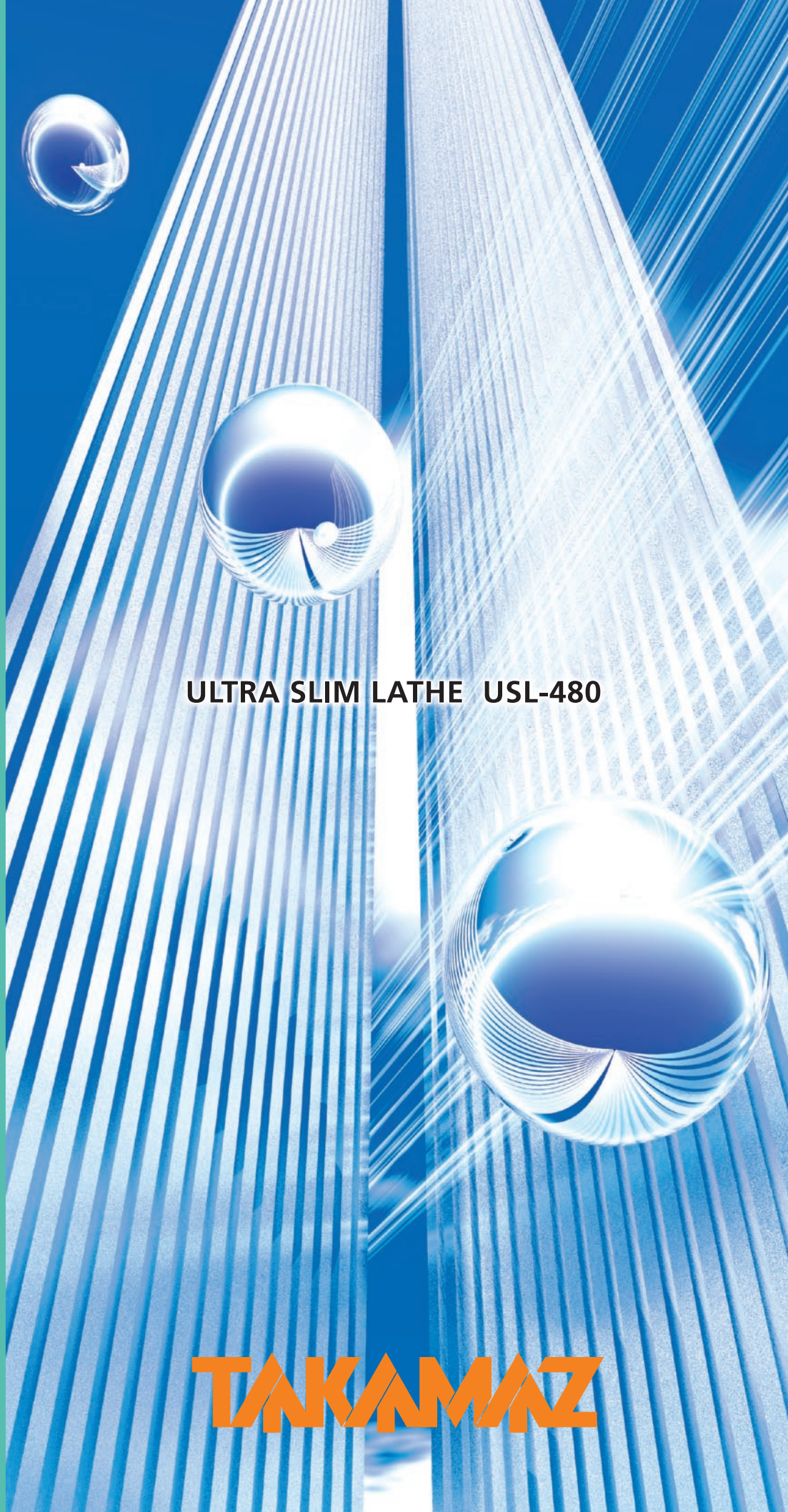
CNC Precision Lathe

USL-480



Superior Energy Saver Equipment Award
JMF Chairman's Award received

TAKAMAZ

Ultra Slim Lathe

USL-480

The living environment all around us is ecologically evolving in automobiles, household appliances, and construction. Even in the "mother machines" (machine tools) that form the foundation of any industry, products with "reduced energy consumption", "reduced production installation space", "reduced waste/recycling", and small environmental footprint are in demand. The current situation that production conditions are often long on waste and short of efficiency, such as working with machines with excess production capacity, production with machines just taking up factory space, etc. It is here that we present TAKAMAZ 's environmentally-friendly machines. The compact slim lathe "USL-480" achieves the concept of "Small item machining with small machines" in half the space of conventional machines. We promise great benefits in our customer's facility investments through reducing expenses in unseen areas such as fixed land assets, power consumption, etc., while taking maximum advantage of your existing space.

"Caring for the environment" is our standard concept.

※The photo shows the X-100 models in new TAKAMAZ standard color. Environmentally friendly powder coating is employed.

Performance

Stable Balance Produced by the Symmetry※ Structure

※Right/Left Symmetry

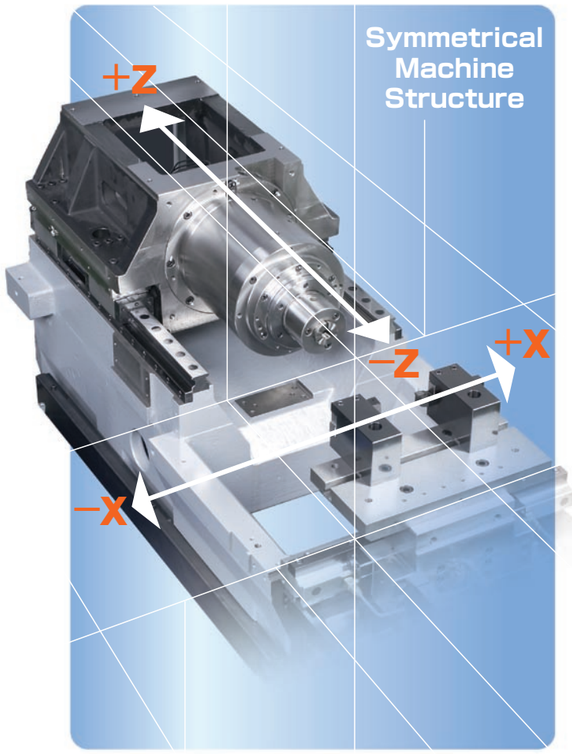
Suppresses thermal displacement, achieving circularity of 0.2μm, surface roughness of 0.2μm

●This machine was designed with a symmetrical structure, thereby suppressing the relative displacement, and suppressing component elongation due to heat. In addition, by arranging the X- and Z-axes independently of each other, connection was possible with the least distance from the slide surface to the spindle center, and having the ball screw adopt a pre-tension structure leads to stability in machining accuracy. In actual measurement data, the positioning accuracy was marked at ±1μm or less, and the repeating accuracy was no more than 1μm.

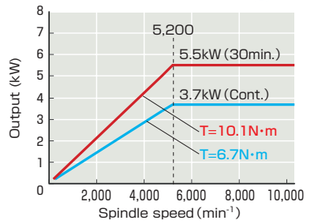
Pursuing High Accel/Decel Speeds with Built-in Spindle

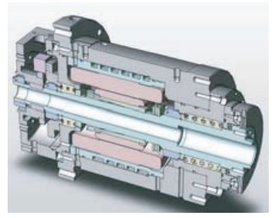
●Reductions in non-cutting time were sought with a high-responsiveness spindle structure through shaft inertia optimization and the adoption of dedicated built-in motors. The time from 0 to Max.10,000min^{-1} was marked at 1second or less※. In addition, we are pursuing stability in temporal changes by adopting shaft motion-type zero core structure and a structure not prone to influence by heat over time, centering on the shaft.

※ With a precision diaphragm air chuck



Spindle motor output characteristics diagram

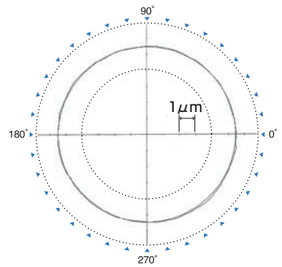




■Cross Section of Built-In Spindle

Circularity

Spindle Speed : 10,000min^{-1}
Feed Rate : 0.02mm/rev
Stock Removal : 0.2mm(Diameter)
Material : C3604BD、φ18mm×40L
Insert : Diamond

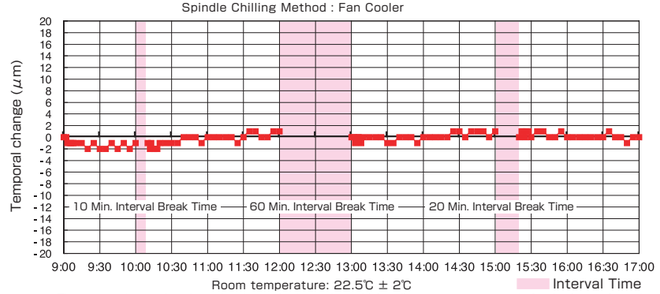


Circularity: 0.19μm

Temporal Change

Spindle Speed : 8,000min^{-1}
Feed Rate : 0.05mm/rev
Stock Removal : 0.2mm(Diameter)
Material : C3604BD、φ18mm×40L
Insert : Diamond
Spindle Chilling Method : Fan Cooler

The holder is mounted nearby X-axis home position
Precision Air Chucking Cylinder & Collet
20 Sec./Cycle



These were the results where the change in the work machining diameter was measured after having performed an 8-hour temporal change cutting test with the "USL-480". The cutting conditions were as shown here, with a spindle speed of 8,000min^{-1}, and a fast-cut brass rod as the cutting material. In addition, the pink parts in the figure simulated stops such as worker breaks and tip replacements, etc., thus showing states where cutting was not being performed. From this, we can see that the maximum change in machining diameter at 8 hours was 3μm, the maximum change of machining diameter after each break was 1μm, achieving an extremely stable machining accuracy.

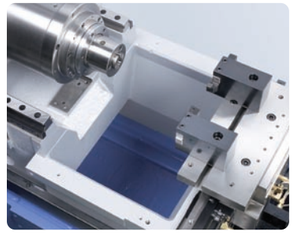
※The precision capacity is a value based on multiple conditions. Because these conditions will differ during actual machining, the accuracy capacity will differ accordingly.

Environment

Automation

Environmental Improvements are Connected to Production Rationalization.

In Pursuit of Space and Energy Use Half that of Previous Machines

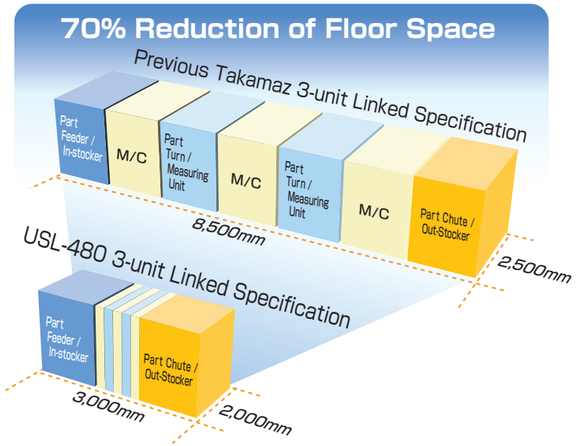


■Disposability of cutting chip is improved by the vertical shape.

●The structure of this machine is a 2-axis structure where a spindle-move axis (Z-axis) and a gang style toolbox (X-axis) intersect perpendicularly. Though this perpendicular structure arrangement※ a heretofore unknown body compactness is achieved. In addition, the chip disposability is improved by the vertical shape, and is even superior in operator interface, resulting in a design intended to raise productivity.

●In the case of the 2-unit linked specification, the horizontal width of a single line can be reduced by about half compared to our previous "J-WAVE Linked Machine" devices, contributing to a reduction in factory installation space. In addition, maintenance points are concentrated at the front and back of the machine, and the possibility of sharing using only one chip conveyor when linked is considered, achieving increases in working efficiency.

※Patent Pending



●Holding power was reduced by optimum motor size selection for each unit. In addition, environmental protection has been taken into account by energy savings through miniaturization of the structural components, materials used, reduction of waste, and reduction of startup loss of the rotors.

10.4 Inch Color Monitor

Operability Improved through Touch Panels

●In pursuit of improved operability, this machine has adopted touch panel monitors. A tool counter and work counter are integrated, standard, making display possible on the touch panel screen. The operation panel is simple, without the counter boxes attached in earlier models. Chuck OP/CL select /chip conveyor intermittent timer setting, etc., can be performed in the optional setting screen.

■Main Screen (Manual Mode)

■Main Screen (Auto Mode)

■Option Select Screen

■Preset Counter Screen

■Preset Counter Setting Screen

■Tool Offset Screen

Toward a Flexible Line Configuration.

Equipped with the Newly-developed High-speed Loader "ΣU30"

●Quick switchover from unitary to linked is required for dealing with variable-type, variable-quantity production. This device can be easily moved with a forklift, and the loading system is mounted using the top space on the machine, making possible the construction of a high-efficiency transport system.

●A loading time of 4seconds, and a minimum cycle time of 10seconds※ were achieved through downsizing the transport devices, such as by minimization of the loader transport shaft up/down axis stroke, distance between processes, etc.

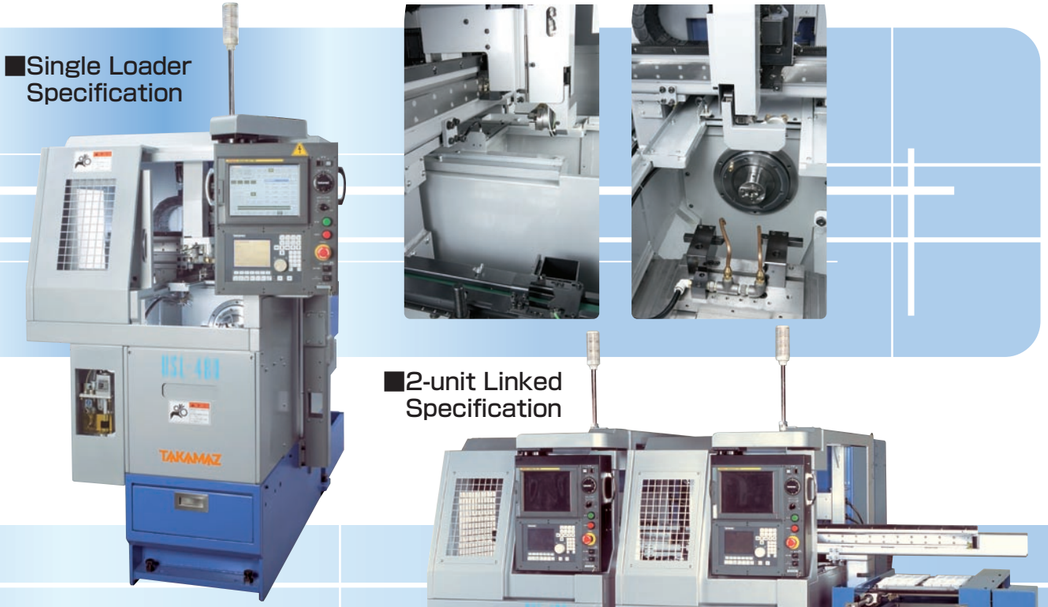
●Peripheral devices such as various parts feeders, washing/measuring equipment, etc., can be arranged as needed.

※There are situations where the cooling equipment specification may be changed to an oil-cooled specification according to various conditions such as the spindle rotation speed, etc.

■Loader transfer capacity

Item		Unit	ΣU30 (3 jaw hand)
Workpiece dimension	Diameter (Max.)	mm	φ30
	Weight (One side)	kg	0.3
Shoulder (Traverse axis)	Drive system		Servomotor
	Stroke	mm	645 (Depends on specifications)
	Rapid traverse rate	m/min	70
Arm (Vertical axis)	Drive system		Servomotor
	Stroke	mm	260 (235 : 2 jaw hand)
	Rapid traverse rate	m/min	60
Hand rotation	Drive system		Air cylinder
	Angle	deg.	90

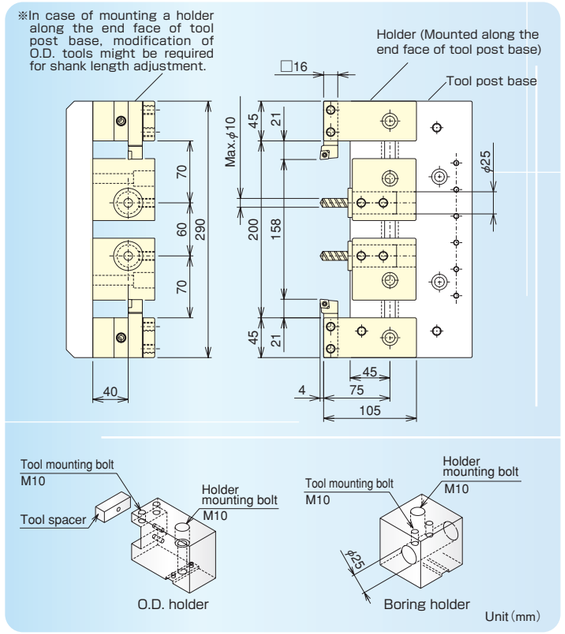
■Single Loader Specification



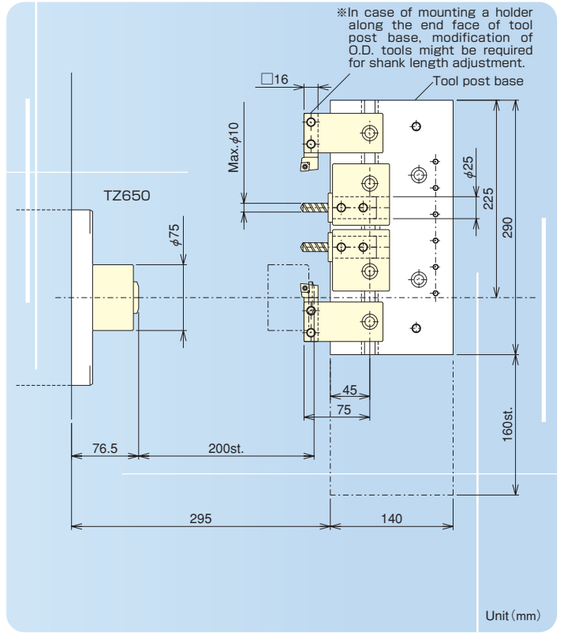
■2-unit Linked Specification

Specification

Tooling System

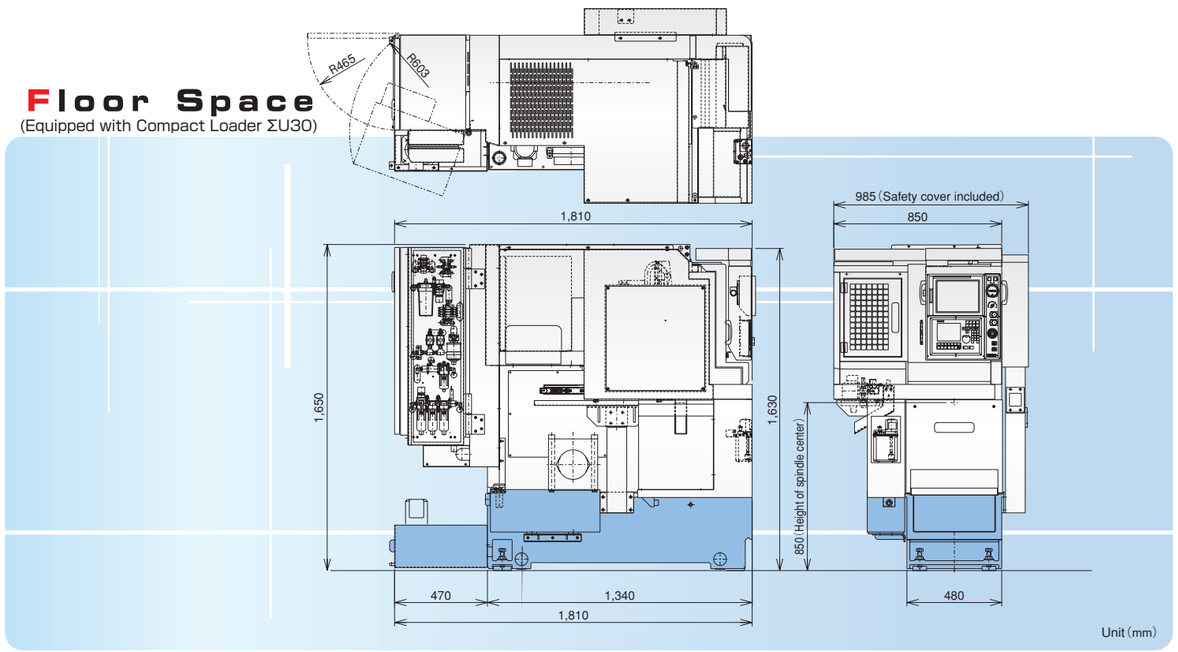


Stroke



Floor Space

(Equipped with Compact Loader ΣU30)



Performance Specifications

Machine Specifications

	Item	Unit	USL-480
Capacity	Optimum turning diameter	mm	ϕ40 × 50
	Max. bar diameter	mm	———
	Chuck size	inch	Collet／3
Spindle	Spindle nose	JIS	A3-S2
	Spindle bearing I.D.	mm	ϕ50
	Spindle speed	min⁻¹	Max.10,000※1
Tool post	Type		Horizontal linear (Four tools)
	Tool shank	mm	□16
	Boring holder I.D.	mm	ϕ25 (Max. Drill Diameter: ϕ10)
	Max.stroke	mm	X:160 Z:200
	Rapid traverse rate	m/min	X:12 Z:15
Motors	Spindle motor	kW	AC5.5/3.7
	Feed motor	kW	X: AC0.5 Z: AC0.5
Size	Spindle center height	mm	850
	L × W × H	mm	480 × 1,810 × 1,630
	Machine weight	kg	1,000 (1,300※2)
Total electric capacity		KVA	13

※1 It may vary with specification of chuck type.
※2 When the loader is mounted.

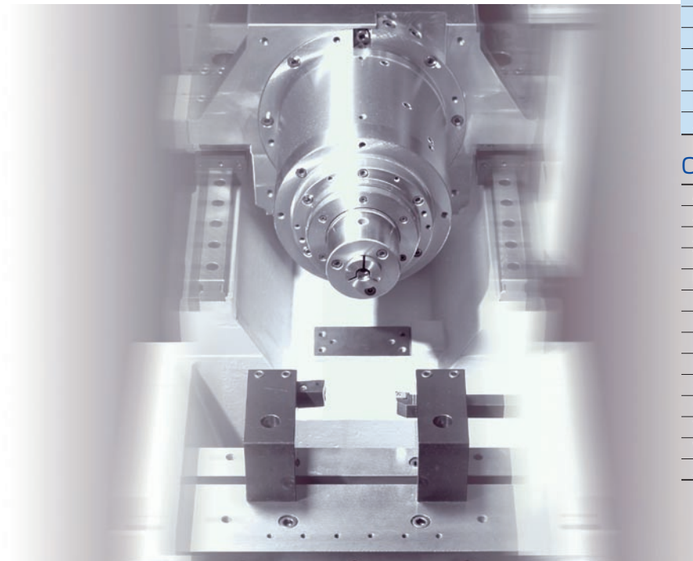
Standard Accessories

- □TZ650 collet flange ····· 1set
- □Tool holder ····· 4sets
- □Spindle cooling unit (Cooling fan) ··· 1set
- □Tool kit ····· 1set
- □Instruction manuals ····· 1set

Optional Accessories

- □Tool holders
- □TZ650 collet chuck
- □Collet chucks
- □Chuck clamp detector
- □TAKAMAZ loader system
- □Combined system
- □Spindle cooling unit (Thermostat)
- □Spindle indexing device (Electrical)
- □Chip conveyor (Spiral type／Floor type)
- □Air blow from front side
- □Air blow from rear side
- □Cycle end signal light (1-color／2-color／3-color)
- □Coolant unit※1
- □Breaker
- □Special color
- □Automatic fire extinguisher
- □Others※2

※1 When a coolant pump is mounted,an auxiliary tank is required.
※2 For more information on attachments,consult our sales representative.



Controller Specifications

Item	TAKAMAZ&FANUC
Controlled axes	2 axes (X, Z)
Simultaneously controllable axes	Simultaneous 2 axes
Least input increment	0.001mm (X in diameter)
Least command increment	X:0.0005mm Z:0.001mm
Auxiliary function	M-code 3 digit
Spindle function	S-code 5 digit
Tool function	T-code 4 digit
Tape code	EIA/ISO automatic recognition
Cutting feedrate	1～5,000mm/min
Command system	Incremental／Absolute
Linear interpolation	G01
Circular interpolation	G02, G03
Cutting feedrate override	0～150%
Rapid traverse override	F0, 100%
Program number	4 digits
Backlash compensation	0～9999μm
Part program storage length	40m
Tool offsets	16 sets
Workpiece／Tool counter	Standard
Registered programs	63 pcs.
Tool geometry／Wear offset	Standard
Canned cycle	G90, G92, G94
Radius designation on arc	Standard
Tool offset measurement input	Standard
Background editing	Standard
Custom macro B	Standard
Nose R compensation	G40, G41, G42
Inch／Metric conversion	G20／G21
Programmable data input	G10
Chamfering／Corner R	Standard
Spindle orientation	G96, G97
Thread cutting retract	G32
Clock function	Standard
Help function	Standard
Alarm history display	50 pcs.
Self-diagnosis function	Standard
Sub-program call	Up to 4 loops
Decimal point input	Standard
2nd reference point return	G30
Stored stroke check 1	Standard
Input／Output interface	RS232C, Memory card
Alarm message	Standard

Optional Controller Specifications

Additional part program storage lengh	80m ・ 160m
Additional registered programs	125
Additional tool offset memory	32 sets ・ 64 sets
Tool life management	
Direct drawing dimension programming	
Run hour／Parts count display	
Extended part program editing	
Multiple repetitive cycle	G70～76
Multiple M codes in one block	Max. 3
Spindle orientation	
Continuous thread cutting	G32
Variable lead thread cutting	G34
Work coordinate system setting	G54～G59
Adnormal load detection	

Engineering Providing Your Company with Optimum Products, Service, and Effort.

As a result of having pursued the increased satisfaction of our various customers, TAKAMAZ 's rate of repeat orders actually reaches 90%. Then, over 80% of the machines we manufacture are machines customized to customer specifications. Product variations are arranged from 3inches to 10inches chuck size in wide range of varieties, and TAKAMAZ considers its mission to be providing products at low prices and short lead times, as well as "Only One" products though customizing to customer needs.

TAKAMATSU consult flow

- **Listening**
  - Customer consultation
- **Inquiry**
  - Conceptual Design
  - Jigging/ Tooling Study
  - Test Cutting
  - Time Study
- **Proposal**
  - Estimate
  - Delivery Confirmation
  - Transport Method
- **Design/Outsourcing/ Manufacturing**
  - Linking Specifications
  - Peripheral Equipment
- **Assembly/Adjustment**
  - TAKAMAZ Line
- **In-house Flow Check**
  - Completeness Evaluation
- **Runoff at TAKAMAZ's**
  - Based on meetings with the Customer
- **Delivery/Installation**
- **Final Inspection**
  - Maintenance/ Service Response
  - Parts Procurement
  - Modification Support

Japan ISHIKAWA

TAKAMATSU MACHINERY CO.,LTD.

- Arrayed at 10 bases nationwide, and providing a sales and service system close to regions.
- At TAKAMAZ, we offer an "NC Schooling" for prospective customers, striving for full factor maintenance.

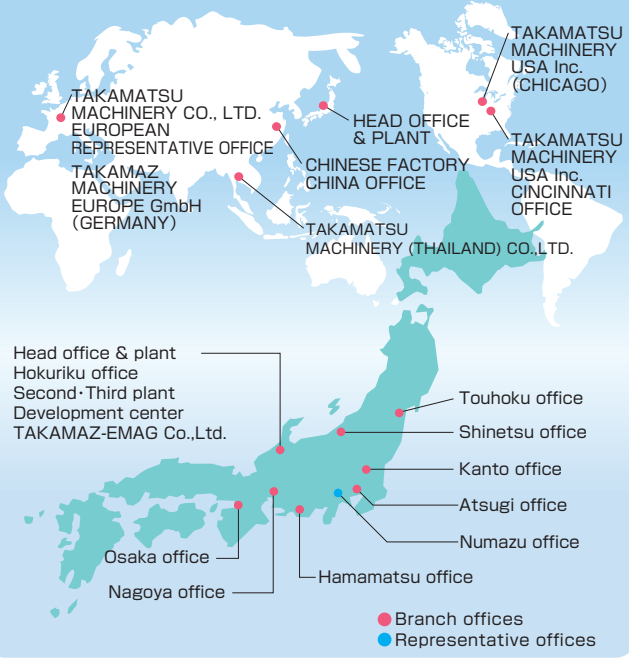



Europe GERMANY

TAKAMATSU MACHINERY EUROPE OFFICE
TAKAMAZ MACHINERY EUROPE GmbH

- We are performing sales and service targeted on the European and Russian markets.

Global Network



Thailand BANGKOK

TAKAMATSU MACHINERY (THAILAND) CO.,LTD.

- Our Bangkok base performs sales and service targeted on the Asian market.
- Facility is capable for machine set-up and modification.

America CHICAGO

TAKAMATSU MACHINERY USA Inc.

- Our Chicago base performs sales and service targeted on the American market.

China HANGZHOU

HANGZHOU FEELER TAKAMATSU MACHINERY CO.,LTD.

- We are performing "X-100c" "X-150c" manufacturing, sales, and service targeted on the Chinese market.

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Specifications and accessories are subject to change without notice.
Standard specifications of the machine may differ according to destinations.

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