

# FINN-POWER

► **PUNCHING**

■ **LASER CUTTING**

■ **BENDING**

■ **INTEGRATED PUNCHING & SHEARING**

■ **INTEGRATED PUNCHING & LASER CUTTING**

■ **FLEXIBLE MANUFACTURING SYSTEMS**



## **E SERIES TURRET PUNCH PRESSES**

# DISCOVER THE UNIQUE VERSATILITY OF SERVO ELECTRIC PUNCHING

***The new generation of FINN-POWER's servo operated E series turret punch presses offers versatile punching, nibbling, forming and bending capacity on a single machine tool.***

Based on the ECOPUNCH® concept, the E series is an astonishing money saver, featuring

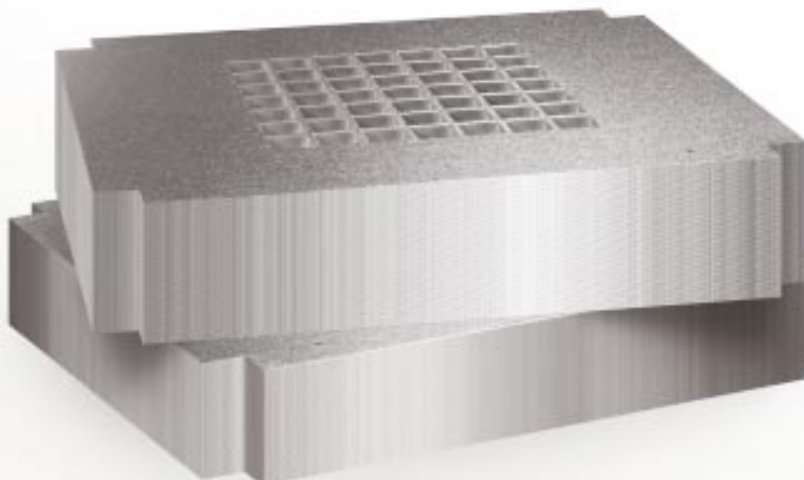
- Low connection power
- Low power consumption
- Low maintenance costs
- High speed
- High accuracy
- High repeatability

Moreover, carefully planned ergonomics, low noise level and modern industrial design combine to make the E series turret punch press a truly state-of-the-art solution for flexible, productive fabrication.



## OPERATING COST vs. VOLUME

Production  
by traditional  
method



**FINN-POWER E:**  
Production  
at same  
energy and  
maintenance  
cost



## **Energy in Efficient Use®**

### **FINN-POWER E TECHNOLOGY OFFERS YOU**

Sheet sizes 2,500 mm, 3,000 mm or 4,300 mm (96", 121" or 170")

Max. ram speed up to 2,800 hpm (marking)

Punching forces 20 or 30 ton (23 or 33 US ton)

Average power consumption: 5 kVA / 4 kW

Power consumption when idle: less than 1 kW

Power supply connection: 15 kVA (3 x 20 A fuse / 400 V)



## THREE MODELS FOR DIFFERENT SHEET SIZES

### **FINN-POWER E5** – small layout and convenient operation

- Max sheet size without repositioning 2,530 mm x 1,270 mm [96 " x 48 "]
- Punching speed 800 hpm at 1 mm pitch

### **FINN-POWER E6** – higher range of automation and optional features

- Max sheet size without repositioning 3,074 mm x 1,542 mm [121 " x 60 "]
- Punching speed 900 hpm at 1 mm pitch

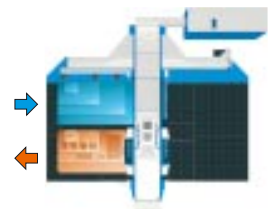
### **FINN-POWER E8** – full support for large sheet sizes

- Max sheet size 4,300 mm x 1,565 mm [169.3 " x 61.2 "]
- Punching speed 900 hpm at 1 mm pitch

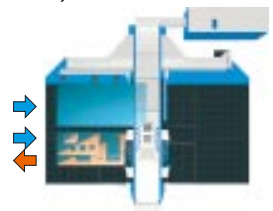
### **E technology features**

- Servo operated: the punching and forming stroke become NC controlled axes
- 200 kN (23 US ton) punching force
- Extremely high punching and forming accuracy
- Robust "O" type frame for perfect tool alignment
- Compatible with all latest tooling options
- Max. 200 tools in turret, of which 80 index tools
- MultiTools® for additional punching versatility
- Intelligent Stroke Control (ISC)
- Forming up to 16 mm (0.63") in height measured from the bottom of the sheet
- NC controlled forming stroke; repeatability 0.01 mm (0.004")
- Progressive forming – possibility of integrated bending
- Tapping unit can be integrated
- Large work chute for component removal
- Central lubrication for less maintenance
- Servo controlled punching and high forming axis – 5 axis synchronous roll forming mode
- 300 kN (33 US ton) punching force update possible

*E5 material flow*



*E6/E8 material flow*



- ➡ Sheet loading
- ➡ Part unloading

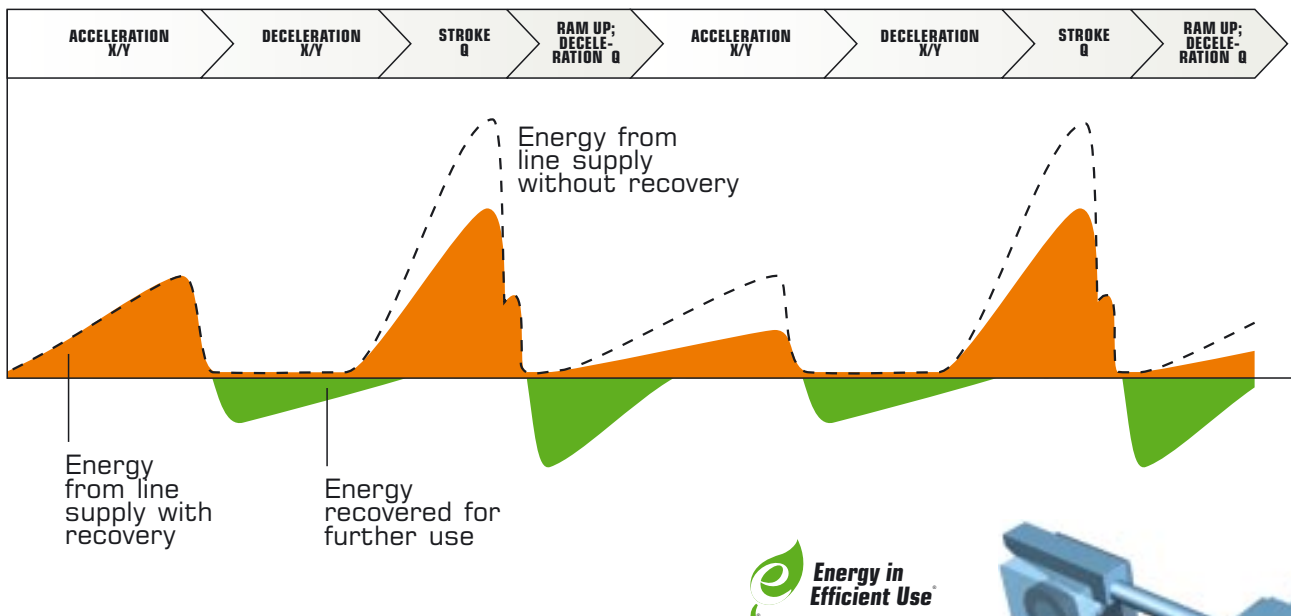
*Some of the listed features are options*





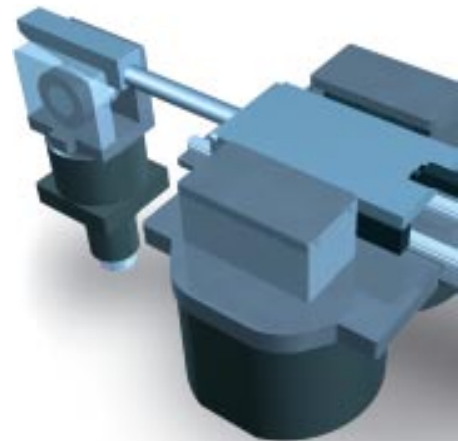
# ENERGY SAVING PRINCIPLE

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.



The E series 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.

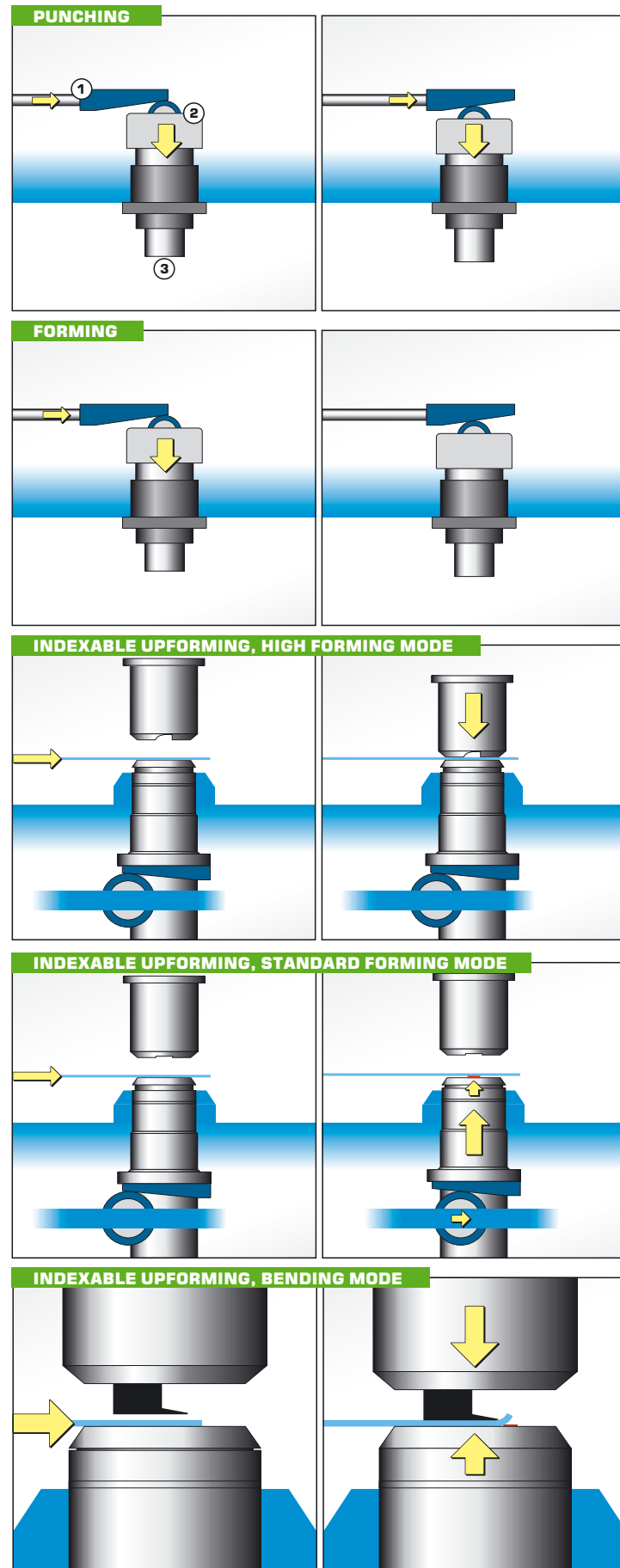
In the forming mode, ram movement is programmed to stop when the desired forming stroke position has been reached, after which the return movement of the roll and the ram begins. The stroke is NC-controlled and thus forming accuracy is outstanding. The static counter-force required in forming equals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

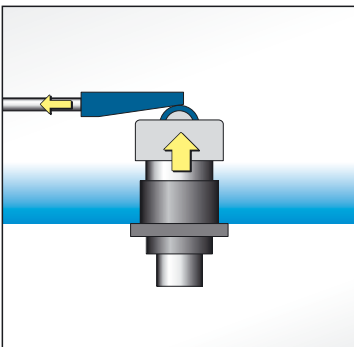
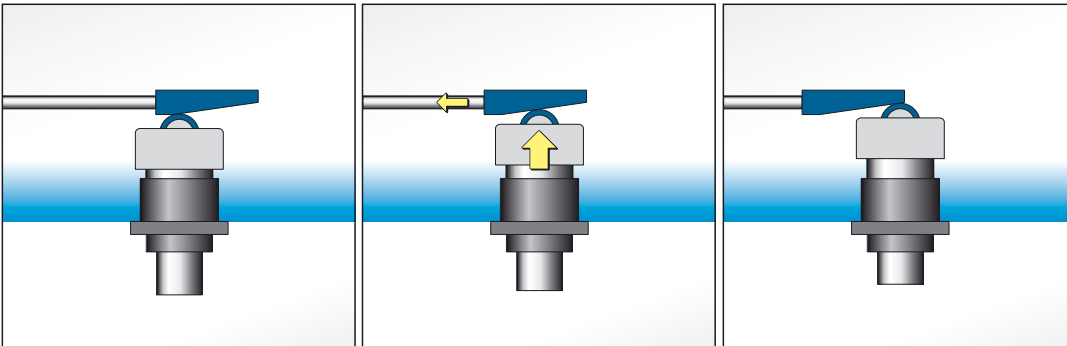
## Upforming

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.

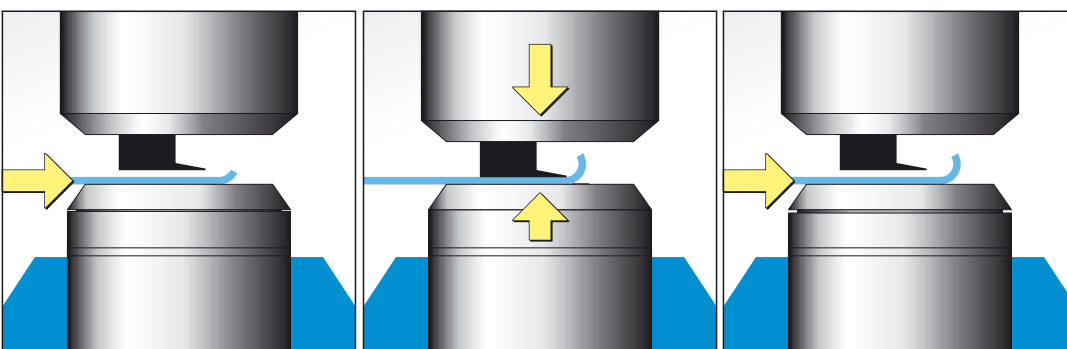
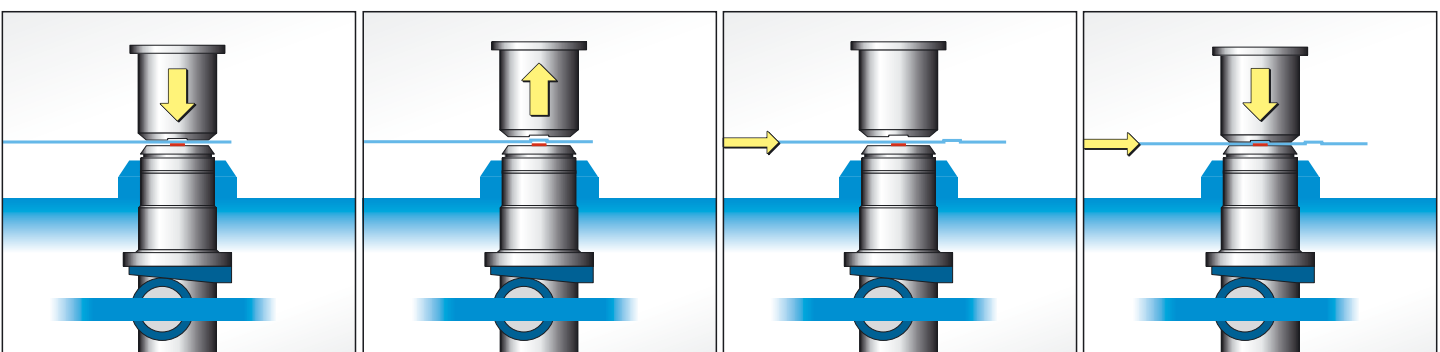
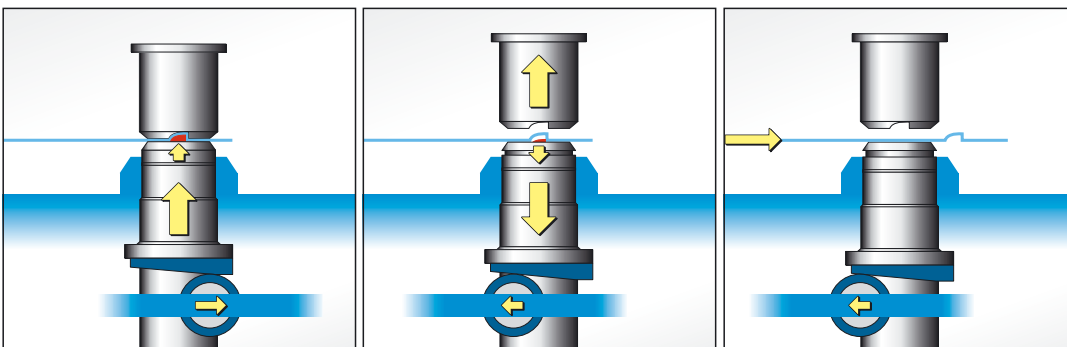
Forms up to 16 mm (0.63") in height (inclusive of sheet thickness) can be made. Due to the possibility of indexing the parts can be freely nested, resulting in major savings both in raw material and tooling cost.

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 in  
Efficient Use<sup>®</sup>***



# FINN-POWER PUNCHING FEATURES

## Solid engineering

FINN-POWER machines have a rugged "O" frame. Upper and lower turret plates are machined as a set to eliminate any flexing and yawing.

## Sheet positioning

The machine features an axis actuation system based on maintenance free AC-servo motors. The rotation movement of the motors is transformed into linear movement by precision ball screws or rack & pinion systems (E6). The construction allows high positioning speeds and axis acceleration with excellent accuracy. Machine dependent default sheet size can be processed without repositioning (E5/E6). The working area can be expanded in X-direction with automatic repositioning.

## Automatic clamp setting and moving

FINN-POWER's patented Programmable Clamp Setting PCS is a standard E series turret punch press feature. It automatically positions sheet

clamps according to numerical program. The possibility of punching the clamps is eliminated, and programming is easier.

When changing production from full size to small sheets, clamp settings can be made automatically without wasting operator time.

Dead zones are completely eliminated with an individual clamp movement as well as using traditional repositioning. While moving one clamp, the sheet is held by the two other clamps.

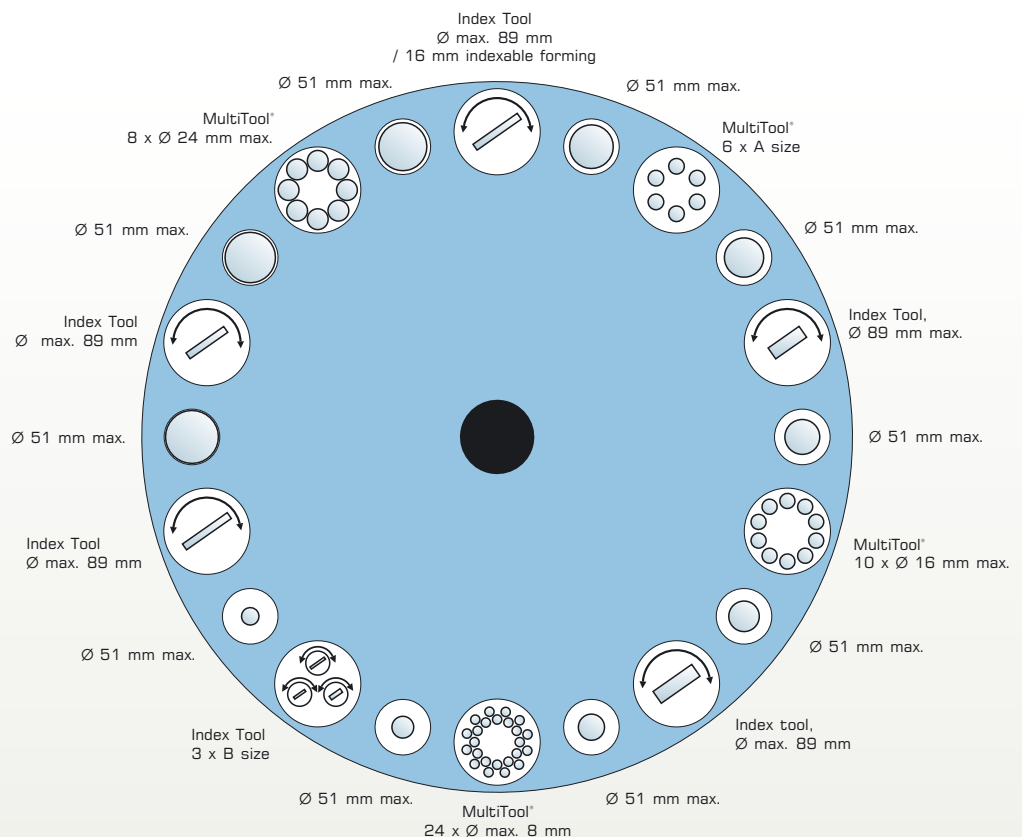
## Up to 200 tools

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.

### **Powerful numerical control**

E Series turret punch presses are 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 low noise level and maintain sheet surface quality.

### **Sophisticated software**

FINN-POWER's Windows® based PowerLink cell control allows unattended running of automatic work queues, even up to 24-hour unmanned operation.

FINN-POWER's ControlLink software is a user interface for operating all machine functions. It features user-friendly diagnostics, interactive electrical drawings, full machine manuals, spare part library, etc.

### **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 turrets 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-7100.



# 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.



## Tool and sheet lubrication systems

Continuous automatic tool lubrication extends the lifetime of spring housing, sliding surfaces of tool and punch, and makes stripping easier.

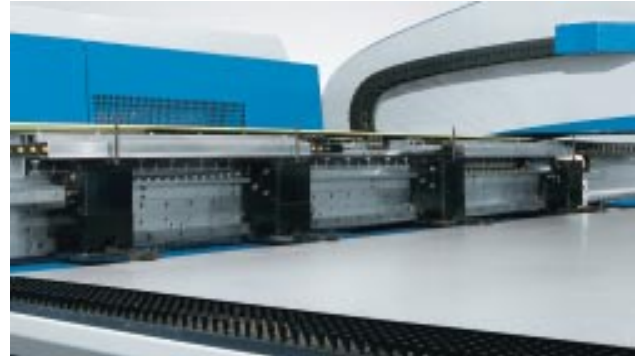
The sheet lubricator sprays cutting fluid automatically onto the sheet, extending lifetime of the punches.

## 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 in height (incl. sheet thickness) can be made. Louvers, knockouts, hinges, all complex forms can be made.

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 have a varying height over their length.

### Marking

Mate Sheetmarker or 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.



### Fast component identification

Integrated, continuous-flow inkjet marking solution ensures the availability of sufficient information at the next process stage (logistics, assembly, packing, etc.). The option is available for E6 and E8.

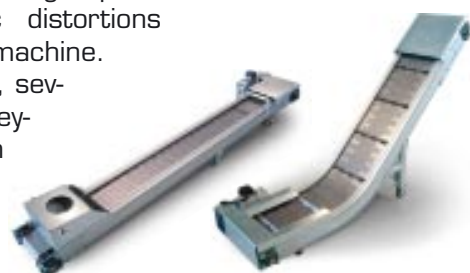


### Flexible tapping solutions

Versatile tapping capability can be integrated either with a servo driven, six-station tapping unit TU6 or by the EasyTap™ system developed by FINN-POWER in cooperation with Mate Tooling.

### ... 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.





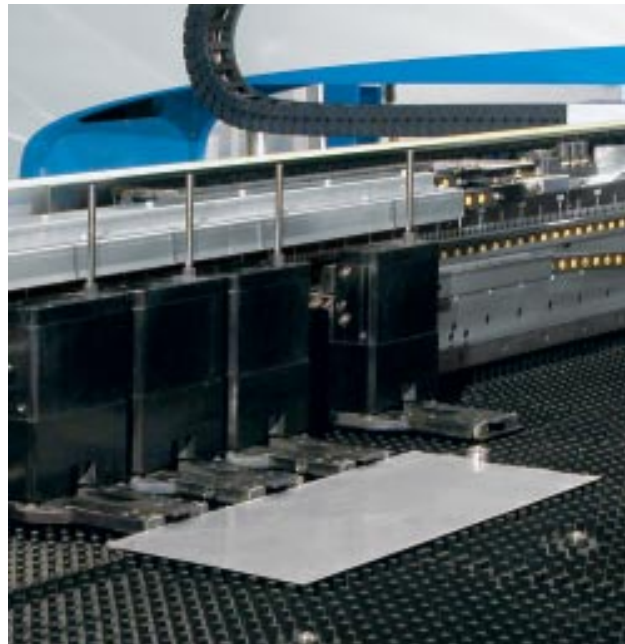
# EASY TO OPERATE



## Easy load features

Whether you are processing small, pre-cut sheets or full size material, sheet loading takes place with a simple push and always close to the table edge with four optimally positioned gauge pins. The loading cycle has been designed for optimum operator ergonomics. Sheet supports rise up from the table to allow easy positioning of heavy sheets. Manual loading is easy even with automation devices added to the system.

Unloading of processed components is semi-automatic: the machine places the component in a freely programmable position on the table, increasing efficiency and making the operator's work much easier.



## Material flow

The whole material flow can be handled from one side. This means simple, efficient logistics and the freedom of positioning the machine anywhere in your plant, even in a corner.

## Large work chute

The work chute option can be used for removing parts up to 500 mm x 500 mm (19.7 " x 19.7 ") in size. In small part production this makes micro jointed parts unnecessary. A part detection function and a three address sorting device to automate part sorting are also available.



# MORE PRODUCTIVITY WITH FLEXIBLE AUTOMATION OF MATERIAL FLOW



Three complementary solutions are available for automating the material flow of the E Series turret punch press.



Compact Express is a fully automated material handling device. The placing of the automatic loading and unloading unit makes it possible to use several combinations of automatic and manual loading and unloading cycles. The manual loading table is free for use for manual operation.

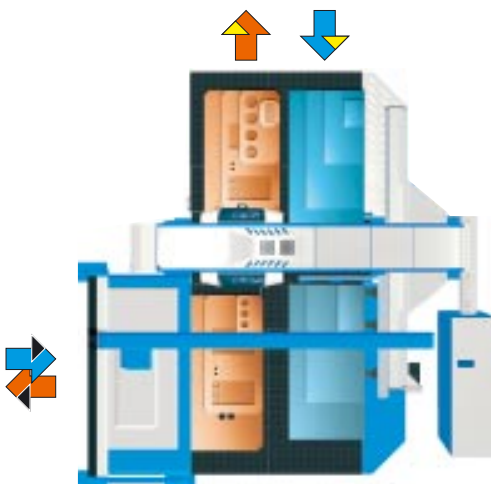
## 1 Compact Express – fast loading and unloading with a small footprint Available for E5 and E6

- ➡ automatic loading ➡ automatic unloading
- ➡ manual loading ➡ automatic unloading
- ➡ automatic loading ➡ manual unloading
- ➡ manual loading ➡ manual unloading

Loading capacity is 3,000 kg (6,614 lbs), with max. stack height of 350 mm (13.8 "). Sheets are loaded from a loading table to the clamps of the turret punch press. Double sheet detection and centering can be performed for every sheet.

Ready sheets are unloaded using a moving table, and they can be stacked on an unloading table, which is below the moving table.

Raw material can be added and unloaded sheets removed while the machine continues to operate.



*Short cycle time with Compact Express*





## MORE PRODUCTIVITY WITH FLEXIBLE AUTOMATION OF MATERIAL FLOW

### 2 **FINN-POWER Express – automation for FMU operation or system integration** Available for E6 and E8

The E6 Express and E8 Express construction consists of a loading device, an unloading device and loading and unloading tables.

In the standard model, the sheet stack is positioned on a stationary loading table which is equipped with magnetic sheet separators; manual stack adjustment is possible using the floating table cover.

Sheet positioning and double sheet detection functions are integrated in the system and can be used for each sheet. The loading device is electrically operated, and suction cup areas are programmable.



The unloading device is used to unload material from the turret punch press automatically.

Alternative table types for loading and unloading are available from a single manual table up to a double automated table. The double loading station allows automatic changing of sheet stack material.

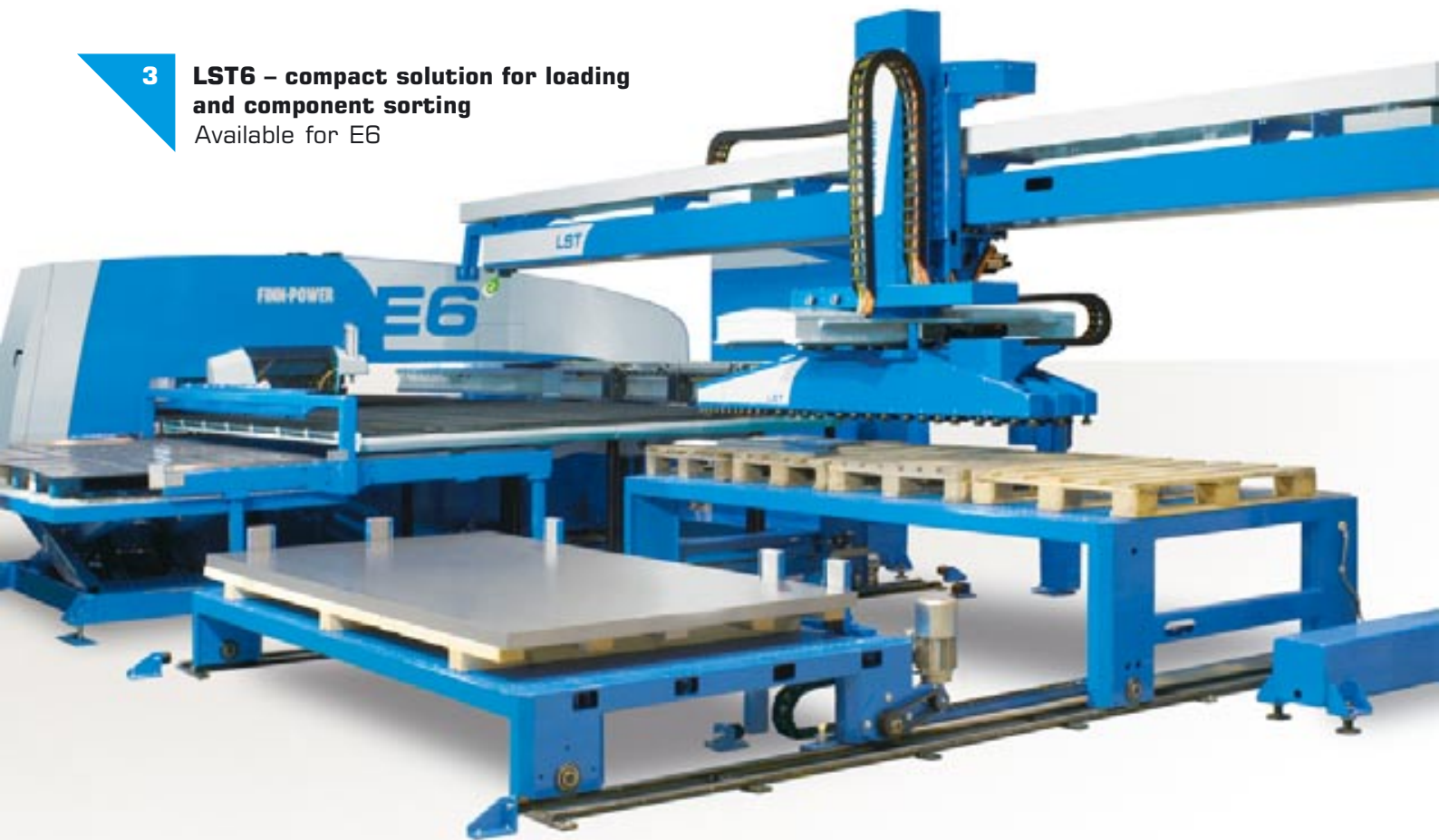
FINN-POWER Express can be connected to sheet storages and to FMS systems.



3

### LST6 – compact solution for loading and component sorting

Available for E6



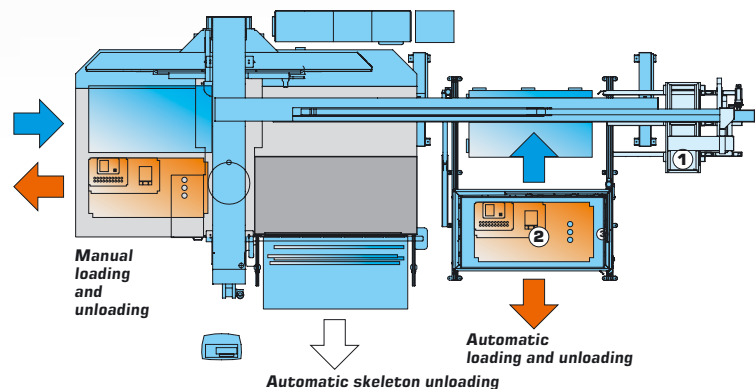
LST6 is a compact, automatic sheet loading and part sorting system. LST6 loads sheets to the machine, picks up parts from the machine and sorts them to the programmed coordinate. Loading capacity is 3,000 kg (6,614 lbs), with max. stack height of 250 mm (9.8").

Punched parts are picked up in front of the turret by using a vacuum gripper (1). Parts are sorted on the moving table (2) in programmed position. Three moving gripper bars make it easy to pick up parts inside the skeleton.

Skeletons are unloaded using an unloading device, UD or UDC.

There is a choice of two models. The long model can be equipped with up to four moving tables. The short model is more compact and can be equipped with max. two moving tables. The first table is used for sorting and the second for loading. In the basic model, both raw material and sorted part pallets are on the floor. Several options are available for customizing the loading/sorting equipment best to meet logistic requirements.

The three moving gripper bars have a total of 1,200 mm (47.2") movement area in Y-direction. This makes it possible to sort parts into several different positions in Y-direction without moving the wagon under the gripper.



*Flexibly yours®*



## FINN-POWER GROUP

### Global Headquarters & Manufacturing

**Finn-Power Oy**  
P.O. Box 38  
FI-62201 Kauhava  
FINLAND  
Tel. +358 6 428 2111  
Fax +358 6 428 2244  
[www.finn-power.com](http://www.finn-power.com)

### Sales & Service Units

#### Benelux

**Finn-Power N.V.**  
Leenstraat 5  
B-9810 Eke-Nazareth  
BELGIUM  
Tel. +32 9 382 9030  
Fax +32 9 382 9031

#### Germany

**Finn-Power GmbH**  
Lilienthalstr. 2 a  
D-85399 Hallbergmoos  
GERMANY  
Tel. +49 811 55330  
Fax +49 811 1667

#### Canada

**Finn-Power Canada, Ltd.**  
1040 Martingrove Road, Unit 11  
Toronto, Ontario  
M9W 4W4  
CANADA  
Tel. +1 416 242 4431  
Fax +1 416 242 7867

#### Italy

Headquarters & Production  
**Finn Power Italia srl**  
Via Finlandia, 2  
37044 Cologna Veneta (VR)  
Tel. +39 0442 413111  
Fax +39 0442 413199

#### Sales & After Sales

**Finn Power Italia srl**  
Via Denti, 38  
25020 Cadimaro di Fiesse  
(BS)  
Tel. +39 030 9506311  
Fax +39 030 9506340

#### Spain

**Finn-Power Iberica, S.L.**  
Ctra. Molins de Rei-Rubí,  
km. 13,5 Nave 5  
08191 - RUBÍ (Barcelona)  
Tel. +34 902 302 111  
Fax +34 902 302 112  
SPAIN

#### China

**FINN-POWER  
Representative Office**  
1/F, Block 1,  
Golden Dragon Ind. Centre  
152-160 Tai Lin Pai Road  
Kwai Chung, N.T.  
Hong Kong, P.R. CHINA  
Tel. +852 2427 7991  
Fax +852 2487 5548

#### Finland

**Finn-Power Oy**  
P.O. Box 38  
FI-62201 Kauhava  
FINLAND  
Tel. +358 6 428 2111  
Fax +358 6 428 2083

#### France

**Finn-Power S.A.R.L.**  
13, avenue Condorcet,  
F-91240 St Michel-sur-Orge  
FRANCE  
Tél. +33 1 69 46 55 80  
Fax +33 1 69 46 55 81

#### United States

**Finn-Power International, Inc.**  
710 Remington Road,  
Schaumburg, IL 60173  
USA  
Tel. +1 847 885 3200  
Fax +1 847 885 9692

For world-wide FINN-POWER  
Sales & Service representati-  
on, see [www.finn-power.com](http://www.finn-power.com)

FINN-POWER, Flexibly yours, Combi FMS, Bendcam, Bendterm, Ecobend, Energy in Efficient Use, Ecocut, Ecopunch, Express, ISC, Multi-Tool, NC Express, Night Train FMS, Shear Genius and Shear Brilliance are registered trademarks. All other product names identified through-out this publication are trademarks or registered trademarks of their respective owners.

The photography and line art shown throughout this brochure may not be indicative of the final product. Equipment and equipment design is subject to change without notice. Safety devices have been removed from photography and line art for layout purposes.