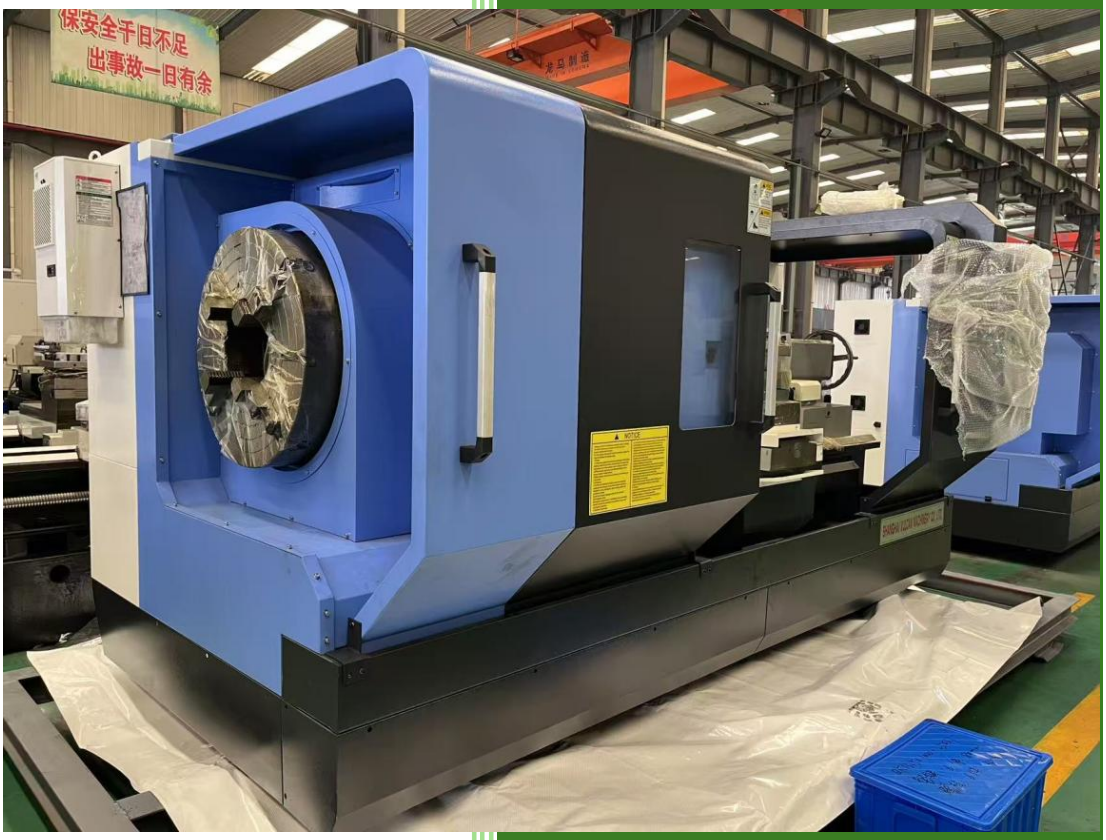
2025

CNC Pipe Threading Lathe



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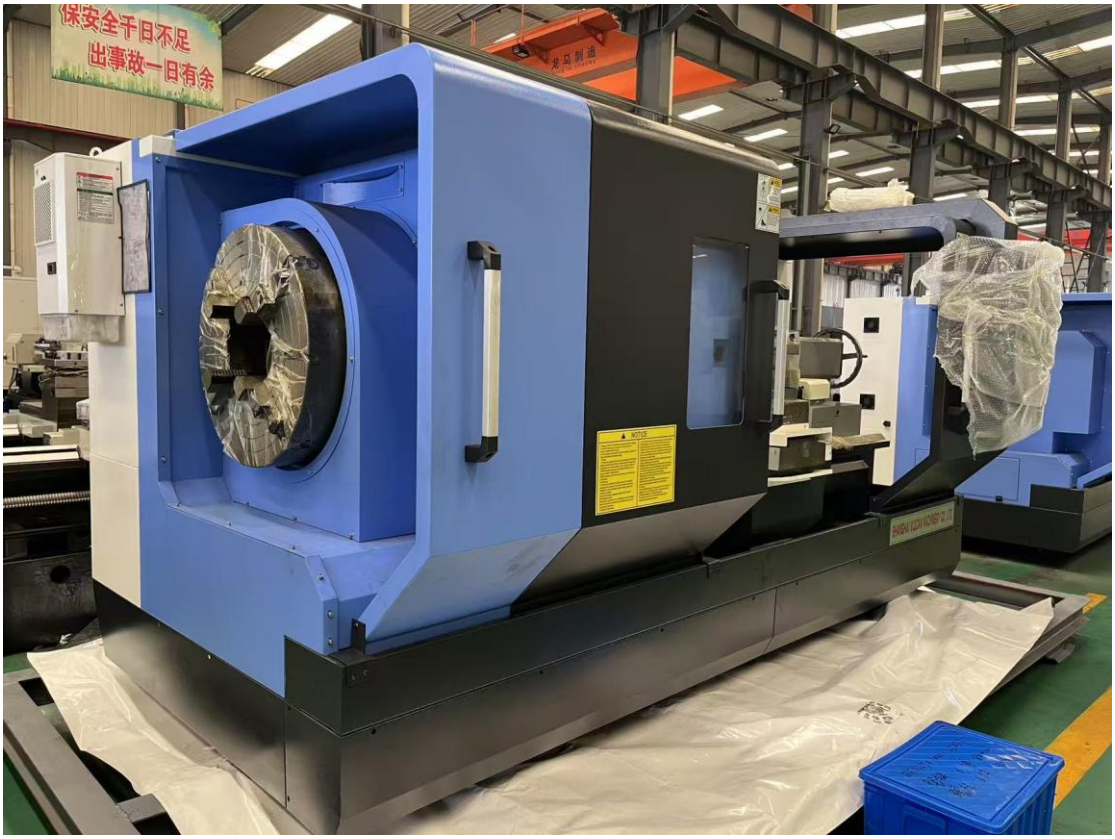
CNC Pipe Threading Lathe | QK1350C×1500

一、Product Introduction



Machine Name: CNC Pipe Threading Lathe **QK1350×1500**
Machine Specification: φ1200x1500mm
Workpiece Outer Diameter Range: φ330—φ510mm

Thread Types: API standards such as **API Spec 5B**, **API Spec 5CT**, **API Spec 7-1**, and **API Spec 7-2**, covering a wide range of pipe and tool connections.

Additionally, the machine supports threading for **various drill tools**, **metric and imperial threads for oil and casing pipes**, as well as **custom and special thread profiles** tailored to specific operational requirements.

二、Main Applications and Functional Features

This **CNC Pipe Threading Lathe** is a two-axis, two-linkage precision machine tool designed for semi-finishing and finishing of shaft-type and disc-type components, as well as for drilling and tapping operations. It is equipped with an advanced CNC control system, offering comprehensive machining capabilities including:

- **Turning operations**: straight lines, tapers, arcs (cylindrical surfaces, rotary surfaces, spherical surfaces, conical surfaces)
- **Thread cutting**: straight and taper threads in both metric and imperial standards
- **Drilling and threading of axial holes**

This machine is particularly suitable for machining complex-shaped and high-precision disc, sleeve, and shaft components.

Structural Design Features

- **Integrated flat bed structure** ensures ease of operation and adjustment, efficient chip removal, and convenient workpiece loading/unloading.
- **Induction-hardened longitudinal and transverse guideways** enhance dynamic response and extend service life.
- **Main spindle drive system** utilizes a wide-range variable-speed AC frequency motor, transmitting power via belt and gear mechanisms within the headstock.
- **X and Z axes** adopt direct-drive transmission, significantly improving stability, reliability, and responsiveness.

Tooling System

- Equipped with a **domestic high-quality 4-station vertical electric tool turret**, featuring high positioning accuracy, smooth rotation, and simple operation.
- Comes with appropriate auxiliary tooling, offering broad process adaptability and reducing non-cutting time during machining.

CNC System & Electrical Components

- The machine features a **modern and ergonomic design**, combining aesthetics with practicality.
- Electrical components are **stable and reliable**, ensuring consistent performance.
- The CNC system adopts **AC digital drives** with semi-closed loop control for feed axes, providing strong anti-interference capability.

- **Advanced functions include:**

✧ Lead screw pitch error compensation

✧ Constant surface speed cutting

✧ Fixed machining cycles

✧ Direct dimension programming from engineering drawings

✧ DNC communication interface

The machine delivers **high-speed response**, **excellent dynamic rigidity**, and **superior machining quality**, making it a reliable choice for demanding industrial applications.

三、Technical Specifications

Items	Unite	Specification
Machining Performance		
Max. Swing Diameter over Bed	mm	Φ1200
Max. Swing Diameter over Cross Slide	mm	Φ710
Max. Machining Diameter (Short Flange)	mm	Φ900
Pipe Threading Diameter Range (OD)	mm	330-510
Max. Turning Length (External Diameter)	mm	1250
Bed Guideway Span	mm	765
Spindle System		
Spindle Nose Type		Short Cylindrical
Spindle Through Hole Diameter	mm	Φ520
Front Spindle Bearing Diameter	mm	610
Spindle Speed Range	r/min	10～50rpm、40～110rpm、70～200rpm
Spindle Speed Steps		Three Manual
Electric Combination Chuck	mm	Φ1000
Main Motor Power	kW	22
Max. Spindle Torque	N·m	6600
Tailstock		
Tailstock Quill Diameter	mm	Φ160
Tailstock Quill Travel	mm	300
Tailstock Quill Taper		莫氏 6 号
Feeding System		
Feed Motor Torque (X/Z)	Nm	15/30
Rapid Traverse Rate (X/Z)	m/min	X:4/ Z:6
Max. Travel of Feed Axes (X/Z)	mm	520/1250
Minimum Feed Setting Unit		0.001mm
Turret System		
Turret Type		Vertical 4-Positon
Turret Size	mm	380x380
Turret Positions		4

Tool Cross-Section Size	mm	50×50
Lubrication System		
Lubrication Type		Automatic
Lubrication Pump Capacity	L	4
Cooling System		
Coolant Delivery Head	m	3.3
Coolant Pump Flow Rate	L/min	22
Maching Accuracy Performance		
Finish Turning OD Dimensional Accuracy		IT7
Finish Turning OD Surface Roughness (Ra)	μm	3.2
Finish Turning OD Roundness	mm	≤0.015
OD Diameter Consistency (Finish Turning)	mm	0.04/300
End Face Flatness (Finish Turning)	mm /mm	0.025/φ300
Repeatability of Feed Axes (X/Z)	mm	X:0.011/Z:0.018
Positioning Accuracy of Feed Axes (X/Z)	mm	X:0.04/Z:0.045
Weight And Dimension		
Machine Net Weight	kg	15000
Overall Dimensions (L × W × H)	mm	5000×2300×2200

四、Description of Main Functional Components

4.1 Bed

The lathe bed is constructed using an **integrally cast HT300 high-strength gray cast iron**, ensuring excellent rigidity and vibration damping. With a **bed width of 600 mm**, it features a **"mountain-flat" guideway configuration**, providing enhanced structural stability and precision.

The internal rib layout of the bed is **optimally designed**, offering high rigidity and ensuring machine stability during heavy-duty cutting of large-diameter workpieces.

The guideways are processed using **induction hardening and precision grinding techniques**, resulting in a deep hardened layer and high surface hardness. To prevent low-speed stick-slip phenomena, **anti-creep guide strips** are applied to the sliding surfaces. These measures optimize the dynamic characteristics of the feed system, including stiffness and friction damping coefficient, thereby ensuring smooth and accurate feed motion.

4.2 Spindle Headstock

The spindle headstock adopts a **symmetrical structural design**, which ensures uniform thermal deformation and prevents spindle center deviation during prolonged operation.

Power is transmitted from the **variable-frequency motor** to the spindle via a **belt and gear system** housed within the headstock.

To enhance spindle accuracy and rigidity, several effective design measures have been implemented:

- The spindle is **precision ground to match the inner ring of the bearing**.
- The headstock housing is **bored to fit the outer ring of the bearing**.
- The spindle bearings are **preloaded** to improve stability and reduce axial play.

All gears inside the headstock are processed using **induction hardening and precision grinding**, ensuring **accurate transmission** and **low noise levels**.

The carefully assembled spindle features:

- **Low temperature rise**
- **Minimal thermal deformation**
- **High dimensional accuracy** These characteristics ensure long-term operational stability and precision.

High-precision spindle bearings are selected to meet demanding machining requirements.

To minimize thermal deformation of the machine, **enhanced heat dissipation measures** have been incorporated. The headstock lubrication system adopts an **oil bath lubrication method**, providing reliable and consistent lubrication to critical components.

4.3 Feeding System

The X and Z axes utilize **large-pitch, high-precision, high-strength ball screws** to ensure stable and accurate feed motion. **Servo motors** are directly connected to the ball screws via **flexible couplings**, enabling efficient and precise transmission of power without backlash.

Both the X and Z axis ball screws are equipped with **fully enclosed protective covers**, effectively preventing contamination from dust, chips, and coolant. This design ensures the cleanliness of the screw assemblies and maintains the **transmission accuracy and motion precision** of the machine over long-term operation.

4.4 Turret System

The machine is equipped with a **domestically renowned brand 4-station CNC vertical electric tool turret**, featuring:

- **High indexing accuracy**
- **Smooth rotation**
- **Simple and reliable operation**

This turret ensures stable tool change performance and supports efficient multi-process machining, contributing to improved productivity and machining precision.

4.5 Cooling and Lubrication System

The cooling system adopts a **multi-stage filtration design**, ensuring thorough purification of the coolant and significantly reducing the risk of clogging in the cooling circuit. The **coolant tank is separated from the main machine body**, effectively minimizing the impact of cutting heat on machining accuracy.

A **high-efficiency coolant pump** is used, with a **flow rate of 23 L/min** and a **delivery head of 7 meters**. The **coolant tank capacity is 70 liters**, providing sufficient cooling during turning operations. This ensures that both the workpiece and cutting tools are adequately cooled, thereby improving machining accuracy and extending tool life.

The entire machine is equipped with a **centralized automatic lubrication system**, which delivers precise and timely lubrication to critical components, reducing wear and enhancing the overall reliability and service life of the equipment.

4.6 Electrical System

The machine's electrical circuits are equipped with **overcurrent and short-circuit protection** in all power loops. All machine operations are safeguarded by **interlocking mechanisms**, ensuring both equipment and operator safety.

The electrical system features a **self-diagnostic function**, allowing operators and maintenance personnel to monitor the operational status of various machine components in real time via **indicator lights and display panels**.

The **electrical cabinet** adopts a **fully enclosed design**, equipped with **cooling fans** to achieve effective dust protection and temperature control. The cabinet meets the **IP54 protection rating**, ensuring reliable performance in industrial environments

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4.7 Protection System

The machine adopts a **semi-enclosed protective enclosure**, featuring a **modern and aesthetically pleasing design** that enhances operator comfort and safety during operation

4.8 Safety Protection System

The machine is equipped with an **alarm system** and an **emergency stop button**, which help minimize potential damage caused by unexpected faults or malfunctions.

Thanks to the well-designed software architecture, alarms are displayed either as **text messages and alarm codes on the monitor**, or indicated via **status lights on the control panel**.

Depending on the severity and nature of the alarm, the system categorizes responses into three types:

- **Emergency alarms** trigger an immediate **emergency stop**
- **General alarms** activate **feed hold**
- **Operator errors** result in **informational prompts only**

This multi-level safety mechanism ensures both equipment protection and operator safety during machine operation.

五、Control System Configuration

- ✧ Equipped with the **GSK980TDi CNC system**, including the CNC control unit, servo amplifier, AC variable frequency spindle motor, and encoder.
- ✧ Supports **tool radius compensation**, allowing precise control of cutting paths.
- ✧ Enables **direct programming based on engineering drawing dimensions**, simplifying the programming process.
- ✧ Provides **linear and circular interpolation functions**, ensuring smooth and accurate tool movement.
- ✧ Features **electronic handwheel feed**, allowing manual fine adjustment during setup and operation.

六、Machine Operating Environment

- ✧ **Power Supply**: Three-phase AC 380V ±5%, 50Hz ±1Hz

- ✧ **Control Power**: AC 110V / DC 24V
- ✧ **Relative Humidity**: ≤85%, non-condensing
- ✧ **Ambient Temperature**: 5°C to 40°C
- ✧ **Compressed Air Supply**: 3 to 5 bar
- ✧ **Altitude**: Below 1000 meter

七、Machine Main Component List

No	Items		Size	Qty
1	CNC System		GSK980 TDi	1
2	Servo Motor		10/15N·m	1(each)
3	Encoder		1024line	1
4	Variable Frequency Motor		15KW	1
5	Frequency Converte		15KVA	1
6	Spindle Bearings		32968X2A/P5	2
7	Ball Screw Assembly	X	GD3206	1
		Z	GD5012	1
8	Vertical 4-Station Tool Turret		300x300	1
9	4-Jaw Independent Chuck		Φ680mm	2
10	Coolant Pump		250W	1
11	Automatic Lubrication Unit		2L	1
12	Electrical Components		Main Parts	1

八、Supplied Accessories

No	Items	Size	Qty
1	Tools		1Set
2	Center (Dead Center)	MT6#	1Set
3	Adjusting Wedges		1Set
4	Foundation Bolts		1Set

九、Supplied Documents

No	Items	Qty	Remarks
1	Operation Manual	1	Mechanical Section
2	Certificate of Conformity	1	Accuracy Inspection Report
3	Packing List	1	
4	Operation Manual	1	Electrical Part
5	System Operation Manual	1	
6	System Maintenance Manual	1	
7	TurretOperation Manual	1	

十、Acceptance and Training

10.1 Acceptance

10.1.1 Pre-Acceptance:

Conducted at Party B's site, based on the technical agreement signed by both parties. The acceptance includes geometric accuracy, positioning accuracy, and trial cutting of standard workpieces. Party B is responsible for inspection. Upon passing the inspection, representatives of both parties shall sign the pre-acceptance report.

10.1.2 Final Acceptance:

Conducted at Party A's site. Party A is responsible for unloading the equipment, positioning, rough leveling, oil filling, wiring, water filling, and other preparatory work. Party B shall guide the installation and be responsible for commissioning. The acceptance includes checking the quantity of goods (according to the packing list), appearance quality, specifications and parameters, machining of standard test pieces, verification of accessories and technical documents. Upon successful final acceptance of the machine tool, both parties shall sign the final acceptance report.

10.2 Free Training

10.2.1 Training Content:

Machine tool operation, programming, and maintenance.

10.2.2 Number of Trainees:

2 persons from Party A, training duration: 1 working day.

10.2.3 Requirements for Trainees:

Trainees from Party A should have basic work experience.

十一、After-Sales Service

11.1 Warranty Period:

The machine tool is covered by a warranty for **12 months**, starting from the date of successful final acceptance.

11.2 Warranty Service:

During the warranty period, under normal usage conditions, if any malfunction occurs at Party A's site, Party B shall provide **free repair and replacement of damaged parts**. Upon receiving formal notification from Party A, Party B must respond within **24 hours** and arrive on-site within **48 hours** to resolve the issue.

11.3 Post-Warranty Support:

After the warranty period expires, Party B shall continue to provide **preferential technical support and spare parts supply** to Party A.

十二、Contact Us

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