



Box way type Turning lathe



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GUDWAY CNC Horizontal Lathe

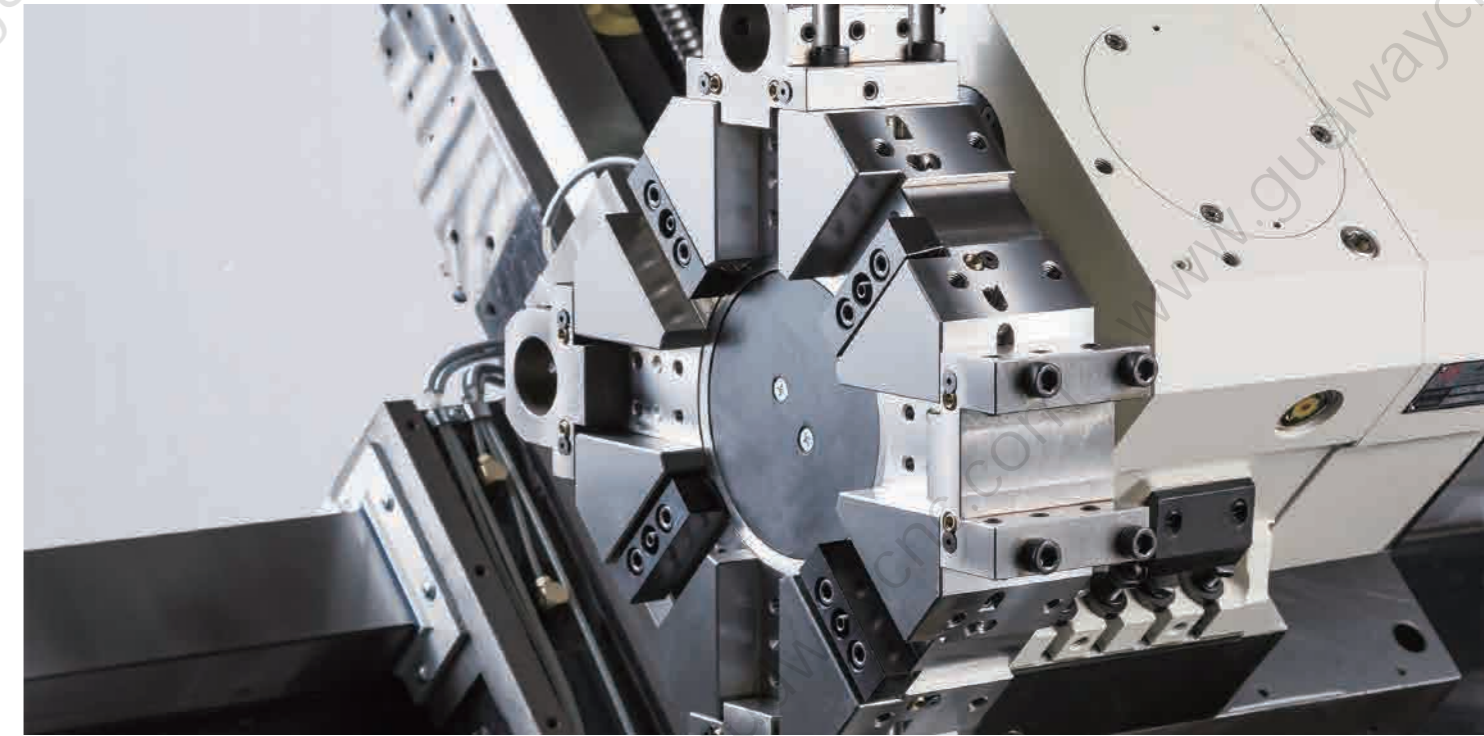
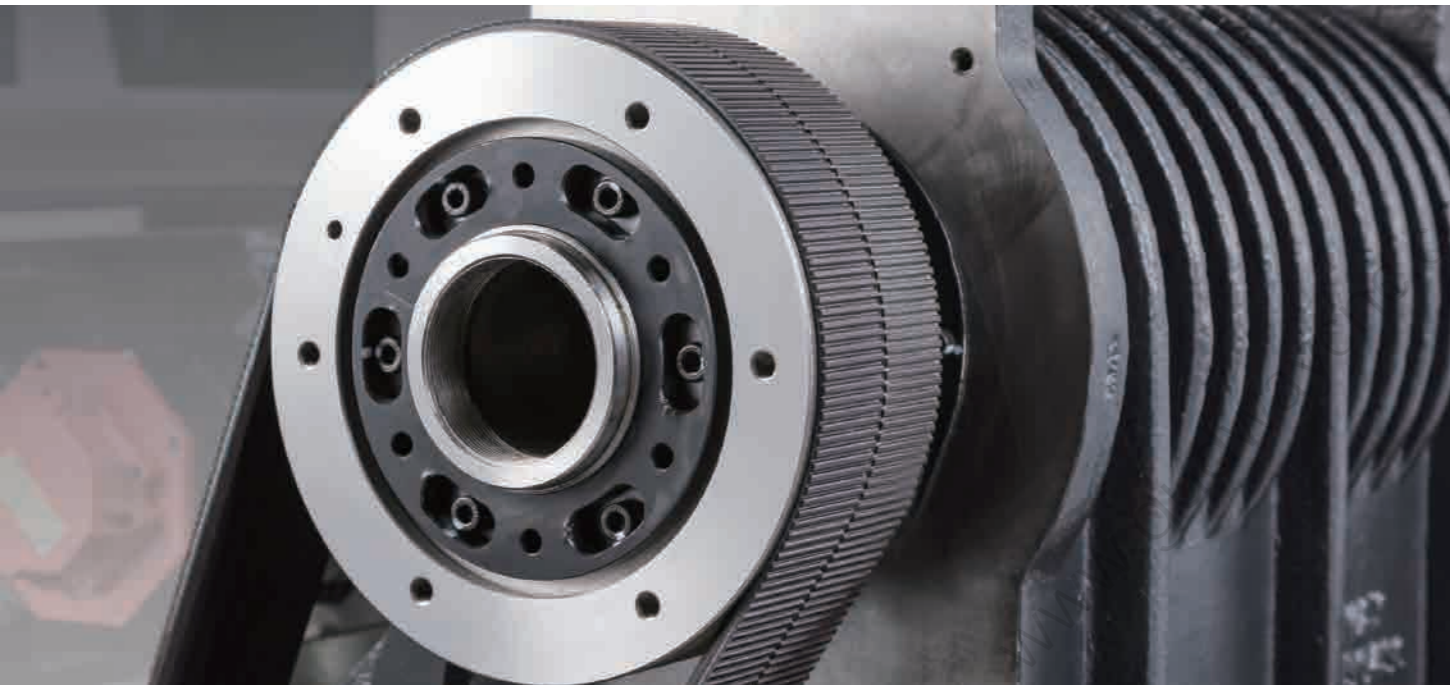
GUDWAY's diverse CNC horizontal lathes are designed to meet the high class machining needs of the unique and different industries. The high quality and high precision guaranteed by our zero-defect manufacturing processes have won the trust and praise from many customers of worldwide.

- The well-organized layout of the machine provides easy access to check electrical, hydraulic, and pneumatic, which are all well labeled.
- The 45° slant bed design with compact structure provides high rigidity needed for heavy cutting. Key components are made by special resin sand cast iron, which can effectively improve the machining performance and guarantee better vibration dampening characteristics.
- Each casting is treated with up to 4 aging processes to improve the stability of the machine by the perfect cast iron.
- Through the finite element structure analysis, enhance the machine rigidity, heat dissipation and vibration reduction.
- All main components are machined by World-Class machines to ensure the accuracy of key components. Then, the parts will be measured on the best CMM measuring devices, re-checked and adjusted to ensure tolerance within the specification needed.
- Key components not made by GUDWAY CNC utilize readily attainable world-famous brands, which greatly increase the long-term running reliability. The ease of gaining components from multiple sources in local market, makes these machines keep running well in the future.
- The modular design is both flexible and diverse. Many platforms share technology and components. The goal is to efficiently and economically meet customers' special requirements.
- GUDWAY CNC lathe with compact structures and small footprints, which can effectively save customer's space, time and money; and while the fully enclosed protection and inclined structure make continuous chip removal easily.



01 High-Speed

Independently designed spindle, bed, saddle and tailstock are independently designed. The maximum speed of the machine tool can reach 6000rpm, and the rapid traverse speed can reach 30m/min, which greatly improves the processing efficiency of the machine tool.



Spindle

- Independently designed, the front and rear bearing supports are optimized by the finite element structure to ensure excellent rigidity and precision.
- The spindle bearing mounting surface and the locking nut mounting thread are formed through a single grinding process. This method provides precise coordination between the spindle and the spindle box, which improves the spindle speed and stability.
- All spindle bearings are World Class imported P4-class machine tool bearings. They use permanent grease lubrication, to guarantee the higher precision and excellent longevity.

Max Spindle Speed ▶
NL16/20 6000r/min

Rapid Traverse X/Z ▶
NL16 Rapid Traverse X/Z 30/30m/min
NL20 Rapid Traverse X/Z 24/30m/min



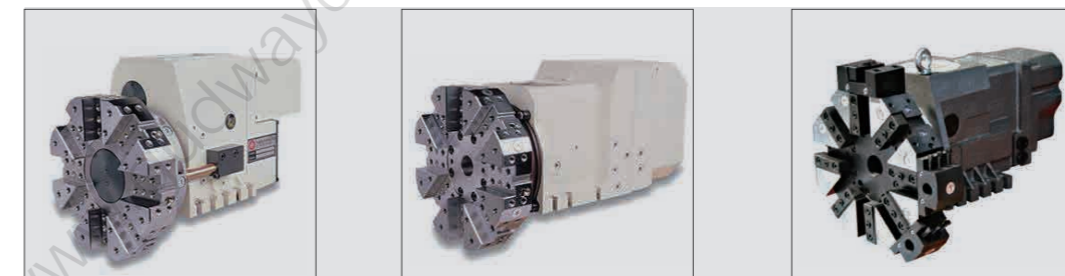
Headstock

- The use of thermal symmetry design combines with the wide range of heat dissipation. Reinforce rib supported structure dramatically resists and reduces the deformation caused by internal heat generation in the machine tool and they can also control thermal growth to improves the machining accuracy.
- The front and rear bores of the spindle box are completed through one-step machining on the World-Class Swiss SIP boring machine. This high level boring process provides micron tolerances and ensures excellent bore alignment and spindle alignment.

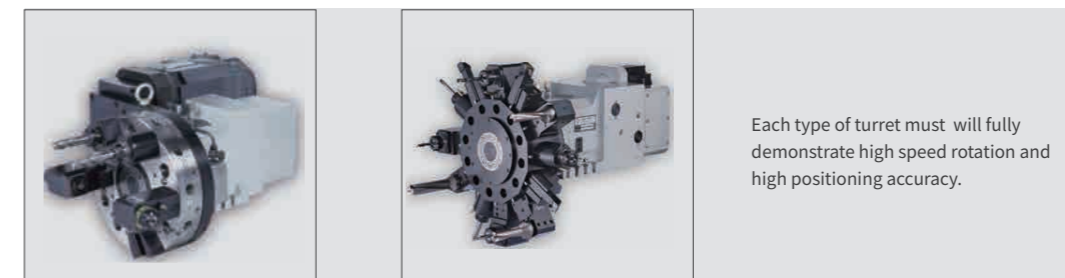


Turret

- Standard 8 station turret with customized thickened tool disc improve turret rigidity, cutting efficiency, positioning accuracy and realize automation of processing. GUDWAY also offers various turrets, such as 10 or 12 station turret as options.
- Reinforced tool holders and keyway positioning stabilizes tool point and minimizes harmonics under heavy load cutting conditions.
- Different turret can be equipped according to customer's requirements.



● Hydraulic turret ● Servo turret ● Electric turret



● VDI Live turret ● BMT Live turret

Each type of turret must will fully demonstrate high speed rotation and high positioning accuracy.

02 High Precision

All structural parts are produced by casting, aging treatment and managed correctly



● Laser interferometer testing to guarantee the all axes' precision.

- The castings are machined for flatness and squareness with one of the World-Class Zayer Five-sided Bridge Milling machines. Smaller parts are manufactured on World Class Starrag- Heckert Athletic Horizontal Machining Centers.
- Swiss Kellenberger cylindrical grinding machine machine the spindles. Huge Favretto Gantry type grinding machine finish the all castings grinding to realize the best castings in the World used on GUDWAY machines.
- All these machines are some of the World' s Finest, which are continuously calibrated to ensure extremely predictably stable high precision.
- The overall bed design has plenty of built-in reinforce ribs, which is optimized through the finite element analysis. This realize high rigidity, better heat dissipation (thermal symmetry) and more accurate machining.

Fine Craftsmanship

The all contact surfaces, including spindle mounting surface, turret, tailstock, and pedestal base, are meticulously scraped to achieve high assembly accuracy, rigid structure, and balanced load.



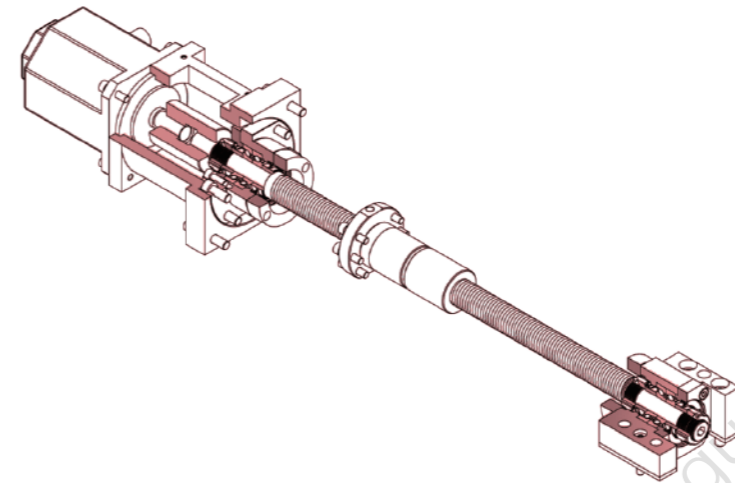
Double-nut Ball Screw

High speed, silent ball screw with double nuts, by pre-tensioned to realize no backlash, high precision and rapid travel.



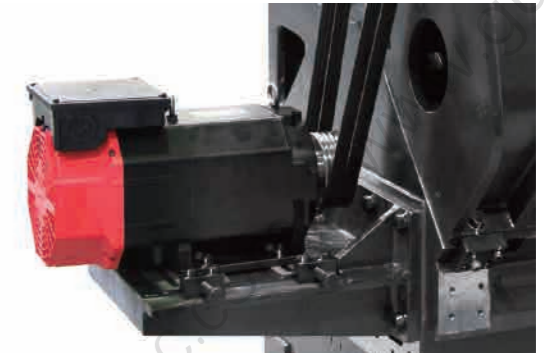
Pre-tensioning

The ball screw adopts the pre-tension process, which effectively reduces the slack in the ball screw and helps reduce the heat transfer and friction. This improves the accuracy and strengthens the rigidity and heat deformation resistance.



Spindle Motor

The motor seat is beside of the machine, eliminates heat transfer and vibration caused by the motor.



03 High Stability

In the critical components assembling, multiple measuring and quantifying assembly process is the key to achieving GUDWAY's quality goal. Each process has strict quality control to ensure the highest stability of the end-product.

Spindle Performance Testing

a. Performs dynamic balance test on the spindle to guarantee the stability of the high-speed rotation of the spindle.



b. Through 48 hours spindle run-in test, monitoring the temperature changing of the rotating parts, applying corrective actions to eliminate any out of tolerance conditions of the assembly and ensure the stability and reliability in high-speed spindle rotating.



Torque Wrench

All major locking screws are locked by specially calibrated torque wrenches according to process standards to ensure the stability and reliability of the connection.



Tension Test for The Spindle Belt

The all spindle belts' tension is measured by a special sonic tensiometer and adjusted to perfect condition to ensure stable operation of the machine.



Availability of Key Components

Global purchasing of available key parts and selection of first-class brands in the industry have significantly ensured the long-term sustainability of the machine tools through attainability of available parts through World Class suppliers.

GUDWAY's Casting Multiple Aging Process Produces World Class Castings

Through natural aging and secondary aging, the internal stress is fully released, and the machine tool accuracy can be maintained for a much longer time.



04 R&D

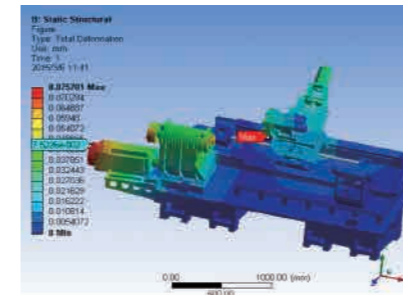
7 R&D departments and 150+ R&D engineers with specific expertise. GUDWAY can develop 20+ new products per year. 10+ continuous improvement projects in fundamental areas, using the PLM full life cycle management system to enhance R&D efficiency.

Ongoing continuously improving quality refining projects:

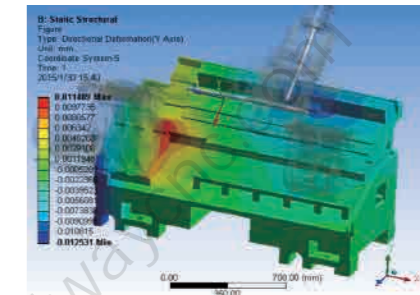
- Static stiffness testing and research of machine tools
- Research on vibration and dynamic stiffness of machine tools
- Research on spectrum analysis of machine tools
- Finite Element Analysis of complete machine and components
- Thermal deformation analysis of entire machine and components
- High-speed ball screw cooling system research and improving
- Research on intelligent development and application of CNC machine tool
- High-pressure chip breaking test and application

Finite Element Analysis

The essential parts are all based on finite element analysis. The layout of the optimized structure is cast from high-quality cast iron materials with high stability and excellent shock absorption.



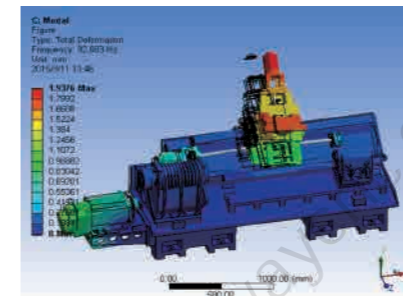
- Machine stiffness analysis deformation map shows where more material needs to be applied



- Y direction analyzes deformation

Dynamic Analysis

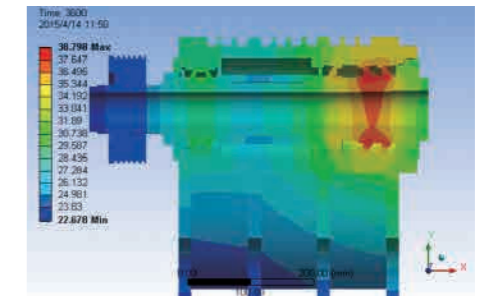
Through dynamic performance balancing analysis, greatly reduce harmonics, improves the natural frequency and vibration resistance of the machine tool.



- Modal dynamic analysis

Thermal Analysis

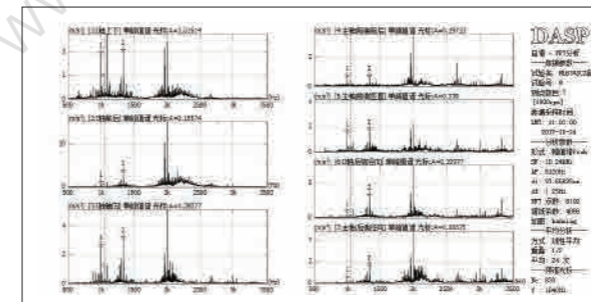
Thermal analysis of the spindle components reduces the thermal deformation of the spindle.



- Thermal analysis of lathe spindle

Vibration and Spectrum Analysis

The vibration spectrum analysis prevents and eliminates the excessive vibration of the machine.



- Gear box spectrum analysis

Static and Dynamic Stiffness Studies

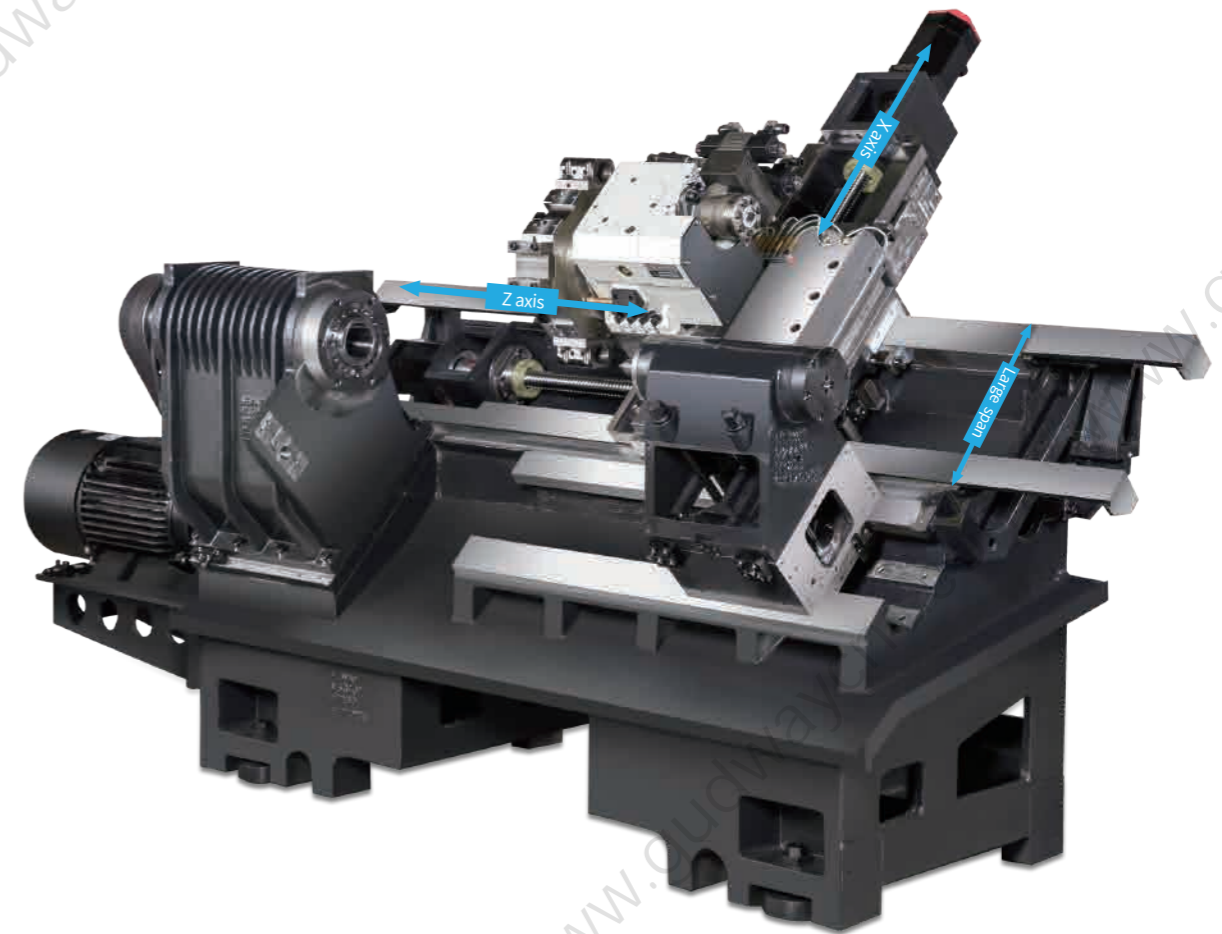
By measuring and studying the static and dynamic stiffness properties of the machine, GUDWAY ensures the excellent stiffness performance.



- Dynamic stiffness test

GHT Series- Box Way Guideway CNC Horizontal Lathe

- 45° overall slant bed design offers high rigidity for heavier cutting and excellent chip removal. The X/Z axis ball screw is pre-tensioned to reduce influence of temperature increase on the accuracy of the ball screw during machining. Fasten bolts are installed on both sides of the ball screw itself to increase the protection of the ball screw bearing. The servo motor is directly connected to drive the high speed and silent ball screw.
- X/Z axis is box-way design with HRC48 hardness surface through heat treatment, bigger guideway span, higher rigidity, better torsional and shock resistance, stable machining accuracy. The box ways are equipped with imported wear resistant turcite to realize lower friction, smooth movement and good dynamic characteristics.
- Tailstock adopts rectangular guideway, with excellent rigidity both up and down the layered structure. There are micro-adjustment devices between the upper and lower tiers. The tailstock center height can be adjusted. The tailstock body can be moved manually or dragged by the slide board, and the quill is driven by hydraulic.
- Utilizes a high rigidity spindle box with lower noise, higher precision, better heat dissipation and and longer service life.
- The wide range of options: such as bar feeder, parts catcher, larger hollow chuck, bigger spindle bore, programmable tailstock, tool measurement, hydraulic steady rest, etc.



1 Box-way

Box-ways are used to provide a large contact area and large-span layout to realize excellent rigidity. The X-axis and Z-axis of this type of machine are all rectangular-shaped box-way, all of which are carefully scraped by experienced expert technicians. Special attention is paid to the surface matching and finishing. After final quality acceptance, GUDWAY machines achieve high precision level.



2 Tailstock

The tailstock is center structure. Tailstock quill is driven through hydraulic and controlled by CNC controller. The tailstock adopts a rectangular guideway bed saddle. The tailstock body is dragged by the slide board (drag pin on the tailstock seat connect the tailstock body and the slide board), which has excellent accuracy and precise movement.



3 X/Z axis Bed Layout Design

The bed are made from world class Meehanite castings. The heat treatment make the hardness reach HRC48. This treatment offers the full span with enhanced rigidity, longer life, good vibration absorption and higher deflection resistance.

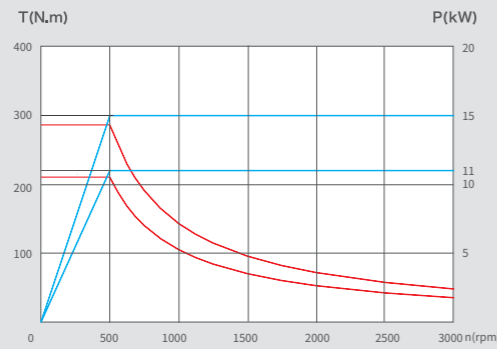
The main parameters

		GHT502SC	GHT504SC	GHT634SC/SCZ	GHT635SC/SCZ	GHT636SC/SCZ	GHT638SC
Max. swing over bed	mm	Φ600	Φ600	Φ650	Φ650	Φ650	Φ650
Max. cutting dia	mm	Φ500	Φ500	Φ630	Φ630	Φ630	Φ630
Max. cutting length	mm	500	1000	1000	1500	2000	3000
Motor power	kW	11/15	11/15	15/18.5	15/18.5	15/18.5	18.5/22
Spindle speed	rpm	3000	3000	2000/1000	2000/1000	2000/1000	2000

Spindle Power Torque Diagram

(Unit: mm)

GHT502SC, GHT504SC

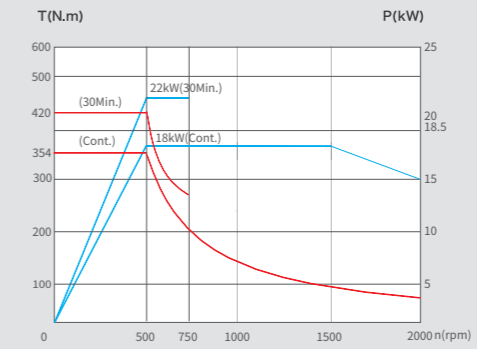


Spindle Power Torque Diagram

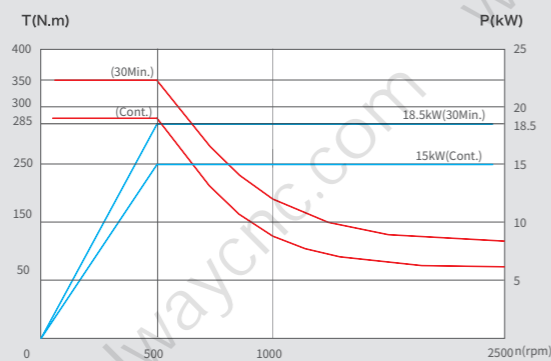
Tool Interference Diagram

(Unit: mm)

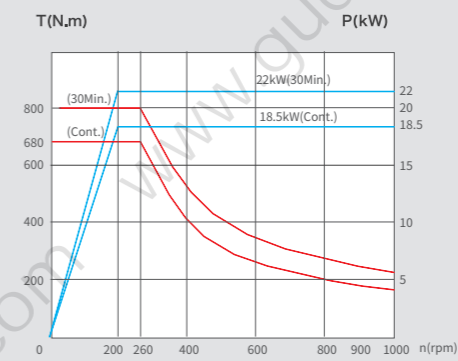
GHT638SC



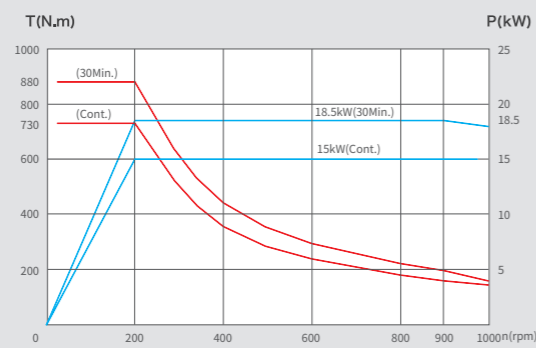
GHT634SC, GHT635SC, GHT636SC



GHT63SCZ

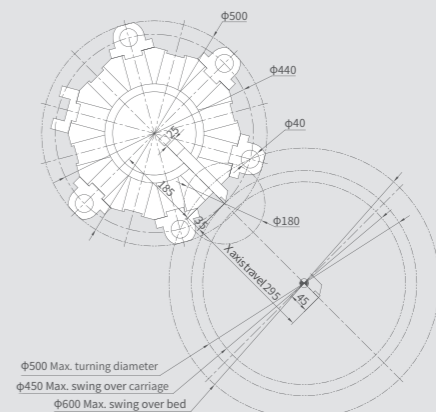
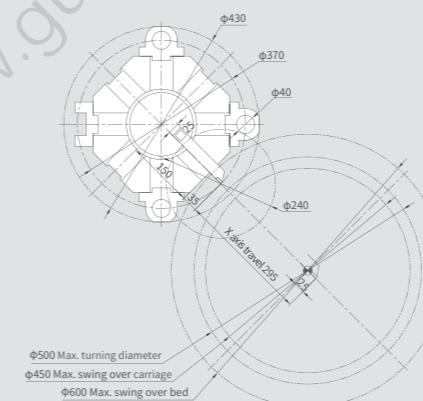


GHT634SCZ, GHT635SCZ, GHT636SCZ



GHT502SC, GHT504SC Standard 8 pos turret

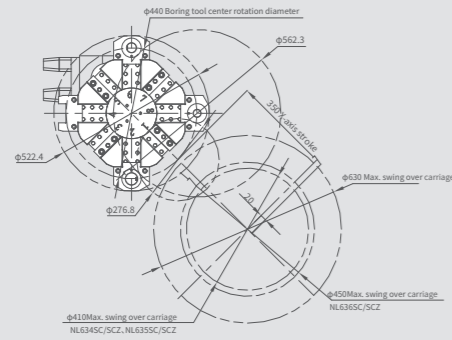
GHT502SC, GHT504SC Option 12 pos turret



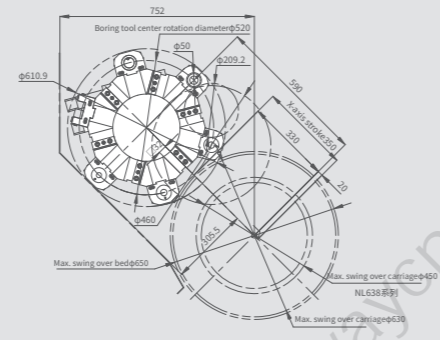
Tool Interference Diagram

(Unit: mm)

GHT634SC/SCZ, GHT635SC/SCZ, GHT636SC/SCZ



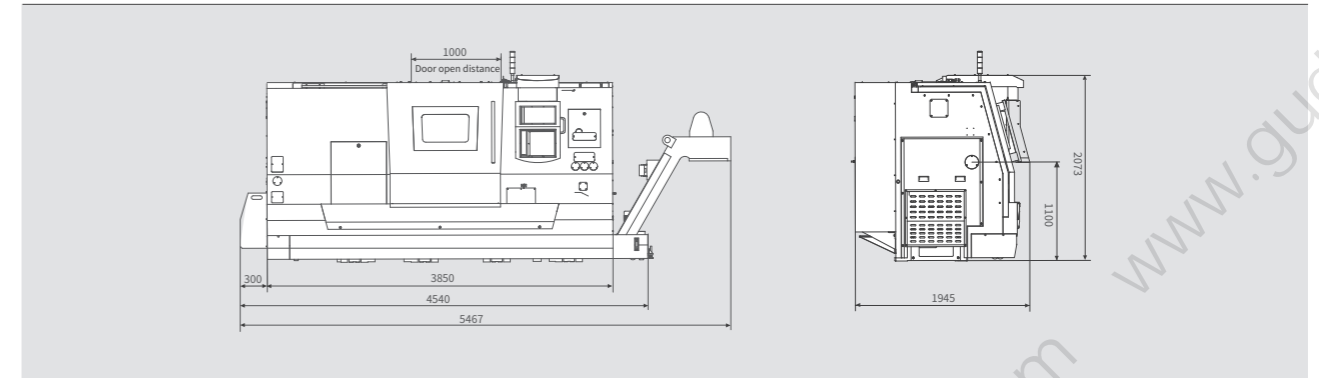
GHT638SC/SCZ OP 12 POSITION



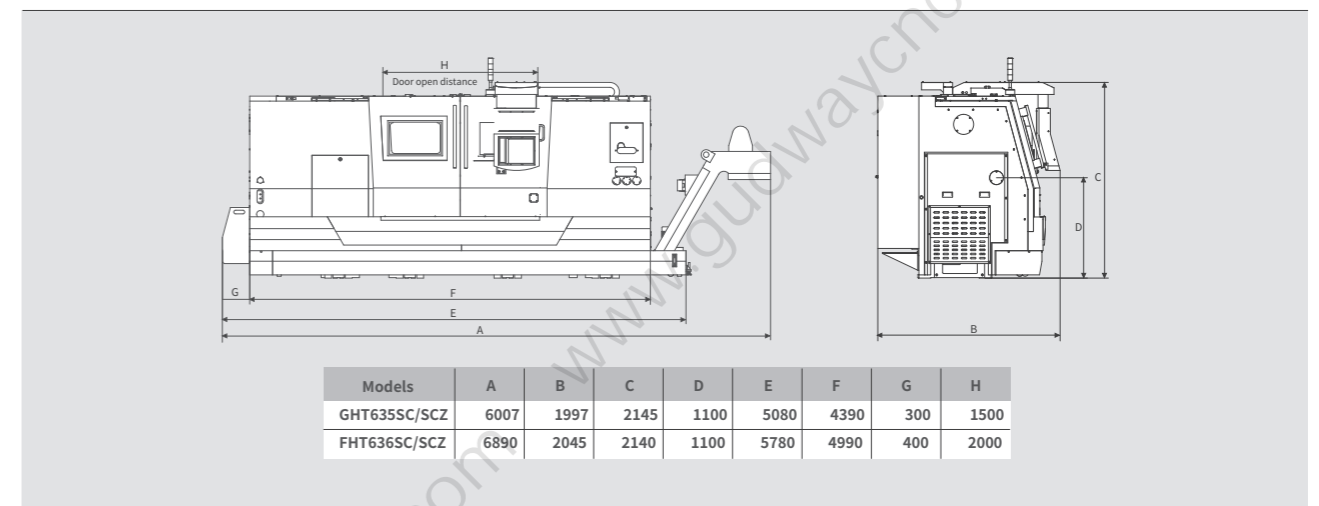
External Dimensions

(Unit: mm)

GHT634SC/SCZ



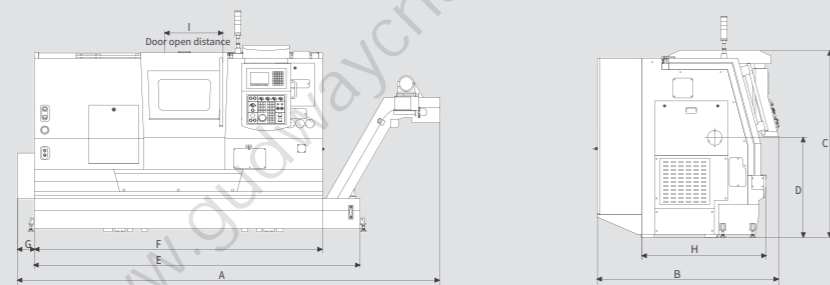
GHT635SC/SCZ, 636SC/SCZ



External Dimensions

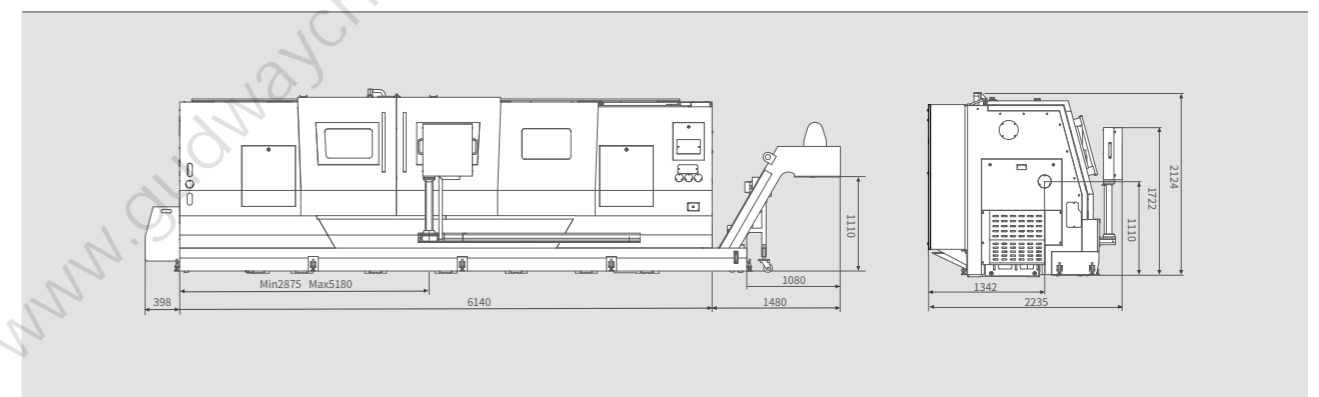
(Unit: mm)

GHT502SC, GHT504SC



Models	A	B	C	D	E	F	G	H	I
GHT502SC/H	4250	1880	1875	1000	3280	2900	170	1245	620
GHT504SC/H	4750	1880	1875	1000	3780	3400	170	1245	920

GHT638SC/SCZ



Item		Unit	GHT502SC	GHT504SC	GHT634SC	GHT634SCZ	GHT635SC	GHT635SCZ	GHT636SC	GHT636SCZ	GHT638SC	GHT638SC	
Processing range	Max. swing over bed	mm	Φ600	Φ600	Φ650	Φ650	Φ650	Φ650	Φ650	Φ650	Φ650	Φ650	
	Max. swing over saddle	mm	Φ450	Φ450	Φ410	Φ410	Φ410	Φ410	Φ450	Φ450	Φ450	Φ450	
	Max. turning diameter	mm	Φ500	Φ500	Φ630	Φ630	Φ630	Φ630	Φ630	Φ630	Φ630	Φ630	
	Max. turning length	mm	500	1000	1000	1000	1500	1500	2000	2000	3000	3000	
	Max. bar capacity	mm	Φ51	Φ51	Φ74	Φ89	Φ74	Φ89	Φ89	Φ89	Φ89	Φ89	
Spindle	Max. spindle speed	rpm	3000	3000	2000	1000	2000	1000	2000	1000	2000	1000	
	Spindle nose	ISO	A2-6	A2-6	A2-8	A2-11	A2-8	A2-11	A2-8	A2-11	A2-11	A2-11	
	Spindle bore	mm	Φ65	Φ65	Φ87	Φ106	Φ87	Φ106	Φ102	Φ106	Φ102	Φ106	
	Spindle taper	-	Metric 80	Metric 80	Metric 100	Metric 120	Metric 100	Metric 120	Metric 120	Metric 120	Metric 120	公制120	
	Height from spindle center to ground	mm	1000	1000	1100	1100	1100	1100	1100	1100	1100	1100	
Hydraulic tailstock	Tailstock quill diameter	mm	Φ100	Φ100	Φ130	Φ130	Φ130	Φ130	Φ130	Φ130	Φ130	Φ130	
	Tailstock quill travel	mm	100	100	100	100	100	100	100	100	100	100	
	Quill Center	Morse	5#(Live center)	5#(Live center)	5#	5#	5#	5#	5#	5#	5#	5#	
Axis X/Z	Travel X/Z	mm	295/600	295/1100	330/1100	330/1100	330/1600	330/1600	350/2100	350/2100	350/3100	350/3100	
	Rapid travel speed X/Z	m/min	12/16	12/16	8/12	8/12	8/12	8/12	8/12	8/12	8/10	8/10	
	X axis ball screw dia. / pitch	mm	Φ32/8	Φ32/8	Φ32/8	Φ32/8	Φ32/8	Φ32/8	Φ32/8	Φ32/8	Φ40/10	Φ40/10	
	Z axis ball screw dia. / pitch	mm	Φ40/10	Φ40/10	Φ40/10	Φ40/10	Φ40/10	Φ40/10	Φ50/10	Φ50/10	Φ50/12	Φ50/12	
Hydraulic turret	Tool position	-	8	8	8	8	8	8	8	8	12	12	
	Turning tool shank size	mm	25×25	25×25	32×25	32×25	32×25	32×25	32×25	32×25	32×32	32×32	
	Boring tool holder diameter	mm	Φ40	Φ40	Φ50	Φ50	Φ50	Φ50	Φ50	Φ50	Φ50	Φ50	
Machining accuracy	Positioning accuracy	X	mm	0.01	0.01	0.012	0.012	0.012	0.012	0.016	0.016	0.016	
		Z	mm	0.012	0.012	0.014	0.014	0.014	0.014	0.04	0.04	0.05	
	Repeatability accuracy	X	mm	0.005	0.005	0.006	0.006	0.006	0.006	0.007	0.007	0.007	
		Z	mm	0.007	0.007	0.008	0.008	0.008	0.008	0.02	0.02	0.022	
Machine power capacity	kVA	25	25	35	35	35	35	35	35	35	35		
Machine dimension (L x W x H)	mm	4250×1880×1950	4750×1880×1950	5467×1945×2075	5467×1945×2075	6007×1997×2145	6007×1997×2145	6890×2045×2140	6890×2045×2140	8020×2235×2125	8020×2235×2125		
Machine weight	kg	4300	4800	7500	7600	8000	8100	8800	8900	10000	10100		
CNC system	-	GUDWAY FANUC [SIEMENS]						GUDWAY FANUC				SIEMENS [GUDWAY FANUC]	
Spindle motor power	kW	11/15	11/15	15/18.5	15/18.5	15/18.5	15/18.5	[SIEMENS]15/18.5	15/18.5	18.5/22	18.5/22		
Motor torque X/Z	N.m	10.5/10.5	10.5/10.5	10.5/20	10.5/20	10.5/20	10.5/20	10.5/20	10.5/20	11/20	10.5/20		
Hydraulic chuck	inch	solid 10" [hollow10"/solid(hollow)12"]	solid 10" [hollow10"/solid(hollow)12"]	solid 12" [hollow12"]	solid15" [hollow15"]	solid12" [hollow12"]	solid15" [hollow15"]	solid12" [hollow12"]	solid15" [hollow15"]	solid12" [hollow12"]	solid12" [hollow12"]		
[Hydraulic steady rest]	mm	Φ200	Φ200	Φ200	Φ200	Φ200	Φ200	Φ200	Φ200	Φ200	Φ200		
Automatic chip conveyor	-	Automatic right chip conveyor [Automatic rear chip conveyor/Automatic left chip conveyor]				Automatic right chip conveyor[Automatic left chip conveyor]							

Standard on GUDWAY Lathes:

Coolant system, installation kit, automatic lubricating device, standard tool attachment, foot pedal clamp and unclamp switch, hydraulic chuck and cylinder, soft jaws, hydraulic device, air gun, tri-color status lamp, chip cart, fully enclosed cabinet protection, waste oil collection device, LED lamp

Optional on GUDWAY Lathes:

Hard jaws, special chuck, automatic tool measurement, steady rest, automatic door, additional tool attachment, air-blow mechanism, bar feeder, oil mist collector, oil skimmer, tailstock travel inspection, high-pressure coolant chip break, parts catcher.

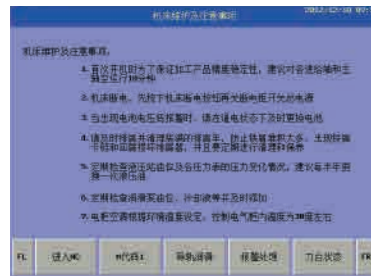
Control system

GUDWAY uses the FANUC PICTURE function to carry out a truly user friendly Human Machine Interface (HMI).

Production and detection

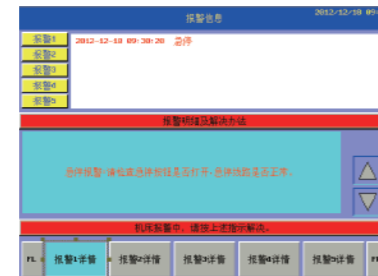
1 Machine Maintenance

Machine maintenance precautions and related tips.



2 Diagnostic Alarms

FANUC System PMC processing alarm information and processing methods allow the machine operators / maintenance people quick access to find out the cause of the alarm.



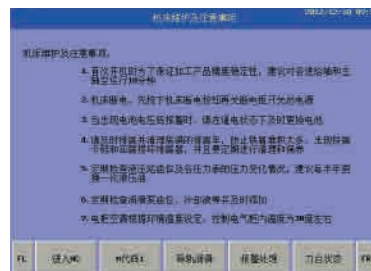
3 M code

Machine tool auxiliary function codes "M codes" can be customized, this interface can make the programming faster and considerably more intuitive.



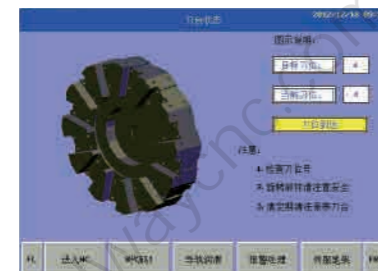
4 Chuck control

Manual chuck or hydraulic chuck can be chosen as options. Controller has specific parameters and auxiliary function codes for further control on processes.



5 Turret

Shows the tool change process and the status of tool change.



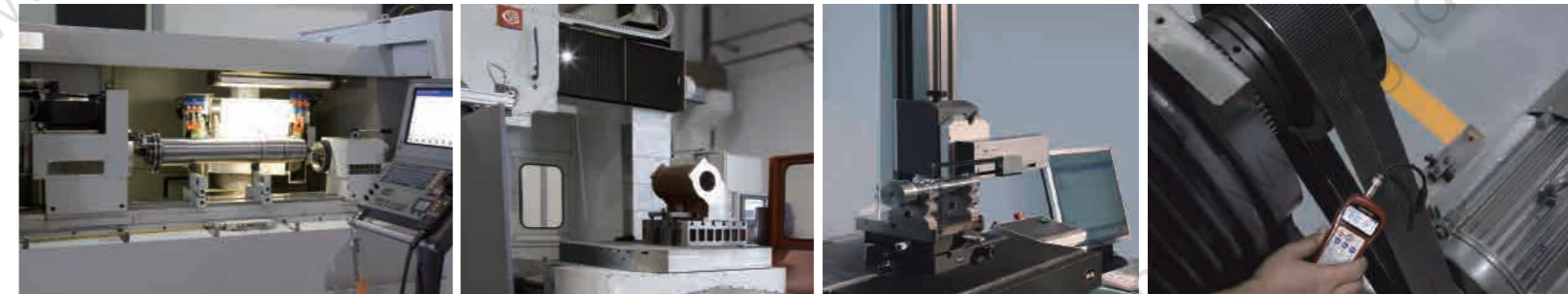
6 Tailstock control

Servo tailstock or hydraulic tailstock as option, which can be viewed and manipulated at the controller.



7 Parameter Interface

The Keeper Relay parameter can be selected on screen to turn on or turn off the different alarm information and auxiliary functions.



• High-precision spindle grinding • High precision spindle boring • Optics test equipment • Belt tension test



• Assembly inspection • Boring bar concentricity inspection • Hand scraping • Laser calibration

