

# APHS HYBRID

www.baykal.com.tr

Think Big, We Do.

**PRESS BRAKE**  
technology



**Baykal**



**“ THINK BIG, WE DO. ”**

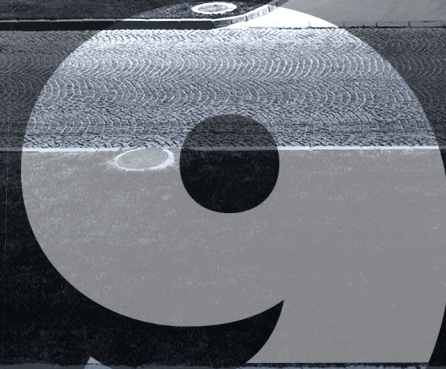
**READY 4.0  
CHANGE**

*Baykal*

APHSH 31200  
HYBRID



*Baykal*





## From Past to *Future*

With a foundation history going back to the early 1950s, Baykal today is placed as a leading manufacturer and global supplier of sheet metal working machinery specializing in the production of press brakes, shears, notchers, punching machines, laser cutting systems, plasma cutting machines, and Vertical Machining Centers.

For its manufacturing operations, Baykal utilizes three factories which together combine a production area of 70,000 square meters, making it one of Europe's largest facilities for sheet metalworking and fabricating machinery. The total workforce at Baykal is currently numbered at 650 employees and is composed of highly trained and qualified machine operators and assembly technicians supported by a staff of 80 engineers. All the machines offered by Baykal are designed, manufactured, assembled, and finished wholly at Baykal's purpose-built plants in a CAD environment with extensive use of CNC machining and modern workshop equipment.

Baykal company is accredited for the ISO 9001 Certification issued by the German TÜV NORD institution. Also, since 1995, Baykal has been building machines in conformity with the European CE regulations for safety, being the first Turkish machine-tool manufacturer certified eligible to bear the CE Mark on its products. In addition, all Baykal products are manufactured with the TSE and TSEK quality certificates issued by the Turkish Standards Institution.

Since the last 50 years, Baykal has progressed to become a major exporter of sheet metal working machines to the world markets with customers located in all the machine-tool consuming countries of the global geography from the Americas to Australasia. Baykal is currently represented in over 100 countries worldwide through appointed dealers. In the base market of Turkey, Baykal sheet metal working machines have traditionally commanded a leading market share thanks to the company's pioneering role in the development of Turkey's machine industry and its never-lessening emphasis on quality and service. Here, with a long engineering experience behind it, Baykal wishes to present itself as a quality-conscious, professional machine-building company serving the industry.

# APHS HYBRID

01

## ACCURATE

Because each side of the APHS HYBRID press brake is independently operated by its own hydraulic system, it is an on-demand direct drive system. It is very fast, accurate and repeatable.

02

## AFFORDABLE

While still not the least expensive option, the Hybrid brake technology allows for a more efficient hydraulic system design.

03

## FLEXIBLE

Large range of lengths and tonnages are available.





04

## GREEN

Up to 60% energy savings while in standby and a 45% savings during forming with a likely total of 60% savings over one hour with 15 press cycles. That's a very big deal when you are looking at saving energy and operating costs.

05

## QUIET

When it's in standby mode (all axis not moving), the hydraulics are not running.

06

## SAFE

Most hybrid machines are incorporating a great deal of safety into their designs including lasers and other features to improve operator safety.

# Servo electric technology: innovation first

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Over the years, manufacturers have been developing different solutions to improve the performance of their products. Through tools, functionalities, and technological innovations sheet metal press brakes have evolved starting from mechanical presses to hybrid press brakes. Hybrid is a newly developed technology that uses hydraulics but instead without a proportional valve. Hybrid Brakes are becoming more prevalent and more widely available. With a servo-hydraulic drive, when you turn the pump on each cylinder in one direction, you are pumping the ram down, when the CNC control unit sets the pump in the other direction, you are pumping the ram back up. By controlling the speed of the servo, you can also control the ram speed.

Benefits of this technology include substantial power saving as you don't have a conventional AC motor running all or most of the time. The servos only activate as required. You also get incredibly fast response time and minimal piping as it does away with a central tank and proportional valves. You can expect higher speeds for both high-speed approach and high-speed return, around 200mm/sec. Hybrid press brakes use hydraulics in small tanks to assist with the bending process and servo motors to control the flow to the cylinders. Small oil tanks translate into many advantages, such as:



## User Friendly

Easy to install, use and maintain

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## Modular

Capable of meeting any production need, with a variety of possible configurations

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## Energy Efficient

Less energy required and lower environmental impact

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## Productive

High productivity due to reduced cycle times and higher process reliability

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## Flexible

Suitable for a wide range of different products



# Headlines to enhance Your **Worklife**

**Significantly low oil consumption compared to the hydraulic press brakes.**

- **More savings**
- **Less environmental impact**
- **Fewer maintenance costs**
- **A quicker production**



The Hydraulic system is directly connected to two small oil tanks. The advantage is that the CNC press brake is more precise and is not affected by temperature variation, as opposed to traditional machines.

The advantage of the hybrid machine is to run the hydraulics with servo motors only during bending and go off during standby which brings about half as much electrical energy. The hybrid system allows the machine to consume energy only when the pedal is activated. This means that the consumption of the press brake is minimum when tools are changed and, in general, during those steps in which the crosspiece is not involved.

There is a mix of electric and hydraulic systems that allow the machine to be much more responsive while maintaining a higher degree of accuracy than a traditional hydraulic press brake system. Reducing cycle times by 30% or more while maintaining a high degree of accuracy in these systems.

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HYBRID

Industry 4.0  
**READY**



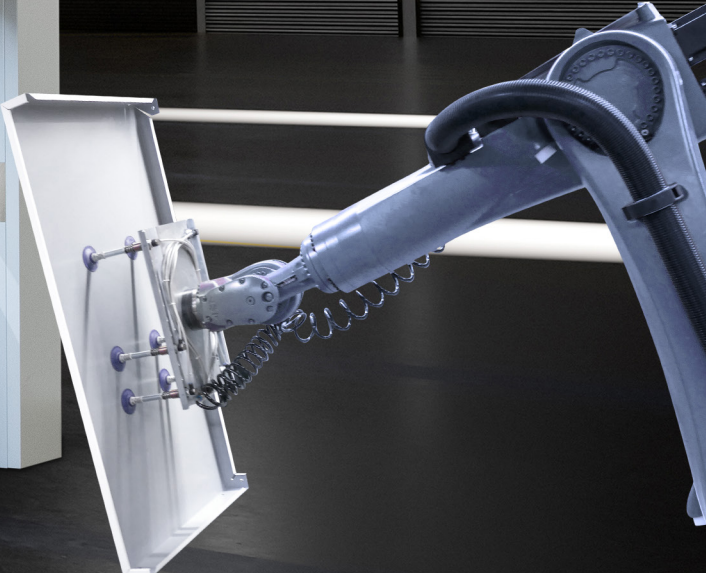
**GREEN**

**60 % less energy and oil consumption on average compared to the Standard Hydraulic Press Brakes.**



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APHS 31200  
HYBRID



**AUTOMATION**

Ready for robotic applications.



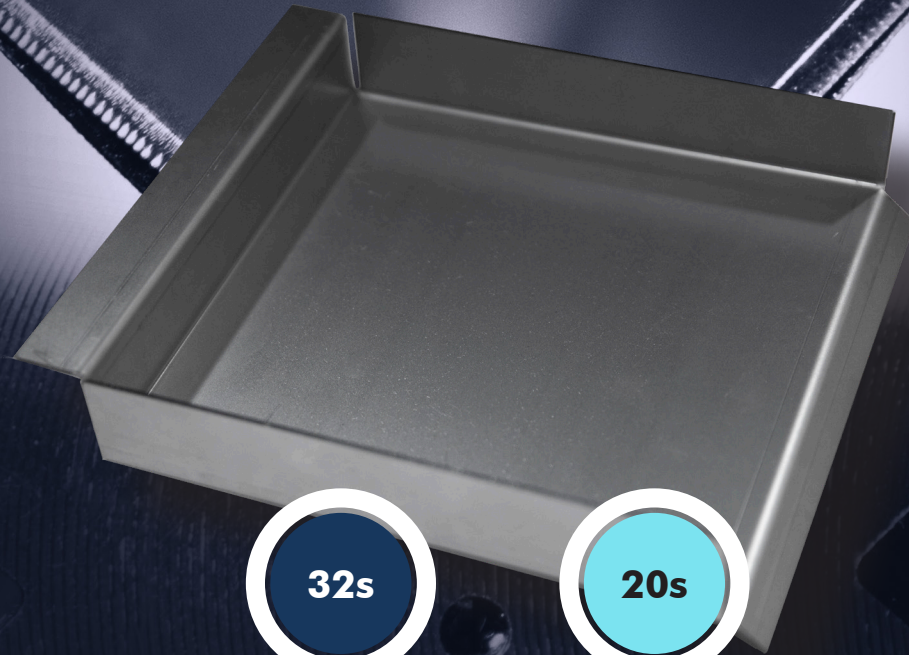
## EFFICIENCY

Compared with standard hydraulic press brakes,  
Hybrids can easily reach 200 mm/s movement speeds.  
(For 240-300 tons higher speeds are available with H+Package)

# High reliability and Maximum Productivity



**Time Cycle  
Comparison**

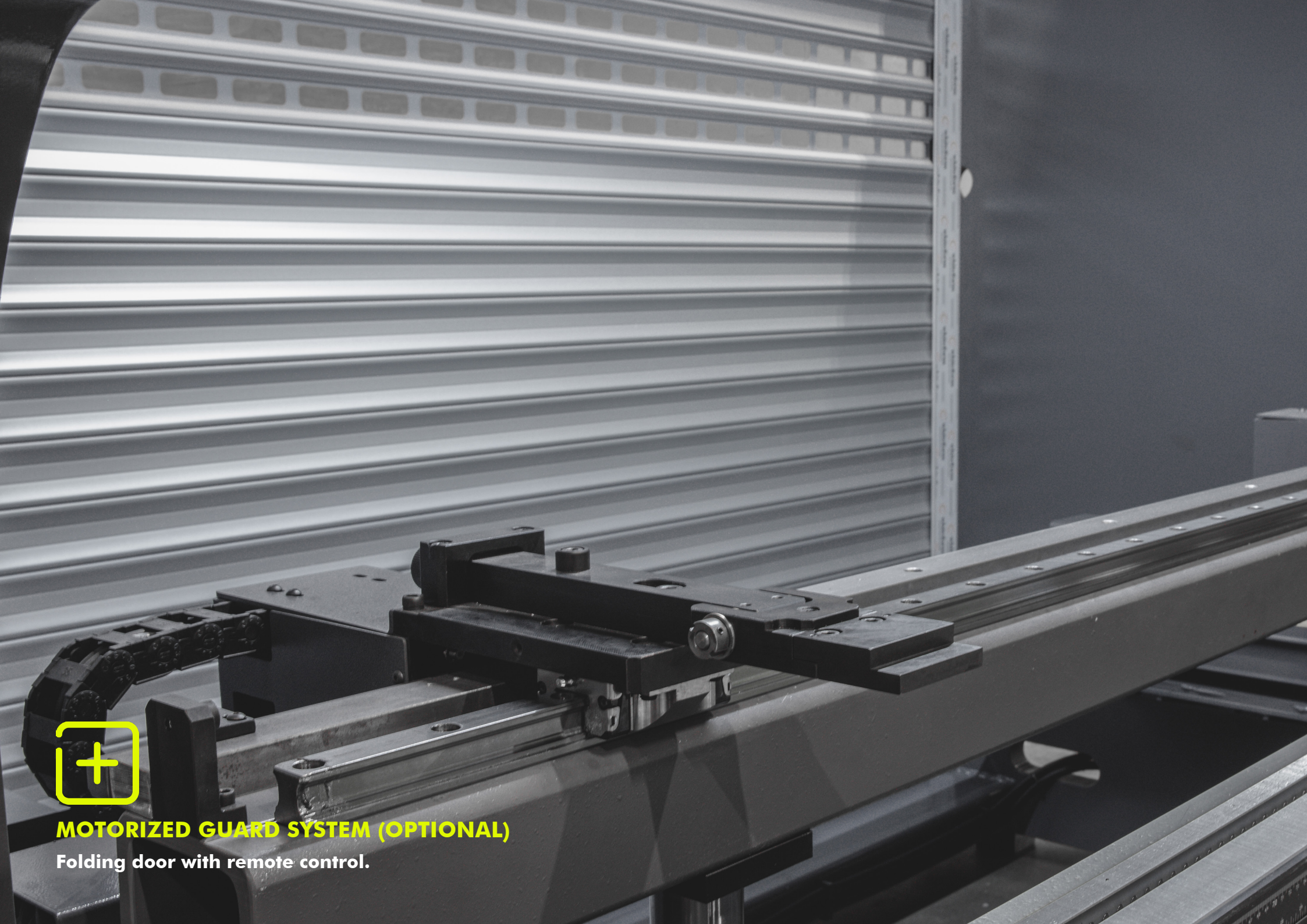


**32s**

100t Conventional  
Press Brake  
110 mm/s

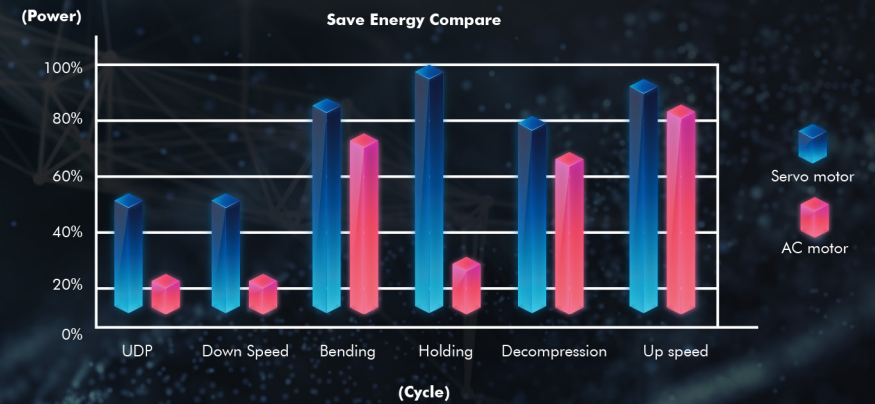
**20s**

100t APHS-Hybrid  
200 mm/s



**MOTORIZED GUARD SYSTEM (OPTIONAL)**

Folding door with remote control.



**ENERGY SAVE**

**To reduce electrical consumption and heat, the pump motor is active only when the machine is working.**



**INNOVATIVE**

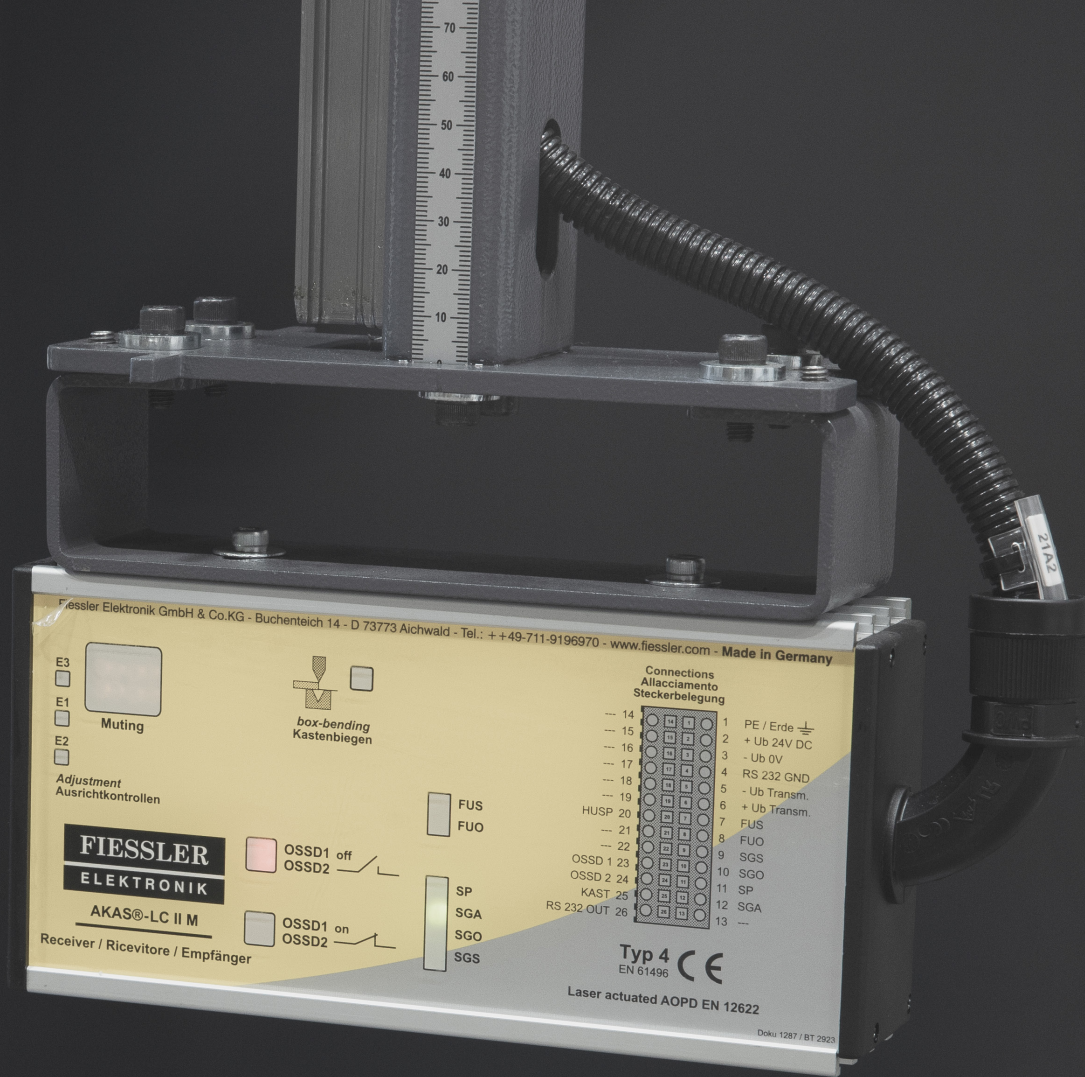
**Lead to Lean Manufacturing and Ready for Industry 4.0**



Baykal

APHSH 31200  
HYBRID





## INTEGRATED SAFETY

Front and Rear Safeguarding systems allow safe operation.

Fessler Elektronik GmbH & Co.KG - Buchenteich 14 - D 73773 Aichwald - Tel.: ++49-711-9196970 - www.fessler.com - Made in Germany

**E3**  **Muting**

**E1**  **E2**

**Adjustment**  
Ausrichtkontrollen

**FISSLER**  
**ELEKTRONIK**

**AKAS®-LC II M**

Receiver / Ricevitore / Empfänger

**box-bending**  
Kastenbiegen

**OSSD1 off**  **OSSD2**

**OSSD1 on**  **OSSD2**

**FUS**  **FUO**

**SP**  **SGA**  **SGO**  **SGS**

**Connections**  
Allacciamento  
Steckerbelegung

14	1	PE / Erde
15	2	+ Ub 24V DC
16	3	- Ub 0V
17	4	RS 232 GND
18	5	- Ub Transm.
19	6	+ Ub Transm.
20	7	FUS
21	8	FUO
22	9	SGS
23	10	SGO
24	11	SP
25	12	SGA
26	13	---

**Typ 4**  
EN 61496

Laser actuated AOPD EN 12622

Doku 1267 / BT 2923

# Important Steps for Perfect Bending.



**ACCURATE**

Because of the servo drives, the movement of the brakes is considerably faster in all directions when compared to conventional press brakes, the result of that is increased productivity while maintaining perfect accuracy and repeatability in all directions.



## QUIET

As servo motor and pump are assembled inside of the tank thanks to the compact design of hydraulic system, 13% more silent work is achieved with 63 dB of sound level.



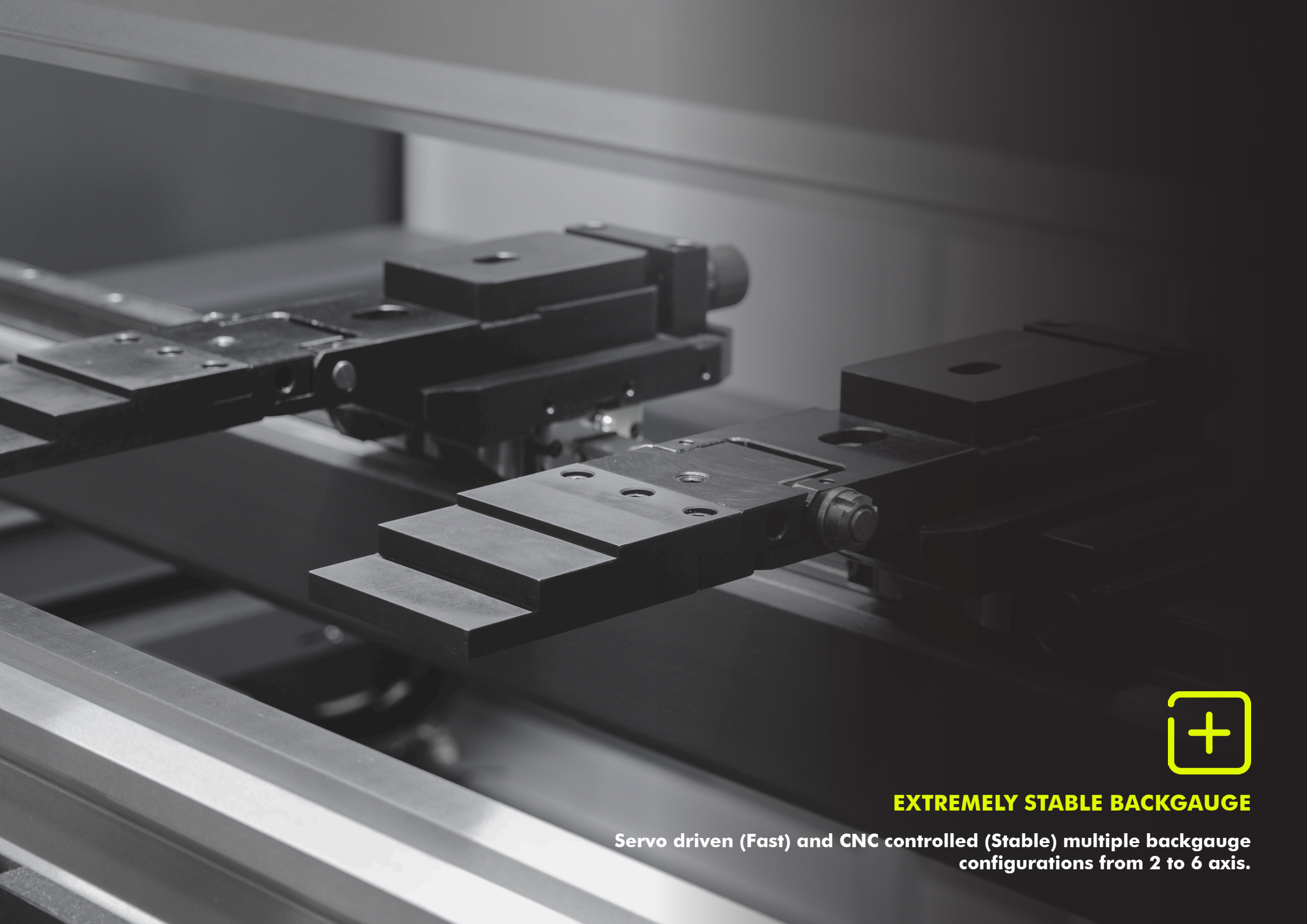
**REPEATABILITY WITH SERVO MOTOR SYSTEM**

**With servo motor and compact hydraulic system,  
precision and repeatability are achieved as 0.01.**



**MOVEABLE AND ADJUSTABLE SUPPORT ARMS**

**A Range of Support Arms for Light- and Heavy-Duty- Sheet Metal-Work**



**EXTREMELY STABLE BACKGAUGE**

Servo driven (Fast) and CNC controlled (Stable) multiple backgauge configurations from 2 to 6 axis.



## ERGONOMICS

Hybrid press brakes with height-adjustable control arm system allow operator comfort and easy use of control unit.





Delem

DA-60



**FRIENDLY CONTROLLER**

Full Control of Operations with one finger.

## TECHNICAL DATA

Baykal	APHS-HYBRID									
No		31120	31160	31200	31240	31300	41160	41200	41240	41300
Bending Length	mm	3100	3100	3100	3100	3100	4100	4100	4100	4100
Bending Force	Tons	120	160	200	240	300	160	200	240	300
Oil Capacity	lt	2x34.5	2x55	2x55	2x55	2x55	2x55	2x55	2x55	2x55
Daylight opening	mm	530	530	530	530	660	530	530	530	635
Stroke	mm	260	260	260	260	320	260	260	260	320
Throat Gap	mm	410	410	410	410	500	410	410	410	500
Approach	mm/s	200	200	200	160/200*	140/200*	200	200	160/200*	140/200*
Working	mm/s	10	10	10	8/10*	7/10*	10	10	8/10*	7/10*
Return	mm/s	200	200	200	160/200*	140/200*	200	200	160/200*	140/200*
X axis Range	mm	750	750	750	750	750	750	750	750	750
X axis Speed	mm/s	350	350	350	350	350	350	350	350	350
X axis Precision		0,03	0,03	0,03	0,03	0,03	0,03	0,03	0,03	0,03
R axis Range	mm	150	150	150	150	150	150	150	150	150
R axis Speed	mm/s	200	200	200	200	200	200	200	200	200

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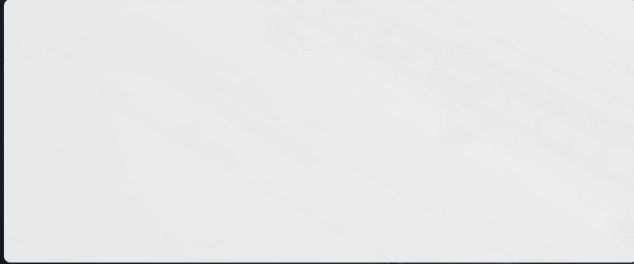
Higher Speeds are available with **H+Package**

Legal Notice:

Machine built with CE-safety conformity are available as option.

Design and specifications are subject to change without notice.





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