

FINN-POWER

- PUNCHING
- LASER CUTTING
- BENDING
- INTEGRATED PUNCHING & SHEARING
- ▶ **INTEGRATED PUNCHING & LASER CUTTING**
- FLEXIBLE MANUFACTURING SYSTEMS



LPe6 – SERVO ELECTRIC PUNCHING AND INTEGRATED LASER CUTTING

INTEGRATED TECHNOLOGY THAT MAKES THE BEST OF

With FINN-POWER LPe6, you get versatile manufacturing capacity based on the availability of both punching and laser cutting capacity in an integrated, flexible manufacturing cell.

Following deliveries of custom engineered punching – laser cutting cells in early 90's, FINN-POWER introduced the concept into standard range in 1996. Subsequent development with several later models has secured FINN-POWER unrivalled experience in this highly versatile technology.

The same harmony of experience and innovation underlies FINN-POWER's servo electric punching, backed by ten years of continuous development and nearly a thousand installations world-wide.

The new LPe6 cell combines these technologies in a manufacturing solution that offers outstanding flexibility, versatility, accuracy and productivity. It integrates FINN-POWER's latest servo electric punching technology with state-of-the-art laser technology.

The inherent benefit of integrated punching and laser cutting is versatility. You can use the turret punch press where it is easier or faster and the laser where it is most efficient. Depending upon the manufacturing task at hand, you can always choose the most productive manufacturing method. This amounts to flexibility for fulfilling varying requirements, cost-efficiency and competitiveness, the things that FINN-POWER works for in our consistent development of new technology.



BOTH WORLDS



Energy in Efficient Use®

FINN-POWER LPe6 technology offers you

- Versatile servo electric punching, forces 20 or 30 ton (23 or 33 US ton)
- Integrated laser cutting (high-quality 2.5 kW laser beam power)
- Max. sheet size
LPe6: 3,074 mm x 1,565 mm (120" x 60")
LPe8: 4,300 mm x 1,565 mm (169" x 60")
- Max. material thickness
punching: 8 mm (.314")
laser cutting: 6 mm (.236")
laser cutting/mild steel: 8 mm (.314")
- Modular automation of material flow

Innovative integration

FINN-POWER LPe6 makes the best of both worlds, punching and laser cutting.

In punching, the cell features FINN-POWER's well-known capabilities. Forming capacity is especially versatile due to availability of upforming unit and progressive forming, which allows making bends.

Major energy savings are achieved in punching by FINN-POWER's Ecopunch® concept which uses braking energy in the acceleration of the next movement. The same applies to the 2,500 Watt CO₂ laser with no moving parts like a turbine. Stand-by power consumption, gas consumption and maintenance requirements are low.

Thus, the LPe6 combines low operating and maintenance cost with superior versatility, precision, ergonomics and compatibility with modern ecological thinking.



THE GENIUS OF SERVO ELECTRIC PUNCHING

The ECOPUNCH® operating principle is made possible by an ingenious combination of electrical servo technology and mechanical power transmission.

The punching and forming stroke are based on horizontal movement, made by a servo motor, which is converted into vertical ram movement and transmitted to a punching or forming tool.

Operating principle

In the punching mode, a servo operated wedge (1) moves over the roll connected to the ram (2) causing it and, consequently, the tool (3) to move downwards. After the ram has reached its programmed lower position, it returns back to its programmed upper position, actuated by pneumatic pressure.

In the forming mode, ram movement is programmed to stop when the desired forming stroke

position has been reached, after which the return movement of the roll and the ram begins. The stroke is NC-controlled and thus forming accuracy is outstanding. The static counter-force required in forming equals the maximum punching force even at zero ram speed.

Upforming

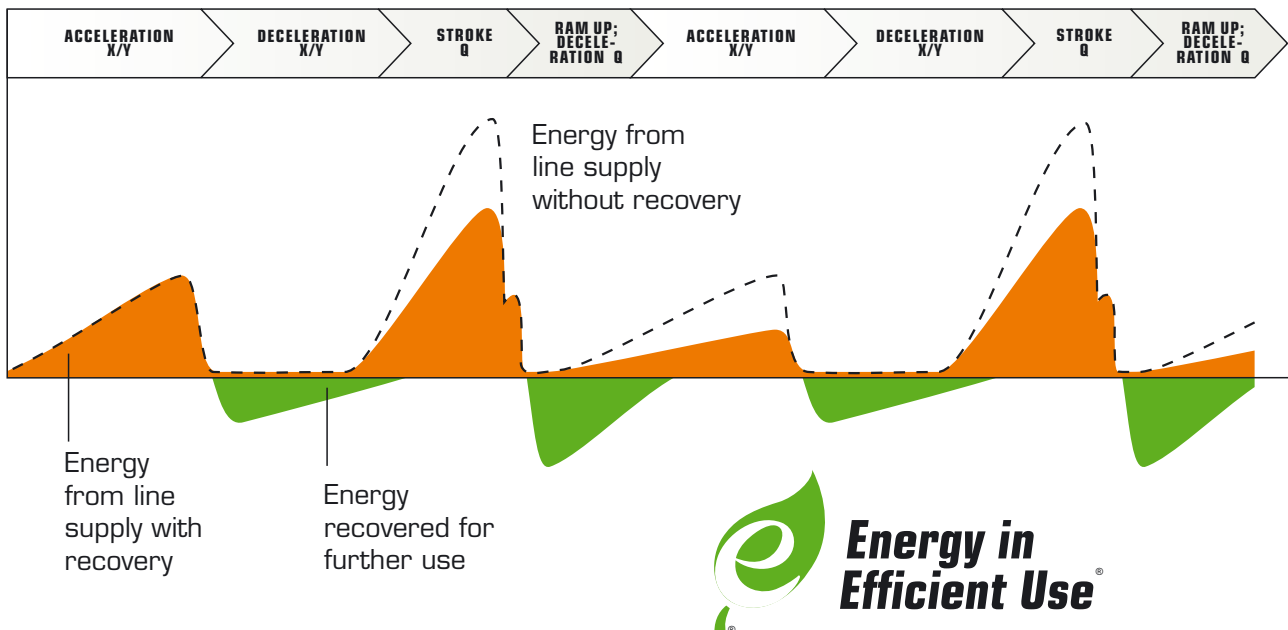
The indexable upforming option is a servo operated ram installed in the lower machine frame. It lifts the lower forming tool to a programmed position. The tool is retracted after forming, preventing a collision with the moving sheet.

The position of consecutive forming ram strokes can be programmed individually. Thus progressive forming and bending are simple to perform. The new control solution of the forming cylinder allows new possibilities for e.g. fast forming and sophisticated use of roll forming tools.

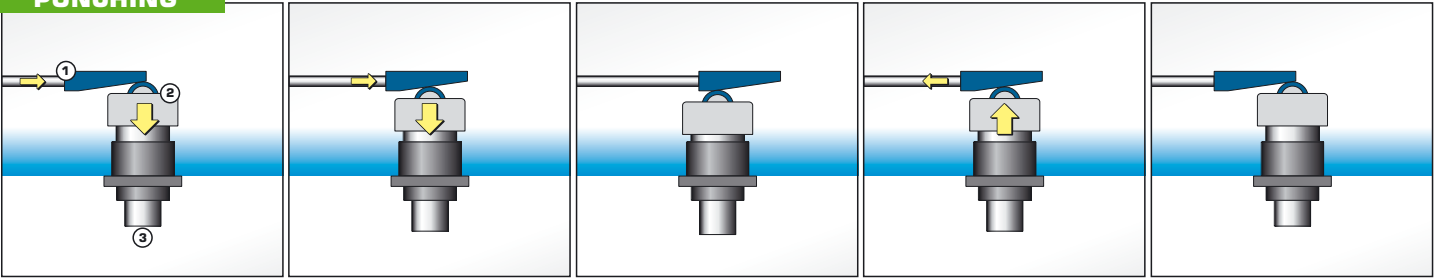
ENERGY SAVING PRINCIPLE

FINN-POWER's ECOPUNCH® concept is an astonishing money saver in terms of energy consumption.

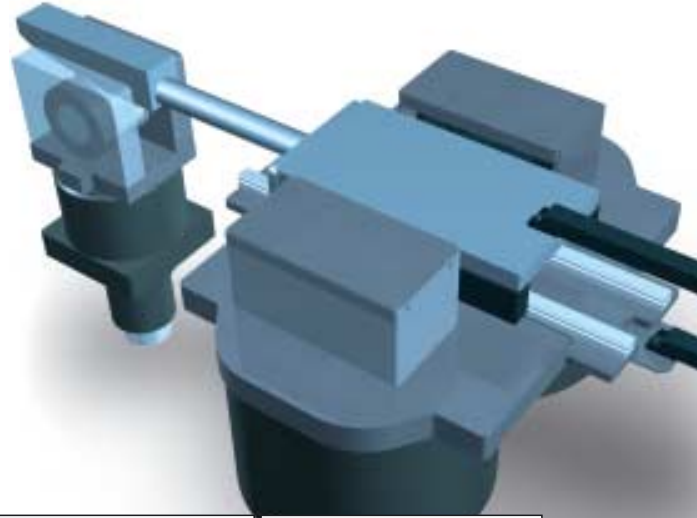
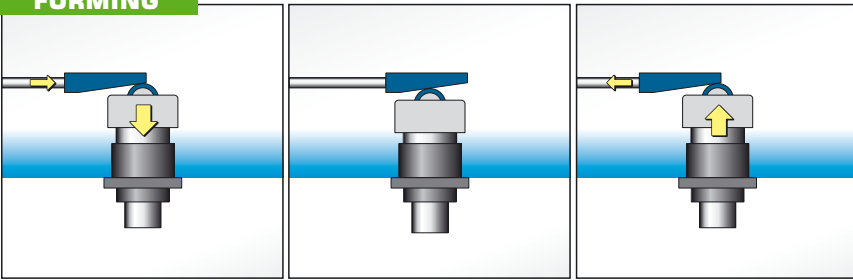
It uses braking energy in the acceleration of the following movement.



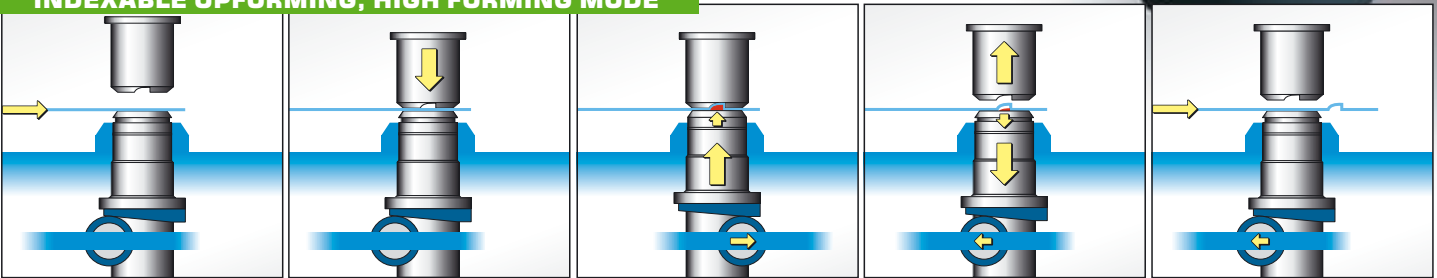
PUNCHING



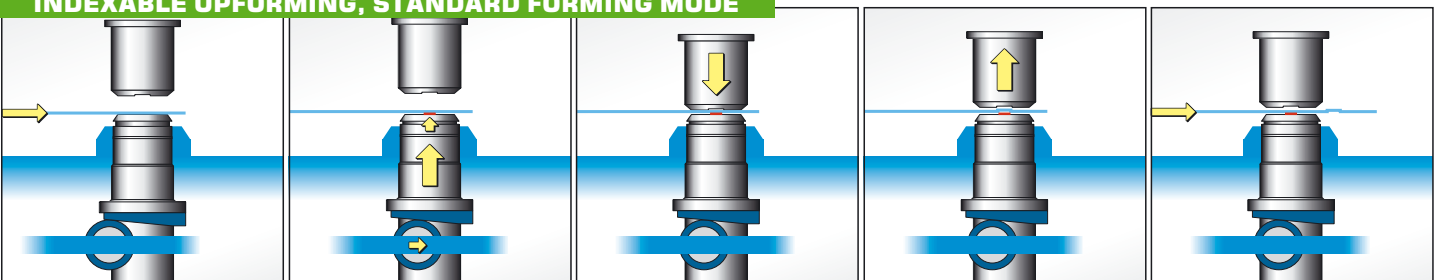
FORMING



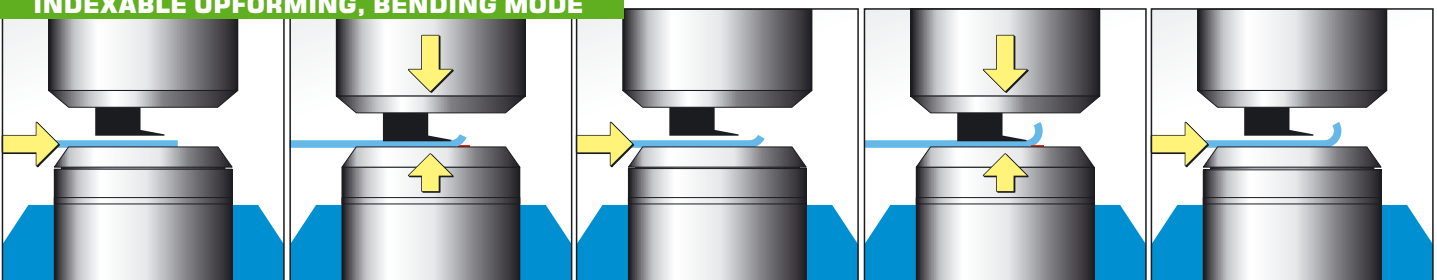
INDEXABLE UPFORMING, HIGH FORMING MODE



INDEXABLE UPFORMING, STANDARD FORMING MODE



INDEXABLE UPFORMING, BENDING MODE

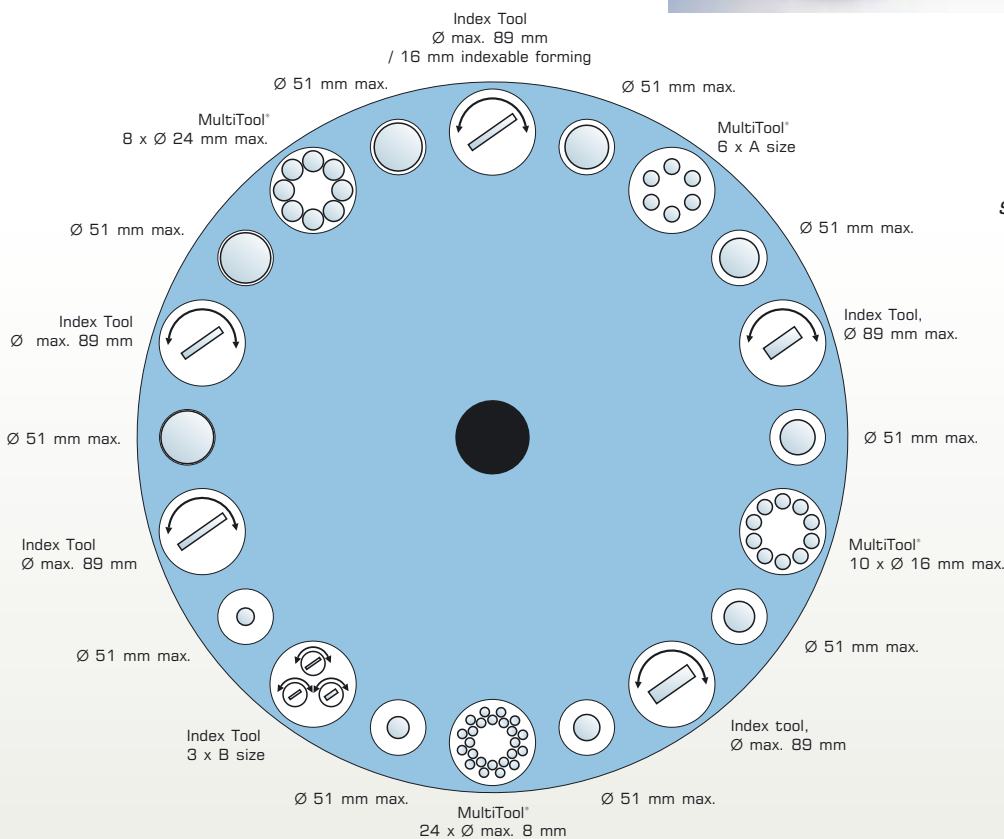


FINN-POWER PUNCHING FEATURES

Up to 200 tools

The turret layout is customer-specific. Various tool holder sizes can be changed or switched from station to station. Thick turret tooling style is used, and you can often use your existing tooling. Additional index stations can be added up to 10 (optional).

Multi-Tool® allows the astonishing versatility of 200 tools simultaneously in the turret, with both indexable and fixed Multi-Tools® available.



Example of a customer specific turret layout. This one includes 66 tools, of which seven index tools and one indexable high-forming station.

Fast Auto index system

Up to 10 large index stations (88.9 mm / 3.5") and even 80 indexable tools with R Multi-Tools® can be installed.

The fast auto-index system is based on an AC servo motor; the rotation mechanism of the punch and die is mechanically engaged and disengaged vertically. Tool rotation can be programmed in 0.001° increments and throughout the 360° rotation. The

system automatically selects the shorter path to desired angle.

Full tonnage and punch speeds can be used in any station, with any tool size.





Automatic clamp setting and moving

FINN-POWER's patented programmable automatic clamp positioning eliminates the need for clamp protection areas as well as manual clamp set-up. The machine is therefore ready for another job in a matter of seconds. Programmable clamp setting (PCS) allows 100 % material utilization. PCS also enables an individual clamp to be moved during the program.

This feature eliminates dead zones and allows virtually 100 % of the material to be utilized with no compromise to part accuracy as the sheet remains fixed by the other clamps. The LPe6 / LPe8 is equipped with 3 clamps as standard but an optional 4th sheet clamp for better grip and additional support for large sheets can be added any time.

Powerful numerical control

LPe6 is equipped with the leading Siemens Sinumerik 840D including an Ethernet connection and fast NC program downloading as standard.

Machine tables

Machine is equipped with full sheet support tables for the maximum sheet size and weight as standard. The brush tables ensure best possible sheet support, keep noise level low and maintain sheet surface quality.



Easy maintenance

In machine construction, special care has been taken to ensure as easy access to service points as possible. The need for maintenance is reduced by central lubrication and control cabinet cooler, which are included as standard.

Outstanding, guaranteed accuracy

FINN-POWER systems have always been known for their high accuracy. The combination of optimum speed and high accuracy is achieved through improvements in coordinate table design, numerical control and high speed adjustment algorithms.

All turret punch presses undergo a punching accuracy testing programme specified in the FINN-POWER factory standard LKP-7300.



PRODUCTION NEEDS VARY – MODULAR OPTIONS PROVIDE THE ANSWER

One of the cornerstones of FINN-POWER's well-known flexibility and versatility is the wide range of optional equipment available for meeting specific fabrication requirements. Each machine can be customized to meet specific requirements exactly, using standard modules.

Extra clamp

The machine can be equipped with an optional sheet clamp for better grip and additional support for larger sheet sizes.

E-station

The turret of a 300 kN punch press can be equipped with 114.3 mm (4.5") E-size tool holder. The holder is for use with cluster, off-centre, punching and forming tools.

Multi-Tool® stations

The turret can be equipped with Multi-Tool® stations to increase the number of tools. Multi-Tool® stations are mounted on the turret like a normal tool station, and the tools are mounted in rapidly changeable punch and die cassettes.

The latest development in Multi-Tool® technology is the possibility of using drop-in style Multi-Tools® on D-size index tool holders. The system has been developed by FINN-POWER in cooperation with Wilson Tool International and Mate Precision Tooling.

Indexable or fixed angle drop-in Multi-Tools® in different types and sizes are available. This technology increases tooling capacity and makes setup fast and easy – an excellent solution in short batch production when tooling setup is required frequently during the day.





State-of-the-art forming solution

The safe and natural solution for sheet metal forming is from below the sheet. Using a servo electrically actuated die holder and die movement, the common hazard caused by conventional, high forming dies – scratching of the sheet, collisions, bending of the components etc. – is automatically avoided.

With the upforming unit, versatile forms up to 16 mm (0.63") in height (incl. sheet thickness) can be made. Fabrication of louvers, knockouts, hinges, all complex forms is simple.

New forming modes improve both speed and upforming possibilities. Not uncommonly, even slightly complex forming operations have required the installation of several forming tools in the turret. This means not only a considerable investment in tooling, but a reduction in available turret capacity. The problem is solved with an indexable forming system, which uses standard forming tools.

Continuous forming

Wilson Wheel and Mate Roller Ball are special forming tools which make continuous forms with a selected ball or wheel during linear or arc movement of the sheet. FINN-POWER has developed wheel and ball applications further. The tools can be used in index and upforming stations, and special soft commands can be used. This allows forms which a varying height over their length.

Marking

Mate Sheetmarker and Wilson scribing tool are special tools for marking sheet metal. They can be used like a "pen" for writing and drawing according to program. The tools can be equipped with hardened spike or a diamond head for different materials. Marking can be performed into programmed depth and can thus be visible also after painting.

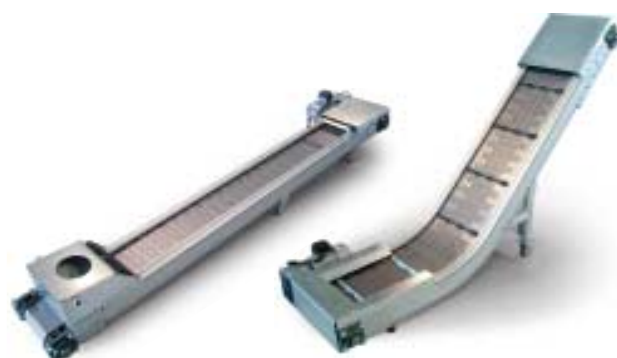


Tapping

A six-station servo driven tapping unit (option) can be installed for extensive threading capacity. Alternatively, a one-station unit utilizing the fast index system and accurate ram control is available.

... and much more...

Further options available include UPS and RAID system for cell control computers, an electronic transformer, and an EMC/RFI filter, which prevents eventual voltage peaks and unwanted electric distortions from reaching the machine. For scrap removal, several types of conveyors and a vacuum suction unit can be chosen.



EXCELLENCE IN LASER CUTTING

Laser processing

The diffusion cooled Rofin Slab laser with 2,500 Watt laser power allows the processing of a wide range of materials used in a sheet metal workshop. Slab lasers have proven their reliability in thousands of installation in manufacturing industries.

This compact and highly efficient solution offers laser power with excellent mode structure (K-factor is 0.9 or better). This allows cutting speeds comparable to more than 3,000 Watt laser power in conventional laser types.

A diffusion-cooled laser does not require moving parts like a turbine. This results in extremely low stand-by electrical power consumption, and service requirements are low. Additional major advantage and cost saving factor of this type of laser is the practically negligible laser gas consumption.

A small gas bottle is integrated into the laser head, which eliminates the need for auxiliary resonator gas supply installations and the logistic needed for frequent gas cylinder change. Fresh laser gas needs to be supplied only at certain intervals, thus the ready-made gas mix bottle will last for a period of more than a year.

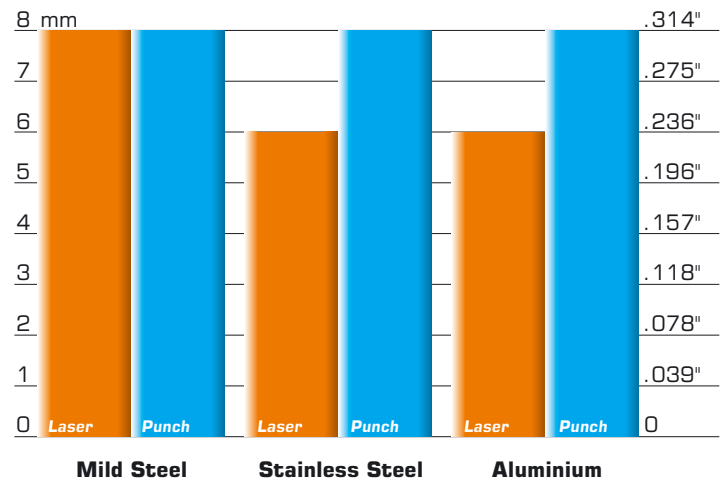
The laser and the beam delivery system are built into the system on an rigid and completely isolated frame support.

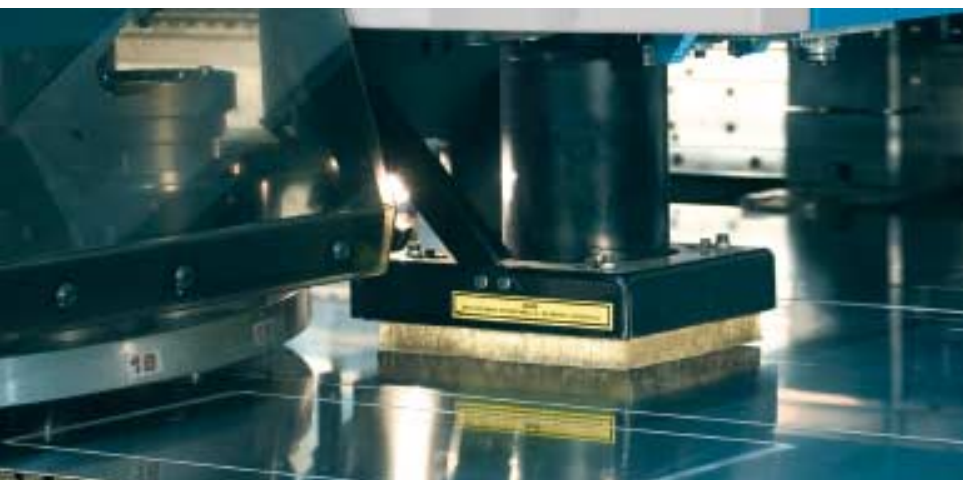
The system is protected by special isolation dampers against vibrations coming from the turret punch press as well as from other equipment and machinery to guarantee the highest laser beam stability and accuracy.

The high-quality laser beam is guided via two mirrors onto the focussing lens, which is mounted into a high pressure autofocus cutting head, featuring a capacitive (non-contacting) measuring system, automatic fast calibration, and connection for different cutting assist gases with fully automatic regulation.

Due to the intelligent quick-change cassette system of the cutting head, a new or different focusing lens can be changed by the operator in seconds.

Material Thickness Range





Laser cutting head



Diffusion cooled CO₂ SLAB Laser



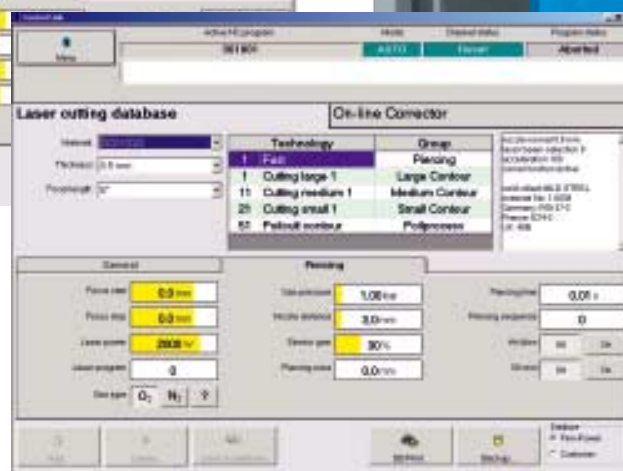
EXCELLENCE IN USER FRIENDLINESS

ControlLink and laser parameter manager

The operator interface software, installed on an industrial PC, has been developed by FINN-POWER to support the operator in several ways facilitating self-learning possibilities, giving recovery instructions and simple access to electronic manuals etc. This multi-tasking control provides easy access to NC programs, tool, or forming parameters and the laser parameter manager, etc.

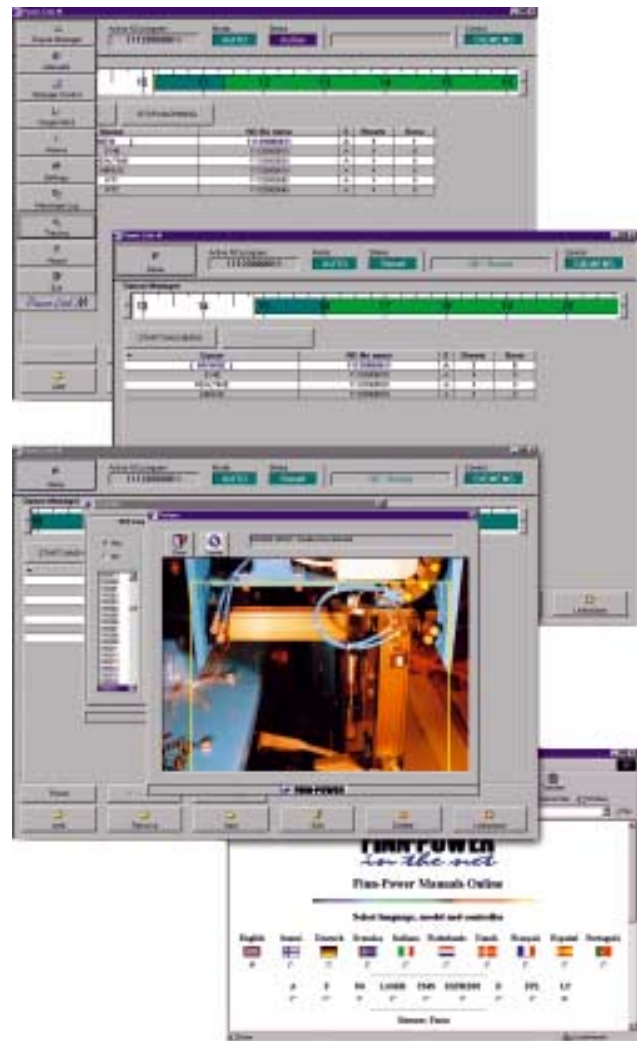
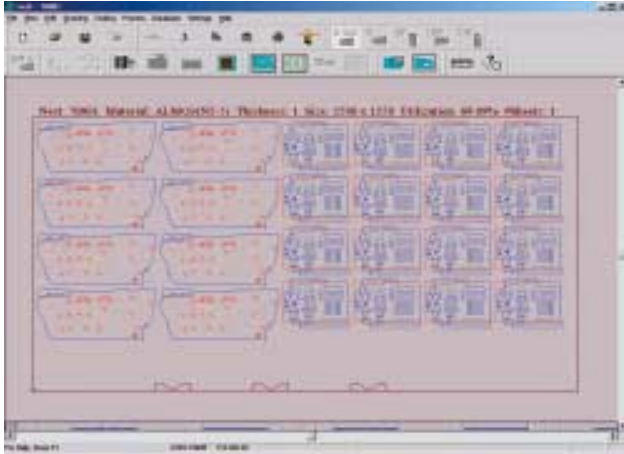
The system allows work preparation, tool management, and setup while the machine is running, thus minimizing the time between jobs.

FINN-POWER's solution for controlling laser processing and cutting parameters features a database for storing a practically unlimited number of combinations of laser parameters for various materials. All the operator has to do is specify the material and sheet thickness and the system automatically determines the parameters needed for proper part processing.



Sophistication in software

FINN-POWER is also a pioneer in multimedia machine diagnostics that provide extensive support to the user in graphical format. The multimedia based, integrated diagnostic system helps the operator monitor the different machine functions and quickly identify and correct possible operational unstabilities.



By using Teleservice, the Siemens Sinumerik 840D CNC control can be connected directly to FINN-POWER's customer support organization for diagnosis and analysis of the entire system.

The remote monitoring optional feature provides a connection between the system and a remote monitoring station where the current machine status is readily available. The data available include: program in progress information, operational status of different system components, active alarms, and others.



FINN-POWER also offers the option of Alarm Text Messaging to GSM. The GSM message of system is able to send text messages to the operator's GSM telephone in case the machine stops during an unmanned operation period. Continuously monitored system status is guaranteed for highly productive manufacturing. (Available only when GSM network is present.)

EXCELLENCE IN AUTOMATION

LPe6 with LSR – robot solution for loading, unloading and high precision stacking

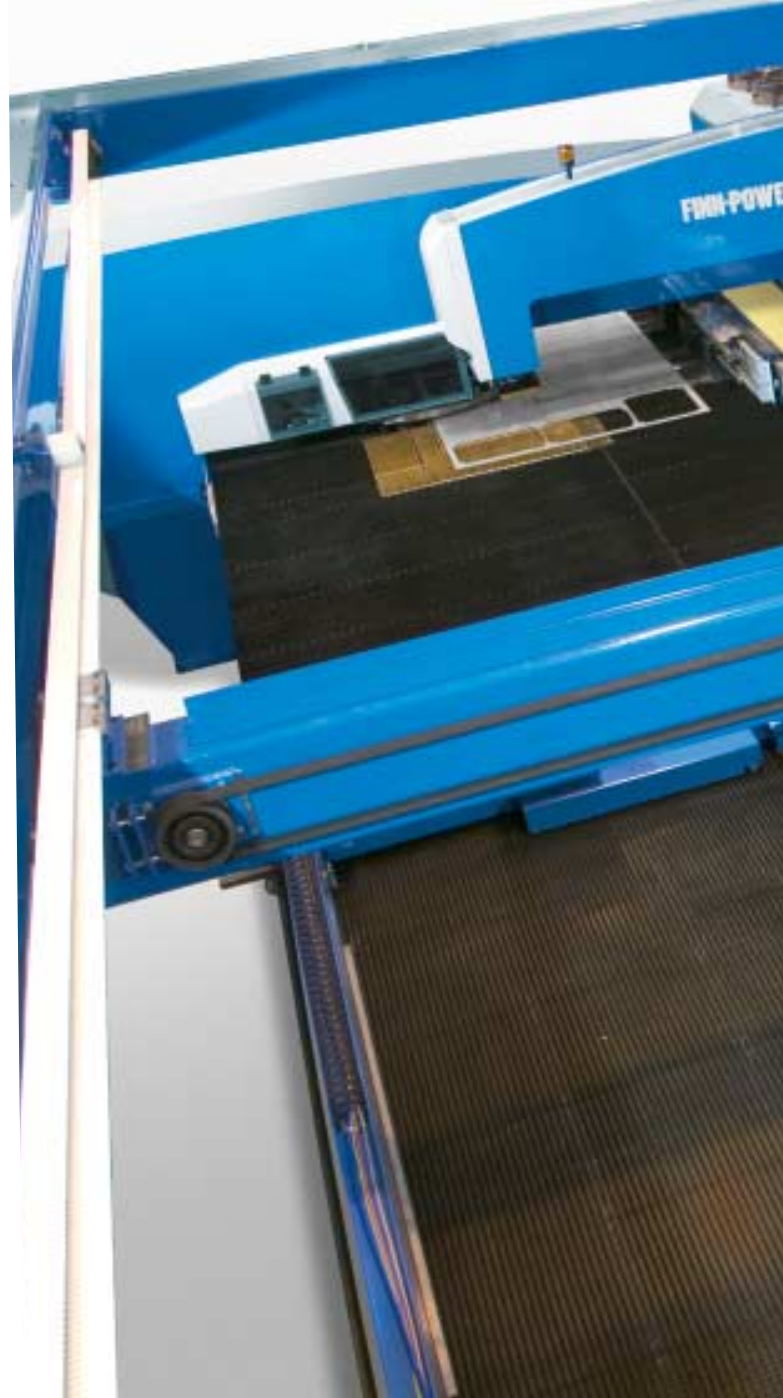
FINN-POWER's extensive experience in integrated manufacturing solutions is obvious in the compact overall design of the LPe6 cell. It allows flexible automation of the material flow for added productivity.

FINN-POWER started automating the material flow in sheet metal processing 20 years ago, the first step being automation of loading and unloading.

Today, FINN-POWER's modular system allows full automation of the entire material flow. The equipment is custom engineered from a range of standard modules to meet exactly the specific requirements of your production.

In the area of material handling of laser cut components, FINN-POWER has one of the most versatile sorting and stacking solutions in the market. These modules completely automate this section of the material flow – even for complex nests.

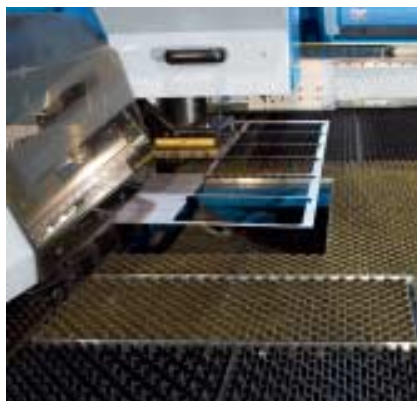
True to FINN-POWER's application oriented design principle, our modular range consists of a number of solutions that automate the following steps in the overall material flow:



- Scrap removal from punching and laser cutting outside the system
- Sorting of small parts into sorting boxes



- Sorting and stacking of components
- Integration with an automatic sheet storage or within Night Train® FMS.



FINN-POWER LPe6 features a unique part removal solution using three different, sensor monitored drop doors to guide parts outside the machine area:

- work chute for punched parts (500 mm x 500 mm / 19.7" x 19.7")
- two drop doors for laser cut parts (300 mm x 400 mm / 11.8" x 15.7" and

MODULAR RANGE OF SOLUTIONS TO AUTOMATE YOUR MATERIAL

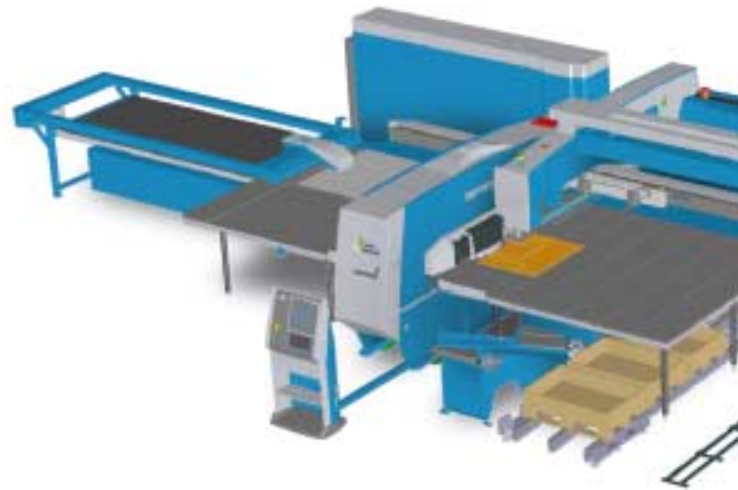
JUST SOME OF OUR SOLUTIONS...

FINN-POWER solutions for automating punch-laser combination systems are designed to optimize productivity:

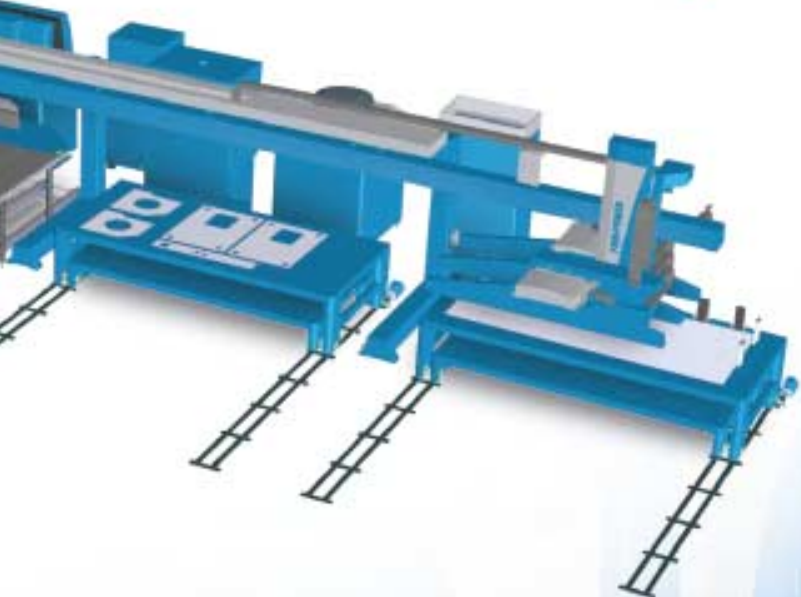
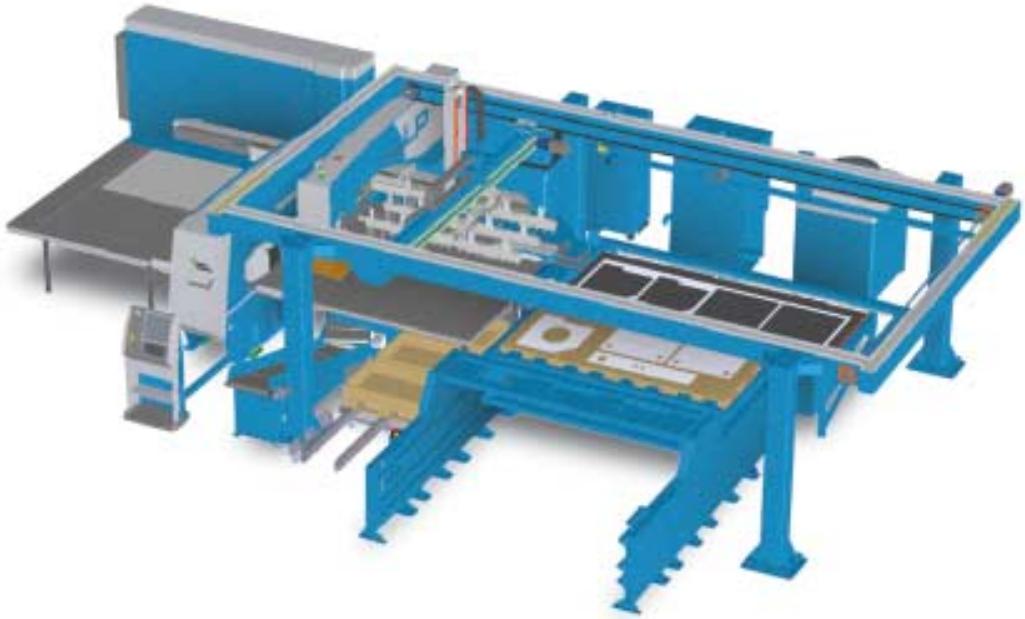
LPe6 Express – FINN-POWER Express – automation for FMU or system integration consisting of a loading and an unloading device with a wide range of optional tables for loading and unloading the sheets.

LPe6 LST – FINN-POWER LST – easy solution for loading and component sorting including an unloading device. There is a choice of two models available – long and short – as well as optional table versions for the individual devices.

LPe6 LSR – FINN-POWER LSR – robot solution for loading and high-precision stacking. This 5 axis, high-performance loading, unloading and stacking robot is designed for comfortable operation, versatile part stacking and small floor space requirements.



FLOW



E TECHNOLOGY BY FINN-POWER



FINN-POWER introduced its first servo electric turret punch press in 1998. Since then we have continued developing this sophisticated punching technology, and extended servo electric solutions to other fabrication techniques.

Today, FINN-POWER offers probably the widest range of servo electric machine tools and manufacturing cells for flexible, productive sheet metal working. What they all have in common is an outstanding degree of versatility, precision and manufacturing economy.



Servo electric press brakes



Servo electric turret punch presses



Integrated servo electric punching and laser cutting



Servo electric bending machines and automatic bending cells



FINN-POWER IN BRIEF

FINN-POWER Oy and its worldwide network of subsidiaries and representatives specialize in advanced sheet metal working technology. The company was established in 1969. Since February 2008 the group is owned by Prima Industrie S.p.A.

Following the introduction of its first hydraulic turret punch press in 1983, FINN-POWER has developed a modular product range for:

- ▶ ***punching***
- ▶ ***laser cutting***
- ▶ ***punching/shearing***
- ▶ ***punching/laser cutting***
- ▶ ***bending***
- ▶ ***automation of the entire material flow.***

Flexibly yours®



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