MiCROCUT
THE CHALLENGER

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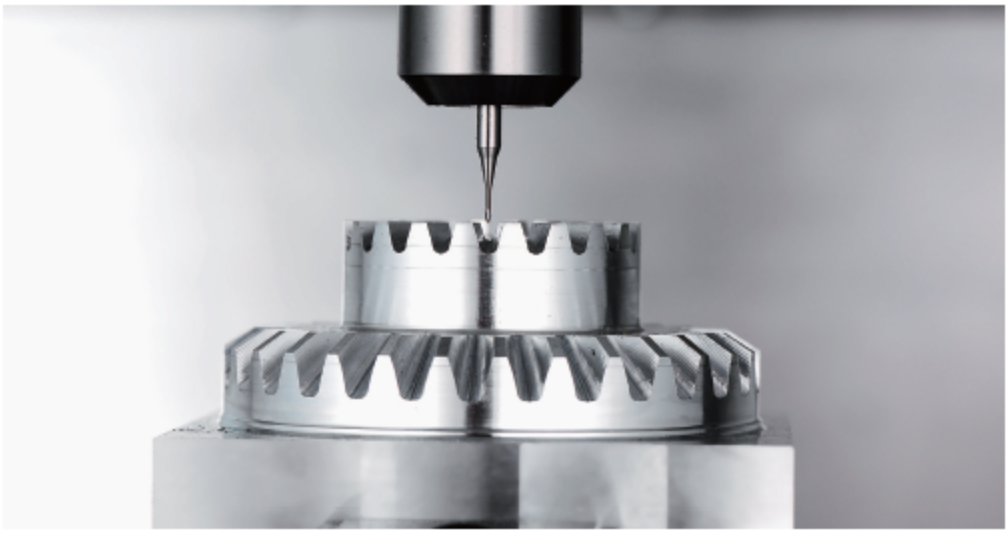
Metal removal rate and good quality of surface finish are two main concerns when dealing with the high speed machining. The capability of high metal removal rate are based on well design of its structure, axes thrust force and spindle horse power and torque. Thus, spindle horse power and torque can be considered as the main variable factors while improvement of machining technology.

A higher metal removable volume can be achieved while the high speed machining technology is applied. Quality of the surface finish can be affected by many factors, including chip load, tool geometry and inclination of the tool, etc. The benefit of high speed machining is that higher removal rates can be accomplished, a better tolerance can be achieved and the cutting time becomes shorter, in addition to high spindle speed, fast cutting feed, high acceleration/deceleration, and a high end CNC controller. However, risks of vibration and thermal expanse could occur due to high speed, the technique of mechatronics is a great effort to improve the reliability.

New V-series Vertical Machining Center provides the technique of high speed machining technology. The combination of great performance high speed spindle, structure rigidity and latest powerful CNC produces a greater productivity and tolerance. An optional selection of high value package, the **Smart Machining Technology(SMT)** ensures the machine works better of the finish precision and faster of its cutting hour.



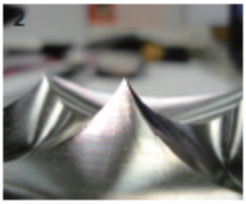
The Application and Parts

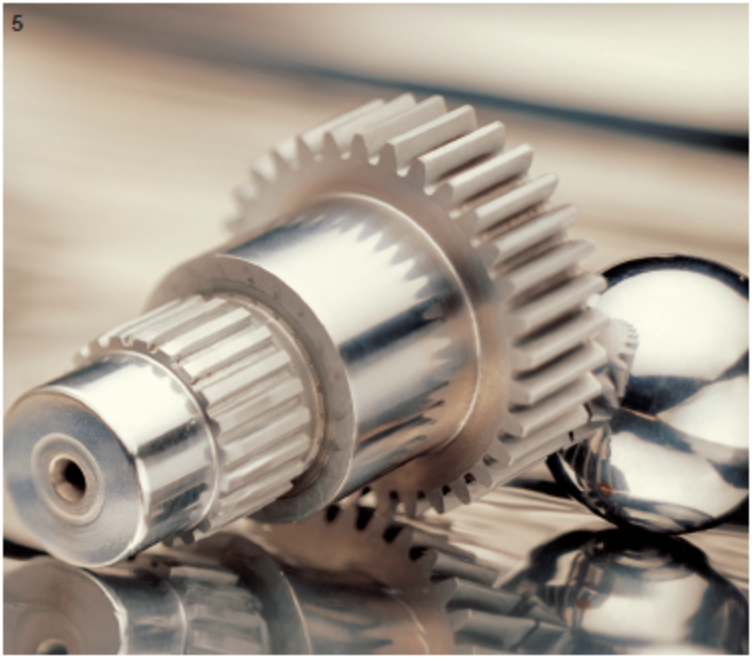
Investment for Future

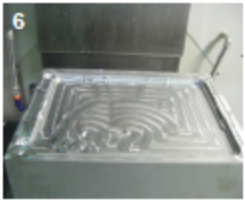
Competition in processing industry not only exists in developed countries but also in production line of emerging countries, the advantage of the location and low cost labor is no longer natural benefit. The global competition are threatened heavily because of shorten physical distances of transportation time and technology background. In this case, excellent performances of processing time and speed can provide higher benefit and long-term vantage for investors.

Therefore, investing in new equipment with advanced features is absolutely a guarantee of better profit, which costs slight higher equipment expense but offers high reliability and efficiency.

[1] Mercedes mold [2] Casting iron mold [3] Testing piece with Microcut logo [3] Ash tray
[4] Gear machining [6] Tablet case







Wide Application:

* Die and mold industry
* Automobile industry
* Medical industry
* General workshop
* Aero space

Intelligent Technology

1.Various spindle speed selection:12000rpm/15000rpm/18000rpm/24000rpm

2.Side-mounted ATC offers quick tool change time (T-T: 2 sec): V-20/V-22: 24 tools or 32 tools ATC, V-26/V-30: 30 tools ATC.

3.Direct-mounted servo motors improve positioning accuracy and provide better contouring and threading. An enlarged servo motor with brake for Z-axis and a pneumatic counter weight is available on request.

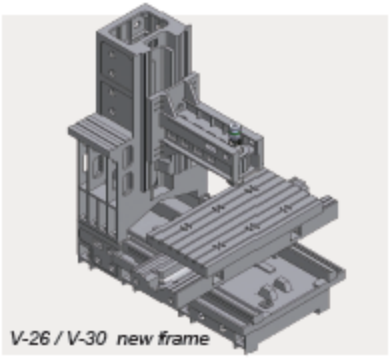
4.Enlarged wide table to supply wider Y-axis travel for die & mold machining.

5.Precision C3 class ball screws with preloaded double-nut device which allows a high tolerance and low backlash. Hollow shaft ball-screws with internal cooling system(opt.) which allows the mechanism running at stable environment of temperature, a smallest thermal growth of driven system is provided.

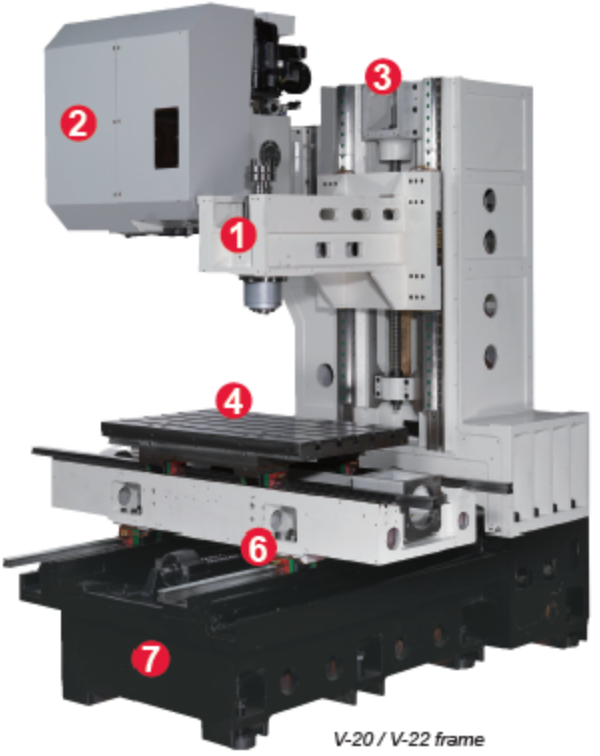
6.Roller type linear guide ways provide high rigidity and accuracy, the device is capable to provide a rapid traverse up to 48M/min and fast acceleration/deceleration speed.

7.The major structural components are Meehanite cast iron and heat treated to relieve stress thereby assuring maximum rigidity and accuracy. All castings are reinforced with heavy ribs to resist flex and damp vibrations.

8.ANSYS Design Space and ANSYS Mechanical software applied to ensure the structural optimization, and the dynamic function is confirmed by harmonic procedure.



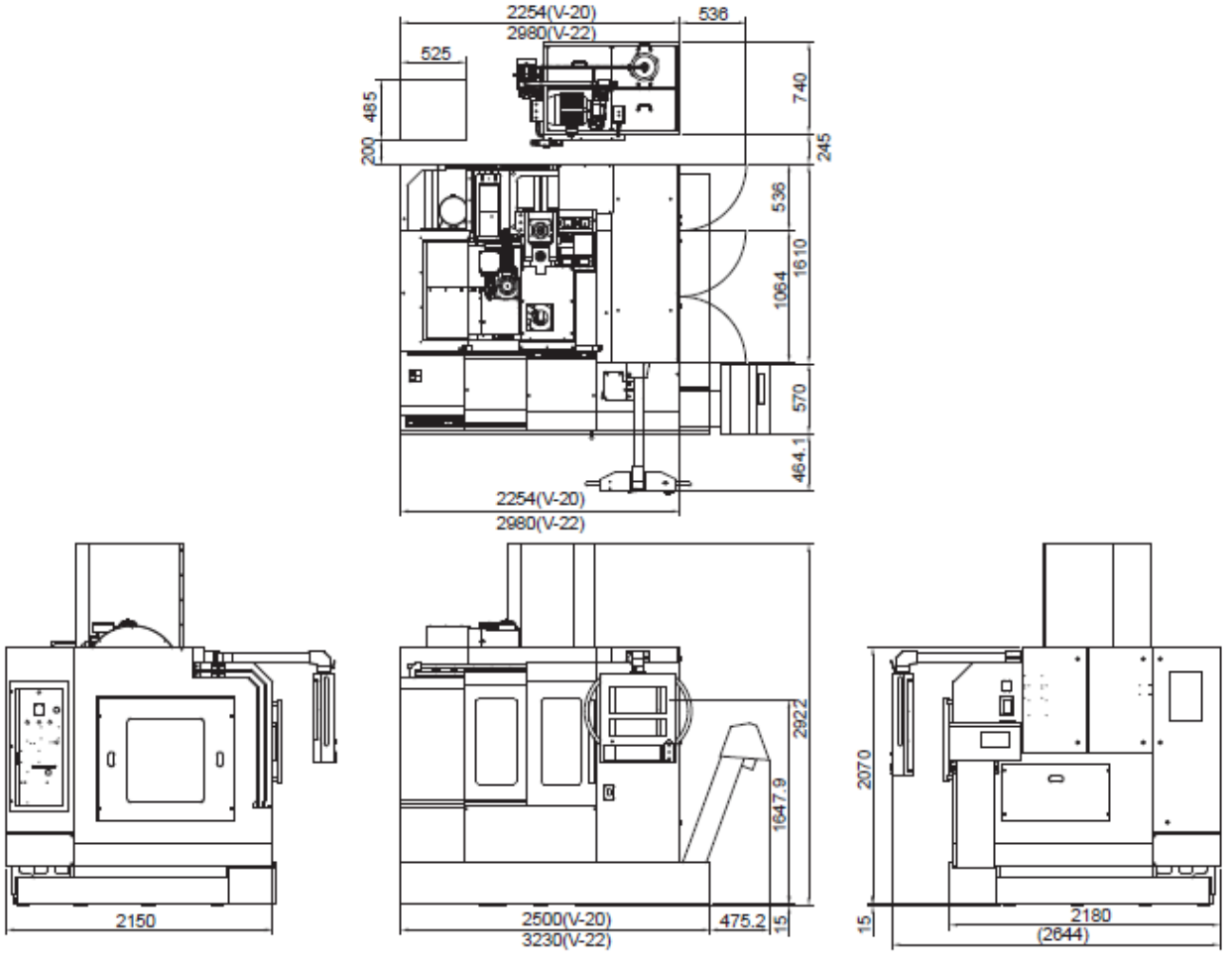
V-26 / V-30 new frame



V-20 / V-22 frame

Layout Dimension

V-20 / V-22



Specifications

Description	Unit	V-20	V-22	V-26	V-30
TABLE					
Table size	mm	900x520	1200x520	1400x610	1400x710
Table height	mm	870	870	915	915
T-slot (w/pitch/no)	mm	16x80/100x5	16x80/100x5	18x5x100	18x5x100
Max. table load	kg	450	800	1000	1000
TRAVEL					
X axis	mm	800	1000	1000	1200
Y axis	mm	500	560	650	730
Z axis	mm	500	550	650	650
Spindle center to column	mm	595	595	800	800
Spindle nose to table	mm	100-600	100-650	100-850	100-850
SPINDLE					
Spindle taper		ISO 40/HSK A63	ISO 40/HSK A63	ISO 40/HSK A63	ISO 40/HSK A63
Spindle speed	rpm	12000(direct driven)	12000(direct driven)	10000(belt driven)	10000(belt driven)
Spindle speed (direct drive)	rpm	15000	15000	12000/15000	12000/15000
Spindle speed (built in)	rpm	18000/24000	18000/24000	18000/24000	18000/24000
Motor output - direct drive	kw	10(H.H. iTNC530)/ 7.5(Fanuc H.H. TNC620)	10(H.H. iTNC530)/ 7.5(Fanuc H.H. TNC620)	15/18.5(12000/15000) 20/25(18000/24000)	15/18.5(12000/15000) 20/25(18000/24000)
AXES TRANSMISSION					
X axis					
Ballscrew		ø40xP16; C3	ø40xP16; C3	ø40xP16; C3	ø40xP16; C3
Ballscrew lubrication		oil(auto)	oil(auto)	oil(auto)	oil(auto)
Transmission		Direct	Direct	Direct	Direct
Y axis					
Ballscrew		ø40xP16; C3	ø40xP16; C3	ø40xP16; C3	ø40xP16; C3
Ballscrew lubrication		oil(auto)	oil(auto)	oil(auto)	oil(auto)
Transmission		Direct	Direct	Direct	Direct
Z axis					
Ballscrew		ø40xP16; C3	ø40xP16; C3	ø40xP16; C3	ø40xP16; C3
Ballscrew lubrication		oil(auto)	oil(auto)	oil(auto)	oil(auto)
Transmission		Direct	Direct	Direct	Direct
GUIDE WAYS					
X guide way					
X-axis linear guide type (roller)		RA35	RA35	RA 45	RA 45
X guideway distance	mm	360	360	405	405
Y guide way					
Y-axis linear guide type (roller)		RA35	RA35	RA 45	RA 45
Y-axis guideway distance	mm	700	700	720	720
Z guide way					
Z-axis linear guide type (roller)		RA35	RA35	RA 45	RA 45
Z guideway distance	mm	400	400	365	365
AXES FEED RATE					
X/Y/Z Rapid feed	M/min	32(std.)/48(opt.)	32(std.)/48(opt.)	32-10000rpm spindle 42-12000/15000/18000/24000 rpm spindle	
X/Y/Z cutting feed	M/min	10	10	10	
ATC					
Tool shank type		BT/CAT/DIN-#40	BT/CAT/DIN-#40	BT/CAT/DIN-#40(std.), HSK63(opt.)	
ATC type		arm	arm	arm	
No. of tools		24	24	30	
Tool changing time (T-T)	sec.	2	2	2	
Max. tool diameter	mm	80	80	75	
Max. tool dia. with next tool empty	kg	125	125	125	
Max. tool length	mm	300	300	300	
Max. tool weight	mm	8	8	8	
Max. loading weight	mm	170	170	240	
ACCURACY					
Positioning accuracy	mm	+/-0.005/300	+/-0.005/300	+/-0.005/300	
Repeatability	mm	0.005	0.005	0.005	
DIMENSIONS					
Length (without chip conveyor)	mm	2500	3230	3250	3600
Length (with chip conveyor)	mm	2975	3705	3887	4237
Width	mm	2644	2644	4103	4103
Height	mm	2922	2972	3285	3285
Weight	kg	5000	5200	10000	10500
Floor space	m	3490x3229	4216x3229	5161x5649	7417x5649

**Specifications are subject to change without notice.*

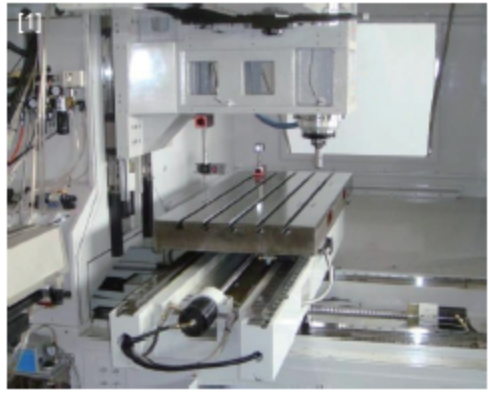
Smart Machining Technology(opt.)

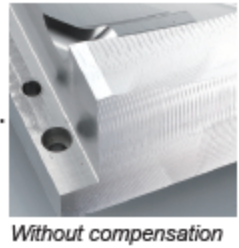
AAC TPC SVS MRRO

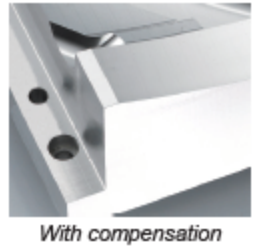
Smart Machining Technology (SMT)

- Update Spindle thermal growth compensation
- Spindle vibration supervision, tool and spindle bearing wearing reduction.
- Abnormal vibration data recorded supports maintenance.
- Optimization of productivity to utilize machine capacity.
- Extremely fast CNC processing time, maximization of metal removal rate.
- High tool durability and preface surface finishing.
- High axial accuracy control by compensation on axes thermal expanse displacement.

[1]





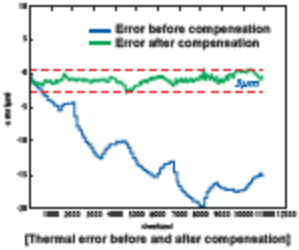


Without compensation *With compensation*

[1] Photos shows set up of Axial Accuracy Control [2] Finishing quality comparsion without/with Spindle Vibration Supervison [3] with Tool-tip Positioning Control, the displacement of tool tip is reduced from 65um to 15um [4] The thermal error reduced from 20um to 3um by Axial Accuracy Control

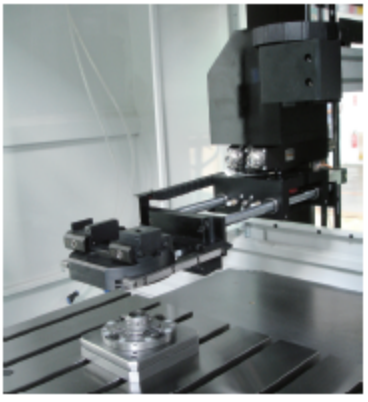
[3]

[4]



[Thermal error before and after compensation]

Non-Stop=High-Productivity



Bring the automatic solution into production line, Microcut Loader is an automatic loading system suitable for considerable numbers of workpieces. Maximum 60 stations and up to 25kg weight capacity.

[1] Built-in type high pressure 20 bar coolant through spindle [2] Linear scale [3] Touch probe
[4] Tool setter [5] CTS 20 bar(or 70 bar) with individual tank [6] Heat exchanger [7] Air conditioner [8] Rotary table

[1]

High pressure 20 bar coolant through spindle(Built-in type)

[2]

Linear Scale

[3]

Touch probe

[4]

Tool setter

[5]

CTS individual tank(20 bar or 70 bar) on request

[6]

Heat exchanger

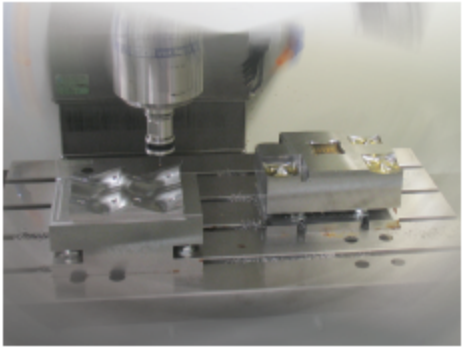
[7]

Air conditioner

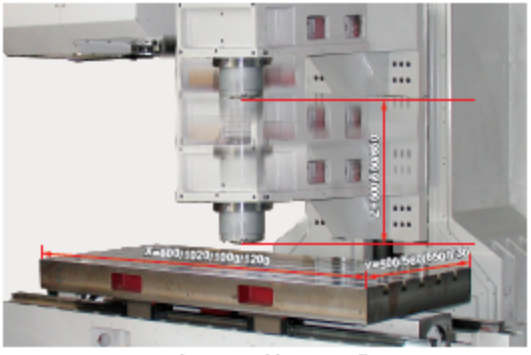
[8]

Rotary table

Large Working Area



Large working area for workpieces



Large working capacity

Working Capacity

Features	Unit	V-20	V-22	V-26	V-30
Stroke X/Y/Z	mm	800x500x500	1000x560x550	1000x650x650	1200x750x650
Table size LxW	mm	900x520	1200x520	1400x610	1400x710
Working weight max.	kg	450	800	1000	1000

User-Friendly Design

- Large window with safety approved protection window provide easy checking of cutting condition.
- Ergonomic panel design and most comfortable eye-level monitor ease operators.
- Easy loading/unloading because of short distance between guarding and table center.
- Door design makes crane or lifting device reach table center.
- Strong chip flash removes chips efficiently.
- Close to working piece which enables easy handling

V-26 / V-30

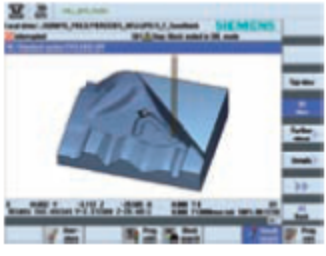
High Efficiency Controller

The optimal ease-of-use controller with large screen allows 3D graphics visualization. The screen and operation panel is swivel and the screen height is set to fit the ergonomic requirement of operators perfectly. USB, Ethernet connection port is designed on the front panel provides easy usage of memory card or network. Heidenhain TNC620/iTNC530HSCI, Siemens 828D Basic/ 840D solution line and Fanuc 32i/31i are available. All CNC configured with large memory capacity and high speed machining capability with proven architecture and software algorithms to radically reduce cycle times while improving part accuracy and quality.

[1] New Heidenhain control
[2] 3D simulation on Siemens control
[3] Tool management on Heidenhain control
[4] Manual Guide I on Fanuc control

[1]

[2]



[3]

[4]

Controller Selection

Heidenhain TNC620/ iTNC 530 HSCI

- Shop floor compatible with Heidenhain plain-text programming, smarT.NC and visual support
- Heidenhain motion guidance of axes for the highest precision and surface quality even at high machining speeds

Siemens 828D Basic/ 840D Solutionline

- Excellent efficiency due to state-of-the-art platform
- Programming is easy and can be learned quickly, with the ShopMill visual programming system
- Integrated, powerful engraving cycle

Fanuc 32iMB / 31iMB

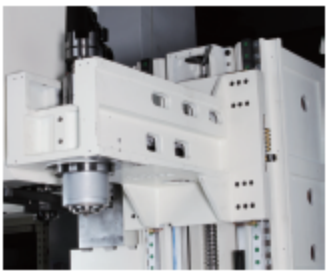
- Clearly laid-out arrangement of the operating components in a wide screen format
- Manual Guide i with improved ease-of-use
- Status displays for access right, program status and tool information in the proprietary DMG screen area(upper screen)

Control Highlights

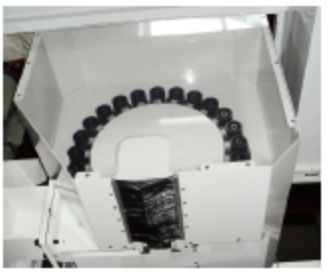
- Large screen

Heidenhain	iTNC530	15" std. panel
Heidenhain	TNC620	10.4" std. panel
Siemens	840DSL	15" std. panel
Siemens	828D Basic	10.4" std. panel
Fanuc	32i/31i	10.4" std. panel

- High performance path control available
- Automatic smoothing of contour
- Perfect surfaces can be created with any CAM tool
- 3D radius compensation available
- Quick mid program start up on specific NC blocks
- 3D line graphics enables visualization of externally generated NC programs
- Function TCPM
- Easy mirroring of rotary axis
- Free contour programming
- Parameter programming
- Ethernet connect in front of panel



In-line spindle



Automatic tool changer on V-26

Built-in spindle

V-20 / V-22

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Updated Machine Structure and SMT

One Step Ahead

High speed machining equipment is not unique; however, the factors of high speed are not merely high-speed spindle, high feed rate and using high level CNC controller. Apart from the basic performances of spindle speed, feed rate and acceleration/deceleration, the reliability, stability and usability of equipment under its best condition are also crucial for providing time efficiency (no-waste-of-time) and the performance of accuracy. The new V-series Vertical Machining Center is not just a new machine providing the **Smart Machining Technology (SMT)**; it is a great progress of the business!

Highlights

* **High productivity and excellent finishing:** high spindle speed, excellent CNC controller, fast cutting feed, optional with Smart Machining Technology (SMT) for optimization material removal rates.
* **Powerful spindle drive:** 20kW for 18000 & 24000RPM spindle, and 15kW for 12000, 15000RPM spindle.
* **Reduced idle times:** 48 M/min rapid traverse and fast tool to tool change time.
* **Highest rigidity, brilliant precision and small floor space required.**
* **Excellent reliability** and process safety.
* **High precision** through roller type linear guide way with optional linear scales.
* **Wide machine base** 720mm Y axis guide ways distance for V-26/30, & 480mm for V-20 and V-22