

# TONGTAI

## Beyond Accurate



**Tongtai Tongtai Machine & Tool Co., Ltd.**

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Europe Branch	TEL : 31-161-454639	FAX : 31-161-454768
Romania Branch	TEL : 40-264-415273	FAX : 40-264-403983
Malaysia Branch	TEL : 603-78597113	FAX : 603-78597115
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China Operation Center

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 TEL : 86-512-63430168  
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Tianjin Branch	TEL : 86-22-24417640	FAX : 86-22-24416738
Shanghai Office	TEL : 86-21-24208138	FAX : 86-21-34073262
Shenyang Office	TEL : 86-24-24142968	FAX : 86-24-24115782

Affiliates

<b>Honor Seiki Co., Ltd.</b>	<b>Asia Pacific Elite Corp.</b>	<b>Quick-Tech Machinery Co., Ltd</b>	<b>PCI-SCEMM - rue Copernic</b>	<b>ANGER Machining GmbH</b>
TEL : 886-7-9759888	TEL : 886-4-23589313	TEL : 886-6-3841155	TEL : 33-4-77426161	TEL : 43-7229-71041-0
FAX : 886-7-9759999	FAX : 886-4-23588913	FAX : 886-6-3841177	FAX : 33-4-77426023	FAX : 43-7229-71041-199
www.honorseiki.com.tw	www.apecnc.com	www.quicktech.com.tw	www.pci.fr	www.anger-machining.com



## Trust & Technology



Tongtai has been established for over 40 years. With the employees' effort, our quality is appreciated by worldwide customers. In 2011, Tongtai was awarded as one of Top 100 Taiwan Brands. Reviewing the history, Tongtai is seen as always embracing the business concepts of "explore the innovation, create the value and pursue the customer satisfaction". On the path of Tongtai development, we contribute ourselves on providing the best machining experience for customers. Focusing on the future, we have to keep obtaining the latest technologies and put the energy in talents acquirement and cultivation for extending the competence in the global machine tools industry.

## Company History



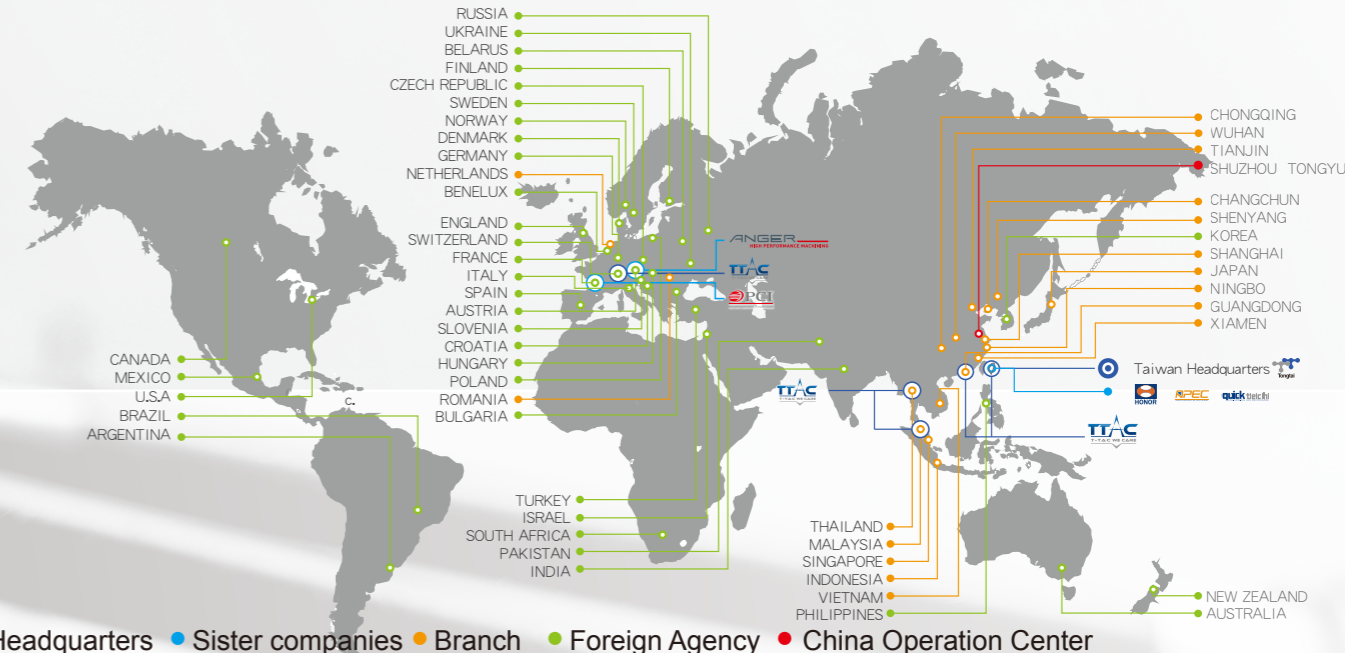
January	1969	Company founded and registered with the capital assets of NTD 4,600,000. Principal products : Automatic turning machines, Multi-spindle drilling and tapping machines.
January	1981	First Class was awarded in Quality Control (QC) after inspection by the Ministry of Economic Affairs.
April	1982	Product line expanded : Numerical drilling machines, Spining machines, CNC lathes, Printing circuit board drilling machines. (Anto Denki Cooperation)
March	1985	Product line expanded : Vertical machining centers, Horizontal machining centers.
October	1986	Technical cooperation with Aisin Seiki Co., Ltd. (Japan) for horizontal machining centers, MY-I.
November	1986	Technical cooperation with Hitachi Seiki Co., Ltd. (Japan) for horizontal machining centers, MY-II.
July	1992	Cooperated with Hitachi Seiki Co., Ltd. (Japan) and provided numerous automatic production lines to automobile and air conditioner companies such as TOYOTA, Far Hsing, Hitachi Taiwan, Toshiba Taiwan, Elite Sewing Machine, Panasonic Taiwan, SYM, YAMAHA Taiwan.
September	1992	Technical cooperation with Kiryu Co., Ltd. (Japan) for vertical CNC lathes, TVL30-S2 and TVL30-S4.
January	1993	Tongtai's CNC lathes and vertical machining centers won "Taiwan Excellence" awards by Ministry of Economic Affairs.
July	1994	Certified ISO-9002
October	1995	Signed the documents of asset and technical cooperation with Hitachi Seiki (Japan) and developed horizontal machining centers, TMH-400 and TMH-500.
October	1998	Self-developed 6-axis super high speed PCB drilling machine.
December	1999	Certified ISO-14001
September	2000	Listed on OTC market.
September	2002	Certified ISO-9001
September	2003	Listed on the Taiwan exchange market.
June	2004	Tongtai held 52% interest in alliance with Honor Seiki Co., Ltd. Expanded medium and large size CNC vertical lathes.
October	2004	Suzhou factory in China started official operation and it fulfilled the first goal of dual manufacturing centers.
October	2005	Tongtai held 52% interest in alliance with APEC Co., Ltd. Integrated mold machining centers.
June	2006	Tongtai headquarters started official operation in Southern Taiwan Science Park-Kaohsiung Science Park.
February	2008	Phase 2 factory expanded. Total space achieved 39,500 m <sup>2</sup> . This established the foundation of future development.
October	2010	Tongtai held 52% interest in alliance with Quicktech. Expanded to small high speed CNC lathes.
December	2010	AEO was awarded by Directorate General of Customs, Ministry of Finance.
July	2011	Tongtai was recognized as one of "Top 100 Taiwan Brands" by the Bureau of Foreign Trade, Ministry of Economic Affairs R.O.C.
February	2013	Tongtai was recognized as a potential company for becoming a Taiwan Mittelstand by Ministry of Economic Affairs R.O.C.
September	2013	National Brand Yushan Award was awarded by Republic of China National Enterprise Competitiveness Development Assosication.
December	2013	T51-USA won the prize of "2014 Taiwan Excellence" by Bureau of Foreign Trade.
January	2014	Tongtai was recognized as a potential company for becoming a Taiwan Mittelstand by Ministry of Economic Affairs R.O.C.
March	2015	Strategy alliance with PCI-SCEMM (France) for improving the competitive advantages in the automotive supply chain in the Asia and Europe markets.
June	2015	Strategy alliance with Anger Machining GmbH (Austria) for extending product lines to high-end transfer centers.
June	2015	Launched Taiwan's 1st independently R&D power bed fusion additive manufacturing equipment, AM-250.
March	2016	Hold the 1st Tongtai Open House in Tongtai HQ, Kaohsiung.

# Tongtai in the World

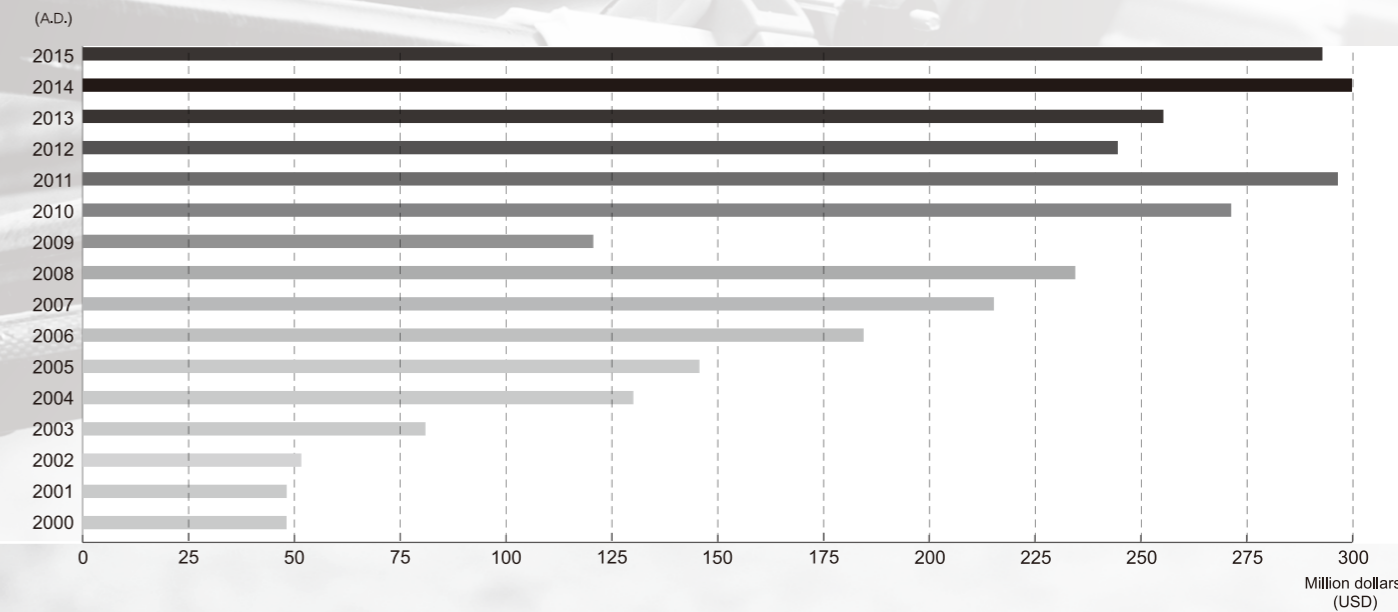
# Global Sales & Service Network



Tongtai's products have been approved by international leading manufacturers or their subcontractors in various industries, such as BMW, Volkswagen, Fiat, Toyota, Honda, Renault-Nissan, Continental, TRW, Bosch, GE Aviation, Rolls-Royce, Pratt & Whitney, Safran Group and so on. To satisfy global customers with excellent sales and service closely, Tongtai has established branches in the Netherlands, Romania, USA, China, Japan, Malaysia, Indonesia, Thailand and Vietnam to expand local market progressively. In other important markets around the world, Tongtai also has lots of agents and dealers for constructing sales and service net.



Turnover Chart



# Organization Chart

### Organization Chart

**Operation Division**

- Overseas Sales Dept.
- Greater China Business Dept.
- Sales & Marketing Dept.
- Customer Service Dept.

**Procurement Division**

- Parts Machining Dept.
- Production Management Dept.
- Materials Supply Dept.

**Quality Assurance Division**

- Administration Dept.
- Sales Dept.
- Production Dept.
- Customer Service Center.

**Human Resource Dept.**

**Administration Division**

**Chairman**

**Chief Executive's Office**

**President**

**Industrial Safety Office**

**Business Division 1**

- Mechanical R&D Dept. 1
- Manufacturing Dept. 1
- System integration Dept.

**Business Division 2**

- Project Dept. 2
- Mechanical R&D Dept. 2
- Manufacturing Dept. 2

**Business Division 3**

- Project Dept. 3
- Mechanical R&D Dept. 3
- Manufacturing Dept. 3
- Project Dept. 5
- Mechanical R&D Dept. 5
- Manufacturing Dept. 5

**R&D integration Division**

- Information & Technical Support Center
- Software Development Dept.
- Electronic Control Technology Dept. 1
- Electronic Control Technology Dept. 2
- Technology Development Dept.

**Electronic Equipment Business Division**

- Manufacturing Dept. 6
- Technical Support Dept.
- Sales Dept.

**Employee Statistics :  
857 People (2016/04)**

**Personnel Distribution**

- Management and administrator 29%
- Research & development engineer 21%
- Production engineer 50%

**Educational Distribution**

- Doctor/Master 13%
- Bachelor 63%
- Others 24%

**Seniority Distribution**

- 0-5 years 35%
- 5-10 years 20%
- 10-15 years 20%
- 15-20 years 13%
- Above 20 years 11%

# Research and Development Capacity



To ensure continued product improvement, each project manager organizes technical engineers and engages them in the improvement process. In addition, there is an in-house technology forum held monthly. Each project manager has to present the results of his projects in the meeting to share technology. Furthermore, these results will be used in immediate machine manufacturing to improve performance.

In technology development, besides technology resources from Japan. In recent years, Tongtai seeks technology resources from Europe. For large machine tools, we cooperate with Italian companies to develop horizontal boring and milling machines and moving column gantry milling machines. For high-speed cutting horizontal machining centers, we cooperate with German companies for developing twin spindle horizontal machine centers. In the domain of horizontal boring and milling machines, we introduced the manufacturing skills of hydrostatic system and boring quills. In the domain of moving column gantry milling machines, we introduced the electronic compensation system of anti-backlash, 5-axis milling heads, universal milling heads, and large bed gear transmission systems. Due to cooperation with European companies, Tongtai has kept in step with high-end technology.

In the first years of Tongtai, under the leadership of the first Japanese president Yoshii-Ryozo, the management skills, R&D methods, and products manufactured for Japan were introduced. After that, cooperation with many well-known machine tool companies in Japan like AISIN SEIKI, HITACHI SEIKI, and KIRYU SEIKI established the foundation of technology ahead of the industrial curve in Taiwan.

Tongtai employs 140 R&D engineers for hardware and software development based on their professional technology backgrounds to develop better products and processes, improve product stability and reliability and provide quick response with technologic services.

In mechanical design development, use of Inventor and AutoCAD design software and Ansys FEA software to analyze machine module construction, hydrokinetics and interactions between mediums, has enabled Tongtai to achieve high efficiency and developmental efficacy. The R&D department not only develops new products but modifies product designs to improve the common characters of key elements. Increasing the "use of common components" will enhance the stock utilization ratio and economy of scale reduces purchasing costs.



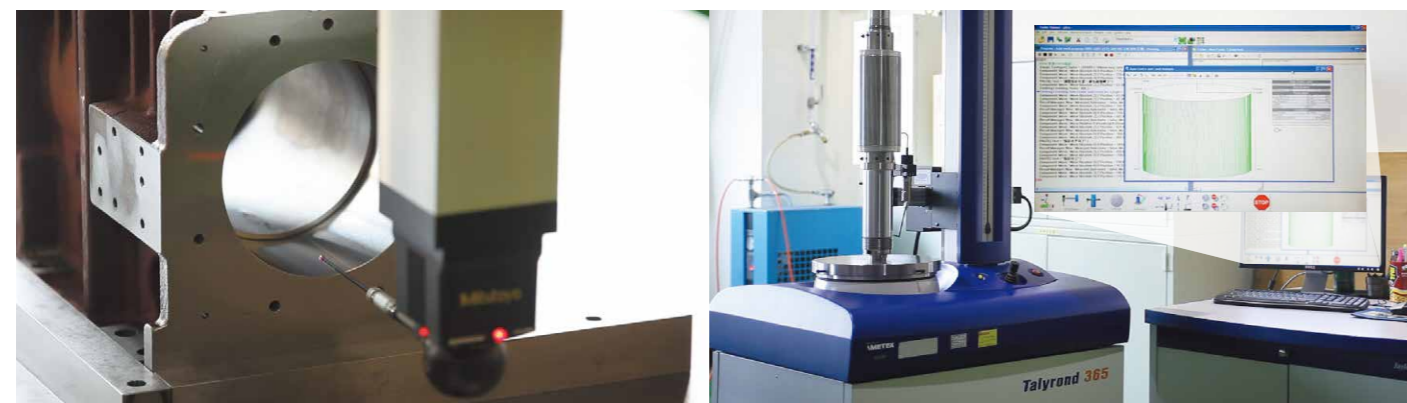
# Precision Machining and Unit Assembly

In machining the key components of Tongtai machines, we use 30 different types of in-house machining equipments at Tongtai including 5-dimension machining centers, vertical milling machines, horizontal boring and milling machine, horizontal machining center, vertical machining centers and CNC lathes.



Tongtai uses precision instruments, professional skills and experience to maintain quality and to extend the life and reliable capacity of our products. For example : casting beds, columns, headstocks and gear boxes.

The department of quality management will perform comprehensive tests after the parts are finished. The testing instruments in our quality management department, like coordinate measuring machines and roundness measuring equipment, are used to test the components made in our factory. According to the blueprint design and all the way through production, we check each part to make sure the precision standard is met.



To achieve the serious requests of key parts, all units of mechanism are assembled in the constant temperature room. The important units like spindles, gear boxes and power turrets are built by professional assembly engineers. When finished, test running and dynamic balance testing are performed.



All ball bearings go through a preinstalled super-sonic cleaning process during which extra high pressure will be produced. This effect will remove any and all attached dirt molecules.



Temperature Control Module of spindle run-in can spread lubrication grease evenly on the ball bearings and the rail gaps and to assure good spindle performance and to extend product life. Furthermore, spindle balance testing is a test for keeping smooth spindle motion during high-speed operations to allow the equipment to achieve the high performance necessary to satisfy precision requests.



## Excellent Quality Management



## Precision assembling

All machines are assembled by experienced engineers. Every engineer engages appropriate adjustments during the process. In addition, Tongtai organizes senior engineers from within the factory and outside experts in the industry to hold in-house technology seminars frequently for improving the technology level of our employees and to maintain advanced and reliable assembly skills. With professional attitude, and careful step by step machine assembly, Tongtai assures that the machines we produce will remain in the stable precision situation.



## Quality Control

For assuring assembly precision, Tongtai not only sets internal controls through Standard Operating Procedures, but also has designed self-check forms for each machine assembly line. Employees can follow the forms to enforce setting and testing tasks to check the quality of products anytime. Moreover, the quality control department has more than 30 professional testing engineers to make sure the results of precision testing are correct. With a series of SOP training, our testing personnel can provide professional and accurate tests for each machine according to the recorded data in the forms. Tongtai's testing engineers enforce the tests with over 25 different testing instruments and devices including laser inspection devices, ball-bar measuring system, coordinate measuring equipment, and roundness measuring equipment. Finally, that data is recorded and stored in the Tongtai database.



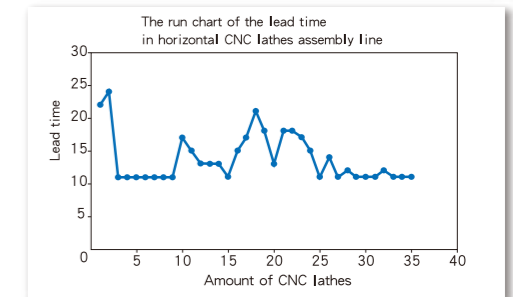
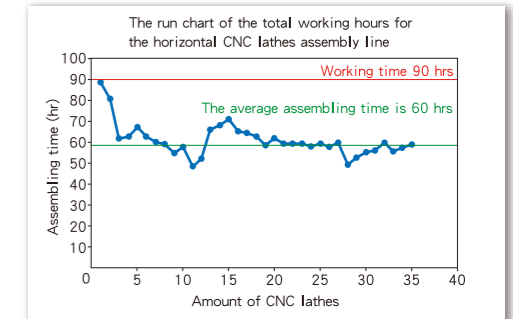
## Introduction of Tongtai Toyota Production System (TTPS)

In 2011, with the introduction of Toyota Production System (TPS), Tongtai established the Tongtai Toyota Production System (TTPS) committee to execute internal procedural improvements in Tongtai with C.E.O. Mr. Yen as the chairman. In addition, the TTPS Affairs is in charge of planning and guiding a series of improvement activities for the whole company.

Initially, the TTPS Affairs started to inculcate the staff with the visible management 5S (Seiri, Seiton, Seiso, Seiketsu, Shitsuke) program to identify the areas of waste and loss. Furthermore, with the relevant training and the understanding of improvement steps, then, we can accumulate the energy of systematic improvement. Besides these visible goals, Tongtai expects that the employees in the company could develop the abilities for trouble solving via participation in TTPS.

In the aspect of assembly line improvement, Tongtai launched many changes for increasing the efficiency. For example, considering the time wasted in tool searching and screw replenishment, Tongtai made some improvements including ergonomically designed tool wagons. Furthermore, by analyzing the production processes and dividing them into several standard procedures, the production is stimulated through efficiency that in turn helps the supervisors to understand the situations at any time. Moreover, with the materials supply mechanism in place, it facilitates the staff to arrange supply orders and make sure the materials are prepared in each manufacturing step. Using CNC lathes as an example, originally, the lead time (L/T) is 24 days, but after the improvement, the time is shorted to 11 days. Furthermore, the assembling time is reduced from 90 hours to 60 hours.

For satisfying the market's demands of high quality and short lead time, Tongtai launched the integration activities for improving the crosswise communication in the cross-function departments. It helps Tongtai staff to learn the skills of procedure diagnosis and weakness correction. We believe that these kinds of skills are some of the highly competitive weapons to overcome the challenges of short lead time, high customization demand, and flexible manufacturing requirements.



## Customizations & Special Purpose Machines

### Customized machine tools

Due to the Taiwanese industrial environment, in the beginning Tongtai manufactured customized machine tools and single function duplication machines. Tongtai not only provided the machining equipments for the motorcycle and household appliance sectors in Taiwan but helped these clients to solve problems including shortening lead-time for machine purchases and to decrease service costs.

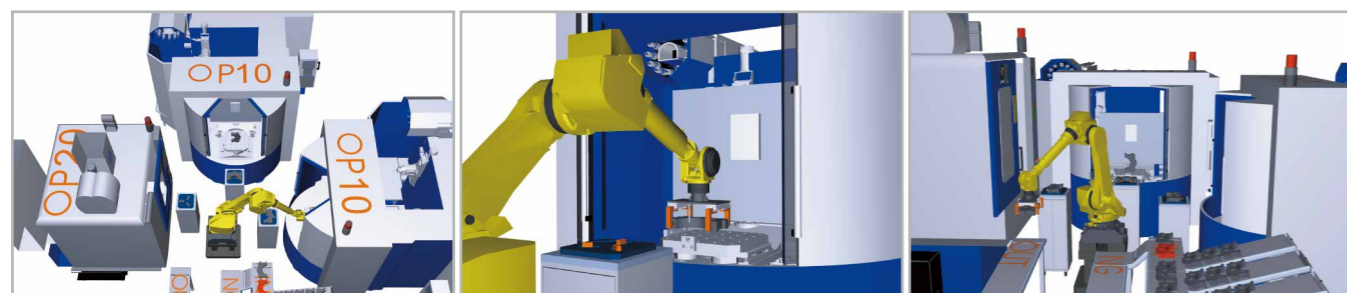
Below is the process for special purpose machine development : we need only six months to develop the machine after confirming the contract. During that time, the teams complete the construction design, review client's technical requirements and finish integrating all machine parts to test and finalize any adjustments. Finally, the client arrives at the factory to inspect that the built machine matches their needs and to complete the project. Due to the high level of success in producing special purpose machines, Tongtai is well-known in the field.

CUSTOMER  
FEEDBACK  
SUPPORT  
INNOVATIVE  
QUALITY  
EXCELLENT  
FRIENDLY



### Research and development customized machine tools

Tongtai's R&D team constantly looks forward to satisfying client needs. The machine design engineers apply their professional abilities and draw the outline of the machine structure, arrange the engineering order to match clients' needs. Tongtai refines the customized manufacturing skills year by year, and it also accumulates strong and competitive R&D capacity continually. The ability to customize is the unique advantage to make Tongtai different from other competitors in the market. Recently, with much more mature technology than the past years, Tongtai has started to focus on individual customer's needs and to develop mass production customized machines in a short time. This is the evidence that Tongtai's customized capacity is excellent.



## Ability of Turnkey Projects

### Turnkey projects

In the department, there are professional divisions for design and cutting trials. The design division's main mission is to fulfill the customers' product requirements and to arrange the production lines for them. Tongtai's design engineers will analyze the customer's product processing. Then, they decide on the appropriate machines and draft layouts for the production lines. Tongtai calculates the information about the possible cycle time of the proposed machine with probable annual production capacity and the cost of the equipment investment. After all the information has been gathered, the engineers will have meetings with the clients and focus on discussing the specifications, modifying the details and try to get a consensus with the customer. Moreover, the division of cutting trials is in charge of setting the cutting tools and jigs, and performing cutting tests. Furthermore, this division also is responsible for contacting the customers to process the final machine precision inspection.

In providing turnkey projects, Tongtai manages the entire machine manufacturing process from choosing appropriate machine model to constructing that machine and assuring its high performance. Finally, after the final tests and with client's approval, the machines are delivered quickly for clients to realize immediate benefits. This is Tongtai's unique skill to win clients' admiration.

In recent years, Tongtai introduced a concept of 3 dimensional (3D) designs by using 3D medium to specifically and concisely explain the ideas of design to the clients to arrange cutting tools and jigs and plan production lines. Tongtai believes that this technology will help customers to realize the best construction of machine, shorten the development time and avoid mistakes or any miscommunication.





# Tongtai- Technical Application Center

The purpose of T-TAC is to take care of customer's machining solution actively. Based on the outstanding technical applications, Tongtai is able and willing to provide advanced machining technologies, machining solutions as well as trial tests to its customers and ensures them excellent experiences in machine operation, maintenance convenience and machine availability.



Automotive



Motorcycle



## T-TAC technical and machining solutions

Solutions	Contents
<b>Product manufacture test</b>	Through the manufacturing progress and jig & fixture plans, Tongtai's skilled staff will manufacture the first piece for understanding the client's corresponding demands.
<b>Machining technologies</b>	By introducing innovative technologies and adding the extra functions, T-TAC is available to provide the brand-new solutions.
<b>Machine technology</b>	Our technical staff will test current problems, which clients have, in the same machine model for processing problem diagnosis and providing possible solutions. Furthermore, our skilled staff is able to provide the services at the client's factory.
<b>Training</b>	T-TAC is open to train current clients, potential customers, agents, teachers/students, and employees and to strengthen their abilities.
<b>Technology exhibits</b>	T-TAC is also an excellent platform to launch new products/technologies by cooperation with software/hardware suppliers. With presentation of highly reliable products/technologies, it's possible to provide higher efficiency and availability solutions than existing ones.

House appliances

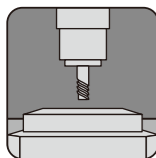


Valves & Fittings



Others





## CNC Milling and Tapping Center



EZ-5



EZ-7

Item	Specification	Unit	EZ-5	EZ-5A	EZ-7	EZ-7A
<b>Table</b>	Table size (L×W)	mm	600×400		850×400	
	Max. loading capacity	kg	250			
	Table height from floor	mm	850			
	T-slot (size×No.)	mm	18×3			
<b>Spindle</b>	Spindle taper		7/24 Taper No. 30			
	Spindle speed	rpm	12,000 (Opt. 20,000/24,000)			
<b>Travel</b>	X/Y/Z axis travel	mm	510/400/300	510/400/350	710/400/300	710/400/350
	Spindle nose to table	mm	200-500			
<b>Feed</b>	X/Y/Z axis rapid traverse	m/min	60/60/60			
	Cutting feedrate	mm/min	1-20,000			
<b>ATC</b>	Tool shank		BBT-30			
	Tool capacity	pc	16 (Opt. 21)	20	16 (Opt. 21)	20
	Max. tool diameter	mm	Ø80	Ø68	Ø80	Ø68
	Max. tool diameter (w/o adjacent tool)	mm	Ø80	Ø100	Ø80	Ø100
	Max. tool length	mm	200			
	Max. tool weight	kg	3			
<b>Motor</b>	Spindle motor	kW	3.7/5.5			
	X/Y/Z axis servo motor	kW	1.5/2.2/2.2 (Opt. 1.8/1.8/3)			
	Coolant motor	kW	0.18			
<b>Machine size</b>	Width×depth×height	mm	1,700×2,600×2,700		2,100×2,600×2,700	
	Weight	kg	2,850		3,150	

## CNC Milling and Tapping Center

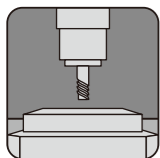


VTX-5



VTX-7

Item	Specification	Unit	VTX-5	VTX-5A	VTX-7	VTX-7A
<b>Table</b>	Table size (L×W)	mm	600×400		850×400	
	Max. loading capacity	kg	250			
	Table height from floor	mm	850			
	T-slot (size×No.)	mm	18×3			
<b>Spindle</b>	Spindle taper		7/24 Taper No. 30			
	Spindle speed	rpm	12,000 (Opt. 20,000/24,000)			
<b>Travel</b>	X/Y/Z axis travel	mm	510/400/300	510/400/350	710/400/300	710/400/350
	Spindle nose to table	mm	200-500			
<b>Feed</b>	X/Y/Z axis rapid traverse	m/min	60/60/60			
	Cutting feedrate	mm/min	1-20,000			
<b>ATC</b>	Tool shank		BBT-30			
	Tool capacity	pc	16 (Opt. 21)	20	16 (Opt. 21)	20
	Max. tool diameter	mm	Ø80	Ø68	Ø80	Ø68
	Max. tool diameter (w/o adjacent tool)	mm	Ø80	Ø100	Ø80	Ø100
	Max. tool length	mm	200			
	Max. tool weight	kg	3			
<b>Motor</b>	Spindle motor	kW	3.7/13 (Opt. 3.7/5.5)			
	X/Y/Z axis servo motor	kW	1.8/1.8/3			
	Coolant motor	kW	0.18			
<b>Machine size</b>	Width×depth×height	mm	1,700×2,600×2,700		2,100×2,600×2,700	
	Weight	kg	2,850		3,150	



## CNC Milling and Tapping Center with Automatic Pallet Changer



QT-II+APC



QVM-610AII

Item	Specification	Unit	TMV-510T+APC [QT-II+APC]	TMV-510+APC	QVM-610AII
<b>Pallet</b>	Pallet size (L×W)	mm	600×360	600×360	700×410
	Max. loading capacity	kg	100×2	100×2	400×2
	Pallet height from floor	mm	920	920	950
	T-slot (size×No.)	mm	18×3	18×3	M16×66+8PIN
<b>Spindle</b>	Spindle taper		7/24 Taper No. 30	7/24 Taper No. 30	7/24 Taper No. 40
	Spindle speed	rpm	8,000 (Opt. 4,000/12,000) [15,000]	8,000 (Opt. 4,000/12,000)	8,000 (Opt. 10,000)
<b>Travel</b>	X/Y/Z axis travel	mm	510/360/435	510/360/300	610/410/510
	Spindle nose to table	mm	200-635	200-500	180-690
<b>Feed</b>	X/Y/Z axis rapid traverse	m/min	40/40/48	40/40/48	36/36/30
	Cutting feedrate	mm/min	1-10,000 [1-15,000]	1-10,000	1-10,000
<b>ATC</b>	Tool shank		BT-30	BT-30	BT-40
	Tool capacity	pc	20	10 (Opt. 14)	24
	Max. tool diameter	mm	Ø68	Ø80	Ø89
	Max. tool diameter (w/o adjacent tool)	mm	Ø100	-	Ø135
	Max. tool length	mm	200	200	250
	Max. tool weight	kg	3	3	7
<b>Motor</b>	Spindle motor	kW	5.5/3.7 [2.2/1.5]	5.5/3.7	7.5/5.5 (Opt. 9.0/7.5)
	X/Y/Z axis servo motor	kW	1.6/1.6/1.6	1.6/1.6/1.6	3.0/3.0/4.0
	Coolant motor	kW	0.18	0.18	0.37(0.55)
<b>Machine size</b>	Width×depth×height	mm	2,000×3,050×2,450	2,000×3,450×2,450	2,440×4,610×2,880
	Weight	kg	4,300	4,300	7,500

## Vertical Machining Center

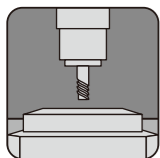


VP-6



VP-8

Item	Specification	Unit	VP-6	VP-8	VP-10
<b>Table</b>	Table size (L×W)	mm	700×410	900×510	1,070×510
	Max. loading capacity	kg	350	500	
	Table height from floor	mm	850	900	
	T-slot (size×No.)	mm	18×3	18×5	
<b>Spindle</b>	Spindle taper		7/24 Taper No. 40		
	Spindle speed	rpm	12,000	10,000 (Opt. 15,000)	
<b>Travel</b>	X/Y/Z axis travel	mm	610/410/510	820/510/535	1,020/510/600
	Spindle nose to table	mm	100-610	100-635	100-700
<b>Feed</b>	X/Y/Z axis rapid traverse	m/min	48/48/48	48/48/36	36/36/36
	Cutting feedrate	mm/min	1-10,000		
<b>ATC</b>	Tool shank		BBT-40		
	Tool capacity	pc	24	24 (Opt. 30)	
	Max. tool diameter	mm	Ø75		
	Max. tool diameter (w/o adjacent tool)	mm	Ø150		
	Max. tool length	mm	250	300	
	Max. tool weight	kg	7		
<b>Motor</b>	Spindle motor	kW	5.5/7.5/11	7.5/11 (Opt. 7.5/11/15)	
	X/Y/Z axis servo motor	kW	1.8/1.8/3 (Opt. 1.5/2.2/3)	1.8/1.8/3 (Opt. 2.2/2.2/3)	
	Coolant motor	kW	0.82		
<b>Machine size</b>	Width×depth×height	mm	1,900×2,414×2,542	2,200×2,642×2,745	2,280×2,642×2,810
	Weight	kg	3,700	5,000	5,200



## Vertical Machining Center



TMV-720A



TMV-1050QII CE guard cover

## Vertical Machining Center



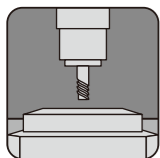
TMV-1100A CE guard cover



TMV-1600A

Item	Specification	Unit	TMV-610A	TMV-720A	TMV-850QII [TMV-1050QII]
<b>Table</b>	Table size (L×W)	mm	710×410	800×480	950 [1,100]×600
	Max. loading capacity	kg	350	500	800
	Table height from floor	mm	900	900	900
	T-slot (size×No.)	mm	18×3	18×5	18×5
<b>Spindle</b>	Spindle taper		7/24 Taper No. 40	7/24 Taper No. 40	7/24 Taper No. 40
	Spindle speed	rpm	8,000	Belt type 10,000 Direct drive type (Opt. 10,000)	Belt type 8,000(Opt. 10,000) Direct drive type (Opt. 10,000/15,000)
<b>Travel</b>	X/Y/Z axis travel	mm	610/410/460	720/480/530	850/600/530 [1,050/600/530]
	Spindle nose to table	mm	150-610	100-630	100-630
<b>Feed</b>	X/Y/Z axis rapid traverse	m/min	36/36/30	48/48/48	48/48/48
	Cutting feedrate	mm/min	1-10,000	1-10,000	1-12,000
<b>ATC</b>	Tool shank		BT-40	BT-40	BT-40
	Tool capacity	pc	12	24	24
	Max. tool diameter	mm	Ø100	Ø80	Ø89
	Max. tool diameter (w/o adjacent tool)	mm	-	Ø125	Ø125
	Max. tool length	mm	250	250	250
	Max. tool weight	kg	4.5	7	7
<b>Motor</b>	Spindle motor	kW	7.5/5.5	7.5/5.5	7.5/5.5 (Opt. 9.0/7.5, 15/11)
	X/Y/Z axis servo motor	kW	1.6/1.6/3.0	1.8/1.8/3.0	4.5/4.5/5.5
	Coolant motor	kW	0.37	0.37	0.37
<b>Machine size</b>	Width×depth×height	mm	1,700×2,530×3,000	2,000×2,740×2,690	2,200×2,870×2,810 [2,500×3,260×2,810]
	Weight	kg	3,500	4,400	5,500 [5,900]

Item	Specification	Unit	TMV-920A	TMV-1100A	TMV-1350A	TMV-1500A	TMV-1600A
<b>Table</b>	Table size (L×W)	mm	1,000×530	1,200×600	1,500×750	1,600×762	1,700×850
	Max. loading capacity	kg	800		1,300	1,869	2,000
	Table height from floor	mm	900		950	950	950
	T-slot (size×No.)	mm	18×5		18×5	18×7	18×6
<b>Spindle</b>	Spindle taper		7/24 Taper No. 40/No. 50		7/24 Taper No. 50	7/24 Taper No. 40	7/24 Taper No. 50
	Spindle speed	rpm	BT-40 : 8,000 (Opt. 5,000/7,000/10,000) BT-50 : 3,500 (Opt. 6,000)		3,500/6,000 (Belt type) (Opt. 3,500/6,000 gear box)	Belt type 10,000 (Opt. 10,000/ 12,000/15,000)	3,500/6,000 (Gear box) (Opt. 3,500/6,000 belt type)
<b>Travel</b>	X/Y/Z axis travel	mm	920/530/530	1,100/600/530	1,350/750/700	1,525/762/710	1,600/800/700
	Spindle nose to table	mm	100-630		200-900	100-810	200-900
<b>Feed</b>	X/Y/Z axis rapid traverse	m/min	30/30/24		20/20/15	18/18/18	15/15/12
	Cutting feedrate	mm/min	1-10,000		0-5,000	1-10,000	0-5,000
<b>ATC</b>	Tool shank		BT-40/BT-50		BT-50(Opt. BT-40)	BT-40	BT-50
	Tool capacity	pc	24		24 (Opt. 32)	24	32 (Opt. 40)
	Max. tool diameter	mm	BT-40 : Ø89/BT-50 : Ø110		Ø110 (Opt. Ø125)	Ø89	Ø110 (Opt. Ø125)
	Max. tool diameter (w/o adjacent tool)	mm	BT-40 : Ø125/BT-50 : Ø200		Ø200 (Opt. Ø220)	Ø125	Ø200 (Opt. Ø220)
	Max. tool length	mm	BT-40 : 250/BT-50 : 300		350	250	300
	Max. tool weight	kg	BT-40 : 7/BT-50 : 15		15	7	15
<b>Motor</b>	Spindle motor	kW	BT-40 : 9.0/7.5 (Opt. 15/11) BT-50 : 15/11		15/11	15/11	15/11
	X/Y/Z axis servo motor	kW	BT-40 : 3.0/3.0/4.0 (Opt. 7.0) BT-50 : 3.0/3.0/7.0		4.0/4.0/7.0	3.0/4.0/7.0	4.0/4.0/7.0
	Coolant motor	kW	0.37		0.37	0.37	0.37
<b>Machine size</b>	Width×depth×height	mm	2,400×3,050×2,500	2,800×3,050×2,920	3,700×3,640×3,250	4,000×3,600×3,520	4,250×3,440×3,290
	Weight	kg	BT-40 : 7,700 BT-50 : 8,600	BT-40 : 7,700 BT-50 : 8,800	13,000	13,000	15,000



## Vertical Machining Center for High Speed Contouring



VC-608

Item	Specification	Unit	VC-608	VC-610	VC-711
<b>Table</b>	Table size (L×W)	mm	950×600	1,100×650	1,200×710
	Max. loading capacity	kg	500		
	Table height from floor	mm	900		
	T-slot (size×No.)	mm	18×5		
<b>Spindle</b>	Spindle taper		7/24 Taper No. 40		
	Spindle speed	rpm	Direct drive type 12,000 (Opt. 15,000)(Opt. Built-in type 20,000)		
<b>Travel</b>	X/Y/Z axis travel	mm	850/610/530	1,050/610/530	1,100/710/710
	Spindle nose to table	mm	100-630	100-630	100-810
<b>Feed</b>	X/Y/Z axis rapid traverse	m/min	24/24/24		
	Cutting feedrate	mm/min	1-10,000		
<b>ATC</b>	Tool shank		BBT-40 (Opt. HSK-A63)		
	Tool capacity	pc	24		
	Max. tool diameter	mm	Ø95		
	Max. tool diameter (w/o adjacent tool)	mm	Ø180		
	Max. tool length	mm	300		
	Max. tool weight	kg	7		
<b>Motor</b>	Spindle motor	kW	11/7.5 (Opt. 15/11/7.5, 40/30)		
	X/Y/Z axis servo motor	kW	2.0/2.0/3.0		
	Coolant motor	kW	0.82		
<b>Machine size</b>	Width×depth×height	mm	2,150×3,000×2,960	2,550×3,000×2,960	2,800×3,300×3,550
	Weight	kg	7,000	8,000	9,000

## Vertical Machining Center for High Speed Contouring

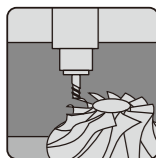


MDV-812



MDV-1013

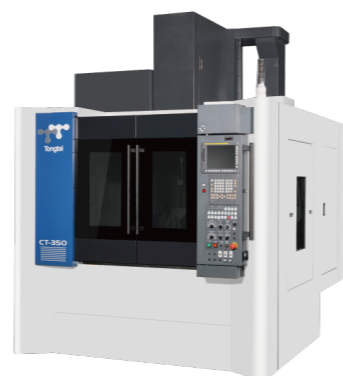
Item	Specification	Unit	MDV-812	MDV-1013
<b>Table</b>	Table size (L×W)	mm	1,320×800	1,400×1,000
	Max. loading capacity	kg	2,000	2,500
	Table height from floor	mm	850	900
	T-slot (size×No.)	mm	18×7	18×9
<b>Spindle</b>	Spindle taper		7/24 Taper No. 40	7/24 Taper No. 40
	Spindle speed	rpm	Direct drive type 12,000 (Opt. 15,000)(Opt. Built-in type 20,000)	
<b>Travel</b>	X/Y/Z axis travel	mm	1,200/800/500	1,320+272/1,040/610
	Spindle nose to table	mm	150-650	200-810
<b>Feed</b>	X/Y/Z axis rapid traverse	m/min	30/30/30	30/30/24
	Cutting feedrate	mm/min	1-10,000	1-10,000
<b>ATC</b>	Tool shank		BBT-40 (Opt. HSK-A63)	BBT-40 (Opt. HSK-A63)
	Tool capacity	pc	16 (Opt. 40)	20 (Opt. 30/40)
	Max. tool diameter	mm	16 tools : Ø125/40 tools : Ø70	Ø115
	Max. tool diameter (w/o adjacent tool)	mm	Ø125	Ø200
	Max. tool length	mm	300	300
	Max. tool weight	kg	8	7
<b>Motor</b>	Spindle motor	kW	11/7.5 (Opt. 15/11/7.5, 40/30)	
	X/Y/Z axis servo motor	kW	7.0/7.0/7.0	7.0/7.0/7.0
	Coolant motor	kW	0.37×2	0.37×2
<b>Machine size</b>	Width×depth×height	mm	4,390×3,350×3,370	4,050×3,480×3,100
	Weight	kg	13,000	14,300



## Five-Axis Vertical Machining Center



MDV-551-5AXII



CT-350

Item	Specification	Unit	MDV-551-5AXII	CT-350
<b>Table</b>	Table size (L×W)	mm	Ø500	Ø350
	Max. loading capacity	kg	400	200
	Table height from floor	mm	1,130	1,100
	Max. workpiece dimension (diameter×height)	mm	Ø670×375 (Shape limited)	Ø380×220 (Shape limited)
	A/C axis min. indexing increment	deg	0.001°	
<b>Spindle</b>	Spindle taper		7/24 Taper No. 40	
	Spindle speed	rpm	Built-in type 15,000 (Opt. 20,000)	Direct drive type 15,000 (Opt. 20,000)
<b>Travel</b>	X/Y/Z axis travel	mm	510/530/450	400/510/510
	Spindle nose to table	mm	170-620	50-560
	A axis travel	deg	+30° ~ -120°	
	C axis travel	deg	±360°	
<b>Feed</b>	X/Y/Z axis rapid traverse	m/min	48/48/48	36/36/30
	A/C axis rapid traverse	rpm	30/50 (Roller gear)	33.3/40 (Roller gear)
	Cutting feedrate	mm/min	1-20,000	1-20,000
<b>ATC</b>	Tool shank		BBT-40 (Opt. HSK-A63)	
	Tool capacity	pc	16 (Opt. 30/60)	24 (Opt. 30/40)
	Max. tool diameter	mm	Ø110 (Opt. 60 支刀 : Ø95)	Ø76
	Max. tool diameter (w/o adjacent tool)	mm	- (Opt. 60 支刀 : Ø125)	Ø125
	Max. tool length	mm	300	
	Max. tool weight	kg	8	7
<b>Motor</b>	Spindle motor	kW	40/40 (Opt. 40/30)	7.5/11/15 (Opt. 40/30)
	X/Y/Z axis servo motor	kW	8.6/8.6/8.6	2.7/2.7/4
	Coolant motor	kW	0.37×2	0.82×1, 1.09×1
<b>Machine size</b>	Width×depth×height	mm	3,250×2,400×3,270	2,150×3,280×3,060
	Weight	kg	11,000	7,000
<b>Controller</b>			Heidenhain TNC640	Fanuc 0i-MF (Opt. Siemens 840D)

## Five-Axis Vertical Machining Center

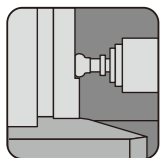


GT-630



GT-800

Item	Specification	Unit	GT-500	GT-630	GT-800
<b>Table</b>	Table size (L×W)	mm	Ø500	Ø630	Ø800
	Max. loading capacity	kg	400	600	1,000
	Table height from floor	mm	800	900	1,100
	Max. workpiece dimension (diameter×height)	mm	Ø600×400	Ø800×500 (Shape limited)	Ø1,000×600
	A/C axis min. indexing increment	deg	0.001°		
<b>Spindle</b>	Spindle taper		7/24 Taper No. 40		
	Spindle speed	rpm	Built-in type 15,000 (Opt. 20,000)		
<b>Travel</b>	X/Y/Z axis travel	mm	610/610/510	760/820/560	850/1,020/610
	Spindle nose to table	mm	130-640	150-710	150-760
	A axis travel	deg	+30° ~ -120°		
	C axis travel	deg	±360°		
<b>Feed</b>	X/Y/Z axis rapid traverse	m/min	48/48/48		
	A/C axis rapid traverse	rpm	50/100 (DD motor)	50/100 (DD motor)	16/30 (DD motor 16/50)
	Cutting feedrate	mm/min	1-20,000		
<b>ATC</b>	Tool shank		BBT-40 (Opt. HSK-A63)		
	Tool capacity	pc	32 (Opt. 40)	32 (Opt. 40/64/80)	30 (Opt. 40/64/80)
	Max. tool diameter	mm	Ø80		
	Max. tool diameter (w/o adjacent tool)	mm	Ø125		
	Max. tool length	mm	300		
	Max. tool weight	kg	8		
<b>Motor</b>	Spindle motor	kW	40/40 (Opt. 42/35)		
	X/Y/Z axis servo motor	kW	4.4/8.17/4.84	6.5/8.6/8.6	
	Coolant motor	kW	0.37×2		
<b>Machine size</b>	Width×depth×height	mm	2,100×4,100×3,225	2,200×5,400×3,390	3,250×5,660×3,855
	Weight	kg	16,000	16,000	28,000
<b>Controller</b>			Heidenhain TNC640 / Siemens 840D / Fanuc 0i-MF		



## Horizontal Machining Center



TMH-400

Item	Specification	Unit	TMH-400	TMH-500
<b>Table</b>	Table size (L×W)	mm	Ø400	Ø500
	Max. loading capacity	kg	350	700
	Table height from floor	mm	1,150	1190
	Max. workpiece dimension (diameter×height)	mm	Ø510×H630	Ø700×H700
	B axis min. indexing increment	deg	0.001°	1° (Opt. 0.001°)
<b>Spindle</b>	Spindle taper		7/24 Taper No. 40	7/24 Taper No. 50
	Spindle speed	rpm	8,000 (Opt. 10,000, 12,000)	3,500 (Opt. 6,000)
<b>Travel</b>	X/Y/Z axis travel	mm	510/510/510	710/600/600
	Spindle nose to table	mm	50-560	140-740
<b>Feed</b>	X/Y/Z axis rapid traverse	m/min	36/36/36	48/48/48
	Cutting feedrate	mm/min	1-10,000	1-10,000
<b>ATC</b>	Tool shank		BT-40	BT-50
	Tool capacity	pc	24 (Opt. 30)	24
	Max. tool diameter	mm	Ø89 (Opt. 30 tools : Ø75)	Ø110
	Max. tool diameter (w/o adjacent tool)	mm	Ø140 (Opt. 30 tools : Ø125)	Ø200
	Max. tool length	mm	300	350
	Max. tool weight	kg	7	15
<b>Motor</b>	Spindle motor	kW	11/7.5	15/11
	X/Y/Z axis servo motor	kW	3.0/4.0/4.0	4.0/7.0/4.0
	Coolant motor	kW	0.55×1/1.1	0.55×1/1.1
<b>Machine size</b>	Width×depth×height	mm	3,200×1,700×2,790	3,650×2,000×3,120
	Weight	kg	6,500	9,500

## Horizontal Machining Center

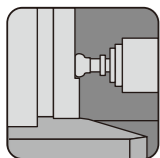


SH-4000P



SH-5000P

Item	Specification	Unit	SH-4000(P)	SH-4500(P)	SH-5000(P)
<b>Table</b>	Table size (L×W)	mm	400×400	400×400(Opt. 500×500)	500×500
	Max. loading capacity	kg	400	450	500
	Table height from floor	mm	1,100	1,200	1,200
	Max. workpiece dimension (diameter × height)	mm	Ø550×H800	Ø630×H900	Ø800×H1,000
	B axis min. indexing increment	deg	0.001°		
<b>Spindle</b>	Spindle taper		7/24 Taper No. 40		
	Spindle speed	rpm	15,000		
<b>Travel</b>	X/Y/Z axis travel	mm	510/510/510	630/630/730	730/730/830
	Spindle center to table	mm	80-590	80-710	80-810
	Spindle nose to table	mm	70-580	70-800	70-900
<b>Feed</b>	X/Y/Z axis rapid traverse	m/min	60/60/60		
	Cutting feedrate	mm/min	1-20,000		
<b>ATC</b>	Tool shank		BT-40(Opt. BBT40)		
	Tool capacity	pc	40 (Opt. 60)		
	Max. tool diameter	mm	Ø75		
	Max. tool diameter (w/o adjacent tool)	mm	Ø170		
	Max. tool length	mm	300	450	550
	Max. tool weight	kg	8		
<b>Motor</b>	Spindle motor	kW	37/26/18.5		
	X/Y/Z axis servo motor	kW	5.5/5.5/4.5		
	Coolant motor	kW	1.5×5		
<b>Machine size</b>	Width×depth×height	mm	1,750×4,210(5,060)×2,720	2,200×4,745(5,700)×2,985	2,290×4,885(5,840)×2,985
	Weight	kg	8,100(8,700)	11,100(11,800)	11,700(12,400)



## Horizontal Machining Center



HA-400II/500II



HB-500II



HB-630

Item	Specification	Unit	HA-400II	HA-500II	HB-500II	HB-630	HB-800II
<b>Table</b>	Table size (L×W)	mm	400×400	500×500	500×500	630×630	800×800
	Max. loading capacity	kg	400×2	500×2	600×2	1,200×2	1,800×2
	Table height from floor	mm	1,150	1,150	1,150	1,300	1,392
	Max. workpiece dimension (diameter × height)	mm	Ø630×H800	Ø800×H1,000	Ø900×H1,000	Ø11,00×H1,100	Ø1,300×H1,250
	B axis min. indexing increment	deg	1° (Opt. 0.001°)			1° (Opt. 0.001°)	
<b>Spindle</b>	Spindle taper		7/24 Taper No. 40			7/24 Taper No. 50	
	Spindle speed	rpm	Built-in type 12,000			Built-in type 10,000	Built-in type 10,000 (Opt. gear box type 6,000)
<b>Travel</b>	X/Y/Z axis travel	mm	610/580/580	710/680/680	800/710/710	1,050/850/970	1,400/1,200/1,300
	Spindle center to table	mm	80-660	80-760	50-760	100-950	100-1,300
	Spindle nose to table	mm	70-650	70-750	150-860	100-1,070	150-1,450
<b>Feed</b>	X/Y/Z axis rapid traverse	m/min	60			60	50
	Cutting feedrate	mm/min	1-20,000			1-20,000	
<b>ATC</b>	Tool shank		BT-40 (Opt. BBT40)			BT-50 (Opt. BBT50)	
	Tool capacity	pc	60 (Opt. 90/120)			60 (Opt. 90/120)	
	Max. tool diameter	mm	Ø75			Ø125	
	Max. tool diameter (w/o adjacent tool)	mm	Ø150			Ø250	
	Max. tool length	mm	410			610	
	Max. tool weight	kg	12			25	
<b>Motor</b>	Spindle motor	kW	25/22			25/30	
	X/Y/Z axis servo motor	kW	5.5/5.5/4.5			5.5/9/4.5	7/9/7
	Coolant motor	kW	0.55×3/1.1	0.55×3/1.1	0.55×3/1.1	0.55×3/1.1	0.55×3/1.1
<b>Machine size</b>	Width×depth×height	mm	2,550×4,893×2,878	2,650×5,170×3,075	3,125×6,209×3,124	3,510×7,484×3,325	4,535×8,803×3,875
	Weight	kg	9,500	12,200	14,500	21,600	22,000

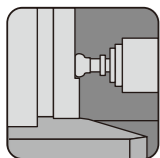
## Horizontal Machining Center



HG-1250

Item	Specification	Unit	HG-800	HG-1250
<b>Table</b>	Table size (L×W)	mm	800×800	1,250×1,250
	Max. loading capacity	kg	1,600×2	4,000×2
	Table height from floor	mm	1,100	1,300
	Max. workpiece dimension (diameter × height)	mm	Ø1,400×H1,100	Ø1,970×H1,500
	B axis min. indexing increment	deg	0.001°	
<b>Spindle</b>	Spindle taper		7/24 Taper No. 50	
	Spindle speed	rpm	4,500 (Opt. 6,000)	3,600 (Opt. 6,000)
<b>Travel</b>	X/Y/Z axis travel	mm	1,120/950/850	2,000/1,400/1,250
	Spindle center to table	mm	0-950	0-1,400
	Spindle nose to table	mm	250-1,100	400-1,650
<b>Feed</b>	X/Y/Z axis rapid traverse	m/min	20	
	Cutting feedrate	mm/min	1-5,000	1-10,000
<b>ATC</b>	Tool shank		BT-50 (Opt. BBT50)	
	Tool capacity	pc	60 (Opt. 90/120)	
	Max. tool diameter	mm	Ø125	
	Max. tool diameter (w/o adjacent tool)	mm	Ø250	
	Max. tool length	mm	610	
	Max. tool weight	kg	25	
<b>Motor</b>	Spindle motor	kW	22/18.5	
	X/Y/Z axis servo motor	kW	4/7/7	6/9/6
	Coolant motor	kW	0.55×1/1.1×2	0.55×1/1.1×2
<b>Machine size</b>	Width×depth×height	mm	5,930×3,940×3,370	5,740×6,070×4,040
	Weight	kg	18,500	40,850





## Horizontal 5-axis machining center



HTT-1250



HTH-800

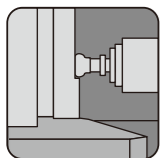
Item	Specification	Unit	HTT-1250	HTH-800 Two pallets (single pallet)
<b>Table</b>	Table size (L×W)	mm	1,250×1,250	800×800
	Max. loading capacity	kg	4,000×2	2400×2
	Table height from floor	mm	2,255	1290
	T-slot (size×No.)	mm	18×7	18×5
	Max. workpiece dimension (diameter×height)	mm	Ø1,800×H1,000	Ø1500×H1100
	A/B axis min. indexing increment	deg	0.001°	0.001°
<b>Spindle</b>	Spindle taper		7/24 Taper NO.50	7/24 Taper NO.50
	Spindle speed	rpm	8,000	6,000(Opt. 8000)
<b>Travel</b>	X/Y/Z axis travel	mm	2,000/1,800/1,250	1,550/1,500/1,250(1,600)
	Spindle nose to table	mm	400~1,650	-295~1,205
	Spindle center to table	mm	-600~1,200	-25~1,475
	A axis travel	deg	+60°~-105°	+60°~-105°
	B axis travel	deg	360	360
<b>Feed</b>	X/Y/Z axis rapid traverse	m/min	10	10
	A/B axis rapid traverse	rpm	5	10/5
	Cutting feedrate	mm/min	1~5,000	1~5,000
<b>ATC</b>	Tool shank	m/min	BT-50	CAT-50
	Tool capacity	pc	60(Opt. 90/120)	60(Opt. 90/120)
	Max. tool diameter	mm	Ø125	Ø120
	Max. tool diameter(w/o adjacent tool)	mm	Ø250	Ø250
	Max. tool length	mm	610	610
	Max. tool weight	kg	25	25
<b>Motor</b>	Spindle motor	kw	26/22	30/36
	X/Y/Z axis servo motor	kw	10.5/8.2/8.2	-
	Coolant motor	kw	3	-
<b>Machine size</b>	Width×depth×height	mm	7,544×10,824×5,298	6,500×8,300×4,100
	Weight	kg	30,000	30,000(25,000)
<b>Controller</b>			SIEMENS 840Dsl	SIEMENS 840Dsl

## Horizontal Machining Center

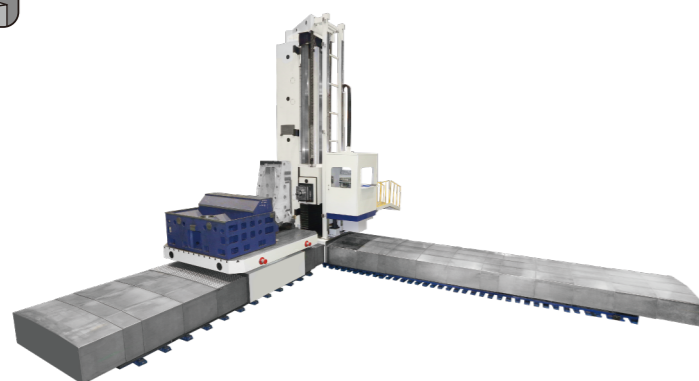


TFH-100M

Item	Specification	Unit	TFH-100M	
<b>Spindle</b>	Spindle nose (DIN 69893)		HSK-A63	
	Spindle speed	rpm	15,000	
	Max. Spindle torque	Nm	Low:195 / High:47.7	
	Distance between twin-spindle unit	mm	-	
	<b>Travel</b>	X axis	Single-spindle unit	mm
		Twin-spindle unit	mm	-
Y axis			mm	560+200 (tool changing)
	Z axis		mm	530
<b>Feed</b>	X/Y/Z axis rapid traverse	m/min	62/62/62	
	X/Y/Z axis acceleration	G	0.6/1.2/1.46	
<b>ATC</b>	Tool change time (C to C)	sec	4.5	
	Tool capacity	Single-spindle unit	pc	25 (Limited to single machine)
		Twin-spindle unit	pc	-
	Max. tool diameter		mm	95
	Max. tool diameter (w/o adjacent tool)		mm	180
	Max. tool length		mm	300
	Max. tool weight		kg	8
<b>Coolant pressure</b>	Coolant through spindle	bar	20	
	External coolant	bar	1-3	
<b>Controller</b>			FANUC 0i-MF	



## Horizontal Boring and Milling Machine

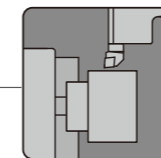


Floor Type  
TBF-160



Table Type  
TBT-130/160

Item	Specification	Unit	TBF-160	TBT-130H	TBT-160 [+APC]
<b>Table</b>	Table size	mm	No.1/No.2 table 3,000×3,500/2,500×3,000	1,600×1,800	2,000×2,000 (Opt 2,000×2,500/2,500×2,500)
	Max. loading capacity	kg	No.1/No.2 table 65,000/40,000	12,000	15000 (Opt 20,000, 25,000)
	Min. index positioning	deg	0.001°	0.001°	0.001°
	Table locking		90°×4 positions by lock pin	90°×4 positions by lock pin	90°×4 positions by lock pin
	T-slot (size×No.)		-	22×7	28×9
	Rotating speed	rpm	-	3	2.5
	<b>Spindle</b>	Quill diameter	mm	Ø160	Ø130
Spindle speed		rpm	6-3,500	2,500	3,500
Spindle transmission			3 step	2 step	2 step
Max. spindle torque		Nm	5,000	1,015/1,616 (Opt. 1,813/2,236)	2,400(S1) / 4,057(S3)
Spindle taper			7/24 Taper No. 50	7/24 Taper No. 50	7/24 Taper No. 50
<b>Travel</b>	X axis travel	mm	5,000-25,000	3,000	3,000 (Opt 4,000, 5,000)
	Y axis travel	mm	3,000 (Opt 4,000, 5,000)	1,800 / 2,300	2,500 (Opt 3,000)
	Z axis travel	mm	1,200	1,600 / 2000	2,200 (Opt 2,700)
	W axis travel	mm	1,000	700	800
<b>Feed</b>	X/Y/Z/W axis rapid traverse	m/min	20/20/20/20	12/12/12/12	25/25/25/25
	Cutting feedrate	mm/min	1-5,000	1-5,000	1-5,000
	V axis rapid traverse	m/min	10	-	-
<b>ATC</b>	Tool shank		BT-50 (Opt BBT-50)	BT-50 (Opt BBT-50)	BT-50 (Opt BBT-50)
	Tool capacity	pc	60 (Opt 90/120)	60	60 (Opt. 90/120)
	Max. tool diameter	mm	Ø125	Ø125	Ø125
	Max. tool diameter (w/o adjacent tool)	mm	Ø250	Ø250	Ø250
	Max. tool length	mm	610	610	610
	Max. tool weight	kg	35	25	35
<b>Motor</b>	Spindle motor	kW	60	22/26/35	52
	X/Y/Z/W/B axis servo motor	kW		6/9/6/4/7	12/12/12/9.74/9.74 [6/6/6/6/6]



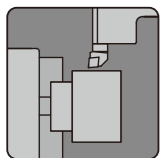
## CNC Lathe



HS-22+Loader

Item	Specification	Unit	HS-22	HS-22M
<b>Turning capacity</b>	Max. swing diameter	mm	Ø220	
	Max. swing diameter over saddle	mm	-	
	Max. turning diameter	mm	Ø220 (includes robot arm Ø100)	
	Max. turning length	mm	200 (includes robot arm 50)	
<b>Spindle</b>	Spindle nose		* A2-5 [A2-6/A2-6]	
	Spindle speed	rpm	* 6,000 [4,800/4,500]	
	Chuck O.D.	inch	6" (Opt. 8")	
	Through-spindle hole diameter	mm	* Ø35 [Ø56/Ø62]	
	Bar capacity	mm	* Ø26 [Ø44/Ø51]	
	Spindle bearing diameter	mm	* Ø65 [Ø85/Ø100]	
<b>Turret</b>	Tool capacity	pc	12 (Opt. 8)	-
	O.D. tool	mm	20×20	-
	I.D. tool	mm	Ø32	-
<b>Power turret</b>	Tool capacity	pc	-	12 (VDI-40)
	Motor	kW	-	5.5/3.7
	O.D. tool	mm	-	25×25
	I.D. tool	mm	-	Ø32
	Max. speed	rpm	-	6,000
<b>Travel</b>	X/Z axis travel	mm	155/220	
<b>Feed</b>	X/Z axis rapid traverse	m/min	20/20 (Opt. linear guide 24/30)	
	Cutting feedrate	mm/rev	0.001-5,000	
<b>Tailstock (Opt.)</b>	Tailstock/Quill travel	mm	165 (Manual)/50	
	Center taper		MT#3	
	Center diameter	mm	Ø90	
	Driving system		Manual	
<b>Robotic arm (Opt.)</b>	X/Y/C axis rapid traverse	m/min	30/30/(0.6 sec/180°)	
	X/Y/C servo motor	kW	0.4/0.4/0.4	
	Clamp capacity	kg	3×2	
	Loading/Unloading time (inner/outer)	sec	5/15	
<b>Hydraulic unit</b>	Hydraulic tank capacity	L	30	
	Hydraulic motor	kW	1.5	
<b>Coolant unit</b>	Coolant tank capacity	L	65	
	Coolant motor	kW	0.37	
<b>Motor</b>	Spindle motor	kW	11/7.5	15/11
	X/Z axis servo motor	kW	1.8/1.8	
<b>Machine size</b>	Width×depth×height	mm	1,410×1,450×1,730	1,560×1,450×1,730
	Weight	kg	2,350	

\* — Ø65 mm — Ø85 mm — Ø100 mm Spindle bearing diameter



## Gang Type CNC Lathe



Q5



A1500

## CNC Lathe (With 90° Vertical Saddle )

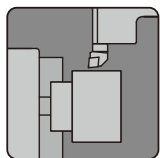


TNL-100T

Item	Specification	Unit	Q5	A1500
<b>Turning capacity</b>	Max. swing diameter	mm	Ø230	Ø300
	Max. swing diameter over saddle	mm	-	-
	Max. turning diameter	mm	Ø100 (includes robot arm Ø50)	Ø150
	Max. turning length	mm	100 (includes robot arm 40)	350
<b>Spindle</b>	Spindle nose		A2-4	A2-5 (Opt. A2-6)
	Spindle speed	rpm	6,000 (Opt. 8,000)	4,800 (Opt. 4,500)
	Chuck O.D.	inch	5" (Opt. 4" pneumatic chuck)	6" (Opt. 8")
	Through-spindle hole diameter	mm	Ø35	Ø56 (Opt. Ø66)
	Bar capacity	mm	Ø26	Ø44 (Opt. Ø51)
	Spindle bearing diameter	mm	Ø70	Ø80 (Opt. Ø100)
<b>Turret</b>	Tool capacity	pc	2-5 pectens (Depend on workpiece)	2-5 pectens (Depend on workpiece)
	O.D. tool	mm	16×16	20×20
	I.D. tool	mm	Ø20	Ø32
<b>Travel</b>	X/Z axis travel	mm	220/220	320/400
<b>Feed</b>	X/Z axis rapid traverse	m/min	30/30	30/30
	Cutting feedrate	mm/rev	0.001-5,000	0.001-5,000
<b>Robotic arm (Opt.)</b>	X/Y/C axis rapid traverse	m/min	90/90/(0.3 sec/90°)	-
	X/Y/C servo motor	kW	0.4/0.4/0.2	-
	Clamp capacity	kg	0.6×2	-
	Loading/Unloading time (inner/outer)	sec	5/15	-
<b>Hydraulic unit</b>	Hydraulic tank capacity	L	12	12
	Hydraulic motor	kW	0.75	0.75
<b>Coolant unit</b>	Coolant tank capacity	L	90	150
	Coolant motor	kW	1.1 (for tool) /0.37 (for machine bed)	
<b>Motor</b>	Spindle motor	kW	5.5/3.7	12/11/7.5
	X/Z axis servo motor	kW	0.75/0.75	1.8/1.8
<b>Machine size</b>	Width×depth×height	mm	1,520×2,090×1,610	1,990×1,820×1,750
	Weight	kg	2,500	2,450

Q5 with robot arm  
2,050×2,090×2,250

Item	Specification	Unit	TNL-100T [L]	TNL-120T [L]	TNL-130T [L]
<b>Turning capacity</b>	Max. swing diameter	mm	Ø400		
	Max. swing diameter over saddle	mm	Ø310		
	Max. turning diameter	mm	Ø320 (Opt. power turret Ø285)		
	Max. turning length	mm	400[600]		
<b>Spindle</b>	Spindle nose		A2-6	A2-8	
	Spindle speed	rpm	3,000 (Opt. 4,500)	2,500 (Opt. 3,500)	
	Chuck O.D.	inch	8"(Opt. 10")	10"(Opt. 12")	
	Through-spindle hole diameter	mm	Ø62	Ø76	Ø86
	Bar capacity	mm	Ø51	Ø64	Ø74
	Spindle bearing diameter	mm	Ø100	Ø120	Ø130
<b>Turret</b>	Tool capacity	pc	12 (Opt. 8)		
	O.D. tool	mm	25×25		
	I.D. tool	mm	Ø40		
<b>Power turret (Opt.)</b>	Tool capacity	pc	12 (VDI-40)		
	Motor	kW	5.5/3.7		
	O.D. tool	mm	25×25		
	I.D. tool	mm	Ø40		
	Max. speed	rpm	6,000		
<b>Travel</b>	X/Z axis travel	mm	200/400[600]		
<b>Feed</b>	X/Z axis rapid traverse	m/min	24/30		
	Cutting feedrate	mm/rev	0.001-5,000		
<b>Tailstock</b>	Tailstock/Quill stroke	mm	400[600]-		
	Center taper		MT#5		
	Center diameter	mm	Ø56		
	Driving system		Hydraulic		
<b>Hydraulic unit</b>	Hydraulic tank capacity	L	30		
	Hydraulic motor	kW	1.5		
<b>Coolant unit</b>	Coolant tank capacity	L	170[190]		
	Coolant motor	kW	0.37		
<b>Motor</b>	Spindle motor	kW	9/7.5 [15/11]	15/11	
	X/Z axis servo motor	kW	3.0/3.0		
<b>Machine size</b>	Width×depth×height	mm	2,350×1,860×2,010 [2,580×1,790×2,010]		
	Weight	kg	4,300[4,700]	4,300[4,700]	4,300[4,700]



## CNC Lathe



MT-2000

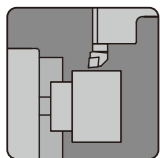
## CNC Lathe (With 30° Slant Saddle)



TC-2000

Item	Specification	Unit	MT-1500	MT-1500M	MT-2000	MT-2000M
<b>Turning capacity</b>	Pitch of two spindles	mm	440		440	
	Max. swing diameter	mm	Ø210		Ø210	
	Max. swing diameter over saddle	mm	Ø230		Ø230	
	Max. turning diameter	mm	Ø210 (with robot Ø120)		Ø210 (with robot Ø120)	
	Max. turning length	mm	145 (with robot 100)		145 (with robot100)	
<b>Spindle</b>	Spindle nose		A2-5		A2-6	
	Spindle speed	rpm	4500 (Opt. 6,000 )		4500 (Opt. 3,000)	
	Chuck O.D.	inch	6"		8"	
	Through-spindle hole diameter	mm	Ø56		Ø66	
	Spindle bearing diameter	mm	Ø80		Ø100	
	Min. CS axis indexing increment	deg	-	0.001°	-	0.001°
<b>Turret</b>	Tool capacity	pc	12 (Opt. 8)	-	12 (Opt. 8)	-
	O.D. tool	mm	25x25	-	25x25	-
	I.D. tool	mm	Ø32	-	Ø32	-
<b>Power turret (Opt.)</b>	Tool capacity	pc	-	12(VDI-40)	-	12(VDI-40)
	Motor	kW	-	5.5/3.7	-	5.5/3.7
	O.D. tool	mm	-	25x25	-	25x25
	I.D. tool	mm	-	Ø32	-	Ø32
	Max. speed	rpm	-	5,000	-	5,000
<b>Travel</b>	X/Z axis travel	mm	155/155		155/155	
<b>Feed</b>	X/Z axis rapid traverse	m/min	30/30		30/30	
	Cutting feedrate	mm/min	0.001-5,000		0.001-5,000	
<b>Hydraulic unit</b>	Hydraulic tank capacity	L	30		30	
	Hydraulic motor	kW	1.5		1.5	
<b>Coolant unit</b>	Coolant tank capacity	L	220		220	
	Coolant motor	kW	1.1x2		1.1x2	
<b>Motor</b>	Spindle motor	kW	11/7.5/5.5		15/11/7.5	
	X/Z axis servo motor	kW	1.8/1.8		1.8/1.8	
<b>Machine size</b>	Width×depth×height	mm	4,200×2,845×3,120		4,200×2,845×3,120	
	Weight	kg	6,000	6,200	6,500	6,700

Item	Specification	Unit	TC-1500	TC-1500M	TC-2000	TC-2000L	TC-2000M	TC-2000LM	TC-2500	TC-2500L	TC-2500M	TC-2500LM
<b>Spindle bearing diameter</b>		mm	Ø80		Ø100				Ø120 / Ø130			
<b>Turning capacity</b>	Max. swing diameter	mm	Ø520		Ø520				Ø520			
	Max. swing diameter over saddle	mm	Ø320		Ø320				Ø320			
	Max. turning dia.	mm	Ø300 (12V) Ø320 (8V)	Ø280 -	Ø300 (12V) Ø320 (8V)		Ø280 -		Ø300 (12V) Ø320 (8V)		Ø280 -	
	Max. turning length	mm	400	300	400	600	300	500	400	600	300	500
	Spindle	Spindle nose		A2-5		A2-6				A2-8		
	Spindle speed	rpm	4,800		4,500 (Opt. 3,000)				2,500 (Opt. 3,500)			
	Chuck O.D.	inch	6"		8"				10"			
	Through-spindle hole dia.	mm	Ø56		Ø62				Ø76 / Ø86			
	Bar capacity	mm	Ø44		Ø51				Ø64 / Ø74			
<b>Turret</b>	Tool capacity	pc	12 (Opt. 8)	-	12 (Opt. 8)		-	-	12 (Opt. 8)		-	-
	O.D. tool	mm	25×25	-	25×25		-	-	25×25		-	-
	I.D. tool	mm	Ø32/Ø40	-	Ø32/Ø40		-	-	Ø32/Ø40		-	-
	Driving system		Servo	-	Servo		-	-	Servo		-	-
<b>Power Turret</b>	Tool capacity	pc	-	12 (VDI-40)	-	-	12 (VDI-40)	-	-	-	12 (VDI-40)	-
	Motor	kW	-	5.5/3.7	-	-	5.5/3.7	-	-	-	5.5/3.7	-
	O.D. tool	mm	-	25×25	-	-	25×25	-	-	-	25×25	-
	I.D. tool	mm	-	Ø40	-	-	Ø40	-	-	-	Ø40	-
	Max. speed	rpm	-	6,000	-	-	6,000	-	-	-	6,000	-
<b>Travel</b>	X/Z axis travel	mm	170/400	200/400	170/400	170/600	200/400	200/600	170/400	170/600	200/400	200/600
<b>Feed</b>	X/Z axis rapid traverse	m/min	30/30		30/30				30/30			
	Cutting feedrate	mm/rev	0.001-5000		0.001-5,000				0.001-5,000			
<b>Tailstock</b>	Tailstock/Quill stroke	mm	275/100		275/100	500/100	275/100	500/100	275/100	500/100	275/100	500/100
	Center taper		MT#4		MT#4				MT#5			
	Center diameter	mm	Ø75		Ø75				Ø75			
	Driving system		Manual		Manual				Manual			
	<b>Hydraulic unit</b>	Hydraulic tank capacity	L	30		30				30		
	Hydraulic motor	kW	1.5		1.5				1.5			
<b>Coolant unit</b>	Coolant tank capacity	L	95		95				95			
	Coolant motor	kW	0.55×1		0.55×1				0.55×1			
<b>Motor</b>	Spindle motor	kW	9/7.5		15/11				15/11			
	X/Z axis servo motor	kW	1.8/1.8		1.8/1.8				1.8/1.8			
<b>Machine size</b>	Width×depth×height (TC)	mm	3,370×2,150×2,480	3,370×2,150×2,480	3,630×2,150×2,480	3,370×2,150×2,480	3,630×2,150×2,480	3,370×2,150×2,480	3,630×2,150×2,480	3,370×2,150×2,480	3,630×2,150×2,480	3,630×2,150×2,480
	Width×depth×height (TCS)	mm	3,240×1,820×2,380	3,440×1,820×2,380	3,240×1,820×2,380	3,440×1,820×2,380	3,240×1,820×2,380	3,440×1,820×2,380	3,240×1,820×2,380	3,440×1,820×2,380	3,240×1,820×2,380	3,440×1,820×2,380
	Weight	kg	3,250	3,350	3,300	3,900	3,400	4,000	3,400/3,500	4,000/4,100	3,500/3,600	4,100/4,200



## CNC Lathe (Box-Way Type)



TNL-130AL (45° Slant Bed)

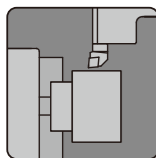
Item	Specification	Unit	TNL-130ALII [0.7M/1M/1.6M/2M]	TNL-160A [0.7M/1M/1.6M/2M]
<b>Turning capacity</b>	Max. swing diameter	mm	Ø620	
	Max. swing diameter over saddle	mm	Ø410	
	Max. turning diameter	mm	Ø550	
	Max. turning length	mm	680 [980/1,580/1,980]	
<b>Spindle</b>	Spindle nose		A2-8	A2-11
	Spindle speed	rpm	3,500 (Opt. 2,500)	2,500
	Chuck O.D.	inch	10" (Opt. 12")	12" (Opt. 15")
	Through-spindle hole diameter	mm	Ø90	Ø105
	Bar capacity	mm	Ø75	Ø90
	Spindle bearing diameter	mm	Ø130 Single spindle/Gear box	Ø160 Single spindle
<b>Turret</b>	Tool capacity	pc	12 (Opt. 10")	
	O.D. tool	mm	25×25 (Opt. 32×32)	
	I.D. tool	mm	Ø40 (Opt. Ø50)	
<b>Power turret (Opt.)</b>	Tool capacity	pc	12 (BMT-65)	
	Motor	kW	5.5/3.7	
	O.D. tool	mm	25×25	
	I.D. tool	mm	Ø40	
	Max. speed	rpm	4,500	
<b>Travel</b>	X/Z axis travel	mm	285(260+25) / 680 [980/1,580/1,980]	
<b>Feed</b>	X/Z axis rapid traverse	m/min	20/24	
	Cutting feedrate	mm/rev	0.001-5.00	
<b>Tailstock</b>	Tailstock/Quill stroke	mm	680+100 [980+100/1,580+100/1,980+100]	
	Center taper		MT#5 (Opt. Enforced built-in MT#4)	
	Center diameter	mm	Ø100	
	Driving system		Carries by z axis (Opt. servo)	
<b>Hydraulic unit</b>	Hydraulic tank capacity	L	40	
	Hydraulic motor	kW	2.25	
<b>Coolant unit</b>	Coolant tank capacity	L	300[350/420/550]	
	Coolant motor	kW	1.3	
<b>Motor</b>	Spindle motor with gear box	kW	18.5/15	-
	Spindle motor	kW	22/18.5/15 (Opt. 30/22/18.5)	
	X/Z/B axis servo motor	kW	4.0/4.0/4.0	
<b>Machine size</b>	Wide×depth×height	mm	4,165 [4,465/5,065/5,465]×1,835×2,145	
	Weight	kg	6,500 [6,900/7,200/7,500]	7,200 [7,600/7,900/8,200]

## CNC Lathe (Box-Way Type)



THL-620LM (45° Slant Bed)

Item	Specification	Unit	THL-620	THL-620L	THL-620XL
<b>Turning capacity</b>	Max. swing diameter	mm	Ø780		
	Max. swing diameter over saddle	mm	Ø620		
	Max. turning diameter	mm	Ø620		
	Max. turning length	mm	1,100	1,900	2,900
<b>Spindle</b>	Spindle nose		A2-11		
	Spindle speed	rpm	2,500 (Opt. 2,000)		
	Chuck O.D.	inch	15" (Opt. 18")		
	Through-spindle hole diameter	mm	Ø105 (Opt. Ø125)		
	Bar capacity	mm	Ø90 (Opt. Ø116)		
	Spindle bearing diameter	mm	Ø160 (Opt. Ø180)		
<b>Turret</b>	Tool capacity	pc	12		
	O.D. tool	mm	32×32		
	I.D. tool	mm	Ø50		
<b>Power turret (Opt.)</b>	Tool capacity	pc	12 (BMT-75)		
	Motor	kW	15/11		
	O.D. tool	mm	32×32		
	I.D. tool	mm	Ø50		
	Max. speed	rpm	3,000		
<b>Travel</b>	X/Z axis travel	mm	365/1,200	365/2,000	365/3,000
<b>Feed</b>	X/Z axis rapid traverse	m/min	20/20		
	Cutting feedrate	mm/rev	0.001-5.000		
<b>Tailstock</b>	Tailstock/Quill stroke	mm	990/150	1,790/150	2,790/150
	Center taper		MT#5		
	Center diameter	mm	Ø150		
	Driving system		Carries by Z axis		
<b>Hydraulic unit</b>	Hydraulic tank capacity	L	40		
	Hydraulic motor	kW	2.2		
<b>Coolant unit</b>	Coolant tank capacity	L	240	290	400
	Coolant motor	kW	1.1×1 / 1.3×1		
<b>Motor</b>	Spindle motor with gear box	kW	37/30		
	Spindle motor	kW	37/30		
	X/Z axis servo motor	kW	4.0/7.0		
	<b>Machine size</b>	Wide×depth×height	mm	4,350×2,100×2,280	5,500×2,100×2,280
	Weight	kg	11,400	13,300	17,000

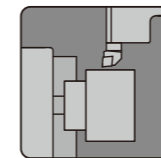


## CNC Lathe (With 60° Slant Saddle)



TA-25MB

Item	Specification	Unit	TA-20 [TA-20B]	TA-20M [TA-20MB]	TA-25 [TA-25B]	TA-25M [TA-25MB]
<b>Turning capacity</b>	Max. swing diameter	mm	Ø620	Ø620	Ø620	Ø620
	Max. swing diameter over saddle	mm	Ø440	Ø440	Ø440	Ø440
	Max. turning diameter	mm	Ø450	Ø380	Ø450	Ø380
	Max. turning length	mm	630	630	630	630
<b>Spindle</b>	Spindle nose		A2-6	A2-6	A2-8	A2-8
	Spindle speed	rpm	4,500	4,500	3,500	3,500
	Chuck O.D.	inch	8"	8"	10"	10"
	Through-spindle hole diameter	mm	Ø62	Ø62	Ø78	Ø78
	Bar capacity	mm	Ø51	Ø51	Ø64	Ø64
	Spindle bearing diameter	mm	Ø100	Ø100	Ø120	Ø120
	Spindle center to floor	mm	1,140	1,140	1,140	1,140
	Min. CS axis indexing increment	deg	-	0.001°	-	0.001°
<b>Sub-spindle</b>	Spindle nose		- [A2-5]	- [A2-5]	- [A2-5]	- [A2-5]
	Spindle speed	rpm	- [5,000]	- [5,000]	- [5,000]	- [5,000]
	Through-spindle hole diameter	mm	- [Ø35]	- [Ø35]	- [Ø35]	- [Ø35]
	Spindle bearing diameter	mm	- [Ø90]	- [Ø90]	- [Ø90]	- [Ø90]
	Min. CS axis indexing increment	deg	-	- [0.001°]	-	- [0.001°]
<b>Turret</b>	Tool capacity	pc	12 B/H	-	12 B/H	-
	O.D. tool	mm	25×25	-	25×25	-
	I.D. tool	mm	Ø40	-	Ø40	-
	Driving system		Servo	-	Servo	-
<b>Power turret</b>	Tool shank		-	VDI-40	-	VDI-40
	Tool capacity	pc	-	12	-	12
	O.D. tool	mm	-	25×25	-	25×25
	I.D. tool	mm	-	Ø40	-	Ø40
	Max. speed	rpm	-	6,000	-	6,000
	Motor	kW	-	5.5/3.7	-	5.5/3.7
	Max. tool diameter	mm	-	Dia. 20/M16	-	Dia. 20/M16
<b>Travel</b>	X/Z/B axis travel	mm	260/660/- [700]	260/660/- [700]	260/660/- [700]	260/660/- [700]
	X/Z/B axis rapid traverse	m/min	30/30/- [24]	30/30/- [24]	30/30/- [24]	30/30/- [24]
<b>Feed</b>	Cutting feedrate	mm/rev	0.001-5,000	0.001-5,000	0.001-5,000	0.001-5,000
	Tailstock travel	mm	700	700	700	700
<b>Tailstock</b>	Center taper		MT#5	MT#5	MT#5	MT#5
	Driving system		Hydraulic (Opt. servo)	Hydraulic (Opt. servo)	Hydraulic (Opt. servo)	Hydraulic (Opt. servo)
	Hydraulic tank capacity	L	30	30	30	30
<b>Hydraulic unit</b>	Hydraulic motor	kW	1.5	1.5	1.5	1.5
	Coolant tank capacity	L	170	170	170	170
<b>Coolant unit</b>	Coolant motor	kW	0.37	0.37	0.37	0.37
	Spindle motor	kW	15/11	15/11	15/11	15/11
<b>Motor</b>	Sub-spindle motor	kW	- [7.5/5.5]	- [7.5/5.5]	- [7.5/5.5]	- [7.5/5.5]
	X/Z/B axis servo motor	kW	4.0/3.0/- [1.6]	4.0/3.0/- [1.6]	4.0/3.0/- [1.6]	4.0/3.0/- [1.6]
	Width×depth×height	mm	2,940×1,850×2,140 [3,540×2,050×2,210]	2,940×1,850×2,140 [3,540×2,050×2,210]	2,940×1,850×2,140 [3,540×2,050×2,210]	2,940×1,850×2,140 [3,540×2,050×2,210]
<b>Machine size</b>	Weight	kg	4,700	4,900	5,500	5,700

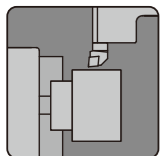


## Multi-Tasking Turning Center



TD-2000YBC

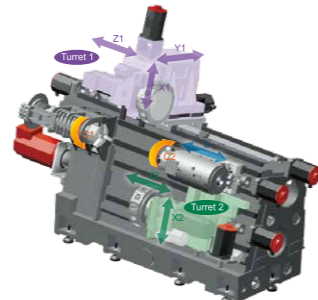
Item	Specification	Unit	TD-2000Y	TD-2000YBC	TD-2500Y	TD-2500YBC
			12V BMT-65 Tool		12V BMT-65 Tool	
Turning capacity	Spindle bearing diameter	mm	Ø100			Ø120/130
	Max. swing diameter	mm	Ø700			Ø700
	Max. swing diameter over saddle	mm	Ø310			Ø310
	Max. turning diameter	mm	Ø360			Ø360
Spindle	Max. turning length	mm	530			530
	Spindle nose		A2-6			A2-8
	Spindle speed	rpm	4500 (Opt. 3000)			3500 (Opt. 2500)
	Chuck size	inch	8"			10"
Sub-spindle	Through-spindle hole diameter	mm	Ø62			Ø77/Ø86
	Bar capacity	mm	Ø51 (Opt. built-in type Ø51)			Ø74
	Min. CS axis indexing increment	deg	0.001°			0.001°
	Spindle nose		-	A2-5	-	A2-5
Power turret	Spindle speed	rpm	-	5000	-	5000
	Chuck size	inch	-	6"	-	6" (Opt.8")
	Through-spindle hole diameter	mm	-	Ø35	-	Ø35
	Spindle bearing diameter	mm	-	Ø90	-	Ø90
Feed	Min. CS axis indexing increment	deg	-	0.001°	-	0.001°
	Tool shank		BMT-65		BMT-65	
	Tool capacity	pc	12		12	
	O.D. tool	mm	25×25		25×25	
	I.D. tool	mm	Ø40		Ø40	
	Max. speed	rpm	6000		6000	
	Spindle motor	kW	5.5/3.7		5.5/3.7	
Hydraulic tailstock	Max. tool diameter	mm	Dia. 20/M16		Dia. 20/M16	
	X/Z axis travel	mm	230/±51/600	230/±51/600/630	230/±51/600	230/±51/600/630
	X/Z axis rapid traverse	m/min	30/15/30	30/15/30/30	30/15/30	30/15/30/30
	Cutting feedrate	mm/min	0.001-5,000		0.001-5,000	
Servo type tailstock (Opt.)	Tailstock travel	mm	600	-	600	-
	Center taper		MT4	-	MT4	-
	Center diameter	mm	100	-	100	-
Hydraulic unit	Tailstock travel	mm	600	-	600	-
	Center travel	mm	80	-	80	-
	Center taper		MT4	-	MT4	-
Coolant unit	Center diameter	mm	100	-	100	-
	Hydraulic tank capacity	L	30		30	
Motor	Hydraulic motor	kW	1.5		1.5	
	Coolant tank capacity	L	400		400	
Machine size	Coolant motor	kW	0.55		0.55	
	Spindle motor	kW	18.5/15/11		18.5/15/11	
	Sub-spindle motor	kW	-	7.5/5.5	-	7.5/5.5
Machine size	X/Y/Z/B axis servo motor	kW	4.5/2.7/4.5	4.5/2.7/4.5/2.7	4.5/2.7/4.5	4.5/2.7/4.5/2.7
	Width×depth×height	mm	3290×2180×2337		3290×2180×2337	
Machine size	Weight	kg	5,900	6,400	6,100	6,600



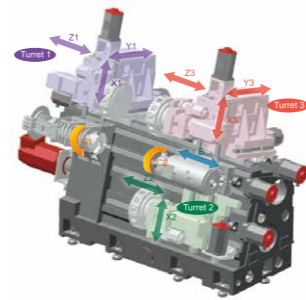
## Multi-Tasking Turning Center



TMT 2000 Series

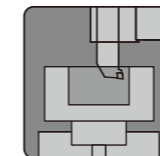


TMT2000-T2Y1



TMT2000-T3Y2

Item	Specification	Unit	TMT2000-T3Y2	TMT2000-T2Y2	TMT2000-T2Y1	TMT2000-T2	
<b>Turning capacity</b>	Max. swing diameter	mm	Ø720				
	Max. swing diameter over saddle	mm	Ø310				
	Max. turning diameter	mm	Ø320				
	Max. turning length	mm	600				
<b>Spindle</b>	Spindle nose		A2-6				
	Spindle speed	rpm	4,500 (Opt. 6,000)				
	Chuck O.D.	inch	8				
	Through-spindle hole diameter	mm	Ø76 (Opt. Ø62)				
	Bar capacity	mm	Ø65 (Opt. Ø51)				
	Spindle bearing diameter	mm	Ø100				
	Spindle center to floor	mm	1,300				
<b>Sub-spindle</b>	Min. CS axis indexing increment	deg	0.001				
	Spindle nose		A2-6				
	Spindle speed	rpm	6,000				
	Chuck O.D.	inch	8				
	Through-spindle hole diameter	mm	Ø62				
	Bar capacity	mm	Ø51				
	Spindle bearing diameter	mm	Ø100				
<b>Power turret</b>	Min. CS axis indexing increment	deg	0.001°				
	Tool shank		12V: BMT-65 (Opt. VDI-40) 16V: BMT-55				
	Tool capacity	pc	12x3 (Opt. 16)	12x2 (Opt. 16)			-
	O.D. tool	mm	25x25				
	I.D. tool	mm	Ø40				
	Max. speed	rpm	5,000				
	Motor	kW	5.5/3.7				
<b>Travel</b>	Max. tool diameter	mm	Dia. 20/M16				
	X1/X2/X3 axis travel	mm	230/205/230	230/-/230	230/205/-	230/205/-	
	Y1/(Y2)/Y3 axis travel	mm	±51/-/±51	±51/-/±51	±51/-/-	-	
	Z1/Z2/Z3/B axis travel	mm	440/600/440/680	440/-/440/680	600/600/-/680	600/600/-/680	
<b>Feed</b>	X/Y/Z/B axis rapid traverse	m/min	36/15/36/30	36/15/36/30	36/15/36/30		
	Cutting feedrate	mm/rev	0.001-5000				
<b>Hydraulic unit</b>	Hydraulic tank capacity	L	40				
	Hydraulic motor	kW	3HPx4P				
<b>Coolant unit</b>	Coolant tank capacity	L	500				
	Coolant motor (T1/T2/T3)	kW	0.55/1.1/0.55				
<b>Motor</b>	Spindle motor	kW	15/11				
	Sub-spindle motor	kW	18.5/11				
	X/Y/Z/B axis servo motor	kW	4/3/4/3			4/-/4/3	
<b>Machine size</b>	Width×depth×height	mm	4,100×2,600×2,500				
	Weight	kg	10,630	10,000	9,500	9,500	



## Vertical CNC Lathe



TVL-40 (Left side spindle)



TVL-30-D4 (Dual-spindles and dual-turrets)

Item	Specification	Unit	TVL25-S2	TVL-40 / TVL-40R	TVL-40M / TVL-40RM	TVL-30-D4
<b>Turning capacity</b>	Max. swing diameter	mm	Ø370	Ø700		Ø480
	Max. swing diameter over saddle	mm	Ø370	-		-
	Max. turning diameter	mm	Ø370	Ø520	Ø370 (Opt. Ø640)	Ø450
	Max. turning height	mm	300	350		350
<b>Spindle</b>	Spindle nose		A2-6 (Opt. A2-8)	A2-8		A2-8
	Spindle speed	rpm	3,000 (Opt. 2,250)	2,250		2,250
	Chuck O.D.	inch	8" (Opt. 10")	12" (Opt. 15")		12"×2 (Opt. 15"×2)
	Through-spindle hole diameter	mm	Ø40 (Opt. Ø56)	Ø55 (Opt. Ø57)		Ø55 (Opt. Ø57)
	Spindle bearing diameter	mm	Ø100 (Opt. Ø120)	Ø120 (Opt. Ø130)		Ø120×2 (Opt. Ø130×2)
	<b>Turret</b>	Tool capacity	pc	8 (Servo)	8	-
O.D. tool		mm	25×25	25×25	-	25×25
I.D. tool		mm	Ø40	Ø40	-	Ø40
<b>Power turret</b>	Tool capacity	pc	-	-	12 (VDI-50)	-
	O.D. tool	mm	-	-	32×25	-
	I.D. tool	mm	-	-	Ø50	-
	Max. speed	rpm	-	-	4,000	-
	Motor	kW	-	-	5.5/3.7	-
<b>Travel</b>	X/Z axis travel	mm	290/400	285/390 (Opt. 500/600)		285×2/390×2
<b>Feed</b>	X/Z axis rapid traverse	m/min	30/24	20/24 (Opt. box-way16/16)		Box-way 16/16
	Cutting feedrate	mm/rev	0.001-5,000	0.001-5,000		0.001-5,000
<b>Hydraulic unit</b>	Hydraulic tank capacity	L	30	30		100
	Hydraulic motor	kW	1.5	1.5		2.25
<b>Coolant unit</b>	Coolant tank capacity	L	200	280		280
	Coolant motor	kW	0.37/1.1	0.37/1.5		0.37×2/1.5
<b>Motor</b>	Spindle motor	kW	15/11 (Opt. 18.5/15)	22/18.5		22/18.5×2 (Opt. 30/22×2)
	X/Z axis servo motor	kW	3.0/3.0	3.0/7.0		3.0/7.0
<b>Machine size</b>	Width×depth×height	mm	1,370×2,820×2,430	1,840×3,450×3,060		3,240×3,760×3,180
	Weight	kg	4,900	8,000		12,000

(TVL-40 Left side spindle) (TVL-40M Left side spindle)  
 (TVL-40R Right side spindle) (TVL-40RM Right side spindle)

## Inverted Vertical CNC Lathe (With Stocker)



TGL-15



TGL-30

Item	Specification	Unit	TGL-15	TGL-15C	TGL-15D		TGL-20	TGL-30
					OP10	OP20		
Turning capacity	Max. swing diameter	mm	Ø300	Ø300	Ø300		Ø450	Ø650
	Max. swing diameter over saddle	mm	-	-	-		-	-
	Max. turning diameter	mm	Ø100	Ø100 (Ø140)	Ø100		Ø370 (Feed Ø200)	Ø500 (Feed Ø300)
	Max. turning height	mm	100	100	100		150	220
	Max. workpiece weight	kg	6	6 (Ø100)/12 (Ø140)	6		20	50
Spindle (Built-in motor)	Spindle nose		A2-5	A2-5	A2-5		A2-6	A2-8
	Spindle speed	rpm	4,500	4,500	4,500		4,500	3,500
	Chuck O.D.	inch	6" (Opt. 8")	6" (Opt. 8")	6" (Opt. 8")		8" (Opt. 10")	10" (Opt. 12")
	Through-spindle hole diameter	mm	Ø35	Ø35	Ø35		Ø62	Ø80
Turret	Spindle bearing diameter	mm	Ø90	Ø90	Ø90		Ø100	Ø130
	Tool capacity	pc	12	12	12	12 (VDI)	12	12
	O.D. tool	mm	25×25	25×25	25×25	VDI-30	25×25	25×25
Travel	I.D. tool	mm	Ø32	Ø32	Ø32	VDI-30	Ø40	Ø40
	X/Z axis travel	mm	180+120/260	180+560/260	180+120/260		260+1,050/370	300+1,660/600
Feed	X/Z axis rapid traverse	m/min	36/36	36/36	30/30		30/30	30/30
	Cutting feedrate	mm/rev	0.001-500	0.001-500	0.001-500		0.001-500	0.001-500
Hydraulic unit	Hydraulic tank capacity	L	30	30	40		30	30
	Hydraulic motor	kW	1.5	1.5	2.25		1.5	1.5
Coolant unit	Coolant tank capacity	L	120	120	220		125	210
	Coolant motor	kW	0.37	0.37	0.55×2		0.37	0.37
Motor	Spindle motor	kW	7.5/5.5	7.5/5.5	7.5/5.5		18.5/11	30/22
	X/Z axis servo motor	kW	3.0/4.0	3.0/4.0	3.0/4.0		3.0/4.0	4.0/7.0
Machine size	Width×depth×height	mm	2,660×1,030×2,410	2,750×1,680×2,410	1,780×1,750×2,400		2,840×2,840×2,690	3,440×3,640×3,330
	Weight	kg	3,600	3,000	5,100		5,000	9,700

## Total-Solution for Aluminum Wheel Machining



TVW-26DT Vertical CNC Lathe



TVW-26T



HS-40W Mirror Turning CNC Lathe

Item	Specification	Unit	TVW-22DT	TVW-22T	TVW-26DT	TVW-26T	TVW-28DT	TVW-28T	HS-36WII	HS-40W
	Chuck type		Finger jaw (Opt.)		Finger jaw (Opt.)		Finger jaw (Opt.)		Finger jaw (Opt.)	
Spindle	Spindle nose		A2-11		A2-11		A2-11		A2-11	
	Spindle speed	rpm	2,500		2,000		2,000		2,500	2,000
	Spindle bearing diameter	mm	Ø160		Ø160		Ø160		Ø160	
Turret	Tool capacity	pc	6+6	6	6+6	6	6+6	6	10	8
	O.D. tool	mm	32×32		32×32		32×32		32×32	
	I.D. tool	mm	Ø50		Ø50		Ø50		Ø50	
Travel	X axis travel (Left/Right)	mm	450	450	500/500	500	540/540	540	350	385
	Z axis travel (Left/Right)	mm	450	450	525/525	525	750/750	750	740	750
Feed	X/Z axis rapid traverse	m/min	20/20		20/20		20/20		16/20	
	Cutting feedrate	mm/rev	0.001-5,000		0.001-5,000		0.001-5,000		0.001-5,000	
Hydraulic unit	Hydraulic tank capacity	L	80		80		80		40	
	Hydraulic motor	kW	3.75		3.75		3.75		2.25	
Coolant unit	Coolant tank capacity	L	650	450	750	600	750	600	425	475
	Coolant motor	kW	2.2×1+1.1×1	2.2×1	2.2×1+1.1×1	2.2×1	2.2×1+1.1×1	2.2×1	2.2×1	
Motor	Spindle motor	kW	55/45	45/37	55/45	45/37	75/60	45/37	37/30	
	X/Z axis servo motor	kW	4.0/7.0		4.0/7.0		4.0/7.0		4.0/4.0	4.0/7.0
Machine size	Width×depth×height	mm	3,570×4,240×3,220	2,430×4,008×3,175	4,210×4,080×3,640	2,770×4,000×3,650	4,210×4,170×4,080	2,540×4,060×4,080	4,600×2,080×2,200	4,900×2,450×2,420
	Weight	kg	15,500	10,000	19,800	12,850	23,000	15,000	7,000	10,000



## Total-Solution for Aluminum Wheel Machining



MA-24AW Horizontal Aluminum Wheel Drilling Machine



TMV-1050W

Item	Specification	Unit	MA-24AW	TMV-850W	TMV-1050W	TMV-1100W
Turning Capacity	Aluminum wheel	inch	O.D. : 14"~24" Height : 4"~13"	O.D. : 14"~22" Height : 4"~11.5"		O.D. : 14"~26" Height : 4"~10.5"
	Machining		P.C.D hole : Max. 195mm Valve : Max. 45° P.C.D back inverse chamfer	Valve : Max. 25° P.C.D back inverse chamfer		
	Chuck type		Special Jigs with 1°NC INDEX 4th-axis (Opt.)	Special Jigs with 1°NC INDEX 4th-axis (Opt.)		
Spindle	Spindle nose		7/24 Taper No. 40	7/24 Taper No.40		
	Spindle speed	rpm	7,000	8,000 (Opt. 10,000)		
	Spindle bearing diameter	mm	Ø75	Ø70		
ATC	Tool capacity	pc	ATC : 24	24		
	Max. tool diameter	mm	Ø110	Ø89		
	Max. tool length	mm	350	300		
Travel	X/Y/Z axis travel	mm	710/710/500	850/650/610	1,050/650/610	1,100/762/710
Feed	X/Y/Z axis rapid traverse	m/min	40/36/40	48/48/48		30/30/30
	Cutting feedrate	mm/min	1-10,000	1-10,000		
Hydraulic unit	Hydraulic tank capacity	L	30	30		
	Hydraulic motor	kW	1.5	1.5		
Coolant unit	Coolant tank capacity	L	550	730		
	Coolant motor	kW	0.75×3	0.55		
Motor	Spindle motor	kW	22/18.5	15/11		
	X/Y/Z axis servo motor	kW	7.0/4.0×2/3.0	4.0/4.0/7.0		
Machine size	Width×depth×height	mm	2,900×3,890×2,920	3,000×2,650×2,940	3,090×2,300×3,100	3,000×4,112×3,395
	Weight	kg	11,700	6,500	7,300	9,800

## Numerical Control Drilling Machine



SD-116/216/516/616/716

## Numerical Control Routing Machine



TRM-622

Specification	Unin	SD-116	SD-216	SD-516	SD-616	SD-716	SD-616B
Number of stations	axis	1	2	5	6	7	6
Working area	mm	660×760	550×690	660×760	550×690	470×690	625×760
Spindle max. rpm	rpm	160,000 (Opt. 180,000 200,000 250,000)					
Tool magazine capacity	pcs	400	300	400	400	400	350
Drill diameter	mm	0.1~6.35					
X-Y axis rapid traverse speed	m/min	50					
Z axis rapid traverse speed	m/min	30					
Positioning accuracy	mm	0.005					
Repeatability accuracy	mm	0.0025					
Drilling/Router accuracy	mm	0.05					
Controller		SIEB & MEYER CNC 84.00					
Pneumatic pressure	kg/cm <sup>2</sup>	7					
Air consumption	L/min	150	300	800	1,000	1,165	1,000
Power requirement	KVA	10	10	20	20	20	20
Dimension	mm	1,930×2,230×1,690	2,330×2,180×1,690	4,580×2,180×1,690	4,580×2,180×1,690	4,580×2,180×1,690	5,160×2,180×1,770
Weight	kg	3,600	4,000	11,200	11,200	11,200	11,200

Specification	Unin	TRM-122	TRM-222	TRM-422	TRM-522	TRM-526	TRM-526L	TRM-622
Number of stations	axis	1	2	4	5	5	5	6
Working area	mm	560×720	560×720	560×720	560×720	674×720	674×813	560×720
Spindle max. rpm	rpm	60,000 (Opt 80,000)						
Tool magazine capacity	pcs	100						
Drill diameter	mm	0.75-3.175						
X-Y axis rapid traverse speed	m/min	30						
Z axis rapid traverse speed	m/min	15						
Positioning accuracy	mm	±0.005						
Repeatability accuracy	mm	±0.0025						
Drilling/Router accuracy	mm	±0.05						
Pin size	mm	3.175						
Controller		SIEB & MEYER CNC 82AS						
Air consumption	L/min	60/72	60/144	60/288	60/360	60/360	60/360	60/440
Power requirement	kVA	1.5	2.8	2.8	3.8	4	4	4
Dimension	mm	1447×2180×1616	1892×2180×1616	3032×2180×1616	3602×2180×1616	4172×2180×1616	4172×2180×1616	4172×2180×1616
Weight	kg	2300	3000	4700	7000	7000	7000	7000

## CO2 Laser Drilling Machine



## V-Scoring System & Roll to Roll CO2 Laser Drilling Machine



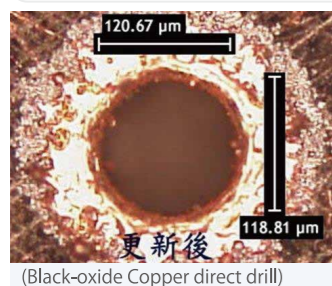
V-Scoring System Machine  
CVC-700

Roll to Roll CO2 Laser Drilling Machine  
TLC-2R25

### TLC-2H22 Features

2 heads / 2 panels working table	Low power consumption	Chinese and English version support
High speed galvano 3,000 pps×2 galvano (1 mm pitch)	Copper hole polishing	Copper direct drilling (DLD)

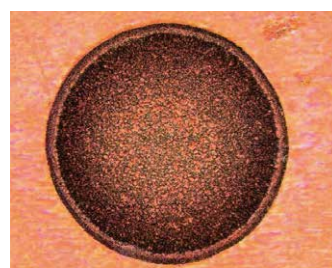
### Process



(Black-oxide Copper direct drill)



(Brown-oxide Copper direct drill Φ85 μm)



(Φ125 μm via in copper and polyimide)

Specifacaton	Unit	TLC-2H22
Dimension	mm	4,080(W)x2,100(D)x1,850(H)
Weight	kg	7,500
Power		220V 3P 60Hz 20KVA
Pneumatic	kg/cm <sup>2</sup>	5~6
Air consumption	L/min	Max.1,200
Laser type	μm	9.4 CO2 Laser
Max. average power	W	350
Pulse frequency	Hz	100~10,000
Pulse width	μs	2~100
Max. working range	mm	560x620x 2Panels
Rapid traverse	m/min	50
Positioning accuracy	μm	±3
Scan range	mm	70x70 (Opt. 25x25, 50x50)
Scan accuracy	μm	±10
Loading/unloading tpye		Movable cart
Loading/unloading time	sec	<10
Board size	mm	Min.300x300 Max.560x620
Board thickness	mm	0.3~3.0 (Opt. 0.1~1.5)

### CVC-700 Features

- Built-in spindle motor ensures the transmission of motive force
- High rigidity spindle motor ensures production quality
- Able to input outer tool diameter directly and automatically adjust residual thickness, which greatly reduces the required configuration time
- Direct positioning of the tools by the servo motor improves production quality
- Able to set different residual thickness when repeating the process in the same location
- Able to preview the V-scoring production after modification to avoid errors
- Able to set up to 20 jumps per axis (Jump and V-Scoring combined)
- Equipped with automatic loader/unloader, capable of unmanned operations for long hours
- Able to perform cutting and jump cutting of materials with tooling
- Able to configure tool revolution speed and feed rate
- Loading failure detection
- Able to customize the order of the machining process
- Tool cooling system
- Tool lubricating system

Item	Unit	CVC-700
Controller		CNC controller
Motor		Servo-driver
Auto. mode max. working area	mm	720×380
Manual mode max. working area	mm	720×550
V-Score mode max. working area	mm	Min. : 50×70 (50×50 with tooling) ; Max. : 720×550
Jump cut		Max. 20 pitches (Linear + Jump)
Spindle type		Built-in spindle motor (750W)
Max. blade speed	rpm	10,000
Linear working speed	m/min	Max. 28
Z axis jump cut federate	m/min	Max. 10
Working Thickness	mm	0.4~3.2
X/Y/Z axis rapid traverse		28/40/10
Cutting accuracy	mm	±0.05
Blade dimension	mm	Ø130 x t2~2.5
Vacuum sensor		Yes
Load/Unload		Yes
Max. load for auto. load/unload	kg	70
Power voltage		AC 220V
LCD display		Chinese/English
Operating panel		Chinese/English
Nameplate description		Chinese/English
Vacuum method		Vacuum dust & Funnel type chip removal
Vacuum		1600/45 CFM/CMM
Three tier light tower		R (Error) / G (Working) / Y (Finish)
Pneumatic pressure	kg/cm <sup>2</sup>	6
Air consumption	L/min	300
Dimension	mm	L 3,040×W 2,270×H 1,320
Weight	kg	2,000

Item	TLC-2R25
Dimension	3400x2220x2250mm
Power	220V 3P 60Hz 20kVA
Pneumatic	5~6kg/cm <sup>2</sup> ( 100psi )
Air consumption	1000L/min( Max )
Laser type	9.4μm CO2 Laser
Max. average power	350W
Pulse frequency	100~10,000Hz
Pulse width	10~100μs
Max. working range	260x420mm( Max )
Rapid traverse	30m/min
Positioning accuracy	±5μm
Scan range	65x65mm
Scan accuracy	±10μm
Weight	7000kg