KOMO

Built for a Lifetime

CNC Machining Center Specifications

VGM 5 Axis Series
Metal Machining Center

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MADE IN THE USA

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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

A variety of table options are available, including a non-machined aluminum table or with Keensert inserts or machined with a universal grid and vacuum system, or a steel table with "T" slots.

Work Area Dimensions

Depth (1206) .....72" (1829mm)
Depth can be increased in 72" (1829mm) sections
Width .....144" (3658mm)

Axis Configuration

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

Y and V axis (gantry) motion is accomplished via dual precision ball screw assemblies mounted on each side of the base frame, driven by digitally synchronized Fanuc Alpha HVI servo motors.

X axis motion is accomplished via precision ball screw assembly and powered by a Fanuc Alpha HVI servo motor.

Z axis motion is accomplished via precision ball screw assembly and powered by a Fanuc Alpha HVI servo motor.

The Z axis is supported by a pneumatic counterbalance system.

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

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

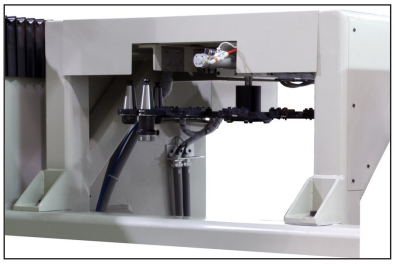
Automatic Lubrication System

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 tool changer. The tool changer is powered by a Fanuc servo motor for fast, reliable tool changes.

The VGM 1206 can be equipped with up to four (4) tool changers for a total of 60 positions.



Spindle Configuration #1

20HP (15kw) 20,000RPM HSK 63F Liquid Cooled Spindle

Travel

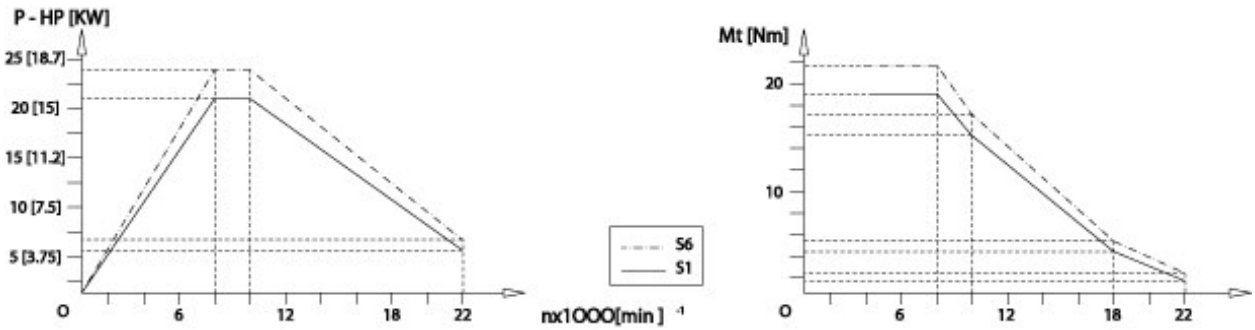
A Axis .....± 120°
C Axis .....± 245°

Feed Rates

A Axis .....121°/sec
Continuous torque while rotating.....300Nm
C Axis .....208°/sec
Continuous torque while rotating.....300Nm

Available Options

- Rotary encoders on A and C axes
- Coolant mist or flood through nozzle
- Pneumatic brakes on A and C axes
  - A Axis - 490Nm torque with brake engaged
  - C Axis - 600Nm torque with brake engaged
- Rotary distributor for continuous C axis rotation

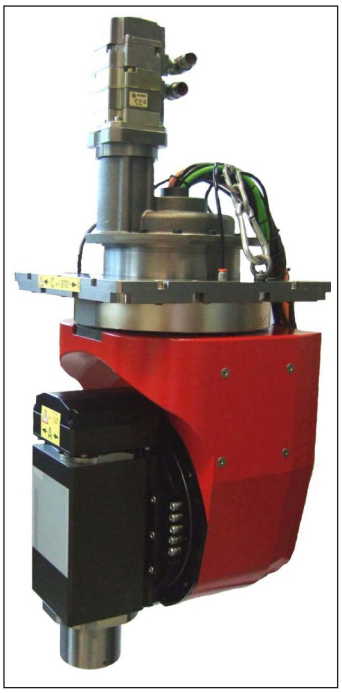


Spindle Configuration #2

29.5HP (22kw) 20,000RPM HSK 63A Liquid Cooled Spindle

Travel

A Axis .....± 120°
C Axis .....± 270°



Feed Rates

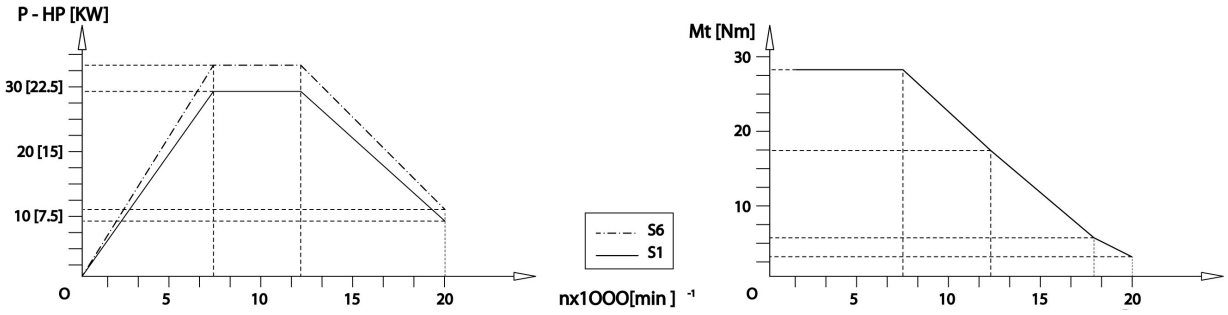
A Axis .....121°/sec
Continuous torque while rotating.....300Nm
Intermittent torque while rotating.....1200Nm

C Axis .....208°/sec
Continuous torque while rotating.....490Nm
Intermittent torque while rotating.....1200Nm

Available Options

- Rotary encoders on A and C axes
- Coolant mist or flood through nozzle
- Coolant mist or flood through spindle
- Pneumatic brakes on A and C axes
  A Axis - 1800Nm torque with brake engaged
  C Axis - 1800Nm torque with brake engaged

(Rotary distributor not available on this head).



Spindle Configuration #3

67HP (50kw) 12,000RPM HSK 100A Liquid Cooled Spindle

Travel

A Axis .....± 110°
C Axis .....± 270°

Feed Rates

A Axis .....180°/sec
Continuous torque while rotating.....391Nm

C Axis .....180°/sec
Continuous torque while rotating.....688Nm

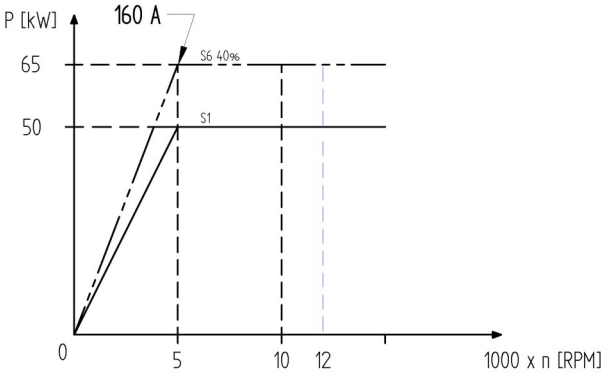
Rotary encoders on A and C axes are standard

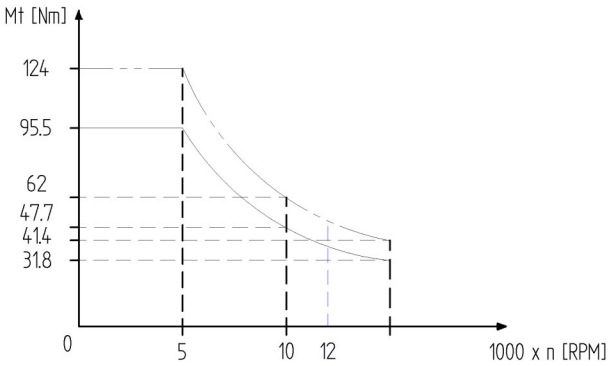
Hydraulic brakes on A and C axes are standard
A Axis - 2990Nm torque with brake engaged
C Axis - 4000Nm torque with brake engaged

Available Options

- Coolant mist or flood through nozzle
- Coolant mist or flood through spindle

(Rotary distributor not available on this head).





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

Operator Interface

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

Manual Override Features

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

Features to Simplify Programming

- Tool length/work zero point measure
- Position switch
- Stored limit check
- Helical interpolation
- Program restart
- Work piece setting error compensation
- Custom macro B
- 99 tool length offsets
- External data input
- Advanced Preview Control (APC)
- 128k (320M) part program memory
- Rotary axis control
- Inverse time feed
- Increment system type C
- Bell-shaped acc/dec
- Stored pitch error compensation
- Inch/metric conversion
- 54 work coordinate offsets
- Tool offset memory type C
- Manual feed
- Multi-part program editing

Enhanced Accuracy / Speed / Part Finish for 5 Axis Machining

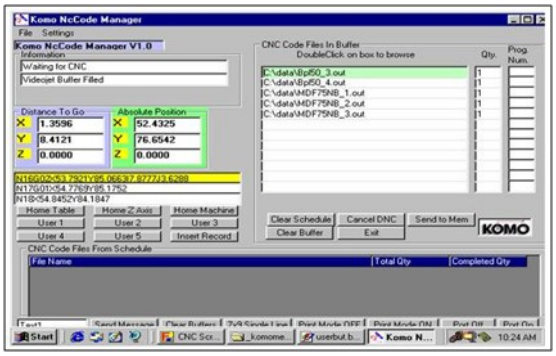
- AI contour control 1
- 3D tool length offset
- Tool radius compensation
- Tool center point control
- Tool nose radius compensation
- Simultaneous 5 axis control
- Backlash compensation
- Fanuc Alpha HVI servo motors
- High speed skip

Optional Control Features

- Rigid tapping
- Rigid tapping retract
- 3D rigid tapping

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.



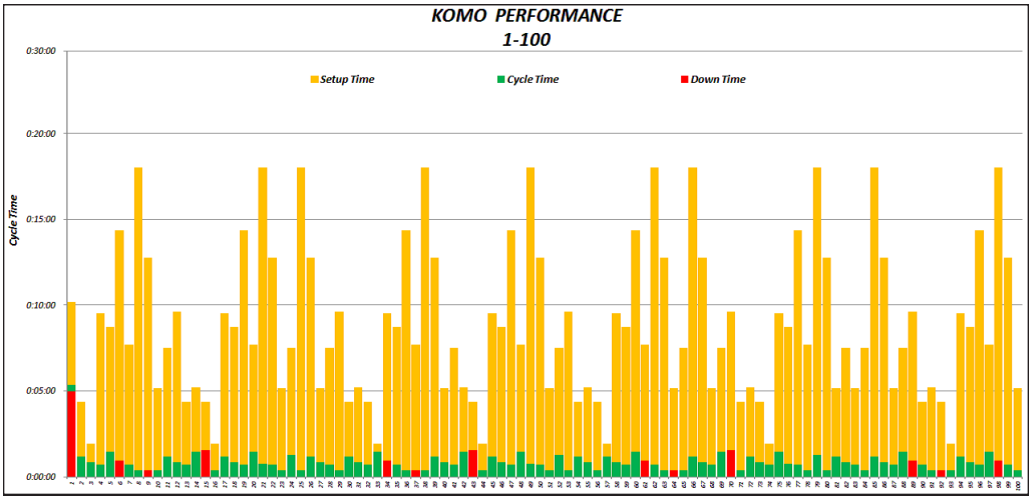
Intelligent Spoil Board Management

- 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.



Standard Machine Specifications

Machine Space - Overall with Guarding

Depth	144" (3658mm)
Width	244" (6198mm)
Height	210" (5334mm)
Clearance under the bridge	40" (1016mm)
Table height (floor to table top)	18" (381mm)
Weight	40,000lbs (18,182kg)

Table

Depth	72" (1829mm)
Width	144" (3658mm)

Travels

X Axis	151" (3835mm)
Y/V Axes	75" (1905mm)
Z Axis	36" (914mm)
	Z axis travel available in 48" (1220mm)
A Axis	see spindle option
C Axis	see spindle option

Feed and Traverse Rates

X Axis	2000 ipm (50.8 mpm)
Y/V Axes	2000 ipm (50.8 mpm)
Z Axis	735 ipm (18.7 mpm)
Acc/Dec	83.3 in/sec²

Tool Changer

Capacity	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)	10.5" (266mm)

The VGM 1206 can be equipped with up to four (4) tool changers for a total of 60 stations.

Drive System

X, Y/V, Z Axes	Fanuc Alpha HVI digital servos
X Axis	Precision ball screw, 50mm
Y/V Axes	Precision ball screw, 40mm
Z Axis	Precision ball screw, 40mm
A and C Axes	Torque motor with Fanuc drive
Lubrication	Automatic grease lubrication

Linear Guide Ways

X Axis	45mm, six (6) bearing trucks
Y/V Axes	45mm, eight (8) bearing trucks
Z Axis	45mm, six (6) bearing trucks
Lubrication	Automatic grease lubrication

Accuracies

Unidirectional linear axis positioning (per meter)	± 0.0006" (± 0.015mm)

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. Amp rating will be supplied with the New Owner's Manual. Contact Komo Machine for new amp rating if any alterations are made to the head configuration and for transformer requirements.

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 circuit brought to main machine disconnect. Full load amperage varies based on spindle options. Electrical inspections required by state and local governments are the responsibility of the customer and are not included in this machine quotation unless specified.

All major electrical components are housed in a NEMA 12 electrical enclosure equipped with an industrial grade air conditioning system to prevent premature component failure.

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)

Safety

A safety light beam is mounted to the front and rear of the moving gantry, and Emergency Stop pushbuttons are installed in several locations.

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

Enclosure / Chip Collection Options

Dual Augers
Augers situated on the sides evacuate chips from the chip enclosure. Optimal for aggressive cutting and hogging.

Hinged Front Chip Guards
Guards placed in the front of the table allow for operator safety blocking most chips from exiting out the front of the machine. Easy to open for part placement and cleaning.

Coolant Options

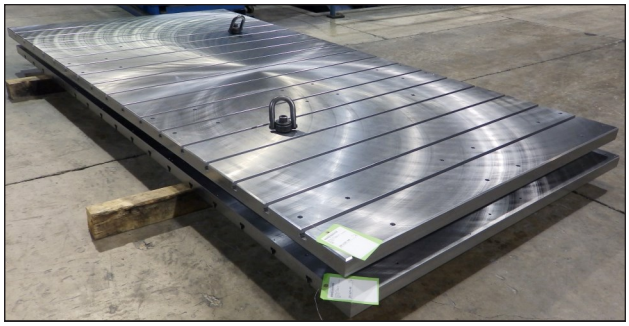
Mist Coolant
Adjustable nozzles located near the spindle nose dispense a fine spray for tool lubrication during cutting.

Flood Coolant
Designed for medium to heavy metal cutting, flood coolant surrounds the cutting surface for chip evacuation and cooling (40 gal/min, 20 psi).

Coolant Through Spindle
Low or high pressure available (22 gal/min, 120 psi nominal - low pressure - dependant on tool orifice).

Table Options

- Non-machined aluminum table
- Aluminum table with Keensert inserts on 6" centers
- Machined aluminum universal grid vacuum table (multiple vacuum zones available)
- Steel table with "T" slots



Non-Perishable Tooling Package

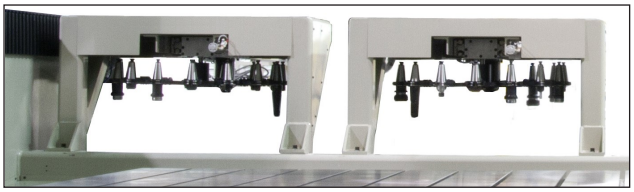
A complete set of tool holders can be supplied as optional equipment, configured per customer requirements.

Vacuum Pump System

The machine can be supplied with a variety of vacuum pumps with a low vacuum sensing feature. The pumps are very efficient and low maintenance for effective operation in vacuum chuck/clamp applications.

Additional 15 Pocket Tool Changer(s)

Increase tool capacity by adding up to three (3) additional 15 pocket tool changers (maximum capacity 60 pockets).



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.

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:

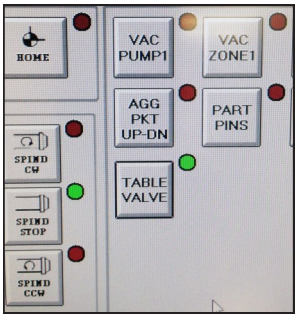
Laser Scanners

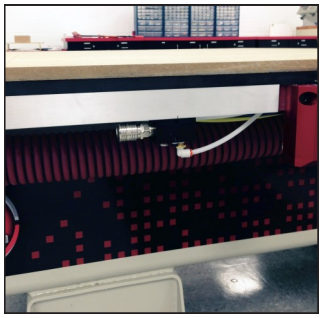
Light Curtains

Pressure Mats

Table Fixture Air Supply

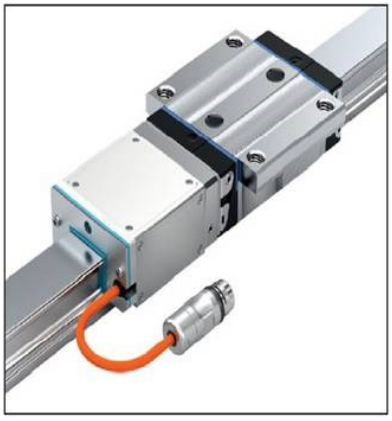
In cases where a vacuum system is not always required for part holding, an air supply can be provided if fixtures will be utilized on the machine table. This option is manually operated by a pushbutton, or can be controlled by an M code in the part program.





Options for Enhanced Accuracy

Integrated Measuring System (IMS)
Separate positioning feedback is available on the X, Y, V and Z axes of the machine. KOMO utilizes feedback built into the linear guide ways to ensure accuracy and repeatability.



Renishaw TS27R Contact Tool Setting Probe
TS27R is mounted on the machine table. It enables the user to set tool length and diameter of rotating tools, and to detect broken tools.

Renishaw RMP600 High Accuracy Touch Probe
RMP600 is a compact, high accuracy touch probe with radio signal transmission, offering all the benefits of automated job set-up plus the ability to measure complex 3D part geometries on all sizes of machining centers including 5-axis machines.

Renishaw NC4 Non-Contact Laser Tool Setter
NC4 allows fast, non-contact tool setting and tool breakage detection, and precise tool length and tool diameter measurement using only one M code.

Notes

Notes

KOMO

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From Us to You - Since 1966

Corporate Headquarters

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Manufacturing and Assembly Facility

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