THE ULTIMATE MACHINING POWER

GOODWAY®

GS-400 SERIES

Maximum performance CNC Turning Centers

GOODWAY MACHINE CORP.

MAXIMUM PERFORMANCE CNC TURNING CENTERS

Most of today's large machines are still relying on yesterday's technology. Many have common problems such as: slow rapids, under powered spindles, weak structures, turrets that index at a snail's pace, or turrets that are too small to provide adequate tool clearance. The GOODWAY GS-400 series completely eliminate these downsides with industry leading new designs. Combining tremendous power, strength, and speed for the ultimate turning power to accomplish today and tomorrow's most demanding turning applications.

- The first thing you'll notice inside the door of the GS-400 series is the massive turret, which boasts a turret disk over 762 mm in diameter. Blazing fast indexing times of 0.5 seconds from station to station and 1.5 second for stations at 180 degrees are achieved with servo indexing technology.
- Under the covers, you'll find a 45 degrees true slant bed with super wide box ways, and an enormous 2-speed head stock driven by a 37 Kw (Peak) Fanuc motor.
- Axes rapids are 20 m/min. on X and 24 m/min. on Z, which are 50~100% faster than the competition.

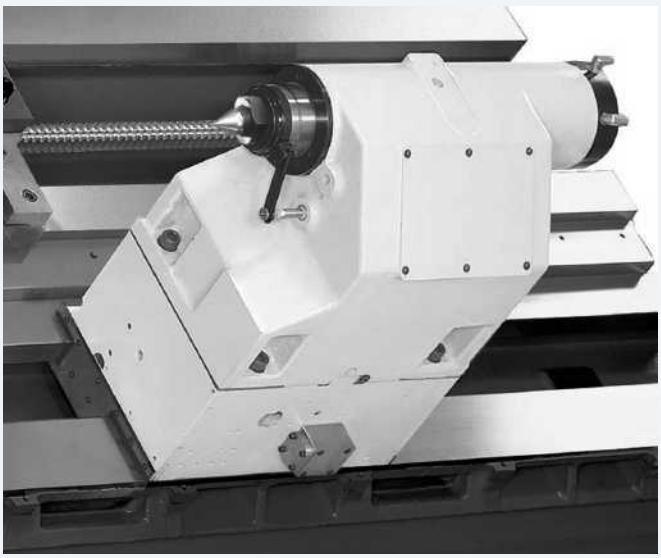
(GS-400 model shown with optional accessories)

- Together, these exceptional features generate cutting forces and speed unmatched by any other machine in this capacity and price range. Furthermore, a standard chip conveyor and separate coolant tank system enhance production efficiency and operation convenience.

(GS-400L model shown with optional accessories)

- 2 bed lengths and 3 spindle sizes offer a total of 6 basic models configurations.

- Available live tooling and C-axis capabilities in the GS-400 series allow the machine to perform multiple tasks on a work piece, such as turning, milling, drilling, and tapping. It cuts down manpower and cycle time, while reducing accuracy lost, which will occur if the part is moved from machine to machine. (More on page 9)

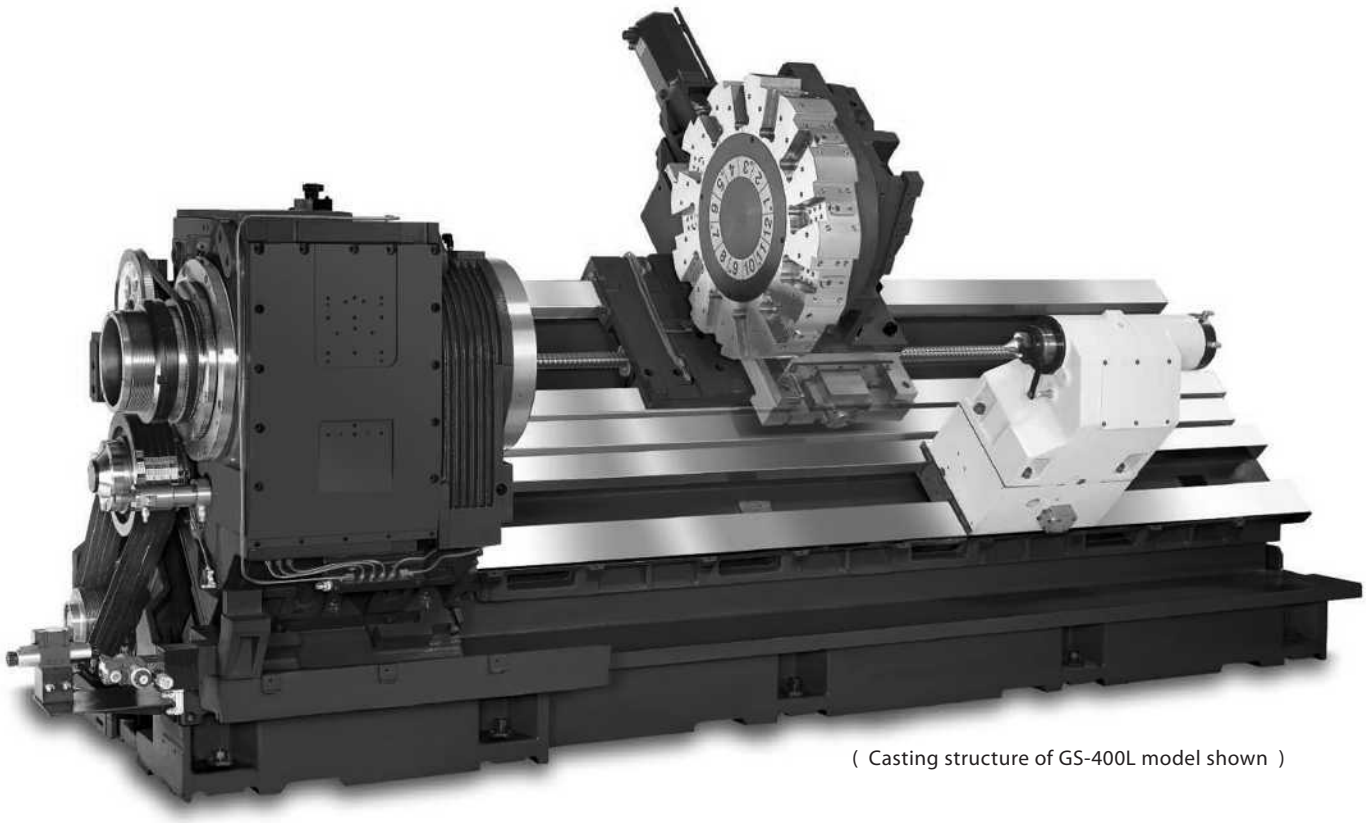


- Positioning of the programmable base tailstock has been simplified through use of custom software interface. The Z-axis carriage automatically locks on to the base of the tailstock and drags it to the desired position.

- The built-in bearings quill provide greater rigidity for heavyloads. The extension and retraction of the quill is programmable and thrust pressure adjustable.

MAXIMUM STRENGTH CONSTRUCTION

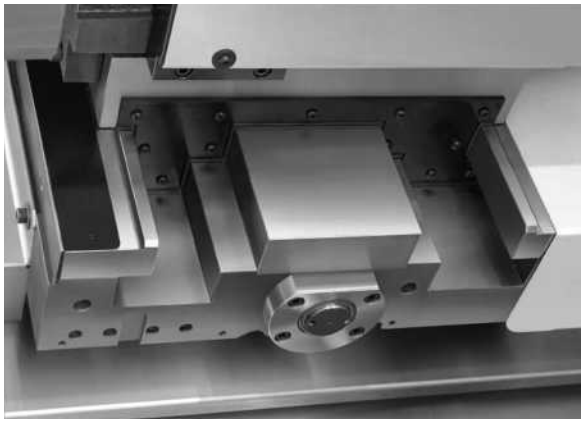
- Major structural components have been combined into one solid platform. The low center of gravity 45° slant bed design provides the most rigid foundation possible for the headstock, turret, and tailstock.
- By using Finite Element Methods (FEM), optimal reinforce ribbings are directly cast into the one-piece bed structure. Mechanical rigidity has been increased by more than 40 % when compared to conventional designs. The GS-400 series is capable of performing super heavy-duty turning and maintain long-term super high-precision accuracy. More rigidity also means extended tool life.
- Built to endure years and years of rigorous high production turning, the heavily ribbed, one-piece thermally balanced bed and casting components are of FC35-Meehanite casting (industry standard is FC25~30). FC35 grade cast iron is capable of withstanding much greater stress without deforming and provides maximum vibration damping, which result in a machine that will outlast and outperform the competition.



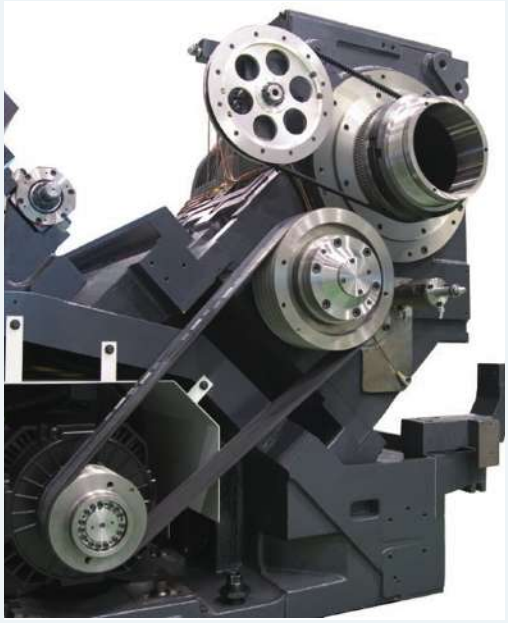
(Casting structure of GS-400L model shown)

- All spindle and servo motors, including drives, are Fanuc alpha *i* series components to ensure peak machining performance and accuracy.
- X and Z axes are driven by over-sized Fanuc alpha *i* series absolute AC servo motors, providing tremendous thrust outputs with faster acceleration and deceleration. Absolute encoder technology saves time and money by eliminating the use of limit switches, thus, eliminating referencing axes to home positions and replacing broken limit switches.

- C3 class hardened and precision ground ball screws ensure the highest accuracy and durability possible. Plus, pretension on all axes minimizes thermal distortion.



- Extra wide hardened and ground box ways are directly formed into the machine bed and saddle during the casting process. They are precision machined and widely spaced for maximum strength. The box way design also provides the rigidity needed for heavy duty and interrupted turning applications.



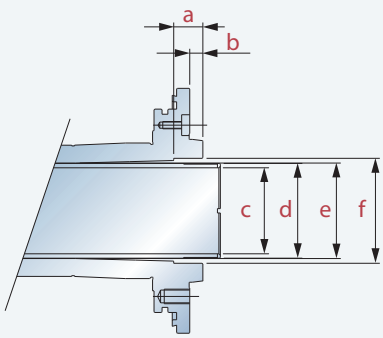
- Both gears and bearings are lubricated and cooled by an oil mist system, which evenly and efficiently lubricates the components. This system is much more advanced and environmental compared to the traditional oil bath system by eliminating the chance of oil contaminating the bearings and the use of a oil cooler.

- The 2 - speed super heavy duty gear head incorporates advance mechanical designs. Mated with a 37 Kw (Peak) motor to provide tremendous amount of low-end torque to handle heavy material removal on large diameter parts.

ULTIMATE TURNING POWER

- With over 2,048 N-m of torque available on the low speed of the 2-speed gear head, turning tough material with big diameter is now a simple task.
- 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.

【 Draw Tube Dimension Drawing 】



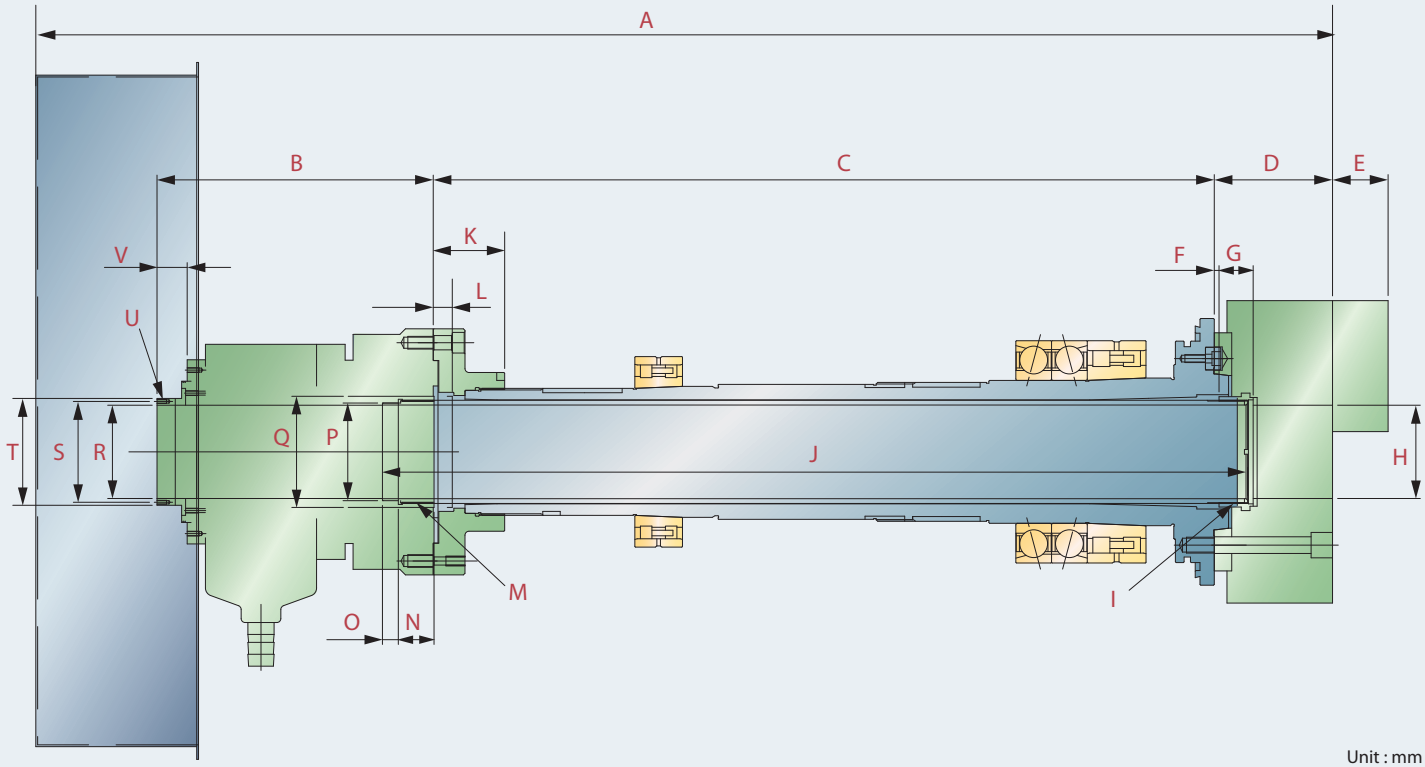
Unit : mm

Model	a	b	c	d	e	f
GS-400/L Hyd. chuck	40	18	Ø118	Ø130	Ø131	Ø144
GS-460/L Hyd. chuck	–	19	Ø180	Ø195	Ø205	–
GS-460/L Air chuck	–	19	–	–	Ø205	–

c : Draw Tube I.D.
d : Draw Tube O.D.
e : Spindle I.D.
f : Spindle I.D. Step

【 Spindle Dimension Drawing 】

Hydraulic chuck + Hydraulic cylinder



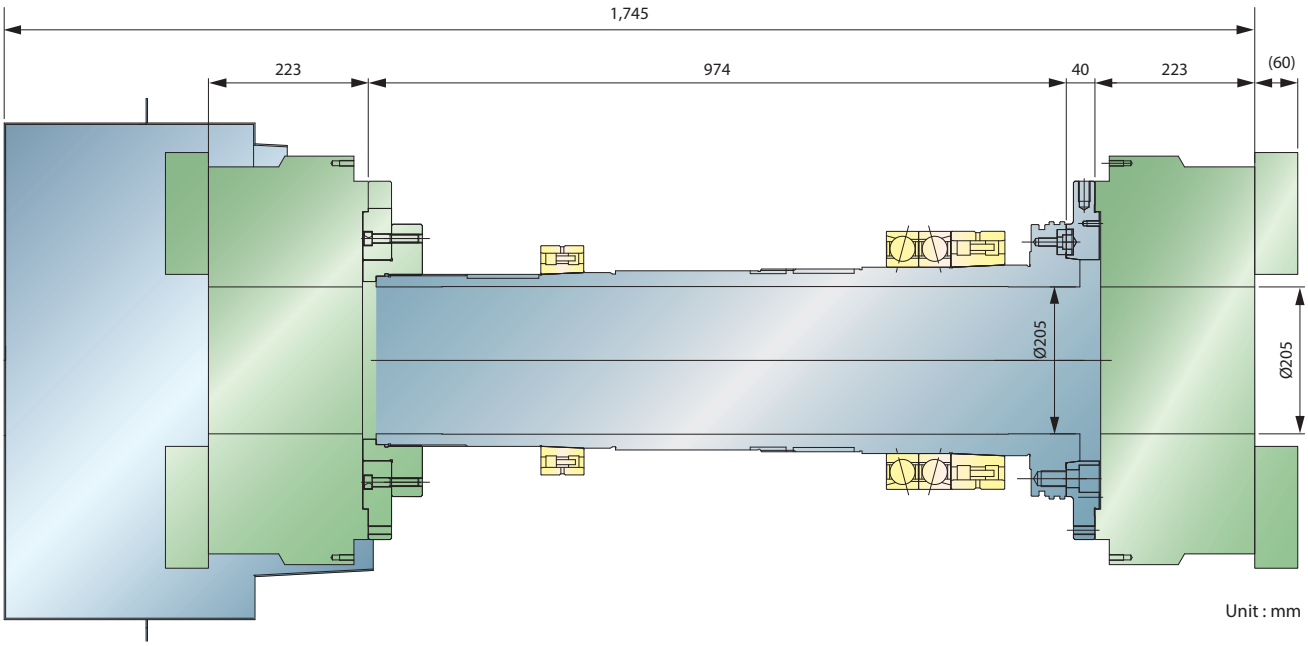
Unit : mm

Model	A	B	C	D	E	F	G	H	I	J	K
GS-400/L	1,634	348	984	149	70	max : 29 min : 6	43	Ø117.5	M130 x P2.0	1,090	90
GS-460/L	1,796	485.5	1,023	210	80.5	max : 51 min : 21	40	Ø184	M195 x P3.0	1,125	110

Model	L	M	N	O	P	Q	R	S	T	U	V
GS-400/L	max : 24 min : 1	M130 x P2.0	45	20	Ø123	Ø140	Ø117.5	PCD Ø127	Ø134.6	6-M5 x 12L	max : 38 min : 15
GS-460/L	max : 42 min : 12	M195 x P3.0	63	15	Ø184	Ø218	Ø184	PCD Ø215	Ø285	6-M8 x 16L	max : 85.3 min : 55.3

- 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.

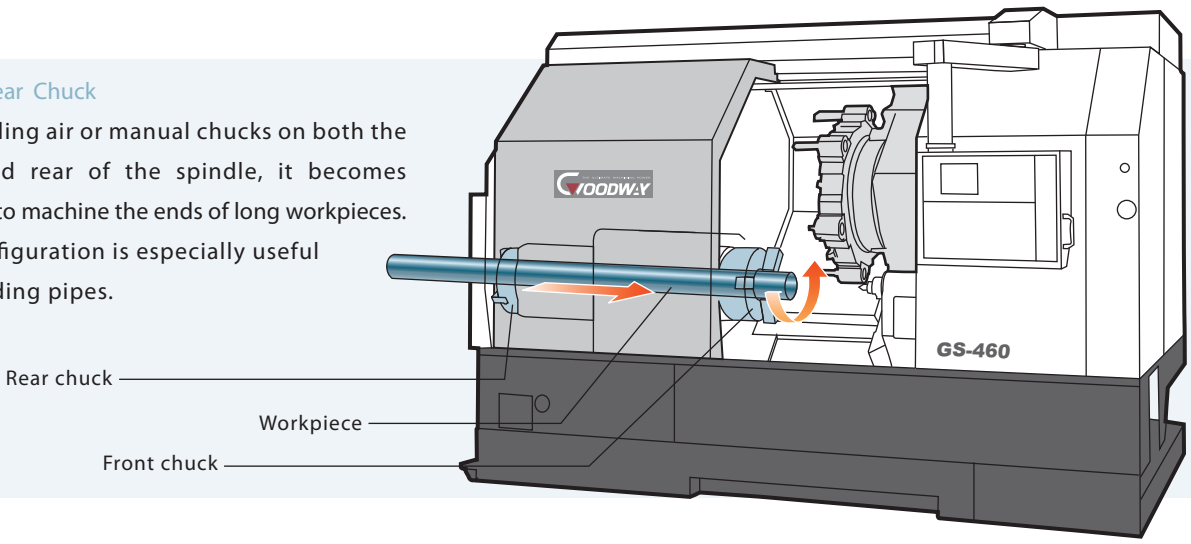
Front or Front + Rear Air Chuck Configurations



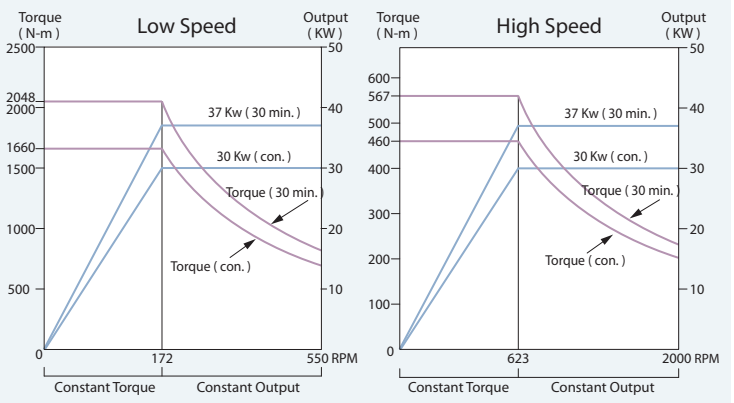
Unit : mm

Front + Rear Chuck

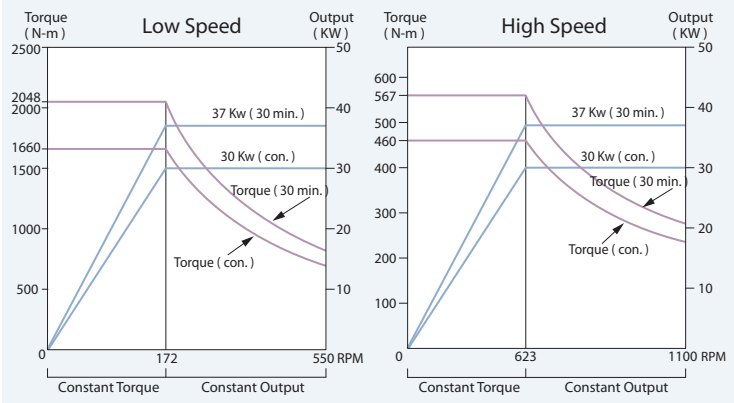
By installing air or manual chucks on both the front and rear of the spindle, it becomes possible to machine the ends of long workpieces. This configuration is especially useful in threading pipes.



Spindle Output —GS-400/L

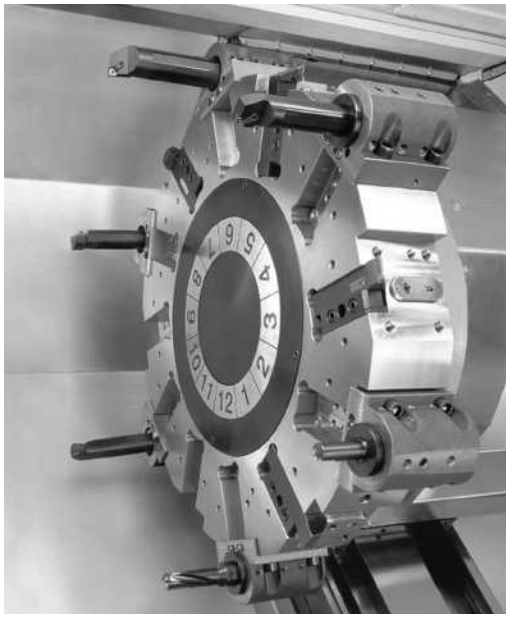


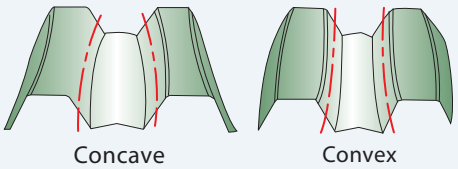
Spindle Output —GS-460/L



ADVANCED TURRET TECHNOLOGY

- While competitors are cutting cost by using straight couplings on their turrets, we insist on using the finest CURVIC couplings available. The curvature of the CURVIC teeth provides a very unique self-centering feature and wider uniform tooth contact throughout all the teeth, therefore, achieving very high accuracy and rigidity. The CURVIC teeth are hardened to HRC 58, which ensures the coupling retains its high accuracy characteristics over long periods of use.
- 450 mm (17.7") diameter super high precision CURVIC couplings accurately position the turret disk (+/- 2 sec. of arc) and 12,000 Kg (26,400 lbs.) of clamping force ensures abundant turret rigidity for all cutting conditions.
- The 12-station heavy-duty servo indexing turret achieves 0.5 second indexing times for adjacent stations and 1.5 second times for stations at the opposite end of the disk turret. Index movements are continues, without pauses, and is capable of turning 380 mm diameter work pieces without interference when using boring tools. The optional 8-station turret even clears up to 584 mm diameter.

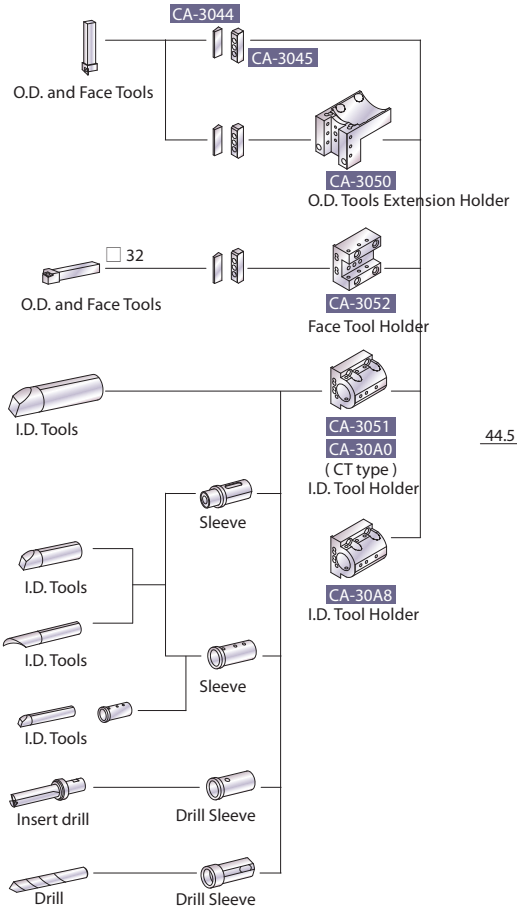




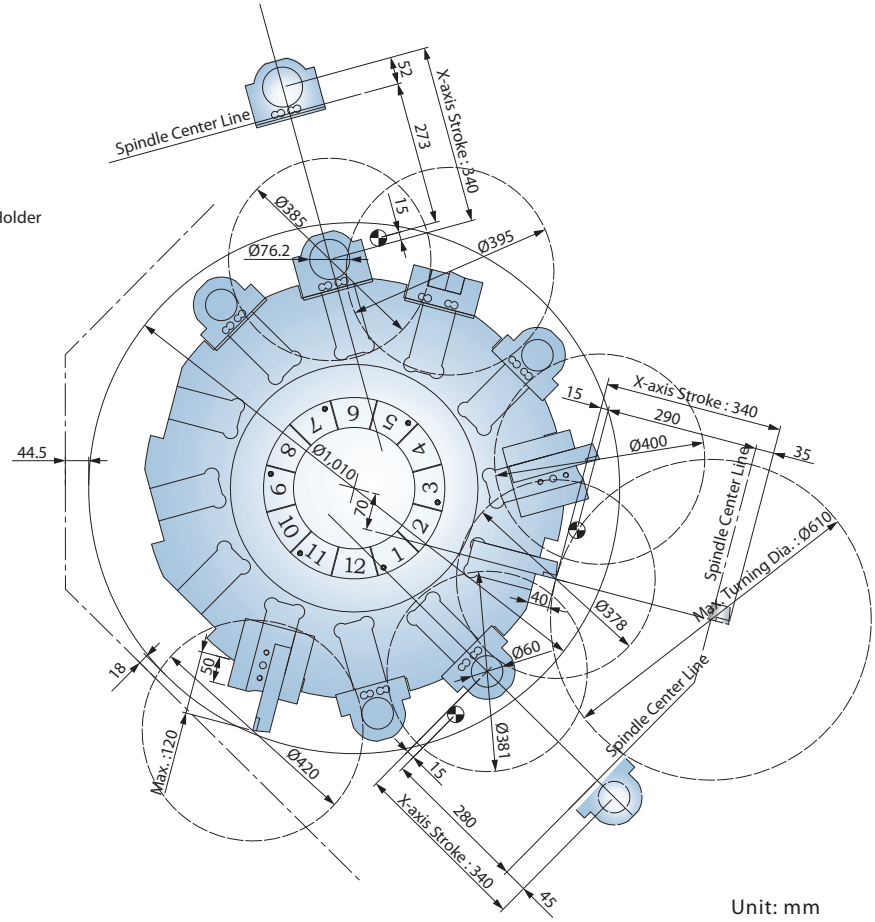
Curvic Coupling

【 Standard 12-Stations Turret 】

Tooling System

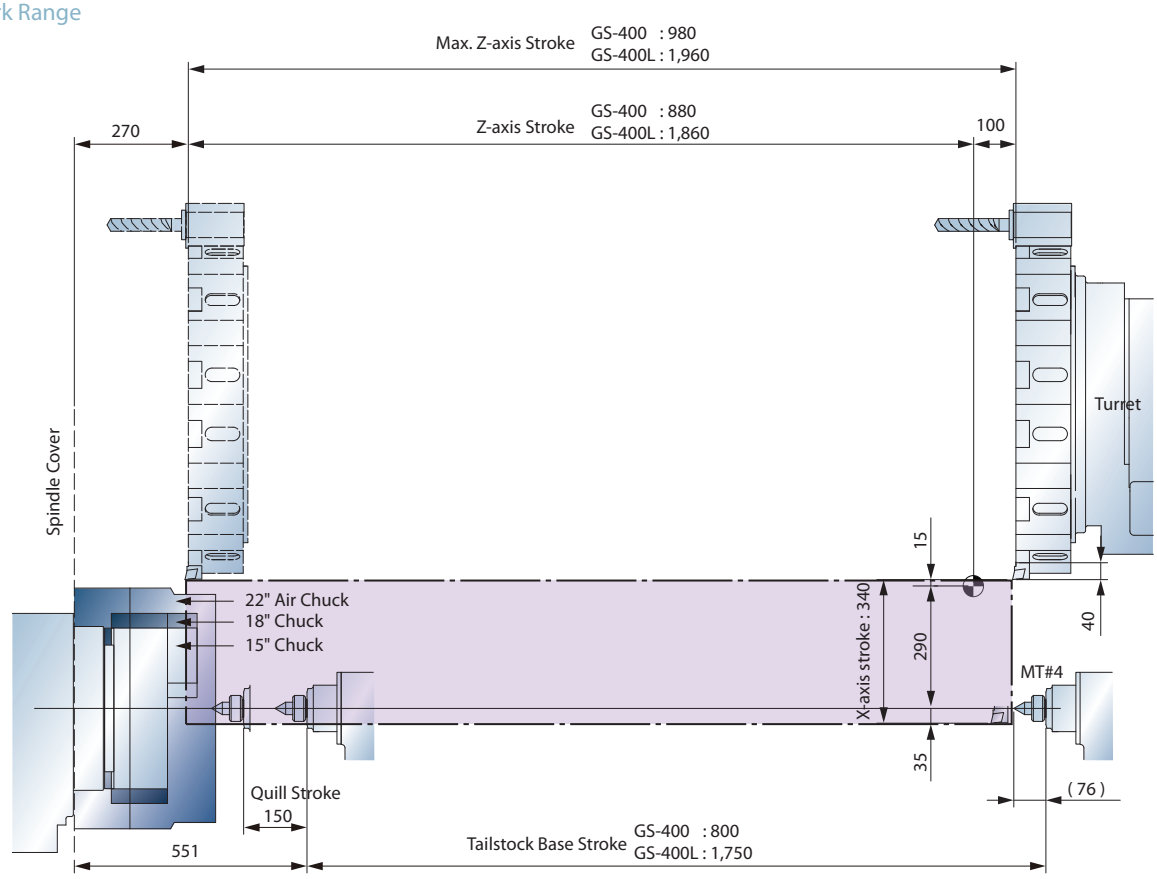


Interference Diagram



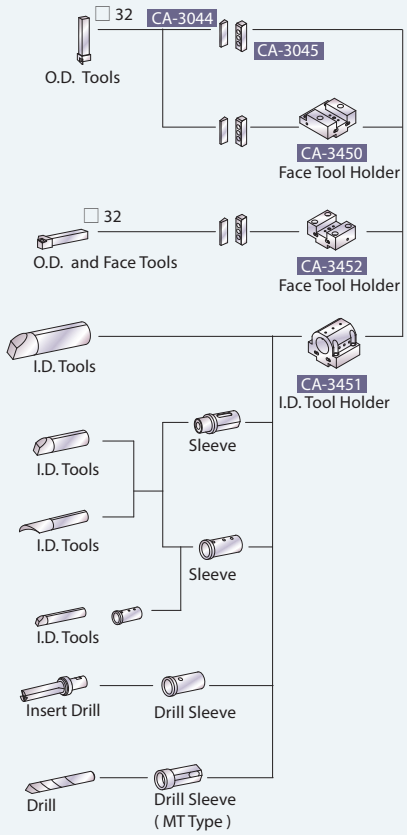
Unit: mm

Work Range

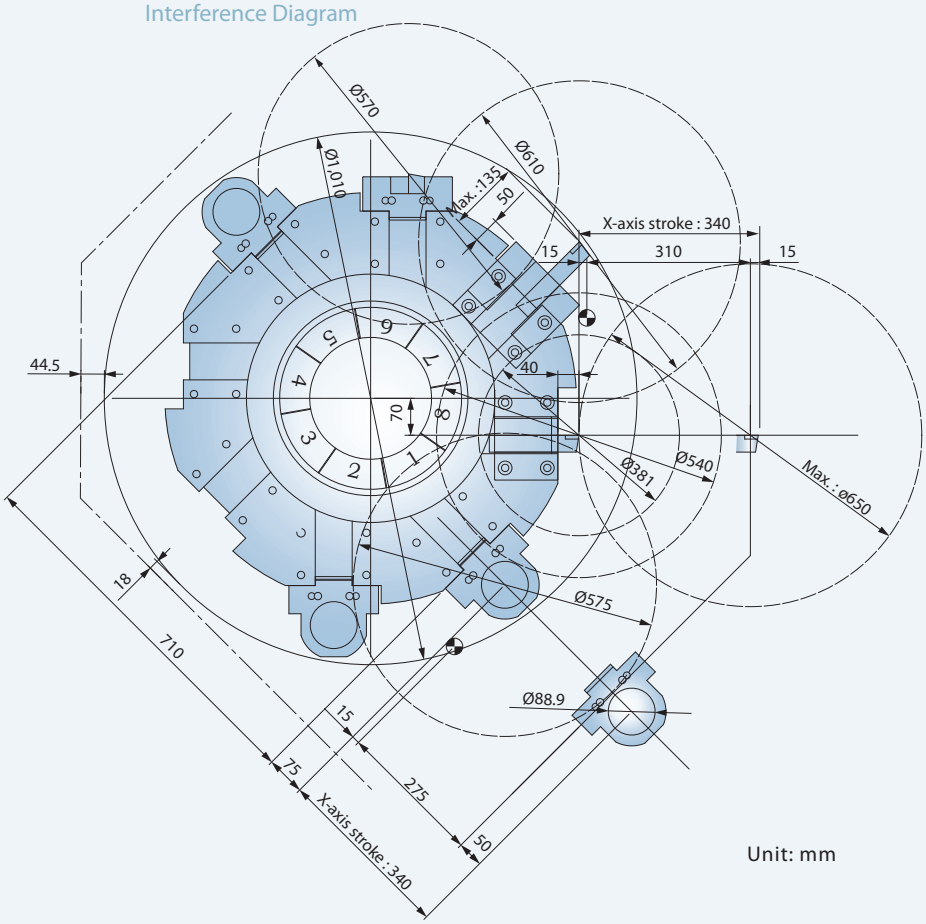


【 Optional 8-Stations Turret 】

Tooling System



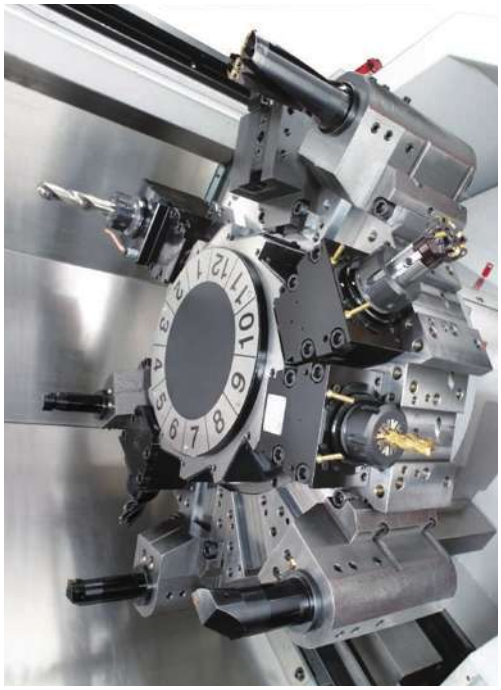
Interference Diagram



Unit: mm

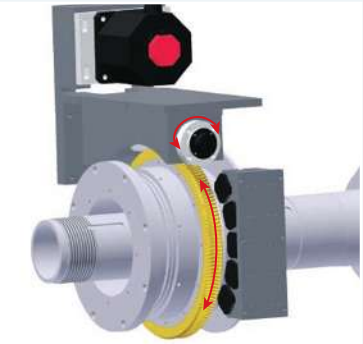
LIVE TOOLING TURRETS

- Live tooling and C-axis control capabilities on the GS-400 series allows the machine to perform multiple tasks on a work piece, such as turning, milling, drilling and tapping. It eliminates manpower and cycle time, while reducing accuracy lost, which will occur if the part is moved from machine to machine.
- More powerful than a standard 40-taper machining center, the GS-400 series live tooling turret is driven by a 9 Kw (30 min.) AC double wound high torque spindle motor to provide ample power, now, even the toughest of jobs may be tackled without a sweat.
  (Please see page 12 for motor spec.)
- The 12-station GOODWAY live tooling turret offers 12 stations available for live tooling, live tools rotate in working position only to reduce power loss and heat.
- GOODWAY live tooling turret utilizes advance servo indexing technology to achieve 0.5 second indexing times for adjacent stations and 1.5 second for stations at the opposite end of the disk.

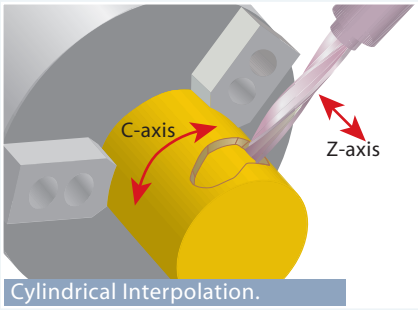


ULTIMATE C-AXIS SPINDLE

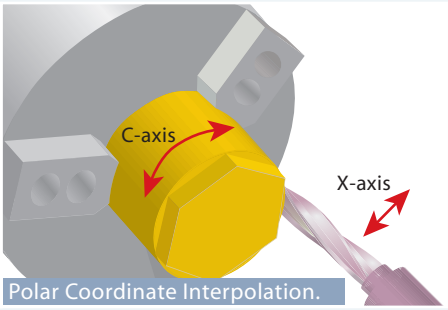
- The Cf-axis and disk brake system available on the GS-400 series provide the most rigid and powerful type of C-axis on the market today. In Cf-axis mode, a servo motor is engaged and drives the rotation of the spindle; engagement time is approximately 1 second.



- 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, including 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 150 million pulses per spindle rotation and 1,800 N-m (1,327 ft-lb.) of spindle torque (Con.), machined surface finishes are much superior than Cs-axis (driven by spindle motor) equipped machines. Plus, dynamic accuracy is within +/-0.02° even under heavy cutting loads.



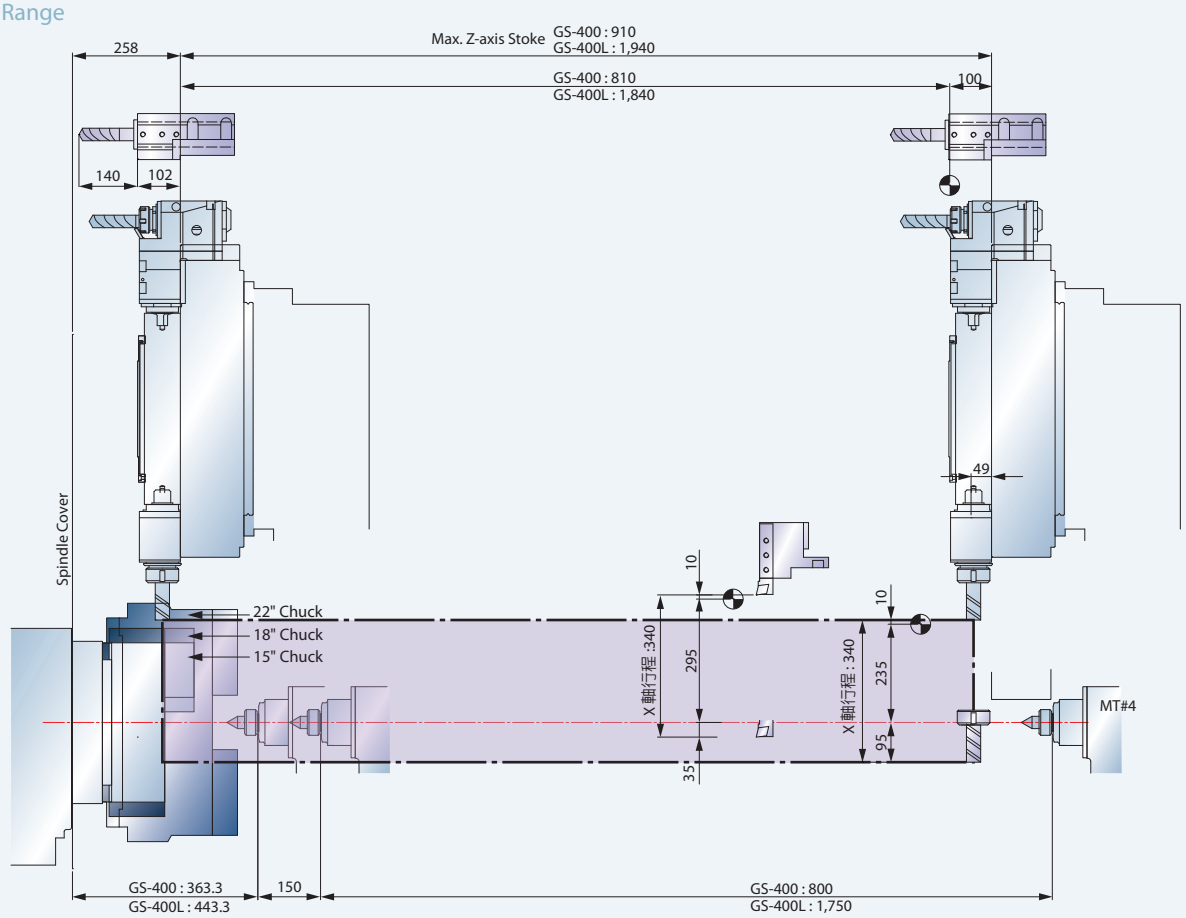
Cylindrical Interpolation.



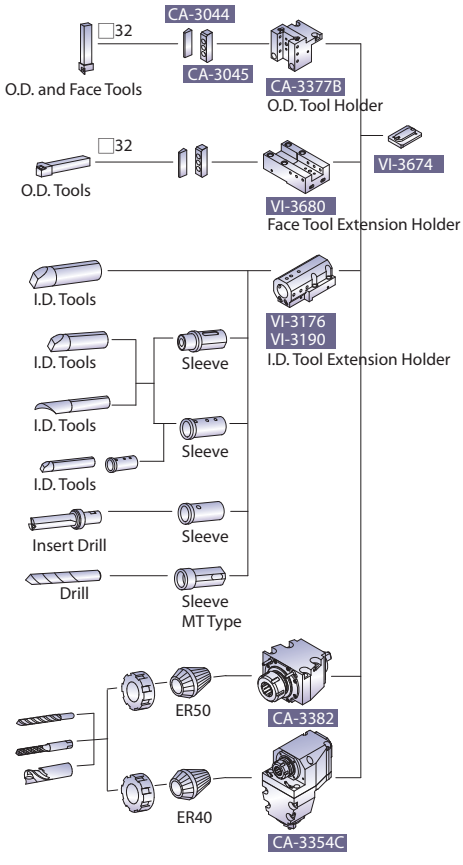
Polar Coordinate Interpolation.

【 Optional 12-Stations Live Tooling Turret 】

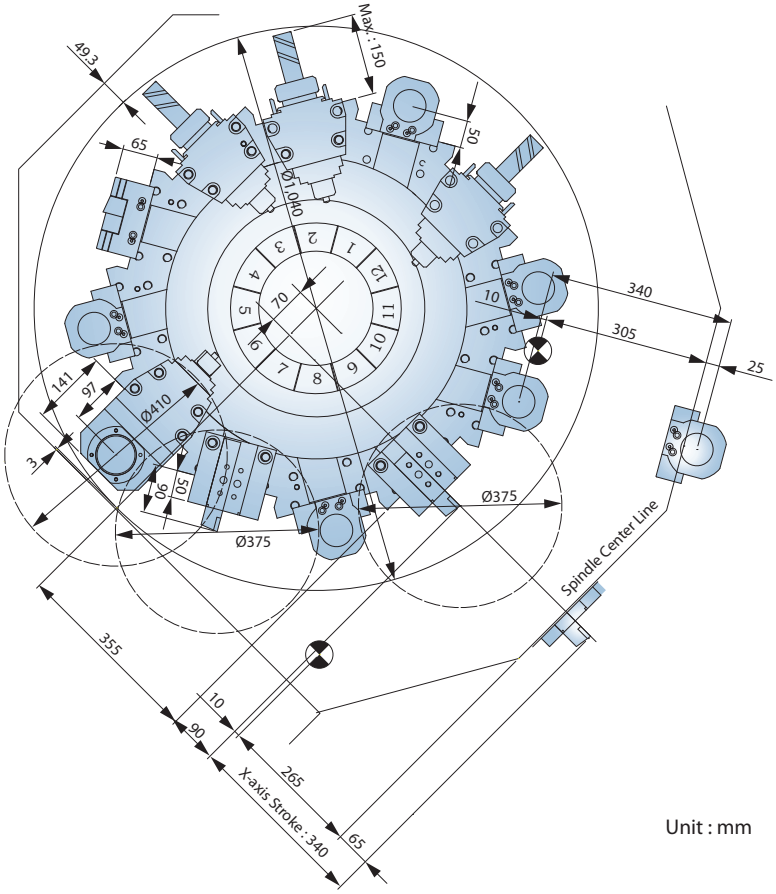
Work Range



Tooling System



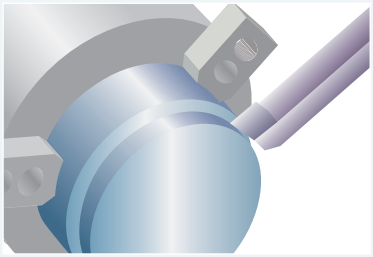
Interference Diagram



Unit : mm

MACHINING PERFORMANCE

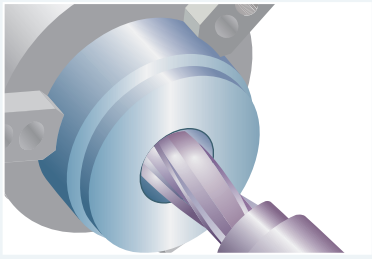
OD Heavy Cutting Example



Tools	Od Before Cut	Od After Cut	Depth of Cut	Spindle Speed	F / Rev.	Spindle Load	Z-axis Load
(mm)	(mm)	(mm)	(mm)	(rpm)	(mm / rev)		
□32	Ø 215	Ø 195	10	195	0.8	97 %	60 %

Raw Material : S45C Model : GS-400M

Drill Example



Tools	Id Before Cut	Id After Cut	Spindle Speed	F / Rev.	Tap Diameter	Spindle Load	Z-axis Load
(mm)	(mm)	(mm)	(rpm)	(mm / rev)	(mm)		
Ø 58 Insert Drill	-	-	878	0.3	-	123 %	110 %

Raw Material : S45C Model : GS-400M

Sample Work Pieces

TURRET HEAD

Material : FCD500

PULLEY

Material : FC30

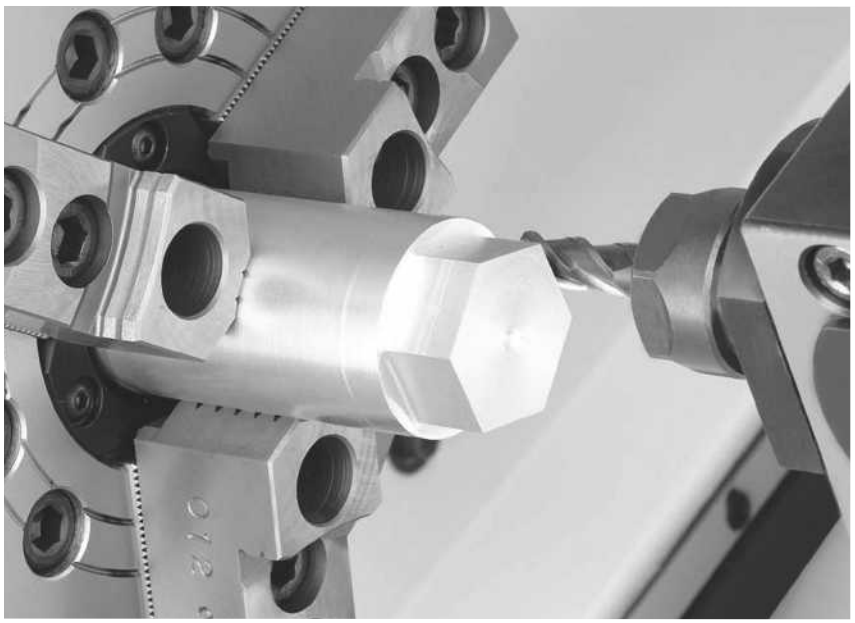
WHEEL

Material : Aluminum

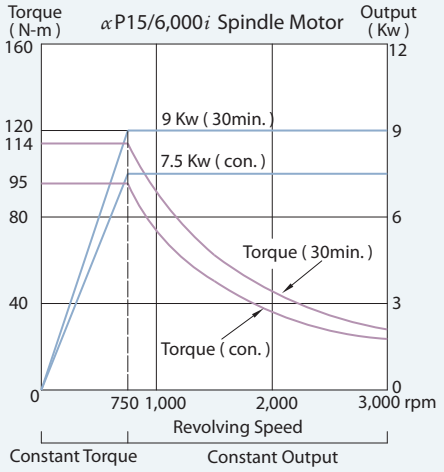
SPINDLE

Material : SCM21H

LIVE TOOLING CUTTING EXAMPLE



Live Tooling Turret



Machining Capability

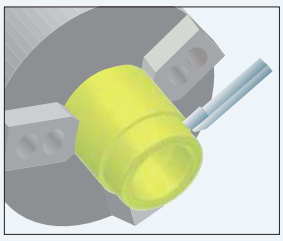
	Tools (mm)	Spindle Speed (rpm)	Feedrate (mm / min)	Cutting Speed (m / min)	Cutting Depth (mm)
Drill	Ø 40 HSS	200	48	25	N/A
End mill	Ø 32 HSS 4-flute Rough End mill	375	120	30	25
Tapping	M24 * P3.0	106	318	8	30

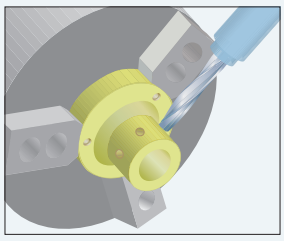
Raw Material : S45C Model : GS-400M

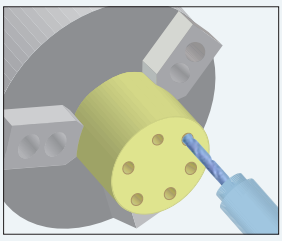
Specification of Live Tooling Turret

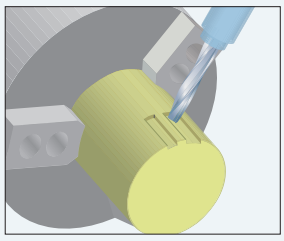
Drive Motor Power (con.)	7.5 kw (10 HP)
Drive Motor Power (30 min.)	9 kw (12 HP)
Drive Motor	FANUC αP15 / 6,000 i
Max. tapping Capacity	M 24 mm
Max. Milling Capacity	Ø 40 mm
Gear Ratio	1 : 1

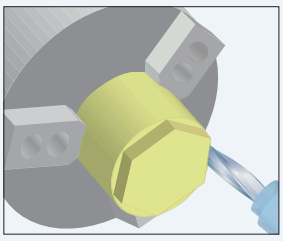
GOODWAY Multi-tasking machine can perform the functions below in one setup :


Turning


Side Drilling & Tapping


Face Drilling & Tapping


Keyway Milling


Contour Milling

BRAKE DISC


Material : ASTM G3000

COUPLING


Material : SCM 415

DURM BRAKE


Material : FC30

CYLINDER


Material : S45C

FEATURES

【 Standard Features 】

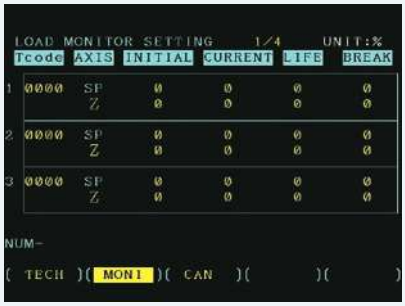
Chip Conveyor

- 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.

Separate Coolant Tank

Tri-color status light

【 Optional Features 】



Load Monitoring (Std. on machines w/ O*i*-TD controls)

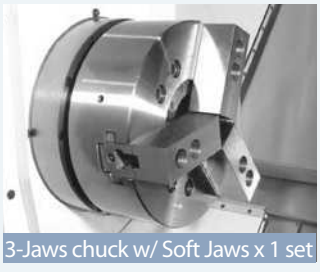
- The load monitoring function is used to detect abnormal load of tools by monitoring the variation in spindle motor and servo motor loads during the cutting process. When abnormal loads are detected, the machine will stop at program end (M30) or immediately (feed hold status) according to tool life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

Oil Skimmer

- The optional oil skimmer removers lubrication oil from the coolant tank, thus, keeping the coolant fresh and minimizes manual cleaning effort.

Tool Setter

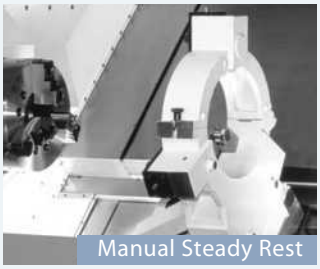
- The optional Renishaw HPRA tool presetter simplifies machining setup.



3-Jaws chuck w/ Soft Jaws x 1 set

Automatic Steady Rest

Air Chuck



Manual Steady Rest

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

		GS-400	GS-460
SPINDLE			
Main spindle configuration	2-Speed Gear	S	S
Rigid tapping & spindle orientation		S	S
Main spindle disk brake		O	O
Cs-axis & disk brake for main spindle*1		O	O
WORK HOLDING			
Hydraulic hollow cylinder for chuck	118 mm ID.	S	O
	180 mm ID.	–	O
Hollow 3-jaws chuck & 1 set soft jaws	15"	O	O
	18"	O	O
	20" (180 mm ID.)	–	O
	21"	O	O
	24"*2	O	O
	Air Chuck	O	O
Hard jaws		O	O
Special work holding chuck		C	C
In spindle work stopper		O	O
Spindle liner (guide bushing)		O	O
Foot switch for chuck operation		S	S
Programmable base & quill hydraulic tailstock		O	S
MT#4 dead center quill		O	S
MT#5 live center quill		O	O
Foot switch for tailstock operation		O	O
Manual steady rest		O	O
Self-centering hydraulic steady rest		O	O
Foot switch for steady rest operation		O	O
Two-stage programmable pressure	Chuck clamping	O	O
	Tailstock thrust	O	O
TURRET			
8-station turret		O	O
10-station turret		O	O
12-station turret		S	S
12-station live tooling turret		O	O
Tool holder & sleeve package		S	S
Live tooling tool holders (0° x 2 , 90° x 2)*1		O	O
MEASUREMENT			
Renishaw HPRA tool presetter	Removeable	O	O
COOLANT			
Coolant pump	3 Kg/cm²	S	S
	5 Kg/cm²	O	O
High-pressure coolant system	20 Kg/cm²	C	C
Roll-out coolant tank		S	S
Oil skimmer		O	O
Coolant flow switch		O	O
Coolant level switch		O	O
Coolant intercooler system		O	O
CHIP DISPOSAL			
Chip conveyor with auto timer	Right discharge	S	S
	Rear discharge	–	–
Chip cart with coolant drain		O	O
Chuck air blow		O	O
Tailstock air blow		O	O
Coolant gun		O	O
Oil mist collector		O	O
AUTOMATIC OPERATION SUPPORT			
Bar feeder		O	O
Bar feeder interface		O	O
Gantry-type loader / unloader		O	O
Auto door		O	O
External M-code output	4 sets (8)	O	O
	8 sets (16)	O	O

Specifications are subject to change without notice.
Above standard & optional features also apply to L models.
*1 Standard on M (live tooling) models.
*2 Tool setter must be deleted.
*3 10.4" color LCD option needed.

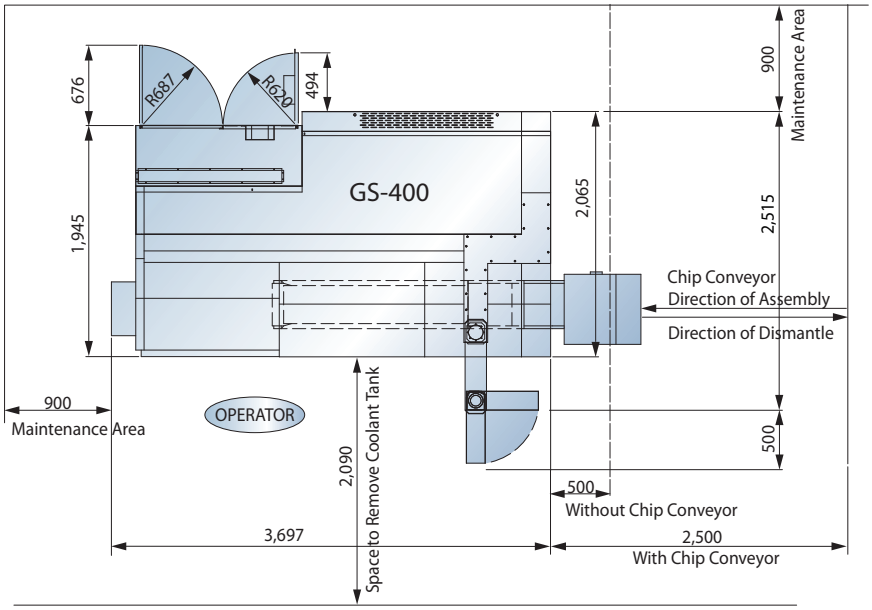
		GS-400	GS-460
SAFETY			
Fully enclosed guarding		S	S
Door interlock (incl. Mechanical lock)		S	S
Impact resistant viewing window		S	S
Tailstock stroke out - end check		S	S
Chuck cylinder stroke out - end check		S	S
Chuck cylinder check valve		S	S
Low hydraulic pressure detection switch		S	S
Over travel (soft limit)		S	S
Load monitoring function		O	O
OTHERS			
Tri-color machine status light tower		S	S
Work light		S	S
External work light		O	O
Electrical cabinet	Heat exchanger	S	S
	A/C cooling system	O	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
CONTROL			
Fanuc O*i*-TD control		S	S
Fanuc 18*i*-TB control		O	O

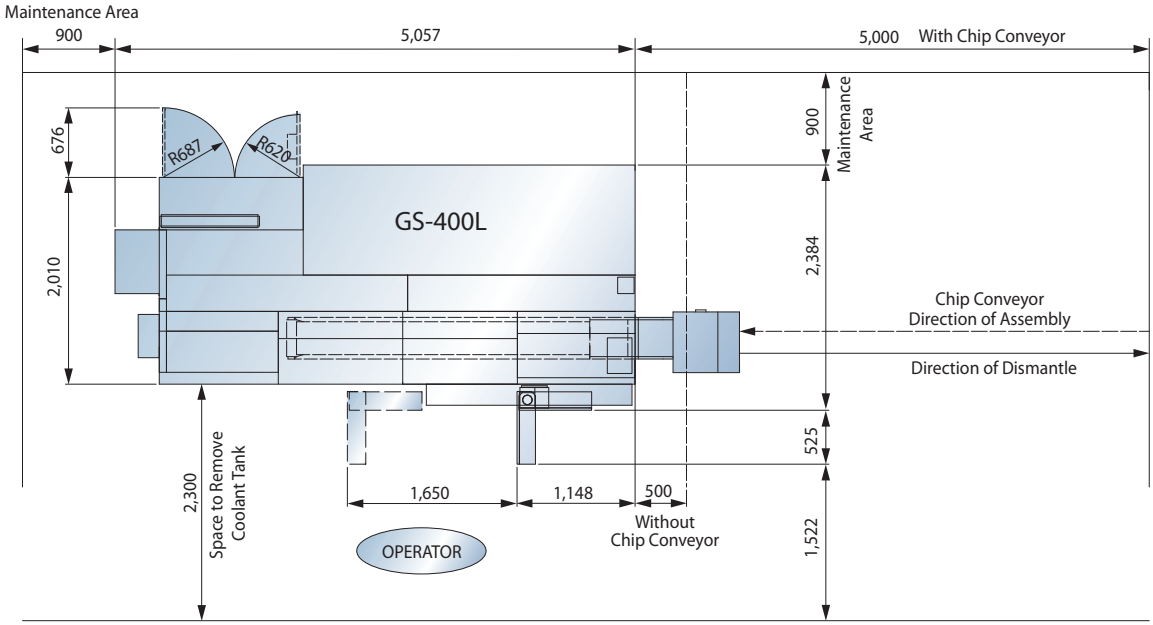
S: Standard O: Option
–: Not Available C: Contact GOODWAY

		Oi-TD	18i-TB
FANUC CONTROL FUNCTIONS			
PMC system	SB7: 0.025 μ sec/step	S	S
Display	8.4" color LCD	S	–
	10.4" color LCD	O	S
Graphic function	Standard	S	S
	Dynamic	O	S
Full keypad	Small - 44 keys	S	–
	Large -56 keys	O	S
Part program storage length	640m	S	–
	1,280m	–	S
	2,560m	–	O
Registerable programs	400	S	S
	1,000	–	O
Tool offset pairs	64	S	S
	99	–	O
	400	–	O
	999	–	O
Servo control	HRV2 (3)	S	S
Conversational programming	Manual Guide O*i*	S	–
	Manual Guide *i**3	O	S
	CAP *i*-T	–	O
Servo motors	Alpha *i*	S	S
Spindle motors	Alpha *i*	S	S
Tool Life Management		S	O
Tool Nose Radius Compensation		S	S
Background editing		S	S
Variable Lead Thread Cutting		S	S
Polygon Turning		S	S
Unexpected disturbance torque detection function		S	S
Polar coordinate & cylindrical interporlation*1		O	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
Fast ethernet		O	O

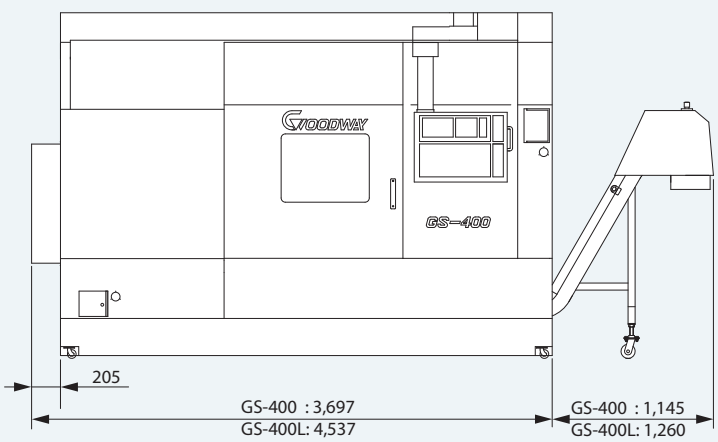
GENERAL DIMENSION

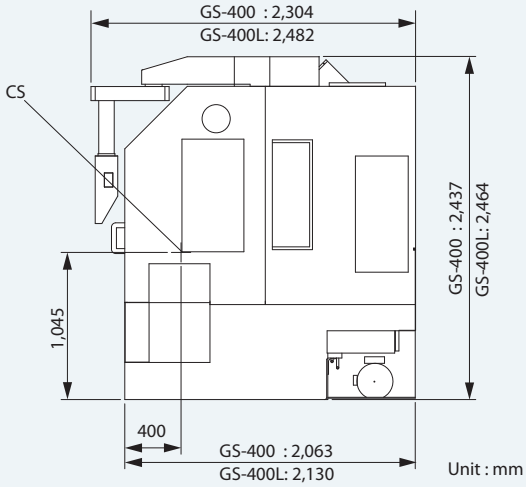
Foot - Print





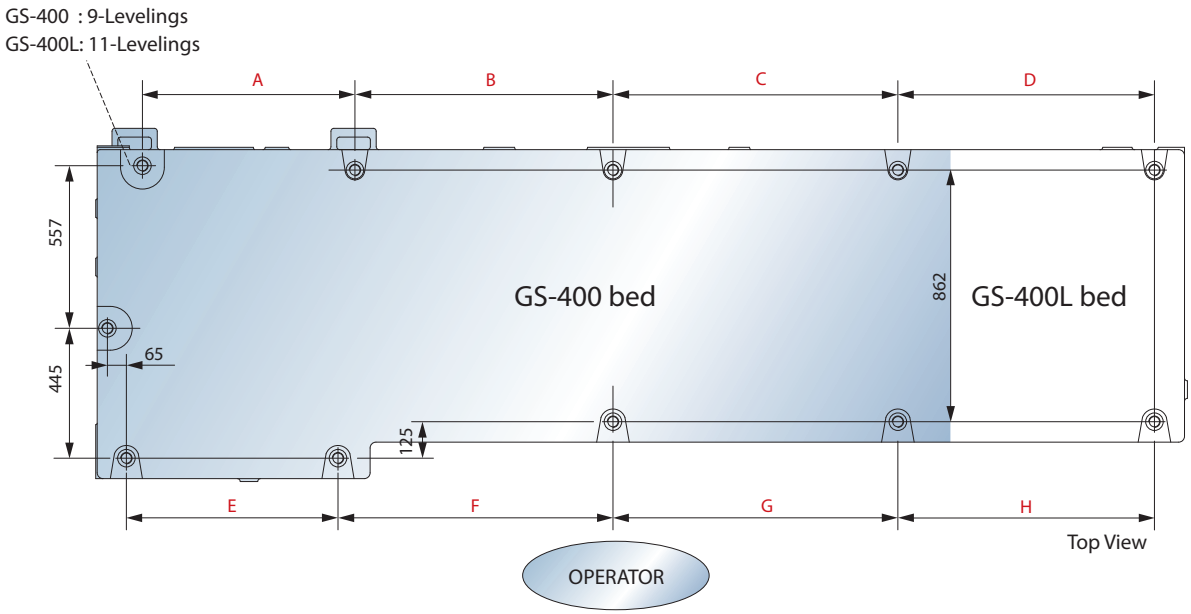
Machine Layout





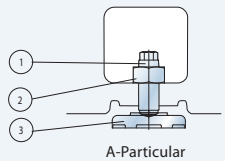
Unit : mm

Foundation



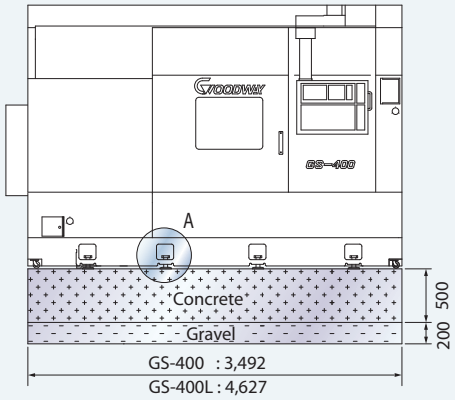
Model	A	B	C	D	E	F	G	H
GS-400	728	804	895	-	725	862	895	-
GS-400L	728	884	976	879	725	942	976	879

Requirements of the Foundation

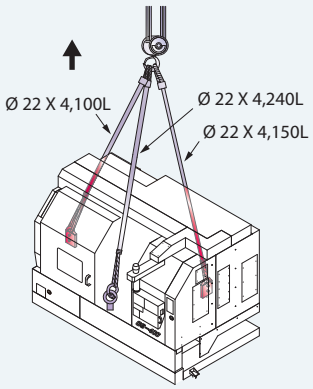


A-Particular

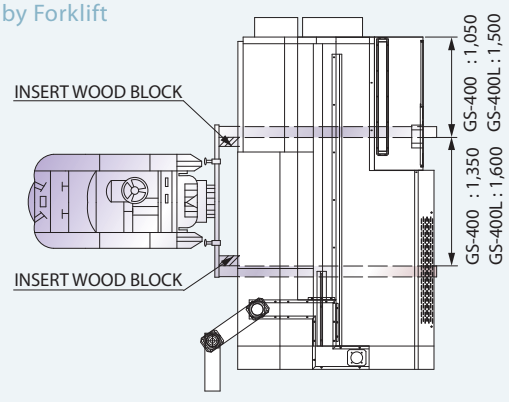
NO.	Part NO	Part name
1	CA-1029	Levelling Bolt
2	NA3900BA	Hex. Nut M39
3	CA-1030	Levelling Block

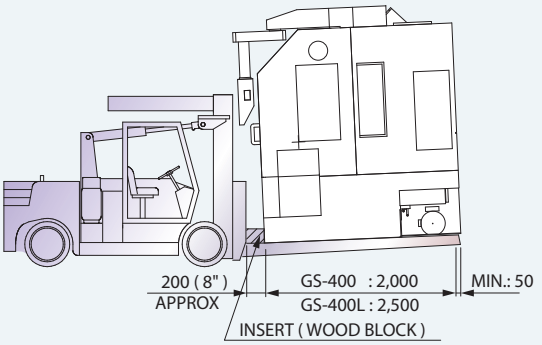


Lifting by Overhead Crane



Lifting by Forklift





Unit : mm

MACHINE SPECIFICATIONS

CAPACITY		GS-400 / 400L	GS-460 / 460L	
Max. swing diameter		Ø 740 mm (29.13")		
Swing over saddle		Ø 710 mm (27.95")		
Max. turning diameter		Ø 610 mm (24.01")		
Std. turning diameter		Ø 380 mm (14.96")		
Max. turning length		950 mm (37.40") / 1,980 mm (77.96")		
Max. weight load		850 kg (1,870 lbs)		
Chuck size		15" (opt. 18" / 21" / 24")	20" (opt. Hyd. Chuck)	22" (opt. Air Chuck)
Bar capacity		Ø 115 mm (4.52")	Ø 180 mm (7.09")	Ø 205 mm (8.07")
SPINDLE				
Hole through spindle		Ø 130 mm (5.11")	Ø 205 mm (8.07")	
Spindle bearing diameter		Ø 180 mm (7.08")	Ø 260 mm (10.23")	
Hydraulic cylinder		Ø 15"	Ø 20"	—
Spindle nose		A2-11	A2-15	
Spindle motor type		α 30 / 6,000i		
Motor output (Con.)		30 Kw (40 HP)		
Motor output (30 min. / Peak)		37 / 45 Kw (50 / 60 HP)		
Motor full output speed		623 rpm		
Spindle drive system		V-Belt + Gear Box		
Spindle drive ratio	L	3 : 20		
	H	27 : 50		
Spindle speed range	L	550 rpm	550 rpm	
	H	2,000 rpm	1,100 rpm	
Spindle full output speed	L	2,048 N-m @ 172 rpm (30 min.)		
	H	567 N-m @ 623 rpm (30 min.)		
X & Z AXES				
Max. X-axis travel		340 mm (13.38")		
Max. Z-axis travel		980 mm (38.58") / 1,960 mm (77.17")		
X axis rapids		20 m/min. (788 IPM)		
Z axis rapids		24 m/min. (945 IPM)		
Slide way type		Box Way		
Feed rates		1~ 4,800 mm/min. (1~189 IPM)		
X-axis servo motor		AC 7 Kw (9.5 HP , Fanuc α 30B / 3,000i, Absolute encoder, 1,000,000 / rev.)		
Z-axis servo motor		AC 4 Kw (5.5 HP , Fanuc α 22 / 3,000i, Absolute encoder, 1,000,000 / rev.)		
X-axis ball screw Ø / pitch		Ø 40 mm (1.57") x P8		
Z-axis ball screw Ø / pitch		Ø 45 mm (1.77") x P12 / Ø 50 mm (1.97") x P16		
X / Z axes thrust (Con.)		X : 1,923 Kg (4,232 lbs.)	Z : 1,175 Kg (2,586 lbs.)	
TURRET				
Stations		12		
Indexing drive		Fanuc AC Servo motor α 22 / 3,000 i		
Indexing speed		0.5 sec. Adjacent / 1.5 sec. 180 degrees (Single step)		
Accuracy		Positioning : ± 0.00069°, Repeatability : ± 0.00027°		
OD tool shank size		□ 32 mm		
ID tool shank size		Ø 60 mm (Opt. 75 mm)		

LIVE TOOLING TURRET (OPTIONAL)	GS-400 / 400L	GS-460 / 460L
Max. turning length	950 mm / 2,000 mm (37.40" / 78.74")	
Max. turning diameter	Ø 640 mm (25.19")	
Stations	12	
Live tooling stations	12 (Live tooling tools rotate in working position only)	
Live tooling drive motor (Con. / 30 min.)	AC 7.5 / 9 Kw (10 / 12 HP , Fanuc αp15 / 6,000i, Absolute encoder, 1,000,000 / rev.)	
Live tooling torque	120 N-m @ 750 rpm [30 min.]	
Indexing drive type	Fanuc AC Spindle motor	
Index speed	0.5 sec. (Adjacent) / 1.5 sec. 180 degrees (Single step)	
OD tool shank size	□ 32 mm	
ID tool shank size	Ø 60 mm	
Live tooling shank size	4 ~ 34 mm (0.16" ~ 1.34") ER 50 collets	
Live tooling RPM range	10 ~ 4,400 RPM	
Cf-AXIS SPINDLE (OPTIONAL)		
Cf-axis drive motor	α 12i	
Cf-axis drive ratio	1 : 150	
Cf-axis rapid	20 rpm	
Cf-axis torque output (Con.)	1,800 N-m (1,327 ft-lbs)	
Min. spindle indexing angle	0.001°	
Dynamic accuracy	± 0.02°	
TAILSTOCK		
Quill center taper	MT#4 (Dead center) / MT#5 (Live center opt.)	
Quill diameter / travel	Ø 110 mm (4.33") / 150 mm (5.90")	
Tailstock base travel	800 mm (31.49")	1,750 mm (68.89")
Programmable quill / base	Yes / Yes	
Programmable base type	Position by Z-axis	
GENERAL		
Positioning accuracy (X / Y / Z)	± 0.005 mm (± 0.0002")	
Repeatability (X / Y / Z)	± 0.003 mm (± 0.0001")	
CNC control	Fanuc Oi-TD (Opt. 18i-TB)	
Voltage / Power requirement	AC 200 / 220 +10% to -15% 3 phase / 64 KVA	
Air pressure	6 kgf / cm² (80 PSI)	
Hydraulic tank capacity	15 L (3.3 gal.)	
Coolant tank capacity	240 L (63.5 gal.)	320 L (84.5 gal.)
Coolant pump	1 Kw rated at 90 PSI	
Machine weight	11,000 Kg (24,200 lbs.)	15,000 Kg (33,000 lbs.)
Dimensions L × W × H	3,700 x 2,305 x 2,440 mm (145.68" x 90.75" x 96.06")	4,830 x 2,465 x 2,465 mm (190.16" x 97.05" x 97.05")

Specifications are subject to change without notice.

THE ULTIMATE MACHINING POWER

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