

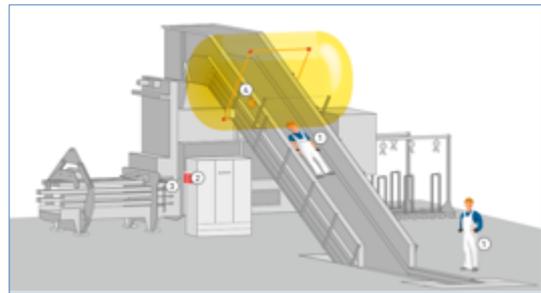
Contact-free personnel protection system „Life Guard PSS i-BOR 17“

The occupational safety management is a top priority in every company. Nevertheless, press-, shredder- and recycling plant operators unknowingly expose themselves to danger every day. The safety measures, demanded by the EU Machinery Directive, such as emergency stop button and rip cord do not provide protection in every case. For example in situations in which a person becomes unconscious and is incapable of movement and can not stop the machine by itself.

Based on the standard DIN EN 16252:2013-03, the EU Machinery Directive demands the use of contact-free personnel protection system for underfloor feeding conveyors without safety guard. Such systems are available on the market, but often do not have the type-certification required by the legislature and generally only meet the performance level c.

According to the EU Machinery Directive Annex IV, personnel protection systems must type approved by the manufacturer and awarded with a type-examination certificate.

Conventional personnel protection systems often do not meet the requirements of modern process control systems and cloud applications and offer little comfort to system users. Lifeguard PSS i-BOR 17 opens up new possibilities with regard to the standard industry 4.0.



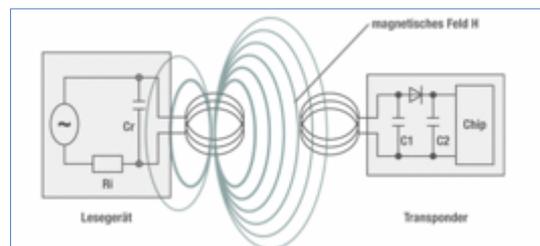
How does the „Life Guard PSS i-BOR 17“ work?

The Personnel Protection System based on "Active RFID Technology" is a supplementary, electronic safety device which causes a machine / system to be switched off in the event of a personal danger in connection with a personal transponder (P-TAG).

What is RFID technology

RFID is a technology for transmitter-receiver systems for the automatic and contact-free identification and localisation of objects / living beings with radio waves. (Radio detection) An RFID system consists of a transponder, which is located on objects / living beings and contains an identifying ID code, as well as a reading device for reading out this ID identification. A coupled logic device evaluates the information and initiates an action.

The coupling is generated by the reader producing magnetic alternating fields with high-frequency radio waves. In the area of personnel protection systems, "active RFID transponders" are used, which use their energy source both for the supply of the internal microchip and for the generation of the modulated return signals. The range can be up to one kilometre depending on the transmission power. In the PSS i-BOR 17, signals are received in the 125 kHz. and sent in the 868 MHz.



Applications for the „Life Guard PSS i-BOR 17“

There are potential risks for people on machines everywhere. If a danger area can be precisely defined, it is possible to secure persons with the PSS i-BOR 17 Lifeguard Personal Protection System. The PSS can be used for bale presses, sorting and shredding plants, conveying systems, but also for reel splitters and industrial robots. Ask the manufacturer for specific requirements.

The components of the „Life Guard PSS i-BOR 17“

ALM Logic module (2); Plants which are supervised by a personal protection system are equipped with a logic module (ALM). The ALM has a safety PLC and is integrated into the single- or two-circuit EMERGENCY STOP of the corresponding system. The ALM antenna is used to define the danger area in which people are to be protected. (Radius 10 m to 250 m) An ALM logic module can protect up to 5 feeding systems via ATM units.

The ALM monitors the entire danger area, automatically registers every P-tag containing, checks it for its functionality and records any security-relevant incident. Users are proactively informed by an optical and acoustic alarm, as well as messages on the display about safety-relevant incidents! (E.g., battery of P-TAG too low, UHF receiver failure)

The touch-screen color display (3) with self-explanatory, interactive user guidance in 7 languages allows the system administrator a comprehensive system management. Users of the system will see messages and work instructions on the display.

Thanks to the included data gateway interface, the PSS i-BOR 17 can be integrated into external process control systems or the data can be viewed on PCs / mobile devices via Cloud.

ATM Activation module (4); Each feeding system with a potential danger is equipped with an activation module (ATM). The coil located in the ATM frame generates an electromagnetic protection field which can be adapted to the local conditions in a radius of 100 mm to 3'000 mm. If a person equipped with a transponder (P-TAG) enters the protective field of the ATM frame, the system is switched off in the EMERGENCY STOP via a signal to the ALM.

By using an "ATM frame" over 4 sides of the feeding system, malfunctions such as these can occur with markers in the form of sector antennas (eg, mirroring of surfaces) are avoided. Several feeding systems arranged side by side can be secured with only one ATM frame.

Each ATM is monitored for its correct operation by the pulse signal of a reference transponder (REF-TAG) by the ALM. If these monitoring pulses fail, e.g. due to low REF-TAG signal strength, cable break, ATM error, the ALM switches off the system in EMERGENCY STOP.



Fig. 1) ALM mounted on the control box of a baling press



Fig. 2) Message list on the screen of the ALM



Fig. 3) ATM activation module with ATM frame on conveyor

ETM Self-test module (5); The legislature requires that safety components are being tested once a year for their proper functioning. The P-TAG is a safety component, the two frequency ranges of 125 kHz. and 868 MHz. must therefore be tested with regard to the release of the EMERGENCY STOP. The ALM asks the users to check the P-TAG on the ETM self-test module.



Fig. 4) Test of a P-TAG transponder on the ETM module

P-TAG Transponder (1); The P-TAG is a battery-powered "Activ RFID transponder" which receives signals in the 125 kHz. and transmits signals in the 868 MHz area. P-TAG's are available in the form of a button, credit card or watch and are worn by the user on the body.

P-TAG's are personalized by the system administrator of the user, means provided with the names of the users. The ID signal transmitted by the P-TAG enables the ALM to recognize when and which person is in the danger area.

As soon as a P-TAG is detected by the electromagnetic protection field of the ATM, the system switches off in the EMERGENCY STOP. Due to the transmission frequencies used, also P-TAGs, which are spilled under material can be detected.



Fig. 5) P-TAG transponder available in 3 different types

AUM Authorization module; The authorization module (AUM) allows an additional protection of the supervised system, so that can only be started by a person with a P-tag. The AUM is integrated into the voltage supply of the system to be monitored via relay contacts. The AUM accesses the ALM and accepts its signal impulse whether the system should be started or automatically switched off.

To enable a controlled shutdown, the ALM provides setting parameters which regulate the behavior in the absence of the transponders during operation. (Switch off the system Yes / No or with time delay, ALARM Yes / No)

Communication; In the context of digitization, the networking and communication of different systems plays a key role. An RJ45 interface makes it possible to network the "PSS i-BOR 17" with other PLC systems or to view the incident messages of the systems of PC's or mobile devices via a cloud solution.

Installation, start-up and training

The installation can be carried out by the local electrician according to the specifications of the manufacturer. The start-up and training of the system users is carried out by an authorized specialist staff of the supplier. The start-up work as well as the training are recorded and documented according to the specifications of the occupational and plant safety.

Advantages of the „Life Guard PSS i-BOR 17“

The "Lifeguard PSS i-BOR 17" from Borema Umwelttechnik AG is characterized by the following points:

- **Europe-wide type approval no. E 7148** according to DIN EN 61496-1 and DIN EN ISO 13849-1 and meets the requirements of professional associations (DGUV / BGHW / SUVA...!)
- Thanks to the innovative concept, the PSS fulfils the **performance level „d“!**
- The system complies with the **industry standard 4.0!**
- **Plug & Play**, the PSS can easily be installed by the electrician on site and put into operation by the technician of a regional sales office!
- The PSS can be easily **integrated into existing systems!**
- **An ALM logic module** can monitor up to **5 feeding systems!**
- Can be equipped with an AUM authorization module, which allows the system start only in combination with a personnel tag!
- The integrated **data gateway interface** allows the PSS to be integrated into external process control systems or the data can be viewed in the cloud on PCs and mobile devices!
- Users can choose between **three types of P-TAG** transponders!
- **Automatic function control** of the P-TAG transponders. All safety incidents are recorded.
- **Automatic registration** of persons in the danger area, due to **personalised P-TAG's!**
- The **system management** is carried out by the user via a **7" touch-screen color display** with self-explanatory, interactive user guidance in **7 languages!**
- Users are proactively informed about safety-relevant incidents (e.g. battery charge P-TAG too low) by an **optical / acoustic alarm** as well as messages on the display.
- Largely **maintenance-free** due to **dual-circuit system monitoring**.
- The PSS ensures **maximum protection** for employees, even if they are incapable of movement!
- Maximum **certainty of operation** for safety officers / companies!

Das Life Guard PSS i-BOR 17 der Borema Umwelttechnik AG ist ein innovatives Sicherheitssystem, welches nach höchsten technischen Standards entwickelt und Baumuster zertifiziert wurde. Das System ist erhältlich bei regionalen Vertretern in allen europäischen Ländern.

Profitieren Sie aber auch von der jahrelangen praktischen Erfahrungen unserer CMSE® - Certified Machinery Safety Expert (TÜV NORD) Fachleute in Fragen zur Arbeits- und Anlagensicherheit.