

Training and Support -vital to your success

To comfortably and profitably use your system, you must understand how to program, operate and maintain it. Each Thermwood CNC router system and each major software package includes formal, structured training classes including professional support material and a lot of hands-on experience. Our goal is to make you totally comfortable and confident.



Our systems come complete with detailed manuals, including an electronic version of the operator's manual on the control that you can access, even while the machine is operating.

In addition to Thermwood's professional phone support and on-site service, each CNC router also includes your first year of Virtual Service at no additional cost. You can connect your control to Thermwood's technical service center with the push of a button, establishing an audio, video and data link. You see and talk to the service technician, right on the control screen, and he sees

talks to you, but he also sees deep into your system to provide help with everything from tooling and programming questions to machine configuration and performance. In fact, virtually everything a service technician can do in your shop can also be done via Virtual Service.



Virtual Service makes getting help easy, fast and highly effective.

With your new system, you also receive the next control system software update at no additional cost. Both Virtual Service and continuing system updates are available on an ongoing basis through the Advanced Support Program, which also includes substantial discounts on hardware updates. A single low annual payment gets you unlimited Virtual Service help and each control update as it is released.

Thermwood training, Virtual Service and continuing control updates offer you support like no one else and assures continuing profits from your Thermwood investment, years into the future.

Multi-Purpose Series - 5 Axis

CNC Router Packages for 3-Dimensional Machining Applications



Thermwood's Multi-Purpose Series systems are available in a variety of sizes and configurations with one that is ideal for every customer.

| | M67-55 | M67-510 | M67-512 | M67-55DT | M67-510DT | M70-1010 | M70-1015 | M70-1020 | M90-55DT | M90-510 | M90-510DT |
|--------------------------------------|-----------|-----------|-----------|-------------------|-------------------|-----------|-----------|-----------|-------------------|-----------|-------------------|
| Table Size (mm x mm) | 1524x1524 | 1524x3048 | 1524x3658 | Dual 1524x1524 | Dual 1524x3048 | 3048x3048 | 3048x4572 | 3048x6096 | Dual 1524x1524 | 1524x3048 | Dual 1524x3048 |
| Table Type | Moving | Moving | Moving | Moving | Moving | Moving | Moving | Fixed | Moving | Moving | Moving |
| Part Hold Down | | | | | | | | | | | |
| Aluminum jig plate | Standard | Standard | Standard | Standard | Standard | Standard | Standard | Standard | Standard | Standard | Standard |
| Drilled and tapped on 12" centers | Available | Available | Available | Available | Available | Available | Available | Available | Available | Available | Available |
| Conventional vacuum system | Available | Available | Available | Available | Available | Available | Available | Available | Available | Available | Available |
| Universal High Flow vacuum system | Available | Available | Available | Available | Available | N/A | N/A | N/A | N/A | Available | Available |
| Spindle | | | | | | | | | | | |
| 7 HP, 3,000-18,000 RPM | Standard | Standard | Standard | Standard | Standard | Standard | Standard | Standard | Standard | Standard | Standard |
| 7.5 HP, 3,000-18,000 RPM, Dual-end | Available | Available | Available | Available | Available | Available | Available | Available | Available | Available | Available |
| 10 HP, 3,000-18,000 RPM, Dual-end | Available | Available | Available | Available | Available | Available | Available | Available | Available | Available | Available |
| 10 HP, 3,000-18,000 RPM, Tool Change | Available | Available | Available | Available | Available | Available | Available | Available | Available | Available | Available |
| Impact Resistant Head | Available | Available | Available | Available | Available | Available | Available | Available | Available | Available | Available |
| Tool Changer | | | | | | | | | | | |
| 6 Position Bar Style in Gantry Leg | Available | Available | Available | Available | Available | Available | Available | Available | Available | Available | Available |
| Auto Tool Length Sensor | Available | Available | Available | Available | Available | Available | Available | Available | Available | Available | Available |
| 5 Axis Chip Collector Hood | Available | Available | Available | Available | Available | Available | Available | Available | Available | Available | Available |
| Z Stroke (Vertical) | | | | | | | | | | | |
| 610 mm Axis | Standard | Standard | Standard | Standard | Standard | Standard | Standard | Standard | Standard | Standard | Standard |
| 914 mm Axis | Available | Available | Available | Available | Available | Available | Available | Available | Available | Available | Available |
| 1219 mm Axis | Available | Available | Available | Available | Available | Available | Available | Available | Available | Available | Available |
| 1524 mm Axis | Available | Available | Available | Available | Available | Available | Available | Available | Available | Available | Available |
| Machine Enclosure | Standard | Standard | Standard | Standard | Standard | Standard | Standard | Standard | Standard | Standard | Standard |
| Auto Lubrication | Available | Available | Available | Available | Available | Available | Available | Available | Available | Available | Available |
| Control Networking | Standard | Standard | Standard | Standard | Standard | Standard | Standard | Standard | Standard | Standard | Standard |
| Virtual Service | Standard | Standard | Standard | Standard | Standard | Standard | Standard | Standard | Standard | Standard | Standard |
| Hand Held Programmer | Available | Available | Available | Available | Available | Available | Available | Available | Available | Available | Available |
| Programming Probe | Available | Available | Available | Available | Available | Available | Available | Available | Available | Available | Available |
| Software | | | | | | | | | | | |
| CAD Path | Standard | Standard | Standard | Standard | Standard | Standard | Standard | Standard | Standard | Standard | Standard |
| CAD/CAM software systems | Available | Available | Available | Available | Available | Available | Available | Available | Available | Available | Available |

Multi-Purpose Series - 5 Axis

CNC Router Package for 3-Dimensional Machining Applications

Five-axis CNC routers have become the accepted method for production trimming of thermoformed, composite and fiberglass parts and are being increasingly used to machine patterns and molds directly from CAD data. Thermwood is the industry leader in these applications with more five-axis systems in operation than any other company.

With Thermwood 5 axis CNC router packages you can:

- Trim formed parts or machine patterns or molds using full five-axis simultaneous motions.
- Execute extremely large CAD generated programs at high speed without pausing.
- Create three-dimensional programs directly from hand made models using a Hand Held Programmer and/or a Programming Probe.

One reason for our success is that Thermwood offers features and capabilities not available from anyone else, and these features are important to your success. Thermwood is the oldest manufacturer of CNC routers and has consistently been the technical leader with more US patents on CNC router technology than all other CNC router companies in the world, combined.

A highly advanced CNC control - your key to success

Your CNC router is only as flexible as your CNC control. Thermwood is the only major CNC router manufacturer that designs and builds its own CNC control, a control so advanced it is used by aerospace, defense and even NASA for some of their most demanding applications. This control is designed from its very core to operate a CNC router, which means you can do more and it's easier.

Thermwood's CNC control offers full five axis simultaneous motion which allows for more efficient program motions. The system is equipped with five-axis tool length compensation and individual compensation for each gantry axis of a moving gantry configuration machine.

There is another important consideration when machining three dimensional patterns or molds. CAD generated programs usually consist of millions of tiny motions, all strung together. When these are sent to most CNC controls, they choke on them. There are two reasons for this.

Most commercial controls have limited program memory, memory that is too small for typical pattern programs. They rely on a separate PC to feed pieces of the program to the control as needed. However, because these tiny motions are executed so fast, it is common to run out of program code before the PC can supply the next segment, so the machine stops. It stops and waits until the buffer is refilled and then starts again. This of course slows you down, but depending on the material, dwelling on the part can cause burns or other problems.

The second problem with commercial controls is called block processing time. This is the amount of time required to process a single block of data. This is important because the block processing time determines how fast the tiny motion supplied by the CAD system can be run. Slow block processing times means that the actual program runs slower, sometimes much slower.

Thermwood's control is on the leading edge in both of these areas. First, it has huge program storage capacity and uses the hard disk as virtual memory. We can easily hold programs tens of gigabytes in

size and execute them with no delays, no stopping.

Thermwood's control also has one of the fastest, if not the fastest block processing time in the industry. We can execute complex CAD generated programs at high speed, and without stopping.

Although these sound like obscure technical issues, they are quite important to you on any five-axis system you buy. They determine how easy the system is to use and productive it will be and in some cases, what it can and cannot do.

The control keeps track of machine use and alerts you when lubrication or maintenance is needed. It shows you step by step videos of how to adjust, maintain and repair your machine.

And, because Thermwood controls all the technology, you have single source responsibility. No longer must you tolerate the machine builder and control manufacturer blaming each other when you have a problem. Thermwood stands behind and supports the entire system.

And when new technology comes out, you can easily upgrade your Thermwood control, we do it all the time. This is seldom possible with others.

The key to CNC router capability is the CNC control, and Thermwood clearly has the most capable CNC control.

Programming a Five Axis Machine

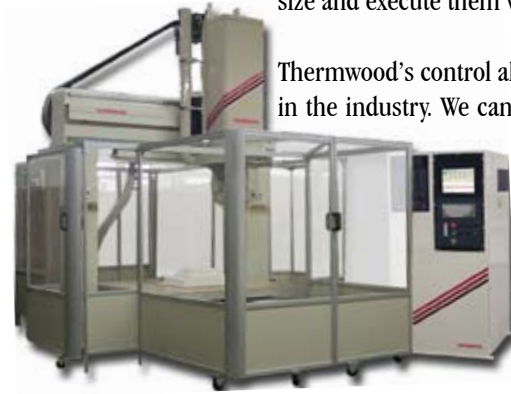
Creating CNC programs for five-axis trimming can be challenging, especially when CAD data is not available for a part. In these instances, Thermwood offers a powerful Hand Held Programmer which you can use, right on the machine, to trace the part and create the program. You can create lines, arcs, circles and even splines, quickly and easily, and this method of creating programs has been refined over the years to include many programming tools that make the process quicker and easier.

The Hand Held Programmer is easy to use and intuitive, so virtually anyone can learn to develop programs with it. Others may offer a programming box, but there is nothing today that compares to Thermwood's Hand Held Programmer.

If you have complex curves, another approach available from Thermwood is a Programming Probe. This is a probe that is attached to the spindle, and is used to guide the head around to create the program. You simply move the probe tip by hand and the machine follows. Trace a trimmed part and the program is complete. You can use the Programming Probe and the Hand Held Programmer at the same time to make the job even easier.

If CAD data is available for your part, it can be used to generate the trimming program. We can execute programs generated by your existing CAD/CAM system, or Thermwood can supply full five-axis CAD/CAM systems capable of designing your part and creating the trimming program. This same system can also create programs for the models or molds for your part. The models and molds can be machined on your Thermwood system and as we stated earlier, huge program capacity and fast block processing speeds means the most efficient program execution possible.

Whether executing complex CAD generated programs or developing programs right at the machine from hand made models, Thermwood's systems excel.



Prove your application BEFORE you buy

It is dangerous to take anyone's word they can do your job. The only way to know for sure is to see your job being done. Watch the cycle, see the result and then you truly know.

Thermwood operates a well equipped, fully staffed demonstration lab whose purpose is to demonstrate to both you and us, that we can do your job and that you will be completely satisfied. We set up, program and run your parts, with no obligation to you, to prove out the application before we receive, or accept, a commitment.

You are invited to our Southern Indiana facility to see this process in person and discuss your needs in a friendly, easy and open environment. We also have the ability to broadcast these demonstrations live over the web, although if your job is truly custom, a personal visit is highly recommended. Most people that visit say they leave with a wealth of information beyond seeing their parts run. After all, we have been doing this longer than anyone else and are happy to share this experience with you.

With this approach, you know and we know it will work well. This is the only way to be sure you will be a completely satisfied customer, after all, you being satisfied is important to us because a large part of our business is repeat orders from satisfied customers.



Demonstration Lab fully staffed to insure that we can do your job.

Impact Resistant Head - A Thermwood Exclusive

There is one potential problem that occurs during programming and setup of five axis machines. At some time or another you will run the head into the fixture, in short, a crash. Maintaining accurate alignment of the axis 4 and 5 head is important, and this type of impact can knock the head out of alignment.

Thermwood's head allows for realignment. Some others have no provision for adjustment, so once you are out of alignment, you're out of luck. In the past, a crash often meant you had to realign the head before you could continue. Today, Thermwood offers an impact resistant head, which all but eliminates this problem.

On Thermwood's machines, the axis four and five mechanism is held accurately in place on precision tapered die seats with a series of heavy duty die springs. An impact simply compresses the springs, allowing the head to move off the seats before enough force is generated to cause damage or affect alignment. This also instantly stops the machine. Move away from the part and the head returns to the original position on the die seats and you are ready to continue with no permanent damage and, seldom, if ever, a requirement for realignment.

The impact resistant head is another feature only available from Thermwood. Regardless of how you develop your programs or how careful you are, some time or another, you will crash the head. How the machine handles this is the difference between a minor inconvenience and perhaps days or weeks of downtime while the head is re-machined or replaced.

