# TUE-100

**Vertical Boring and Turning Mill** 



# TUE-100 Further expanding our VTL li Excellent cutting ability whi Vertical lathe creating new





# neup ch is born from High power added value

### **Features**

- · Identical Ram Cross-Section as Larger model Ensures
  Heavy Duty Cutting Capability
- Wide Range of Table Speeds for Exceptional Surface Finishes on Various Materials.
- · Highest Rapid Rate Available in its Class, Reduces Cycle Time.
- A full enclosure with door interlocks is Standard Allowing for Cleaner Working Environment.
- · 100(S) type machine equipped with a live spindle reduces the amount of setups, in order to achieve a more efficient process.



# Mechanical structure to allow powerful cutting

Main structure is made up using a thick high-quality cast iron.

### Column

The wall-type column with a large cross-sectional shape and the cross rail are a single casting designed to reach out to the table center. This type construction firmly supports the rail-head for high-precision, high speed positioning, and heavy cutting.



### **Table**

The table is supported by a combination of 2 different types of bearings, a tapered roller bearing which bears the radial load and a large diameter thrust ball bearing which bears the axial load. This combination makes high-speed and heavy cutting possible.

### Railhead & Ram

The Railhead and Ram create a hybrid system of motion utilizing large diameter ball screws with linear roller guide ways for the X axis and Hardened and Ground box slide ways for the Z axis making it possible for high-precision and high speed positioning to coexist with heavy cutting.

Tool can be clamped/unclamped automatically in the Spindle (ISO taper No.50) with the collet type pull stud and the spindle is driven by the AC type motor located at the top of the ram.

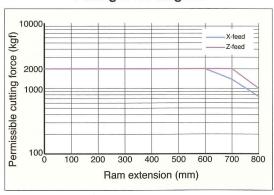
### Bed

The bed, made of cast iron, was engineered for maximum support of the Table and Column. By design, the chips efficiently flow down the slope shape of the bed into the standard chip conveyor with the aid of a shower type coolant.

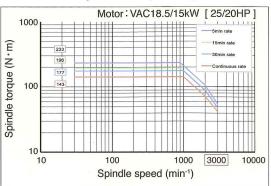




### **Cutting force diagram**



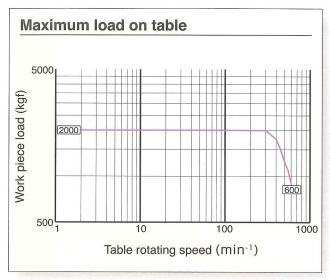
### Live Spindle torque diagram

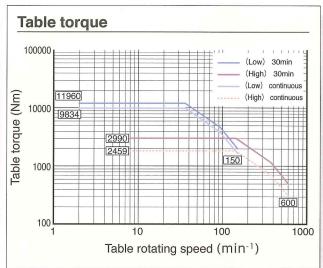


# **Machine capability**

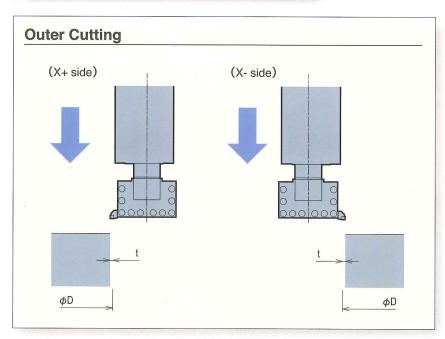


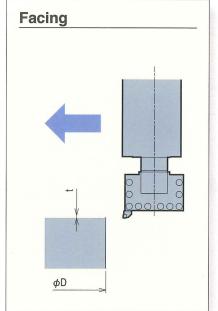
### Table capability diagram





# Machining capability (Material: AISI 1055)





Ram Ext.	:	700 ~ 722mm
Dia.: D	;	φ408mm
Depth: t	:	10mm
Feed: F	:	1.0mm/rev
Cutting force	:	2ton

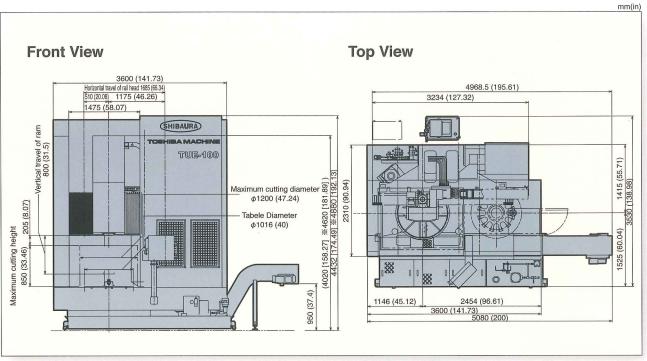
Ram Ext.	: 700 ~ 725mm	
Dia.: D	: φ420mm	
Depth: t	: 10mm	
Feed: F	: 1.0mm/rev	
Cutting force	: 2ton	

Ram Ext.	: 650mm
Dia.: D	: φ445 ~ 220mm
Depth: t	: 10mm
Feed: F	: 1.0mm/rev
Cutting force	: 2ton

Note) This data may not be achieved due to a variety of different factors such as - method of work holding, type of tool holder, type of cutting tool, etc...

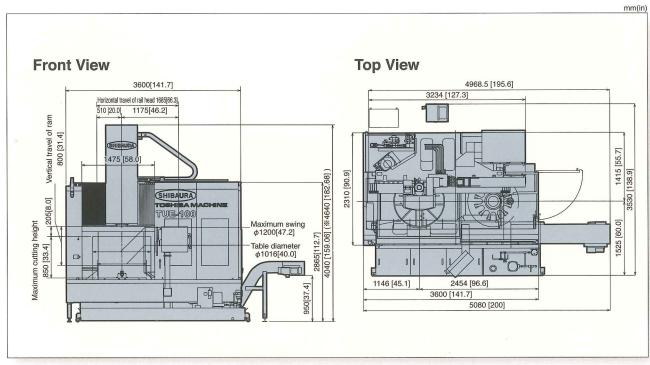
# **Machine General View**

## **FULL COVER**



**%100(S)** 

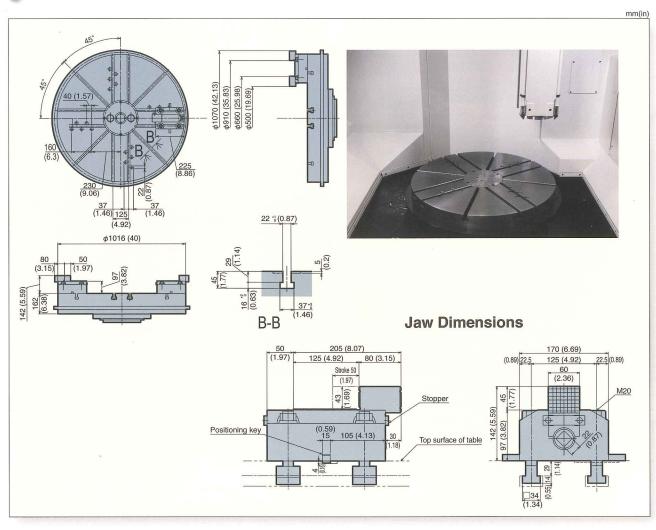
### HALF COVER



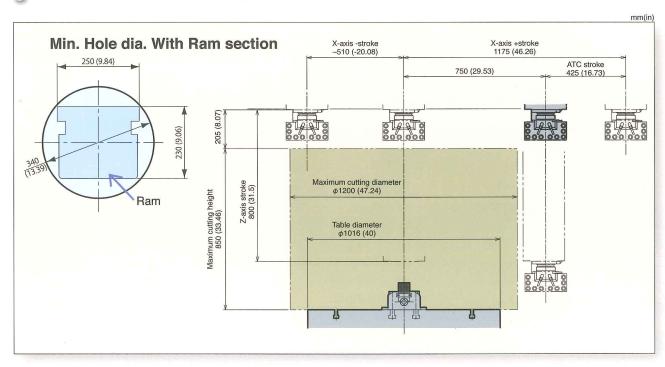
**%100(S)** 

# **Table Dimensions**





# **Machine Area**



# **Machine specifications**

40	Table diameter	mm[in]	1 016 [40.0]	
Capability Maximum height from table top to ram bottom		mm[in]	1 200 [47.2]	
		mm[in]	1 055 [41.5]	
and	Maximum cutting height		850 [33.4]	
capacity	Maximum cutting diameter		1 200 [47.2]	
Maximum cutting force of ram		N[lbf]	19 600 [4 406]	
	Maximum load on table		2 000 [4 400]	
Travel  Horizontal travel of rail head(X-axis)  Vertical travel of ram(Z-axis)		mm[in]	-510 ~ 750 [-20.0 ~ 29.5]	
		mm[in]	800 [31.4]	
	Lc Lc	w min <sup>-1</sup>	2 ~ 150	
Table	Rotation speed(2 ranges) Hi	gh min <sup>-1</sup>	8 ~ 600	
	Maximum torque	N·m[lbf·ft]	9 834 [7 253] (at 36min <sup>-1</sup> )	
Live Spindle			15 ~ 3 000	
[100(S)]	Maximum torque		233 [171.8]	
	Rapid traverse rate of rail head		15 [590.5]	
Feed rate	Rapid traverse rate of ram	m/min[ipm]	12 [472.4]	
Feed rate		mm/min[ipm]	1 ~ 2 000 [0.04 ~ 78.7]	
Туре			Square ram type	
Ram	Guideways		Dual parallel	
	Section	mm[in]	250 × 230 [9.84×9.06]	
	Type of tool shank		7/24 taper No.50	
Tool	Type of retention knob		JIS 50 PU	
	Automatic tool changer(ATC)		Tool storage capacity : 12 tools	
Motor	Table drive motor(30min./Continuous rating)		VAC 45/37 [60/50]	
	Height	mm[in]	4 432 [174.4] [4 880] [192.1] ※4 040 [159] [4 640] [183	
Machine size Floor area  Machine weight		mm[in]	5 080 × 3 530 [200×138.9]	
		kg[lb]	11 000 [24 200] [11 500] [25 300] ※ 10 300 [22 700] [10 800] [23	
			X and Z axis: ±0.007 per 500 [±0.0003 per	
	Positioning accuracy	mm[in]	X-axis: ±0.015/(0~1 000)[±0.0006/(0~39.	
Accuracy			Z-axis: $\pm 0.015/(0\sim800)[\pm0.0006/(0\sim31.4)]$	
	Positioning repeatability accuracy	mm[in]	±0.003 [±0.00012]	
B. 1	Exterior painting		Munsell 5Y8.4/0.5(R4-383) and Munsell N2	
Painting color	Interior painting		Munsell 10YR8/4	

※HALF COVER
[ ] 100(S)

# Standard Accessory

Installations parts	1set	5 Telescopic crossrail slide cover 1se
2 Special service tools	1set	6 Splash cover (Full-cosed type) 1se
Automatic slideway lubricating unit	1set	Coolant throuth spindle 1se
Four (4) independent manually-operated jaws	1set	

# Optional Accessory



### Turning basic package

### (1) Automatic tool changer (ATC)

Tool storage capacity : 12 tools (※18 tools)

Type of tool shank for turning : 7/24 taper No.50

Maximum tool size : 350W×150T×400L mm

{13.8W×5.9T×15.7L inch}

Maximum tool weight: 40 kg (88 lb)

Method of tool selection : Soft tool pot address

(2) Work light (LED)

10 Watt x 2 piece, Located inside of splash cover

(3) Operator call lamp

(This lamp is mounted on top of the arm right side.)

Green: Illuminated during automatic operation.

Yellow: Illuminated when M00, M01, M02, M30 or

M52 has been executed.

Red: Illuminated at NC alarm or machine alarm generation.

- (4) Table lubricant oil cooling unit
- (5) Automatic power OFF
- (6) Chip conveyor with tank / coolant unit Used to discharge chips recovered by the chip scraper from the machine.

Not available to operate by inputting M-code

(only manual push button).

Coolant tank capacity: 550 L [145.3 gal]
Standard type: Motor: AC 4P, 0.2kW [0.27 HP]

(7) Additional table center hole and tap hole

Table center hole for fixture: Dia. 100 mm [3.94"]

Tap size: M24×pitch 3.0 [1-8UNC]

### **User Option**

- (8) High type independent manually-operated jaw set (4 pieces)
- (9) Separate type independent manually-operated Soft jaw set (4 pieces)
- (10) Separate type independent manually-operated Hard jaw set (4 pieces)
- (11) Special stroke type independent manually-operated jaws set (4 pieces)

  Jaw stroke: 100 mm [3.94"]
- (12) Tool holder (see below)
- (13) X-axis linear scale feedback
- (14) Automatic diameter and step difference measuring device (Included automatic tool compensation function)

This consists of "touch probe from Renishaw" and measuring software for it.

Printer is not included in this option.

(15) Automatic tool tip measuring device (Included automatic tool compensation function)

This consists of "tool eye (with a cross type feeler) from Renishaw" and measuring software for it. Printer is not included in this option.

(16) ATC jib crane

Maximum lifting load: 50 kg (110lb)

(17) HALF COVER

**%100(S)** 

# Tool holder (Optional Accessory)

ISO No.50

		Н	В	С
FMS50A-ST(3232)-160-JH	160(6.3)	295.8(11.65)	95(3.74)	30(1.18)
FMS50A-ST(3232)-200-JH	200(7.87)	335.8(13.22)	135(5.31)	45(1.77)
FMS50A-ST(3232)-250-JH	250(9.84)	385.8(15.19)	185(7.28)	45(1.77)
FMS50A-BFP110-250-JH	250(9.84)	385.8(15.19)	195(7.68)	-
FMS50A-BFP110-300-JH	300(11.81)	435.8(17.16)	245(9.65)	
FMS50A-BFP110-350-JH	350(13.78)	485.8(19.13)	295(11.61)	-
FMS50A-BFP110-400-JH	400(15.75)	535.8(21.09)	345(13.58)	

# **CNC FANUC Series Oi-TD**



### **CNC FANUC Series Oi-TD**

Most advanced CNC controller of FANUC seriese 0i-TD is applid on the machine.

Most of functions including optional functions in Fanuc's classification are specified as standard.

In addition to common operational functions, the machine is provided with such oprator friendly functions as help function, alarm display, and display of operation status to assist operator.

### **Manual operation**

The "TUE series machine can be operated in manual very easily, in addition to automatic operation.

Many opration buttons to be used in manual mode are located on the operation panel, which are "Table CW/CCW" including jogging, Feed selection switch for X and Z including jogging, "Table speed overrideswitch", "Feed override switch" "Operation mode selection buttons", and Manual pulse generator (MPG)".

### **Basic Specifications**

General purpose retract

. Axis control	
Controlled path	1 path
Controlled axis (total)	2 axis(%3 axis)
Simultaneous controllable axis	2 axis(%3 axis)
Axis name	X and Z
Spindle	1 uni
Least input increment	0.001mm(%0.001deg),0.0001inch
Flexible feed gear	Optional DMF
Fine Acc & Dcc control	
Servo HRV control	HRVS
Inch/metric conversion	
	direction /block start / cutting block star
	All axes/each axis
Machine lock	All axes/each axis
Emergency stop	
Over trave	· · · · · · · · · · · · · · · · · · ·
Stored stroke check 1	
Stored stroke check 2	
Stored stroke check 2,3	
Stroke limit check before move	
Chuck and tail stock barrier	
Mirror image	Each axis
Follow-up	
Servo off	
Chamfering on/off	
Backlash compensation	
Backlash compensation for each rapid trav	erse and cutting feed
Stored pitch error compensation	croe and catting reed
Position switch	
	unation
Unexpected disturbance torque detection for	unction
0	
. Operation	
Automatic operation (memory)	B 1 / 1 1 / 1 1 1 1 1 1 1 1 1 1 1 1 1 1
DNC operation	Reader/puncher interface is required
DNC operation with Compact Flash card	Enabled by using an attached
	PCMCIA card attachment
MDI operation	
Schedule function	
Program number search	
Sequence number search	
Sequence number comparison and stop	
Program restart	
Manual intervention and return	
Buffer register	
Dry run	
Single block	
JOG feed	
Manual reference position return	
Manual handle feed	1 uni
Manual handle feedrate	x1, x10,x10
Incremental feed	
Jog and handle simultaneous mode	
. Interpolation functions	
Positioning	G0
Linear interpolation	G0
Circular interpolation	G02,G0
Dwell	G0
Threading, synchronous cutting	
Multiple threading	
Threading retract	
Continuous threading	
Variable lead threading	
Skip	G3
High speed skip	
Torque limit skip	
Reference position return	G2
Reference position return check	G2
	G3
2nd reference position return	G3
3rd/4th reference position return	
General nurnose retract	



I. Feed function  Rapid traverse rate	X: 15m/min, Z: 12m/min	7. Tool function/Tool compens Tool function
	0~100%, 10% step	-
Rapid traverse override Feed per minute	0~100%, 10% step	Tool offset pairs Tool offset
Feed per revolution		Tool onset Tool nose radius compensation
Cutting feedrate clamp		Tool geometry/wear compensation
	near, Cutting feed: exponential	Tool life management
Rapid traverse bell-shaped acceleration/deceleration	icar, caming rood, experiental	Tool offset value counter input
Linear acceleration/deceleration after cutting feed interp	olation	Automatic tool offset
Feedrate override	0~200%, 10% step	Direct input of tool offset value n
Jog handle override	,	Direct input of tool offset value n
Override cancel		
Manual per revolution feed		8. Editing operation
Error detection		Part program storage length
Rapid traverse block overlap		Number of registerable programs
External deceleration		Part program editing
		Program protect
. Program input		Background editing
Tape code	EIA RS244/ISO840	Extended part program editing
Label skip		Playback
	orizontal and vertical parity	Password function
Control in/out		
Optional block skip	max. 9 pieces	9. Setting and display
Max. programmable dimension	-8~+8 digit	Status display
Program number	O4-digit	Clock function
External memory and sub program calling function		Current position display
Sequence number	N5-digit	Program display
	ined use in the same block	Parameter setting display
External memory and sub program calling function		Parameter set supporting screen
Input unit 10 time multiply		Self-diagnosis function
Diameter/radius programming (X axis)	017 010 010	Alarm display
**Plane selection	G17, G18, G19	Alarm history display
**Rotary axis designation		Operation history display
*Rotary axis roll over		Operation history display
Coordinate system setting Automatic coordinate system setting		Help function
Coordinate system shift		Run hour and parts count display Actual cutting feed feedrate disp
Direct input of coordinate system shift		Display of spindle speed and T of
Workpiece coordinate system	G52~G59	Directory display and punch for e
Direct input of workpiece origin offset value measured	G02 G00	Graphic function
Manual absolute on and off	-	Servo setting screen
Direct drawing dimension programming		Spindle setting screen
G code system	Α	Servo waveform display
Chamfering/corner R		Display of hardware and softwar
Programmable data input	G10	Periodic maintenance screen
Sub program call	4 folds nested	Maintenance information screen
Custom macro B		Trouble diagnosis
Addition of custom macro common variables	#100~#199, #500~#999	Software operator's panel
Pattern data input		Software operator's panel gener
Interruption type custom macro		Multi-language display En
Canned cycles		Data protection key
Multiple repetitive cycle		Erase CRT screen display
Multiple repetitive cycle 2	pocket profile	
※Canned cycles for drilling		10. Data input/output
Circular interpolation by R programming		Reader/puncher interface
Tape format for FANUC Series 10/11		Embedded Ethernet
Macro executor		External I/O device control
		External tool offset
. Auxiliary/Spindle speed function		External message
Auxiliary function	M2-digit	External machine zero point shif
2nd auxiliary function	B2-digit	External data input
Auxiliary function lock		External key input
High speed M/S/T/B interface		External program input
Multiple command of auxiliary function	3	External workpiece number sear
Spindle speed function	S4-digit	Extended External workpiece nu
Spindle serial output	S4-digit, serial output	External program number search
Constant surface speed control	50 400 51 551	Memory card input/output
Spindle override	50~120 %, 5% step	Power mate CNC manager
Actual spindle speed output		USB Memory input/output
Spindle speed fluctuation detection		
1st spindle orientation		Oputional Accessories (to be
1st spindle output switching function		Dynamic Graphic display
*2nd spindle orientation		The function is not allowed to
*2nd spindle output switching function		2 Data server
Spindle synchronous control		The function is not allowed to
*Multi-spindle control		3 FAST Ethernet
Spindle positioning		4 Manual guide i
WB: : 1:		Manual guide i basic
※Rigid tap		Manual guide i turning c

Tool fortset pairs Tool offset reduce counter input Automatic tool offset poil for the pair of the pai	T4.41-44
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