Machining Equipment
Created for Performance Racing & Engine Remanufacturing.
So Advanced, It’s Simple.

High Power
High Precision
High Performance

**EM69HP**
5 Axis CNC Digitizing/Porting and Universal Machining Center

**High Output Spindle Motor**
43HP 32kW up to 20,000RPM
Rottler’s new EM69 CNC Machining Centers have been specifically designed to be the most technically advanced industry-specific systems ever. More than just a single machine, these new “Engine Machining” CNC Vertical Machining Centers are designed to give customers even more flexibility for engine parts machining, digitizing and porting, and custom parts manufacturing.

Rottler’s totally new, next generation CNC control found in the EM Series machines continues to give users unmatched speed of learning and ease of use when probing/digitizing without the need of additional cumbersome and expensive software. This advanced 4C software lets users know they are machining with the most state-of-the-science equipment available.

One of the main features is the EM series’ expanded size 32˝ touch screen – by maximizing screen size, Rottler’s CAM software allows unprecedented amounts of information to be displayed for the operator’s use. The user can choose the information to be displayed for incremental and interactive functionality.

The EM69HP 5-axis CNC Machining Center offers the precision and speed needed to reproduce cylinder heads and intake manifolds with exceptional accuracy and speed, with no handwork required.

The advanced software design allows professional engine builders and head developers to maximize production and minimize preparation time. The next generation CNC control gives even greater capability beyond porting by letting users probe parts for duplication and modification all within the machine control – no external or third-party software or equipment required.

EM69HP

The EM69HP features a new 24-tool ATC Automatic Tool Changer – the system provides greater flexibility for general parts machining and less downtime waiting for an operator to manually change tools between operations.

The EM69HP CNC Machining Center is versatile and great for machining engine blocks and making custom parts.

Just as Rottler revolutionized CNC head porting with our unique “all at the machine approach,” we are now focused on revolutionizing general CNC/ CAD/CAM/CMM by bringing the same “all at the machine approach” to the general machine tool industry.

**EM Series Features**

- Increased Spindle Power & Torque for Billet and Casting machining
- Maximum Functionality – operators can machine blocks and cylinder heads as well as create custom parts all in one machine
- All EM series machines feature linear roller bearing slideways with direct drive ball screws for smooth and movements and precise accuracy and repeatability.

**What is 4C Software?**

Rottler’s newest EM Series equipment offers Computer Numeric Control (CNC), Computer Aided Design (CAD) and Computer Aided Manufacturing (CAM) in the industry’s most advanced Computer Measuring Machine (CMM). The 4C technology allows users to digitize, edit designs and begin cutting in less time but also requires less machining/programming expertise compared to many other systems. This brand new, revolutionary CNC machine CAD/CAM software allows 3D CAD Solid Models to be imported or created at the machine – the built-in CAM functions can be used to semi-automatically and interactively create complex 3D tool paths direct from the CAD geometry.

**ADVANCED SPINDLE POWER**

Machining parts from solid billet and castings requires serious cutting power and innovative software to convert designs from solid metal into completed parts. The new EM69HP has an advanced, very powerful spindle drive motor and is able to make huge cuts and remove a large quantity of material very fast. This system is also able to cut difficult to machine materials like steel and titanium.
There are 3 fixtures available for the EM69 machines:
1. 5537 Universal Cylinder Head, Block and Rotational Parts
2. 5511 Cylinder Head only
3. 690-3-63 Cylinder Block only

The 5511 fixture is designed for cylinder heads only and can handle extra long cylinder heads up to 41" (1,050mm) overall/outside length. The 690-3-63 fixture is designed for cylinder blocks only. The 5537 universal fixture has been further developed to be more versatile and universal for a wide variety of applications. One fixture can now be used for digitizing and porting cylinder heads, machining engine blocks such as boring and sleeving, surfacing, lifter bores, etc. The 5537 fixture also has a rotary part adapter kit including a chuck mounted on the headstock and a center mounted on the tailstock to allow round parts such as crankshaft to be set up and rotated for machining. The 5537 universal fixture has maximum cylinder head length capacity of 37" (940mm). The increased versatility and length capacity of the 5537 should allow most cylinder heads to be machined with 5537 fixture and the only application that require the 5511 fixture are extremely long cylinder heads longer than 37" (940mm) overall/outside length. Note that some cylinder heads have castings such as timing covers or protrusions cast onto the end of heads and this overall length must be considered when measuring the length of the cylinder head. When an EM69P machine is sold ‘for heads only’ and the maximum head length is not more than 37" (940mm) it is advisable to offer the 5537A and 5537B so that the customer can add additional adapters such as 5537C and 5537D in the future - increasing versatility.

### Automatic 4th Axis Block Roll Over Fixture 690-3-63

Rottler’s Universal quick load/unload Automatic 4th Axis Block Roll Over Fixture and Software allows the computer to rotate the block during the automatic machining cycle. Large V blocks can be rotated 360 degrees to allow special machining jobs such as stroker clearance in same set up as boring, surfacing and lifter bore machining. The tail stock is pneumatically operated allowing easy and fast loading and unloading of heavy blocks.

### Crankshaft and Camshaft Centerline Fixture

All engine block machining should be done with reference to the Crankshaft or Camshaft Centerlines. It is not accurate to set up blocks on their pan rail or end faces! When any main line boring work is to be done, this should be completed before any other machine work is done to the block. The Rottler 4th Axis quick load/ unload fixture utilizes precision locators to set up blocks accurately and quickly on their crankshaft centerline. Some customers like to set up on Camshaft Centerline for machining lifter bores and this can also be done on the Rottler 4th Axis Fixture.

### The 5537 Universal Fixture has 3 main configurations:

- **5537A plus 5537B** – this is the basic fixture plus parts to set up cylinder head fixture plates, semi-finished plates or T slot table
- **5537A plus 5537C** – this is the basic fixture plus parts to set up cylinder blocks on crankshaft centerline.
- **5537A plus 5537D** – this is the basic fixture plus parts to set up rotation parts such as crankshaft with a chuck and center.

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Internet Support
Rottler offers cutting edge internet support direct from the machine to the factory. Our cutting edge internet support even enables us to "Log In" and remotely control your machine from our factory if necessary. Shop too busy or noisy for talking? The pre-installed Skype™ application gives you instant messaging capabilities with Rottler Factory Technicians.

Video Chat and Instant Messaging
Skype™ and a webcam are installed on the EM69HP for video conferencing, instant messaging and internet support. This feature gives you instant, direct contact with Rottler right on the machine without even making a phone call. The standard webcam comes pre-installed so that Rottler technicians can see exactly what you are seeing. This saves a tremendous amount of time when trying to answer questions.

www.rottlermfg.com
An extensive library of video tutorials is available online 24 hours a day. Many customers find that they can get quick answers to their questions regarding the EM69HP with the use of this library without even contacting Rottler for support. Tutorials are added with each software enhancement.

SUPPORT & TRAINING

EM69HP STANDARD EQUIPMENT

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<thead>
<tr>
<th>American</th>
<th>Metric</th>
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<tbody>
<tr>
<td>Control</td>
<td>Rottler CNC Control</td>
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<tr>
<td>High Speed Spindle Motor available for increased speed and output up to 20,000RPM</td>
<td>80Ncm @ 1000RPM</td>
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<tr>
<td>Torque</td>
<td>600lbs @ 1000RPM</td>
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<tr>
<td>Axis Feed Method (X/Y/Z)</td>
<td>Direct Coupled Servo Driven Ball Screw</td>
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<tr>
<td>Linear roller Bearing Slide Way construction for smooth and precise axis movement</td>
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<tr>
<td>Spindle - Rotation Speed</td>
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<tr>
<td>Coolant Capacity</td>
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<td>Weight Capacity</td>
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<td>5th Axis Rotation</td>
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<td>Feed Rate - Variable</td>
<td>0-100rpm</td>
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<tr>
<td>Tool Changer - Number of Tools</td>
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<tr>
<td>Tool Changer - Maximum Weight of Tool</td>
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<td>Tool Changer - Maximum Length of Tool</td>
<td>11.8&quot;</td>
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<tr>
<td>Dimensions - Machine</td>
<td>111.30D x 119.09W x 108.07&quot;H</td>
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<tr>
<td>Dimensions - Floor Space Requirements</td>
<td>136.22D x 170.67&quot;W</td>
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<tr>
<td>Machine Weight - Approx.</td>
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<td>Electrical Requirements</td>
<td>208-240V, 50A, 50/60Hz, 3Ph</td>
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<td>Air Requirements</td>
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<td>Paint Color Code</td>
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EM69HP SPECIFICATIONS

SUPPORT & TRAINING

Examples of screens from training videos

Specifications and design subject to change without notice.
New EM Series Spindle Motor Power and Torque Ratings

A lot of research and development has been put into sourcing and engineering the new high output spindle motors in the EM machines. CNC machine spindle motor power and torque is commonly given in 2 different ways – continuous and peak.

**Continuous** power and torque rating refers to the maximum cutting load that a spindle can sustain running non-stop 24 hours per day without overheating. Advanced technology spindle motors are able for a limited time period to deliver substantially more power and torque before overheating.

**Peak** power and torque rating can be significantly, or many times more compared to continuous rating but the limiting factor is heat. It is common when CNC machining that spindle motors are not running continuously for example when changing tools. The depth of cut and feed rates will also determine to amount of heat that the spindle motor has to overcome. The integral spindle motors on the EM 5 axis models are liquid cooled and the liquid’s temperature is accurately controlled by special AC chiller unit allowing peak operation for longer periods of time.

The most common measure of continuous spindle motor use is S6 60% as shown in the graphs below. This means that the spindle motor is running at full load for 60% of the time the machine is in use. S6 is the specifications for power and torque that is given out as specifications in literature such as brochures. As the graphs below show, the peak power and torque is substantially higher but can only be for shorter period of time.