VISION WIDE

widen your cutting vision

VF series

CNC Double Column Vertical Machining Center

Heavy Cutting Double Column Machining Center

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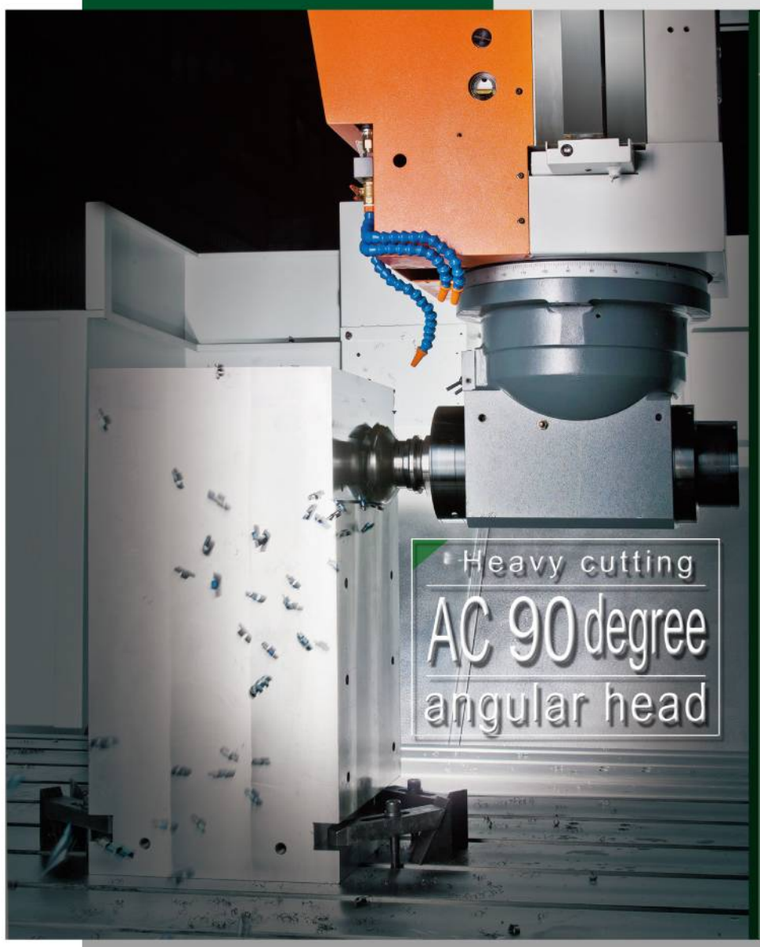
VF Series
Heavy cutting double column machining center

With bevel support design on cross beam,
VF series is the most suitable machine to meet
requirements from high efficiency and heavy cutting.
(per kW of spindle power offers 40Nm,
15% more than before)



Total solution on multi-angle machine modules includes

1. Various head attachments
2. Auto/ manual head storage modules
3. Auto tool changing with head
4. Specific TCPM
5. Intelligent operation

- Rapid traverse: 12m/min
- Cutting feed rate: 7m/min
- High torque gear type spindle: 4,000/ 6,000rpm
- Belt type spindle: 8,000/ 10,000rpm

X-axis travel:3.2/ 4.2/ 5.2m
Y-axis travel:2.3/ 2.6m
Z-axis travel: 920/ 1,020mm
Port width:2,400/ 2,700mm
Box way for XYZ-axis

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Photo: VF-3000 model with enclosed splash guard (without roof)

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High rigid structure design

Following Vision Wide tradition,
the optimized structure design offers the best
rigidity in heavy cutting.

V-shape rib on the bed allows the best level and dynamic accuracy under heavy workpiece loading.

Photo: VF-3000 model with gear type spindle 6,000rpm

X-axis feeding system is fully supported by box guide ways	Improving high rigidity and reliability
High rigid box way	Enhancing the loading capability, and keeping high dynamic level accuracy
2-way support design on the bed with optimal span design	Ensuring straightness within 0.01mm/2m at X-axis motion

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High rigid structure design

The large size on column cross section dimension (425x1,000mm) gives the beam the strongest support

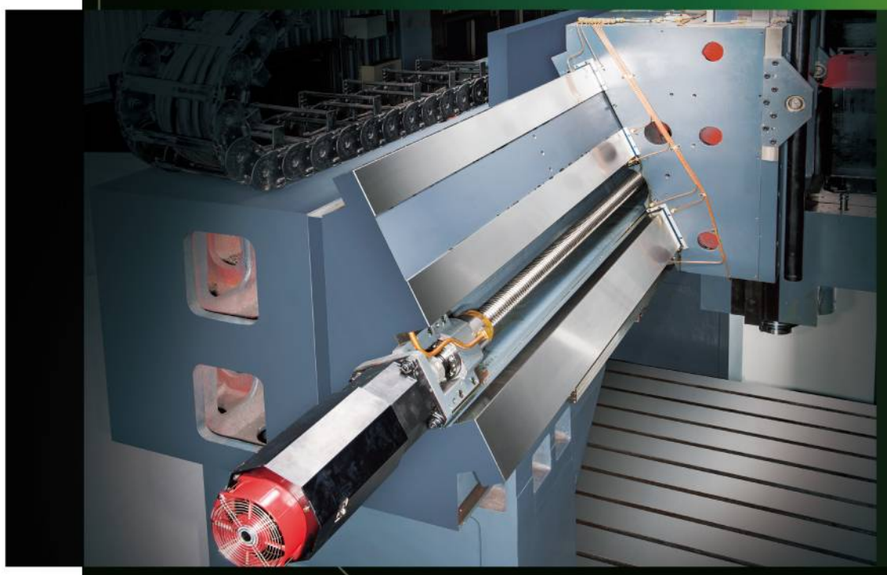
Bevel beam design makes

Z-axis center closing to beam achieves exclusively excellent dynamic performance.

beam contact width (805mm) offering larger dimension and giving the best support on Z-axis.

beam rigidity and cutting capability increase significantly with 3 box ways support design.

Y-axis motion in best straightness and cutting rigidity.



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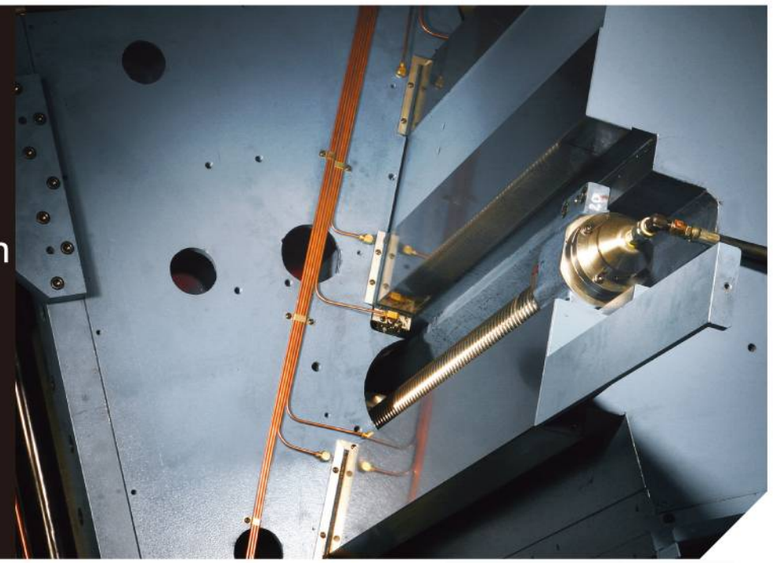
High precision mechanism features

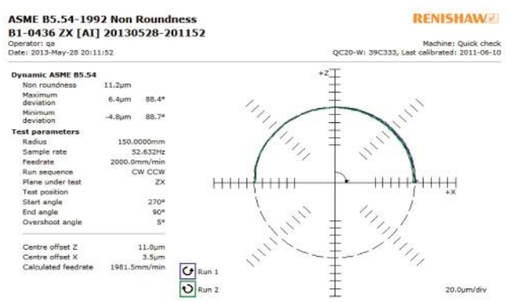
- 3-axis ball screw cooling system including the hollow ball screw and oil cooling system efficiently reduces thermal deformation at machine operation.
- Spindle and 3-axis ball screw cooling system ensure optimal heat balance control.

Large special span in Y-axis for rigidity, with bevel beam design reduces movement friction, and improve positioning accuracy.



One-piece casting design in Z-axis and spindle gear box for symmertrical heat conduction and high rigidity ensuring.

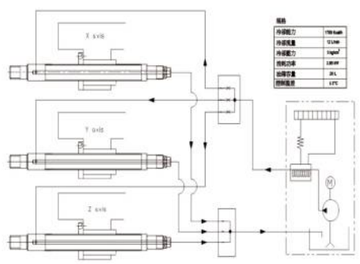
2-step gear type spindle with 4 sets high rigidity ball type bearing configuration, bearing dimension 100x50mm provides high rigidity, and also increases working lifetime.

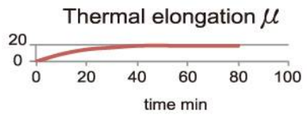


12m/ min rapid traverse and 0.5G high acceleration/ deceleration on Z-axis performance achieve the requirements from contour accuracy of high speed mold machining.

High speed balancing system including economical twin hydraulic cylinders with pressured air assistance achieves:

- Smoother Z-axis movement
- Z-axis retract function at power failure
- Excellent performance for power saving





Independent spindle and 3-axis ball screw cooling system:

1. To force spindle bearing and gear cooling, effectively restrain spindle thermal deformation
2. Effectively control ball screw temperature within +/-2 degree to ensure ball screw thermal deformation

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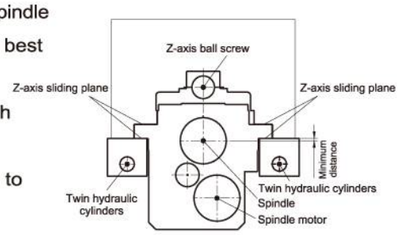
Optimal central symmetric spindle system design offers high cutting performance

High torque gear type spindle
Industry-leading output torque,
15% more than competitors,
providing excellent heaving cutting performance

Also providing high torque gear type spindle can be chosen, max. power 30/37kW
spindle speed 4,000rpm, max. torque 1952Nm
spindle speed 6,000rpm, max. torque 1517Nm

- Minimum distance between spindle center and Z-axis roller way not only shortens cutting lever arm but also significantly improves cutting rigidity.
- Symmetric spindle gravity configuration, Z-axis ball screw, spindle center and spindle motor configure at gravity point of Z-axis box structure centerline provide the best feed precision and thermal balance.
- Gear spindles made of Japan-made JIS-0 grade precision gears are with high precision, low noise and high efficiency transmission performance.
- 2-step gear type spindle provides high torque and high speed characteristics to ensure heavy cutting ability on surface finish of high speed cutting.



2-step gear type 4,000/ 6,000,
belt-driven 8,000/10,000rpm spindle speed
can be chose according different kinds of machining.

Heavy cutting ability | test specification 22/ 26kW 6,000rpm spindle

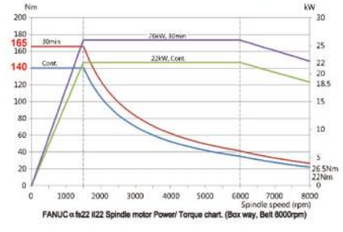
Face milling:
Tool dia.:125mm
Removal rate:650cc/min

Drilling:
Tool dia.:32mm
Feed rate:500mm/min

Mold cutting:
Tool dia.:25mm
Feed rate:5000mm/min

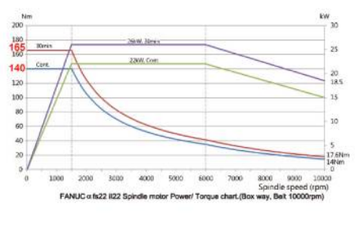
Spindle power and torque chart

Fanuc α 18 18.5/22kW gear type 4,000rpm



FANUC αil18 Spindle motor Power/ Torque chart. (Box way, Gear 4000rpm)

Fanuc α 18 18.5/22kW gear type 6,000rpm



FANUC αil18 Spindle motor Power/ Torque chart. (Box way, Gear 6000rpm)

Fanuc α 22 22/26kW gear type 4000rpm

FANUC αil22 Spindle motor Power/ Torque chart. (Box way, Gear 4000rpm)

Fanuc α 22 22/26kW gear type 6,000rpm

FANUC αil22 Spindle motor Power/ Torque chart. (Box way, Gear 6000rpm)

Fanuc α 30 30/37kW gear type 4000rpm

FANUC αil30 Spindle motor Power/ Torque chart. (Box way, Gear 4000rpm)

Fanuc α 30 30/37kW gear type 6,000rpm

FANUC αil30 Spindle motor Power/ Torque chart. (Box way, Gear 6000rpm)

Fanuc α 22 22/26kW belt type 8,000rpm

FANUC α fs22 if22 Spindle motor Power/ Torque chart. (Box way, Belt 8000rpm)

Fanuc α 22 22/26kW belt type 10,000rpm

FANUC α fs22 if22 Spindle motor Power/ Torque chart.(Box way, Belt 10000rpm)

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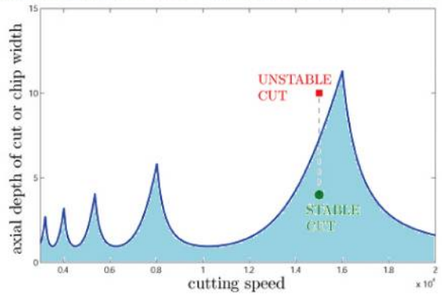
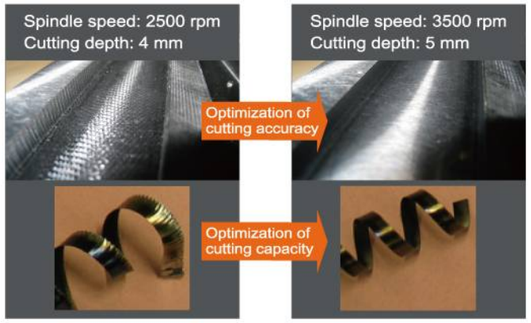
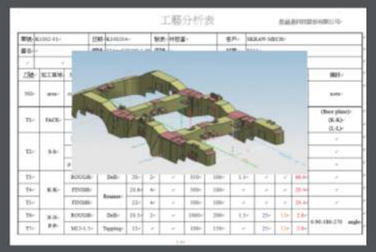
Optimal cutting application from the analyzation of the combination between CAD/CAM and LOBE analysis

▶ To provide best cutting conditions and recommendations on combination between tool and machine

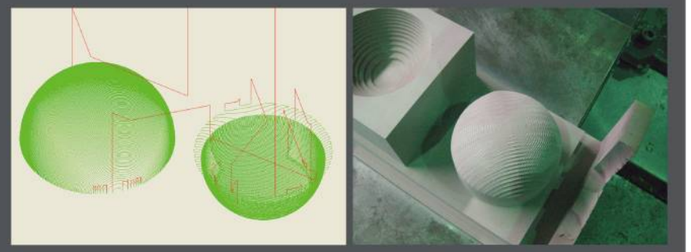




▶ Providing estimate cutting time



▶ 2D/3D cutting path optimization analysis



Modularized Production-After components assembled and tested.

▶ After assembling & testing, these parts will be assembled in the main production line

Strict production precesses and quality management system
Complete quality check procedures to create high machine quality

▲3D mold cutting test

▲Noise and vibration test (ISO-230)

▲CMM inspection

▲Laser alignment inspection

Parts quality check

Reliability test

Accuracy inspection during machine making

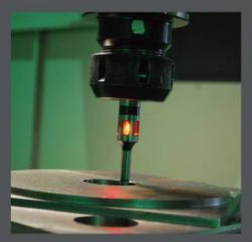
We commit for "Quality First" by following P-D-C-A process in every production segment, using the advanced instruments and strict quality standards.

Machine performance test

Machine function test

Positioning accuracy inspection

▲Heavy cutting test



▲Dynamic accuracy cutting test ISO 10791-7

▲2-axis accuracy inspection ISO 10791-6

▲Positioning accuracy inspection ISO 10791-4

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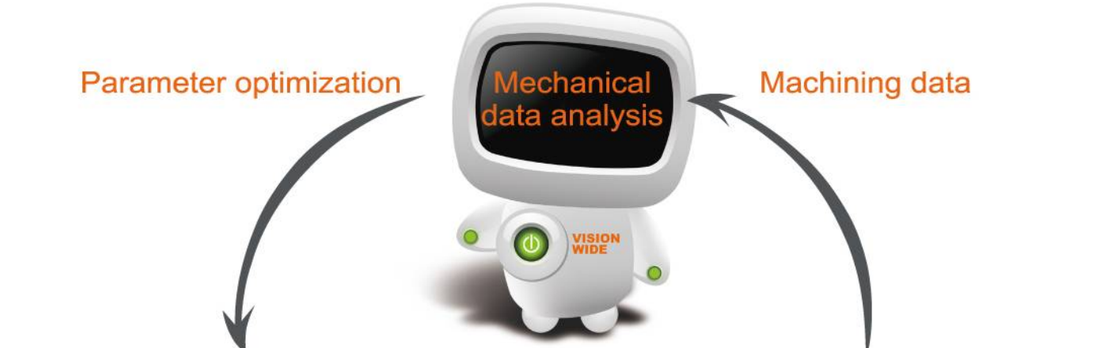
Intelligent Application



IEM
Intelligent Efficiency Management

- Feedrate optimization
- Spindle loading monitoring
- Table loading setting (opt.)

IAM
Intelligent Accuracy Management

- TCPM
- Path optimization
- Thermal compensation (opt.)

VW-FX intelligent software
VW-FX100/VW-FX500

IFM
Intelligent Factory Management

- Machine utilization rate
- Remote real-time monitoring
- Multi-controller connection
- Factory capacity management (opt.)
- Immediate notification alert (opt.)
- Maintenance notification (opt.)

Remote monitoring software
VW-Cloud/VW-Mobile

IOM
Intelligent Operation Management

- Tool/ workpiece measurement
- Parameter/ program management
- Trouble diagnosis
- Simulation before machining (opt.)
- Path interference inspection (opt.)
- Tool life management (opt.)

Anti-collision & machining simulation software
VW-Anti collision

VW-FX
Intelligent Software

VW-FX for Fanuc controller

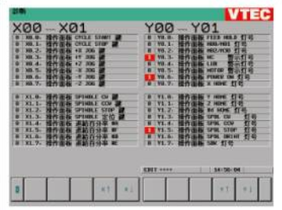
Tool List

- Tool table data
- Tools status refer to ATC

Tool Compensation

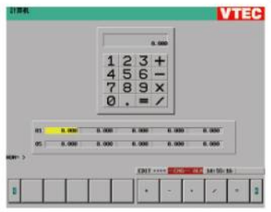
- Tool compensation data
- Tool position
- Utilization rate information

Machine Status



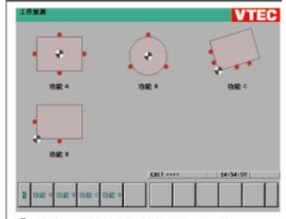
- Fast mappings of I/O and program comment

Calculator



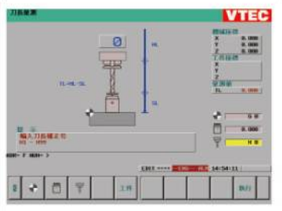
- +, −, ×, ÷ arithmetic operations
- Sine, cosine and tangent function
- 10 sets memory function

Workpiece Measurement



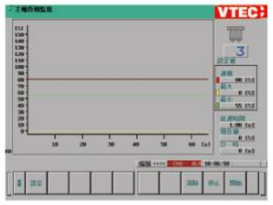
- Rectangle center measurement
- Rectangle corner center & angle measurement between workpiece
- Circle center/ circle radius measurement
- Angle corner center measurement

Manual Tool Length Measurement



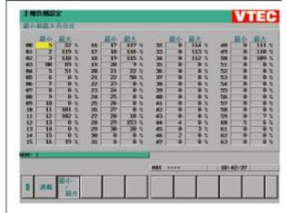
- Fast Z-axis workpiece coordinate/ tool length measurement

Tool Load Manager



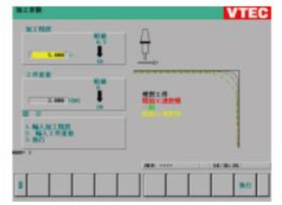
- 1 min. spindle loading status can be recorded
- Each tool spindle loading value can be set
- Machine stops when spindle overloading

AFO Feedrate Optimization



- Max. & min. spindle cutting overloading setting for each tool
- Auto acceleration when spindle lower than the min. overloading value
- Auto deceleration when spindle higher than the max. overloading value

APO Auto Parameter Optimization



- Optimal parameters can be obtained through entering machine accuracy and workpiece weight
- Parameters backup and restore function
- Linear, angular acceleration/ deceleration function, effectively improve angular error

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Intelligent Application /
Remote monitoring software
VW-Cloud/ VW-Mobil
not available for Siemens controller

Machine Status

- +, −, ×, ÷ arithmetic operations
- Machine coordinate/ absolute coordinate/ incremental coordinate
- Running program showing
- G/S/T/M code status
- Spindle speed/ axial feedrate
- Machine boot time
- Machine total machining time
- Single program machining time

Program Transfer

- Program network transfer function (upload/ download)
  PC ⟷ Data Server
  PC ⟷ NC Memory

Alarm Record

- Controller Alarm Record
- Operation record

Compensation Data Transfer

- Tool compensation value
- Worpiece coordinate
- Macro variable

※edit function (opt.)

Server and Spindle Loading Record (opt.)

- Record spindle and server overloading status

Maintenance time auto notification (opt.)

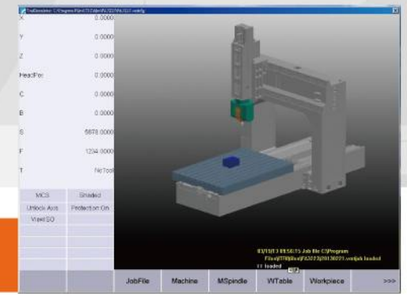
- Maintenance items/ time can be set
- Alarm notification when overtime

Tool Management (opt.)

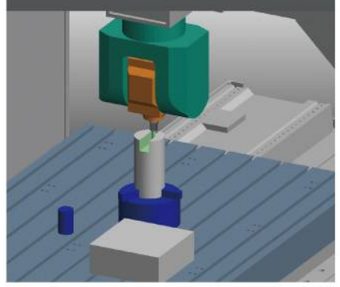
- Tool data and lifetime setting
- Alarm notification when overtime

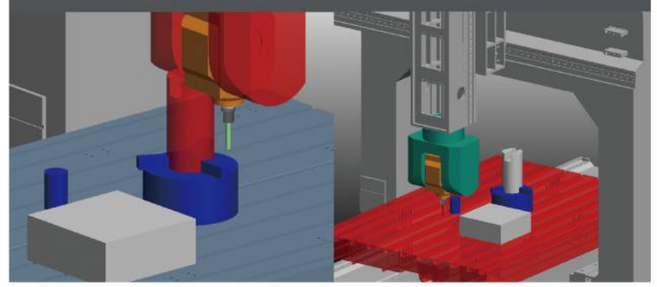
APP VW-Mobile

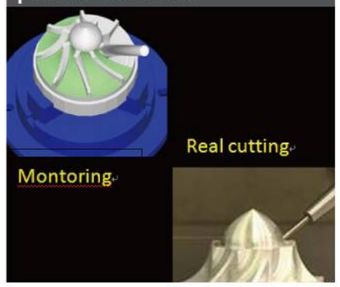

Intelligent Application /
Anti-collision and machining simulation software
VW-Anti collision (opt.)
not available for Mitsubishi controller



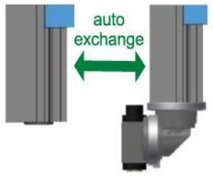
Safety | Efficiency

Online cutting simulation and monitoring

- Sync 3D cutting simulation
- Material removal operation
- Wide angle monitoring and surveillance

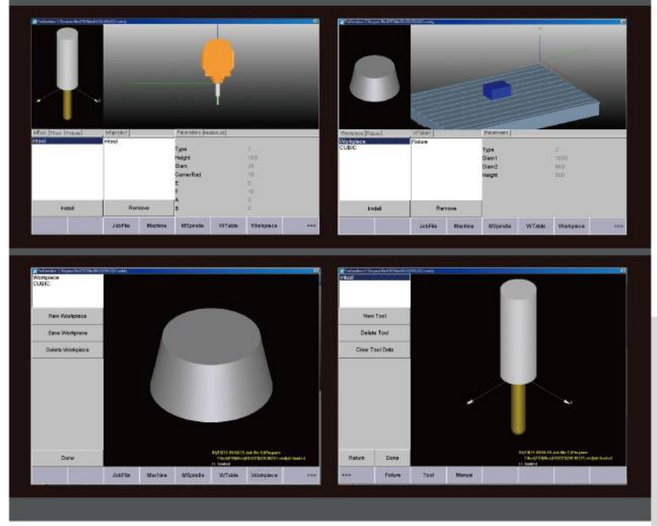
Online Anti-collision Detection and Protection

- Tool, tool shank, workpiece, fixture anti-collision detection
- Hand wheel/ manual/ auto mode anti-collision protection
- Dynamic anti-collision protection zone

Continuous Machining process Validation


- Machining program simulation (online dry run)
- End product and semi-product import and access

Head Attachment Auto Exchange


- Machine head attachment graphic auto switch

Easy and Fast Process

- Built-in machine data
- Complete tool, billet, fixtures geometry editing and installation setting
- Controller origin data synchronization

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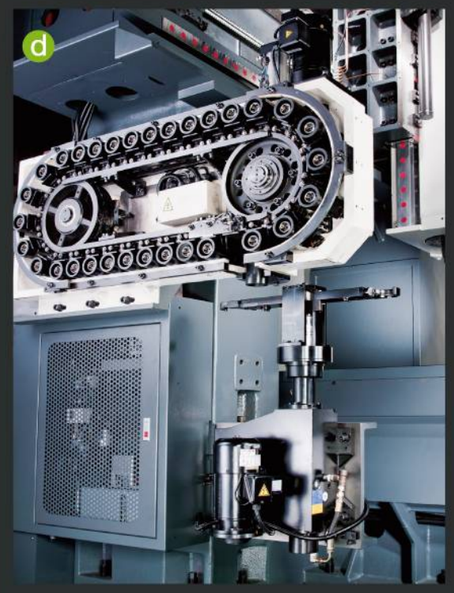
Diversity machining module and function can be equipped with

- a Various types of heads
- b Manual swiveling arm type head bracket (on operation side)
- c Auto swiveling arm type head bracket (on operation side)
- d Arm type ATC



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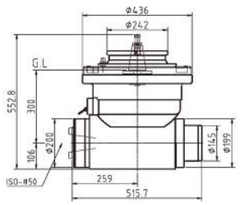
Auto multi-angle head attachment

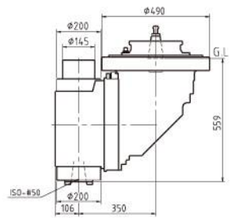
- C-axis auto 5˚/ 1˚indexing
- Large diameter indexing mechanism(Φ400mm)
- Auto tool clamping device
- Flood coolant function
- AC 90˚ angular head with coolant through spindle


AC 90 degree angular head



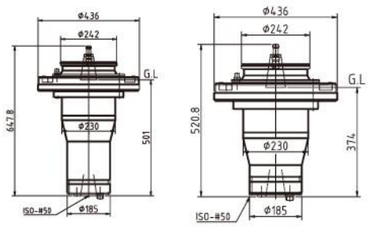
Tool clamping	Auto hydraulic clamping
Head clamping	Auto hydraulic clamping
C-axis indexing	Auto 1˚/ 5˚
Machining coolant	External nozzle/ coolant through spindle(opt.)
Max. power	26 kW
Max. speed	3,000 rpm


AC 2-axis head



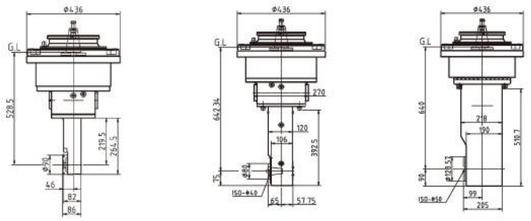
Tool clamping	Auto hydraulic clamping
Head clamping	Auto hydraulic clamping
C-axis indexing	Auto 1˚/ 5˚
B-axis indexing	Auto 5˚(manual1˚/ 5˚)
Machining coolant	External nozzle
Max. power	26 kW
Max. speed	3,000rpm


AC extended head



Tool clamping	Auto hydraulic clamping
Head clamping	Auto hydraulic clamping
Max. power	26kW
Max. speed	4,000rpm

Various types of milling head



Tool clamping	Manual
Head clamping	Auto hydraulic clamping
C-axis indexing	Auto 1˚/ 5˚
Max.power	26 kW
Max. speed	800 rpm

Note: Spindle power must be more than 22/ 26kW while opting head attachments.

Intelligent multi-faced machining

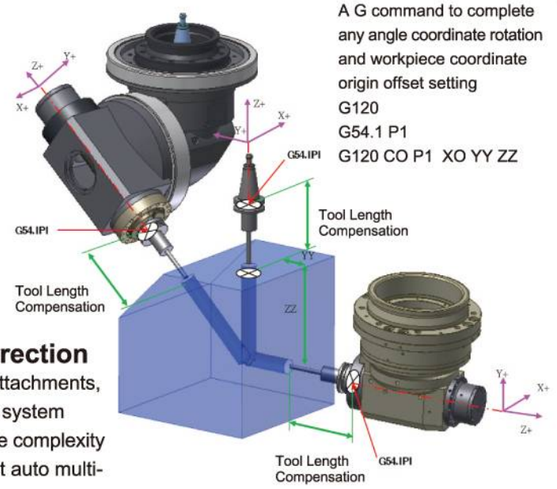
(For AC head attachments)

Tool center point management (TCPM)＜0.04mm

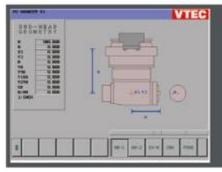
Each type of head attachment with tool center point management, takes vertical workpiece as origin reference, and converts the workpiece coordinates to any new specified plane of workpiece coordinates automatically.

Head attachment dimensions correction

Intelligent compensation on each type of head attachments, rotation center, tool size, workpiece coordinates system correction management, and greatly simplifies the complexity of programming and operation to achieve perfect auto multi-angle machining.

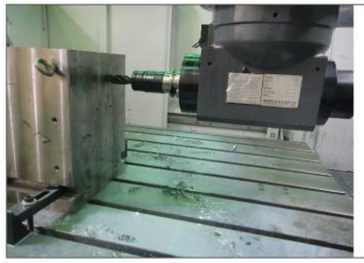


A G command to complete any angle coordinate rotation and workpiece coordinate origin offset setting
G120
G54.1 P1
G120 CO P1 XO YY ZZ



FX500 5-face machining function

- V/H tool diameter correction
- V/H spindle origin correction
- V/H working coordinate affine transformation
- V/H 3D rigid tapping
- V/H manual interrupting



Auto coordinates tool axis 3D conversion

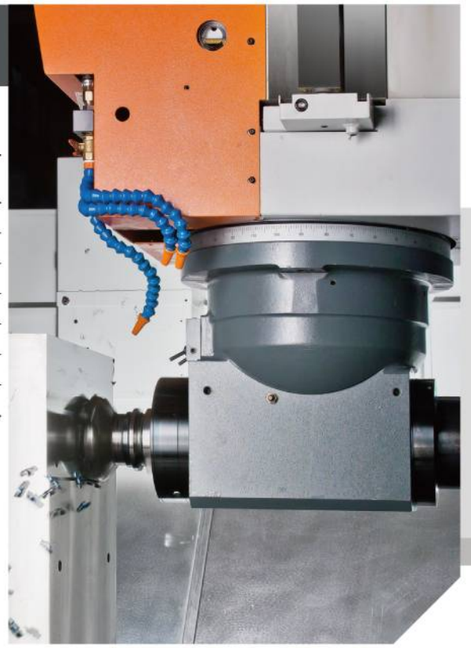
3-axis mechanical coordinates system can be automatically converted to machining coordinates system, easily achieving face milling, end milling, drilling and rigid tapping machining operations.

Heavy cutting ability

test specification: 22/26kW 4,000rpm spindle

Through cutting depth test to show excellent heavy cutting rigidity

Head attachment	Extended head	90 degree angular head	2-axis head
Tool type	BT-50 face milling tool-diameter Φ125/5 edge		
Cutting material	S45C		
Spindle speed(rpm)	600		
Machining width(mm)	100		
Feed rate(mm/min)	1000		
Machining depth	5	7	6
Removal rate(cc/min)	500	700	600



VF series VISION WIDE

Safe, friendly and reliable operation interface

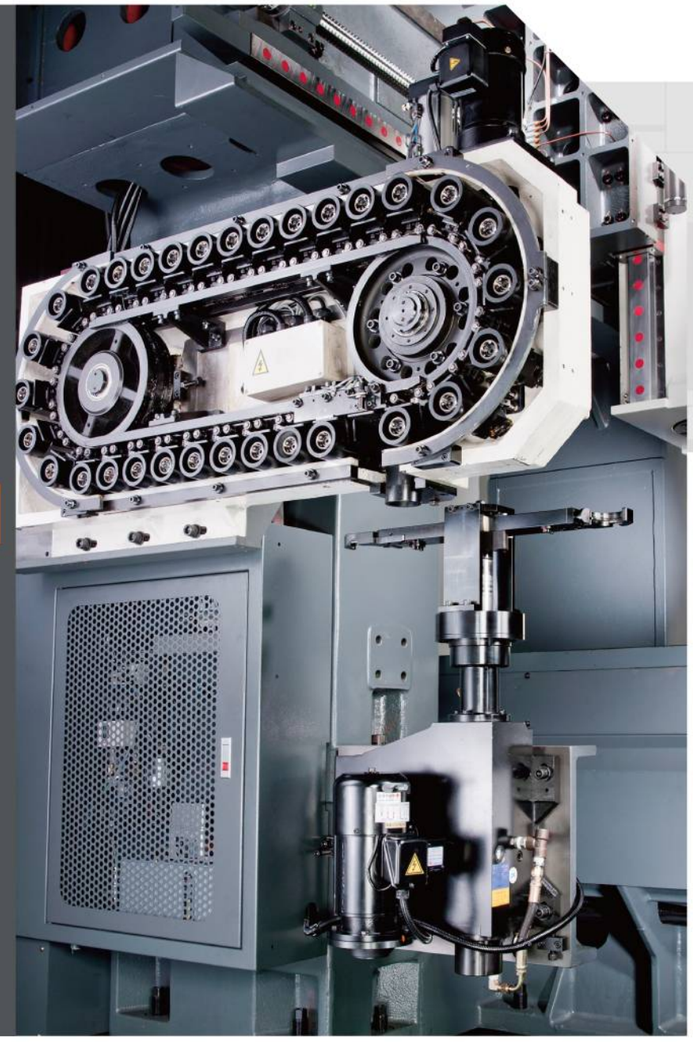
- Safe and reliable electrical circuit design
- CE compliant safety circuit design
- CE compliant EU regulation electrical parts for whole machine
- Auto locking operation door protection switch
- Z-axis retract function at power failure
- Anti-interference design on motor power cables
- Overload and phase protecting device on servo motors
- 3-axis over travel and hard limit protection
- Heat exchanger for electrical cabinet
- Main power protecting device
- EU regulation softkey operation panel
- Ethernet and RS232 interface
- USB port

Sectional type design of sliding door type at operator's side extends the space for workpiece loading. Open-outward doors at both ends of the machine offer safety and large door open space.

▶ Overhead pendulum type operation panel for users offers an easy-measuring, easy-programming, and safe working environment.

VISION WIDE

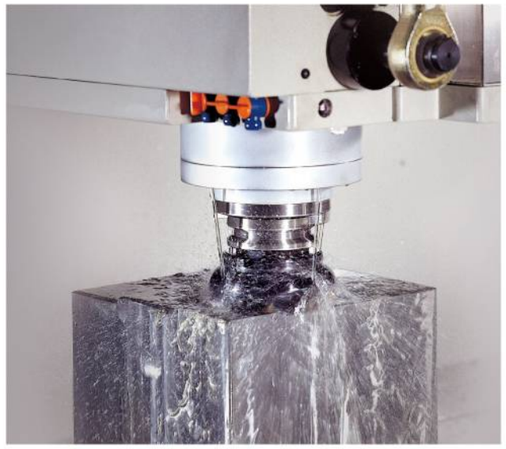
Side-mount tool magazine to save floor space,
40 tools magazine
(60 tools magazine(opt.))
Random tool change and special tool management offer easy cutting operation.



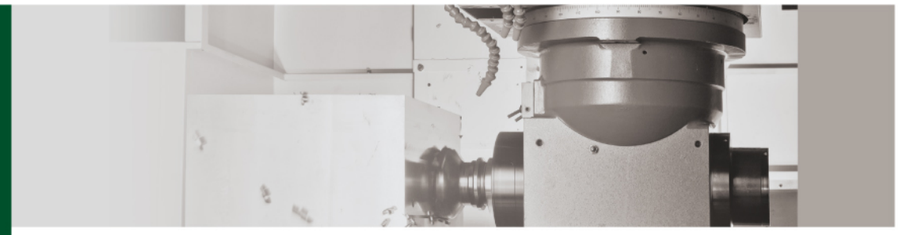
▶ Auto tool exchange, tool to tool 5 sec.

▶ Fast tool length measurement device for mold cutting.

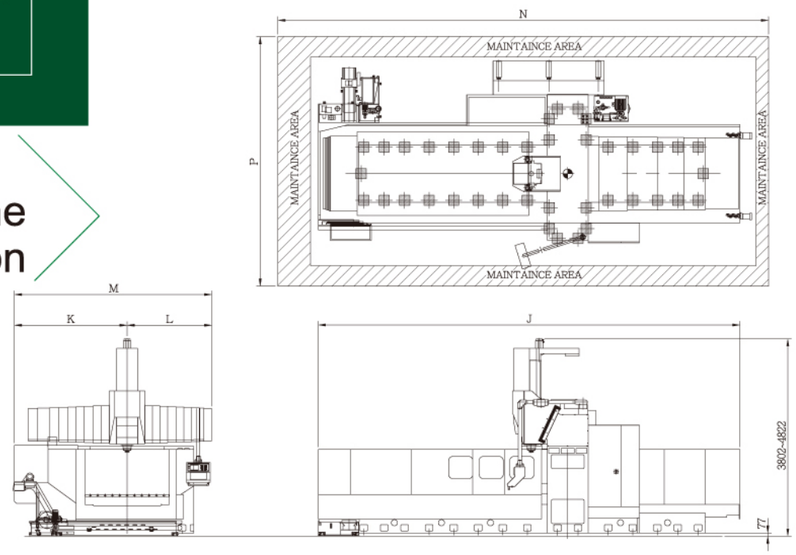
▶ Spindle annular coolant jet efficiently reduces chips and heat in machining.
(opt. for no head attachment)



VF series
VISION WIDE



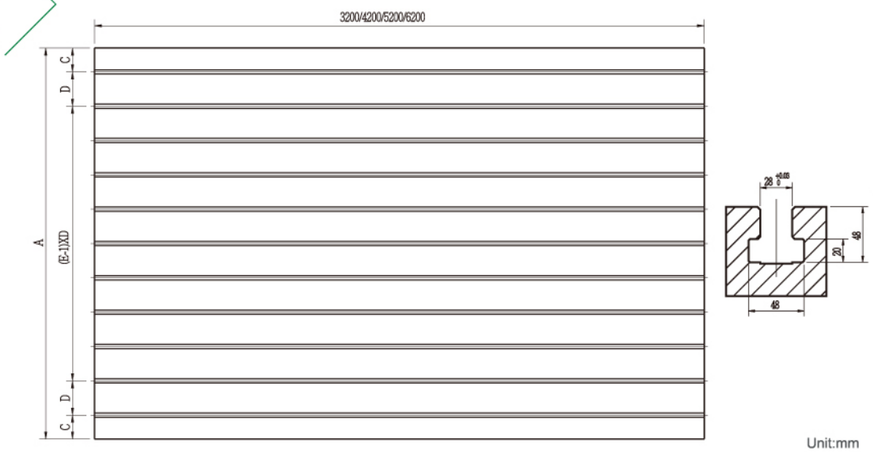
Machine Dimension



Unit:mm

Model	J	K	L	M	N	P
VF-3000	7,480	2,380	2,130	4,860	10,000	6,100
VF-4000	9,480				12,000	
VF-5000	11,480				14,000	
VF-3026	7,480	2,550	2,300	5,200	10,000	6,400
VF-4026	9,480				12,000	
VF-5023	11,480				14,000	

Table Dimension

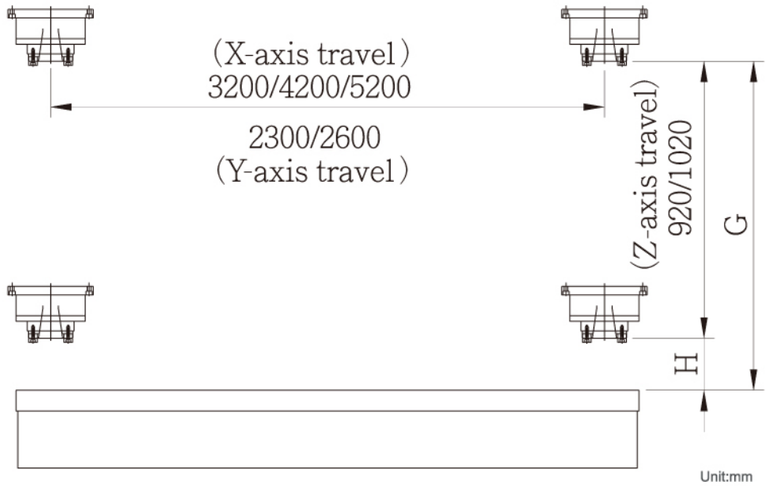


Unit:mm

Model	A	C	D	E(pcs)
VF	2,500	125	180	9

Working Range

Vertical machining zone (without head attachment)

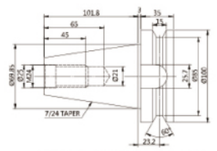


Unit:mm

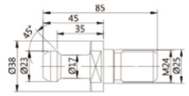
Spindle type	Z-axis travel 920mm	Z-axis travel 1,020mm
H	150	150
G	1070	1170

Tool Shank & Pull Stud Dimension

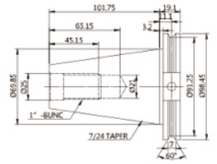
Tool shank / Pull stud



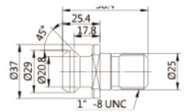
BT-50 MAS403 BT-50



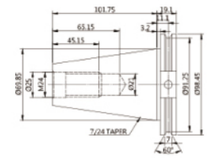
MAS430 P50T-1



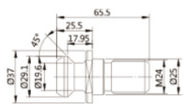
CAT-50 ANSI B5.50 CAT-50 (Imperial units)



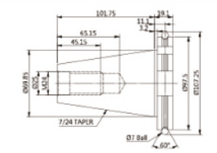
ANSI B5.50



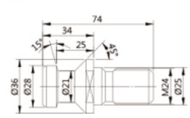
CAT-50 ANSI B5.50 CAT-50 (Metric units)



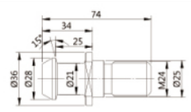
ISO 7388/ 2/ B



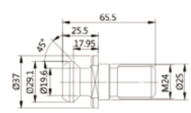
DIN-50 DIN 69871 ; ISO 7388/ 1



DIN 69872



ISO 7388/ 2/ A



ISO 7388/2/B

Machine Specification

VF series

Model			unit	VF-3000	VF-4000	VF-5000	VF-3026	VF-4026	VF-5026
TRAVEL									
X aixs			mm	3,200	4,200	5,200	3,200	4,200	5,200
Y aixs			mm	2,300			2,600		
Z aixs	Box way		mm	900/ 1,020 (opt.)			920/ 1,020 (opt.)		
Distance form spindle nose to table	(2-step gear/ Belt-driven)	Z axis=800	mm	150-1,070			150-1,070		
		Z axis=1,020	mm	50-1,070			50-1,070		
Distance form spindle center to column			mm	390			390		
Distance between columns (port width)			mm	2,400			2,700		
TABLE									
Dimension			mm	3,200x2,050	4,200x2,050	5,200x2,050	3,200x2,050	4,200x2,050	5,200x2,050
T-slot(Width x Number x Pitch)			mm	28x11x180			28x11x180		
Max. table load			kg	11,000	13,000	15,000	11,000	13,000	15,000
SPINDLE									
Spindle motor(cont./30 min. rated)			kW	18.5/ 22 (22/ 26opt.) (30/ 37opt.)			18.5/ 22 (22/ 26opt.) (30/ 37opt.)		
Spindle speed	Box way	2-step gear	rpm	4,000/ 6,000 (opt.)			4,000/ 6,000(opt.)		
		Belt-driven		8,000 (opt.) / 10,000(opt.)			8,000(opt.)/ 10,000(opt.)		
Spindle taper			-	ISO NO.50			ISO NO.50		
FEED									
Cutting feed rate			mm/min	1-7,000			1-7,000		
Rapid traverse			m/min	X/ Y/ Z:12	X: 10 Y/ Z:12		X/ Y/ Z:12	X: 10 Y/ Z:12	
3 axis motor power (FANUC)			kW	X:9 · Y:9 · Z:7			X:9 · Y:9 · Z:7		
ACCURY(X,Y,Z)(Measured by laser instrument)									
Positioning accuracy	Refer to JIS B6333		mm	±0.005/300, ±0.015 Full travel			±0.005/300, ±0.015 Full travel		
	Refer to ISO 10791-2		mm	P0.035		P0.045	P0.035		P0.045
Repeatability	Refer to JIS B6333		mm	±0.003			±0.003		
	Refer to ISO 10791-2		mm	Ps0.028			Ps0.028		
ATC									
ATC capacity			pcs	40/ 60(opt.)			40/ 60(opt.)		
Max. tool weight			kg	18			18		
Tool size (DxL) (Full tools)			mm	Φ125 x 450L			Φ125 x 450L		
Max. tool size (DxL) (next pocket empty)			mm	Φ215 x 450L			Φ215 x 450L		
Tool shank			-	BT 50/ CAT 50			BT 50/ CAT 50		
Pull stud			-	P50T-1			P50T-1		
OTHERS									
Power requirement			kVA	60			60		
Machine net weight			kg	33,400	38,400	43,400	36,400	41,400	46,400
Machine gross weight			kg	37,100	43,400	48,400	40,100	46,400	51,400
Max. space (LxWxH)			m	10.0x6.1x4.7	12.0x6.1x4.7	14.0x6.1x4.7	10.0x6.5x4.7	12.0x6.5x4.7	14.0x6.5x4.7

Standard Accessory

1 FANUC 0iMD controller
2 4,000rpm 2-step gear type spindle
3 Spindle oil cooler
4 Twin hydraulic cylinders with pressured air assistance balacing system
5 X-axis ball screw supporter (4m & above)
6 Centralized auto lubrication system
7 Independent lubricarion oil collector
8 Ball screw cooling system
9 Air blast through spindle
10 Wash gun and pneumatic interface
11 Cutting fluid cooling system
12 40 tools magazine with arm type ATC
13 Enclosed splash guard (without roof)
14 Swiveling arm type operation panel
15 Screw type chip conveyor on table side
16 Caterpillar type chip conveyor
17 Heat exchanger for electrical cabinet
18 Working lamp
19 Operation cycle finish and alarm light
20 Movable manual pulse generator
21 Footswitch for tool clamping
22 RS232 and RJ45 interface
23 XYZ-axis absolute pulse coder feedback
24 XYZ-axis travel hard limits protection
25 Spindle cutting load software protection
26 Remote monitoring software-Standard (Not available for Siemens controller)
27 Auto power off
28 Vision Wide FX graphical user interface
29 Foundation pads and bolts kits
30 Adjustment tool and tool kits
31 Technical manuals(operation, maintenance manual and circuit diagram)

Optional Accessory & Function

1 6,000rpm 2-step gear type spindle
2 8,000/ 10,000rpm belt-driven spindle
3 Z-axis travel 1,020mm
4 200/ 300/ 400/ 500mm higher column
5 Interface preparation for coolant through spindle system
6 Coolant through spindle system 20/70 bar(Vertical spindle)
7 Coolant through tool holder interface (Hydraulic device and electrical interface)
8 Coolant through tool holder 5/20 bar cutting fluid interface
9 Oil skimmer
10 Oil mist cooling device
11 Spindle ring cutting coolant device (for no head attachment)
12 60 tools magazine with arm type ATC
13 Enclosed splash guard with roof
14 Chip auger on table side
15 Chip cart
16 Air conditioner for electrical cabinet
17 XYZ-axis linear scale feedback
18 3 axis independent manual pulse generator
19 Sub working table
20 Rotary table
21 Interface preparation for fourth axis (Hydraulic device and electrical interface)
22 Z-axis retract function at power failure
23 Anti-collision and machining simulation software
24 Remote monitoring software-Professional (Not available for Siemens controller)
25 Auto tool length measurement
26 Auto workpiece measurement
27 Transformer
28 Auto warm up

Optional accessory for auto head attachment

1 Auto AC90 degree angular head/ AC 2-axis head/ AC extended head
2 Auto AC milling head/ small head/ customized head attachment
3 Manual 90 degree angular head/ universal head/ extended head
4 Manual swiveling arm type head bracket on operation side(one head attachment)
5 Auto swiveling arm type head bracket on operation side (one head attachment, one cover)
6 AC90 degree angular head coolant through spindle system 20bar

VISION WIDE