Turning

Hardinge SUPER-PRECISION®
Quest CHNC 42

Quotation to: ABMNameAlpha
Quotation Number: SOHDocumentOrderInvoice
Contact: Contact Name
Address: ShipToAddressLine1
ShipToAddressLine2
ShipToAddressLine3
ShipToAddressLine4
ShipToCity1, ShipToState, ShipToCountry

Date: Month/Day/Year
Prices Valid for 30 Days

Your Hardinge Representative
Sales Person Name
Phone
Email
Address 1
Address 2
City, State, Zip

TURNING MILLING GRINDING WORKHOLDING
Machine Summary and Quotation

Thank you for taking the time to discuss your machine requirements with Hardinge. After reviewing your needs, we are pleased to present the Super Precision Hardinge QUEST® CHNC 42 Turning Center as a solution to your requirements.

The SUPER-PRECISION® QUEST CHNC 42 lathe is designed and built by Hardinge to offer high-precision machining, very fast cycle times and maximum part production. The machine is configured with the Hardinge collet-ready spindle and quick-change top plate design for fast job changeovers. The top plate is compatible with existing top plates and tooling offered on previous Hardinge CHNC models.

Pre-tooled top plates can be quickly interchanged ideal for running repeat jobs or a wide range of job diameters and lengths by simply changing the pre-tooled top plate to either a 4 or 8 station top plate allowing maximum flexibility from job to job.

Included Features
- .000010” / .00010mm Resolution Control
- Nanometer Interpolation
- 16C Collet/Chuck ready spindle
- HARCRETE® polymer composite base
- PCMCIA flash card slot
- SP certification
- LED work light
- Headwall Coolant
- CHNC Tooling Height Gauge
- CNC Control – Fanuc 32i-T Series or Mitsubishi M70V

- Full Machine Documentation
- Custom Macro B
- Rigid tapping
- Dynamically balanced spindle and drive motor
- Laser and Ball Bar tested
- Run time/parts counter
- Maintenance Kit (Grease & Grease Gun)
- Round Shank Tool Setting Gage
- Three-Position Stack Light

“No tool holders are provided as standard equipment with this machine – these must be purchased separately. We offer an extensive line of high-quality tool holders. Please consult with your sales representative for a complete list.”

With the purchase of this machine with a Mitsubishi control, Mitsubishi will provide complementary, one day, onsite training at the customer’s facility. This training includes a day of application training focused on control navigation, control functions and features. This training usually takes approximately 5-6 hours. The first half generally consist of applications training followed by operator hands-on machining observed by the trainer. All travel, lodging, per diem cost etc. will be covered at Mitsubishi’s expense.
### Machine Options

#### Machine Configurations

<table>
<thead>
<tr>
<th>QUEST CHNC 42 LIST PRICE</th>
</tr>
</thead>
<tbody>
<tr>
<td>QUEST CHNC 42</td>
</tr>
</tbody>
</table>

#### Top Plate

<table>
<thead>
<tr>
<th>Description</th>
<th>Standard</th>
<th>Included</th>
</tr>
</thead>
<tbody>
<tr>
<td>Interchangeable CHNC Top Plate (8 Station ½&quot;)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Additional Top Plate 4 Station 1/2&quot;</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Additional Top Plate 8 Station 1/2&quot;</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### Machine Options

<table>
<thead>
<tr>
<th>Description</th>
<th>Option</th>
</tr>
</thead>
<tbody>
<tr>
<td>Air Blast System (includes dual safety Check)</td>
<td></td>
</tr>
<tr>
<td>Tool Touch Probe</td>
<td></td>
</tr>
<tr>
<td>Collet Closer Foot Switch (one pedal)</td>
<td></td>
</tr>
<tr>
<td>X-Axis Glass Scale</td>
<td></td>
</tr>
<tr>
<td>External Ethernet Plug</td>
<td></td>
</tr>
<tr>
<td>Auto Door (REQUIRES ELECTRICAL KIT, 2500/I0 MODULE GG 00032782500INS)</td>
<td></td>
</tr>
<tr>
<td>Coolant Chiller</td>
<td></td>
</tr>
</tbody>
</table>

#### Parts Catcher

<table>
<thead>
<tr>
<th>Description</th>
<th>Option</th>
</tr>
</thead>
<tbody>
<tr>
<td>Parts Removal System (includes Dual Safety Check)</td>
<td></td>
</tr>
</tbody>
</table>

#### Chip Management

<table>
<thead>
<tr>
<th>Description</th>
<th>Option</th>
</tr>
</thead>
<tbody>
<tr>
<td>125 PSI Coolant Pump (required with Thru Spindle Coolant)</td>
<td></td>
</tr>
<tr>
<td>Thru Spindle Coolant (requires 125 PSI pump)</td>
<td></td>
</tr>
<tr>
<td>Chip Conveyor</td>
<td></td>
</tr>
<tr>
<td>Chip Conveyor Interface</td>
<td></td>
</tr>
</tbody>
</table>

#### Additional I/O & M-Code’s

<table>
<thead>
<tr>
<th>Description</th>
<th>Option</th>
</tr>
</thead>
<tbody>
<tr>
<td>Electrical Kit 2500/I0 Module, Includes 6 spare M Codes</td>
<td></td>
</tr>
<tr>
<td>Dual Safety Check (required with Air Blast or Part Catcher)</td>
<td></td>
</tr>
</tbody>
</table>

#### Automation

<table>
<thead>
<tr>
<th>Description</th>
<th>Option</th>
</tr>
</thead>
<tbody>
<tr>
<td>Automation quotes available through the Turnkey Department.</td>
<td></td>
</tr>
<tr>
<td>Robot Interface (requires electrical kit I/O 3) (spare m-codes not available with robot)</td>
<td></td>
</tr>
</tbody>
</table>

### Mitsubishi Robot RV-7FL with IP67 rating

#### System description:

The robot is top mounted to the machine and incorporates a double gripper and custom fingers for the application. Also on top of the machine is a self contained perimeter guard constructed out of aluminum extrusions, coated mesh grid, & Lexan. The guard has interlocked access doors and provides easy access to the robot. We also supply a basic hand held teach pendant for the robot.

The pallet trays are integrated into the guard design so that the pallets can be accessed without the need to enter the robot work envelope. The theory of operation is that both trays are manually loaded with blank parts and the robot removes the blanks from one pallet and loads them in out of the machine. Once the parts have been machined, the robot can either put the finished parts back into the pallet or deposit the parts onto a simple gravity chute. When one pallet tray has been completed, the robot will automatically switch to the other pallet which allows the operator to replenish blanks back into the first pallet.

Note that the robot & guard system does not require removal for shipping, therefore, installation at the customer’s facility is very easy.
Mitsubishi RV-7FL 6-axis Robot Specifications

Payload: 7kg
Reach: 908mm
Repeat: +/- .02mm
Speed: Approx. 10977 mm/s

Key Standard Features:
64 Bit RISC Processing- Faster more precise moves and execution
Singularity Avoidance- Ease of programming in areas of singularity
Built-in Collision Detection- Safety and cost savings
Compliance Control- User defined path forgiveness
Multi-Task Programming- Allows tasks to be easily separated and programmed
Single programming software package for all robot types- Efficient program development
Plug and play interface to Cognex cameras
Additional axis interface - Plug and play SSCNETIII connection to MR-J4 servos
Serial encoder interface - 2 channels for conveyor tracking
Ethernet communication port - Easy integration to vision or other accessories
USB and RS232 - quick connect to PC

Barfeeds
Bar Feed Interface For CHNC 42
Hardinge 16C Spindle Liner Kit – 2 Spacers, 3 Bushings, 1 Cap
16 C Spindle Liner Bushing – 3 Bushings required for each bar size
Automatic Machine Power Down Used with magazine bar feeds

Transformers
208, 380 or 415 Volt Isolation Transformer (35 KVA)
230/460 Volt Isolation Transformer (35 KVA)
Machine Options cont.

**FANUC 32i-T CONTROL OPTIONS**

- Registered Part Program Expansion from 63(standard) to 1000  
  Option
- Thread Cutting Cycle Retract  
  Option
- Additional Custom Macro Variables  
  Option
- Part Program Storage – 128KB (Total) includes SRAM module  
  Option
- Part Program Storage – 256KB (Total) includes SRAM module  
  Option
- Part Program Storage – 512KB (Total) includes SRAM module  
  Option
- Part Program Storage – 1MB (Total) includes SRAM module  
  Option
- Part Program Storage – 2MB (Total) includes SRAM module  
  Option
- Additional Offsets 64, 99, 200, 400  
  Option
- French/German Language Display  
  Option
- Chinese Language Display  
  Option
- Italian Language Display  
  Option
- Workpiece Coordinate System  
  Option
- Helical Interpolation  
  Option
- Polar COO Interpolation  
  Option
- Cylindrical Interpolation  
  Option

Prices listed in USD
Machine Specifications

**Collet-Ready Spindle**

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spindle Configuration</td>
<td>ANSI A2-5, 16C</td>
</tr>
<tr>
<td>Spindle Through-Hole</td>
<td>1.687&quot; (42.84mm)</td>
</tr>
<tr>
<td>Collet (Through Capacity)</td>
<td>1.625&quot; (42mm)</td>
</tr>
<tr>
<td>Jaw Chuck Size</td>
<td>6&quot; (152.4mm)</td>
</tr>
<tr>
<td>Gripping Capacity</td>
<td>5.6&quot; (139mm)</td>
</tr>
<tr>
<td>Hang Weight with Device and Part (Max.)</td>
<td>75lb/34kg</td>
</tr>
<tr>
<td>Spindle Centerline Height</td>
<td>43.69&quot; (1109mm)</td>
</tr>
<tr>
<td>Operator's Reach to Spindle</td>
<td>22&quot; (559mm)</td>
</tr>
</tbody>
</table>

**AC Digital Belted Drive System**

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Base Speed</td>
<td>1,500 RPM</td>
</tr>
<tr>
<td>Power Rating – 30-Min.</td>
<td>10hp (7.5kW)</td>
</tr>
<tr>
<td>Continuous</td>
<td>7.5hp (5.6kW)</td>
</tr>
<tr>
<td>Torque Rating – 30-Min.</td>
<td>35 ft-lb (47.40Nm)</td>
</tr>
<tr>
<td>Continuous</td>
<td>26 ft-lbs (35.21Nm)</td>
</tr>
<tr>
<td>Speed Range (1-rpm Steps)—Standard</td>
<td>50 to 5,000 rpm</td>
</tr>
</tbody>
</table>

**Capacity**

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Swing Diameter</td>
<td>17.94&quot; (455.6mm)</td>
</tr>
<tr>
<td>Turning Diameter (Max.)</td>
<td>8&quot; (203mm)</td>
</tr>
<tr>
<td>Turning Length with Collet (Max.)</td>
<td>4&quot; (101.6mm) **</td>
</tr>
<tr>
<td>Maximum X-Axis Travel</td>
<td>12.24&quot; (310.9mm)</td>
</tr>
<tr>
<td>Maximum Z-Axis Travel</td>
<td>12.25&quot; (311.2mm)</td>
</tr>
<tr>
<td>Maximum Z-Axis Thrust</td>
<td>750 lbs. (3,336N)</td>
</tr>
<tr>
<td>X-Axis Rapid Traverse Rates</td>
<td>472-ipm (12m/min)</td>
</tr>
<tr>
<td>Z-Axis Rapid Traverse Rates</td>
<td>630-ipm (16m/min)</td>
</tr>
</tbody>
</table>

**Parts Catcher—Option**

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Workpiece Length (Max.)</td>
<td>4&quot; (101.6mm)</td>
</tr>
</tbody>
</table>

**Machine Dimensions**

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Machine Length</td>
<td>77.00&quot; (1956mm)</td>
</tr>
<tr>
<td>Machine Length (with chip conveyor)</td>
<td>117.80&quot; (2992mm)</td>
</tr>
<tr>
<td>Machine Depth</td>
<td>58.63&quot; (1489mm)</td>
</tr>
<tr>
<td>Machine Height</td>
<td>64.10&quot; (1628mm)</td>
</tr>
<tr>
<td>Machine Weight</td>
<td>4,500lb (2040kg)</td>
</tr>
<tr>
<td>Approx. Shipping Weight</td>
<td>5,230lb (2370kg)</td>
</tr>
</tbody>
</table>

**Full travel is 12.25", limited by part diameter**
Machine Specifications Cont.

Miscellaneous

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Power Supply Requirement (requires balance 3 phase)</td>
<td>11.0/12.7 Kva</td>
</tr>
<tr>
<td>Coolant Tank Capacity</td>
<td>76 Liter (20gal)</td>
</tr>
<tr>
<td>Coolant Pressure</td>
<td>1.03bar (15psi)</td>
</tr>
<tr>
<td>Coolant Flow Rate</td>
<td>25.4L/min (6.7gpm)</td>
</tr>
</tbody>
</table>

Inspection Specifications

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Part Surface Finish</td>
<td>.30 micron (12 micro-inch)</td>
</tr>
<tr>
<td>Part Roundness</td>
<td>.38 micron (.000025&quot;)</td>
</tr>
<tr>
<td>Part Continuous Machining Accuracy (Total Variation on Diameter)</td>
<td>5 micron (.0002&quot;)</td>
</tr>
<tr>
<td>Overall Axis Repeatability</td>
<td>1.27 micron (.00005&quot;)</td>
</tr>
</tbody>
</table>

Inspected to ISO 230-2 standard. Actual results may be greater or less than those listed due to a number of factors including but not limited to speeds, feeds, tooling, machine maintenance, coolant material, ambient temperature and type of machine foundation.

All features, benefits and specifications are subject to change. Hardinge Inc. is not responsible for any typographical errors, omissions or misprints.
Hardinge Fanuc 32i-T CNC Control

**General**
- Two Interpolating Axes
- Programmable Resolution—.000010”/.00010mm
- Tool Offset Capability—.000010”/.00010mm
- Inch/Metric Data Selection by G-Code
- 64 KB Part Program Storage
  - Part Program Storage 128/256/512KB or 1/2 MB

**Programming Functions**
- Absolute/Incremental Programming
- Custom Macro Variables
- Auto Coordinate System Setting
- Auto Acceleration/Deceleration
- Background Editing
- Canned Cycles (Drilling)
- Chamfer/Corner Rounding
- Constant Surface Speed Programming
- Continual Thread Cutting
- Coordinate System Setting (G50)
- Custom Macro B
- Decimal Point Programming
- Diameter/Radius Programming
- Extended Part Program Edit (copy/paste)
- External Workpiece Number Search
- Hardinge Safe Start Format
- Input of Offset Values by (G10)
- Interpolation (Linear/Circular)
- Multiple Repetitive Cycles I (Turning)
- Multiple Repetitive Cycles II (Pocketing)
- Program Number Search
- Reference Point Return
- Registered Part Program (63 total)
  - Part Program Expansion to 1000
- Rigid Tapping
- Sequence Number Search
- Single Block Operation
- Stored Stroke Check
- Thread, Synchronous Cutting
- Tool Life Management
- Tool Nose Radius Compensation
  - Variable Lead Thread Cutting
- Canned Cycles (Drilling)
- Chamfer/Corner Rounding
- Constant Surface Speed Programming
- Continual Thread Cutting
- Coordinate System Setting (G50)
- Custom Macro B
- Decimal Point Programming
- Diameter/Radius Programming
- Extended Part Program Edit (copy/paste)
- External Workpiece Number Search
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- Sequence Number Search
- Single Block Operation
- Stored Stroke Check
- Thread, Synchronous Cutting
- Tool Life Management
- Tool Nose Radius Compensation
  - Variable Lead Thread Cutting

**Data Input/Output**
- MDI (Manual Data Input) Operation
- Reader/Punch Interface
  - (RS-232 Software/Hardware)
- Ethernet Card
- Flash Card Capability PCMCIA

**Operation**
- Block Delete
- Dry Run
- Dwell Time
- Emergency Stop
- Feed Hold
- Feedrate Override (0 to 150%)
- Incremental Jog
- Jog Feed
- Machine Lock
- Manual Pulse Generator (MPG Handwheel)
- On-Screen Spindle & Axis Load Meters
- Option Stop
- Rapid Traverse Override (Low-25-50-100%)
- Spindle Speed and T-Code Displays on All Screens
- Tool Geometry and Tool Wear Offsets (32 pair each)
- Second auxiliary function

**Miscellaneous**
- Actual Cutting Speed Display
- Alarm Display
- Clock Function
- Graphic Display
- English Color LCD Display with Full Keyboard
  - French/German/Italian/Spanish Language
- Ladder Diagram Display
- Mechanical Run Meter
- On-Screen “HELP” Functions for Alarms
- One-Degree Spindle Orient
- Program Protect
- Run Time Parts Counter
- Self-Diagnostic Function

- Standard
  - Optional
Hardinge Mitsubishi M70V Control

General
- Two Interpolating Axes
- Programmable Resolution—.000010"/.00010mm
- Tool Offset Capability—.000010"/.00010mm
- Inch/Metric Data Selection by G-Code
- 1280 Meters Part Program Storage
- USB and Compact Flash Drives

Programming Functions
- Absolute/Incremental Programming
- Custom Macro Variables
- Auto Coordinate System Setting
- Auto Acceleration/Deceleration
- Background Editing
- Canned Cycles (Drilling)
- Chamfer/Corner Rounding
- Constant Surface Speed Programming
- Continual Thread Cutting
- Coordinate System Setting (G50)
- Custom Macro
- Decimal Point Programming
- Diameter/Radius Programming
- Extended Part Program Edit (copy/paste)
- External Workpiece Number Search
- Hardinge Safe Start Format
- Input of Offset Values by (G10)
- Interpolation (Linear/Circular)
- Multiple Repetitive Cycles I (Turning)
- Multiple Repetitive Cycles II (Pocketing)
- Program Number Search
- Reference Point Return
- Registered Part Program (1000 total)
- Rigid Tapping
- Sequence Number Search
- Single Block Operation
- Stored Stroke Check
- Thread, Synchronous Cutting
- Tool Life Management
- Tool Nose Radius Compensation
- Variable Lead Thread Cutting

Data Input/Output
- MDI (Manual Data Input) Operation
- Reader/Punch Interface (RS-232 Software/Hardware)
- Ethernet Data Transfer Card
- USB Drive
- Compact Flash Card

Operation
- Block Delete
- Dry Run
- Dwell Time
- Emergency Stop
- Feed Hold
- Feedrate Override (0 to 150%)
- Incremental Jog
- Jog Feed
- Machine Lock
- Manual Pulse Generator (MPG Handwheel)
- Option Stop
- Rapid Traverse Override (Low-25-50-100%)
- Tool Geometry and Tool Wear Offsets (80 pair each)

Miscellaneous
- Actual Cutting Speed Display
- Alarm Display
- Clock Function
- Graphic Display
- English Color LCD Display with Full Keyboard
- Ladder Diagram Display
- Mechanical Run Meter
- On-Screen “HELP” Functions for Alarms
- One-Degree Spindle Orient
- Program Protect
- Run Time Parts Counter
- Self-Diagnostic Function
- Navi-Lathe Conversational Programming
- Buffer Editing (edit while running)

- Standard
QUEST CHNC 42 Floor Plan

NOTE:
All dimensions shown in inches [millimeters].
Investment Summary for ABMNameAlpha

Quote Number:
All Prices in: SOHCurrencyCodeFrom

<table>
<thead>
<tr>
<th>Qty</th>
<th>UOM</th>
<th>Description</th>
<th>Unit Price</th>
<th>Extended</th>
</tr>
</thead>
</table>

Total Investment: $XXXX