



Montigo Delray's new stainless steel outdoor H Series fireplaces are fabricated on the Finn-Power E5 servo-electric turret punch press.



**Servo-Electric
Turret Punch Press
Increases Accuracy
& Productivity at
Montigo Delray Corp.**



Canadian fireplace manufacturer Montigo Delray Corp. began operations in 1976 as a distributor of wood-burning fireplaces. Today, the company has evolved into one of the leading manufacturers of gas fireplaces, primarily positioned in the new construction market, with hundreds of thousands of units installed throughout North America,.

Montigo has three manufacturing facilities located in Surrey, BC, Langley, BC, and Ferndale, WA. The company moved into the Ferndale facility in 1996. Through the years, the fabrication equipment at the Washington facility grew to include a laser, press brakes, and two Finn-Power F Series hydraulic turret punch presses. About 2-1/2 years ago, Montigo purchased the Finn-Power E5 servo electric turret punch press.

The Finn-Power E5 Work Center is a 6-axes precision fabricating system featuring a servo-motor-driven punch mechanism and is both flexible and amazingly accurate. In the E5 Work Center both the position and speed of the punch and die are programmable like normal CNC axes, which allows punching, nibbling, cutting, forming, marking, bending, and tapping in just a single set up.

This new approach to precision sheet metal fabricating has the following features:

- ▲ Excellent forming properties – .630" high (16 mm) – with no die interference
- ▲ Intelligent tool management technology for easy settings
- ▲ User-friendly operator interface via touch screen control
- ▲ Forming repeatability of .0004"
- ▲ Low energy consumption

According to Mark Wilczak, Montigo's general manager, the company's new fabrication equipment helped to dramatically increase productivity. "Four years ago, we used to run three shifts, five days per week. For the past three years, our volume has grown,"

explains Wilczak. "Thanks to the turret punch presses and laser, and the skills of our production manager Joel Nelson, we now run one shift five days a week...with more production."

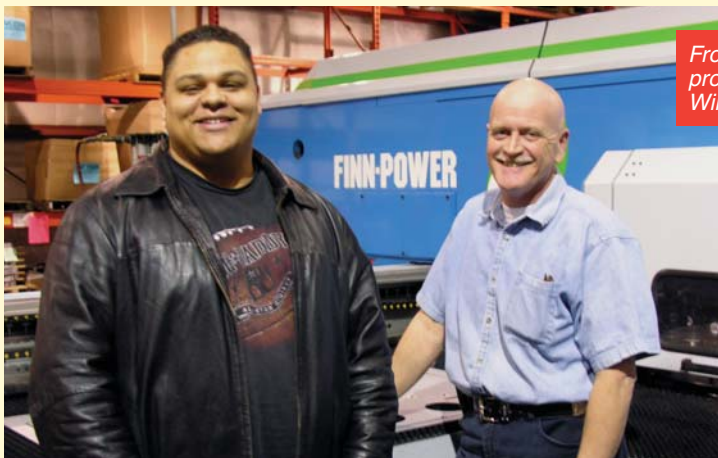
Servo-Motor Driven Punching Mechanism

The punching process of the E machine combines electrical servo technology with mechanical power transmission, enabling strict punch control. A servomotor, together with a lead screw, move a roll that in turn moves the ram by means of a guiding surface.

Due to the wedge shaped surface, the force exerted against the ram is 200 kN (22 US tons) on the top of the guiding surface. This is the area of the ram movement where force for punching or forming is needed. At both ends of the guiding surface, the wedge angle is larger, so ram speed is higher in the upper stroke area where force is not required. Because of the optimized shape of the guiding surface, heavy force and outstanding positioning accuracy can be reached in the lower stroke. Optimal speed and accuracy of the punching stroke will thus be achieved.

The punching mechanism is designed for two basic modes: punching and forming. In the punching mode, the roll moves horizontally over the top of the guiding surface, producing a punching stroke during each movement. The punching stroke is generated by a servomotor-driven mechanism. The ram that moves the tool has numerically settable upper and lower limits (CNC-axis). For punching, the operator enters the tool length for each tool in the tool table. The CNC control determines the optimum stroke length according to tool length and sheet thickness. The stroke lower limit is based on the ram's mechanical bottom position that is fixed in punching. In forming, the upper and lower limits of the ram are freely set from its bottom position upwards.

The punching stroke is numerically controlled by the CNC, which provides a very fast and optimal punching stroke. The stroke position and speed are controlled by



From left to right: Joel Nelson, production manager, and Mark Wilczak, general manager.

"The Finn-Power E machine has really increased our efficiency and accuracy."

The Finn-Power E5 Work Center is a 6-axis precision fabricating system featuring a servo-motor-driven punch mechanism and is both flexible and amazingly accurate.

the CNC. With forming tools, you can program a lower ram speed and use a lower forming speed and a positioning tolerance based on G-code, which allows for making exact and intricate parts.

“The Finn-Power E machine has really increased our efficiency and accuracy,” says Joel Nelson, production manager. “We also noticed less tool wear on the servo electric press compared to the hydraulic models. In some cases the tools in the E machine have kept their sharpness twice as long as the hydraulic machines.”

Other Finn-Power features that have impressed Montigo include:

Tool Holders – Finn-Power incorporates an individual tool holder concept that allows customers to design their own turret layouts. Unlike other designs, specific tool stations are not machined into the turret. Finn-Power offers the only flexible selection of tool holders in the industry. Any tooling style from Mate Precision Tooling or Wilson Tool International can be installed in a Finn-Power turret. Up to 10 auto-index, forming, or Multi-Tool® stations may be installed in a Finn-Power turret. “We have Mate, Wilson, and older tooling in all three of the Finn-Power turret punch presses,” says Nelson.

Auto-Index – Finn-Power’s unique auto-index system precisely rotates the punch and die in their tool holders using a single A.C. servo-motor system. The system does not need to match separate servo-motors as in some other machines. Rotation in .001 degree programmable increments gives the machine the ability to rotate beyond 360 degrees, thus allowing the system to automatically select the shortest path to rotate to a programmed angle input into the NC part program with simplicity, speed, and reliability.

Montigo has four auto-index stations from 1-1/2 inches to 3-1/2 inches. “Finn-Power approach to auto-index is in a class by itself,” says Nelson. “It gives us the flexibility to do what we need to do, and we’re not tied down to particular setups. It enables us to make whatever hole sizes we need. Instead of nibbling, we just use a quad radius to knock out the hole.”

Multi-Tool® – Finn-Power’s Multi-Tool stations increase the number of tools available in a turret, thus reducing set-up and increasing productivity. The Multi-Tool system allows multiple tools to be put in one station. Finn-Power Multi-Tool offers 6, 8, 10, or 24 different punch/die combinations in only one station-a turret within a turret. Using 40 station



Finn-Power’s upward forming option provides more accurate forming and greater forming heights up to 16 mm (.63”) and 5” in diameter. And Finn-Power’s unique auto-index allows Montigo to make whatever hole size is needed with the use of a large quad radius tool.



“The E machine has been running pretty much maintenance free since we’ve installed it. It just runs with little or no downtime except for planned maintenance.”

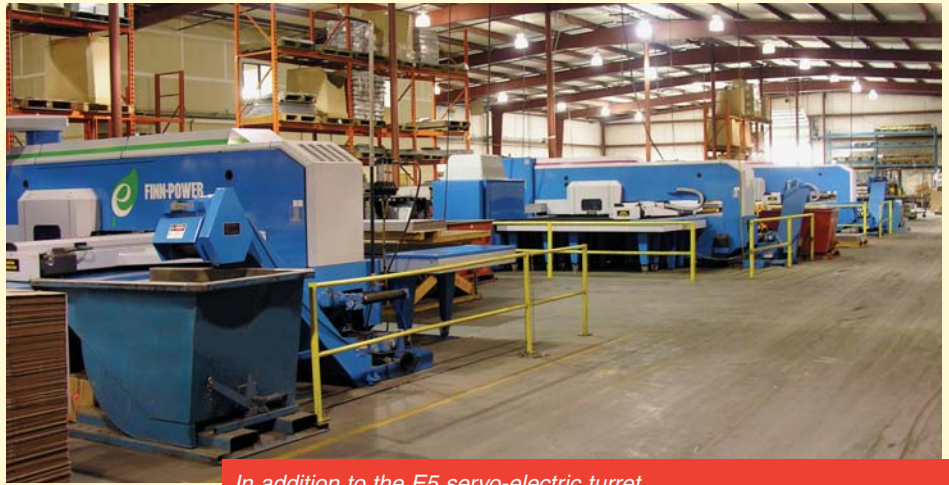
alpha/numeric Multi-Tool part identification programs are fast and easily done. Montigo has an 8-station Multi-Tool.

Upward Forming System – Finn-Power's upward forming option provides more accurate forming and greater forming heights up to 16 mm (.63") and 5" in diameter. Another advantage is that all dies are at the same height and there are more high-forming dies in the turret, thus, reducing risk of material damage and increasing machine uptime. "We use the E machine's upforming capability for forming explosion ports," explains Nelson. "The Finn-Power upform station sits below the turret and raises when it is in use and then drops back down, eliminating the chance of grabbing or catching the metal."

NC Express Software – Another area of satisfaction for Montigo is the Finn-Power operating software. The NC Express CNC programming system is a user friendly, integrated, and automated tool for managing Finn-Power equipment in the most efficient manner. NC Express is a tooling, nesting, and optimizing software package designed to easily integrate into an existing manufacturing environment, taking full advantage of the CAM features and the Finn-Power machine tool product line. "We have the NC Express on all three Finn-Power machines," says Nelson. "I like this software a lot. It cuts down our programming time, it's very flexible, and it has helped us to be more efficient and productive."

Other E5 Work Center features include:

- ▲ A large work chute capable of removing large parts up to 19.6" x 19.6". These parts are then dropped onto a conveyor to be exited out the end of the machine, thereby reducing shaker parts and eliminating skeletons.
- ▲ The operator interface makes use of a touch screen for easy access to all punching and forming parameters and tooling date. Tooling is made to learn its own length. When a new or sharpened tool is installed, its length value is simply set at zero. The first punch programmed



In addition to the E5 servo-electric turret punch press (front) Montigo also has two Finn-Power hydraulic turret punch presses.

for the tool automatically stops at the sheet contact and the correct, accurate length of the tool is automatically recorded in the tool library. Intelligent Stroke Control (ISC) takes care of stroke control, setting optimal length for all tools and also individually for each sheet movement. The operator is free to concentrate on more important tasks-Finn-Power's ISC handles all punch stroke settings automatically.

Energy Savings

Another major benefit Montigo realized was the energy savings aspects of the E5. According to Finn-Power International, recent tests have proven that by using an ingenious combination of servo-electric technology and mechanical power transmission the E5 consumes less than 1/3 the amount of electrical power of a comparable hydraulic turret punch press. More specifically, the E5 concept is an astonishing money saver in terms of energy consumption. It uses breaking energy in the acceleration of the following movement. "The E5 is cheap to operate," explains Wilczak. "Since we've installed the E machine, our power cost increases have been insignificant."

And how has the E5 performed at Montigo? "The E machine has been running pretty much maintenance free since we've installed it," reflects Wilczak. "It just runs with little or no downtime except for planned maintenance."



Finn-Power International, Inc.

710 Remington Road / Schaumburg, IL 60173 / USA / Tel 847 885 3200 / Fax 847 885 9692 / www.finnpower.com

Finn-Power Canada, Ltd.

1040 Martin Grove Road / Unit 11 / Toronto, Ontario / M9W 4W4 / Canada / Tel 416 242 4431 / Fax 416 242 7867 / www.finnpower.com

