

## Lazer Safe LZS-003

### Operator guarding for hydraulic press brakes

The Lazer Safe LZS-003 guarding system for hydraulic press brakes offers a highly effective solution for both operator safety and machine productivity.

The LZS-003 system is fully compliant with **Category 4** safety requirements and can be installed either at the time of manufacture or as a retrofit to a press brake already in service.

#### How the LZS-003 works

An LZS-003 installation comprises: **LZS Controller, Operator Interface Panel, Laser Transmitter / Receiver Pair, Optical Encoder** and **Brackets** (for mounting the transmitter / receiver on the press brake).

The Transmitter and Receiver are mounted on the upper beam of the press, allowing the operator to be positioned close to the work piece as the tools close at high speed. Hands and fingers are protected by a continuous band of laser light that senses the zone below the punch. If an obstruction is detected, the beam movement is stopped so that the punch cannot make contact with the obstruction.



Additional LZS-003 safety capabilities include:

- Detection of material or items accidentally left on the die that could cause injury or damage.
- Continuous monitoring of the critical speeds and stopping distance of the moving member of the machine. If the crawl (bending) speed is exceeded and / or the stopping distance is exceeded, the LZS controller will issue a stop command to the machine. There is no need for a separate stopping performance monitor.

#### 100% fail-safe

Dual micro-processors constantly monitor each other and a tool movement tracking system monitors commands against movements.

#### Key advantages

- Delivers comprehensive operator protection at close proximity to the work piece.
- Allows tools to close at high speed, increasing productivity.
- Complex shapes can be achieved with the "**Tray / Box**" and "**Field Muted**" modes of operation.
- Encoder feedback provides closed-loop monitoring of speed and stopping distance of the beam.
- A flat band of continuous laser light detects obstructions as small as 3 mm while remaining vibration tolerant.
- The mute point is automatically determined, easily set and continuously monitored.
- The rear section of laser band is easily muted to ignore the back gauge in "up-close" situations.

#### Closed loop design

The closed-loop design of the LZS-003 enables monitoring of the stopping distance of the moving beam every time the beam stops. If the stopping distance limit is exceeded, an emergency stop signal is issued and the machine shut down within milliseconds.

The LZS-003 surveys the effect of failures of hydraulic valves, failures of electrical components, and failures in the machine controller software in relation to the actions of the parts of the machine that pose risk to the operator.



## LZS-003 models

The LZS-003 is available in a number of models to match the stopping distance capabilities of individual press brakes. Matching the right LZS-003 model to the press brake results in less slow speed travel and increased productivity. Tailored versions can be developed for press brake manufacturers with special needs.

Parameter	Model			
	LZS-003	LZS-003-SS6	LZS-003-SS4	LZS-003-HS
Laser-to-punch distance	9 mm	7 mm	5 mm	4 and 14 mm
Change-of-speed point	> 12.5 mm	> 9 mm	> 7 mm	> 6 mm
Stopping distance limit	8.5 mm	6.5 mm	4.5 mm	13.5 mm
Bending speed	10 mm	10 mm	10 mm	20 mm
General usage	Standard press brakes up to ~150 mm/sec	Short stop-capable press brakes	Short stop capable press brakes	High speed capable press brakes > 150 mm/sec

### LZS-003-HS High Speed Dual Laser model

For press brakes with a high closing speed (150 mm/sec or faster), the LZS-003-HS is recommended. This model features a transmitter with two lasers that are 4 mm and 14 mm below the punch. The lower beam triggers the deceleration of the press to bending speed while the higher beam continues to provide protection.

## Specifications

### Functional

**Equipment Type:** Electrosensitive Protective Equipment (ESPE) to EN954-1: 1997 Category 4 for Hydraulic Press Brakes.

**Optical Range:** 15 m net (distance between windows of laser Transmitter and Receiver)

**Vertical Adjustment Range:** 450.0 mm (Hexagonal rail bracket)  
310.0 mm (Linear bearing bracket)

**Protective Functions:**

- Recognition of interruptions in sections of a flat band of laser light which runs both in parallel and in a fixed position to and ahead of the edge of the punch.
- Monitors stopping distance.
- Monitors press brake beam high speed.
- Monitors press brake beam low speed.
- Monitors mute point position.
- Forces press into a safe condition upon detection of fault.

**Response Time:** 12 ms from interruption of light beam until opening of relay contacts (both paths).

**System Structure:** Two-channel computer system with mutually independent processing of input signals, exchange of parity data and reciprocal monitoring of output data in accordance with requirement classes 5 and 6-DIN V VDE 0801-/A1 (principles of computers in safety related systems) congruent with EN 954 category 4. LZS-003 has been EC type examined to the requirements of IEC 61496-1, -2 for a Type 4 ESPE.

TUV (Registration number 78/205/551876)  
UL (File number E246744)

### Environmental

**Degree of Protection:** IP54 (all system units)

**Operating Temp:** 0 to 55 °C

**Storage Temperature:** -30 to 75°C

**Humidity Class:** E

### Electrical

**Supply Voltage:** 115 V (-15%, 60 Hz) to 230 V (+30%, 50 / 60 Hz)

**Safety Output:** 4 Normally Closed contacts (2 primary & 2 secondary)

**Auxiliary Output:** 1 Normally Closed contact

**Contact Rating:** 5 A resistive, 2 A inductive @ 24 VDC; minimum load 10 mA @ 5 VDC

**Isolation:** All contact paths are isolated



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