

**TWINHORN VQ-1300II 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)
- ▶ Spindle Oil Refrigeration Unit
- ▶ Roll Out Coolant Tank & Chip Tray
- ▶ Fanuc Operating & Maintenance Manual
- ▶ 4<sup>th</sup> Axis Interface Cable only Ready
- ▶ One Year Machine Parts Warranty
- ▶ 20 HP Spindle Motor & **CAT-40**
- ▶ Spindle Speed **10000 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
- ▶ Spiral Type Chip Auger
- ▶ Tool Kit / Work Light
- ▶ Operating & Electrical Manuals
- ▶ Hand Held Coolant & Air Nozzle
- ▶ Two Year Control Warranty

**MACHINE SPECIFICATIONS**

Travel X Axis -----	51" (1300mm)
Travel Y Axis -----	27.56" (700mm)
Travel Z Axis -----	25.59" (650mm)
Rapid Feed Rate X & Y Axis -----	630ipm
Rapid Feed Rate Z Axis -----	472ipm
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 -----	55.12" x 27.56" (1400mm x 700mm)
Maximum Loading -----	3,300 lb (1500Kg)
Spindle Motor -----	FANUC AC Spindle Motor
Spindle Horse Power -----	20 HP
Spindle Speed -----	6000 RPM
Spindle Taper -----	CAT-40
Servo Drive Motor X & Y Axis -----	Fanuc β 22 / 3000is
Servo Drive Motor Z Axis -----	Fanuc β 22 / 3000is
Distance from Spindle Nose to Table -----	7.48" – 33.07" (190 – 840mm)
Distance from Spindle to Column -----	26.37" (670mm)

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 (7kg)
Maximum Tool Length -----	11.81" (300mm)
Maximum Tool Diameter -----	3.14" (80mm)
Floor Space W x D x H -----	177"x134"x130" (4500mmx3400mmx3300mm)
Power Requirement -----	220V, 3 Phase, 60Hz, 30kVA, 100Amp
Machine Weight -----	23,568 lb (10700 kg)

**MACHINE PRICES**

VQ-1300II Fanuc Oi-MC Package A/CAT40/10000RPM/24 Tool Arm Type ATC -----	<b>\$109,900</b>
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**OPTIONAL ACCESSORIES**

Mitsubishi 64SM Control -----	<\$3,500>
Mitsubishi 65SM Control -----	N/C
Fanuc 21i-MB Control -----	\$5,000
Fanuc 18i-MB Control -----	\$10,800
Data Server 256MB (DNC) -----	\$2,200
Coolant Through Spindle (Included Filter System) -----	\$11,900
Coolant Through Tool -----	\$1,250
4 <sup>th</sup> Axis Interface Included Servo Drive & Power/Signal Cable -----	\$4,900
4 <sup>th</sup> Axis Complete with Manual Tailstock + Install (Tanshing MRNC-320) -----	\$16,000

**SPINDLE TORQUE FOR VQ SERIES**

1. 6000 Rpm spindle & 20Hp regular spindle motor (SJ-15A)  
 Torque: 70/52.5 lb-ft. (30 min./Continue)  
 Full power output speed: 1500-4500 Rpm
2. 4800 Rpm spindle & 20Hp wide range spindle motor (SJ-15XW8)  
 Torque: 168/126 lb-ft. (30 min./Continue)  
 Full power output speed: 625-5000 Rpm
3. 4800 Rpm spindle & 20Hp regular spindle motor & ZF Gear box  
 Torque: 350/250 lb-ft. (30 min./Continue)  
 Full power output speed: 300-900 Rpm in low gear

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## Twinhorn VQ-1300II Machine Specifications

### 1. HEADSTOCK

A. High Torque Gear Drive Spindle -----	Direct Gear Driven
B. Gear Box Type -----	2K121
C. Gear Box Refrigeration Unit (Oil Type) -----	CO-8
D. Spindle Bearing (Front) (6000RPM) -----	NSK7020A5 P4
E. Spindle Bearing (Front) (8000RPM) -----	NSK7020C P4
Contact Angle (6000RPM) -----	25 Degree
Contact Angle (8000RPM) -----	15 Degree
O.D -----	5.91" (150mm)
I.D -----	3.94" (100mm)
Width -----	0.94" (24mm)
Angular Contact (Rear) (6000RPM) -----	NSK7020A5 P4
Angular Contact (Rear) (8000RPM) -----	NSK7020C P4
O.D -----	4.53" (115mm)
I.D -----	2.95" (75mm)
Width -----	0.79" (20mm)
Rear Support Bearing -----	7015C
F. Spindle Shaft Hardness -----	HRC 60 - 62
G. Retention System -----	Bevel Springs
H. Holding Force -----	3,760 lb (1700kg)
I. Counter Balance -----	Mechanical
J. Spindle Orientation -----	Sensor
K. Spindle Taper -----	Cat50 or BT50
L. Spindle Motor -----	Fanuc Motor 20 Hp

### 2. TABLE

A. Dimensions	
Length x Width -----	55.12" x 27.56" (1400 x 700mm)
B. Max. Table Load -----	3,300 lb (1500kg)
C. Slideways -----	Hardened & Ground Box Ways

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**3. AUTOMATIC TOOL CHANGER (ATC)**

A. Type	-----	Arm Type
B. Max. Tool Weight	-----	15.4 lb (7kg)
C. Max. Tool Length	-----	11.81" (300mm)
D. Max. Tool Diameter	-----	5" (127mm)
E. Tool Change Time Arm Type (Tool to Tool)	-----	2.5 Seconds
F. Magazine Capacity	-----	24 Tools
G. Max. Tool Diameter (Adjacent Pot Tool)	-----	3.14" (80mm)
H. Max. Tool Diameter (Adjacent Pot Empty)	-----	4.92" (125mm)

**4. X AXIS**

A. Ballscrew Diameter	-----	1.97" (50mm)
Lead	-----	0.47" (12mm)
Accuracy	-----	C3
B. Drive Motor	-----	Fanuc $\alpha$ C22 / 1500
C. Thrust	-----	2,332 lb (1060kg)
D. Rapid Rate	-----	630ipm (16000mm/min)
E. Travel Stroke	-----	50" (1270mm)
F. Positioning	-----	0.0001"/12"
G. Repeatability	-----	$\pm$ 0.0001"

**5. Y AXIS**

A. Ballscrew Diameter	-----	1.97" (50mm)
Lead	-----	0.47" (12mm)
Accuracy	-----	C3
B. Drive Motor	-----	Fanuc $\alpha$ C22 / 1500
C. Thrust	-----	2,332 lb (1060kg)
D. Rapid Rate	-----	630ipm (16000mm/min)
E. Travel Stroke	-----	27.56" (700mm)
F. Positioning	-----	0.0001"/12"
G. Repeatability	-----	$\pm$ 0.0001"

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## 6. Z AXIS

A. Ballscrew Diameter	-----	1.97" (50mm)
Lead	-----	0.47" (12mm)
Accuracy	-----	C3
B. Drive Motor	-----	Fanuc α C22 / 1500
C. Thrust	-----	2,332 lb (1060kg)
D. Rapid Rate	-----	472ipm (12000mm/min)
E. Travel Stroke	-----	25.59" (650mm)
F. Positioning	-----	0.0001"/12"
G. Repeatability	-----	± 0.0001"

## 7. COOLANT SYSTEM

A. Coolant Motor Type	-----	CH2-20 / 520W
B. Pump Capacity	-----	33.3L/min, 2bar
C. Coolant Tank Volume	-----	450L
D. Coolant Flush System (Option)	-----	CH2-30*2
E. Coolant Through Spindle System (Option)	-----	CRK2-180/18
F. Pump Capacity	-----	20L/min, 20bar
G. Coolant Filter Type	-----	PFA-60-50

## 8. FLOOR SPACE REQUIREMENTS / OPEN DOOR

A. Length	-----	177" (4500mm)
B. Width	-----	134" (3400mm)
C. Height	-----	130" (3300mm)

## 9. PACKING SIZE

A. Standard Machine (W x D x H)	-----	87" x 120" x 117" (2200 x 3050 x 2975mm)
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## 10. WEIGHT

A. Net	-----	23,540 lb (10700kg)
B. Gross	-----	24,640 lb (11200kg)

## 11. POWER REQUIREMENTS

220 Volt	-----	208/220 VAC, 3 Phase, 50/60HZ, 100 Amps
440 Volt	-----	220-440 3 Phase Transformer / 40 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>
- \* 2<sup>nd</sup> auxiliary function (B8-digit)
- \* High speed M/S/T interface
- \* Spindle serial output
- \* Spindle override
- \* 1<sup>st</sup> spindle orientation
- \* 2<sup>nd</sup> 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
- \* 1<sup>st</sup> spindle output switching function
- \* 2<sup>nd</sup> 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)