

GV-1 SERIES

Maximum Performance Vertical CNC Turning Centers

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YAMA SEIKI
TURNING CENTERS by **WOODWAY**

MAXIMUM PERFORMANCE VERTICAL TURNING CENTERS

Packed with industry leading technology and top quality components, the YAMA SEIKI GV-1 series vertical turning centers combine incredible power, strong constructions, and heavy-duty cutting capabilities to bring you The Ultimate Machining Power®. These maximum performance machines will easily accomplish the demanding turning applications of today and tomorrow. With maximum turning diameter up to 1,800 mm, maximum table load up to 8,000 kg, and available live tooling spindle & C_f-axis capabilities, turning, milling, contour milling and drilling applications may be completed in one single machine.

- ▶ Enclosed splashguards keep chips and coolant contained for a safe clean working environment.
- ▶ Extra wide door enables large size work-pieces to be loaded onto the work table with a crown block providing easy loading and unloading operations.

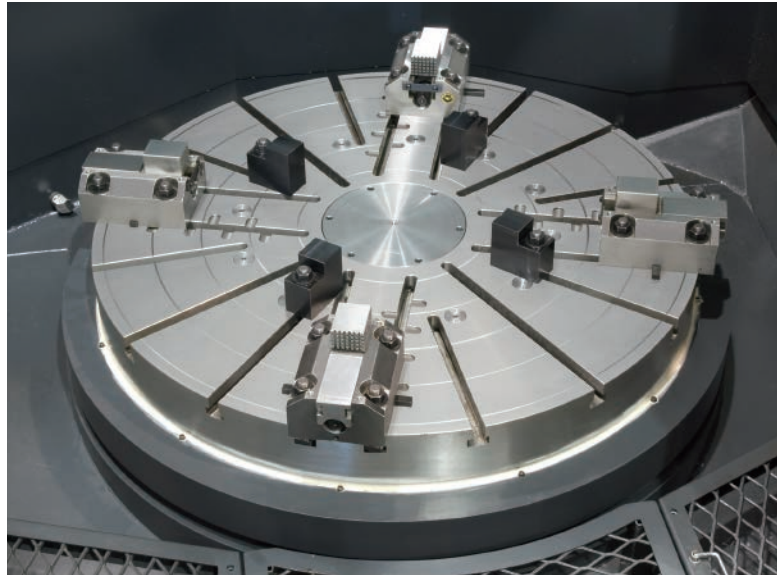


Models	GV-1200	GV-1600
Max. swing diameter	Ø 1,600 mm (Ø 63")	Ø 2,000 mm (Ø 79")
Max. turning diameter	Ø 1,350 mm (Ø 53")	Ø 1,800 mm (Ø 70")
Max. turning length	1,300 mm (51")	1,300 mm (51")
Max. table load	5,000 Kg (11,000 lb)	8,000 Kg (17,600 lb)

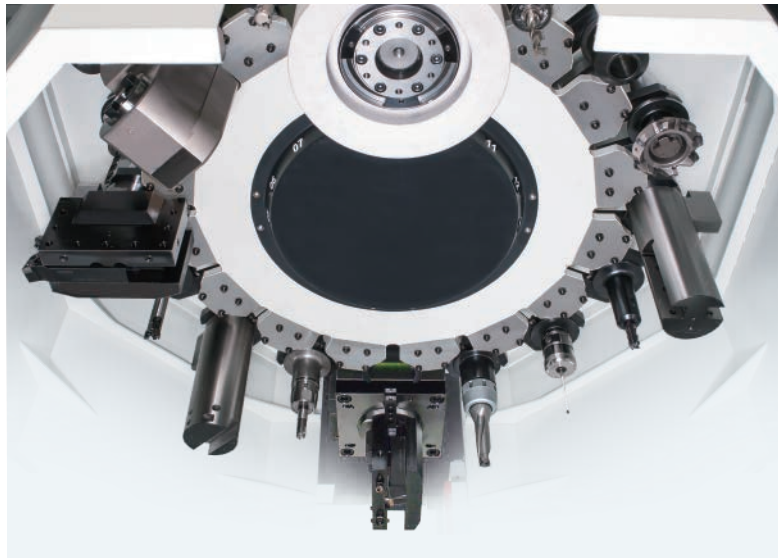
* Live tooling spindle available

(GV-1200M model shown with FANUC Oi-TD control)

- ▶ High rigidity work table with a standard 4-jaws individual manual chuck provides easy operation and outstanding heavy-duty cutting capability.
- ▶ With the outstanding chip disposal design, chips can be easily brought out through the coolant tank and chip conveyor to the chip cart.



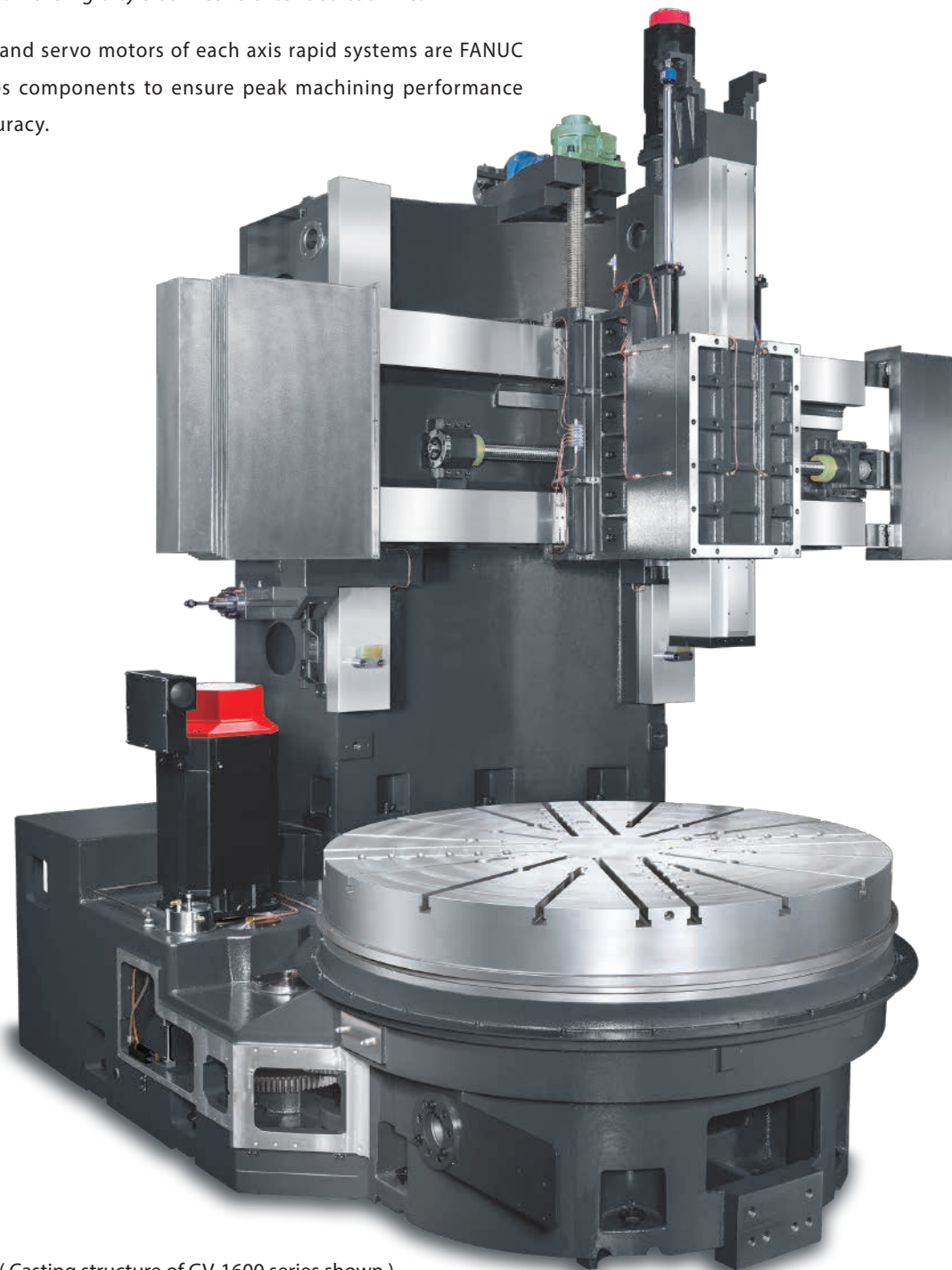
- ▶ Standard CAT50 16-tool umbrella type ATC with fully enclosed guarding can be equipped with various turning, milling, and drilling tools based on different turning applications.



- ▶ Super large 900L coolant tank capacity allows smooth coolant circulation which tremendously improves the machine's overall accuracy by lowering thermal expansion effects to a minimum.
- ▶ Right discharge chip conveyor can be equipped with a programmable controller to minimize coolant loss and increase chip disposal efficiency.

HIGH RIGIDITY CONSTRUCTION

- ▶ Built to endure years and years of rigorous high production turning, the heavily ribbed, thermally balanced, high rigidity bed and column are of Meehanite casting. It is capable of withstanding much greater stress without deforming and provides maximum vibration dampening, which result in a machine that will outlast and outperform the competition.
- ▶ By using Finite Element Methods (FEM), optimal reinforce ribbings are directly cast into the bed and column structure. Mechanical rigidity has been increased by more than 30% when compared to conventional designs. The GV-1 series is capable of performing super heavy-duty turning and maintain long-term super high precision accuracy. More rigidity also means extended tool life.
- ▶ Spindle and servo motors of each axis rapid systems are FANUC α i series components to ensure peak machining performance and accuracy.



(Casting structure of GV-1600 series shown)



- ▶ The column is adopted with the high-low box way design to firmly support the crossrail while minimizing structural distortion and increasing rigidity.
- ▶ Super large box way and components are of one-piece casting, they are applied with heat treatment and precision grinded to provide maximum strength and accuracy.

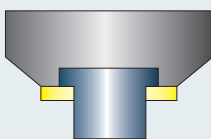


- ▶ Contact surfaces of all slides, spindles, ball screw bearing housings, bed and column are precision hand scraped to provide maximum assembly precision, structural rigidity, and load distribution.

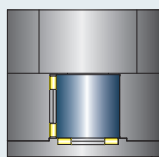
- ▶ The moving cross rail structure adopts reduction drive mechanism which is driven by servo motor. When cross rail moves to the position, two sets of live locking bolts start to engage with column and cross rail in the first place, and then 4 sets of hydraulic cylinders automatically lock itself which ensure the rigidity of cross rail structure and excellent positioning.
- ▶ W-axis travel (cross rail up and down) : 800 mm.
Space between each step of the positioning mechanism : 200 mm.



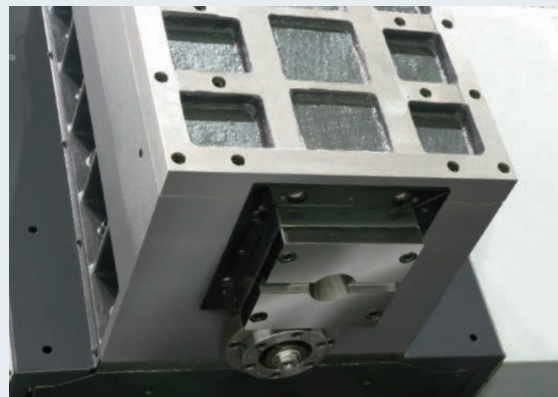
- ▶ The square ram on the tooling spindle is adopted with a closed-type design and fixed with 4 sets of powerful wedges. This gives the GV-1 series with greater structural rigidity and machining accuracy compared to peer models with a semi-closed type square ram structure.



Semi-closed Type Square Ram



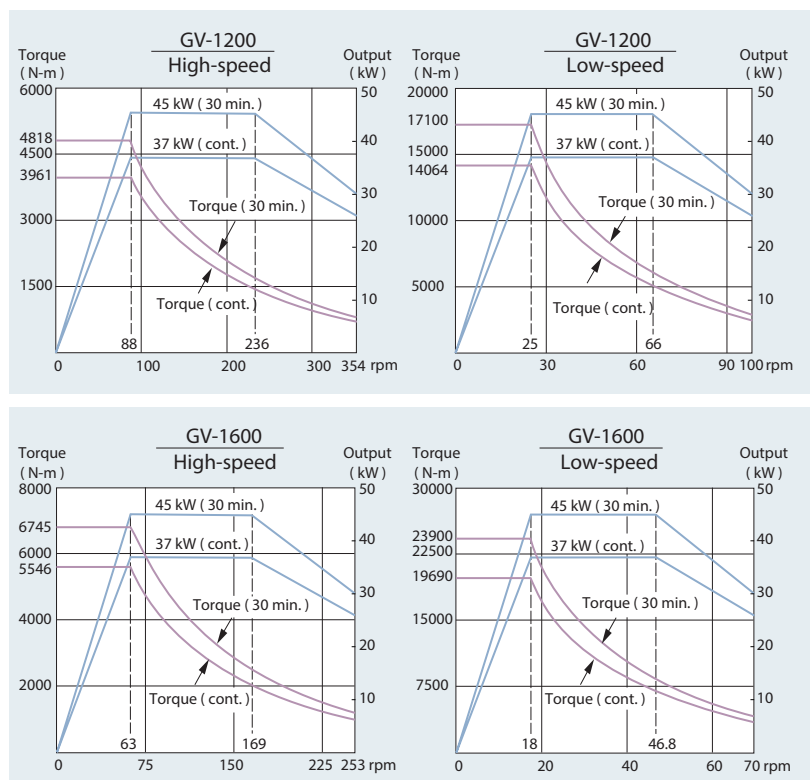
Closed-type Square Ram



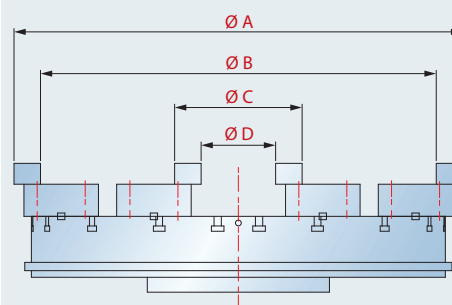
ULTIMATE TURNING POWER



Work-Piece Spindle Output



Clamping Range



Unit : mm		
Max. I.D. Clamping	A	C
GV-1200	1,355	385
GV-1600	1,675	385
Max. O.D. Clamping	B	D
GV-1200	1,195	225
GV-1600	1,515	225

Work-Piece Spindle



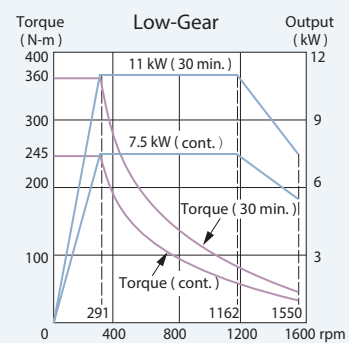
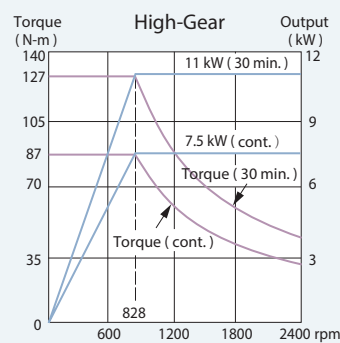
- ▶ Generating twice the torque output of standard motors, the A/C constant output, wide-range, high torque *i* series motor is rated at 45 kW (30 min.). This double wound motor is designed to reach full output at 1/2 the RPM of standard motors, providing the ability to take heavier cuts in the lower RPM ranges.



- ▶ The high rigidity, high rotation accuracy cross roller bearing can sustain radial, axial and torque compound loads to ensure machining accuracy under long-term heavy work loads and extend the service life of the spindle.
- ▶ Standard high-speed ratio, high-torque 2-speed gear box mated with α 40/6000 *i* series spindle motor provides ample power output for heavy-duty cutting.

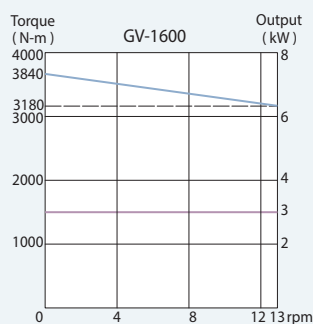
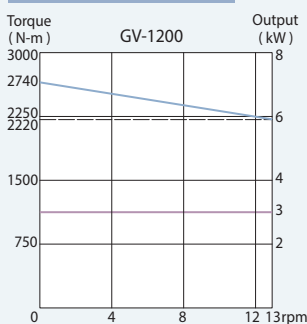
Tooling Spindle

- ▶ Ø 90 mm big diameter NN TYPE high-precision roller bearings provide high-rigidity and low-wear advantages.
- ▶ High precision gear-box and pulley-deceleration mechanism provide high torque output when machining in low-speed range.



C-axis Spindle (Optional)

Cf-axis motor output



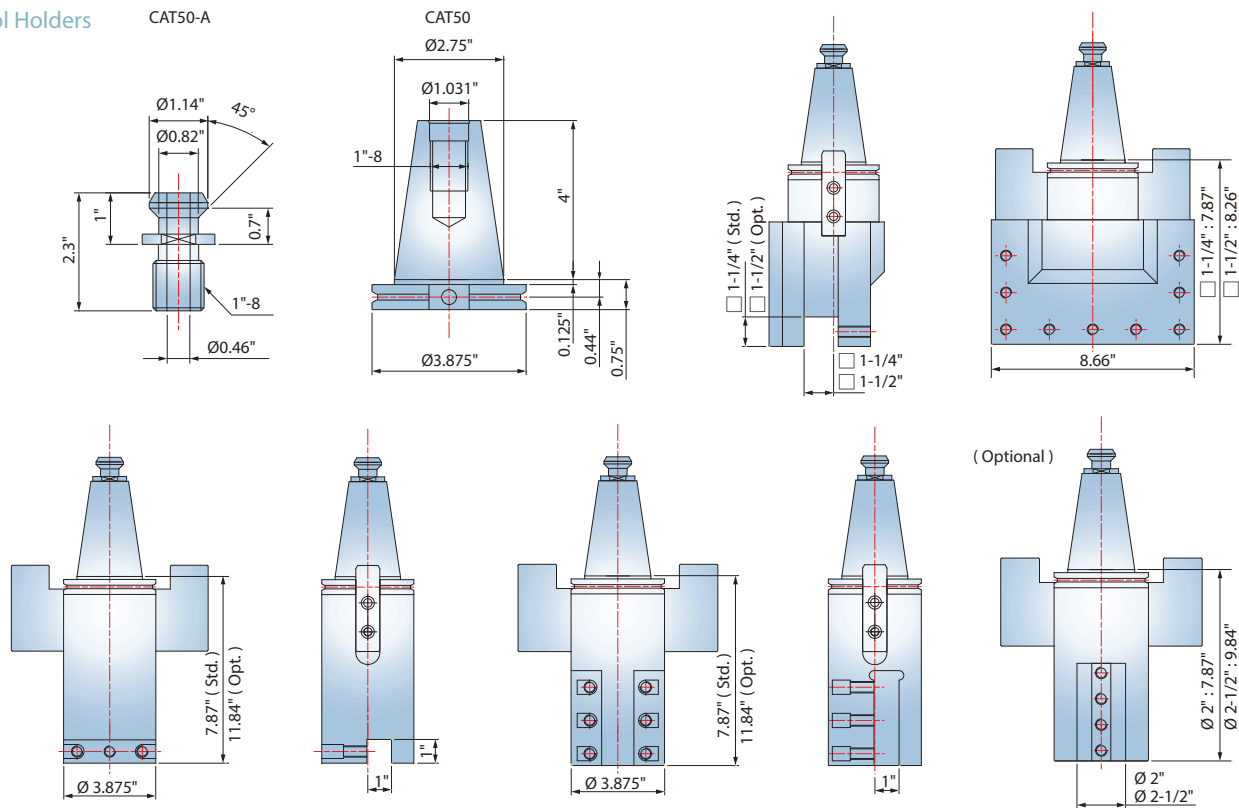
- ▶ The optional Cf-axis and disk brake system available on the GV-1 series provide the most rigid and powerful type of C-axis on the market today. It is adopted with worm gear drive system for high accuracy transmission and easy backlash adjustment. The indexing accuracy is up to 0.001°.
- ▶ Working with the live tooling spindle, the Cf-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.

- ▶ With the FANUC servo motor generating an ultra high resolution of 100 million pulses per spindle rotation and 3,840 N-m (GV-1600) , 2,740 N-m (GV-1200) of torque, machined surfaces finishes are much superior than Cs-axis (driven by spindle motor) equipped machines.

GENERAL DIMENSION

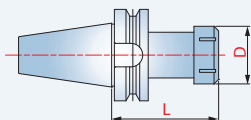
Tool Holders

CAT50-A



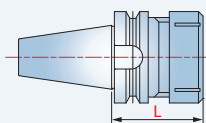
Tool Shank (Optional)

Tapping tool holders



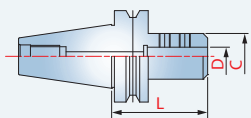
Model	L	D	Tapping Range
CAT50-TER16	3.15"	1.10"	M3-M12
CAT50-TER40	4.60"	2.48"	M12-M35

Drilling (collect type) tool holders



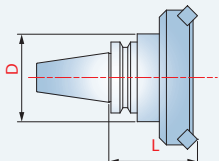
Model	L	Capacity	Collet Type
CAT50-ER20-100	3.93"	1-13	ER-20
CAT50-ER32-100	3.93"	2-20	ER-32
CAT50-ER40-100	3.93"	3-26	ER-40

Drilling (side lock) tool holders



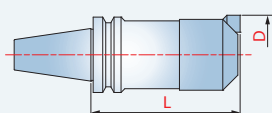
Model	L	C	D
CAT50-SLA20-10	4.13"	1.96"	3/4"
CAT50-SLA25-10S	4.13"	2.16"	1"
CAT50-SLA32-10S	4.13"	2.36"	1-1/4"
CAT50-SLA40-10S	4.13"	3.15"	1-1/2"
CAT50-SLA50.8-10S	4.13"	3.74"	2"

Face milling tool holders



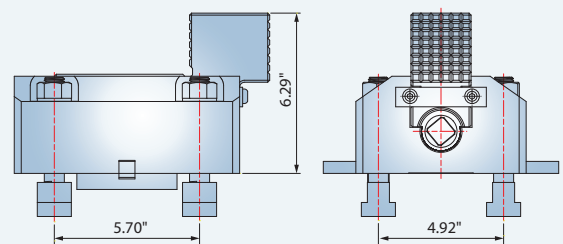
Model	L	D	Cutter Dia.
CAT50-FMA25.4-105	4.92"	3.34"	3.15"
CAT50-FMA31.75-105	5"	3.34"	3.93"
CAT50-FMA38.1-75	3.85"	3.74"	4.92"
CAT50-FMA50.8-75	3.89"	3.74"	5.90"

Boring tool holders

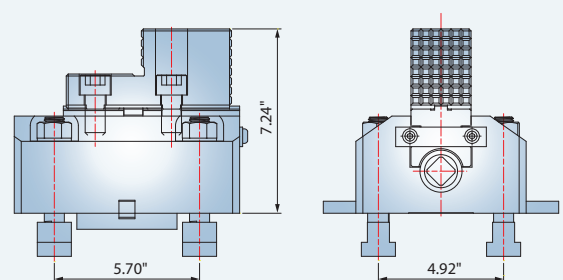


Model	L	D
CAT50-BSA62-300	11.81"	2.44"~3.54"
CAT50-BSA72-320	12.59"	2.83"~4.33"
CAT50-BSA105-195	7.67"	4.13"~6.29"

Boring Mill Jaw

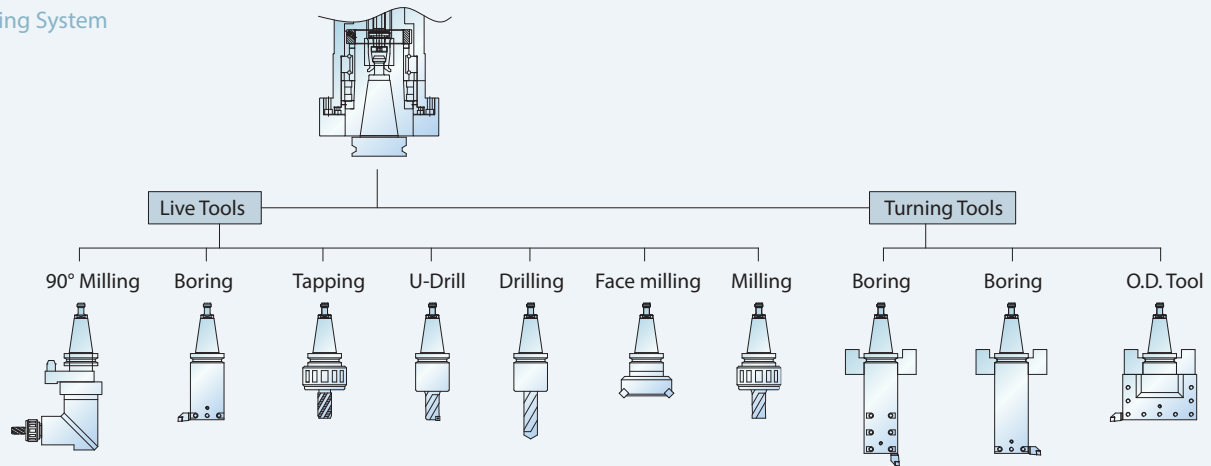


Exchangeable Mill Jaw

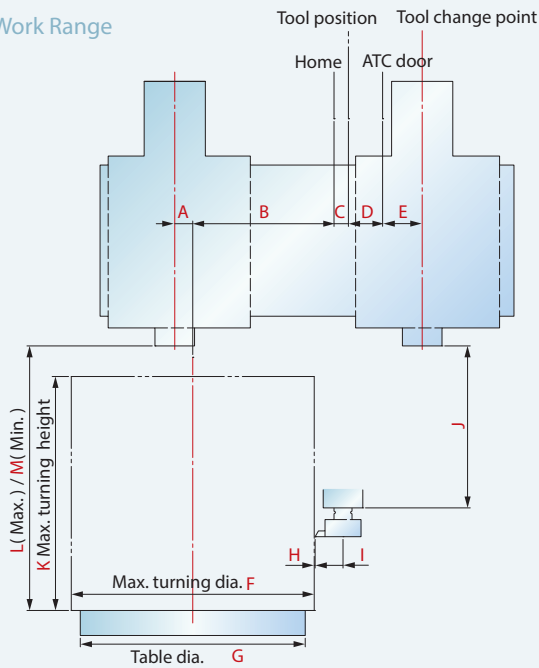


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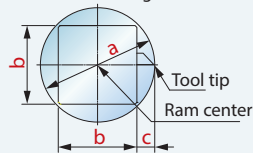
Tooling System



Work Range



Min. inner turning dia.

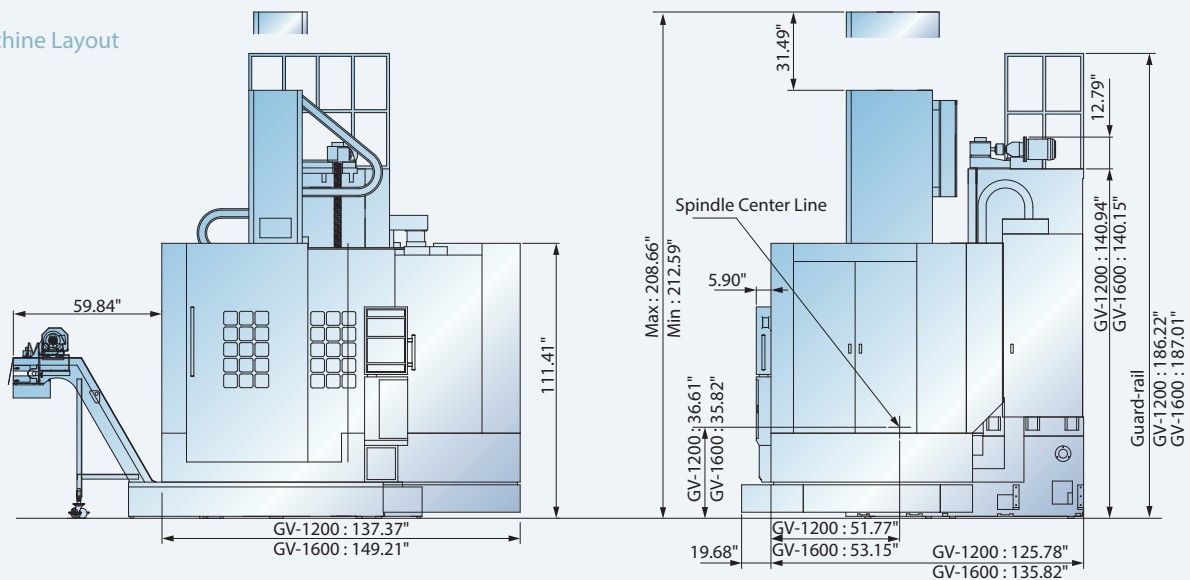


Model	a	b	c
GV-1200	Ø12.59"	8.66"	1.96"
GV-1600	Ø12.59"	8.66"	1.96"

Model	A	B	C	D	E	F
GV-1200	3.93"	32.87"	1.57"	7.08"	8.66"	Ø53.15"
GV-1600	3.93"	41.73"	7.08"	7.08"	8.66"	Ø70.86"

Model	G	H	I	J	K	L	M
GV-1200	Ø49.21"	0.19"	6.10"	35.43"	51.18"	61.02"	29.52"
GV-1600	Ø62.99"	0.19"	6.10"	35.43"	51.18"	61.02"	29.52"

Machine Layout



Specifications are subject to change without notice.

FEATURES

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

		GV-1200	GV-1600
WORK-PIECE SPINDLE			
Main spindle		S	S
Rigid tapping		S	S
Cf-axis		O	O
Disk brake for main spindle		O	O
Lubrication system		S	S
WORK HOLDING			
4-jaws manual chuck		S	S
TOOLING SPINDLE			
CAT50 spindle		S	S
BT50 spindle		O	O
Spindle Coolant		O	O
Coolant through spindle (CTS)		S	S
Drilling & milling function		O	O
16-tool magazine		S	S
24-tool magazine		O	O
MEASUREMENT			
Tool presetter		O	O
X & Z axes linear scales		O	O
Part presence check		O	O
COOLANT			
Coolant pump	5 Kg/cm ²	S	S
High-pressure coolant system	20 Kg/cm ²	O	O
Oil skimmer		O	O
Coolant flow switch		O	O
Coolant level switch		O	O
Coolant intercooler system		O	O
Paper tape filter		O	O
CHIP DISPOSAL			
Chip conveyor with auto timer		S	S
Chip cart		O	O
Coolant gun		O	O
Air gun		O	O
SAFETY			
Fully enclosed splash guard		S	S
Door interlock (incl. Mechanical lock)		S	S
Impact resistant viewing window		S	S
Low hydraulic pressure detection switch		S	S
Over travel (soft limit)		S	S
Auto power-off device		S	S
OTHERS			
Tri-color operation status signal light tower		S	S
Florescent work light		S	S
Electrical cabinet	Heat exchanger	S	S
	A/C cooling system	O	O
Complete hydraulic system		S	S
Advanced auto lubrication system		S	S
Emergency maintenance electrical part package		S	S
Operation & maintenance manuals		S	S

		O-iD	31i
FANUC CONTROL FUNCTIONS*1			
PMC system	O <i>i</i> D PMC 0.025 μ sec/step	S	-
	31 <i>i</i> PMC 25 μ nsec/step	-	S
Display	8.4" color LCD	S	-
	10.4" color LCD	O	S
Graphic function	Standard	S	-
	Dynamic	O	S
Full keypad	Small - 44 keys	S	-
	Large - 56 keys	O*2	S
Part program storage length	512K bytes	S	-
	1M bytes	-	S
	2M bytes	-	O
	4M bytes	-	O
	8Mbytes	-	O
Registerable programs	400	S	-
	1,000	-	S
	4,000	-	O
Tool offset pairs	64	S	-
	99	O	S
	400	-	O
	499	-	O
	999	-	O
	2000	-	O
Servo control	HRV2 (3)	S	S
Conversational programming	Manual Guide O <i>i</i>	S	-
	Manual Guide <i>i</i>	O*2	S
Servo motors	α <i>i</i>	S	S
Spindle motors	α <i>i</i>	S	S
Tool Life Management		S	S
Tool Nose Radius Compensation		S	S
Background editing		S	O
Variable Lead Thread Cutting		S	S
Polygon Turning		S	S*3
Unexpected disturbance torque detection function		S	S
Polar coordinate & cylindrical interpolation		-	O
Multiple Threading		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

Specifications are subject to change without notice.

*1 Please contact YAMA SEIKI for complete control specification list.

*2 10.4" LCD option needed.

*3 For servo motor driven live tooling spindle only.

MACHINE SPECIFICATIONS

CAPACITY	GV-1200	GV-1600
Table diameter	Ø 1,250 mm (Ø 49")	Ø 1,600 mm (Ø 63")
Max. swing diameter	Ø 1,600 mm (Ø 63")	Ø 2,000 mm (Ø 79")
Max. turning diameter	Ø 1,350 mm (Ø 53")	Ø 1,800 mm (Ø 70")
Max. turning length	1,300 mm (51")	
Max. table load	5,000 Kg (11,000 lb)	8,000 Kg (17,600 lb)
WORK-PIECE SPINDLE		
Spindle bearing diameter	Ø 423 mm (Ø 16.65")	Ø 580 mm (Ø 22.83")
Motor output (Cont.)	37 kW (50 HP)	
Motor output (30 min.)	45 kW (60 HP)	
Gear step	2	
Spindle speed range	2 ~ 350 rpm	2 ~ 250 rpm
Max. spindle torque	17,100 N-m (12,600 lbf-ft)	23,900 N-m (17,600 lbf-ft)
TOOLING SPINDLE (OPTIONAL)		
Motor output (Cont.)	11 kW (15 HP)	
Motor output (30 min.)	15 kW (20 HP)	
Spindle speed range	24 ~ 2,400 rpm	
CF-AXIS		
Motor output	3 kW (4 HP)	
Cf-axis speed range	13 rpm	9 rpm
Cf-axis torque output	2,740 N-m (2,020 lbf-ft)	3,840 N-m (2,830 lbf-ft)
X & Z AXES		
Max. X-axis travel	935 mm (36.8")	1,160 mm (45.5")
Max. Z-axis travel	900 mm (35.5")	
Max. W-axis travel	800 mm (31.5")	
X / Z axes rapids	12 / 10 m/min. (473 / 394 IPM)	
X-axis servo motor output	6 kW (8 HP)	
Z-axis servo motor output	9 kW (12 HP)	
ATC		
Magazine capacity	16	
Spindle taper	CAT50 (Opt. BT50)	
Max. tool size	280 x 150 x 400 mm (11" x 6" x 15.7")	
Max. tool weight	50 Kg (110 lb)	
Max. magazine load	360 Kg (790 lb)	
GENERAL		
Positioning accuracy (JIS B 6338)	± 0.007 / 500 mm (X & Z axes), ± 7.5 arcsec / 360° (C-axis)	
Repeatability (JIS B 6338)	± 0.005 mm (X & Z axes), ± 4 arcsec / 360° (C-axis)	
Standard CNC control	FANUC Oi-TD	
Voltage / Power requirement	AC200 / 220 + 10 % to -15 % 3 phase / 100 KVA	
Hydraulic capacity	50 L (13 gal)	
Coolant tank capacity	900 L (237 gal)	
Machine weight	23,500 Kg (51,800 lb)	25,500 Kg (56,200 lb)
Dimensions L x W x H	3,540 x 3,695 x 5,300 mm (140" x 145" x 209")	3,790 x 3,950 x 5,300 mm (150" x 156" x 209")

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