



*INNOVALUE & EXCELLENCE*

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**ISO 9001**  
**ISO 14001**



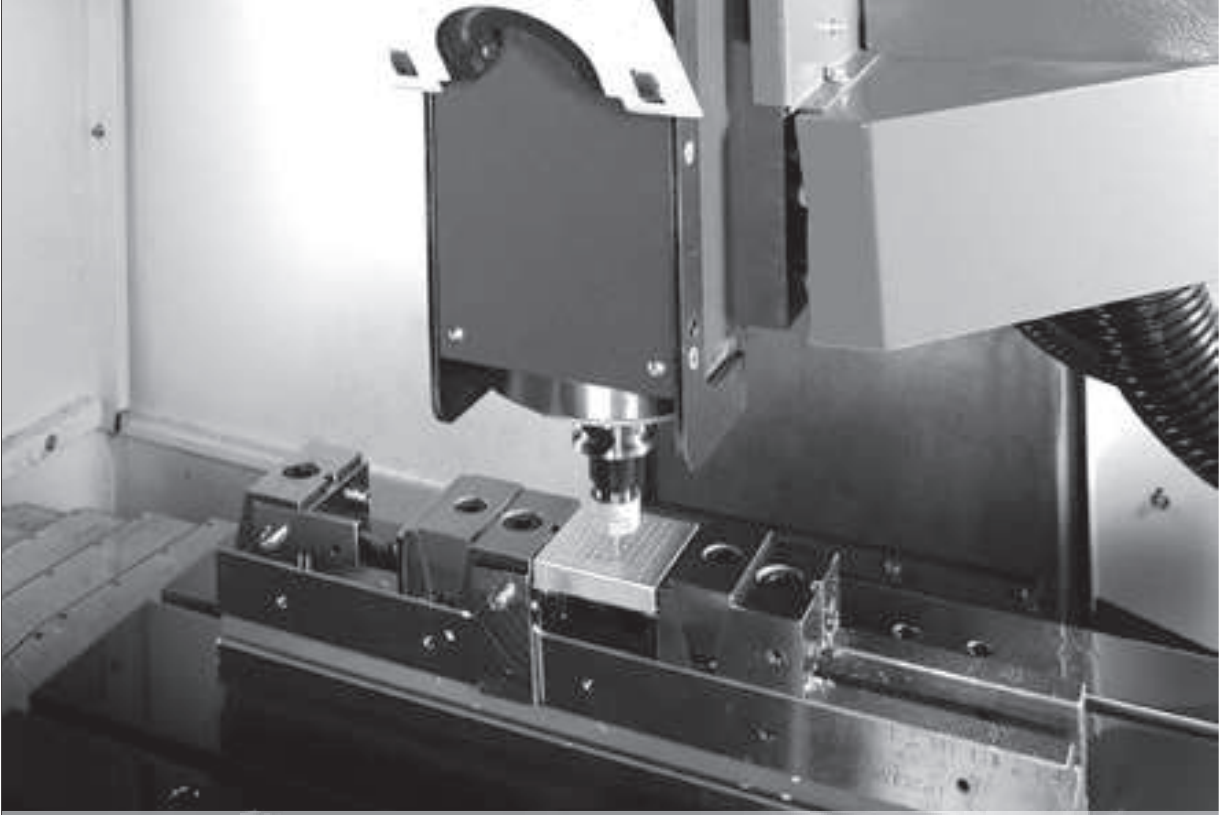
# TV SERIES

## DRILLING & TAPPING CENTER

<http://www.feeler.com>

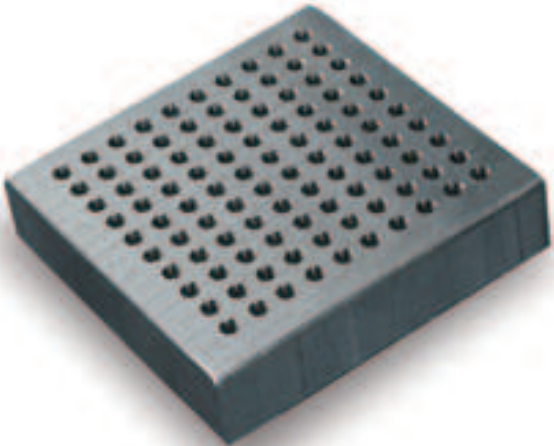
# Introducing a New Level of Performance and Productivity in the Drilling & Tapping Operations

The new TV 510 Drilling & Tapping Center from Fair Friend is designed and manufactured to offer outstanding efficiency in drilling and tapping. It integrates many improved and fine features which gain Fair Friend's TV510 a reputation for dependable high productivity and high accuracy. Its rugged construction is manufactured from high quality cast iron, assuring excellent toughness and excellent vibration absorption. There is a 160 degree swing type CNC control box for easier workpiece set-up. Linear motion guides on 3 axes allow rapid traverse rate up to 60 meters per minute. Reinforced A-shape column bottom is combined with massive base for extra rigid support. 12,000/15,000 RPM provides additional efficiency in drilling operations. A choice of 14-tool turret-type ATC or 20-tool arm-type ATC to meet your machining requirements.



### DRILLING

Spindle Speed: 8,500 RPM  
Feed Rate: 300 mm/min.  
Min. Drill Diameter: Ø0.8 mm  
Drill Depth: 7.5 mm



## TV-510



Has unique design of rotary table exchange, imported 3D technology to enhance the systematic function, and reinforced rigidity of the mechanism, so that the best overall structure could be obtained.



Unique design of rotary table exchange is driven by servomotor, providing fast, stable, and reliable pallet changing.



## TV-510Aapc

■ Tool shelves is optioal accessories.

# New FEELER TV510 Offers the Advanced Features for More Accurate and Efficient Operations!

- The column bottom is specially designed with an A-shaped structure.
- Outstanding machine structure, combined with high speed servo system, allows rapid traverse up to 60 m/min. on 3 axes.
- Servomotor directly drives ball screw thereby ensuring high rigidity and high accuracy required for the feed transmission system.
- 250 mm span of guideways on X-axis. 440 mm span of guideways on Y-axis and 270 mm span on Z-axis guarantee superior stability for saddle and spindle head stock traverse.
- Linear guideways on 3 axes.

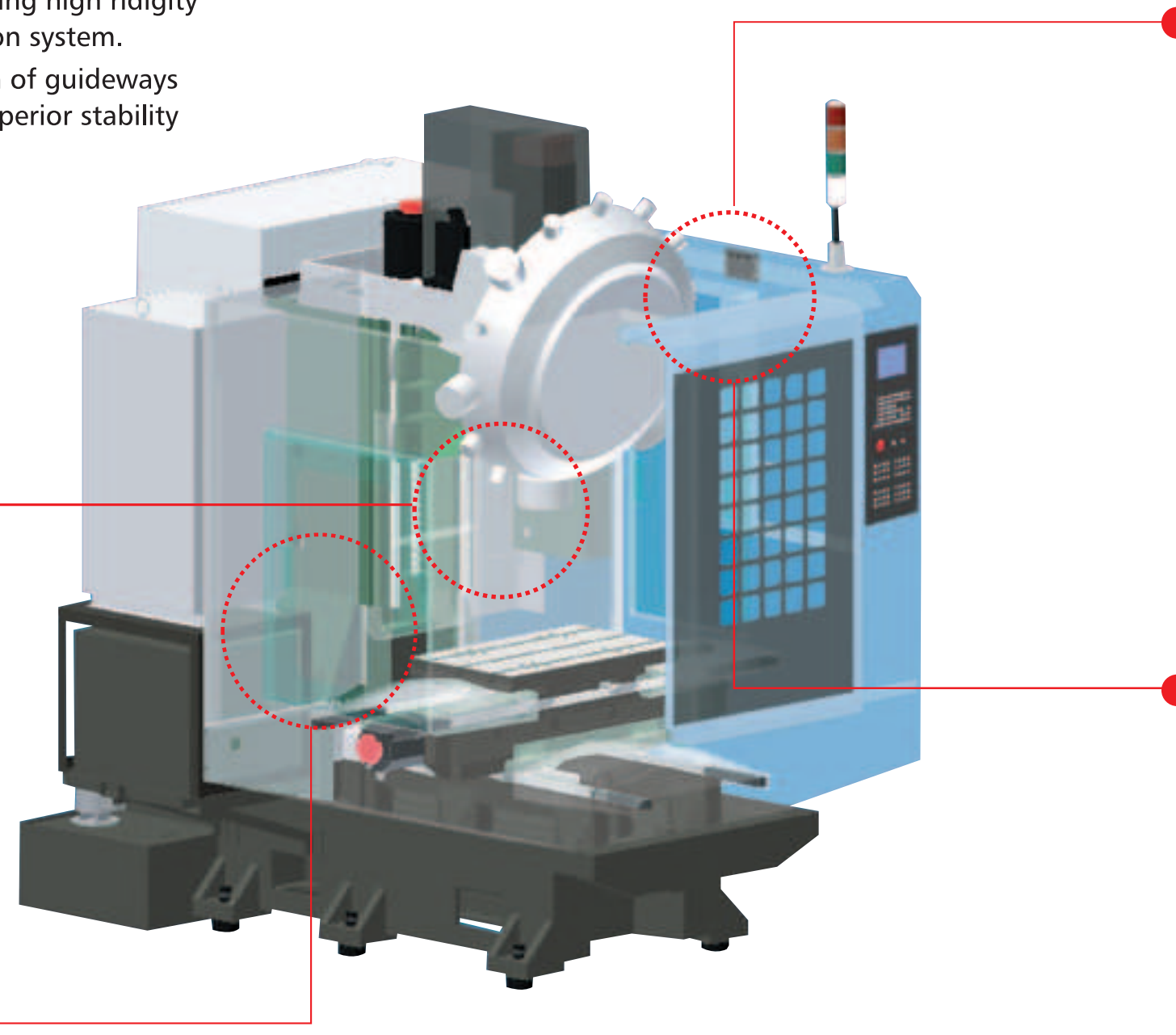


## 10,000RPM SPINDLE (BELT TYPE AS STANDARD)

The belt-drive spindle provides a maximum 10,000 RPM spindle speed. Specially-designed bearing layout ensures maximum spindle rigidity.



Oversized side-window openings for convenient maintenance of the X-axis servomotor, linear guideways and ballscrews.



The operation conditions for the pneumatic unit and lubricator are conveniently checked from the right side of the machine. This allows the operator identify the proper time for filling lubricant.



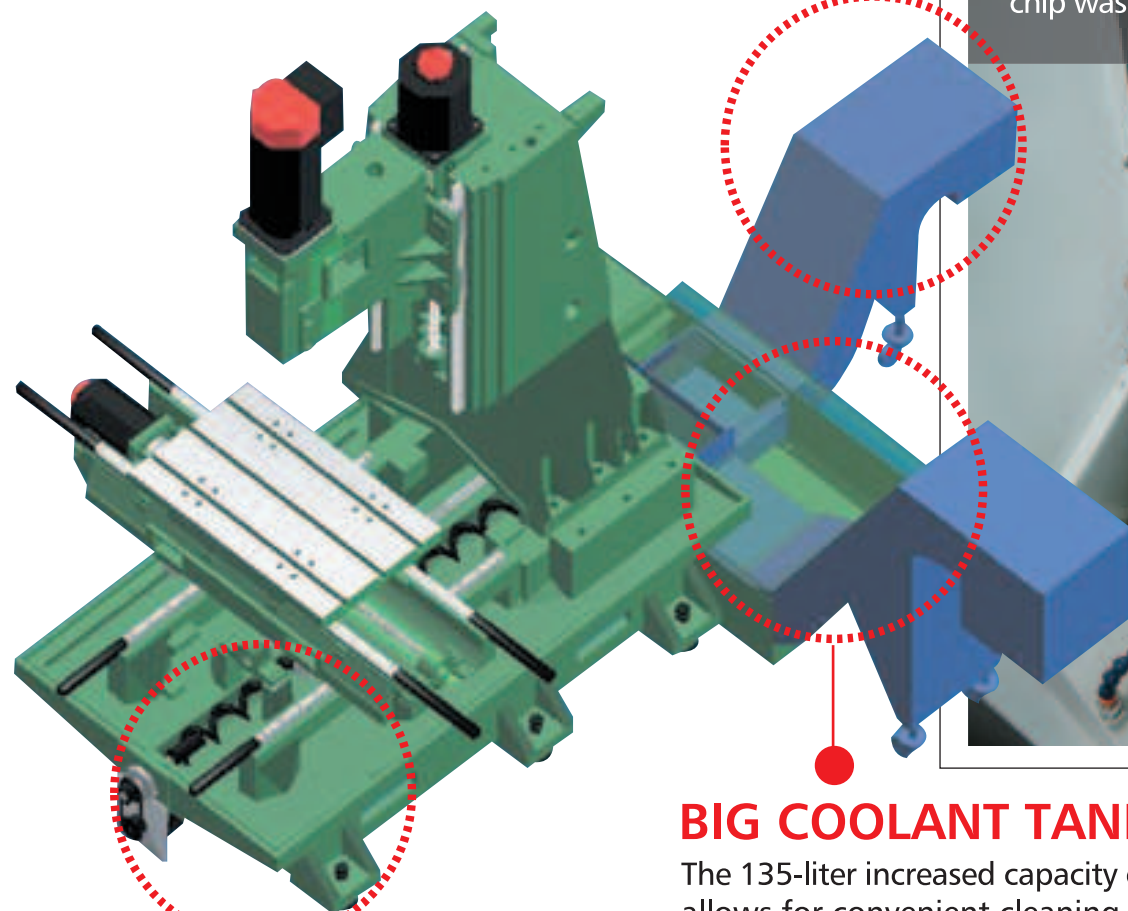
The swing-type plate for the pneumatic unit allows the operator to check the circuit and provides added convenience for machine cleaning and maintenance.



# Efficient Chip Removal

## CHIP CONVEYOR (OPTION)

There are various types of chip conveyors to choose from.



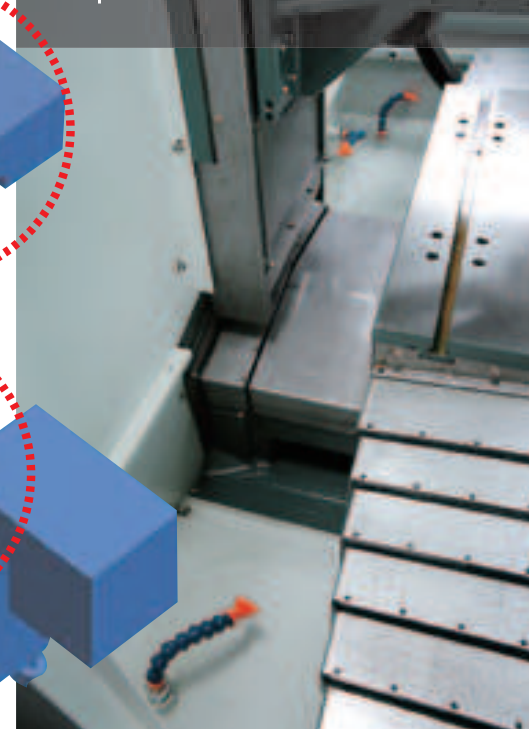
## CHIP SCREW (OPTION)

The center mounted chip auger delivers chips to back end of the machine.



## REAR FLUSHING DEVICES ON BOTH SIDES

The chip flushing devices provided at right and left side of the machine, and combined with skew surface on base top, for added efficiency in chip wash-down.



## BIG COOLANT TANK CAPACITY

The 135-liter increased capacity of the coolant tank allows for convenient cleaning.

The coolant tank is equipped with an immerse-type coolant pump, providing higher coolant delivery efficiency than that of a conventional self-prime-type pump.

TV-510 Versatile machining is possible including drilling, tapping  
A machining sample with 10,000 rpm spindle (BT30)

Workpiece	Medium carbon steel	Gray cast iron	Aluminium alloy diecasting
Drill diameter	21.5 dia	21.5 dia	21.5 dia
Drill material	HSS	HSS	HSS
Spindle Speed	600	600	600
Feedrate	100	250	425
Coolant	Cutting oil	Cutting oil	Cutting oil
Load meter %	155	132	155

Workpiece	Medium carbon steel	Gray cast iron	Aluminium alloy diecasting
Tap size	M14	M20	M20
Tap pitch	2	2.5	2.5
Spindle Speed	400	150	150
Feedrate	800	375	375
Coolant	Cutting oil	Cutting oil	Cutting oil
Load meter %	70	60	75
Tolerance class	6H		



## DRILLING - SMALL / LARGE HOLE

Spindle Speed: 8,500 / 600 RPM  
Feed Rate: 300 / 425 mm/min  
Drill Diameter:  $\varnothing 0.8$  /  $\varnothing 21.5$  mm  
Drill Depth: 7.5 / 42 mm

## TAPPING - SMALL / LARGE HOLE

Spindle Speed: 6,000 / 150 RPM  
Feed Rate: 1,500 / 375 mm/min.  
Tap Diameter: M1 x 0.25 / M20 x 2.5  
Tap Depth: 2.5 / 50 mm

## CUTTING CAPACITY EXAMPLE (Material: Aluminum)

Machining Types	
Drilling	Tapping
Min.: $\varnothing 0.8$	Min.: M1 x 0.25
Max.: $\varnothing 21.5$	Max.: M20 x 2.5



# Exceptional Spindle/Magazine



## ▲ TURRET-TYPE ATC

The turret-type magazine has a loading capacity of 14 tools. Tool changing can be accomplished in only 1.9 seconds/60Hz. The tool magazine accommodates 7/24 taper tool shank and features bi-directional tool change.

## ARM-TYPE ATC ►

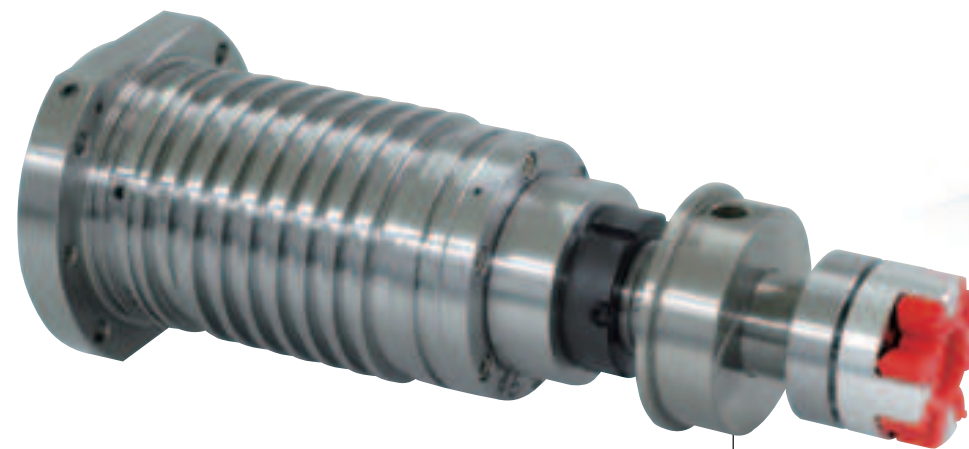
The arm-type magazine provides a loading capacity of 20 tools. Fast tool changing time is in only 1 second with tool clamping mechanism.

The tool magazine accommodates 7/24 taper tool shank and features random bi-directional tool selection.



## ■ 12,000/15,000/24,000 RPM SPINDLE (OPTIONAL DIRECT DRIVE SPINDLE)

Spindle acceleration dramatically reduces non-cutting time with the TV-510 reaching 12,000 rpm within 1 sec., reaching 15,000 rpm within 1.2 sec. and reaching 24,000 rpm within 1.5 sec. (24,000rpm spindle only for Mitsubishi control)



## ■ TOOL CLAMPING MECHANISM

The tool clamping mechanism employs fixed-type jaws and is combined with the use of a disc spring for efficient tool clamping. It features higher efficiency than that of steel ball configurations.





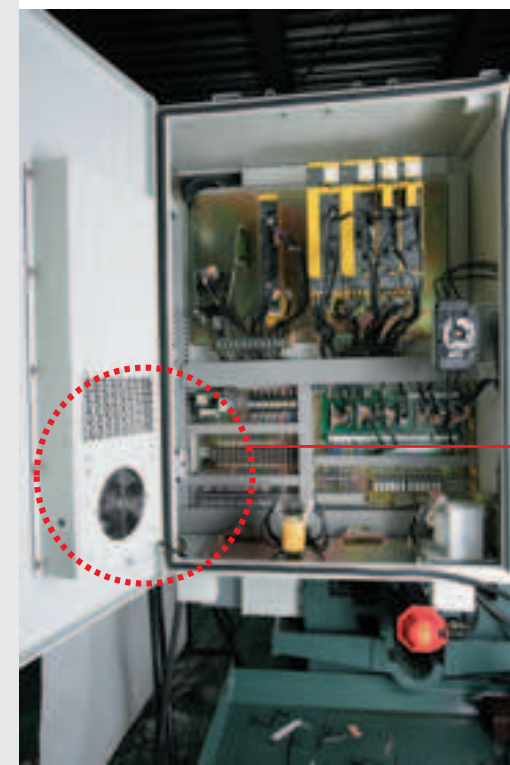


# CNC CONTROL

- FANUC
- MITSUBISHI
- HEIDENHAIN
- SIEMENS

## THE FEELER CONTROL

- ▶ Ergonomic panel design
- ▶ High resolution screen for user-friendly viewing
- ▶ Compact, embedded control box design
- ▶ RS-323/CF card / RJ45 Data Interface



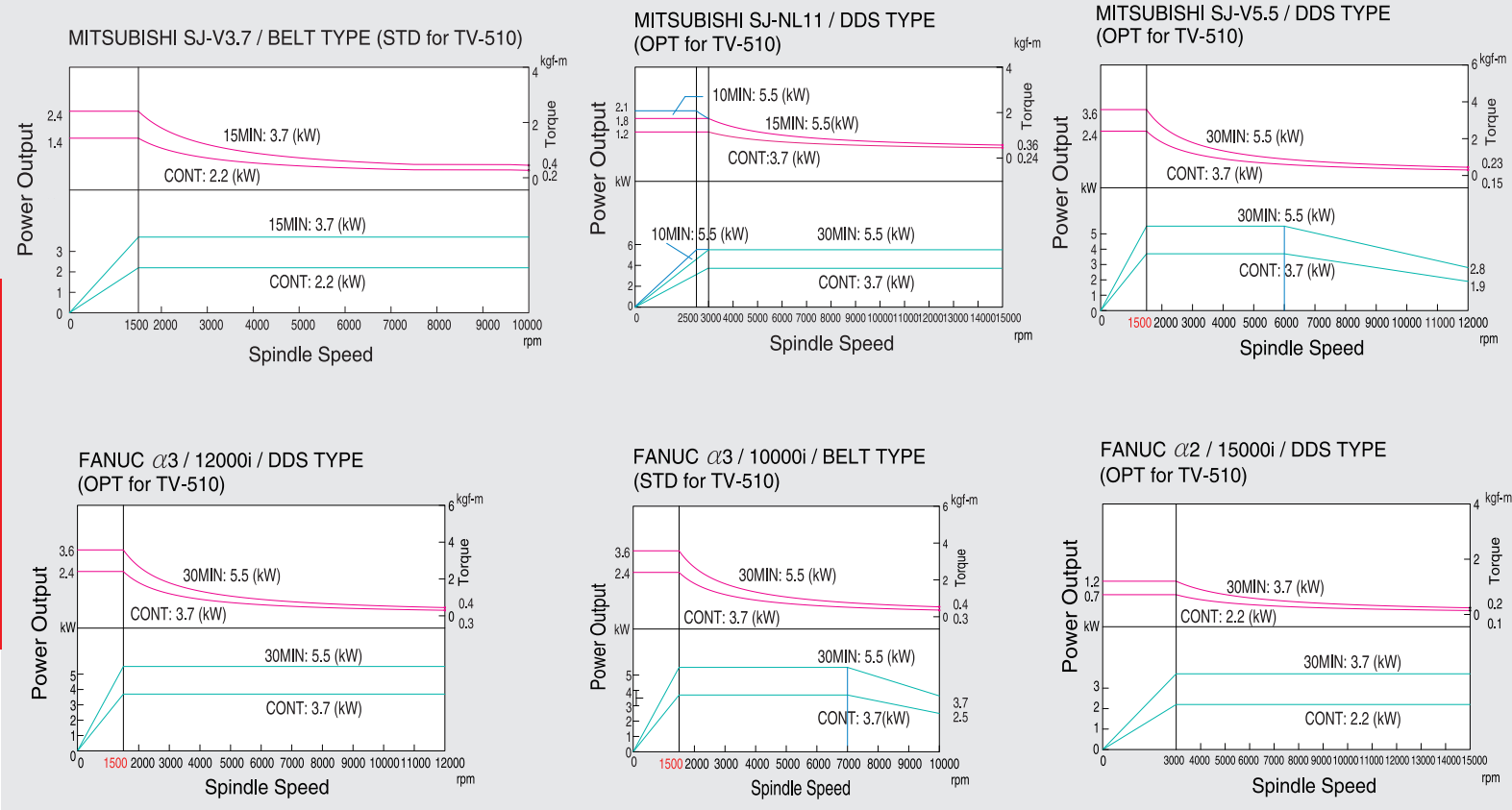
## DUST-PROOF ELECTRICAL CABINET

The control circuit employs high quality electronic components. The electrical cabinet is dust-proof. All wire through-holes are protected to prevent oil moisture from entering. This extends electronic part service life and ensures maximum dependability.

- Heat exchanger is included as a standard accessory.



## SPINDLE SPEED & POWER OUTPUT DIAGRAM



# SPECIFICATION

TRAVEL	MODEL	TV-510A (Arm Type ATC)	TV-510 (Turret Type ATC)	TV-510Aapc
		Pulley	Direct Drive	Pulley
X-Axis Travel		510 mm	510 mm	510 mm
Y-Axis Travel		400 mm	400 mm	360 mm
Z-Axis Travel		400 mm	300 mm	450 mm
Spindle Nose to Table Surface		170-570 mm	170-470 mm	160-610 mm
Spindle Center to Column Surface		430 mm	430 mm	420 mm

TABLE				
Table Dimensions		650 x 400 mm	650x400 mm	[560x400 mm] x2
Maximum Load		250 kgf (200 kgf for 60 m/min)	250 kgf (200 kgf for 60 m/min)	200 kgf x2
T-Slot		14 mm x 3 x 125 mm	14 mm x 3 x 125 mm	14 mm x 5 x 80 mm

SPINDLE						
Spindle Speed		10,000 rpm	12,000 & 15,000 rpm	10,000 rpm	12,000 & 15,000 rpm	8,000 rpm(10,000 & 12,000 rpm)
Spindle Taper		7/24 Taper No.30		7/24 Taper No.30		7/24 Taper No.30
Spindle Diameter		φ45 mm		φ45 mm		
Spindle Power		3.7 / 5.5 kW (2.2 / 3.7 kW)		3.7 / 5.5 kW (2.2 / 3.7 kW)		3.7 / 5.5 kW

FEED RATE					
X-Axis Rapid Traverse		36 / 48 / 60 m/min		36 / 48 / 60 m/min	48 m/min
Y-Axis Rapid Traverse		36 / 48 / 60 m/min		36 / 48 / 60 m/min	48 m/min
Z-Axis Rapid Traverse		48 / 48 / 60 m/min		48 / 48 / 60 m/min	48 m/min

ATC					
No. of Tools		20		14	20
Pull Stud		P-30T (45°)		P-30T (45°)	P-30T (45°)
Maximum Tool Weight		3 kgf		3 kgf	3 kgf
Maximum Tool Length		200 mm		150 mm	200 mm
Maximum Tool Diameter		φ63 mm		φ80 mm	φ65 mm
Max. Tool Diam. (No Adjacent Tool)		φ100 mm		φ80 mm	φ140 mm
Tool Changing Time (Tool-to-Tool)		1.9 sec (60Hz) 2.2 sec (50Hz)	1 sec (60Hz) 1.2 sec (50Hz)	1.9 sec (60Hz) / 2.2 sec (50Hz)	
Floor Space		1,600 x 2,125 mm		1,600 x 2,125 mm	3,520 x 2,640 mm
Machine Weight		2,200 kgf		2,200 kgf	4,300 kgf
Maximum Machine Height		2,400 mm		2,400 mm	2,450 mm
Power Capacity		15 kVA		15 kVA	10 kVA
Air Source		6-8 bar		6-8 bar	6 bar

\* Available Controls: FANUC OIMD;MITSUBISHI M70  
\* Specifications are subject to change without notice

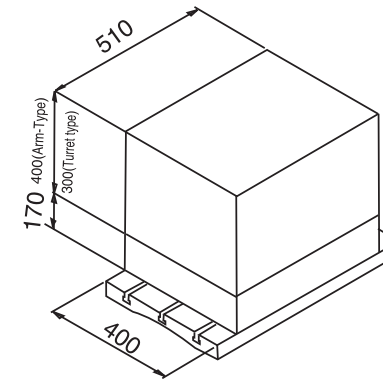
## STANDARD ACCESSORIES

- Automatic Lubrication System
- Fully Enclosed Splash Guard
- Heat Exchanger for Electric Cabinet
- Leveling Bolts
- Operation and Maintenance Manual
- Rigid Tapping
- RS-232 Interface
- Spindle Air Blast
- Spindle Air Curtain
- Spindle Coolant Nozzle
- Tool Box
- 3-Color Signal Lamp
- Alarm Light (TV-510Aapc)
- Chip Auger (TV-510Aapc)
- Portable Air Gun (TV-510Aapc)
- Portable Coolant Gun (TV-510Aapc)
- Work Lamp (TV-510Aapc)

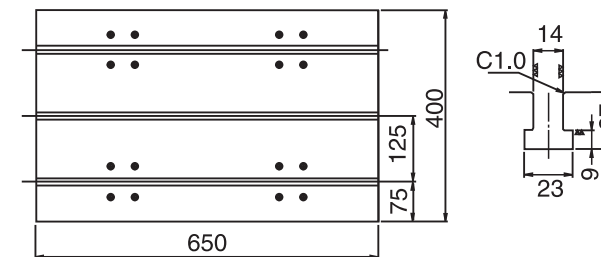
## OPTIONAL ACCESSORIES

- Auto Tool Length Measurement
- Chip Screw
- Chip Conveyor
- Fanuc / Mitsubishi Controller
- Flushing System
- M30 Automatic Power Off
- Oil / Coolant Separator
- Spindle 10,000 rpm / 12,000 rpm
- Spindle Oil Cooler
- Transformer
- Tool Probe System
- 4th. Axis Rotary Table

## Working Capacity

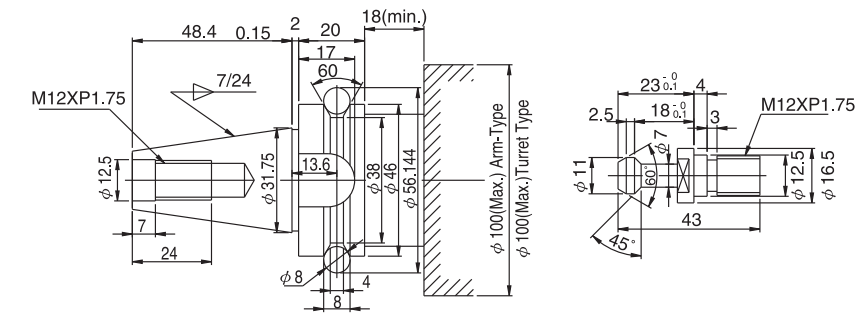


## Table Dimensions

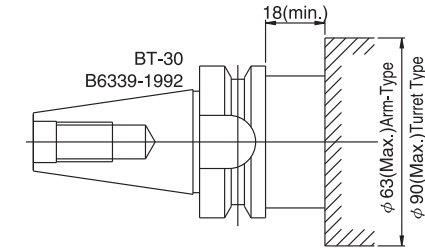


## Tooling Interference

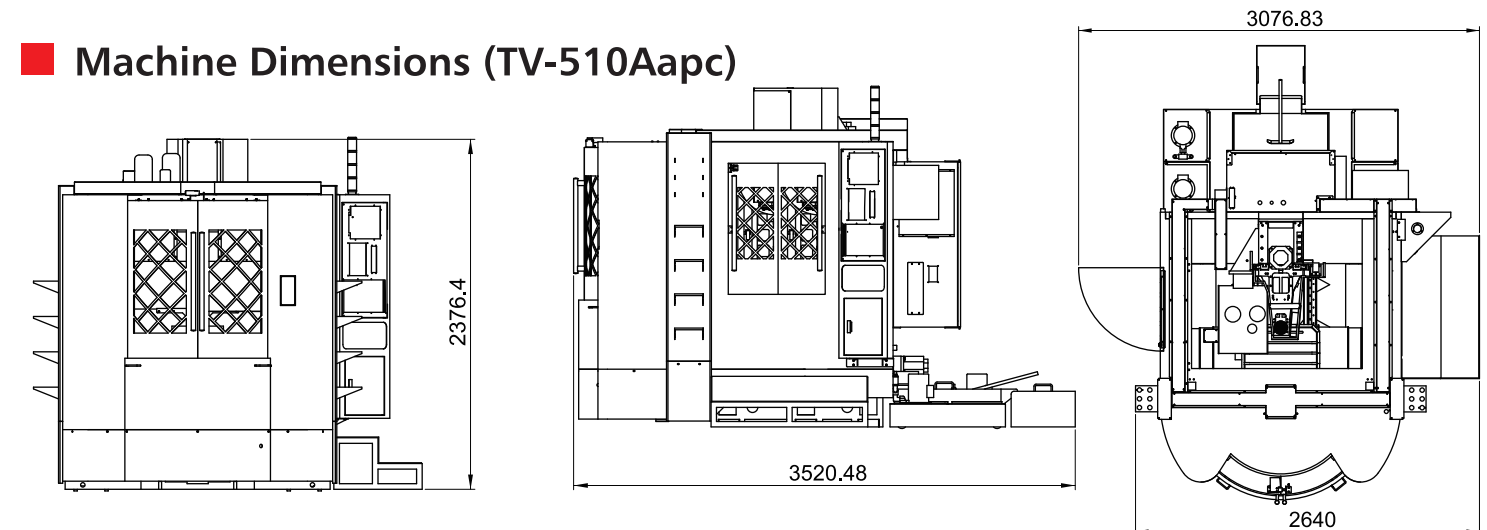
### BT-30



### DIN-30



## Machine Dimensions (TV-510Aapc)



## Machine Dimensions (TV-510)

