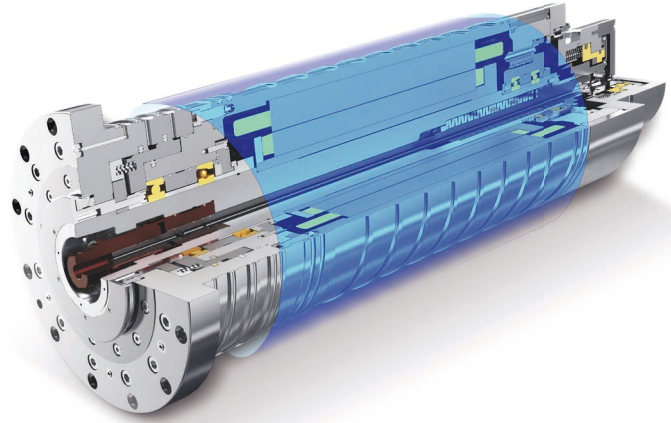
Performance Curves

A215



HSKT100/BT50 Motorized Spindle

The motorized spindle adopts a high-efficiency built-in asynchronous motor and high precision ceramic bearing. There are also such options as vibration sensor, temperature sensor and tool internal cooling.

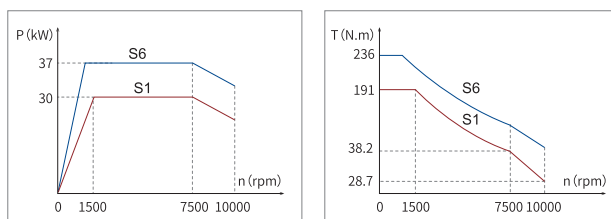


Product Features

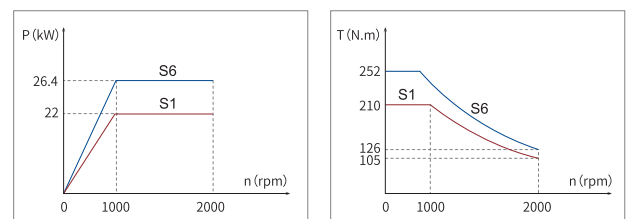
- ◇ High-efficiency built-in asynchronous motor with copper rotor
- ◇ High-speed、High-precision、High dynamic responsiveness, realizing stepless speed
- ◇ changingDynamically balanced to G1
- ◇ Little noise and thermal deformation
- ◇ High dynamic rotational accuracy

Performance Curves

HSKT100



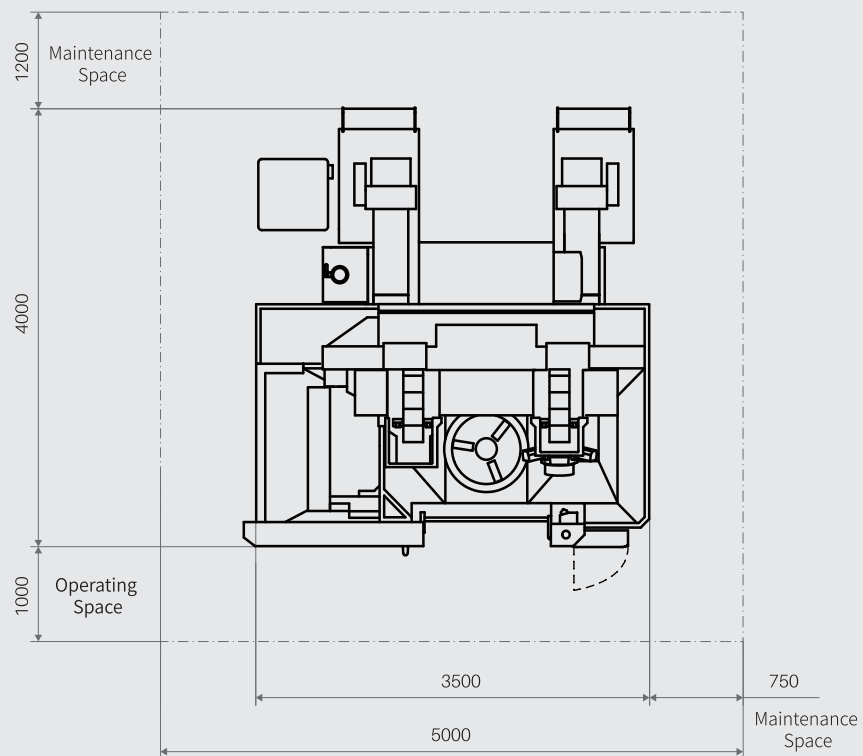
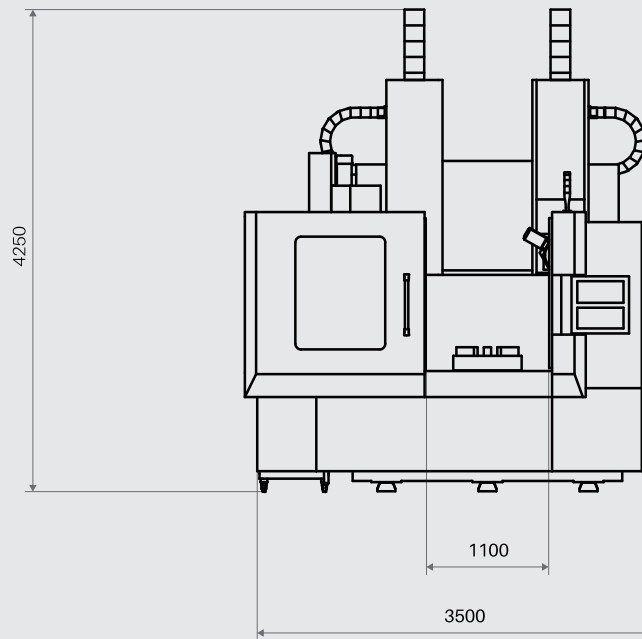
BT50



MT63 Technical Data

		Unit	Spec.
Table			
Diameter		mm	610
Max turning diameter		mm	950
Max speed		rpm	750/1500
Rated power		kW	45
Rated torque		Nm	1230/573
Max workpiece weight		kg	800
Machining range			
X axis		mm	670 (exceed center 20)
Y axis		mm	500
Distance from milling spindle nose to table surface		mm	160~660
Distance from turning tool holder mounting surface to table surface		mm	243~743
Spindle			
Rated/Max speed		rpm	1000/2000
Rated power		kW	22/26.4
Rated torque		Nm	210/252
Automatic tool changer			
Type			Disk type
Capacity		T	24
Max tool length		mm	350
Max tool weight		kg	15
Max disk diameter	Full	mm	105
	Adjacent positions empty		220
Tool rest			
CNC turret			AK27320X6 (6-station)
Feed rate			
Rapid traverse	X/Z	m/min	15
Max working speed	X/Z	m/min	10
CNC controller			KND K2000T6C3(I)
Accuracy			
Standard			JB/T9895.1
Positioning accuracy	X/Z	mm	0.015
	C	"	15
Repeatability	X/Z	mm	0.008
	C	"	8
Weight		kg	13000
Overall dimensions (L×W×H)		mm	3500×4000×4250

MT63 Outline Drawing



CNC

CNC Controllers



SINUMERIK828D

Panel based SINUMERIK828D is a compact CNC controller which supports turning and milling applications. Horizontal and vertical panel layouts, and two-stage performance are available to satisfy the need of different forms of installation and different performance requirements. Entirely independent turning and milling system software allows presetting of machine functions as far as possible, thus minimizing machine commissioning time and making it easier than was thought.

SINUMERIK840D

SINUMERIK840D is a CNC controller developed by Germany SIEMENS for various complicated machining operations. It constitutes a digital control system together with SINUMERIK 611 digital drive system and SIMATIC S7 programmable controller. Featuring excellent dynamic quality and control accuracy, it is particularly suitable for machining of parts with complicated surfaces and cavities.

HEIDENHAIN TNC 640

HEIDENHAIN TNC640 is particularly suitable for high-performance milling machines. By maintaining the advanced features of other HEIDENHAIN systems in five-axis machining, high-speed machining and intelligent machining, it can perfectly combine machining speed, accuracy and surface quality. In addition, it has other innovative functions; it supports high resolution 3D graphic simulation, and the unique advanced dynamic prediction (ADP) can significantly improve machining efficiency and surface roughness. Hence, it is applicable to such high-end fields as aerospace, mold manufacturing and healthcare.

MEASURE

Measuring System

Optical / Radio Workpiece Probes

Optical / Radio / Laser Tool Setters

Five-axis Accuracy Calibration

- ◇ Make sure the CNC machine produces good parts in one single cycle
- ◇ Reduce down time, reject ratio and testing costs of the machine
- ◇ Comply with machine performance and quality management standards
- ◇ Make preventative maintenance plans as required

The workpiece measuring system realizes workpiece measurement in a rapid and accurate manner. The measuring system is provided with relevant measuring software and the measured data can be saved as data files. The tool setter measures the tool length and diameter, automatically records them on the tool data sheet of the machine, and gives broken tool (tool wear) alarms.



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FORK MILLING HEAD



ROTARY TILT TABLE



MOTORIZED SPINDLE

Intelligent manufacturing for intelligent equipment manufacturing



FIVE-AXIS MACHINE



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