

CNC Vertical Boring & Turning Mills

# **VTB/VTC Series**

VTB-100T/100/125/140/160/125E/140E/160E  
VTC-100/125/140/160/125E/140E/160E



# VTB/VTC Series

## 100T/100/125/140/160/125E/140E/160E

### Heavy Duty, High Precision, Vertical Boring and Turning Mills Designed to Deliver Superior Performance

#### ■ High Quality Cast Iron Constructions

The column, cross rail, bed, saddle, and table are constructed of high quality Meehanite cast iron. These main components are densely ribbed, thick walled, and fully stress relieved for long lasting accuracy.

#### ■ Guide Ways

The wide box type guide ways are induction-hardened and precision-ground. Mating surfaces of the sliding components are coated with fluoro-plastic resin and are hand scraped for perfect fit. Fully automatic metered lubrication system provided.

#### ■ High Powered Table

The 60HP maintenance free Fanuc AC spindle motor and two gear ranges produce high table torque. Transmission of this enormous power is accomplished by the use of induction hardened and precision ground heavy duty gears and shafts of special alloy steel. Helical gears are used for their smooth and efficient power transmission characteristics. Extremely heavy table loads and full horse power cuts are attained by the use of extra large diameter high precision thrust roller bearing and tapered roller bearings. Forced lubrication system provided.

#### ■ Elevating Cross Rail (VTB/VTC-E)

Vertical positioning of this massive cross rail is hydraulically powered. Positioning accuracy is assured by automatically actuated precision pins and 37.4 tons of hydraulic clamping force.

#### ■ Ram

The extra large heavy duty ram, induction-hardened and precision-ground, is made of spheroidal graphite iron. Spheroidal-graphite-iron is used for unsurpassed rigidity and dampening characteristics. This hydraulically counter balanced ram is encased in the robust saddle to permit heavy duty machining. Ram sliding surfaces of the saddle are coated with fluoro-plastic resin.

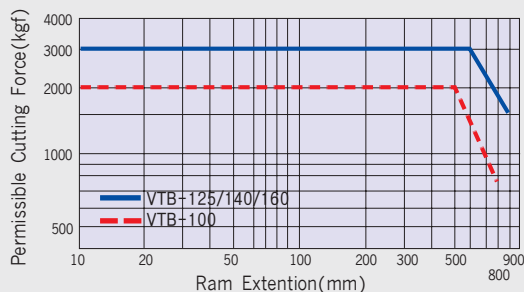
#### ■ Automatic Tool Changer

The standard 12 tool capacity(24 tools for model VTC) automatic tool changer system and a wide variety of available tooling enable uninterrupted fully automatic machining possible. This rigidly constructed carousel type tool changer features high speed random indexing and is capable of safely handling tools of up to 50kg(110 pounds).

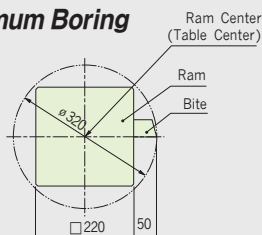
#### ■ Axis Drives

Each axis is driven by a high precision ballscrew and is powered by a high torque, maintenance free Fanuc digital AC servo motor. Ballscrews are supported on both ends by high precision bearings. The optional X axis linear scale feed back system combined with double anchor pretensioned design assures outstanding machining accuracy and repeatability. Rapid traverse rate of both X & Z axes is 7500mm/min(295 ipm).

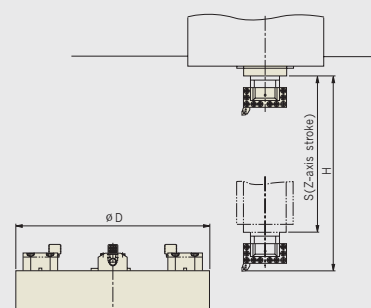
#### ■ Ram Head Cutting Capability



#### ■ Minimum Boring



#### ■ Machining Range



Model	VTB/VTC			
	100	125	140	160
D (Table dia.)	1000	1250	1400	1600
S (Ram stroke)	800		900	
H	Ind.chuck	1000	1100	1600
	Hyd.chuck	950	1050	1550

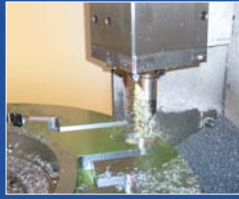
※ Ind: Independent, Hyd: Hydraulic



Turning



Face milling

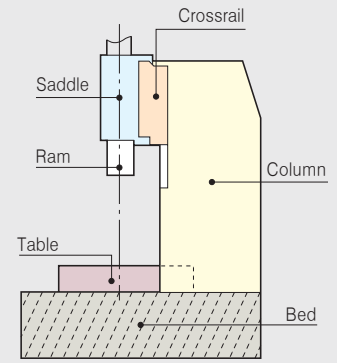


End milling



Drilling

## Machine Construction



# VTB/VTC Series

CNC VERTICAL BORING & TURNING MILLS

## Saddle & Ram



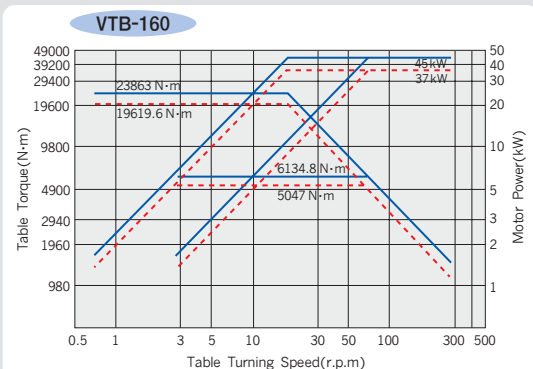
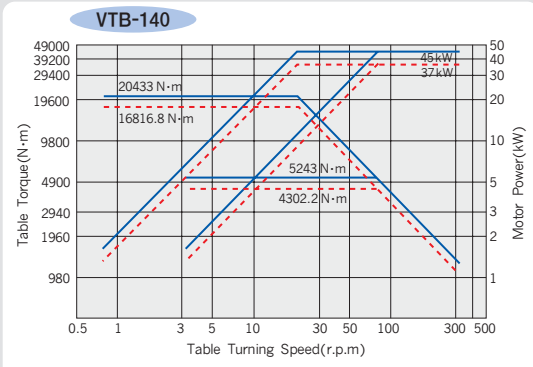
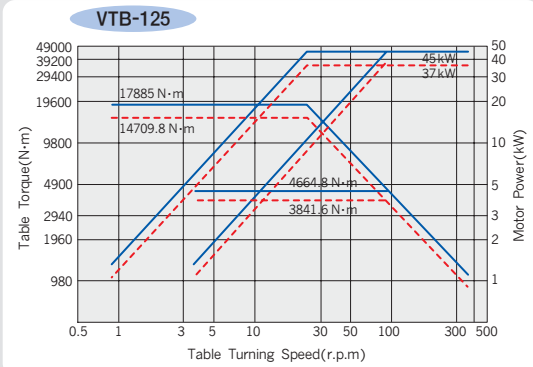
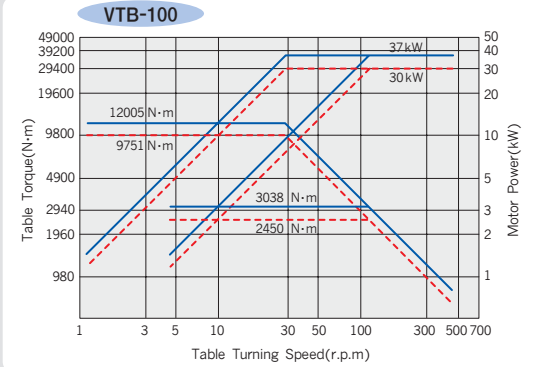
- The saddle enclosing the ram is one-piece casting to keep the high rigidity.
- Huge 220mm(8.66") square spheroidal graphite iron ram, hardened and ground, is encased in the heavily ribbed saddle and is hydraulically counter balanced.
- Low friction fluoroelastic resin bonded to the ram sliding surfaces of the saddle minimizes friction.
- Model VTC has milling spindle with high-speed that involves drilling, milling, and tapping.
- Pull stud tool mounting and dismounting way of machining center type (P50T-I).
- Automatic metered lubrication system ensures lasting accuracy.
- Tool fall-safety device assures safe operation.

## Table & Spindle Bearings



- Heavy duty table and large diameter high precision spindle bearings guarantee heavy loads and precise machining.
- Heavy duty 4-jaw independent chuck is standard(max. clamping force 4 metric tons). Hydraulic power chuck and automatic pallet changer system are available.
- The main spindle and drive gears are made of special alloy steel. They are induction hardened, fully stress relieved, and then precision ground for maximum performance.
- The power is transmitted to the table through the automatically shifted two speed gear box which generates enough speed and torque to satisfy wide spectrum of most demanding machining requirement.
- Helical gears are used for smooth and efficient power transmission characteristics.
- High-accurate table index by C-axis control: 0.001° on model VTC.
- Forced lubrication system provided.

## Table Torque & Power Diagram



— 30min Operating Zone  
 - - - Continuous Operating Zone





**VTB/VTC Series Line-up**



**VTB-100T**



**VTB(C)-100**



**VTB(C) Series**



**VTB(C)-E Series**



**VTB-V Series**



**VTB(C)-APC**

# VTB/VTC Series

CNC VERTICAL BORING & TURNING MILLS

## Machine Specifications

Items		Unit	VTB/VTC				
			100T	100	125 125E	140 140E	160 160E
Capacity	Max. turning diameter	mm(inch)	1250(49.2)		1600(63)		2000(78.7)
	Max. turning height	mm(inch)	800(31.5)		900(35.4) 1400(55.1)		
	Max. torque	N·m(lbf.ft)	12005(8860)		17885(13200)	20433(15100)	23863(17600)
	Max. cutting force	kgf(lbs)	2000(4410)		3000(6615)		
	Max. workpiece weight	kg(lbs)	4000(8820)		8000(17640)		10000(22100)
Table	Table diameter	mm(inch)	1000(39.4)		1250(49.2)	1400(55.1)	1600(63)
	Table speed	rpm	1.1~450		0.9~360	0.8~320	0.7~280
	Table speed range	step	Auto. 2-step				
C-axis (VTC)	Min. index angle	deg.	0.001°				
	Cutting feedrate	deg/min	0~1200				
	Max. speed	rpm	3.333				
Spindle Head	Tool size	mm(inch)	□32(□11/4)				
	Spindle taper	-	ISO 7/24 No.50				
	Mill spindle speed	rpm	30~3000				
	Max. mill spindle torque	N·m(lbf.ft)	-	186(137)	235(173)		
	Ram cross section	mm(inch)	220×220(8.66×8.66)				
Travel & Feedrate	X-axis travel(Saddle horizontal)	mm(inch)	1390(55)	1300(51)	1600(63)		1900(75)
	Z-axis travel(Ram Vertical)	mm(inch)	800(31.5)		900(35.4)		900(35.4)
	Vertical travel of cross rail	mm(inch)	-		700(27.5)		
	X/Z-axis cutting feedrate	mm/min(ipm)	Max.7500(295)				
	X/Z-axis rapid traverse	mm/min(ipm)	7500(295)				
	Cross rail rapid traverse	mm/min(ipm)	-		300(12)		
ATC	Type of tool holder	-	MAS BT50				
	Tool magazine capacity	VTB	Turning 6-tool: VTB-100T, Turning 12-tool: VTB-100/125/140/160 16-tool(Turning 8, Milling 8): VTC-100 24-tool(Turning 12, Milling 12): VTC-125/140/160				
		VTC					
	Max. tool weight	kg(lbs)	50(110)				
Type of pull stud	-	P50T-I					
Motor	Table motor	kW(HP)	AC 37/30(50/40)		AC 45/37(60/50)		
	Mill spindle motor	(30min/cont.)	-	AC 15/11	AC 18.5/15(25/20)		
	C-axis motor	kW(HP)	-	AC 4(5.3)	AC 7(9.3)		
	X/Z-axis servo motor	kW(HP)	AC 4(5.3)		AC 7(9.3)		
Power Source	Input power supply	-	AC 200/220V ±10%, 50/60Hz ±1%				
	Power capacity(VTB/VTC)	kVA	65/70		75/80		
Machine Size	Height	mm(inch)	4505(159)		4690(185) 5190(204)		
	Floor space(L×W)	mm(inch)	4685×3880(184×153)		4875×3885(192×153)		5285×4515 (208×178)
	Weight	kg(lbs)	28500 (62800)	29000 (63900)	30000 (66200)	31000 (68300)	34000 (74900)
CNC System		-	FANUC 21i-TB				

## Standard Accessories

- CNC controller, Fanuc 21i-TB
- AC table and servo drives and motor
- Heavy duty 4-jaw independent chuck
- Automatic tool changer(ATC device 12/24 set)
- Table lubrication cooling system
- Hydraulic power unit
- Automatic lubrication system for guides
- Coolant system
- Through tool coolant
- Through spindle coolant(only VTC )
- C-axis scale(only VTC )
- Speed reducer(X/Z-axis)
- Splash guard
- X-axis telescopic steel cover
- NC power off
- Work light
- Warning light(Red, Yellow, Green)
- Levelling block
- Foundation bolt & nut
- Operating tool box & tool kits

## Optional Accessories

- Automatic pallet changer(2-pallet/3-station)
- Hydraulic chucks
- Automatic index chucks(for large valve machining)
- Tool setter
- Work probe
- Linear scale feedback(X-axis & Z-axis)
- Chip conveyor
- Transformer
- Tool holders



## Standard CNC Control Features



### FANUC 21i-TB Control Features

- Simultaneously controllable axes: 2
- Minimum programmable increment: 0.001mm (0.0001")
- Tape storage length: 160m (520 feet)
- Registerable programs: 63
- Backlash compensation
- Pitch error compensation
- Constant surface speed control
- Self diagnostic functions

### Programming Features

- Circular interpolation by radius designation
- Tool nose radius compensation (G40-G42)
- Combined use of absolute/incremental command
- Inch/metric programming
- Chamfering, corner R
- Multiple repetitive cycles (G70-G76)
- Canned cycles (G90, G92, G94)
- Decimal point programming
- Reference point return (G27-G30)
- Sub-program 4 holds nested
- Custom macro B

### Operation Features

- 10.4" color LCD
- Absolute position encoders (no zero return required)
- Geometry and wear offsets
- 32 pairs of tool offsets
- Run hour display
- Automatic tool offset value measured
- Input/output interface (RS232C)
- Keyboard type manual data input (MDI full key)
- Program protect key
- Incremental offset
- Rapid traverse override
- Feed rate override
- Spindle speed override
- Tape code: EIA, ISO automatic recognition

## Accessories & Special Applications



Automatic Tool Changer



Tool Setter



Work Probe



Automatic Pallet Changer(2 pallets)



Hydraulic Chuck



Automatic Index Chuck  
(for machining large valve)



Automatic Index Chuck  
(for machining small valve)



Electrical V-6 Turret(VTB-100T only)

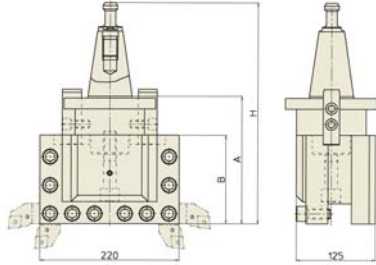




## Tool Holders(Option)

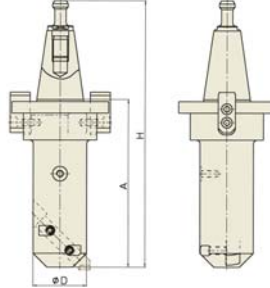
Unit : mm(inch)

### ● Square tool holder



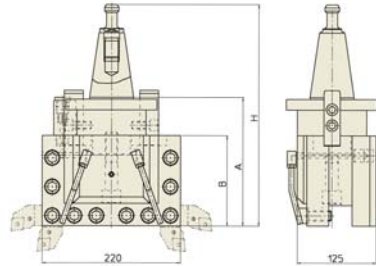
Model	A	B	H	Tool Size
TA12B41000-0060	160	100	306.8	□32(□11/4)
TA12B41000-0061	200	140	346.8	□32(□11/4)
TA12B41000-0062	250	190	396.8	□32(□11/4)

### ● Boring tool holder(BA type)



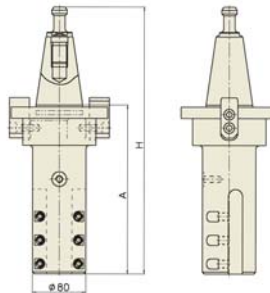
Model	A	H	D	Tool Size
TA12B41000-5040	200	346.8	$\phi 80$	□20(□3/4)
TA12B41000-5041	250	396.8	$\phi 80$	□20(□3/4)
TA12B41000-5042	300	446.8	$\phi 80$	□20(□3/4)
TA12B41000-5043	350	496.8	$\phi 80$	□20(□3/4)
TA12B41000-5050	200	346.8	$\phi 110$	□25(□1)
TA12B41000-5051	250	396.8	$\phi 110$	□25(□1)
TA12B41000-5052	300	446.8	$\phi 110$	□25(□1)
TA12B41000-5053	350	496.8	$\phi 110$	□25(□1)

### ● Square tool holder (Through tool coolant)



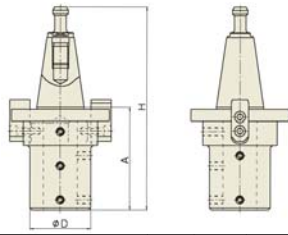
Model	A	B	H	Tool Size
TA12C41000-0160	160	100	306.8	□32(□11/4)
TA12C41000-0161	200	140	346.8	□32(□11/4)
TA12C41000-0162	250	190	396.8	□32(□11/4)

### ● Boring tool holder(BP type)



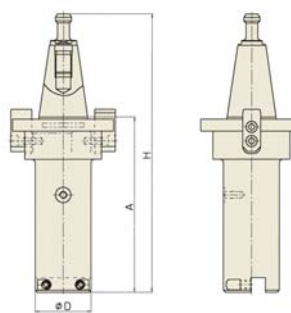
Model	A	H	D	Tool Size
TA12B41000-5140	200	346.8	$\phi 80$	□20(□3/4)
TA12B41000-5141	250	396.8	$\phi 80$	□20(□3/4)
TA12B41000-5142	300	446.8	$\phi 80$	□20(□3/4)
TA12B41000-5143	350	496.8	$\phi 80$	□20(□3/4)
TA12B41000-5150	200	346.8	$\phi 110$	□25(□1)
TA12B41000-5151	250	396.8	$\phi 110$	□25(□1)
TA12B41000-5152	300	446.8	$\phi 110$	□25(□1)
TA12B41000-5153	350	496.8	$\phi 110$	□25(□1)

### ● Side lock holder



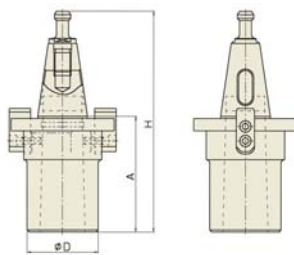
Model	A	H	D	Tool Size
TA12B41000-5350	110	256.8	$\phi 55$	$\phi 25(\phi 1)$
TA12B41000-5360	110	256.8	$\phi 62$	$\phi 32(\phi 1\ 1/4)$
TA12B41000-5370	160	306.8	$\phi 70$	$\phi 40(\phi 1\ 1/2)$
TA12B41000-5380	160	306.8	$\phi 90$	$\phi 50(\phi 2)$

### ● Boring tool holder(BF type)



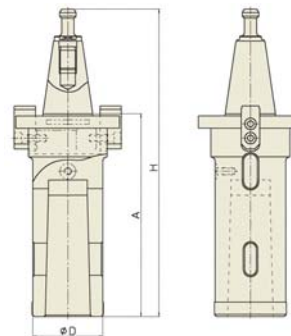
Model	A	H	D	Tool Size
TA12B41000-5240	200	346.8	$\phi 80$	□20(□3/4)
TA12B41000-5241	250	396.8	$\phi 80$	□20(□3/4)
TA12B41000-5242	300	446.8	$\phi 80$	□20(□3/4)
TA12B41000-5243	350	496.8	$\phi 80$	□20(□3/4)
TA12B41000-5250	200	346.8	$\phi 110$	□25(□1)
TA12B41000-5251	250	396.8	$\phi 110$	□25(□1)
TA12B41000-5252	300	446.8	$\phi 110$	□25(□1)
TA12B41000-5253	350	496.8	$\phi 110$	□25(□1)

### ● Morse taper holder(MS type)



Model	A	H	D	Tool Size
TA12B41000-5450	110	256.8	$\phi 85$	MT No.5
TA12B41000-5460	160	306.8	$\phi 100$	MT No.6

### ● Morse taper holder(ML type)



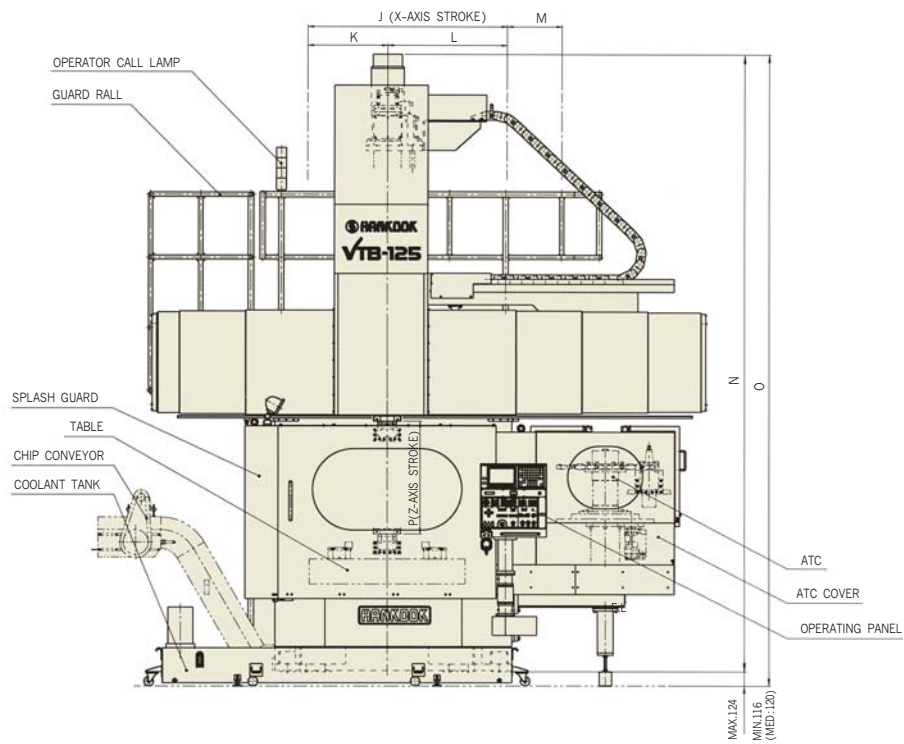
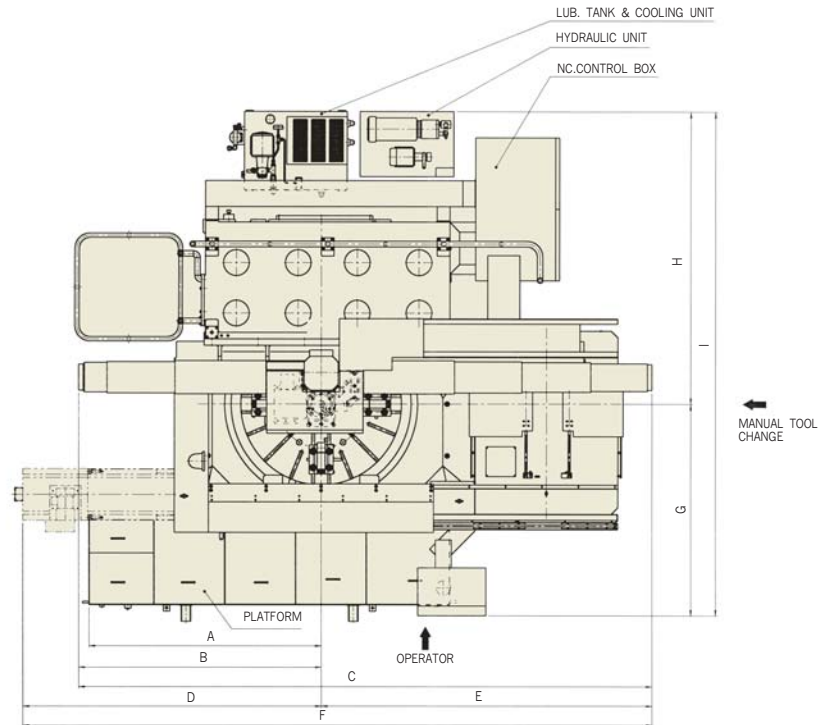
Model	A	H	D	Tool Size
TA12B41000-5550	240	386.8	$\phi 85$	MT No.5
TA12B41000-5560	290	436.8	$\phi 100$	MT No.6



# VTB/VTC Series

CNC VERTICAL BORING & TURNING MILLS

## External Dimensions



Unit:mm

MODEL	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	
VTB/VTC	100	1680	1735	4283	2860	2548	5407	1690	2420	4110	1300	515	785	485	4670	4790	800
	125/140(E)	1800	1880	4635	2992	2740	5732	1825	2740	4565	1600	640	960	440	4913(5413)	5028(5528)	900
	160(E)	2170	2055	4995	3422	2940	6398	2045	2770	4960	1900	740	1160	440	4913(5413)	5028(5528)	900

