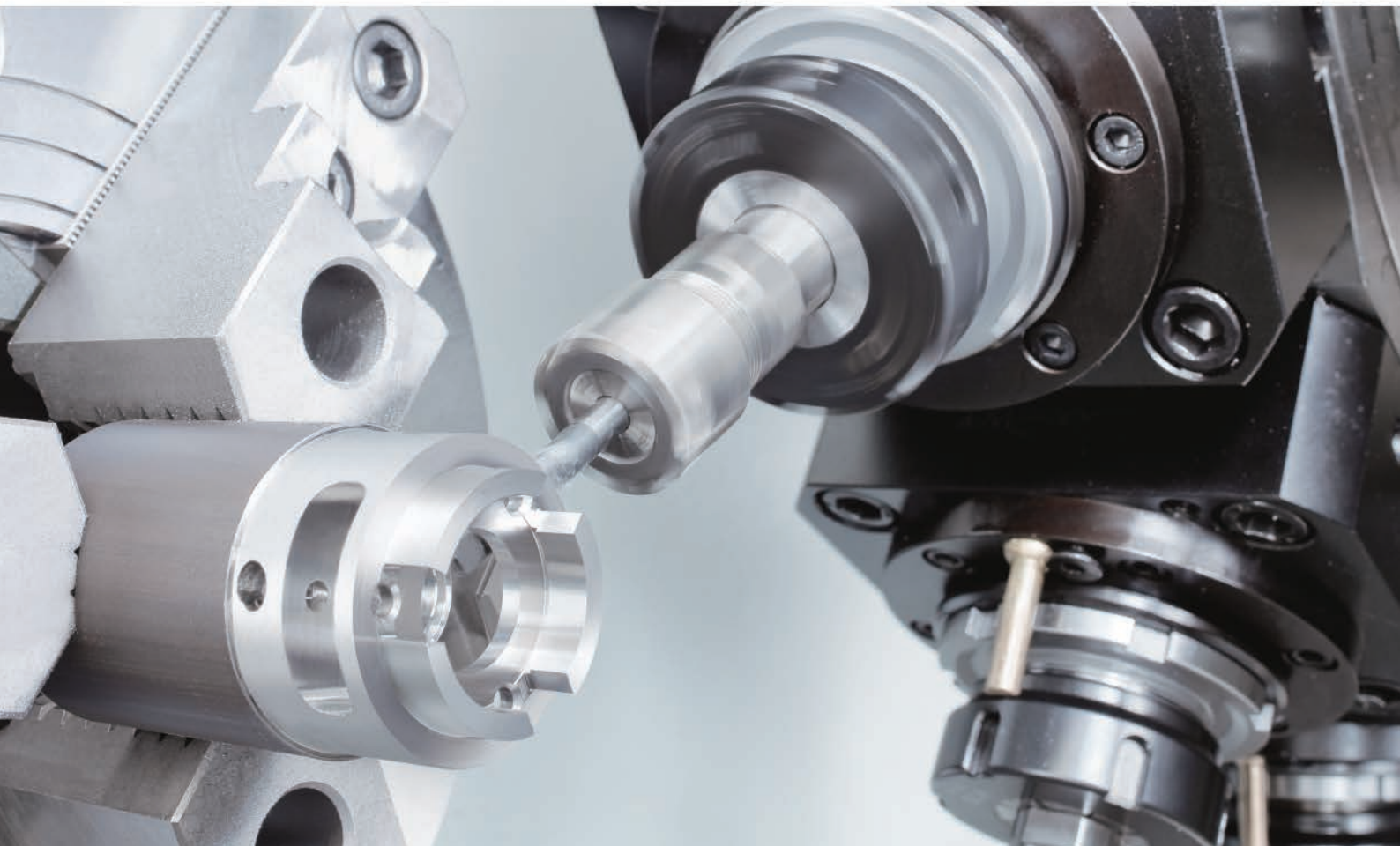


# GLS-1500 SERIES

High Speed CNC Turning Centers

[www.YAMASEIKI.com](http://www.YAMASEIKI.com)



**YAMA SEIKI**<sup>®</sup>  
TURNING CENTERS by **WOODWAY**<sup>®</sup>

## HIGH SPEED CNC TURNING CENTERS

With the latest machine tools technology and precision turning performance, YAMA SEIKI brings you the new GLS-1500 series high speed CNC turning center. Using 2 types of bed combined with high rigidity, high speed turning capability and compact size provides you with high efficiency cutting power. The new GLS-1500 series equipped with an optional live tooling turret, Y-axis and sub-spindle can work on turning, milling, drilling tasks at the same time to increase the output capacity with high end value to meet your needs of today and tomorrow.

- ▶ 30° slant-bed design provides smooth chip disposal and easier operator access.
- ▶ Steel way covers and special steel wipers molded with industrial strength rubber are used for durability.
- ▶ 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.



( GLS-1500 model shown. )

SERIES	GLS-1500 SERIES	GLS-2000 SERIES	GLS-2600 SERIES
Chuck size	6"	8"	10"
Bar Capacity	Ø 51 mm ( 2" )	Ø 65 mm ( 2.56" )	Ø 65 mm ( 2.56" )
Turning Length*2	330 mm ( 12.99" )	GLS-1500 / M	GLS-2000 / M
	630 mm ( 24.80" )	GLS-1500L / LM / LY / LMS / LYS*1	GLS-2000L / LM / LY / LMS / LYS*1
			GLS-2600 / M
			GLS-2600L / LM / LY / LMS / LYS*1

\*1 Y-axis and sub-spindle is only applicable to the L series.

\*2 Individual models may vary, detail Specification please see work range diagram.



( GLS-1500LYS model shown with optional accessories. )

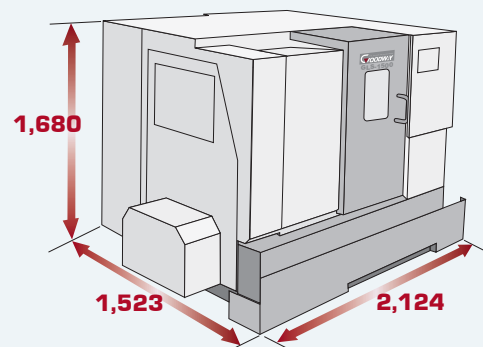


- ▶ Z-axis carriage manual locks onto the tailstock base and moves it to the desired position with precision accuracy.
- ▶ The tailstock quill can be controlled by program automatically, which makes it easier to insert the center into quill.

- ▶ Large 100L separate type coolant tank provides optimal heat dispersion and lower coolant temperature, which will help extend coolant life.

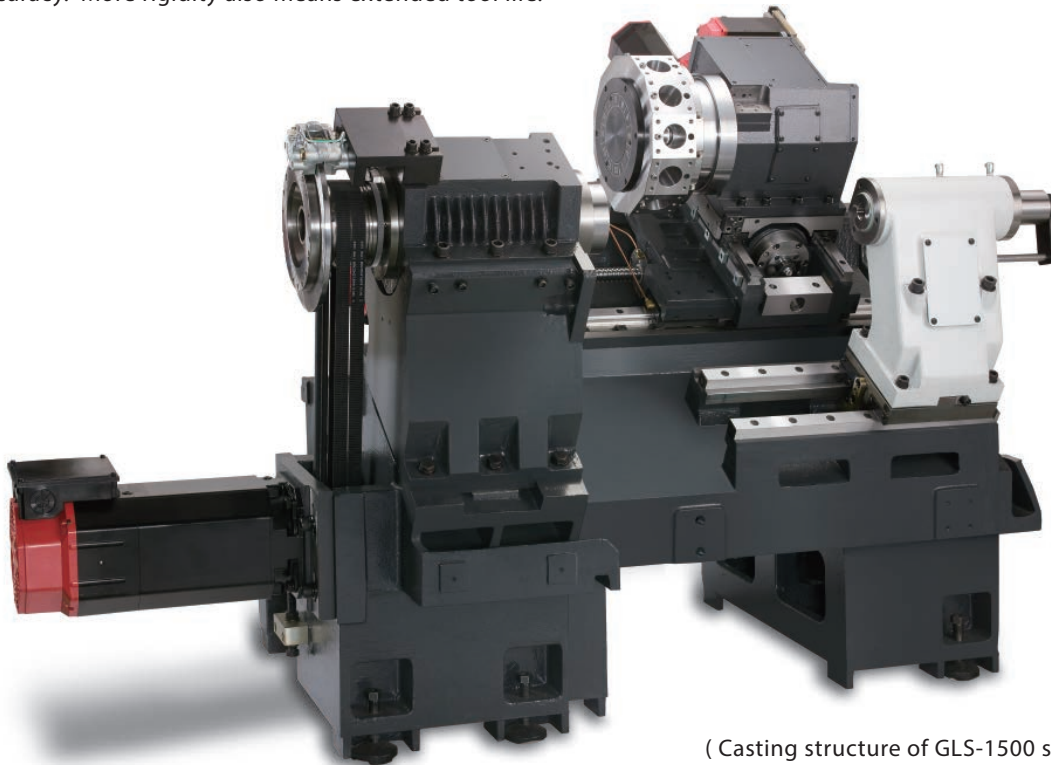


- ▶ Compact structure and cover design minimizes factory space usage which increases efficiency.



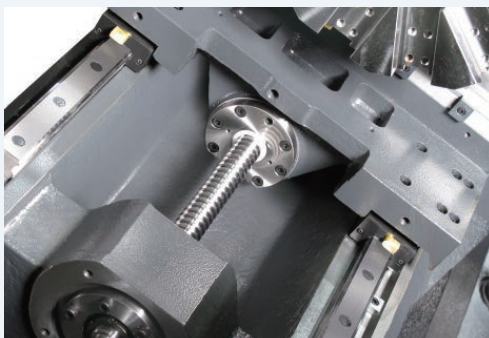
## MAXIMUM STRENGTH CONSTRUCTION

- ▶ 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.
- ▶ 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 degrees 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.
- ▶ By using Finite Element Methods ( FEM ), optimal reinforce ribbings are directly cast into the one-piece bed structure. Mechanical rigidity has been increased by more than 20% when compared to conventional designs. The GLS-1500 series is capable of performing heavy-duty turning and maintaining long-term high-precision accuracy. More rigidity also means extended tool life.

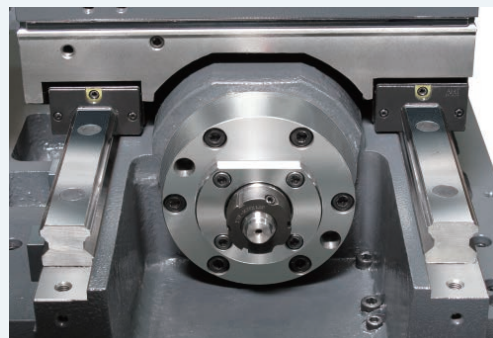


( Casting structure of GLS-1500 series shown. )

- ▶ C3 class hardened and precision ground ball screws ensure the highest accuracy and durability possible.

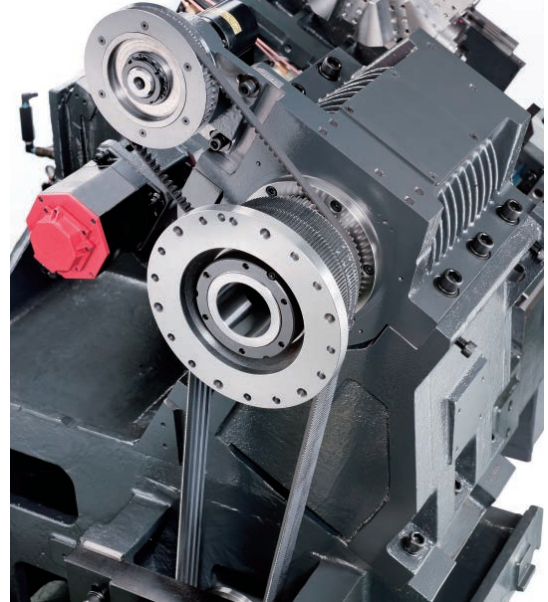


- ▶ X & Z axes utilize high performance linear guide way design which provides high precision high speed and low abrasion advantages.



# ULTIMATE TURNING POWER

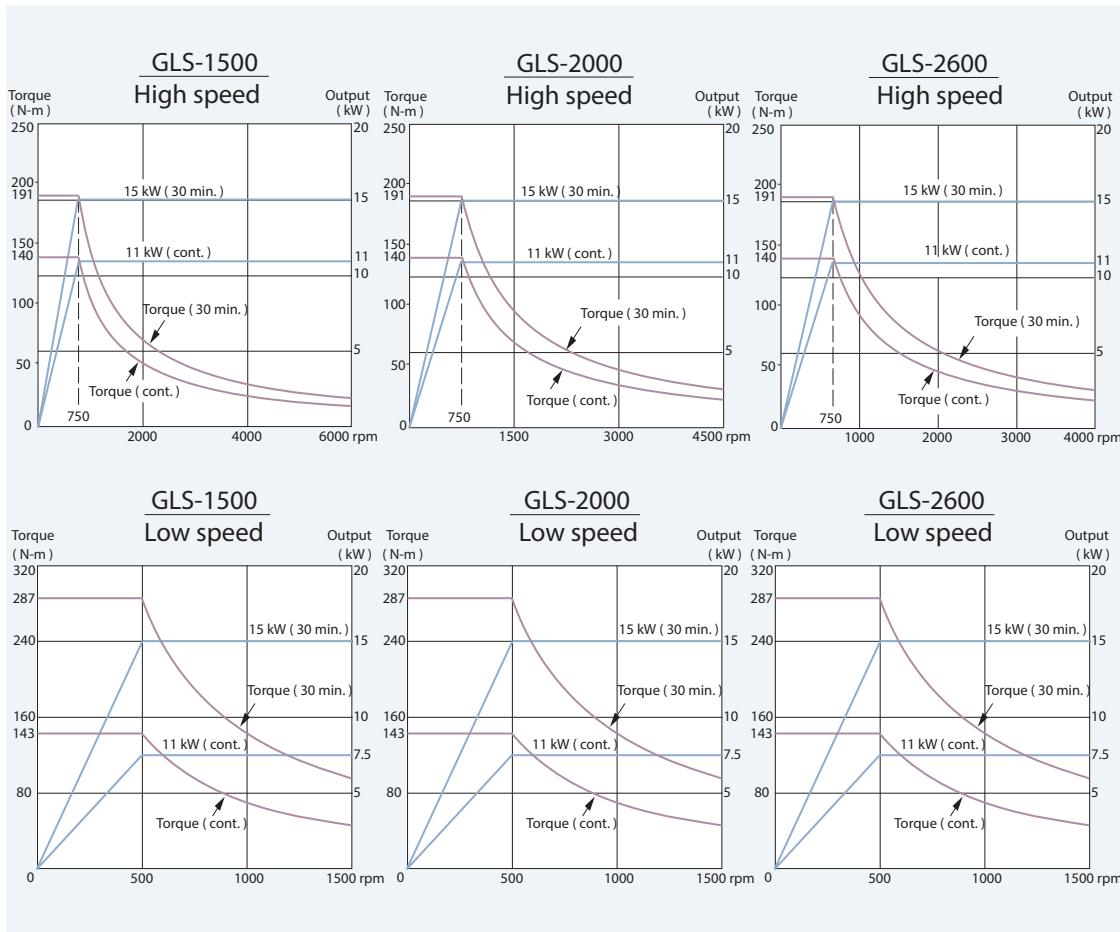
- ▶ The heavily ribbed, one-piece thermally balanced headstock and heat dissipating fins evenly disperse heat to reduce deformation, therefore, increasing machining accuracy.
- ▶ Standard rigid tapping feature provides high-speed precision tapping without the use of floating tap holders. Set-up is easier 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.
- ▶ GLS-1500 models are available with built-in spindle motors, which eliminate traditional belts and pulleys. This advanced system provides faster spindle response, reduces vibration and power loss, which translate to faster cycle times, higher accuracy, and lowers maintenance costs.



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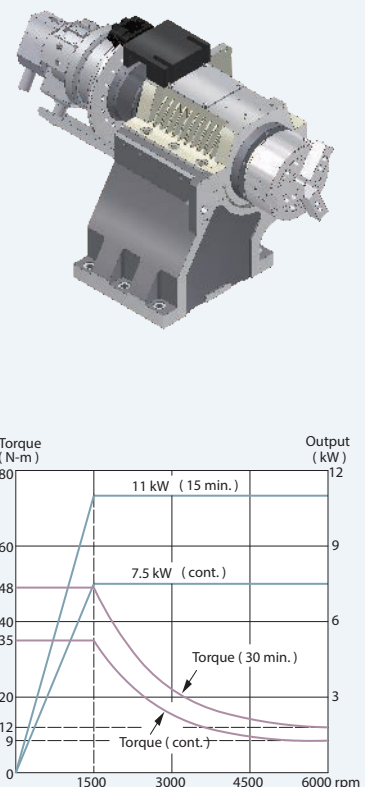
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## Spindle Output



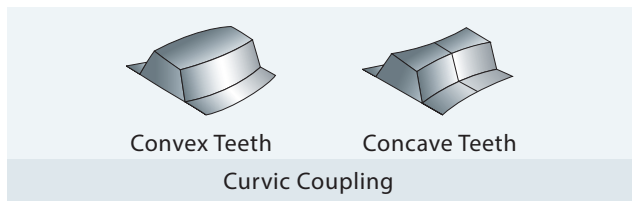
## Built-in Spindle Output

### Optional Built-in spindle

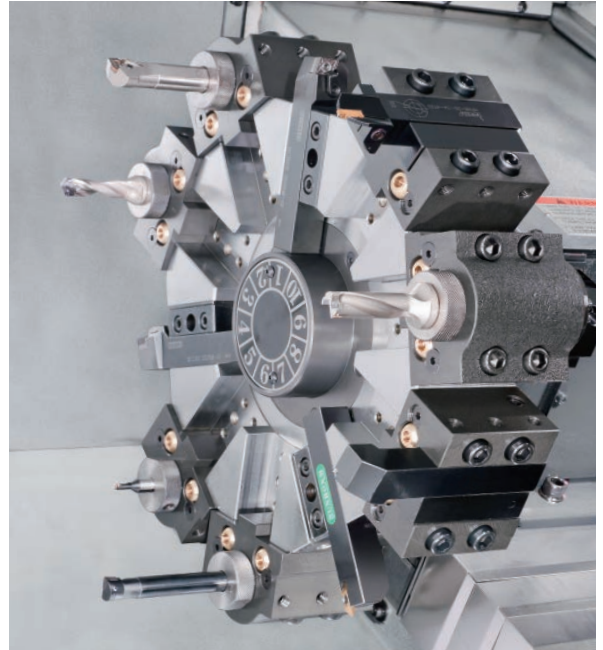


## ADVANCED TURRET TECHNOLOGY

- ▶ A high-speed servo motor indexing system provides the 10 or 12-station turret with a 0.2 sec. indexing time. Large diameter high precision curvic couplings and hydraulic clamping are used to enhance tool indexing accuracy and turret disk rigidity.
- ▶ The curvic couplings provide a large contact area and are designed with an auto-clean feature not seen on traditional couplings.



- ▶ Optional 24-tool turret and gang type turret are available to provide you with more machining flexibility.



## LIVE TOOLING TURRET

- ▶ Live tooling and C-axis control capabilities on the GLS-1500 series allow the machine to perform multiple tasks on a work piece, such as turning, milling, drilling and tapping. This eliminates manpower and cycle time, while reducing accuracy lost, which will occur if the part is moved from one machine to another.
- ▶ YAMA SEIKI 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.



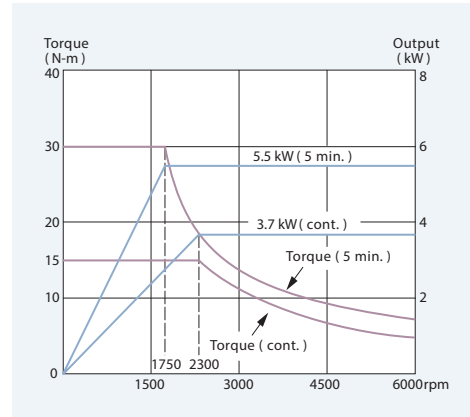
## BACK-END MACHINING CAPABILITY

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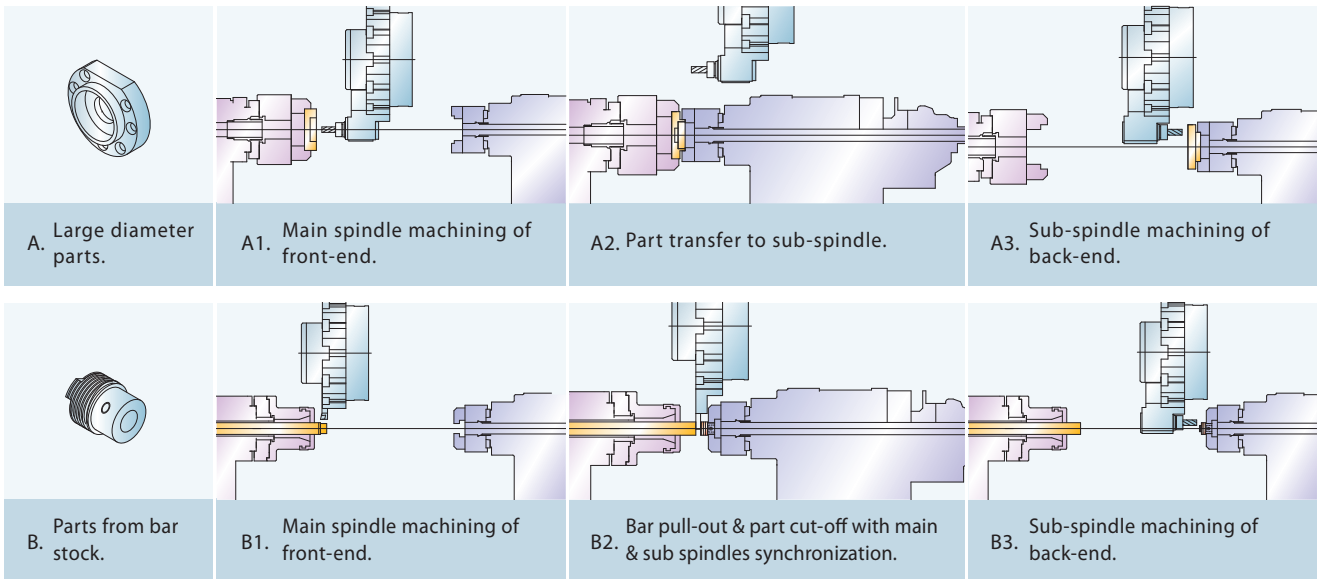
6

- ▶ A 5" chuck size sub-spindle driven by a powerful 5.5 kW ( 7 HP, 5 min. ) built-in type Fanuc motor ( Integrated Motor ) for back-end machining is available on the GLS-1500L series.
- ▶ The Z2-axis movement of the sub-spindle is applied with high performance linear guide way design which provides high speed high precision and low abrasion advantages.

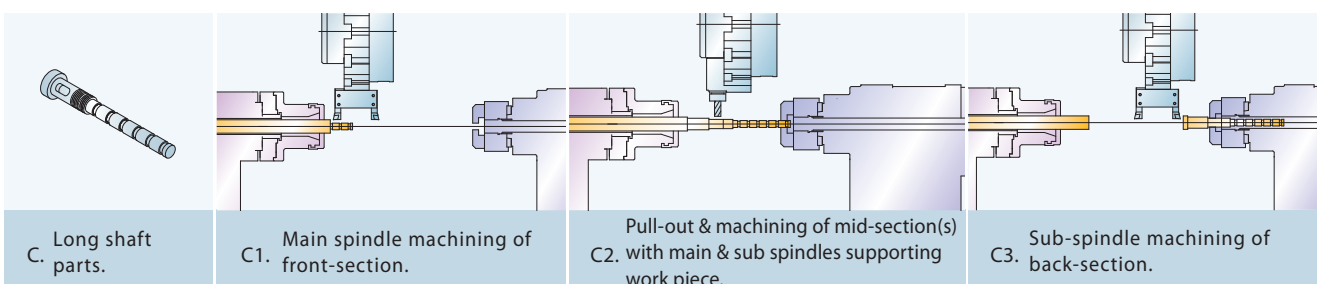
Sub-spindle Output



- ▶ Automatic part transfer of work piece from main spindle to sub-spindle saves manpower and cycle time, while reducing accuracy lost, which will occur if manually handling the part from machine to machine.

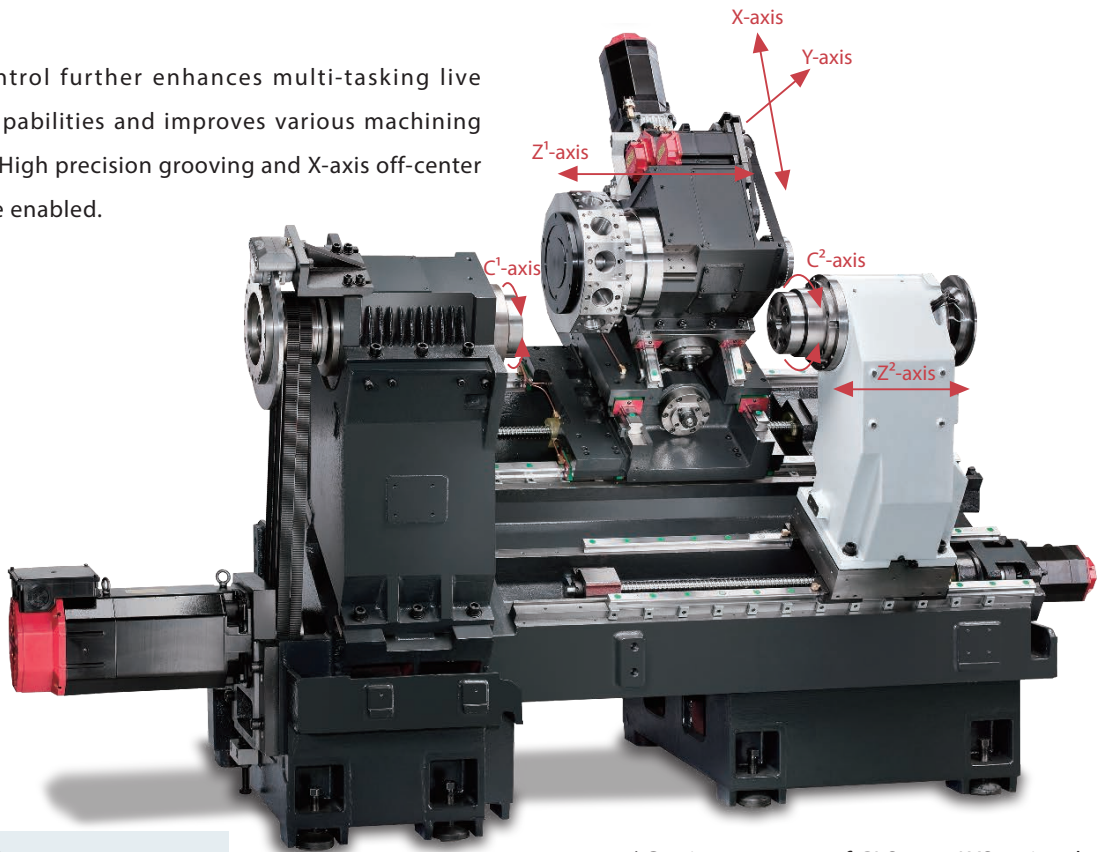


- ▶ With  $\varnothing 32$  mm ( 1.25" ) bar capacity, the sub-spindle configuration is also ideal for machining long work pieces such as small diameter shafts. Both ends of the work piece can be supported by the main and sub spindles, allowing the middle section(s) to be accurately machined.

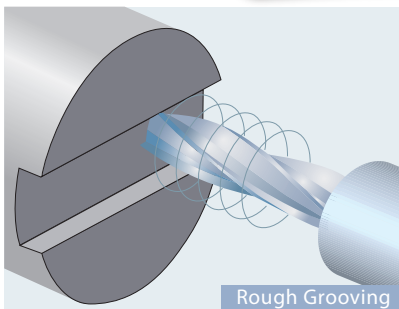


# Y-AXIS MACHINING CAPABILITY

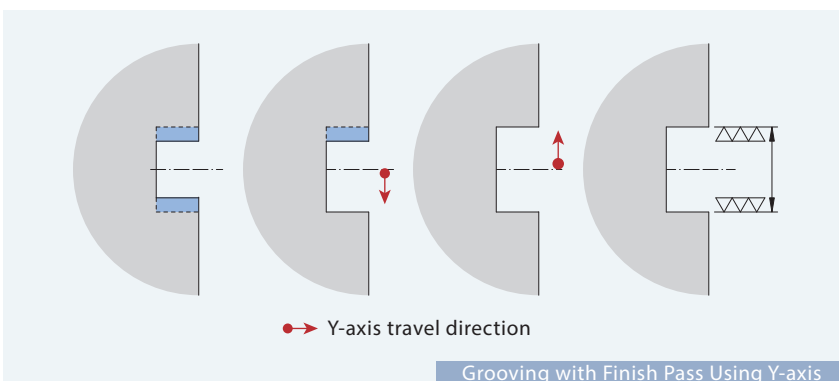
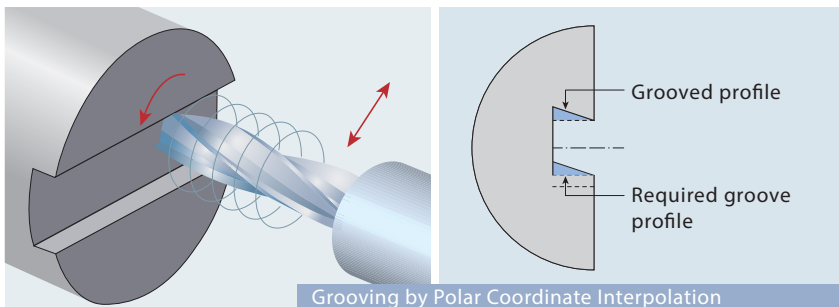
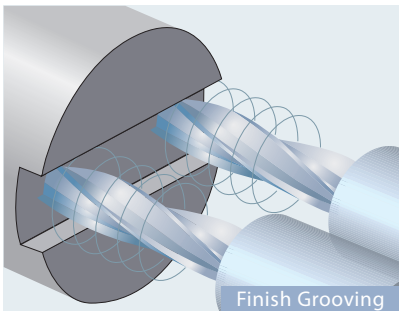
- ▶ Y-axis control further enhances multi-tasking live tooling capabilities and improves various machining precision. High precision grooving and X-axis off-center drilling are enabled.



( Casting structure of GLS-1500LYS series shown. )



- ▶ On Y-axis equipped machines, the turret is mounted on a secondary 30 degrees wedge saddle on top of the X-axis slide. Both X & Y axes have extra wide linear guide ways to provides maximum strength.



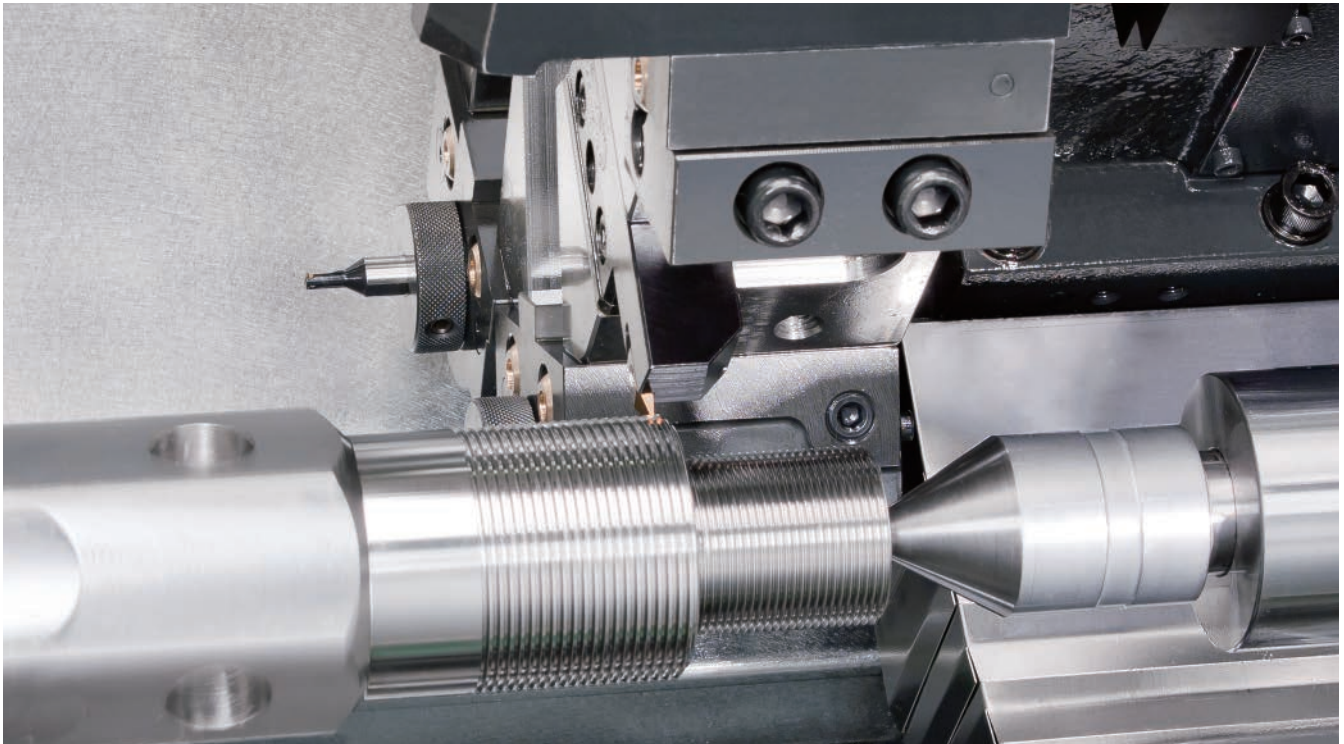
- ▶ Grooving with Y-axis control produces grooves with higher accuracy.



# MACHINING PERFORMANCE

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## Turning Capability

Test Model	Workpiece		Cutting Condition				Power Requirement
	Material	Diameter (mm)	Spindle Speed (rpm)	Cutting Speed (m/min)	Cutting Depth (mm)	Feedrate (mm/rev)	
Heavy Cutting	S45C	Ø 50	1,050	165	4	0.25	126 / 38
Drill	S45C	Ø 40	954	120	—	0.13	—

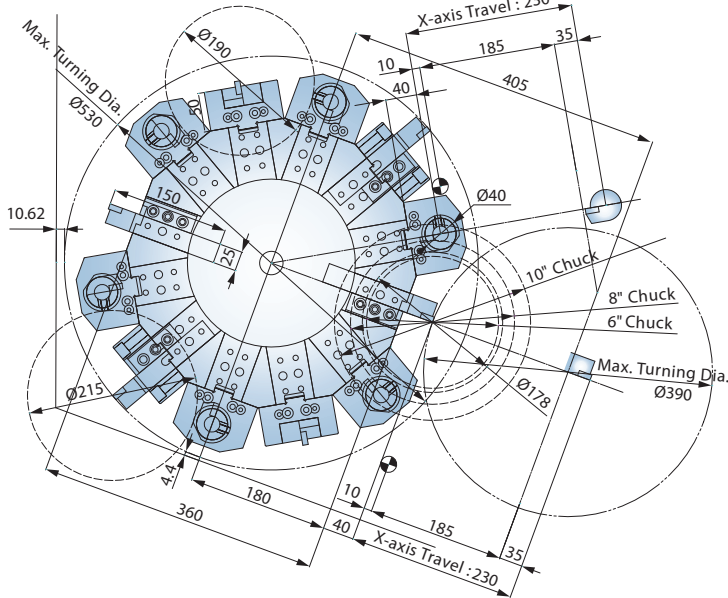
## Machining Capability

Test Model	Workpiece		Cutting Condition				Power Requirement
	Material	Diameter (mm)	Speed speed (rpm)	Cutting Speed (m/min)	Cutting Depth (mm)	Feedrate (mm/min)	
Drill	S45C	Ø 13	610	25	—	183	160 / 80
End Mill	S45C	Ø 13	490	30	15	122	180 / 30
Tapping	S45C	M12 x P1.75	400	15	—	700	200 / 27

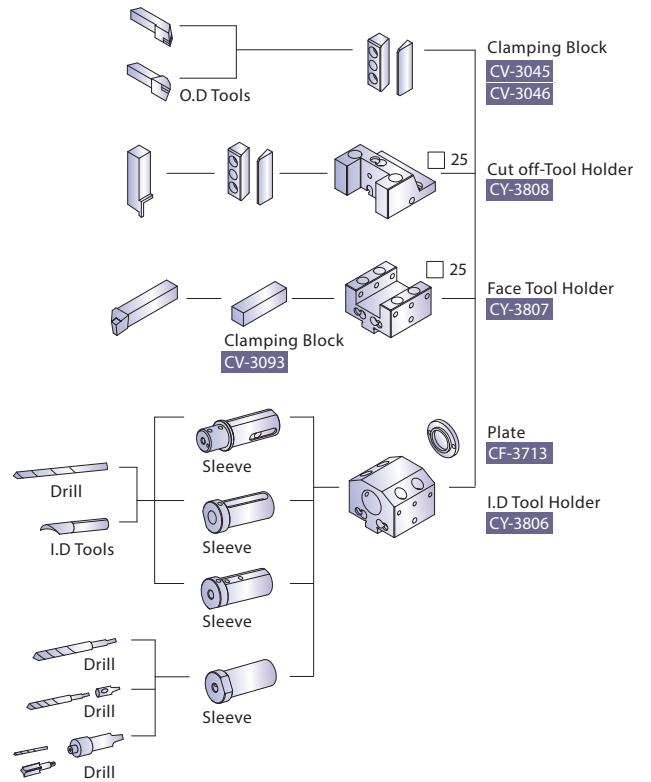


Interference Diagram

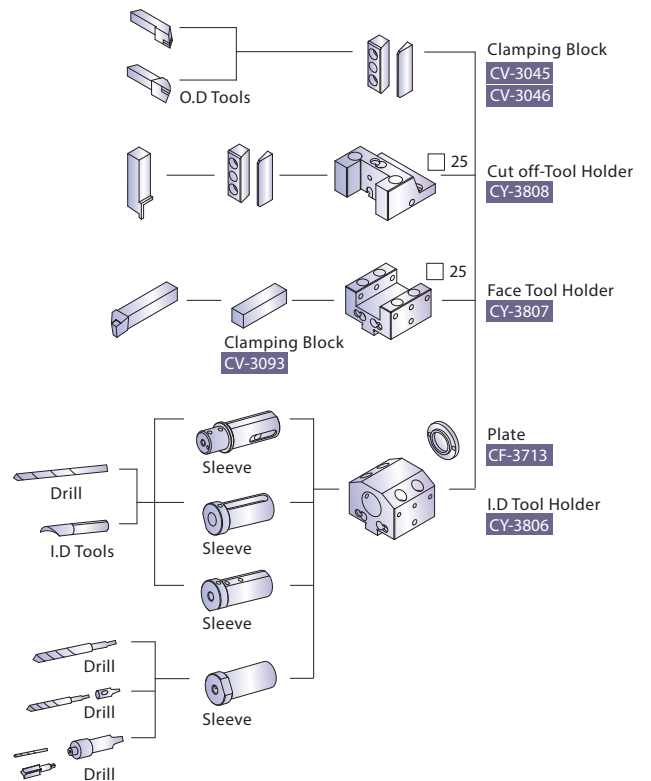
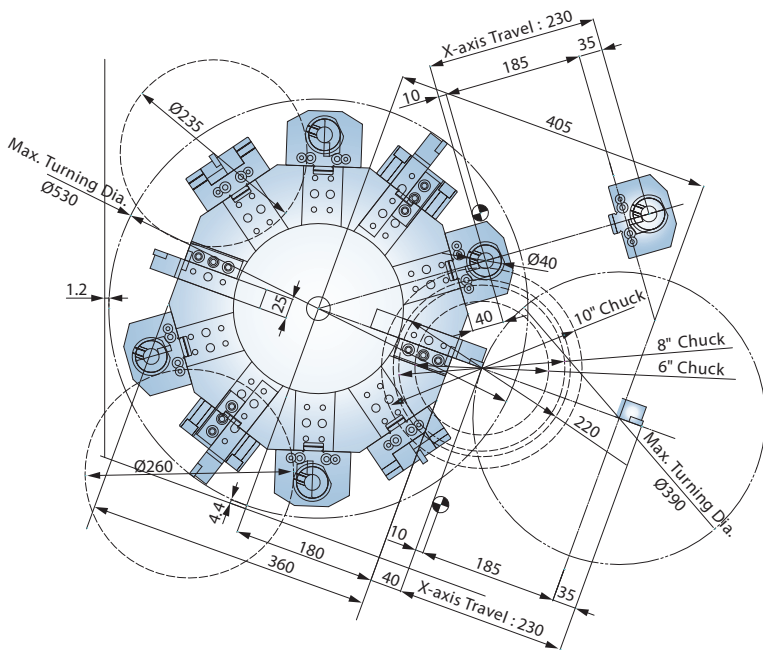
[ 12-Stations Turret ]



Tooling System

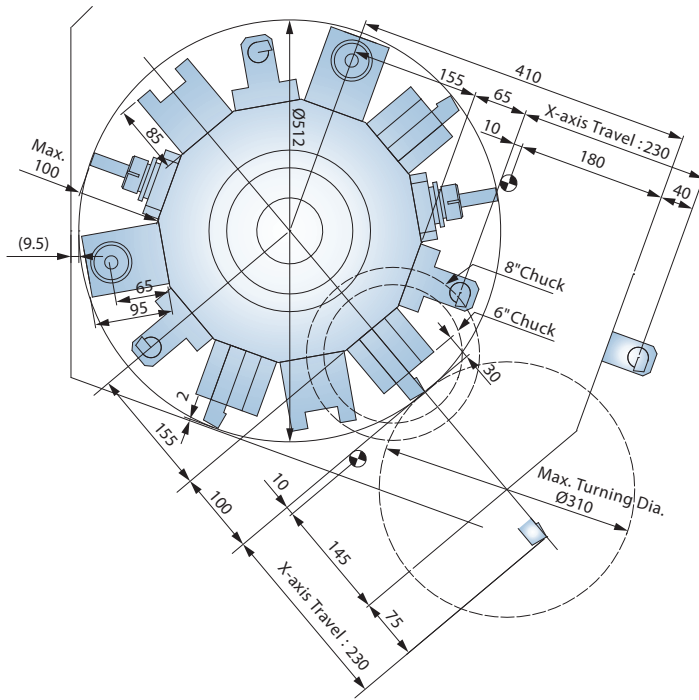


[ 10-Stations Turret ]

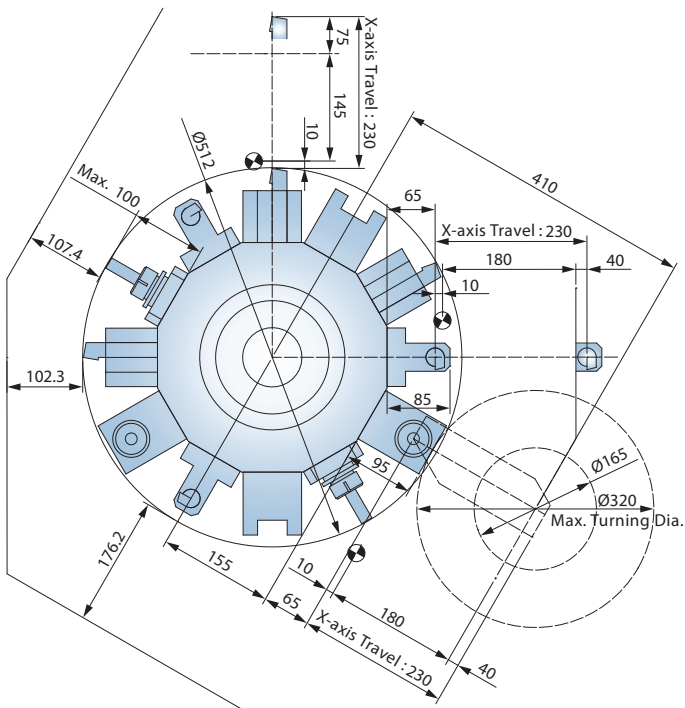


Interference Diagram

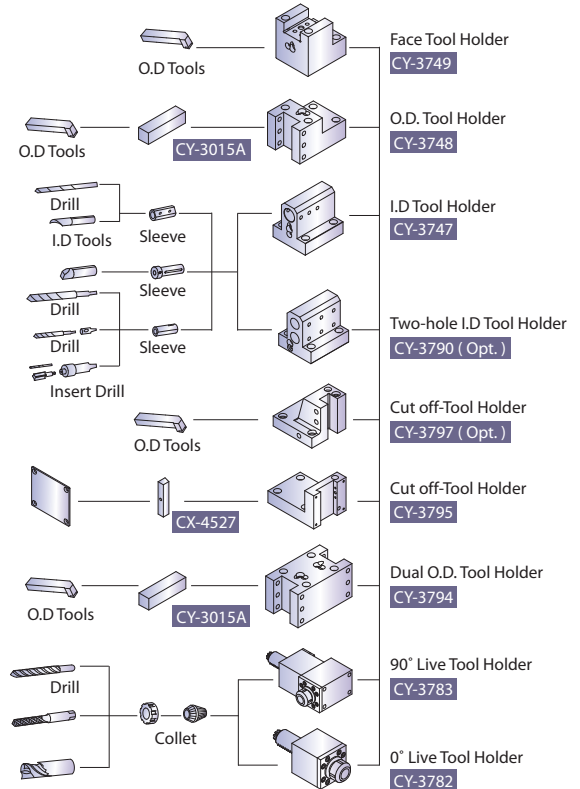
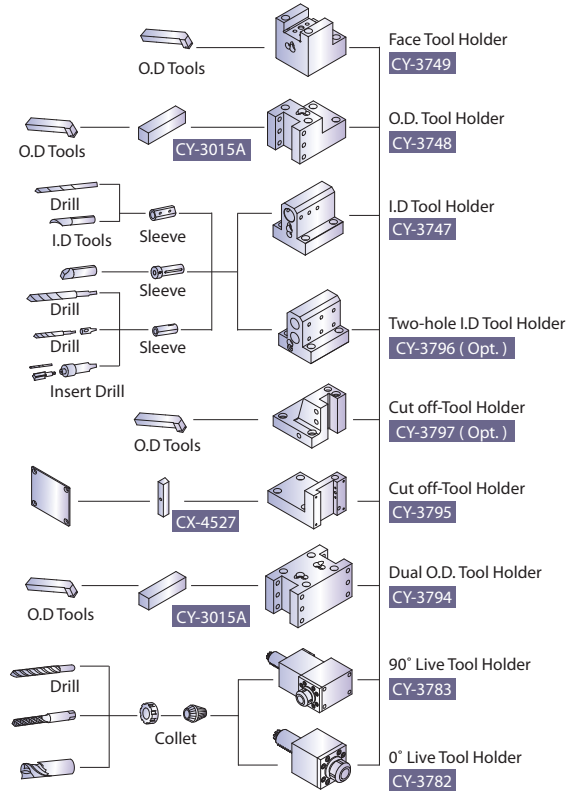
[ Live Tooling Turret ]



[ Y-axis ]

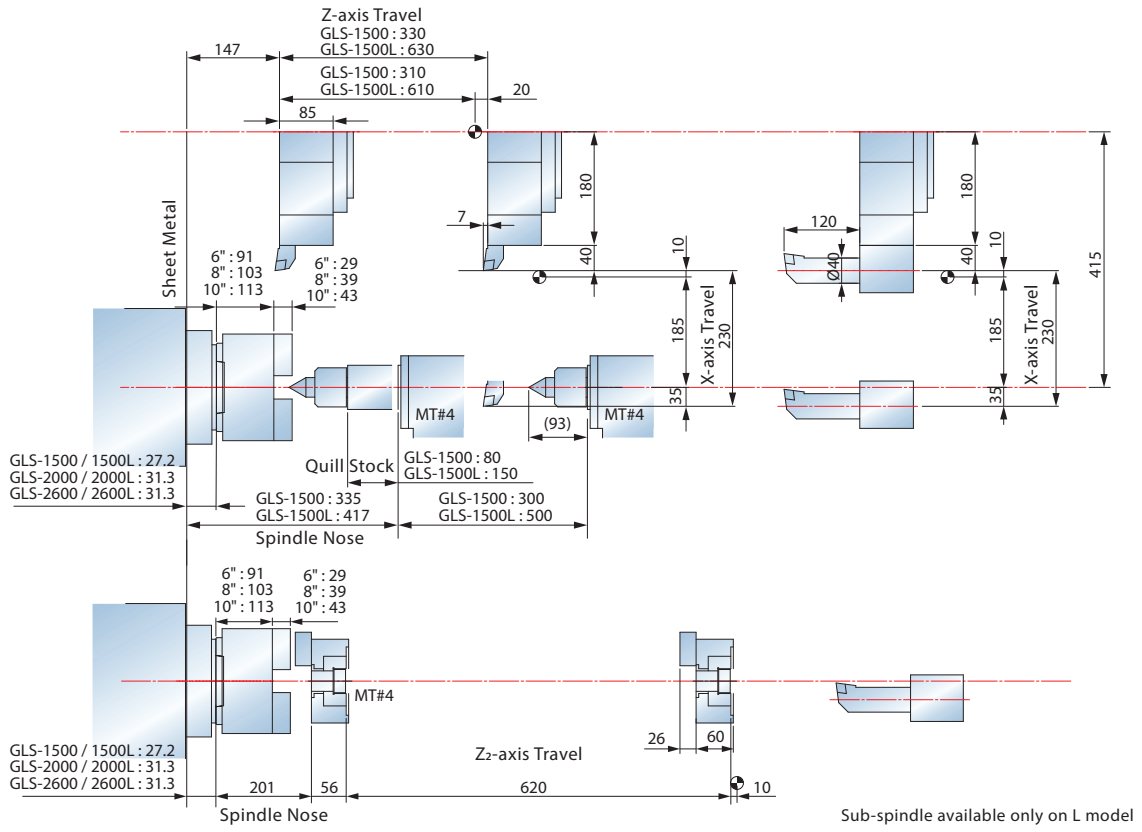


Tooling System

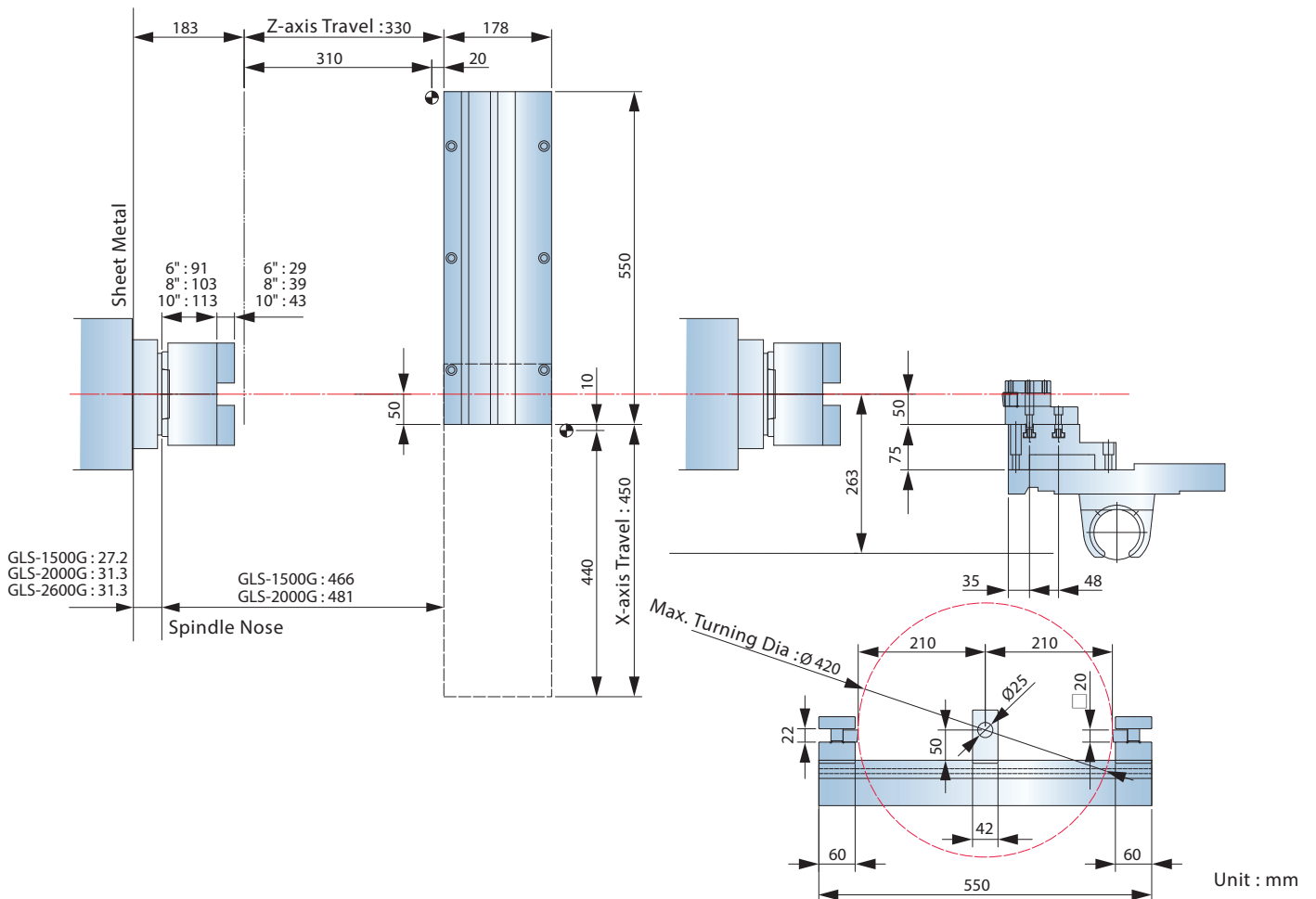


Work Range

[ 12-Stations Turret / 10-Stations Turret ]



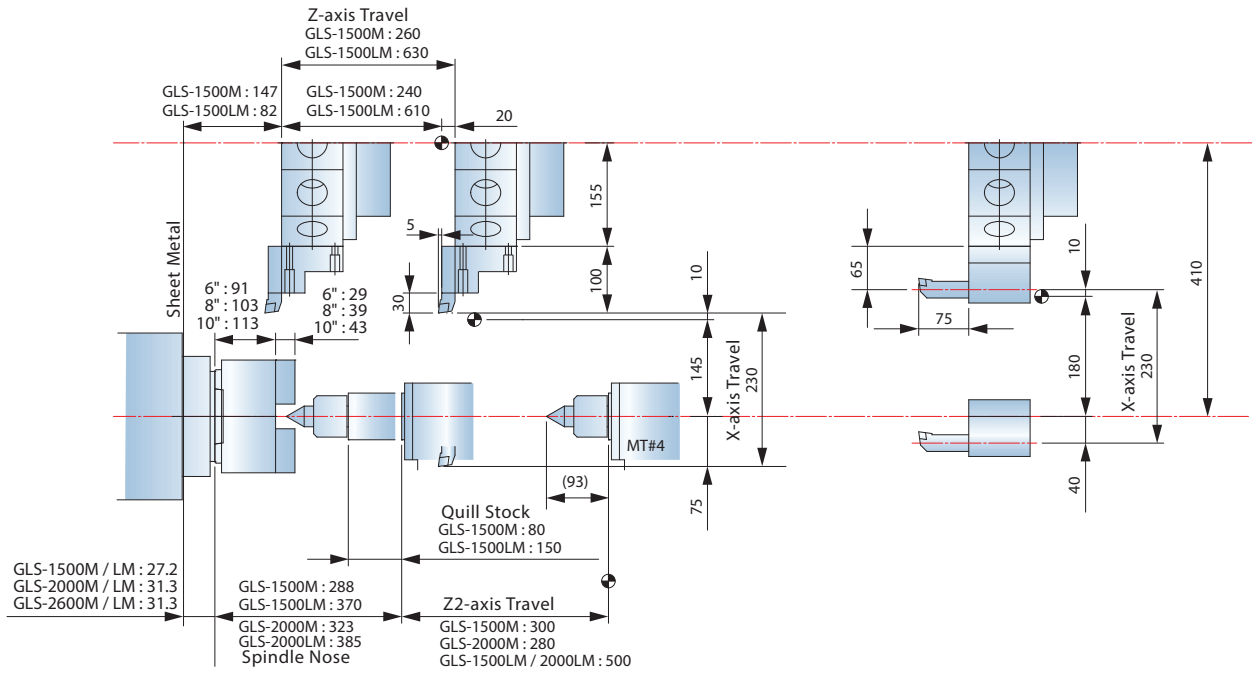
[ Gang Type Turret ]



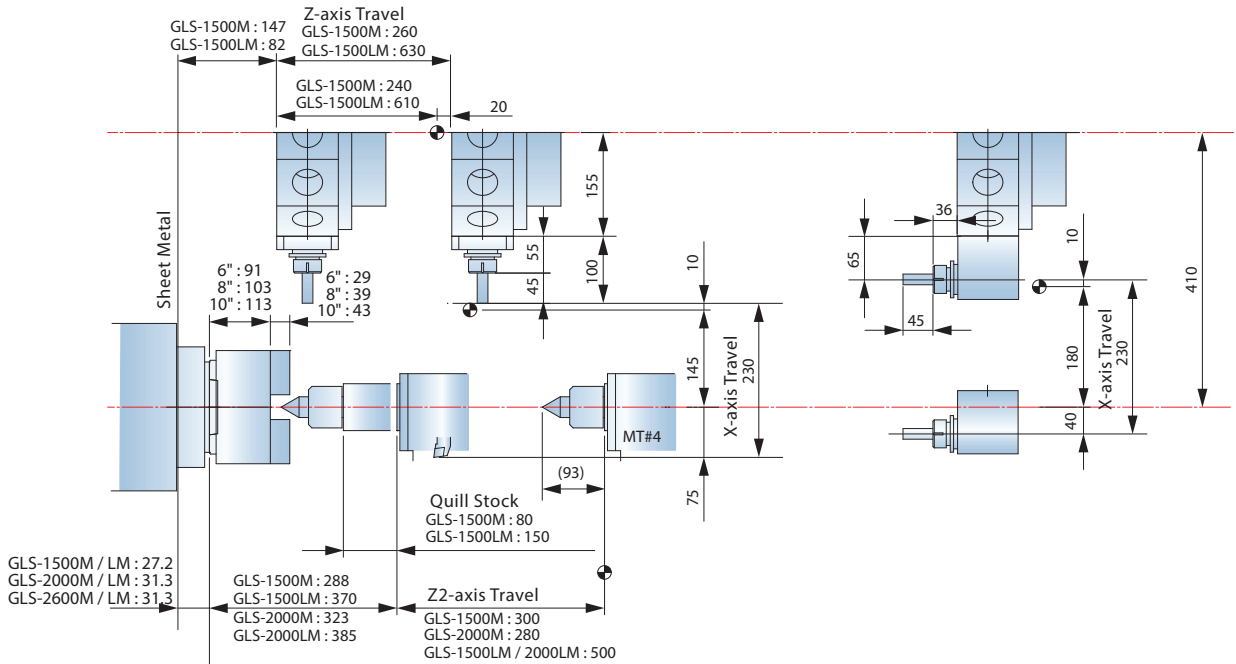
Work Range

[ Live Tooling Turret ]

I.D / O.D. Tools



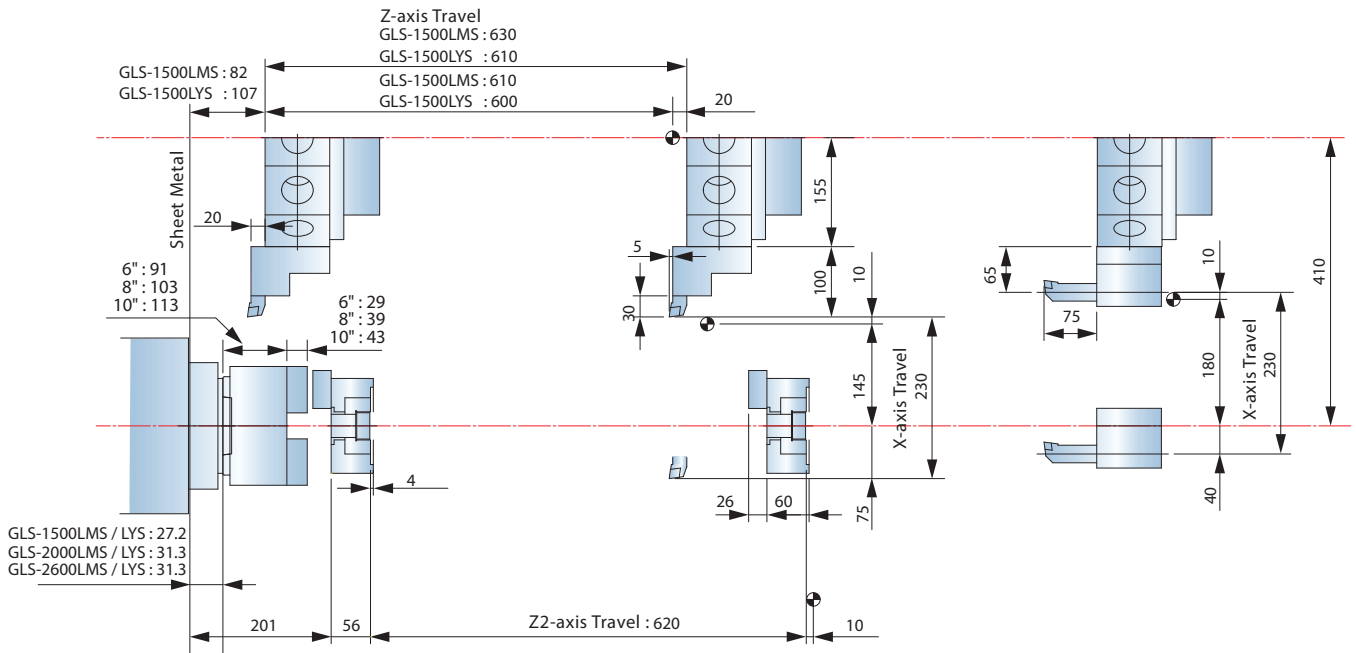
Live Tools



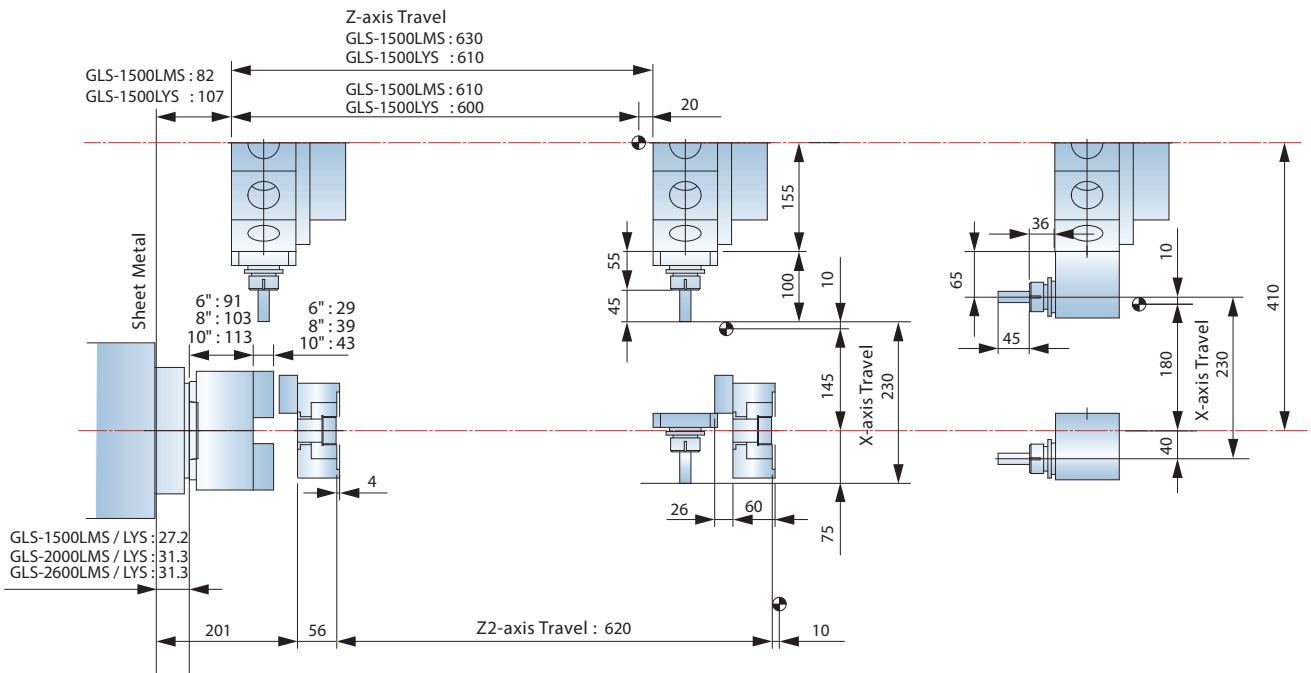
Work Range

【 Live Tooling Turret + Sub-spindle / Y-axis + Sub-spindle 】\*1

I.D / O.D. Tools



Live Tools



\*1For 「 L 」 models only.

# FEATURES

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## Chip Conveyor



3-Jaw chuck w/ Soft Jaws x 1 set

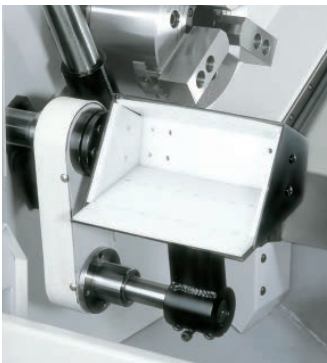


Built-in lub. oil collection system



Tri-color status light

- ▶ 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.



LOAD MONITOR SETTING						1/4	UNIT:%
Teode	AXIS	INITIAL	CURRENT	LIFE	BREAK		
1	SP	0	0	0	0		
	Z	0	0	0	0		
2	SP	0	0	0	0		
	Z	0	0	0	0		
3	SP	0	0	0	0		
	Z	0	0	0	0		

NUM=

( TECH ) ( **MONI** ) ( CAN ) ( ) ( )

## Parts Catchers ( Optional )

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

## Tool Load Monitoring ( Optional )

- ▶ The tool 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.



## Tool Setter ( Optional )

- ▶ The optional Renishaw HPMa tool presetter simplifies machining setup.

# STANDARD & OPTIONAL FEATURES

S: Standard  
 -: Not Available  
 O: Option  
 C: Contact YAMA SEIKI

CAPACITY		GLS-1500	GLS-2000	GLS-2600
Main spindle motor configuration	Belt	S	S	S
	Built-in	O	—	—
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
Sub-spindle & 5" hydraulic cylinder		O	O	O

WORK HOLDING		GLS-1500	GLS-2000	GLS-2600
Hydraulic hollow cylinder for chuck	6"	S	—	—
	8"	—	S	—
	10"	—	—	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
Hydraulic tailstock with programable quill		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

TURRET		GLS-1500	GLS-2000	GLS-2600
10-station turret		O	O	O
12-station turret		S	S	S
12-station live tooling turret		O	O	O
24-station live tooling turret		O	O	O
Gang type turret		O	O	O
Tool holder & sleeve package		S	S	S
Live tooling tool holders ( 0°x2, 90°x2 )*1		O	O	O

MEASUREMENT		GLS-1500	GLS-2000	GLS-2600
Renishaw HPA automatic tool setter		O	O	O
Renishaw HPRA removable tool setter		O	O	O

COOLANT		GLS-1500	GLS-2000	GLS-2600
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

CHIP DISPOSAL		GLS-1500	GLS-2000	GLS-2600
Chip conveyor with auto timer	Right discharge	S	S	S
	Rear discharge	C	C	C
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

AUTOMATIC OPERATION SUPPORT		GLS-1500	GLS-2000	GLS-2600
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

Specifications are subject to change without notice.

SAFETY		GLS-1500	GLS-2000	GLS-2600
Fully enclosed guarding		S	S	S
Door interlock ( incl. Mechanical lock )		S	S	S
Impact resistant viewing window		S	S	S
Proximity switch for tailstock quill position confirmation		S	S	S
Proximity switches for chuck clamp/unclamp confirmation		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*2		O	O	O

OTHERS		GLS-1500	GLS-2000	GLS-2600
Tri-color machine status light tower		S	S	S
Work light		S	S	S
External work light		O	O	O
Electrical cabinet	Heat exchanger	S	S	S
	A/C cooling system	O	O	O
Complete hydraulic system		S	S	S
Advanced auto lubrication system		S	S	S
Foundation leveling & maintenance tool kit		S	S	S
Emergency maintenance electrical part package		S	S	S
Operation & maintenance manuals		S	S	S

CONTROL		GLS-1500	GLS-2000	GLS-2600
FANUC Oi-TD		O	O	O
FANUC 31i		O	O	O

FANUC CONTROL FUNCTIONS*3		Oi-TD	31i
PMC system	Oi-TD PMC : 25n sec/step	S	—
	31i PMC : 25n sec/step	—	S
Display	8.4" color LCD	S	—
	10.4" color LCD	O	S
Graphic function	Standard	S	S
	Dynamic	O	O
Full keypad	Small - 44 keys	S	—
	Large - 56 keys	O	S
Part program storage length	512 K byte	S	—
	1M byte	—	S
	2M byte	—	O
	4M byte	—	O
	8M byte	—	O
Registerable programs	400	S	—
	1,000	—	S
	4,000	—	O
	64	S	—
Tool offset pairs	99	O	S
	400	—	O
	499	—	O
	999	—	O
	2000	—	O
Servo control	HRV2 ( 3 )	S	S
Conversational programming	Manual Guide Oi	S	—
	Manual Guide i	O	S
Servo motors	$\alpha$ i	S	S
Spindle motors	$\alpha$ i	S	S
Run hour & parts counter		S	S
Auto power off function		S	S
Custom macro B		S	S
RS-232 port		S	S
Memory card input /output		S	S
Ethernet		S	S
Fast ethernet		O	O

\*1 For live tooling turret or Y-axis models.

\*2 For Oi-TD controller.

\*3 Please contact YAMA SEIKI for complete control specification list.



# MACHINE SPECIFICATIONS

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CAPACITY		GLS-1500 / 1500L	GLS-2000 / 2000L	GLS-2600 / 2600L
Max. swing diameter		Ø 560 mm ( 22.05" )		
Swing over saddle		Ø 230 mm ( 9.06" )		
Max. turning diameter		Ø 390 mm ( 15.35" )		
Max. turning length		330 mm / 630 mm ( 12.99" / 24.80" )		
Chuck size		Ø 6" ( Big-bore )	Ø 8" ( Big-bore )	Ø 10"
Bar capacity		Ø 51 mm ( 2" )	Ø 65 mm ( 2.56" )	Ø 65 mm ( 2.56" )
SPINDLE				
Hole through spindle		Ø 61 mm ( 2.40" )	Ø 76 mm ( 2.99" )	Ø 76 mm ( 2.99" )
Spindle bearing diameter		Ø 90 mm ( 3.54" )	Ø 110 mm ( 4.33" )	Ø 120 mm ( 4.72" )
Hydraulic cylinder		Ø 8"	Ø 10"	Ø 10"
Spindle nose		A2-5	A2-6	A2-8
Motor output ( Cont. / 30 min. / Peak )		11 kW / 15kW / 18.5 kW ( 15 HP / 20 HP / 25 HP )		
Motor full output speed		750 rpm		
Spindle drive system		Direct Belt Drive		
Spindle drive ratio		1 : 1	1 : 1	1 : 1
2-SPEED SPINDLE ( OPTIONAL )				
Spindle speed ranges	L	20 ~1,500 rpm	20 ~1,500 rpm	20 ~1,500 rpm
	H	1,501 ~ 6,000 rpm	1,501 ~ 4,500 rpm	1,501 ~ 4,500 rpm
Spindle full output speed	L	500 rpm	500 rpm	500 rpm
	H	750 rpm	750 rpm	750 rpm
Spindle torque ( 15 min. )	L	287 N-m ( 211 lb-ft. )	287 N-m ( 211 lb-ft. )	287 N-m ( 211 lb-ft. )
Spindle torque ( 30 min. )	H	191 N-m ( 140 lb-ft. )	191 N-m ( 140 lb-ft. )	191 N-m ( 140 lb-ft. )
BUILT-IN SPINDLE MOTOR ( OPTIONAL )				
Spindle motor type		α B112M / 15,000i	—	
Motor output ( Cont. )		5.5 kW ( 7.4 HP )	—	
Motor output ( 30 min. )		7.5 kW ( 10 HP )	—	
Cs-AXIS SPINDLE ( OPTIONAL )				
Cs-axis drive motor			Bz-sensor	
Min. spindle indexing angle			± 0.001°	
Dynamic accuracy			± 0.002°	
X & Z AXES				
Max. X-axis travel		230 mm ( 9.06" )		
Max. Z-axis travel		330 mm / 630 mm ( 12.99" / 24.80" )		
X / Z axes rapids		30 m/min ( 1,181 IPM )		
Slide way type		Linear Guide Way		
Feed rates		1~ 4,800 mm / min		
X-axis servo motor		AC 2.7 kW ( 3.6 HP )		
Z-axis servo motor		AC 2.7 kW ( 3.6 HP )		
X-axis ball screw Ø / pitch		Ø 32 mm / Pitch 10		
Z-axis ball screw Ø / pitch		Ø 32 mm / Pitch 10		
X / Z axes thrust ( Cont. )		769 Kg ( 1,692 lbs. )		

Specifications are subject to change without notice.

# MACHINE SPECIFICATIONS

TURRET	GLS-1500 / L	GLS-2000 / L	GLS-2600 / L
Stations	12 ( 10 Opt. )		
Indexing drive	FANUC AC Servo motor		
Indexing speed	0.2 sec. Adjacent / 0.5 sec. 180 degree ( Single step )		
Accuracy	Positioning : $\pm 0.00069^\circ$ , Repeatability: $\pm 0.00027^\circ$		
OD tool shank size	□ 1"		
ID tool shank size	1-1/2"		
<b>LIVE TOOLING TURRET ( OPTIONAL )</b>			
Max. turning length	240 mm / 540 mm ( 9.45" / 21.26" )		
Stations	12 ( 24 Opt. )		
Live tooling stations	12 ( Live tooling tools rotate in working position only. )		
Live tooling drive motor	2.7 kW ( 3.6 HP )		
Live tooling torque	12 N-m ( Cont. ) ( 8.85 lbs-ft )		
Index speed	0.2 sec. Adjacent / 0.5 sec. 180 degrees ( Single step )		
OD tool shank size	3/4" ( Opt. 1" )		
ID tool shank size	1" ( Opt. 1-1/2" )		
Live tooling shank size	ER 25 collets		
Live tooling RPM range	4,000 RPM		
<b>Y-AXIS ( OPTIONAL )</b>			
Max. turning diameter	Ø 310 mm ( 12.20" )		
Max. turning length	540 mm ( 21.26" )		
Max. Y-axis travel	70 mm = $\pm 35$ mm ( 2.76"= $\pm 1.38$ " )		
Y-axes rapids	10 m/min ( 394 IPM )		
Slide way type	Linear Guide Way		
Feed rates	1 ~ 4,800 mm/min		
Y-axis servo motor	AC 2.7 kW ( 3.6 HP )		
Y-axis ball screw Ø / pitch	Ø 32 mm / Pitch 10		
Y-axes thrust ( Cont. )	769 Kg ( 1,692 lbs )		
<b>TAILSTOCK ( OPTIONAL )</b>			
Quill center taper	MT#4 ( Live center required. )		
Quill diameter	Ø 70 mm ( 2.76" )		
Quill travel	80 mm / 150 mm ( 3.15" / 5.91" )		
Tail stock base travel	300 mm / 500 mm ( 11.81" / 19.69" )		
Programmable quill / base	Yes / No		
Programmable base type	Positioned by Z-axis carriage		

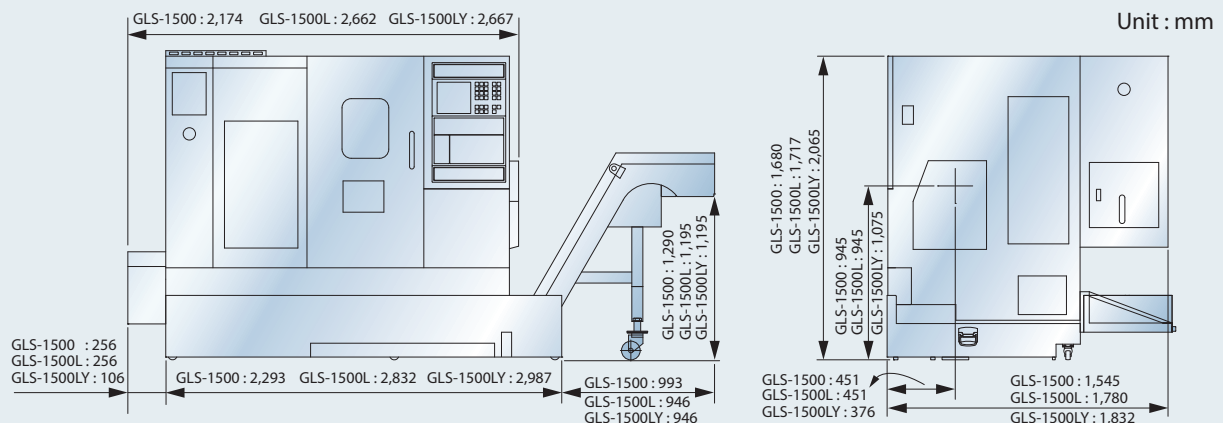
Specifications are subject to change without notice.

SUB-SPINDLE ( OPTIONAL ) <sup>*1</sup>	GLS-1500 / L	GLS-2000 / L	GLS-2600 / L
Hole through spindle		Ø 42 mm ( 1.65" )	
Bar capacity		Ø 31 mm ( 1.22" )	
Spindle bearing diameter		Ø 75 mm ( 2.95" )	
Spindle nose		Ø 110 mm ( 4.33" )	
Motor ( Cont. / 5 min. )		3.7 kW / 5.5 kW ( 5 HP / 7.4 HP )	
Spindle drive system		Built-in motor	
Spindle drive ratio		1:1	
Spindle speed range		6,000 RPM	
Spindle full output speed		1,750 RPM ( 5 min. ) / 2,300 RPM ( Cont. )	
Spindle torque ( Cont. / 5 min. )		15 N-m / 30 N-m	
Z2-axis travel		630 mm ( 24.80" )	
Z2-axis rapid		30 m/min	
Slide way type		Linear guide way	
Z2-axis ball screw Ø [ pitch ]		Ø 32 mm / Pitch 10	
Z2-axis thrust ( Cont. )		448 Kgf ( 985 lbs. )	
<b>GENERAL</b>			
Repeatability on X-axis		± 0.002 mm ( ± 0.00008" )	
Repeatability on Z-axis		± 0.002 mm ( ± 0.00008" )	
Standard CNC control		FANUC Oi-TD or 31i-B	
Voltage / Power requirement		AC 200 / 220 +10% to -15% 3 phase / 20 KVA	
Hydraulic tank capacity		20 L	
Coolant tank capacity		100 L / 160 L ( Y-axis model : 170 L )	
Coolant pump		0.5 kW ( 3/4 HP , 60 Hz ) rated at 3 bar ( 65 PSI )	
Machine weight		3,000 Kg / 3,400 Kg ( 6,600 lbs / 7,480 lbs ) Y-axis model : 3,700 Kg ( 8,140 lbs )	
Dimensions L × W × H		3,542 x 1,545 x 1,680 mm ( 139.4" x 60.8" x 66.1" ) L model : 4,034 x 1,780 x 1,717 mm ( 158.8" x 70.1" x 67.6" ) Y-axis model : 4,039 x 1,832 x 2,065 mm ( 159.1" x 72.1" x 81.3" )	

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\*1 For 「 L 」 models only.

### Machine Layout





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