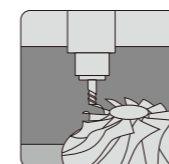


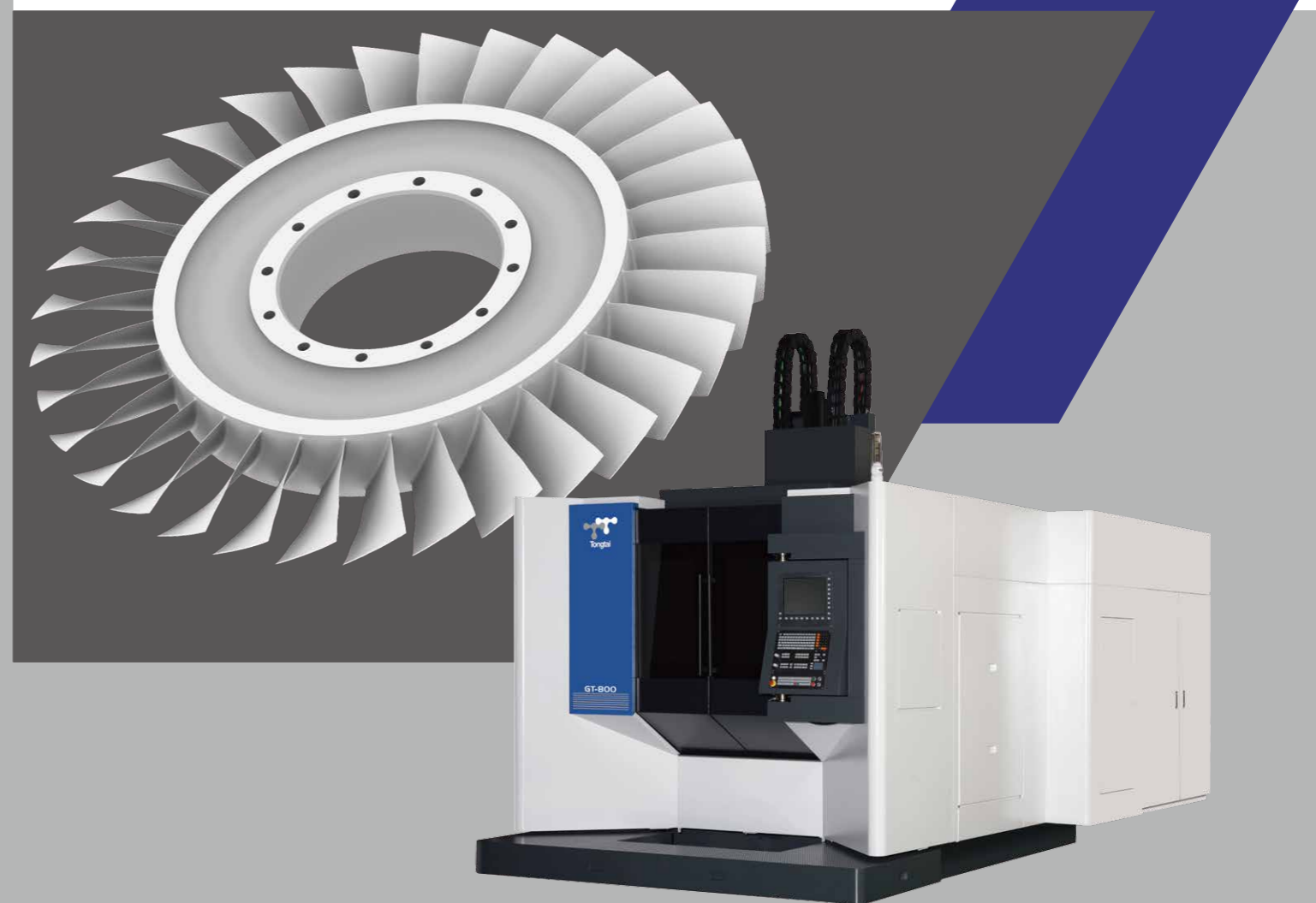
Five-Axis Vertical Machining Center
GT Series





Five-Axis Vertical Machining Center

GT Series



Tongtai Machine & Tool Co., Ltd.

Headquarters

No.3, Luke 3rd Rd., Luzhu Dist., Kaohsiung City 82151, Taiwan

TEL : 886-7-9761588 FAX : 886-7-9761589

www.tongtai.com.tw

Taoyuan Branch	TEL : 886-3-4551399	FAX : 886-3-4559730
Taichung Branch	TEL : 886-4-23589600	FAX : 886-4-23589993
Japan Branch	TEL : 81-4-71438355	FAX : 81-4-71438360
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
Vietnam Branch	TEL : 84-4-62766090	
Thailand Branch	TEL : 66-2-7443440	FAX : 66-2-3986518
Indonesia Office	TEL : 62-21-45850875	FAX : 62-21-45850876

China Operation Center

Shuzhou Tong-yu Machine & Tool Co., Ltd.

No.555 Huahong Rd., Economic Development Zone of Wujiang, Suzhou City, Jiangsu Province, China

TEL : 86-512-63430168

FAX : 86-512-63431622

E-mail : sales@tong-yu.com.cn

Wuhan Branch	TEL : 86-27-84586587	FAX : 86-27-84853595
Chongqing Branch	TEL : 86-23-67865925	FAX : 86-23-67867717
Guandong Branch	TEL : 86-769-81158198	FAX : 86-769-81158108
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

Honor Seiki Co., Ltd.	Asia Pacific Elite Corp.	Quick-Tech Machinery Co., Ltd	PCI-SCEMM - rue Copernic	ANGER Machining GmbH
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



GT Series 2016.12.01



www.tongtai.com.tw

GT Series



- GT Series is developed for aerospace, mold, and automotive parts machining. According to the machining requirements, 15,000/20,000/24,000 rpm spindle are both available for selection.
- Gantry type structure, the control of three linear axes, which are free from affect of workpiece weight, and the driven centers of three axes are all on these gravity center. It significantly improves dynamic stability.
- The optimized force route design on spindle saddle, it minimizes spindle overhang and improves the stability and rigidity during machining.

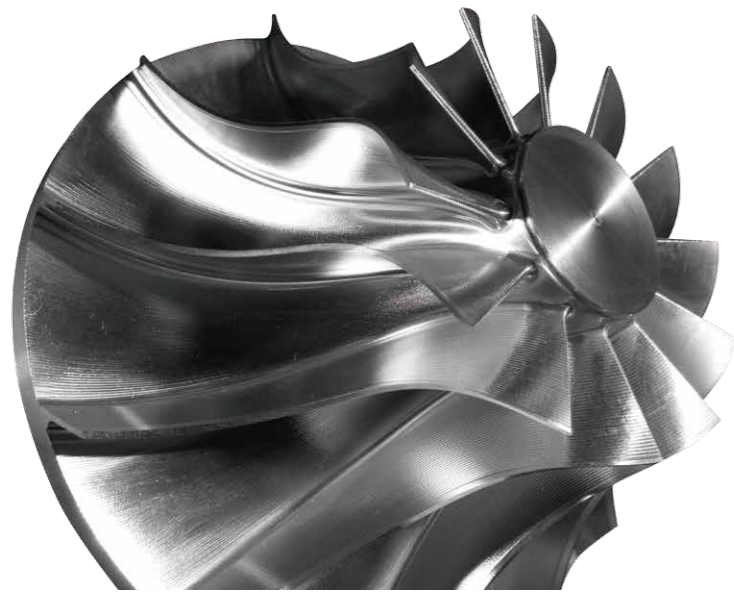


Main specification

	GT-500	GT-630	GT-800E	GT-800
Spindle	15,000/20,000/24,000 rpm built-in type spindle			
	Rapid traverse 48 m/min			
X/Y/Z axis	X/Y/Z axis □45 mm	X/Y/Z axis □45 mm		X/Z axis □45, Y axis □55mm
	high precision roller guide way	high rigidity roller guide way		high rigidity roller guide way
	X axis Ø40, Y/Z axis Ø45 mm	X/Z axis Ø40 mm, Y axis Ø50 mm		X/Y/Z axis Ø50 mm
	high precision ballscrew	high precision ballscrew		high precision ballscrew
A/C axis rotary table	A axis : DD motor type			A axis : Roller gear cam type
	C axis : DD motor type			C axis : Roller gear cam type (Opt. DD motor type)
Table size	Ø500 mm	Ø630 mm	Ø800 mm	Ø800 mm
Max. workpiece dimension	Ø600×H400 mm	Ø800×H500 mm	Ø900×H500 mm	Ø1,000×H600 mm

Industry applications

Industry applications



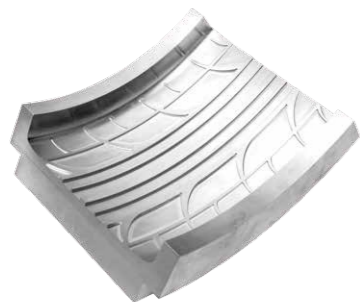
Energy industry

Workpiece : Impeller
Material : A6061(JIS)



Energy industry

Workpiece : Impeller
Material : A6061(JIS)



Mold industry

Workpiece : Tire mold
Material : A6061(JIS)



Aerospace industry

Workpiece : Blisk
Material : SUS 630(JIS)



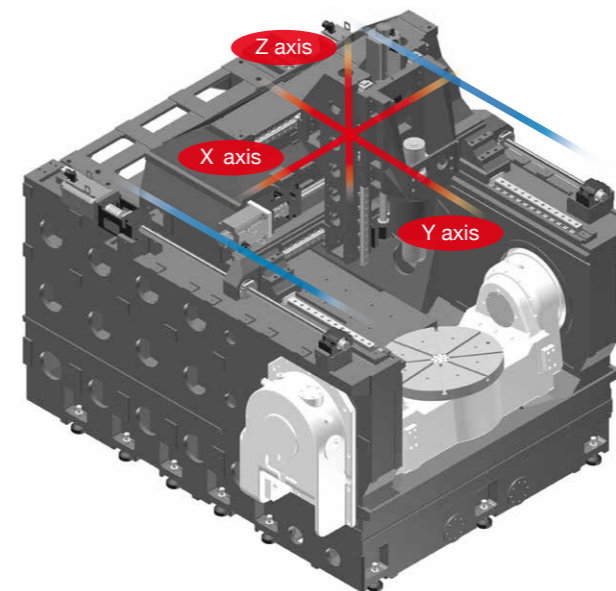
Aerospace industry

Workpiece : Blade
Material : SUS 630(JIS)

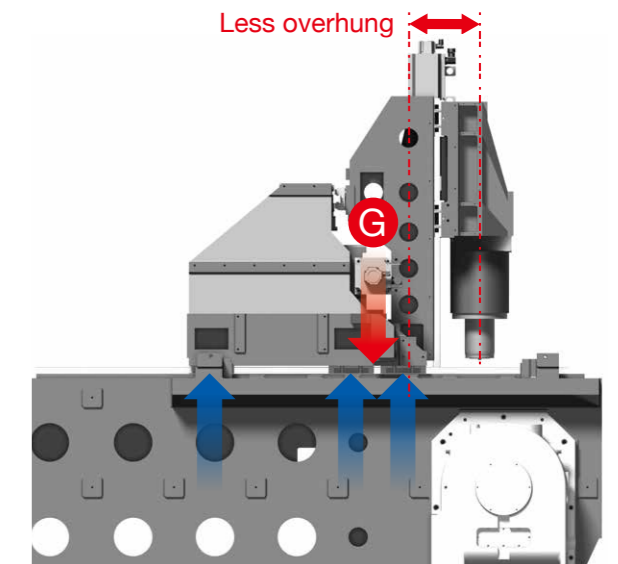
Main structure

Driven at the center of gravity

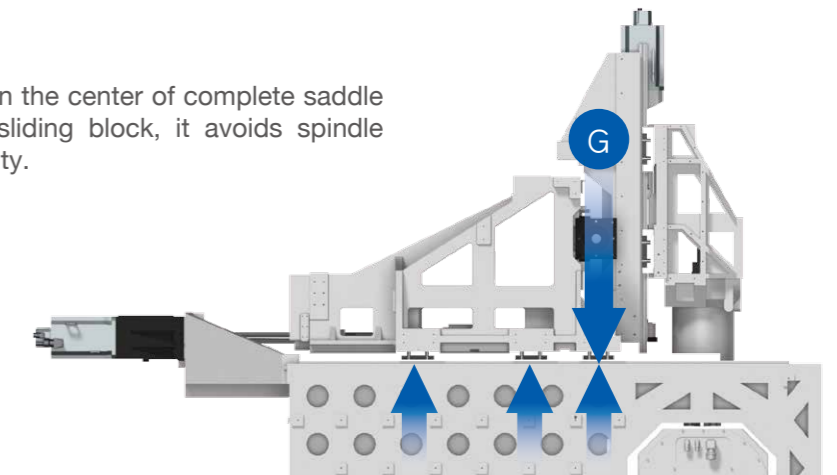
- The driven centers of three axes are all on these gravity center. It dramatically improves dynamic stability.



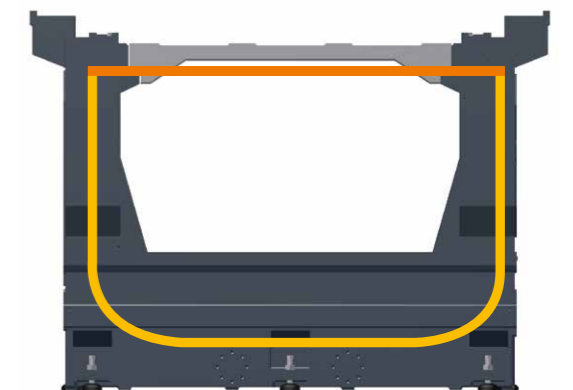
- The shortest force route between Z-axis and X-axis to optimize the weight of structure and increase machining rigidity.



- The gravity center of Y-axis moving is in the center of complete saddle falls within the supporting range of sliding block, it avoids spindle overhang and improves dynamic stability.



- An enclosed structure design enhances complete structure rigidity.



Main structure

GT-500 Table

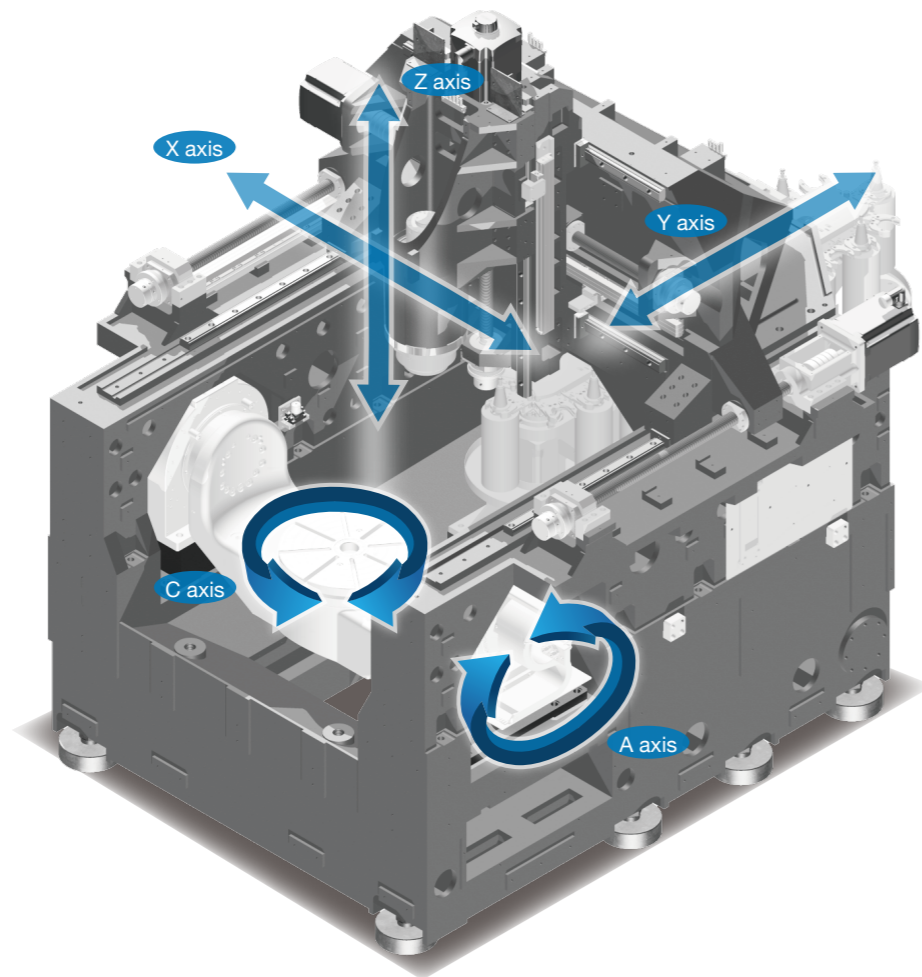
Rotary axis, tilting axis
DD motor driving
Features of high speed and high accuracy

Stroke

X/Y/Z axis 610/610/510 mm
A/C axis 150(+30°~-120°)/360° mm

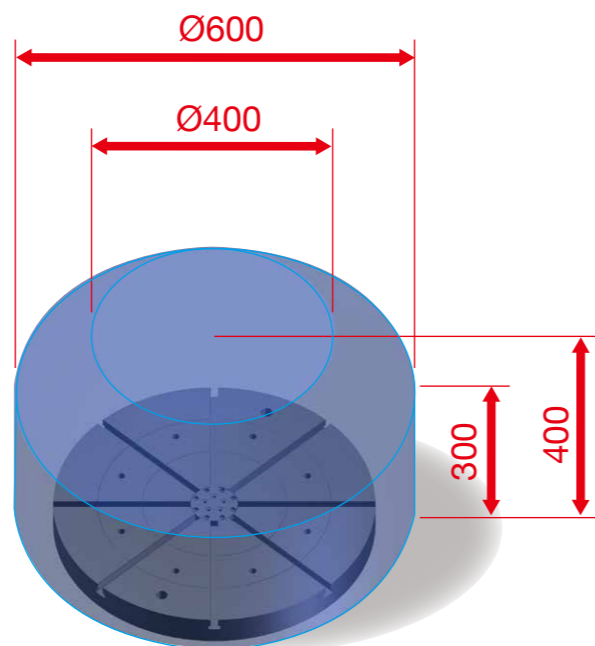
Rapid traverse

X/Y/Z axis 48/48/48 m/min
A/C axis 50/100 rpm



Max. workpiece size

Max. table load	400 kg	
Table size	Ø500 mm	
Table rotary speed	A axis	50 rpm
	C axis	100 rpm



Unit : mm

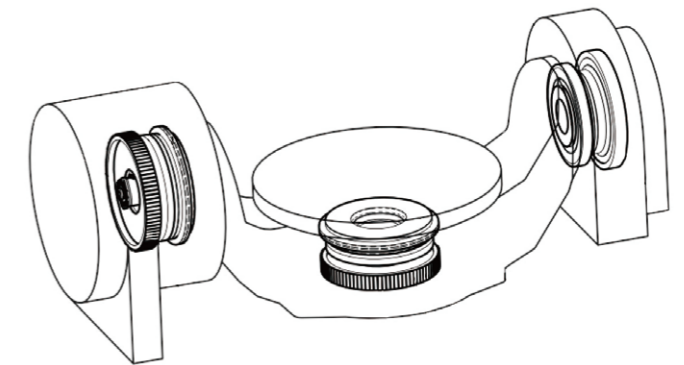
GT-500

A/C axis : Direct-direct motor type

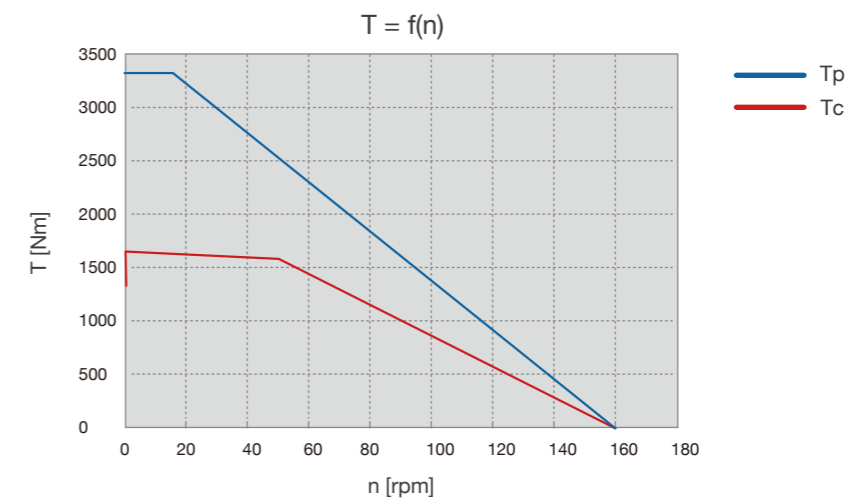
Direct-drive type tilting/rotating table

Direct-drive motor is used as the driver of A/C-axis tilting and rotating. It's one of the best solutions for high speed machining. The advantages of DD motor are space saving, less error, higher resolution, higher torque, and higher speed.

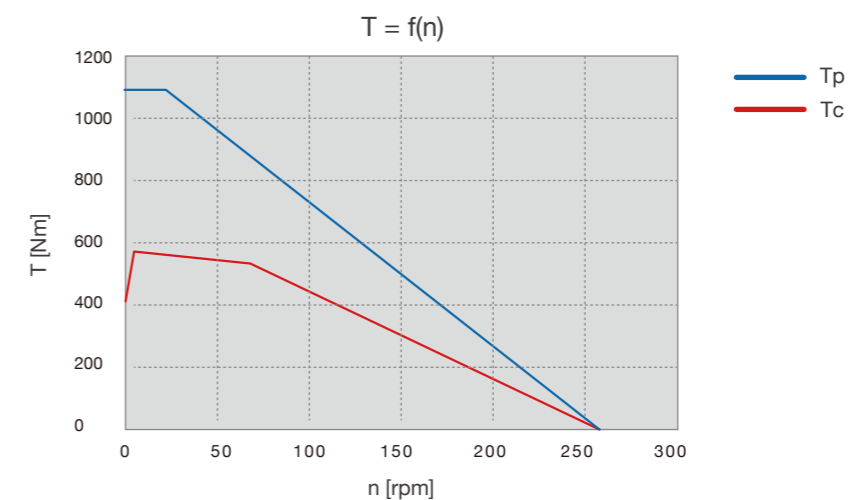
A/C axis positioning accuracy	5"
A/C axis repeatability accuracy	±2.0"
A axis torque	1,350/3,300 Nm
C axis torque	440/1,000 Nm



A axis motor



C axis motor



Main structure

GT-630 Table

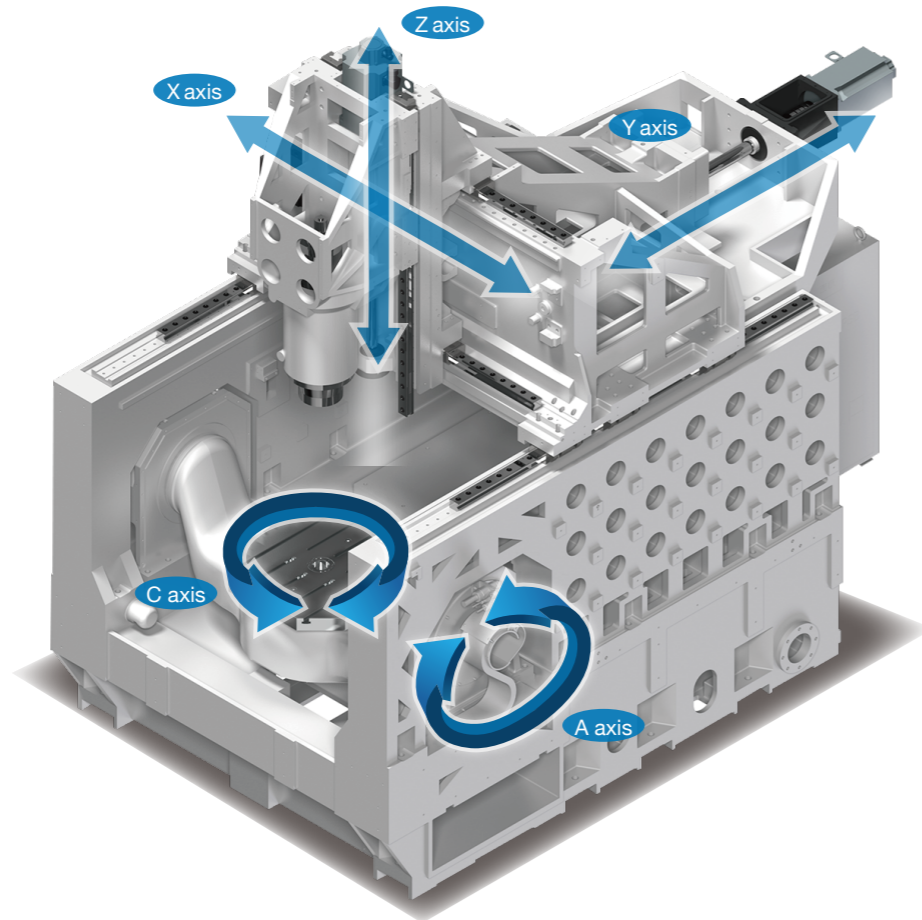
Rotary axis, tilting axis
DD motor driving
Features of high speed and high accuracy

Stroke

X/Y/Z axis 760/820/560 mm
A/C axis 150(+30°~-120°)/360° mm

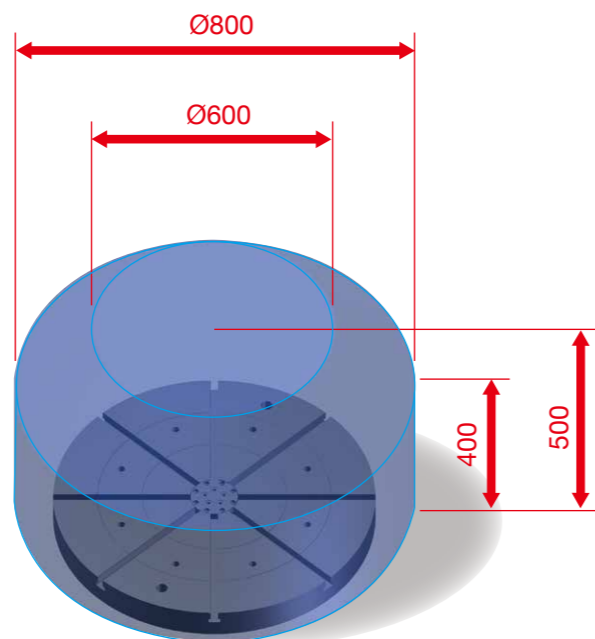
Rapid traverse

X/Y/Z axis 48/48/48 m/min
A/C axis 50/100 rpm



Max. workpiece size

Max. table load	600 kg	
Table size	Ø630 mm	
Table rotary speed	A axis	50 rpm
	C axis	100 rpm



Unit : mm

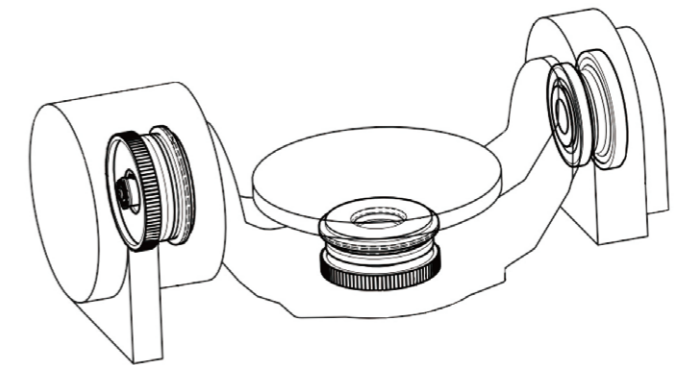
GT-630

A/C axis : Direct-direct motor type

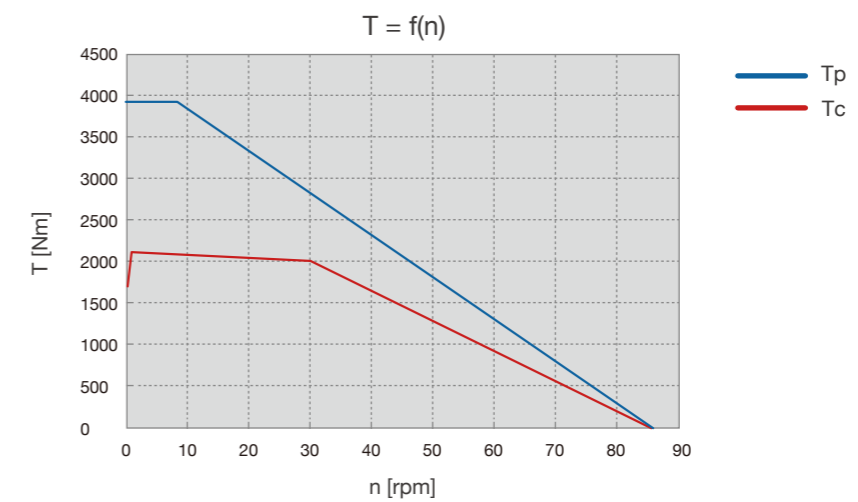
Direct-drive type tilting/rotating table

Direct-drive motor is used as the driver of A/C-axis tilting and rotating. It's one of the best solutions for high speed machining. The advantages of DD motor are space saving, less error, higher resolution, higher torque, and higher speed.

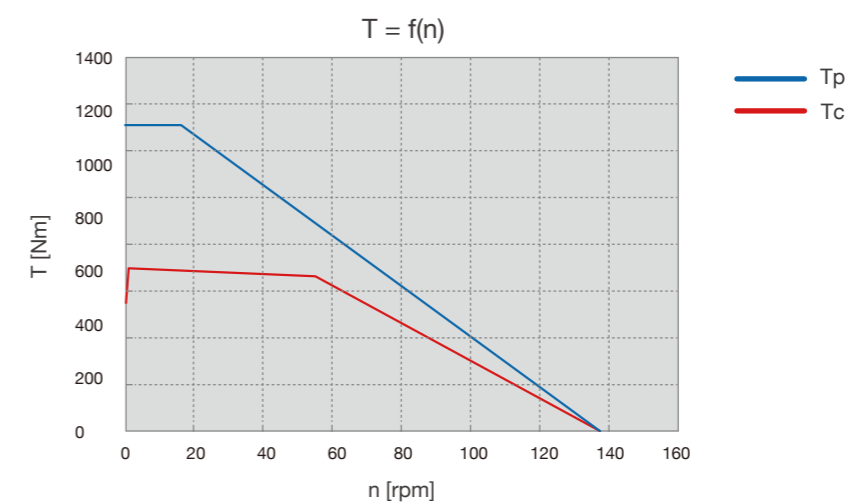
A/C axis positioning accuracy	5"
A/C axis repeatability accuracy	±2.0"
A axis torque	2,125/3,920 Nm
C axis torque	615/1,150 Nm



A axis motor



C axis motor



Main structure

GT-800E Table

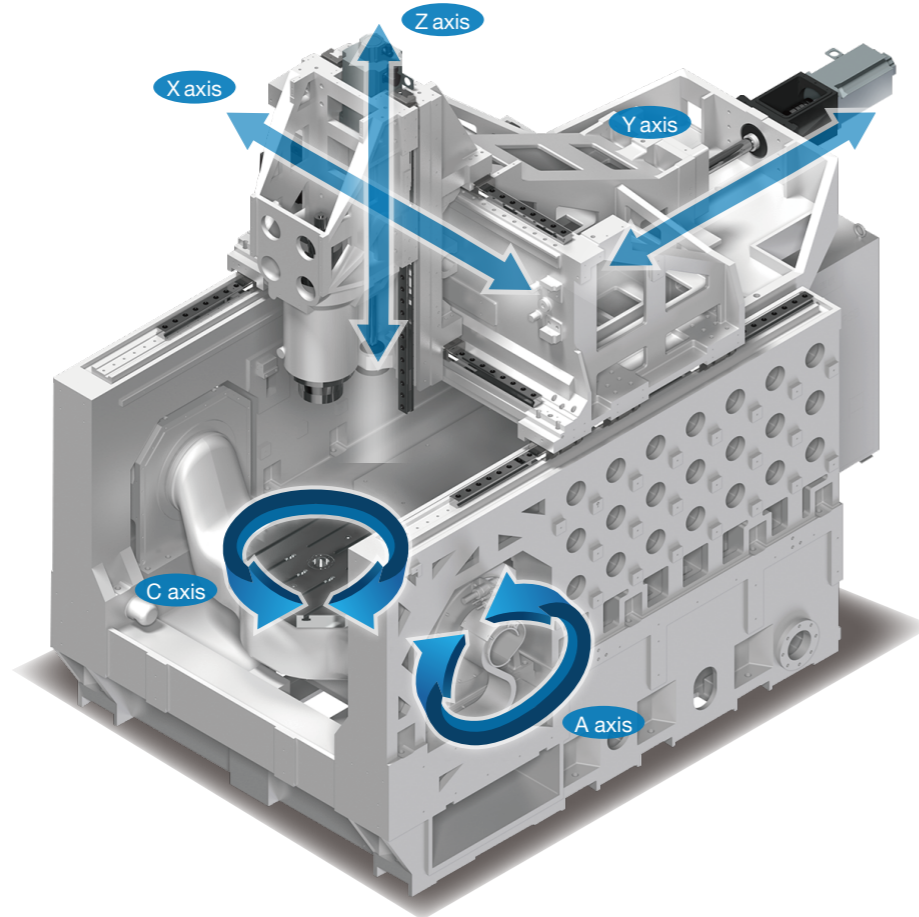
Rotary axis, tilting axis
DD motor driving
Features of high speed and high accuracy

Stroke

X/Y/Z axis 800/820/560 mm
A/C axis 150(+30°~-120°)/360° mm

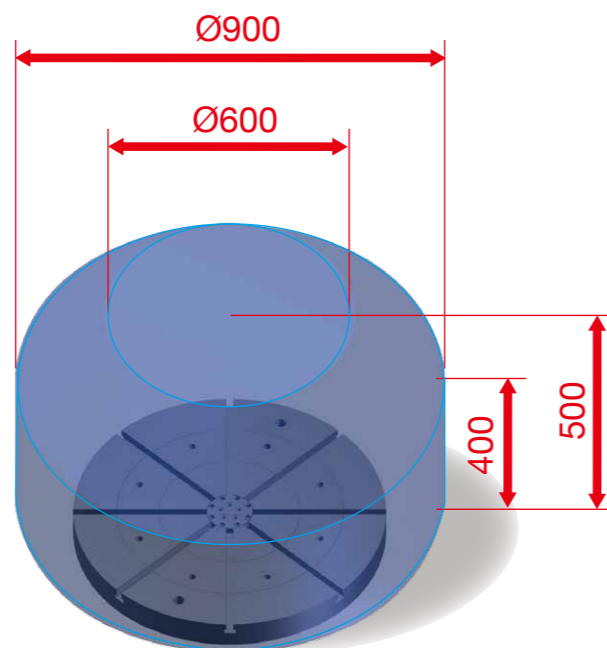
Rapid traverse

X/Y/Z axis 48/48/48 m/min
A/C axis 50/100 rpm



Max. workpiece size

Max. table load	1,000 kg	
Table size	Ø800 mm	
Table rotary speed	A axis	50 rpm
	C axis	100 rpm



Unit : mm

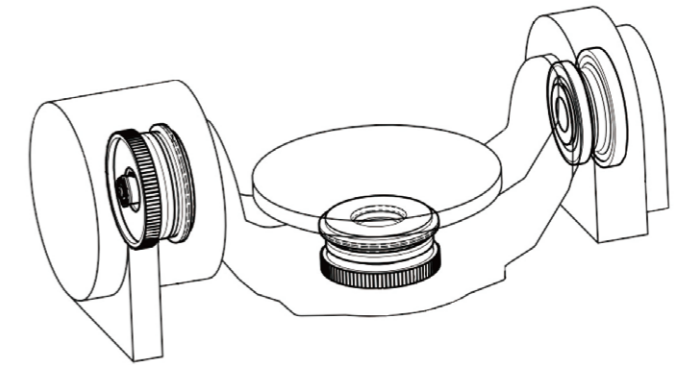
GT-800E

A/C axis : Direct-direct motor type

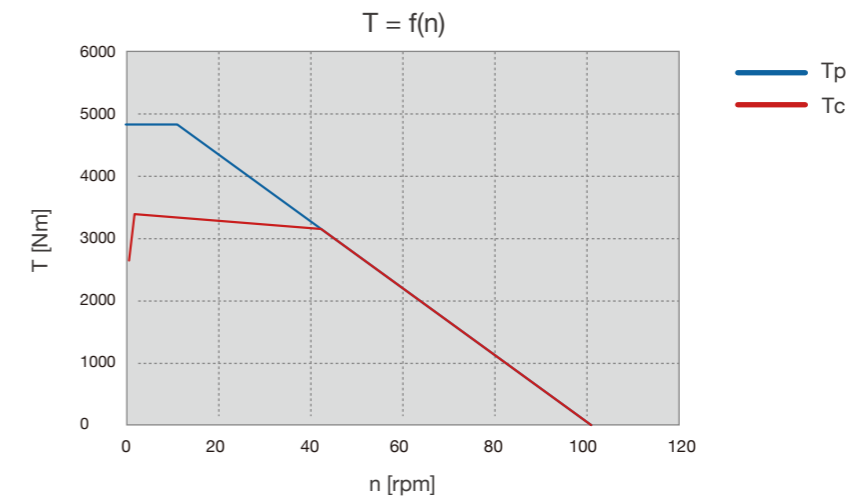
Direct-drive type tilting/rotating table

Direct-drive motor is used as the driver of A/C-axis tilting and rotating. It's one of the best solutions for high speed machining. The advantages of DD motor are space saving, less error, higher resolution, higher torque, and higher speed.

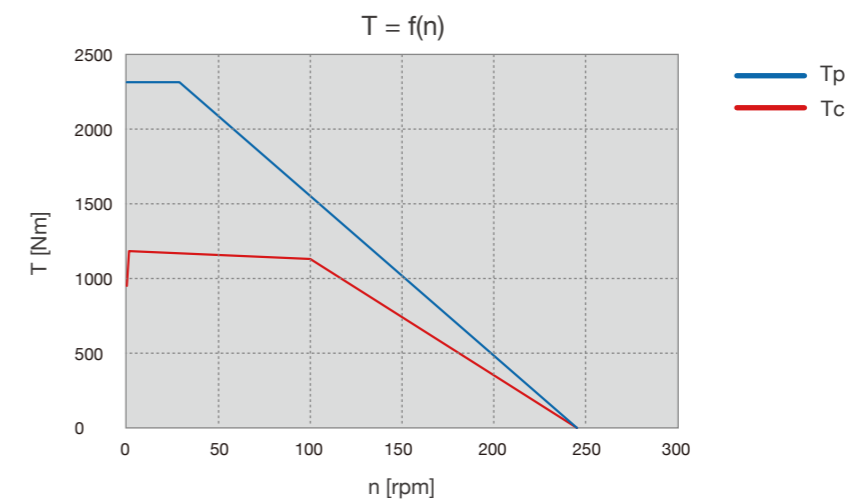
A/C axis positioning accuracy	5"
A/C axis repeatability accuracy	±2.0"
A axis torque	2,500/4,850 Nm
C axis torque	980/2,310 Nm



A axis motor



C axis motor



Main structure

GT-800 Table

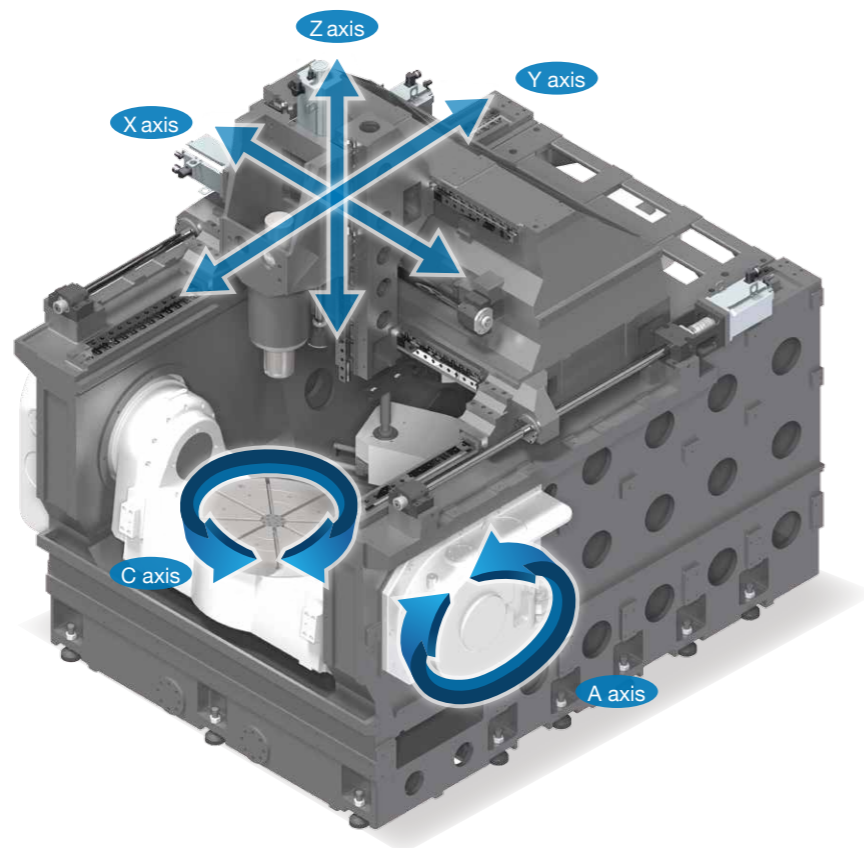
Rotary axis, tilting axis
 Roller cam driving
 High dynamic rigidity (DD motor is available in the rotary axis)

Stroke

X/Y/Z axis 850/1,020/610 mm
 A/C axis 150(+30°~-120°)/360° mm

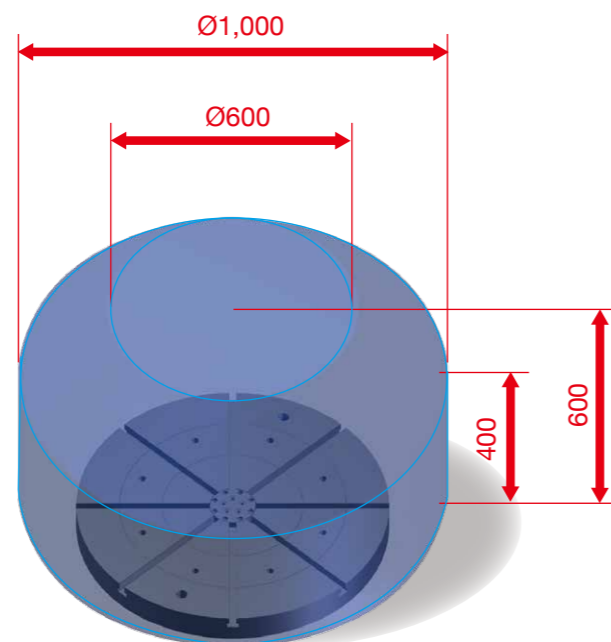
Rapid traverse

X/Y/Z axis 48/48/48 m/min
 A/C axis 16/30(Opt. DD50) rpm



Max. workpiece size

Max. table load	1,000 kg	
Table size	Ø800 mm	
Table rotary speed	A axis	16 rpm
	C axis	30 rpm 50 rpm(Opt. DD)



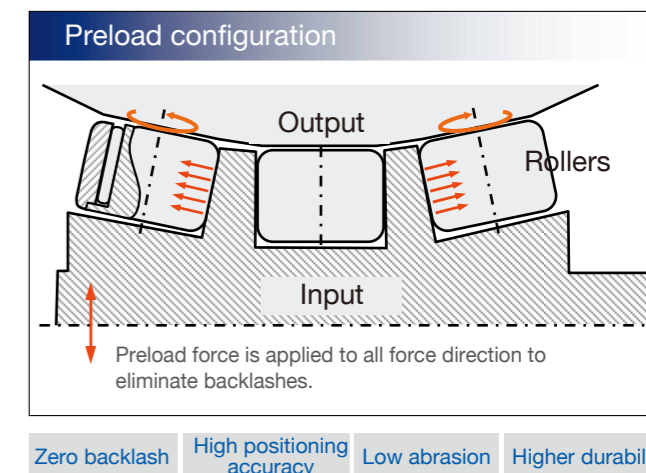
Unit : mm

GT-800

A/C axis : Roller gear cam type

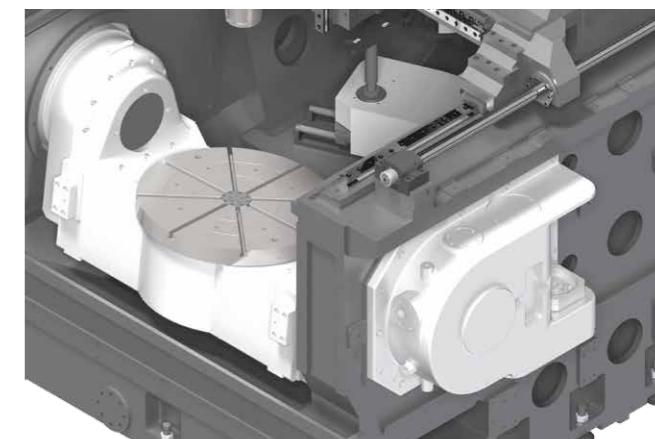
The positioning accuracy, repeatability accuracy, backlash and durability performances of roller gear cam mechanism are superior to worm-gear mechanism. Well contact between roller and gear drives A/C rotary table with lowest torque. Backlash adjustment is not required after long time continuously heavy cutting.

A/C axis positioning accuracy	5.6"
A/C axis repeatability accuracy	±3.0"
A axis torque	4,536×2/13,770×2 Nm
C axis torque	3,024/9,180 Nm



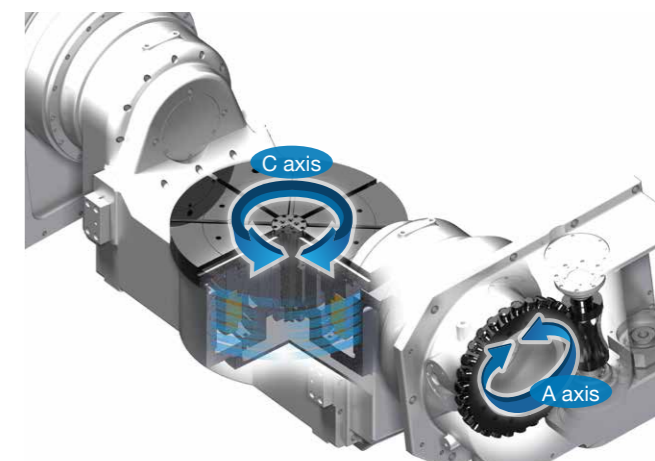
World No.1

GT-800 roller gear cam type A axis is designed to be embedded in U-shape machine bed for enhancing table rigidity.



C axis : Direct-drive type (Opt.)

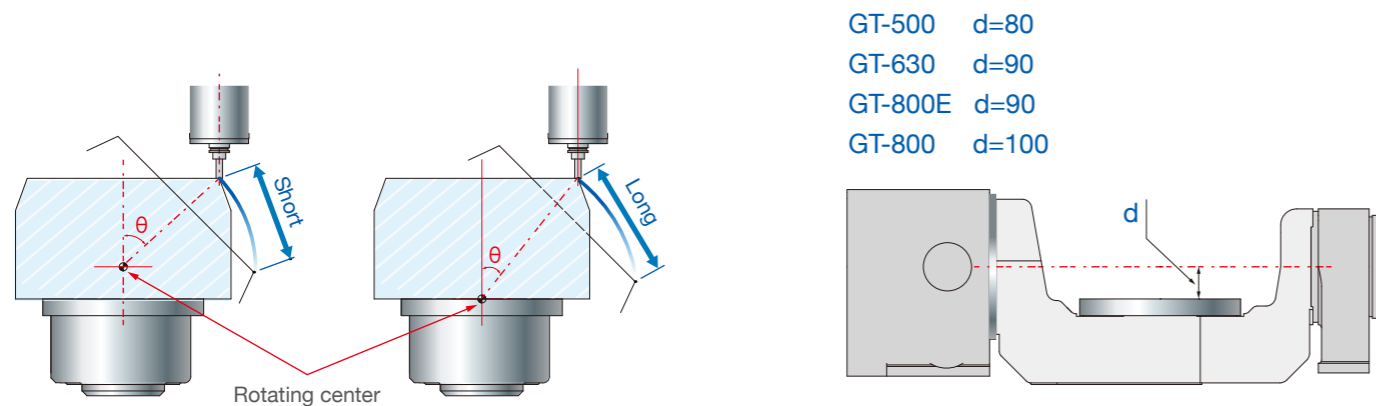
Direct-drive motor is used as the driver of C-axis rotating. It's one of the best solutions for high speed machining. The advantages of DD motor are less volume, less error, higher resolution, higher torque, and higher speed. With 50 rpm rotating speed, high torque output can be upto 1,800/3,320 Nm.



Main structure

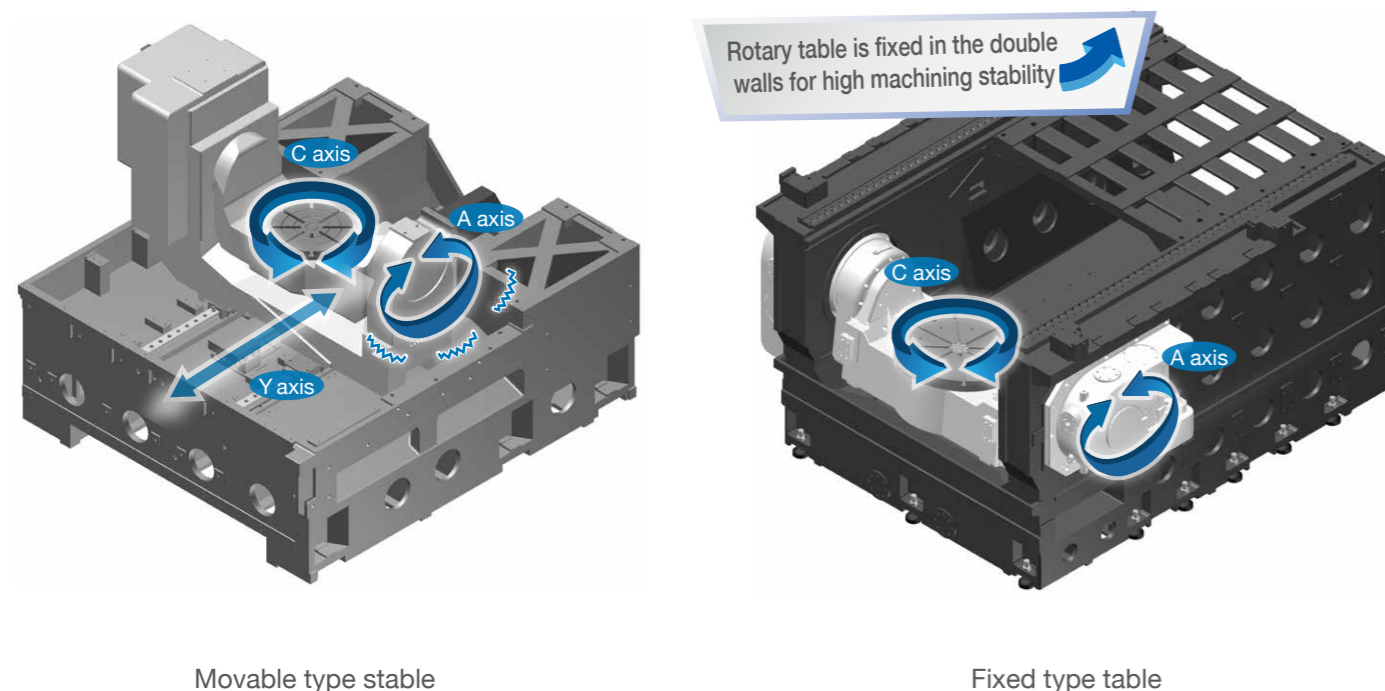
Rotating center is higher than table surface

Rotating center of A axis is 100 mm higher than table surface, that reduces the distance while tool moving and table rotation simultaneously to save cycle time and gives perfect surface finishing in profile machining.



Fixed type table design

X/Y/Z axis moving and table rotation are working individually to make sure machining is free from 3 axis inertia influences. Perfect servo driven design gives excellent machining stability. Comparing with table moving type, A/C axis are equipped in fixed position, A axis positioning accuracy can be free from vibration by feeding axis.



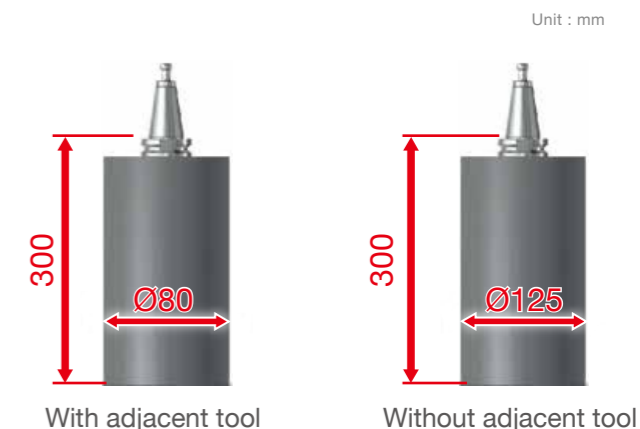
Main structure / Operation

ATC (Automatic Tool Changer)



Tools Specification

	GT-500	GT-630	GT-800E	GT-800
Standard	32T			
Optional	40T	40 T		
		64 T		
		80 T		
Max. tool weight	7 kg			
Max. tool diameter	Ø80			
	Ø125(w/o adjacent tool)			
Max. tool length	300 mm			

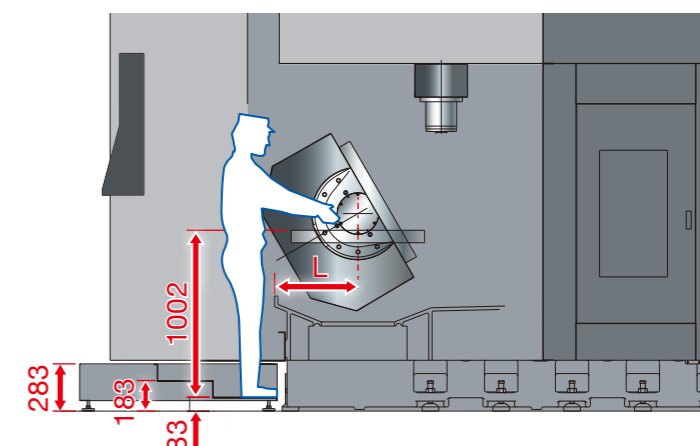


Operation / Accessibility

Easily reachable distance to working table and widely door open space is convenient for loading/unloading.

	GT-500	GT-630	GT-800E	GT-800
L	630	650	650	700

Unit : mm



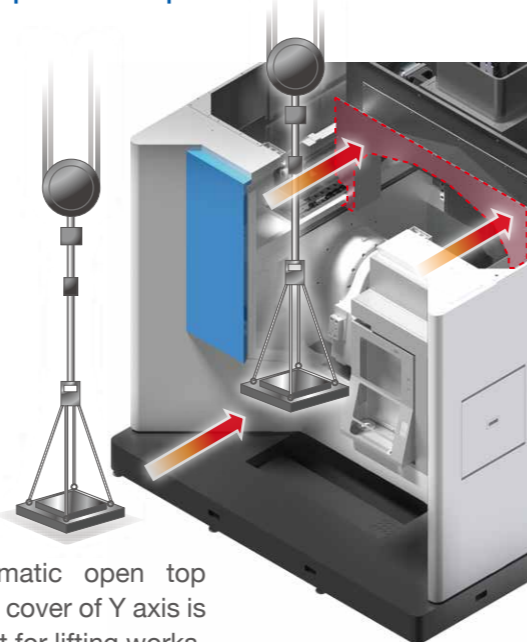
Operation

Door opening width

Wide door opening facilitates the operation and maintenance.



Open top telescopic cover



The automatic open top telescopic cover of Y axis is convenient for lifting works.

Swivel-type operation panel

The swivel panel enables operator to operate and inspect easily during operation.



Distance of tool changing

The excellent access for tool changing and checking.



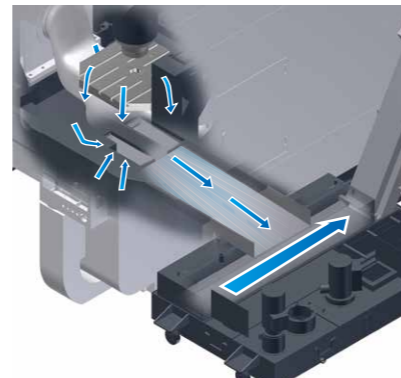
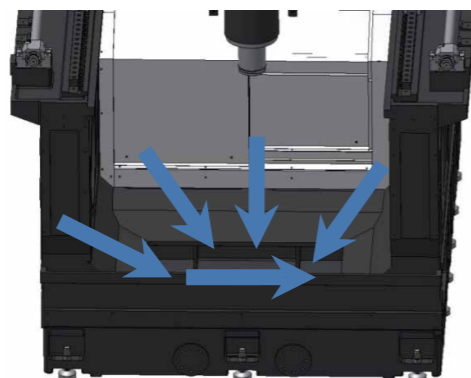
Easy daily maintenance

Through centralized management of air FIRC unit and lubricant pump, daily maintenance is made easily.



Well chip flow

Central chip flow design, chips can be carried out immediately while machining. It prevents casting structure from being affected by hot chips and maintains machining accuracy.

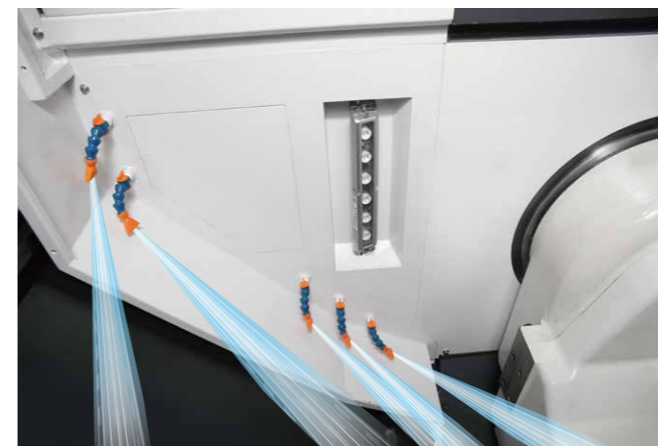


Accessory specifications

Linear scale (Std.)

With linear scales in X/Y/Z axis, that is able to compensate positioning errors, repeatability errors, and ballscrew pitch errors caused by temperature. Positioning accuracy can be maintained in $\pm 5 \mu\text{m}$. Further option for $\pm 3 \mu\text{m}$ linear scale is also available. $2 \mu\text{m}$ and $5 \mu\text{m}$ rotary scales is standard equipped in A and C axis to guarantee rotary positioning accuracy.

Chip disposal (Std.)



Comprehensive bed flush make sure all chips flow out. Various type chip conveyors are available for different materials disposal.

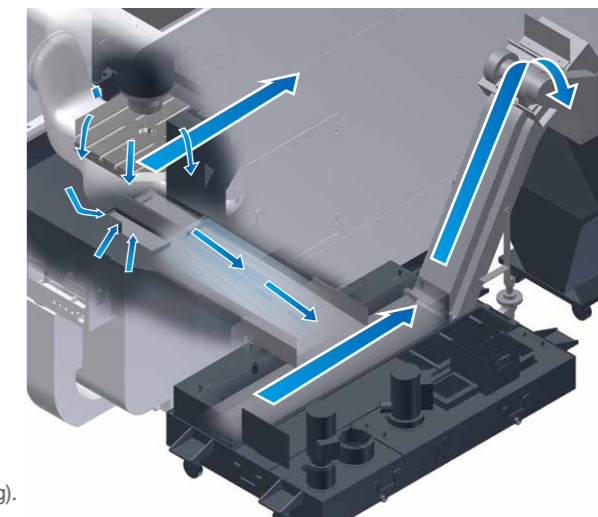
Chip conveyor (Opt.)

According to different materials and chip size, Tongtai provides various chip conveyors for the best chip disposal.

Specification	Steel		Cast iron		Aluminum/non-ferrous metal		
	Long/Curl chips	Short chips	Powder chips	Short chips	Long/Curl chip	Short chips	Powder chips
Chain type	○	×	×	×	○	×	×
Scraper type	×	○	○	○	×	○	○
Magnetic scraper type	×	○	○	○	×	×	×
Drum type	×	○	○	○	×	○	○
Integrated type	○	○	○	○	○	○	○

○ : Suitable × : Non-suitable

Short chips : The chip length is smaller than 60 mm or $\varnothing 40$ mm (ball shape cutting).
Long/Curl chips : Chip is longer than short chips mentioned above.



Optional accessories

Spindle thermal deformation compensation (opt.)

- Built-in type temperature sensor detects the temperature of spindle bearing for protecting the bearing from overheating.
- By measuring temperature of the nearest point to bearings, compensation can be adjusted accordingly.
- Through thermal compensation, precision of each axis can be maintained below 20 μm.

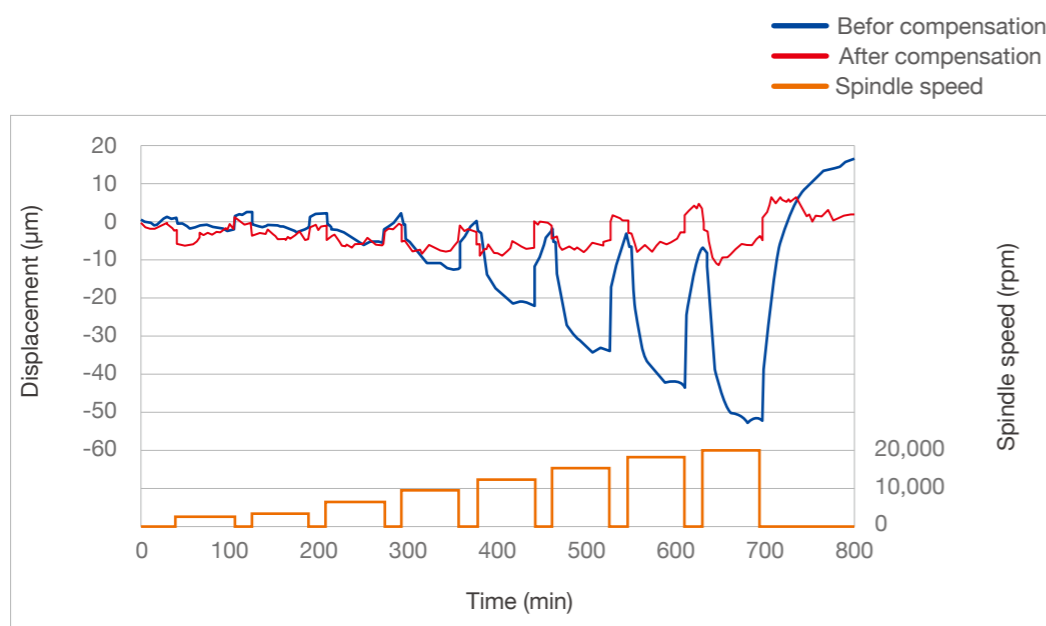
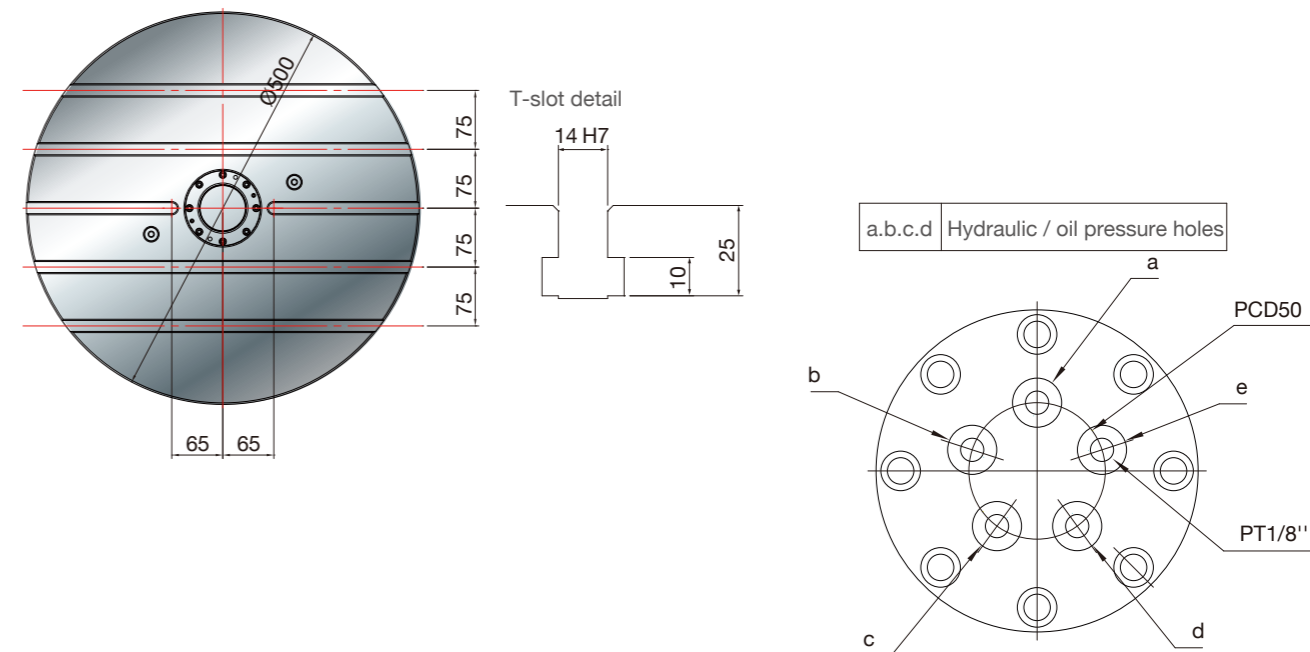


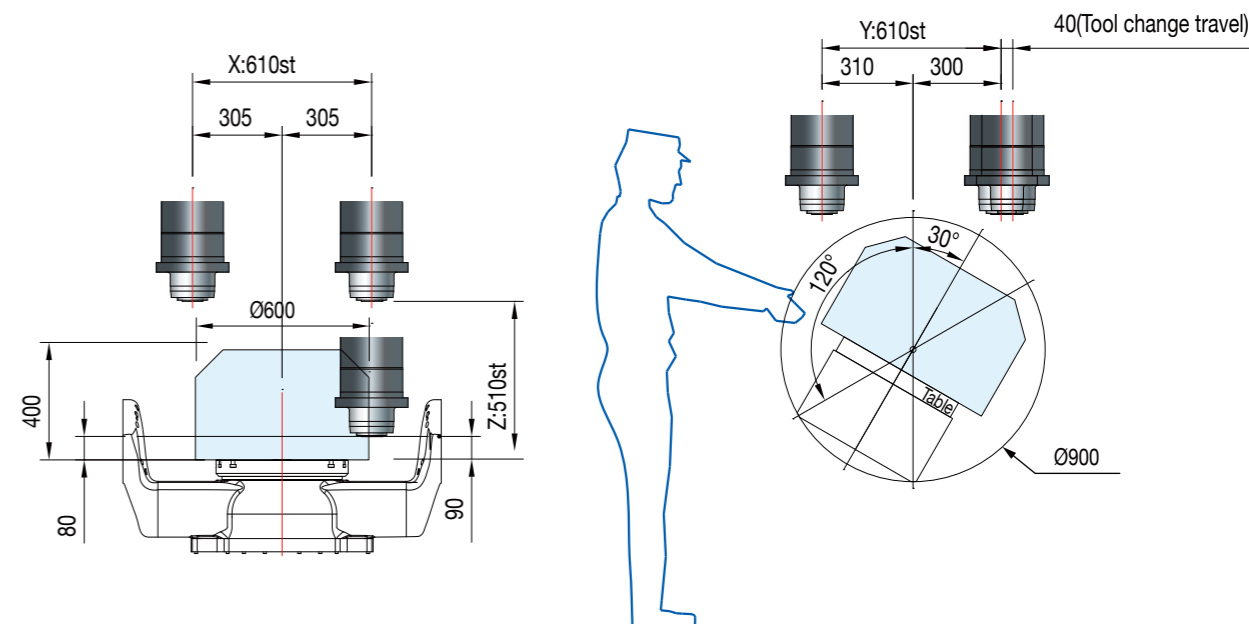
Diagram of thermal displacement on Z-axis

Table size

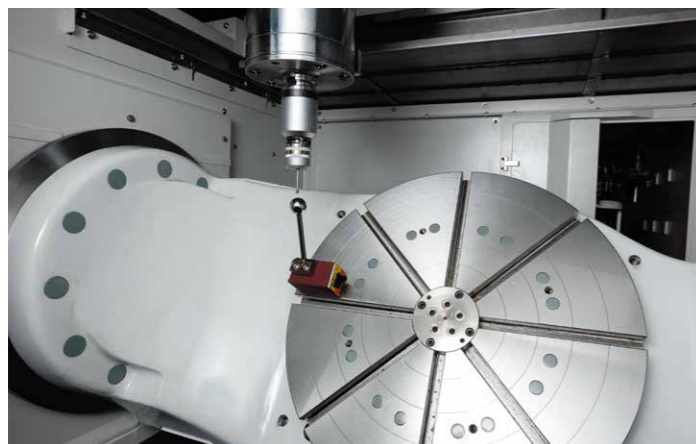
GT-500 Table size



GT-500 Working area



Rotating center detection for five-axis machining center (opt.)

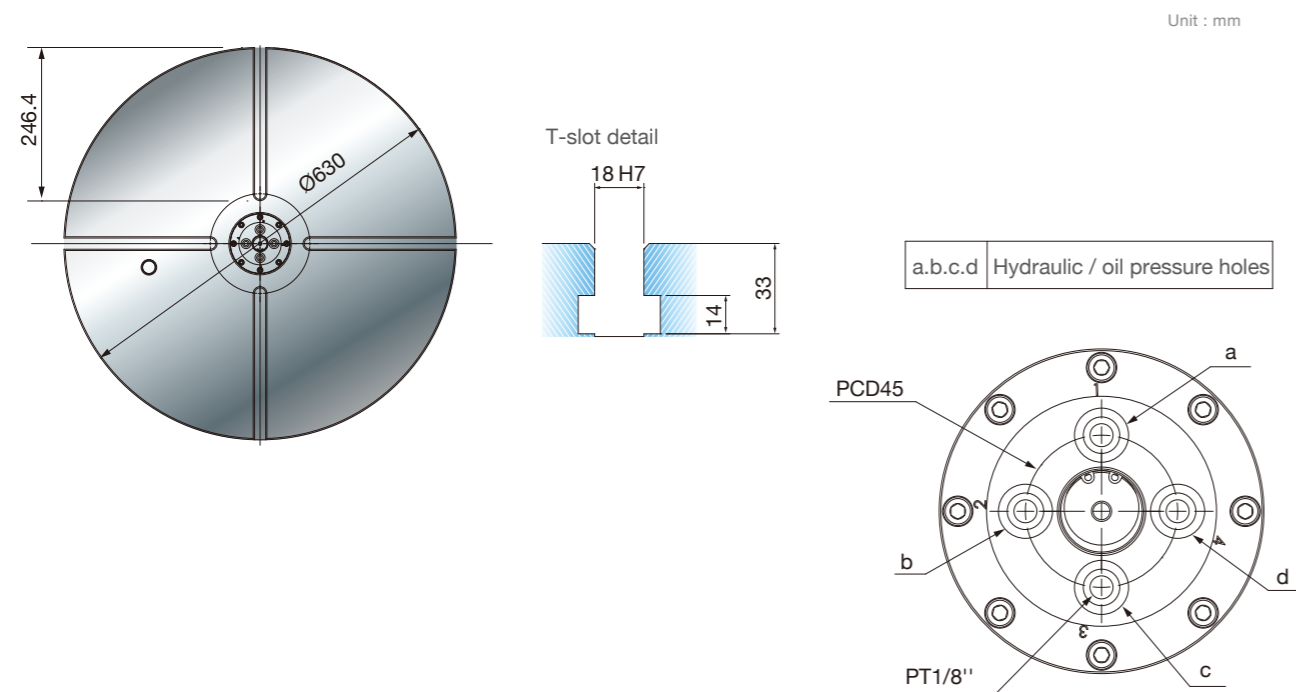


3D Interference Protection

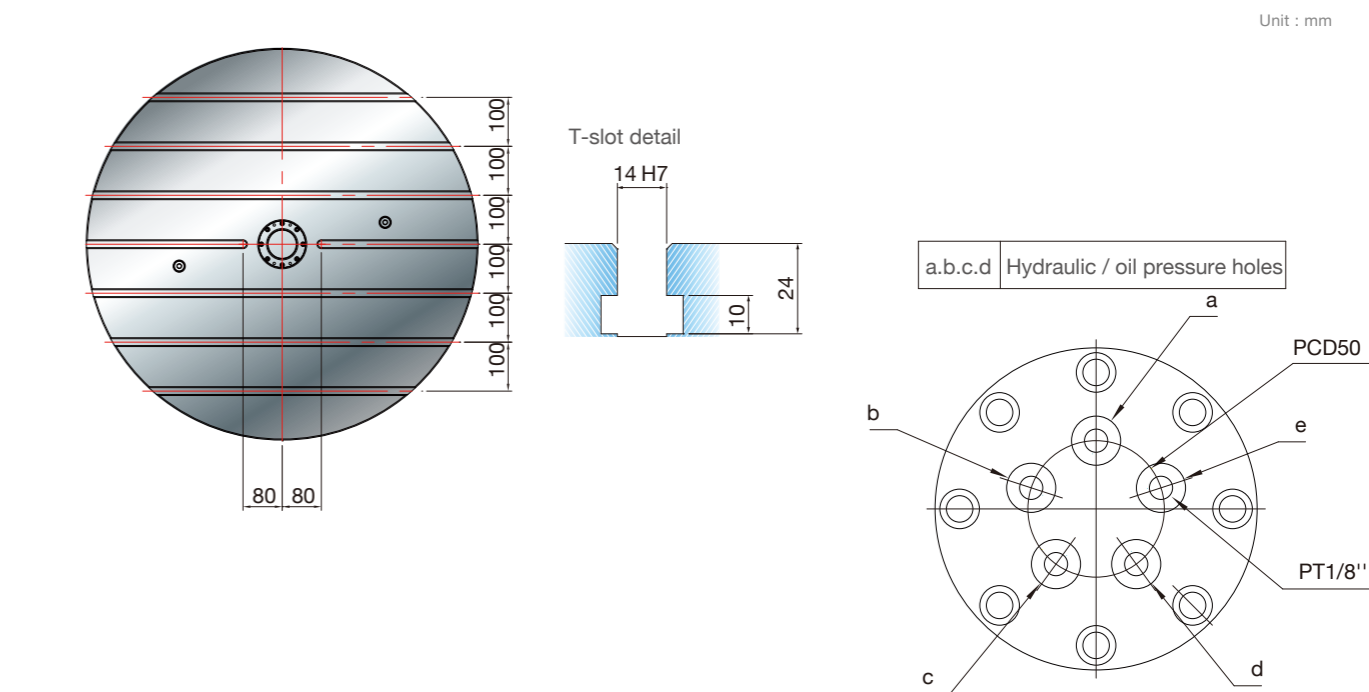


Table size

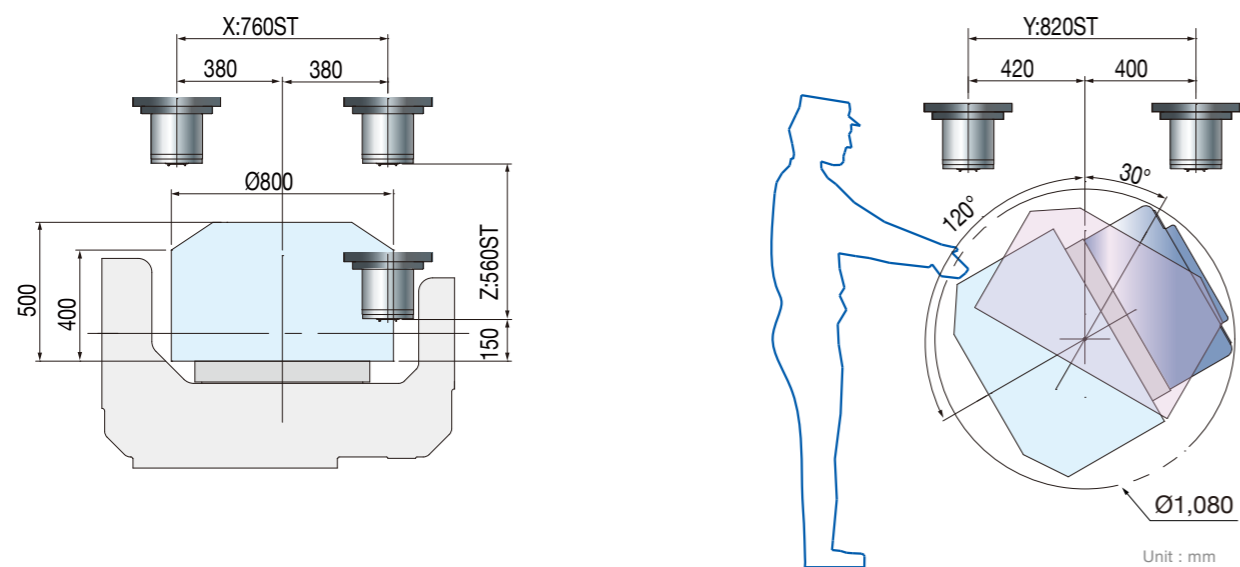
GT-630



GT-800E



GT-630 Working area



GT-800E Working area

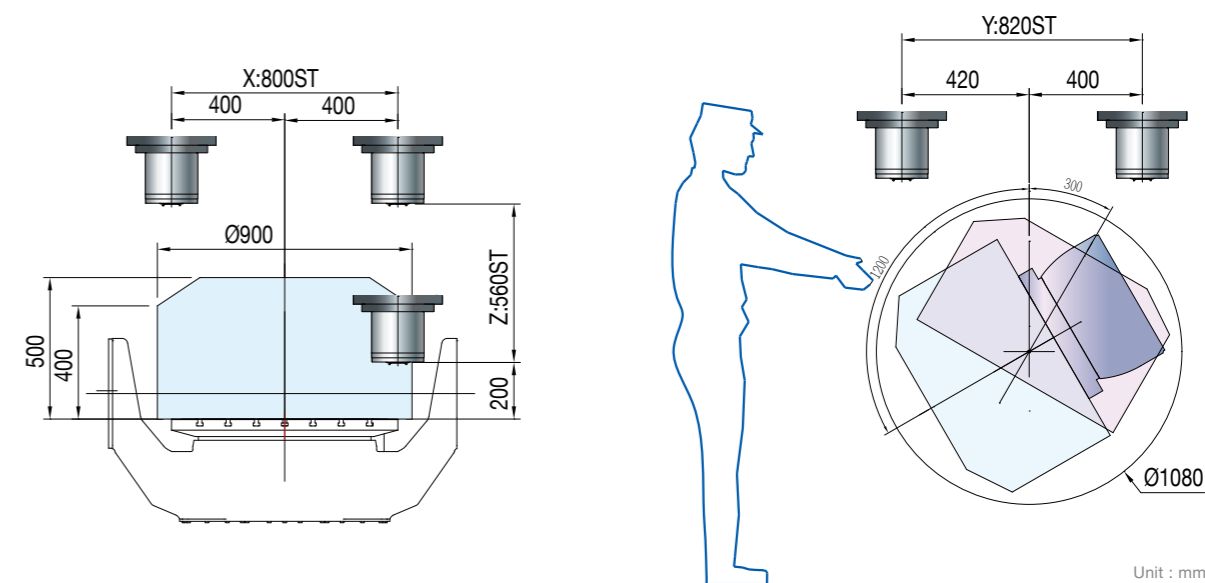
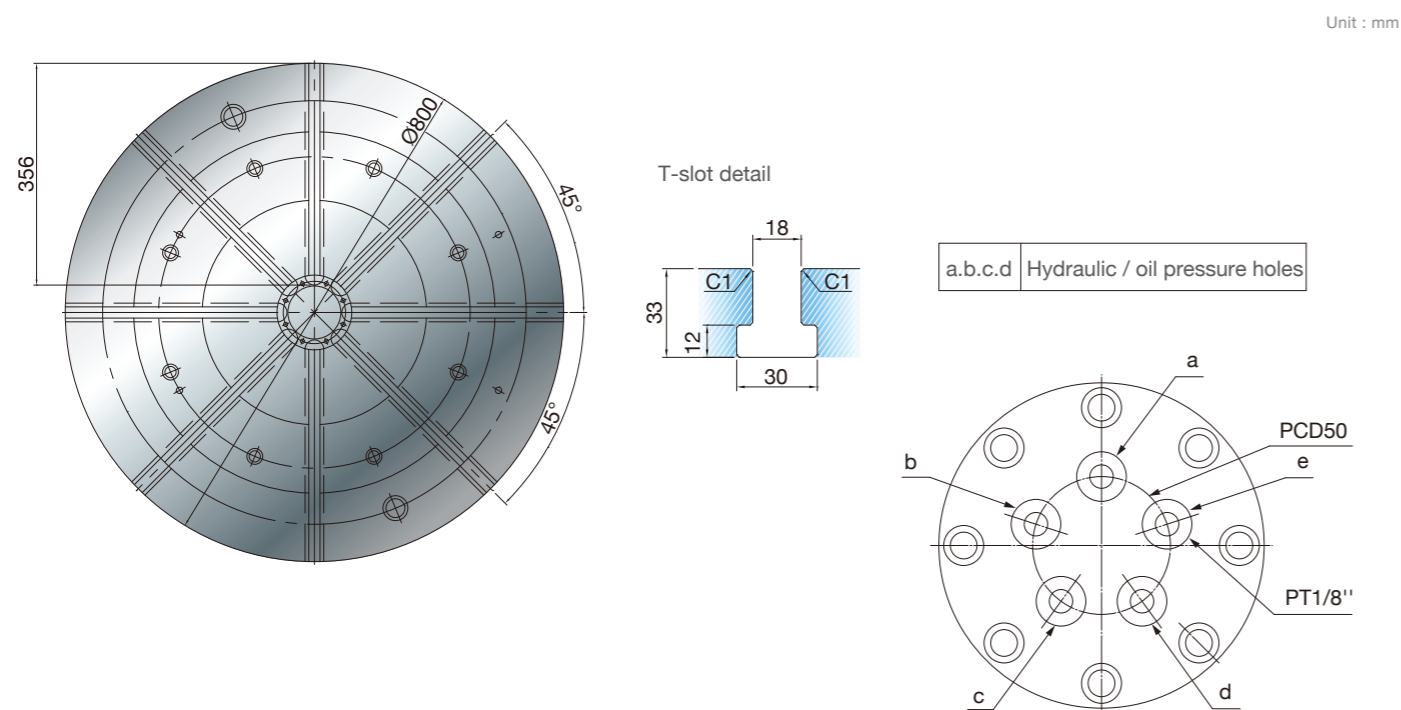


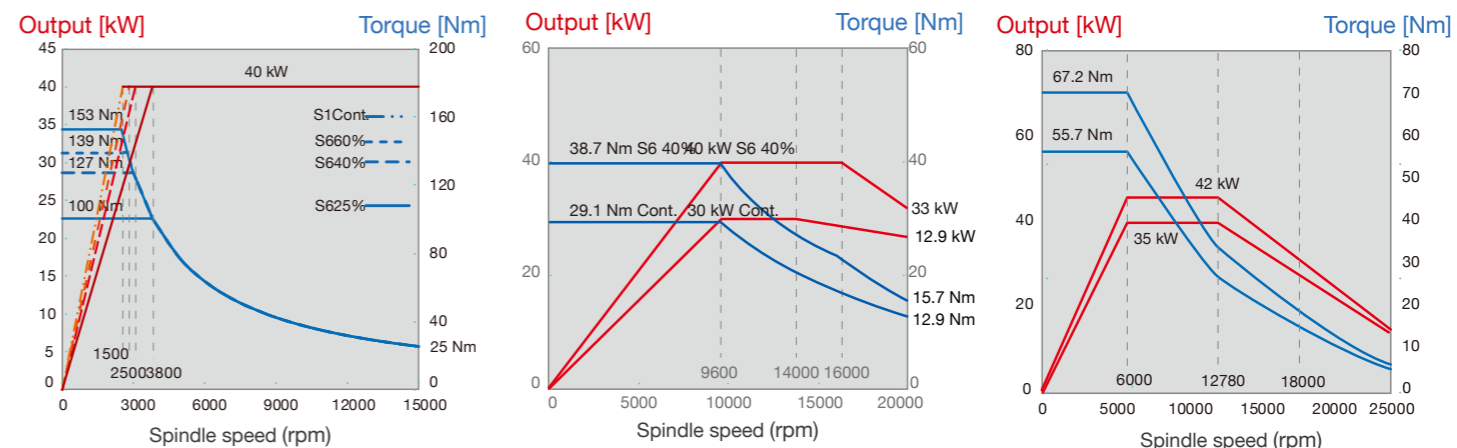
Table size

GT-800

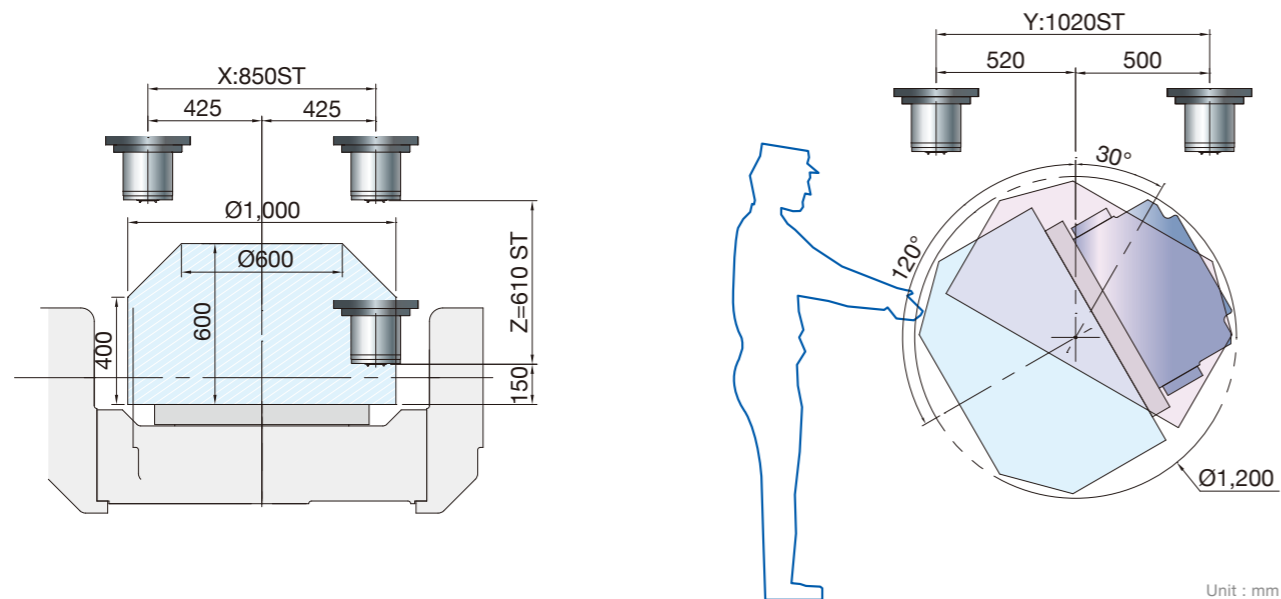


Spindle output / Machining precision

15,000 rpm Built-in type spindle (Std.) 20,000 rpm Built-in type spindle (Opt.) 24,000 rpm Built-in type spindle (Opt.)



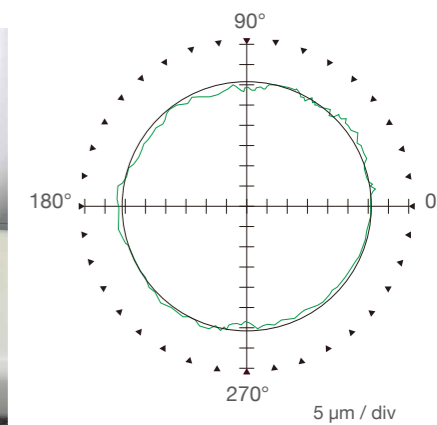
GT-800 Working area



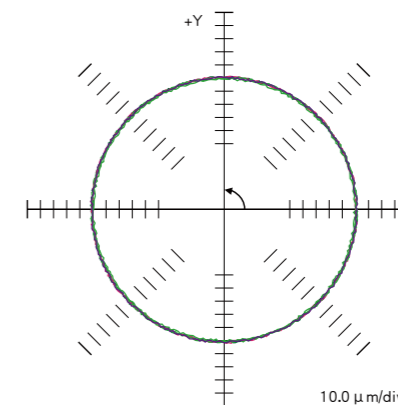
Machining precision

Test Standard : ISO-10791-7

Circularity	10.13 μm
Material	A6061
Tool	Super hard $\phi 20$ mm end milling tool
Spindle speed	3,183 rpm
Cutting feedrate	4,755 mm/min
Workpiece shape	$\phi 80 \times \phi 35 \times H15$ mm



Assembling accuracy

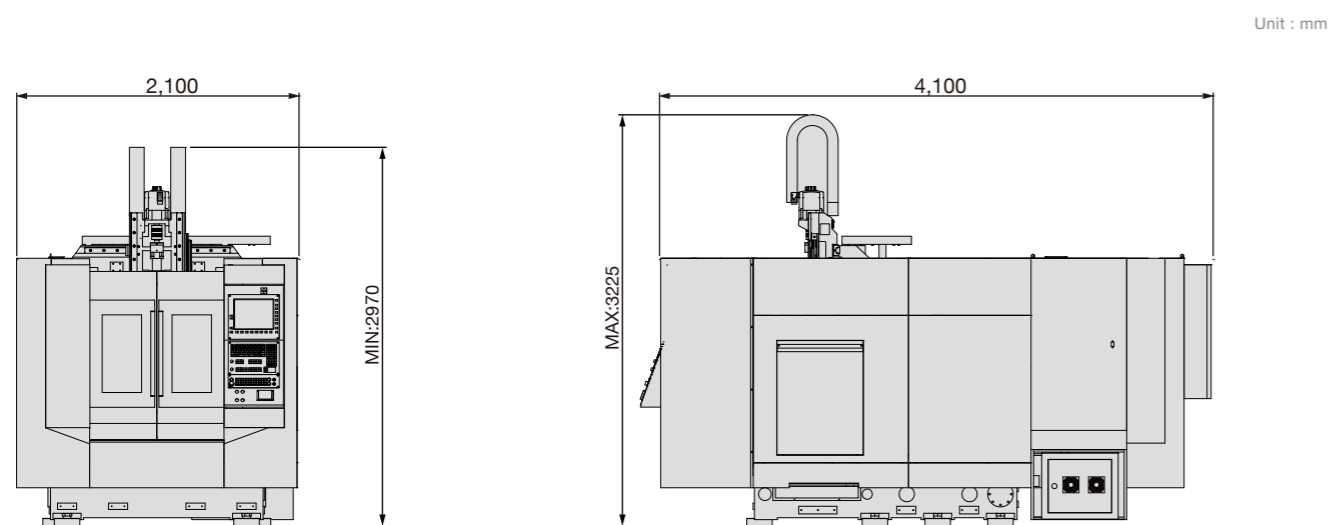


Circle for roundness : within 8 μm

Machine dimension

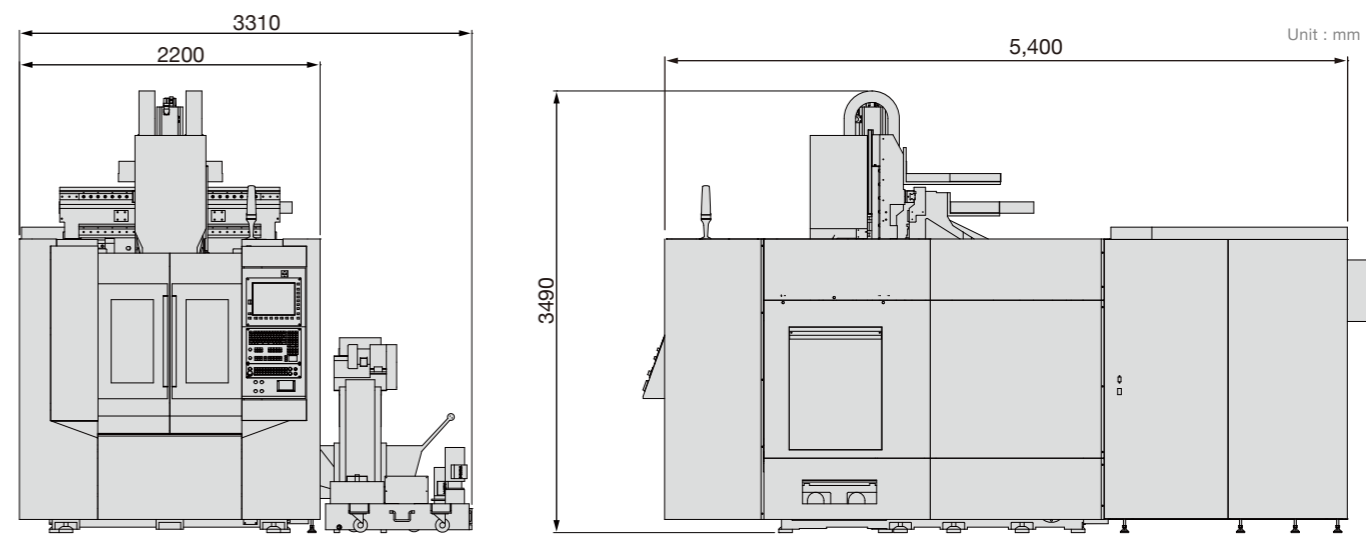
Machine size

GT-500

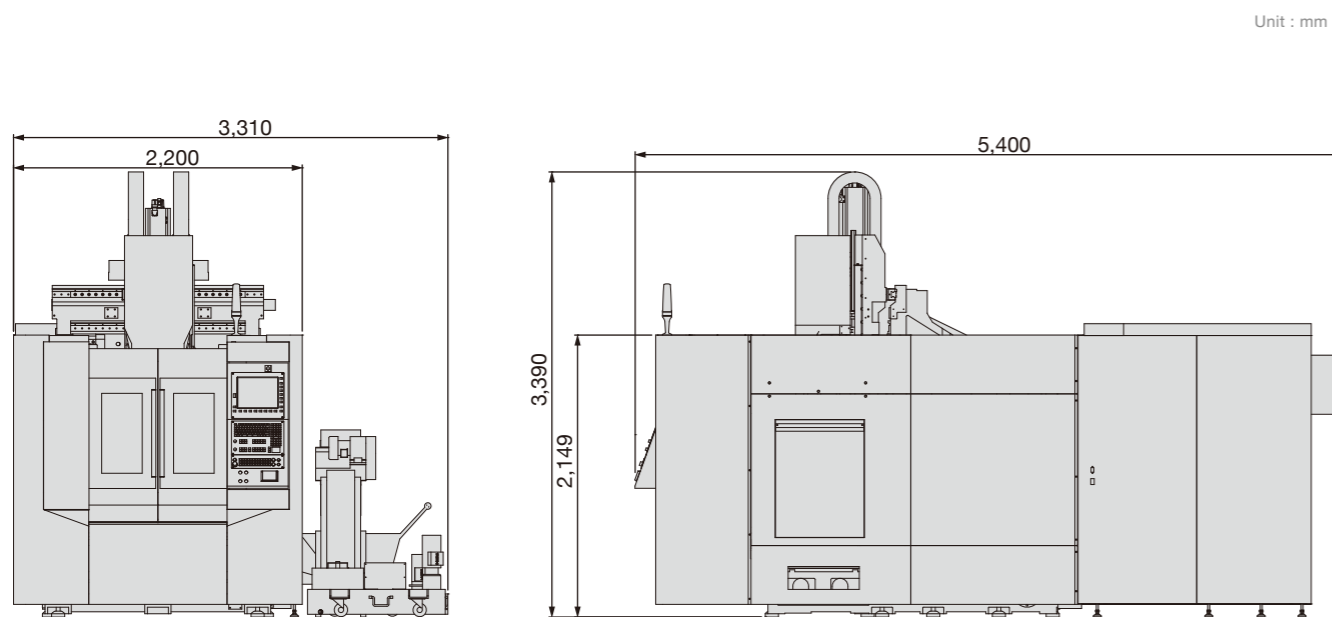


Machine size

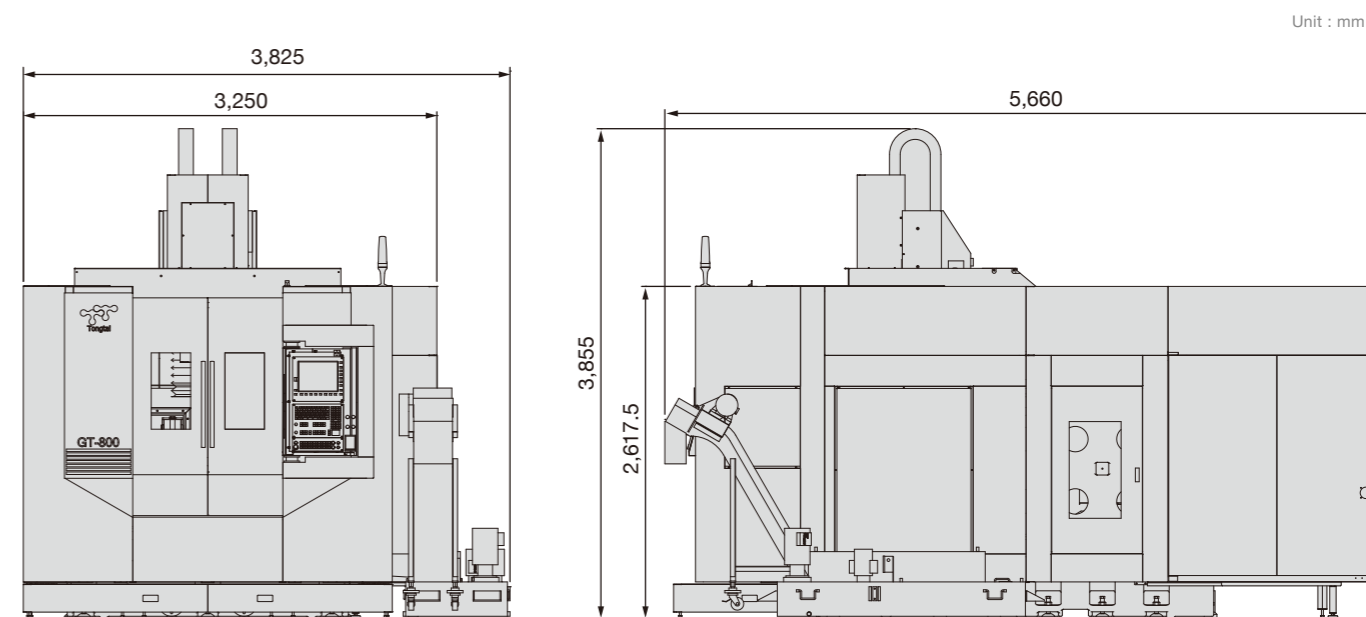
GT-800E



GT-630



GT-800



Standard/optional accessories

● Standard ○ Optional

Item	Specification	GT-500	GT-630	GT-800E	GT-800
Spindle	Built-in type 15,000 rpm	○	●	●	●
	Built-in type 20,000 rpm	○	○	○	○
	Built-in type 24,000 rpm (HSK-A63)	●	○	○	○
Table	Roller gear type A axis	-	-	-	●
	DD motor type A axis	●	●	●	-
	Roller gear type C axis	-	-	-	●
	DD motor type C axis	●	●	●	○
Tool Shank	BBT-40	○	●	●	●
	HSK-A63	●	○	○	○
Tool capacity	32 tools	●	●	●	●
	40 tools	○	○	○	○
	64 tools	-	○	○	○
	80 tools	-	○	○	○
Coolant through spindle pump	20 bar	○	○	○	○
	50 bar	○	○	○	○
	70 bar	○	○	○	○
Cooling system	Spindle coolant system	●	●	●	●
	AC axis coolant system	●	●	●	○
	Air conditioner for electrical cabinet	●	●	●	●
Chip conveyor	Scraper type conveyor	○	○	○	○
	Chain type conveyor	○	○	○	○
Lubrication system	General lubrication system	○	○	○	○
	LHL integrated lubrication system	●	●	●	●
Positioning accuracy system	Three axes linear scale 5 μm resolution	●	●	●	●
	Three axes linear scale 3 μm resolution	○	○	○	○
	A axis linear scale (2 μm)	●	●	●	●
	C axis linear scale (5 μm)	●	●	●	●
Tool measuring system	Renishaw NC4	○	○	○	○
	Blum NT-A3-2	○	○	○	○
Workpiece measuring system	Renishaw OMP400	○	○	○	○
	Renishaw RMP600	○	○	○	○
	Blum TC50	○	○	○	○
Others	Machining air blow	●	●	●	●
	Air gun	●	●	●	●
	Coolant gun	○	○	○	○
	Oil skimmer	○	○	○	○
	Oil mist collector	○	○	○	○
Controller	HEIDENHAIN TNC640	●	●	●	●
	SIEMENS 840D	○	○	○	○
	FANUC 31i-MB	-	-	-	○

Specifications

Item	Specification	Unit	GT-500	GT-630	GT-800E	GT-800
Table	Table size (LxW)	mm	Ø500	Ø630	Ø800	Ø800
	Max. loading capacity	kg	400	600	1,000	1,000
	Table height from floor	mm	840	900	955	1,100
	Max. workpiece dimension (diameter×height)	mm	Ø600×400(shape limited)	Ø800×500(shape limited)	Ø900×500(shape limited)	Ø1,000×600(shape limited)
	A/C axis min. indexing increment	deg	0.001°			
	Spindle	Spindle taper		7/24 Taper No.40		
Spindle speed		rpm	24,000 (Opt. 15,000)	15,000 (Opt. 20,000/24,000)		
Stroke	X/Y/Z axis stroke	mm	610/610/510	760/820/560	800/820/560	850/1,020/610
	Spindle nose to table	mm	90-600	150-710	200-760	150-760
	A axis stroke	deg	+30 ~ -120			
	C axis stroke	deg	±360			
	Feed	X/Y/Z axis rapid traverse	m/min	48/48/48		
A/C axis rapid traverse		rpm	50/100			16/30 (DD motor16/50)
Cutting feedrate		mm/min	1-20,000			
ATC	Tool shank		BBT-40 (Opt. HSK-63A)			
	Tool capacity	pc	32 (Opt. 40)	32 (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	7			
Motor	Spindle motor	kW	42/35 (Opt. 40/40)	40/40 (Opt. 42/35)		
	X/Y/Z axis servo motor	kW	4.4/8.17/4.87	6.5/8.6/8.6		
	Coolant motor	kW	0.37×2			
Machine size	Width×Depth×Height	mm	2,100×4,100×3,225	2,200×5,400×3,390	2,200×5,400×3,490	3,250×5,660×3,855
	Weight	kg	13,500	16,000	17,000	26,000

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