

# CNC TAPPING CENTERS



**TR-45E / TR-51E**  
**TR-510 / TR-600 / TR-700**

  
A New Standard of Tapping Center

**High Acceleration. High Speed. High Precision.**

## A New Standard of Tapping Center

Based on advanced design concepts, **Cubic** has successfully developed a new generation of CNC tapping centers. Each machine exhibits the efficiency and accuracy you've come to expect.

**TR-45E**  
**TR-510**  
**TR-600**  
**TR-700**



- Spindle speed

**10,000** min<sup>-1</sup> Std

**15,000** min<sup>-1</sup> Opt

- Rigid tapping

**4,000** min<sup>-1</sup>

- Rapid traverse

**X:1890 ipm Y:1890 ipm Z:2362 ipm**

- Spindle nose taper

**BT#30**

- Directly coupled spindle drive system



## Outstanding Design



The CNC tapping center, designed and manufactured by **Cubic**, is your best choice in drilling and tapping operations. The TR-series achieves high acceleration and high traverse rates on three axes to significantly increase drilling and tapping efficiency. Armless automatic tool changer can change tool in as short as 2.3 second chip-to-chip. The entire machine is ruggedly constructed to assure to highest machining accuracy.

# TR-51E



- Standard spindle speed

**8,000** min<sup>-1</sup>

- Rigid tapping

**3,000** min<sup>-1</sup>

- Rapid traverse

**X:1890 ipm Y:1890 ipm Z:1890 ipm**

- Spindle nose taper

**BT#40**

## High Acceleration



**x:2.2 G**

**y:1.9 G**

**z:1.0 G** (on TR-45E)

## Machine Structure

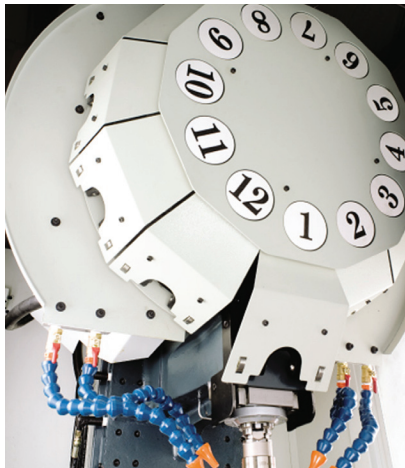


The structural parts of the machine are manufactured from high quality Meehanite cast iron, rib reinforced and stress relieved to assure the machine remains deformation-free year after year.

Servo motors directly drive ballscrews, providing high positioning accuracy without backlash.



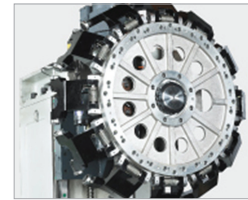
# Automatic Tool Changer



**TR-45E / TR-510**  
**TR-600 / TR-700**

#30 Armless Type Magazine  
12 tools  
Tool change time

**1.4 sec** (Tool to Tool)



**TR-51E**

#40 Armless Type Magazine  
12 tools  
Tool change time

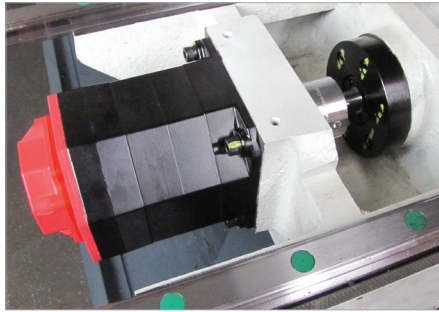
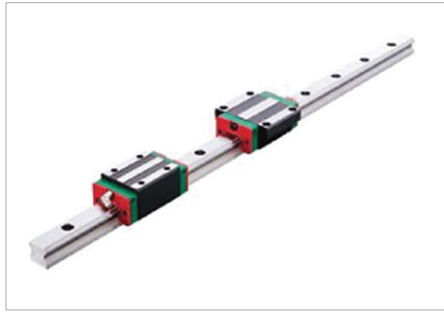
**1.8 sec** (Tool to Tool)



**21 tool servo ATC** (Optional)



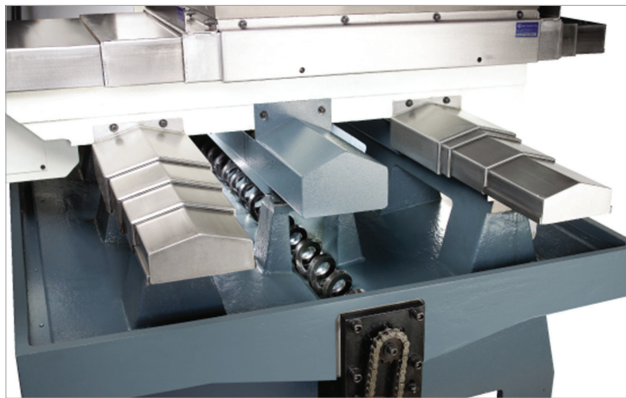
# Structure



## Linear Ways on 3 Axes

The X, Y, Z-axis slideways are mounted on precision linear guide ways with optimal span length between guides. The design maintains maximum stability during high speed traverse. The ball bearing linear ways feature low friction coefficient and high positioning accuracy.

The three axes are driven by **FANUC** digital AC servo motors with fast acceleration and deceleration.

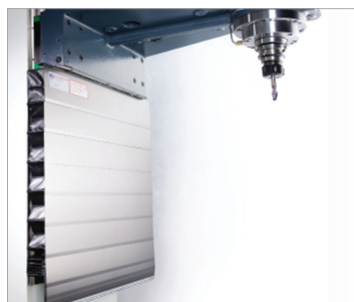


## Chip Auger

A chip auger is mounted at the center of the base, delivering chips to the chip cart located at the backside of machine. The chip auger frees operator from manually removing chips while maintaining a clean interior of machine at all times.

## X, Y-axis Telescopic Guard

The telescopic guards on X, Y-axis prevent chips from coolant from damaging linear ways.



## Z-axis Telescopic Guard

To meet the high speed traverse of Z-axis, the guard is a combination of canvas and steel plates. It provides superior protection for linear ways and extends their service life.

# High Precision Spindle



TR-45E / TR-510  
TR-600 / TR-700

#30 Taper  
Direct Drive  
Spindle Speed

**10,000 min<sup>-1</sup>**

**15,000 min<sup>-1</sup>** (optional)



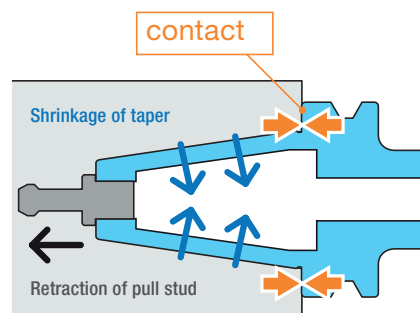
TR-51E

BT #40 Taper  
Belt Drive  
Spindle Speed

**8,000 min<sup>-1</sup>**

## NBT spindle with dual face contact

- NBT spindle allows dual contact along both spindle taper and spindle flange.
- Improved in metal removal rate.
- Higher positioning accuracy
- Less vibration during cutting



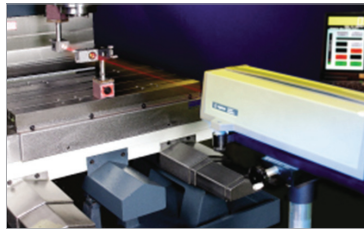
A retraction of the pull stud results in shrinkage of the taper, which leads to a tight flange face contact.

## Control Specifications

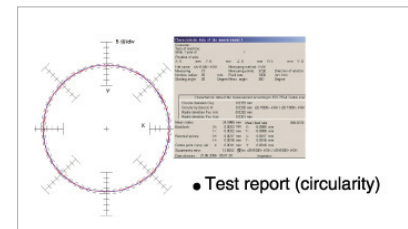


	Fanuc
MODEL	Oi-MD
CPU	32 bit
Max. controlled axes	7
Max. simultaneous axes	4
Program storage length	256 K
Macro variables common	600
Tool offset sets	200
Conversational programming	○
Display	8.4" TFT LCD
Multi-language display	○
Servo system with ABS. encoder	○
Memory card	○
Ethernet	○
High speed and accuracy machining code	G05.1 Q1
RS-232 interface	○
Tool path simulation	○

## Quality Control



- The positioning accuracy is inspected by using  **Agilent Technologies** laser interferometer unit.
- Positioning accuracy in full travel is less than 0.010mm.

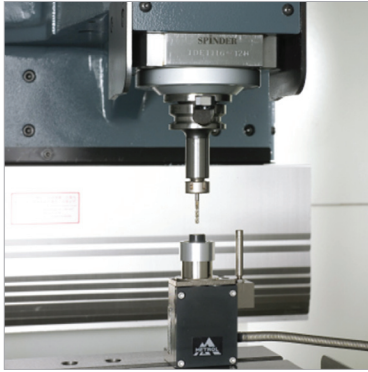


Diameter Ø100 mm, F=3000 mm/min,  
circularity <0.010 mm.

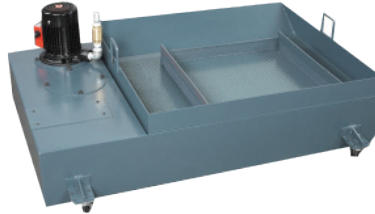
**HEIDENHAIN** grid encoder is used to ensure dynamic contouring accuracy.



## Optional Equipment



Tool length measurement  
and breakage detection

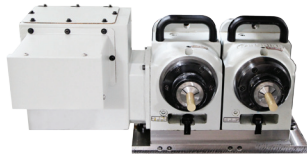


Movable, large capacity coolant tank

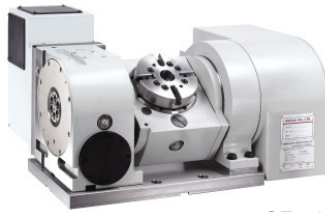
- Equipped with casters for pulling the coolant tank out from the machine. This permits convenient and fast cleaning of tank inside.
- The large capacity coolant tank is equipped with filter screen to filter coolant impurity.



Transformer   Spindle oil chiller



5C indexer



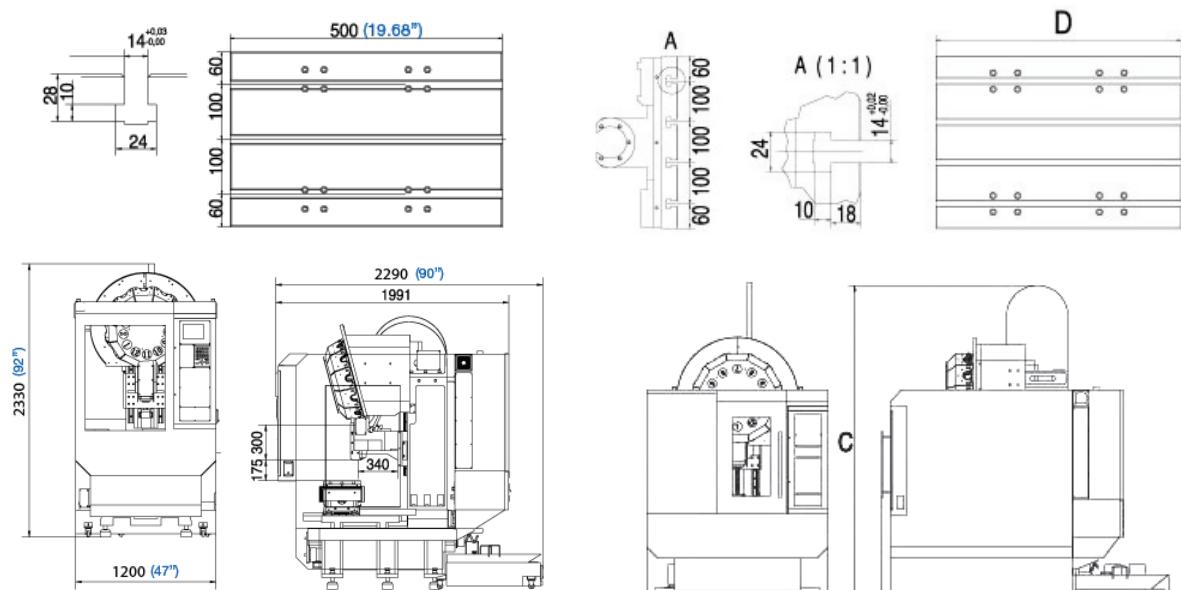
GF-125P

CNC rotary table (4th or 5th axis)

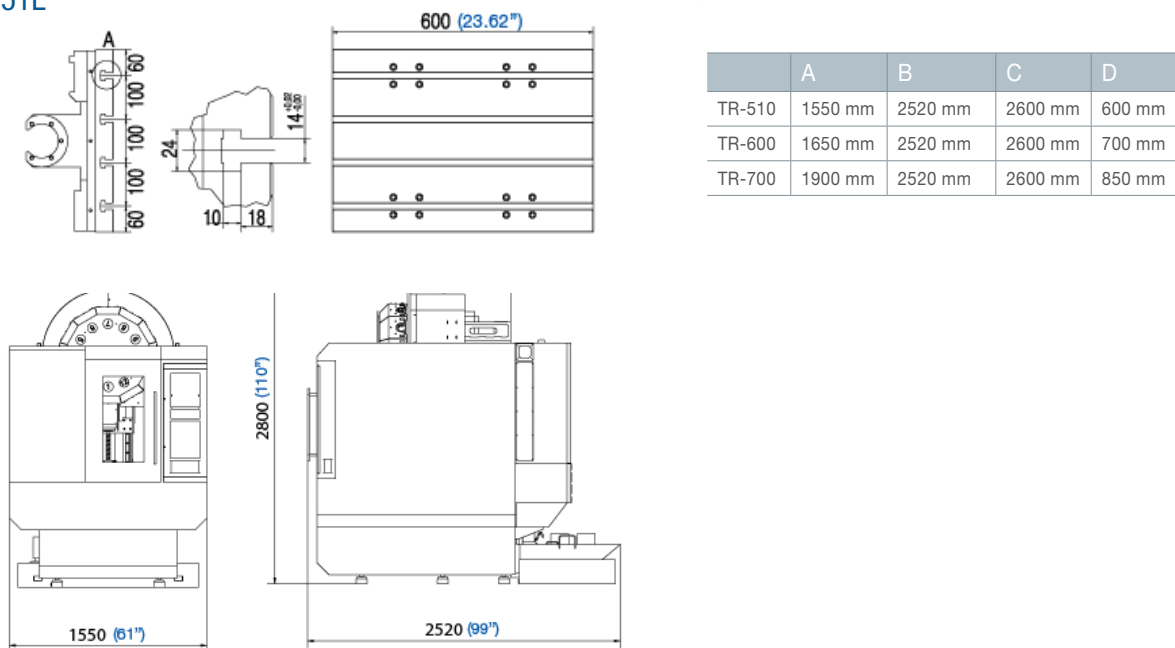
The use of motor with absolute encoder on tilting shaft is recommended.

# Dimensions

## TR-45E



## TR-51E



	A	B	C	D
TR-510	1550 mm	2520 mm	2600 mm	600 mm
TR-600	1650 mm	2520 mm	2600 mm	700 mm
TR-700	1900 mm	2520 mm	2600 mm	850 mm

# Specifications

	MODEL	TR-45E		TR-51E		TR-510		TR-600		TR-700	
TRAVEL	X-axis	450 mm	17.71 in	510 mm	20 in	510 mm	20 in	600 mm	23.6 in	700 mm	27.5 in
	Y-axis	300 mm	11.81 in	400 mm	15.74 in	400 mm	15.7 in	400 mm	15.7 in	400 mm	15.7 in
	Z-axis	300 mm	11.81 in	400 mm	15.74 in	350 mm	13.8 in	350 mm	13.8 in	350 mm	13.8 in
	Table to spindle nose	175 ~ 475 mm	6.9 ~ 18.7 in	150 ~ 550 mm	5.9 ~ 21.6 in	150~500 mm	5.9~19.7 in	150~500 mm	5.9~19.7 in	150~500 mm	5.9~19.7 in
TABLE	Table area	500 x 320 mm	19.6 x 12.6 in	600 x 420 mm	23.6 x 16.5 in	600 x 420 mm	23.6 x 16.5 in	700 x 420 mm	27.5 x 16.5 in	850 x 420 mm	33.5 x 16.5 in
	Max. load	200 kg	440 lbs	250 kg	551 lbs	250 kgs	551 lbs	250 kgs	551 lbs	250 kgs	551 lbs
	T-slot	14 x 100 x 3 mm	0.55 x 3.9 x 0.11 in	14 x 100 x 4 mm	0.55 x 3.9 x 0.15 in	14 x 100 x 4 mm	0.55 x 3.9 x 0.15 in	14 x 100 x 4 mm	0.55 x 3.9 x 0.15 in	14 x 100 x 4 mm	0.55 x 3.9 x 0.15 in
SPINDLE	Spindle speed	10000 rpm (15000 rpm optional)		8000 rpm (15000 rpm optional)		10000 rpm (15000 rpm optional)		10000 rpm (15000 rpm optional)		10000 rpm (15000 rpm optional)	
	Max. tapping speed	4000 rpm		3000 rpm		4000 rpm		4000 rpm		4000 rpm	
	Spindle taper	7/24 BT#30		7/24 BT#40		7/24 BT#30		7/24 BT#30		7/24 BT#30	
	Transmission	Direct drive		Belt		Direct drive		Direct drive		Direct drive	
FEED RATE	Rapid traverse (G00)	48 / 48 / 60 m/min	1890 / 1890 / 2362 ipm	48 / 48 / 48 m/min	1890 / 1890 / 1890 ipm	48 / 48 / 60 m/min	1890 / 1890 / 2362 ipm	48 / 48 / 60 m/min	1890 / 1890 / 2362 ipm	48 / 48 / 60 m/min	1890 / 1890 / 2362 ipm
	Cutting feedrate (G01)	10000 mm/min	394 ipm	10000 mm/min	394 ipm	10000 mm/min	394 ipm	10000 mm/min	394 ipm	10000 mm/min	394 ipm
ATC	Tool shank	BT#30		BT#40		BT#30		BT#30		BT#30	
	Pull stud	P30T-1 MAS403-45°		P30T-1 MAS403-45°		P30T-1 MAS403-45°		P30T-1 MAS403-45°		P30T-1 MAS403-45°	
	Magazine type	ARMLESS		ARMLESS		ARMLESS		ARMLESS		ARMLESS	
	Magazine capacity	12	21 optional	12	21 optional	12	21 optional	12	21 optional	12	21 optional
	Max. tool length	200 mm	7.87 in	250 mm	9.84 in	200 mm	7.87 in	200 mm	7.87 in	200 mm	7.87 in
	Max. tool diameter	100 mm	3.93 in	100 mm	3.93 in	100 mm	3.94 in	100 mm	3.94 in	100 mm	3.94 in
	Max. tool weight	2.5 kg	5.51 lbs	3 kg	6.6 lbs	2.5 kg	5.5 lbs	2.5 kg	5.5 lbs	2.5 kg	5.5 lbs
	Tool change time	Tool to tool	1.4 sec	1.8 sec		1.4 sec		1.4 sec		1.4 sec	
		Chip to chip	2.3 sec	2.7 sec		2.3 sec		2.3 sec		2.3 sec	
MOTOR	X-axis	1.0 kw	1.3 HP	1.5 kw	2 HP	1.5 kw	2 HP	1.5 kw	2 HP	1.5 kw	2 HP
	Y-axis	1.5 kw	2 HP	1.5 kw	2 HP	1.5 kw	2 HP	1.5 kw	2 HP	1.5 kw	2 HP
	Z-axis	2.2 kw	3 HP	3.0 kw	4 HP	3.0 kw	4 HP	3.0 kw	4 HP	3.0 kw	4 HP
	Spindle	3.7 / 2.2 kw	5 HP / 3HP	5.5 / 3.7 kw	7 HP / 5HP	3.7/2.2 kw	5 HP/3 HP	3.7/2.2 kw	5 HP/3 HP	3.7/2.2 kw	5 HP/3 HP
MISC.	W x D x H	120 x 229 x 233 cm	47 x 90 x 92 in	155 x 252 x 280 cm	61 x 99 x 110 in	155 x 252 x 260 cm	61 x 99 x 102 in	165 x 252 x 260 cm	65 x 99 x 102 in	190 x 252 x 260 cm	75 x 99 x 102 in
	Net weight	2380 kg	5250 lbs	3100 kg	6834 lbs	3100 kg	6834 lbs	3250 kg	7165 lbs	3350 kg	7385 lbs

## STANDARD ACCESSORIES

Spindle air blow device
Work light (PL light)
Tool cooling system and coolant tank
Leveling bolts and pads
Double-door type heat insulated electrical cabinet with heat exchanger
Screw-type chip conveyor
Automatic lubrication system
Tool kit and tool box
Dual-color LED alarm light
TFT LCD monitor

## OPTIONAL ACCESSORIES

Armless 21-tool ATC
Spindle motor 15,000 rpm
High pressure coolant through spindle (20 bar)
Automatic tool length measurement with breakage detection
Automatic door
Transformer
Workpiece air blow system
5C indexer
4th axis
5th axis

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**CUBIC MACHINERY, INC.**

13401 Benson Ave. Chino, CA. 91710

Tel 909 590-9995

Fax 909 590-9996

[CubicMachinery.com](http://CubicMachinery.com)

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