Ultrasonic Sensors for Automated Guided Transport Systems Keep Personnel Safe

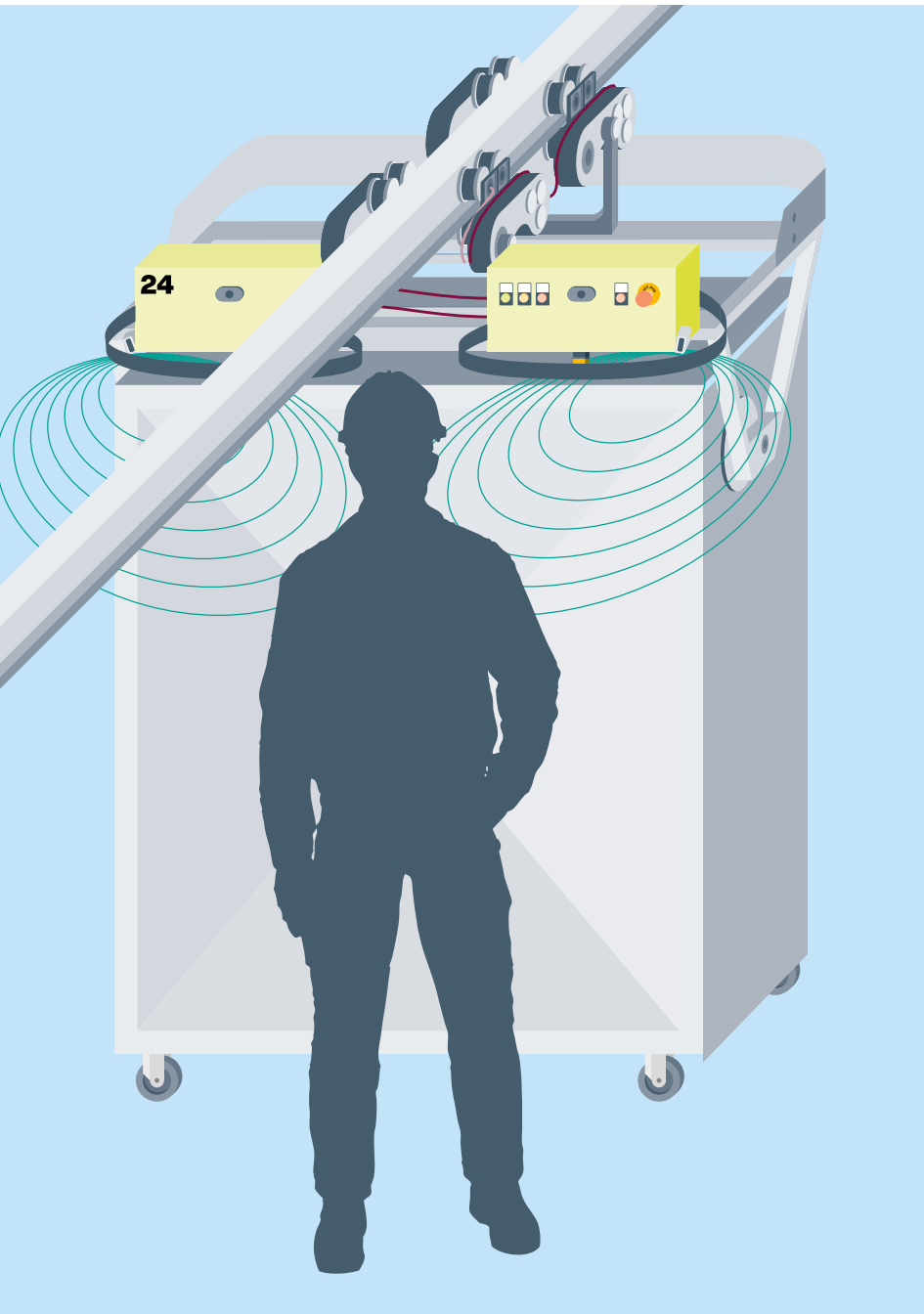
USi®-safety Ultrasonic Sensor System with Safety Approval to EN ISO 13849 Category 3 PL d

At a Glance

- The only ultrasonic sensor system to keep personnel safe
- Safety approval for use according to EN ISO 13849 category 3 PL d
- Elliptical sound field with an opening angle of ±17° and ±5°
- Extremely compact sensor unit that can be installed in the smallest of spaces
- Resistant to environmental influences such as dirt, air currents, humidity, and other similar factors

The Application

Automated guided transport (AGT) systems can be found in many hospitals. This specific application involves an overhead conveyor with metal rolling containers in which materials such as laundry, medicine, and food are moved to their destination. The AGT system moves through the supply passages in basement floors, picking up rolling containers and transporting them to the required station through special shafts. Containers full of dirty laundry, dishes, and similar items are likewise transported from their destinations back to the supply area.



The Goal

The chassis in the AGT system for the described application need to be gradually retrofitted. These chassis consist essentially of a drive system, two adjacent switch cabinets, and a holder underneath for the containers. Since compliance with current regulations is a must, the chassis require personal protection systems that reliably prevent possible collisions and injury. The monitoring area required for this needs to be generated over the entire width of the vehicle in the direction of travel. The idea is to create a protection field upstream of the collision guard, which is a metal bracket with miniature contact strips. Installing a laser scanner is not possible due to its size. The scanner would be damaged or separated by the container holder when moving round corners or transitioning into the supply shaft. Since the system is an overhead conveyor, the solution must ensure that the head and shoulder area of personnel in the lane is detected to prevent injury through collisions.

The Solution

The USi®-safety is an ultrasonic sensor system that keeps personnel safe. Its sensor unit that reliably detects obstacles is small, which makes the system very compact. The devices are therefore ideal for integrating into the new chassis of the AGT system. The freely positionable sensor units are fixed at a predefined angle on the right and left using customized mounting sets. To prevent the sensor units from separating when the container holder rotates, they each seal with the bottom edge of the switch cabinet.

The ultrasonic transducers generate an elliptical sound field with an opening angle of ±17° and ±5°. This makes it to possible to generate a suspended detection field upstream of the AGT with one transducer on the left and one on the right. As the only safe ultrasonic sensor to EN ISO 13849 category 3 PL d, the USi-safety guarantees the safety monitoring required for this application. The ultrasonic sensor system is perfect for this application thanks to the extremely compact sensor unit, which can be optimally mounted and easily parameterized for the application.

The Advantages

Using the USi®-safety ultrasonic sensor system ensures safe and reliable detection of personnel in the lane at all times. It is the only industrial ultrasonic sensor with safety approval for use to EN ISO 13849 category 3 PL d. This means the benefits of ultrasonic sensor technology can now be utilized for safety applications for the first time. Objects made of different materials are reliably detected using the USi-safety. The sensors are resistant to contamination, air currents, humidity, and similar factors.

Technical Features

- Sensing range: up to 2,500 mm
- IP safety class: sensor units IP69K, control interface IP65
- Reaction time: typically 91 ms
- Safety rating: in accordance with EN ISO 13849 category 3 PL d
- Operating temperature: –30 °C ... +50 °C

For more information, visit: **pepperl-fuchs.com/px-usi-safety**