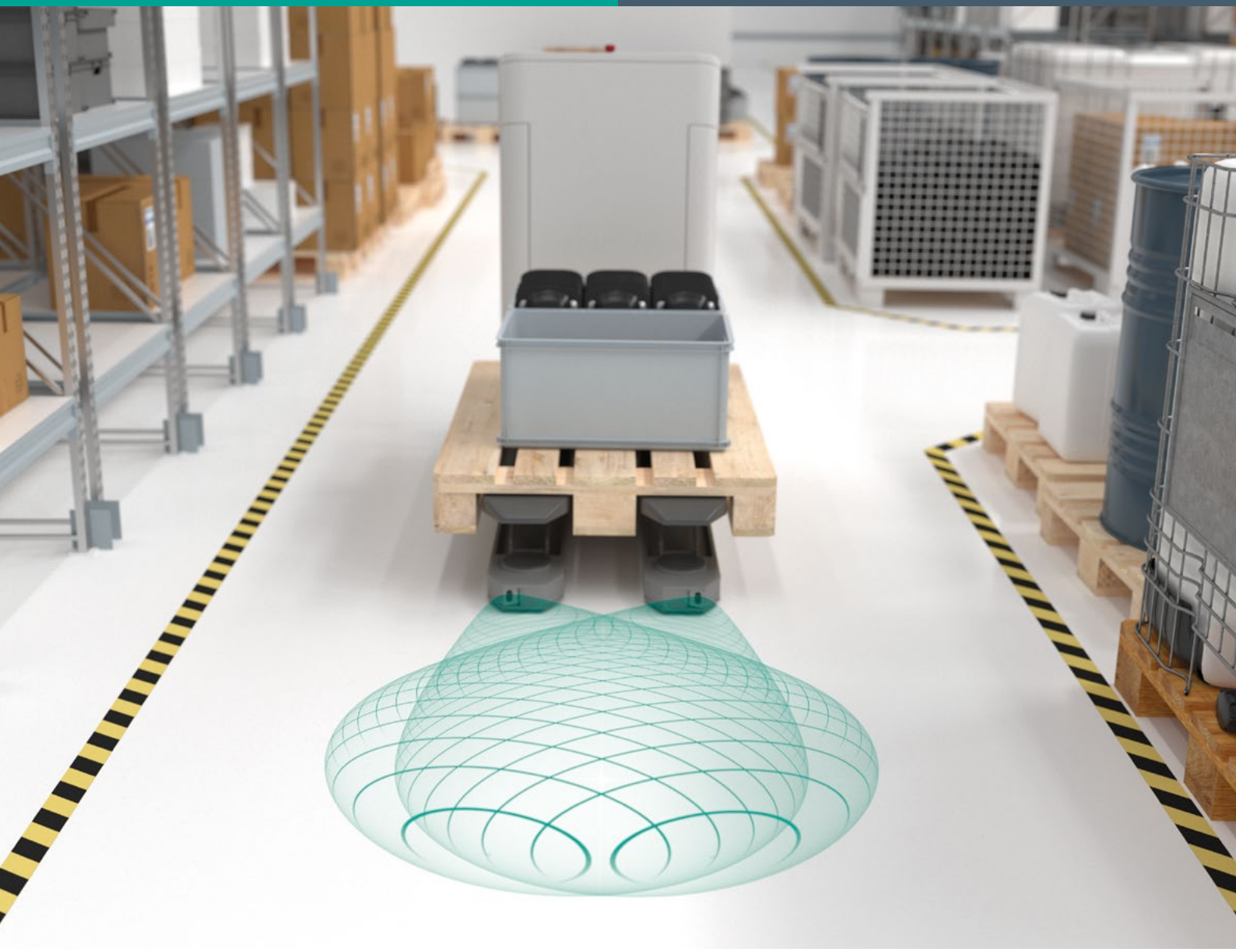
Driverless and Safe Through the Logistics Center

USi®-safety Ultrasonic Sensor System Keeps Personnel Safe 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



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The Application

In modern logistics centers around the world, materials are now transported using automated guided vehicles (AGV) such as automated forklifts. When moving materials using these AGVs, all directions of travel must be reliably protected to keep personnel and objects in the lane safe from collisions. At least one protection measure to PL d in the main direction of travel (forward) and at least one to PL c in the secondary directions (sideways and reverse) are required. With load transfers, a protection measure to PL d is needed for automatic reverse travel if loaded pallets are picked up or placed on the ground. Depending on the logistics center, the safety technology must be resistant to environmental influences such as dust, dirt, and humidity. Robustness against weather influences such as wind, rain, and snow comes into play when driving outside between the halls.

The Goal

The AGVs should be reliably protected against collisions with people and objects in the lane when in automatic reverse travel, even if the vehicle is loaded. The blind spot in front of the fork arms must be secured in the phase instantly before lowering into the pallet. Approval according to ISO 13849-1 category 3 PL d is required for these application requirements. It should be possible to use these devices in confined spaces and they must be resistant to environmental influences such as dust, dirt, and humidity.

The Solution

The USi®-safety is the only safe ultrasonic sensor system according to EN ISO 13849 category 3 PL d. It enables reliable monitoring of three-dimensional spaces, making it ideal for use on materials handling equipment. The sensor units are extremely small and can be freely positioned, meaning they can be detached from the control interface for flexible positioning in the extremely narrow space of the fork arms.

The control interface offers two safe OSSD outputs per channel for the adjustable protection field and one PNP switching output for the warning field.

The elliptical sound field of the ultrasonic transducer has an opening angle of ±17° and ±5°. It has been optimized for monitoring a 3-D range and is therefore—unlike laser scanners—perfect for detecting obstacles that hang from above into the lane or are raised off the ground.

If the USi-safety system is installed on several independent AGVs that happen to cross each other's paths, the mutual interference suppression prevents them from interfering with their function. A physical connection between the USi-safety systems is therefore unnecessary.

The Advantages

As the only industrial ultrasonic sensor, the USi®-safety has safety approval for use according to EN ISO 13849 category 3 PL d.

This means the benefits of ultrasonic technology over optical systems can now be utilized for safety applications for the first time. This allows objects made of different materials to be reliably detected. Furthermore, the sensor is resistant to environmental influences such as dirt, 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**