

V

VERTICAL MACHING CENTERS



Haas Automation Inc. EN





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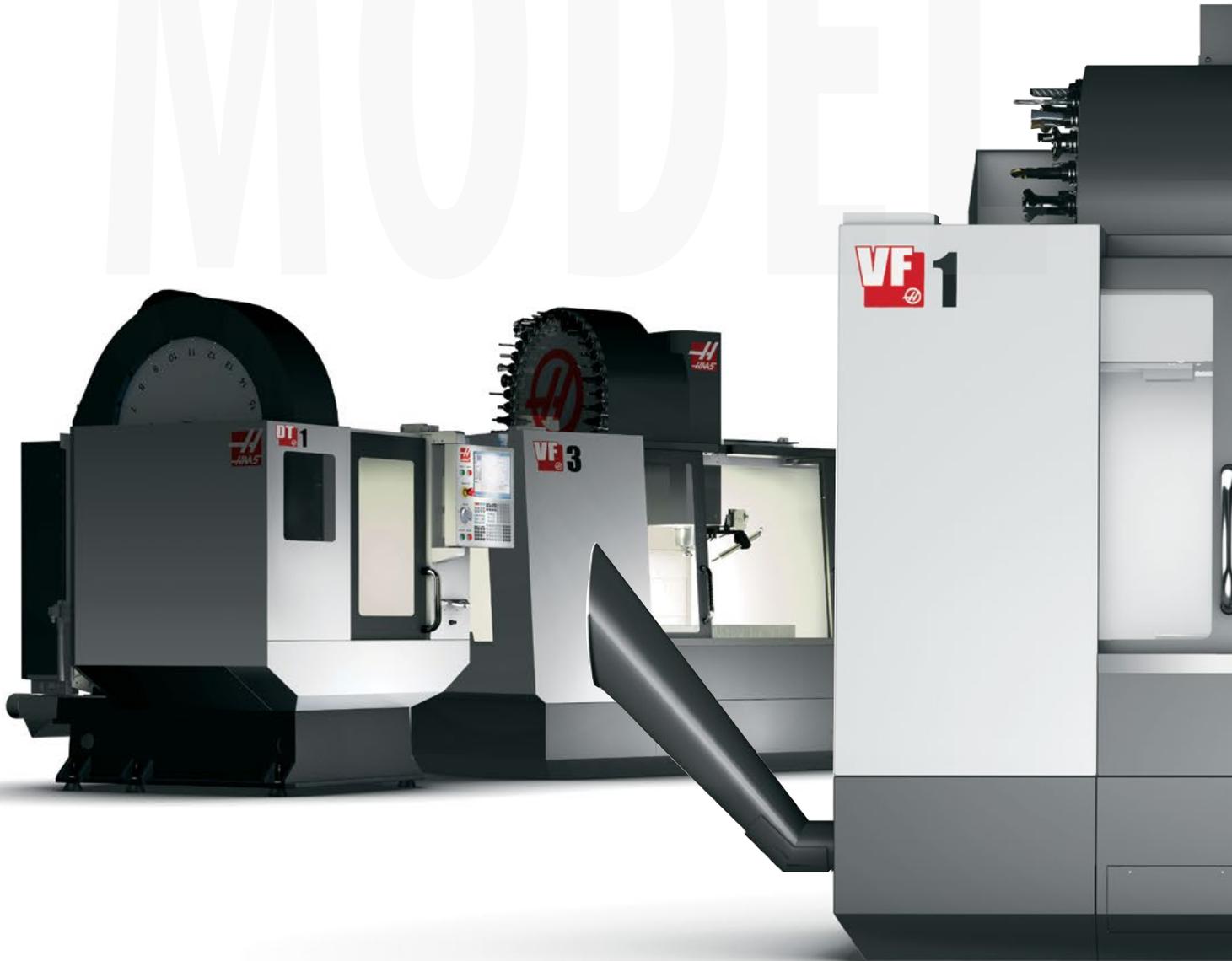
onstant improvement is a way of life at Haas Automation. We're always looking for ways to improve our CNC products and give you – our customers – more value.

Normally, we roll these incremental improvements into production without fanfare – you simply get a better machine. For our new-generation vertical machining centers, however, we redesigned the entire product line to incorporate a wide range of enhancements that make Haas VMCs better than ever before. Our engineers reviewed all aspects of the machines – including motion control, coolant containment, chip evacuation, ergonomics, and serviceability – then made improvements, and put everything into an all-new package.

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MODEL



Our customer-first focus:

- **Published pricing policy** The published price is what you pay. We're still the only CNC builder to make this promise.
- **On-time delivery** We build the entire machine and control in-house, and use the most advanced ERP (enterprise resource planning) system in the world. There's no finger-pointing around here.



THROUGH ECONOMIES OF SCALE, THE USE OF COMMON COMPONENTS,
AND EXTENSIVE AUTOMATION IN OUR PURPOSE-BUILT FACTORY,
WE DELIVER THE LOWEST COST OF OWNERSHIP IN THE INDUSTRY.

- **Fast service promise** Every local HFO fields fully stocked service vans and provides a “right-now” response.
- **Fair spares pricing** We’re not interested in gouging a customer in need. Your loyalty is more important.
- **Great resale value** Year after year, Haas machines bring the highest documented resale value in the industry.

TAKE CONTROL

The Haas CNC Control

We've put years of development into designing the best control hardware and software in the industry. Our new-generation VMCs pack even more innovation into what was already the industry's greatest CNC control.

To ensure smooth, precise motion control, Haas VMCs use next-generation digital servomotors and high-resolution encoders on all axes. Combined with significant software and motor-control advancements, these yield better surface-finish performance than ever before.

Main Features

Closed System The robust, dependable Haas control is seamlessly integrated with the machine. Our closed system is optimized specifically for Haas machines, and does not rely on third-party NC suppliers. We take full responsibility for the entire machine.

Dedicated Keypad The Haas keypad has a full array of keys, including a complete alphanumeric keypad. All common functions are clearly labeled for operator ease, and many functions can be performed with a single button push.

One-Button Features Common multi-step functions, such as powering-up the machine or setting tool offsets, have been reduced to the push of a single button. Other often-used functions, such as setting work offsets, homing the machine, and selecting the next tool during set up, are also one-button commands.

Multi-Function Jog Handle Most machines use the jog handle only to move the axes around. On Haas machines, the jog handle can also be used in other modes to cursor through the program for faster editing, override spindle speeds and feedrates, or scan through offsets, parameters, etc.

15" Color LCD Screen Our full-color, 15" TFT LCD display is designed for the machine shop environment. The high-intensity, high-contrast LCD has a wide viewing angle, and will not fade out in bright light. The panel is mounted behind anti-glare, tempered glass for protection and easy viewing.

USB Port The built-in USB port allows the use of customer-supplied USB flash memory devices or external hard drives.

Memory Lock Keyswitch Locks memory to prevent program editing by unauthorized personnel. Can also be used to lock settings, parameters, offsets, and macro variables.





POWER ON | POWER OFF



EMERGENCY STOP



HANDLE JOG



CYCLE START

FEED HOLD

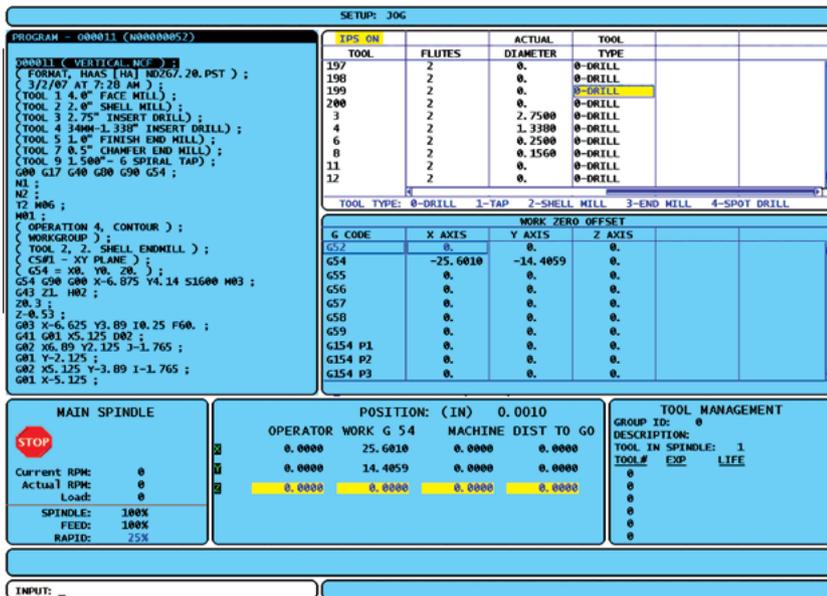


RETHINKING THE OBVIOUS

Three-screen simplicity

The Haas control was designed to be the most user-friendly CNC in the industry. It has a reputation for reliability and longevity, and Haas owners say it is the easiest-to-operate CNC they have ever used. It's what a Haas is all about.

The Haas control's three-screen system gives users access to every control feature needed in each mode without having to leave the current display screen. Here are examples of how the screens look and function.



The Setup Screen

Above is the Setup screen. Let's take a look.

The **Active Program** is displayed in the upper left. The **Tool Offsets** are displayed in the upper right. Below the tool offsets are the **Work Zero Offsets**. Below left, is the **Spindle Information** box displaying spindle speed, plus any override values for spindle speed, feedrate, and rapid rate. Next to that is the **Position** box, showing operator, work offset, machine, and distance-to-go coordinates. To the right of the position box is the **Tool Management** information.

Simple, clean, and easy to understand. Notice the tool offset box (upper right) is white and the other boxes are colored. This indicates the box is active, and the cursor can be moved within the box using the keypad arrow keys.

THE HIDDEN POWER IN THE HAAS CONTROL





Remote Jog Handle The patented Haas color remote jog handle has a 7 cm color display, an 11-button keypad, a triple-knob motion-control system, and a built-in LED inspection light. You can set tool and work offsets, jog up to 9 axes, display machine position, show the current program running, and more — all from the jog handle.

CURNT/COMDS The Current Commands page displays the current running status of the machine, including the program running, the position, which tool is in the spindle, the spindle and axis loads, the spindle speed, and the feedrate. Additional screens show the commands and G-codes being used in the current program, and timers show cycle time, cutting time, power-on time, and M30 count (number of parts). Other displays show macro variables, provide tool-life information, and show the minimum and maximum spindle load for each tool.

HELP/CALC The Help function is a built-in, searchable operator's manual that explains the various functions of a Haas machine. Simply type in a keyword to find a topic, or hit F1 for G-code help and F2 for M-code help. The Calculator pages have powerful tools for solving triangle equations, circle-circle-tangent equations, and circle-line-tangent equations, as well as a speeds-and-feeds calculator, and a standard math calculator. The solution to any equation can be pasted directly into a program from the calculator.

The Power of a Single Button Some of the most powerful features of the Haas control take only the push of a single button. For example, you can set tool offsets with the push of a single button — without having to manually enter numbers into the control. Simply jog a tool to the surface of the part, push the Tool Offset Measure button, and the tool's length is automatically stored in the tool length register. Push the Next Tool button to repeat the process for each tool. Setting work offsets is just as easy.

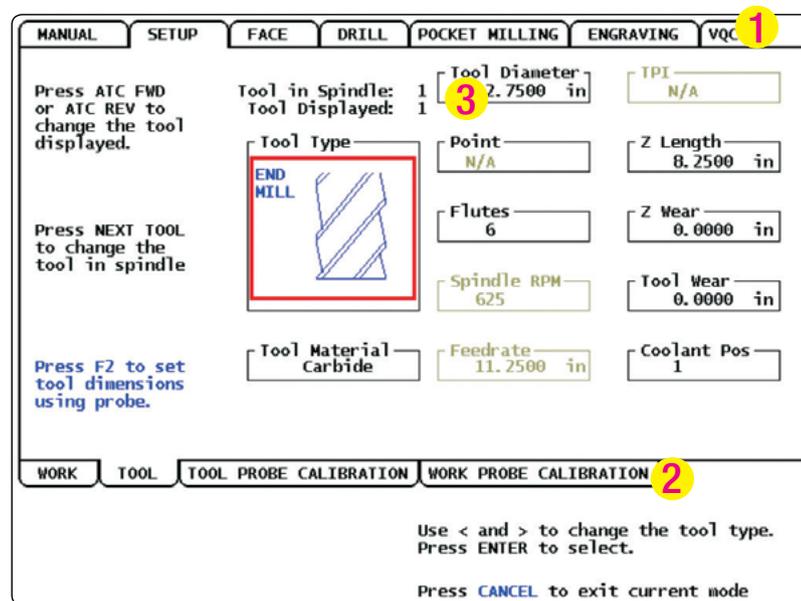
Tool-Load Monitoring Maximizing tool life is another key to increasing productivity. The Haas control can monitor the spindle load for each tool, and automatically adjust the feeds if the load exceeds a limit set by the operator. If a tool exceeds the preset limit, the control can be set to reduce the commanded feedrate, alert the operator, go into feed-hold mode, or generate a tool-overload alarm. This maximizes tool life, and protects the workpiece and machine from the effects of tool wear.

Advanced Tool Management The Haas control has an Advanced Tool Manager that allows you to create a group of redundant tools for use within a program. From a single screen, you can define which tool numbers are part of a group, and what parameter will determine when to change to a redundant tool. This can be based on feed time, the number of tool calls, the number of holes drilled or tapped, or a preset load limit. To use a group of redundant tools in a program, simply enter the group number as your tool call-out. The tool offsets defined during set up are automatically loaded for each tool as it's called up.

UPGRADES: options

Intuitive Programming System The Haas Intuitive Programming System allows machine operators to perform basic milling operations without knowing G-code. Our proprietary conversational operating system uses an easy-to-understand tabbed format to guide the operator through the steps necessary to machine a part. First, the control leads the operator through basic job setup: setting tool and work offsets, selecting the tool type, and specifying the material being cut. The operator then selects an operation to perform and fills in basic information as prompted. Default values for spindle speed, depth of cut, and feedrate are filled in automatically, based on the information provided. The operator can change these conservative values if desired.

Once all necessary information is entered, pushing Cycle Start performs the desired operation. Multiple operations can be recorded and saved as a single G-code program that can be played back to duplicate the part. Help menus are available directly on screen, and a graphic dry-run feature allows operators to check their work before running a part.



1. Use the top tab menu to select the type of operation to perform.
2. Further define your specific cutting operation by choosing from the lower set of tabs.
3. Fill in the information when prompted by the control and press Cycle Start.

4th- and 5th-Axis Control Allows the use of 4th- and 5th-axis rotary tables for multi-side machining or machining complex contours and shapes. Increases productivity and reduces setups.

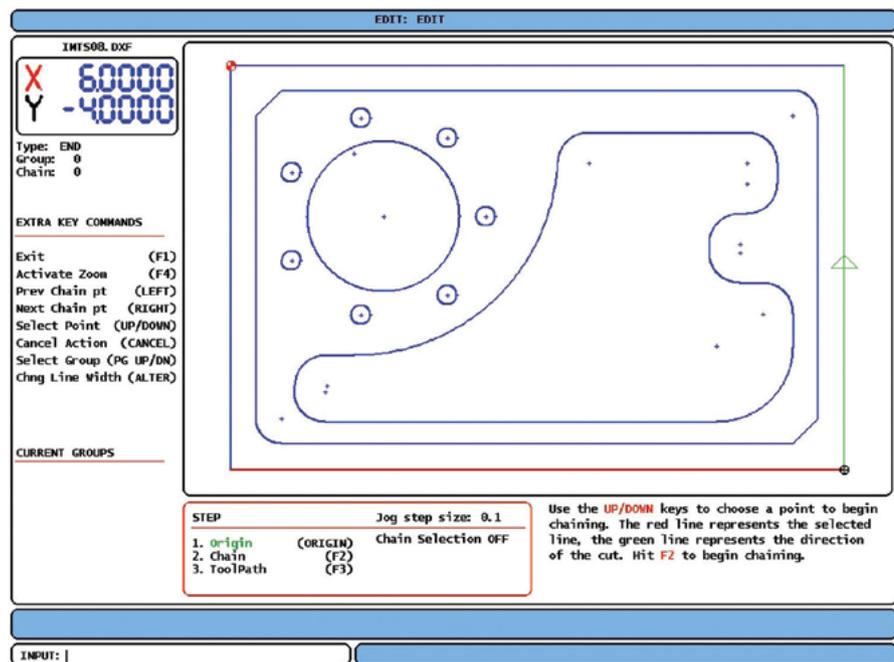
Coordinate Rotation/Scaling Use rotation in conjunction with work offset probing to speed workpiece set up, or use it to rotate a pattern to another location. Use scaling to reduce or enlarge a toolpath or pattern.

Second Home Position Allows the operator to send the axes to a user-defined Home position other than the machine's default Home position.

Ethernet Interface Transfer data between your Haas and a network or PC via Ethernet. Transfer program files to and from the machine, and access large files with multiple machines. High-speed data rates allow DNC of large files. Easily set up from the control screen.

DXF File Import The *.dxf import capability of the Haas Intuitive Programming System allows a programmer to import a *.dxf file into the Haas control, select features on the file, and generate the toolpath. The program output is standard G-code. By taking advantage of the editing functions of the Haas control, the user can modify features, change the order of operations, or even conveniently put them into other programs – all at the control, without going back to a computer to repost a CAM-generated program.

The Haas control provides the best of both G-code and conversational-style systems. Use manual or CAM-generated G-code, use the Intuitive Programming System, or mix them. Use the programming strategy that is best for the part.



User-Definable Macros Create subroutines for custom canned cycles, probing routines, operator prompting, math equations or functions, and family-of-parts machining with variables.

Engraving Using a single block of code, you can easily engrave any text string enclosed in parentheses. Engrave sequential part numbers using the standard serializing function.

8 M Functions Adds 8 additional M functions for a total of up to 13 user interfaces. Use these to activate probes, auxiliary pumps, clamping devices, part loaders, etc.

Memory Upgrades Expandable on-board solid-state memory allows storing, running, and editing large programs directly at the machine.



HIGH-SPEED MACHINING The High-Speed Machining option is a powerful tool to reduce cycle times and improve accuracy.

Using a motion algorithm called “acceleration before interpolation,” combined with full look-ahead, the HSM option allows contouring feedrates up to 30,5 m/min* without risk of distortion to the programmed path. All programmed motions are accelerated before interpolation to ensure the movement of each axis does not exceed the acceleration capability of the machine. The look-ahead algorithm determines the fastest feedrate at which each stroke can be blended into the next without stopping. This results in higher accuracy, smoother motion, and a higher actual feedrate — even with complex part geometry.

* Maximum feedrate determined by machine model

HSM BENEFITS

- *Greatly reduces cycle times*
- *Full look-ahead*
- *Up to 30,5 m/min contouring*
- *Acceleration before interpolation*
- *ISO standard G-code programming*
- *Higher accuracy*
- *Smoother motion*

Control Features

- User-friendly
- Advanced program editor
- Brushless AC servo drives
- Up to 30,5 m/min cutting feedrates
- Triple 32-bit processors
- Executes up to 1000 blocks/second
- ISO standard G-code compatibility
- Haas one-button tool offset entry
- 200 tool offsets
- 105 work coordinates
- Tool load monitoring
- Tool life management
- Helical interpolation
- Background editing
- Split-screen program review
- Trig calculator
- Arc & tangent calculators
- Speeds and feeds calculator
- Run/stop/jog/continue
- RS-232 / DNC / USB / optional Ethernet
- Mid-program restart
- Inch or metric programming
- Message page
- More than 20 selectable languages
- More than 200 user-definable settings
- Self-diagnostics
- Fully descriptive alarms
- Programmable mirror-imaging
- Advanced pocket milling
- Bolt-hole drilling
- Graphic dry run
- 5 spare M functions
- Contour accuracy control
- Text engraving
- Made in the USA

Control Specifications

General

Microprocessor	Triple high-speed 32-bit
Program execution speed	1000 blocks/sec standard
Axis control	3 axes linear, 4th and 5th axes optional
Interpolation	G01, G02, G03, helical
Min. input increment	– inch mode 0,0001" – metric mode 0,001 mm
Min. output resolution	0,000 18 mm

Feed Functions

Rapid Traverse Override	5%, 25%, 50%, 100%
Feedrate Override	0% to 999% in 1% increments
Jog Handle Resolution	– inch mode 0,0001"/0,001"/0,01"/0,1" per handle division – metric mode 0,001/0,01/0,1/1,0 mm per handle division
Jog Feeds	– inch mode 0,1/1,0/10,0/100,0 ipm – metric mode 1,0/10/100/1000 mm/min.
Zero Return	One key (G28)

Spindle Functions

Speed Command	S = 1 to max spindle rpm
Override	0% to 999% in 1% increments

Tool Functions

Length Compensation	200 sets, geometry & wear
Diameter/Radius Compensation	200 sets, geometry & wear
Length Measurement	Automatic length storage
Life Management	200 sets w/alarms
Selection	Txx command

Programming

Compatibility	ISO standard G code
Positioning	Absolute (G90), incremental (G91)
Canned Cycles	22 functions standard
Circular Pocket Milling	G12, G13
Bolt-Hole Drilling	G70, G71, G72
Advanced Pocket Milling	G150
Inch/Metric	Switchable
Work Coordinates	105 sets
Part Zero Set	Automatic storage
M Code Outputs	5 spare †
2D Cutter Diameter Compensation	G40, G41, G42
2D Cutter Length Compensation	G43, G44, G49
3D+ Cutter Diameter Compensation	G141
5-Axis Tool Length Compensation	G143

Data Input/Output

Communications Port	RS-232, USB, optional 100Base-T Ethernet
Data Rate	To 115 200 baud ‡

Memory Capacity

Standard	1 MB; up to 750 MB optional
Number of Programs	500

† May be used by options. ‡ With 6' or shorter cable.

THE FOUNDATION FOR SUCCESS





A Rigid Platform The soundness of any structure is determined by the sturdiness of the foundation. That same principle applies to vertical machining centers. The sturdiness of the base and column structures determine how well the machine cuts.

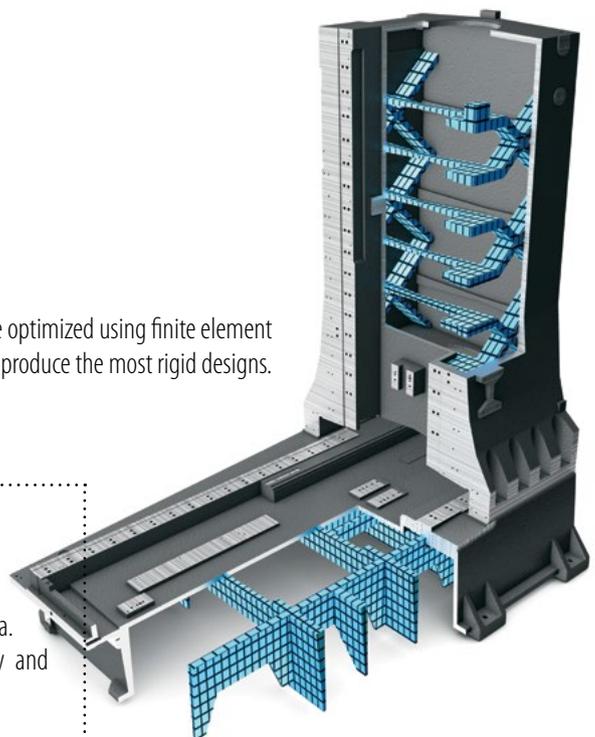
Massive Cast-Iron Construction Cast iron provides up to ten times the damping capacity of steel. That's why Haas uses cast iron for all major components. All castings are reinforced with heavy ribs to resist flex and damp vibrations, and inspected before and after machining to ensure they are free of flaws.

Triangulated Wide-Stance Castings Our triangulated wide-stance castings allow maximum structural loading with efficient use of materials. They provide a rigid and stable machining platform that resists flex, distributes cutting forces effectively, and is very thermally stable.

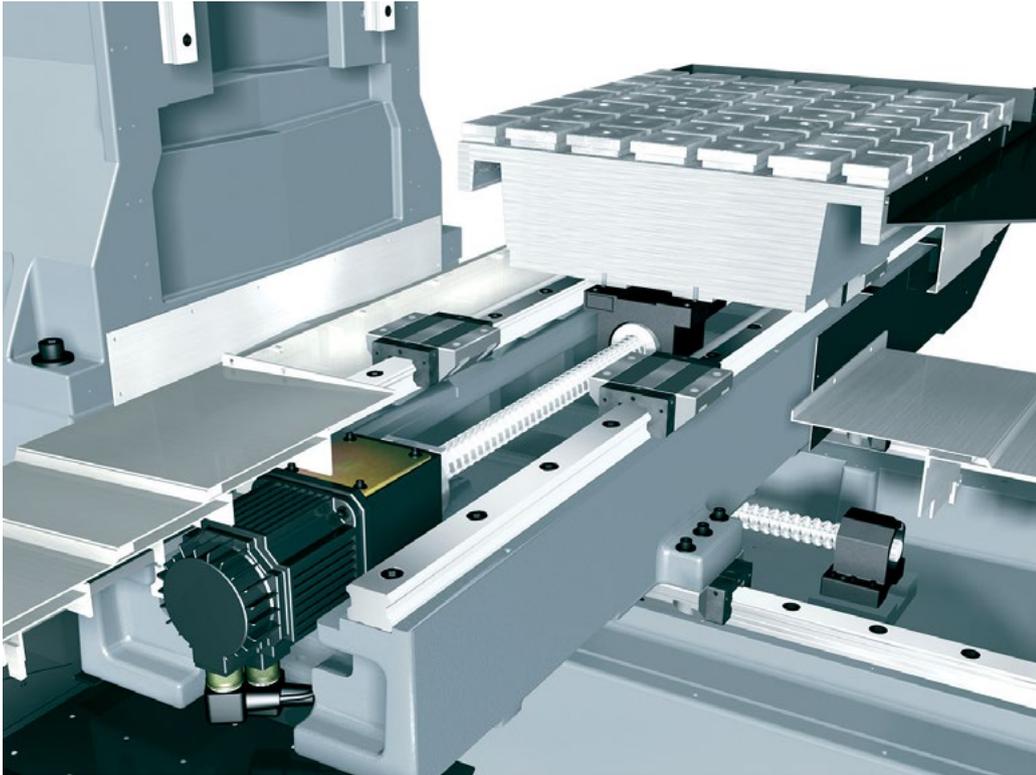
All structural components are optimized using finite element analysis (FEA) to produce the most rigid designs.

Anti-Flex, Reinforced Base & Column Castings

Our base and column castings feature vibration-absorbing ribs that transfer vibration away from the cutting area. The columns use a torque-tube design that yields superior rigidity and resists flex.



MOTION CONTROL



Double-Anchored Ballscrews Haas uses only premium-quality ballscrews and guides from the world's top manufacturers. Ballscrews are anchored at both ends and inspected for 100% parallelism to the axis guides. Preloaded ball nuts eliminate backlash.

Brushless Servomotors Haas uses state-of-the-art, energy-efficient brushless servomotors on all axes. These high-performance servos provide more power for heavy cuts, and higher acceleration/deceleration rates to reduce cycle times. High-resolution encoders and closed-loop digital feedback ensure ultra-precise positioning.

Direct-Coupled Servomotors Our servomotors are coupled directly to the ballscrews with steel disc couplings to eliminate windup, even under severe loading. This greatly improves positioning accuracy, and provides more accurate threading and contouring. And they don't wear out or lose accuracy over time.

100% Ballbar Tested Haas uses a state-of-the-art ballbar test to check the linear positioning and geometry of every machine. The ultra-precise ballbar tracks movement as the machine is put through a series of moves to certify synchronous movement and verify machine geometry. This generates a chart illustrating machine condition and performance data. Any deviations in geometry or position show up as distortions that are very easy to spot. A copy of this chart ships with each Haas VMC as assurance that the machine is accurate and properly aligned.

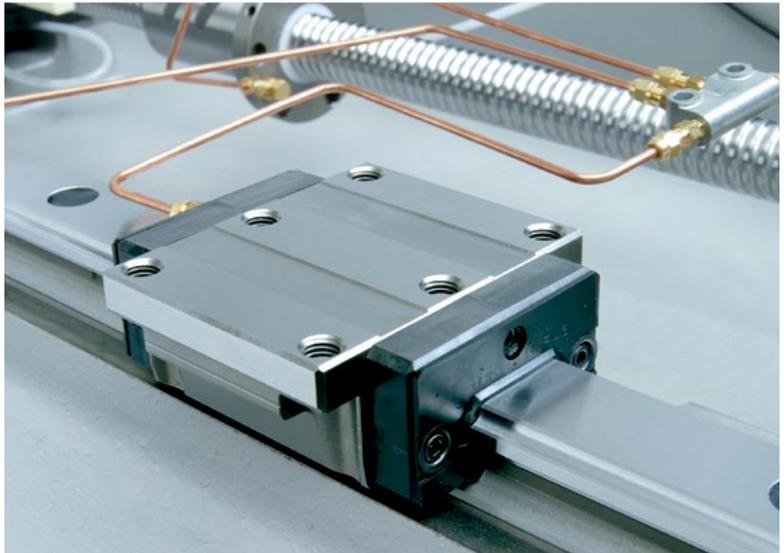
Minimal Lubrication System

The Haas Minimal Lubrication System consists of two sub-systems that optimize the amount of lubrication to the machine components. The system supplies lubrication only when it is needed, thus reducing the amount of lube required for the machine, and limiting the chance of excess lube contaminating the coolant.

The lube system for the linear guides and ballscrews is based on the distance the axes travel, rather than on time. Lubricant is injected once any of the axes has traveled the distance specified in the control.

The lube system for the spindle is based on the number of actual revolutions of the spindle. During low-speed spindle operation, a timed injection cycle is also used to ensure adequate lubrication is delivered.

One fill of each system should last a minimum of 1 year of continuous operation.



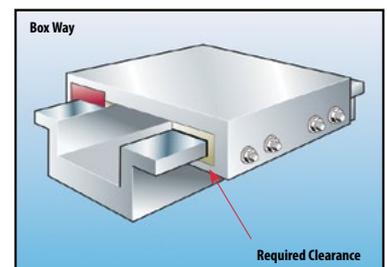
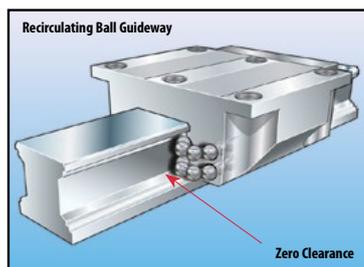
Recirculating Ball Guideways Haas uses recirculating ball guideways for each axis of every VMC. These guideways are preloaded for zero clearance, and provide full load-carrying capacity in all directions. They consume less power, do not require adjustment, and are proven to outperform sliding box ways for accuracy and speed. Each guideway is automatically lubricated to guarantee long life.

Linear Scales Linear scales ensure positioning accuracy along X, Y, and Z axes by compensating for the thermal variations inherent in all machine tools. With a 1-micron resolution, these scales deliver the extreme accuracy required for mold making and other high-precision machining applications.

Electronic Thermal Compensation System

Ballscrews generate heat when they rotate, which can cause them to expand. With high duty cycles, ballscrew growth can lead to cutting errors. Our electronic thermal-compensation (ETC) algorithm accurately models this heating effect and compensates for screw position.

Recirculating Ball Guideways Outperform Box Ways Recirculating ball guideways are preloaded to provide zero clearance between the moving surfaces. This increases rigidity and stiffness in all directions, while providing higher accuracy and reliability. They have a very low coefficient of friction, which allows faster movements without sacrificing repeatability or positioning accuracy. Box ways require clearance between the moving surfaces in order to operate. They have a high coefficient of friction, which produces stick-slip effects that can lead to machine errors.



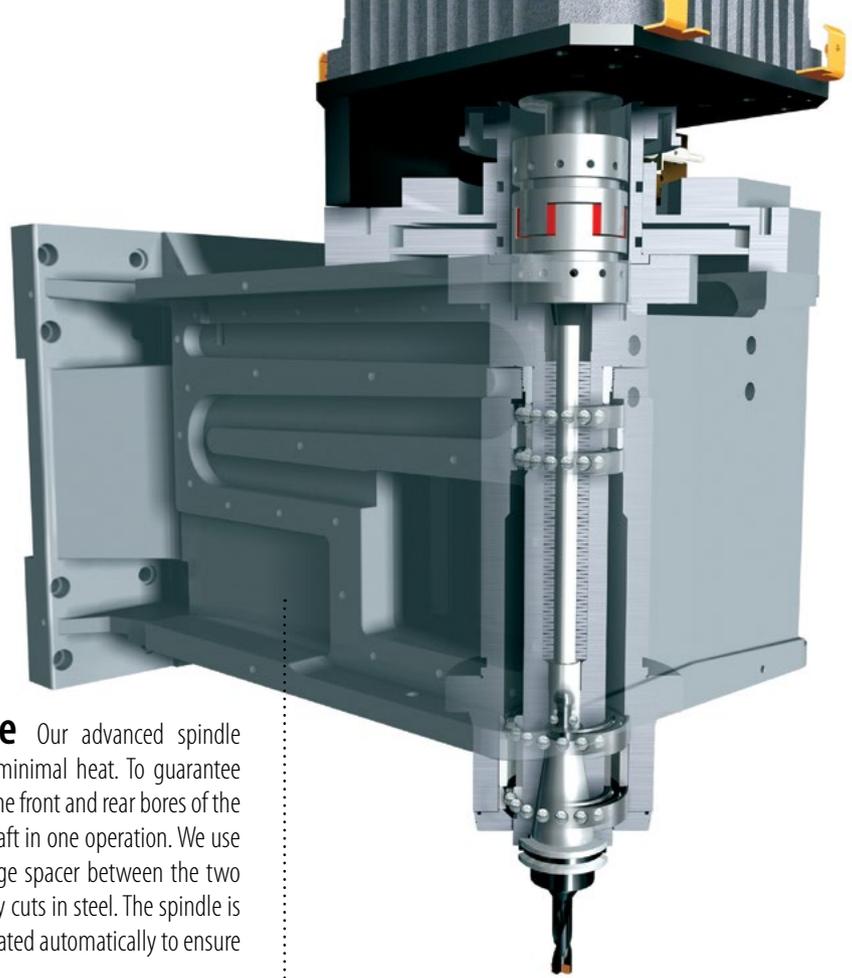
MAIN SPINDLE FEATURES



Spindle Configurations 40 Taper 50 Taper

Model	TM	MM	VF-1	VF-2	VF-3	VF-4	VF-5	VF-6	VF-7	VF-8	VF-9	VF-10	VF-11	VF-12	VM	GR
40 TAPER	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
50 TAPER					<input type="checkbox"/>		<input type="checkbox"/>									
2-SPEED GEARBOX ¹			<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="checkbox"/>	<input type="radio"/>	<input type="checkbox"/>								
4000 / 5000 RPM	<input type="radio"/> (4K)															<input type="radio"/> (5K)
6000 RPM	<input type="radio"/>	<input type="radio"/>														
7500 RPM					<input type="checkbox"/>		<input type="checkbox"/>									
8100 RPM			<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>		
10 000 RPM		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="checkbox"/>	<input type="radio"/>	<input type="checkbox"/>		<input type="radio"/>						
12 000 RPM				<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
15 000 RPM			<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>		
30 000 RPM			<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>		

¹ Gearbox optional w/40-taper spindle and standard w/50-taper spindle. Gearbox not compatible with all spindle options. All machines available in CT or BT. Some items shown in this brochure are optional. Please contact your local distributor for assistance.

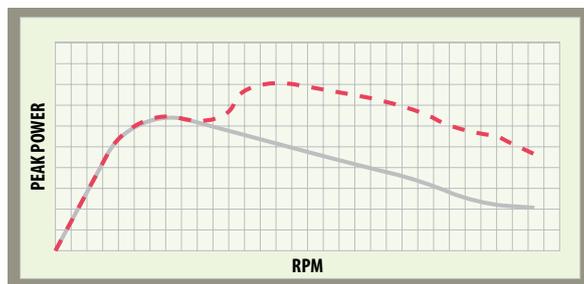


High-Capacity Cartridge Spindle Our advanced spindle design provides high axial-thrust capability, yet generates minimal heat. To guarantee perfect alignment between the shaft and housing, we finish the front and rear bores of the housing in one operation, and grind the OD of the spindle shaft in one operation. We use pre-loaded angular-contact bearings throughout, with a large spacer between the two forward bearings to enhance radial stability – enabling heavy cuts in steel. The spindle is pressurized to prevent contamination from coolant, and lubricated automatically to ensure long bearing life.

Powerful Vector Spindle Drives The Haas-designed vector spindle drive uses closed-loop, digital servo technology to provide precise speed control and peak performance under heavy cutting loads. The system greatly increases low-speed torque and accelerations, resulting in the fastest, most powerful spindle ever. These drives provide enough performance headroom to push the spindle to 150 percent of the motor's continuous power rating for 15 minutes, and to 200 percent for 5 minutes.



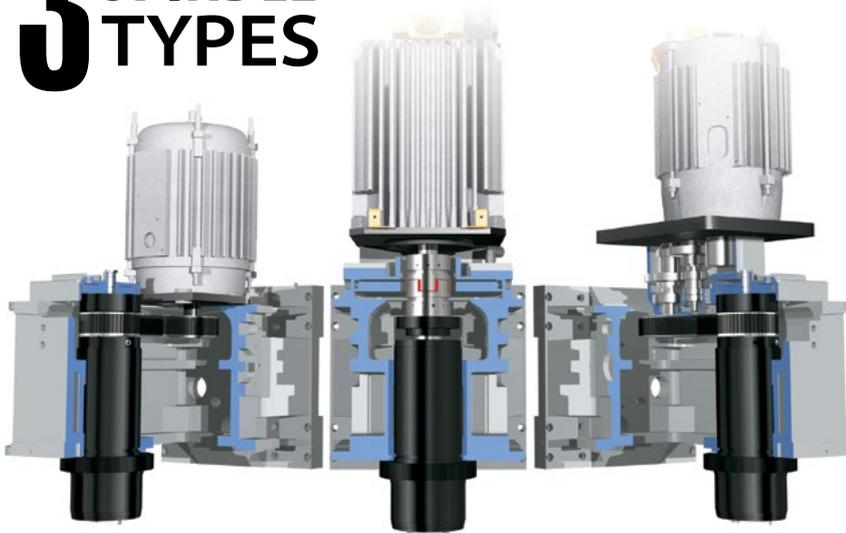
On-The-Fly Wye-Delta Switching Many Haas VMCs use a dual-winding spindle motor – wye and delta – with an electronic switch to change between the two windings. Selecting the best winding for either low-rpm cutting or high-rpm cutting yields higher torque over a wider rpm range, and on-the-fly switching maximizes acceleration/deceleration rates.



— Typical power curve
 - - - Enhanced power range with on-the-fly wye-delta

MAIN SPINDLE FEATURES

3 SPINDLE TYPES



In-line Drive The standard configuration for most Haas 40-taper VMCs is an in-line direct-drive spindle that is coupled directly to the motor to provide excellent surface finishes and greater thermal stability. The in-line spindle is available in 8100-rpm, 10 000-rpm, and 12 000-rpm configurations.

Gear Drive The Haas geared-head spindle provides increased low-end torque for heavy cutting, while retaining the ability to run up to 10 000 rpm for high-speed machining. It is standard on 50-taper machines, and optional on 40-taper machines.

Belt Drive This system features a Haas-built cartridge spindle that is driven by the motor via belt. This provides a good combination of torque and speed for a wide range of machining operations. It is a great overall value.

Synchronized Tapping

An encoder on the spindle synchronizes Z-axis motion with the spindle's rotation. This eliminates the need for expensive floating tap holders, and prevents lead-thread distortion and start-thread pullout. To reduce cycle times, the tap can reverse out of a rigid-tapped hole four times faster than it went in.

(Standard on all machines except GR, Mini Mill and Toolroom Mill.)



Vibration-Isolated Gearbox

Haas has invested more than \$4 million in the finest gear-making and inspection equipment in the world. Haas gears are CNC machined and hobbled out of alloy steel, heat-treated to 60 Rc, and precision CNC ground to AGMA Class 13 quality. A dry-sump oiling system circulates oil to all vital areas of the gearbox, and polyurethane mounts eliminate vibrations that could show up on finishing passes.



Spindle Head Thermal Stability Enhancements

To minimize thermal distortion of the spindle head and eliminate Y- and Z-axis changes, we circulate coolant through an independent jacket in the head casting to remove heat generated by the spindle. Because the coolant touches all parts of the machining area, it accurately reflects the overall temperature of the machine, providing greater thermal stability.

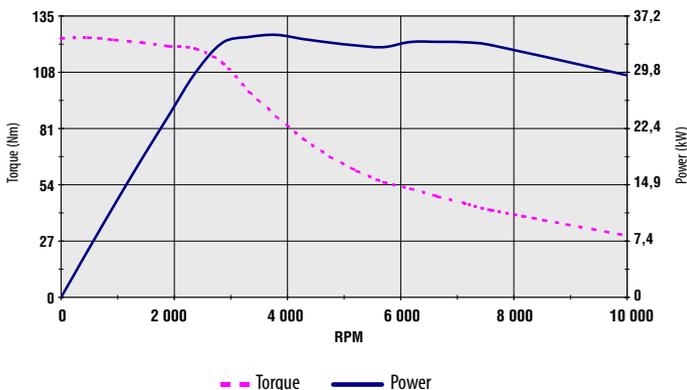
For additional thermal stability, we've insulated the spindle head, and increased air flow through the assembly. Cool air enters from the rear of the machine, flows around the spindle, and exits at the top, away from the spindle head.

For customers wanting to add an aftermarket spindle chiller, a chiller-ready provision is available for VF-1 through VF-12 40-taper models.

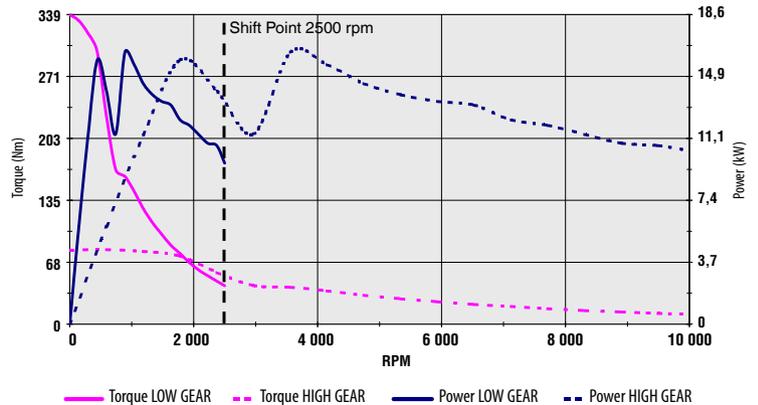
More Spindle Torque

Cutting performance and material removal rates are a product of torque, speed, and power. These charts show two of the enhanced-performance options available for your Haas VMC.

40 Taper - 8100 rpm / 10 000 rpm - 22,4 kW (Inline Drive)
 Standard: 8100 rpm Optional: 10 000 rpm



8100 rpm / 10 000 rpm - 14,9 kW (Gear Drive)
 Standard: 8100 rpm Optional: 10 000 rpm



TOOL MANAGEMENT



Economical Electronic Tool Changer

The standard Haas 40-taper tool changer is an economical choice for cost-conscious shops. A sinusoidal motion arm accelerates and decelerates the shuttle for smooth operation, and each pocket has a retractable cover that prevents chips from entering the changer and sticking on the tool tapers. Simple design and minimal moving parts guarantee long life and reliable service.

(Standard on Mini Mill and VF-1 through VF-5 40-taper models. VF-6 through VF-12 and all 50-taper models come standard with a side-mount tool changer.)

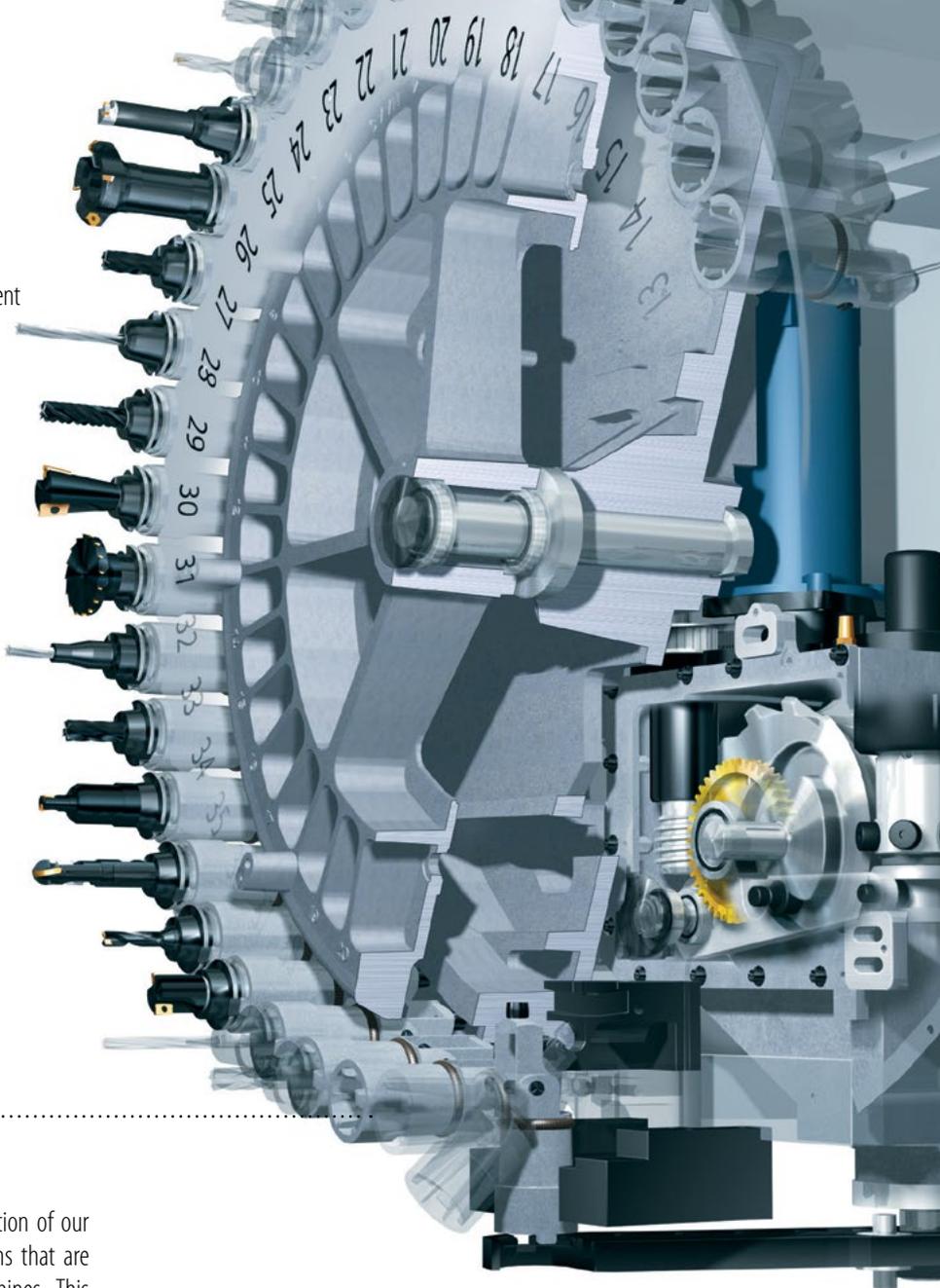
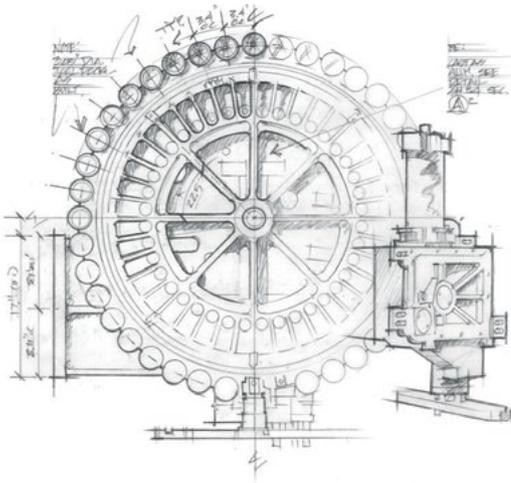
Tool Changer Specifications

Tool Changer Type	# Tools	Machine Models	Tool-to-Tool	Chip-to-Chip	Max Diameter full (adj empty)
Standard configuration					
40-taper umbrella-style	20	VF-1 thru VF-5	4.2 sec	4,5 sec	89 mm
40-taper side-mount	24+1	VF-2SS thru VF-5SS	1,6 sec	2,2 sec	76 (127) mm
40-taper side-mount	24+1	VF-6SS	2,3 sec	3,2 sec	76 (152) mm
40-taper side-mount	24+1	VF-6 thru VF-12	2,8 sec	3,6 sec	76 (152) mm
50-taper side-mount	30+1	VF-5/50 thru VF-12/50	4,2 sec	6,3 sec	101 (254) ¹⁾ mm
Optional configuration					
40-taper side-mount	24+1	VF-1 thru VF-5	2,8 sec	3,6 sec	76 (127 ²⁾) mm
40-taper side-mount	40+1	VF-2YT thru VF-12	2,8 sec	3,6 sec	76 (127 ³⁾ , 152 ⁴⁾) mm

1) VF-5/50 max diameter 101 (177) mm 2) VF-5/40 max diameter 76 (152) mm 3) VF-2YT to VF-4 4) VF-5 to VF-12

From concept to reality

The Haas-designed and -built side-mount tool changer symbolizes our focus on in-house design, development, and manufacturing. This approach ensures total control, allowing us to refine our processes, control costs, and ensure a consistent high level of quality in everything we build.



Inside The Haas Side-Mount Tool Changer

The synchronized cycloidal motion of our side-mount tool changers is controlled by precision cams that are manufactured in-house on standard Haas 5-axis machines. This rugged, dependable design uses a special Haas worm-gear drive and an electronically controlled start/stop system for long life and maintenance-free operation. Every Haas SMTC is manufactured completely in-house to guarantee fast, smooth, reliable operation.

50 Taper Offers More

	40 Taper	50 Taper
Gage diameter (A)	44,45 mm	69,85 mm
Taper length (B)	68,25 mm	101,60 mm
Tool clamp force*	8 007 N	17 793 N
Max tool weight	5,4 kg	13,6 kg
Max tool diameter	152,4 mm	254 mm

*Nominal



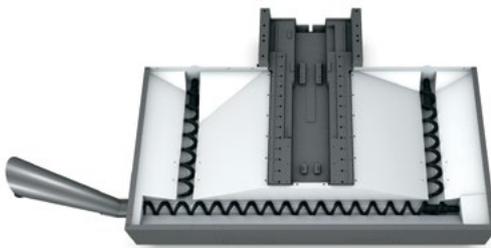
CHIP AND COOLANT MANAGEMENT



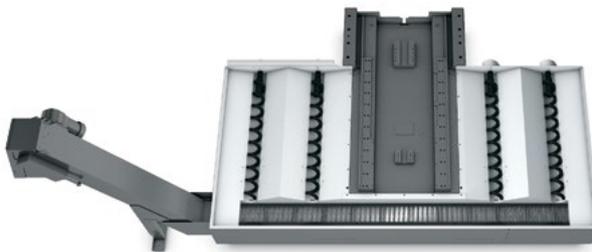
Chip Removal Systems People buy CNC machines to make parts faster. The last thing they want is to waste time removing chips. Haas VMCs are available with an optional single- or multi-auger system that automatically removes chips from the enclosure and conveniently discharges them at the side of the machine.



Single Auger All Haas VMCs are available with a single, auger-style chip conveyor that automatically removes chips from the machine, while compressing them and wringing out the coolant. For added reliability, the system reverses automatically if a jam occurs.



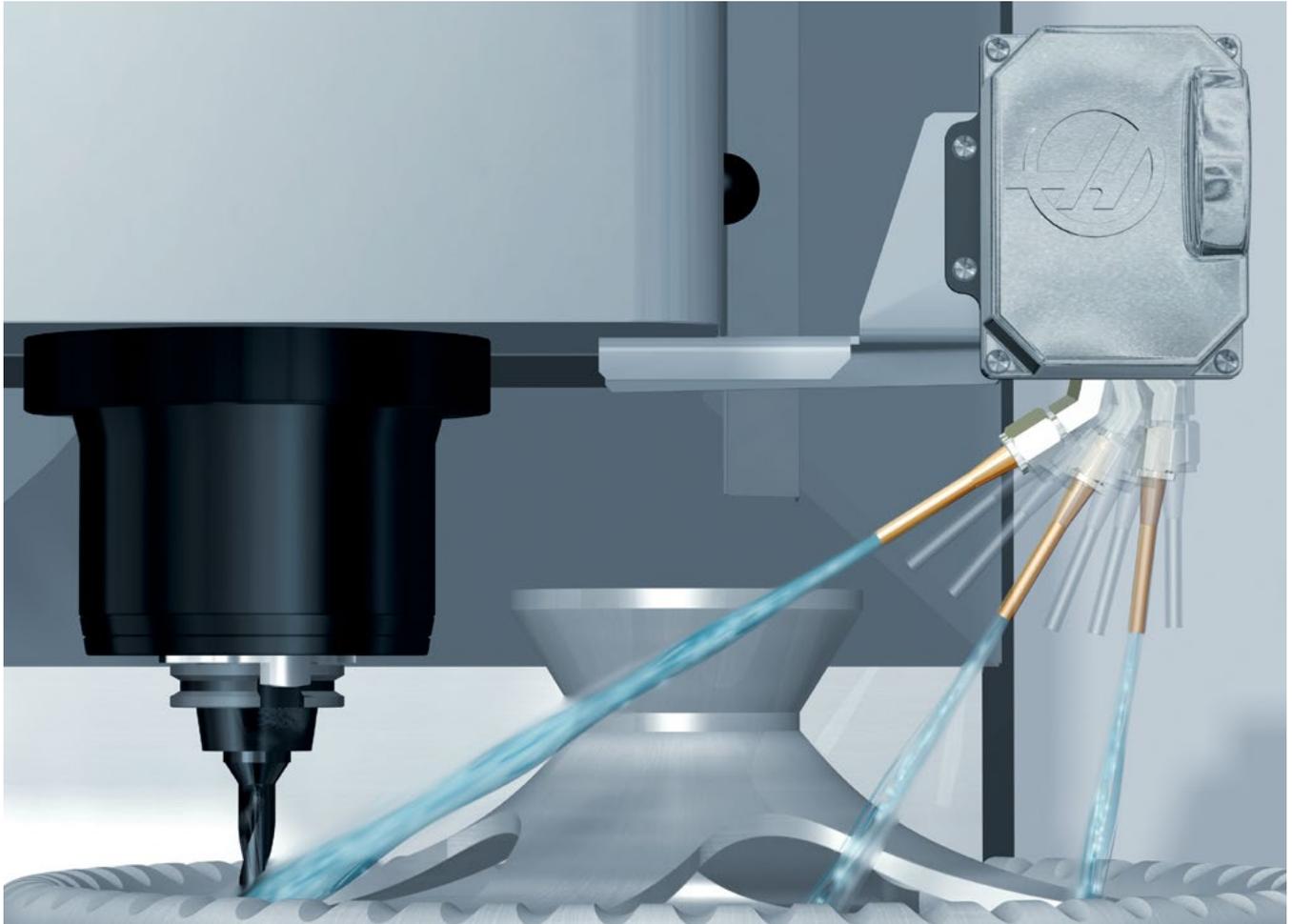
Triple Auger VF-1 and VF-2 machines (all models) are available with a high-volume chip-removal system comprising dual side augers to transport chips to the front of the pan, and a primary chip auger to discharge the chips from the machine.



Quad Auger VF-3 through VF-6 machines (all models) are available with a high-volume chip-removal system comprising four side augers to transport chips to the front of the pan, and a belt-type chip conveyor to discharge chips from the machine at barrel height. The belt conveyor may be installed on either side of the machine.



CHIP AND COOLANT MANAGEMENT



Programmable Coolant Nozzle Our programmable coolant nozzle is controlled automatically by the part program to direct coolant precisely at the cutting area, eliminating constant adjustments by the operator. The nozzle can also be adjusted from the keypad while a program is running.

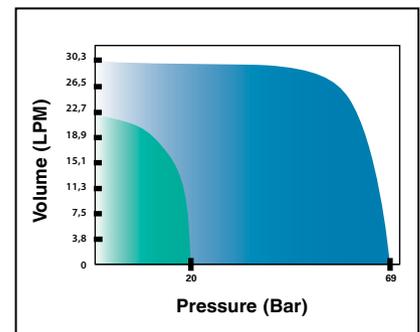
Rear Coolant Discharge Haas VMCs now discharge coolant at the rear of the machine, directly into a chip tray spanning the high-volume, roll-out coolant tank. The large-capacity tray prevents chips from entering the coolant tank, and is easily cleaned without removing the tank. All electrical and hose connections at the tank can be removed easily, and the lid and pump can be lifted up and out without removing any fasteners.

- Large-capacity chip tray • Keeps chips out of the coolant tank
- Reliable and trouble-free • Convenient and easy to maintain
- Accessible from the back of the machine • In plain view



21 bar or 69 bar Through-Spindle Coolant Through-spindle coolant uses an auxiliary pump to supply coolant through the tool, directly to the cutting edge. This increases tool life, allows higher cutting speeds, and clears chips during deep-hole drilling and blind-pocket milling. Two systems are available. One provides up to 21 bar to the cutting edge, and the other provides up to 69 bar. The 69 bar system includes the auxiliary coolant filter (described below).

Flow Rate Dynamics With through-spindle coolant systems, the actual pressure delivered to the cutting edge depends on the size of the coolant passages in the tool. The highest pressure occurs at the lowest flow rate. Smaller coolant passages restrict the flow, causing the pressure to increase (up to the maximum provided by the system). Conversely, larger coolant passages allow more fluid to pass through, resulting in lower pressure at the cutting edge.



Auxiliary Coolant Filter This 25-micron, #2 bag-type filter system removes contamination and minute particles from the coolant before they can be recirculated through the coolant pump.

Coolant Level Sensor A sensor in the coolant tank allows you to monitor coolant level directly on the control screen, preventing damaged tools and saving time.

Waste Oil/Coolant Separator During normal operation, tramp oil and coolant can collect inside a machine's base casting. This unit removes the oil before it enters the machine's coolant system, significantly increasing coolant life and reducing costs.

OPERATOR CONVENIENCE



Automatic Air Gun Provides a constant blast of air to the cutting tool to clear chips during dry machining. Activated by M-code, the air gun can be programmed to turn on while the spindle is turning, or at the end of a cycle. Air consumption is 6 scfm.

Door-Activated High-Intensity Lighting Halogen lights provide bright, even illumination of the work area for part inspection, job set up, and changeovers. Lights turn on and off automatically when doors open and close, or can be activated manually via a switch.

Servo Auto Door This option opens and closes the machine doors automatically via the part program. This reduces operator fatigue during repetitive machining operations, or allows for unattended operation when used with a robotic loader. (Available on VF-1 through VF-5.)

Pendant Storage Cabinet A large cabinet behind our new thin pendant houses the operator's manual, and provides storage for tools, gauges, spare inserts, and much more. A convenient "glove box" below the pendant provides additional storage, and the hinged door folds down to form a convenient shelf.



Operator Work Station This versatile work station offers a convenient place to keep toolholders, change cutting tools, store accessories, and much more – right at the machine.

- Built-in work light
- Large storage shelf
- Toolholder tray holds more tools
- Heavy-duty stainless steel work table
- Side rack for wrenches and screwdrivers
- Built-in toolholder vise (40-taper machines)



Work and Tool Probe Features

- Excellent repeatability
 - Cycle-time reduction
 - High protection against coolant
 - High reliability
 - High performance
 - No wires in the work envelope
 - Easy and intuitive programming of measuring cycles
-



Haas Wireless Intuitive Probing System The Haas Wireless Intuitive Probing System (WIPS), with optical transmission for part setting, tool setting, and inspection, consists of the following elements:

- Spindle Probe Module (work probe)
- Tool Setter Module (tool probe)
- Intuitive Probing System Software

The Haas Wireless Intuitive Probing System makes probing easy to understand and use through simple language, a graphical interface, and clear instructions. The software guides the operator through the probing set-up process, prompting them to enter each necessary dimension.

Once all dimensions are entered, the operator executes the probing cycle by pushing the Cycle Start button. No knowledge of G-code or macro programming is needed, and the probing cycle can be saved in memory and recalled when needed.

WIPS is available as a factory-installed option on most new Haas VMCs.

VMC PRODUCT LINE



Office Mills (xyz)

OM-2A 305x254x305 mm

Toolroom Mills (xyz)

TM-1 762x305x406 mm

TM-1P 762x305x406 mm

TM-2 1016x406x406 mm

TM-2P 1016x406x406 mm

TM-3 1016x508x406 mm

TM-3P 1016x508x406 mm

Mini VMCs (xyz)

Mini Mill 406x305x254 mm

Mini Mill 2 508x406x356 mm

Super Mini Mill 406x305x254 mm

Super MM 2 508x406x356 mm

40-Taper Standard VMCs (xyz)

VF-1 508x406x508 mm

VF-1YT 508x508x508 mm

VF-2 762x406x508 mm

VF-2YT 762x508x508 mm

VF-3 1016x508x635 mm

VF-3YT 1016x660x635 mm

VF-4 1270x508x635 mm

VF-5 1270x660x635 mm

VF-5XT 1524x660x635 mm

VF-6 1626x813x762 mm

VF-7 2134x813x762 mm

VF-8 1626x1016x762 mm

VF-9 2134x1016x762 mm

VF-10 3048x813x762 mm

VF-11 3048x1016x762 mm

VF-12 3810x813x762 mm

50-Taper Standard VMCs (xyz)

VF-3YT/50 1016x660x635 mm

VF-5/50 1270x660x635 mm

VF-5/50XT 1524x660x635 mm

VF-6/50 1626x813x762 mm

VF-7/50 2134x813x762 mm

VF-8/50 1626x1016x762 mm

VF-9/50 2134x1016x762 mm

VF-10/50 3048x813x762 mm

VF-11/50 3048x1016x762 mm

VF-12/50 3810x813x762 mm

5-Axis VMCs (xyz)

VF-2TR 762x406x508 mm

VF-5TR 965x660x635 mm

VF-5/50TR 965x660x635 mm

VF-6TR 1626x813x762 mm

VF-6/50TR 1626x813x762 mm

Super-Speed VMCs (xyz)

VF-2SS 762x406x508 mm

VF-2SSYT 762x508x508 mm

VF-3SS 1016x508x635 mm

VF-3SSYT 1016x660x635 mm

VF-4SS 1270x508x635 mm

VF-5SS 1270x660x635 mm

VF-6SS 1626x813x762 mm

Gantry (xyz)

GR-510 3073x1549x279 mm

GR-712 3683x2159x279 mm

Mold Machines (xyz)

VM-2 762x508x508 mm

VM-3 1016x660x635 mm

VM-6 1626x813x762 mm

Drill/Tap Center (xyz)

DT-1 508x406x394 mm

Universal Machining Center (xyz)

UMC-750 762x508x508 mm

Machine Configurations & Options

▲ = Available configuration ● = Standard on 40-taper machines ○ = Optional on 40-taper machines ■ = Standard on 50-taper machines □ = Optional on 50-taper machines

SPINDLE CONFIGURATIONS	TM	MM	VF-1	VF-2	VF-3	VF-4	VF-5	VF-6	VF-7	VF-8	VF-9	VF-10	VF-11	VF-12	VM	GR	UMC	
40-TAPER SPINDLE	●	●	●	●	▲	●	▲	▲	▲	▲	▲	▲	▲	▲	●	●	●	
50-TAPER SPINDLE					▲		▲	▲	▲	▲	▲	▲	▲	▲				
2-SPEED GEARBOX			○	○	○■	○	○■	○■	○■	○■	○■	○■	○■	○■				
BT / CT SPINDLE	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	
4000 / 5000 RPM	● 4K															○ 5K		
6000 RPM	▲	●																
7500 RPM					■		■	■	■	■	■	■	■	■				
8100 RPM			●	●	●	●	●	●	●	●	●	●	●	●				
10000 RPM		▲	○	○	○□	○	○□	○□	○□	○□	○□	○□	○□	○□		●		
12000 RPM				▲	▲	▲	▲	▲							●		○	
15000 RPM		○	○	○	○	○	○	○	○	○	○	○	○	○				
(BT30 TAPER) 30000 RPM			○	○	○	○												
TOOL CHANGERS	TM	MM	VF-1	VF-2	VF-3	VF-4	VF-5	VF-6	VF-7	VF-8	VF-9	VF-10	VF-11	VF-12	VM	GR	UMC	
24-POCKET SMTC		○	○	○	○	○	○	●	●	●	●	●	●	●	●			
30-POCKET SMTC					■		■	■	■	■	■	■	■	■				
40-POCKET SMTC					○	○	○	○	○	○	○	○	○	○	○		●	
SPECIAL MACHINES	TM	MM	VF-1	VF-2	VF-3	VF-4	VF-5	VF-6	VF-7	VF-8	VF-9	VF-10	VF-11	VF-12	VM	GR	UMC	
SUPER-SPEED MODEL		▲		▲	▲	▲	▲	▲										
5-AXIS TRUNNION MODEL				▲			▲	▲										
SPECIAL OPTIONS	TM	MM	VF-1	VF-2	VF-3	VF-4	VF-5	VF-6	VF-7	VF-8	VF-9	VF-10	VF-11	VF-12	VM	GR	UMC	
AUTO AIR GUN			○	○	○	○	○□	○□	○□	○□	○□	○□	○□	○□	○□	●	○	
AUX. COOLANT FILTER		○	○	○	○	○	○	○□	○□	○□	○□	○□	○□	○□	○	○	○	
AUTOMATIC CHIP AUGER		○	○	○	○■	○	○■	●■	●■	●■	●■	●■	●■	●■	●		○	
MULTI-AUGER CHIP CONVEYOR			○	○	○□	○	○	○□										
EXTENDED Z-AXIS CLEARANCE		○						○□	○□	○□	○□	○□	○□	○□		○		
EXTENDED Y AXIS			▲	▲	▲													
EXTENDED X AXIS							▲											
360 L COOLANT TANK			○	○	○	○	○	●■	●■	●■	●■	●■	●■	●■	○			
LINEAR SCALES									○□	○□	○□	○□	○□	○□	○□	○		
PROGRAMMABLE COOLANT		○	○	○	○■	○	○■	●■	●■	●■	●■	●■	●■	●■	●	○	○	
THROUGH-SPINDLE COOLANT		○ SMM	○	○	○	○	○□	○□	○□	○□	○□	○□	○□	○□	○	○	○	
HIGH-INTENSITY LIGHTING			○	○	○	○	○	○□	○□	○□	○□	○□	○□	○□	○□	○		
CONTROL OPTIONS	TM	MM	VF-1	VF-2	VF-3	VF-4	VF-5	VF-6	VF-7	VF-8	VF-9	VF-10	VF-11	VF-12	VM	GR	UMC	
EXPANDED MEMORY	○	○	○	○	○	○	○□	○□	○□	○□	○□	○□	○□	○□	○□	●	○	○
4TH-AXIS DRIVE	○	○	○	○	○	○	○□	○□	○□	○□	○□	○□	○□	○□	○	○	●	
5TH-AXIS DRIVE	○	○	○	○	○	○	○□	○□	○□	○□	○□	○□	○□	○□	○	○	●	
8 ADDITIONAL M FUNCTIONS	○	○	○	○	○	○	○□	○□	○□	○□	○□	○□	○□	○□	○	○	○	
COORD. ROTATION/SCALING	○	○	○	○	○	○	○□	○□	○□	○□	○□	○□	○□	○□	○	○	●	
ETHERNET INTERFACE	○	○	○	○	○	○	○□	○□	○□	○□	○□	○□	○□	○□	○	○	○	
RIGID TAPPING	○	○	●	●	●■	●	●■	●■	●■	●■	●■	●■	●■	●■	●	○	●	
HIGH-SPEED MACHINING	○	○	○	○	○	○	○□	○□	○□	○□	○□	○□	○□	○□	○	○	○	
USER-DEFINABLE MACROS	○	○	○	○	○	○	○□	○□	○□	○□	○□	○□	○□	○□	○	○	●	
REMOTE JOG HANDLE	○	○	○	○	○■	○	○■	●■	●■	●■	●■	●■	●■	●■	●	○	●	
SPINDLE ORIENTATION	○	○	○	○	○	○	○□	○□	○□	○□	○□	○□	○□	○□	○	○	●	
INTUITIVE PROGRAMMING	●	○	○	○	○	○	○□	○□	○□	○□	○□	○□	○□	○□	○	○		
TOOL & PART PROBING	○	○	○	○	○	○	○□	○□	○□	○□	○□	○□	○□	○□	○	○	●	

Important: The above chart represents the standard configurations of machines distributed in North America. Machine configurations and availability may differ for other countries and regions. This chart is for reference only. Check with your local Haas distributor for exact pricing, configuration, and availability of machines and options. *X-axis scale only.

HIGH-PERFORMANCE VMCs

5-Axis Trunnion Machines The Haas Trunnion Series machines provide full, simultaneous 5-axis motion for machining complex parts, or can position a workpiece to almost any angle for multi-side machining.

The VF-5TR and VF-6TR have a dual-axis trunnion table in place of the standard T-slot table, and are available in 40- or 50-taper configurations. The VF-2TR has a removable dual-axis trunnion mounted to the standard T-slot table, which provides the flexibility to run the machine with or without the trunnion table installed.

- Dual-Axis Table
- $\pm 120^\circ$ Tilt, 360° Rotation
- Side-Mount Tool Changer
- Automatic Chip Auger
- Programmable Coolant Nozzle
- Expanded Program Memory
- USB Port
- Remote Jog Handle
- High-Speed Machining w/Look-Ahead
- User-Definable Macros



Available Models

VF-2TR

VF-5TR – 40 or 50 taper

VF-6TR – 40 or 50 taper

HIGH PERFORMANCE



The VM Series – Speed and Accuracy for the Mold Making Industry

Designed specifically for mold makers, the VM Series machines feature the Haas 12 000-rpm, inline direct-drive spindle, a unique 40-taper design that provides superior surface finishes, excellent thermal stability, and quiet operation. VM machines come standard with an automatic chip auger, remote jog handle, automatic air gun, high-speed machining, Ethernet interface, expanded program memory, USB port, user-definable macros, programmable coolant nozzle, and more.

A unique, multi-fixture table provides T-slots in both X and Y directions, as well as drilled and tapped holes and precision dowel-pin bores.

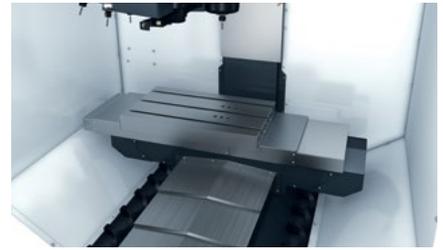
Available Models

- VM-2
- VM-3
- VM-6



HIGH-PERFORMANCE DRILL/TAP

The DT-1 is a compact, high-speed drill and tap machine with full milling capabilities. It has a 508 x 406 x 394 mm (xyz) work cube and a 660 x 381 mm T-slot table. A powerful BT30 taper inline direct drive spindle provides 12 000 rpm, and allows rigid tapping at speeds to 5000 rpm. A high-speed sidemount tool changer swaps tools quickly, while 60,9 m/min rapids and high accelerations combine to shorten cycle times and reduce non-cutting time.



Steeply sloped internal sheet metal and available dual chip augers efficiently move chips to the rear of the DT-1 for discharge.



The DT-1's high-speed 20+1 tool side-mount tool changer swaps tools quickly to reduce noncutting time. The 12 000-rpm inline direct-drive spindle allows rigid tapping to 5000 rpm, with up to 4-times retract speed.



The user-friendly Haas control and available Intuitive Programming System make the DT-1 easy to program and operate.

HIGH PERFORMANCE

VF-SS Super-Speed VMCs – Affordable High-Speed Performance

The Haas SS Series high-performance vertical machining centers come standard with an innovative 12,000-rpm, inline direct-drive spindle, a high-speed side-mount tool changer, and high-speed rapids for reduced cycle times.

The enhanced performance of the Super-Speed machines yields shorter cycle times and more parts per shift, making them some of the more popular innovations offered by Haas Automation.

Available Models

VF-2SS

VF-2SSYT

VF-3SS

VF-3SSYT

VF-4SS

VF-5SS

VF-6SS



MACHINING WITH HAAS VMCs

What's new — The latest Haas vertical machining centers feature refinements focused both on the machine owner and on the operator. The newest version of the Haas control has a simplified user interface and powerful operator features. The new-generation Haas VMCs are easier than ever to operate, and they perform with more speed, better chip evacuation, better coolant containment, smoother surface finishes, and more operator-friendly features than ever. Whether you focus on high-production output or specialized short-run work, there's a Haas machining center with the features and price to help you succeed.





Here are some examples of what's new:

Chip evacuation – We redesigned the chip pans and reviewed coolant flow of the new VMCs to reduce chip build-up and efficiently flush chips into the auger trough for removal. For high-volume production applications, VF-1 through VF-6 VMCs are available with optional chip removal systems that combine multiple side augers with either a front discharge auger or belt-type conveyor to move chips out of the machines faster and easier than ever.

Coolant containment – To prevent chip and coolant egress during machining, we optimized the enclosures on the new VMCs, paying close attention to panel fit, service access, and internal routing of plumbing and cables. The result is a far better enclosure and a much simpler overall design that thoroughly contains chips and coolant, while increasing reliability and simplifying service.

Ergonomics – Our engineers worked hard to make everything the operator touches work better. For example, the machines' windows and doors are now stiffer, move more smoothly, and close tightly. And our new thin-design control pendant is mounted directly to the enclosure, providing a lighter but more stable operator interface than the previous version, with a convenient storage compartment behind the pendant.

Enhanced motion control – To ensure smooth, precise motion control, the new Haas VMCs use next-generation digital servomotors and high-resolution encoders on all axes. Combined with significant software and motor-control advancements on the new machines, these yield better surface-finish performance and higher accelerations. These latest versions of the wildly popular Haas VMCs are the best machines we've ever made – providing more performance and value than ever before.



WORK SMART

4TH- AND 5TH-AXIS OPTIONS Adding a fully integrated 4th- or 5th-axis Haas brushless rotary table to your Haas VMC creates a supercharged machining center package that boosts your productivity and reduces setups. Fully synchronized 4th- and 5th-axis configurations are available on most Haas VMC models.



NEW, FASTER ROTARY SPEEDS

Rotary Models	4th-Axis Speed	Acceleration	Brake Dwell Time
HA5C (5C collet rotary)	25% Increase (now 410°/sec)	45% Increase	—
HRT160, HRT160SP, HRTA5 160 mm platter table	30% Increase (now 130°/sec)	33% Increase	89% Reduction
HRT210, HRT210SP, HRTA6 210 mm platter table	34% Increase (now 100°/sec)	125% Increase	89% Reduction
HRT310, HRT310SP 310 mm platter table	26% Increase (now 75°/sec)	33% Increase	95% Reduction

ROTARY TABLES & INDEXERS



SCOLCR



HA5CSB



HA5C



HA5C 2



HA5C 3



HA5C 4



T5C



T5C 2



T5C 3



T5C 4



HRT110



HRT160



HRT210



HRT310



HRT320/FB



HRT450



HRT600



HRT160SP



HRT210SP



HRT310SP



HRTA5



HRTA6



HRT160-2



HRT210-2



HRT210SHS-HD



TRT160



TRT210



TR110



TR160Y



TR160



TR160-2



TR210



TR310

GOING GREEN

Long before “Green” meant lessening one’s carbon footprint, Haas machines could save you money by reducing electricity usage during idle times.

While Haas engineers continue to improve the efficiency of Haas machines, below are things you can do today to reduce electricity usage in your Haas machining center.



SAVING ENERGY MEANS SAVING MONEY

- Auto Power-Off setting turns the machine off after a specified number of minutes idle
- Power-Off at M30 sets the control to start a 30-second timer that will turn off all power unless interrupted
- Sleep Mode puts the machine into a low-power mode for a programmed length of time
- Screen Saver setting
- LCD Backlight Off setting blanks the LCD after a specified number of minutes idle
- Conveyor Off setting automatically turns off the chip conveyor after a specified number of minutes idle
- Servos and Hydraulics Off setting automatically turns off the servos and hydraulic pump after a specified number of minutes idle



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Refer to your operator’s manual for detailed information on these settings and more.

MACHINE SPECIFICATIONS *(Super-Speed Machines)*

		VF-2SS VF-2SSYT	VF-3SS VF-3SSYT	VF-4SS	VF-5SS	VF-6SS	
Travels	X	762 mm	1 016 mm	1 270 mm	1 270 mm	1 626 mm	
	Y	406 mm 508 mm	508 mm 660 mm	508 mm	660 mm	813 mm	
	Z	508 mm	635 mm	635 mm	635 mm	762 mm	
	Spindle Nose to Table	102 - 610 mm	102 - 737 mm	102 - 737 mm	178 - 813 mm	102 - 864 mm	
Table	Length	914 mm	1 219 mm 1 372 mm	1 321 mm	1 321 mm	1 626 mm	
	Width	356 mm 457 mm	457 mm 635 mm	457 mm	584 mm	711 mm	
	Max Weight on Table	680 kg	794 kg	794 kg	794 kg	907 kg	
	T-Slot Width	16 mm					
	T-Slot Center Distance	125 mm	80 mm	80 mm	80 mm	125 mm	
Spindle	Taper size	#40 Taper					
	Speed	12 000 max rpm					
	Drive System	Inline Direct Drive					
	Max Torque Standard	122 Nm @ 2000					
	Bearing Lubrication	Air/Oil Injection					
	Cooling	Liquid Cooled					
	Spindle Motor Max Rating ¹	22,4 kW					
Axis Motors	Max Thrust Rating	X	8 874 N	13 723 N	13 723 N	14 902 N	15 124 N
		Y	8 874 N	13 723 N	13 723 N	14 902 N	15 124 N
		Z	13 723 N	17 450 N	17 450 N	14 902 N	15 124 N
	Rapid	X	35,6 m/min	35,6 m/min	35,6 m/min	30,5 m/min	22,9 m/min
		Y	35,6 m/min	35,6 m/min	35,6 m/min	30,5 m/min	30,5 m/min
		Z	35,6 m/min	35,6 m/min	35,6 m/min	30,5 m/min	30,5 m/min
	Max Cutting	21,2 m/min					
Tool Changer	Capacity Standard (optional) ²	24+1 24+1 (40+1)	24+1 (40+1)	24+1 (40+1)	24+1 (40+1)	24+1 (40+1)	
	Tool Type / Taper	CT or BT / 40					
	Max Tool Diameter Standard (full / adjacent empty)	76 mm / 127 mm	76 mm / 152 mm				
	Max Tool Weight	5,4 kg					
	Changer Type Standard	SMTC	SMTC	SMTC	SMTC	SMTC	
	Tool to Tool (avg)	1,6 sec	1,6 sec	1,6 sec	1,6 sec	2,3 sec	
	Chip to Chip (avg)	2,2 sec	2,2 sec	2,2 sec	2,2 sec	3,2 sec	
Miscellaneous	Machine Weight ³	3 629 kg 3 810 kg	5 670 kg 6 350 kg	6 033 kg	6 623 kg	9 526 kg	
	Air Required	113 lpm, 6,9 bar					
	Power Required (min)	354 - 488 VAC					

1) 5-minute rating. 2) See page 22 for optional tool changer specifications. 3) Approximate; will vary with machine options.

NOTE: FLA/KVA requirements determined by motor horsepower. Check with your Haas distributor for various requirements. Differing VAC/KVA options available. Specifications subject to change without notice. Not responsible for misprints or typographical errors.

MACHINE SPECIFICATIONS *(Standard 40-Taper Machines)*

		VF-1 VF-1YT	VF-2 VF-2YT	VF-3 VF-3YT	VF-4	VF-5 VF-5XT	VF-6	
Travels	X	508 mm	762 mm	1016 mm	1270 mm	1270 mm 1524 mm	1626 mm	
	Y	406 mm 508 mm	406 mm 508 mm	508 mm 660 mm	508 mm	660 mm	813 mm	
	Z	508 mm	508 mm	635 mm	635 mm	635 mm	762 mm	
	Spindle Nose to Table	102 - 610 mm	102 - 610 mm	102 - 737 mm	102 - 737 mm	178 - 813 mm	102 - 864 mm	
Table	Length	660 mm	914 mm	1219 mm 1372 mm	1321 mm	1321 mm 1575 mm	1626 mm	
	Width	356 mm 457 mm	356 mm 457 mm	457 mm 635 mm	457 mm	584 mm	711 mm	
	Max Weight on Table	1361 kg	1361 kg	1588 kg	1588 kg	1814 kg	1814 kg	
	T-Slot Width	16 mm	16 mm	16 mm	16 mm	16 mm	16 mm	
	T-Slot Center Distance	125 mm	125 mm	80 mm	80 mm	80 mm	125 mm	
Spindle	Taper Size	#40 Taper	#40 Taper	#40 Taper	#40 Taper	#40 Taper	#40 Taper	
	Speed	8100 max rpm	8100 max rpm	8100 max rpm	8100 max rpm	8100 max rpm	8100 max rpm	
	Drive System	Inline Direct Drive	Inline Direct Drive	Inline Direct Drive	Inline Direct Drive	Inline Direct Drive	Inline Direct Drive	
	Max Torque Standard	122 Nm @ 2000	122 Nm @ 2000	122 Nm @ 2000				
	with Optional Gearbox	339 Nm @ 450	339 Nm @ 450	339 Nm @ 450				
	Bearing Lubrication	Air/Oil Injection	Air/Oil Injection	Air/Oil Injection	Air/Oil Injection	Air/Oil Injection	Air/Oil Injection	
	Cooling	Liquid Cooled	Liquid Cooled	Liquid Cooled	Liquid Cooled	Liquid Cooled	Liquid Cooled	
Spindle Motor Max Rating ¹	22,4 kW	22,4 kW	22,4 kW	22,4 kW	22,4 kW	22,4 kW		
Axis Motors	Max Thrust Rating	X	11 343 N	11 343 N	11343 N	11343 N	15 124 N	
		Y	11 343 N	11 343 N	11343 N	11343 N	15 124 N	
		Z	18 683 N	18 683 N	18 683 N	18 683 N	24 910 N	
	Rapids	X	25,4 m/min	25,4 m/min	25,4 m/min	25,4 m/min	18,0 m/min 13,7 m/min	13,7 m/min
		Y	25,4 m/min	25,4 m/min	25,4 m/min 18,0 m/min	25,4 m/min	18,0 m/min	15,2 m/min
		Z	25,4 m/min	25,4 m/min	25,4 m/min 18,0 m/min	25,4 m/min	18,0 m/min	15,2 m/min
	Max Cutting	16,5 m/min	16,5 m/min	16,5 m/min	16,5 m/min	12,7 m/min	12,7 m/min	
Tool Changer	Capacity Standard (optional) ²	20 (24+1)	20 (24+1)	20 (24+1, 40+1)	20 (24+1, 40+1)	20 (24+1, 40+1)	24+1 (40+1)	
	Tool Type / Taper	CT or BT / 40	CT or BT / 40	CT or BT / 40				
	Max Tool Diameter Standard (full / adjacent empty)	89 mm	89 mm	89 mm	89 mm	89 mm	76 mm / 152 mm	
	Max Tool Weight	5,4 kg	5,4 kg	5,4 kg	5,4 kg	5,4 kg	5,4 kg	
	Changer Type Standard (Optional)	Carousel (SMTC)	Carousel (SMTC)	Carousel (SMTC)	Carousel (SMTC)	Carousel (SMTC)	SMTC	
	Tool to Tool (optional)	4,2 sec (2,8)	4,2 sec (2,8)	4,2 sec (2,8)	4,2 sec (2,8)	4,2 sec (2,8)	2,8 sec	
	Chip to Chip (optional)	4,5 sec (3,6)	4,5 sec (3,6)	4,5 sec (3,6)	4,5 sec (3,6)	4,5 sec (3,6)	3,6 sec	
Miscellaneous	Machine Weight ²	3220 kg 3357 kg	3311 kg 3402 kg	5670 kg 6350 kg	6033 kg	6623 kg 6872 kg	9526 kg	
	Air Required	113 lpm, 6,9 bar	113 lpm, 6,9 bar	113 lpm, 6,9 bar				
	Power Required (min)	354 - 488 VAC	354 - 488 VAC	354 - 488 VAC				

VF-7	VF-8	VF-9	VF-10	VF-11	VF-12	VM-2	VM-3	VM-6	UMC
2134 mm	1626 mm	2134 mm	3048 mm	3048 mm	3810 mm	762 mm	1016 mm	1626 mm	762 mm
813 mm	1016 mm	1016 mm	813 mm	1016 mm	813 mm	508 mm	660 mm	813 mm	508 mm
762 mm	508 mm	635 mm	762 mm	508 mm					
102 - 864 mm	102 - 610 mm	102 - 737 mm	102 - 864 mm	102 - 610 mm					
2134 mm	1626 mm	2134 mm	3048 mm	3048 mm	3048 mm	914 mm	1372 mm	1626 mm	630 mm
711 mm	914 mm	914 mm	711 mm	711 mm	711 mm	457 mm	635 mm	711 mm	500 mm
1814 kg	1361 kg	1814 kg	1814 kg	300 kg					
16 mm	22 mm	16 mm	16 mm	16 mm	16 mm				
125 mm	111 mm	100 mm	125 mm	63 mm					
#40 Taper									
8100 max rpm	12 000 max rpm	12 000 max rpm	12 000 max rpm	8 100 max rpm					
Inline Direct Drive									
122 Nm @ 2000									
339 Nm @ 450	—	—	—	—					
Air/Oil Injection									
Liquid Cooled									
22,4 kW									
15 124 N	24910 N	15 124 N	12 233 N						
15 124 N	24910 N	15 124 N	12 233 N						
24 910 N	15 124 N								
15,2 m/min	13,7 m/min	15,2 m/min	9,1 m/min	9,1 m/min	9,1 m/min	18,0 m/min	18,0 m/min	13,7 m/min	25,4 m/min
15,2 m/min	18,0 m/min	18,0 m/min	15,2 m/min	25,4 m/min					
15,2 m/min	18,0 m/min	18,0 m/min	15,2 m/min	25,4 m/min					
12,7 m/min	12,7 m/min	12,7 m/min	9,1 m/min	9,1 m/min	9,1 m/min	12,7 m/min	12,7 m/min	12,7 m/min	16,5 m/min
24+1 (40+1)	24+1 (40+1)	24+1 (40+1)	24+1 (40+1)	24+1 (40+1)	24+1 (40+1)	24+1 (40+1)	24+1 (40+1)	24+1 (40+1)	40+1
CT or BT / 40	CT or BT/40	CT or BT/40	CT or BT/40	CT or BT/40					
76 mm / 152 mm	76 mm / 127 mm								
5,4 kg									
SMTC									
2,8 sec									
3,6 sec									
10 433 kg	10 886 kg	11 340 kg	12 701 kg	13 336 kg	12 701 kg	3402 kg	6350 kg	9526 kg	8 165 kg
113 lpm, 6,9 bar									
354 - 488 VAC									

NOTE: FLA/KVA requirements determined by motor horsepower. Check with your Haas distributor for various requirements. Differing VAC/KVA options available. Specifications subject to change without notice. Not responsible for misprints or typographical errors.

MACHINE SPECIFICATIONS *(Standard 50-Taper Machines)*

		VF3YT/50	VF-5/50 VF-5/50XT	VF-6/50	VF-7/50	
Travels	X	1016 mm	1270 mm 1524 mm	1626 mm	2134 mm	
	Y	660 mm	660 mm	813 mm	813 mm	
	Z	635 mm	635 mm	762 mm	762 mm	
	Spindle Nose to Table	178 - 813 mm	178 - 813 mm	127 - 889 mm	127 - 889 mm	
Table	Length	1321 mm	1321 mm 1575 mm	1626 mm	2134 mm	
	Width	584 mm	584 mm	711 mm	711 mm	
	Max Weight on Table	1814 kg	1814 kg	1814 kg	1814 kg	
	T-Slot Width	16 mm	16 mm	16 mm	16 mm	
	T-Slot Center Distance	80 mm	80 mm	125 mm	125 mm	
Spindle	Taper Size	#50 Taper	#50 Taper	#50 Taper	#50 Taper	
	Speed	7500 max rpm	7500 max rpm	7500 max rpm	7500 max rpm	
	Drive System	2-Speed Geared Head	2-Speed Geared Head	2-Speed Geared Head	2-Speed Geared Head	
	Max Torque Standard	610 Nm @ 500	610 Nm @ 500	610 Nm @ 500	610 Nm @ 500	
	Bearing Lubrication	Air/Oil Injection	Air/Oil Injection	Air/Oil Injection	Air/Oil Injection	
	Cooling	Liquid Cooled	Liquid Cooled	Liquid Cooled	Liquid Cooled	
	Spindle Motor Max Rating ¹	22,4 kW	22,4 kW	22,4 kW	22,4 kW	
Axis Motors	Max Thrust Rating	X	24 910 N	24 910 N	24 910 N	15 124 N
		Y	24 910 N	24 910 N	24 910 N	24 910 N
		Z	24 910 N	24 910 N	24 910 N	24 910 N
	Rapids	X	18,0 m/min	18,0 m/min	13,7 m/min	15,2 m/min
		Y	18,0 m/min	18,0 m/min	15,2 m/min	15,2 m/min
		Z	18,0 m/min	18,0 m/min	15,2 m/min	15,2 m/min
	Max Cutting	12,7 m/min	12,7 m/min	12,7 m/min	12,7 m/min	
Tool Changer	Capacity Standard	30+1	30+1	30+1	30+1	
	Tool Type / Taper	CT or BT / 50	CT or BT / 50	CT or BT / 50	CT or BT / 50	
	Max Tool Diameter Standard (full / adjacent empty)	102 mm / 178 mm	102 mm / 178 mm	102 mm / 254 mm	102 mm / 254 mm	
	Max Tool Weight	13,6 kg	13,6 kg	13,6 kg	13,6 kg	
	Changer Type Standard	SMTC	SMTC	SMTC	SMTC	
	Tool to Tool (avg)	4,2 sec	4,2 sec	4,2 sec	4,2 sec	
	Chip to Chip (avg)	6,3 sec	6,3 sec	6,3 sec	6,3 sec	
Miscellaneous	Machine Weight ²	7212 kg	7303 kg 7552 kg	10206 kg	11113 kg	
	Air Required	113 lpm, 6,9 bar	113 lpm, 6,9 bar	113 lpm, 6,9 bar	113 lpm, 6,9 bar	
	Power Required (min)	354 - 488 VAC	354 - 488 VAC	354 - 488 VAC	354 - 488 VAC	

VF-8/50	VF-9/50	VF-10/50	VF-11/50	VF-12/50
1626 mm	2134 mm	3048 mm	3048 mm	3810 mm
1016 mm	1016 mm	813 mm	1016 mm	813 mm
762 mm				
127 - 889 mm				
1626 mm	2134 mm	3048 mm	3048 mm	3048 mm
914 mm	914 mm	711 mm	711 mm	711 mm
1814 kg				
16 mm	16 mm	16 mm	16 mm	22 mm
125 mm				
#50 Taper				
7500 max rpm				
2-Speed Geared Head				
610 Nm @ 500				
Air/Oil Injection				
Liquid Cooled				
22,4 kW				
24910 N	15 124 N	15 124 N	15 124 N	15 124 N
24910 N				
24910 N				
13,7 m/min	15,2 m/min	9,1 m/min	9,1 m/min	9,1 m/min
15,2 m/min				
15,2 m/min				
12,7 m/min	12,7 m/min	9,1 m/min	9,1 m/min	9,1 m/min
30+1	30+1	30+1	30+1	30+1
CT or BT / 50				
102 mm / 254 mm				
13,6 kg				
SMTC	SMTC	SMTC	SMTC	SMTC
4,2 sec				
6,3 sec				
11567 kg	12020 kg	13381 kg	14016 kg	14583 kg
113 lpm, 6,9 bar				
354 - 488 VAC				

Dimensions and machine drawings available at:
WWW.HAASCNC.COM



NOTE: FLA/kVA requirements determined by motor horsepower. Check with your Haas distributor for various requirements. Differing VAC/kVA options available. Specifications subject to change without notice. Not responsible for misprints or typographical errors.

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