

Trust & Technology



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# Vertical 5-Axis Machining Center MDV551-5AX

High ■ Quality ■ Precision ■ Efficiency ■ Economy



Tongtai Machine & Tool Co.,Ltd.



# New Machine for Space 5-Axes Machining

(5-AXES)

Super Productive Vertical Machine Center

## MDV551-5AX



### Merits of 5-axes machining

- Maching of complicated profiles.
- High accuracy machining, three of machining errors due to re-setting.
- Reduced fixtures owing to the reduced processes.
- Shortened tool length by 5-axis control.
- High efficiency machining of complicated profiles.
- Reduced interprocess travel time.

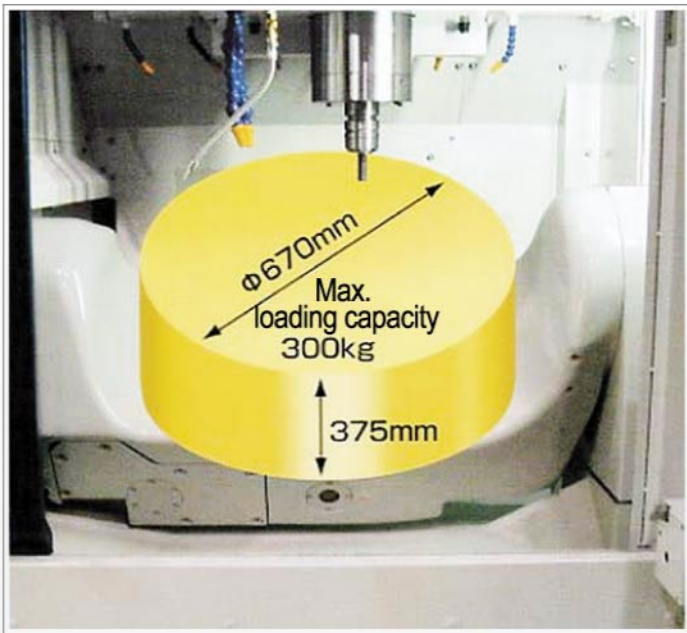


Workpiece

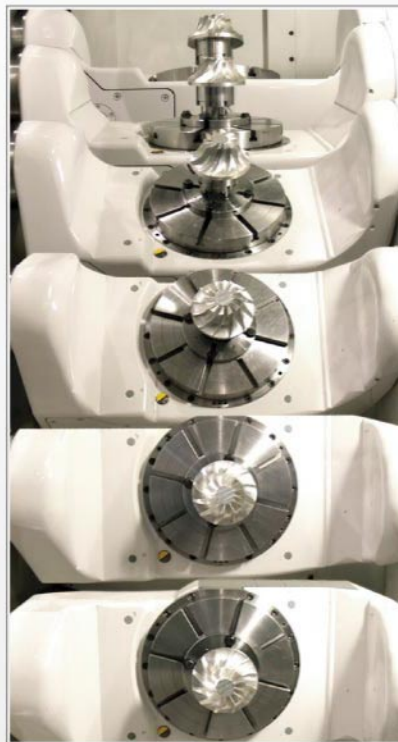


# -Saving

## Extra Large Work Capacity



- $\Phi 670\text{mm} \times 375\text{mm}$  (26.4"x14.8")
- **Max. loading capacity : 300kg**  
*maximum machining area in minimum space !*



## High speed drive

- **The table can rotate and tilt 30% quicker than other machines.**
  - **Table rotation(C-axis) 12000°/min**
  - **Table tilt(A-axis) 4000°/min**

## High accuracy

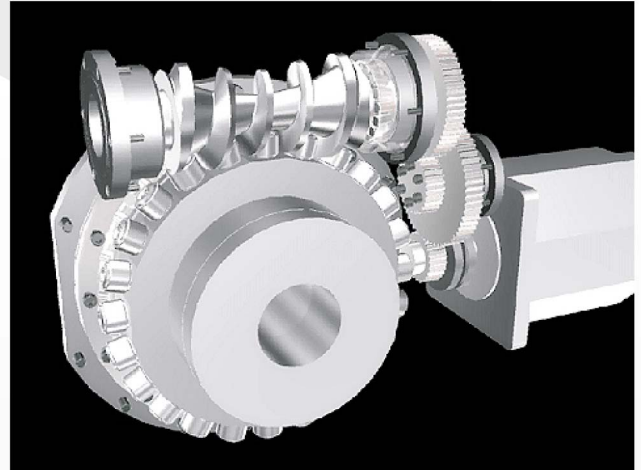
- **Test condition**
  - **Material : Aluminum**
  - **Spindle speed : 5000 min<sup>-1</sup>**
  - **Feed : 250 mm/min**
  - **Tool :  $\Phi 16$ (5/8") x 4 flute end mill**
- **Roundness 6.9  $\mu$**   
**Conical shapes by simultaneous 5-axis machining**



# Built-in Advanced Mechanical Contribute to High Cutting

## A-axis . C-axis

Super built-in table with unique roller gear drive used for A-axis (table tilt) and C-axis (table rotation).



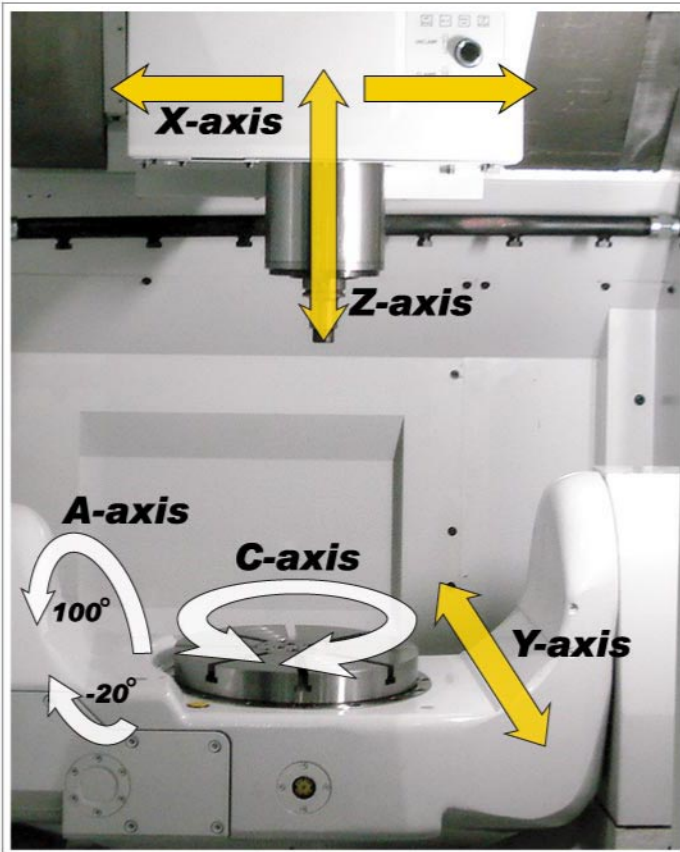
### High accuracy even without scale feedback

DC INDEX ACCURACY	Rolling/Tilting speed
▪ Repeatability $\pm 7$ Sec	▪ C-axis $360^\circ/1.8$ sec
▪ Positioning accuracy $\pm 2$ Sec	▪ A-axis $120^\circ/1.8$ sec

### High speed, High accuracy and high rigidity compared to conventional worm wheel system

	<b>MDV551-5AX (Roller gear cam)</b>	<b>OTHERS (Worm wheel)</b>
<b>accuracy</b>	The rolling transmission provides more than 90 % transmission efficiency, which ensures high accuracy continuous cutting. The rolling transmission minimizes wear and heat generation.	The sliding drive needs backlash. Transmission efficiency below 90%, and generates a large amount of heat leading to inaccuracies. The sliding transmission promotes gear wear requiring frequent backlash adjustment.
<b>rigidity</b>	The preloaded system eliminate backlash, and provides high rigidity necessary for heavy-duty cutting	No preload and the presence of backlash creates weaknesses for interrupted milling
<b>Shock-proof</b>	In the event of a collision, multiple large diameter cam followers bear the shock.	Small contact area causes damage to the tooth surfaces during a collision, requiring the replacement of the worm wheel.

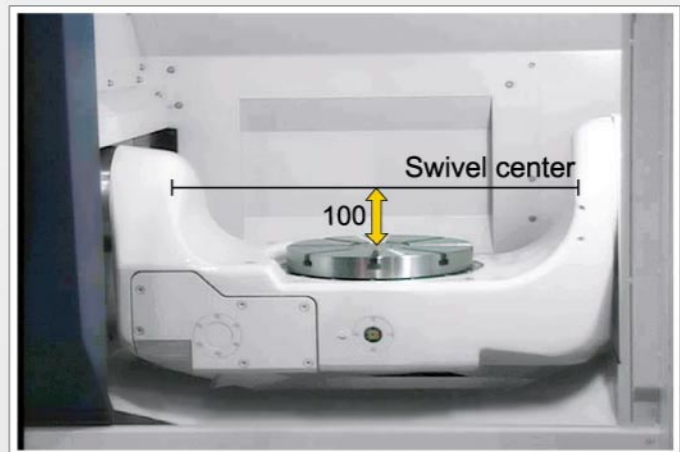
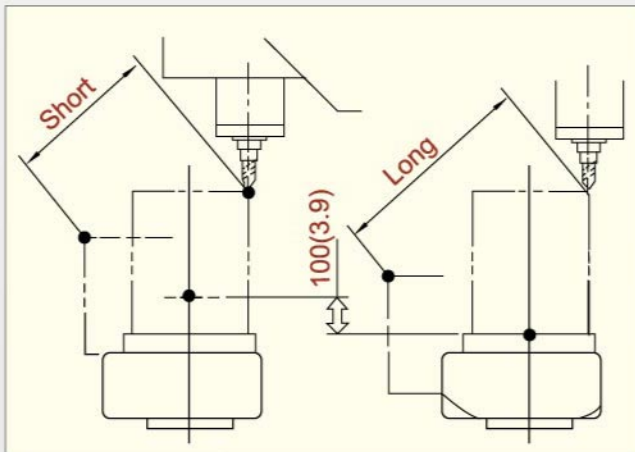
# isms Performance



Component	Minimum	Maximum
X	-255mm	380 mm
Y	-255 mm	275 mm
Z	-450mm	0mm
A	-20°	100°
C	0°	360°

## Tilting table minimizes axes motion

**Tool travel can be minimized on X,Y and Z axis tilting motion by having tilting center 100mm above the table surface this allows the quick response to fit the programmed path as accurate possible.**





# Cutting capacity / High speed

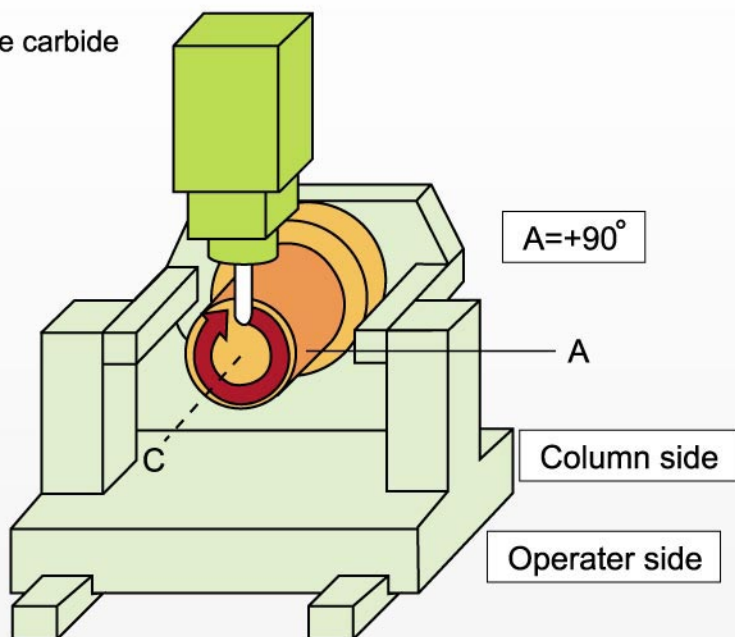
## Big work envelope / Work i

### Heavy cutting with C-axis

- Tool Endmill 16mm(5/8")4-Flute carbide
- Material S45C
- Cutting with x depth 25mm x 4mm (1" x 0.16")
- Feed 2340mm/min (C axis 972 /min)

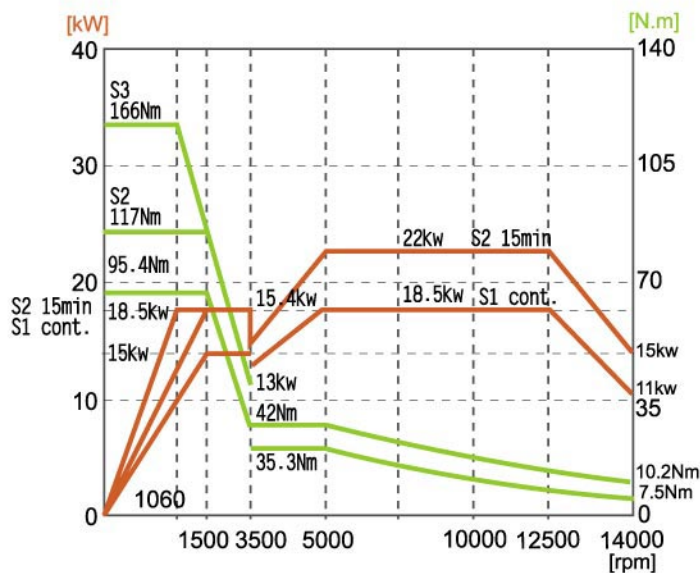
#### High speed

- Rapid traverse rate 40m/min(X/Y/Z axis)
- 12000°/min(C axis)
- 4000°/min(A axis)

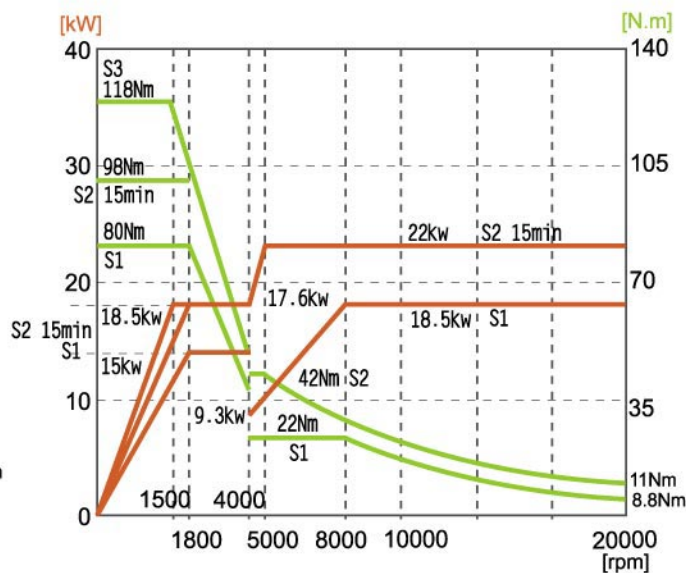


#### • Spindle power diagram

■ High power



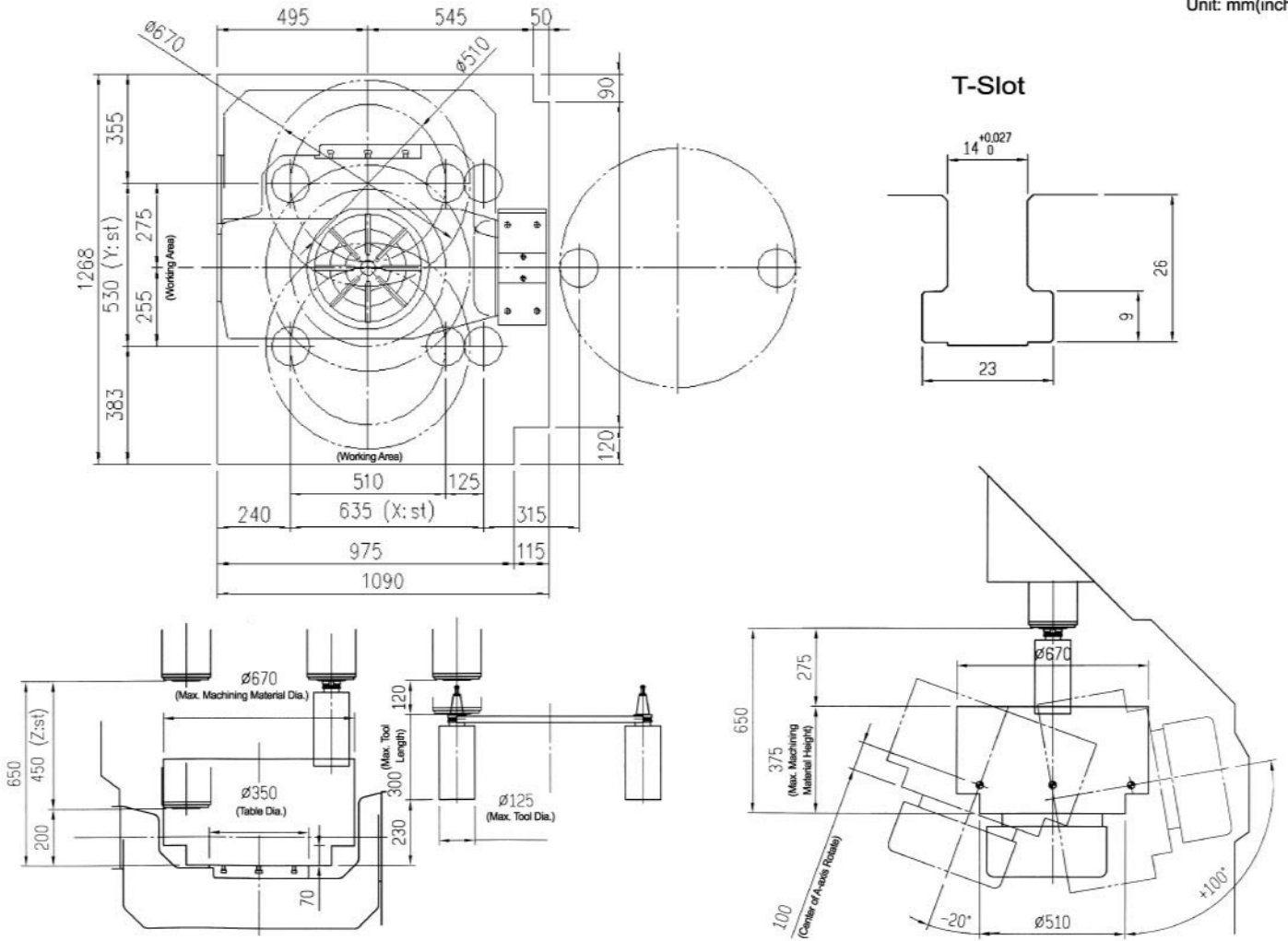
■ High speed



# Speed Interference

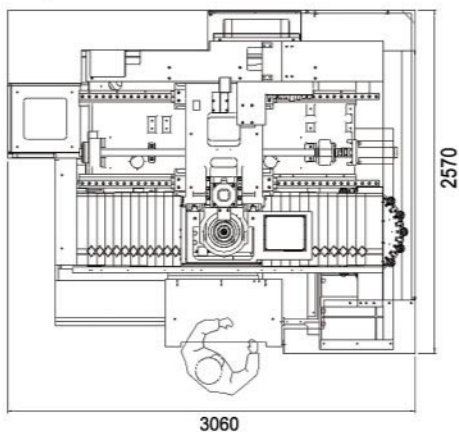
## Work interference

Unit: mm(inch)

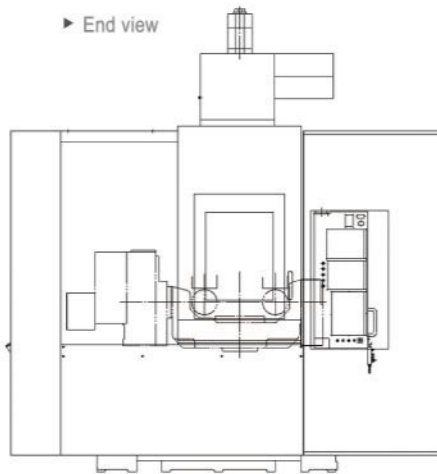


## Machine Layout

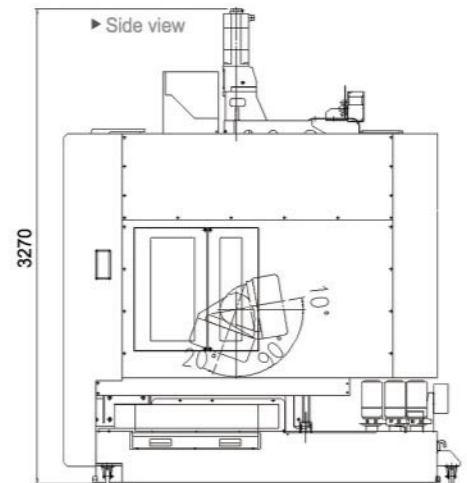
► Top view



► End view



► Side view



# MDV551-5AX Standard Specifications

Item	Specification	Unit	MDV551-5AX
CAPACITY	X/Y/Z-Axis Stroke	mm	635+315/530/450
	Spindle Nose to Table	mm	200~650
	Table Height from Floor	mm	1100
	A-Axis Move	deg	-20°~100°(Opt. -30°~120°)
	C-Axis Move	deg	360°
TABLE	Tabel Size	mm	Ø350
	Max. Workpiece Dimension	mm	Ø675xH375 (Shape Limit)
	Max. Load Capacity(Workpiece Load)	kg	300
SPINDLE	Spindle Taper		7/24 Taper No. 40(Opt. HSK-A63)
	Spindle Speed	rpm	12000(Opt. 20000)
	Bearing Lubrication Method		Grease
FEED	X/Y/Z Rapid Traverse	m/min	40/40/40
	A/C Rapid Traverse	deg/min	4000°/12000°
	X/Y/Z Servo Motor	kw	4.0/4.0/7.0
ATC	Tool Shank		BT40(Opt. HSK-A63/BBT40)
	Tool Capacity	pc	16(Opt. 30/40/60)
	Max. Tool Drameter	mm	Ø110
	Max. Tool Drameter(w/o Adjacent Tool)	mm	16 or 30Tools:Φ110 / 40 or 60Tools:Φ220
	Max. Tool Length	mm	300
	Max. Tool Weight	kg	8
MACHINE	L x W x H	mm	3060x2570x3270
	Weight	kg	11000
CONTROLLER	FANUC		18i MB5(Opt. 31i-A5)
	HEIDENHAIN		(Opt. iTNC 530)

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