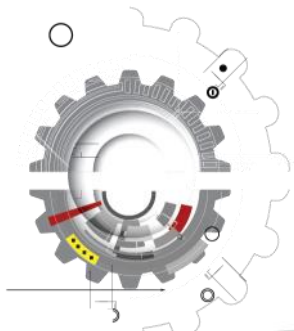




► Built for a *Lifetime*



CNC Machining Center Specifications

FUSION 5 AXIS



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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 precision machined aluminum, which provides superior rigidity to insure high cut quality in a variety of applications. All tables are 2" (50.8mm) cast aluminum stock.

Work Area Dimensions

Length (508)	96" (2438mm)
Length (510)	120" (3048mm)
Length (512)	144" (3658mm)
Width	60" (1524mm)



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.

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.

A and C axis motion is accomplished via belt-driven precision gears. Both axes are driven by a digital Fanuc Alpha HVI servo motor.

The Fanuc servo motors provide the fastest acceleration/deceleration rates in the industry.

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.

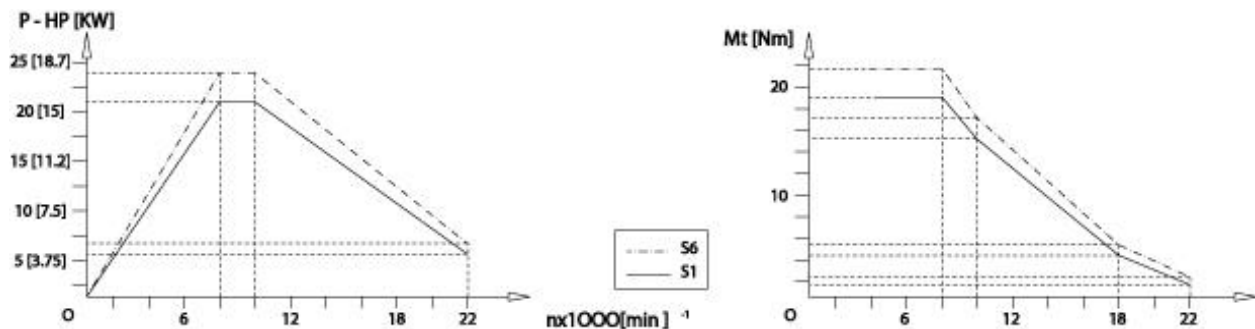


Head Configuration

KOMO uses only the highest quality spindles on the entire machining center product line. Each spindle must meet exacting specifications, and is subject to a strict inspection process prior to being accepted into inventory.

The spindle is a 24HP (18kw) 22,000 RPM, HSK 63F electro-spindle powered by an AC frequency inverter. 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 5 axis spindle is not supplied with a dust collection assembly. Ask about our dust collection options.

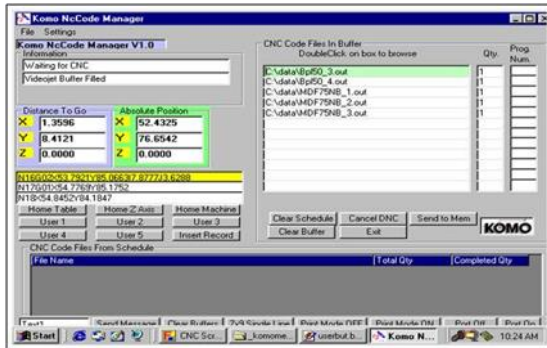


Guarding

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.

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.



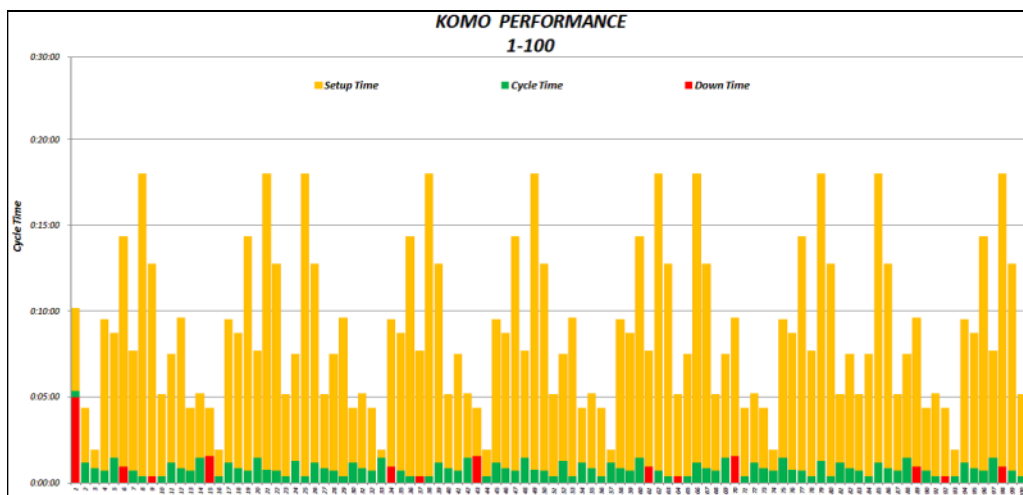
Intelligent Spoil Board Management

- 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 310i-B5 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	High-speed serial bus
Network compatible	USB ports (2)
Windows® 7	120 GB solid state hard drive
4 GB RAM	

Operator Interface

19" color touch screen monitor	Controller keyboard
Run hour / parts count display	Current position display
Actual feed rate display	Tool length measurement
Alarm / operator message display	Remote diagnostic capability
Spindle load meter	KOMO Production Manager software

Manual Override Features

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

Features to Simplify Programming

Tool length / work zero point measure	Rotary axis control
Position switch	Inverse time feed
Stored limit check	Increment system type C
Helical interpolation	Bell-shaped acc/dec
Program restart	Stored pitch error compensation
Work piece setting error compensation	Inch/metric conversion
Custom macro B	54 work coordinate offsets
99 tool length offsets	Tool offset memory type C
External data input	Manual feed
Advanced preview control (APC)	Multi-part program editing
512 KB part program memory	

Enhanced Accuracy / Speed / Part Finish for 5 Axis Machining

AI contour control 1	Simultaneous 5 axis control
3D tool length offset	Backlash compensation
Tool radius compensation	Fanuc Alpha HVI servo motors
Tool center point control	High speed skip
Tool nose radius compensation	

Optional Control Features

Rigid tapping	3D rigid tapping
Rigid tapping retract	

Standard Machine Specifications

Machine Space - Overall with Guarding

Length (508)	246" (6248mm)
Length (510)	294" (7468mm)
Length (512)	342" (8687mm)
Width	188" (4775mm)
Height	173" (4395mm)
Clearance under the bridge	40" (1016mm)
Table height (floor to table top)	30" (762mm)
Weight	18,000 – 26,000lbs (8165 – 11,794kg)

Table

Length (508)	96" (2438mm)
Length (510)	120" (3048mm)
Length (512)	144" (3658mm)
Width	60" (1524mm)

Travels

X Axis (508)	116" (2946mm)
X Axis (510)	138" (3505mm)
X Axis (512)	159" (4038mm)
Y Axis	95" (2413mm)
Z Axis	36" (914mm)
Z Axis travel available in 48" (1220mm)	
A Axis	±120°
C Axis	±245°

Feed and Traverse Rates

X Axis	3150 ipm (80 mpm)
Y Axis	3150 ipm (80 mpm)
Z Axis	735 ipm (18.7 mpm)
A Axis	82.5°/sec
C Axis	82.5°/sec

Special options may affect feed rates and travels

Spindle / Tool Changer

Speed (liquid cooled)	22,000 RPM
Power (S6)	24HP (18kw)
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)	11" (280mm)

Drive System

X, Y, Z Axes	Fanuc Alpha HVI digital servos
A, C 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 1.57" (40mm) dia
Lubrication	Centralized automatic lubrication

Linear Guide Ways

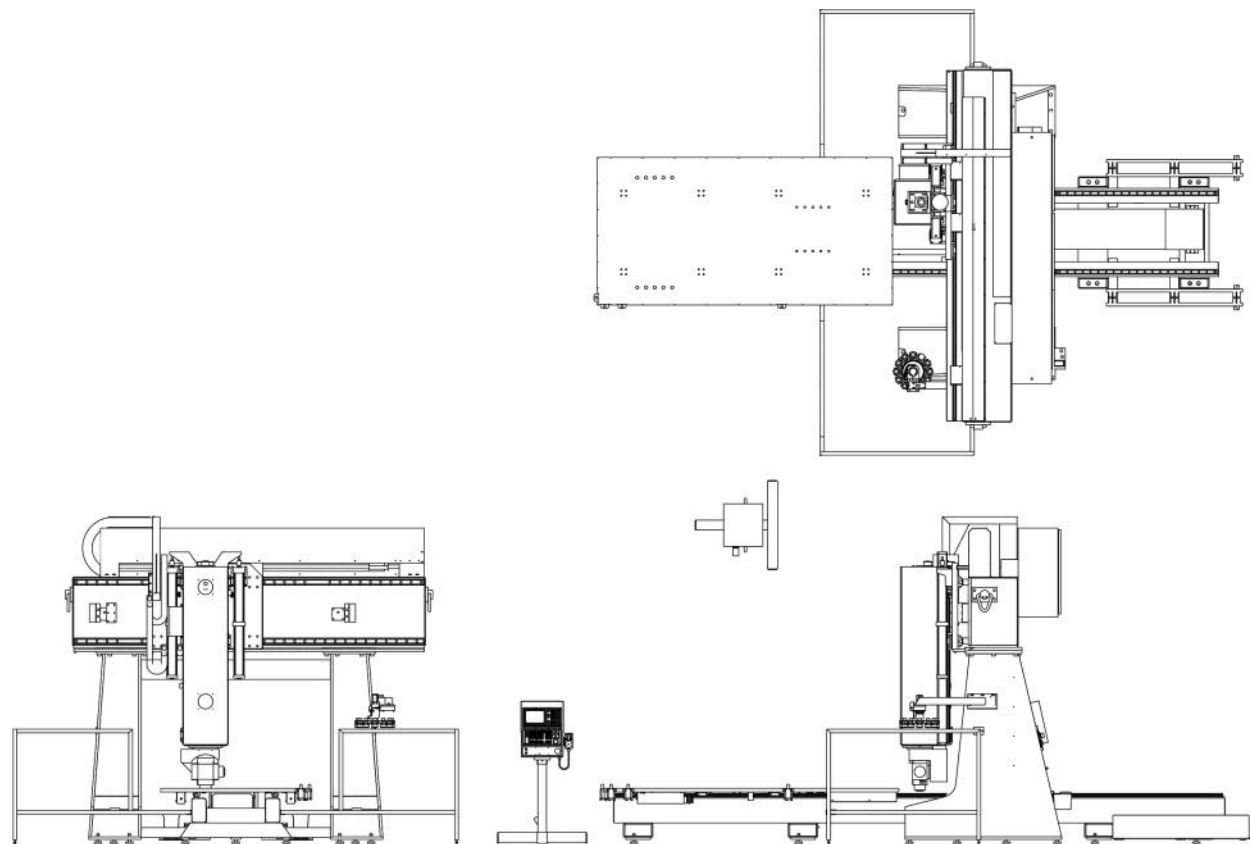
X Axis	35mm, ten (10) bearing trucks
Y Axis	45mm, six (6) bearing trucks
Z Axis	45mm, four (4) bearing trucks
Lubrication	Centralized automatic lubrication

Accuracies

Unidirectional linear axis positioning (per meter)	$\pm 0.0006"$ ($\pm 0.015\text{mm}$)
A, C axes unidirectional repeatability	20 arc seconds

Machine-specific drawings are available on request.

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



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)

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.

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.

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.



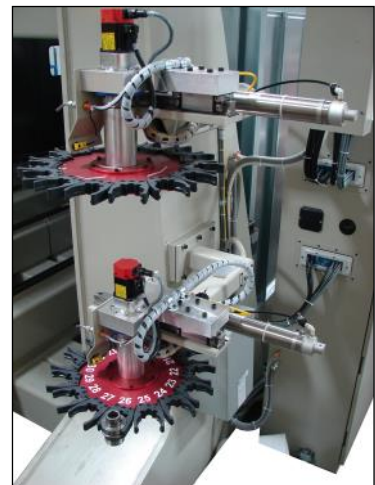
The vacuum pumps are started via pushbutton on the main operator panel and come complete with a remote start relay, allowing the pump itself to be located either next to the machine, or in a remote location.

Table Options

- Threaded steel inserts for the machined aluminum table
- Vacuum manifold for clamping devices
- Machined aluminum universal grid vacuum table (multiple vacuum zones available)
- Custom table options

Additional 15 Pocket Side Mounted Tool Changer(s)

Increase tool capacity by adding 15 pocket side mounted tool changers (maximum capacity 60 pockets) with full aggregate capability.



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



A and C Axis Options

A and C Axis Rotary Encoders

Add rotary encoders to increase the repeatability tolerance of the A and C axes to 10 arc seconds.

A and C Axis Brakes

Add hydraulic brakes to the A and C axes for additional rigidity when doing indexing machining operations.

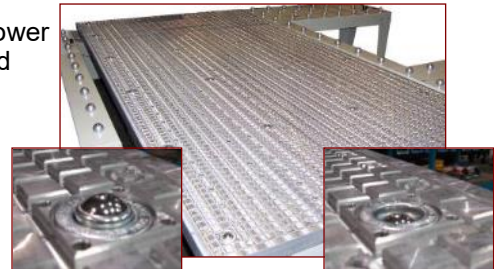
Rotary Distributor

Add the rotary distributor to allow for continuous rotation in the C axis and eliminate the need for unwinding of the spindle head.



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.



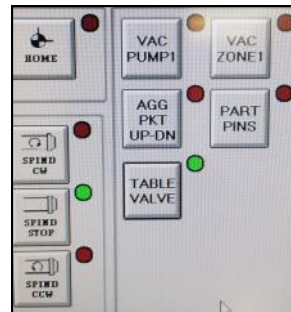
Dual Screen

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.



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.



Mist Coolant System

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



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.





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