

GTH SERIES

PARALLEL TWIN-SPINDLE CNC TURNING CENTERS



THE ULTIMATE MACHINING POWER
WOODWAY

PARALLEL TWIN-SPINDLE CNC TURNING CENTERS

From high efficiency production demand for automobile industry, the GTH series CNC turning center with advanced parallel twin spindles, twin turrets structure and high efficiency automation system, the GTH provides automatic loading, front/rear cutting, unloading and work-piece detecting, which make its ultimate machining capabilities a coordinated process. Furthermore, the GTH series fulfills all types of plate-shape and short-shaft work-piece of automatic mass production needs.

Revolutionary Parallel Twin-spindle Structure Design

Excellent Expandability

Low mechanical interference, easy to integrated twin spindles machine, single spindle machine and all types of automatic system into a highly efficient production line.

More Flexible Process Arrangement

Assist by robot arm and flipping device, the twin spindles design can provide front/rear cutting simultaneously but also front cutting simultaneously to meet the best process arrangement of mass production.

Higher Unit Area Production Output Value

Compare to normal twin spindles turning center, GTH is more compact and smaller floor space.

Loading by robot arm on 2nd spindle increase the working efficiency more than 5 times base on twin spindles simultaneous receiving design, shorten non-cutting time.

By optimized production line layout, leading quality and mass production capabilities to an unprecedented level



Tailor-made Production Line Available

For different application needs, GOODWAY R&D team with rich experience of Turn-Key cases and precise process analysis program, can integrated GTH series, automation system and work-piece detector optimized configuration to achieve ultra-high mass production capacity while ensuring stable product accuracy.



Double Machines + Double Robot Arm

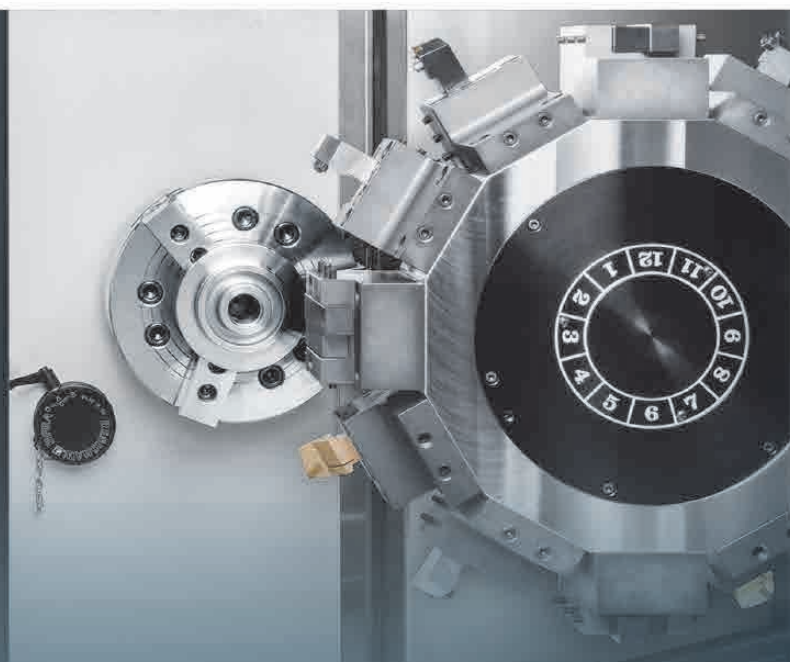
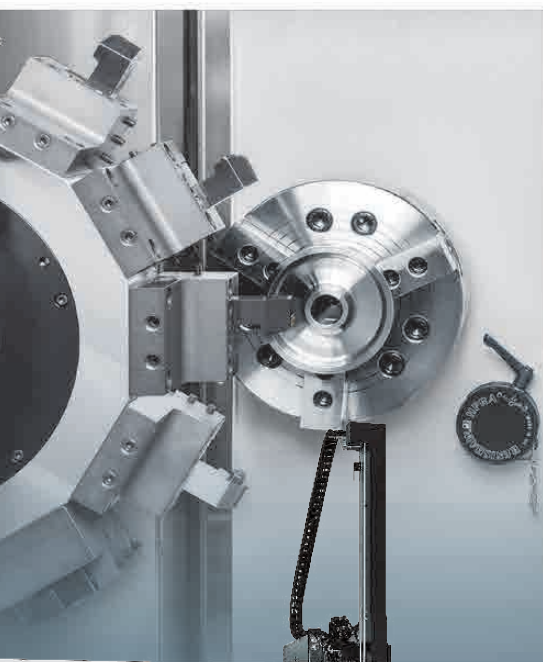


Single Machine + Single Robot Arm
(w /work-piece cleaning and detecting device)



Single Machine + Single Robot Arm

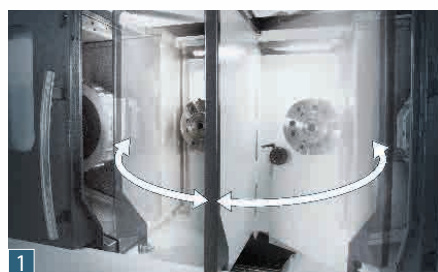




(GTH-2000 series)



(GTH-1500 series)



1 Safety Maintenance

- ▶ Movable protection door between two spindles which can prevent chips contamination of another processing area.
- ▶ When the machine is not running, operator can rotate the movable protection door to increase the space of operation.



2 3 Chip Removal

- ▶ Optimized chip removal design, chips can easily fall into chip conveyor and quickly take away from the processing area.
- ▶ Rear discharge chip conveyor makes GTH production line more compact. It is not only improves the utilization rate of factory space, but also good to achieve central chip conveyor belt design.

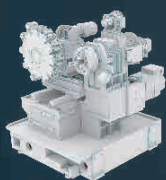
SUPER RIGID STRUCTURE

By using Finite Element Analysis (FEA) and high tension Meehanite casting structure, super rigidity frame of spindles, turrets and saddle are reaching the optimal reinforcement. Mechanical strength is well enough to load extremely heavy cutting while maintaining long period of super high accuracy. Moreover, super rigidity of machine can extend life time of tools.

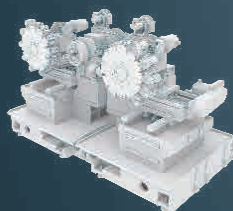
Independent Twin Base Design

It can efficiently decrease cutting resonance of two spindles systems and increase reliability of machining, roundness and roughness of appearance.

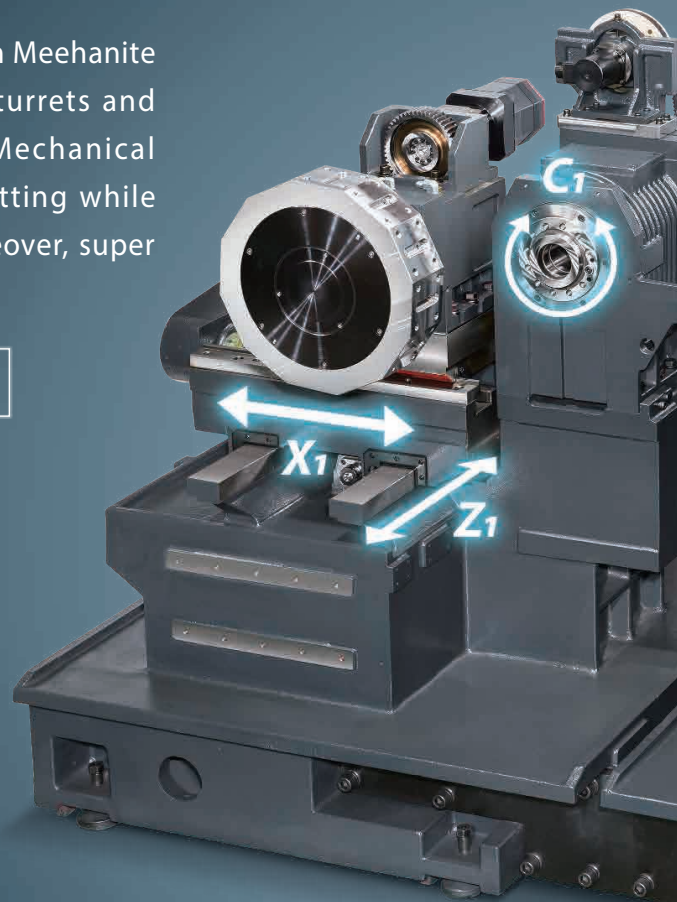
Ensure the single spindle model or twin spindles models can be flexibly provided under the conditions of high rigidity structural design to meet the configuration requirements of various production lines.



Single spindle model



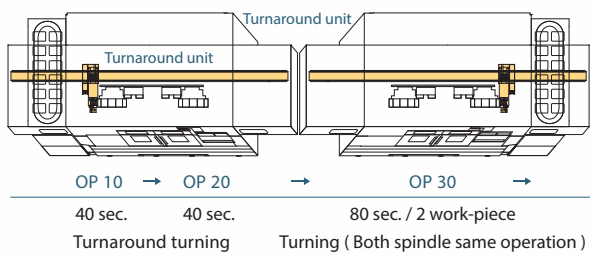
Twin spindle model



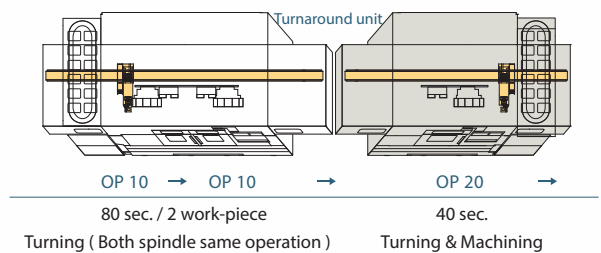
(Casting structure of GTH-2000 model shown.)

Varies Applications

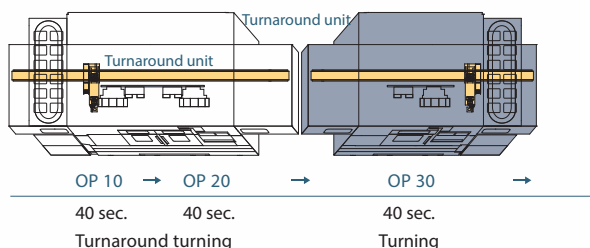
1 Line tact time 40 sec. / work-piece



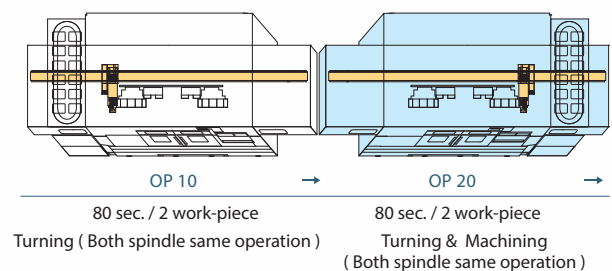
3 Line tact time 40 sec. / work-piece

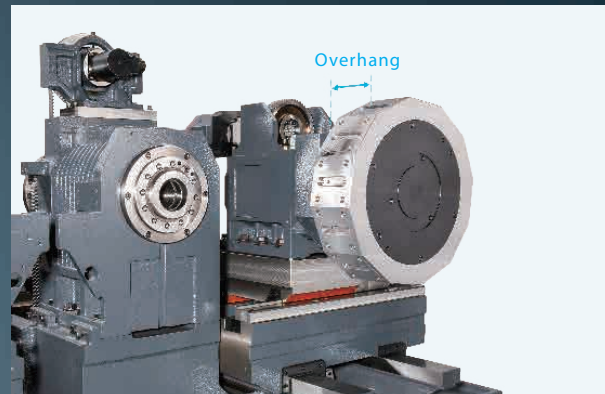
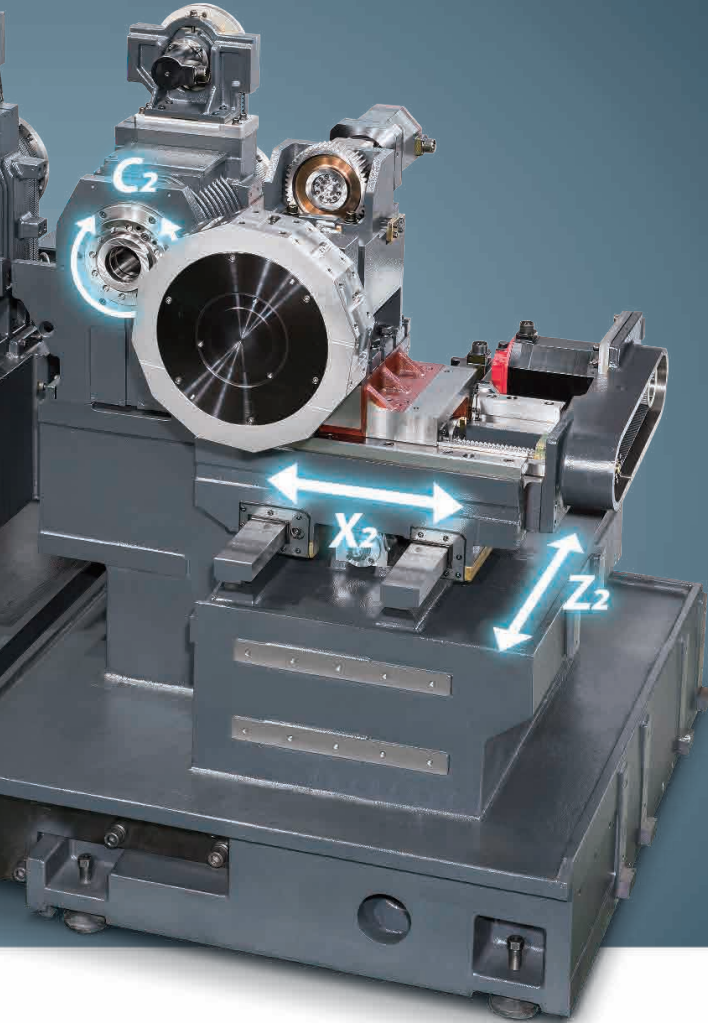


2 Line tact time 40 sec. / work-piece



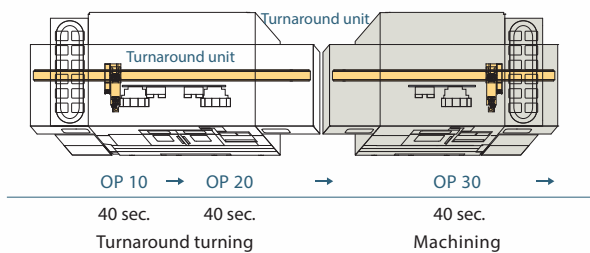
4 Line tact time 40 sec. / work-piece



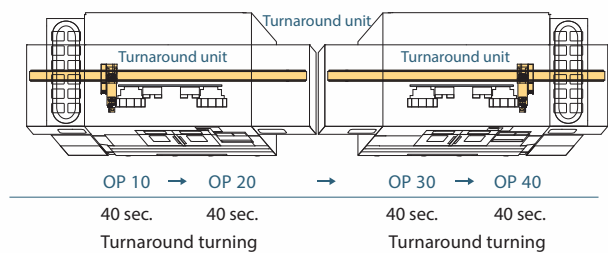


- ▶ Full travel of saddle and turret are firmly supported by bed, and distance of overhang of turret is shorter which increase cutting rigidity.
- ▶ X / Z axes adopt super rigidity box ways design which is through heat treatment and precise finishing processes. And long span design of traverse can maximize strength and precision.
- ▶ Contact surfaces of all slides, headstock, turret, and ball screw bearing housings with the machine bed are precision hand scraped to provide maximum assembly precision, structural rigidity, and load distribution.

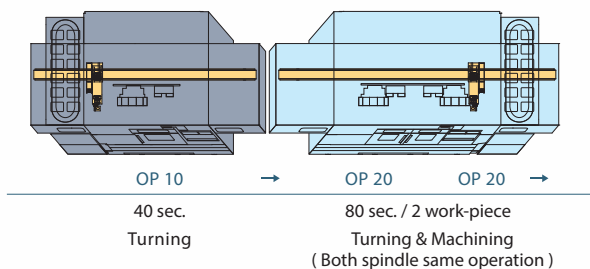
5 Line tact time 40 sec. / work-piece



7 Line tact time 40 sec. / work-piece



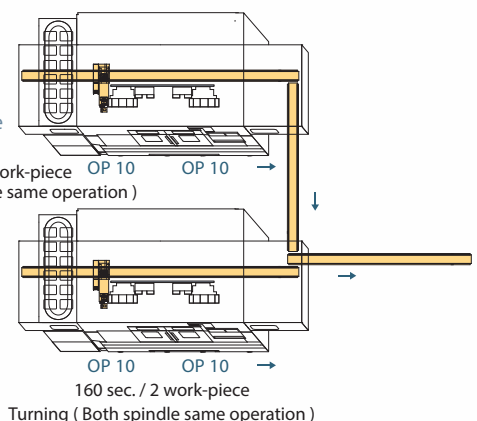
6 Line tact time 40 sec. / work-piece



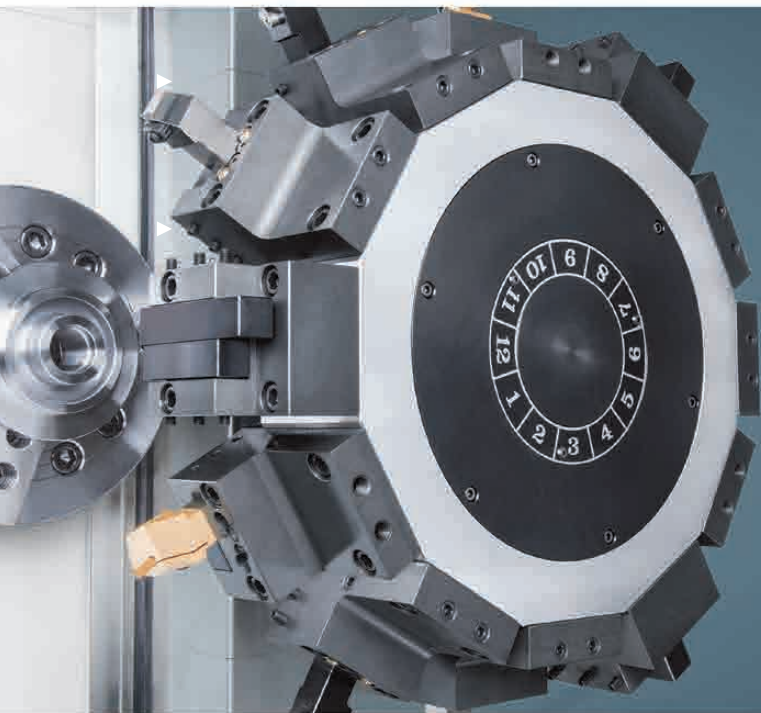
8

Line tact time 40 sec. / work-piece

160 sec. / 2 work-piece
Turning (Both spindle same operation)



ULTIMATE MACHINING POWER



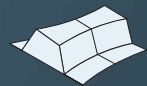
High Performance Servo Indexing Turret

- ▶ Heavy-duty servo indexing turret achieves 1 second indexing times for adjacent stations and 1.5 second times for stations at the opposite end of the disk turret.
- ▶ Ø 210 mm (8.26") diameter super high precision CURVIC couplings accurately position the turret disk (± 2 sec. of arc) and 4,000 Kg of clamping force ensures abundant turret rigidity for all cutting conditions. (GTH-2000)
- ▶ The CURVIC coupling is provided with automatic centering, cleaning and super large contact area of tooth flank, which ensures long-term usage of cutting rigidity and positioning accuracy.

Curvic Coupling



Concave

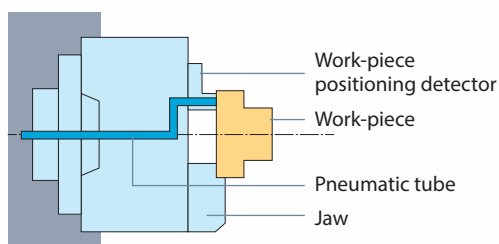
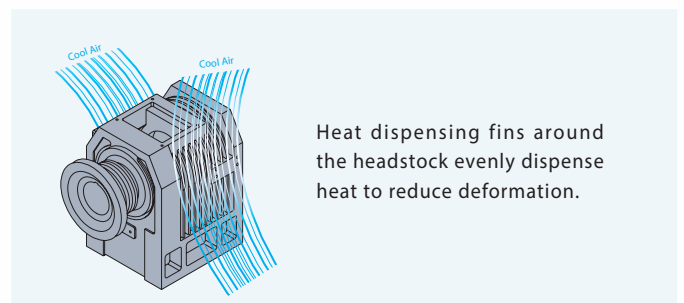
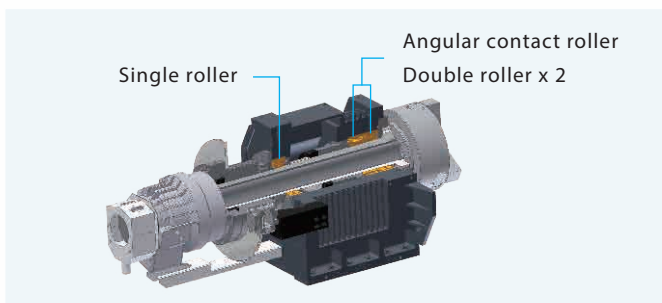
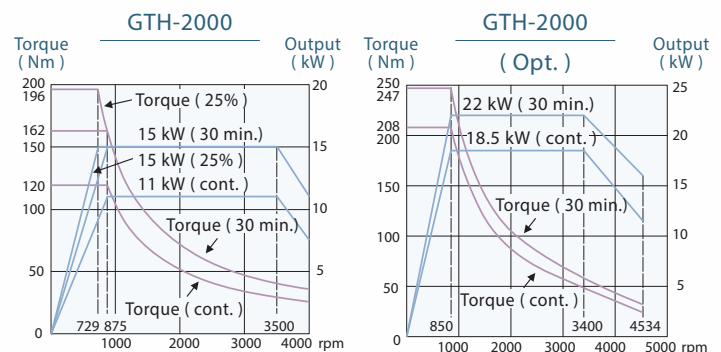


Convex

High Power Spindle

- ▶ The precision direct belt drive system provides greater spindle control, flexibility and serviceability.
- ▶ The 4,000 rpm high torque spindle is equipped with a powerful 15 kW (30 min.) wide-range motor that generating twice the torque output of standard motors.
- ▶ P4 grade (Class 7) super-high precision bearings are directly assembled for maximum level of support and precision. Bearing configuration is designed for super heavy-duty cutting with ultra-smooth performance and long term durability with a higher level of accuracy.

Spindle Output



Pneumatic Work-Piece Positioning Detector

Option

Apply pneumatic flow to detect work-piece and fit of clamping jaw surface. When not adjust closely to fit, robot arm will re-load again to ensure operation safety.

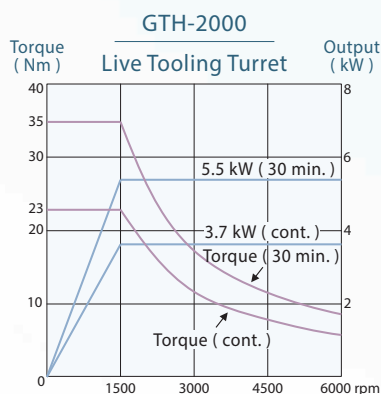
LIVE TOOLING TURRET

Option



Live Tooling Turret & C-axis

- ▶ Working with the live tooling turret, the C-axis and disk brake system enables the machine to perform multiple tasks, such as drilling, tapping, and milling operations, including cylindrical and polar coordinate interpolations, resembling a 4th-axis rotary table on a machining center.



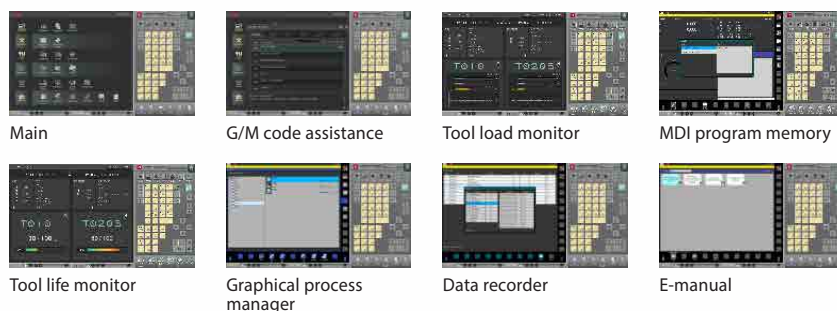
- ▶ The 12-station GOODWAY live tooling turret offers 12 stations available for live tooling (live tooling tools rotate in working position only).^{*1}
- ▶ With the latest technology, live tooling is driven by an AC servo motor to provide ample power, in the form of torque. Now, even the toughest of jobs may be tackled without a sweat.
- ▶ The FANUC Cf-axis servo motor generating an ultra-high resolution of 33,000,000 pulses per spindle rotation and high output torque, machined surface finishes are much superior. Also, dynamic accuracy is within $\pm 0.02^\circ$ even under heavy cutting loads. (GTH-2000)

^{*1} : 16-station live tooling turret are also available on GTH-2000.

INTELLIGENT OPERATING SYSTEM

G.LINC

Option



Machining preparation

- Ultra fast tool selection
- To memorize MDI program

Program editing

- Adjuvant of G/M code
- Graphical procedure management
- Manual Guide *i*

Machining

- Load monitor
- Tool life time
- Machined parts counter
- Visible servo observation

Adjuvant function

- Data record
- Maintenance Warn
- Prt Scrm record
- Memo
- E book

AUTOMATION SYSTEM

GOODWAY supply various flexible automatic system according to different specification of work-piece and processing characteristics to meet your high efficiency and low manpower requirements.

High Performance Gantry Type Loading / Unloading System

- ▶ Abnormal load automatic detection and stop all axes movement.
- ▶ Allow restart from the interrupted position.
- ▶ Auto unload current work-piece if pneumatic work-piece positioning detector under NG status while loading*

* Optional pneumatic work-piece positioning detector is required.

X-axis Rapids | **2,500 (mm/sec.)**

Gantry type loading / unloading system		I	II	III
Loader work-piece handling capacity (weight)		3 kg x 2	6 kg x 2	8 kg x 2
Loader work-piece handling capacity (size)		Ø 150 x 80 mm	Ø 200 x 60 mm	Ø 250 x 60 mm
X-axis (Left / Right)	Stroke	4,200 mm*1		
	Max. speed	2,500 mm/sec.	2,000 mm/sec.	2,000 mm/sec.
Y-axis (Up / Down)	Stroke	800 mm		
	Max. speed	2,000 mm/sec.	1,500 mm/sec.	1,500 mm/sec.
Z-axis (Front / Rear)	Stroke	210 mm		
	Max. speed	750 mm/sec.		
C-axis	Stroke	180°		
	Max. speed	1 sec./180°		
Repeatability		±0.1 mm		
Jaw rotation		Pneumatic rotation module		
Jaw (robot arm)		3-jaw (Ø20mm)	3-jaw (Ø20mm)	3-jaw (Ø26mm)
Jaw (flipping device)		3-jaw (Ø20mm)	3-jaw (Ø20mm)	3-jaw (Ø26mm)

*1 Stroke varies from requirements.

Standard stocker	I	II	III
Number of pallets	12	10	10
Max. work-piece diameter	Ø 150 mm	Ø 200 mm	Ø 250 mm
Stack height	350 mm	350 mm	350 mm
Weight of work-piece / pallet	40 kg	50 kg	50 kg

Specifications are subject to change without notice.



2 1st spindle unloading / loading



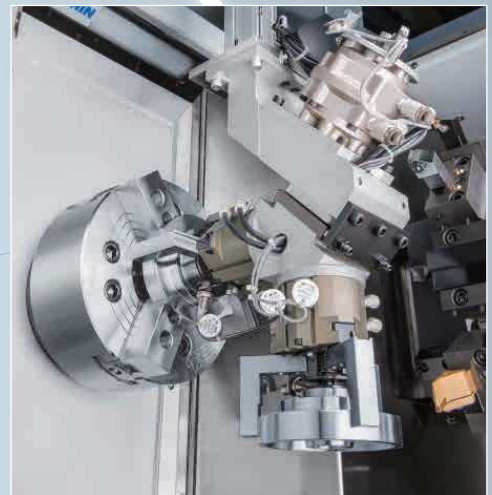
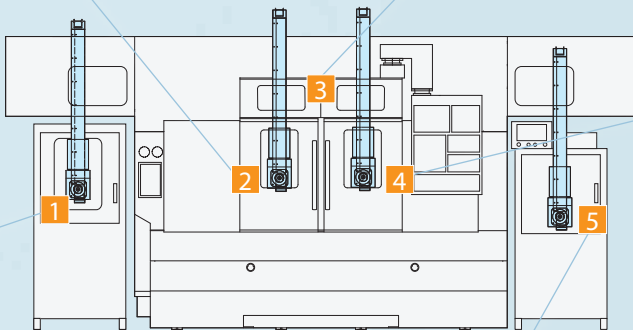
1 Work-piece clamping

Standard Stocker

Optional 10 / 12 sets of pallets by various fixing way to meets all kinds of machining requirement.



3 Flipping work-piece



4 2nd spindle unloading / loading

Rotary Twin Jaws Robot Arm

Programmable 3 axes robot arm with rotary twin jaws design, loading/unloading can be done by one robot arm. Fast, safe and simple to operate.



5 Work-piece detection / unloading

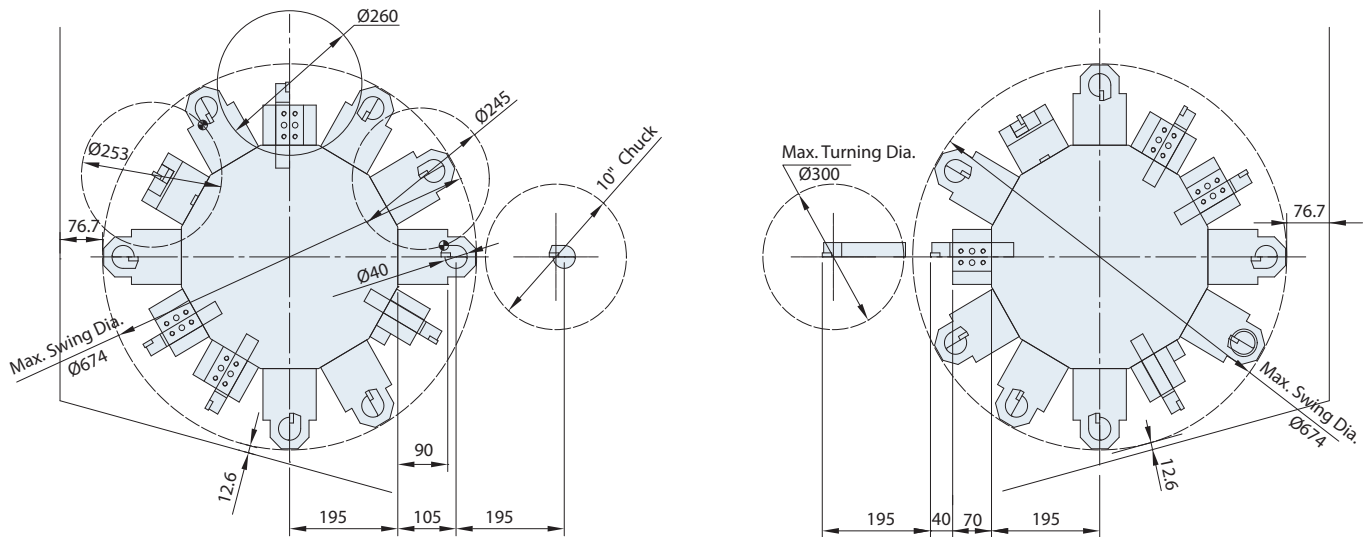
Accuracy Detection Device

By using 0.4 μm high resolution Eddy-current testing technology which measure by relative distance without touching the surface can accurate detect work-piece accuracy. Multiple advantages, such as high reliability, high detection rate and zero wear.

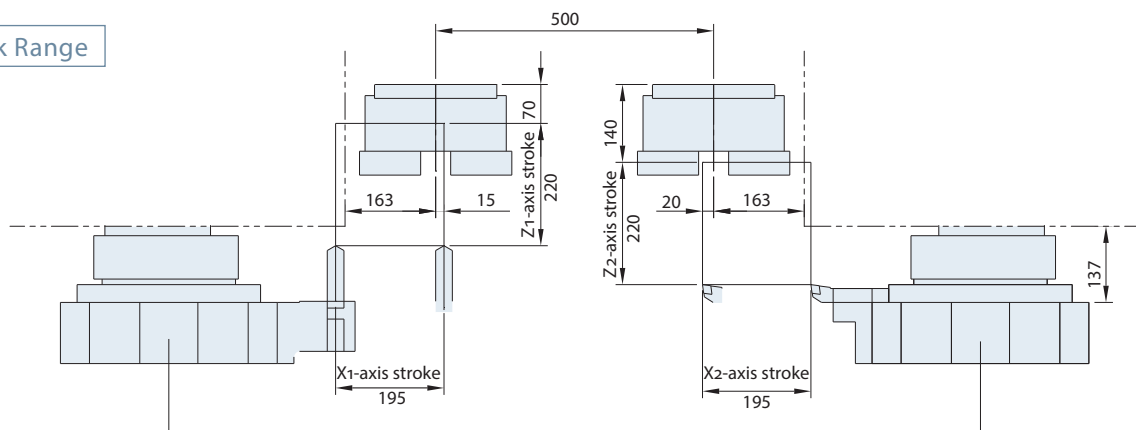
GENERAL DIMENSION

GTH-2000 12-Station Turret

Interference Diagram



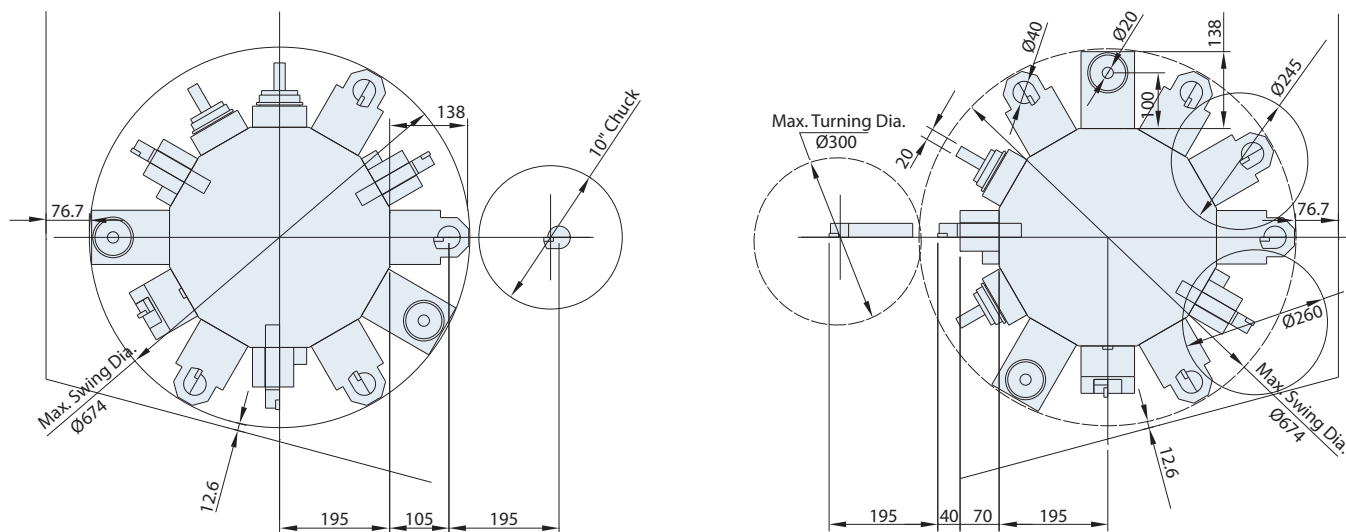
Work Range



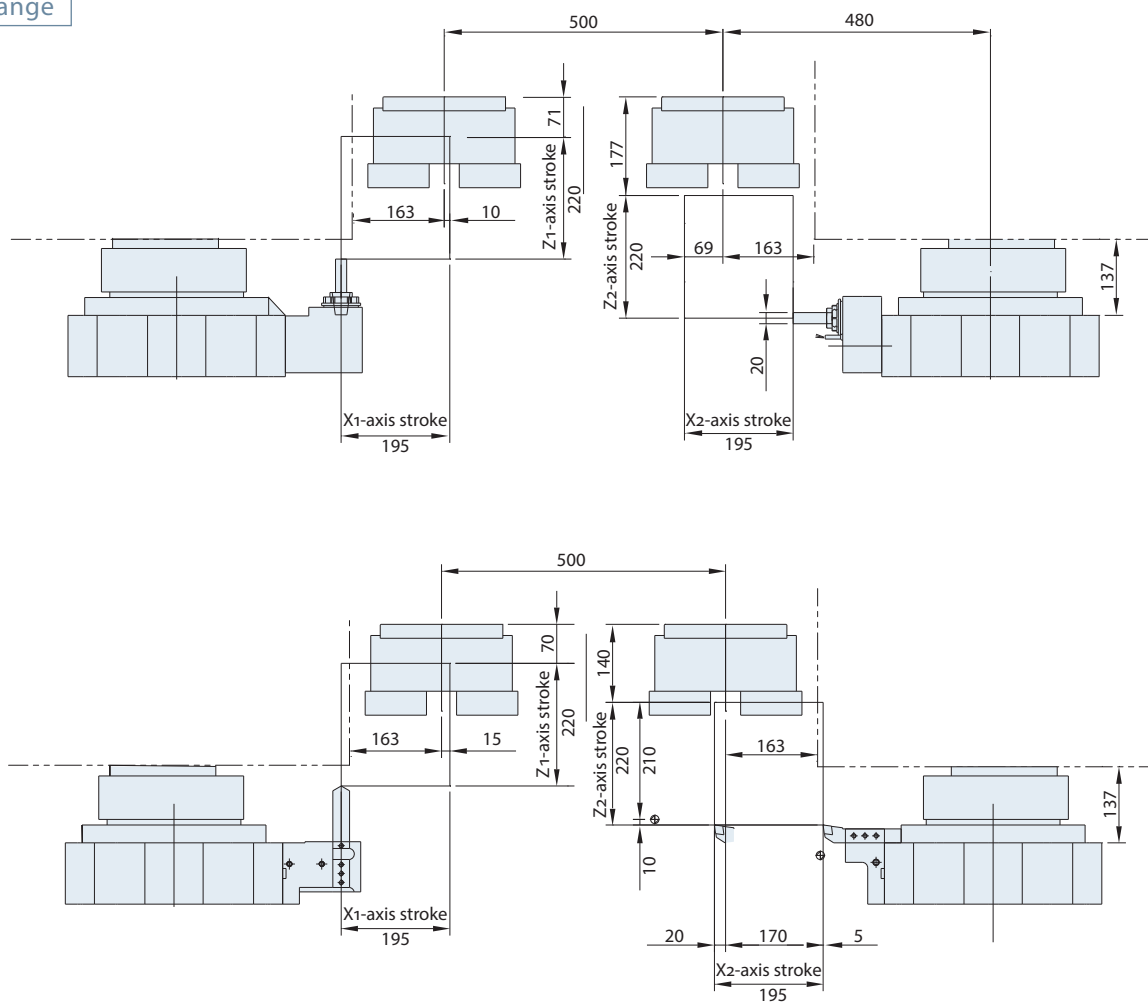
Tooling System

O.D. Tools		CV-3045 CV-3046	O.D. Tool Holder	□ 25 LX-3095 □ 25.4 LX-3095A
Face Tools		CV-3093A	Face Tool Holder	□ 25 LX-3097 □ 25.4 LX-3097A
I.D. Tools			I.D. Tool Holder	CV-3097
I.D. Tools				Ø40 LX-3091 Ø38.1 LX-3091A
Drill		Ø40 Ø38.1	Sleeve	Ø40 CJ-3014C Ø38.1 CJ-3110C
		Ø32 Ø31.75		Ø40 CJ-3110B Ø38.1 CJ-3110A
I.D. Tools		Ø40 Ø38.1	Sleeve	Ø40 CJ-3112B Ø38.1 CJ-3112A
		Ø32 Ø31.75		Ø40 CJ-3010 Ø38.1 CJ-3107
I.D. Tools		Ø40 Ø38.1	Sleeve	Ø40 CV-3203D Ø38.1 CV-3204B
		Ø32 Ø31.75		Ø40 CV-3203C Ø38.1 CV-3204A
I.D. Tools		Ø40 Ø38.1	Sleeve	Ø40 CV-3203B Ø38.1 CV-3204D
		Ø32 Ø31.75		Ø40 CV-3203A Ø38.1 CV-3204C

Unit : mm



Work Range

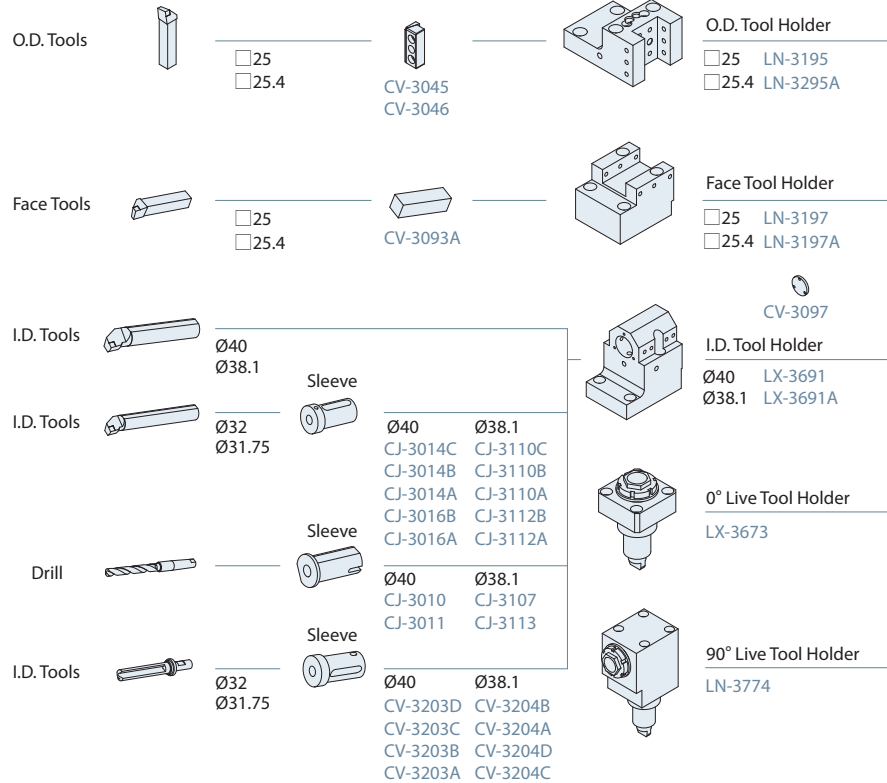


Unit : mm

GENERAL DIMENSION

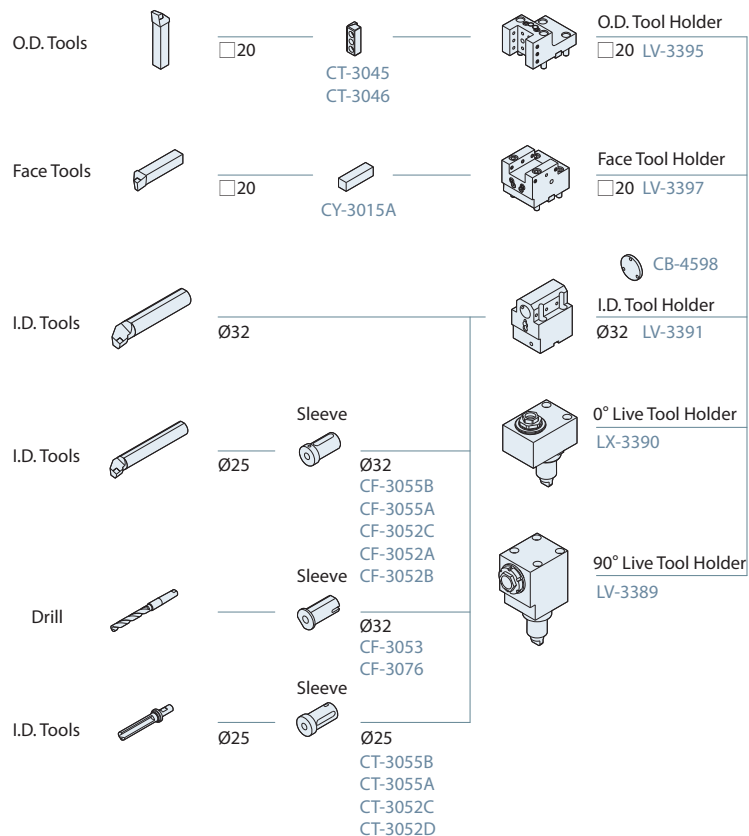
GTH-2000 12-Station Live Tooling Turret

Tooling System



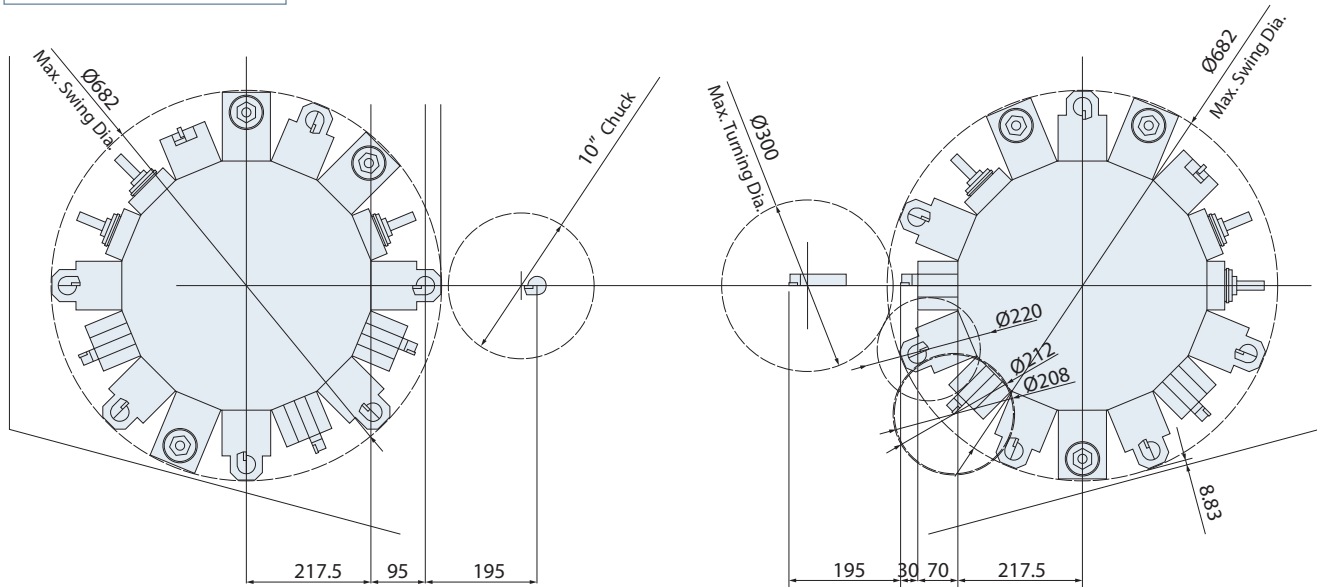
GTH-2000 16-Station Live Tooling Turret

Tooling System

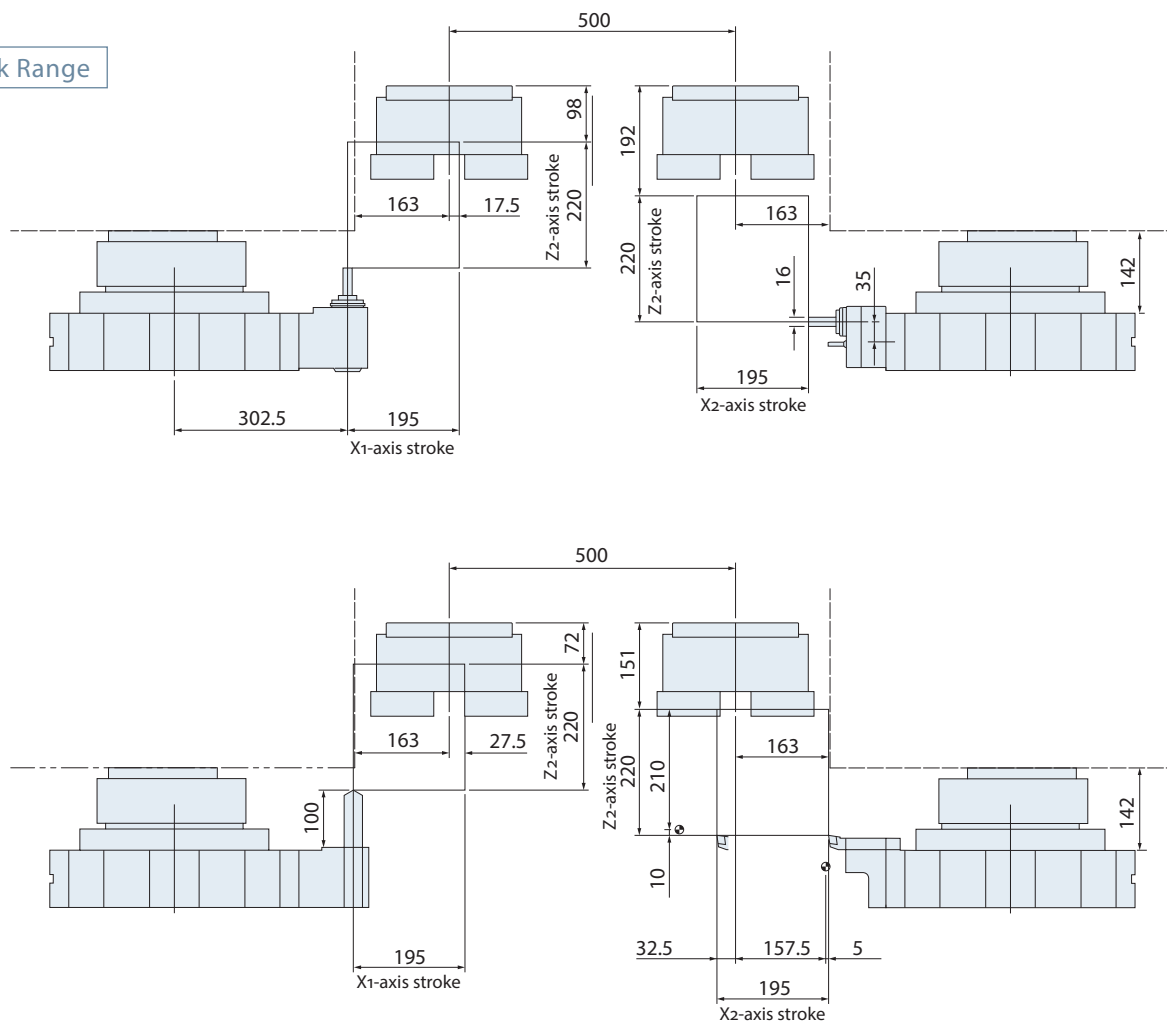


Unit : mm

Interference Diagram



Work Range



Unit : mm

MACHINE SPECIFICATIONS

CAPACITY	GTH-1500	GTH-2000
Max. turning diameter	Ø 240 mm 9.44"	Ø 300 mm 11.8"
Standard turning diameter	Ø 120 mm 4.72"	Ø 260 mm 10.23"
Max. turning length	80 mm 3.14"	205 mm 8.07"
Chuck size	6" / 8"	10"
SPINDLE		
Hole through spindle	Ø 61 mm 2.4"	Ø 66 mm 2.59"
Spindle bearing diameter (Front / Rear)	Ø 90 / Ø 80 mm 3.54" / 3.14"	Ø 100 / Ø 90 mm 3.93" / 3.54"
Spindle nose	A2-5	A2-6
Motor output (Cont. / 30 min.)	5.5 / 7.5 kW 7.5 / 10 HP (Opt. 7.5 / 11 or 11 / 15 kW 10 / 15 or 15 / 20 HP)	11 / 15 kW 15 / 20 HP (Opt. 18.5 / 22 kW 25 / 30 HP)
Motor full output speed	1,500 rpm	1,500 rpm
Spindle drive system	Direct Belt Drive	Direct Belt Drive
Spindle drive ratio	10 : 6	7 : 12 (Opt. 17 : 30)
Spindle speed range	45 ~ 6,000 rpm (Opt. 60 ~ 4,800 rpm)	24 ~ 4,000 rpm (Opt. 24 ~ 4,500 rpm)
Spindle full output speed	900 rpm	875 rpm (Opt. 850 rpm)
Spindle torque (Cont. / 30 min.)	58 / 80 Nm 42 / 59 lb-ft (Opt. 80 / 116 or 116 / 160 Nm 59 / 85 or 85 / 118 lb-ft)	120 / 162 Nm 88 / 119 lb-ft (Opt. 208 / 247 Nm 153 / 182 lb-ft)
Cf-AXIS (OPT.)		
Cf-axis motor	—	AC 1.2 kW 1.6 HP
Cf-axis rapids	—	33 rpm
Max. Cf-axis torque (Cont.)	—	240 Nm 177 lb-ft
Cs-AXIS (OPT.)		
Positioning accuracy	63 arc-sec	—
Repeatability	25 arc-sec	—
X & Z AXES		
Max. X / Z axes travel	135 / 160 mm 5.31" / 6.29"	195 / 220 mm 7.67" / 8.66"
X / Z axes rapids	24 m/min. 945 IPM	24 m/min. 945 IPM
Slide way type	Box way	Box way
Feed rates	1 ~ 500 mm/min. 1 ~ 19.6 IPM	1 ~ 500 mm/min. 1 ~ 19.6 IPM
X / Z axes servo motor	AC 1.2 / 1.8 kW 1.6 / 2.4 HP	AC 1.6 / 3 kW 2 / 4 HP
X / Z axes ball screw Ø / pitch	Ø 32 mm 1.25" / Pitch 12	Ø 32 mm 1.25" / Pitch 8
X / Z axes thrust (Cont.)	372 / 586 Kgf 820 / 1,290 lbf	644 / 958 Kgf 1,420 / 2,110 lbf
TURRET		
Station	12	12
Indexing drive	FANUC AC Servo motor	FANUC AC Servo motor
Indexing speed	1 sec. (Adjacent) / 1.5 sec. (180° Single step)	1 sec. (Adjacent) / 1.5 sec. (180° Single step)
O.D. tool shank size	□ 20 mm 3/4"	□ 25 mm 1"
I.D. tool shank size	Ø 40 mm 1-1/2"	Ø 40 mm 1-1/2"
Turret disk diameter	Ø 300 mm 11.8"	Ø 390 mm 15.3"
LIVE TOOLING TURRET (OPT.)		
Max. turning diameter	Ø 150 mm 5.9"	Ø 300 mm 11.8"
Live tooling stations	12	12 (Opt. 16)
Live tooling motor output	AC 2.2 kW (Cont.) 2.9 HP	AC 3.7 / 5.5 kW (Cont. / 30 min.) 5 / 7.3 HP
Indexing drive	FANUC AC Servo motor	FANUC AC Servo motor
Indexing speed	0.2 sec. (Adjacent) / 0.7 sec. (180° Single step)	0.2 sec. (Adjacent) / 0.7 sec. (180° Single step)
O.D. tool shank size	□ 20 mm 3/4"	□ 25 mm 1"
I.D. tool shank size	Ø 40 mm 1-1/2"	Ø 40 mm 1-1/2"
Live tooling shank size	ER 20 (Ø 13 mm) 0.51"	ER 32 (Ø 20 mm) 3/4"
Live tooling RPM range	6,000 rpm	6,000 rpm



GOODWAYCNC.com

GOODWAY MACHINE CORP.

HEADQUARTERS

No.13, 5th Road,
Taichung Industrial Park,
Taichung City, 407, Taiwan
E-mail : goodway@goodwaycnc.com

CENTRAL TAIWAN SCIENCE PARK BRANCH

No. 38, Keyuan Road,
Central Taiwan Science Park.Taichung,
Taichung City, 407, Taiwan
TEL : + 886-4-2463-6000
FAX : + 886-4-2463-9600

GOODWAY MACHINE (WUJIANG) CO.,LTD

No. 4888, East Lake Taihu Avenue, Wujiang
Economic and Technological Development Zone,
Jiangsu, China
Sales Hotline : + 86-512-8286-8680
Service Hotline : + 86-512-8286-8066
FAX : + 86-512-8286-8620
E-mail : goodway@goodwaycnc.cn