Embedded Solutions
OEM Signature Package

FOR PRESS BRAKES

APRIL 2023

lazersafe

Performance without compromise.™

We are a technology company specialising in the development and manufacture of control, safety and operator protection systems for press brakes and related sheet metal machinery.

Our industry leading systems are designed and certified to the highest European and International safety standards. Press brakes equipped with Lazer Safe technology benefit through significantly higher levels of machine productivity and performance without compromising operator safety.

Since 1998 Lazer Safe has established a reputation as a technology innovator and an international centre of expertise that is recognised by many of the industry's most highly respected press brake manufacturers.

The Lazer Safe difference

Our OEM Signature Package offers a flexible, efficient and tailored solution at an economical price, together with un-compromised levels of safety, functionality and performance that press brake manufacturers have come to expect from Lazer Safe.

OEM Embedded Solutions

Our OEM Embedded Solutions are suitable for press brake manufacturers that seek a medium to long-term solution with a technical partnership to develop and enhance the overall design of their machines.

For manufacturers that only require a one-off safety and guarding solution to fulfil a specific customer order, we offer a range of stand-alone guarding solutions that are simple and quick to integrate. Visit our website www.lazersafe.com or contact us for more information.

Value Added Service

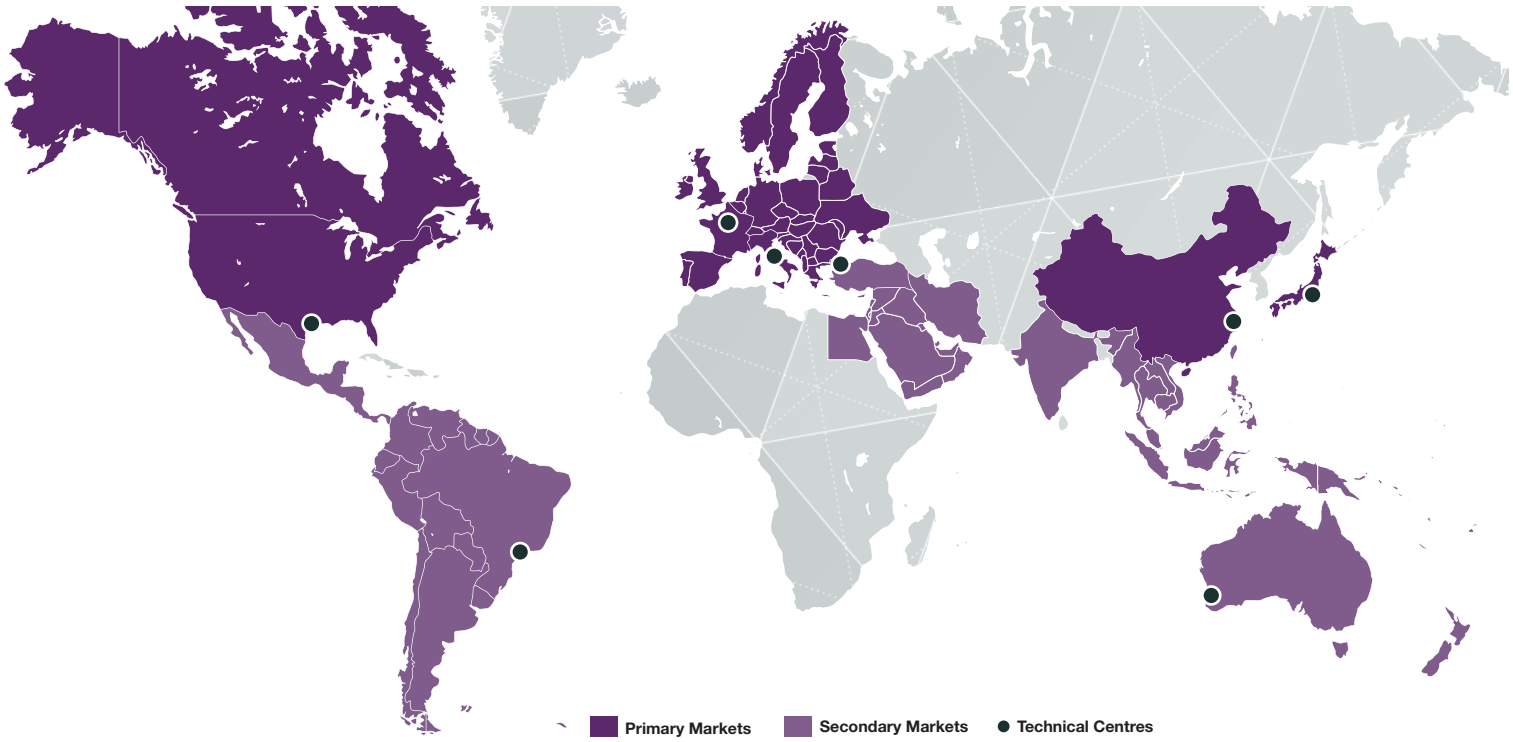
During the initial stages we collaborate with the manufacturer to evaluate their exact requirements for each machine series and model. Hardware and software solutions are then tailored for each machine application and in conjunction with engineering visits, we work alongside the manufacturer during the entire process; from the integration to seamlessly blend our technology with machine design, to customisation and testing, through to final machine production.

As an ongoing process, we continue to work with our partners to provide the highest level of technical and engineering support, incorporating the latest technology and features as they become available as well as looking for ways to enhance machine design to help manufacturers deliver more to their customers.

Our unique approach and commitment to our OEM Partners is part of our value added service and represents no additional cost to the manufacturer.

International markets

We partner with press brake manufacturers and export our systems to key markets around the world. Our primary markets are Europe, Japan, North America and China with secondary markets in South America, Turkey, Southeast Asia, Middle East, India and Australasia.



Product overview

For press brake manufacturers, we supply tailored hardware and software solutions that provide safety control and monitoring, optical laser protection, CNC communications interface and machine diagnostics. Our systems comprise three key elements; safety controllers, optical systems and mounting brackets. These elements are matched and configured to suit the manufacturer's requirements for each machine.

Safety controller

PCSS-A0 Plus

Optical system

LZS-2

Mounting bracket

Standard brackets

PCSS-A series safety controller

PRESS CONTROL SAFETY SYSTEM - ADVANCED

PCSS-A is a programmable safety controller designed to improve the performance and safety of press brakes. It provides flexibility for the press brake manufacturer and simplifies the design process by combining all related control, safety and monitoring functions into a single system and eliminates the need for complex integration of third party components and software. PCSS-A provides an optimum balance of functionality and performance with reduced build cost.

Compact and powerful

PCSS-A replaces conventional safety PLCs, safety relays and modules, guarding system controllers and muting hardware. The small foot print takes up minimal cabinet space with all safety, control and guarding elements connected directly to a single source. This cost effective design reduces the number of components and eliminates complex wiring for a clean and efficient cabinet layout.

Software simplified

CE Certified kernel software with pre-programmed safety function modules takes the work out of designing, testing and certifying system software. A user programmable application integrates with the kernel enabling the manufacturer to simply select the modules that suit the specific machine design and provides flexibility to program additional non-safety functions. This is ideal for finalising machine certification quickly and efficiently. Custom safety function modules can be developed and certified by our engineering team as part of our value added service.

Optical protection options

The manufacturer can select from a variety of optical protection options that connect directly to PCSS-A. No additional control hardware or software is required. These options provide flexibility and enable a high level of machine performance with a speed change point as low as 4mm when forming flat material as well as complex part profiles with side flanges.

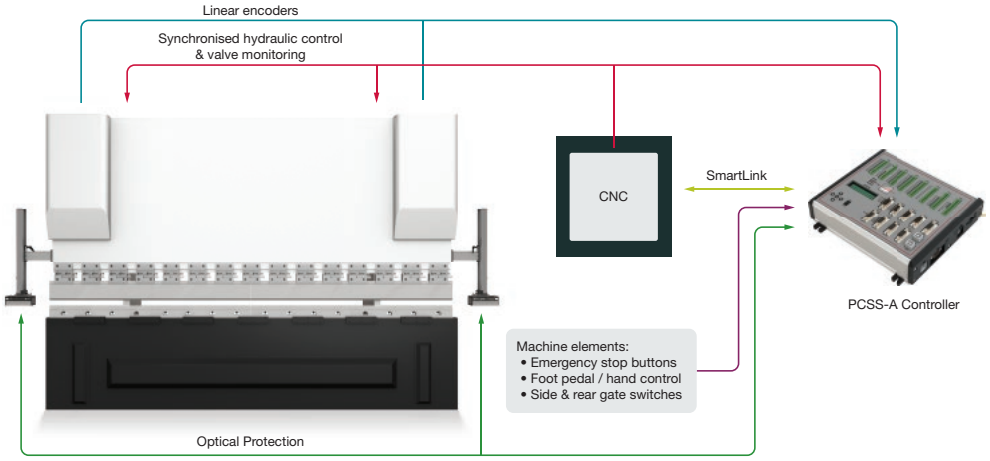
PCSS-A Standard features

- Streamlined management of machine safety elements including valve control, valve monitoring, foot pedals, hand controls, emergency stop, side and rear gate switches, level switches, etc.
- Optical protection system management, control, muting and monitoring.
- Dual optical protection support. Lazer Safe optical protection and third party light curtains can be installed on the same machine.
- Connects to Y1/Y2 linear encoders for automatic speed and stopping performance monitoring.
- Fully embedded communication software interface with the CNC system. Compatible with Delem, Cybelec and ESA. Custom CNC integration also supported.
- CE Certified hardware and software.

PCSS-A design

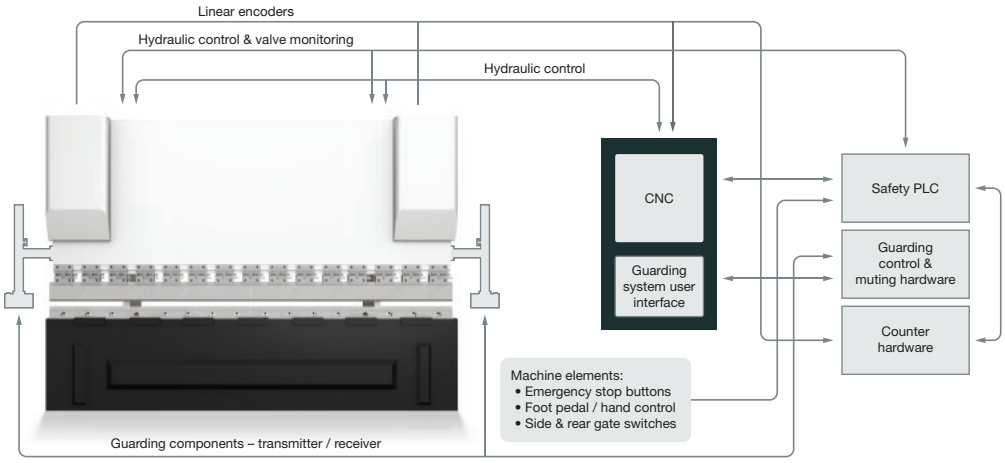
COMPARISON

Press Brake design streamlined with the PCSS-A Platform

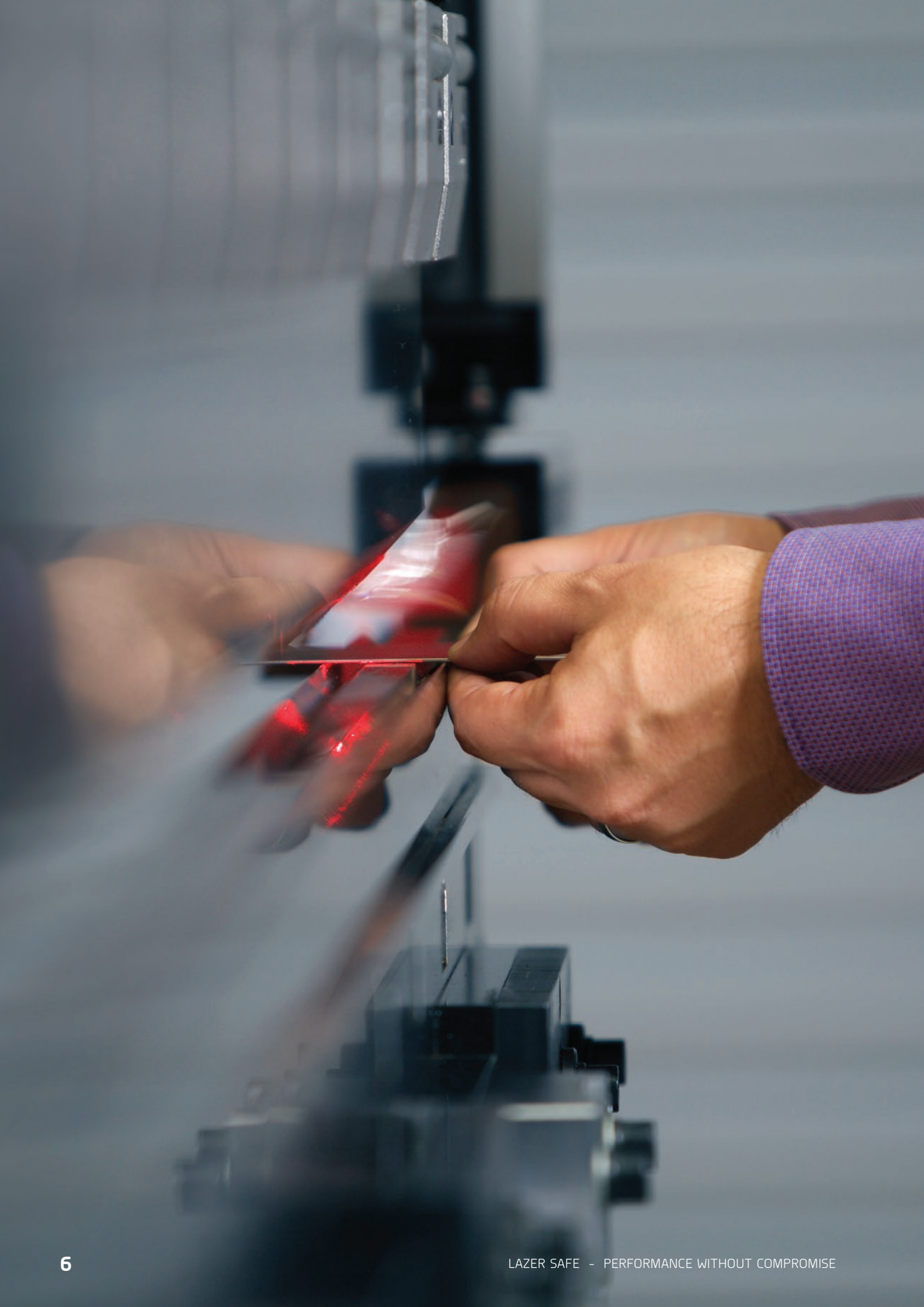


This provides an efficient and cost effective platform with fewer components, reduced wiring, simplified interface and CE Certified hardware and software to minimise engineering and build time.

Press Brake designed with third party components



Traditional press brake design increases the level of complexity and requires many third party components to be made to work together leading to hardware and software compatibility issues, adds extra wiring and increased cabinet size. The manufacturer must consider CE Certification in design and integration when using third party hardware components plus develop and certify the control software. This inefficient design leads to longer manufacturing time and increased build cost.



PCSS-A technology

Our industry leading technology is designed to maximise press brake productivity and performance, streamline operation and enhance functionality and protection. These key technologies are the foundation of our products and form the building blocks that enable us to deliver superior features and performance to press brake manufacturers and users.

FlexSpeed is an advanced high speed hardware architecture that achieves faster response time to enhance machine performance and efficiency.

Traditional safety control systems employ a combination of hardware and software processing. This inefficient process slows down overall response and reaction times and when coupled with optical protection systems leads to a reduction in machine performance by forcing the machine to operate at reduced closing speed in order to improve stopping performance and increasing slow speed travel prior to bending.

FlexSpeed eliminates these delays and imposes no restriction on machine performance. This enables machines to operate with maximum speed and efficiency.

SmartLink is an advanced communications process that seamlessly integrates safety, guarding and imaging functions with the CNC system to enhance the operation, functionality, performance and efficiency of the press brake. SmartLink is compatible* with Cybelec, Delem and ESA CNC systems or can be custom integrated with proprietary CNC systems by the press brake manufacturer.

**SmartLink functionality and features that are available with third party CNC systems will vary between CNC manufacturers.*

AutoSense is an automatic monitoring technology that tracks machine operation and performance in real time. AutoSense automatically monitors control commands, motion, direction, speed and stopping performance to maintain a high level of machine and operator protection. AutoSense also guarantees compliance with international safety standards that mandate automatic monitoring of machine overrun and safe speed.

AutoSense Plus provides additional monitoring to detect and diagnose specific machine electrical and hydraulic faults with visual alerts displayed on the CNC via SmartLink. Machine problems are quickly and easily identified to get the machine back into production with minimal downtime.

AutoSense Ultimate adds advanced Dynamic Valve Monitoring technology to automatically monitor hydraulic valves, associated control commands and machine actions. Dynamic Valve Monitoring reduces machine build cost and complexity by eliminating the need for separate monitoring systems and monitoring sensors built into the hydraulic valves. AutoSense Ultimate is available as standard with selected systems.

PCSS-A0 Plus

PCSS-A0 Plus

1. Input and output connections.
2. LCD display.
3. Display navigations buttons.
4. TX & RX connections for LZS-1, LZS-2 and light curtains.
5. Linear encoder input and output connections (Y2).
6. Linear encoder input and output connections (Y1).
7. SmartLink communications.
8. Software transfer and diagnostics.

PCSS-A0 Plus

SPECIFICATIONS

	PCSS-A0 Plus
	
Technology	
SmartLink	●
FlexSpeed	●
AutoSense / AutoSense Plus	●
AutoSense Ultimate with Dynamic Valve Monitoring	●
Specifications	
Safety Inputs	12
Safety Outputs	4
Standard Inputs	24
Standard Outputs	6
Linear Encoder I/O	2, both Y1 and Y2
Minimum encoder resolution	0.1 micron
Speed capacity of the encoder counters	> 300mm/second
Response time (hardware interrupts)	< 1ms
Dimensions	229mm x 189mm x 45mm
Optics Compatibility	
LZS-2	●
Third party light curtain support	●
Dual guarding support	●

Optical protection technology

Our patented optical protection technology provides a high level of safety and functionality for the machine operator. Through the combination of dynamic muting and independent management of the optical sensors, machines can operate safely without compromising productivity or performance.

Close proximity protection enables safe handling of the work piece during high speed closing.

Optical protection systems comprise a laser transmitter and receiver that are mounted to the upper beam of the press brake. A continuous laser field protects the zone directly below the punch tip allowing the operator to hold the work piece as the tools close at high speed. If an obstruction is detected the machine is automatically stopped.

This close proximity protection allows the operator unrestricted access to the point of operation for increased productivity and unlike traditional light curtains, reduces fatigue by enabling the operator to remain standing in the same position.

The laser field is processed by the receiver and divided into three continuous zones to detect obstructions entering from the front, sides and rear of the tool area.

The front zone provides protection forward of the tool while the middle zone protects the area just behind the tip of the punch. The rear zone provides additional protection for the open gaps created when segmented tooling is used. The protective zones are independently and automatically muted to suit different shaped work pieces allowing parts to be formed safely at high speed to achieve maximum productivity.

LZS-2 optical protection system

The LZS-2 optical protection system provides an economical, entry level option for press brake manufacturers, with the added benefits of better machine performance and simplified setup for the machine operator.

LZS-2

1. M12 plug for connection to PCSS-A
2. Status LEDs - Power / Laser
3. Status LEDs - Power / Front/middle/rear Sensors

How optical protection works

All functions of the optical protection system including mute point management, mode selection and user messages are embedded within the CNC system (via SmartLink). Mode selection is tailored via the CNC bend program to suit the shape and profile of the work piece and all functions of the system are automated during machine operation.

Muting

Muting temporarily deactivates the optical protection just before the punch makes contact with the material allowing the bend to be completed. When the bend program is started the tool and material data is sent to the PCSS-A controller via SmartLink. The mute point position is automatically calculated at 2mm above the programmed material surface and this position is optically verified on every cycle.

Operating modes

SmartLink enables guarding modes to be selected in the CNC bend program. A different mode can be selected for each bend step allowing the operator to streamline set-up to suit the profile of the work piece. SmartLink automatically switches guarding modes on each step of the bend program with automatic blanking of the sensors to eliminate unnecessary stops and reduce cycle time to achieve maximum productivity.

Normal mode

In normal mode all sensors are active, allowing the tools to close safely at high speed. If any sensor is blocked, the machine is automatically stopped. If any sensor remains blocked then the bend can be completed at 10mm/s safe speed.

Tray mode

Tray mode is designed for bending tray or box shaped work pieces where the side flanges block the front or rear sensors. In tray mode all sensors are active and the machine is stopped if a side flange is detected. The operator presses the pedal again to confirm the presence of the side flange then the system automatically blanks the front and rear sensors and the bend continues at high speed.

Tray mode with programmed flange height

The operator has the option to program the height of the side flange in the bend program. During the cycle all sensors are active until the top of the flange is detected. The actual flange position is verified with the programmed position then the front and rear sensors are automatically blanked so the bend continues at high speed without stopping. Activation of the closing movement only requires a single pedal press and does not require any other operator confirmation (e.g. double pedal press). This mode is CE Certified and exclusive to Lazer Safe.

Mute stop mode

Ideal for forming parts with side flanges that block the entire sensing zone. The tools close at high speed and stop automatically at the mute point allowing the operator to simply insert the work piece then press the pedal to complete the bend.

Back gauge mode

Back gauge mode is designed for bend cycles where the back gauge fingers are positioned very close to the bend line and detected by the rear sensor. To maintain protection while avoiding unnecessary interference the rear sensor is automatically blanked just above the back gauge fingers so the bend can be completed without stopping.

Field muted mode

In Field muted mode the optical protection is turned off and closing speed restricted to 10mm/s safe speed. Field muted mode is ideal for bending operations where the laser transmitter or receiver must be moved clear to accommodate work pieces that extend past the ends of the machine bed.

Dual guarding option

This provides the flexibility to install both optical laser protection and a third party light curtain on the same machine. The operator can select which guarding device to activate for a particular bend job or the system can automatically switch between guarding devices on a bend by bend basis.

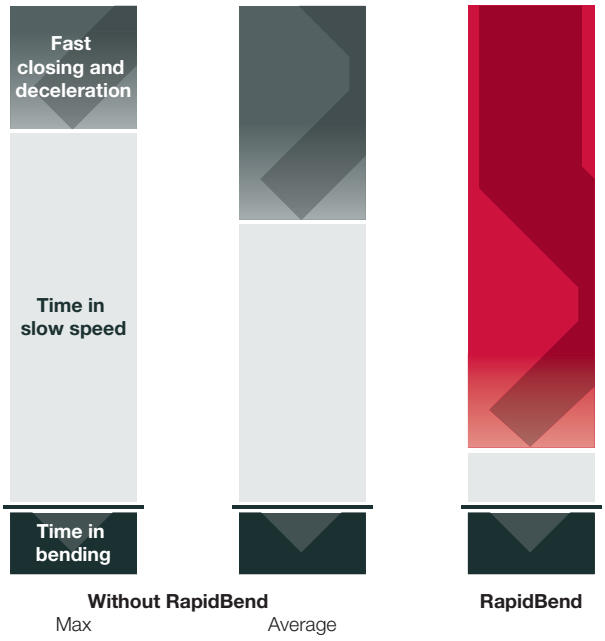
Optical protection technology

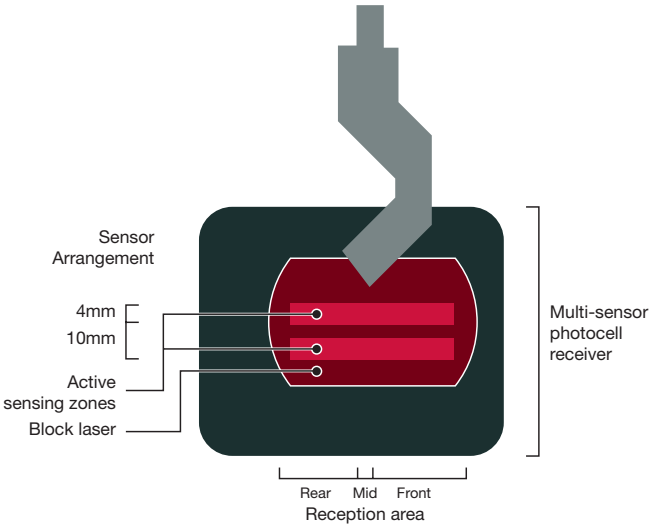
RapidBend technology enables press brakes to operate with a high level of performance, without compromising safety.

Through a two-stage dynamic muting process, the tools can close safely at maximum speed, then transition to bending speed when the punch is 4mm above the material surface.

RapidBend works with a wide range of part profiles including box bending with side flanges. In comparison with other light or laser based guarding systems, RapidBend technology can reduce machine cycle time by up to 2 seconds per cycle, representing a significant saving in operating time and cost.

In comparison to other light or laser based guarding systems, RapidBend technology can reduce machine cycle time by more than two seconds per cycle. This represents a significant saving in operating time and cost. RapidBend guarantees this high level of performance irrespective of machine fast closing speed or stopping performance.





LZS-2

LZS-2 optical protection system

SPECIFICATIONS

	LZS-2
Specifications	
Optical protection functions	●
Laser transmitter	CLASS 1 Block laser
Receiver	Multi-sensor photocell receiver
Maximum recommended optical range	8 metres
Minimum object detection resolution	4mm
Connector type	M12 8 pin
Tool compatibility	V tools and non-standard tools
Integrated status LEDs	●
Technology	
RapidBend	●
Performance	
Minimum speed change point - flat sheet bending	4mm
Minimum speed change point - box bending	4mm
PCSS-A Series Compatibility	
PCSS-A0 Plus	●
Mounting Bracket Compatibility	
Bracket Extrusion Kit	●
Standard Brackets	●

Mounting Brackets

Lazer Safe offers a range of mounting bracket solutions for attaching the laser transmitter and receiver to the press brake. Standard and custom sizes are available to suit various machine types, machine lengths and optical configurations.

Standard Brackets

Our Standard Brackets are manufactured from an extruded high-tensile alloy for rigidity and tolerance to machine vibration with linear rails and bearings that provide precision vertical adjustment of the laser transmitter and receiver. During tool change a spring loaded locking pin keeps the transmitter and receiver clear allowing the tools to be easily removed from the ends of the machine.

After tool change the transmitter and receiver are easily adjusted to match the tool height with the process taking only a matter of seconds. Multiple vertical lengths and horizontal mounting options are available to suit most machines and the bracket system is designed to aesthetically combine well with modern press brake designs.

Economy Option

As an option we offer the Standard Brackets in kit form without the linear rails and carriages. The press brake manufacturer can then source their own linear components.

	Standard Brackets
Specifications	
Vertical bracket length	520mm / 700mm / 1000mm
Vertical adjustment range	350mm / 530mm / 830mm
Horizontal adjustment range	40mm
Maximum recommended machine length	8 metres
Main Features	
Precision linear bearings and rails	●
Free sliding operation	●
Adjustable locking handle	●
Spring loaded tool change lock	●


Press
Control
Safety
System
By
A-Series
lazersafe
CN17
LINK
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Patents
Lazer Safe products are subject to patents granted or applied for in various global territories.

LS-MKT-M-012 *v2*

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Performance without compromise.™

27 Action Road, Malaga WA 6090, Australia
PO Box 2368, Malaga WA 6944, Australia
+61 8 9249 4388 +61 8 9249 6011 info@lazersafe.com
lazersafe.com