

# GLS-150 SERIES

High Speed CNC Turning Centers



THE ULTIMATE MACHINING POWER  
**WOODWAY**®

# HIGH SPEED CNC TURNING CENTERS

Packed with industry leading technology and top quality components, the GOODWAY GLS-150 series turning centers combine speed, stability and compact machine size to bring you The Ultimate Machining Power®. These high speed machines will easily accomplish the demanding turning applications of today and tomorrow. Furthermore, with optional live tooling, C-axis, and Y-axis, milling, turning applications can be completed in one single machine.

- ▶ GLS-150 series designs for optimal performance of the latest machining needs, motor power and structure rigidity are highly increased.
- ▶ High precision linear guide way design is used in X & Z axes to provide the optimum control and efficient movement. Rapids are up to 30 m/min.
- ▶ Fully enclosed splashguards keep chips and coolant contained for a safe clean working environment.
- ▶ The auto lubrication system delivers metered amounts of lubrication to the slide ways, ball screws, and vital components. Distribution is automatically shut-off during idling to prevent waste.

New GLS-150 series  
v.s Previous Model

Output ↑ 40%  
Spindle Motor

Dia. ↑ 16%  
Turret Disk

Dia. ↑ 10%  
Curvic Coupling of Turret



( GLS-200 model shown with optional accessories. )

SERIES	GLS-150	GLS-200	GLS-260
Chuck Size	6"	8"	10"
Bar Capacity	Ø 51 mm ( 2" )	Ø 65 mm ( 2.55" )	Ø 65 mm ( 2.55" )
Max. Turning Length* <sup>1</sup>	500 mm ( 19.6" )	480 mm ( 18.9" )	480 mm ( 18.9" )

\*1 Individual models may vary, detail specification please see work range diagram.

# MAXIMUM STRENGTH CONSTRUCTION

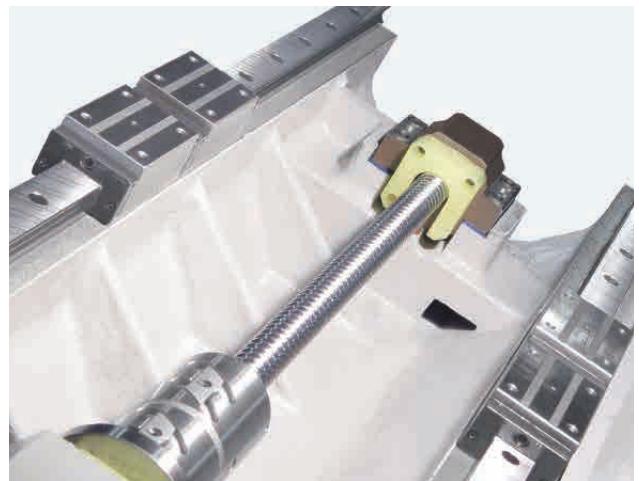
1  
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Built to withstand years and years of rigorous high production turning, the heavily ribbed, one-piece, thermally balanced bed and casting parts are of "MEEHANITE" casting. The 30° true slant bed design further provides superior support for the headstock, turret, and tailstock, thus, creating the rigidity needed for long-term high precision turning and efficient chip removal.



( Casting structure of GLS-150 series shown. )

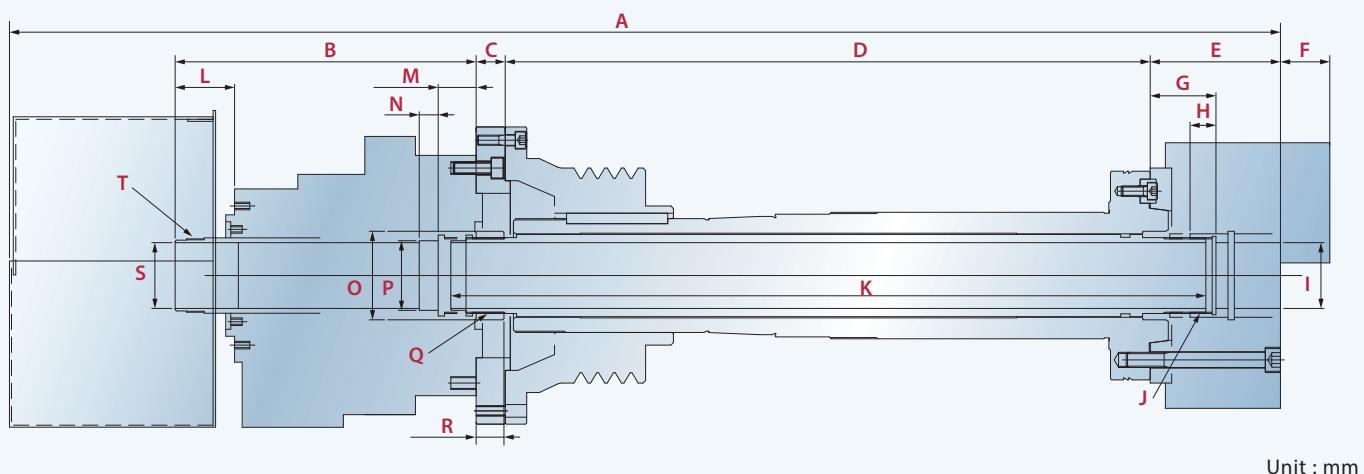
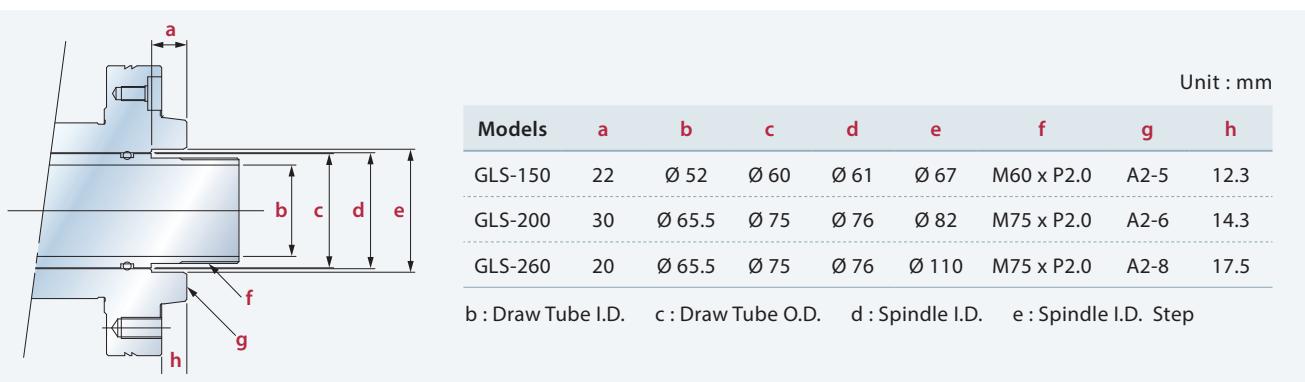
- ▶ Major structural components have been combined into one solid platform. The low center of gravity 30° slant bed design provides the most rigid foundation possible for the headstock, turret, and tailstock.
- ▶ By using Finite Element Analysis ( FEA ), optimal reinforce ribbings are directly cast into the one-piece bed structure. Mechanical rigidity has been increased by more than 30% when compared to conventional designs. The GLS-150 series is capable of performing heavy-duty turning and maintaining long-term high-precision accuracy. More rigidity also means extended tool life.



# ULTIMATE TURNING POWER

- ▶ The heavy-duty headstock is of one-piece casting reinforced with heat dispensing fins.
- ▶ Standard rigid tapping feature provides high-speed precision tapping without the use of floating tap holders. Set-up is easier and depth of thread more accurate, permitting maximum productivity for tapping operations.
- ▶ The precision direct belt drive system provides greater spindle control, flexibility and serviceability. Pulley ratios fine tune the motor's maximum RPM to match the spindle's maximum RPM, which result in full output at the lowest RPM possible. Thus, utilizing the full potential of the spindle motor for maximum cutting power.

## Spindle & Nose Dimension Drawing



- ▶ P4 grade ( Class 7 ) super-high precision bearings are directly assembled for maximum level of support and precision. Bearing configuration is designed for heavy-duty cutting with ultra-smooth performance and long term durability with a higher level of accuracy.

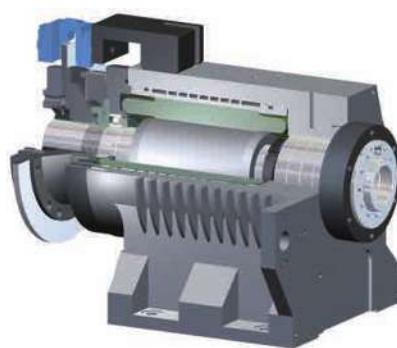
Models	A	B	C	D	E	F	G
GLS-150	1,015	Max. : 237.5 Min. : 215.5	23	505.2	91	37	Max. : 46 Min. : 34
GLS-200	1,031	Max. : 275 Min. : 250	38	510.3	103	38	Max. : 51.5 Min. : 35.5
GLS-260	1,037	Max. : 275 Min. : 250	38	510.3	113	43	Max. : 58.5 Min. : 39.5

Models	H	I	J	K	L	M	N	O	P	Q	R	S	T
GLS-150	20	Ø 52	M60xP2.0	590	Max. : 47.5 Min. : 25.5	Max. : 30 Min. : 8	15	Ø 70	Ø 55	M60xP2.0	Max. : 22 Min. : 0	Ø 52	M58xP1.5
GLS-200	20	Ø 66	M75xP2.0	623	Max. : 50 Min. : 25	Max. : 35 Min. : 10	15	Ø 95	Ø 80	M85xP2.0	Max. : 25 Min. : 0	Ø 75	M84xP2.0
GLS-260	25	Ø 75	M85xP2.0	620	Max. : 50 Min. : 25	Max. : 35 Min. : 10	15	Ø 95	Ø 80	M85xP2.0	Max. : 25 Min. : 0	Ø 75	M84xP2.0

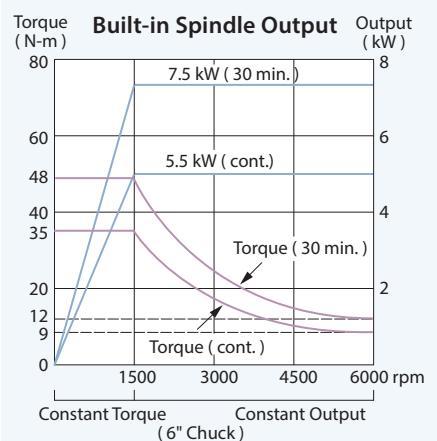
**GLS-150 Spindle Acc. / Dec. Time**  
 Chuck : 6" + hard jaws

RPM	1,000	1,500	2,000	2,500	3,000	4,000	5,000	6,000
Accelerate ( sec. )	1.3	1.6	1.8	2.2	2.6	3.6	5.2	7.3
Decelerate ( sec. )	1.0	1.2	1.6	2.0	2.5	3.1	4.1	4.8

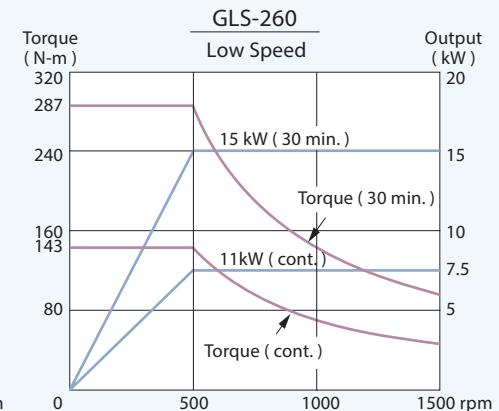
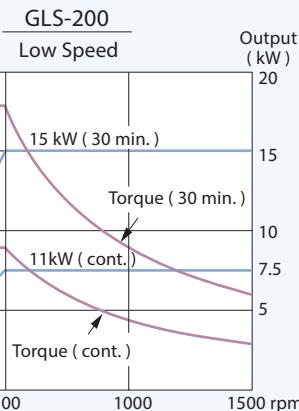
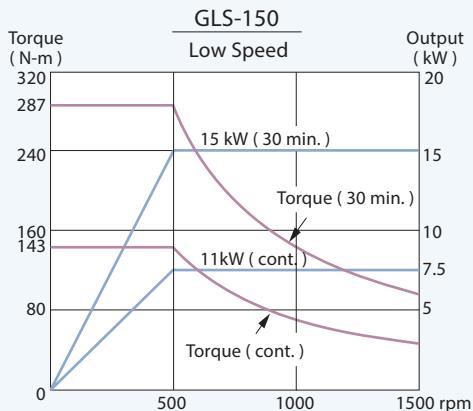
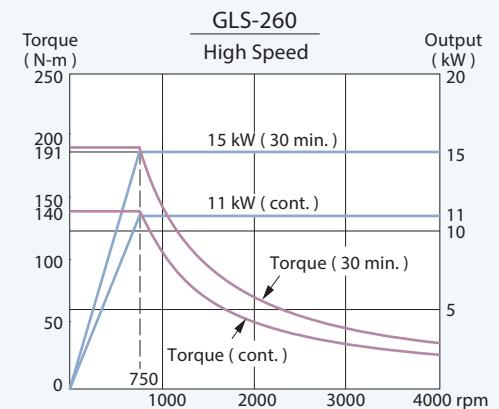
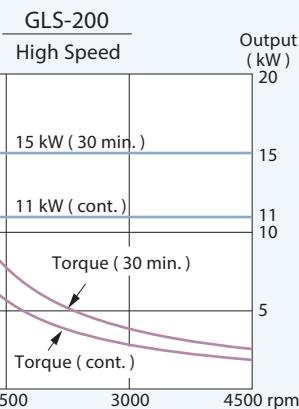
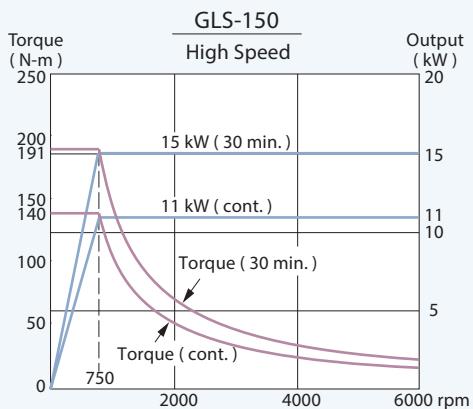
- ▶ GLS-150 models are available with high-speed, high-precision built-in spindle motors, which provides faster spindle response, reduces vibration and power loss, which translate to faster cycle times.



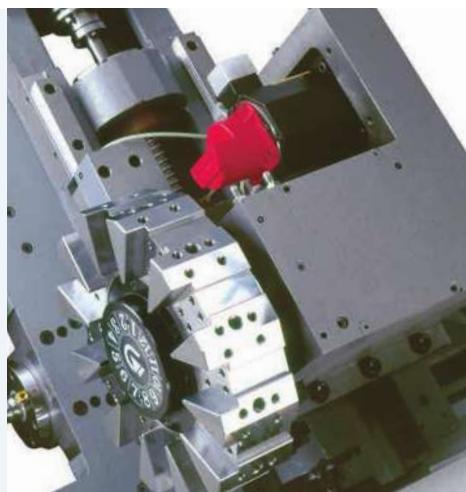
( Built-in spindle construction )



### Spindle Output



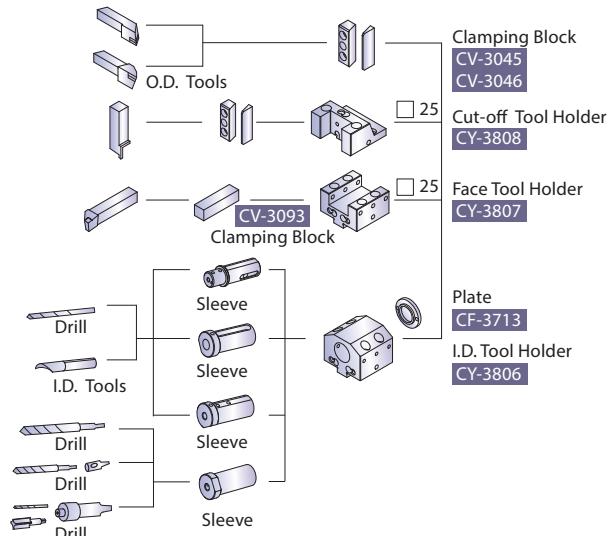
# ADVANCED TURRET TECHNOLOGY



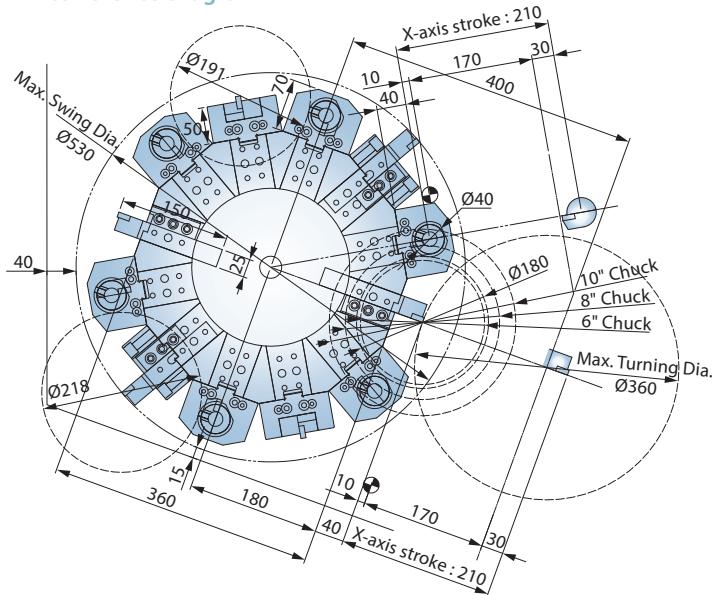
- ▶ A high-speed servo motor indexing system provides the 10 or 12-station turret with a 0.2 sec. indexing time.
- ▶ High precision curvic couplings and hydraulic clamping are used to enhance tool indexing accuracy and turret disk rigidity.
- ▶ The standard 12-station turret clears 180 mm ( 7.08" ) diameter work holding devices without interference while the opt. 10-station turret clears 224 mm ( 8.8" ) diameter.

**Standard 12-Stations Turret**

## Tooling System

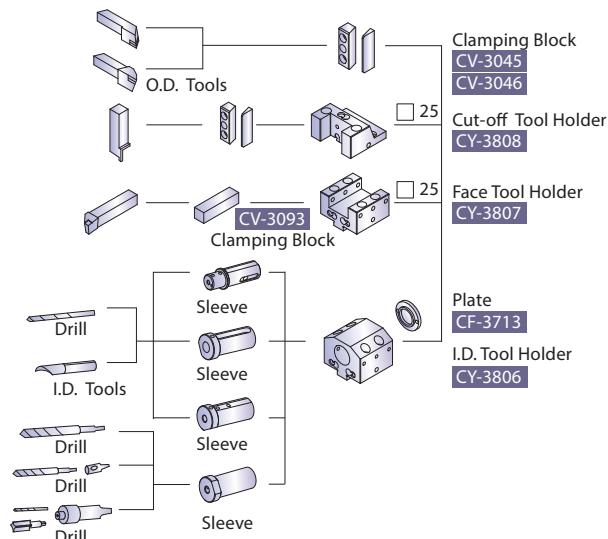


## Interference Diagram

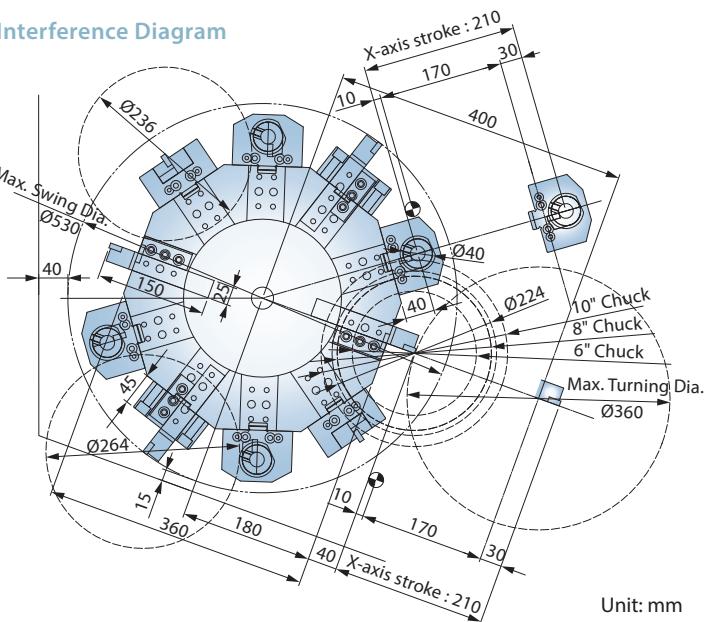


**Optional 10-Stations Turret**

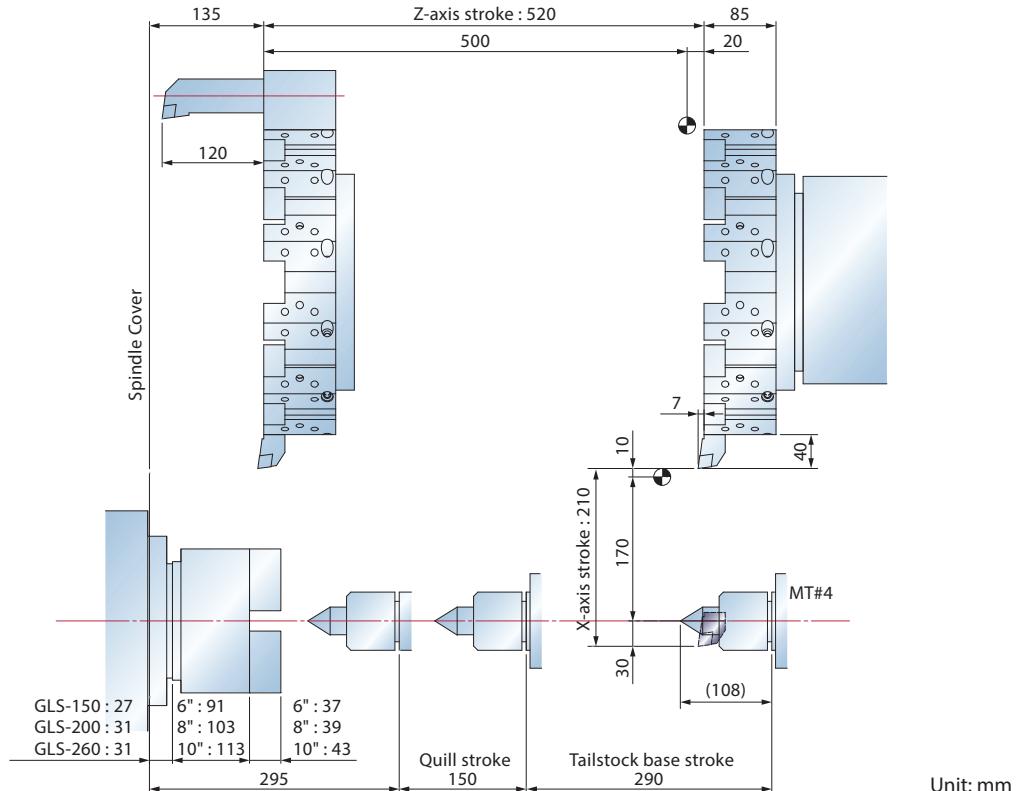
## Tooling System



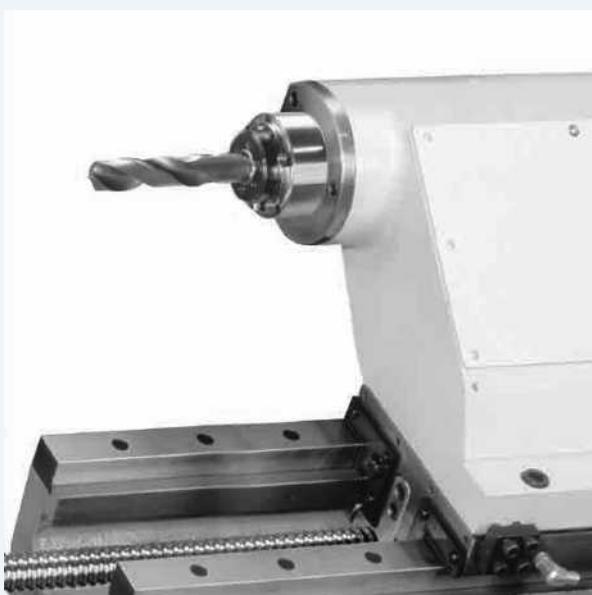
## Interference Diagram



### Work Range



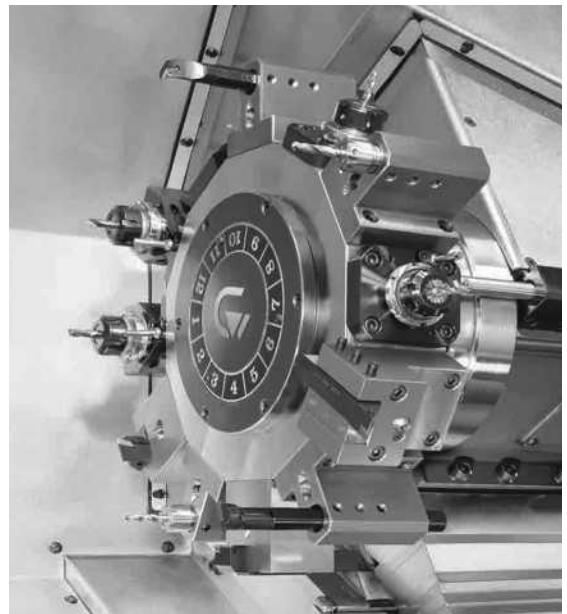
- The standard hydraulic tailstock uses live centers to provide support for long work-pieces. Quill pressure is adjustable and movement is programmable.



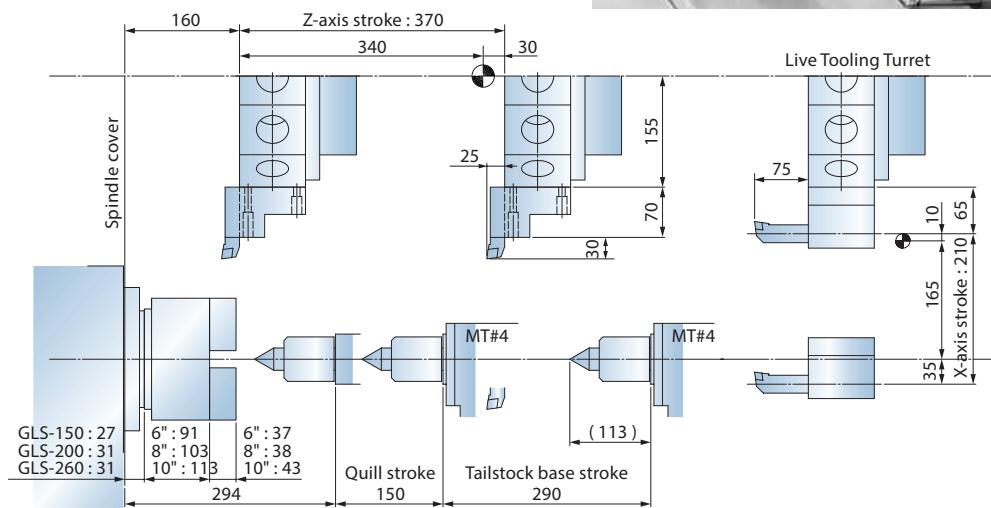
- The optional servo driven tailstock uses a servo motor and ball screw to position the tailstock and generate pressure to support the work-piece. Pressure against a work-piece is adjustable by increasing or decreasing the load of the servo motor, which can be programmed to provide variable and precise pressure during the machining process. This type of tailstock can also be used to drill the work-piece during the O.D. turning process.

# LIVE TOOLING TURRET

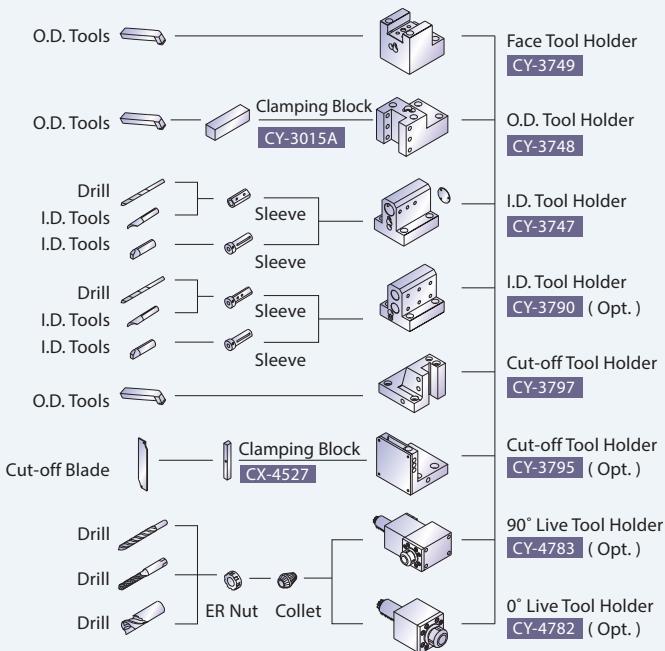
- The 12-station GOODWAY live tooling turret offers 12 stations available for live tooling ( live tooling tools rotate in working position only ) and features a non-lifting turret disk.
- GOODWAY live tooling turret utilizes advanced servo indexing technology to achieve 0.2 second indexing time for adjacent stations and 0.5 second for stations at the opposite end of the disk.
- 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.



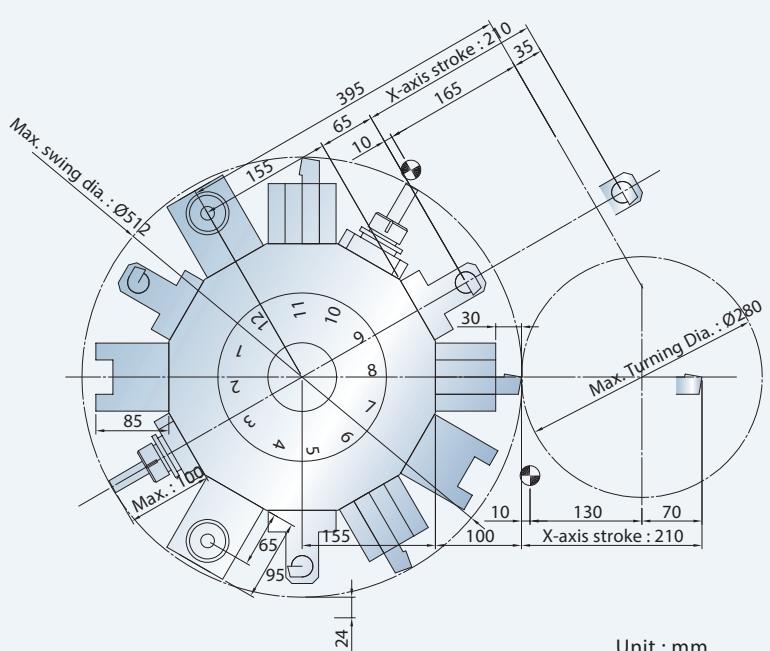
**Work Range**



**Tooling System**



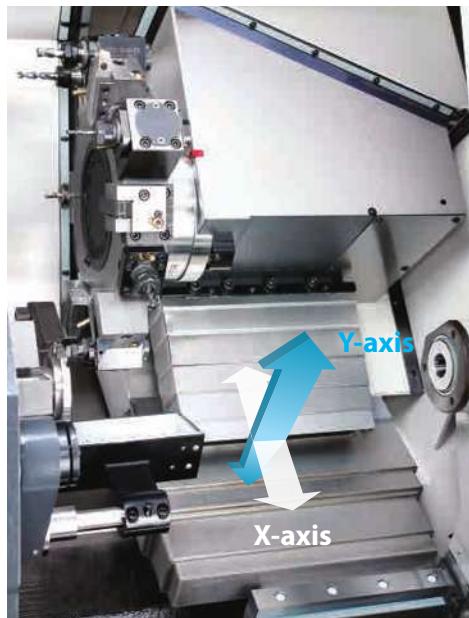
**Interference Diagram**



# Y-AXIS MACHINING CAPABILITY

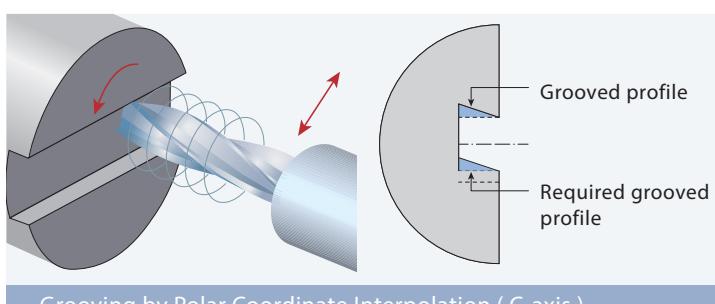
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- ▶ Y-axis models perform virtually the same way as machining centers equipped with 4<sup>th</sup>-axis rotary tables, but with the benefit of built-in turning capability. The C-axis acts as the 4<sup>th</sup>-axis. This configuration replaces a turning center and machining center equipped with 4<sup>th</sup>-axis with one machine, thus, saving money, time, floor space, manpower and fixture costs, while reducing accuracy lost by eliminating the part from being moved to another machine.
- ▶ Y-axis control further enhances multi-tasking live tooling capabilities and improves various machining precision. High precision grooving and X-axis off-center drilling are enabled.
- ▶ With an abundant amount of Y-axis travel, 70 mm = ±35 mm ( 2.75" = ±1.37" ), a wide variety of parts may be efficiently machined.



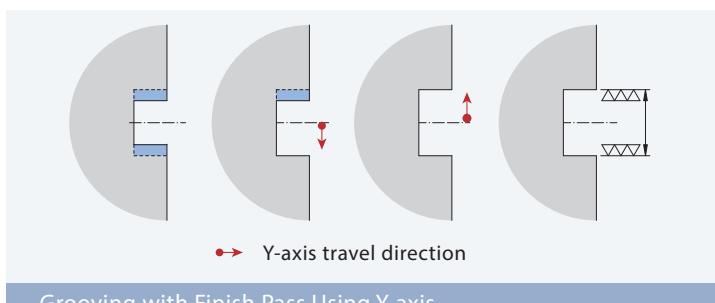
( GLS-150Y model shown with optional accessories. )

- ▶ On Y-axis equipped machines, the turret is mounted on a secondary 30 degrees wedge saddle on top of the X-axis slide. Guide ways are widely spaced for maximum strength.

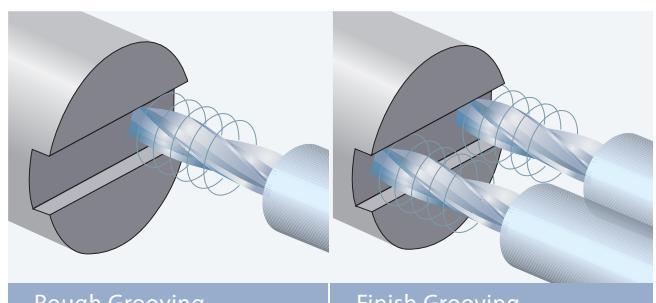


Grooving by Polar Coordinate Interpolation ( C-axis )

- ▶ Grooving with Y-axis control produces grooves with higher accuracy.



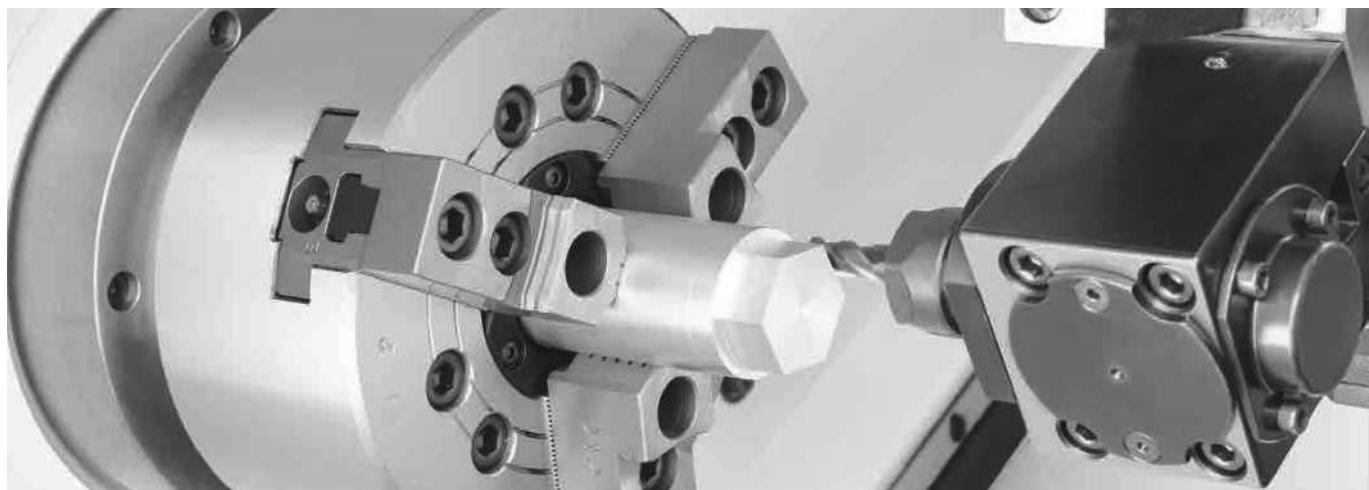
Grooving with Finish Pass Using Y-axis



Rough Grooving

Finish Grooving

# MACHINING PERFORMANCE



## Machining Capability

	Tools	Spindle Speed ( rpm )	Feedrate ( mm/min. )	Cutting Speed ( m/min. )	Cutting Depth ( mm )
Drill	Ø13 HSS	1,225	183	50	N/A
End mill	Ø14 HSS end drill	680	108	N/A	15
Tapping	M12	400	700	12	N/A

Material : S45C Testing Model : GLS-150M

## Live Tooling Turret Specification

Drive Motor Power	2.5 kW ( 3.3 HP )
Drive Motor	FANUC α 8 / 4000 is
Max. Tapping Capacity	M8 * P1.25
Max. Milling Capacity	Ø12 * 10
Gear Ratio	1 : 1

GOODWAY Multi-tasking machine can perform the functions below in one setup :



## Sample Work-Pieces



# NC INTELLIGENCE

Advanced hardware combined with intelligent software, makes your machine smarter

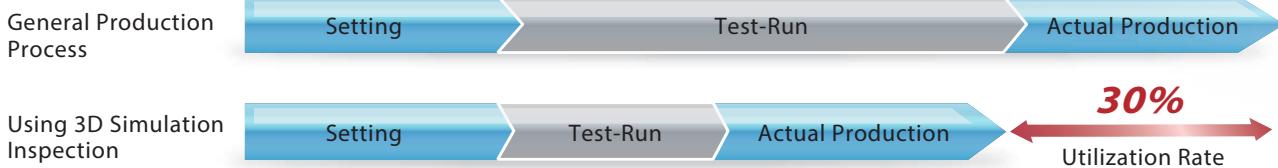
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# G.LINC 350

- Advanced Hardware
- Reliable Continuous Operation
- Outstanding Operability
- Shortened Troubleshooting Time
- Streamlined Programming
- Improved Utilization Rate
- High Security and Shortened Machining Setting



## Significant Production Efficiency



The 3D simulation inspection can greatly reduce test-run time and improve overall utilization rate

## Comprehensive Functions

Programming	Setting	Test-Run	Actual Production	Daily Used
<ul style="list-style-type: none"><li>■ Program management</li><li>■ Friendly programming environment</li><li>■ Programming auxiliary</li><li>■ Manual Guide i</li><li>■ Embedded E-manual</li></ul>	<ul style="list-style-type: none"><li>■ 3D advance tool path and cutting simulation</li></ul>	<ul style="list-style-type: none"><li>■ Tool load monitor</li><li>■ Program check</li><li>■ Smart balance detection</li><li>■ 3D Real-time cutting simulation and interference check</li></ul>	<ul style="list-style-type: none"><li>■ Tool load monitor</li><li>■ 3D Real-time cutting simulation and interference check</li></ul>	<ul style="list-style-type: none"><li>■ Safety signal viewer</li><li>■ Fast alarm check productivity</li><li>■ Productivity management</li><li>■ Twin operation system switch</li><li>■ Maintenance management</li></ul>



# FEATURES

## Chip Conveyor



- ▶ The standard chip conveyor features adjustable timers that allow the operator to set operation intervals according to the amount of chips generated by the machine. Thus, reducing coolant loss to a minimum.

## Built-in lub. oil collection system



## Tri-color status light



## 3-Jaw chuck w/ Soft Jaws x 1 set



## Coolant Pump



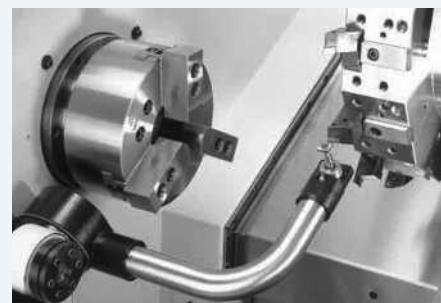
## Coolant Tank



- ▶ Coolant system features a roll-out coolant tank for easy maintenance and high-pressure coolant pump for increased cooling power.

## Tool Setter ( Opt. )

- ▶ The optional RENISHAW HPMA tool presetter utilizes a motorized arm to lower the tool probe into position. An auto tool check function further increases tool touch-off efficiency.



## Load Monitoring ( Opt. )

- ▶ The optional load monitoring function is used to detect abnormal load of tools by monitoring the variation in spindle motor and servo motor loads during the cutting process. When abnormal loads are detected, the machine will stop at program end ( M30 ) or immediately ( feed hold status ) according to tool life value or tool break value respectively.



S : Standard      O : Option  
 – : Not Available      C : Contact Goodway

		GLS-150	GLS-200	GLS-260
<b>SPINDLE</b>				
Main spindle motor configuration	Single-speed	S	S	S
Rigid tapping & spindle orientation		S	S	S
Main spindle disk brake	O	O	O	
Cs-axis & disk brake for main spindle*1	O	O	O	
<b>WORK HOLDING</b>				
Hydraulic hollow cylinder for chuck	8"	S	–	–
	10"	–	S	S
Hollow 3-jaws chuck & 1 set soft jaws	6"	S	–	–
	8"	–	S	–
	10"	–	–	S
Hard jaws	O	O	O	
Collet chuck	O	O	O	
Special work holding chuck	C	C	C	
In spindle work stopper	O	O	O	
Spindle liner ( guide bushing )	O	O	O	
Foot switch for chuck operation	S	S	S	
Programmable quill hydraulic tailstock	O	O	O	
Servo driven tailstock	O	O	O	
MT#4 live center	O	O	O	
Foot switch for tailstock operation	O	O	O	
Two-stage programmable pressure	Chuck clamping	O	O	O
	Tailstock thrust	O	O	O
<b>TURRET</b>				
10-station turret	O	O	O	
12-station turret	S	S	S	
12-station live tooling turret	O	O	O	
Tool holder & sleeve package	S	S	S	
Live tooling tool holders ( 0°x2, 90°x2 )*1	O	O	O	
<b>MEASUREMENT</b>				
RENISHAW HPMA tool presetter	Motorized arm	O	O	O
<b>COOLANT</b>				
Coolant pump	3 kg/cm <sup>2</sup>	S	S	S
	5 kg/cm <sup>2</sup>	O	O	O
	10 kg/cm <sup>2</sup>	O	O	O
High-pressure coolant system	20 kg/cm <sup>2</sup>	C	C	C
Roll-out coolant tank	S	S	S	
Oil skimmer	O	O	O	
Coolant flow switch	O	O	O	
Coolant level switch	O	O	O	
Coolant intercooler system	O	O	O	
<b>CHIP DISPOSAL</b>				
Chip conveyor with auto timer	Right discharge	S	S	S
Chip cart with coolant drain	O	O	O	
Chuck air blow	O	O	O	
Tailstock air blow	O	O	O	
Coolant gun	O	O	O	
Oil mist collector	O	O	O	
<b>AUTOMATIC OPERATION SUPPORT</b>				
Parts catcher	O	O	O	
Work-piece transport conveyor	O	O	O	
Bar feeder	O	O	O	
Bar feeder interface	O	O	O	
Gantry-type loader / unloader	O	O	O	
Auto door	O	O	O	
External M-code output	4 sets ( 8 )	O	O	O
	8 sets ( 16 )	O	O	O
<b>SAFETY</b>				
Fully enclosed guarding	S	S	S	
Door interlock ( incl. Mechanical lock )	S	S	S	
Tailstock stroke out-end check	S	S	S	
Chuck cylinder stroke out-end check	S	S	S	
Chuck cylinder check valve	S	S	S	
Low hydraulic pressure detection switch	S	S	S	
Over travel ( soft limit )	S	S	S	
Load monitoring function	O	O	O	

Above standard & optional features also apply to L models.

\*1 For M ( live tooling turret ) & Y ( Y-axis ) models only.

\*2 10.4" color LCD option needed.

\*3 For servo motor drivern power turret only.

	Oi-TF	31i
<b>OTHERS</b>		
Work light	S	S
External work light	O	O
Electrical cabinet	Heat exchanger	S
	A/C cooling system	O
Complete hydraulic system	S	S
Advanced auto lubrication system	S	S
Foundation leveling & maintenance tool kit	S	S
Emergency maintenance electrical part package	S	S
Operation & maintenance manuals	S	S
<b>FANUC CONTROL FUNCTIONS</b>		
Display	8.4" color LCD	S
	10.4" color LCD	O
	Standard	S
	Dynamic <sup>12</sup>	O
Part program storage size	512K bytes	S
Oi-TF : each path	1M bytes	O
31i : total	2M bytes	O
	4M bytes	–
	8M bytes	–
Registerable programs	400	S
Oi-TF : each path	1,000	O
31i : total	4,000	–
	99	–
	128	S
Tool offset pairs	200	O
	400	–
	499	–
	999	–
	2000	–
Servo HRV control	HRV 3	S
Automatic data backup		S
Synchronous / Composite control	O	O
Inch / metric conversion	S	S
Polar coordinate interpolation	S	S
Cylindrical interpolation	S	S
Multiple repetitive cycle	S	S
Rigid tapping	S	S
Unexpected disturbance torque detection function	S	S
Spindle orientation	S	S
Spindle speed fluctuation detection	S	S
Embedded macro	O	O
Spindle synchronous control	S	S
Tool radius / Tool nose radius compensation	S	S
Multi-language display	S	S
Polygon turning	S	S
Helical interpolation	O	O
Direct drawing dimension programming	S	S
Thread cutting retract	S	S
Variable lead threading	S	S
Multiple repetitive cycle II	S	S
Canned cycles for drilling	S	S
Tool nose radius compensation	S	S
Chamfering / Corner R	S	S
AI contour control I	O	S
Multi part program editing <sup>13</sup>	S	S
Manual handle retrace	O	O
Manual intervention and return	S	O
External data input	S	S
Addition of custom macro	S	S
Increment system C	S	S
Run hour & parts counter	S	S
Auto power-off function	S	S
RS-232 port	S	S
Memory card input / output ( CF + USB )	S	S
Ethernet	S	S

# OPTIONAL AUTOMATION FEATURES

## Gantry Loading Systems

- ▶ Available standardized or custom gantry loading / unloading systems provide automatic operation for chucking operations. These flexible systems can be intergraded onto one or more machines to suit a wide range of applications.

Single Machine /  
Gantry Type Robotic Arm and Stocker



( Gantry Loading with GA-2000/300 series )

Multiple Machines /  
Gantry Type Robotic Arm and Stocker



( Gantry Loading with GS-200 series )

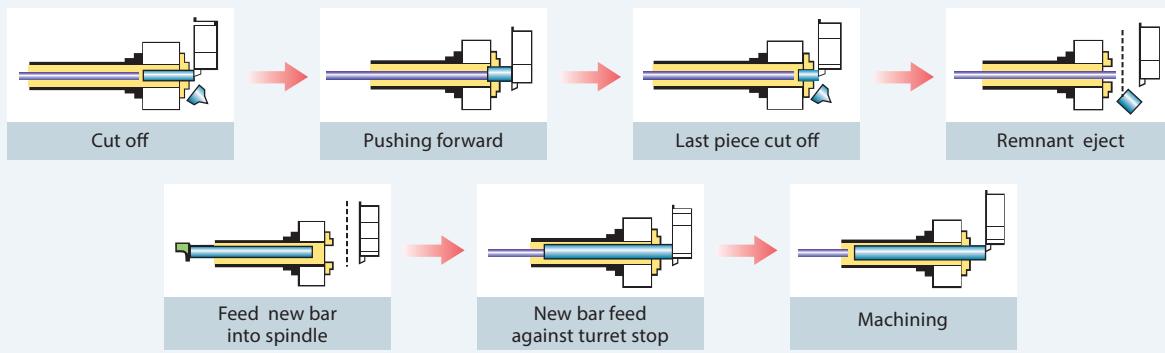


### Bar Feeder

Models	BF-65C	BF-80C
Bar diameters	$\varnothing 5 \sim 65$ mm	$\varnothing 6 \sim 80$ mm
Maximum bar lengths <sup>*1</sup>	1,220 mm	1,525 mm
Magazine capacity	65 mm x 10 bars	80 mm x 7 bars
Control / drive type	SIEMENS / Pneumatic	MITSUBISHI / Servo
Foot print	1,600 x 1,118 mm	2,210 x 1,448 mm
Weight	250 kg	500 kg

\*1 Actual bar length limited by total spindle + work-piece length ( work-piece + chuck + spindle + cylinder + rear spindle cover lengths ). A bar supporting device must be used if bar extends past the rear spindle cover, otherwise, the bar may bend during machining causing serious machine damage and injury or death to operator.

#### ► Bar Feeding & Bar Change Cycle



### Parts Catchers



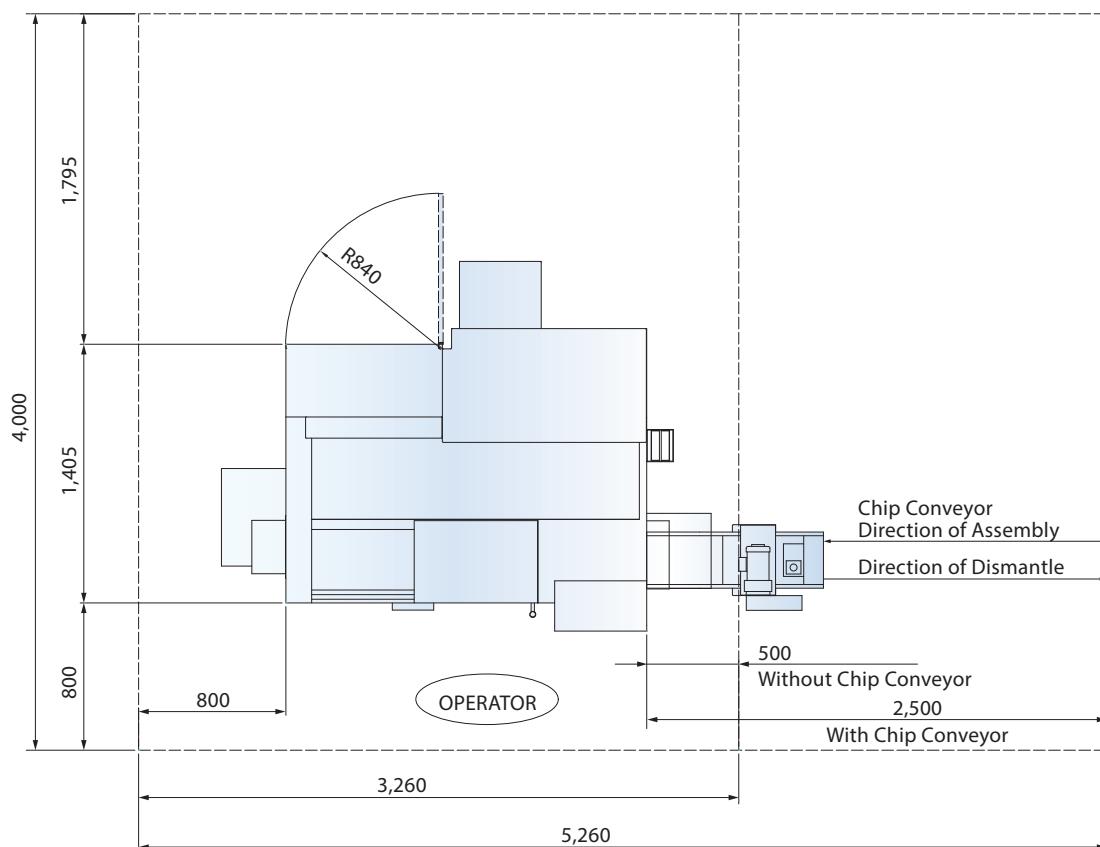
► Optional hydraulic parts catchers can be programmed to catch finished parts after cut-off. Parts conveyor systems are also available.

### Parts Conveyor



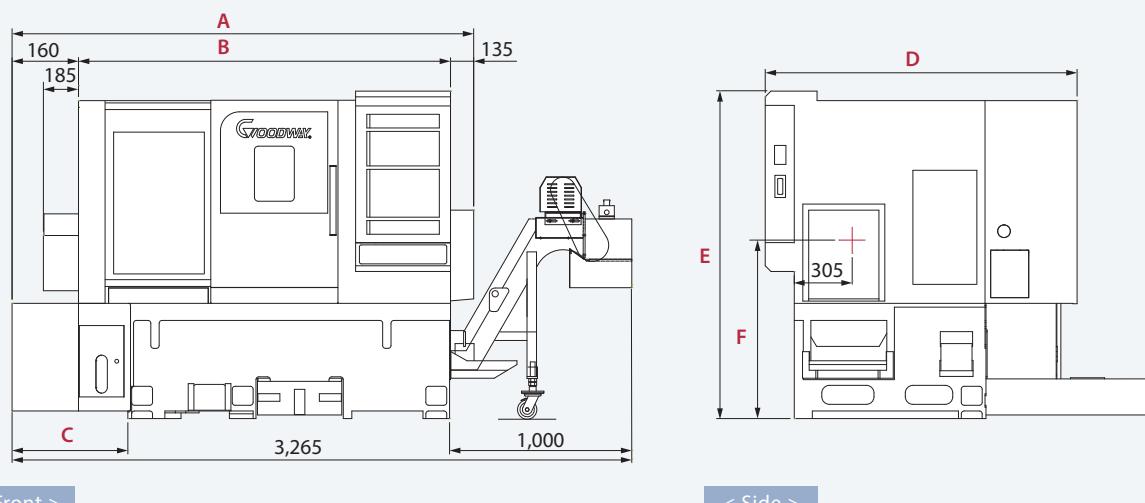
# GENERAL DIMENSION

## Foot - Print



Unit : mm

## Machine Layout



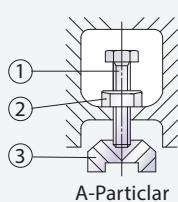
< Front >

< Side >

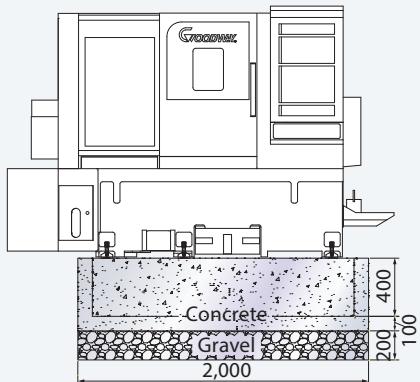
MODELS	A	B	C	D	E	F
GLS-150 / 200 / 260	2,432	1,960	610	1,643	1,727	940
GLS-150 / 200 / 260 (Y-axis)	2,480	2,288	650	1,652	2,057	1,053

Unit : mm

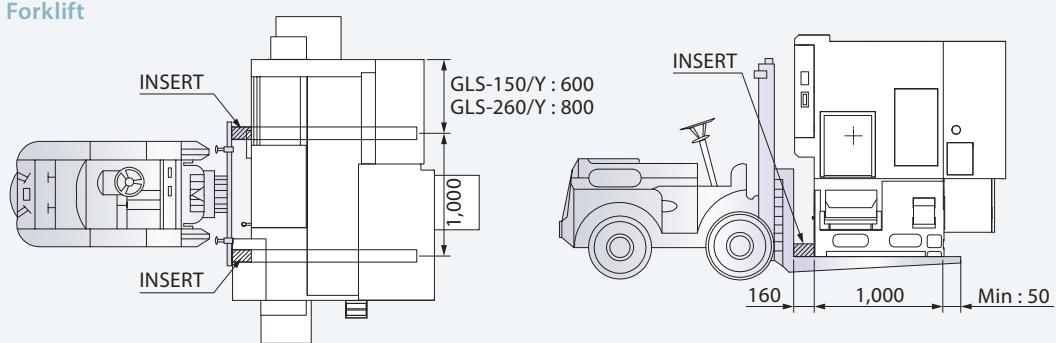
## Requirements of the Foundation



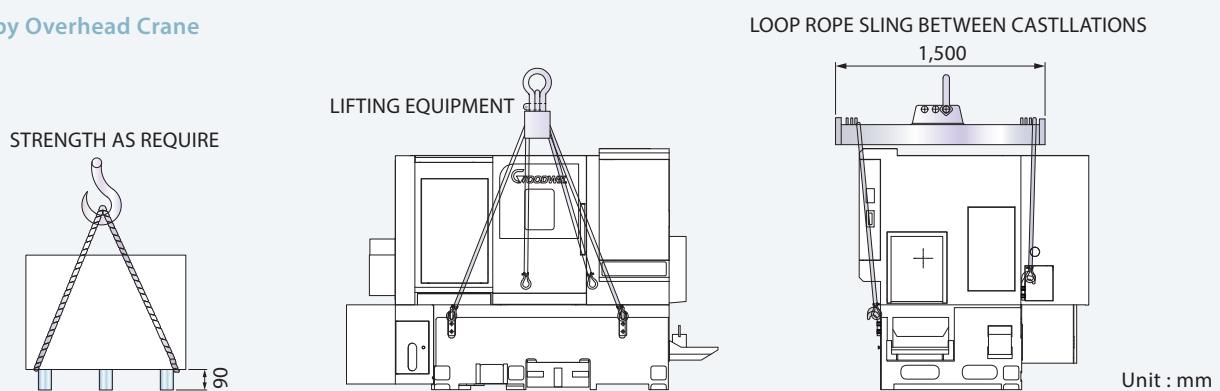
No.	Part No	Part name
1	CF-1048	Levelling Bolt
2	NA2200BA	Hex.Nut M22
3	CF-1047A	Levelling Pad



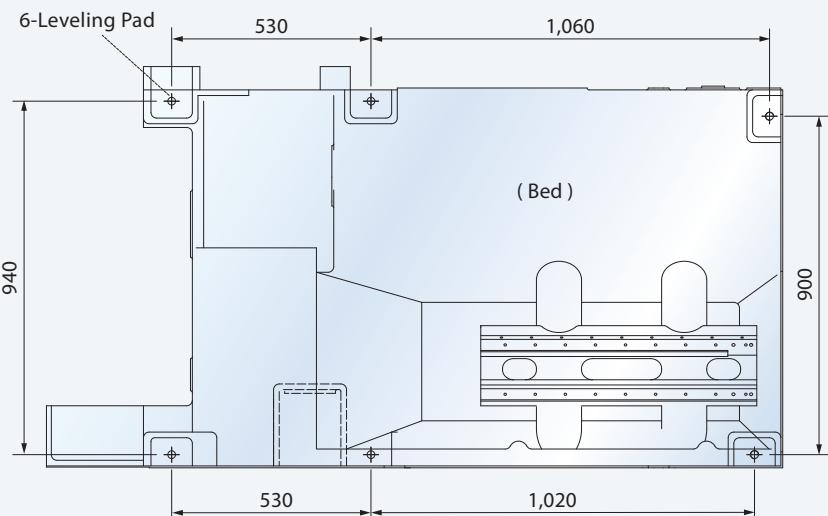
## Lifting by Forklift



## Lifting by Overhead Crane



## Foundation



< Top >

(Front)

Unit : mm

# MACHINE SPECIFICATIONS

CAPACITY	GLS-150	GLS-200	GLS-260
Max. swing diameter		Ø 500 mm	
Swing over saddle		Ø 310 mm	
Max. turning diameter* <sup>1</sup>		Ø 360 / 250 mm* <sup>2</sup>	
Standard turning diameter* <sup>1</sup>		Ø 185 mm	
Max. turning length* <sup>1</sup>		500 mm	
Max. weight load* <sup>3</sup>		85 kg	
Chuck size	6" ( Big-bore )	8" ( Big-bore )	10"
Bar capacity	Ø 51 mm	Ø 65 mm	Ø 65 mm
SPINDLE			
Hole through spindle	Ø 61 mm	Ø 76 mm	Ø 76 mm
Spindle bearing diameter	Ø 90 mm	Ø 110 mm	Ø 120 mm
Hydraulic cylinder	Ø 8"	Ø 10"	Ø 10"
Spindle nose	A2-5	A2-6	A2-8
Motor output ( Cont. )		11 kW ( 15 HP )	
Motor output ( 30 min. )		15 kW ( 20 HP )	
Motor full output speed		750 rpm	
Spindle drive system		Direct Belt Drive	
Spindle drive ratio	1 : 1 ( Opt. 211 : 151 )	1 : 1 ( Opt. 211 : 171 )	1 : 1
Spindle speed range	60 ~ 6,000 rpm	45 ~ 4,500 rpm	40 ~ 4,000 rpm
Spindle full output speed	750 rpm	750 rpm	750 rpm
BUILT-IN SPINDLE MOTOR ( OPTIONAL )			
Motor output ( Cont. )	5.5 kW ( 7.4 HP )	–	–
Motor output ( 30 min. )	7.5 kW ( 10 HP )	–	–
Bar capacity	Ø 45 mm	–	–
Cs-AXIS SPINDLE ( OPTIONAL )			
Cs-axis drive motor		Bz-sensor	
Min. spindle indexing angle		0.001°	
Dynamic accuracy		± 0.02°	
X & Z AXES			
X / Z axes travel* <sup>1</sup>		210 / 520 mm	
X / Z axes rapids		30 m/min.	
Slide way type		Linear Guide Way	
Feed rates		1 ~ 4,800 mm/min.	
X / Z axes servo motor		AC 2.7 kW ( 3.6 HP )	
X / Z axes ball screw Ø / pitch		Ø 32 mm / Pitch 10	
X / Z axes thrust ( Cont. )		769 kg	
TURRET			
Stations		12 / 10	
Indexing drive		FANUC AC Servo motor	
Indexing speed		0.2 sec. Adjacent / 0.5 sec. 180 degrees ( Single step )	
Accuracy		Positioning : ± 0.00069°, Repeatability: ± 0.00027°	
O.D. tool shank size		□ 25 mm	
I.D. tool shank size		Ø 40 mm	

LIVE TOOLING TURRET ( OPT. )	GLS-150	GLS-200	GLS-260
Max. turning length		340 mm	
Stations		12	
Live tooling stations		12	
Live tooling drive motor		AC 2.5 kW ( 3.3 HP )	
Live tooling torque		8 N-m	
Indexing drive type		FANUC AC Servo motor	
Index speed	0.2 sec. Adjacent / 0.5 sec. 180 degrees ( Single step )		
OD tool shank size	<input checked="" type="checkbox"/> 20 mm		
ID tool shank size	<input type="checkbox"/> Ø 25 mm		
Live tooling shank size		1 ~ 16 mm ER 25	
Live tooling RPM range		10 ~ 4,000 RPM	
Y-AXIS ( OPT. )			
Max. turning diameter		Ø 250 mm	
Max. X-axis travel		190 mm	
Max. Y-axis travel		70 mm = ± 35 mm	
X / Y axes rapids		24 / 10 m/min.	
Slide way type		Linear Guide Way	
Feed rates		1 ~ 4,800 mm/min.	
X / Y axes servo motor		AC 2.7 kW ( 3.6 HP )	
X / Y axes ball screw Ø / pitch		Ø 32 mm / Pitch 6	
X / Y axes thrust ( Cont. )		1,282 kg	
TAILSTOCK ( OPT. )			
Quill center taper		MT#4 ( Live center )	
Quill diameter / travel		Ø 70 mm / 150 mm	
Tailstock base travel		290 mm	
Programmable quill / base		Yes / No	
Programmable base type		Hydraulic motor + Guide way [ Servo motor + Ball screw ( Upon request ) ]	
GENERAL			
Repeatability ( X / Y / Z )		± 0.002 mm	
Standard CNC control		FANUC Oi-TF	
Voltage / Power requirement		AC 200 / 220 +10% to -15% 3 phase / 20 kVA	
Hydraulic tank capacity		50 L	
Coolant tank capacity		100 L	
Coolant pump		0.5 kW ( 3/4 HP , 60 Hz ) rated at 3 bar ( 43.5 PSI )	
Machine weight		3,200 kg	
Machine weight ( Y models )		3,500 kg	
Dimensions L × W × H		2,432 x 1,643 x 1,727 mm Machine w/ Y-axis : 2,480 x 1,655 x 2,060 mm	

Specifications are subject to change without notice.

\*1 Individual models may vary, please see interference drawings.

\*2 For M ( Live-tooling turret ) models only.

\*3 Work-piece supported by chuck & tailstock.



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