KOMO

Built for a Lifetime

CNC Machining Center Specifications

FUSION TWIN TABLE

Komo Machine, Inc.
1 Komo Drive
Lakewood, NJ 08701 USA
Phone: 732-719-6222
Toll Free: 800-255-5670
Fax: 732-579-5443
E-mail: info@komo.com

MADE IN THE USA

Machine Construction

Frame

The machine frame is constructed of heavy wall, structural steel tubing. The frame has been designed and analyzed using Finite Element Analysis (FEA) to provide a rigid and stable machining platform.

The frame components are stress relieved prior to machining. Machining is performed using a high precision machining center, capable of five sided machining in one set-up to insure parallelism and perpendicularity of the final product.

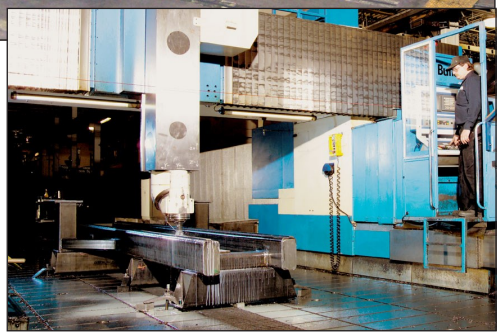


Table / Work Surface

The work surface is a precision machined aluminum high flow vacuum table sub-surface with a composite grid table to present a modular work area for easy setup. The modular design also facilitates quick part changeover for a variety of material sizes. The aluminum construction provides superior rigidity to insure high cut quality in a variety of applications.

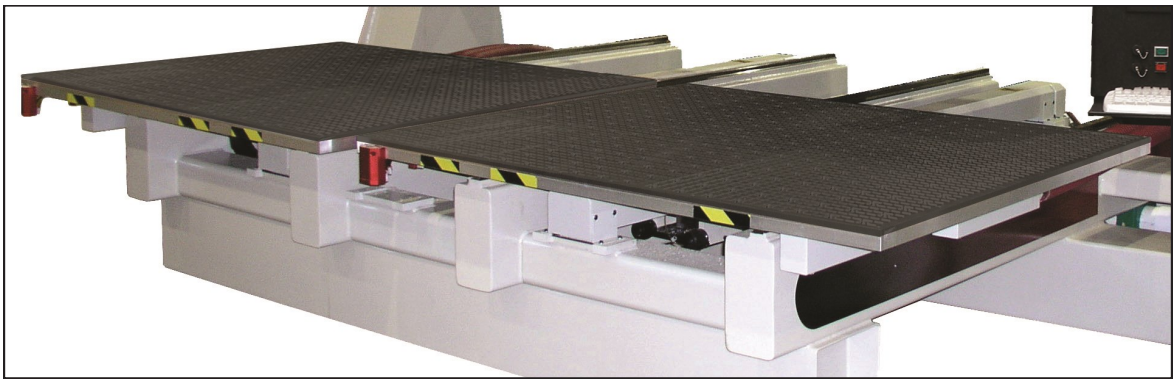
The machine comes equipped with a high flow manifold with a 4" (102mm) diameter butterfly valve to insure high vacuum transfer from a vacuum pump to the machine table.

All fittings and hoses necessary for the connection of the pump to the machine manifold are supplied as part of the vacuum system package, see Machine Options section.

Optional aluminum universal grid table available.

Work Area Dimensions

Length (twin tables) .....72" / 72" (3658mm / 3658mm)
Width .....60" (1524mm)



Axis Configuration

The machine is configured with a traveling table, stationary gantry design.

X axis (gantry) motion is accomplished via pre-loaded precision rotating nut ball screw. The rotating nut is driven by a digital Fanuc Alpha HVI servo motor.

Y, V and Z axis motion is accomplished via pre-loaded precision ball screws and powered by digital Fanuc Alpha HVI servo motors.

The Z axis is supported by a pneumatic counterbalance system. The system is "closed loop" to minimize air use during operation.

Each axis is mounted on precision ground linear guide ways with pre-loaded precision bearing trucks.

The Fanuc servo motors provide the fastest acceleration/deceleration rates in the industry. The machine is also provided with High Speed High Precision (HSHP), found standard on all models of KOMO routers. This high rate of acceleration/deceleration, coupled with HSHP helps insure maximum tool life, along with reducing production times, resulting in a lower per piece part cost.

Travel positioning is maintained via the controller reading 1,000,000 pulse-per-revolution absolute encoders mounted on each servo motor.

Automatic Lubrication System

All positioning bearings, ball screws and racks are serviced by a centralized automatic lubrication system, activated directly by the machine control, the method recommended by the ball screw and linear guide way manufacturers.

Automatic Tool Changer

Each machine is supplied with a 15 station aggregate compatible tool changer. The tool changer is powered by a Fanuc servo motor for fast, reliable tool changes.

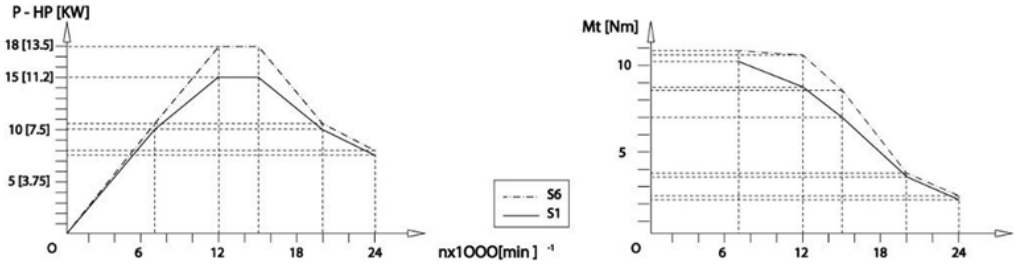
Twin spindle models are equipped with dual 15 station tool changers.

Head Configuration

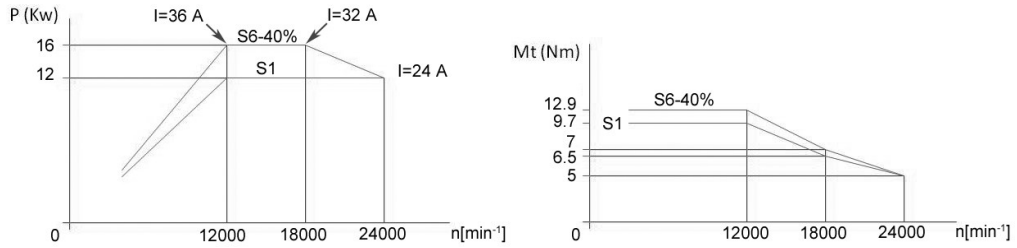
KOMO uses only the highest quality spindles on the entire router product line. Each spindle must meet exacting specifications, and is subject to a strict inspection process prior to being accepted into inventory. The HSK tool connection provides a rigid tool interface to insure high cutting performance in a variety of materials, with the highest quality part finish.

The Fusion series can be equipped with two spindles as an option. KOMO gives you the flexibility to select the spindle configuration that is right for you.

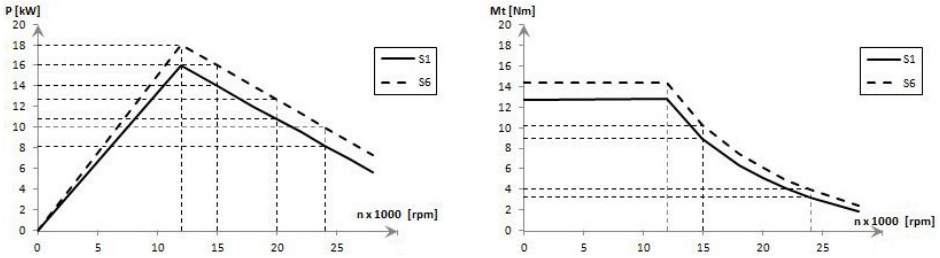
18HP (13.5KW)*
Fan-Cooled,
24,000RPM
HSK 63F (HSD)



21HP (16KW)*
Liquid-Cooled,
24,000RPM
HSK 63F (Omlat)



24HP (18KW)*
Liquid-Cooled,
24,000RPM
HSK 63F (HSD)



*All spindles are rated at the S6 power curve.

Dust and Chip Collection

Dust and chip collection is accomplished through an open/close dust shroud surrounding the main spindle. The dust shroud is connected to the customer supplied dust/chip extraction system through a 9" (229mm) diameter steel adapter.

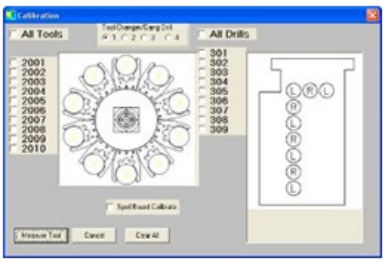
The main spindle comes complete with a programmable air blast system for optimum dust collection.

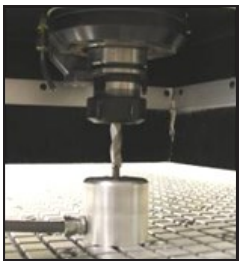
Guarding

As a standard safety feature, a tube frame is provided that surrounds the spindle work zone. This tube frame is designed to prevent the operator from entering the machine work zone during operation.

Automated Tool Setter

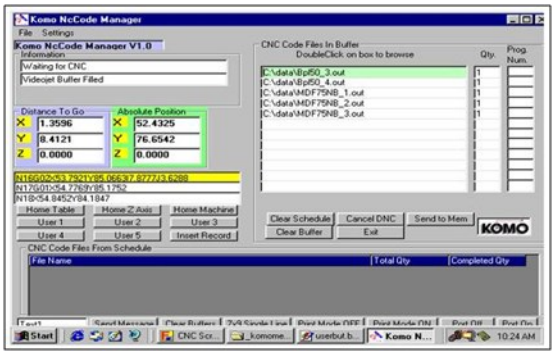
The machine is supplied with an automated tool length measurement system. The tool setter can be placed in a fixed location for easy tool length offsetting or placed on the table for inputting spoil board or fixture offsets.





KOMO Production Manager Software

Each machine includes KOMO's exclusive Production Manager Software with Intelligent Spoil Board Management©. This productivity feature takes the guesswork out of managing your spoil board, insures optimum performance of the flow-through vacuum system when nesting and provides a fast and efficient way to load programs into your CNC machining center.



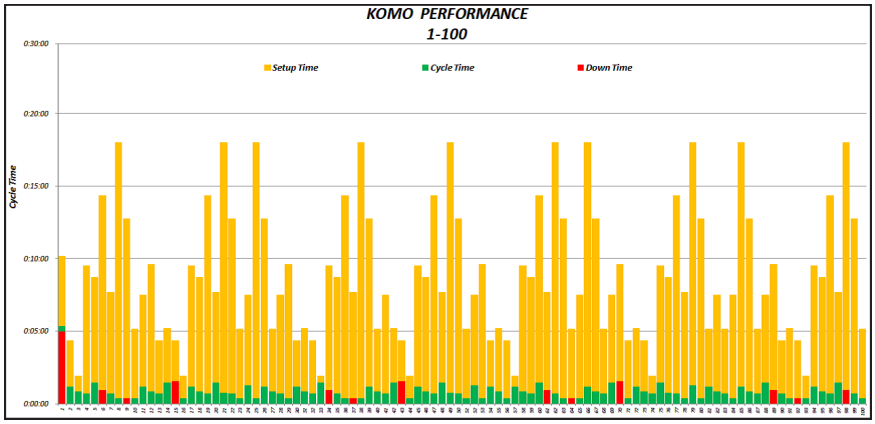
Intelligent Spoil Board Management

- User programmable buttons allow fast access to most commonly used programs
- Send programs to control memory in just seconds
- Ability to save partially run Schedule files due to production interruption
- Multiple file select and drag-and-drop support
- See your programs running on the control without switching screens

KOMO PRODUCTION MANAGER

KOMO Machine Monitoring Software

Each machine now ships with KOMO's exclusive software that captures the machine's production data without any input from the operator. Specific events are recorded throughout the day, which are later imported into a spreadsheet and analyzed. This data is then graphically displayed, which can help to identify problem areas. The software starts up with the machine every morning, and is password protected against being disabled by the operator. This software also includes Tool Life Monitoring, which will visually warn the operator as each tool is nearing its end of life expectancy.



Control

The machine features the latest version Fanuc 0i-MF control with integrated PC front end. As a Fanuc Authorized CNC System Integrator, KOMO has been installing Fanuc controls on our machines for over 30 years. We have worked closely with them to bring improvements and innovations to our products, resulting in some of the highest acceleration/deceleration rates and raw servo accuracies in the industry.

Control Features

Primary Features

- High-speed industrial CNC
- Network compatible
- Windows® 7
- 4 GB RAM
- High-speed serial bus
- USB port
- 120 GB solid state hard drive
- 512k (1280M) part program memory

Operator Interface

- 19" color touch screen monitor
- Run hour / parts count display
- Actual feed rate display
- Alarm / operator message display
- Spindle load meter
- KOMO Production Manager software
- Controller keyboard
- Current position display
- Automated tool setter
- Remote diagnostic capability
- Vacuum gauge
- On-screen drawing viewer

Manual Override Features

- Full function hand wheel (MPG)
- MDI operation
- Feed rate override
- Traverse override
- Spindle override

Features to Simplify Programming

- Custom Macro B
- Work piece coordinate system preset
- Absolute / incremental programming
- Dry run
- Tool offset memory type C
- Background editing
- Programmable mirror image
- Helical interpolation
- Extended macro variables
- Tool length compensation
- 54 work coordinates
- Coordinate system rotation
- 400 tool length offsets
- Linear / circular interpolation
- Canned cycles for drilling
- Dwell (G4)
- Inch / metric capability
- Optional block skip
- Pattern data input
- Extended part program editing
- Cutter compensation type C
- Programmable data input
- Scaling
- Twin table control

Enhanced Accuracy / Speed / Part Finish

- APC – Advanced Preview Control
- AI Advanced preview control
- High speed skip
- Simultaneous 4 axis control
- Backlash compensation
- Alpha HVI servo motors

Installation

Installation of the machine will be performed by a Factory Trained and Certified Technician. Once the machine has been positioned, the technician will level the machine, perform power up and conduct a thorough pre-production test routine.

After the machine has been installed and tested, the technician will provide daily maintenance instruction and review machine operation.

Travel and living expenses of technician are included with machine purchase.

Power and Air Requirements

Electrical Requirements

Machine is 480 volts with a full load amp draw of 60 amps *

Contact Komo Machine for new amp rating if any alterations are made to the head configuration and for transformer requirements.

* Does not include vacuum pump. Vacuum pump will require a separate electrical connection. Amp rating will be supplied with the New Owner's Manual and will vary depending on size and voltage of pump selected.

Plant wiring required: 440/480 volt, 3 phase brought to main machine disconnect. NEMA 12 electrical enclosure is equipped with an industrial grade "closed loop" heat exchanger for temperature control.

Air Requirement

Machine requires 22scfm (900ml per minute) maximum usage, pressure is 90-95psi (7 bar) of filtered, dry air.

Ambient Working Temperature

41º - 95º Fahrenheit (5º - 35º Celsius)

Machine Training

Machine Operation training is provided at Komo Machine for up to two (2) persons for three (3) days. Each seat of training is available for one (1) year from machine installation.

Note: Customer is responsible for travel and living costs for all training programs.

Support

A Control Operator's Manual and a KOMO Operation and Maintenance Manual are supplied in CD-ROM format and are also loaded on the machine hard drive for access from the operator control station. Electrical schematics are provided in hard copy format.

Also included with each machine is our world class **24/7/365 toll free technical support**. As part of this support system, each machine comes equipped with Remote Diagnostics capability, allowing a KOMO Support Technician to "dial into" your machine to assist in troubleshooting and minimize response time to correct a problem.

Warranty

Each machine includes the KOMO **standard two year warranty**. See the Terms and Conditions document for full information.

Standard Machine Specifications

Machine Space - Overall with Guarding

Length	154" (3912mm)
Width	262" (6655mm)
Height	130" (3302mm)
Clearance under the bridge	15" (381mm)
Table height (floor to table top)	32" (812mm)
Weight	17,000lbs (7711kg)

Table

Length (twin tables)	72" / 72" (1829mm / 1829mm)
Width	60" (1524mm)

Travels

X Axis	173" (4394mm)
Y, V Axes	76" (1930mm)
Z Axis	11" (279mm)

Feed and Traverse Rates

X Axis	3150 ipm (80 mpm)
Y, V Axes	2300 ipm (58.5 mpm)
Z Axis	900 ipm (22.7 mpm)
Acc/Dec	83 in/sec²

Spindle / Tool Changer

Speed (fan cooled)	24,000 RPM
Power (S6)	Multiple available
Tooling	HSK 63F
Tool changer	15 stations
Drive system	Precision gear box with Fanuc servo
Maximum diameter (adjacent pockets full)	3.25" (82mm)
Maximum diameter (adjacent pockets empty)	6.5" (165mm)
Maximum weight (per tool)	12lbs. (5.4kg)
Maximum weight (full carousel)	96lbs. (43.5kg)
Maximum tool length (70mm tool holder)	5" (127mm)

Drive System

X, Y, Z Axes	Fanuc Alpha HVI digital servos
X Axis	Precision ball screw 1.97" (50mm) dia
Y, V Axes	Precision ball screw 1.57" (40mm) dia
Z Axis	Precision ball screw 1.26" (32mm) dia
Lubrication	Centralized automatic lubrication

Linear Guide Ways

X Axis	35mm, eight (8) bearing trucks
Y, V Axes	35mm, six (6) per table bearing trucks
Z Axis	35mm, four (4) bearing trucks
Lubrication	Centralized automatic lubrication

Accuracies

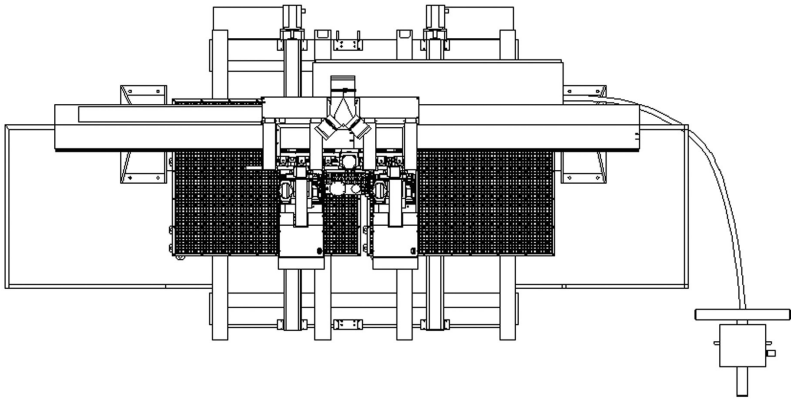
Unidirectional linear axis positioning (per meter)	± 0.0008" (± 0.020mm)

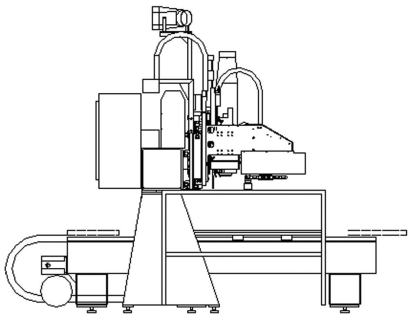
Dust Collection

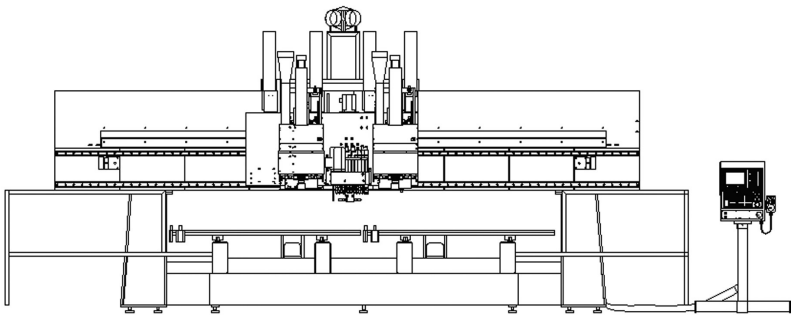
Interface diameter	9" (229mm)
Recommended volume	900 CFM per head

All specifications are based on the standard machine configuration. Any options or changes may result in modifications to the machine specifications.

Model-specific drawings
can be provided on request.







Machine Options

Non-Perishable Tooling Package

A complete set of HSK 63F tool holders with collets can be supplied as optional equipment. All tool holders are balanced to a specification of G2.5 at 24,000RPM for optimum tool performance and spindle life.

Non-Perishable Tooling Package for a 15 Station Tool Changer

- 15 76mm ER40 tool holders
- 15 ER40 collets
- Bench top tool changing block
- Collet wrench

Vacuum System Package

Choose the right vacuum pump for your application. All pumps available in multiple horsepower and voltage options.

Dekker AtlasCopco

Voltages available (3 phase): 208V, 240V, 380V, 480V, 575V
Additional voltages available upon request.

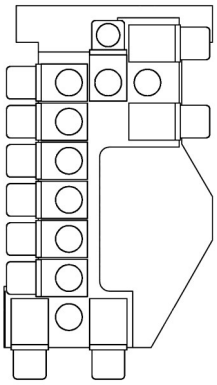
All pumps are designed for fast draw-down to an ultimate vacuum for fast cycle times and more powerful hold down.

The vacuum pumps are started via pushbutton on the main operator panel and come complete with a remote start relay, allowing the pump itself to be located either next to the machine, or in a remote location.

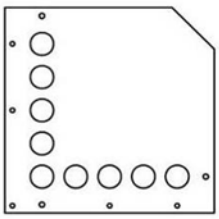
Boring Blocks

9 Spindle, 11 Spindle, 17 Spindle and 20 Spindle (other configurations available)
Enhance the productivity of your machine with a multiple spindle boring block. The boring block gives you the speed to drill multiple holes in one process, ideal for cabinet production. Spindles are on 32mm centers and all will have full table coverage in the X and Y axes.

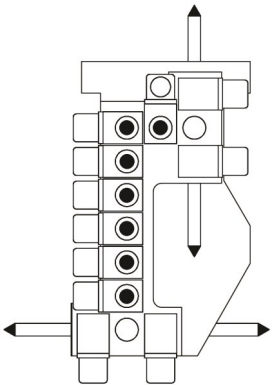
9 Spindle (7+2 All Vertical)



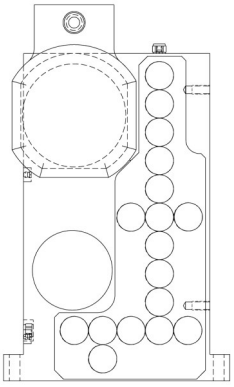
9 Spindle (5+4 All Vertical)



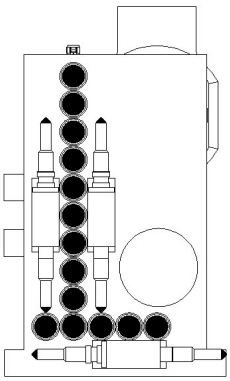
11 Spindle (6+1 with 4 Horizontal Outlets)



17 Spindle (All Vertical)



20 Spindle (5+9 with 6 Horizontal Outlets)



Additional Safety Equipment

KOMO offers a variety of add-on safety equipment that can be configured to any specific model and application, including but not limited to:

Laser Scanners

Light Curtains

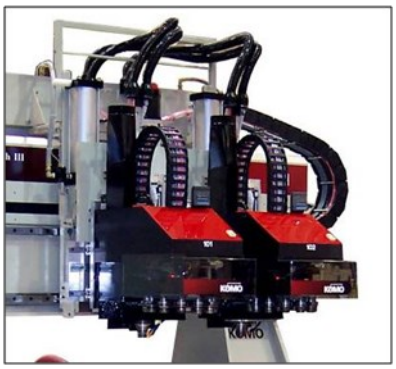
Pressure Mats

Bump Strips

Multiple Spindles with Programmable or Manual Adjustable Head Spacing with Pneumatic Head Locks

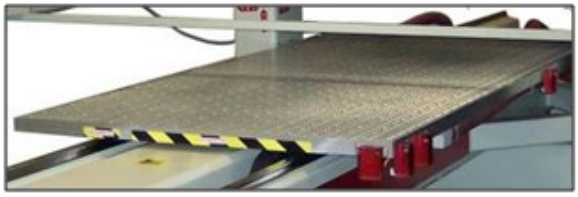
Achieve the benefits of multiple part production by incorporating multiple spindles to achieve faster cycle times and higher productivity.

Multiple heads can be supplied with manual or programmable head spacing with pneumatic head locks for quick and efficient changes in the distance between the heads.



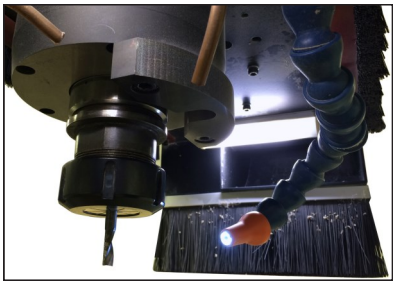
Aluminum Universal Grid Table

Utilizing all the characteristics of our standard grid table, the aluminum construction gives you a more robust holding surface and unmatched vacuum flow for the ultimate in flow through hold down technology.



KOMO Real Time Tool View

An industrial-hardened camera (and LED work light) mounted under the spindle (inside the dust shroud) takes continuous video feed of the tool while it is cutting. This video feed is viewable from the machine control screen, and can be viewed remotely as well.



KOMO Spindle Condition Monitoring

This option is designed to monitor the vibration levels of the spindle as it is operating, and those levels are viewable from the machine control screen and can be fed to a remote office location. This allows an operator or production manager to know when a spindle is worn or overloaded - or being perfectly utilized.

Programmable Dust Shroud Height

The height of the dust shroud can be programmed, for example to match the length of the tool. The brushes can sweep just above the material to allow for air to pass under them for better dust collection, or in the case of a short tool, to avoid crushing the brush material against the part.

Dual Screen

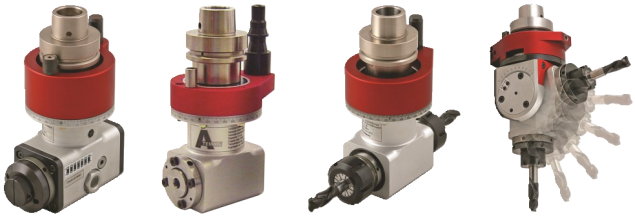
The dual screen option gives you the ability to be running the standard CNC screen with the touch screen interface while running program controls and other operations on the attached 19" screen.

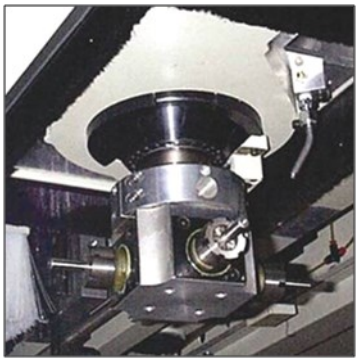
Mist Coolant System

The optional mist coolant system gives you the capability of cutting non-ferrous metals.

C (Rotating) Axis

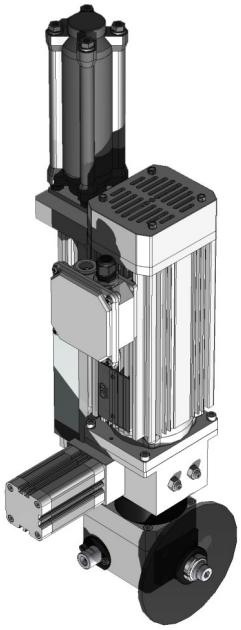
The C (rotating) axis lets you use a wide assortment of aggregate tooling for four axis machining capability.





2.4HP (1.8kW) 90 Degree Indexing Saw

The indexing saw gives you a convenient way to make long, straight cuts at a high machining speed. The saw is independently controlled on its own slide assembly.



On-Machine Part Labeling

Eliminate the need for stick-on labels with the VideoJet inkjet printer head that can print labels directly onto parts before they are machined. This option can be selected in Router-CIM for an easy and efficient way to keep parts organized.

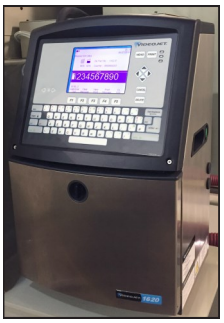
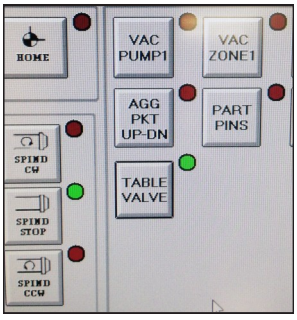
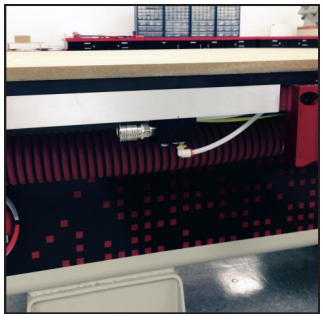


Table Fixture Air Supply

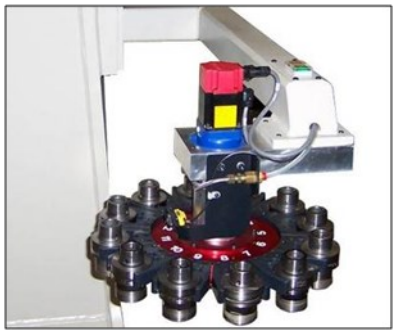
In cases where a vacuum system is not always required for part holding, an air supply can be provided if fixtures will be utilized on the machine table. This option is manually operated by a pushbutton, or can be controlled by an M code in the part program.





15 Pocket Side Mounted Tool Changer

Increase tool capacity by adding a 15 pocket side mounted tool changer with full aggregate capability.



KOMO IPT - Independent Programmable Technology

KOMO's Independent Programmable Technology (IPT) delivers complete flexibility via fully programmable center spacing as well as individual spindle feed, speed and axis control.

IPT is an option rather than a specific model of machine. The spindles can be programmed to operate with complete flexibility. They can be slaved together to cut multiple parts simultaneously, or they can be split up to cut dissimilar parts on separate tables at the same time. Run multiple short cycles on one table while running a long cycle on the other. Produce a unique part on each table while using any combination of spindles. Flexibility and productivity - that's Independent Programmable Technology.

Software Options

Software is an important part of your machine purchase, and KOMO has a number of options available to meet your needs in addition to those described here.

CIM-TECH
AUTOMATED CAD/CAM SOLUTIONS

Router-CIM® Automation Suite CAD/CAM Programming Software
Shaped by years of experience in custom, industry-specific programming, CIM-Tech offers a deeper, more robust software solution. Router-CIM Automation Suite offers a familiar Windows®-style interface, and its enhanced capability supports a variety of third party software to control other equipment.

Router-CIM® Automation Suite is a complete CNC machine programming package. This versatile product combines Computer Aided Manufacturing (CAM) features with the power of AutoCAD®, the world's premiere Computer Aided Design (CAD) software. Now one complete package can take you from concept drawing to machine-ready code automatically!

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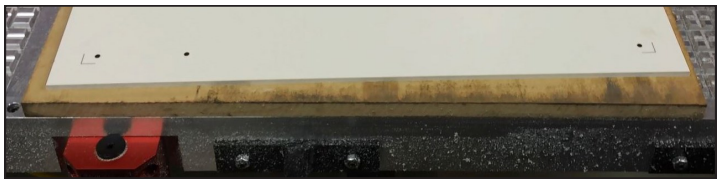
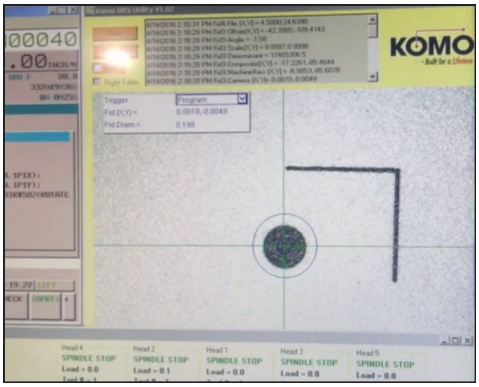
alphacam

Alphacam is a leading CAM solution for wood, stone, composites and metal components from 2 axis through to 5 axis NC programming applications. The emphasis behind the development of Alphacam is to provide customers with productivity, reliability, and flexibility. Improving these attributes in any company will help increase profitability.

KOMO Pathfinder Part Registration System

This option allows "print and cut" type parts to be placed in rough position on the router table and still be cut with precision. The part is printed with reference points (typically solid black dots) which are recognized by a camera utilizing vision processing software.





These dots are then used to calculate the offset and rotation on the fly for each part. The needed corrections are applied and the part is cut - all without changing the program or manually acquiring work offsets. The rotation and offset can vary from part to part and will be corrected automatically without the need

KOMO

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Corporate Headquarters

Komo Machine, Inc.
1 Komo Drive
Lakewood, NJ 08701 USA

Manufacturing and Assembly Facility

Komo Machine, Inc.
2 Komo Drive
Lakewood, NJ 08701 USA

Contact Us

Phone: 732-719-6222
Toll Free: 800-255-5670
Fax: 732-579-5443
E-mail: info@komo.com

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