

# GV-1000 SERIES

High Performance CNC Turning Centers

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

# HIGH PERFORMANCE VERTICAL CNC TURNING CENTERS

With 30 years of experience in the manufacturing, YAMA SEIKI is pleased to introduce our GV-1000 Vertical CNC Turning Center. With a combination of ultra-high power performance, super rigid construction, and high speed machining, the GV-1000 provides the turning and milling capacity for the dynamic demands of today and tomorrows market.

With a maximum turning diameter of 1,000 mm ( 39.37" ) by 760 mm ( 29.92" ) long, the GV-1000 is ideal for the machining of large parts and heavy cutting conditions. The 'C' Axis and a live tooling turret enable " One Hit Manufacturing " of suitable components.

## GV-1000 SERIES

Model	GV-1000	GV-1000M	GV-1000M/ATC
Max. swing diameter	Ø 1,020 mm ( 40.16" )		
Max. turning diameter	Ø 1,000 mm ( 39.37" )		
Max. turning length	760 mm ( 29.92" )	700 mm ( 27.56" )	
Live tooling turret / C-axis	—	Std.	—
Tooling spindle	—	—	Std.

- ▶ Fully enclosed guarding for a clean environment.
- ▶ The use of steel made slide way covers protect all the axial ways.
- ▶ Environmentally friendly lube system provides the lubrication for the slide ways and ball-screws.



( GV-1000M model shown with optional accessories )

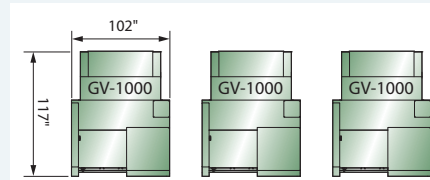
- ▶ Machine design is based on Ergonomics, also known as Human Factor Engineering, which is the science of refining the design of products to optimize the machine for human use. This principle has been fully integrated into the design, from the ease of operation to the compact floor space, which gives a floor space saving of up to 50% over a conventional turning center design.



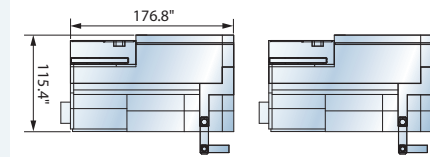
( GV-1000M/ATC model shown with optional accessories )

- Designed for the easy loading of parts, the spindle nose to floor = 1,080 mm ( 42.52" ) & the spindle center line to the operator door = 671 mm ( 26.42" )

The compact body design and working area make the GV-1000 floor space one of the smallest in its class.



Vertical turning centers



Horizontal turning centers



Coolant tank

- Easy maintenance independent coolant system and chip conveyor.

- The spindle gear box lubrication integrity is monitored by flow.



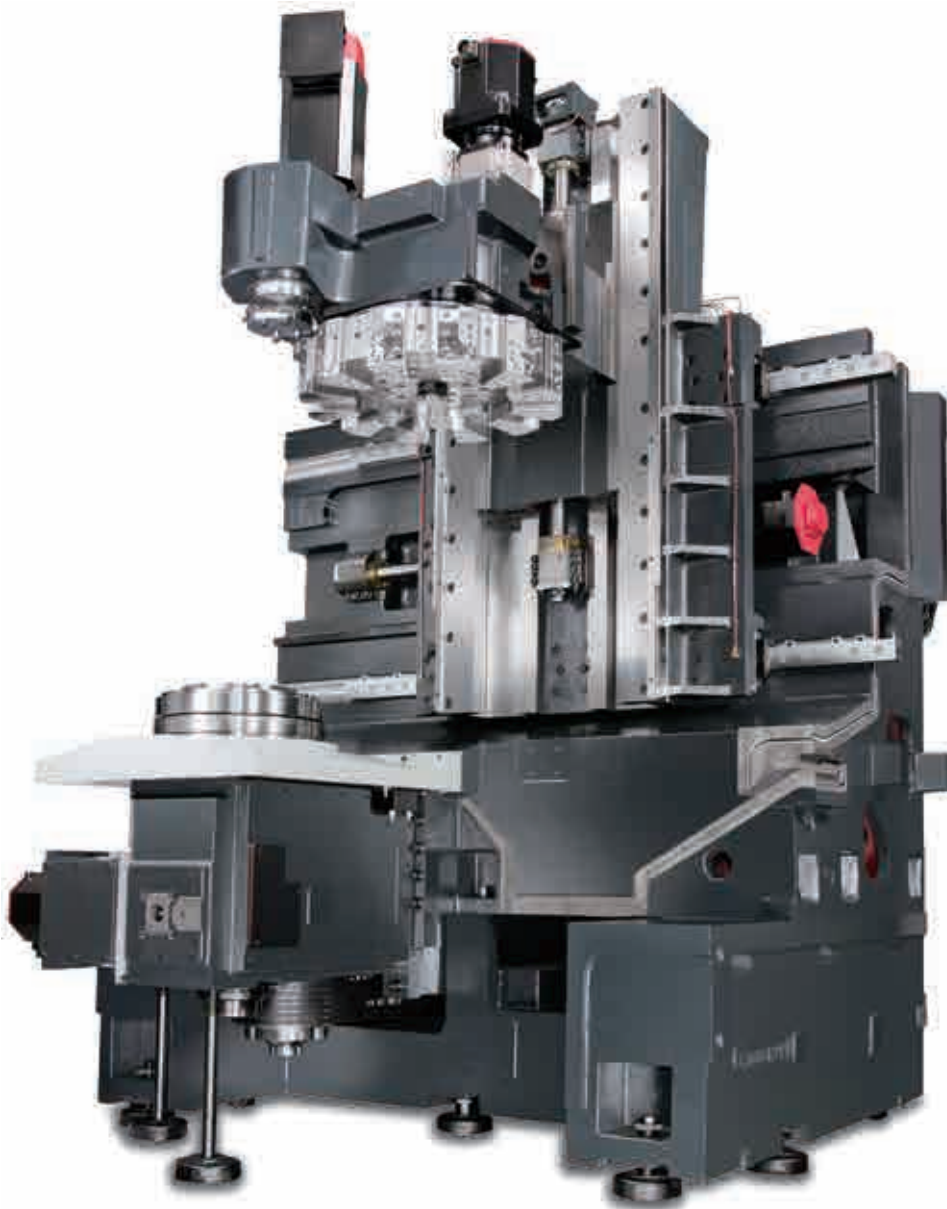
Flow Detector



Chip conveyor

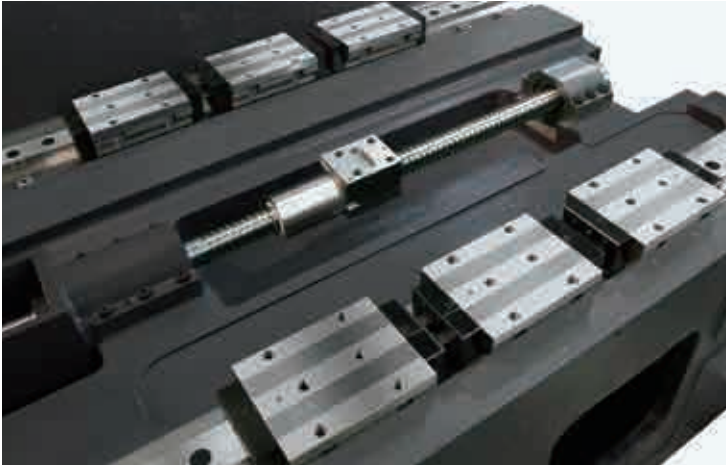
## HIGH RIGID CONSTRUCTION

- ▶ The base and column construction has been made by computer generated design which has increased the stability by 30% over traditional design.
- ▶ MEEHANITE grade castings ribbed and reinforced provide excellent stability, good thermal expansion and performance for the vertical column.



( Casting structure of GV-1000 model shown )

- ▶ FANUC  $\alpha i$  series AC servo motors are fitted to all axes. The  $\alpha i$  intelligent servo motor with its compact size and super high resolution  $\alpha i$  series pulsecoder ( standard 1,000,000/rev ) is the perfect partner to this machine tool.
- ▶ X & Z axes motors are fitted with absolute encoders thus eliminating the need to reference return the axes before machining.



#### X-axis Linear Rails

- ▶ Japanese made linear rails ( roller type ) provide excellent stability in operation.

#### Ball Screws

- ▶ C3 class ball screws ( with a pitch accuracy of  $12.7\mu / 300 \text{ mm}$  ) are fitted with pre-load to X and Z axes.

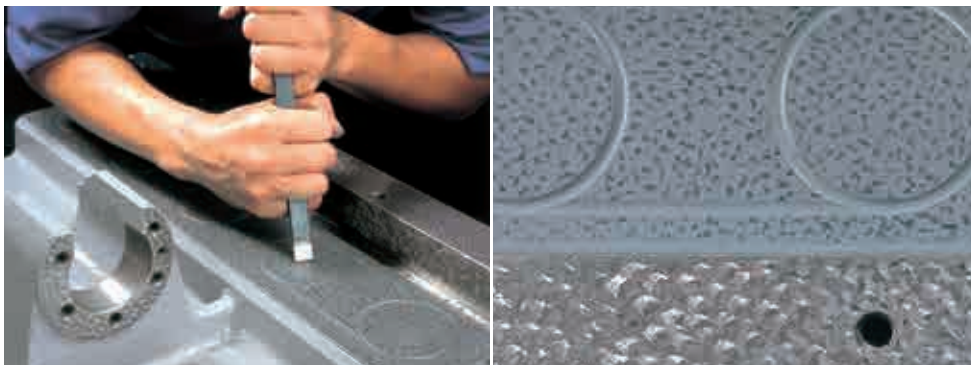


#### Built for Safety

- ▶ The Z-axis is fitted with an independent Japanese made brake system.

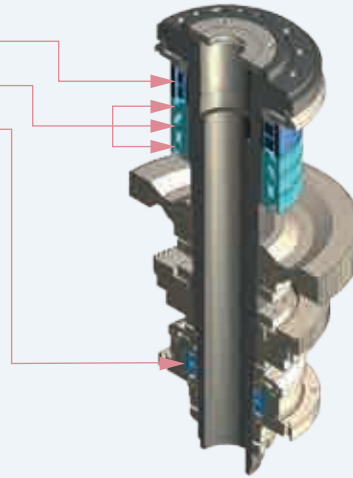


- ▶ Contact surfaces of all slide, turret, and ball screw bearing housings with the machine bed are precision hand scraped to provide maximum assembly precision, structural rigidity, and load distribution.

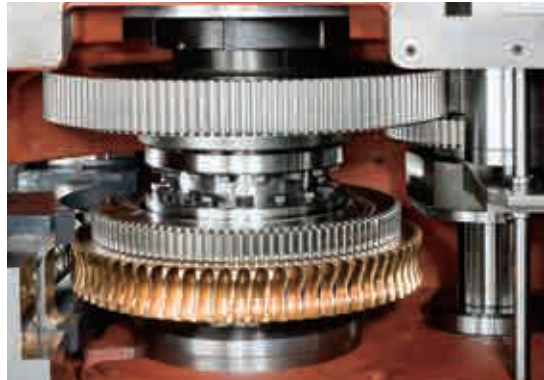


## ULTIMATE TURNING POWER

- ▶ Bearing configuration : Front – Double roller × 1  
Angular contact × 3  
Rear – Double roller × 1
- ▶ 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.



- ▶ The 2-step gear box produces 30 kW ( 40 HP ) of output.
- ▶ With over 3,765 N-m ( 2,777 lb-ft ) of torque available on the low speed of the 2-speed gear head, turning tough material with big diameter is now a simple task.



- ▶ Generating twice the torque output of standard motors, the A/C, constant output, wide-range FANUC high-torque *i* series motor is rated at 30 kW ( 40 HP ). This doublewound motor is designed to reach full output at 1/2 the RPM of standard motors, providing the ability to take heavier cuts in the lower RPM ranges.



- ▶ Standard spindle orientation feature allows the spindle to stop at desired programmed position. Useful in broaching and manual part loading applications where a fixed spindle position is required.



Work piece shown

Flywheel

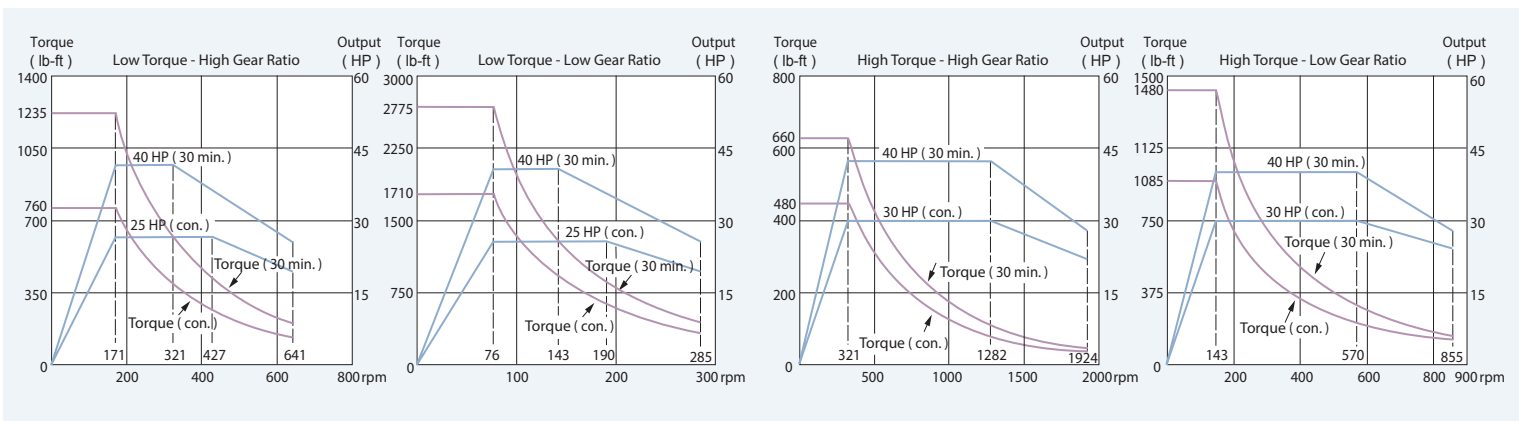
Brake Disc

Wheel

Gear Box Body

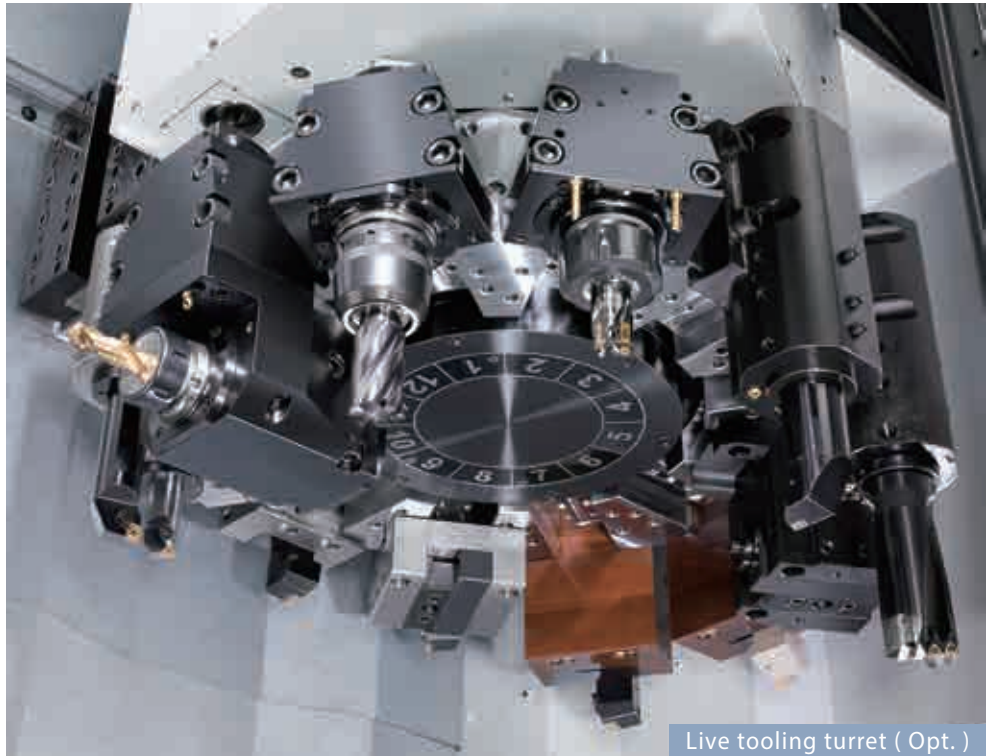
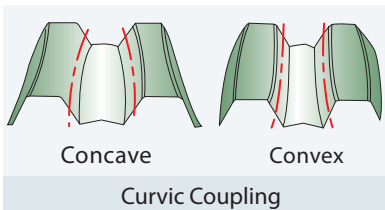


Spindle motor output



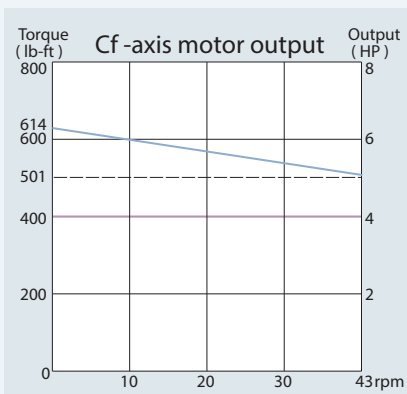
## ADVANCED TURRET TECHNOLOGY

- ▶ The index positioning of the turret is by the large  $\varnothing$  320 mm ( 12.60" ) diameter curvic coupling.
- ▶ Available with straight and 90° live tooling tool holders.
- ▶ Live tooling drive by FANUC servo motor.



## ADVANCED TURRET TECHNOLOGY

- ▶ GV-1000 Cf-axis with FANUC  $\alpha i$  servo motor with FANUC 1.0 million pulse super high resolution  $\alpha i$  series pulsecoder provides ultimate performance for the C-axis and with worm gear drive an accuracy of  $0.001^\circ$  can be attained.
- ▶ Working with the live tooling turret, the Cf-axis and disk brake system enables the machine to perform multiple tasks, such as drilling, tapping, and milling operations. The machine capabilities also include cylindrical and polar coordinate interpolations, resembling a 4th-axis rotary table on a machining center.

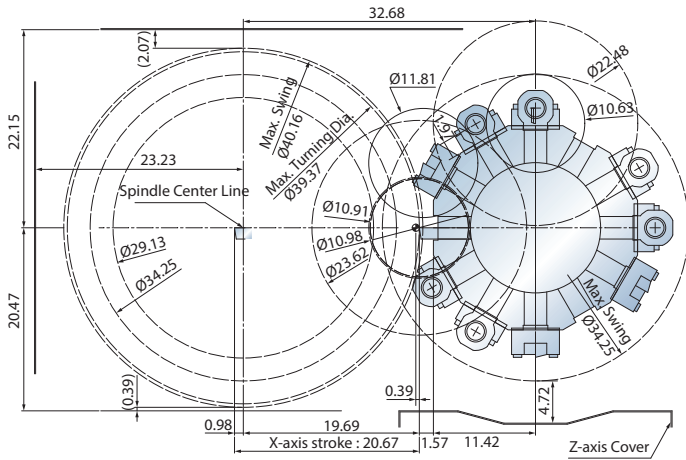


- ▶ With the FANUC servo motor generating an ultra high resolution of 1.0 million pulses per spindle rotation and 833 N-m ( 614 lb-ft ) of spindle torque ( Con. ), machined surface finishes are much superior than Cs-axis ( driven by spindle motor ) equipped machines. Plus, dynamic accuracy is within  $\pm 0.02^\circ$  even under heavy cutting loads.

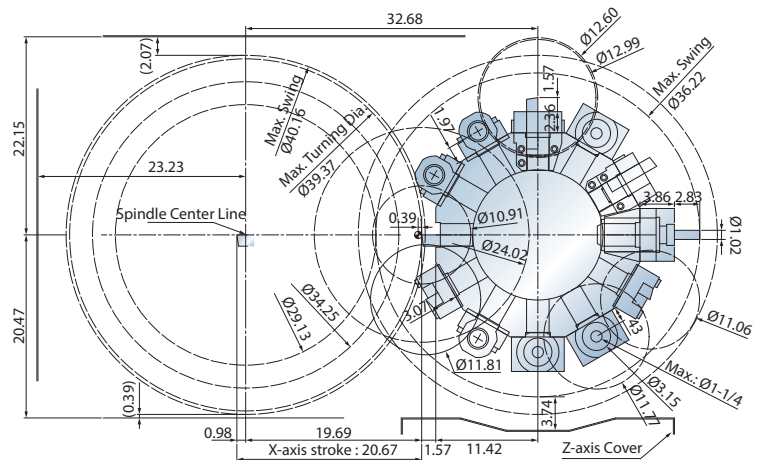


Interference Diagram

Standard Turret



Live Tooling Turret

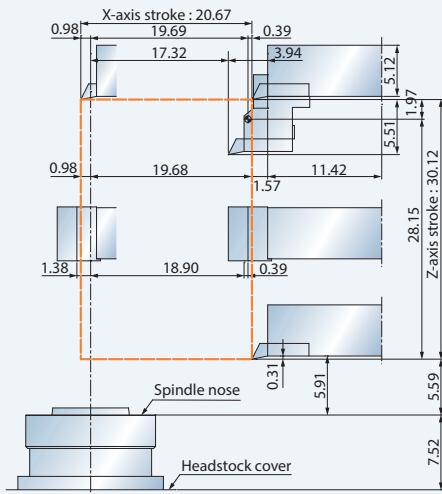


7  
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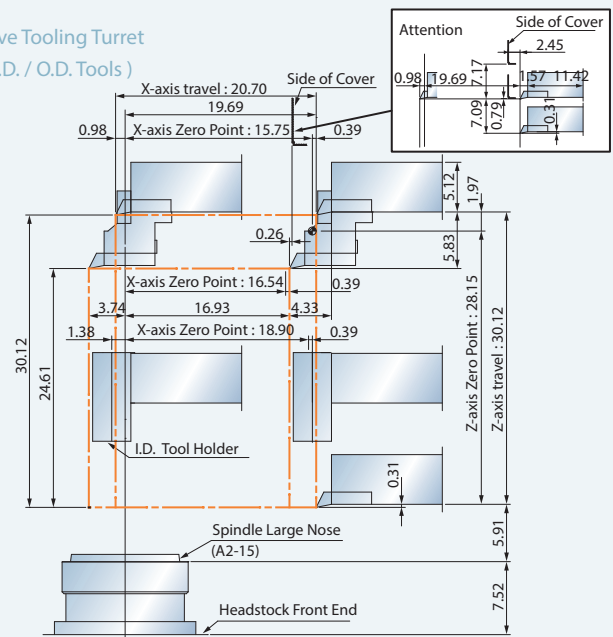
\*1 With O.D. tool holder max. turning dia.

Work Range

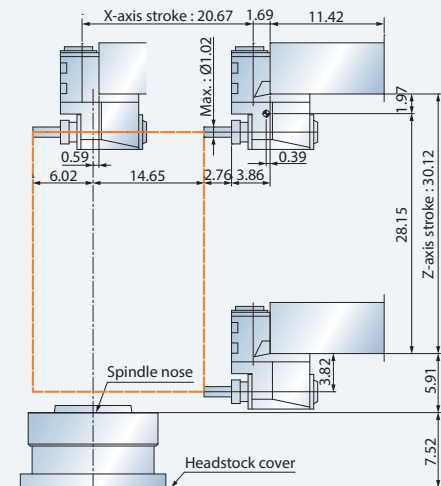
Standard Turret



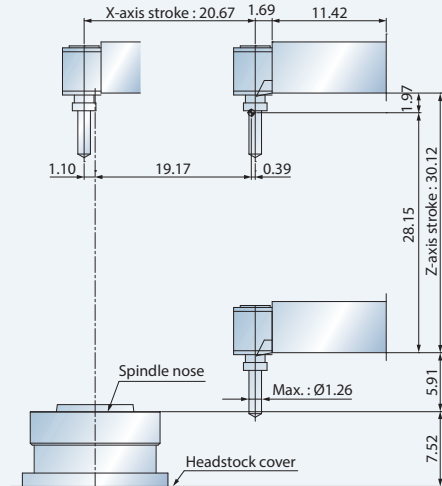
Live Tooling Turret  
(I.D. / O.D. Tools)



Live Tooling Turret  
(90° Live Tooling)



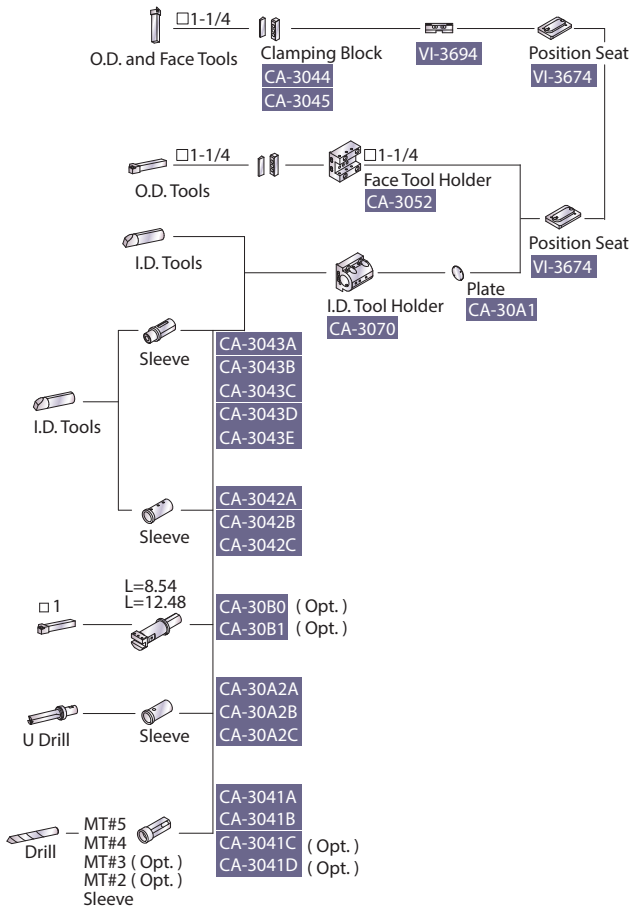
Live Tooling Turret  
(0° Live Tooling)



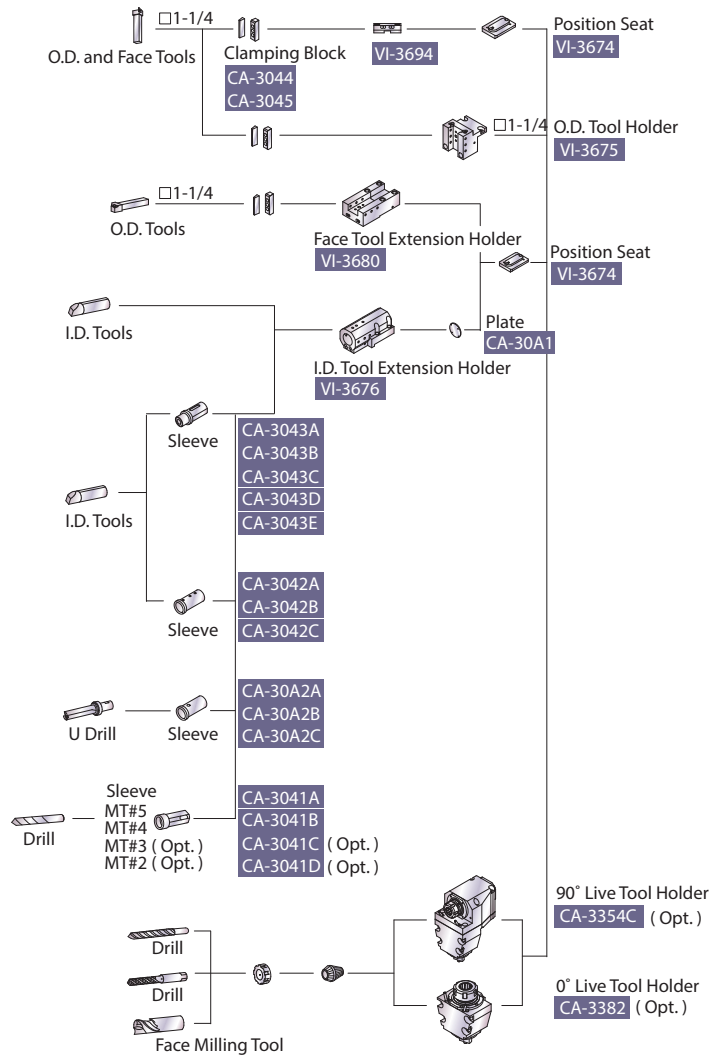
Unit : mm

Tooling System

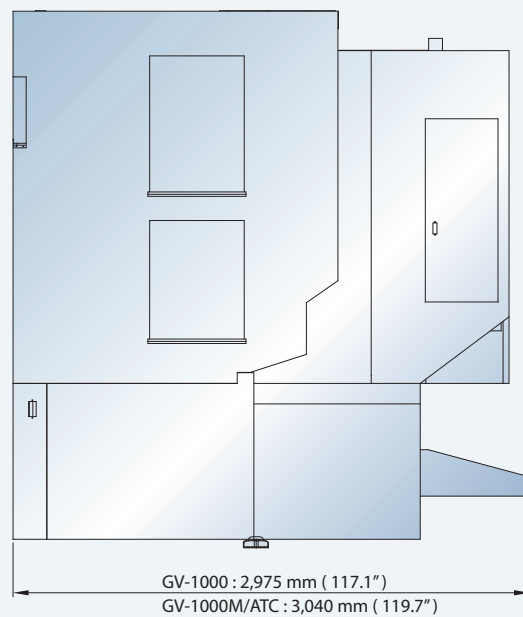
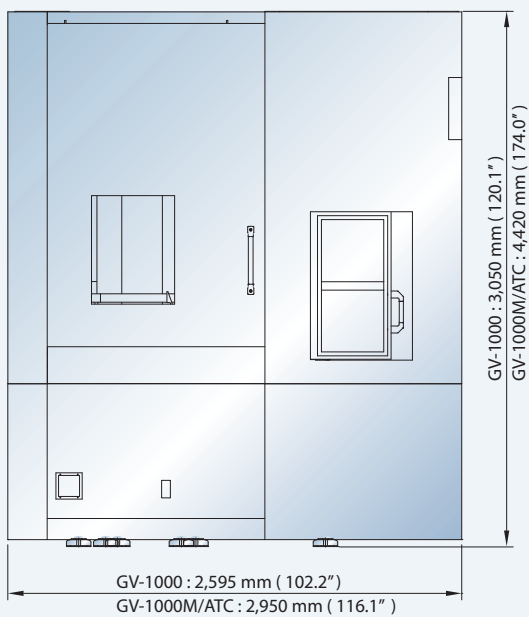
Standard Turret



Live Tooling Turret



Machine Layout



# MACHINE SPECIFICATIONS

CAPACITY	GV-1000	GV-1000M/ATC
Max. swing diameter	Ø 1,020 mm ( 40.16" )	
Max. turning diameter	Ø 1,000 mm ( 39.37" )	
Std. turning diameter	Ø 330 mm ( 12.99" )	—
Max. turning length	760 mm ( 29.92" )	700 mm ( 27.56" )
Hydraulic chuck size	15" ~ 32"	15" ~ 32"
<b>SPINDLE</b>		
Spindle bearing diameter	Ø 200 mm ( 7.87" )	
Spindle nose	A2-11 ( Opt. A2-15 )	
Motor output ( Cont. / 30 min. )	22 kW ( 30 HP ) / 30 kW ( 40 HP )	
Motor full output speed	400 rpm	
Spindle drive system	Belt + Gear	
Gear Step	2	
Spindle speed range	20 ~ 2,000 rpm ( 15" , 18" chuck )	
	15 ~ 1,500 rpm ( 21" , 24" chuck )	
	15 ~ 1,000 rpm ( 32" chuck )	
Spindle full output speed	76 rpm	
Spindle torque ( Cont. / 30 min. )	2,320 N-m ( 1,710 lb-ft ) / 3,765 N-m ( 2,775 lb-ft )	
<b>X &amp; Z AXES</b>		
X / Z axes travel	525 mm ( 20.67" ) / 765 mm ( 30.12" )	750 mm ( 29.53" ) / 850 mm ( 33.46" )
X / Z axes rapids	24 m/min ( 945 IPM ) / 20 m/min ( 787 IPM )	24 m/min ( 945 IPM ) / 20 m/min ( 787 IPM )
X / Z axes servo motor	4 kW ( 5.5 HP ) / 6 kW ( 8 HP )	4 kW ( 5.5 HP ) / 6 kW ( 8 HP )
<b>TURRET</b>		
Stations	12	—
Indexing speed	1.5 sec. Adjacent	—
OD / ID tool shank size	<input type="checkbox"/> 32 mm ( 1-1/4" ) / Ø 60 mm ( 2-1/2" )	—
<b>LIVE TOOLING TURRET ( OPTIONAL )</b>		
Stations	12	—
Live tooling stations	12 ( rotate in working position only )	—
Live tooling drive motor	3.7 kW ( 5 HP ) / 5.5 kW ( 7.5 HP )	—
Index speed	1.5 sec. ( Adjacent )	—
OD / ID tool shank size	<input type="checkbox"/> 32 mm ( 1-1/4" ) / Ø 60 mm ( 2-1/2" )	—
Live tooling shank size	ER 50 / ER 40 ( 0° / 90° )	—
Live tooling RPM range	3,000 rpm	—
<b>TOOLING SPINDLE ( OPTIONAL )</b>		
Spindle bearing diameter	—	90 mm
Motor output ( Cont. / 30 min. )	—	11 / 7.5 kW
Motor full output speed	—	1,500 rpm
Spindle drive system	—	Direct Belt Drive
Spindle speed range	—	2,400 rpm
Spindle torque ( Cont. / 30 min. )	—	95 / 140 N-m
<b>ATC</b>		
Magazine capacity	—	12
Spindle taper	—	BT-50
<b>Cf-AXIS</b>		
Cf-axis drive motor	3 kW ( 4 HP )	
Cf-axis drive ratio	1 : 70	
Cf speed range	30 rpm	
Cf-axis torque output ( Cont. )	833 N-m ( 614 lb-ft )	
Indexing angle / Dynamic accuracy	± 0.02° / ± 0.01°	
<b>GENERAL</b>		
Control	FANUC Oi-TD ( Opt. 31 i )	
Voltage / Power requirement	AC 200 / 220 + 10% to -15% 3 phase / 58 KVA	
Hydraulic / Coolant tank capacity	30 L ( 8 gal ) / 250 L ( 66 gal )	
Coolant pump / pressure	Cutting Coolant : 1.2 kW ( 1.61 HP ) / 10 Kg/cm <sup>2</sup> ( 142 PSI );	
	Washing Coolant : 1 kW ( 1.34 HP ) / 5 Kg/cm <sup>2</sup> ( 71 PSI )	
Machine weight	13,500 Kg ( 29,700 lb )	14,000 Kg ( 30,865 lb )
Dimensions L × W × H	2,595 x 2,975 x 3,050 mm	2,950 x 3,040 x 4,420 mm
	( 102.17" x 117.13" x 120.08" )	( 116.14" x 119.69" x 174.02" )

Specifications are subject to change without notice.



YAMASEIKI.com

**YAMA SEIKI USA, INC.**

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5788 Schaefer Ave., Chino, CA 91710

TEL : (888) 976-6789

(909) 628-5568

FAX : (909) 993-5378

E-mail : [sales@yamaseiki.com](mailto:sales@yamaseiki.com)