FINN-POWER

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

C SERIES TURRET PUNCH PRESSES

TECHNOLOGY OF THE FUTURE BASED ON 25 YEARS OF PIONEERING EXPERIENCE

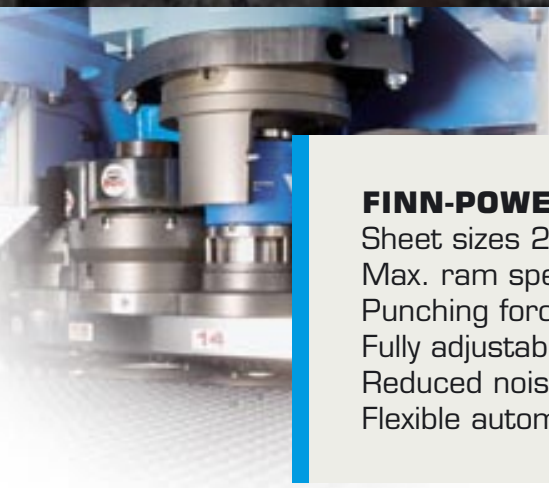
- ***Energy saving hydraulics***
- ***Full FINN-POWER versatility of automation***
- ***Full FINN-POWER versatility of options***

FINN-POWER's range of hydraulic turret punch presses combines twenty five years of pioneering experience with our tradition of continuous innovation and improvement. The result is a major step forward in hydraulic punching: a unique combination of reliability, versatility and high performance with ease of operation and maintenance.

This new fabrication solution is both fast (1,100 hpm in nibbling, and index speed 166 rpm) and heavy-duty (300 kN / 33 US tons).

In keeping with FINN-POWER tradition, several automatic material handling solutions are available to add unmanned operation to the versatility of the turret punch press.

The TP 250 was introduced in 1983, starting the process that made FINN-POWER the true pioneer in hydraulic punching technology. Today, hydraulic punching is the standard solution, and more than 5,000 FINN-POWER turret punch presses serve their users all over the world.



FINN-POWER C SERIES 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 force 30 ton (33 US ton)
Fully adjustable punching stroke
Reduced noise and energy consumption
Flexible automation of material handling through modular system upgrades

THREE MODELS FOR DIFFERENT SHEET SIZES

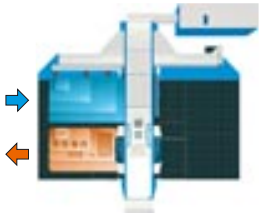
FINN-POWER C5 – small layout and convenient operation
- Max sheet size without repositioning 2,530 mm x 1,270 mm [96 " x 48 "]
- Punching speed 1,100 hpm at 1 mm pitch

FINN-POWER C6 – higher range of automation and optional features
- Max sheet size without repositioning 3,074 mm x 1,542 mm (121 " x 60 ")
- Punching speed 1,100 hpm at 1 mm pitch

FINN-POWER C8 – support for large sheet sizes
- Max sheet size 4,300 mm x 1,565 mm (169.3 " x 61.2 ")
- Punching speed 1,100 hpm at 1 mm pitch

Techical features
- Fast, strong and accurate hydraulic punching
- 300 kN (33 US ton) punching force
- High punching and forming accuracy
- Robust "O" type frame for perfect tool alignment
- Compatible with all latest tooling options
- Fast 166 rpm indexing
- Large Ø 89 mm index tools
- Max. 200 tools in turret, of which 80 index tools
- MultiTools® for additional punching versatility
- Hydraulic 250 kN (27.5 US ton) upforming cylinder
- Forming up to 16 mm (0.63") in height measured from the bottom of the sheet
- Progressive forming – possibility of integrated bending
- Tapping unit can be integrated
- Large work chute for component removal
- Central lubrication for less maintenance (C6/C8)
- Roll forming and diamond marking capability
- Brush tables and easy manual sheet loading

C5 material flow



C6/C8 material flow

Sheet loading
Part unloading

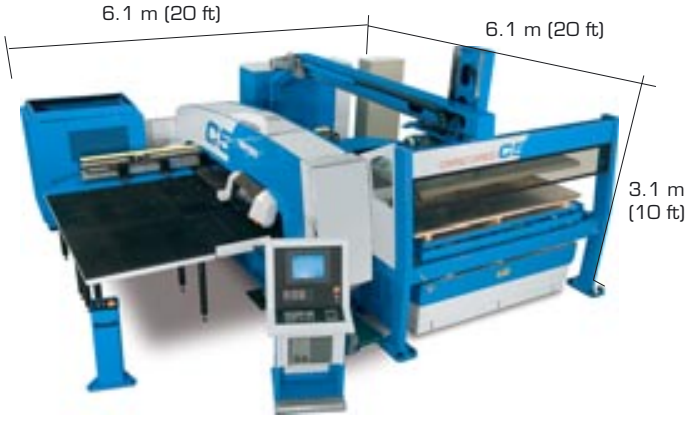
Some of the listed features are options

Energy saving hydraulic system

C6 and C8 offer a full 300 kN (33 US tons) punching force. Nibbling speed on 1 mm (0.039 ") centres is 1,100 hits per minute. As a result of digitally servo controlled ram, stroke speed is fully and individually adjustable in both directions. Other benefits include the availability of different punching modes (punch, slow punch, forming, marking, etc.).

FINN-POWER's servo hydraulic punching system automates overload protection and provides the greatest flexibility for all kinds of punching, forming and special applications, like wheel, tapping and many others.

The F4 technology also offers low noise levels on hydraulics (67 dB). Electric consumption and connection power meet today's demands, and punching accuracy is brought to a new level with servo hydraulic punching and fully digital punch control and measuring.



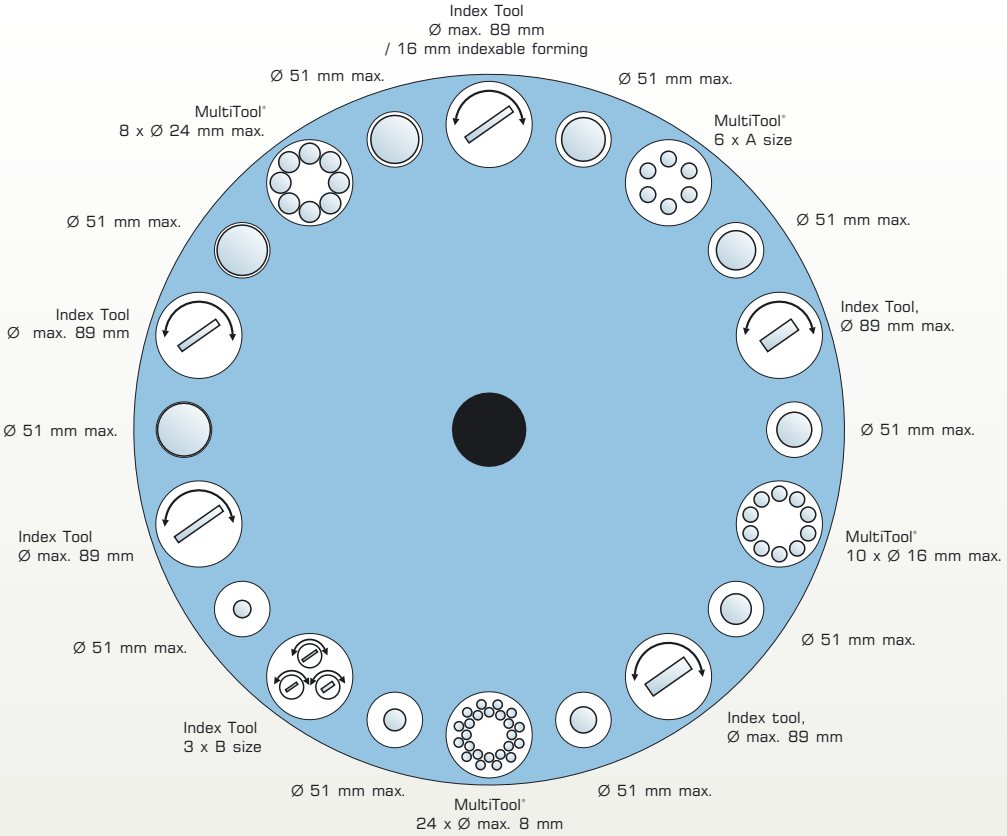
Compact Express is true to its name: the equipment adds only 15 % to the floor space requirement of the punch press. C5 and Compact Express C5 machines without safety equipment compared above.

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.

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



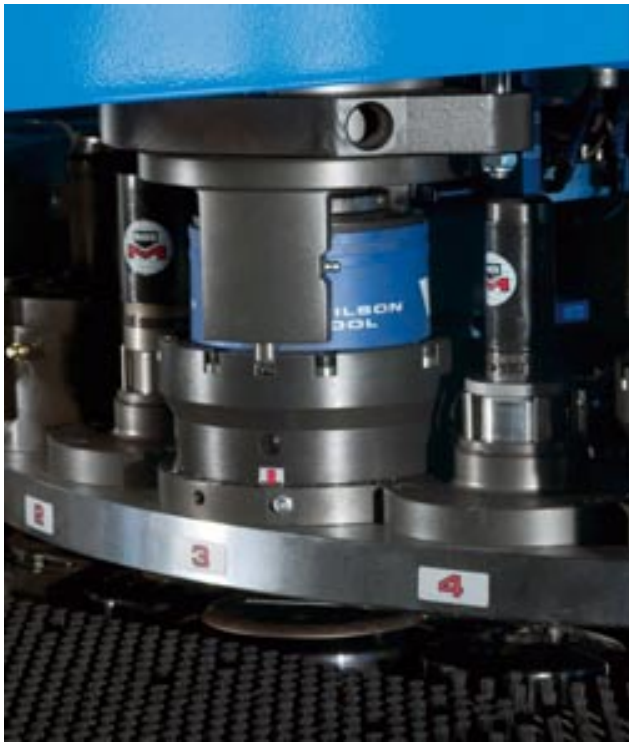
Example of a customer specific turret layout. This one includes 66 tools, of which seven index tools and one indexable high-forming station.

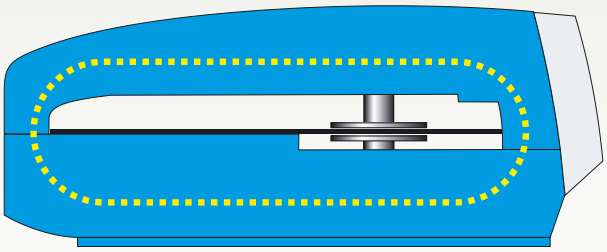
Fast Auto index system

Up to 10 large index stations (max. 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.





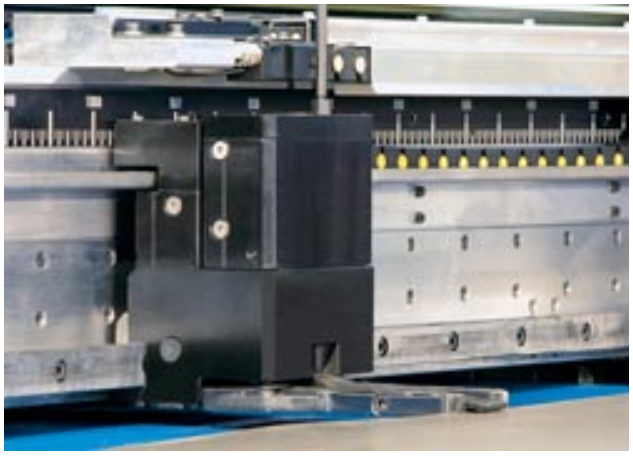
Solid engineering

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 (C5) or rack & pinion systems (C6/C8). The construction allows high positioning speeds and axis acceleration with excellent accuracy. Machine dependent default sheet size can be processed without repositioning (C5/C6). 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 C 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.

Powerful numerical control

C 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 200 kg weight as standard. The brush tables ensure best possible sheet support, keep low noise level 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 (C6/C8).

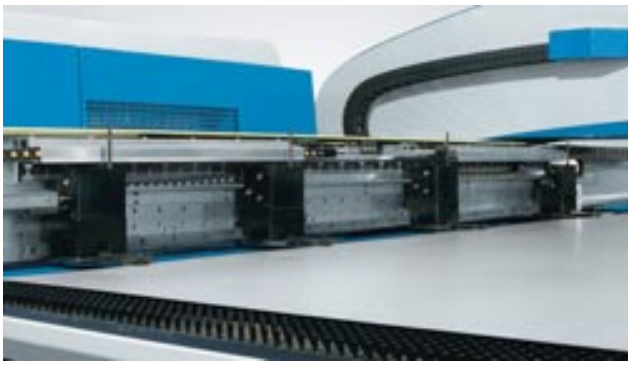
Outstanding, guaranteed accuracy

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

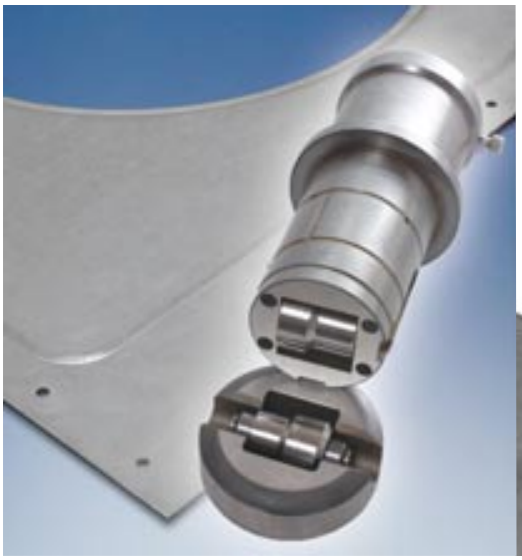
The turret of a 300 kN punch press can be equipped with a 114.3 mm (4.5") E-size tool holder. The holder is for use with cluster, off-centre punching and standard forming tools.

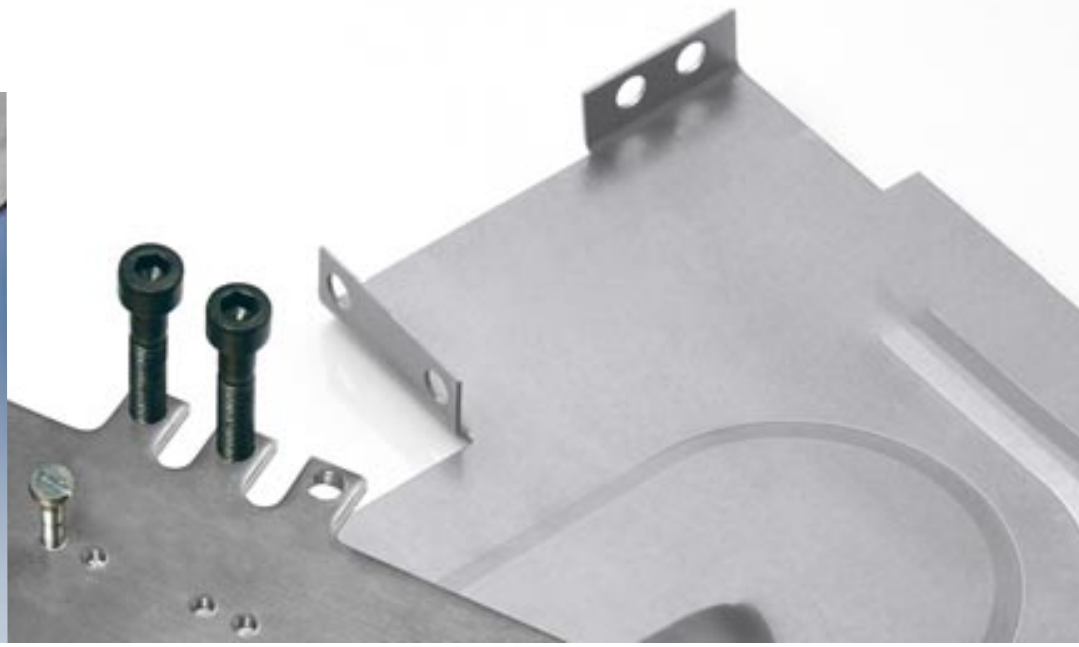
Multi-Tool® stations

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 systems have 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 an upforming cylinder 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. They can be used for stiffening, which allows reduction of sheet thickness, for various visual effects and so on.

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

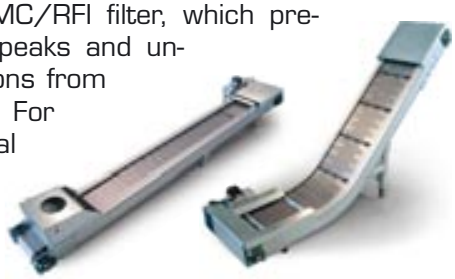
Integrated, continuous-flow inkjet marking solution ensures the availability of sufficient information at the next process stage (logistics, assembly, packing, etc.). The option is available for C6 and C8.

Flexible tapping solutions

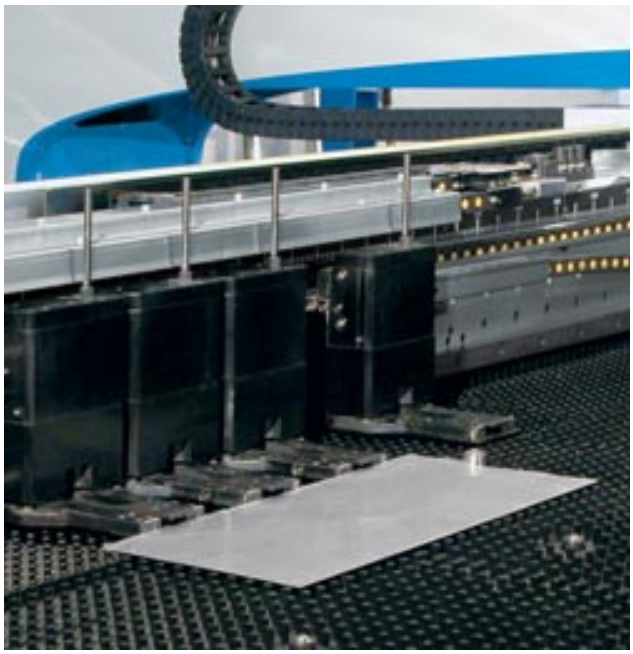
Versatile tapping capability can be integrated either with a servo driven, six-station tapping unit TU6 or by the EasyTap™ system developed by FINN-POWER in cooperation with Mate Tooling.

... 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 C Series turret punch press.

1 **Compact Express – fast loading and unloading with a small footprint**
Available for C5 and C6

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.

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 pres. Double sheet detection and centering can be performed for every sheet. Manual stack adjustment is possible using the floating table cover.

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.

- a ***automatic loading*** a ***automatic unloading***
- m ***manual loading*** a ***automatic unloading***
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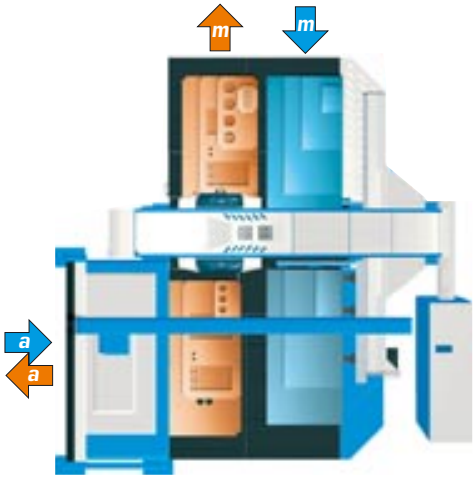


Short cycle time with Compact Express

MORE PRODUCTIVITY WITH FLEXIBLE AUTOMATION OF MATERIAL FLOW

2 **FINN-POWER Express – automation for FMU operation or system integration**
Available for C6 and C8

The C6 Express and C8 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 C6

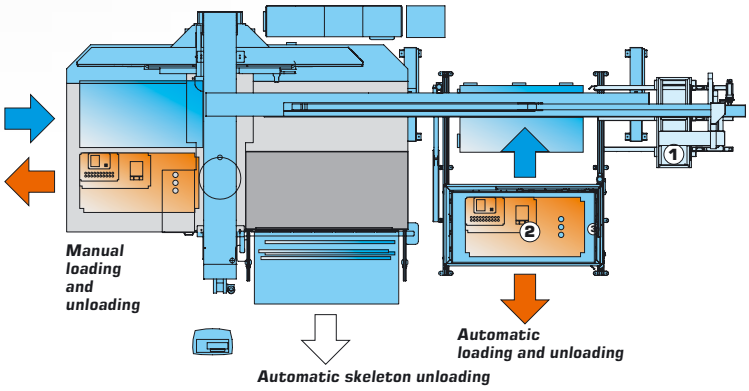
LST6 is a compact, automatic sheet loading and part sorting system. LST6 loads sheets to the machine, picks up parts from the machine and sorts them to the programmed coordinate. Loading capacity is 3,000 kg (6,614 lbs), with max. stack height of 250 mm (9.8 ").

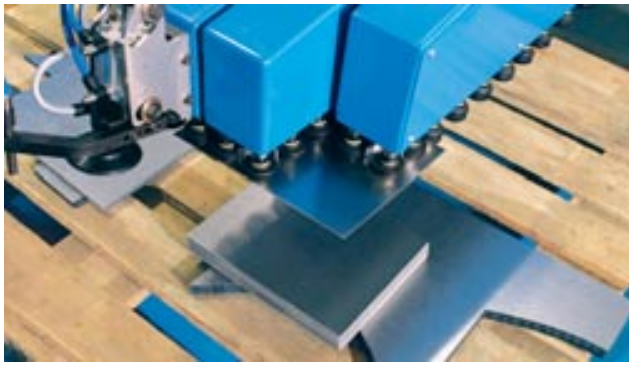
Punched parts are picked up in front of the turret by using a vacuum gripper (1). Parts are sorted on the moving table (2) in programmed position. Three moving gripper bars make it easy to pick up parts inside the skeleton.

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.

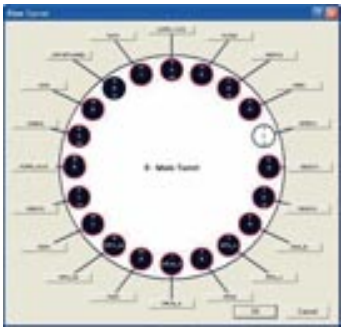


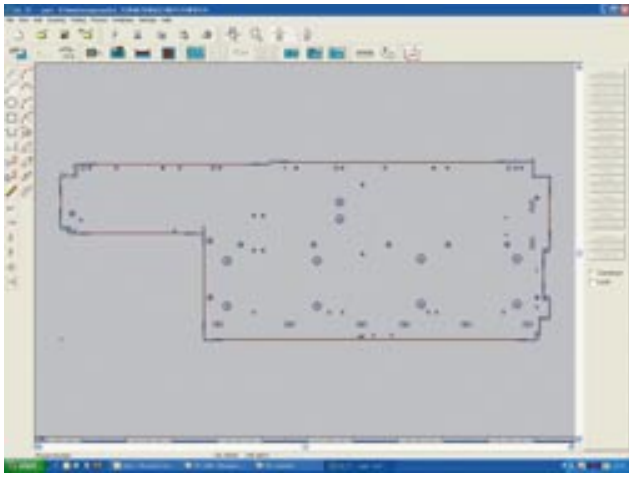


SOPHISTICATED SOFTWARE

Software for easy operation

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



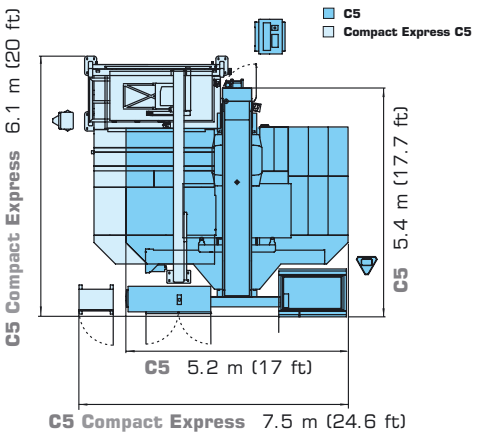


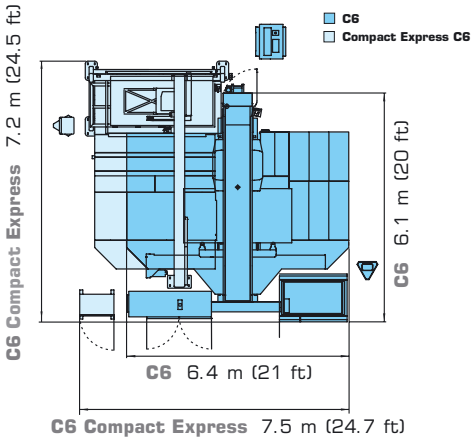
FINN-POWER's ControlLink software is a user interface for operating all machine functions. It features user-friendly diagnostics, interactive electrical drawings, full machine manuals, spare part library, etc. It also provides full support for additional FINN-POWER sorting and stacking devices.

MAIN DIMENSIONS

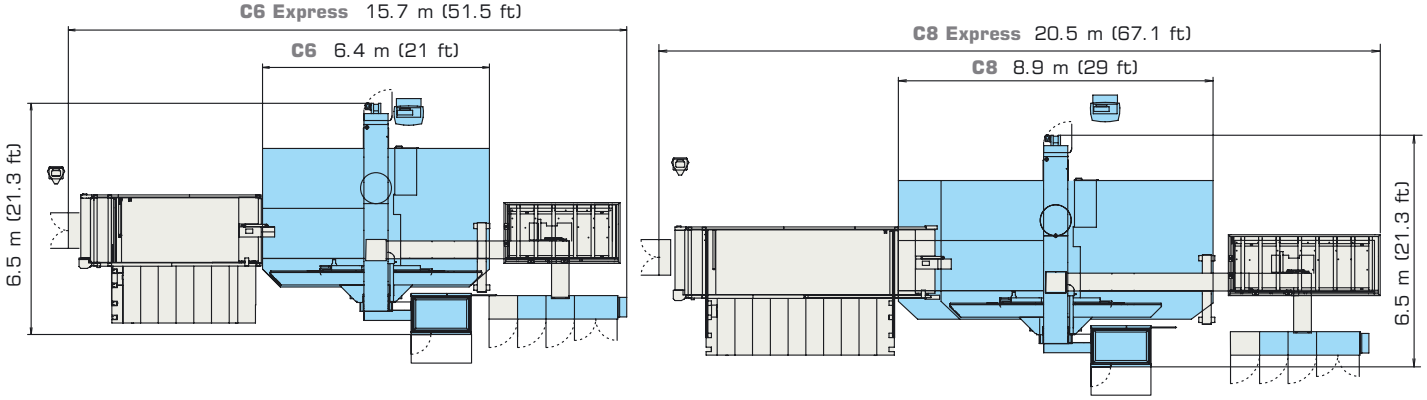
All dimensions without safety equipment

C and Compact Express

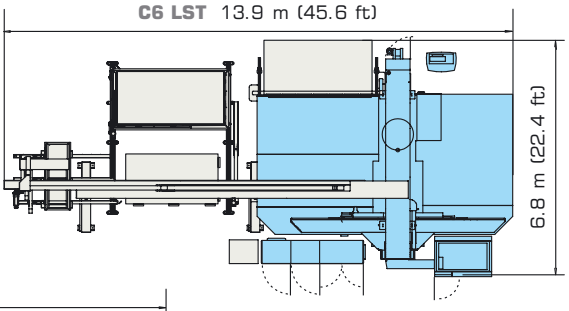


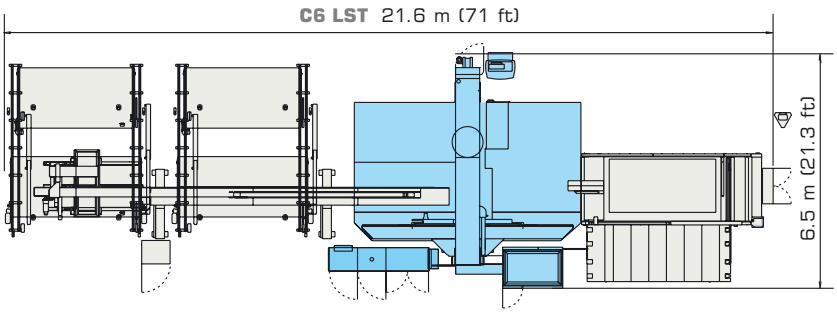


Express



LST





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