TURNING

TC 150
TC 200
Precision CNC Turning

TURNING MILLING GRINDING WORKHOLDING ROTARY CHUCKS
www.hardinge.com

HARDINGE

TC-series Precision CNC Turning

Thanks for over 130 years experiences in precision CNC turning technology, Hardinge built TC - series horizontal CNC lathes for high efficiency and high performance with very compact footprint, and capability of integrated automation loading/unloading system all-in one machine, which can meet requirements for widely industry customer!

High Precision

Positioning Accuracy	0.008mm (Full stroke, ISO230-2)
Repeatability Accuracy	0.004mm (Full stroke, ISO230-2)
Roundness	0.7μm
Surface roughness	Ra0.2μm
CMA	10 micro

High Rigidity

The Machine base is made of high-quality gray cast iron, which has excellent rigidity, durability, and thermal stability.

Benefit of FEA finite element analysis technology of Hardinge group engineering team to make the mechanical structure more balanced and ensure the best rigidity and longevity.

Equipped with heavy-duty linear guide, it can increase the rigidity by more than 30% and longer the life of the machine tool.

The standard 8-station turret can be installed with 25mm square shank and 40mm round shank, which has stronger heavy cutting ability.

High Efficiency

TC150/200 6000/5000 rpm spindle

Fast traverse speed: the rapid traverse speed of X/Z axis 30m/min

Fast tool change speed: Servo turret with high precision and fast response.

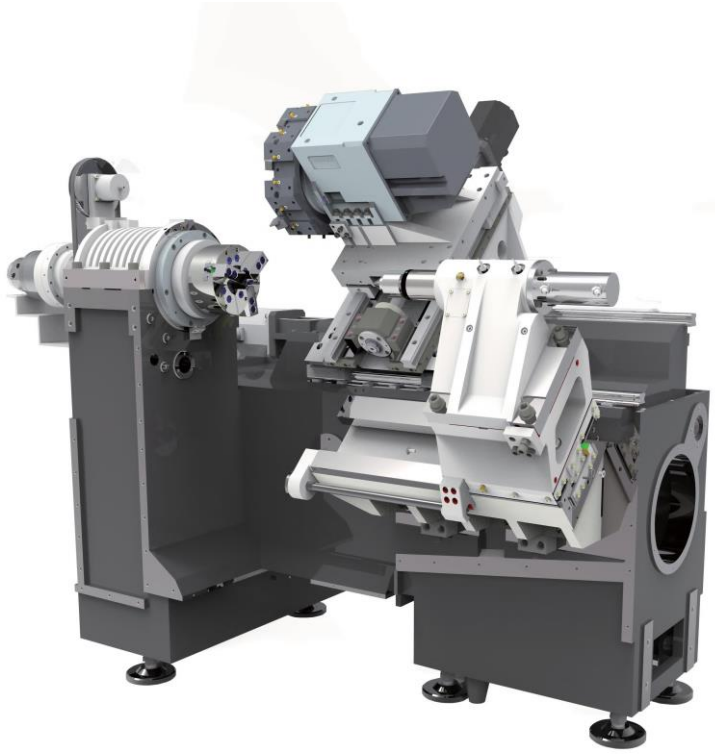
The design of integrate - in automation have capability for higher production efficiency.

Compact Structure

Compact machine (length x width only 1741x1620mm)

The chip conveyor can be placed in the side or the rear freely according to the site requirements, which is flexible and convenient.

Machine Features



TC 150 Specifications

Max. Swing Dia---------- 500mm
Max. Turning length ---------- 380mm
Max. Turning Dia ---------- 370mm
Spindle speed---------- 6000rpm
Chuck size ----------6″
Spindle nose ----------A2-5

TC 200 Specifications

Max. Swing Dia ----------500mm
Max. Turning length ---------- 350mm
Max. Turning Dia---------- 370mm
Spindle speed ----------5000rmp
Chuck size---------- 8″
Spindle nose ---------- A2-6

Headstock

"Wing-type" design is used for symmetrical installation to ensure the accuracy and stability of the spindle during long-term running.

Ball Screw

The reinforced bearing support is adopted, and the lead screw is pre-stretched to ensure the rigidity and thermal stable for better performance.

Structural Design

Machine structure design is analysis with FEA, with Z-axis guideway step-type locate for best stressed structure, and box-type machine base for rigidity.

Linear Guide

Equipped with a heavy-duty linear guide, and the Z-axis adopts a step-type installation design, machining force can be recomposited to right direction for
Z-axis guideway bearing, provides the most optimized flexibility and rigidity, and increases the service life.

Servo System

The reliable servo motor and drive system provide TC-series with excellent processing stability and processing capability.

Machine Base

The machine base and other castings are made of high-quality gray cast iron, which has excellent rigidity, durability, and thermal stability.

Exhaust structure

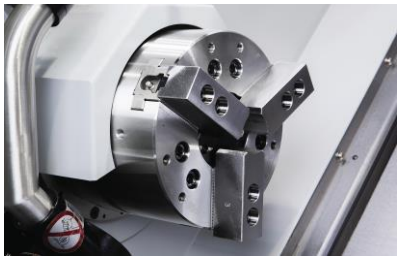
An exhaust structure is designed on the base of the machine base to optimize the heat and temperature rise model of the machine tool and reduce the influence of the machine tool on the stability of processing for a long time.

Standard

Fanuc 0i TF Plus 10.4" color monitor
Automatic central lubrication system (Grease)
Tri-stack status light
Coolant tank and pump LED lighting
Dynamic graphic display
8 stations Servo driven turret Air gun
Spindle clamp/unclamp foot switch
Three-jaw chuck (including a pair of soft jaws)
Hinge type chip conveyor

Optional

Siemens 828D
Spindle oil chiller
12 stations servo driven turret Tool Set probe
X/Y/Z axis linear scales Auto door
Portable hand wheel
Hydraulic quill tailstock High pressure coolant 20/50/70 bar
Chip cart
Oil mist collector
Part Catcher

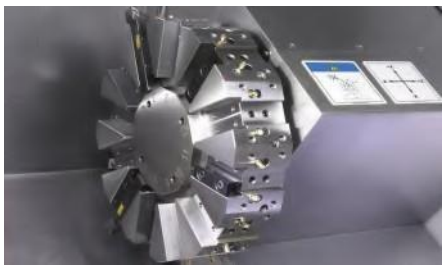


Spindle ：

The headstock is installed in a "wing-type" symmetrical structure to reduce machining errors caused by thermal deformation with air purge and dust-proof cover design for protect spindle from coolant and chips ingress.

Tailstock (optional):

The hydraulic programmable quill tailstock has been optimized through professional structural analysis to ensure higher stability of the tailstock.



Turret:

Standard with 8-station servo turret without lifting, square tool shank 25mm (optional 12-station, square tool shank:20mm)

Chip conveyor:

Freely choose the side or the rear discharge according to the place on site, which is flexible and convenient.

Lubrication unit:

The machine tool adopts an energy-saving and environmentally friendly automatic centralized grease lubrication system, which reduces daily maintenance time.

Working lamp:

The working area of the machine tool adopts energy-saving LED to ensure sufficient illumination and longer service life.

TC 150A/200A Integrated-in Automation

Designed for small parts processing, a convenient choice for mass production!

Integrated-in Automation Features

Integrated control of machine tool operating system.

Compact structure and small footprint. Safety

integrated protection design.

Stable and reliable gantry structure.

The automation can be quickly installed with the machine tool.

The integrated gripper module can realize quick change over of gripper and fixture.

Standard storage unit selection: For different parts, a variety of feeding systems can be provided

Specifications

X/Z axis maximum rapid traverse speed: 90/60 m/min Maximum

part length: 250mm

Maximum part diameter: 100mm Maximum
part weight: 2.5kg

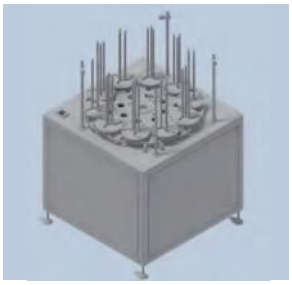
Drive mode: servo motor

Stable gantry structure

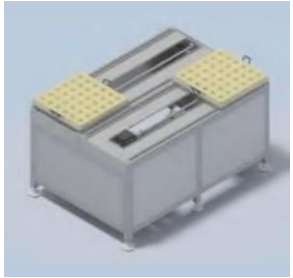
Servo motor + Reducer

Integrated gripper module

Integrated control system



Ten-station rotary storage unit

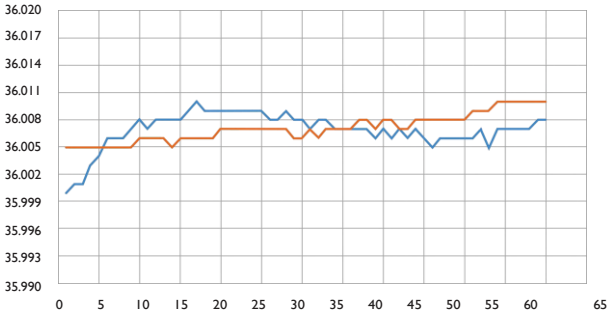


Dot Matrix Storage unit

CMA Performance

CMA (Continue Machining Accuracy) is an important test method to consider the thermal stability of machine tools, and an important factor for machine tool performance. The TC series are designed and manufactured for the precision machining of small and medium-sized parts. The CMA performance can reach 0.005mm (with linear scale), which can meet the accuracy requirements of most precision parts.

CMA Diameter Curve



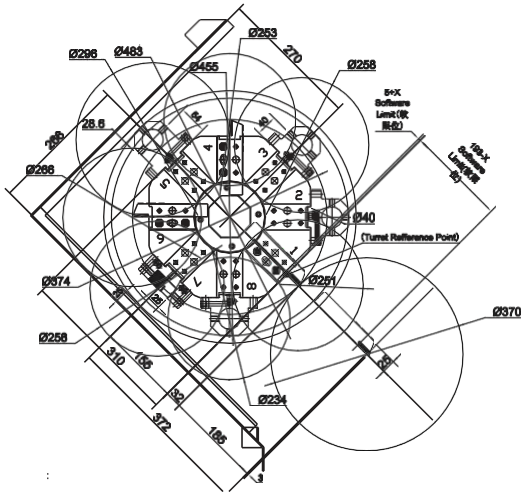
Cutting Conditions		
	Rough	Finish
Workpiece Material	Brass	Brass
Tool	Diamond	Diamond
Spindle Speed	3000 rpm	1200 rpm
Cutting Depth on a Side	0.125 mm	0.065 mm
Feed rate	0.13 mm/rev	0.013 mm/rev
Coolant (Water Based)	On	On
Ambient Temp	20.3°C to 22.7°C	

Note:

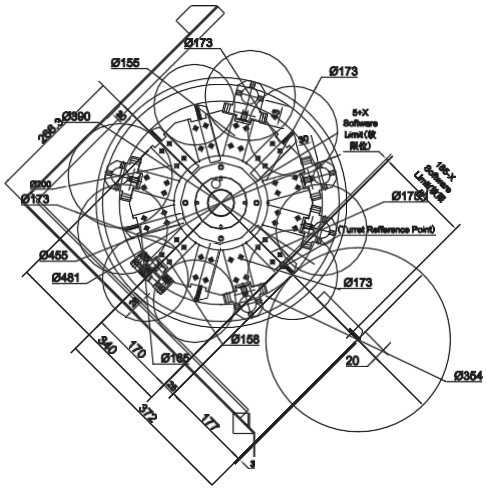
The actual result may vary according to the processing conditions, and the actual test value may be larger or smaller than the above CMA test result.

Turret Interference

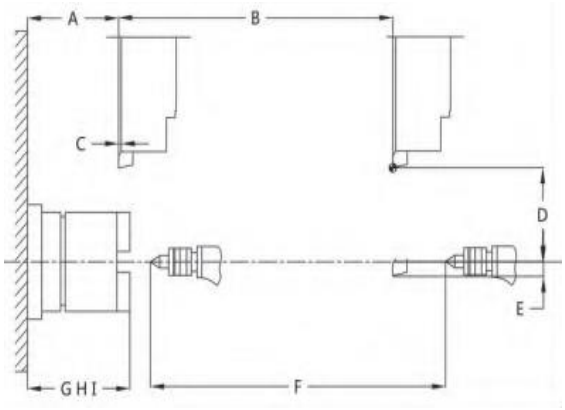
8T



12T



Travel



TC 150 8T	A 147.2mm	B 380mm	C 7mm
	D 185mm	E 3mm	F 360mm
TC 200 8T	A 177.2mm	B 350mm	C 7mm
	D 185mm	E 3mm	F 330mm
TC 150 12T	A 147.2mm	B 380mm	C 5mm
	D 177mm	E 11mm	F 360mm
TC 200 12T	A 177.2mm	B 350mm	C 5mm
	D 177mm	E 11mm	F 330mm

Machine Tooling

Hardinge is not only a precision machine tool manufacturer, but also one of the world's most complete tooling and fixture system manufacturers, with more than a century of tooling manufacturing experience. Hardinge's complete and rich tooling product line covers precision three-jaw chucks, spring chucks, quick-change spindle tooling and CNC turntables. Hardinge GS machine is equipped with a three-jaw chuck (wedge type) as standard, and a variety of precision spindle tooling can also be selected to further enhance the processing capacity and scope of the machine.

QLC translational chuck

QLC translational chuck
A high-precision translation chuck with centrifugal force compensation. Special appearance design. It is calculated to bring 30%-40% weight loss effect. The special wedge groove design is our patent, which greatly improves the life of the chuck and the problem of the claw lifting.

Dead-Length Systems

Maintain part-length control by using Hardinge dead-length systems. This series includes fixed length chuck assembly, through-hole chuck, step chuck, and cross-type positioning step chuck.

Spring chuck adapter

16C, 3J, 5C (applicable to GS150 Plus), 16C, 3J (applicable to GS200Plus), back-pull structure, can use Hardinge precision spring chuck.

Flex C™ Quick-Change Vulcanized Collet Systems

Interchangeable quick-change vulcanized collet heads have a working range of ±. 0.5mm to accept bar stock variation. Collets change in seconds,
while accuracy
is maintained at 0. 01mm.

FNC translational chuck

A high-precision translational chuck with quick-change jaw function. The special jaws and drive design give the chuck the function of quick-change jaws, without bolt locking, it only takes 15 seconds to complete the switching of jaws with technology.

Zero-point positioning

A series of products with quick change and quick positioning. Through the special design, the quick change of the chuck jaws can be realized. It can be used in a variety of scenarios, milling, turning, and other non-standard tooling. flexible.

Sure-Grip® internal expansion chuck

Hardinge Sure-Grip internal expansion chuck system provides a high-precision, true parallel clamping internal hole clamping program. According to different machine tool models, two types of chuck seat installation and spindle outer cone installation can be selected.

Ladder chuck and adapter

The stepped chuck is used for precision clamping of large diameter parts, and only a short length is required to provide sufficient clamping force.
There can be multiple clamping surfaces and positioning surfaces on the same chuck, which can realize the turning processing of parts or the processing of multiple types of parts, and even meet the special clamping requirements of special-shaped parts and eccentric parts.

Fanuc 0i TF Plus Control System (Standard)

10.4” Display

Program memory capacity 2MB

Number of registered programs 1000

Servo Control HRV3

Two-axis interpolation

Programming Resolution 0.001mm

Nano

interpolation

PCMCIA Interface

Embedded Ethernet (100base)

USB interface

Tool offset pairs, 128pairs

User macro program

Programmable Data Input

Subroutine Instruction Call

Working time/parts number display

Graphic display

Linear interpolation

Thread cutting back

Help function

Dynamic graphic display

Circular interpolation

Feed per minute/Feed per revolution

Self-diagnosis function

Variable pitch thread cutting

Fixed tangent speed control

Siemens 828D Control System (Optional)

10.4 "color display

Integrated QWERTY keyboard

80-bit floating point nanometer calculation accuracy (NANOFP)

Program segment switching time 9ms

Tool management function with tool life monitoring Number

of tools/cutting edges in the tool table128/256 Graphical

Conversational Programming

Linear, arc and spiral interpolation

CNC user memory (cache), used to store parts CNC machining program 3MB

Expansion memory >16 GB via USB device or inserting user CF

card from the front interface

SINUMERIK Operate graphical user interface with animation support

SINUMERIK CNC programming language with high-level language extension

Geometry calculator for turning and milling of freely defined contours

Settable workpiece coordinate compensation number 100

Execute the program from the storage device in the front USB/CF card interface

Supported G code programming standard DIN/ISO

Turning, drilling, and milling of standard geometries

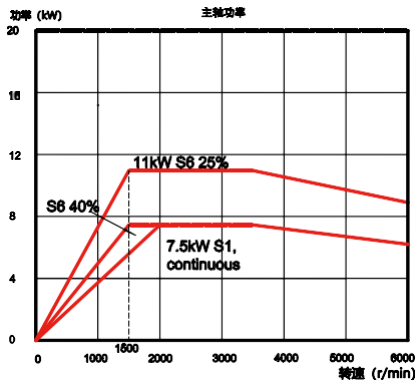
The maximum number of part programs on the PPU 750

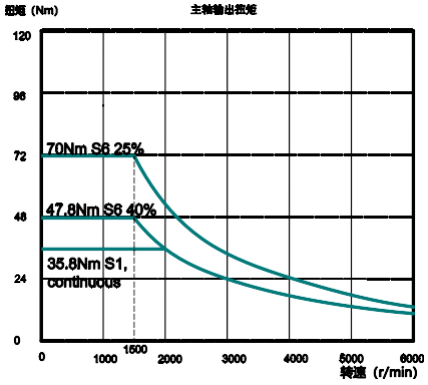
Planar graphics CNC machining simulation

A notable predefined user variable (R variables)

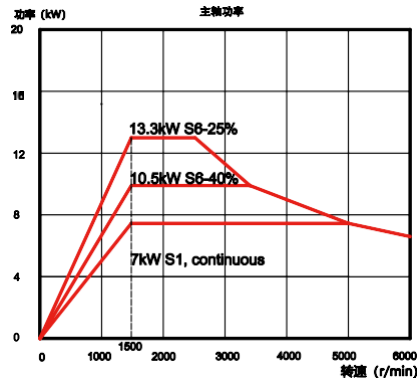
TC 150 Power/Torque

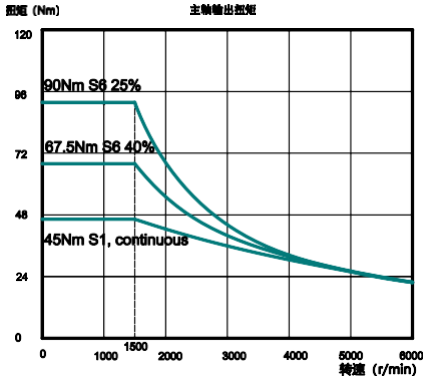
TC 150(Fanuc)





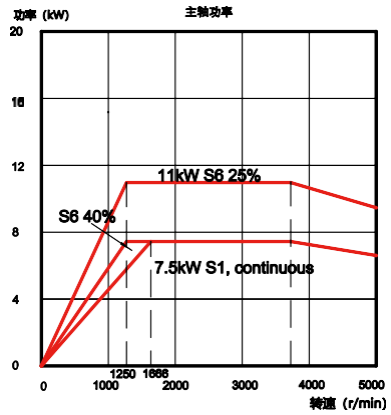
TC 150(Siemens)

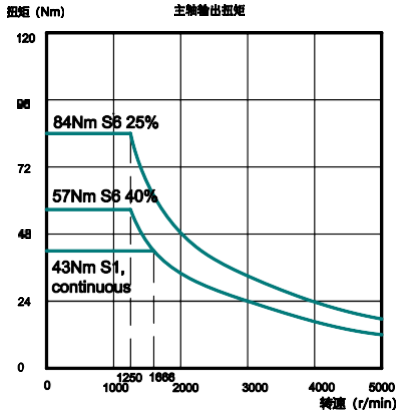




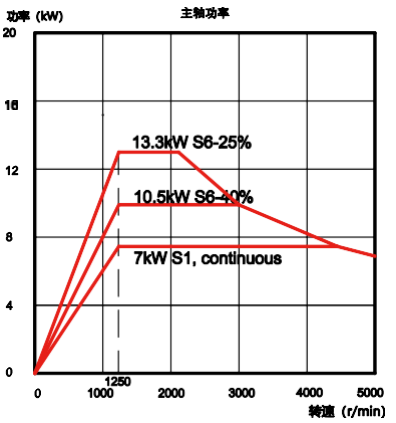
TC 200 Power/Torque

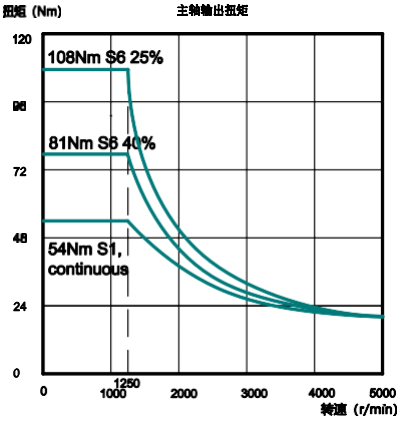
TC 200(Fanuc)





TC 200(Siemens)





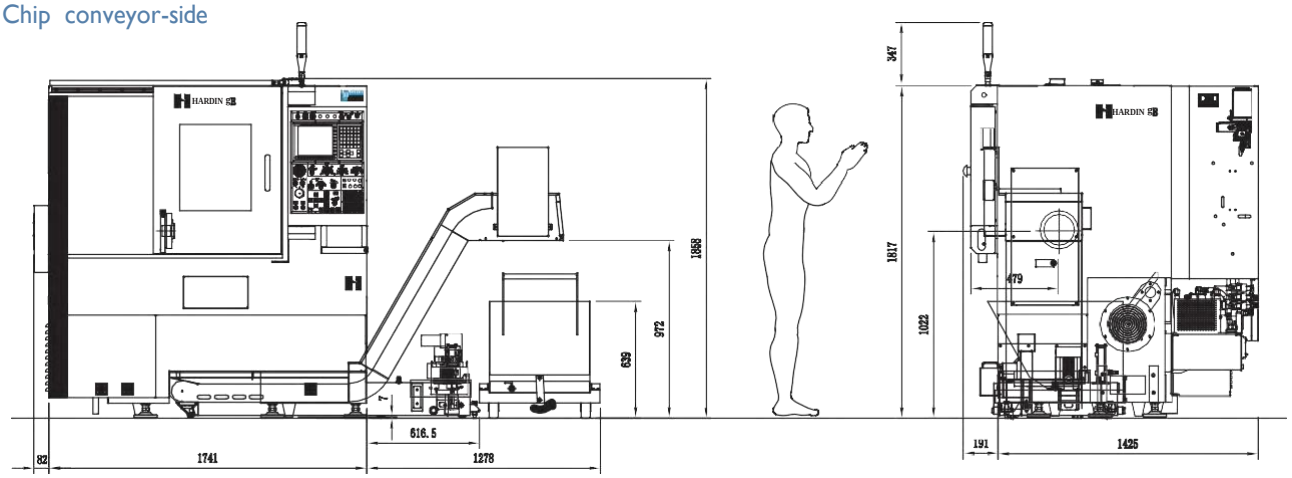
Machine Specifications

Machine Model	TC 150		TC 200	
	Fanuc	Siemens	Fanuc	Siemens
Spindle				
Spindle Nose	ANSI A2-5		ANSI A2-6	
Spindle Center Through Hole Diameter	56mm		62mm	
Chuck Size	6"		8"	
Spindle Center Height	1022 mm		1022mm	
Distance From Spindle center to door	334 mm		334mm	
Clamping Mode	hydraulic		hydraulic	
Driver Motor				
Spindle Power	11 kW	13.3 kW	11kW	13.3 kW
Max. Spindle Speed	6000rpm		5000rpm	
Spindle Torque	70Nm	90Nm	84Nm	108Nm
X/Z Axis Servo Motor	1.2 kW	2.85 kW	1.2 kW	2.85 kW
Machining Range				
Max. Swing Over Lathe	500mm		500mm	
Max. Machining Length	380mm		350mm	
Max. Machining Diameter	370mm		370mm	
Max. Bar Hole Through Diameter	45mm		52mm	
X/Z Axis				
X Axis Travel	188mm		188mm	
Z Axis Travel	380 mm		380mm	
X/Z Axis Rapid Traverse Rate	30 m/min		30 m/min	
Turret "() For options"				
Drive Mode	Servo		Servo	
Capacity	8（12）		8（12）	
Turning Tools (Square)	25x25（20x20）mm		25x25（20x20）mm	
Boring Tools (Round)	Φ40（Φ32）mm		Φ40（Φ32）mm	
Tool Change Time(T-T)	0.5S		0.5S	
Tailstock（Option）				
Taper No.	MT.4		MT.4	
Tailstock Travel	360 mm		330mm	
Sleeve Travel	80mm		80mm	
Coolant System				
Coolant Capacity	120L		120L	
Coolant Pressure	2.8 bar		2.8 bar	
Machine accuracy（ISO 230-2）				
X/Z Position Accuracy	0.008mm		0.008mm	
X/Z Repeatability Accuracy	0.004mm		0.004mm	
Other				
Length x Width x Height	1830×1560×1850mm		1830×1560×1850mm	
Weight	2850Kg		2850Kg	
Power Requirement	15KVA, 3Phase 380V		15KVA, 3Phase 380V	

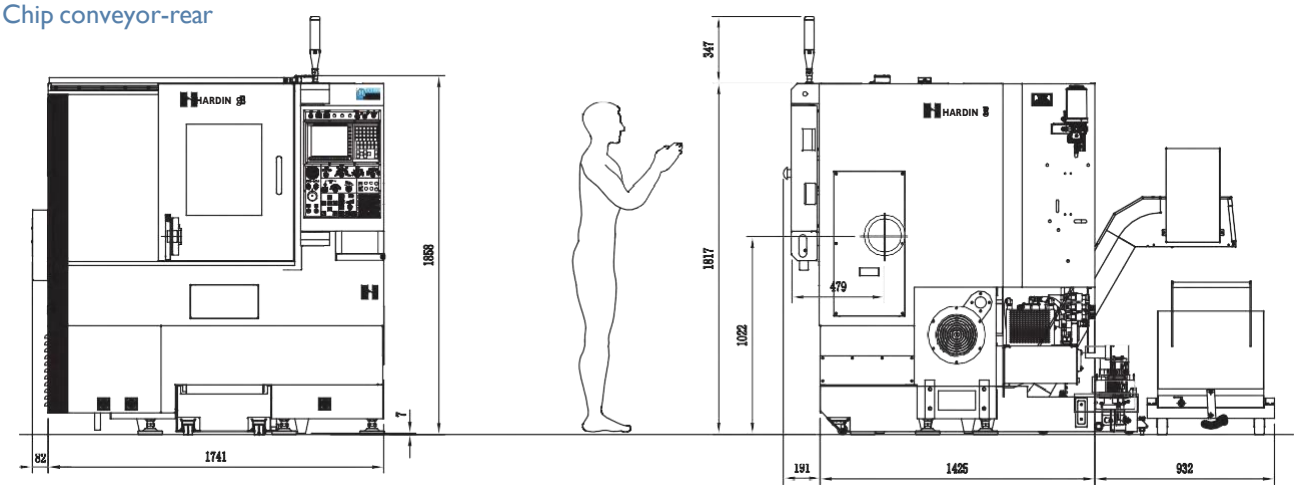
Note：Sample data are based on printing period lever only, any technology and parameters change without notice。

Floor Plan

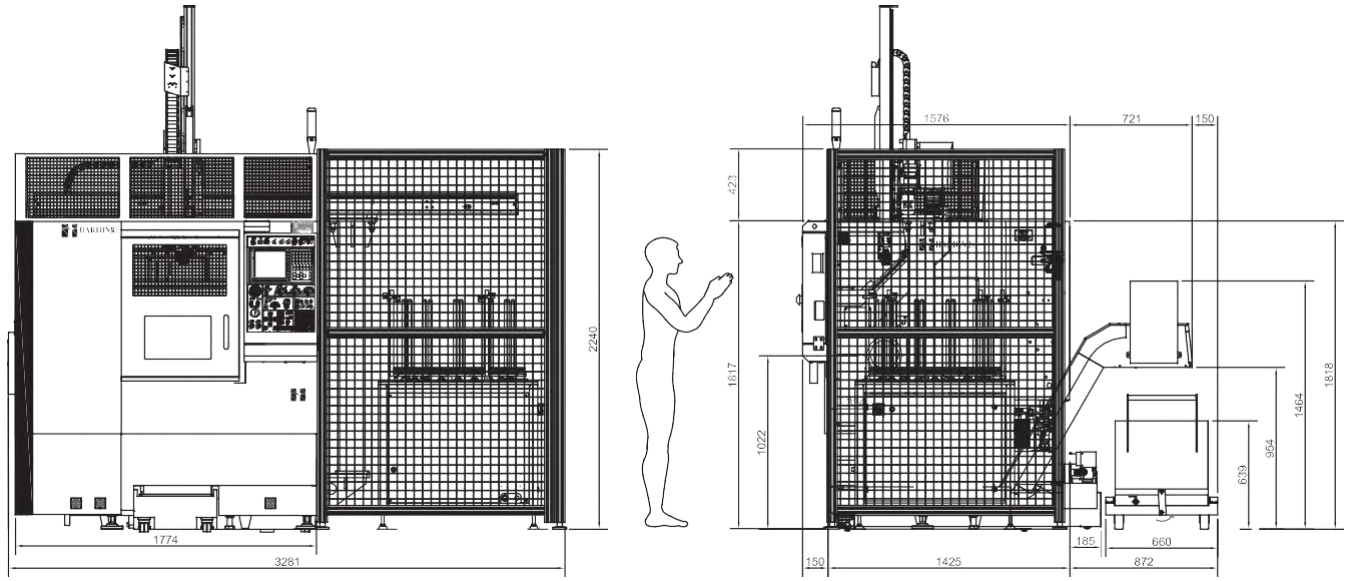
Chip conveyor-side



Chip conveyor-rear



TC150A/200A floor plan



HARDINGE COMPANIES WORLDWIDE

Over the years, The Hardinge Group™ steadily diversified both its product offerings and operations. Today, the company has grown into a globally diversified player with Manufacturing operations in North America, Europe and Asia. In addition to designing and building turning centers, and collets, Hardinge is a world leader in grinding solutions with the addition of the Kellenberger, Jones & Shipman, Hauser, Tschudin, Usach and Voumard brands to the Hardinge family. The company also designs and manufactures Bridgeport machining centers and other industrial products for a wide range of material cutting, turnkey automation and workholding needs.

Expect more from your Hardinge products. Choose Hardinge precision and reliability for increased productivity and value!

Call us today, we've got your answer.

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