

SCHMERSAL Tech Briefs: Pulse Echo Safety Sensors



CSS 180 CSS 34 CSS 30S AZ200 / AZM 200 MZM 100 / MZM 120 CSS 16

Applications

- Material handling systems
- Packaging machinery
- Chemical processing equipment
- Robot cells
- Folding or brake presses
- Filter presses
- Punching machines
- Printing machines
- Injection molding
- Palletizers
- Packaging equipment

Locking: AZM200 & MZM100

- Textile machines
- Stamping machines
- Metal working equipment
- Wood working
- Packaging machines

IP69K: CSS30S & MZM120

- Food processing machinery
- Pharmaceutical machinery
- Medical applications
- Outdoor equipment

Overview

Pulse Echo is a Schmersal-patented non-contact microprocessor-based technology. As the actuator approaches the sensor, the sensor excites the actuator at a predetermined resonant frequency and the reads back the actuator oscillation. The sensor evaluates the actuator frequency and its distance to the actuator. Identification of the actuator is interpreted as a closed guard by the safety sensor, and the safety outputs are enabled.

The non-contact operating principle limits wear since components do not move against each other. The sensors are also tolerant of gaps and misalignments. Since the sensors and actuators are matched pairs, the technology is highly tamper resistant.

Each model of pulse echo sensor incorporates several colored LEDs for status signaling: Green indicates power on but no actuator present; Solid yellow shows actuation; Flashing yellow signals that the actuator is near the switching distance limit, and flashing red lights indicate specific faults.

Integral self-monitoring of the dual channel contacts satisfy requirements of PL_e to EN ISO 13849-1, or SIL 3 to IEC 61508. Any number of standard diagnostic devices can be connected in series within the maximum cable length of 200 meters (656 feet) or up to 31 serial diagnostic versions of RFID and Pulse echo devices can be wired in series - without loss of safety category or performance level.



Available Literature



Pulse Echo Products Catalog
156 pages

Serial Diagnostic Gateways

The SD Gateways for the different field bus systems convert the serial diagnostic signal of the sensors and solenoid interlocks into the desired field bus protocol:

- | | |
|-----------|-------------|
| PROFIBUS | PROFINET IO |
| DeviceNet | EtherNet IP |
| CC-Link | CANopen |

The SD Gateways are integrated as slave in the available field bus system. In this way, the diagnostic signals can be evaluated through the connected control system.



Various Models

Pulse Echo technology has been applied to a number of non-contact sensors and interlock switches:

CSS180

The compact M18 diameter sensor is suitable for flush mounting without loss of detection area.

CSS34

A squared safety sensor housing allows for actuation at the end or on any of its four side faces.

CSS30S

This M30 diameter sensor is made from stainless steel and is IP 69K rated, suitable for hygienic or outdoor applications.

CSS16

The non-contact pulse echo sensor in our familiar AZ16 housing.

AZ200

Keyed interlock switch with a door handle actuator designed for larger guards/doors.

AZM200

Keyed interlock switch with solenoid latching. Door handle actuator designed for larger guards/doors.

MZM100

This switch uses an electromagnet to produce a 100 pound locking force to secure the safety guard during hazardous operation cycles.

MZM120

An IP69K rated version of the electromagnetic lock, suitable for hygienic or outdoor applications.

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