PILZ

THE SPIRIT OF SAFETY

Background information

Optoelectronic products and solutions must cover type classes
and all protection requirements

Optimum, barrier-free safety

**Thanks to extremely short reaction times of up to 6 ms and
the absence of dead zones, today's innovative safety light
curtains are moving even close to the danger zone. Where
the demand is for safety, flexibility, simple wiring and rapid
commissioning, such light curtains are setting standards
for barrier-free safety solutions.**

In both production and logistics, light curtain-based safety
solutions are always the first choice whenever the process or
production requires continuous infeed and outfeed, an absence
of barriers or exchange between human and machine as part of
innovative HRC applications.

New type class for light curtains

In accordance with the Machinery Directive 2006/42/EC,
appropriate safety measures must be taken on plant and
machinery to eliminate any danger to humans or reduce it to an
acceptable level. These measures must meet the determined
risk level and the normative specifications. In 2015, the
standard IEC/EN 61496 was the first to establish a connection
between the type classes for electrosensitive

protective equipment (ESPE), the safety integrity level (SIL – in accordance with IEC 62061) and the degree of reliability with which a controller must perform a safety function (Performance Level PL – in accordance with ISO 13849). As a result, since May 2015 it has only been possible to use Type 2 light curtains in applications up to Performance Level PL c / SIL 1 and SIL CL 1. Type class 3 light barriers were not yet available on the market, so users were forced to switch to Type 4 devices, intended for PL e requirements, in order to satisfy the safety requirements of PL d. In most cases this meant significant overdimensioning – with correspondingly higher costs.

External specifications, framework changes and the resulting repercussions are often the stimulus behind innovative processes. Even before the change to the standard came into effect, the automation specialist Pilz decided to bridge this "type gap" with a light curtain tailored exactly to Type 3. The PSENopt II Type 3 safety light curtain completely excludes dead zones and is the only model to date that is designed for applications up to PL d of EN/IEC 61496-1.

Simultaneously barrier-free, safe and versatile

Flexible safety solutions that comply with the required categories and restrict neither operation nor productivity are a basic requirement for light curtains. That's why the basic function of light curtains protects a defined area against any encroachment. Essentially they are based on a simple

transmitter-receiver principle consisting of individual, invisible infra-red beams. If one or more of these beams is interrupted, the controller brings any potentially hazardous movements to a safe stop.

However, the flexible, manageable functions are what are really special about light curtains: in addition to safety features such as finger, hand and body protection, a wide range of extra functions can be implemented such as muting, blanking and cascading, depending on the type. As such, light curtains can be adapted fully to the desired requirements.

Faster, almost indestructible, closer to the action

Another requirement is shock resistance. Functionality must be covered where rugged environments with vibration or collisions are involved. There must also be an extremely fast reaction time and unconditional protection for the surrounding area: with short reaction times of up to 6 ms and the absolute absence of dead zones, Pilz light curtains, for example, also safeguard such danger zones. They are the only devices on the market equipped with an extremely high shock resistance of 50 g and as such are extremely robust. The body resolution type covers distances of up to 50 m, reliably safeguarding access to robot cells, packaging machines or presses. The status of all the light barriers in this series is clearly legible even under these conditions thanks to LED diagnostics.

Rugged environments are conditions that require special solutions, but the spatial conditions are equally prescriptive. The physical arrangement of the light curtains must be free and flexible in accordance with the implementation requirements and must not adversely affect functionality. Coding may be a solution here, in which case even light curtains installed in close proximity will not interfere with each other. If several pairs of light curtains are used, these will be coded differently: if a receiver should receive the light from an unknown transmitter there will be no repercussions. Security zones can be set up cost-effectively using the mirror columns available as an accessory. For example, if three sides of a robot application are to be safeguarded, one pair of light curtains is sufficient in conjunction with two mirror columns

Advanced model means: "more"

Muting, blanking or cascading are often an issue. There is a demand for models that include all these functions. When infeed and outfeed operations regularly transport objects through the light curtain, it is not desirable to have the machine at standstill because light beams have been interrupted. Muting can be used to allow defined exceptions within a protected field. It's an advantage if light curtains can be retrofitted in this case: alternatively muting can also be implemented using light curtains that can be retrofitted. In the case of the Pilz light curtains, if the configurable small controller PNOZmulti 2 from Pilz is added, then the muting function integrated within the

small controller can be implemented. Should a component or machine part constantly protrude into a defined protected field due to the process or design, this component can be hidden via the software. The blanking function permanently blocks this part of the protected field (fixed blanking). If objects protrude into a protected field only occasionally, then "floating blanking" comes into play. For applications that require either high protected fields or protection against encroachment from behind, cascading offers an appropriate solution. Light curtains are arranged one above the other and are connected in series, reducing the wiring effort.

Intuitive software

Software tools tailored specifically for light curtains provide support with installation, commissioning and handling, making implementation simple. For example, Pilz has a special software package for its light curtain portfolio: the PSENopt Configurator makes each individual beam visible. From alignment through to functions such as muting, blanking and cascading, the light barriers are configured with just a single tool. Fast, targeted diagnostics are available, plus the location and cause of an interruption are immediately traceable. The fault memory can also be read in plain text messages. All these tool features reduce downtimes and increase a plant's availability. Also, with this tool, users can easily download the created configuration to other machines via the programming adapter.

Slimline version – when space is tight

Flexibility in terms of space is one thing, the issue of limited space is another. There's not always sufficient space in production or at the point of use. If a high level of flexibility is also required, then slimline light curtains are worth considering. Their compact size and versatile installation options move them closer to the action. The high resolution supports a rapid shutdown, without compromising on safety. That ultimately results in slimline plant designs with a reduced space requirement.

Conclusion: Anyone who requires a barrier-free safety solution that's tailored exactly to applications up to PL d and in accordance with EN/IEC 61496-1 need go no further than fast, extremely robust light curtains. Anyone looking for light curtains for applications up to PL e in accordance with EN/IEC 61496-1/-2 should consider light curtains that are fast and robust and can be used efficiently in conjunction with control technology across a complete performance range.

Characters: 8,197

Pilz light curtain portfolio for all requirements

With a mechanical load capacity of up to 50 g and therefore high availability, the shock resistant light curtains PSENopt II

from Pilz are the preferred choice for use on robot applications, packaging machines and presses. With the PSENopt II Type 3 light curtain the automation company is also the only manufacturer to offer an economical safety solution that's specifically tailored to applications up to PL d in accordance with EN/IEC 61496-1.

Type 4 light curtains are also available for applications up to PL e in accordance with EN/IEC 61496-1/-2. The light curtains PSENopt II meet the highest requirement for finger, hand and body protection and are available in lengths of 15 cm to 180 cm. Add to that a wide range of accessories, such as mirror columns for example, enabling economical, complete solutions. On their own, such light curtains offer users maximum design scope, efficiency and reliability. In conjunction with configurable small controllers – in the case of Pilz the PNOZmulti 2 – they become a complete, economical solution.

The light curtains PSENopt slim are suitable for areas where space is critical, on machines where intervention is required as part of each cycle, such as insertion work, or the infeed and outfeed of material, for example. In these cases the super slimline light curtains provide finger and hand protection up to the highest Performance Level (PL) e, depending on the requirement. Thanks to the cascading function without dead zones they offer effective protection against encroachment into and behind the protected area in accordance with IEC 61496-2.

Characters: 1,475