

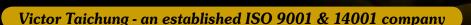




Vcenter-H630/H1000

Horizontal Machining Center

- RELIABILITY GUARANTEED
- HIGH PERFORMANCE
- EASY OPERATION



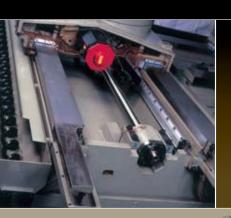
High Performance, High Percision



Reliability Guaranteed

As with all Victor Taichung machine tools, Vcenter-H630/H1000 have been designed with the concept of reliability and stability foremost. Emphasis has been placed on continuous cutting ability in selecting machine structure and components.

From the bed ribbing to machine assembly, Victor Taichung employs over 55 years experience in machine tool building to ensure machine down-time is kept to a minimum.



Advanced design

Through the use of advanced CAD and CAE, our R&D laboratory makes computer simulations of the machine's structure for deformation and vibration during operation, which can be later confirmed by computer aided testing. Areas of high stress concentration or excessive thermal growth are pinpointed on the drawing board, so they are eliminated at an early stage and optimum machine life can be guaranteed.

Strong machine structure

Heavy duty Meehanite castings are used in the bed and column for maximum damping and strength. One-piece bed casting with triangular structure and heavily ribbed column minimise machine distortion during operation. Boxways are cast into the bed and column so no distortion occurs due to thermal differences between the slide-ways and machine casting! This maintains alignment of the ways throughout the machine life.

Improved positioning accuracy

Table height is kept low to reduce the bending moment so that improved positioning accuracy is possible under heavy cutting.

A curvic coupling in table indexing offers excellent repeatability.

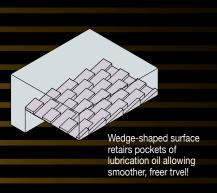
All axes motors are direct coupled with flexible couplings so that no transmission vibrations are present. For Y-axis counter balancing is replaced with high powered (7 kW) servo-motor with built-in brake, for smoother travel and finer positioning accuracy.



n Machine

Hydro-dynamic plain bearing ways

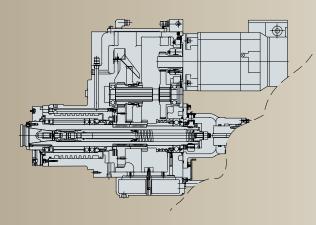
The large contact area offered by plain bearings over rolling element bearings means slide-way wear is reduced, prolonging machine accuracy in heavy cutting or machining of hard materials. Higher damping, which is further improved with the use of bonded turcite, eliminates tool chatter for improved finishing and longer tool life.



Hand scraping

The traditional method of handscraping remains the most effective way of ensuring squareness and flatness in machine tools using plain bearing linear ways. With 55 years experience in building machine tools using this traditional manufacturing manner, our understanding of the critical factors that ensure accuracy and durability are second to none. Highly skill personnel, trained in-house, are employed to make sure this handscraping is done to perfection.

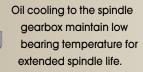




Heavy duty spindle with integral 2-speed gearbox

Vcenter-H630/H1000 have been designed to handle large workpieces in a single set-up. The 2-speed gearbox coupled with 18.5 kW/22 kW spindle motor offers maximum torque output of

> 91/108 kg-m giving unrivalled metal removal rates. Spindle is supported with heavy duty roller bearings with large contact areas that easily handles large axial and radial loads.



Minimizing the effects of thermal growth

Symmetrical design and construction means heat generation is limited to minimise the effects of thermal growth on machine accuracies. Double-anchored ballscrews are pretensioned during assembly to absorb thermal growth without effecting accuracy. Effective chip evacuation from the machining area improves heat dissipation from the working area while spindle oil cooling prevents excessive spindle growth.



Durable tool changer

Twin arm type ATC performs better over continuous tool changes compared with disc type tool changers, while at the same time offering fast tool change.

The ATC mechanism and tool magazine are both driven by durable hydraulic motors which ensures increased stability and longer service life. The entire unit is designed for minimum maintenance.



Safe Easy Operation With Improve

Improved servicability for minimum downtime!

Regardless of the machine we must face the fact that at some time during a machines life some fault will render the machine useless, eating into profits while the machine must be repaired. In order to minimise profit eating downtime we have designed Vcenter-H630/H1000 to be easily serviced so faults can be quickly found and repaired. A large access area at the rear of the machine allows the engineer to walk into the machine with over 70% of the machines hardware within reach to simplify servicing and maintenance.

Victor NC package

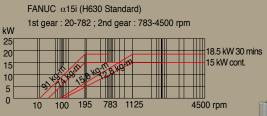
Having worked closely with FANUC for nearly 30 years in developing CNC machine tools, our standard 21 i-MB control package offers optimum reliability with the highest level of machine integration. Load monitoring display for servo and spindle motors allows operator to reach optimum cutting conditions in roughing. For fast precision milling Fanuc 18i-MB is available. With the use of Al contouring control, which includes 180 block look ahead function and smooth acc/deceleration capabilities, higher cutting feedrates within minimum machine vibration are possible.

Machine operation panel

Operator friendly control panel makes manual operation simple which includes remote MPG to ease machine set-up and ergonomic layout to maximise operator efficiency. Control panel is CE compatabile and is built to withstand the most arduous shop floors! Air cond for control cabinet maintains temperature control to ensure durable operation. High level of PLC integration with numerous safety features ensures smooth and safe operation.



Spindle speed-output diagram



FANUC α18i (H1000 Standard, H630 Optional)

1st gear : 20-782 ; 2nd gear : 783-4500 rpm

kW

25

20

10

10

10

195

783

1125

4500 rpm

ed Serviceability





Manually operated APC available

Table can be manually rotated on APC with foot operated release.



Efficient chip removal

Horizontal machining centres offer reduced chip build over vertical machining centres. Coupled with our symmetrical machine design, strong coolant flow, twin scroll conveyors for front and rear of table and steeply angled slideway guards, efficient chip evacuation is provided, removing the need for valuable manpower in manually sweeping out chips!

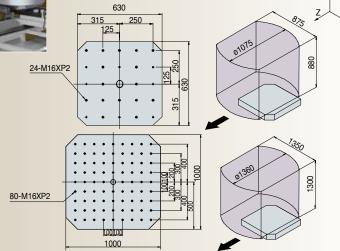


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Maximum flexibility with parallel type APC

Parallel pallet changer offers increased machining area for oversized parts without interference with machine guarding. Pallets can be easily removed from the APC to make workpieces set-ups trouble free. Additional pallets can be set-up and kept in storage until needed. This system also enables swift and simple integration into FMS lines.



Tool arbor cleaning system (Rotating tool pocket with brushes)

Intermediate tool pot for cleaning tools during tool changes ensures tool arbor is free from swarf and prevents damage to spindle taper and tools, which would otherwise degrades machining precision. Also ensures better mating between tool arbor and spindle taper for improved tool tip runout.

Side mounted tool magazine

Using ram & arm type ATC means the tool magazine can be

located at the sides of the machine make un/loading of tools easy. Isolated ATC and tool magazine unit prevents chip contamination, with door interlock to prevent access during operation while still allowing easy access to service engineer.



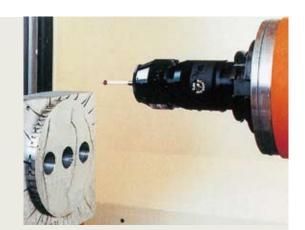
Independent coolant tank with oil skimmer to remove contamination from slide way lubrication enhances coolant life!



MACHINE OPTIONS

Workpiece measurement

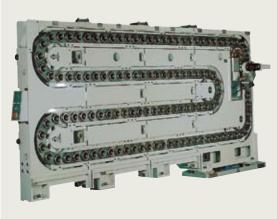
To reduce time spent setting workpiece positions and then manually inspecting finished parts, which would be better invested in machining, automatic workpiece measurement is available with the use of Renishaw MP-10, OMP-60 or RMP-60 measuring probes. Workpiece position can be identified with the probe and work offsets automatically updated, enabling parts to be made right first time. During batch production in-processing checking can be performed on the machine, while for optimum accuracy in machining part inspection can be done after roughing so that finished part can maintain tight tolerances.



Expandable tool magazine

Modular design allows from 60 to 120 tools to be held in tool magazine.

Since the magazine is made up of cast-sections it is easy to slot in additional sections to expand tool capacity on site!





Linear scales (standard on Vcenter-H1000)

Linear scales on all 3 axes offer exceptional positioning accuracy, up to 0.005 mm over full stroke. Only Heidenhain linear scales with a thermal behaviour similar to that of the machine are selected, so that thermal expansion can be compensated for further enhancing repeatability. Sealed encoders with durable aluminum housing offer improved reliability and service life. This option is included as standard for Vcenter-H1000 to guarantee the consistent accuracy.

Table shower (Niagara coolants)

To enhance chip removal around the workpiece and reduce thermal growth supplies a table shower system is available which flood coolant from above.

The strong coolant flow ensures the workpiece and guards are swept clear of cutting chips. Coupled with steeply angled slideway guards and twin scroll conveyors ensures maximum efficiency in chip removal.



Coolant options

Std. - coolant ring Purpose : general

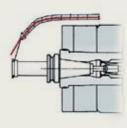
Opt. - directional pipePurpose : general

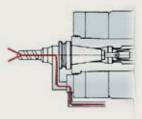
Opt. - oil hole coolantPurpose : drilling, boring

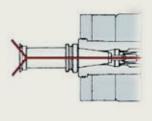
Opt. - thru. spindle coolant Purpose : drilling, boring

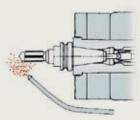
Opt. - oil mistPurpose: tapping, reaming













CNC table with 0.001° continuous indexing

0.001° continuous indexing is available on the B-axis for simultaneous 4-axes machining. The servo-motor is upgraded so that plenty of power is provided in machining complex forms and contours. Table indexing time is also reduced to only 0.2 sec per deg. Rotary scale is included as standard for improved positioning accuracy.



Auto tool length measurement

To reduce tool set-up times and improve machine operator interface, Victor Taichung offers Renishaw tool measurement system. Using the Renishaw TS-27R probe, the tool length and diameter values can be automatically inputted into the tool offset values once the tool is tipped off the probe. This system is ideal for batch production where tools need to be constantly changed or replaced.

Multi-face table

T-slotted fixture block allows a variety of parts to be clamped offering improved productivity over vertical machine centres. Used in conjunction with standard B-axis pallet allows more parts to be set-up at a time!



Coolant through spindle

For improved deep drilling and boring capability, coolant can be forced through the center of the spindle under high pressure, to flow through the tool directly to the cutting area. To ensure long and reliable running of this system. Fine particles produced during machining must be filtered out to prevent damage to the spindle. Victor's customized centrifugal cleaning system offers the most effective method available. The centrifugal cleaning action is far more reliable with less maintenance required than conventional systems.



Control features for fast contour milling (Victor's standard)

Controller	Fanuc		Heidenhain
Feature	21i-MB	18i-MB	iTNC-530
Block addressing time	2 ms	2 ms (opt. 1 ms, 0.4 ms)	3.6 ms (opt. 0.5 ms)
Data storage	1280 m (512 kB)	2560 m (1MB)	256 kB + 26 GB
Data server (Memory Extension)	Opt. (by ATA or CF card)	Std. (Std. with 1GB CF card)	Hard disk (30 GB)
Ethernet link	Opt. (Avail. with data server)	Std.	Std.
Preview contouring (look ahead blocks)	80	180 (Opt. 600)	256
Graphic display	10.4"	10.4"	15"
Conversational function	Manual guide i	Manual guide i	Smart NC
PCMCIA port	Std.	Std.	N.A.
NURBS interpolation	N.A.	Opt.	Opt.

FMC & FMS INTEGRATION





Victor's FANUC 21i-MB/18i-MB Control SPECIFICATIONS

	SPECIFICATION led Axes	DESCRIPTION	
۱.	Controlled Axes	3 Axes (X, Y, Z)	
2.	Simultaneous Controlled Axes	Position / Linear interpolation / Circular	
3.	Least Input Increment	interpolation (3/3/2) 0.001 mm / 0.0001 inch / 0.001 deg.	
). -	Least Input Increment 1 / 10	0.0001 mm / 0.00001 inch / 0.0001 deg	
5.	Max, command value	± 99999.999 mm (± 9999.9999 in)	
6.	Fine Acceleration & Deceleration Control	Std.	
7.	High Speed HRV Control	Std.	
3.	Inch / Metric Conversion	Std. (G20/G21)	
9.	Interlock	All Axes / Each Axis / Cutting Block Start	
10.	Machine Lock Emergency Stop	All Axes / Each Axis Std.	
12.	Over-travel	Std.	
13.	Stored Stroke Check 1 and Check 2	Std.	
14.	Mirror Image	Each Axis	
15.	Mirror Image M73, M74, M75, M76	X, Y Axes	
16.	Follow-up	Std.	
17. Operati	Position switch (with Victor's own PLC)	Std.	
) perau 1 .	Automatic Operation	Std.	
2.	MDI Operation	MDI B	
3.	DNC Operation	Reader / Puncher Interface is Required	
1.	DNC Operation with Memory Card	PCMCIA Card Attachment is Required	
5.	Program Number Search	Std.	
3.	Sequence Number Search	Std.	
7.	Sequence Number comparison and stop	Std.	
3. 9.	Buffer Register Dry Run	Std. Std.	
0.	Single Block	Std.	
11.	JOG Feed	Std.	
12.	Manual Reference Position Return	Std.	
3.	Manual Handle Feed	1 Unit / Each Path	
14.	Manual Handle Feed Rate	X1, X10, X100	
15.	Z Axis Neglect	Std.	
nterpo		000	
1.	Positioning Single Direction Resitioning	G00	
2. 3.	Single Direction Positioning Exact Stop Mode	G60 G61	
1.	Exact Stop Mode Exact Stop	G09	
5.	Linear Interpolation	G01	
3.	Circular Interpolation	G02, G03 (multi-quadrant is possible).	
7.	Dwell	G04	
3.	Polar coordinate interpolation	G12.1 (only available on 18i-M)	
9.	Helical interpolation	Std.	
10.	Skip Function	G31	
11.	Reference Position Return Reference Position Return Check	G28 G27	
12.	2 nd / 3 nd / 4 th Reference Position Return	Std.	
14.	Index Table Indexing	Std. (only available on HMC)	
Feed			
1.	Rapid Traverse Rate	Std.	
	D III O II	F0, 25%, 50%, 100%	
2.	Rapid Traverse Override	,,, , , , , , , , , , , , , , , ,	
3.	Feed Per Minute	G94 (mm / min)	
3. 4.	Feed Per Minute Tangential Speed Constant Control	G94 (mm / min) Std.	
3. 4. 5.	Feed Per Minute Tangential Speed Constant Control Cutting Feed rate Clamp	G94 (mm / min) Std. Std.	
3. 4. 5.	Feed Per Minute Tangential Speed Constant Control Cutting Feed rate Clamp Automatic Acceleration / Deceleration	G94 (mm / min) Std. Std. Rapid traverse: linear; Cutting feed: exponent	
3. 4.	Feed Per Minute Tangential Speed Constant Control Cutting Feed rate Clamp Automatic Acceleration / Deceleration Rapid traverse Bell-shaped Acc. / Deceleration	G94 (mm / min) Std. Std.	
3. 4. 5.	Feed Per Minute Tangential Speed Constant Control Cutting Feed rate Clamp Automatic Acceleration / Deceleration Rapid traverse Bell-shaped Acc. / Deceleration Bell-shaped Acc. / Deceleration Before & After Cutting Feed	G94 (mm / min) Std. Std. Rapid traverse: linear; Cutting feed: exponent	
3. 4. 5. 6. 7.	Feed Per Minute Tangential Speed Constant Control Cutting Feed rate Clamp Automatic Acceleration / Deceleration Rapid traverse Bell-shaped Acc. / Deceleration Bell-shaped Acc. / Deceleration Before & After Cutting Feed Interpolation	G94 (mm / min) Std. Std. Rapid traverse: linear; Cutting feed: exponent Std. (G00) Std. (G01)	
3. 4. 5. 6. 7.	Feed Per Minute Tangential Speed Constant Control Cutting Feed rate Clamp Automatic Acceleration / Deceleration Rapid traverse Bell-shaped Acc. / Deceleration Bell-shaped Acc. / Deceleration Before & After Cutting Feed Interpolation Automatic Corner Deceleration	G94 (mm / min) Std. Std. Std. Rapid traverse: linear; Cutting feed: exponent Std. (G00)	
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33. 3. 4. 4. 55. 3. 3. 4. 4. 55. 3. 3. 4. 4. 55. 3. 3. 4. 4. 6. 6. 6. 6. 6. 6. 6. 6. 6. 6. 6. 6. 6.	Feed Per Minute Tangential Speed Constant Control Cutting Feed rate Clamp Automatic Acceleration / Deceleration Rapid traverse Bell-shaped Acc. / Deceleration Bell-shaped Acc. / Deceleration Before & After Cutting Feed Interpolation Automatic Corner Deceleration Before & After Cutting Feed Interpolation Linear Acc. / Deceleration Before & After Cutting Feed Interpolation Joy Override Jog Override Jog Override Automatic Corner Override Feed Stop Al nano contour control (G05.1) (in total) Jerk Control Rigid Tapping Bell-Shaped Acc. / Deceleration Feed rate clamp by arc radius (G02 / G03) In Input Eli / ISO Automatic Recognition Label Skip Parity Check	G94 (mm / min) Std. Std. Rapid traverse: linear; Cutting feed: exponent Std. (G00) Std. (G01) Std. (G01) Std. (G01) 0 ~ 150% 0 ~ 100% G62. Std. (21i / 18i only) Std. Std. (Std. Std. Std. Std. Std. Std. Std. Std.	
33. 33. 44. 55. 33. 34. 44. 34. 34. 34. 34. 34. 34. 34	Feed Per Minute Tangential Speed Constant Control Cutting Feed rate Clamp Automatic Acceleration / Deceleration Rapid traverse Bell-shaped Acc. / Deceleration Bell-shaped Acc. / Deceleration Before & After Cutting Feed Interpolation Automatic Corner Deceleration Before & After Cutting Feed Interpolation Linear Acc. / Deceleration Before & After Cutting Feed Interpolation Feed rate Override Jog Override Automatic Corner Override Feed Stop Al nano contour control (GOS.1) (in total) Jerk Control Rigid Tapping Bell-Shaped Acc. / Deceleration Feed rate clamp by arc radius (GO2 / GO3) In Input EIA / ISO Automatic Recognition Label Skip Parity Check Control In / Out	G94 (mm / min) Std. Std. Rapid traverse: linear; Cutting feed: exponent Std. (G00) Std. (G01) Std. (G01) Std. (G01) Std. (G01) 0 ~ 150% 0 ~ 100% G62. Std. (21i / 18i only) Std. (Std. (Std. Std. Std. Std. Std. Std. Std.	
33. 33. 44. 55. 33. 34. 44. 35. 36. 36. 37. 37. 37. 37. 37. 37. 37. 37. 37. 37	Feed Per Minute Tangential Speed Constant Control Cutting Feed rate Clamp Automatic Acceleration / Deceleration Rapid traverse Bell-shaped Acc. / Deceleration Bell-shaped Acc. / Deceleration Before & After Cutting Feed Interpolation Automatic Corner Deceleration Before & After Cutting Feed Interpolation Linear Acc. / Deceleration Before & After Cutting Feed Interpolation Jeric Poweride Jog Override Automatic Corner Override Feed Stop Al nano contour control (G05.1) (in total) Jerk Control Rigid Tapping Bell-Shaped Acc. / Deceleration Feed rate clamp by are radius (G02 / G03) Intput EIA / ISO Automatic Recognition Label Skip Parity Check Control In / Out Optional Block Skip Max. Programmable Dimension Program Number	G94 (mm / min) Std. Std. Rapid traverse: linear; Cutting feed: exponen Std. (G00) Std. (G01) Std. (G01) Std. (G01) Std. (G01) 0 → 150% 0 → 100% G62. Std. (B01)	
33. 44. 55. 67. 10. 111. 122. 133. 144. 156. 167. 177. 188. 197. 198. 199. 199. 199. 199. 199. 199. 199	Feed Per Minute Tangential Speed Constant Control Cutting Feed rate Clamp Automatic Acceleration / Deceleration Rapid traverse Bell-shaped Acc. / Deceleration Bell-shaped Acc. / Deceleration Before & After Cutting Feed Interpolation Automatic Corner Deceleration Before & After Cutting Feed Interpolation Linear Acc. / Deceleration Before & After Cutting Feed Interpolation Feed rate Override Jog Override Automatic Corner Override Feed Stop Al nano contour control (G05.1) (in total) Jerk Control Rigid Tapping Bell-Shaped Acc. / Deceleration Feed rate clamp by arc radius (G02 / G03) In Input EIA / ISO Automatic Recognition Label Skip Parity Check Control In / Out Optional Block Skip Max. Programmable Dimension Program Number Sequence Number	G94 (mm / min) Std. Std. Rapid traverse: linear; Cutting feed: exponen Std. (G00) Std. (G01) Std. (G01) Std. (G01) O ~ 150% O ~ 100% G62. Std. (G01) Std. (G1/1 (18) blocks Std. Std. Std. Std. Std. Std. Std. Std.	
33. 44. 55. 60. 10. 111. 122. 133. 144. 155. 166. 177. 177. 188. 189. 199. 199. 199. 199. 199. 199	Feed Per Minute Tangential Speed Constant Control Cutting Feed rate Clamp Automatic Acceleration / Deceleration Rapid traverse Bell-shaped Acc. / Deceleration Bell-shaped Acc. / Deceleration Before & After Cutting Feed Interpolation Automatic Corner Deceleration Before & After Cutting Feed Interpolation Linear Acc. / Deceleration Before & After Cutting Feed Interpolation Linear Acc. / Deceleration Before & After Cutting Feed Interpolation Linear Acc. / Deceleration Before & After Cutting Feed Interpolation Feed rate Override Jog Override Automatic Corner Override Feed Stop Al nano contour control (G05.1) (in total) Jerk Control Rigid Tapping Bell-Shaped Acc. / Deceleration Feed rate clamp by arc radius (G02 / G03) In Input EIA / ISO Automatic Recognition Label Skip Parity Check Control In / Out Optional Block Skip Max. Programmable Dimension Program Number Sequence Number Absolute / Incremental Programming	G94 (mm / min) Std. Std. Rapid traverse: linear; Cutting feed: exponen Std. (G00) Std. (G01) Std. (G01) Std. (G01) Std. (G01) 0 ~ 150% 0 ~ 100% G62. Std. (B01) Std. (B1) Std.	
33. 34. 44. 55. 56. 56. 57. 77. 111. 111. 111. 111. 111. 111.	Feed Per Minute Tangential Speed Constant Control Cutting Feed rate Clamp Automatic Acceleration / Deceleration Rapid traverse Bell-shaped Acc. / Deceleration Bell-shaped Acc. / Deceleration Before & After Cutting Feed Interpolation Automatic Corner Deceleration Before & After Cutting Feed Interpolation Linear Acc. / Deceleration Before & After Cutting Feed Interpolation Feed rate Override Jog Override Automatic Corner Override Feed Stop Al nano contour control (G05.1) (in total) Jerk Control Rigid Tapping Bell-Shaped Acc. / Deceleration Feed rate damp by are radius (G02 / G03) Intput EIA / ISO Automatic Recognition Label Skip Parity Check Control In / Out Optional Block Skip Max. Programmable Dimension Program Number Sequence Number Absolute / Incremental Programming (Pocket Calculator Type) Decimal Point Programming	G94 (mm / min) Std. Std. Flapid traverse: linear; Cutting feed; exponen Std. (G00) Std. (G01) Std. (G01) Std. (G01) Std. (G01) 0 ~ 150% 0 ~ 100% G62. Std. (B01) S	
3. 3. 4. 5. 5. 5. 5. 6. 6. 17. 18. 19. 19. 19. 19. 19. 19. 19. 19. 19. 19	Feed Per Minute Tangential Speed Constant Control Cutting Feed rate Clamp Automatic Acceleration / Deceleration Rapid traverse Bell-shaped Acc. / Deceleration Bell-shaped Acc. / Deceleration Before & After Cutting Feed Interpolation Automatic Corner Deceleration Before & After Cutting Feed Interpolation Linear Acc. / Deceleration Before & After Cutting Feed Interpolation Feed rate Override Jog Override Automatic Corner Override Feed Stop Al nano contour control (G05.1) (in total) Jerk Control Rigid Tapping Bell-Shaped Acc. / Deceleration Feed rate clamp by arc radius (G02 / G03) In Input EIA / ISO Automatic Recognition Label Skip Parity Check Control In / Out Optional Block Skip Max. Programmable Dimension Program Number Sequence Number Absolute / Incremental Programming [Pocket Calculator Type) Decimal Point Programming Input Unit 10 Time Multiply	G94 (mm / min) Std. Std. Rapid traverse: linear; Cutting feed: exponen Std. (G00) Std. (G01) Std. (G01) Std. (G01) Std. (G01) 0 ~ 150% 0 ~ 100% G62. Std. (G1) 10 (21), 180°1 (18) blocks Std. (21/1 / 18) only) Std. Std. Std. Std. Std. Std. Std. Std.	
3. 3. 4. 5. 5. 5. 6. 6. 6. 6. 6. 6. 6. 6. 6. 6. 6. 6. 6.	Feed Per Minute Tangential Speed Constant Control Cutting Feed rate Clamp Automatic Acceleration / Deceleration Rapid traverse Bell-shaped Acc. / Deceleration Bell-shaped Acc. / Deceleration Before & After Cutting Feed Interpolation Automatic Corner Deceleration Before & After Cutting Feed Interpolation Linear Acc. / Deceleration Before & After Cutting Feed Interpolation Linear Acc. / Deceleration Before & After Cutting Feed Interpolation Feed rate Override Jog Override Jog Override Automatic Corner Override Feed Stop Al nano contour control (G05.1) (in total) Jerk Control Rigid Tapping Bell-Shaped Acc. / Deceleration Feed rate clamp by arc radius (G02 / G03) In Input EIA / ISO Automatic Recognition Label Skip Parity Check Control In / Out Optional Block Skip Max. Programmable Dimension Program Number Sequence Number Absolute / Incremental Programming (Pocket Calculator Type) Decimal Point Programming Input Unit 10 Time Multiply Plane Selection	G94 (mm / min) Std. Std. Rapid traverse: linear; Cutting feed: exponen Std. (G00) Std. (G01) Std. (G01) Std. (G01) Std. (G01) 0 ~ 150% 0 ~ 100% G62. Std. (B0 (21i), 180*1 (18i) blocks Std. (21i / 18i only) Std.	
11. 12. 13. 14. 15. 16. 16. 17. 18. 17. 18. 19. 19. 19. 19. 19. 19. 19. 19. 19. 19	Feed Per Minute Tangential Speed Constant Control Cutting Feed rate Clamp Automatic Acceleration / Deceleration Rapid traverse Bell-shaped Acc. / Deceleration Bell-shaped Acc. / Deceleration Before & After Cutting Feed Interpolation Automatic Corner Deceleration Before & After Cutting Feed Interpolation Linear Acc. / Deceleration Before & After Cutting Feed Interpolation Feed rate Override Jog Override Automatic Corner Override Feed Stop Al nano contour control (G05.1) (in total) Jerk Control Rigid Tapping Bell-Shaped Acc. / Deceleration Feed rate clamp by arc radius (G02 / G03) In Input EIA / ISO Automatic Recognition Label Skip Parity Check Control In / Out Optional Block Skip Max. Programmable Dimension Program Number Sequence Number Absolute / Incremental Programming [Pocket Calculator Type) Decimal Point Programming Input Unit 10 Time Multiply	G94 (mm / min) Std. Std. Rapid traverse: linear; Cutting feed: exponen Std. (G00) Std. (G01) Std. (G01) Std. (G01) Std. (G01) 0 ~ 150% 0 ~ 100% G62. Std. (G1) 10 (21), 180°1 (18) blocks Std. (21/1 / 18) only) Std. Std. Std. Std. Std. Std. Std. Std.	
33. 44. 55. 36. 37. 37. 37. 37. 37. 37. 37. 37. 37. 37	Feed Per Minute Tangential Speed Constant Control Cutting Feed rate Clamp Automatic Acceleration / Deceleration Rapid traverse Bell-shaped Acc. / Deceleration Bell-shaped Acc. / Deceleration Before & After Cutting Feed Interpolation Automatic Corner Deceleration Before & After Cutting Feed Interpolation Linear Acc. / Deceleration Before & After Cutting Feed Interpolation Feed rate Override Jog Override Jog Override Automatic Corner Override Feed Stop Al nano contour control (G05.1) (in total) Jerk Control Rigid Tapping Bell-Shaped Acc. / Deceleration Feed rate clamp by arc radius (G02 / G03) Interpolation Label Skip Parity Check Control In / Out Optional Block Skip Max. Programmable Dimension Program Number Sequence Number Absolute / Incormental Programming Input Unit 10 Time Multiply Plane Selection Rotary Axis Designation	G94 (mm / min) Std. Std. Fapid traverse: linear; Cutting feed: exponen Std. (G00) Std. (G01) Std. (G01) Std. (G01) Std. (G01) Std. (G01) 0 ~ 150% 0 ~ 100% G62. Std. (B1)	
33. 33. 44. 44. 45. 45. 45. 45. 45. 45. 45. 45	Feed Per Minute Tangential Speed Constant Control Cutting Feed rate Clamp Automatic Acceleration / Deceleration Rapid traverse Bell-shaped Acc. / Deceleration Bell-shaped Acc. / Deceleration Before & After Cutting Feed Interpolation Automatic Corner Deceleration Before & After Cutting Feed Interpolation Linear Acc. / Deceleration Before & After Cutting Feed Interpolation Feed rate Override Jog Override Automatic Corner Override Feed Stop Al nano contour control (G05.1) (in total) Jerk Control Rigid Tapping Bell-Shaped Acc. / Deceleration Feed rate clamp by arc radius (G02 / G03) In Input EIA / ISO Automatic Recognition Label Skip Parity Check Control In / Out Optional Block Skip Max. Programmable Dimension Program Number Sequence Number Absolute / Incremental Programming Input Unit 10 Time Multiply Plane Selection Rotary Axis Designation Rotary Axis Boll-Over Function	G94 (mm / min) Std. Std. Rapid traverse: linear; Cutting feed: exponen Std. (G00) Std. (G01) Std. (G01) Std. (G01) Std. (G01) Std. (G01) 0 ~ 150% 0 ~ 100% G62. Std. (G1) 180°1 (18) blocks Std. (211 / 18i only) Std. Std. Std. Std. Std. Std. Std. Std.	
33. 44. 55. 33. 34. 10. 111. 122. 133. 34. 155. 166. 177. 139. 111. 121. 139. 141. 155. 166. 167. 168. 169. 169. 169. 169. 169. 169. 169. 169	Feed Per Minute Tangential Speed Constant Control Cutting Feed rate Clamp Automatic Acceleration / Deceleration Rapid traverse Bell-shaped Acc. / Deceleration Bell-shaped Acc. / Deceleration Before & After Cutting Feed Interpolation Automatic Corner Deceleration Before & After Cutting Feed Interpolation Linear Acc. / Deceleration Before & After Cutting Feed Interpolation Linear Acc. / Deceleration Before & After Cutting Feed Interpolation Feed rate Override Jog Override Jog Override Automatic Corner Override Feed Stop All nano contour control (G05.1) (in total) Jerk Control Rigid Tapping Bell-Shaped Acc. / Deceleration Feed rate clamp by arc radius (G02 / G03) In Input EIA / ISO Automatic Recognition Label Skip Parity Check Control In / Out Optional Block Skip Max. Programmable Dimension Program Number Sequence Number Absolute / Incremental Programming (Pocket Calculator Type) Decimal Point Programming Input Unit 1 of Time Multiply Plane Selection Rotary Axis Designation Rotary Axis Besignation Rotary Axis Bosignation Rotary Axis Rotl-Over Function Polar coordinate Command	G94 (mm / min) Std. Std. Rapid traverse: linear; Cutting feed: exponen Std. (G00) Std. (G01) Std. (G01) Std. (G01) Std. (G01) 0 ~ 150% 0 ~ 100% G62. Std. (G11/ 18i only) Std. Std. Std. Std. Std. Std. Std. Std.	
33. 44. 55. 56. 77. 110. 111. 112. 113. 114. 115. 116. 117. 118. 77. 119. 111. 111. 111. 111. 111. 111.	Feed Per Minute Tangential Speed Constant Control Cutting Feed rate Clamp Automatic Acceleration / Deceleration Rapid traverse Bell-shaped Acc. / Deceleration Bell-shaped Acc. / Deceleration Before & After Cutting Feed Interpolation Automatic Corner Deceleration Before & After Cutting Feed Interpolation Linear Acc. / Deceleration Before & After Cutting Feed Interpolation Linear Acc. / Deceleration Before & After Cutting Feed Interpolation Feed rate Override Jog Override Jog Override Automatic Corner Override Feed Stop Al nano contour control (G05.1) (in total) Jerk Control Rigid Tapping Bell-Shaped Acc. / Deceleration Feed rate clamp by arc radius (G02 / G03) In Input EIA / ISO Automatic Recognition Label Skip Parity Check Control In / Out Optional Block Skip Max. Programmable Dimension Program Number Sequence Number Absolute / Incremental Programming (Pocket Calculator Type) Decimal Point Programming Input Unit 1 of Time Multiply Plane Selection Rotary Axis Designation Rotary Axis Designation Rotary Axis Besignation Rotary Axis Rell-Over Function Polar coordinate System Setting Work piece Coordinate System Setting	G94 (mm / min) Std. Std. Rapid traverse: linear; Cutting feed: exponen Std. (G00) Std. (G01) Std. (G01) Std. (G01) Std. (G01) 0 ~ 150% 0 ~ 100% G62. Std. (G11/ 180 hlocks Std. (G11/ 181 only) Std.	
33. 4. 5. 5. 6. 6. 6. 6. 6. 6. 6. 6. 6. 6. 6. 6. 6.	Feed Per Minute Tangential Speed Constant Control Cutting Feed rate Clamp Automatic Acceleration / Deceleration Rapid traverse Bell-shaped Acc. / Deceleration Bell-shaped Acc. / Deceleration Before & After Cutting Feed Interpolation Automatic Corner Deceleration Before & After Cutting Feed Interpolation Linear Acc. / Deceleration Before & After Cutting Feed Interpolation Feed rate Override Jog Override Automatic Corner Override Feed Stop Al nano contour control (G05.1) (in total) Jerk Control Rigid Tapping Bell-Shaped Acc. / Deceleration Feed rate clamp by are radius (G02 / G03) In Input Eld / ISO Automatic Recognition Label Skip Parity Check Control In / Out Optional Block Skip Max. Programmable Dimension Program Number Sequence Number Absolute / Incremental Programming (Pocket Calculator Type) Decimal Point Programming Input Unit 10 Time Multiply Plane Selection Rotary Axis Reli-Voer Function Polar coordinate System Setting Automatic Coordinate System Pair	G94 (mm / min) Std. Std. Fapid traverse: linear; Cutting feed: exponen Std. (G00) Std. (G01) Std. (G01) Std. (G01) Std. (G01) Std. (G01) 0 ~ 150% 0 ~ 100% G62. Std. (G11/ 18) blocks Std. (Z11/ 18) oloks Std. (Z11/ 18) oloks Std. (Z11/ 18) oloks Std. (Z11/ 18) oloks Std.	
3.3. 3. 4. 5. 5. 3. 9. 0. 11. 22. 33. 44. 5. 6. 77. 8. 44. 15. 6. 17. 8. 16. 17. 18. 18. 19. 19. 19. 19.	Feed Per Minute Tangential Speed Constant Control Cutting Feed rate Clamp Automatic Acceleration / Deceleration Rapid traverse Bell-shaped Acc. / Deceleration Bell-shaped Acc. / Deceleration Before & After Cutting Feed Interpolation Automatic Corner Deceleration Before & After Cutting Feed Interpolation Linear Acc. / Deceleration Before & After Cutting Feed Interpolation Linear Acc. / Deceleration Before & After Cutting Feed Interpolation Feed rate Override Jog Override Automatic Corner Override Feed Stop Al nano contour control (G05.1) (in total) Jerk Control Rigid Tapping Bell-Shaped Acc. / Deceleration Feed rate damp by arc radius (G02 / G03) Iniput ElA / ISO Automatic Recognition Label Skip Parity Check Control In / Out Optional Block Skip Max. Programmable Dimension Program Number Sequence Number Absolute / Inceremental Programming Input Unit 10 Time Multiply Plane Selection Rotary Axis Designation Rotary Axis Roll-Over Function Polar coordinate Command Coordinate System Setting Automatic Coordinate System Pair Manual Absolute On And Off	G94 (mm / min) Std. Std. Flapid traverse: linear; Cutting feed; exponent Std. (G00) Std. (G01) Std. (G01) Std. (G01) Std. (G01) Std. (G01) 0 ~ 150% 0 ~ 100% G62. Std. (B01) St	
33. 4. 5. 5. 5. 5. 6. 6. 6. 6. 6. 6. 6. 6. 6. 6. 6. 6. 6.	Feed Per Minute Tangential Speed Constant Control Cutting Feed rate Clamp Automatic Acceleration / Deceleration Rapid traverse Bell-shaped Acc. / Deceleration Bell-shaped Acc. / Deceleration Before & After Cutting Feed Interpolation Automatic Corner Deceleration Before & After Cutting Feed Interpolation Linear Acc. / Deceleration Before & After Cutting Feed Interpolation Feed rate Override Jog Override Jog Override Automatic Corner Override Feed Stop Al nano contour control (G05.1) (in total) Jerk Control Rigid Tapping Bell-Shaped Acc. / Deceleration Feed rate clamp by arc radius (G02 / G03) In Input Label Skip Parity Check Control In / Out Optional Block Skip Max. Programmable Dimension Program Number Sequence Number Absolute / Incremental Programming (Pocket Calculator Type) Decimal Point Programming Input Unit 10 Time Multiply Plane Selection Rotary Axis Bell-Over Function Polar coordinate System Setting Work piece Coordinate System Pair Manual Absolute On And Off Optional Chamfering / Corner R	G94 (mm / min) Std. Std. Rapid traverse: linear; Cutting feed: exponent Std. (G00) Std. (G01) Std. (G01) Std. (G01) Std. (G01) 0 ~ 150% 0 ~ 100% G62. Std. (B01) 80 (21), 180*1 (18) blocks Std. (21) / 18i only) Std. Std. Std. Std. Std. Std. Std. Std.	
3.3.4.4.5.5.3.3.4.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1	Feed Per Minute Tangential Speed Constant Control Cutting Feed rate Clamp Automatic Acceleration / Deceleration Rapid traverse Bell-shaped Acc. / Deceleration Bell-shaped Acc. / Deceleration Before & After Cutting Feed Interpolation Automatic Corner Deceleration Before & After Cutting Feed Interpolation Linear Acc. / Deceleration Before & After Cutting Feed Interpolation Linear Acc. / Deceleration Before & After Cutting Feed Interpolation Feed rate Override Jog Override Automatic Corner Override Feed Stop Al nano contour control (G05.1) (in total) Jerk Control Rigid Tapping Bell-Shaped Acc. / Deceleration Feed rate clamp by are radius (G02 / G03) In Input Eld / ISO Automatic Recognition Label Skip Parity Check Control In / Out Optional Block Skip Max. Programmable Dimension Program Number Absolute / Incremental Programming (Pocket Calculator Type) Decimal Point Programming Input Unit 10 Time Multiply Plane Selection Rotary Axis Relil-Over Function Polar coordinate System Setting Automatic Coordinate System Setting Mork piece Coordinate System Pair Manual Absolute On And Off Optional Charmering / Corner R Programmable Data Input	G94 (mm / min) Std. Std. Rapid traverse: linear; Cutting feed: exponent Std. (G00) Std. (G01) Std. (G01) Std. (G01) Std. (G01) 0 - 150% 0 - 100% G62. Std. (B01) 80 (21), 180*1 (18) blocks Std. (21i / 18i only) Std.	
(i.e., 1) (i.e.,	Feed Per Minute Tangential Speed Constant Control Cutting Feed rate Clamp Automatic Acceleration / Deceleration Rapid traverse Bell-shaped Acc. / Deceleration Bell-shaped Acc. / Deceleration Before & After Cutting Feed Interpolation Automatic Corner Deceleration Before & After Cutting Feed Interpolation Linear Acc. / Deceleration Before & After Cutting Feed Interpolation Feed rate Override Jog Override Jog Override Automatic Corner Override Feed Stop Al nano contour control (G05.1) (in total) Jerk Control Rigid Tapping Bell-Shaped Acc. / Deceleration Feed rate clamp by arc radius (G02 / G03) Interpolation Feed rate clamp by arc radius (G02 / G03) Interpolation Label Skip Parity Check Control In / Out Optional Block Skip Max. Programmable Dimension Program Number Sequence Number Absolute / Incermental Programming (Pocket Calculator Type) Decimal Point Programming Input Unit 10 Time Multiply Plane Selection Rotary Axis Designation Rotary Axis Roll-Over Function Polar coordinate Cormmand Coordinate System Setting Automatic Coordinate System Setting Mork piece Coordinate System Pair Manual Absolute On And Off Optional Charmfering / Corner R Programmable Data Input Sub Program Call	G94 (mm / min) Std. Std. Rapid traverse: linear; Cutting feed: exponent Std. (G00) Std. (G01) Std. (G01) Std. (G01) Std. (G01) Std. (G01) 0 ~ 150% 0 ~ 100% G62. Std. (21i / 18i only) Std. (Std. (21i / 18i only) Std. Std. (21i / 18i only) Std.	
11. (22. 33. 44. 45. 55. 66. 77. 77. 77. 78. 78. 78. 78. 78. 78. 78	Feed Per Minute Tangential Speed Constant Control Cutting Feed rate Clamp Automatic Acceleration / Deceleration Rapid traverse Bell-shaped Acc. / Deceleration Bell-shaped Acc. / Deceleration Before & After Cutting Feed Interpolation Automatic Corner Deceleration Before & After Cutting Feed Interpolation Linear Acc. / Deceleration Before & After Cutting Feed Interpolation Linear Acc. / Deceleration Before & After Cutting Feed Interpolation Feed rate Override Jog Override Automatic Corner Override Feed Stop Al nano contour control (G05.1) (in total) Jerk Control Rigid Tapping Bell-Shaped Acc. / Deceleration Feed rate clamp by are radius (G02 / G03) In Input Eld / ISO Automatic Recognition Label Skip Parity Check Control In / Out Optional Block Skip Max. Programmable Dimension Program Number Absolute / Incremental Programming (Pocket Calculator Type) Decimal Point Programming Input Unit 10 Time Multiply Plane Selection Rotary Axis Relil-Over Function Polar coordinate System Setting Automatic Coordinate System Setting Mork piece Coordinate System Pair Manual Absolute On And Off Optional Charmering / Corner R Programmable Data Input	G94 (mm / min) Std. Std. Rapid traverse: linear; Cutting feed: exponent Std. (G00) Std. (G01) Std. (G01) Std. (G01) Std. (G01) 0 - 150% 0 - 100% G62. Std. (B01) 80 (21), 180*1 (18) blocks Std. (21i / 18i only) Std.	

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28.	Circular Interpolation by R Programming	Std.
29.	Program FormatFANUC	std. format
30.	Program Stop / Program End	M00 / M01 / M02 / M30
31.	Reset Scaling	Std.
	Coordinate System Rotation	
33.		G68
	y Spindle Speed Function	
1.	Auxiliary Function Lock	Std.
2.	High Speed M / S / T Interface	Std.
3.	Spindle Speed Function	Std.
4.	Spindle Override	50 ~ 120%
5.	1 st Spindle Orientation	Std.
6.	M Code Function	M3 digit
7.	S Code Function	S5 digit
8.	T Code Function	T2 digit
9.	Rigid tapping	Std.
Tool Fun	action & Tool Compensation	
1.	Tool Function	T8 digit
2.	Tool Offset Pairs	± 6-digit, 400 (21i), 999 (18i)
3.	Tool Offset Memory C	Std. (D / H codes are separated)
4.	Tool Length Compensation	G43-G44, G45-G48, G49
5.	Cutting Compensation C	Std.
6.	Tool Management Function	For 1 Path, Tool 64 Pairs
Accurac	cy Compensation	
1.	Backlash Compensation	Rapid Traverse / Cutting Feed
2.	Stored Pitch Error Compensation	Std.
3.	Bi-directional Pitch Error Compensation	Std.
Edit ope	eration	
1.	Part Program Storage Length (in total)	1280m (512Kbyte) (21i), 2560m (18i)
2.	Number of Registerable programs (in total)	400 (21i), 1000 (18i) programs.
3.	Part Program Editing	Std.
4.	Program Protect	Std.
4. 5.	Program Protect Machining Time Stamp	
4. 5. Setting a	Program Protect Machining Time Stamp and Display	Std. Std. (only available on 18i-M)
4. 5. Setting a	Program Protect Machining Time Stamp and Bisplay Status Display	Std. Std. (only available on 18i-M) Std.
4. 5. Setting a 1. 2.	Program Protect Machining Time Stamp and Display Status Display Clock Function	Std. Std. (only available on 18i-M)
4. 5. Setting a 1. 2.	Program Protect Machining Time Stamp and Display Status Display Clock Function Current Position Display	Std. Std. (only available on 18i-M) Std. Std. Std. Std.
4. 5. Setting a 1. 2. 3. 4.	Program Protect Machining Time Stamp and Bisplay Status Display Clock Function Current Position Display Program Display	Std. Std. (only available on 18i-M) Std. Std. Std. Std. Program name 31 characters
4. 5. Setting a 1. 2. 3. 4. 5.	Program Protect Machining Time Stamp and Bisplay Status Display Clock Function Current Position Display Program Display Parameter Setting and Display	Std. Std. (cnly available on 18i-M) Std. Std. Std. Std. Std. Std. Std. Std.
4. 5. Setting a 1. 2. 3. 4. 5. 6.	Program Protect Machining Time Stamp and Display Status Display Clock Function Current Position Display Program Display Program Display Parameter Setting and Display Self Diagnosis Function	Std. Std. (only available on 18i-M) Std. Std. Std. Std. Std. Program name 31 characters Std. Std.
4. 5. Setting a 1. 2. 3. 4. 5. 6. 7.	Program Protect Machining Time Stamp and Bisplay Status Display Clock Function Current Position Display Program Display Parameter Setting and Display Self Diagnosis Function Alarm Display	Std. Std. (cnly available on 18i-M) Std. Std. Std. Std. Std. Std. Std. Std.
4. 5. Setting: 1. 2. 3. 4. 5. 6. 7.	Program Protect Machining Time Stamp and Bisplay Status Display Clock Function Current Position Display Program Display Prarameter Setting and Display Self Diagnosis Function Alarm Display Alarm History Display	Std. Std. (only available on 18i-M) Std. Std. Std. Std. Std. Program name 31 characters Std. Std. Std.
4. 5. Setting : 1. 2. 3. 4. 5. 6. 7. 8. 9.	Program Protect Machining Time Stamp and Bisplay Status Display Clock Function Current Position Display Program Display Parameter Setting and Display Self Diagnosis Function Alarm Display Alarm History Display Operation History Display	Std. Std. (only available on 18i-M) Std. Std. Std. Std. Program name 31 characters Std. Std. Std. Std. 25
4. 5. Setting a 1. 2. 3. 4. 5. 6. 7. 8. 9. 10.	Program Protect Machining Time Stamp and Bisplay Status Display Clock Function Current Position Display Program Display Pragrameter Setting and Display Self Diagnosis Function Alarm Display Alarm History Display Operation History Display Help Function	Std. Std. (only available on 18i-M) Std. Std. Std. Std. Std. Program name 31 characters Std. Std. Std. Std. Std. Std. Std. Std.
4. 5. Setting : 1. 2. 3. 4. 5. 6. 7. 8. 9. 10. 11.	Program Protect Machining Time Stamp and Bisplay Status Display Status Display Clock Function Current Position Display Program Display Program Display Parameter Setting and Display Self Diagnosis Function Alarm Display Alarm History Display Operation History Display Help Function Run Hour and Parts Count Display	Std. Std. (only available on 18i-M) Std. Std. Std. Std. Std. Std. Std. Std.
4. 5. Setting; 1. 2. 3. 4. 5. 6. 7. 8. 9. 10. 11. 12.	Program Protect Machining Time Stamp and Bisplay Status Display Clock Function Current Position Display Program Display Program Display Parameter Setting and Display Saff Diagnosis Function Alarm Display Alarm History Display Operation History Display Help Function Run Hour and Parts Count Display Actual Cutting Feedrate Display	Std. Std. (cnly available on 18i-M) Std. Std. Std. Std. Std. Std. Std. Std.
4. 5. Setting: 1. 2. 3. 4. 5. 6. 7. 8. 9. 10. 11. 12. 13.	Program Protect Machining Time Stamp and Bisplay Status Display Clock Function Current Position Display Program Display Program Display Parameter Setting and Display Self Diagnosis Function Alarm Display Alarm History Display Operation History Display Help Function Run Hour and Parts Count Display Actual Cutting Feedrate Display Display Of Spiridle Speed and T Code At All Screens	Std. Std. (only available on 18i-M) Std. Std. Std. Std. Std. Std. Std. Std. Std.
4. 5. Setting : 1. 2. 3. 4. 5. 6. 7. 8. 9. 10. 11. 12. 13. 14.	Program Protect Machining Time Stamp and Bisplay Status Display Status Display Clock Function Current Position Display Program Display Program Display Parameter Setting and Display Self Diagnosis Function Alarm Display Alarm History Display Alarm History Display Help Function Run Hour and Parts Count Display Actual Cutting Feedrate Display Comparison History Display Actual Cutting Feedrate Display Display of Spindle Speed and T Code At All Screens Graphic Function	Std. Std. (cnly available on 18i-M) Std. Std. Std. Std. Std. Std. Std. Std.
4. 5. Setting i 1. 2. 3. 4. 5. 6. 7. 8. 9. 10. 11. 12. 13. 14. 15.	Program Protect Machining Time Stamp and Bisplay Status Display Clock Function Current Position Display Program Display Parameter Setting and Display Self Diagnosis Function Alarm Display Alarm History Display Operation History Display Help Function Run Hour and Parts Count Display Actual Cutting Feedrate Display Display of Spindle Speed and T Code At All Screens Graphic Function Dynamic graphic display	Std. Std. (cnly available on 18i-M) Std. Std. Std. Std. Std. Std. Program name 31 characters Std. Std. Std. Std. Std. Std. Std. Std.
4. 5. Setting: 1. 2. 3. 4. 5. 6. 7. 8. 9. 10. 11. 12. 13. 14. 15. 16.	Program Protect Machining Time Stamp and Bisplay Glock Function Current Position Display Program Display Prameter Setting and Display Parameter Setting and Display Self Diagnosis Function Alarm Display Alarm History Display Operation History Display Help Function Fun Hour and Parts Count Display Actual Cutting Feedrate Display Display of Spindle Speed and T Code At All Screens Graphic Function Dynamic graphic display Servo Setting Screen	Std. Std. (only available on 18i-M) Std. Std. Std. Std. Std. Std. Std. Std. Std.
4. 5. Setting: 1. 2. 3. 4. 5. 6. 7. 8. 9. 10. 11. 12. 13. 14. 15. 16. 17.	Program Protect Machining Time Stamp and Bisplay Status Display Status Display Clock Function Current Position Display Program Display Program Display Parameter Setting and Display Self Diagnosis Function Alarm Display Alarm History Display Alarm History Display Alarm History Display Help Function Fun Hour and Parts Count Display Actual Cutting Feedrate Display Actual Cutting Feedrate Display Graphic Function Dynamic graphic display Servo Setfing Screen Spindle Spetting Screen	Std. Std. (cnly available on 18i-M) Std. Std. Std. Std. Std. Std. Program name 31 characters Std. Std. Std. Std. Std. Std. Std. Std.
4. 5. Setting : 1. 2. 3. 4. 5. 6. 7. 8. 9. 10. 11. 112. 13. 14. 15. 16. 17. 18.	Program Protect Machining Time Stamp and Bisplay Status Display Status Display Clock Function Current Position Display Program Display Program Display Parameter Setting and Display Self Diagnosis Function Alarm Display Alarm History Display Alarm History Display Help Function Run Hour and Parts Count Display Actual Cutting Feedrate Display Coperation History Display Co	Std. Std. (only available on 18i-M) Std. (only available on 18i-M) Std. Std. Std. Std. Program name 31 characters Std. Std. Std. Std. Std. Std. Std. Std.
4. 5. Setting : 1. 2. 3. 4. 5. 6. 7. 8. 9. 10. 111. 112. 113. 114. 115. 116. 117. 118. 119.	Program Protect Machining Time Stamp and Bisplay Status Display Clock Function Current Position Display Program Display Program Display Parameter Setting and Display Self Diagnosis Function Alarm Display Alarm Display Alarm History Display Operation History Display Help Function Run Hour and Parts Count Display Actual Cutting Feedrate Display Display of Spindle Speed and T Code At All Screens Graphic Function Dynamic graphic display Servo Setting Screen Spindle Setting Screen Display of Hardware and Software Configuration Multi-Language Display	Std. Std. (cnly available on 18i-M) Std. Std. Std. Std. Std. Std. Std. Std.
4. 5. Setting : 1. 2. 3. 4. 5. 5. 6. 6. 7. 8. 9. 10. 11. 12. 13. 14. 15. 16. 17. 18. 19. 20.	Program Protect Machining Time Stamp and Bisplay Status Display Clock Function Current Position Display Program Display Pragrameter Setting and Display Self Diagnosis Function Alarm Display Alarm History Display Alarm History Display Operation History Display Help Function Run Hour and Parts Count Display Actual Cutting Feedrate Display Actual Cutting Feedrate Display Sisplay of Spindle Speed and T Code At All Screens Graphic Function Dynamic graphic display Servo Setting Screen Spindle Setting Screen Display of Harctware and Software Configuration Multi-Language Display Data Protection Key	Std. Std. (only available on 18i-M) Std. Std. Std. Std. Std. Program name 31 characters Std. Std. Std. Std. Std. Std. Std. Std.
4. 5. Setting : 1. 2. 3. 4. 5. 6. 6. 7. 8. 9. 10. 11. 12. 13. 14. 15. 16. 17. 18. 19. 20. 21.	Program Protect Machining Time Stamp and Bisplay Status Display Clock Function Current Position Display Program Display Program Display Parameter Setting and Display Setf Diagnosis Function Alarm Display Alarm Display Alarm History Display Help Function Run Hour and Parts Count Display Actual Cutting Feedrate Display Actual Cutting Feedrate Display Coperation History Display Actual Cutting Feedrate Display Sisplay of Spindle Speed and T Code At All Screens Graphic Function Dynamic graphic display Servo Setting Screen Spindle Spetting Screen Display of Hardware and Software Configuration Multi-Language Display Data Protection Key Erase CRT Screen Display	Std. Std. (only available on 18i-M) Std. Std. Std. Std. Std. Std. Program name 31 characters Std. Std. Std. Std. Std. Std. Std. Std.
4. 5. Setting : 1. 2. 3. 4. 4. 5. 6. 7. 8. 9. 10. 111. 112. 113. 144. 115. 116. 117. 118. 119. 220. 221. 222.	Program Protect Machining Time Stamp and Bisplay Status Display Clock Function Current Position Display Program Display Program Display Parameter Setting and Display Self Diagnosis Function Alarm Display Alarm History Display Alarm History Display Operation History Display Help Function Run Hour and Parts Count Display Actual Cutting Feedrate Display Display of Spindle Speed and T Code At All Screens Graphic Function Dynamic graphic display Servo Setting Screen Spindle Setting Screen Display of Hardware and Software Configuration Multi-Language Display Data Protection Key Erase CRT Screen Display Frase CRT Screen Display Frase CRT Screen Display Frase CRT Screen Display Frase CRT Screen Display Machining Condition Selecting Screen	Std. Std. (only available on 18i-M) Std. Std. Std. Std. Std. Std. Program name 31 characters Std. Std. Std. Std. Std. Std. Std. Std.
4. 5. Setting i 1. 2. 3. 4. 5. 6. 7. 8. 9. 10. 112. 113. 114. 115. 116. 117. 18. 19. 220. 221. 222. 223.	Program Protect Machining Time Stamp and Bisplay Status Display Clock Function Current Position Display Program Display Program Display Pragrameter Setting and Display Self Diagnosis Function Alarm Display Alarm History Display Alarm History Display Operation History Display Help Function Run Hour and Parts Count Display Actual Cutting Feedrate Display Actual Cutting Feedrate Display Actual Cutting Feedrate Display Sisplay of Spindle Speed and T Code At All Screens Graphic Function Dynamic graphic display Servo Setting Screen Spindle Setting Screen Display of Harctware and Software Configuration Multi-Language Display Data Protection Key Erase CRT Screen Display Machining Condition Selecting Screen Color LCD / MID	Std. Std. (only available on 18i-M) Std. Std. Std. Std. Std. Std. Program name 31 characters Std. Std. Std. Std. Std. Std. Std. Std.
4. 5. Setting : 1. 2. 3. 4. 5. 6. 7. 8. 9. 10. 11. 12. 13. 14. 15. 16. 17. 18. 19. 20. 221. 222.	Program Protect Machining Time Stamp Mad Biplay Status Display Clock Function Current Position Display Program Display Program Display Parameter Setting and Display Self Diagnosis Function Alarm Display Alarm History Display Alarm History Display Help Function Run Hour and Parts Count Display Actual Cutting Feedrate Display Actual Cutting Feedrate Display Servo Setting Sprindle Speed and T Code At All Screens Graphic Function Dynamic graphic display Servo Setting Screen Spindle Setting Screen Display of Hardware and Software Configuration Multi-Language Display Data Protection Key Erase CRT Screen Display Machining Condition Selecting Screen Color LCD / MD	Std. Std. (only available on 18i-M) Std. Std. Std. Std. Std. Std. Program name 31 characters Std. Std. Std. Std. Std. Std. Std. Std.
4. 5. Setting: 1. 2. 3. 4. 5. 6. 6. 7. 8. 9. 10. 11. 12. 13. 14. 15. 16. 17. 18. 19. 20. 21. 22. 23. Data Inp. 1.	Program Protect Machining Time Stamp and Bisplay Status Display Clock Function Current Position Display Program Display Program Display Parameter Setting and Display Sett Diagnosis Function Alarm Display Alarm History Display Alarm History Display Help Function Run Hour and Parts Count Display Actual Cutting Feedrate Display Actual Cutting Feedrate Display Carphic Function Dynamic graphic display display of Spindle Speed and T Code At All Screens Graphic Function Dynamic graphic display Servo Setting Screen Spindle Setting Screen Display of Hardware and Software Configuration Multi-Language Display Data Protection Key Erase CRT Screen Display Machining Condition Selecting Screen Color LCD / MD yulf Valryut Reader / Puncher Interface	Std. Std. (only available on 18i-M) Std. Std. Std. Std. Std. Std. Std. Program name 31 characters Std. Std. Std. Std. Std. Std. Std. Std.
4. 5. Setting: 1. 2. 3. 4. 5. 6. 7. 8. 9. 10. 11. 12. 13. 14. 15. 16. 17. 18. 19. 20. 21. 22.	Program Protect Machining Time Stamp Mad Biplay Status Display Clock Function Current Position Display Program Display Program Display Parameter Setting and Display Self Diagnosis Function Alarm Display Alarm History Display Alarm History Display Help Function Run Hour and Parts Count Display Actual Cutting Feedrate Display Actual Cutting Feedrate Display Servo Setting Sprindle Speed and T Code At All Screens Graphic Function Dynamic graphic display Servo Setting Screen Spindle Setting Screen Display of Hardware and Software Configuration Multi-Language Display Data Protection Key Erase CRT Screen Display Machining Condition Selecting Screen Color LCD / MD	Std. Std. (only available on 18i-M) Std. Std. Std. Std. Std. Std. Program name 31 characters Std. Std. Std. Std. Std. Std. Std. Std.

OPTIONS

ITEM	SPECIFICATION		
With ha	rdware included	21i-MB	18i-MB
1.	Conversational programming (Manual Guide i)*2	Std.	Std.
2	Conversational programming (Super Cap i)	-	-
3.	Data server (with PCB and CF card 1 GB)	-	Std.
4.	Embedded Ethernet (10Mbps)	Std.	Std.
5.	Fast Ethernet (100Mbps, available in Data server)	-	Std.
6.	Tool life management	-	-
7.	Part Program Storage Length 5120mm (in total)	N.A.	-
8.	Program restart	-	-
9.	Optional block skip 9 blocks	-	-
10.	High Precision Contour Control (with RISC board)	N.A.	180*1 blocks
11.	Al high precision contour control (RISC)	N.A.	600 blocks
12.	Al nano high precision contour control (RISC)	N.A.	600 blocks
13.	Profibus	-	-
14.	5-axis simultaneous control*2	N.A.	- (18i-MB5)
Without	hardware included		
15.	Tool load monitoring (with Victor own PLC)	-	-
16.	Programmable mirror image (G50.1)	-	-
17.	Addition of tool pairs for tool life management 512 sets	-	-
18.	Cylindrical interpolation (G7.1) (used on 4*-axis)	-	-
19.	Interruption type custom macro	-	-
20.	Addition of work-piece coordinate systems 300 sets	N.A.	-
21.	Exponential interpolation (G2.3)	N.A.	-
22	Smooth interpolation	N.A.	-
23.	Spiral / conical interpolation	N.A.	-
24.	Floating reference position return	N.A.	-
25.	Hypothetical axis interpolation (G07)	N.A.	-
26.	Tool retract and return (G10.6 with Victor own PLC)	N.A.	-
27.	NURBS interpolation (only avail. in HPCC / RISC)	N.A.	-

^{*1.}Block addressing time: -2 ms for Al nano CC (max. cutting feed 30 m / min),
-1 ms for HPCC (max. cutting feed 30 m / min), Al HPCC and Al nano HPCC (150 m / min)
*2.Only available on 181-MBS for 5 axis simultaneous control including HPCC (RISC).

Machine Specifications



ITEM		Vcenter-H630	Vcenter-H1000
CAPACITY			
X axis travel	mm	900	1350
Y axis travel	mm	800	1050
Z axis travel	mm	710	1050
DISTANCE			
Spindle nose to table center	mm	200 - 910	220 - 1270
Spindle center to table surface	mm	0 - 800	0 - 1050
Max. machining area (W x L x H)	mm	875 x ø1075 x 800	1350 x ø1360 x 1350
WORKING TABLE			
Table work area	mm	630 x 630	1000 x 1000
Max. table load	kg	1000	2000
T-slot dimensions	mm	M16 x P2.0	M16 x P2.0
Min. angle of rotation	deg	1° (opt. 5° & 0.001°)	1° (opt. 5° & 0.001°)
Table interchange time	sec	30 (P-P)	45 (P-P)
Table interchange method		2 pallet - parallel changer	2 pallet - parallel changer
Time to inde x 90°	sec	(2 for opt. CNC table)	(4 for opt. CNC table)
Time to inde x 180°	sec	7 (3 for opt. CNC table)	10 (5 for opt. CNC table)
SPINDLE			
Spindle taper		BT 50	BT 50
Spindle speed	rpm	4500 (opt. 6000)	4500
Spindle bearing diameter	mm	ø100	ø100
AXES FEED			
Rapid feed rate - X / Y / Z	m/min	20 / 20 / 15	15 / 15 / 15 (opt. 20/20/15)
Cutting feedrate - X / Y / Z	mm/min	10000	10000
Ballscrew øD x P (pitch)	mm	ø50 x P12	ø55 x P10
Boxway hordness		HRC 55 ± 3	HRC 55 ± 3
ATC			
Tool capacity		60 (opt. 90, 120)	90 (opt. 120)
Tool selection		Fixed tool pot number	Fixed tool pot number
Max. tool diameter	mm	110 (245 with no adj. tool)	110 (245 with no adj. tool)
Max. tool length	mm	600	600
Max. tool weight	kg	20	20
Tool exchange time	sec.	13.8 (T-T), 15.6 (C-C)	13.8 (T-T), 20.5 (C-C)
Tool pull - stud		BT50 - 60°	BT50 - 60°
MOTOR			
Spindle motor (cont / 30 min)	kW	15 / 18.5 (opt. 18.5 / 22)	18.5 / 22
X/Y/Z axis feed motor	kW	4/7/4	9/9/9
B axis feed motor	kW	1.6 (4 for opt. CNC table)	4 (opt. 7)
Hydraulic / lubrication motor	kW	2.2 / 0.02	2.2 / 0.02
MACHINE			
Standard CNC controller		Fanuc 21i-MB	Fanuc 21i-MB
Power requirement	KVA	40 (50 with CTS)	54 (60 with CTS)
Coolant tank	L	500	600
Machine height	mm	3200	3950
		3435 x 5255	4580 x 8400
Floor space requirement	mm	17000	
Machine weight	kg	17000	31420

Standard Accessories:

- 1° indexing table
- Spindle coolant unit
- Coolant tank
- Rigid tapping
- Manual pulse generator (remote type)
- Hand tools and tool box
- · Scroll type chip remover
- Built-in work lamp
- Programming end light
- Leveling block
- Automatic pallet changer with manual turning device
- Spindle load meter
- Oil skimmer
- 21i-MB control
- Air conditioner for electrical cabinet
- Chip conveyor
- Handy coolant gun

Optional Accessories:

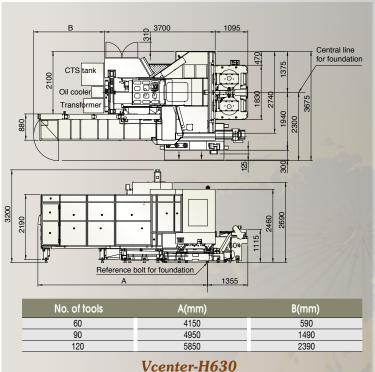
- 90, 120 tool magazine
- Fully enclosed splash guarding
- T-slot pallet
- CNC table with 0.001° continuous indexing
- Linear encoder feedback (std. for Vc-H1000)
- Interface for FMS
- Coolant through spindle
- Table shower system
- Air blow system
- α18i spindle motor (for Vc-H630)
- Auto tool length measurement
- FMC with total 6 pallets and RGV
- 18i-MB control
- Heidenhain controller iTNC-530

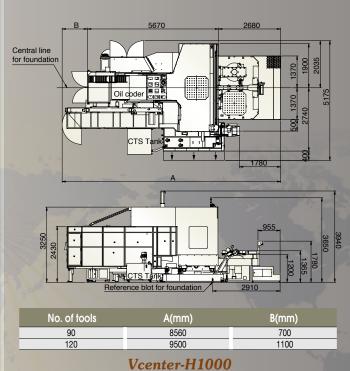
Cutting capability for Vcenter-H630/H1000

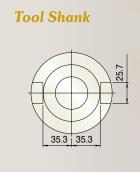
Cutting parameters	Face milling	End milling	Drilling	Tapping
Tool dia. x No. of flutes	Carbide : ø150 mm x 8	Carbide : ø40 mm x 4	HSS: ø40 mm x 2	M36 x P4
Spindle Speed (N)	250 rpm	450 rpm	200 rpm	90 rpm
Cutting feed (Vf)	700 mm/min	300 mm/min	120 mm/min	360 mm/min
Cut area (ap x w)	7 x 140 mm	45 x 35 mm	-	-
Metal removal rate (MRR)	686 cc/min	473 cc/min	151 cc/min	-

Specifications are subject to change without notice for design improvement.

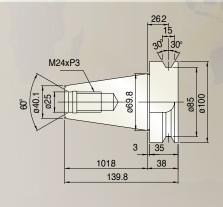
MACHINE LAYOUT

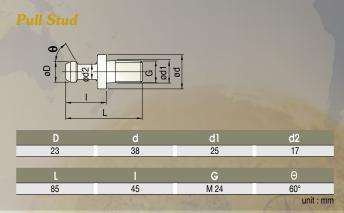














THE VICTOR-TAICHUNG COMPANIES

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R° Victor Taichung profile:

Sales turnover: USD 198.2 mil's (in 2008)* No. of employees: 998
*Exchange rate: 1 USD=32 TWD









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