



About Takumi

Quality Design, Exceeding Expectations

At Takumi we implement stringent processes to design and build rigid and reliable machining centers that will exceed our customers' expectations. From our meticulous manufacturing processes, such as hand scraping contact areas, to the use of premium components, we infuse quality into each of our products.

Takumi has been exceeding customers' expectations in Europe for 30 years. With our new comprehensive support network based in Indianapolis, we are ready to exceed your expectations.

Like us, you believe machine rigidity, reliability and proven control technology yields the greatest benefit to your business, so make Takumi your next CNC Machining Center Investment.



H16

High Speed Double Column Machining Center

The Takumi H16 is a high speed double column machining center with high rigidity and stability. The T-shaped bed is made of one-piece casting to ensure the best rigidity and stability. The beam and columns on the H16 are made of one piece casting iron to ensure the structural rigidity of the machine. With fast rapid traverse and non-counter balance on the spindle head, the H16 provides high speed and quick feed response time.

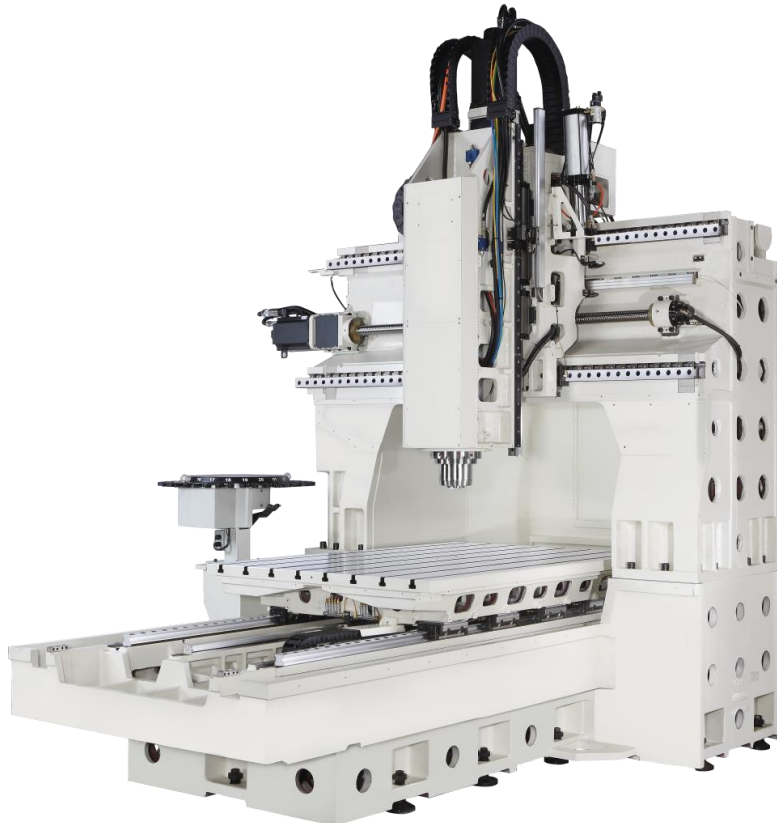


Machine Specifications

Capacity:	H16
X, Y, Z -axis Travel	62.99" x 51.18" x 27.56"
Table Working Surface	74.8" x 51.18"
Table T-Slots	8 x .87" on 6.3" centers
Maximum Table Load	13,200 lbs.
Spindle Nose to Table	7.87" / 35.4"
Coolant Capacity	197.9 gallons
Floor to Table Surface	36.61"
Spindle:	H16
Spindle Taper	CAT #40 / Big Plus
Spindle Speed	15,000 rpm
Spindle Motor Horsepower (30 min.)	24.8 HP @ 1500 rpm
Spindle Motor Torque (Peak)	105.5 ft. lbs.
Motion:	H16
Rapid Traverse Rate X/Y/Z	1,181 ipm
Max Programmable Feedrate	787 ipm
Positioning Accuracy (10 pass VDI 3441 Method)	.0006"
Repeatability (10 pass VDI 3441 Method)	.0003"
Positioning Accuracy with Linear Scales (10 pass VDI 3441 Method)	.0004"
Repeatability with Linear Scales (10 pass VDI 3441 Method)	.0003"
ATC:	H16
Number of Stations	30
Tool Changer Type	Swing Arm
Maximum Tool Diameter	2.95"
Maximum Tool Length	11.81"
Size:	H16
Maximum Floor Space (W x L x H)	191.45" x 204.92" x 156.69"
Machine Weight (approx.)	40,000 lbs.
Machine Shipping Weight (approx.)	42,930 lbs.
Shipping Dimensions (W x D x H) - Crate	14'10" x 11'6" x 11'8"
Accessory Skid - Crate	13'2" x 7'7" x 5'5"
Accessory Skid Weight (approx.)	3,040 lbs.
Voltage Required	220vac ± 10% 60Hz
Power Rating / Full Load KVA	75 KVA
Air Requirements	5 CFM @ 85-115 psi

Standard Machine Features

- » Heavily Ribbed Fine-Grade Cast Iron Frame Optimized with Finite Element Analysis (FEA)
- » Robust, precision machined castings
- » Roller Type Linear Guides on All Three Axes
- » 15,000 RPM, CAT 40 Big Plus, inline spindle
- » Absolute Encoders for fast start-up
- » Hand-scraped contact areas
- » Direct-coupled ballscrews, for increased accuracy
- » Fast 1,181 ipm Rapid Traverse Rates
- » 30 Station ATC – Random Access
- » Extra-wide door openings
- » Oil Skimmer
- » Work Light
- » 3-light indicator lamp
- » Coolant Thru Spindle, 30 Bar
- » Linear Scales
- » Belt filter coolant unit
- » Manual Pulse Generator (MPG)
- » Ethernet & RS-232C Interface
- » Spindle Thermal Chiller
- » Chip Conveyor
- » Air Conditioner
- » Coolant Washdown System
- » Programmable Airblow
- » Wash-down gun and Air gun
- » Fanuc 31i-MB CNC Control
- » 1 GB Dataserver
- » Leveling bolts and pads
- » Operator Manuals



Machine Pricing

H16
\$241,995

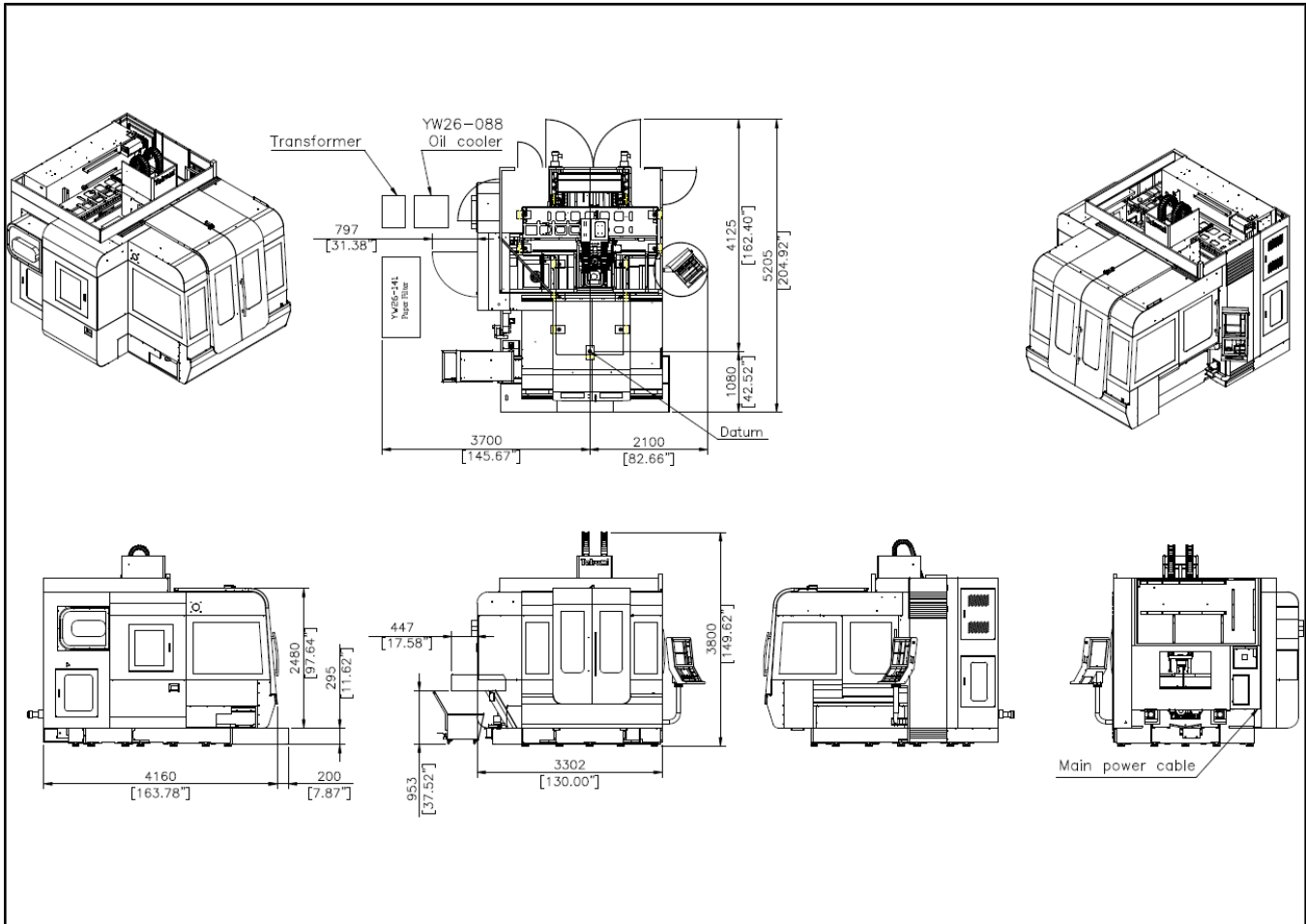
Machine Info
<p>Standard Warranty: 24 months on control and machine / 12 months labor warranty. Delivery: F.O.B. Shipping Point.</p> <p>Shipment: ____ weeks after receipt of order, subject to prior sale. Prices good for 30 days. Proposal subject to error correction. Options and accessory prices listed are valid on new machine purchases only. Options and accessories purchased as field installation items may be subject to additional charges.</p>

Software Options:	Price:
Tool Life Management	\$635
Tool Offset 400 pairs	\$1,059
Additional Work Coord. 48 Pairs	\$635
Machine Hardware Options:	Price:
BT40 Gripper (2 pcs.)	\$750 (ea.)

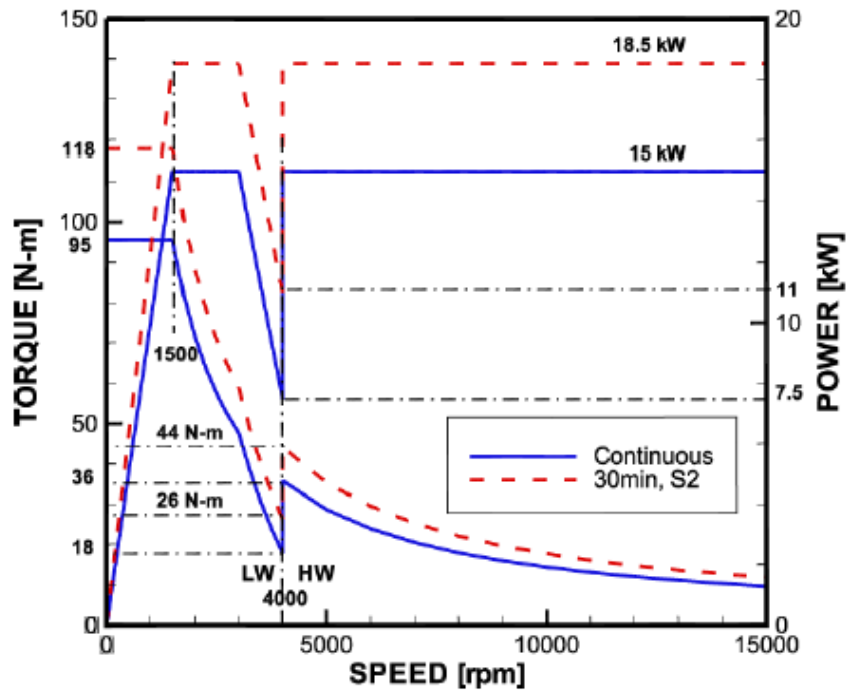
Fanuc 31i-MB – Standard Control Features



- AICC 2 with HI Speed Processing, Machining Condition Selection, Nano Smoothing
- 600 Block Look Ahead
- 1 Gigabyte Data Server with Editing
- 10.4" LCD Display
- All Digital Servo Package
- Memory 1280M (512K Byte)
- 3 Simultaneously Controlled Axis
- Least Input Increment .0001", .001 Degree, .001mm
- Fine Accel/Decel Control
- Inch/Metric Conversion
- DNC Operation with Memory Card
- Program Restart
- Incremental Feed MPG x1, x10, x100
- 1st and 2nd Reference Return
- Nano Interpolation
- Macro Common Variables #100-#199 and #500-#999
- Automatic Exponential G01 Feed Control
- Manual Guide i
- Feedrate Override From 0-120%
- AI Advanced Preview Control
- Operator Message Alarm Display
- USB Memory For Input/output
- High Speed Skip Function
- 2nd Reference Return
- Bell-shaped Acceleration/Deceleration In
- Multiple Modes
- Tool Offsets-99 Pairs
- Tool Length and Radius Compensation And Wear Compensation
- Work Piece Coordinate System G52-G59
- Conversational Programming with Graphic Display.
- Custom Macros #0-#99
- Background Editing



Attachment E





LIMITED WARRANTY

Subject to the terms of this Limited Warranty, Hurco Companies, Inc. d/b/a Takumi USA (“**Takumi USA**”) warrants to the End User that exclusive of the Fanuc CNC Control, the Takumi Machine Tool, Replacement Part or Accessory, (each, a “**Product**”) for which this Limited Warranty is issued will be free from any Covered Defect during the Warranty Period for the Product.

During the Warranty Period, Takumi USA will replace or repair, at its option, a Product with a Covered Defect at no expense to its End User, except that: (1) End User must pay for any repair, replacement or installation costs not authorized in advance by Takumi USA; and (2) End User must pay for all shipping costs (including freight charges, taxes, and insurance), excepting shipping costs for repaired parts and components or a Replacement Part shipped under this Limited Warranty by Takumi USA to End User or an Authorized Distributor.

End User must report to Takumi USA in writing any Covered Defect as soon as practicable upon its discovery and in all events prior to the expiration of the Warranty Period for the Product. Takumi USA shall have no responsibility with respect to any Covered Defect which is not reported to Takumi USA by written notice prior to the expiration of the Warranty Period for the Product. End User must allow Takumi USA or an Authorized Distributor to inspect and test the Product during business hours to determine if there is a Covered Defect. At the option of Takumi USA, a Product with a Covered Defect will be repaired at End User’s location, and should not be returned to Takumi USA except upon inspection and testing by Takumi USA or, with prior approval of Takumi USA, an Authorized Distributor. Upon request, End User must return for repair or replacement, with shipping costs paid by End User, the Product or part(s) or component(s) of a Product with a Covered Defect to Takumi USA at the following address: Takumi USA, 7220 Winton Drive, Indianapolis, Indiana 46268. All parts, components and Products replaced by Takumi USA shall become the property of Takumi USA.

This Limited Warranty is effective and valid only if the Authorized Distributor from which the Product is purchased (or Takumi USA, if it is the seller) is paid in full for the Product, and the End User for that Product executes Takumi USA-provided installation acknowledgments and forms upon completion of installation of the Product.

The warranty covering the Fanuc CNC Control used with and made part of the Takumi Machine Tool is provided by Fanuc Corporation. Each of the Fanuc spindle motors and Fanuc servo motors, spindle and servo drives are covered by a two (2) year Fanuc manufacturer warranty (the “**Fanuc Warranty**”) running from the earlier of: (1) the date of the first use of the Takumi USA Machine Tool by its initial End User; and (2) the date which is 30 days after shipment by or for Takumi USA of the Takumi USA Machine Tool to an Authorized Distributor or the End User (the “**Fanuc Warranty Period**”). Takumi USA shall have no responsibility with respect to any defect in the Fanuc CNC Control occurring during or outside the Fanuc Warranty Period, but during the Fanuc Warranty Period, Takumi USA shall assist End User in reporting and processing a claim under the Fanuc Warranty, provided that End User reports any issue regarding the Fanuc CNC Control in accordance with the requirements for reporting a Covered Defect under the Takumi USA Limited Warranty. Fanuc will replace or repair, at its option, the Fanuc CNC Control at no expense to its End User, except those costs within the categories of costs to be borne by End User under this Takumi USA Limited Warranty.

As used in this Limited Warranty:

- (a) “**Accessory**” means a new accessory, kit or optional equipment supplied and installed on a Takumi USA Machine Tool by Takumi USA or an Authorized Distributor at any time *after* the initial installation of that Takumi USA Machine Tool.
- (b) “**Authorized Distributor**” means a Person authorized by Takumi USA to sell and service Takumi USA Machine Tools.
- (c) “**Covered Defect**” means a failure of a Product during the Warranty Period to conform in any substantial way during normal use with the performance specifications and standards established by Takumi USA for that Product; *provided that* such failure is not caused by or resulting from any of the following: (i) normal wear and tear or deterioration; (ii) inadequate or improper maintenance, such as End User’s failure to clean, lubricate, replenish or replace oil, fluids, coolants, lamps, fuses,

belts, filters and similar items; (ii) accident, negligence, theft, weather, electrical surges or lightning, fire or any other peril, misuse, abuse, programming error, improper operation or failure to follow fully maintenance and operation instructions provided by Takumi USA or a Takumi USA technical specialist to End User; (iv) mishandling, improper packaging or any other act which occurs during or in connection with shipment of the Product, or during or in connection with its rigging or installation, unless caused by Takumi USA or an Authorized Distributor; and (v) any repair, replacement, modification or alteration of the Product which is not authorized by Takumi USA.

(d) “**End User**” means the Person who purchases for its own use directly from Takumi USA or an Authorized Distributor the Product for which this Limited Warranty is issued, and, so long as any relocating and reinstallation of the Product is performed by an Authorized Distributor or Takumi USA, also any Person who purchases the Product from its initial End User prior to expiration of the Warranty Period for the Product. The term does not include any Person who purchases the Product for resale, lease or other transfer to, or use by, another Person.

(e) “**Takumi USA Machine Tool**” means a machine tool manufactured by or for Takumi USA, bearing the name “Takumi USA” and a “Takumi USA” trademark and serial number, and purchased by an End User new directly from Takumi USA or an Authorized Distributor, together with any accessory, component, kit or optional equipment installed on that Takumi USA Machine Tool by Takumi USA or an Authorized Distributor prior to or at the time of initial installation of that Takumi USA Machine Tool.

(f) “**Person**” means and includes an individual, partnership, joint venture, corporation, limited liability company, trust or other legal entity.

(g) “**Replacement Part**” means a new or rebuilt genuine part or component bearing a “Takumi USA” trademark provided by Takumi USA or an Authorized Distributor under this Limited Warranty in replacement of a part or component of a Product.

(h) “**Warranty Period**” means:

(i) for a Takumi USA Machine Tool, unless a different warranty period is expressly stated in the quotation issued by Takumi USA for that Product, a period of One (1) Year. These periods begin on the earlier of: (1) the date of the first use of the Takumi USA Machine Tool by its initial End User; and (2) the date which is 30 days after shipment by or for Takumi USA of the Takumi USA Machine Tool to an Authorized Distributor or the End User. (The warranty period may be extended, on exception basis, by a separate warranty extension issued in writing by Takumi USA to the End User for a Takumi USA Machine Tool);

(ii) for a Replacement Part, a period which is the longer of: (i) the 90 days after the date of its shipment by or for Takumi USA to an Authorized Distributor or the End User; and (ii) expiration of the Warranty Period for the Takumi USA Machine Tool on which that Replacement Part is installed; and

(iii) for an Accessory, a period which is the longer of: (i) the 90 days after the date of its shipment by or for Takumi USA to an Authorized Distributor or the End User; and (ii) expiration of the Warranty Period for the Takumi USA Machine Tool on which the Accessory is installed.

FOR ALL PRODUCTS AND THE FANUC CNC CONTROL TAKUMI USA DISCLAIMS ALL EXPRESS WARRANTIES, EXCEPTING ONLY THIS LIMITED WARRANTY, AND DISCLAIMS ALL IMPLIED WARRANTIES OF ANY KIND, INCLUDING, BUT NOT LIMITED TO, ANY IMPLIED WARRANTY OF MERCHANTABILITY AND ANY IMPLIED WARRANTY OF FITNESS FOR A PARTICULAR PURPOSE.

END USER’S SOLE AND EXCLUSIVE REMEDY UNDER THIS LIMITED WARRANTY IS REPAIR OR REPLACEMENT, AT THE OPTION OF TAKUMI USA OR FANUC CORPORATION AS APPLICABLE, OF THE PRODUCT WITH A COVERED DEFECT OR FANUC CNC CONTROL.

IN NO EVENT SHALL TAKUMI USA BE LIABLE TO END USER OR ANY OTHER PERSON FOR DAMAGES, INCLUDING WITHOUT LIMITATION, LOST PROFITS, LOST WAGES, INOPERATIVE MACHINE OR SOFTWARE TIME, PARTS PROGRAMS, SCRAP PARTS, INFRINGEMENT, OR ANY OTHER INDIRECT INCIDENTAL, CONSEQUENTIAL, SPECIAL OR SIMILAR DAMAGES, OR FOR ANY DAMAGE OR INJURIES RESULTING FROM THE USE, OPERATION OR POSSESSION OF ANY PRODUCT OR THE FANUC CNC CONTROL OR ANY CLAIMS OR DEMANDS BROUGHT

AGAINST END USER, HOWEVER CAUSED AND UNDER ANY THEORY OF LIABILITY, EVEN IF TAKUMI USA WAS ADVISED OF THE POSSIBILITY OF SUCH CLAIMS.

For questions regarding this Limited Warranty, please contact the Authorized Distributor or:

**Takumi USA
7220 Winton Dr.
Indianapolis, IN 46268**

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