

# **A-12/A-14**

**Vertical Machining Center**

*Unique Design Of Four Roller-Rail Linear Guide Ways For The Ultimate Support*



# A12

## Vertical Machining Center

The overall design of A12/A14 series is to achieve the best balance of structure rigidity, machining speed, and output efficiency for various industries, such as automobile and aerospace etc. This series of machines feature 8,000 rpm pulley-drive spindle for BT-40 and BT-50 as standard, and have 10,000/12,000/15,000 rpm direct-drive spindle for BT-40, and 6,000 rpm gear-drive spindle with BT-50 as options. The options on the spindle offer extensive flexibility and supports for various machining applications.



### **A-12**

**X/Y/Z Traverse 1200/700/700mm**  
**ATC type/Arm type 24 tools magazine**  
**BT40 PulleyDrive 8000rpm (standard)**  
**BT40 Direct Drive 10000/12000/15000rpm (option)**  
**BT50 Pulley Drive 8000rpm (standard)**  
**BT50 Gear Drive 6000rpm (option)**

# A-14

## Vertical Machining Center

All three axes adopt high precision 45mm roller-rail linear guideways and Ø45mm ball screws. A12/A14's unique four roller-rail linear guide ways with eight sliders on the Y axis enable the ultimate support for high speed and machining accuracy. With Meehanite cast iron across the machine structure, machine column and saddle are carefully designed with dual layers casting for the most rigid structure to absorb cutting vibration.



### **A-14**

**X/Y/Z Traverse 1400/700/700mm**

**ATC type/Arm type 24 tools magazine**

**BT40 Pulley Drive 8000rpm(standard)**

**BT-40 Direct Drive 10000/12000/15000rpm (option)**

**BT-50 Belt Pulley Drive 8000rpm (standard)**

**BT-50 Gear Drive 6000rpm (option)**

# High-Rigidity Structure Design

## Synchronously Adopt the Advantages of the European & Japanese Design

- 954mm wide-span rigid column.
- Taiwan-made PMI extra-large 45mm precise roller- rail linear guide way.
- Adopt high-end direct motors and high rigidity couplings in three axes.

## Moer Powerful Z-axis Motor

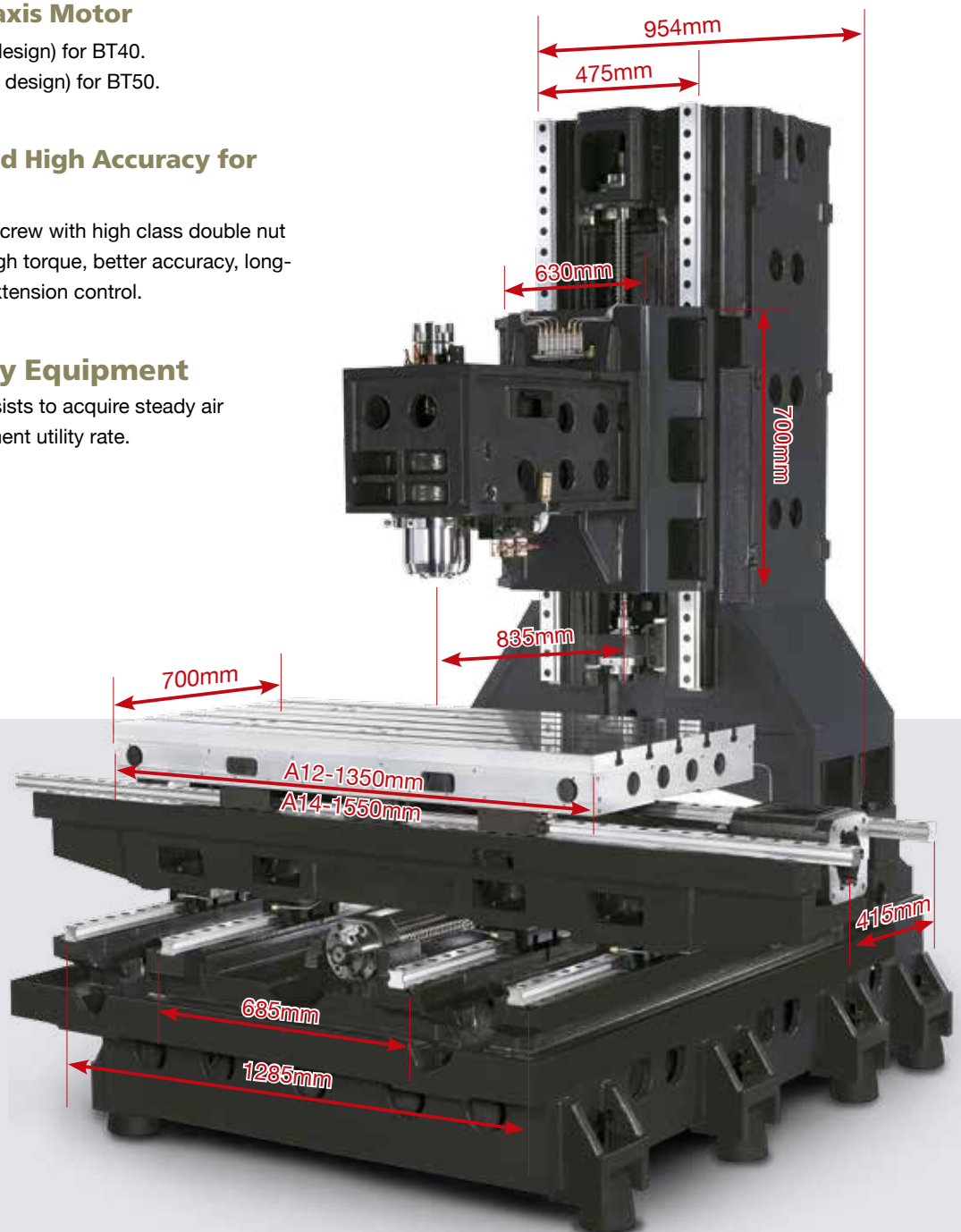
- 7kw (no counter balance design) for BT40.
- 7kw (with counter balance design) for BT50.

## High Reliability and High Accuracy for Ballscrew Design

Ø45mm Pitch 12 C3 ball screw with high class double nut provides strong rigidity, high torque, better accuracy, long-life, and effectively heat extension control.

## Stable Air Supply Equipment

The gas storage barrel assists to acquire steady air source to increase equipment utility rate.





### Design with More Sliders and More Stable Support for X, Y, and Z axis

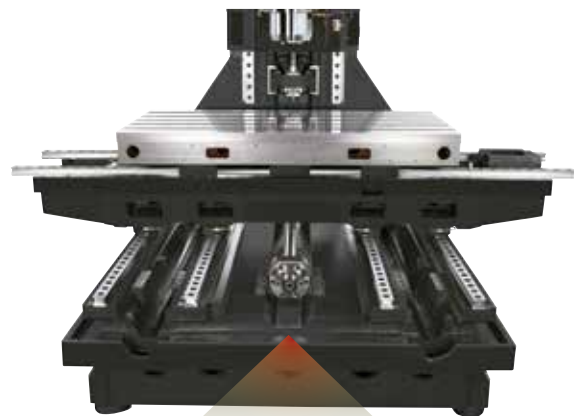
X & Z axes adopt 45mm width roller-rail linear guide ways including 2 tracks, and each track has 3 sliders (total 6 sliders)  
 Y axis adopts 45mm width roller-rail linear guide ways, 4 tracks, each track with 2 sliders (total 8 sliders)



### Design with More Screw-Type Chip Augers for Y axis

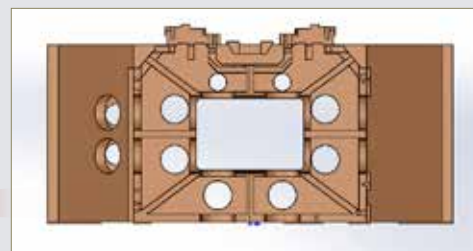
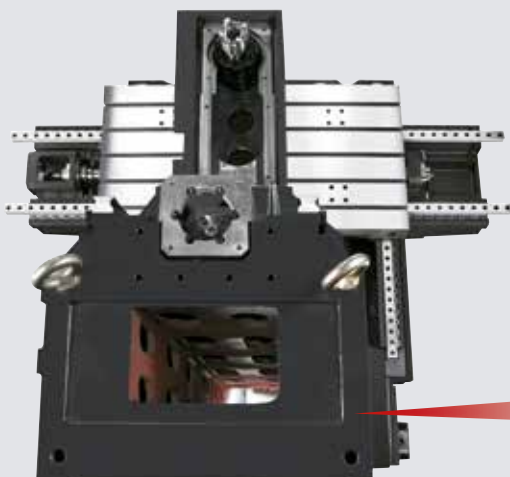
screw-type chip augers on Y axis to increase the chip removable capacity.

### Enlarge Saddle Pads to Enhance the Support for the Table.



### Box-Type Dual-Layers Casting Column

The unique column design achieves the ultra-excellent rigidity to minimize cutting induced vibration and deformation.



# Aesthetics

## Fully Splash Guard (optional)



### Calibration with Laser Interferometer was Performed and Certified

Agma conduct 100% inspection to full travel length of three axes. Standard VDI 3441 3  $\delta$  is employed to ensure the machine accuracy and righteous of the inspection. For each axis, inspection along full axial travel length backwards and forwards for 6 times is conducted.

## Cutting Capability (A-12 BT-40 Direct Driven)



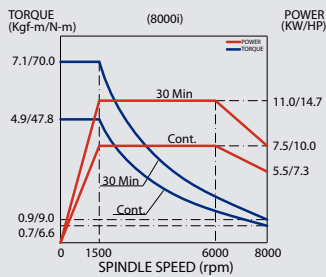
Workpiece Material : A6061 T6  
 Spindle Speed : 12,000rpm  
 Cutting Feedrate : **24,000mm/min.**  
 Cutter :  $\phi 12 \times 3$ Flutes End Mill for Aluminum  
 Depth of cut : 12 mm  
 Width of cut : 1.8 mm



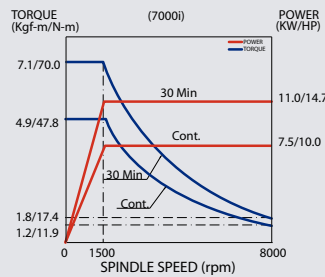
Workpiece Material : S45C  
 Spindle Speed : 2,919rpm  
 Cutting Feedrate : **730mm/min.**  
 Cutter :  $\phi 12 \times 4$ Flutes End mill  
 Depth of cut : 14 mm  
 Width of cut : 12 mm

## FANUC Spindle Torque Drawing

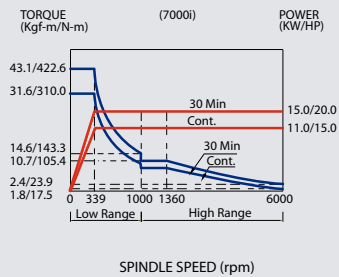
BT40-Pulley driven  $\alpha$  8/8000i  
 Spindle:8000 rpm BT40



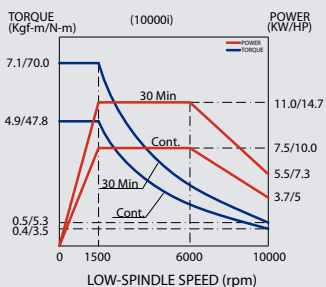
Spindle:8000 rpm BT50-BELT



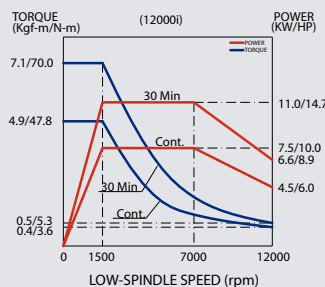
Spindle:6000rpm BT50-GEAR



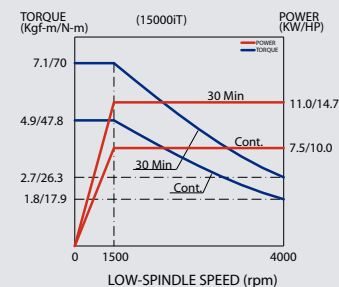
Spindle:10000 rpm BT40



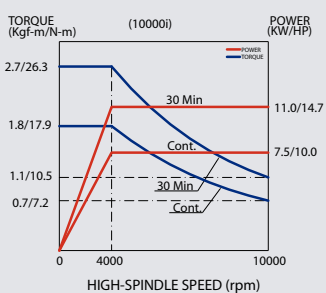
Spindle:12000 rpm BT40



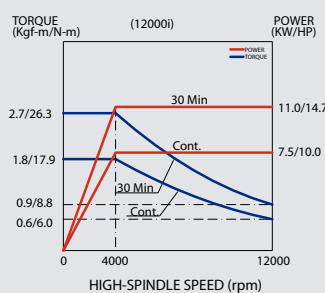
Spindle:15000 rpm BT40



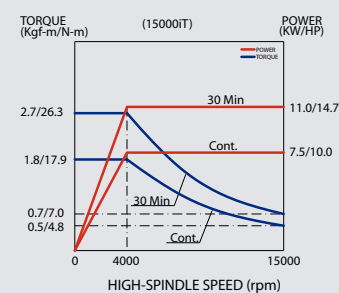
Spindle:10000 rpm BT40



Spindle:12000 rpm BT40



Spindle:15000 rpm BT40



# A12/A14

## Standard and option accessories



Hinge Type Chip Conveyor (option)



XYZ-Axis Optical Linear Scale (Optional Accessories)



Spindle ring sprinkler



Thin-film panel



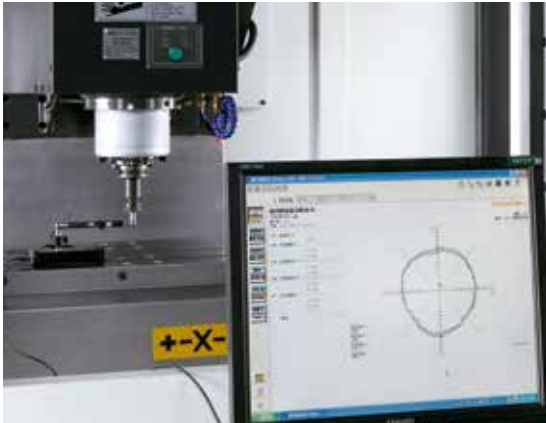
Oil Circulating Coolant System for Spindle



### Fluorescent Light & Quartz Work Light

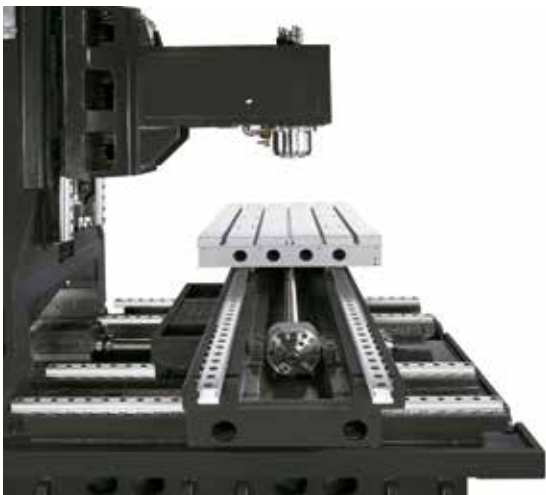
The fluorescent light is installed with the fully enclosed splash guard and it is located on the left hand corner, and the quartz work light is installed on the right hand upper corner to provide a well-lit table area.





### Renishaw Ballbar System

Carry out a three dimensional circular test and optimal adjustment.



### Precision Roller Rail (standard) Linear Guideways and C3 Class Ball Screws for Three Axes

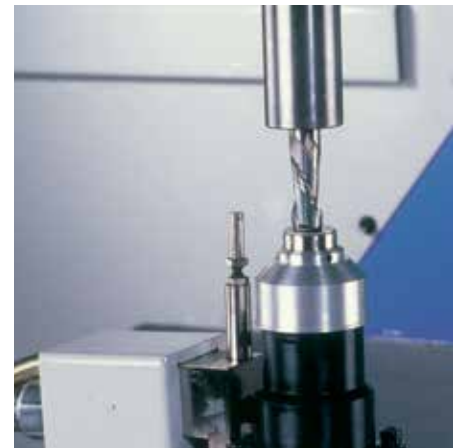
Roller-rail linear Guide ways are used on all three axes. Because of the high rigidity, low noise, and low friction, the machine can perform high-speed rapid movement and excellent circular accuracy. Double nut C3 class precision ballscrews are used on all three axes. Along with pretension double nut and supports to minimize the backlash and to compensate the error caused by temperature variation to maintain high position accuracy.



Oil Skimmer (option)



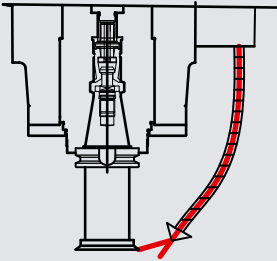
Chassis Chip flushing (Standard)



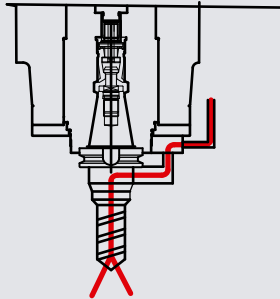
Tool Setup Probe (Tool Setter) (option)

# A12/A14

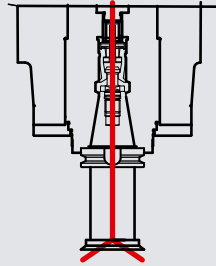
**Std.-Directional Pipe  
Purpose-General**



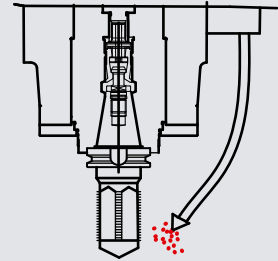
**Opt.-Oil Hole Holder  
Purpose-Drilling, Boring, etc.**



**Opt.-Coolant Through Spindle(CT.S.)  
Purpose-Drilling, Boring, etc.**

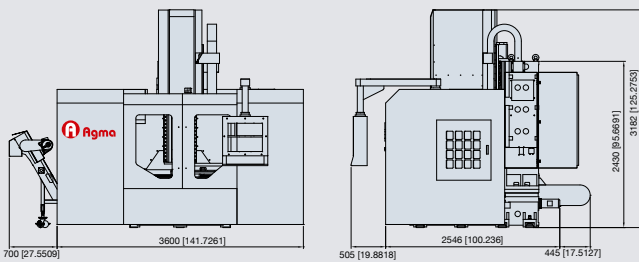


**Opt.- Oil Mist  
Purpose-Tapping, Reaming, etc.**

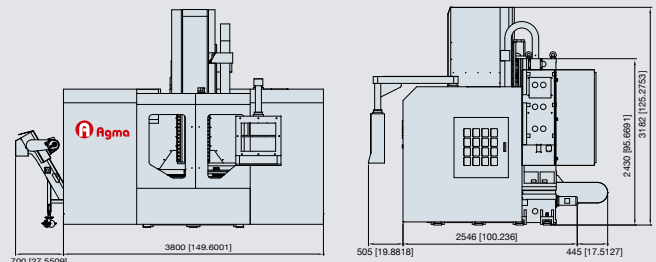


## Machine Layout

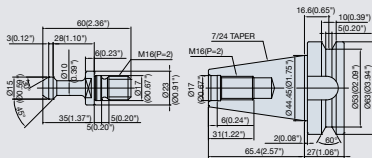
**A12**



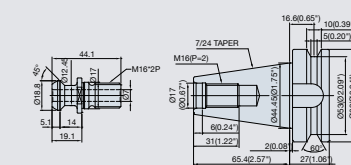
**A14**



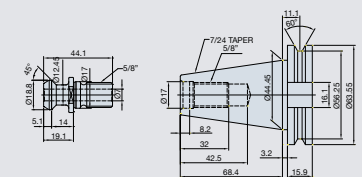
**BT-40 Toolholder Figure**



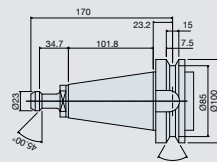
**MAZAK BT-40 Toolholder  
Figure (coolant through spindle)**



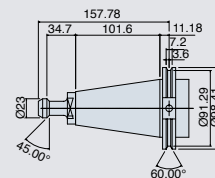
**CAT-40 Toolholder Figure  
(coolant through spindle)**



**BT-50 Toolholder**

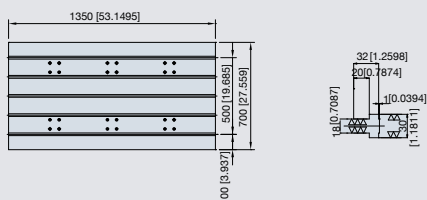


**CAT-50 Toolholder**

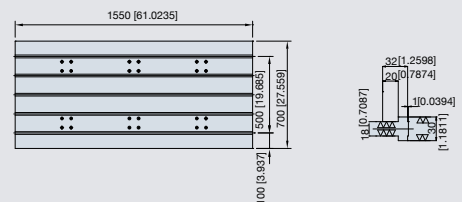


## Table Dimension

**A12**



**A14**



Model / Item	Unit	A-12	A-14
<b>Spindle</b>			
Spindle Taper		NO.40/NO.50	
Transmission		Belt Driven (BT-40)/ Belt Driven (BT-50)	
Spindle Speed	r.p.m.	P8000 (BT-40)/P8000 (BT-50)	
Spindle Diameter	mm	150 (BT-40)/190 (BT-50)	
<b>Table</b>			
Table Size	mm	1350 x 700	1550 x 700
T-Slot	mm	5x18x125	
Max. Table Load	kgs	1200	1400
<b>Travel &amp; Feedrate</b>			
X Axis	mm	1200	1400
Y Axis	mm	700	
Z Axis	mm	700	
Distance from Spindle Nose to Table	mm	120 ~ 820	
Distance from Spindle Center to Surface of Column Way	mm	820	
Rapid Traverse (X/Y/Z)	M/Min	X,Y,Z:32/32/24	
Cutting Feedrate	mm/min	X,Y,Z: 1 ~ 10,000	
<b>ATC</b>			
Tool Shank		BT-40/BT-50	
Pull Stud		MAS P40T-1(45° )/MAS P50T-1(45° )	
Magazine Capacity	pcs	24	
Max. Tool Diameter (Full Storage)	mm	φ 80/ φ 125(for BT-40)/ φ 125/ φ 250 (for BT-50)	
Max. Tool Length	mm	300	
Max. Tool Weight	kgs	6 (BT-40)/15 (BT-50)	
ATC Type		Arm Type	
<b>Motor</b>			
For Spindle (Cont./30 min)	Kw	7.5/11(10/15) BT-40/ 11/15(15/20) BT-50	
X/Y/Z Axis	Kw	4 / 4 / 7	
<b>Ball screw</b>			
X Axis (Diameter/Pitch/Accuracy)		φ 45/P12/C3	
Y Axis (Diameter/Pitch/Accuracy)		φ 45/P12/C3	
Z Axis (Diameter/Pitch/Accuracy)		φ 45/P12/C3	
Triaxial Bearings (Motor End / Bearing End)		35TAC72B/(4/2)	
<b>Three axes linear guide way</b>			
X Axis		45mm Width Roller Linear Guideways / 3 Slider / 2-Track	
Y Axis		45mm Width Roller Linear Guideways / 2 Slider / 4-Track	
Z Axis		45mm Width Roller Linear Guideways / 3 Slider / 2-Track	
<b>Misc.</b>			
Machine Height	mm	3200	3200
Machine Space	mm	3600*3350	3800*3350
Machine Weight	kgs	8450	8650
Controller		OiMF	

## Standard Accessories :

- 1.FANUC OiMF 8.4" Controller
- 2.Heat Exchanger for Electric Cabinet
- 3.Program Execution/End/Abnormal Three Color Indite Light
- 4.Quartz Work Lamp
- 5.Fluorescent Lamp
- 6.RS-232 Interface
- 7.Oil Circulating Coolant System for Spindle
- 8.Spindle Air Blast
- 9.Automatic Lubrication Equipment
- 10.Protection Device for Three Axes Slide Ways
- 11.Full Splash Guard
- 12.Rigid Tapping
- 13.Auto Power Off
- 14.Y-Axis Screw Type Chip Auger (4 pcs)
- 15.Tool Box w/Leveling Bolt
- 16.Machine and Electric Operation Manual
- 17.(380/220V) Transformer (Exclude India, USA and Canada)
- 18.CE/CSA Electrical Specification (For European/Canada Only)

## Optional Accessories :

- 1.FANUC 31iMB Controller
- 2.Mitsubishi 70/720/730M controller
- 3.Direct Driven Spindle  
10,000/12,000/15,000RPM (BT-40)
- 4.Gear Driven Spindle 6,000rpm (BT-50)
- 5.Coolant-Thru Tool Holder
- 6.Three Axes Optical Linear Scale
- 7.Oil Mist
- 8.Oil Mist Collector
- 9.Coolant Through Spindle A Type (20 Bars)
- 10.Renishaw TS-27R Tool Setup Probe (Tool Setter)
- 11.Disc Type Oil Skimmer
- 12.CNC Rotary Table
- 13.Air Conditioning Equipment for Electric Cabinet
- 14.4Th Axis Interface



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