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Editorial

New solutions for the safety of machinery, occupational health and safety and infection prevention

Friedrich Hölderlin once wrote ‘but where danger is, there grows also that which saves.’ What quote could be more appropriate in times of coronavirus? In line with this principle, this issue presents new solutions for the safety of machinery, occupational health and safety and infection prevention.

Just over one year ago, no one would have predicted that danger could be hiding in otherwise harmless places like lift cars. But today, we have internalised the fact that social distancing in lift cars is often tricky and that aerosols spread particularly rapidly in enclosed spaces. On page 14, we present a selection of new products that enable ‘coronavirus-safe’ use of lifts.

On occasion, ‘that which saves’ might be found where you least expect it – such as in the dry statistics supplied by the German Federal Institute for Occupational Safety and Health (BAuA). The Institute’s current report on ‘Health and Safety at Work’ highlights, among other things, the positive effects that digitisation, AI and Industry 4.0 can have on the health of employees.

The human heart beats roughly 60 times a minute, and it too can be threatened by dangers such as an electric shock. Our guest contributor, Wilfried Straßmann, is a recognised expert in the fields of electromagnetic compatibility and electrical safety in machinery. In his technical article, he looks at protective measures as well as aspects from practice in relation to ‘earthing.’

A new white paper written by two expert authors from Schmersal and Wachendorff presents an example safety solution with redundant rotary encoder and safety controller and evaluates it in accordance with EN ISO 13849. You can read a summary in this issue and, if you prefer, you can read the complete white paper, which is available for download.

Optoelectronic protective devices must be tested regularly by a qualified person. The article on page 12 explains what must be taken into account during testing and looks at when and where interested parties can qualify as a ‘qualified person.’

And finally, we provide an overview of the tec.nicum seminar programme for 2021.

Happy reading!

Announcement: Revision of EN ISO 14119

After a good 18 years, the current EN ISO 14119:2013 (Principles for design and selection of interlocking devices, irrespective of energy type, associated with guards) is being reviewed.

The Typ B standard, tried and tested over many years and listed as a harmonised standard under the Machinery Directive, is undergoing a number of changes alongside its regular revision.
Compared to EN ISO 14119, the following amendments have been made and an informative technical rule as well as a technical specification have been integrated into this standard.

- ISO/TS 19837 'Safety of machinery – Trapped key interlocking devices – Principles for design and selection' is being incorporated as new **normative Appendix L** with the specific requirements for interlocking devices of type 5 – key transfer systems. This technical specification, ISO TS 'Safety of machinery – Key transfer systems – Principles for design and selection for key transfer systems', published in 2018, was not previously available in German.

- Table 4 has been improved and renamed. The new title is 'Additional measures to be taken in the event that there continues to be a foreseeable incentive to bypass interlocking devices according to their design.' The installation requirements for type 5 – key transfer systems are incorporated into table 4.

- Technical Rule ISO/TR 24119 'Safety of machinery – Evaluation of fault masking in serial connections of interlocking devices associated with guards with potential free contacts' has been integrated into the standard as new **normative Appendix K.** This Appendix covers the masking of faults in series connections of interlocking devices.

- This Technical Rule, ISO/TR 21119 'Evaluation of fault masking in serial connections of potential free contacts of interlocking devices of movable guards,' published in 2015, has only recently been made available in German.

The German language draft of the standard is know available from Beuth Verlag as draft 'DIN EN ISO 14119:2021-02 – draft' – Safety of machinery – Interlocking devices associated with guards – Principles for design and selection (ISO/DIS 14119:2021); as prEN ISO 14119:2021. The publication does not, however, include additions such as those being incorporated for the publication of EN ISO 14119.

Publication of the standard as an international standard is scheduled for the end of 2021 / start of 2022. An eighteen-month transition period to the current standard is intended so that users can adapt to the supplementary normative appendices as early as possible.

Conclusion:
The editorial revision, the incorporation of the new normative appendices, in conjunction with a clarification of terminology and the practical interpretation of the existing content of EN ISO 14119:2013 make EN ISO 14119 practical and easy to implement. The new requirements for machinery manufacturers are clear. The benefits of the various ascertainments, in particular those relating to functional safety and new technologies, outweigh the drawbacks.

Table 4 of the revised EN ISO 14119 now contains mounting requirements for key transfer systems.

Occupational health and safety pays off for businesses

Occupational health and safety measures can help to boost the competitiveness of a business. This is because employee absence leads to production losses and increased costs for businesses. This correlation has once again been confirmed by the latest 'Safety and Health at Work – Reporting Year 2019' report. The report is produced annually by the Federal Institute for Occupational Safety and Health (BAuA) on behalf of the Federal Ministry of Labour and Social Affairs (BMAS).

According to the report, the number of reportable occupational accidents in Germany fell by around 12,000 to approximately 937,000 in 2019, while the occurrence of occupational accidents remained at an overall low level, with a slight downward trend. Still, it is estimated that there were around 712 million working days lost in 2019 due to incapacity for work. The report says that 'The incidence of incapacity for work resulted in an estimated total loss of production based on wage costs of around 88 billion euros. If the loss in labour productivity is taken into account, the German economy would lose around 149 billion euros in gross value added.'

You should always bear in mind that properly implemented preventive measures within the context of occupational health and safety are also of economic benefit to businesses.

Risk assessments are the 'foundation underpinning occupational health and safety'

The BAuA report also highlights another aspect of accident prevention: 'A key element of occupational health and safety is and remains risk assessments. Despite the overriding significance of this occupational health and safety tool, we observe that only around half of all businesses prepare a risk assessment.' This figure is also surprising as employers, under the Occupational Health and Safety Act, are obliged to assess and document all hazards to their employees in the workplace. This obligation also includes an assessment of infection risks – a factor that has become more important in view of the coronavirus pandemic. The BAuA report also draws attention to the following: 'A much-voiced criticism is that risk assessments lead to unnecessary bureaucracy. The pandemic in particular shows that the opposite is in fact true – risk assessments are the foundation underpinning occupational health and safety.' Aside from the legal obligation to carry them out, risk assessments have the obvious benefit of being able to systematically identify sources of danger and thus are able to highlight which protective measures are most appropriate and efficient. In view of this, tec.nicum has also included the execution and documentation of 'Risk assessments for infection

The German Federal Institute for Occupational Safety and Health (BAuA) publishes an annual report on 'Safety and health at work.' Photo: BauA

prevention' in its range of services (for further details, see page 14).

The positive effects of digitisation on occupational health and safety

Reading the BAuA report is also valuable as it investigates some other interesting correlations. Unsurprisingly, in businesses that employ Industry 4.0 technologies, employees are less likely to have to carry out strenuous physical work as the work is increasingly automated and completed by machines.

The evaluation also points out that this development is associated with a reduction in health complaints: 'For example, it shows that (only) 31% of employees in businesses that employ 4.0 technologies say that they have always or frequently suffered back, muscle or joint pain within the past twelve months, compared to 39% of employees in businesses with no Industry 4.0 technologies.' A further positive effect of increasing digitisation in businesses is the effect that artificial intelligence can have on occupational health and safety. The report says that 'Occupational health and safety inspectorates also generate significant quantities of data that (...) could be analysed more thoroughly and in greater detail with the aid of AI. Dynamic, constantly reconfiguring human-machine interaction (Industry 4.0) systems could even become safer with the use of AI.'

'When compiling a risk assessment, AI can help to map areas of attention based on previous analyses and, if necessary, provide more in-depth analysis in relevant areas. This could be used to optimally adapt the stress profile of individual workplaces to the employees working there and to make work processes safer and healthier overall.' Much like 'predictive maintenance,' which is already standard practice in many production organisations, 'predictive monitoring' is also conceivable, and would contribute to an increase in safety in the workplace. ■

The full report is available here (in German):

Source: 'BMAS/BAuA (2020): Safety and Health at Work – Reporting Year 2019.'

Total numbers of accidents at work in 2019[1]

Parameters	Cases absolute	Cases per 1,000 full-time workers	Changes from 2018 to 2019 absolute[2]	Changes from 2018 to 2019 per 1,000 full-time workers[2]
Reportable accidents	937,456	21.922	–11,853	–2.304
New accident pensions	14,829	0.47	–225	–0.037
Fatal accidents[3]	626	0.015	+85	+0.001

Source: Accident Insurance Fund
Rounding errors

[1] Number of full-time workers (in thousands): 42,764.1 (2019) and 39,186.6 (2018).
[2] From 2019, the number of full-time employees and working hours as well as accident rates based on these variables are not comparable with previous years. This is due to a change in the recording of insurance relationships with commercial employers' liability insurance associations and public accident insurance institutions. Therefore, there are significant changes in individual areas.
[3] Including 84 cases in the trade associations from the years 2000 to 2005, that could not be included until 2019 after criminal trials were completed.

EN 60204-1: Aspects from practice in relation to ‘earthing’

The mandated harmonised European basic safety standard EN 60204-1 Safety of machinery – Electrical equipment of machines is one of the main standards applied to the electrical safety of machinery and systems. This article looks at aspects from practice in relation to ‘earthing.’ In the following it is assumed that the machine is of protection class I (SK I); the electrical connection of the machine is therefore designed with a protective conductor (the machine is earthed).

1. Introduction

The effect of electrical current on a human being depends on the level of the electrical current, the frequency of the current, the duration and the path of the electrical current through the human body. A current path running from the hand to the heart and then to the foot is particularly dangerous.

The human heart of an adult beats roughly 60 times a minute (pulse rate), i.e. one heartbeat per second. Consequently, the heart beats at a frequency of one hertz. Within this period of around one second (as shown graphically on an electrocardiogram), there is a vulnerability period of around 0.16 seconds, which means that an electrical current (electric shock) through the human body of no more than 0.2 seconds could lead to a fatal accident.

Protective measures comprise basic protection (protection against direct contact) and fault protection (protection against indirect contact).

This generally means the following for machinery of protection class I:

- As basic protection, the electrically active parts are insulated, and
- The protective conductor system (earthing) is used as protection in the event of a fault.

Within this context, the following two terms in EN 60204-1 are of particular relevance:

- Exposed conductive part: an ‘exposed conductive part’ is a part that is live when a fault occurs.
- Extraneous conductive part: the new edition of EN 60204-1 defines a distance (less than 2.5 metres) in relation to an ‘extraneous conductive part’; a person could bridge this distance with parts of the body (e.g. distance from hand to foot).

2. Protective conductor system

All ‘exposed conductive parts’ must be connected to the protective conductor system. The diameters of the protective conductors must have sufficient current-carrying capacity in the event of a fault – in particular until an overcurrent protection device (e.g. a fuse) or a residual current device (RCD) interrupts the circuit.

New to EN 60204-1:2018 is the requirement that a protective conductor that is not part of a cable (individual protective conductor) may not be smaller than:

- 2.5 mm² Cu, if mechanically protected
- 4 mm² Cu, if not mechanically protected

This also applies if the mains connection is designed as 1.5 mm², for example. Here, the focus is not on the electrical requirement, but on the mechanical requirement. Consequently, this requirement only applies to individual wires (in the case of a sheathed cable (e.g. 3G1.5) with three wires of 1.5 mm² each, the other two wires are supporting mechanically). Is there a minimum size requirement for the screws or bolts as well? The size must be M4 at a minimum (EN 61010-1 specifies this). The protective conductor protects humans, domestic animals and livestock. The protective conductor operates in the low-frequency range (50 Hz). The symbol for a protective conductor connection is an inverted tree in a **complete circle:**

IEC 60417-5019 

If the protective conductor is colour coded, the colour coding of the protective conductor will be GREEN/YELLOW. The protective conductor connection point may not be used for attachment of parts. Protective conductors are connected individually. →

3. Functional earthing

Machinery today is equipped with electronics, e.g. clocked power supplies and drive inverters. Consequently, sinusoidal 50 Hz currents no longer flow, but high-frequency harmonic currents are superimposed on the basic oscillation. Additionally, control signals no longer operate at frequencies in the kilohertz range, but with frequencies in the megahertz range.

On the other hand, components are becoming increasingly small, they are being placed closer together and the electrical voltages of the electronics are becoming lower to help improve efficiency. This means that interference emissions are increasing and interference immunity is decreasing, in turn making the problem of electromagnetic compatibility (EMC) worse.

Functional earthing, amongst other measures, is needed to help ensure electromagnetic compatibility. This offers protection to guard against malfunctions in the electrical equipment and can even protect against (irreparable) damage. Functional earthing should operate in the high-frequency range (kHz to MHz). The inductive resistance of a cable increases proportionally with the frequency. A frequency of 50 kilohertz is one thousand times greater than 50 hertz and 50 megahertz is one thousand times greater again. This is countered by special designs of high-frequency functional earthing. In order to ensure that protective conductors also operate at high frequency, they comprise several hundreds or thousands of strands that act in parallel (e.g. earth straps, high-frequency strands, finely stranded earthing wires, shielded braids).

Functional earthing should, therefore, be as short as possible (in practice, less than 30 cm) and use earthing clamps with a large contact area.The symbol for a functional earth connection is an inverted tree in a **semi-circle:**

IEC 60417-5018 

The colour coding of the functional earthing conductor must not be GREEN/YELLOW; in practice, non-insulated or transparent cables are often used.

A functional earthing conductor may be connected to screws used to attach parts.

Several functional earthing conductors may also be connected together at a single connection point.

4. Protective conductor and functional earthing together

An earth strap or earthing wire can also fulfil the function of protective conductor and functional earthing at the same time – here, the more stringent requirements of the protective conductor system apply.

In that case, the connection point must be marked with the IEC 6041-5019 ⏚ symbol.

The type (earth strap, shielded braid, etc.) indicates that it is high-frequency functional earthing, while the IEC 60417-5019 symbol ⏚ indicates that this connection is also a protective earth conductor.

5. ‘Exposed conductive part’

In accordance with EN 60204-1, an ‘exposed conductive part’ is defined as a ‘conductive part of electrical equipment, which can be touched and which is not live under normal operating conditions, but which can become live under fault conditions.’

Can an electrically conductive object (‘exposed conductive part,’ e.g. a cover) become live in the event of a fault? The manufacturer of a machine must start by carrying out a risk assessment. Can an electrical cable come loose from a terminal and touch the object? Can the insulation of an electrical cable become damaged and cause the exposed conductive part to become live?

Reasonably foreseeable incidents must also be taken into consideration. For instance, during troubleshooting, fault rectification, measurements or tests, extension cables, lighting fixtures or electrical tools with mains connection cables are used on a temporary basis. This cable – even if it is not part of the machine but is connected to a socket in the building – could become damaged and cause the exposed conductive part to become live.

In accordance with EN 60204-1, the protective conductor system comprises the connection of

- PE terminal(s),
- Protective conductors,
- Conductive structural parts,
- Exposed conductive parts of the electrical equipment.

6. ‘Extraneous conductive part’

In accordance with EN 60204-1, an extraneous conductive part is a ‘conductive part not forming part of the electrical installation and liable to introduce a potential, generally the earth potential.’ →

Within the vicinity of the machine and within reach of a person (distance less than 2.5 metres), there is (for example) a metal magazine. A person could, at the same time, touch the machine with one part of the body and touch the metal magazine with another part of the body. The machine has the electrical potential of the protective conductor system. The metal magazine has an unknown electrical potential, which depends on local and temporal conditions (e.g. on electrical machinery operating within the vicinity and its operating state, the condition of the equipotential bonding in the building). Consequently, there could be a potential difference between the machine and the metal magazine, thus endangering a person. If the extraneous conductive part (e.g. metal magazine) is connected to the protective conductor system of the machine, there is no longer a hazard.

7. Summary

- Both the 'exposed conductive part' within the sense of EN 60204-1 and the 'extraneous conductive part' at a distance from the machine of less than 2.5 metres must be earthed.
- The minimum diameter for individual protective conductors is 2.5 mm² Cu (mechanically protected) or 4 mm² Cu (mechanically unprotected).
- The protective conductor connection point may not be used for attachment of parts.
- Protective conductors are connected individually.
- Functional earthing conductors should be short (in practice, less than 30 cm) and cover a large area. ■

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https://strassmann.de

Practical safety solution for setup operation

Safety evaluation of a redundant rotary encoder when using a safety controller in accordance with EN ISO 13849

For setup operation or troubleshooting on machinery, the ‘Safely limited speed with opened guard door’ safety function is extremely relevant. A new white paper from Schmersal and Wachendorff proposes an example safety solution involving a redundant rotary encoder and safety controller and evaluates the solution in accordance with EN ISO 13849. You can read a summary of the white paper here.

On larger machines or systems, such as those used in the packaging industry, the operator is usually protected from hazardous movements by a safety fence or enclosure. Access to the danger zone is provided by a guard.

From the perspective of machine safety, the ‘Protection against unexpected start-up’ and ‘Halt with emergency-stop device’ safety functions are often required to be accompanied by the additional safety function – ‘Safely limited speed (SLS) with opened guard door.’ This SLS function makes it easier for the operator to set up a production line or to carry out troubleshooting activities.

The white paper from Schmersal and Wachendorff proposes an example safety solution for a system of this kind, incorporating a redundant rotary encoder and a small safety controller, and provides an aid for evaluating the suitability of this solution in safety applications. In order to determine and verify the requisite level of safety, the EN ISO 13849 series of standards is applied to this example. The risk evaluation for the example machine in this white paper has produced a PLr of d. This Performance Level can be implemented in a number of ways. Category 3 is usually suitable for technical realisation. Category 3 requires single-failure proofing, which can usually be achieved with a consistent two-channel configuration.

A rotary encoder can be used to measure speed. In addition to the rotary encoder, the evaluation logic, such as the PSC1 safety controller from Schmersal, and the drive system itself, monitoring of the guard door must usually also form part of the considerations, as this is what generally activates the PLC function.
In this structure, consideration of the rotary encoder for speed detection is of particular relevance.

The simplest approach to achieving the two-channel system required would be to use two separate encoders, which would need to be fitted at different locations in order to be mechanically two-channel. In practice, however, this is often time-consuming and complicated. More practical is to only have to use one location. The rotary encoder from Wachendorff unites these two properties. It comprises two completely independent encoders employing different technologies in a single enclosure. This enables straightforward installation. Moreover, the internal redundancy satisfies the requirements of category 3. →

Fig. 1: Production line in the packaging industry

Structure of a redundant rotary encoder

In principle, a redundant rotary encoder comprises two fully autonomous standard rotary encoders, which means that the electronic part of the rotary encoder can be viewed as a two-channel system. Only the mechanical structure, comprising a shaft and bearing assembly, is single-channel in its design. The standard for electrical drive systems, EN 61800-5-2, provides for consideration of the error case by severing the mechanical link between the rotary encoder and the drive system. In many cases, error exclusion is required as the controller cannot necessarily detect such errors. This error exclusion can be achieved with appropriate dimensioning of the attachment elements and by using a 100% reliable mechanical link.

Rotary encoders from Wachendorff rely on the principle of diversity, which means that you implement targeted increases to failure safety by using different measuring principles and in so doing, as few components of identical construction as possible. The basic philosophy underpinning this is that the different sensor platforms respond with varying degrees of sensitivity, or insensitivity, to malfunctions of different kinds and consequently do not drop out concurrently, thus allowing the downstream electronic system to reliably detect this potential failure.

The redundant standard rotary encoder provides divergent (magnetic and optical) signals, which are generated completely independently of one another, but which can nevertheless be correlated with one another. Even the supply voltage is available separately for each sensor unit.

'Speed detection' sub-system

The single-failure proofing required by category 3 is provided by the continuous two-channel capability of the speed/direction detection in the rotary encoder. The error coverage (DC) that is required is not integrated into the encoder, but must be covered by the evaluation logic. The PSC1 series of safety controllers from Schmersal is a pertinent example. If the application requires it, as many as twelve axes can be reliably monitored, with the rotary encoders connected easily via D-Sub interfaces. By cross comparing the two encoder signals or, in the case of sin-cos encoders, by evaluating the relationship $\sin^2+\cos^2=1$, errors can be detected and a response to the error initiated. In addition, the SafePLC2 programming tool for the PSC1 integrates function blocks for the main monitoring functions, such as SLS, SOS or SCA, in accordance with DIN EN 61800-5-2. These can be easily integrated into the safety logic program.

Error exclusion on the mechanical link between shaft and encoder

Particular attention should be focused on the mechanical link between the encoder and the drive system, which is designed as a single-channel configuration. The latter necessitates error exclusion for this link since a single error here would lead to a hazardous situation.

In addition to verification of the maximum bearing capacity of the link, EN ISO 13849 also requires an FMEA (Failure Mode and Effects Analysis) to be carried out for this error exclusion.

The additional aspects required to satisfy category 3 in accordance with EN ISO 13849 include measures to prevent failures with a common cause (CCF – Common →

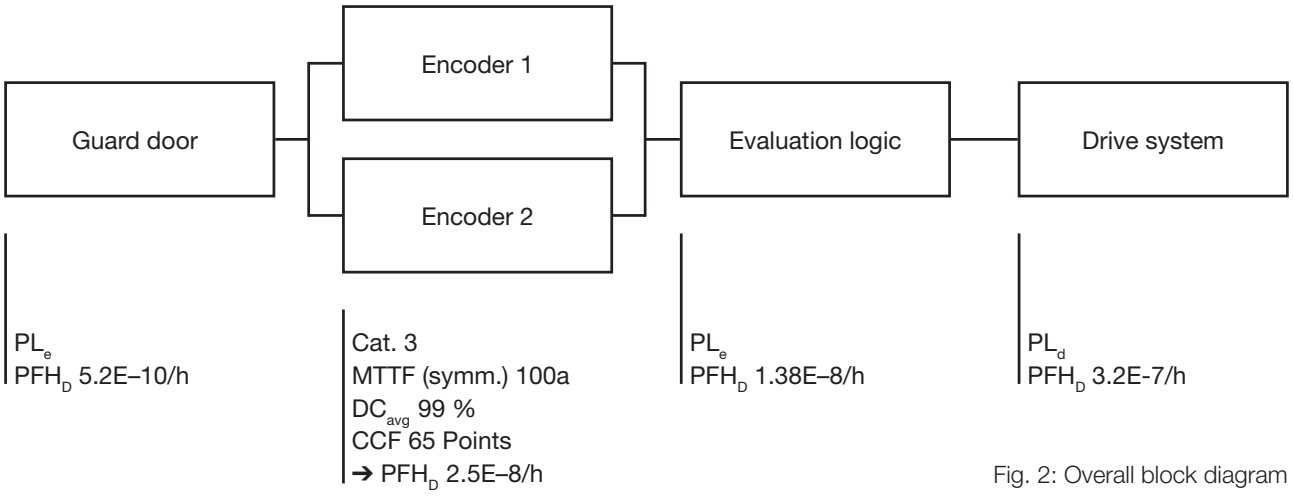

Fig. 2: Overall block diagram

Cause Failure), to prevent systematic failures in the software in the small safety controller, calculation of the probability of failure of the control solution based on MTTFD values (mean time to failure dangerous) and/or a higher value diagnostic (DC – Diagnostic Coverage).

The white paper considers all of these aspects to ultimately calculate a Performance Level for this example safety solution.

Conclusion:

The structure outlined allows for a Performance Level of d. The potential PL in our example is largely limited by the PL of the frequency inverter. A high safety level can, therefore, be achieved despite the partial use of standard components. In addition, use of the redundant encoder simplifies installation. Plus, combination with the PSC1 safety controller facilitates additional safety functions such as an emergency stop or monitoring of additional safety circuits in a single device. ■

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The complete whitepaper is available at this link:

Fig. 3: Safety controller PSC1

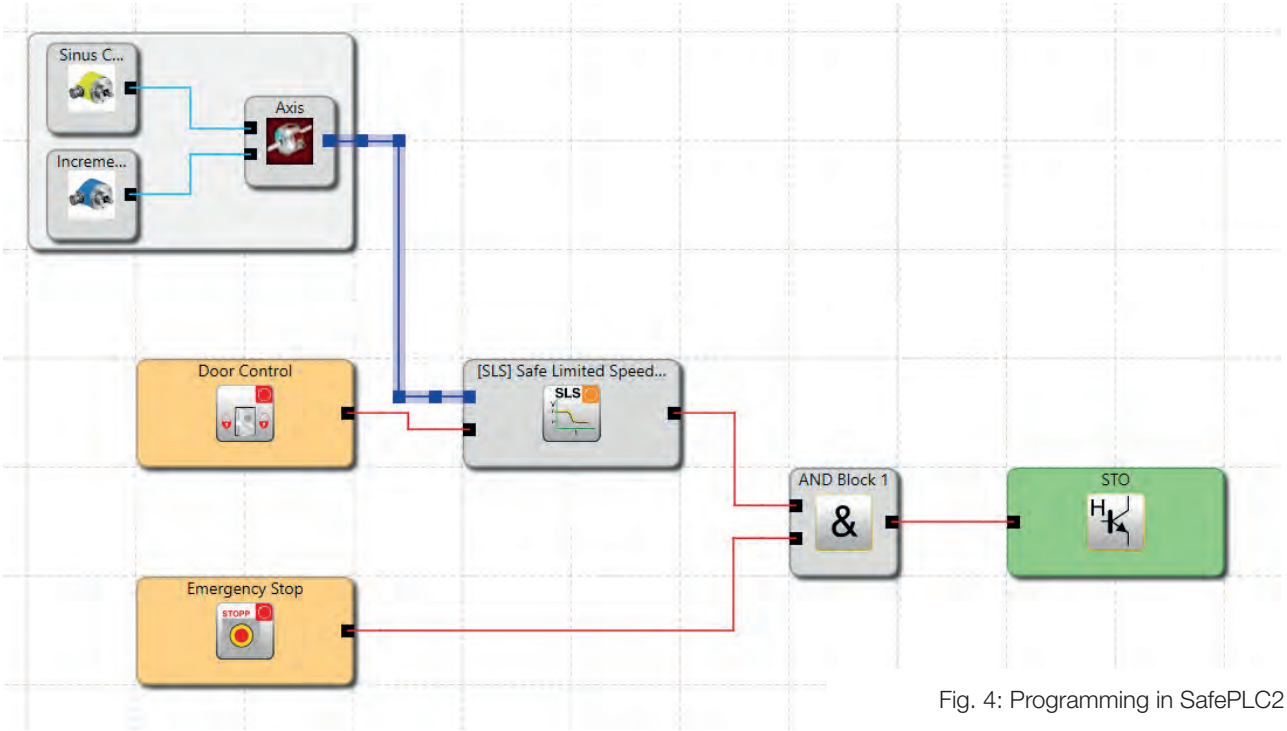

Fig. 4: Programming in SafePLC2

Testing of active optoelectronic protective devices

Machinery manufacturers and operators use optoelectronic safety switchgear to safeguard against hazardous machinery movements. Under the Ordinance on Industrial Safety and Health, operators are obliged to have these protective devices inspected at regular intervals by a qualified person.

Employers are obliged to carry out a risk assessment before machinery is used for the first time, and to implement the requisite protective measures derived from the assessment. Light curtains, light grids and light barriers – referred to as active optoelectronic protective devices (AOPDs) – are frequently used as safeguarding at hazardous points.

As the function of protective devices also depends on their correct installation, they must undergo testing before their initial use. One of the aspects that must be checked is their installation in accordance with the regulations, and their efficacy. A further test must be carried out following any modification to the machine that is relevant from a safety perspective.

Machinery operators must also carry out periodic tests to verify the proper condition of the protective devices as well as their reliable function and efficacy.

Under the Ordinance on Industrial Safety and Health (BetrSichV), AOPDs are not considered to be systems requiring monitoring (unlike lifts and systems at risk of explosion). This means that periodic testing can also be carried out by a 'qualified person.' These persons must have specialist expertise acquired through vocational training, professional experience and up-to-date professional activity. The specialist expertise required is defined in greater detail in the Technical Rules for Operational Safety (TRBS) 1203.

Test intervals and documentation

The interval at which recurring tests should be carried out depends on a number of factors, including national regulations (e.g. BetrSichV, TRBS in Germany), the result of the risk assessment, the AOPD manufacturer's specifications as well as the results of previous tests. Test results must always be documented and the records must be kept for the entire period of use of the AOPD. This can also be done electronically – the new SLC/SLG 440/440 COM series of safety light curtains and light grids from Schmersal, featuring Bluetooth interface and Schmersal's 'SLC Assist' app allows these tests to be documented with ease. Many users take the absolute operating duration of the safety light curtain (or light grid) as the basis for the test intervals. The operating hours counter integrated into the app helps the user to schedule and specify the periodic tests. Following the test, the current status of the safety light curtains can be stored directly on the mobile device. It is also possible to send the status of the light curtains as an HTML file by e-mail for storage on the company server.

The Schmersal app 'SLC Assist' simplifies the documentation of the tests.

Test parameters for initial tests and periodic tests

What should be taken into account when testing optoelectronic protective devices?

The initial test should look at whether:

- The AOPD is operating according to the current use of the machine,
- The choice of protective device, installation and mode of operation are suitable for countering hazards,
- The type of AOPD meets the requisite safety level,
- The interlinking of the AOPD including signal transfer to the next-level controller is consistent with the requisite controller category (e.g. PLr),
- The AOPD is easy to bypass.

Additionally, the test must also determine whether there is sufficient safety clearance between the protective device and the hazardous movement. This helps to ensure that the machine can be brought to a halt before an approaching person is able to access the hazardous zone. The minimum clearance must also be maintained for all foreseeable directions of approach. →

S = (K x T) + C

- S = Minimum safety clearance to the hazard point in mm
- K = Approach speed of the part of the body in mm/s
- T = Total response time in seconds (comprising the sum of t_1: max. response time of AOPD + safety monitoring module in s, t_2: machine response time (time to standstill) in s)
- C = Additional clearance in mm in relation to penetration into the hazardous zone before tripping

The first element of a periodic test is to determine whether the AOPD has been modified or tampered with since the machine was commissioned or whether it is still firmly fitted in its original position and no structural modifications have been made. In addition, the test should also look at, inter alia, whether there has been any damage, including to plug connections and connecting cables.

Where the AOPD has the transmitter and receiver in separate enclosures, the test must also assess whether the AOPD has been rendered ineffective due to reflection (e.g. by reflecting parts) or misalignment. To detect reflections or misalignments, a test rod must be used on the transmitter, receiver and in the centre of the light curtain to determine whether the red LED (OSSD OFF) is active over the entire length of the protective field.

Regular function tests on a daily or a shift basis may also be helpful, but should not replace a properly executed periodic test. Checklists can help to ensure that all relevant parameters are considered. ■

Qualification as a 'qualified person'

This autumn, the tec.nicum academy will be offering a whole-day seminar on the topic of the 'Fundamentals of and inspection of optoelectronic protective devices in accordance with the BetrSichV with qualification as a "qualified person" in accordance with TRBS 1203.' The seminar will impart expert knowledge and conclude with a certificate. The speaker will be Klaus Schuster, Managing Director of the Schmersal subsidiary Safety Control GmbH.

Date: Wednesday, 27 October 2021
For further information and registration, please visit
www.tecnicum.com/academy

Optoelectronic safety devices for machines and systems must be checked regularly.

New products and services for infection prevention from Schmersal

The coronavirus pandemic has posed significant challenges for businesses, which have been forced to implement new occupational health and safety regulations as well as additional safety and hygiene requirements. tec.nicum and the Schmersal Group quickly adapted to the new situation and developed a new range of products and services which enable them to support businesses with infection prevention.

Risk assessments for infection prevention

Under Article 3 'Basic obligations of the employer' of the German Occupational Health and Safety Act, an employer is obliged to carry out a risk assessment in order to be able to ensure the protection of employees. In addition, an employer must also use the risk assessment to derive protective measures and adapt them to changing circumstances, such as the current coronavirus pandemic, in order to be able to define appropriate infection control measures.

tec.nicum now offers the execution and documentation of 'Risk assessments for infection prevention.' Executing and documenting the risk assessment not only helps to satisfy legal requirements, it also helps to identify business risks that could have serious economic consequences.

Seminars on infection prevention

A one-day face-to-face seminar, as well as an abridged online seminar, is also possible – offered by tec.nicum on the topic of risk assessments/infectious diseases, it provides information on biological hazards and how to avert them, and highlights measures that businesses can use to more easily implement occupational health and safety requirements. The seminar is intended primarily for occupational health and safety specialists, safety officers and infection prevention assistants.

Access control system for public buildings

Retail businesses and other public facilities will continue to need to limit the number of visitors or people on their premises in order to comply with social distancing rules. The same also applies to locations such as company events spaces and canteens. The new 'Schmersal Access Control' system (SAC-IO-20) is an intuitive traffic-light system with integrated counter that automatically counts the number of visitors entering a building. The access possibilities are signalled by traffic light colours: with green meaning 'please enter' and red meaning 'please wait.' As soon as a maximum number of visitors is exceeded, a signal tone is sounded to indicate that the person who entered the building last must leave.

The traffic-light system is quick and easy to install, requiring just a conventional 230 V socket. The system offers a standard version for up to 20 people, while versions for up to 200 people are available, and it comprises industry-tested components. →

The new 'Schmersal Access Control' system.

Pandemic products for lift manufacturers

Schmersal Böhnke + Partner has also upgraded some of its products so that they now support infection prevention. The software of the bp408 lift control module, for example, has been updated to enable 'coronavirus-safe' use of lifts. The upgrade means that the module now offers a number of options, including the 'Single Drive' setting, where all other landing calls are ignored while the lift is in use, and the 'Shabbat Mode', where the lift automatically stops on all floors so that users don't have to touch the call buttons. Special air purification systems for lift cars are now also available to help reduce the risk of infection. The bp408 is compatible with a number of different air purification systems that are currently available on the market.

Foot switches can also be used and remove the need to touch the call buttons. With the new lower operator panel from Schmersal Böhnke + Partner, lift users can select the floor they need by pressing the button with their foot. The foot buttons are protected against vandalism and can be installed in lift cars alongside the usual call buttons. ■

The tec.nicum academy seminar programme for 2021

During the course of the coronavirus pandemic, many organisers have cancelled face-to-face sessions. But at the tec.nicum academy, the seminar programme will continue in 2021! tec.nicum seminars will be taking place at five locations in Germany this year – Wuppertal, Bietigheim, Wettenberg, Bremen and Mühldorf/Inn. All face-to-face sessions will be held in compliance with current rules on infection control, i.e. social distancing, hygiene, masks, ventilation.

The tec.nicum academy remains flexible to customer requirements and, if requested, can also deliver seminars online. In order to make optimal use of participants' concentration capacities, online seminars, which typically require more attention than face-to-face sessions, can also be booked in blocks of a maximum of four hours. In addition, the tec.nicum academy also develops bespoke training programmes that are tailored to the individual specialist interests of participants.

The tec.nicum academy is pleased to be able to offer a number of new and interesting topics for this year's programme. A compact seminar will for the first time convey the most important basic information on explosion protection. Engineer Marlies Gerstkämper-Oevermann of the Schmersal Group will provide information on the legal and normative requirements as well as the requisite safety precautions in a potentially explosive environment. Also new are the 'Safety in integrated robot production plants' and 'Human-robot collaboration' seminars. Engineer (FH) Ulrich Hochrein, EDAG Production Solutions GmbH & Co. KG, will outline the divergent safety requirements and look at proposed solutions for industrial robots.

The full seminar programme, current dates and further detailed information on registration can be found at www.tecnicum.com/academy

You can also find the latest news on the safety of machinery in the current webinar series offered by the Schmersal Group. You can find more details on topics and dates at: www.schmersal.com ■

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