

TWINHORN VQ-1600 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 Refrigeration Unit
- ▶ Roll Out Coolant Tank & Chip Tray
- ▶ Fanuc Operating & Maintenance Manual
- ▶ 4th Axis Interface Cable only Ready
- ▶ One Year Machine Parts Warranty
- ▶ 20 HP Spindle Motor with ZF Gear Box
- ▶ Spindle Speed CAT-50 with 4800 RPM
- ▶ Arm Type 32 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 -----	63" (1600mm)
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 -----	70.87" x 27.56" (1800mm x 700mm)
Maximum Loading -----	3,960 lb (1800Kg)
Spindle Motor -----	FANUC AC Spindle Motor
Spindle Horse Power -----	20 HP
Spindle Speed -----	4800 RPM
Spindle Taper -----	CAT-50
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 -----	29.72" (755mm)

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 -----	32 Tools
Tool Change Time -----	3.5 Second
Maximum Tool Weight -----	33 lb (15kg)
Maximum Tool Length -----	13.78" (350mm)
Maximum Tool Diameter -----	5" (127mm)
Floor Space L x W x H -----	172"x87"x105" (4380mmx2200mmx2650mm)
Power Requirement -----	220V, 3 Phase, 60Hz, 30kVA, 100Amp
Machine Weight -----	33,039 lb (15000 kg)

MACHINE PRICES

VQ-1600 Fanuc Oi-MC Package A/ZF Gear Box/4800RPM/32 Tool Arm Type ATC ----- **\$138,900**

OPTIONAL ACCESSORIES

Mitsubishi M64SM Control -----	<\$3,500>
Mitsubishi M65SM Control -----	N/C
Fanuc 21i-MC Control -----	\$5,750
Fanuc 18i-MC Control -----	\$8,600
Spindle Speed 6000RPM -----	\$3,500
Spindle Motor 25 Hp -----	\$3,500
Data Server 256MB (DNC) -----	\$2,200
Coolant Through Spindle (Included Filter System) -----	\$11,900
Coolant Through Tool -----	\$1,250
4 th Axis Interface Included Servo Drive & Power/Signal Cable -----	\$4,900
4 th Axis Complete with Manual Tailstock + Install (Tanshing MRNC-320) -----	\$16,000
Transformer 40KVA -----	T/A

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-1600 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 (11/15 Kw) 15 / 20 Hp

2. TABLE

A. Dimensions	
Length x Width -----	63" x 27.56" (1600 x 700mm)
B. Max. Table Load -----	3,960 lb (1800kg)
C. Slideways -----	Hardened & Ground Box Ways

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3. AUTOMATIC TOOL CHANGER (ATC)

A. Type	-----	Arm Type
B. Max. Tool Weight	-----	44 lb (20kg)
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	-----	32 Tools
G. Max. Tool Diameter (Adjacent Pot Tool)	-----	5" (127mm)
H. Max. Tool Diameter (Adjacent Pot Empty)	-----	10" (254mm)

4. X 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	-----	630ipm (16000mm/min)
E. Travel Stroke	-----	60.24" (1530mm)
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 α 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	211.81" (5380mm)
B. Width	140.16" (3560mm)
C. Height	129.92" (3300mm)

9. PACKING SIZE

A. Standard Machine (W x D x H)	86.61" x 120.08" x 117.13" (2200 x 3050 x 2975mm)
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10. WEIGHT

A. Net	25,300 lb (11500kg)
B. Gross	26,400 lb (12000kg)

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>
- * 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)