

TWINHORN VH-650 VERTICAL MACHINING CENTER

STANDARD FEATURES

- ▶ Fanuc Oi-MC & 640 Meters Memory
- ▶ AC Digital Servo & Spindle Drivers
- ▶ High Precision Contouring Function (AICC)
- ▶ PCMCIA Slot for Memory Expansion
- ▶ Helical Interpolation & Custom Macro B
- ▶ Hardened Ground Box Ways on X,Y & Z
- ▶ Meehanite Cast Iron Bed, Base & Headstock
- ▶ Heat Exchanger for Electrical Cabinet
- ▶ Automatic Power off (M30)
- ▶ Roll Out Coolant Tank & Chip Tray
- ▶ Fanuc Operating & Maintenance Manual
- ▶ 4th Axis Interface Cable only Ready
- ▶ One Year Machine Parts Warranty
- ▶ Fanuc 15 HP Spindle Motor
- ▶ Spindle CAT-40 with 8000 RPM
- ▶ Arm Type 24 Tool ATC
- ▶ RS232 Interface
- ▶ Pitch Error Compensation
- ▶ Auto Lubrication System
- ▶ Fully Enclosed Splash Guard
- ▶ Spindle Air Blast & Cutting Air Blast
- ▶ Spindle Air Curtain
- ▶ Tool Kit / Work Light
- ▶ Operating & Electrical Manuals
- ▶ Hand Held Coolant & Air Nozzle
- ▶ Two Year Control Warranty

MACHINE SPECIFICATIONS

Travel X Axis -----	25.59" (650mm)
Travel Y Axis -----	19.69" (500mm)
Travel Z Axis -----	20.47" (520mm)
Rapid Feed Rate X & Y Axis -----	630ipm
Rapid Feed Rate Z Axis -----	630ipm
Cutting Feed Rate -----	196.85ipm (5000mm/min)
Positioning X, Y & Z Axis -----	0.0001/12" (0.005mm / 300mm)
Repeatability X, Y & Z Axis -----	±0.0001" (±0.003mm)
Table Dimension -----	31.50" x 17.72" (800mm x 450mm)
Maximum Loading -----	880 lb (400Kg)
Spindle Motor -----	FANUC AC Spindle Motor βiI 8 / 8000
Spindle Horse Power -----	15 HP
Spindle Speed -----	8000 RPM
Spindle Taper -----	CAT-40
Servo Drive Motor X & Y Axis -----	Fanuc β 12 / 3000is
Servo Drive Motor Z Axis -----	Fanuc β 22 / 3000is
Distance from Spindle Nose to Table -----	4.72" – 25.59" (120 – 650mm)
Distance from Spindle to Column -----	21.26" (540mm)

Note: Prices and model specifications are subject to change without prior notice. All prices are in U.S. Dollars.

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ATC -----	Swing Arm Type Random, Shortest Path, Bi-Directional
Magazine Capacity -----	24 Tools
Tool Change Time -----	2.5 Second
Maximum Tool Weight -----	15.4 lb (7.0kg)
Maximum Tool Length -----	11.81" (300mm)
Maximum Tool Diameter -----	3.14" (80mm)
Floor Space L x W x H -----	99"x86"x106" (2508mmx2180mmx2700mm)
Power Requirement -----	220V, 3 Phase, 60Hz, 30kVA, 75Amp
Machine Weight -----	10,978 lb (4990 kg)

MACHINE PRICES

VH-650 FANUC Oi-MC Control / 8000RPM / 24 Tool Arm Type ATC -----	\$63,500
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OPTIONAL ACCESSORIES

Mitsubishi 64SM Control -----	N/C
Mitsubishi 65SM Control -----	\$5,800
FANUC 21i-MC Control -----	\$11,500
FANUC 18i-MC Control -----	\$15,800
Spindle Speed 10,000RPM -----	\$3,500
Spindle Speed 12000RPM -----	\$5,500
Data Server 256MB (DNC) -----	\$2,300
Spiral Type Chip Conveyor & Cart -----	\$1,950
Chain Type Chip Conveyor & Cart -----	\$3,250
Spindle Oil Refrigeration Unit -----	\$1,700
Coolant Through Spindle (Included Filter System) -----	\$10,800
Coolant Through Tool -----	\$1,250
Chip Flushing System -----	\$780
Coolant Ring -----	\$470
Water Curtain Device -----	\$590
Oil Skimmer -----	\$590
ZF Gearbox -----	\$8,450
4 th Axis Interface with Servo Drive & Power/Signal Cable -----	\$4,300
4 th Axis Complete with Manual Tailstock + Install (Tanshing VRNC-210) -----	\$14,800
Transformer 15KVA -----	\$1,030
Transformer 25KVA -----	\$1,200

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Twinhorn VH-650 Machine Specifications

1. HEADSTOCK

A. Belt Drive	-----	Variable Speed
B. Belt Type	-----	920-8YU-40W for 6000 to 8000Rpm
C. Belt Type	-----	810-5GT-35W for 12000Rpm
D. Spindle Bearings Grade (8000 RPM)	-----	P4
Angular Contact (Front)	-----	7013C DBD P4
Contact Angle	-----	15 Degrees
O.D	-----	3.937" (100mm)
I.D	-----	2.559" (65mm)
Width	-----	0.709" (18mm)
Angular Contact (Rear)	-----	6011
O.D	-----	3.543" (90mm)
I.D	-----	2.165" (55mm)
Width	-----	0.709" (18mm)
E. Spindle Shaft Hardness	-----	HRC 60 - 62
F. Retention System	-----	Bevel Springs 88 pc
G. Holding Force	-----	1,892 lb (860kg)
H. Counter Balance	-----	Mechanical
I. Spindle Orientation	-----	Sensor
J. Spindle Taper	-----	CT or BT40
K. Spindle Motor	-----	Fanuc B12/7000i 10 / 15 Hp

2. TABLE

A. Dimensions	
Length	----- 31.50" (800mm)
Width	----- 17.72" (450mm)
B. Max. Table Load	----- 880 lb (400kg)
C. Slideways	----- Harden & Ground Box Ways

3. AUTOMATIC TOOL CHANGER (ATC)

A. Type	-----	Arm Type Random, Shortest Path, Bi-Directional
B. Max. Tool Weight	-----	15.4 lb (7kg)
C. Max. Tool Length	-----	11.81" (300mm)
D. Tool Change Time (Tool to Tool)	-----	2.5 Seconds
E. Magazine Capacity	-----	24 Tools
Max. Tool Dia. (Adjacent Pot Tooled)	-----	3.14" (80mm)
Max. Tool Dia. (Adjacent Pot Empty)	-----	4.92" (125mm)

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4. X AXIS

A. Ballscrew Diameter	-----	1.57" (40mm)
Lead	-----	0.393" (10mm)
Accuracy	-----	C3
B. Drive Motor	-----	Fanuc B12/3000i
C. Thrust (Continuous)	-----	1518 lb (690kg)
D. Rapid Rate (Linear Way)	-----	944ipm (24000mm/min)
E. Rapid Rate (Box Way)	-----	630ipm (16000mm/min)
F. Harden Ground Box Way (L x W x H)	-----	51.73" x 2.48" x 1.38" (1314 x 63 x 35mm)
G. Travel	-----	25.59" (650mm)
H. Positioning	-----	0.0001"/12"
I. Repeatability	-----	± 0.0001"

5. Y AXIS

A. Ballscrew Diameter	-----	1.57" (40mm)
Lead	-----	0.393" (10mm)
Accuracy	-----	C3
B. Drive Motor	-----	Fanuc B12/3000i
C. Thrust (Continuous)	-----	1518 lb (690kg)
D. Rapid Rate (Linear Way)	-----	944ipm (24000mm/min)
E. Rapid Rate (Box Way)	-----	630ipm (16000mm/min)
F. Harden Ground Box Way (L x W x H)	-----	44.06" x 3.94" x 1.57" (1119 x 100 x 40mm)
G. Travel	-----	19.69" (500mm)
H. Positioning	-----	0.0001"/12"
I. Repeatability	-----	± 0.0001"

6. Z AXIS

A. Ballscrew Diameter	-----	1.57" (40mm)
Lead	-----	0.393" (10mm)
Accuracy	-----	C3
B. Drive Motor	-----	Fanuc B12/3000i
C. Thrust (Continuous)	-----	1518 lb (690kg)
D. Rapid Rate	-----	944ipm (24000mm/min)
E. Rapid Rate	-----	630ipm (16000mm/min)
F. Harden Ground Box Way (L x W x H)	-----	43.85" x 2.95" x 1.57" (1114 x 75 x 40mm)
G. Travel	-----	20.47" (520mm)
H. Positioning	-----	0.0001"/12"
I. Repeatability	-----	± 0.0001"

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7. COOLANT SYSTEM

- A. Coolant Motor Type ----- CH2-30 / 780W-60HZ
- B. Pump Capacity ----- 33.3 L / min-0.3bar
- C. Coolant Tank Volume ----- 200L
- D. Coolant Flush System (Option) ----- CH2-30*2

8. FLOOR SPACE REQUIREMENTS

- A. Length ----- 98.74" (2508mm)
- B. Width ----- 85.83" (2180mm)
- C. Height ----- 106.30" (2700mm)

9. PACKING SIZE

- A. Standard Machine ----- 109.76" x 90.55" x 96.46" (2788 x 2300 x 2450mm)

10. WEIGHT

- A. Net ----- 10,978 lb (4990kg)

11. POWER REQUIREMENTS

- 220 Volt ----- 208/220 VAC, 3 Phase / 75 Amps
- 440 Volt ----- 220-440 3 Phase Transformer / 30 kVA

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Fanuc 0i-MC (Package B) Standard Features

- * Work piece coordinate system (G52 – G59)
- * Manual absolute on and off
- * Programmable data input (G10)
- * Custom macro B
- * Interruption type custom macro
- * Circular interpolation by R programming
- * Feedrate clamp based on arc radius
- * Programmable mirror image
- * Conversational programming with graphic function (Graphic module is required)
- * <Auxiliary/Spindle speed function>
- * 2nd auxiliary function (B8-digit)
- * High speed M/S/T interface
- * Spindle serial output
- * Spindle override
- * 1st spindle orientation
- * 2nd spindle orientation
- * Spindle synchronous control
- * <Tool function/Tool compensation>
- * Tool offset pairs +-6-digit 400
- * Tool length compensation (G43/G44)
- * Cutter compensation C (G41/G42)
- * Extended tool life management
- * Automatic tool length measurement (G37)
- * Part program storage length 320 m
- * Part program editing
- * Background editing
- * Playback
- * Status display
- * Current position display
- * Parameter setting and display
- * Alarm display
- * Operator message history display
- * Help function
- * Actual cutting speed display
- * Directory display of floppy cassette
- * Spindle setting screen
- * Display of hardware and software configuration
- * Software operator's panel general purpose switch
- * Multi-language display English, Japanese, German/French, Italian, Chinese, Spanish, Korean
- * Direct input of work piece origin offset valve measured
- * Optional chamfering / corner R
- * Sub program call (4 folds)
- * Pattern data input
- * Canned cycle for drilling
- * Automatic corner deceleration
- * Coordinate system rotation
- * Tape format for FS10/11
- * Auxiliary function (M8-digit)
- * Auxiliary function lock
- * Multiple command of auxiliary function
- * Spindle analog output
- * Analog voltage control by PMC
- * 1st spindle output switching function
- * 2nd spindle output switching function
- * Rigid tapping
- * Tool function (T8-digit)
- * Tool offset memory C
- * Tool offset (G45~G48)
- * Tool life management
- * Tool length measurement
- * <Editing operation>
- * Number of registerable programs 400
- * Program protect
- * Extended part program editing
- * <Setting and display>
- * Clock function
- * Program display
- * Self-diagnosis function
- * Alarm history display
- * Operation history display
- * Run hour and parts count display
- * Display of spindle speed and T-code
- * Servo setting screen
- * Servo waveform display (Graphic module is required)
- * Software operator's panel
- * Data protection key

- * Erase display
- * Reader/puncher interface (2 ch)
- * External tool offset
- * External machine zero point shift
- * External key input
- * External work piece number search
- * Power Mate CNC manager
- * <Others>
- * CNC screen display
- * <Controlled axis>
- * Simultaneous controllable axes; 4
- * Axis name (X, Y, Z, U, V, W, A, B, C)
- * Least input increment (0.001 mm, 0.001 deg, 0.001 inch)
- * Incremental system 1/10
- * Fine Acc & Dec control
- * Inch/metric conversion
- * Machine lock
- * Overtravel
- * Stroke limit external setting
- * Mirror image
- * Servo-off/mechanical handle
- * Backlash compensation for each rapid traverse and cutting feed
- * Stored pitch error compensation
- * Unexpected disturbance torque detection function
- * <Operation>
- * DNC operation
- * Schedule function
- * Sequence number search
- * Program restart
- * Retraction for rigid tapping
- * Dry run
- * JOG feed
- * Reference position return without DOG
- * Reference position shift
- * Manual handle feed rate
- * Incremental feed
- * <Interpolation functions>
- * Linear interpolation type positioning
- * Exact stop mode (G61)
- * Linear interpolation (G01)
- * <Data input/output>
- * External I/O device control
- * External message
- * External data input
- * External program input
- * External program number search
- * Memory card interface for maintenance
- * Status output signal
- * Built-in Ethernet
- * Number of controlled axes; 4
- * Axis control by PMC
- * Simple synchronous control
- * Flexible feed gear
- * HRV control
- * Interlock
- * Emergency stop
- * Stored stroke check 1
- * Stored stroke check 2
- * Follow-up
- * Backlash compensation
- * Position switch
- * Control axis detach
- * Automatic operation (memory)
- * MDI operation
- * Program number search
- * Sequence number comparison and stop
- * Manual intervention and return
- * Buffer register
- * Single block
- * Manual reference position return
- * Reference position setting with mechanical stopper
- * Manual handle feed
- * Manual handle interruption
- * Jog and handle simultaneous mode
- * Positioning (G00)
- * Single direction positioning
- * Exact stop (G09)
- * Circular interpolation (G02/G03)

- * Dwell (G04)
- * Helical interpolation
- * Skip (G31)
- * Reference position return (G28)
- * 2nd reference position return
- * Normal direction control
- * <Feed function>
- * Rapid traverse override
- * Feed per revolution
- * Cutting federate clamp
- * Rapid traverse bell shaped acceleration/deceleration
- * Linear acceleration/deceleration after cutting feed interpolation
- * Bell-shaped acc/dec after cutting feed interpolation
- * Feedrate override
- * Jog override
- * External deceleration
- * <Program input>
- * Label skip
- * Control in/out
- * Max. programmable dimension +- 8-digit
- * Sequence number
- * Decimal point programming/pocket calculator type decimal point programming
- * Input unit 10 time multiply
- * Rotary axis designation
- * Polar coordinate command
- * Automatic coordinate system setting
- * Cylindrical interpolation
- * Threading/synchronous cutting
- * High-speed skip
- * Reference position return check (G27)
- * 3rd/4th reference position return
- * Index table indexing
- * Rapid traverse rate; 240m/min (1 m)
- * Feed per minute
- * Tangential speed control
- * Automatic acceleration/deceleration
- * One digit F-code feed
- * Override cancel
- * Advanced preview control
- * Tape cede EIA; RS244/ISO840
- * Parity check
- * Optional block skip
- * Program number
- * Absolute/incremental command
- * Plane selection (G17, G18, G19)
- * Rotary axis roll-over
- * Coordinate system setting (G92)