

TCV Series

HIGH PERFORMANCE TRAVELING COLUMN
VERTICAL MACHINING CENTER



TCV *Series*

With the installation of dividing wall in the work area, the TCV series can implement machining and set up workpiece simultaneously. It is specially engineered for long workpiece and with its ultra high feedrate and efficiency, it is suitable for aerospace, automotive and job shop applications.



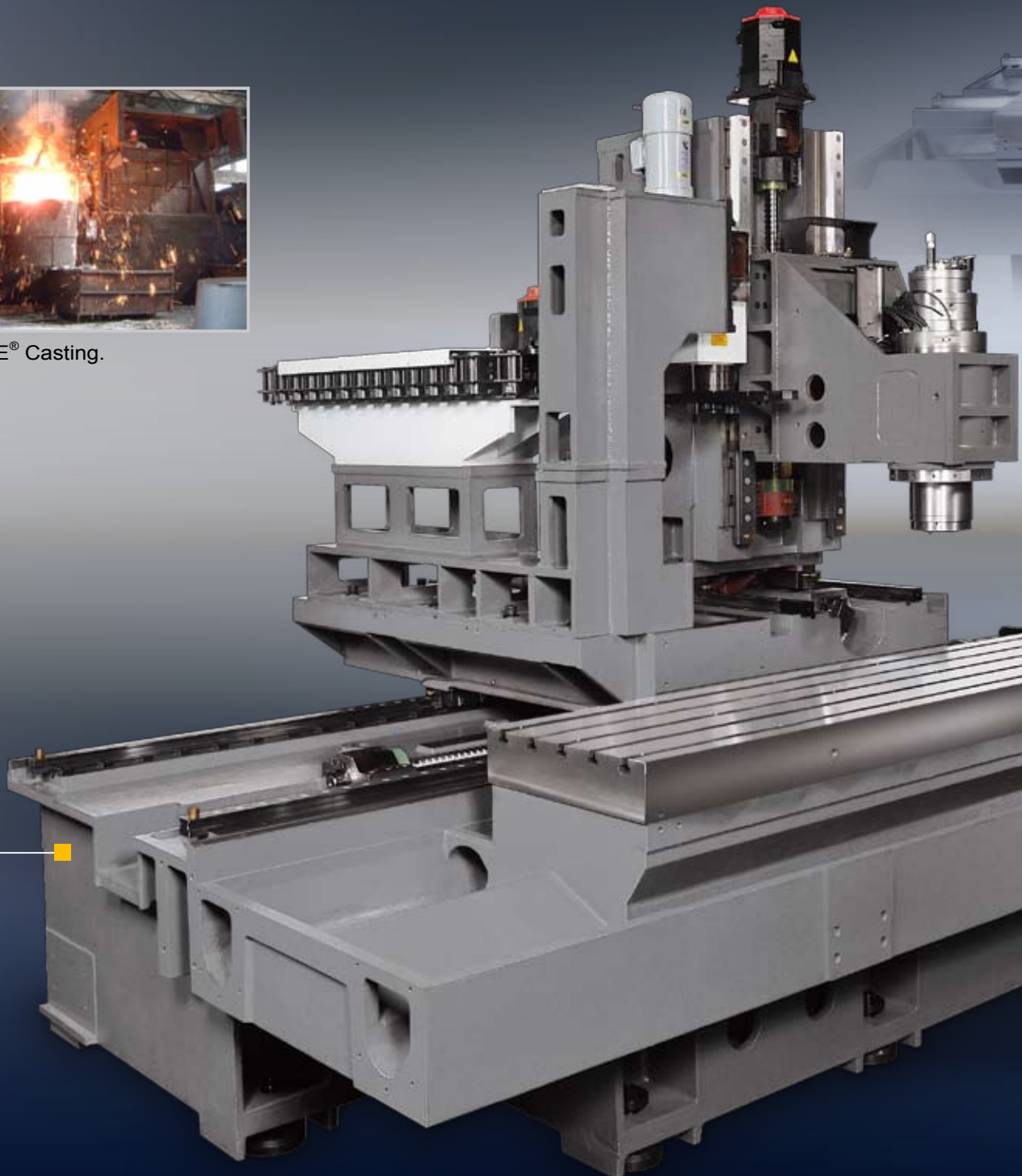


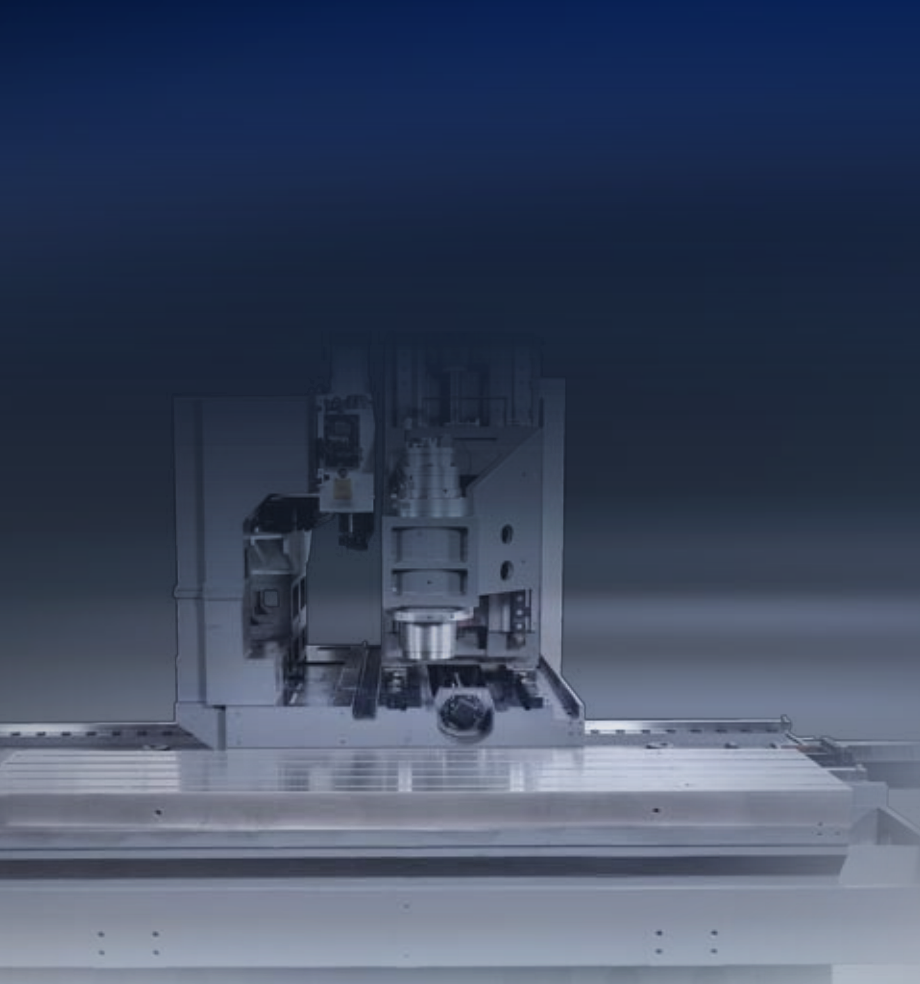
TCV2000A

With the traveling column and fixed table design, TCV2000A provides a wide machining area with minimum tool interface.



■ MEEHANITE® Casting.





- Fixed Work Table Ensures The Best Possibility of Dynamic Leveling, Eliminates Parts Movement on The Axes and Greatly Improves Precision as Well.



- Extra Guideway Blocks Support ATC Magazine to Ensure Smooth and Stable Movement.



- Circulated Cooling System Design on X-axis Ensures Stable Temperature and Optimal Accuracy.



- All 3 Axes Are Equipped With High Rigidity Roller Type Guideways.
- Capable of Reaching Up to 40m/min. Rapid Feedrate and 0.8g Axial Acceleration.



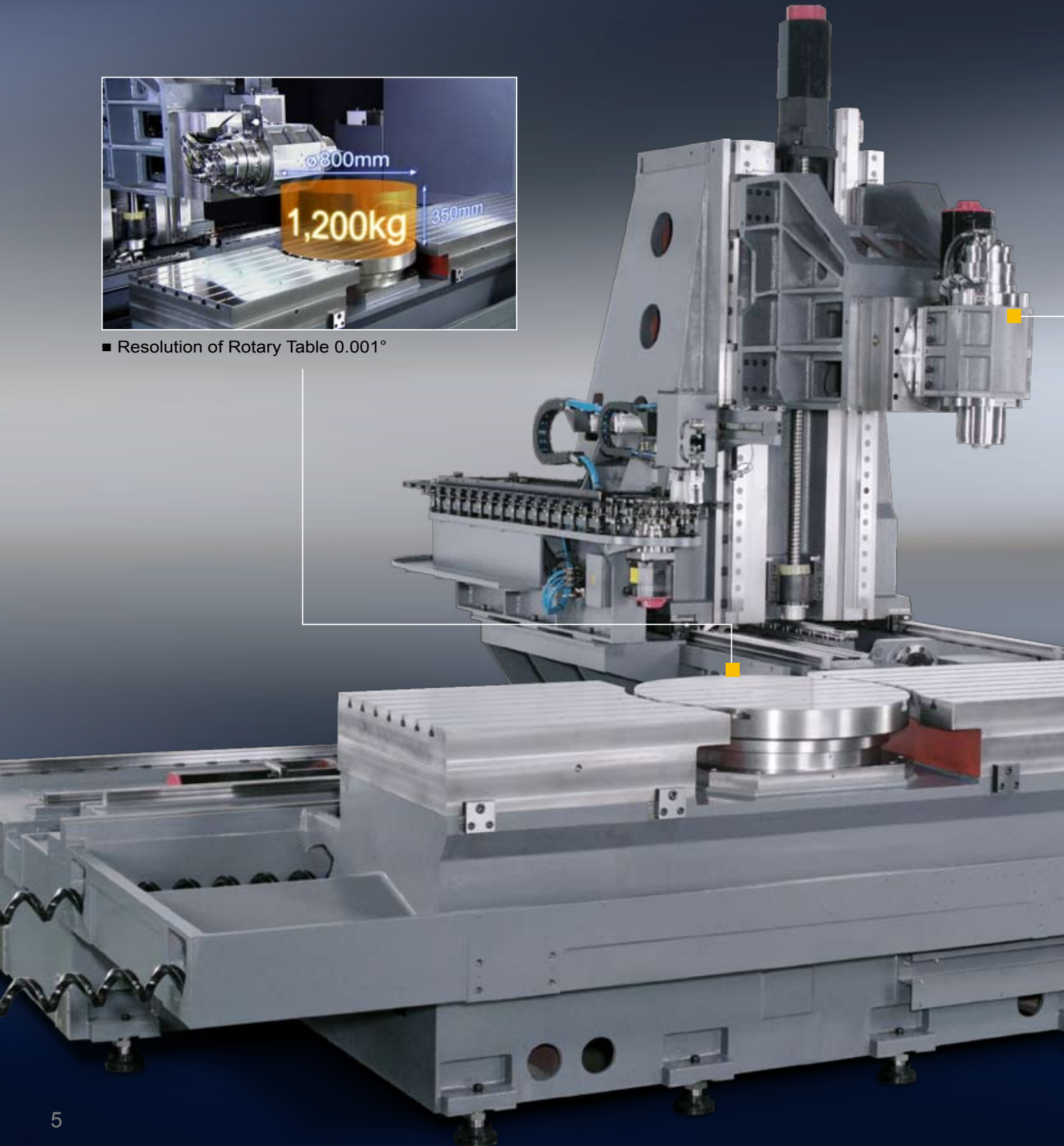
HEIDENHAIN Linear Scales (opt.)

TCV3000A-5AF

Design with low backlash swivel head and rotary table, TCV3000A-5AF achieves all of your challenging job requirements.



■ Resolution of Rotary Table 0.001°



110°

110°

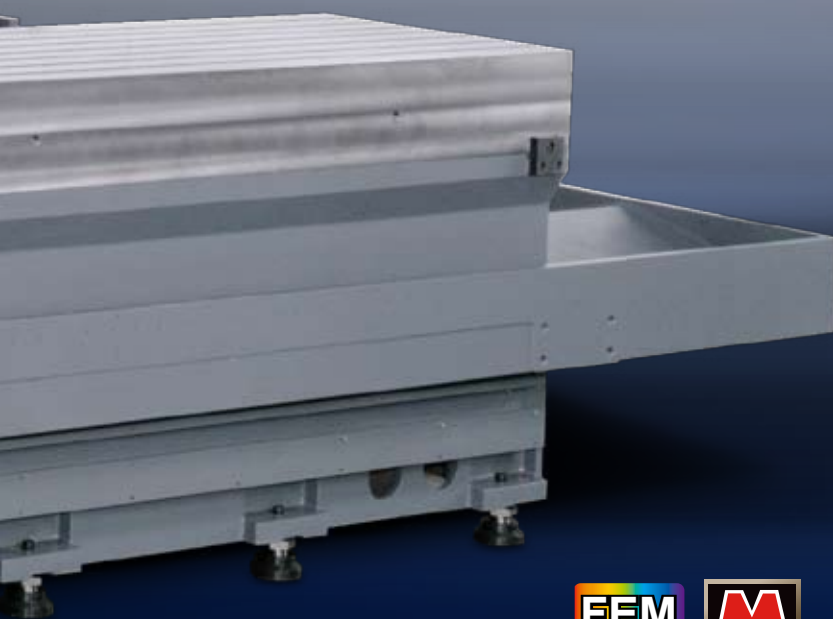
Swivel Angle (B-axis)

33.3/100rpm

Max. Speed (B/C axis)

< 10sec.

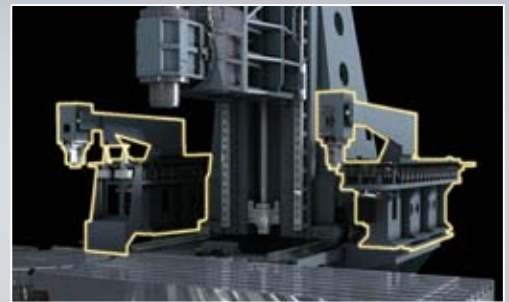
Positioning Accuracy (B/C axis)



HEIDENHAIN Linear Scales (opt.)



■ Dual Working Areas for Machine Flexibility.



■ Tool Magazine 80T. (opt.)



■ Dual Motor Design on X-axis.



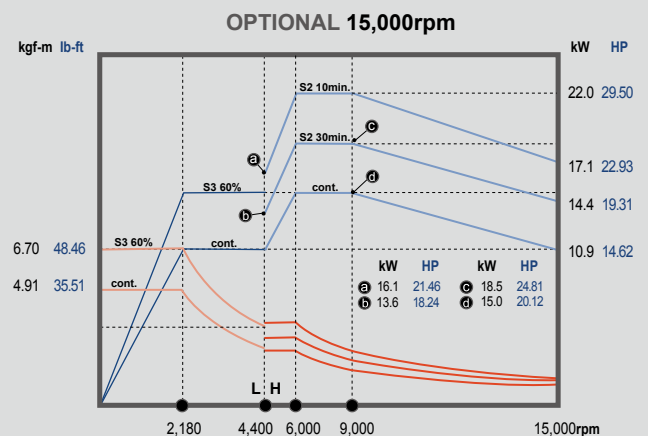
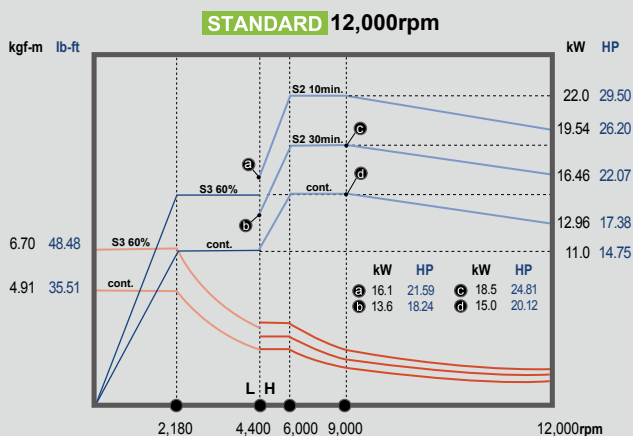
■ Step X-axis Guideways Design with Ultra High Rigidity.

INTEGRAL SPINDLE MOTOR

- Up to 12,000rpm spindle speed and 22 kW **30HP** outputs offers extremely low vibration.
- BBT40 double contact spindle taper greatly enhances machining accuracy.



POWER CHART



SPINDLE SPEED (std.)

POWER L Low Speed H High Speed TORQUE L Low Speed H High Speed

SPINDLE SPEED (opt.)

POWER L Low Speed H High Speed TORQUE L Low Speed H High Speed

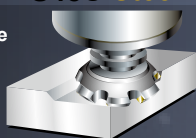
CUTTING TEXTS

TCV2000A

FACE MILL S45C Steel

Material Removal Rate

600
cc/min.

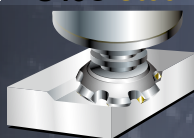


Tool $\phi 63\text{mm} \times 5\text{T}$
Spindle Speed 2,180rpm
Feedrate 10,000mm/min.
Width of Cut 60mm
Depth of Cut 1mm

FACE MILL S45C Steel

Depth of Cut

4
mm

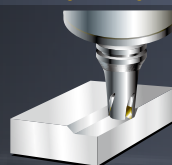


Tool $\phi 80\text{mm} \times 5\text{T}$
Spindle Speed 600rpm
Feedrate 450mm/min.
Width of Cut 60mm
Material Removal Rate 108cc/min.

END MILL Aluminum

Material Removal Rate

2,080
cc/min.



Tool $\phi 40\text{mm} \times 4\text{T}$
Spindle Speed 12,000rpm
Feedrate 20,000mm/min.
Width of Cut 32mm
Depth of Cut 3.25mm

END MILL S45C Steel

Depth of Cut

4
mm

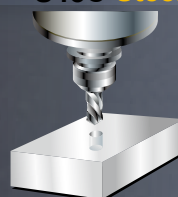


Tool $\phi 32\text{mm} \times 3\text{T}$
Spindle Speed 1,500rpm
Feedrate 675mm/min.
Width of Cut 25mm
Depth of Cut 4mm

DRILL S45C Steel

Cutter Diameter

$\phi 45$
mm

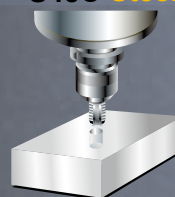


Tool $\phi 45\text{mm}$
Spindle Speed 2,180rpm
Feedrate 218mm/min.

TAP S45C Steel

Max. Tapping

M24



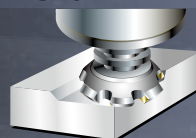
Tool M24
Spindle Speed 60rpm
Feedrate 180mm/min.

TCV3000A-5AF

FACE MILL S45C Steel

Depth of Cut

3.5
mm

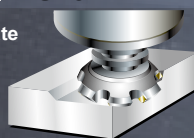


Tool $\phi 80\text{mm} \times 5\text{T}$
Spindle Speed 600rpm
Feedrate 450mm/min.
Width of Cut 65mm
Depth of Cut 3.5mm

FACE MILL S45C Steel

Material Removal Rate

600
cc/min.

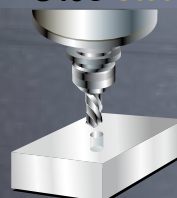


Tool $\phi 63\text{mm} \times 6\text{T}$
Spindle Speed 2,180rpm
Feedrate 10,000mm/min.
Width of Cut 60mm
Depth of Cut 1mm

DRILL S45C Steel

Cutter Diameter

$\phi 49$
mm

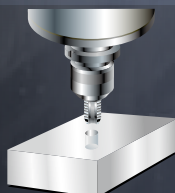


Tool $\phi 49\text{mm}$
Spindle Speed 2,180rpm
Feedrate 218mm/min.

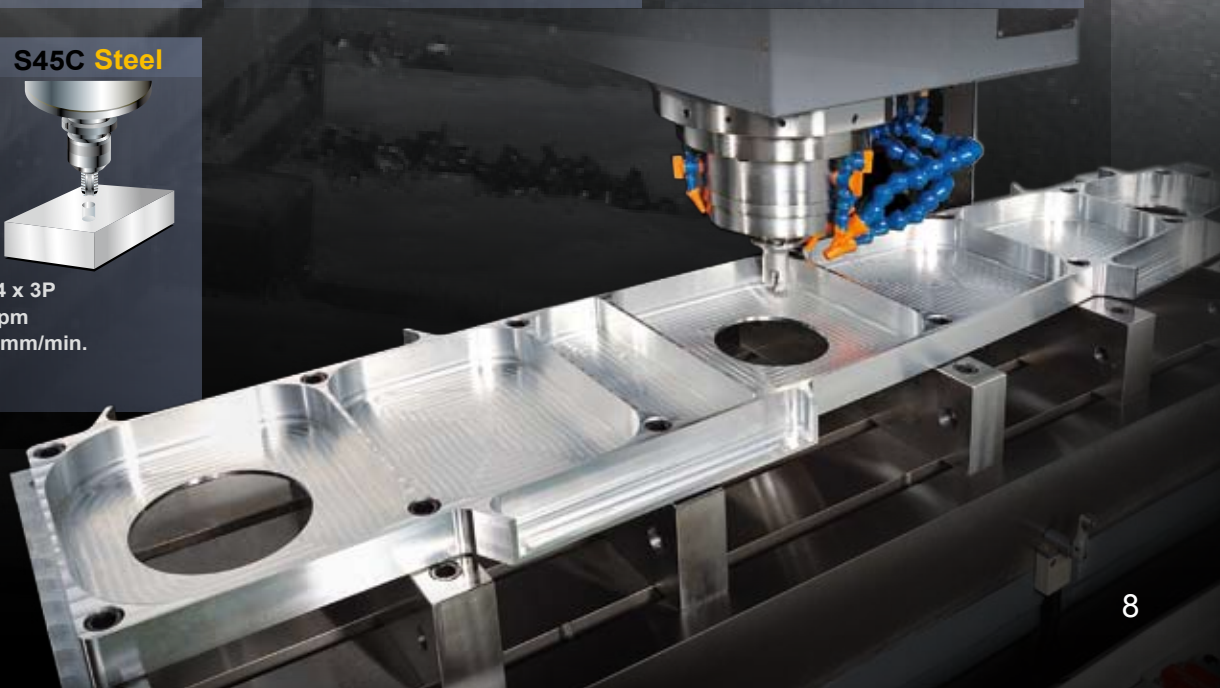
TAP S45C Steel

Max. Tapping

M24



Tool M24 x 3P
Spindle Speed 60rpm
Feedrate 180mm/min.



HIGH PERFORMANCE

- Large work area is ideal for large and long workpieces machining.
- With the installation of dividing wall in the work area, both long and complex parts can be manufactured in the same machine.



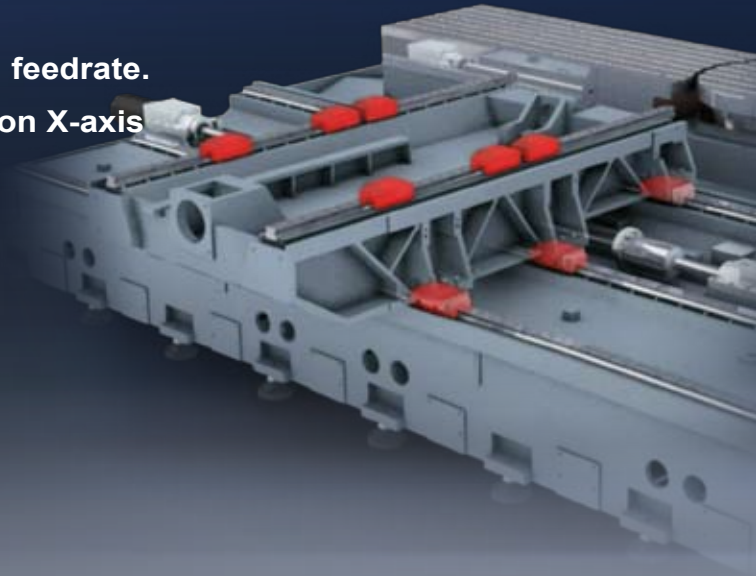
■ TCV3000A-5AF

EFFICIENT CHIP DISPOSAL SYSTEM

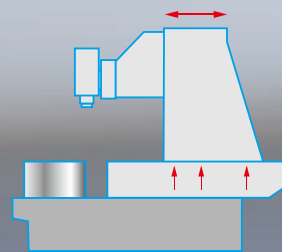


HIGH EFFICIENCY

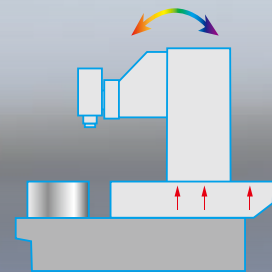
- Capable of reaching up to 40m/min. rapid feedrate.
- With step guideways and 6 slider blocks on X-axis ensure the ultra reliable axial movement.
- No counter weight design on Z-axis.



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✓
TCV series



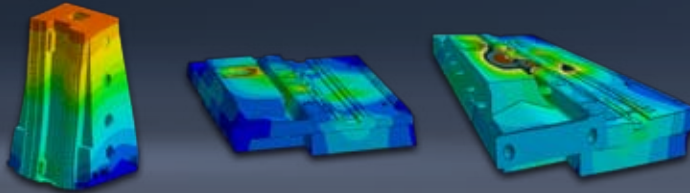
✗
Competitors



- The Spindle is Designed with 6-nozzle Coolant Supply Device. (TCV3000A-5AF)
- Dual Chip Augers and Chip Conveyor for High Chip Removal Rate.

REINFORCED BODY STRUCTURE

- High Efficiency Traveling Column Design.
- Large delta machine column and base ensure the highest stability.
- With FEM analysis.



m/min.



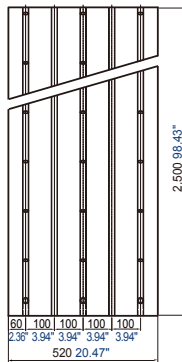
■ TCV2000A

DIMENSIONS

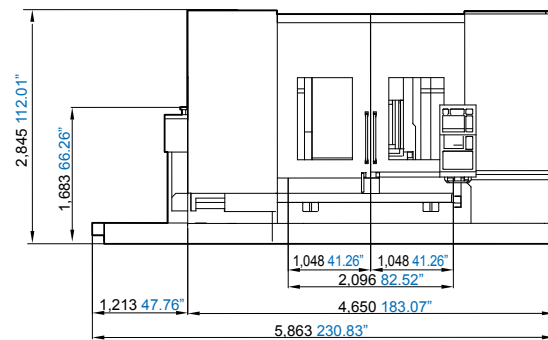
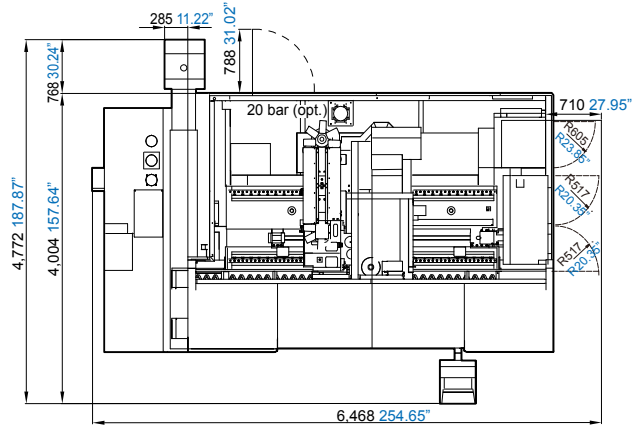
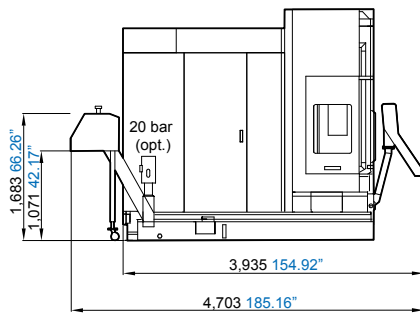
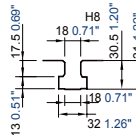
Unit : mm inch

TCV2000A

Table size

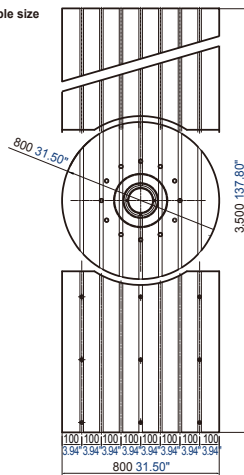


T-slots

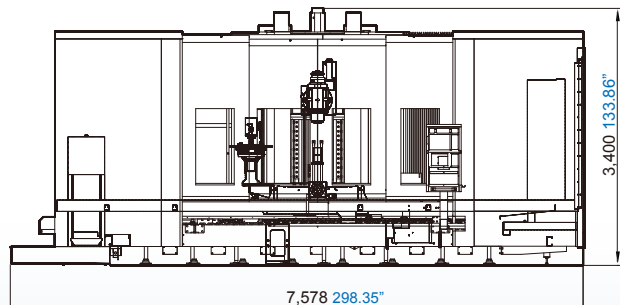
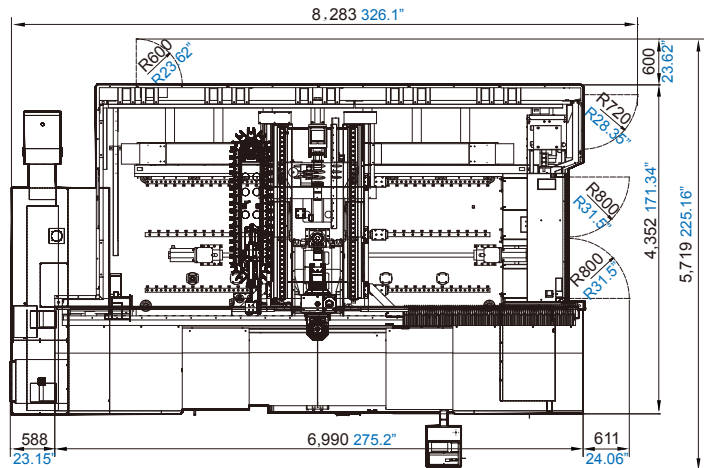
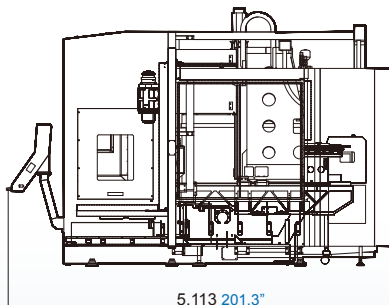
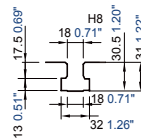


TCV3000A-5AF

Table size



T-slots



SPECIFICATIONS

		TCV2000A	TCV3000A	TCV3000A-5AF
SPINDLE				
Spindle Speed/Power (std.)		12,000rpm	15/18.5/22kW 20/25/29.5HP (cont./30min./10min.)	
Spindle Speed/Power (opt.)		15,000rpm	15/18.5/22kW 20/25/29.5HP (cont./30min./10min.)	
Spindle Taper		BBT40		
TRAVEL				
X-axis Travel	2,000mm 78.7"	3,000mm 118.1"		
X-axis Travel Working in 2 Areas	2 x 650mm 2 x 25.6"	2 x 1,100mm 2 x 43.31"		
Y-axis Travel	520mm 20.5"	800mm 31.5"		
Z-axis Travel	540mm 21.3"	700mm 27.6"	800mm 31.5" (V)	
Distance Between Spindle Nose & Table Top (V)	180~720mm 7.09"~28.35"	100~800mm 3.9"~31.5"	0~800mm 0~31.5"	
Distance Between Spindle Center & Table Top (H)		-	250~1,050mm 9.8"~41.34"	
TABLE				
Table Size	2,500 x 520mm 98.4" x 20.5"	3,500 x 800mm 137.8" x 31.5"		
No. T-Slots x Size x Pitch	5 x 18mm x 100mm 5 x 0.7" x 3.9"	7 x 18mm x 100mm 7 x 0.7" x 3.9"		
Max. Load on Table	2,000kg 4,409lb	3,000kg 6,613 lb	3,000kg 6,613 lb	
B-axis				
Swivel Head Degree	-	-	±110°	
Resolution of Swivel Head	-	-	0.001°	
C-axis				
Rotary Table Size	-	-	ø800mm ø31.5"	
Max. Rotary Table Load	-	-	1,200kg 2,646 lb	
Resolution of Rotary Table	-	-	0.001°	
Max. Workpiece Size	-	-	ø800mm ø31.5"	
FEEDRATE				
Rapid Feedrate	40/40/40 m/min. 1,575/1,575/1,575ipm			
Cutting Feedrate	1~10,000mm/min. 0.04~394ipm			
ACCURACY (LINEAR)				
Positioning (ISO10791-4)	0.014mm 0.0006"	0.020mm 0.0008"		
Repeatability (ISO10791-4)	0.010mm 0.0004"	0.014mm 0.0006"		
Positioning (JIS B 6338)	0.004mm/300mm 0.0002"/11.8"			
Repeatability (JIS B 6338)	±0.003mm ±0.0001"			
ATC				
Tool Magazine Capacity (opt.)	30T (40T)		40T (80T)	
Max. Tool Weight	6kg 13.2 lb			
Max. Tool Dimensions (W/O Adjacent Tools)	ø76 x 300mm ø3" x 11.8" (ø110 x 300mm ø4.3" x 11.8")		ø76 x 300mm ø3" x 11.8" (ø125 x 300mm ø4.92" x 11.8")	
GENERAL				
Power Consumption	57kVA (65kVA)	68kVA (80kVA)		
Machine Weight	13,300kg 29,321 lb	24,000kg 52,910 lb	24,700kg 54,454 lb	

Note: The manufacturer reserves the right to modify the design, specifications, mechanisms, etc., to improve the performance of the machine without notice. All the specifications shown above are just for reference.

ACCESSORIES

■ : Standard ■ : Option

- Tool Kit
- Work Lamp
- Safty Door
- Pilot Lamp
- Coolant Gun
- Air Gun
- Guideway Cover on X/Y/Z
- Chip Augers
- Spindle Air Blast
- Cutting Air Blast
- Spindle Air Seal
- Spindle Cooling System
- Full Chip Enclosure
- Leveling Blocks
- Heat Exchanger for Electrical Cabinet
- Mechanical, Electrical & Operation Manuals
- Foundation Bolt (TCV3000A-5AF)
- Linear Scale(Only for TCV3000A-5AF X-axis)
- CNC Control: MXP-200FB (TCV2000A)
- CNC Control: MXP-200FC (TCV3000A-5AF)
- Linear Scale
- Foundation Bolt (TCV2000A)
- Chip Conveyor
- Chip Flush Coolant Device
- Circula Coolant Nozzle (TCV2000A)
- Oil Skimmer
- A/C Cooler for Electrical Cabinet
- Coolant through Spindle System (TCV2000A)
- NC Rotary Table
- Heavy Duty Coolant Pump (TCV2000A)
- Workpiece Measurement System
- Tool Length & Radius Measurement
- HEIDENHAIN iTNC-530 Control



HEIDENHAIN iTNC-530 Control (opt.)

Linear Encoder

- HEIDENHAIN Linear Scales are available on axes.
- With the absolute measuring method, the position value is available from the encoder immediately upon switch-on. The absolute position information is read from the scale graduation, which is formed from a serial absolute code structure.



Laser Measuring System

- BLUM non-contact precise tool setting and breakage control.
- The integrated electronic system checks each individual cutting edge at full speed.



Tool Length & Radius Measurement

- BLUM Z-3D tool length & radius measurement.
- Universal and economic solution for fast tool setting and breakage control.



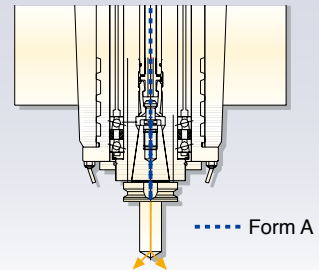
Workpiece Measurement System

- BLUM TC50 multidirectional touch probe.
- Allows fast, precise, and automatic calculation of workpiece position and dimensions.



Coolant Through Spindle (TCV2000A)

- Form A
- 10 Bar/20 Bar/30 Bar/50 Bar/70 Bar



Chip Conveyor

- Hinge type
- Scraper type



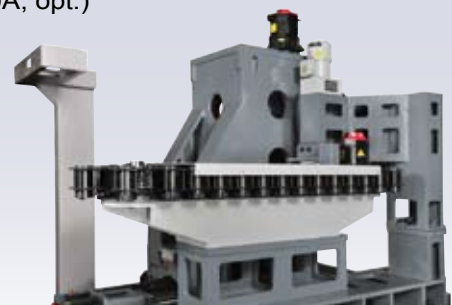
Chip Flush Coolant

- Groundfos pump, max flow rate at 120L/min.
- Efficient chip disposal system



Tool Magazine

- 40T servo driven tool magazine (TCV2000A, opt.)

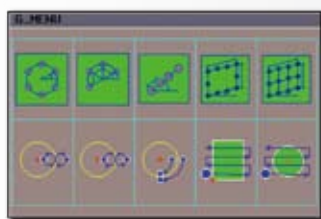




MXP-200 FB/FC

YCM CONTROL
by **FANUC**

- High Performance AC Digital Servo & Spindle Drives with Super Precision Absolute Positioning Encoders
- AI NANO CNC for High Precision Operation in Nanometers and Acknowledged HRV Control
- AICC II High Speed High Accuracy JERK Function & Auto Switching on/off Machining Control Function
- High Speed High Accuracy Rigid Tapping, Helical Interpolation, Custom Marco B, and Tool Path Graphics
- Manual Guide i with Big & Double Screen Display (MXP-200FC, opt.)
- Program File Management for Easy Program Classifying
- USB Drive Port for Easy Parameters & CNC Programs Transfer
- Large Program Capacity with 1,280 Meters of Memory
- High Speed Positioning Function (MXP-200FC, opt.)
- Memory Card Program Edit & Operation (opt.)
- 3D Interference Check (opt.)
- NANO Smooth (opt.)



- **G-menu Function**
User-friendly G-menu function provides multiple machining cycles that greatly simplifies programming steps



- **Calculator Function**
Convenient calculator function provides fast calculation and setting of workpiece offsets



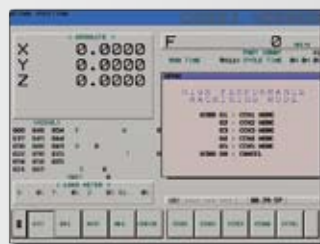
- **Easy Shop-floor Programming Manual Guide i**
Easy to use conversational software offers convenience of part programming right on the shop-floor with 3D graphical display and full simulation function



- **Counter Function**
Allows user to easily keep track on number of workpieces with:
- Main Counter
 - Periodical Counter
 - Daily Counter
 - Over Cycle Alarm



- **Intelligent Tool Data Management**
Comprehensive tool data management function allows operators to monitor and manage all positions in tool magazine



- **High Speed Machining Mode: M400**
Combined with artificial intelligence, M400 provides users more convenient and easier ways of operation and achieves fast cycle time for the best machining result.



- **Pop-up Alarm Display**
Detailed troubleshooting procedures will be automatically displayed when machine alarm occurs that allows users to restore machine status and minimize down time



- **Intelligent Maintenance Reminder**
Pre-set maintenance schedules are programmed to remind operators to inspect periodically prolonging machine life



- **Automatic Tool Length Measurement**
Pre-set macros and graphical procedure are provided for automatic tool length measurement function

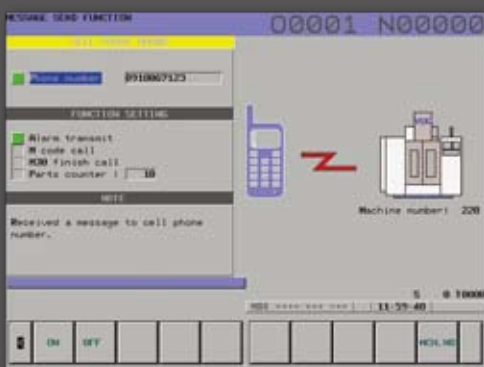
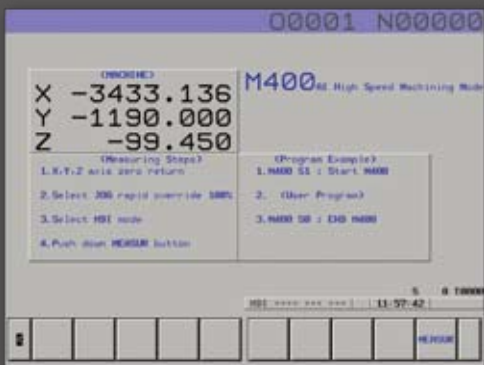


- **Manual Tool Length Measurement**
Easy setup of tool length measurement provides convenient setting of tool offsets data from one tool to another



i OPERATION *Plus*

Software enhancement exclusively from YCM



Multi-function Display

Easily select multiple windows from the following list of display for your monitoring needs.

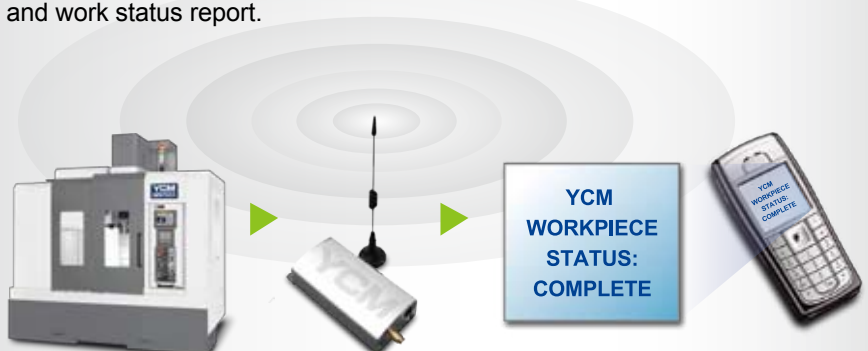
- | | | |
|----------------------------|---------------------|--------------------|
| ■ G-code Status | ■ Feedrate | ■ Parts Count |
| ■ M-code Status | ■ Tool Data | ■ Machining Hours |
| ■ Spindle Status | ■ Work Coordination | ■ Date and Time |
| ■ Controller Running Hours | ■ Spindle Load | ■ Function Display |

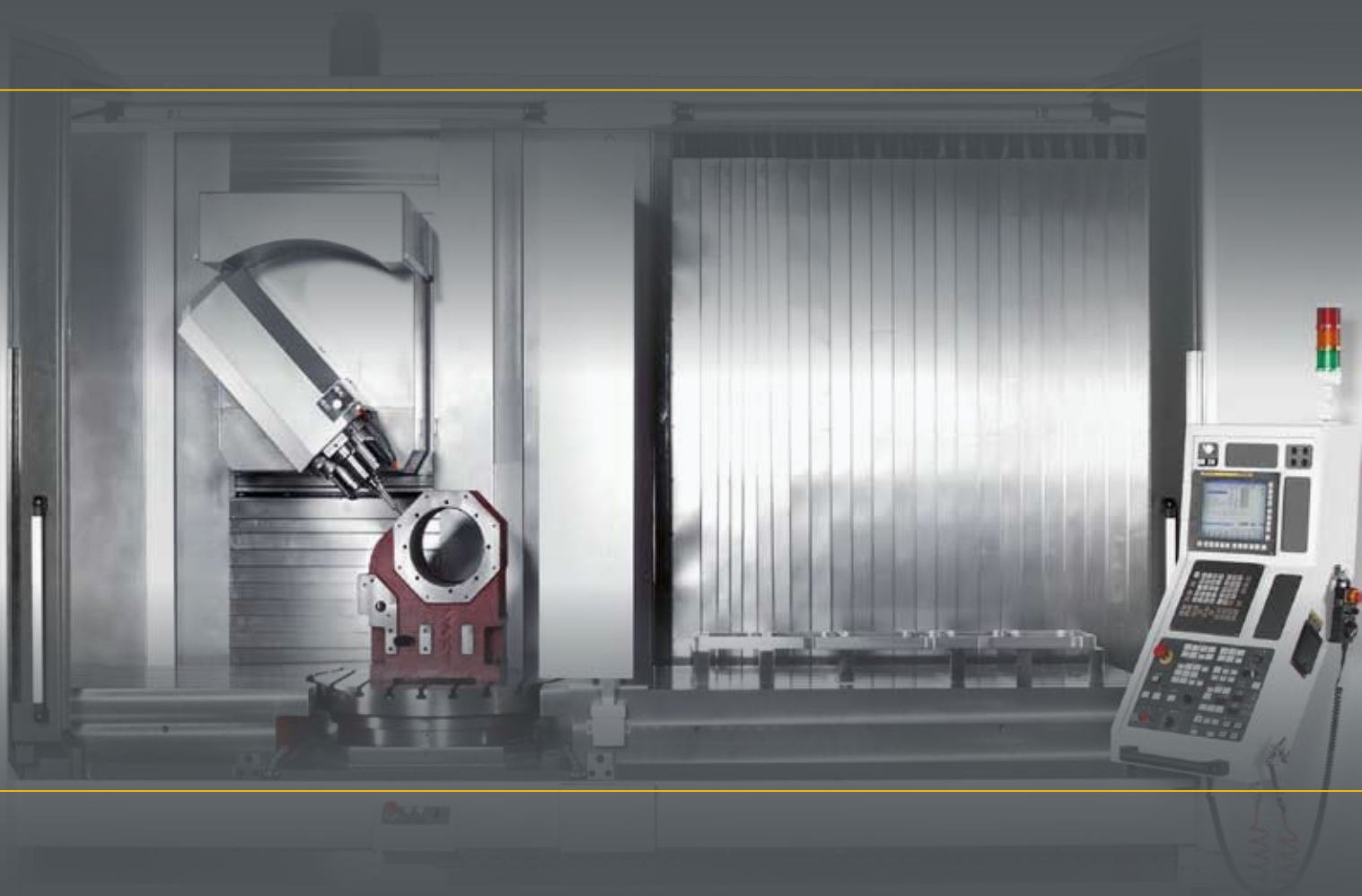
High Performance Machining Mode: M300

High performance mode with 5 settings allows users to select for the best machining results.

Wireless Message Notification (opt.)

Integrating GSM communication and CNC technology, YCM developed the WMN system for wireless notification of machine and work status report.





ISO14001 CERTIFIED MANUFACTURE

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