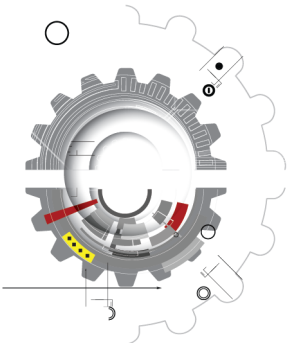




► Built for a *Lifetime*



CNC Machining Center Specifications

FUSION



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www.komo.com

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 that presents 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.

Four (4) 1" (25.4mm) diameter part location pins are included as a standard feature with every machine. The pins are located in a fixed position at 3" (76mm), 3" (76mm), 10" (254mm) and 75" (1905mm).

Optional aluminum universal grid table available.

Work Area Dimensions

Length (508)	96" (2438mm)
Length (510)	120" (3048mm)
Length (512)	144" (3658mm)
Width	60" (1524mm)
All tables are available 72" wide (1829mm)	



Axis Configuration

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

X axis (table) motion is accomplished via pre-loaded precision rotating nut ball screw. The ball screw is driven by a digital Fanuc Alpha HVI servo motor. Fusion 524 travel is accomplished by a precision rack and pinion system.

Y 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.



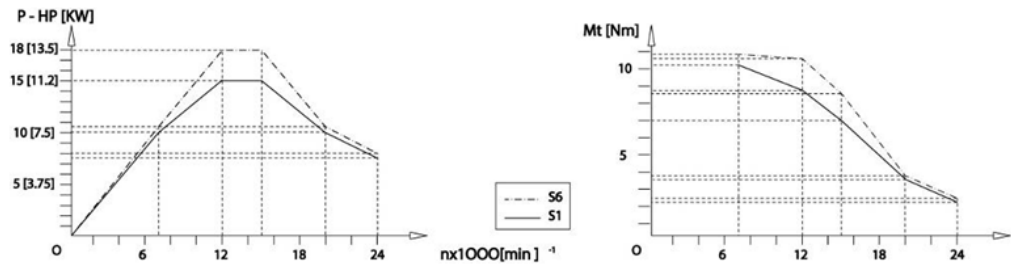
Head Configuration

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.

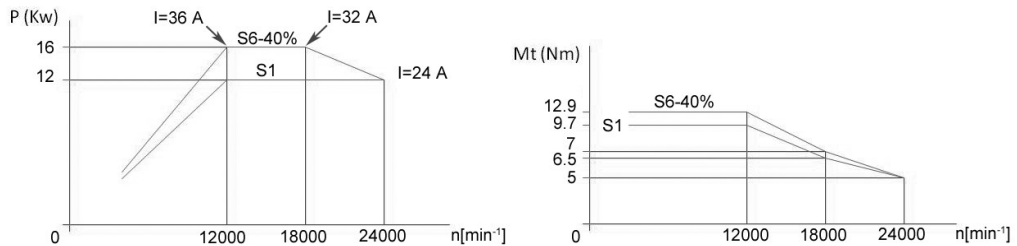


The Fusion series can be equipped with two spindles as an option. KOMO gives you the flexibility to select the spindle configuration that is right for you.

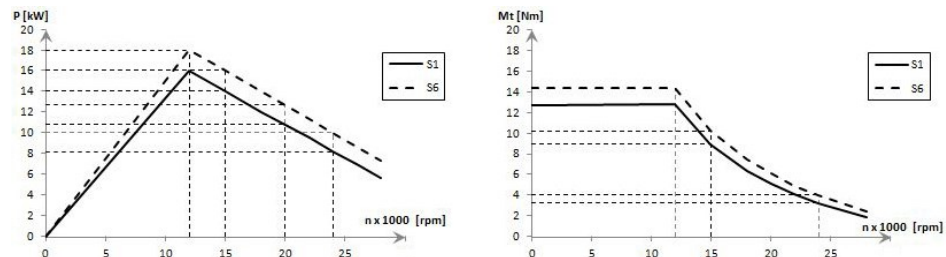
18HP (13.5KW)*
Fan-Cooled,
24,000RPM
HSK 63F (HSD)



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

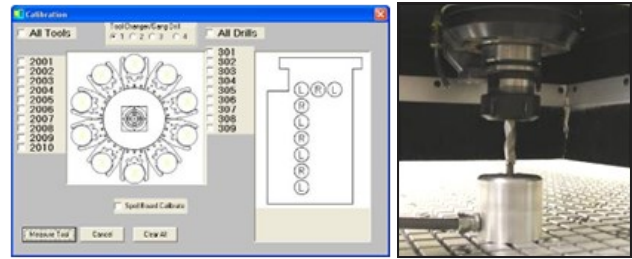
Dust and chip collection is accomplished through an open/close dust shroud surrounding the main spindle. The dust shroud is connected to the customer supplied dust/chip extraction system through a 6" (152mm) diameter steel adapter.

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.

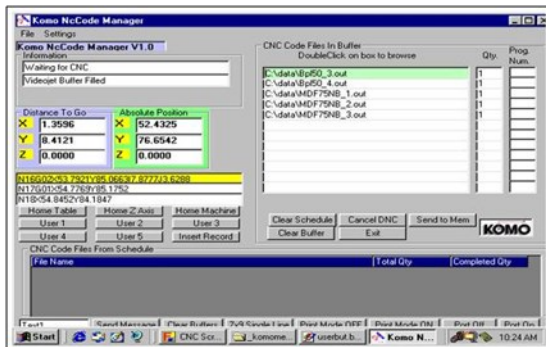
Automated Tool Setter

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.



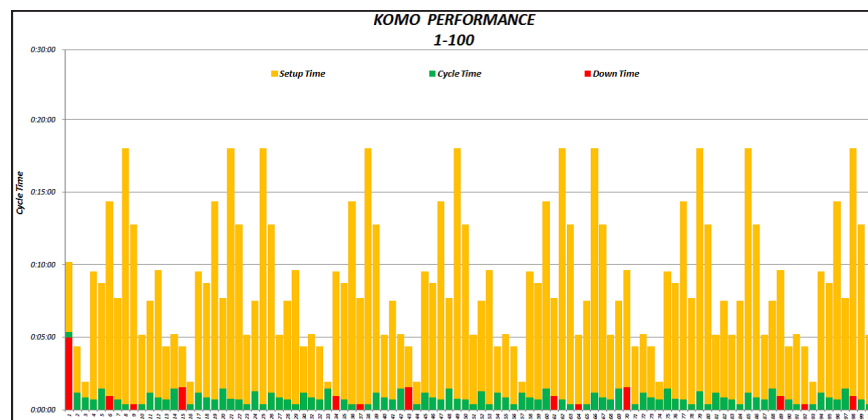
Intelligent Spoil Board Management

- 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 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 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

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 52 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

41° - 95° Fahrenheit (5° - 35° 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 (508)	246" (6248mm)
Length (510)	294" (7468mm)
Length (512)	342" (8687mm)
Width	143" (3632mm)
Height	110" (2794mm)
Clearance under the bridge	15" (381mm)
Table height (floor to table top)	30" (737mm)
Weight	14,000 – 19,000lbs (6350 – 8619kg)

Table

Length (508)	96" (2438mm)
Length (510)	120" (3048mm)
Length (512)	144" (3658mm)
Width	60" (1524mm)
All tables are available 72" wide (1829mm)	
Part Location	Four (4) 1" (25.4mm) diameter pins
	One in Y direction at 3" (76mm)
	Three in X direction at 3", 10", 75" (76mm, 254mm, 1905mm)

Travels

X Axis (508)	116" (2946mm)
X Axis (510)	135" (3429mm)
X Axis (512)	159" (4038mm)
Y Axis	86" (2184mm)
Z Axis	12" (305mm)

Feed and Traverse Rates

X Axis	3150 ipm (80 mpm)
Y Axis	3150 ipm (80 mpm)
Z Axis	900 ipm (22.7 mpm)
Acc/Dec	205 in/sec ²

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 Axis	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, ten (10) bearing trucks
Y Axis	35mm, six (6) bearing trucks
Z Axis	45mm, four (4) bearing trucks
Lubrication	Centralized automatic lubrication

Accuracies

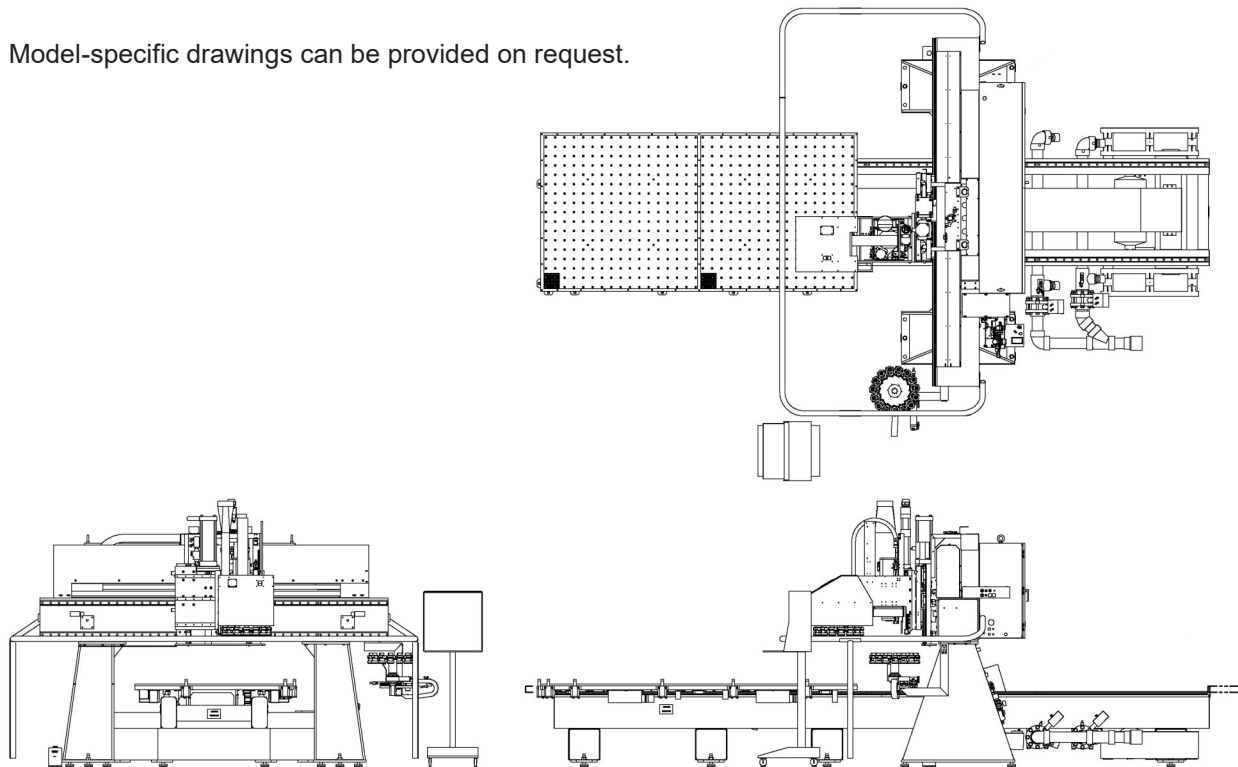
Unidirectional linear axis positioning (per meter)	$\pm 0.0008"$ ($\pm 0.020\text{mm}$)
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Dust Collection

Interface diameter	6" (152mm)
Interface diameter - dual heads	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 24,000 RPM 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.



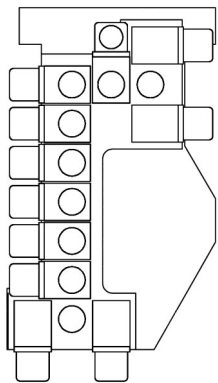
The vacuum pumps are started via pushbutton on the main operator panel and come complete with a remote start relay, allowing the pump itself to be located either next to the machine, or in a remote location.

Boring Blocks

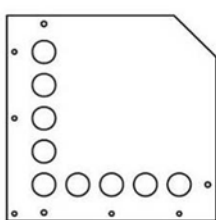
9 Spindle, 11 Spindle, 17 Spindle and 20 Spindle (other configurations available)

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.

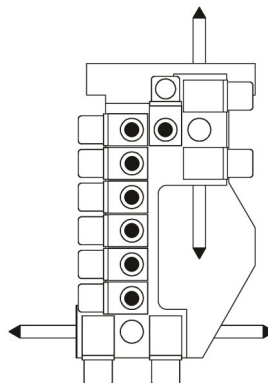
**9 Spindle (7+2
All Vertical)**



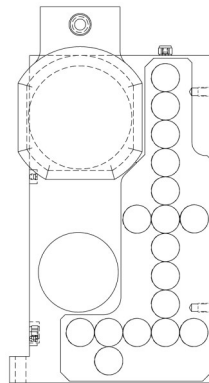
**9 Spindle (5+4
All Vertical)**



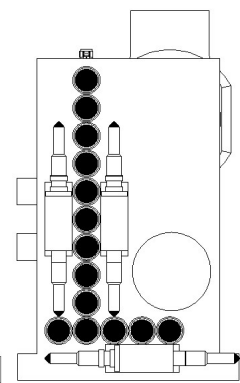
**11 Spindle (6+1 with
4 Horizontal Outlets)**



**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



KOMO Material Management System

Create a high productivity work cell with the KOMO automatic material management system. Remove machined parts, clean the spoil board and load new material all in one pass.

Available in a multiple bunk configuration to accommodate different materials.



KOMO Material Management System 2.0

Flexible material loading and a compact footprint makes the best use of available shop floor space. Sheets are transferred onto the router table, the finished nest is unloaded for sorting, and cutting debris is automatically cleaned from the router table in about 40 seconds.



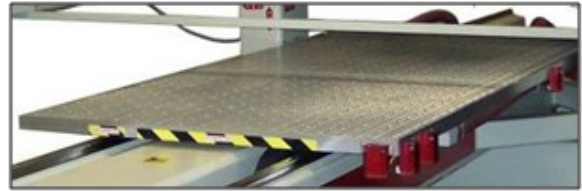
KOMO Automatic Out Feed Conveyor System 2.0

Add safety and increased productivity to the automatic material management system work cell. The conveyor brings machined parts away from the machine, where photo eye sensors prevent them from going over the edge and they can be safely unloaded.



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.



Integrated Pop-Up Roller Ball System

Built right into the machining table, these roller balls raise and lower to facilitate material transfer, which reduces operator fatigue and increases productivity. Available on composite and aluminum universal grid tables.



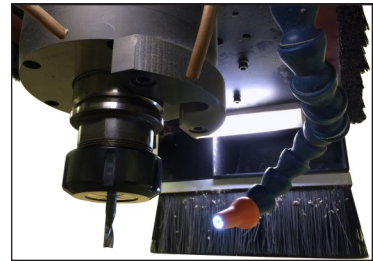
Manual Material Management System

The material handling tables provide an economical option for increasing productivity and reducing operator fatigue. They include the ability to control cycle start and cycle stop from either side of the machine for complete flexibility and control.



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.



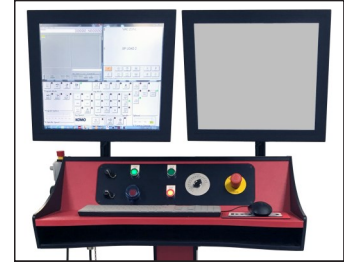
Programmable Dust Shroud Height

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.



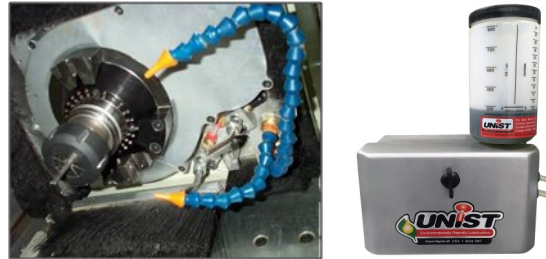
Dual Screen

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.



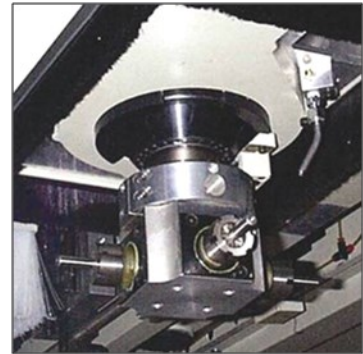
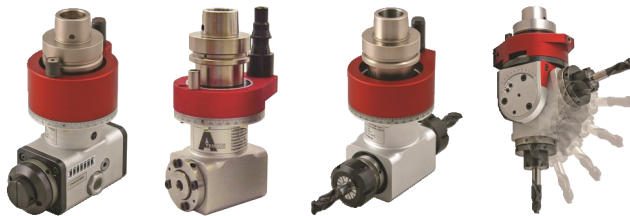
Mist Coolant System

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.

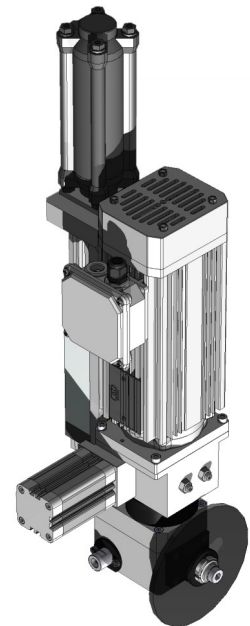


2.4HP

90 Degree Indexing Saw

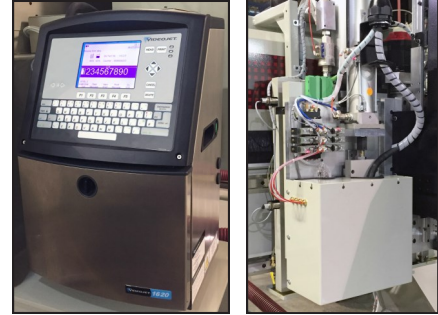
The indexing saw gives you a convenient way to make long, straight cuts at a high machining speed. The saw is independently controlled on its own slide assembly.

(1.8kW)



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.



Roller Hold Down

This system gives you the ability to cut multiple sheets in a single pass. Four robust rollers controlled by pneumatic cylinders will keep constant pressure on your material, allowing for multiple sheets to be loaded and machined in a single cycle.



15 Pocket Side Mounted Tool Changer

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



Dust/Chip Enclosure

Designed to handle large quantities of chips and debris, the dust/chip enclosures have port holes that can be attached to your dust collection system for quick and easy clean up of your CNC machining center.



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.

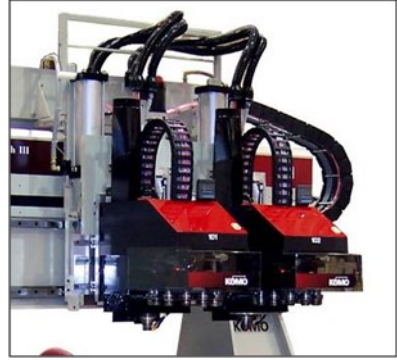
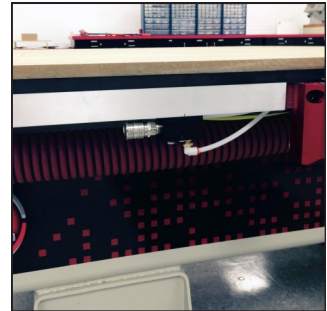
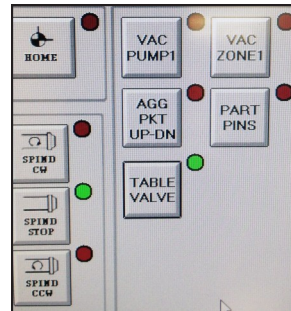


Table Fixture Air Supply

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.



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.



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!



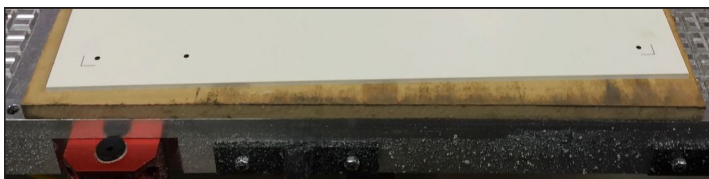
Alphacam is a leading CAM solution for wood, stone, composites and metal

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.

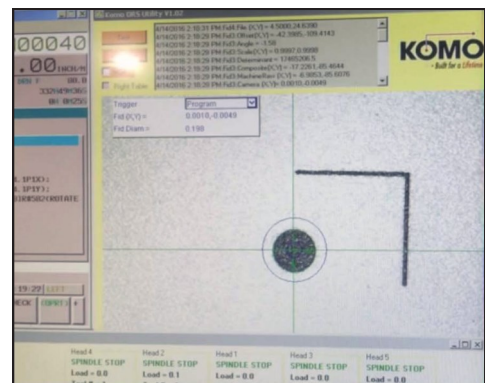
solution for wood, stone, components from 2 axis

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



Notes

Notes

Notes



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From Us to You - Since 1966

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

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

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member
iapd
international association
of plastics distribution



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