

## ELECTROMECHANICAL SOLENOID INTERLOCK 2.0

**It doesn't always have to be electronics. When selecting solenoid interlocks, an electromechanical switching device can be either sufficient or even better, depending on the application profile. This is shown by the example of a compact and universally applicable series from Schmersal, which has been revised and is now available in a new model version.**



**Fig. 1:** With the AZM 150, Schmersal offers a compact electromechanical solenoid interlock for mounting to standard profile systems.

The task is clear: solenoid interlocks are designed keep a guard door locked until a hazardous overrun movement has come to a halt. Varied types of solenoid interlock have this same basic principle in common. Manufacturers, like the Schmersal Group, have more than just one series in their range – Schmersal has eight, in fact, each with its own specific application profile (Figure 1).

### **Slimline design, good integration**

The AZM150 series, one of the newer types of solenoid interlock, is now available as a fundamentally overhauled version and is aimed at users looking for a more slimline design (Figure 2). It is suitable for mounting on standard 40 mm profile systems as well as for mounting on conventional machinery enclosures, particularly those with smaller guard doors. The AZM150 has only a small

installation footprint and can be easily integrated into the surrounding structure, thus having no impact on machine loading and unloading. The locking force of 1,500 N is also perfectly adequate for common applications in mechanical engineering.

### **When costs play a role**

Another criterion is the desire for a cost-effective solution for a maximum safety level of PL d/Cat 3. This level is achieved just as efficiently with the electromechanical AZM150 as excellent tamper protection with coding level 'High'. At this level, the designer or machinery builder benefits from needing to implement fewer additional measures in accordance with ISO 14119 to guard against tampering, such as inaccessible or concealed mounting. This makes the design 'leaner' and more straightforward, and in turn more cost-effective.

### **Wide range of uses**

A notable feature of the AZM150 is its actuator head, which can be rotated by 4x 90°, rather than being bolted in place, and locked easily by simply putting the enclosure cover in place. The version with integrated eight-pin M12 metal connector also enables rapid connection to the safety logic and connection to the failsafe Schmersal 'Safety Fieldbox'.

This makes this series extremely versatile. The combination option with different actuators for different installation situations is also a perfect match. The range includes straight and angled actuators for sliding doors, as well as an adjustable movable actuator for revolving doors.

The extensive range of accessories, which includes mounting plates, locking tongs and an emergency release (from the outside) as well as auxiliary release and escape release (from the hazard zone), helps to ensure optimal customisation to the individual application. In the event of installation on security fences or heavy doors, the corresponding DHS150 door bolt can also be used (Figure 3).



**Fig. 2:** A door latch is available to match the AZM150, along with other accessories.



**Fig. 3:** A noticeable feature of the AZM150 is the actuator head, which can be rotated by 4x 90°.



**Fig. 4:** More compact than the AZM 40 is the AZM150 – the new versions of the Schmersal AZM40 solenoid interlock can be expanded to include emergency release or unlock.



**Fig. 5:** Universal safety module for safety interlocks: the SSW 303HV sensorless standstill monitor.

### Less can be more

If the features mentioned here fit the profile (spatially and in the figurative sense), the user has no need for an electronic solenoid interlock and would be better off using the electromechanical AZM150. Exclusion criteria are both a required performance level of PL e/Cat 4 and the desire for a connection to safety-related bus systems (ASi Safety at Work),

so anyone who needs these features should consider the range of electronic solenoid interlocks, such as the AZM40 (Figure 4). As the world's smallest electronic solenoid interlock, it is even more compact, but has a higher price due to the integrated electronics.

### Simple actuating via standstill monitor

Each interlock has an evaluation unit and standstill monitors, which issue the signal to unlock as needed, have become a firmly established component for this. An appealing model that fits well with the AZM150 is the SSW 303HV, a universal failsafe standstill monitor that works without sensors (Figure 5). This means that the machine designer of the machine need not intervene in the surrounding construction. The safety module is connected directly to a three-phase motor and measures the frequency of the induced voltage, at rated motor voltages of up to 690 V. The enable fields close as soon as the motor comes to a halt.

### Not only for occupational safety

Previous applications of the AZM150 are wide and varied and include packaging machinery with up to 20 guard doors. Here, users benefit most particularly from the more attractive costs when compared to electronic solenoid interlocks and from the flexibility offered by the toolless rotating actuator head (Figure 6).

For some applications, the reason for using the AZM150 is not the safety of machinery, but process safety, which is typical for solenoid interlocks in general. This means that no hazardous overrun movement is anticipated. Instead, the goal is to prevent the operator from interrupting the process by opening the guard door, a process that can only then be restarted through complex measures (resetting to zero, calibration, releasing production goods due to abrupt halts, etc.). For situations like these, the AZM150 is appropriate, which operates according to the open-circuit current principle instead of the closed-circuit current principle.

### Improvements in detail

Schmersal is currently in the process of launching an overhauled version of the AZM150, which differs from its predecessor in terms of the many design improvements. An expansion of the range and accessories for this universal electromechanical solenoid interlock is planned for the near future.

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**Fig. 6:** If multiple solenoid interlocks are used on a machine, users also benefit several times over from the cost benefit of the AZM150 when compared to electronic solenoid interlocks