E-Brake 35-130T
Press brakes with an E for electronic
The E-volution in sheet-metal working

SafanDarley is the new global brand of sheet metal working machines, created by the merger of Safan and Darley. SafanDarley represents a unique combination of expertise and innovative power.

SafanDarley offers innovative solutions for all types of sheet-metal working, applying revolutionary electronic or hydraulic technology. These innovations are the continuation of our previous milestones, such as the first CNCK servo-hydraulic brake press in 1980, the first servo-electronic brake press SMK in 1995, the first hybrid guillotine shearing machine in 1999 and the first fully-fledged electronic brake press, the original E-Brake, in 2004. This revolutionary machine concept started a global ‘E-volution in sheet-metal working’.

SafanDarley now offers a unique programme of electronic brake presses, from the E-Brake 20T Ergonomic to the E-Brake 300T Dual Drive. In the heavier segment too SafanDarley is the leader in innovation, as evidenced by the new generation SafanDarley H-Brake with its unique durable hydraulics.

All SafanDarley machines are operated by means of SafanDarley e-Control or TS Touch Screen control, the most user-friendly Man/Machine interface available. The combined expertise of SafanDarley is particularly strong in the field of automated bending cells and client-specific production solutions, with custom-made machines if so desired.

SafanDarley continues to work on new, more efficient solutions under the motto of ‘the E-volution in sheet-metal working’. Electronics play an increasingly larger role in that respect. Among other things, this has resulted in the second generation E-Brake with pressure forces ranging between 35 and 130 tons.
SafanDarley E-Brake: The new generation

The second generation of SafanDarley E-Brake adds important new advantages to an already proven worldwide E-Brake technology. The machines in the 35T to 130T range are built according to a modular concept, ensuring an advance in the efficiency of machine technology. The new design is in line with the design of the heavier E-Brakes. Important features are the new backgauge and the larger stroke. There are a variety of other improved features and specification options available. In short, the new SafanDarley E-Brake means an important step forward in the E-volution of sheet-metal working.
Servo-electronic bending with an E for even bending

Without crowning you obtain the most accurate and constant bending angle along the full working length of the machine. The unique, patented roller drive system in the upper beam ensures a uniform and even distribution of forces. A balanced combination of powerful electro-motors, fixed and movable rollers and specially developed belts facilitate capacities of up to 300T.

The flexible belts, which are only 3 mm thick and 50 mm wide, are reinforced with steel wires and coated with hard polyurethane. This advanced technology has been extensively tested in the demanding elevator industry. So reliable is the technology that SafanDarley are able to offer a 5 year warranty on the mechanical drive system, when combined with an annual service contract. The special construction of the SafanDarley E-Brake also contributes to the even absorption of large forces. The O-frame acts as a single unit and deformation is kept to an absolute minimum. It is more stable, stronger and produces less deformation than a conventional C-frame.
The new SafanDarley E-Brake is further optimised to take maximum advantage of the high acceleration and other favourable servo-motor characteristics. For this reason, our E-Brake is not only very fast in the rapid approach stage, but also throughout the entire cycle.

Up to 30% shorter cycle times

The SafanDarley E-Brake only uses energy when the top beam is actually moving. This can deliver an energy saving of up to 50% compared with conventional hydraulic press brakes.

SafanDarley’s self-developed controls make use of a new generation of electronics and software. This results in incredibly short reaction and stop times, through which bending speeds of up to 20 mm/sec can be achieved. Cycle times are also far shorter than with conventional press brakes, partly through the fast backgauge.

In comparison tests, the SafanDarley E-Brake is shown to be up to 30% faster than a conventional press brake. Cycle times for this product (see image below):

<table>
<thead>
<tr>
<th>SafanDarley E-Brake 50T 2050</th>
<th>Cycle time 20 sec</th>
</tr>
</thead>
<tbody>
<tr>
<td>Conventional hydraulic press brake</td>
<td>Cycle time 35 sec</td>
</tr>
</tbody>
</table>
Following the success of the first generation of E-Brake and the breakthrough to the heavier 300T segment, SafanDarley has continued to optimise the machine concept. What could be improved even more in the construction, how could working with machines be made more efficient? The answer was found in a modular construction of the E-Brake, a new backgauge and a larger stroke.

Modular machine concept
The greatest innovation of the SafanDarley E-Brake is the way in which the machines are built. Thanks to the new modular concept, every machine in the range can be produced more efficiently and delivered faster, from the 35T - 1250 to the 130T - 3100. The standard daylight opening (Q-dimension) is 590 mm, and you also have the option of choosing 650 mm or 690 mm.

Incredibly stable backgauge with CNC-driven X and R axes
Newly developed construction means that the innovative backgauge system of the SafanDarley E-Brake is extremely stable. The system is unique, as the backgauge is used across the entire length of the machine. Moreover, it is very precise through the electronic control system (0.02 mm). The backgauge has a positioning speed of 350 mm/sec. CNC-controlled X- and R-axes come as standard, as well as hinging backgauge pins and a reach of 1000 mm.

Options
The backgauge system can be optionally complemented with CNC-controlled Z-axes and a ΔX-axis.

Tool clamping system
The E-Brake comes with the New Standard Premium MC mechanical tool clamping system. The New Standard Premium MC hydraulic tool clamping system is an option. European Style clamping is also an option (only in combination with a Q-size of 650 mm).
SafanDarley has developed a range of support arms of modular construction for both light and heavy-duty sheet-metal work. This makes it possible to rapidly set up the correct solution for each application. An optimum combination of ergonomics and efficiency.

Moveable and adjustable support arms

All support arms can be used in combination with the light guard. The support arms are as standard equipped with brushes. You can choose from the following possibilities:

- Support arms fixed to the machine
- Support arms movable across the front side of the machine
- Support arms movable across the front side of the machine and pneumatically adjustable in height (programmable on the control)
- Support arms movable across the front side of the machine and height adjustable with a handwheel

Optionally all support arms can be equipped with adjustable front stops.
SafanDarley E-Control, the new E-standard in ergonomics

Since the introduction in 1995, the SafanDarley TS-controls have been the international standard for ease of operation. The Safan touch screen concept is therefore the most functional and intuitive Man-Machine interface in the sheet-metal working industry. Safan have once again shifted the standards with the SafanDarley E-Control as the latest generation touch screen controls.

Complete Touch Screen convenience

The SafanDarley E-Control is fully touch screen, whereby the only buttons visible on the 17” screen are those that are needed during operation. The controls simply run on a PC under Microsoft Windows®, the software was developed based on Microsoft.net Framework. The unit is fitted with a 100 MB Ethernet UTP network connection as standard. The instructions are transmitted to a central processor from the SafanDarley E-Control controls, which in turn regulates the various axis via a so-called CAN-BUS (Control Area Network). The system can be programmed quickly and accurately thanks to a ‘self-teaching’ database with data on materials, tools and previous, already corrected bending. The SafanDarley E-Control can be coupled to the majority of off-line programming systems. The standard E-Control 20 facilitates both numeric and 2D graphical programming. It is possible to draw a complete product by means of touch screen and to then automatically generate a bending program. The developed length is also calculated. The optional E-Control 3D can be used to generate 3D drawings.

Web-based communication and support

The controls are set-up for web-based communication such as online diagnoses and loading software updates via the web. Machines can also be coupled to each other in a group and tooling databases can be shared. By monitoring and analysing your operating data online, Safan will be in a position to optimise your production process from a distance in the near future.
Summary of SafanDarley press brake controls EC20 - EC30

<table>
<thead>
<tr>
<th>Control type</th>
<th>Possibilities</th>
</tr>
</thead>
</table>
| **EC20**     | Numerical product data entry by means of touch screen  
- extensive tools library  
- numeric entry of bending parameters  
- usage of the actual database  
- 2D programming of products automatic bending sequence calculation with EC Profiler  
- 2D and 3D graphic display of products programmed offline for Autopol and Radan |

| **EC30**     | As EC20, but with graphical 2D and 3D programming and representation of the bending sequence |

<table>
<thead>
<tr>
<th>Off-line connections to</th>
</tr>
</thead>
<tbody>
<tr>
<td>SafanDarley EC software</td>
</tr>
<tr>
<td>Delem Profile on Windows</td>
</tr>
<tr>
<td>Delem V-Bend</td>
</tr>
<tr>
<td>Autopol</td>
</tr>
<tr>
<td>Radan</td>
</tr>
</tbody>
</table>

SafanDarley Easy EC20

Off-line programming with AutoPOL for Windows

The E-standard for Ergonomics
Bending with an E for efficient options

Fast, simple and reliable angle measurement can be essential for your bending process. SafanDarley has made E-volution advancements in this area too. Two SafanDarley E-Bend systems, electronically linked to the SafanDarley Touch Screen controls, increase your efficiency through exact sheet thickness or angle measurement.

SafanDarley E-Bend S

The SafanDarley E-Bend S sheet thickness measurement system is mounted next to the backgauge finger. The system measures the sheet thickness to an accuracy of ± 0.01 mm. It can be precisely programmed when measurement should take place. Measurement takes just tenths of a second and the data in the control system is immediately adjusted. The control system database maintains all records of measurement and is set out graphically.

SafanDarley E-Bend M

This system consists of two pneumatic sensors on a rail, which can be programmed at every desirable position. Both sensors are in contact with the sheet during the bending cycle. Before the definitive angle is bent, the spring-back of the sheet is measured. Based on this, a correction is entered after which the definitive angle is bent. The values measured can be used for other bends in which angle measurement is not possible due to the product’s geometry.
It is often not easy for an operator to position large sheets. Certainly during the return movement of the top beam, it is difficult work to keep everything in hand. Instead of having a second operator provide assistance, it is frequently more efficient to install a SafanDarley bending aid. In most cases, it can be used by a single man to position larger products. In brief, along with accuracy, productivity is increased by the SafanDarley E-Mate, the best partner for your operator.

In order to relieve the operator in the case of long, routine, heavy duty work, SafanDarley has developed an extremely powerful and highly accurate bending aid. The bending aid supports and follows the sheet with great accuracy throughout the entire bending process.

### Machine type | Max. sheet weight
--- | ---
E-Mate | 30 kg.
E-Mate plus | 150 kg.
The SafanDarley E-Brake contributes perfectly to your sustainable business, while at the same time making your business operations much more economic. The absence of hydraulics means that the problems associated with environmentally harmful and risky oil are a thing of the past.

There is no need to adjust the settings of pressure relief valves – with the risk of mistakes and drift – and there are no filters to be checked and replaced. The servo-electronic system is therefore far more reliable than the hydraulic one, because of the lack of oil, tanks, pumps, seals, valves and filters. And you will never have trouble with a cold start up.

**Integrated safety**

Work fast without risk: SafanDarley makes that a reality with the safety system integrated within the controls. It works with a safety light screen that is automatically directed from the SafanDarley TS controls. In addition, the SafanDarley E-Brake has an additional in-built safety provision. The application of a spring return means that the top beam will always move upwards in the event of a failure.
The integral automation is not restricted to the bending cell alone, this also applies to other parts of the process such as punching and spot-welding, and the entire routing of sheet material around the bending cell.

Flexible solutions and off-line software
You retain your flexibility with SafanDarley in terms of new products or changes in your production process. You are also flexible in relation to coupling with external systems and choosing your robot. The SafanDarley E-Brake is perfectly suited to operate as a mid-point for every automated bending cell. The SafanDarley controls run under the Windows® platform, adding a whole range of options for links, networks, software packages and resolving downtime of the unmanned production process over the Internet.

SafanDarley can supply complete, fully tested programs for both new and existing robotic cells. You have a choice between off-line or parametric programming. Naturally, you can contract out all programming to SafanDarley.

The SafanDarley Robowave off-line programming is a guarantee for maximum efficiency of your bending cell. All movements can be programmed and simulated in advance.

From advice & consultancy to manufacturing
SafanDarley makes automation of sheet-metal working easier than you think. This starts with the convenience of a single contact person for the entire project. Our consultants clearly present you with the entire range of options, enabling you to make the best possible choice for your production process. SafanDarley develops and realises turn-key solutions for bending and cutting systems with guaranteed cycle times. This fixes the costs per product. The return time of your investment can be properly determined based on those set costs. With the help of a simulation model, you will get a reliable indication beforehand of your expected Return On Investment.
SafanDarley E-Brake energy consumption

On the SafanDarley E-Brake, the main drive motor is used only when the E-Brake has to actually perform a movement. With a conventional hydraulic press brake, the hydraulic pump motor is running all the time.

The graph above only covers the time while the press brake is actually in operation. During the standby time - which can be as much as 90% on account of sheet handling, machine set up and intervals - this will mean a further saving with the E-Brake up to 3000 kWh a year.

**Standard features**

- SafanDarley EC20 Touch Screen CNC press brake control
- CNC-controlled R-axis
- CNC-controlled Y1-Y2 axis (top beam adjustable inclined +/- 2.5 mm)
- CNC-controlled back gauge (X-axis) with a wide range
- Manual variable adjustment of back gauge fingers width across a linear guide
- NSCL II MC Premium top tool mechanical clamping system and OB/S-3 lower tool mechanical clamping system
- Daylight of 590 mm (Q-dimension)
- 2 support arms (300 mm in length)*
- Hold to Run operating console
- Programmable and integrated safety light guard*
- Safety in conformance with CE*

*Standard only for CE countries
Technical specifications
SafanDarley E-Brake 35 - 130T

<table>
<thead>
<tr>
<th>E-Brake 35-130T</th>
<th>Pressure force in kN</th>
<th>Bending speed max.* in mm/sec</th>
<th>Return speed in mm/sec</th>
<th>Motor Power in kW</th>
<th>Weight in kg</th>
<th>A in mm</th>
<th>B in mm</th>
<th>C in mm</th>
<th>D in mm</th>
</tr>
</thead>
<tbody>
<tr>
<td>35-1250</td>
<td>350</td>
<td>10</td>
<td>180</td>
<td>3250</td>
<td>2230</td>
<td>1250</td>
<td>2510</td>
<td>3120</td>
<td></td>
</tr>
<tr>
<td>40-1600</td>
<td>400</td>
<td>10</td>
<td>180</td>
<td>3950</td>
<td>2580</td>
<td>1600</td>
<td>2510</td>
<td>3120</td>
<td></td>
</tr>
<tr>
<td>50-2050</td>
<td>500</td>
<td>10</td>
<td>160</td>
<td>4750</td>
<td>3030</td>
<td>2050</td>
<td>2510</td>
<td>3120</td>
<td></td>
</tr>
<tr>
<td>65-2550</td>
<td>650</td>
<td>10</td>
<td>140</td>
<td>5500</td>
<td>3530</td>
<td>2550</td>
<td>2510</td>
<td>3120</td>
<td></td>
</tr>
<tr>
<td>80-2550</td>
<td>800</td>
<td>10</td>
<td>90</td>
<td>5500</td>
<td>3530</td>
<td>2550</td>
<td>2510</td>
<td>3120</td>
<td></td>
</tr>
<tr>
<td>100-3100</td>
<td>1000</td>
<td>10</td>
<td>75</td>
<td>6350</td>
<td>4080</td>
<td>3100</td>
<td>2510</td>
<td>3120</td>
<td></td>
</tr>
<tr>
<td>130-4100</td>
<td>1300</td>
<td>10</td>
<td>110</td>
<td>9450</td>
<td>5080</td>
<td>4100</td>
<td>2710</td>
<td>3150</td>
<td></td>
</tr>
</tbody>
</table>

* Optional max. bending speed 20 mm/sec. (Subject to modifications)

Accessories (optional)
- CNC-controlled Z1-Z2 axis (horizontal repositioning back gauge fingers)
- CNC-controlled Delta X-axis (horizontal repositioning of one back gauge finger)
- Built-in size increase up to 650 mm or 690 mm (Q-size)
- Various upper and lower tool adaptors
- Various bending aids
- SafanDarley E-Bend S sheet thickness measurement system
- SafanDarley E-Bend M angle measurement system
- Various support arms, fixed, moveable and adjustable in height where required
- Extra Hold To Run operating console (compulsory with 2 machine operators)
- Integrated tool cabinet
- Machine lighting
- SafanDarley E-Control press brake control:
  - EC30 control, complete 2D and 3D graphic programming