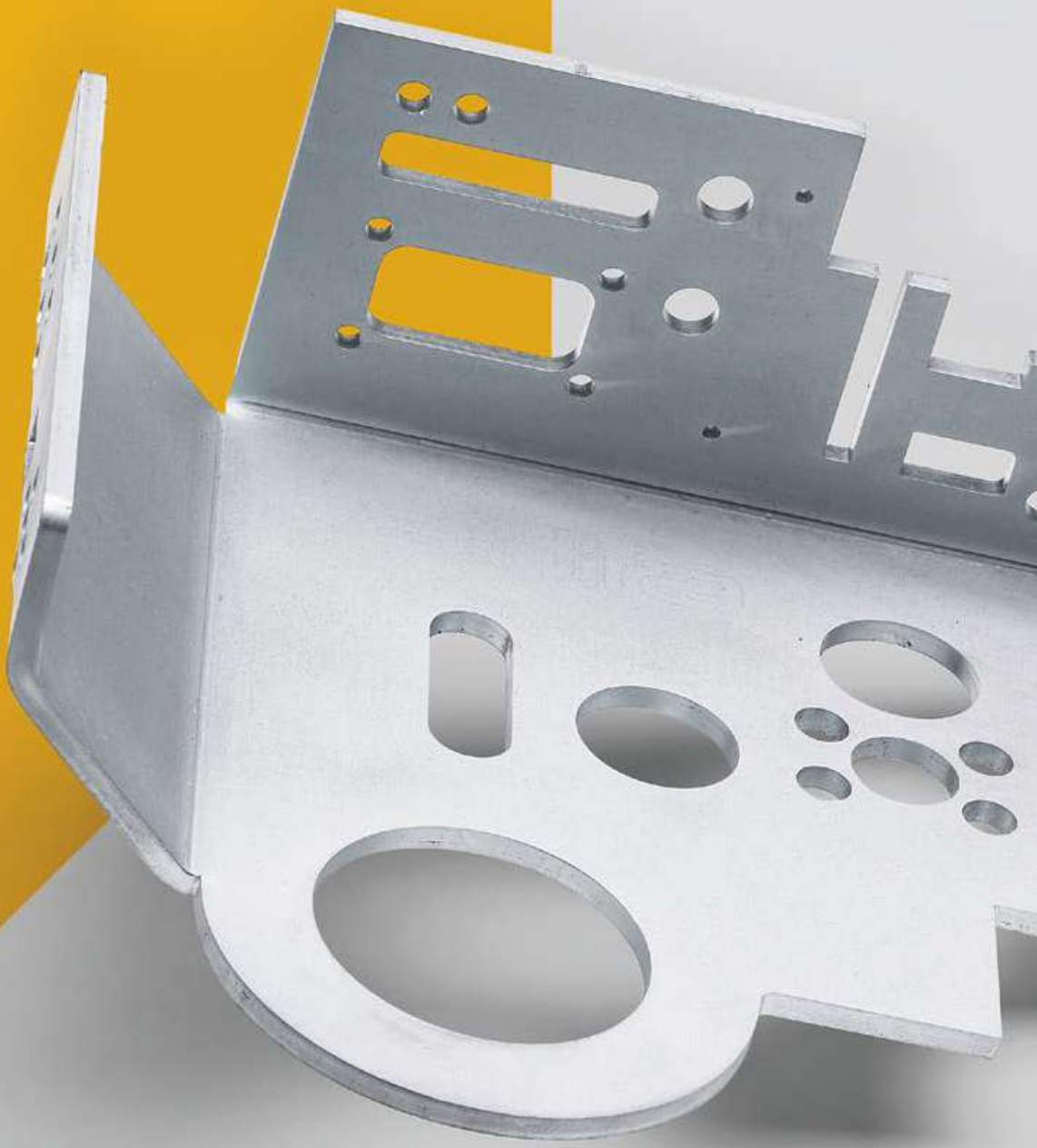
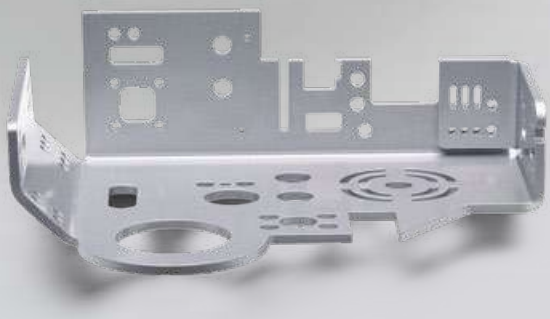
METAL FORMING SOLUTIONS

SHAPING THE FUTURE

ENGLISH





MISSION

Challenge our Clients to increase their competitiveness using customized and innovative Metal Forming solutions, maintaining a close relationship and permanent follow up, creating value in a sustainable manner for all stakeholders.

VISION

To be an internationally recognized manufacturer for its competitiveness, reliability, and differentiation of its Engineering solutions for Metal Forming.

Focus on Technological Leadership

Constant Innovation

05

ADIRA

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BENEFITS

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ADIRA SOLUTIONS

- Press Brakes
- Shears
- Special Solutions

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ADIRA SERVICE

- Our Service Team
- Preventive Maintenance Contract
- Tools and Consumables
- Assembly, Commissioning and Training
- Corrective and Preventive Maintenance
- Upgrades

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TECHNICAL DATA SHEETS

- Press Brakes
- Shears
- Bending Table

ADIRA

HISTORY OF ADIRA

ADIRA IN THE WORLD

ADIRA FIGURES

LEVELS

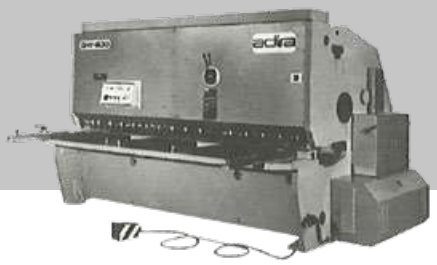
HISTORY OF ADIRA

1956

António Dias Ramos founded ADIRA, located on Rua António Bessa Leite, in Porto. The company remained at these facilities for many years. Lathes and milling and planing machines were produced with just 5 employees, working in an area of 400 m².

1960s

The company expanded to include the manufacture of machinery for sheet metal work.



1970s

Development and technological refinement of mechanical, hydraulic, electric and electronic machines.

- Beginning of partnership with the University of Porto's Faculty of Engineering.
- Beginning of exportation to England, Germany and Japan.

1980s

The era of digitalisation and large-scale exportation.

- The era of digitalisation and large-scale exportation began with exports to the United States, Australia and the Middle East.
- Development of the first 2D and 3D graphic controllers and first steps towards automation.

1990s

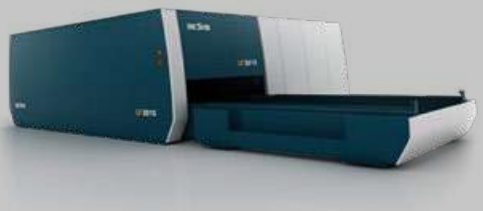
Computer assistance and CE safety certification.

- Diversification of markets to include the Far East, Oceania and Spain.
- Acquisition of our main national competitor: Guifil, a company in São Mamede de Infesta.

2000s

Start of the new millennium with laser cutting machines, robots and automation. Consolidation of international presence.

- Opening of the first subsidiaries: ADIRA France, ADIRA UK and ADIRA Tech (USA).
- Strategy for gaining market share in Eastern European markets, Russia and Brazil.
- Sale of the company to António Cardoso Pinto.



2010s

When António Cardoso Pinto became the shareholder and chairman, ADIRA's involvement with the Dias Ramos family ended.

2017

ADIRA is bought by the SONAE Capital Group, currently its sole shareholder.

With this acquisition and the development of each of the existing business areas, the Sonae Capital Group continues on its path towards achieving its strategic purpose and is positioned as a privileged vehicle for value creation, based on developing and leveraging Portuguese competitive advantages.

2020

Shaping the Future.

The start of a new business phase. ADIRA takes a more competitive and forward-looking stance, is investing in Additive Manufacturing and made-to-measure solutions for each customer. Offering a broader range of services and solutions, allied with digital transformation and restructuring, ADIRA is embracing the challenges of the future more efficiently and successfully.

Active presence in over 30 markets

60 years of experience and history

+60
years in existence

+30
ADIRA agents and representatives all over the world

+50 years
lifetime of ADIRA solutions

+10.000
made-to-measure projects installed all over the world

+1.000
automation solutions installed

+40.000
press brakes produced by ADIRA

Cutting

Thickness of sheet metal:
from 4 mm to 25 mm

4 mm

25 mm

Bending

Tonnage:
35 to 2,000+
TONNES

35 tonnes

2000 tonnes

Sheet Metal Lenght:
1.5 to 9 metres
(can be extended with TANDEM solutions)

1,5 m

9 m

BENEFITS

ADIRA INNOVATION

DESIGN, DEVELOPMENT AND PRODUCTION

LASER SAFE

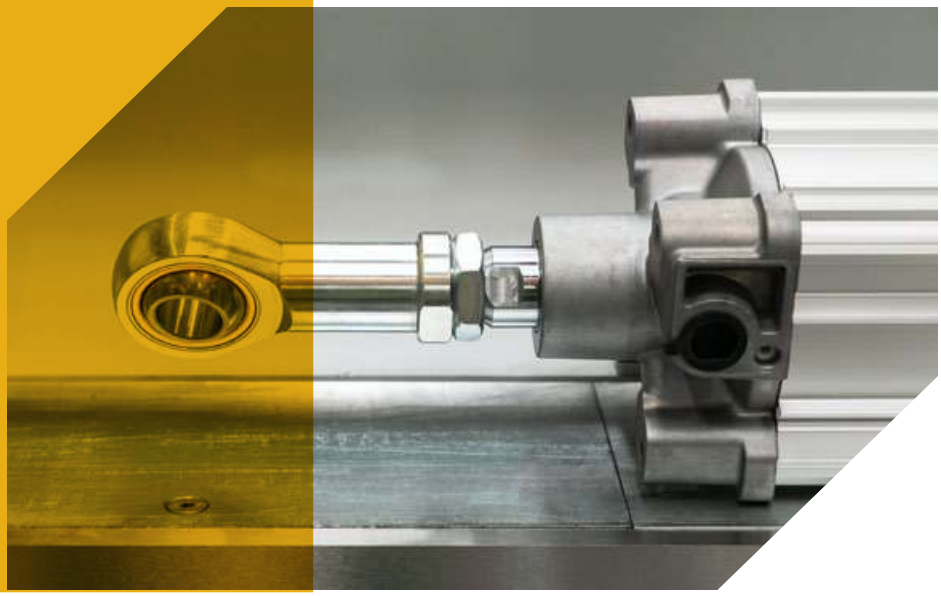
INDUSTRY 4.0 + SOFTWARE

ACCESSORIES AND TOOLS

ADIRA INNOVATION

All ADIRA products and solutions are designed to meet all our customers' needs, from the simplest request to integration with complex production processes (software and hardware).

Explore the many ADIRA solutions for sheet metal surface treatment, automation and machine maintenance.



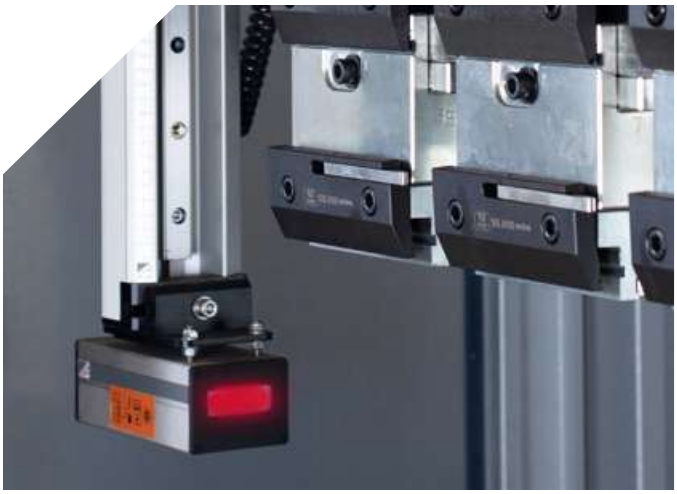
MADE-TO-MEASURE PROJECTS

With over 60 years' experience, our specialised project team can design the right solutions to meet your needs. Created from scratch, all projects are developed with the aim of meeting our customers' needs, offering solutions for sheet metal surface treatment, process automation and integration with a host of already installed and operating solutions (software and hardware).

LASER SAFETY LZS-LG

The Laser Safety LZS-LG protection system has a laser transmitter and receiver mounted on each side of the press brake. A continuous block laser field protects the zone around the punch tip allowing the operator to safely hold the work piece as the tools close at high speed. If an obstruction is detected the machine stops automatically.

If there are density variations, whether caused by temperature changes, draughts or other reasons, there may be beam distortion, causing false obstructions and, as such, making normal operation of the system more difficult.



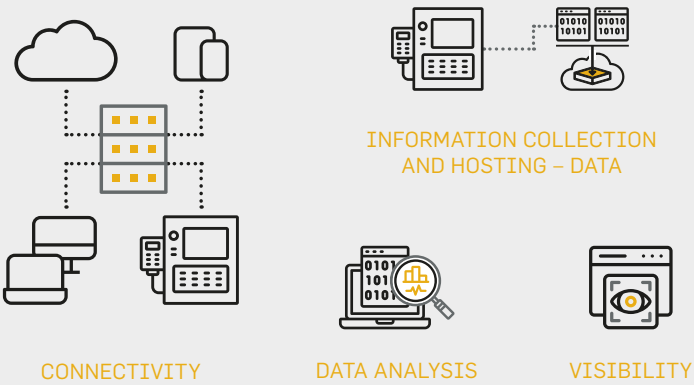
IRIS PLUS

- Ample protection in the bending area.
- Change of speed, approximation/working at 2 mm from the die.
- Increased work cycle.
- Considerable time savings over 8 hours of work.
  See data sheet
- Bend angle measurement (IRIS PLUS)

	Speed Change	Work Speed	Time for 1 cycle	5 cycles per min.	Time savings in 8 hours
Conventional Laser Safety	12 min	10 mm/s	1.2 s	6 s	40 min
Iris Laser Safety	2 min	10 mm/s	0.2 s	1 s	

INDUSTRY 4.0 + SOFTWARE

Industry 4.0 > The main goal is to connect all ADIRA solutions to our customers' solutions enabling:



THE ADD-ON IS **DIVIDED** INTO 2 PARTS:

1. Production Data Management

a. Creates a communication channel between production and the operator/machine;

b. Collects information on the preparation time for the machine;

c. Production time per part/operator;

d. Assesses KPIs > Machine Performance, Quality and Availability.

2. Monitoring Machine Status

a. Machine events and monitoring;

b. Ram Speed;

c. Oil Levels;

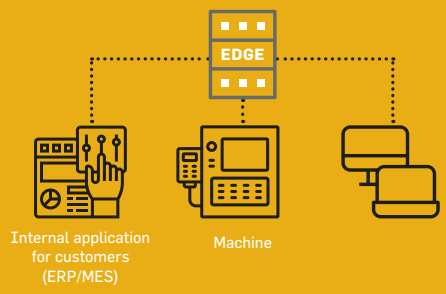
d. Event history.

THE ADD-ON CAN BE **CONTROLLED** IN 2 WAYS:

1. On the Premises

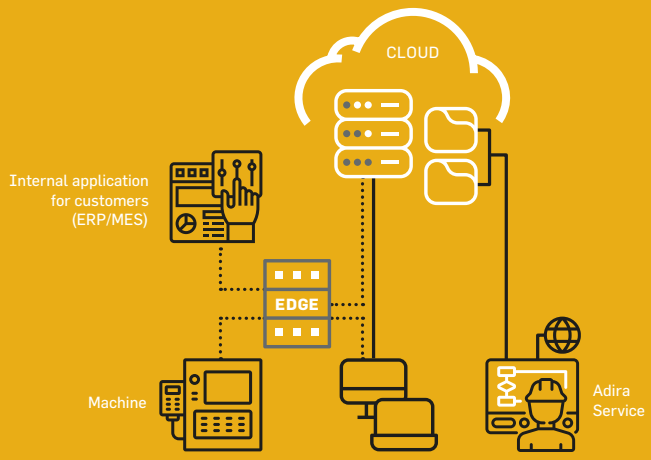
a. Connection between the EDGE solution <> Customer ERP;

b. Access via VPN, with customer authorisation.



2. Cloud Based

Connection between EDGE <> Cloud Platform, permitting real-time monitoring by the ADIRA Service team, operating in real time if any intervention/support or suggestion for process optimisation is required.



BIU-002
100
Wila made
New
Standard
80° R=1
H=98
17.7 kg/m
max 1000 kN/m
BIU-401
100
Wila made
New
Standard
Pro
28° R=1
H=100
14.3 kg/m
max 650 kN/m
BIU-003
100
88° R=1
H=98
24 kg/m
max 650 kN/m
OZU-012
100
Wila made
New
Standard
Premium
H=55
12.5 kg/m
max 1300 kN/m
OZU-403
100
Wila made
New

ACCESSORIES AND TOOLS

WILA
SINCE 1932
THE PRESS BRAKE PRODUCTIVITY PEOPLE

"WILA B.V. has developed extremely durable tool and tightening systems that significantly improve the productivity of its press brake with faster tool changing."

Tecnostamp

ROLLERI

Tecnostamp and Rolleri manufacture a wide range of standard and special tools for all types of tightening styles. The products are fully designed and manufactured in Italy using Italian high precision and durability tools.

adira

changer
adira

ADIRA SOLUTIONS

PRESS BRAKES

SHEARS

SPECIAL SOLUTIONS

Press Brakes

PA / PA PLUS

The PA range offers high versatility and has a large number of optional accessories and equipment.

The HEXA-C® frame ensures better bending precision, given that the movable ram stays perfectly aligned with the fixed ram.

Greendrive System (PA PLUS).

Main Features PA PLUS

Increased return speed (faster work cycle)

The Greendrive system makes the motor turn very slowly, thereby reducing consumption when the operator is not pressing the pedal or using the machine

A significant reduction in energy consumption

Standard machine equipped with a crowning table, Lazersafe safety system and 4-axis back gauge (X/R/Z1 and Z2)

PA Benefits

Electric-hydraulic synchronisation of the movable ram (Y_1 and Y_2 axes);

Electric-hydraulic stoppage of the movable ram at 0.01 mm; Comprehensive programming of the bending angle;

Movable ram slope programming (Y_1 and Y_2);

Programming work speeds (Advance and Return) [10-100%];

Start/Stop system that allows energy savings;

Standard machine equipped with crowning table, Lazersafe safety system and 2 axes on the back gauge with 4 back gauge stops (X/R).

The position of the ram is constantly monitored through guides, located at the ends of the HEXA-C frame, ensuring repeatability of 0.01 mm of ram positioning, irrespective of the tonnage, load position or oil temperature.

PA PLUS Benefits

GREENDRIVE SYSTEM – the system varies rotation of the electric motor, thus enabling:

- Increased return speed (faster work cycle)
- Residual motor rotation when the machine is stopped
- A significant reduction in energy consumption

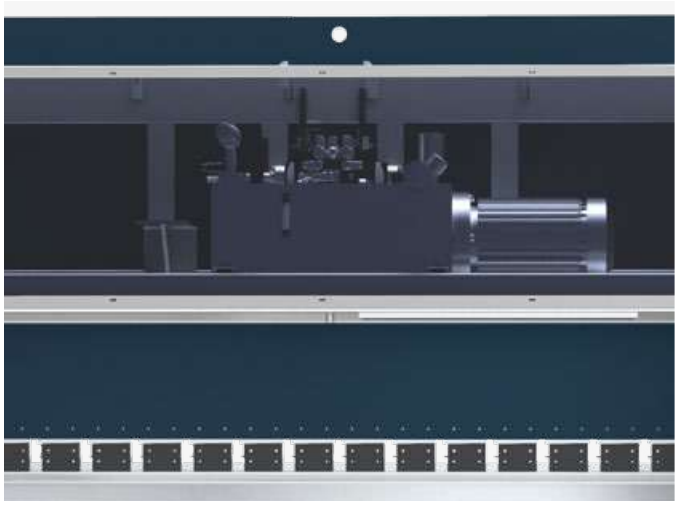
Press Brakes

PF

The high-performance hybrid PF (Press Fast) range is characterised by its high working speed and maximum productivity. With a wide opening and stroke, ADIRA PF press brakes not only allow for larger parts, but also integration with different automation projects (robotised cells).

Multi-axis back gauge and bend angle measuring systems available as an option.

Flexibility and adaptability.



Main Features

Flexible, high-yield tools Ergonomics, Design and Safety

Industry 4.0 ready

(Ideal for integration with robotised cells.) The right choice for performance More efficient energy consumption

Sustainable

Ability to carry out highly complex work with precision

Benefits

High approximation, bending and return speeds;

Wider Opening and Stroke;

Activation via servomotors;

Front support arm on rail with table and brushes (Product Standard); Speed change 2 mm above the sheet metal;

High precision;

Standard machine with crowning table, Lazersafe IRIS safety system, front support arms on rail with brushes and height adjustment and 4-axis back gauge (X, R, Z1 and Z2).

When the operator is not operating the hybrid PF, the hydraulics are also stopped as they are activated instantly by a servomotor. When the servomotor is stopped, the hydraulic system is at rest, leading to energy savings, and it's environmentally friendly too.

Solution for customers that need a high-yield, high-performance machine.

Press Brakes

BB

Equipped with a Hexa-C frame, which ensures precision in guiding the movable ram, this fully electric machine, powered by the Bluedrive system, is capable of faster bending and, at the same time, allows energy savings thanks to its economical operation.

Supplied with all optional extras and accessories, this machine is the way forward for your bending solutions!

Available in two standard models ranging from 35 to 50 tonnes and 1.5 to 2 metres.

Main Features

No need for stoppages when changing the bending speed, thereby considerably reducing cycle time

High acceleration and deceleration ramps

Off-centre bending, enabling load distribution

Pre-loaded guidance system to maintain off-centre bending

Bluedrive: Fast, Precise, Simple and Clean heavy-duty servomotors

Heavy duty Servomotors

Benefits

Incredible precision in stopping the movable ram +/- 0.002 mm;

Hexa-C frame: high precision in off-centre bending, maintaining the advantages of the C frame;

No torsion is transmitted from the frame to the part in multi-station bending;

Energy consumption ratio in the region of 40-60% when compared to hydraulic press brakes;

Low mechanical complexity, simplifying maintenance tasks.

High-performance spindle with high load capacity – 25,000 hours of useful life (maximum load, 50% work cycle).

Automatic lubrication, equipped with an automatic electrical lubrication unit.

SIMPLE AND SUSTAINABLE TECHNOLOGY

Bluedrive: Fast, Accurate, Simple and Clean

Low mechanical complexity

Press Brakes

PH

The range of PH press brakes is ADIRA's answer to the most demanding needs of our customers — "heavy-duty".

Ram parallelism
(hydraulic synchronisation).

Bending depth.

Main Features

Four-point guiding system, with few maintenance requirements

Assurance of adequate alignment between tools Ram slope for conical bending

Dedicated CNC controls (controlling parallelism and bending depth)

Optoelectronic protection system in the form of non-material barriers or a laser beam

Very high approximation speed

Deep arch

Wide opening and long stroke

Benefits

Easy regulation of the bending depth (with the ram in loading condition for sheet metal);

Electric-hydraulic synchronisation of the movable ram (Y_1 and Y_2 axes);

Electric-hydraulic stoppage of the movable ram at 0.01 mm;

Comprehensive programming of the bending angle;

Movable ram slope programming (Y_1 and Y_2);

Programming work/return speeds (10-100%).

With a bending capacity of up to 20,000 kN and lengths of up to 8 metres (tandem solutions can handle longer lengths), this range has electric-hydraulic controls.

The position of the ram is constantly monitored through linear guides located at the ends of the frame, **ensuring 0.01 mm of repeatability of ram positioning.**

Shears

GH

The ADIRA GH range of hydraulic shears are robust and reliable, characterised by their swing cut and low angle of fixed cut.

Regulation of the gap between blades, manual or automatic adjustment, variable according to the type and thickness of the material being cut.

Side arch allows for repeat cuts on sheets longer than the nominal length of the machine.

Main Features

Possibility of retracting the back gauge at the end of the 1000-mm stroke

High tamping strength, proportional to the cutting strength

Blocks with material protections eliminate or minimise markings on the material

Adjustment of the length of the cut to increase the cutting pace on shorter sheets

Benefits

Different cutting capacities and lengths;

Hydraulic Shears with Swing Cut;

Numerical control with CybTouch8 touch screen (GH Plus);

Motorised gap control, controlled by standard CNC (GH Plus);

Mechanical, Hydraulic and simple Electronics;

Rigid, compact back gauge.

They can handle sheet metal measuring 2 to 6 metres, with thicknesses up to 13mm. There are also a wide range of accessories and optional extras, increasing their flexibility of use.

EFFICIENCY AND EFFECTIVENESS

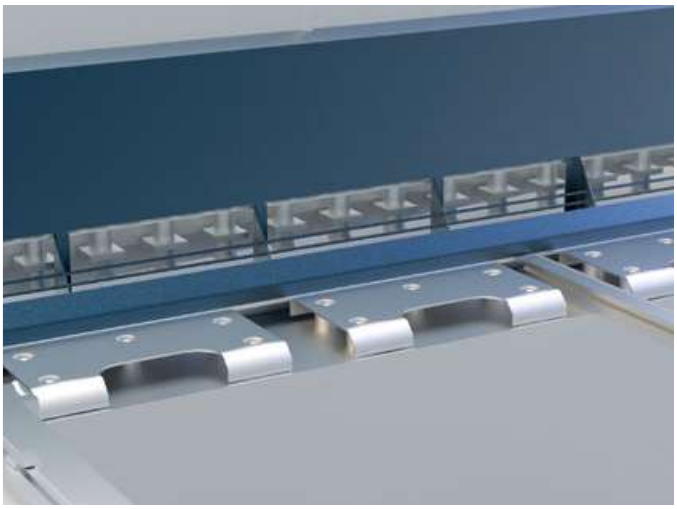
Reduced demand on the machine frame when cutting thicknesses less than the maximum machine capacity.

Shears

GV

The ADIRA GV range of hydraulic shears are robust and reliable, characterised by their vertical cutting blade and variable angle.

Strips are less twisted when cutting thicknesses less than the nominal thickness, by using a smaller cutting angle.



Main Features

Robust back gauge with movable positioning, allows rotation for retraction of the guide

Adapts to cutting sheets of any thickness up to maximum capacity

Strips are less twisted when cutting thicknesses less than nominal thickness, by using a smaller cutting angle and integrating the optional anti-torsion system

Benefits

4-edged upper and lower blade;

Little or no torsion demand on the frame and blade holder;

Standard 410 mm arch and possibility of special arches;

Cuts greater thicknesses (between 16 and 25 mm).

It can handle sheet metal measuring 3 to 6 metres (or longer), with thicknesses of between 16 and 25 mm. There are also a wide range of accessories and optional extras, increasing their flexibility of use.

Solution for customers that need a high-yield, high-performance machine.

Ability to carry out highly complex work with precision.

Special Solutions

adira

Special Solutions

AUTOMATIC TOOL-CHANGER

The automatic tool changer solution is an innovative device designed to allow tools (upper and lower) to be changed automatically, saving time and increasing efficiency.

Automatic Laser: Finds the ideal tool in the machine or in the warehouse.

Storage capacity for between 35 and 52 metres of tools.

Main Features

Manage the tools needed for bending. The system selects and positions the tools and dies available in the automatic tool warehouse, avoiding the manual selection and changing of tools and dies

Tool storage management interface on the controls

Cleans the tool system and work table

Any tool part in the press brake can be replaced without all the parts having to be removed sequentially

The "Twin" option or upgrading to "S52" can be retrofitted, as long is this is provided for initially

"Twin T52" option or upgrade to "Single S32 / S52" retrofitable, provided that this is initially foreseen

The number of magazines can be reconfigured or changed, according to the customer's needs

Benefits

This system can feed 1 (single) or 2 (twin) press brakes. The following options are available:

ATC S32 – Single Tool Replacement System capable of storing 32 metres of tools.

ATC S52 – Single Tool Replacement System capable of storing 52 metres of tools

ATC T52 – Twin Tool Replacement System capable of storing 52 metres of tools.

Large size of tool parts (max. 515 mm), which means less system movement, making it much faster.

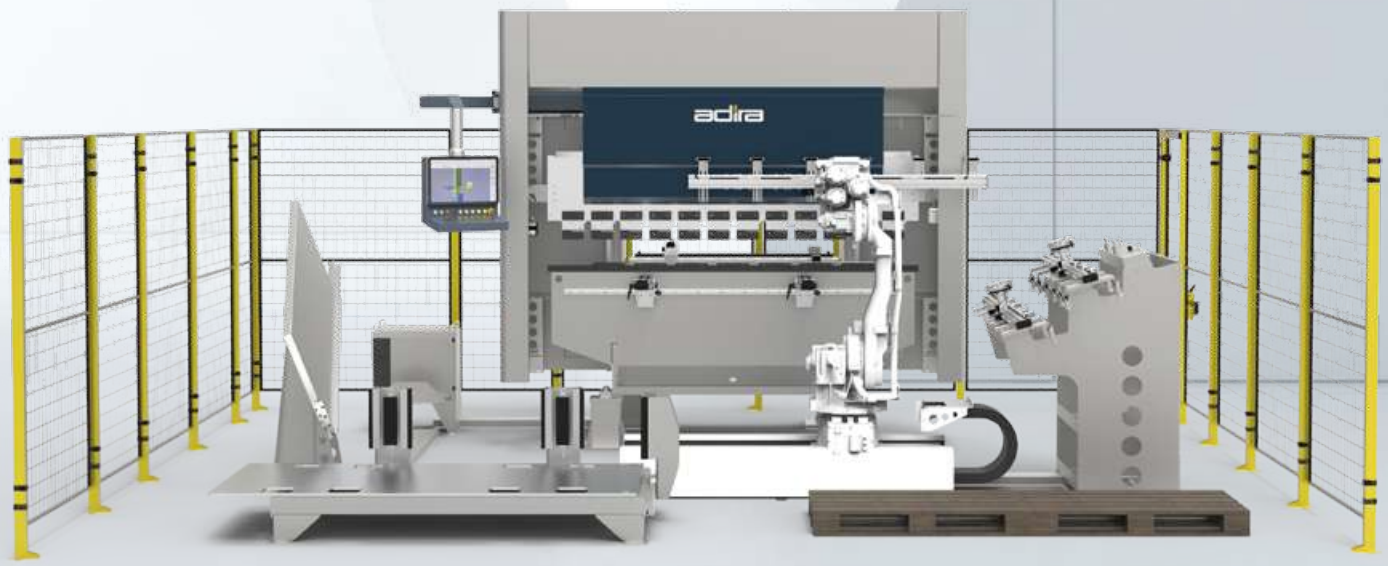
Cleans the tool system and work table, thereby maximising the useful life of the tools.

Special Solutions

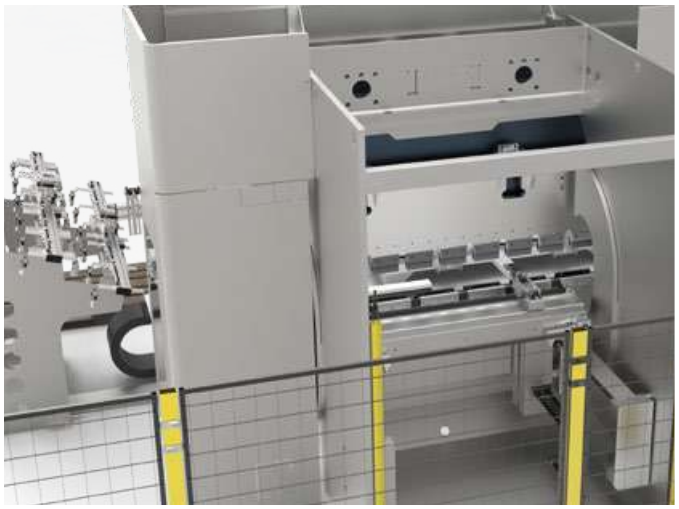
ROBOTISED CELLS

Bearing in mind market requirements and the current production management trends known as "Lean Production", we have noticed a growing interest in the automation of bending methods. Bending cells meet most product quality, production management

and industrial safety requirements, with greater or lesser use of the peripheral components necessary for the different parts manufacturing operations.



Other kinds of operations in addition to the manufacture of bent parts can be added to the cell and carried out by other machines, such as sanders, small punches or welding machines operated by the same robot.



Main Features

High number of controllable degrees of freedom

Ease of making complex routes without great precision or speed, mainly in the anthropomorphic models

High efficiency

Possibility of offline management High productivity

Profitability (immediate financial return), by reducing manufacturing costs

Benefits

High degree of repeatability, not affected by human factors;

Absence of rejections or faults;

High positioning precision;

Ease in dealing with more than one station or machine;

High degree of safety in the ability to operate in a totally closed area.

ADIRA's strategy involves working closely with suppliers of proven quality, providing support to customers throughout the process, from designing the tools to providing technical and commercial advice, including full and continuous training backed by a very capable after-sales service.

ADIRA SERVICE

SERVICE TEAM

PREVENTIVE MAINTENANCE CONTRACT

TOOLS

AND CONSUMABLES

ASSEMBLY, COMMISSIONING AND TRAINING

CORRECTIVE AND PREVENTIVE MAINTENANCE

UPGRADES

Our Service Team

More than just a supplier, we want to be your partner.

We have a comprehensive catalogue of services available for ADIRA press brakes, shears and laser cutting machines and those of the brands we represent.

Our qualified technical assistance team works closely with our customers in preventive and corrective maintenance, installation and training.

All our services are available for the entire portfolio of ADIRA machines, no matter how old they are. We extend the lifecycle of your machine, ensuring optimisation and efficiency of the production system.

We have a wide range of solutions available, from maintenance contracts to numerical control upgrades, safety and more. We study, propose and implement customised solutions that enable our customers to optimise their production.

At ADIRA, we have a dedicated team to answer your requests. We have standard and special tools, as well as all the consumables you need for your machine. Tell us what you need and we'll get back to you as soon as possible.

ADIRA products and services are designed for 4 types of machines: Press Brakes, Shears, Laser and represented brands.

ASSISTANCE
Specialised technical support team for your after-sales

SOLUTIONS
We provide the best made-to-measure

INNOVATION
Constantly seeking out new technologies and innovative methods

Preventive Maintenance Contract

CHECKING AND INSPECTING ALL MACHINE CIRCUITS.

Equipment safety inspection in accordance with Decree-Law 50/2005, of 25 February	General machine lubrication
Changing oil and filter	General tuning
Checking the operation of the electrical distribution board and other electrical components	Testing safety components
Checking the operation of the hydraulic circuit	Checking the condition of tools
Checking the operation of the pneumatic circuit	General machine testing
Checking the operation of the numerical control	Materials and consumable required for preventive maintenance
General tightening of machine components	

BENEFITS
Preventive Maintenance Contract

- Increases the useful life of the machine
- Reduces total average machine downtime
- Training and Consultancy
- Free, unlimited help desk
- Access to advantageous, competitive SLA suited to your needs
- 10% discount on replacement parts and tools

Tools and Consumables

Press Brakes – Tools	Block protection
Punching Tools (standard and/or customised solutions)	Filters
Dies (standard and/or customised solutions)	Laser
Intermediary tools (standard and/or customised solutions)	Bellows
Tools locker	Nozzles
Polyurethane tape and supports	Lenses
Filters	Ceramics
Lubrication cups	Filters
Shears	Cleaning kits
Blades	

BENEFITS
Supply of Tools

Customised solutions for optimising the bending process

Guaranteed supply of high quality blades

Laser consumables capable of promoting and maintaining machine reliability

Assembly, Commissioning and Training

ASSEMBLY AND COMMISSIONING

- New machines
- Second-hand machines
- Customers moving to new premises

TRAINING AND CONSULTANCY

- Machine operation
- Internal customer maintenance
- Tool Programming – Bending Solutions
- CAD/CAM Bending Software

BENEFITS
Assembly, Commissioning and Training

Certified technicians with experience in all kinds of machines, irrespective of the year of manufacture

Bending solutions suited to each machine

Networked bending solutions suitable for working with different ADIRA machines

Corrective and Preventive Maintenance

CORRECTIVE MAINTENANCE

Diagnosis and repair
Supply of original parts
Development of technically tested alternative solutions

BENEFITS
Corrective Maintenance

Proposal of solutions that ensure correct operation of machines; for example, for machines that are more than 10 years old, the supply of parts is always ensured for their proper operation

Certified technicians with experience in all kinds of machines, irrespective of the year of manufacture

PREVENTIVE MAINTENANCE

Checking and inspecting all machine circuits	General tightening of machine components
Equipment safety inspection in accordance with Decree-Law 50/2005, of 25 February	General machine lubrication
Changing oil and filter	General tuning
Checking the operation of the electrical distribution board and other electrical components	Testing safety components
Checking the operation of the hydraulic circuit	Checking the condition of tools
Checking the operation of the pneumatic circuit	General machine testing
Checking the operation of the numerical control	Materials and consumable required for preventive maintenance

Upgrades

NUMERICAL CONTROL

- Adiramatic
- Cybelec
- ESA
- Delem

BENEFITS
Controls

- Viewing parts in 2D and/or 3D, where applicable
- Extending the lifecycle of the machine
- Increasing speed of program execution

SAFETY TRAINING AND CONSULTANCY

(Safety Regulations in force)

- Physical Barriers
- Non-material Barriers
- Replacement of Lazersafe System with current solutions (more productive)

BENEFITS
Safety

- Increased operator safety
- Increased productivity due to the lower speed change point

AXES

(applicable only to press brakes)

- Increase in the number of axes
- Implementation of motorised axes

BENEFITS
Axes

- Increased machine versatility
- Increased productivity due to the use of motorised axes

USE OF THE CROWNING TABLE

USE OF THE CROWNING TABLE FOR THIN SHEET METAL

BENEFITS
Crowning Table

- Reduction in mechanical adjustments in the bending process due to the arrow effect
- Reduction in the cutting arc for very long, thin sheet metal

TECHNICAL DATA SHEETS

PRESS BRAKES

SHEARS

Press Brake PA

PA		13530	13540	16030	16040	22030	22040
Capacity	kN	1350	1350	1600	1600	2200	2200
Bending length	mm	3000	4000	3000	4000	3000	4000
Distance between side frames	mm	2550	3150	2550	3150	2550	3150
Maximum stroke	mm	260	260	260	260	260	260
Max. opening without intermediate tools (A)	mm	500	500	500	500	500	500
Arch (B)	mm	400	400	400	400	400	400
Power	kW	15	15	15	15	15	15
Approximation speed	mm/s	150	150	150	150	130	130
Working speed	mm/s	10	10	10	10	8	8
Return speed	mm/s	100	100	100	100	85	85
X-axis stroke	mm	625	625	625	625	625	625
X-axis speed	mm/s	500	500	500	500	500	500
R-axis stroke	mm	180	180	180	180	180	180
R-axis speed	mm/s	50	50	50	50	50	50
Z1/Z2-axis stroke (optional)	mm	2150	2750	2150	2750	2150	2750
Z1/Z2-axis speed (optional)	mm/s	400	400	400	400	400	400
Min. machine length	mm	3950	4980	3950	4980	3950	4980
Max. machine length (C)	mm	4700	5780	4700	5780	4700	5780
Max. width (D)	mm	2180	2180	2180	2180	2180	2180
Max. height (E)	mm	2960	3120	2960	3120	3050	3120
Height for transport	mm	2750	2880	2750	2880	2830	2880
Approx. weight	Kg	9100	11500	9300	11700	11200	13500
Height of workstation (F)	mm	930	930	930	930	930	930

TECHNICAL DATA SHEETS

PA PLUS		13530	13540	16030	16040	22030	22040
Capacity	kN	1350	1350	1600	1600	2200	2200
Bending length	mm	3000	4000	3000	4000	3000	4000
Distance between side frames	mm	2550	3150	2550	3150	2550	3150
Maximum stroke	mm	260	260	260	260	260	260
Max. opening without intermediate tools (A)	mm	500	500	500	500	500	500
Throat Depth (B)	mm	400	400	400	400	400	400
Power	kW	15	15	15	15	15	15
Approach Speed	mm/s	150	150	150	150	130	130
Working speed	mm/s	10	10	10	10	8	8
Return speed	mm/s	150	150	150	150	130	130
X-axis stroke	mm	625	625	625	625	625	625
X-axis speed	mm/s	800	800	800	800	800	800
R-axis stroke	mm	180	180	180	180	180	180
R-axis speed	mm/s	200	200	200	200	200	200
Approx. Z1/Z2-axis stroke	mm	2150	2150	2150	2750	2150	2750
Z1/Z2-axis speed	mm/s	800	800	800	800	800	800
X/X1-axis stroke (optional)	mm	± 100	± 100	± 100	± 100	± 100	-/100
X/X1-axis speed (optional)	mm/s	100	100	100	100	100	100
Min. machine length	mm	3950	3950	3950	4980	3950	4980
Max. machine length (C)	mm	4700	4700	4700	5780	4700	5780
Max. width (D)	mm	2180	2180	2180	2180	2180	2180
Max. height (E)	mm	2960	2960	2960	3120	3050	3120
Height for transport	mm	2750	2750	2750	2880	2830	2880
Approx. weight	Kg	9100	11700	9300	11700	11200	13500
Height of workstation (F)	mm	930	930	930	930	930	930

Press Brake PA

Equipment		PA	PA PLUS
Punch Tightening	Fast clamping "ADIRA" punch holders, non-reversible	standard	
	Fast clamping "ADIRA" punch holders, reversible	■	standard
	"ADIRA/USA" punch holders	■	■
	Wila Pro Hydraulic Punch Clamping	■	■
	Wila Pro USA Hydraulic Punch Clamping		■
	Aperto Hidráulico Punção Wila Premium		■
	Aperto Hidráulico Punção Wila Premium USA		■
	Pneumatic Punch Clamping Teda with Frontal Insertion		■
Tables	Crowning Table, base 60, "Standard Table Kit"	standard	standard
	Table without Crowning, base 60, "Standard Table Kit"	■	
	Table without Crowning, 180 mm, "Table Kit II"	■	
	Table without Crowning, 13 mm, "Table Kit III"	■	
	180 mm Table for Multi V "Table Kit II" Dies	■	■
	13 mm Table for Wila "Table Kit III" Dies	■	■
	Wila Pro Hydraulic Clamping with Crowning table		■
	Pneumatic Clamping for 60 mm base dies		■
Sheet metal support	2 support arms on rail (without height adjustment, without brushes, L = 500 mm)	standard	standard
	1 additional support arm on rail (without height adjustment, without brushes, L = 500 mm)	■	■
	2 support arms on rail (with height adjustment, with brushes, L = 800 mm)	■	■
	1 additional support arm on rail (with height adjustment, with brushes, L = 800 mm)	■	■
	Bending Follower (AQ1)		■
	Second Bending Follower (AQ2)		■
Back gauges	X, R back gauge for AD25	standard	
	X/R/Z1/Z2 back gauge for AD25	■	
	X/R/Z1/Z2 back gauge for CYBTOUCH 15	■	
	X/R/Z1/Z2 for AD61		standard
	X/R/Z1/Z2 back gauge for Delem 6X		■
	X/X1/R/Z1/Z2 back gauge for AD61		■
	X/X1/R/Z1/Z2 back gauge for Delem 6X		■
	X1/X2 - R1/R2 - Z1/Z2 tower back gauge (AD61 or Delem 6X)		■
	1 extra light-duty back gauge stop	■	■
	2 extra back gauge stops		■
	Anti-collision function per stop (extra for each stop)		■

Equipment		PA	PA PLUS
Angle Measurement Safety	LZS- LG Laser Safety	standard	standard
	No safety	■	■
	IRIS Laser Safety		■
	IRIS PLUS Laser Safety (Angle Measurement) (only with AD60)		■
Controls	ESA AD40	standard	
	ESA AD75		■
	DELEM DA 69_3D (up to 16 axes)		■
Leds	Leds (Smart Placing) Esa (only with Wila and AD6X)		■
	Leds (Smart Placing) Esa (only with Wila and Delem6X)		■
	Leds (Smart Placing) Wila (apenas com Wila e Delem6X)		■
Other	UPS	■	■
	Supply Voltage 220 V/400 V 25 kV	■	■
	Robot Interface		■
	Adaptation to High Temperatures	■	■
	Adaptation to Low Temperatures	■	■
	Air Conditioning on the Electrical Cabinet	■	■
	Special Paint	■	■
	Standard tool kit - @ 85° Punch: 3 or 4 x701603305 + 1x701602302 / 4-vee die 3 or 4 x721103300 +1x721104300	■	■
	Special Tools	on request	on request
	Digital Goniometer		■
	AdBendPro	■	■
	2 Machines in tandem	on request	on request

Press Brake PF

PF		13530	16030	16040	22040
Bending strength	kN	1350	1600	1600	2200
Max. bending length	mm	3000	3000	4000	4000
Distance between side frames	mm	2550	2550	3150	3150
Maximum stroke	mm	400	400	400	400
Max. opening without Punch Holders	mm	630	630	630	615
Throat Depth	mm	400	400	400	400
Power	kW	2x11	2x11	2x11	2x11
Approach Speed	mm/s	180	180	180	170
Working speed	mm/s	10*	10*	10	9
Return speed	mm/s	180	180	180	170
Back gauge					
X-axis stroke	mm	625	625	625	625
X-axis speed	mm/s	800	800	800	800
X1-axis stroke	mm	± 100	± 100	± 100	± 100
X1-axis speed	mm/s	100	100	100	100
R-axis stroke	mm	200	200	200	200
R-axis speed	mm/s	200	200	200	200
Z - Z1/Z2-axis stroke	mm	2150	2150	2750	2750
Z - Z1/Z2-axis speed	mm/s	800**	800**	800**	800**
Tower back gauge					
X1/X2-axis stroke	mm	750	750	750	750
X1/X2-axis speed	mm/s	400	400	400	400
R1/R2-axis stroke	mm	200	200	200	200
R1/R2-axis speed	mm/s	200	200	200	200
Z1/Z2-axis stroke	mm	Variable	Variable	Variable	Variable
Z1/Z2-axis speed	mm/s	800	800	800	800
Standard dimensions (LxWxH)					
Min./Max. Length	mm	3920/4670	3920/4670	4950/5700	4970/5720
Max. Width	mm	2200	2200	2240	2320
Max. Height	mm	3110	3110	3250	3190
Height for transport	mm	2980	2980	2980	2980
Approx. mass	Kg	9600	9800	12000	14500

Equipment		PF
Punch Tightening	Manual Fast Clamping “ADIRA” punch holders, reversible	standard
	"ADIRA/USA" Punch Holders	■
	Wila Pro Hydraulic Punch Clamping	■
	Wila Pro USA Hydraulic Punch Clamping	■
	Wila Premium Hydraulic Punch Clamping	■
	Wila Premium USA Hydraulic Punch Clamping	■
	Pneumatic Punch Clamping Teda with Frontal Insertion	■
Tables	Crowning Table, base 60, "Standard Table Kit"	standard
	180 mm Table for Multi V "Table Kit II" Dies	■
	13 mm Table for Wila "Table Kit III" Dies	■
	Wila Pro Hydraulic Clamping with Crowning table	■
	Pneumatic Clamping for 60 mm base dies	■
Sheet metal support	2 support arms on rail (with height adjustment, with brushes, L = 800 mm)	standard
	1 additional support arm on rail (with height adjustment, with brushes, L = 800 mm)	■
	Bending Follower AQ1	■
	Second Bending Follower (AQ2)	■
Back gauges	X/R/Z1/Z2 back gauge for AD60	standard
	X/R/Z1/Z2 back gauge for Delem 6X	■
	X/X1/R/Z1/Z2 back gauge for AD60	■
	X/X1/R/Z1/Z2 back gauge for Delem 6X	■
	X1/X2 - R1/R2 - Z1/Z2 tower back gauge (AD61 or Delem 6X)	■
	1 extra light-duty back gauge stop	
	2 extra back gauge stops	■
	Anti-collision function per stop (extra for each stop)	■
Safety	IRIS Laser Safety	standard
Controls	ESA AD75	standard
	DELEM DA 69_3D (up to 16 axes)	■
Leds	Leds (Smart Placing) Esa (only with AD6X)	■
	Leds (Smart Placing) Esa (only with Wila and AD6X)	■
	Leds (Smart Placing) Esa (only with Wila and Delem6X)	■
Other	Interface with Robot	■
	Air Conditioning on the Electrical Cabinet	■
	Standard tool kit - @ 85° Punch: 3 or 4 x701603305 + 1x701602302 / 4-vee die 3 or 4 x721103300 +1x721104300	■
	Special Tools	on request
	Digital Goniometer	■
	2 Machines in tandem	on request

* Speeds for machines without CE Safety
** Speeds for machines without an X1 axis

Press Brake BB

BB		BB 3515	BB 5020
Bending strength	kN	350	500
Max. bending length	mm	1500	2000
Distance between side frames	mm	1250	1550
Maximum stroke	mm	250	250
Max. opening without punch holders	mm	480	480
Throat Depth	mm	400	400
Power	kW	2x5.5	2x7.5
Approach Speed	mm/s	140	130
Working speed	mm/s	10	10
Return speed	mm/s	140	130
X-axis stroke	mm	500*	625**
X-axis speed	mm/s	400*	400**
R-axis stroke	mm	150	180
R-axis speed	mm/s	50	50
Z - Z1/Z2-axis stroke	mm	1000	1250
Z - Z1/Z2-axis speed	mm/s	800	800
X1-axis stroke	mm	NA	±100
X1 speed	mm/s	NA	100
Length	mm	2250	3050
Width	mm	1900	1900
Height	mm	2910	2910
Approx. mass	Kg	4400	5900

* Specifications for the series BG (back-gauge) 1.1 (standard)
** Specifications for the BG (back-gauge)3 series

Equipment		BB
Punch Tightening	"ADIRA/USA" Punch Holders	■
	ADIRA Punch holders with fast clamping without reversibility	standard
	ADIRA Punch holders with fast clamping and reversibility	■
	Pneumatic Punch Clamping Teda with Frontal Insertion	■
Tables	Standard 60 Base Table Kit	standard
	Kit table III (13 mm)	■
	Hydraulic Clamping Wila Pro	■
	Pneumatic clamping for 60 mm base dies	■
Sheet metal support	2 support arms on rail (without height adjustment, without brushes, L = 500 mm)	standard
	1 additional support arm on rail (without height adjustment, without brushes, L = 500 mm)	■
	2 support arms on rail (with height adjustment, with brushes, L = 800 mm)	■
	1 additional support arm on rail (with height adjustment, with brushes, L = 800 mm)	■
	Bending Follower(AQ1)	on request
Back gauges	X, R back gauge for AD20	standard
	X, R back gauge for AD58	■
	X/R/Z1/Z2 back gauge for AD60	■
	X/R/Z1/Z2 back gauge for Delem 6X	■
	X/X1/R/Z1/Z2 back gauge for AD60 (available only for BB5020)	■
	X/X1/R/Z1/Z2 back gauge for Delem 6X (available only for BB5020)	■
	X1/X2 - R1/R2 - Z1/Z2 tower back gauge (AD61 or Delem 6X)	■
	2 extra back gauge stops	■
Angle Measurement Safety	IRIS Laser Safety	standard
	IRIS PLUS Laser Safety (Angle Measurement) (only with AD60)	■
Controls	ESA AD20 (4 axes)	standard
	DELEM DA 58 (up to 4 axes)	■
	ESA AD40	■
	ESA AD75	■
	DELEM DA 69_3D (up to 16 axes)	■
	VISIPAC	■
Leds	Leds (Smart Placing) Esa (only with AD6X)	on request
	Leds (Smart Placing) Esa (only with Wila and AD6X)	on request
	Leds (Smart Placing) Esa (only with Wila and Delem6X)	on request
Other	Air Conditioning on the Electrical Cabinet	■
	Standard tool kit - @ 85° Punch: 3 or 4 x701603305 + 1x701602302 / 4-vee die 3 or 4 x721103300 +1x721104300	■
	Special Tools	on request
	Digital Goniometer	■
	Ergonomic kit	■
	2 Machines in tandem	on request

TECHNICAL DATA SHEETS

Press Brake PH

PH		16046	22060	30040	30060	30070	40040	40060	40070	50040	50060	50070	60040
Bending strength	kN	1600	2200	3000	3000	3000	4000	4000	4000	5000	5000	5000	6000
Max. bending length	mm	6050	6050	4050	6050	7050	4050	6050	7050	4050	6050	7050	4050
Distance between side frames	mm	3150	5100	3150	5100	6150	3150	5100	6150	3150	5100	6150	3150
Maximum stroke	mm	250	250	250	250	250	250	250	250	250	250	250	300
Max. opening without	mm	500	500	530	530	530	530	530	530	530	530	530	600
Special stroke, no. 1	mm	–	400	400	400	400	400	400	400	400	400	400	400
Max. special stroke, no. 1	mm	–	–	–	630	630	630	630	630	630	630	630	630
Special stroke, no. 2	mm	–			500	500	500	500	500	500	500	500	500
Max. special stroke, no. 2	mm	–	–	–	800	800	800	800	800	800	800	800	800
Throat Depth	mm	630	400	400	400	400	400	400	400	400	400	400	400
Special Throat Depth, no. 1	mm	–	630	630	630	630	630	630	630	630	630	630	630
Special Throat Depth, no. 2	mm	–	–	800	800	800	800	800	800	800	800	800	800
Special Throat Depth, no. 3	mm	v	–	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
Power	kW	15	15	18	18	18	30	30	30	30	30	30	30
Approach Speed	mm/s	150	130	150	150	150	150	150	150	80	80	80	80
Working speed	mm/s	10	8	8	8	8	9	9	9	8.5	8.5	8.5	7.5
Return speed	mm/s	100	85	100	100	100	90	90	90	75	75	75	75
Length*	mm	7160	7000	4820	7000	7650	4400	7000	8100	4400	7000	8100	4400
Width*	mm		2180	2380	2380	2380	2380	2380	2380	2380	2380	2380	2600
Height*	mm	3170	3540	3450	3500	3950	3450	3700	4050	3650	4280	4600	4200
Height of workstation	mm	950	1050	950	1100	860	1000	860	860	1080	860	860	1100
Distance below the ground	mm	–	–		–	1500	–	1400	1900	–	1500	1900	–
Approx. mass	Kg	16500	24000	19000	35000	40000	25000	38000	44000	32000	45000	59000	42000

* merely indicative values.

TECHNICAL DATA SHEETS

	60060	60070	80060	80070	110060	110070	110080	135060	135070	135080	135090	160075	200070	200080
	6000	6000	8000	8000	11000	11000	11000	13500	13500	13500	13500	16000	20000	20000
	6050	7050	6050	7050	6050	7050	8050	6050	7050	8050	9050	7500	7000	8000
	5100	6150	5100	6150	5100	6150	6800	5100	6150	6800	8100	6200	5500	6500
	300	300	300	300	300	300	300	300	300	300	300	640	300	300
	600	600	600	600	700	700	700	700	700	700	700	1000	700	700
	400	400	400	400	400	400	400	400	400	400	400	–	–	–
	630	630	630	630	800	800	800	800	800	800	800	–	–	–
	500	500	500	500	500	500	500	500	500	500	500		–	–
	800	800	800	800	900	900	900	900	900	900	900	–	–	–
	400	400	400	400	400	400	400	400	400	400	400	640	500	500
	630	630	630	630	630	630	630	630	630	630	630	–	–	–
	800	800	800	800	800	800	800	800	800	800	800	800	–	–
	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	–	–
	30	30	2x22	2x22	2x30	2x30	2x30	2x30	2x30	2x30	2x30	2x55	2x55	2x55
	80	80	80	80	80	80	80	80	80	80	80	70	80	80
	7.5	7.5	7.5	7.5	7	7	7	6.5	6.5	6.5	6.5	8.5	9	9
	75	75	75	75	80	80	80	83	83	83	83	90	95	95
	7000	8100	7000	8100	7000	8100	9200	7000	8100	9200	10200	8700	8200	9200
	2600	2600	2700	2700	2900	2900	2900	3200	3200	3200	3200	3250	3500	3500
	4450	4700	4600	4900	4700	5050	5430	5300	5600	5700	5900	5700	5120	5230
	860	860	860	860	860	860	860	860	860	860	860	850	900	900
	1500	2000	1750	2100	2000	2250	2400	2600	2850	2950	3025	2850	2800	2980
	50000	6400	70000	79000	92000	112000	125500	100000	115000	127500	140000	150000	148000	155000

TECHNICAL DATA SHEETS

Equipment		PH
Punch Tightening	"ADIRA" punch holders and non-reversible	standard
	Wila Premium Hydraulic Punch Clamping	■
	Wila Premium Hydraulic Punch Tightening	■
	Wila Premium USA Hydraulic Punch Clamping	■
Tables	Crowning Table, base 60, "Standard Table Kit"	standard
	Wila Premium Hydraulic Clamping with Crowning table	■
Sheet metal support arms	Fixed, light-duty front arms (L = 500 mm) (pack of 3 for machines = 4 m, pack of 4 for machines > 4 m)	standard
	1 additional support arm on rail (without height adjustment, without brushes, L = 500 mm)	■
	2 support arms on heavy-duty rail (L = 1000 mm)	■
	1 additional support arm on rail (with height adjustment, with brushes, L = 1000 mm)	■
	Light-duty bending aids (AQ1 + AQ2) (capacity 75 kg)	■
Back gauges	2 stops (only on machines with X/R)	standard
	X/R/Z1/Z2 back gauge for AD25	■
	X/R/Z1/Z2 back gauge for CYBTOUCH 15	■
	X/R/Z1/Z2 back gauge for AD61	■
	X/R/Z1/Z2 back gauge for Delem 6X	■
	X/X1/R/Z1/Z2 back gauge for AD61	■
	X/X1/R/Z1/Z2 back gauge for Delem 6X	■
	1 extra light-duty back gauge stop	■
Angle Measurement Safety	LZS- LG Laser Safety (PHs - only 4 m)	standard
	No safety	■
	IRIS Laser Safety (PHs - larger than 4 m)	standard
Controls	Adcontrol 40	standard
	DELEM DA 69_3D (up to 16 axes)	■
	CYB VISIPAC	■
	Adcontrol 75	■
Other	UPS	■
	Interface with Robot	■
	Adaptation to High Temperatures	■
	Adaptation to Low Temperatures	■
	Air Conditioning on the Electrical Cabinet	■
	Special Tools	on request
	Digital Goniometer	■
	2 Machines in tandem	on request

TECHNICAL DATA SHEETS

GH Shears

GH		00420	00630	00640	00660	01030	01040	01330	01340	01360
Cutting capacity (normal speed)		**PLUS**	**GH/PLUS**	**PLUS**	**PLUS**	**GH/PLUS**	**PLUS**	**GH/PLUS**	**PLUS**	**PLUS**
Mild Steel (45 daN/mm²)	mm	4	6,5	6,5	6,5	10	10	13	13	13
Stainless Steel (70 daN/mm²)	mm	2.5	4	4	4	6,5	6,5	8	8	8
Cutting length	mm	2050	3050	4050	6100	3050	4050	3050	4050	6120
Side Throat Depth	mm	260	260	260	260	260	260	260	260	260
Cutting angle	degrees	11/6	11/3	11/3	11/6	2	11/2	2	11/2	12/5
Adjustment of gap between blades	mm	0,05 - 0,6	0,05 - 1,1	0,05 - 1,1	0,05 - 1,2	0,05 - 1,6	0,05 - 1.6	0,05 - 2	0,05 - 2	0,05 - 2
Electric motor power	kW	9	**7.5/15**	15	18	**11/15**	15	**15/18**	18	18
Number of Hold-Downs	–	9	13	19	25	16	22	16	22	31
Back gauge stroke	mm	1000	1000	1000	1000	1000	1000	1000	1000	1000
Cutting frequency	stroke/min	45	**13/24**	21	19	**7/10**	11	**6/9**	8	6
Dimensions (CE Machine)										
Length	mm	2950	3950	4980	7120	3980	4980	3980	4980	7100
Width	mm	2480	2480	2480	2580	2820	2820	2820	2820	3100
Width for transport	mm	2180	2180	2180	2280	2280	2280	2280	2280	2450
Height	mm	1730	1730	1825	2150	2150	2150	2150	2150	2400
Approximate Weight	Kg	5000	5900	8100	15000	10000	13500	10000	13500	31000

Equipment		GH	GH PLUS
Models	GH0420		■
	GH0630	■	■
	GH1030	■	■
	GH1330	■	■
	GH0640		■
	GH1040		■
	GH1340		■
	GH0460		■
	GH0660		■
	GH1360		■
Gap	Manual blade gap adjustment for GH	■	
	Motorized blade gap adjustment for GH PLUS		■
Functions	Support Table for Thin Sheets (SCSC)	■	
	Support Table for Thin Sheets with Pins		■
Arms	Front Support Arm with Scale L=1100 mm	standard	standard
	Additional Front Support Arm with Scale L=1100 mm	■	■
	Two Front Support Arms without Scale L=1100 mm	■	standard
	Front Support Arm without Scale L=1100 mm	standard	■
	Additional Front Support Arm without Scale L=1100 mm	■	■
	Front Support Arm with Scale and pedestal L=2050 mm	■	■
	Front Support Arm without Scale, with pedestal L=2050 mm	■	■
	Squaring arm with scale and pedestal L=2050mm	■	■
	Pillow Bearings	standard	standard
	Support with 2 ball transfer units	■	■
	Two squaring guides	standard	standard
	Long squaring guide L=1100 mm	■	■
Back gauges	One front gauge	■	standard
	One retractable gauge	standard	standard
	Goniometer with auxiliary back gauge	■	■
	Front gauge (1 additional unit)	■	■
	Retractable back gauge (1 additional unit)	■	■
Safety	Rear protection via photoelectric cell	standard	standard
	Without CE safety	■	■
	Guard block with photoelectric cell	■	■
	Guard block with tilting fraction	■	■
Controls	Adiramatic 4087 Control	standard	
	Cybtouch 8 Control		standard
	Hanging Controls (Cybtouch 8)		■
Other	Voltage 220 V; 60 Hz	■	■
	Insulating Supports	■	■
	Special Paint	■	■

GV Shears

GV		GV 1630	GV 1660	GV 2030	GV 2530
Cutting capacity (max. cutting angle)					
Mild Steel (45 daN/mm²)	mm	16	16	20	25.5
Stainless Steel (70 daN/mm²)	mm	10	10	14	17
Cutting capacity (normal cutting angle)					
Mild Steel (45 daN/mm²)	mm	13	13	16	20
Stainless Steel (70 daN/mm²)	mm	8	8	10	14
Cutting length	mm	3050	6100	3050	3050
Side Throat Depth	mm	410	410	410	410
Cutting angle					
0.5° at nominal	degrees	2	1.5	2	2
0.5° at maximum	degrees	3.5	2.75	3.5	3.5
Adjustment of gap between blades	mm	0,05 - 2,5	0,05 - 2,5	0,05 -3	0,05 - 3,5
Electric motor power	kW	30	30	37	45
Number of Hold-Downs	–	16	31	16	16
Hold-Downs force	ton	45	76	58	95
Back gauge stroke	mm	1100	1100	1100	1100
Cutting frequency					
Normal cutting angle	cuts/min.	16 a 32	8 a 17	13 a 25	9 a 17
Maximum cutting angle	cuts/min.	10 a 25	5 a 13	9 a 21	6 a 14
Dimensions (CE Machine)					
Length	mm	4150	7240	4170	4250
Width	mm	2370	2370	2370	2370
Height	mm	2550	2770	2550	2730
Approximate Weight	Kg	16000	35000	17000	23000

Equipment		GV
Functions	Anti-torsion system	■
	Auxiliary ramp for repeat cuts	■
	Support table for thin sheets - heavy-duty series	■
	Unloading ramp	standard
Arms	Simple front support arm, L=1600 mm	standard
	2 Front support arms with scale, L=1600 mm	standard
	Additional front support arm with scale, L=1600 mm	■
	2 long squaring guides, L=1600 mm	standard
	Additional long squaring guide, L=1600 mm	■
	- every additional 500 linear mm	■
	Squaring arm with scale and pedestal, L=2050 mm	■
	Squaring arm with scale and pedestal, L=3050 mm	■
	Squaring arm with two scales and pedestal, L=2050 mm	■
	Squaring arm with two scales and pedestal, L=3050 mm	■
	Transfer balls to be mounted on squaring arms, L=2050 mm	■
	Transfer balls to be mounted on squaring arms, L=3050 mm	■
Back gauges	Retractable back gauge	■
	Front gauge	standard
	Retractable back gauge	standard
	Retractable back gauge with micrometre adjustment	■
	Back gauge for repeat cuts	■
	Auxiliary back gauge for goniometer	■
	Ball screw back gauge	standard
Safety	Rear protection via photoelectric cell	standard
	Cutting line lighting	standard
	Front protection via photoelectric cell	■
Controls	Cybelec Cybtouch 8	standard
Other	Second control pedal	■
	Goniometer	■

Bending Table

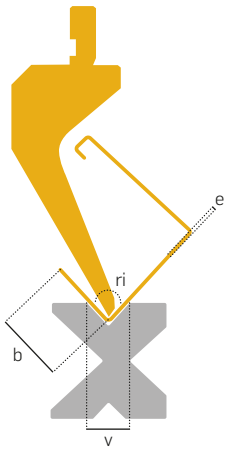
HOW TO SELECT A PRESS BRAKE

The most important factors to be taken into account when selecting a press brake are:

- Maximum length of sheet metal to be bent;
- Maximum size of sheet metal to be bent, which should be removed from the side;
- Machine stroke;
- Tonnage required.

CALCULATING THE TONNAGE REQUIRED

Air bending is the method normally used, as it requires less strength and allows for different angles with the same tools, changing only the bending depth. To obtain very small bending radiuses, the bottom bending method should be used. This method requires much more strength than is necessary for air bending, as well as special tools for each angle. Bottom bending is generally used for thin sheets and angles of 90º. The table below shows how to calculate the strength needed for air bending, according to the thickness of the material and the "V" opening used.



v		6	8	10	12	16	20	22	25	32	40	50	63	80	90	100	110	125	140	160	200	250	320	400	500
b		4	5,5	7	8,5	11	14	15,5	17,5	22	28	35	44	56	63	70	78	88	98	112	140	175	224	280	350
ri		1	1,3	1,6	2	2,5	3,5	3,5	4	5	6,5	8	10	13	14	16	17	20	22	25	31	35	50	63	78
e	0,8	8	6	4																					
	1,0	14	9	7	5																				
	1,25		19	12	9	6																			
	1,5			18	14	10	7																		
	2,0				28	19	14	12	11																
	2,5					32	23	21	18	13															
	3,0						36	32	27	19	15														
	4,0								52	38	28	21													
	5,0									63	47	35	26												
	6,0										72	53	39	29											
	6,5										84	62	46	34											
	7,0										104	76	56	41	36										
	8,0											105	77	56	48	42									
	10												130	94	80	70	62	53	46						
	12														123	107	94	80	69	59					
	14																134	114	98	83	63				
	16																	155	133	112	84				
	18																		175	147	107	83			
	20																			188	140	106	78		
	25																				234	175	128	98	
	30																					266	193	146	112

onnage required per metre, in tonnes, for bending carbon steel. Traction resistance of 400 to 450 N/mm² (= 45 kgf/mm²). The dark yellow figures are the recommended V openings and follow the rule:

V = 8 x e, for ≤ 10 mm; V = 10 x e, for ≥ 12 mm. For other materials, correct the value proportionally according to the new traction resistance. E.g.: For aluminium at 200 N/mm² (= 20 kgf/mm²) divide the value in the graph by 2.

For stainless steel at 700 N/mm² (= 70 kgf/mm²), multiply the value in the graph by 1.6.

TECHNICAL INFORMATION

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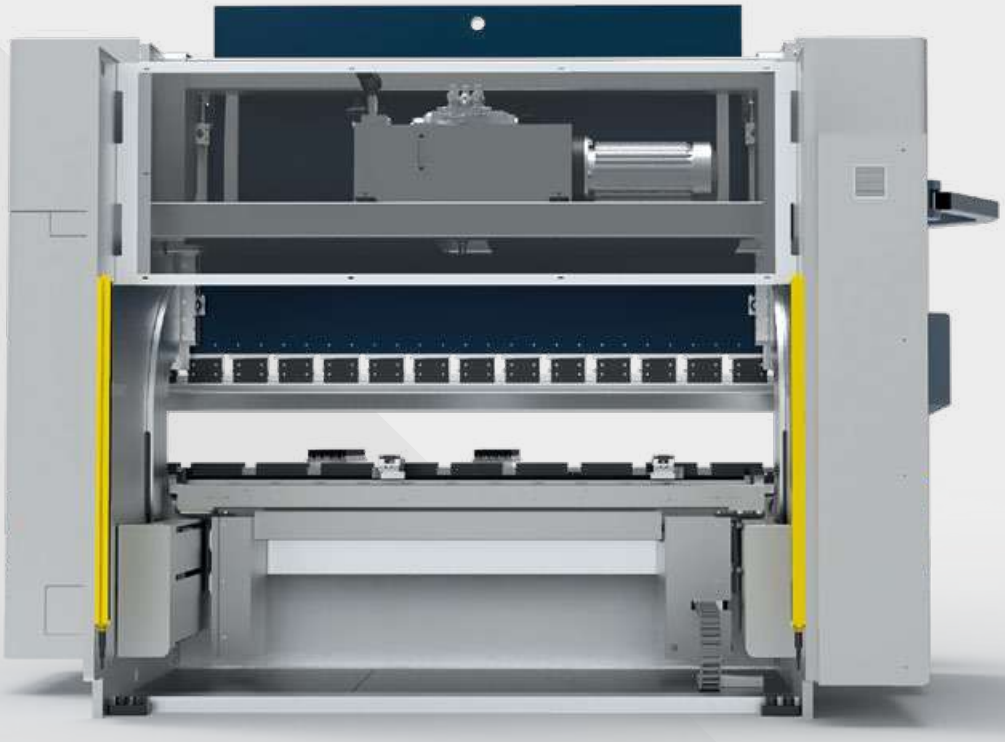
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