Building on experience.
Harnessing progress.
Advancing technology.

Ultrasonic Sensors for
Any Industrial Application

Your automation, our passion.

PEPPERL+FUCHS

Find Your Ultrasonic Sensor in Just a Few Clicks.

Go online. Specify your requirements. Select your ultrasonic sensor. You can find the right solution for your application in just a few clicks. If you have any questions, our experts are available to take your call.

Online Search on the Pepperl+Fuchs Website

Enter the model number in the search field on the Pepperl+Fuchs website and get to your product selection immediately. Model numbers can be found in this brochure in the technical data summaries.

Or you can navigate through our range of product families and groups. Product selectors help you select the optimal ultrasonic sensor.
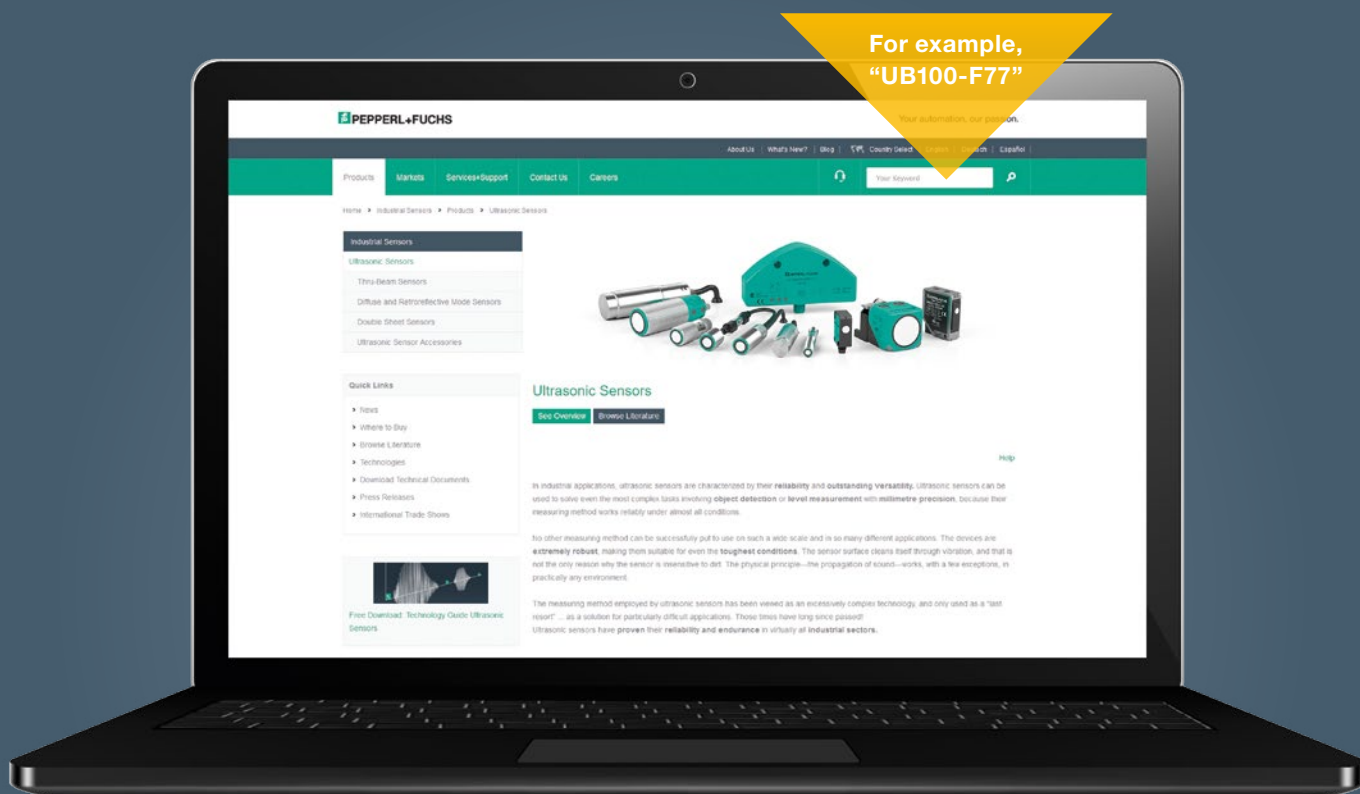
For example, "UB100-F77"

www.pepperl-fuchs.com/ultrasonicsensors

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Innovation and Expertise Right from the Start

With our unique expertise in developing and manufacturing ultrasonic sensors, Pepperl+Fuchs is working on the application solutions of the future. Our ultrasonic portfolio combines decades of in-house expertise in ultrasonic transducers, an ultrasonic technology center, and comprehensive expert knowledge—for future-proof, application-oriented sensor solutions.

Top Quality and Performance

Ultrasonic sensors from Pepperl+Fuchs are built in our own technology center, where transducer development and manufacturing take place. For more than 30 years, our forward-thinking team of experts has been working continually to advance ultrasonic technology for the solutions of tomorrow. That means our customers always receive the highest-performance products on the market.

This approach has led to the broadest portfolio in the industry—supported by numerous patents and innovations—for the highest level of flexibility in product selection and optimal application solutions. In addition to our standard portfolio, Pepperl+Fuchs has the knowledge and infrastructure to respond to customer requirements with speed and flexibility.

Ultrasonic Sensors for Any Industrial Application

Ultrasonic sensors are used to detect objects and measure distance in industrial applications where versatility and reliability are key. Pepperl+Fuchs offers a wide variety of ultrasonic sensors that feature benefits like minimal dead bands, large measuring ranges of up to 10 m, adjustable sound beams, and much more—and all in a variety of housing designs, so we can always offer reliable and efficient solutions.

Sensorik4.0®—Paving the Way for the Smart Factory

In the "Industry 4.0" future of fully networked production systems, communication-ready sensors play a vital role because they send and receive sensor data within production processes and to higher-level, local, or cloud-based information systems. To pave the way for Industry 4.0, Pepperl+Fuchs is providing innovative sensor technologies with Sensorik4.0®. They use the standard IO-Link interface to support the digitization of industrial applications.

Deepen your knowledge of ultrasonic sensors with Pepperl+Fuchs' Ultrasonic Technology Guide:
www.pepperl-fuchs.com/technology-guide
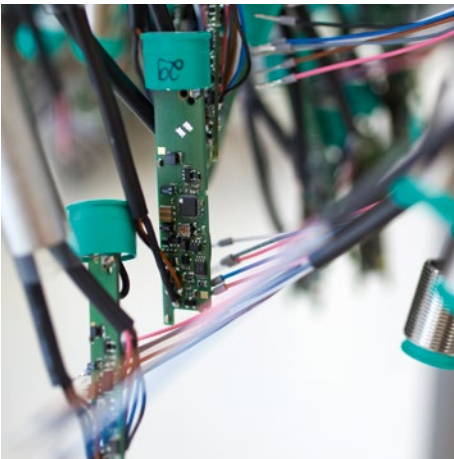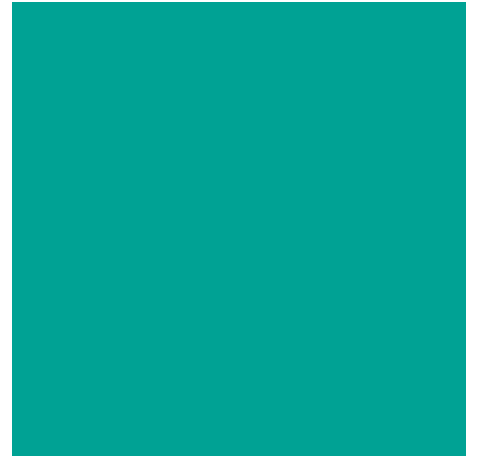
One Technology— Limitless Versatility

Ultrasonic technology is known for its reliability and outstanding versatility. It's up to the challenge when other technologies reach their limits. That's because ultrasound has qualities that make it the ideal sensing technology for a variety of applications. Ultrasonic sensors can be used for even the most complex detection and monitoring tasks, because their measuring method works reliably under almost all conditions.

### Extremely Versatile and Reliable

Wood, metal, or plastic; colored, reflective, or transparent; solid, liquid, or powder—the versatility of ultrasonic technology is almost limitless. The wide range of applications is demonstrated by the technology's insensitivity to countless materials, surface types, and colors. Whether in a conventional industrial environment or in more specialized areas such as agriculture, the chemical industry, or food industry, ultrasonic sensors are extremely versatile. This is true even in harsh environments where other technologies reach their limits.

Ultrasonic Technology for Superior Performance

Ultrasonic sensors offer impressive functionality, taking measurements by transmitting high-frequency sound pulses that are completely inaudible to humans. These pulses spread out in a cone shape into the air and are reflected as soon as they hit a surface. The sensors operate according to a time-of-flight measurement, by which they measure the time between transmitting the sound waves and receiving the object reflection. This allows objects to be detected and their distance from the sensor to be measured. Pepperl+Fuchs ultrasonic sensors are equipped with integrated temperature compensation for reliable and accurate measurement.

The Right Sensing Mode for Every Application

Whether it's with analog or digital output, or as a diffuse, retro-reflective, or thru-beam sensor—ultrasonic sensors open up a wide range of automation solutions. Pepperl+Fuchs provides a comprehensive product range encompassing all operating modes, so we can offer the right ultrasonic sensor for every possible application.
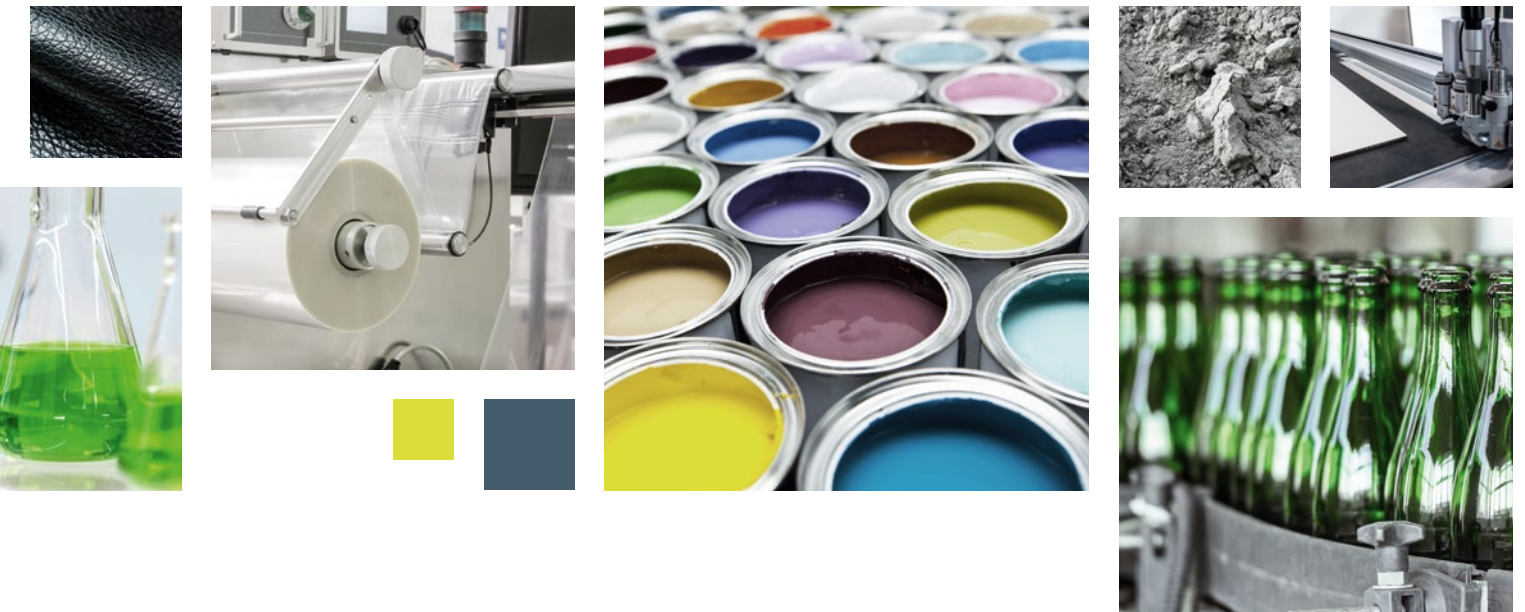
Diffuse Mode Sensor: Detection and Measurement with Just One Ultrasonic Transducer

In a diffuse mode sensor, the ultrasonic transducer is both an emitter and receiver. This single-housing design simplifies installation and is well suited for fill level detection in tanks. The surface of liquids or granular material reflects the emitted sound waves, meaning the sensor can detect a limit level while continually measuring the level.

Retroreflective Sensor: Background as Reference Ensures Reliable Sensor Function

A retroreflective sensor uses the background (such as a conveyor belt, machine part, or the floor) as a reflector rather than the object itself. In this operating mode, sensors detect any change—whether the objects are small or large, sitting at an angle, or made of sound-absorbing material. The single-housing design guarantees easy installation, wiring, and commissioning.

Thru-Beam Sensor: Long Ranges and High Switching Frequencies

Thru-beam sensors use separate emitter and receiver transducers. If a bottle or another object interrupts the sound beam, the electronics in the receiver trigger a switching signal. Even smooth, angled surfaces are detected reliably in this way. A significantly higher switching frequency also makes thru-beam sensors suitable for a wide range of high-speed applications.
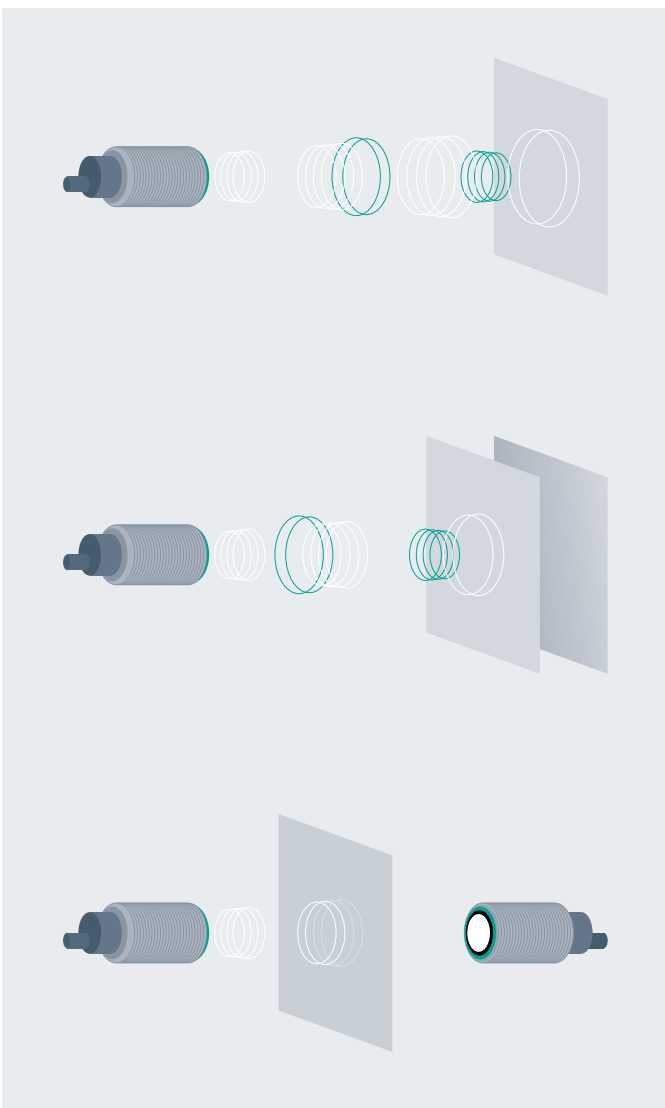
Using Technology to Its Full Potential

No two applications are the same—each one places unique demands on a sensor. To provide reliable measurements at any time, Pepperl+Fuchs combines the advantages of ultrasonic technology with high-performance sensor solutions that meet the toughest challenges in any environment.


Individually Adjustable Sound Beam Ensures Fault-Free Performance

Ultrasonic sensors use a sound beam for detection. This provides maximum reliability because detection is performed within a field rather than at a specific point. If objects are causing interference—like steps on the interior wall of a tank—the sound signal can be narrowed. This means no expensive changes need to be made to the tank. The detection range and full detection performance remain unchanged.

Universal Sensing Technology That Can Handle Any Environment

Ultrasound is a technology that can be used anywhere, offering impressive performance even in tough conditions such as snow, fog, or dust. The ambient temperature can affect the transit time of the high-frequency pulses, but ultrasonic sensors from Pepperl+Fuchs compensate for this internally. That means the user can always rely on the sensor regardless of temperature changes.
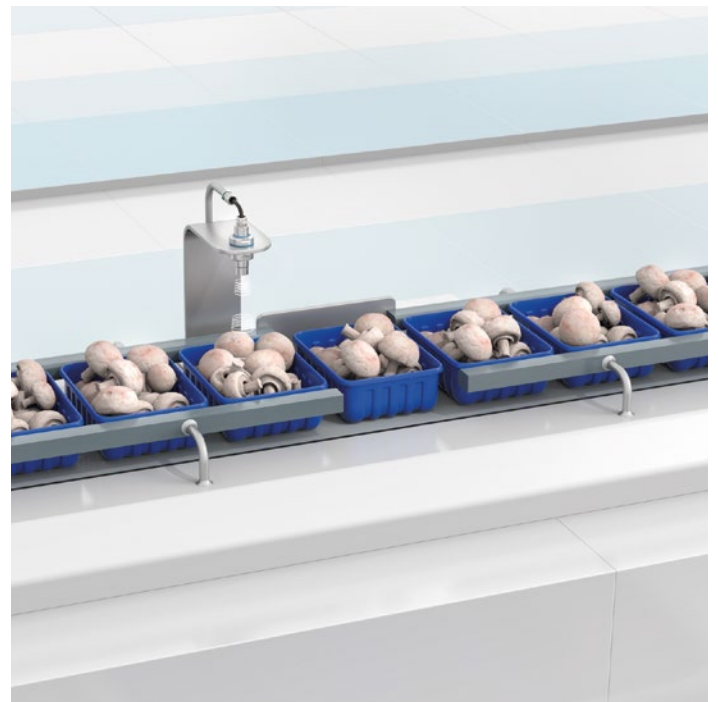
Synchronization: Fault-Free Operation When Using Several Sensors in Tight Spaces

When several ultrasonic sensors are installed close together, they can interfere with each other. To correct this, two operating modes are available, depending on the application. When synchronized in multiplex mode, the sensors send signals alternately and analyze their own echo. In common mode, all sensors transmit at the same time and analyze all received echoes. In both scenarios, maximum functional safety is ensured.

Special Design for Use Outdoors, in Wet Areas, and in Hygienic Applications

Even in extreme conditions, there are a number of special sensor types available:

- Weather-resistant designs for outdoor use
- Certified versions for product-contact zones in the food and pharmaceutical industries
- Corrosion-resistant solutions for use in the presence of aggressive chemicals and gases
- High-pressure-resistant and hygiene-compliant sensors for wet areas in plants

Cube-Style Housings: Broad Portfolio for a Variety of Industrial Applications

Our wide range of cube-style ultrasonic sensors offers the right solution for virtually any application. Special designs and features such as minimized dead bands, extended ranges, and extra-robust versions give the user the greatest possible flexibility.

Extreme Performance in Reduced Space

F77 Series

With IO-Link, sound beam adjustment, synchronization, long detection ranges of up to 800 mm, and minimal dead bands, F77 series ultrasonic sensors offer an unparalleled range of features and adjustment options. The series is available in a standard or side-looker version with integrated M18 thread. The minimized dead bands and long detection range mean objects close to the sensor and farther away are detected reliably. The sound beam width is easy to switch depending on requirements.

At the same time, automatic sensor synchronization allows sensors to operate without cross-talk when installed close together. The highest level of detection reliability is guaranteed even when there are interfering surfaces or strong vibrations from compressed air tools. The IO-Link interface enables quick commissioning via the control panel and provides valuable diagnostic information.

Highlights

- Highly adaptable: a single sensor can be adjusted to fit a wide range of applications
- Precise and reliable: high noise immunity and multiplex capability for maximum reliability
- Simple integration: compact, space-saving housing design with thru-hole and surface-mount options
- Convenient commissioning: intuitive programming and parameterization
- Parameterization and control: communication to the sensor level with IO-Link

Technical Data	UB100-F77	UB250-F77	UB400-F77	UBR250-F77	UBR400-F77	UBE800-F77	UC250-F77	UC400-F77	UC800-F77S
Sensing mode	Diffuse			Retroreflective		Thru-beam	Diffuse		
Sensing range	10…100 mm	20…250 mm	25…400 mm	0…250 mm	0…400 mm	0…800 mm	20…250 mm	30…400 mm	60…800 mm
Operating voltage	20…30 V DC						10…30 V DC (18…30 V DC analog output versions)		
Output type	1 switching output (PNP or NPN, NO, or NC contact) / 1 analog output (Frequency)			1 switching output (PNP or NPN, NO, or NC contact)		1 switching output (PNP, NO, or NC contact)	1 switching output (push-pull output) 1 analog output (current or voltage)		

Detection range max. 800 mm

Dimensions 31 x 23 x 12 mm

SYNC — Synchronizable

IP67 — Degree of protection

IO-Link — UC-F77

Compact and Versatile

F12 Series

F12 series diffuse mode ultrasonic sensors are suitable for a wide range of applications and offer special sensor functions. They are available with either a switching or analog output. The potentiometer or button on the device are used during configuration and operation. It is quick and easy to switch the sound beam between three widths.

This allows measurement to be performed in narrow feeds, such as bottling lines in filling machines or vibrating conveyors. In such arrangements, sensors mounted close together can be synchronized automatically so they do not suffer from cross-talk. This provides the highest level of detection reliability with optimized switching frequencies.

Highlights

- Available with digital or analog output
- Configuration and operation via potentiometer or button on the device
- Sound beam selection for rapid, individual adjustment to the detection application
- Synchronization prevents cross-talk

Technical Data	UB120-F12P	UB250-F12P	UB800-F12P	UB250-F12	UB800-F12
Sensing mode	Diffuse				
Sensing range	15…120 mm	20…250 mm	30…800 mm	20…250 mm	30…800 mm
Operating voltage	10…30 V DC			10…30 V DC / 12…30 V DC (analog voltage output)	
Output type	1 switching output (push-pull output)			1 switching output (push-pull output) / 1 analog output (current or voltage)	

Detection range
max. 800 mm
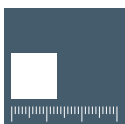
Dimensions
49 x 42 x 15 mm

Synchronizable

SYNC

IP54

Degree of
protection

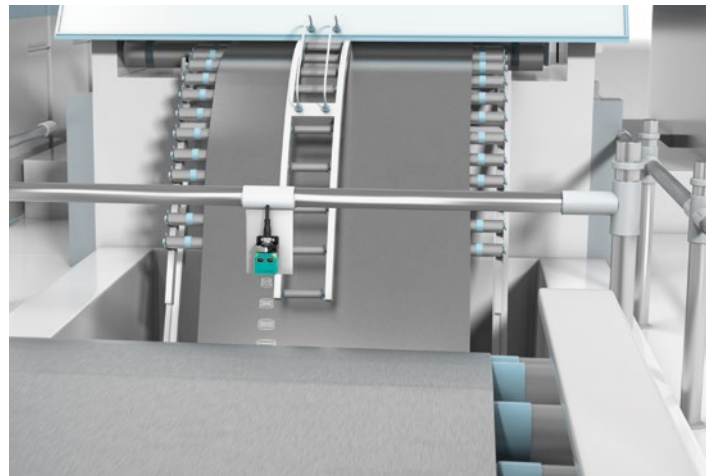# Extremely Flexible and Powerful

L2 Series

L2 series ultrasonic sensors offer a unique range of possibilities. The key features are the sensor's cubic shape and the adjustable sensor head, which opens up a host of integration options. During commissioning, a wide selection of parameters can either be set directly on the device or on a PC—for example, using the device type manager in the PACTware user interface.

IP67 rating offers the best conditions for maximum availability in harsh environments, such as when monitoring recycling collection vehicles or in anti-collision monitoring on mobile vehicles like aerial work platforms.
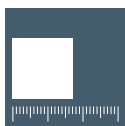
Highlights

- Wide array of ranges enables use even in long-range applications
- Rotating sensor head for customizable installation
- Automatic sensor synchronization for optimum functional reliability when several sensors are mounted near each other

Technical Data	UC500-L2	UC2000-L2	UC4000-L2
Sensing mode	Diffuse		
Sensing range	35 … 500 mm	60 … 2,000 mm	200 … 4,000 mm
Operating voltage	10 … 30 V DC / 12 … 30 V DC (analog voltage output)		
Output type	1 switching output (PNP or NPN) / 2 switching outputs (both PNP or both NPN) / 1 analog output (current or voltage)		

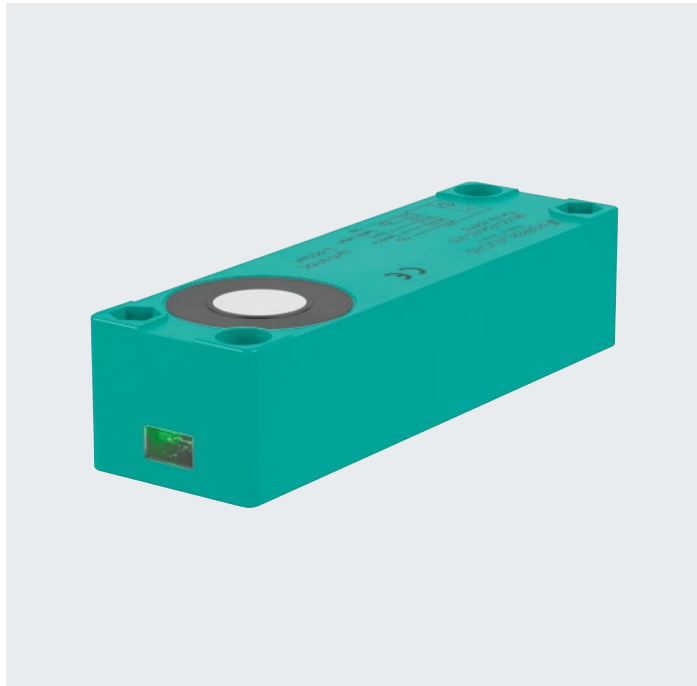|		SYNC	IP67
Detection range max. 4,000 mm	Dimensions 40 x 40 x 67 mm	Synchronizable	Degree of protection

13

Compact Solution for Narrow Spaces

F54 Series

The F54 diffuse mode sensor shows its strengths wherever mounting space is limited, while offering synchronization capabilities and a long detection range of up to two meters. User-friendly configuration is possible via the teach-in input.

The F54 can be used in applications like bottle reverse vending machines or in the detection of roll diameters, for example, when handling endless web-like materials such as aluminum, film, or fabrics. The sensor continuously detects the diameter and gives the user an early warning when the roll falls below the minimum diameter and must be changed.

Highlights

- Detection range of up to 2 m in a narrow housing design
- User-friendly teach-in input
- IP65 rating for maximum availability
- Automatic sensor synchronization prevents cross-talk between multiple sensors
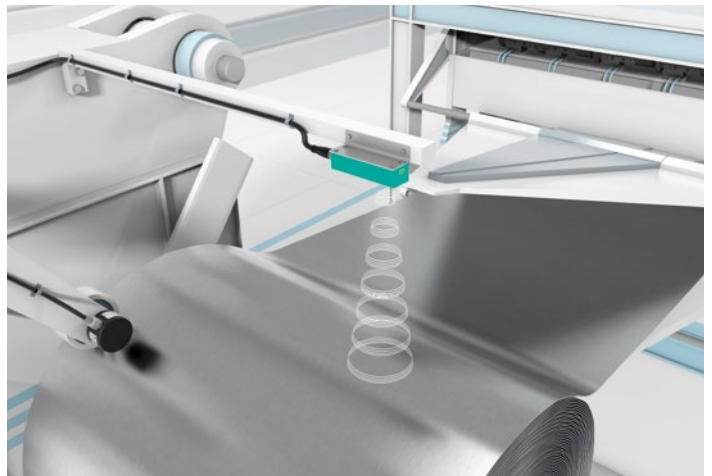
Technical Data	UB500-F54	UB2000-F54
Sensing mode	Diffuse	
Sensing range	30…500 mm	80…2,000 mm
Operating voltage	10…30 V DC / 15…30 V DC (analog voltage output)	
Output type	1 switching output (PNP or NPN) / 1 analog output (current or voltage)	

Detection range max. 2,000 mm
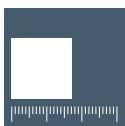
Dimensions 105 x 32 x 25 mm

SYNC Synchronizable

IP65 Degree of protection

Reliable Long-Range Detection

F42 Series

With their universal housing design and operating voltage, F42 series ultrasonic sensors are truly economical and versatile. The six-meter detection range makes the sensor ideal for long-range applications, and the teach button makes commissioning easy.

The diffuse mode sensor may be also used in such applications as automatic door and gate systems, where the sensor provides reliable security. With its wide range power supply, long sensing range, and relay contact output, the F42 offers the functions needed for long-range applications.

Highlights

- Up to 6 m detection range: the long-range solution for objects located at long distances and for large gate dimensions
- Switch points and output functions can be configured using the teach buttons, ensuring simple commissioning
- AC voltage operation and relay contact output for door and gate monitoring

| Technical Data	UB500-F42(S) (UB400-F42(S) UK)	UB2000-F42(S) (UB1500-F42(S) UK)	UB4000-F42 (UB3000-F42 UK)	UB6000-F42 (UB5000-F42 UK)
Sensing mode	Diffuse			
Sensing range	30…500 mm (40…400 mm)	60…2,000 mm (70…1,500 mm)	200…4,000 mm (200…3,000 mm)	350…6,000 mm (350…5,000 mm)
Operating voltage	10…30 V DC / 17…30 V DC (analog voltage output) (22…253 V AC/DC)			
Output type	1 switching output (PNP or NPN) / 2 switching outputs (both PNP or both NPN) / 1 analog output (current or voltage) (1 relay contact output)			

Detection range max. 6,000 mm
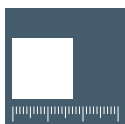
Dimensions 80 x 80 x 34 mm

SYNC
Synchronizable, except UK

IP54 IP67
Degree of protection

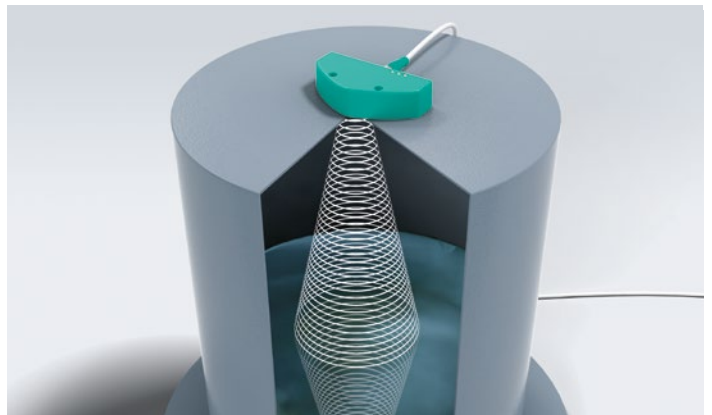# Optimized for Fill Level Detection in Sealed Containers
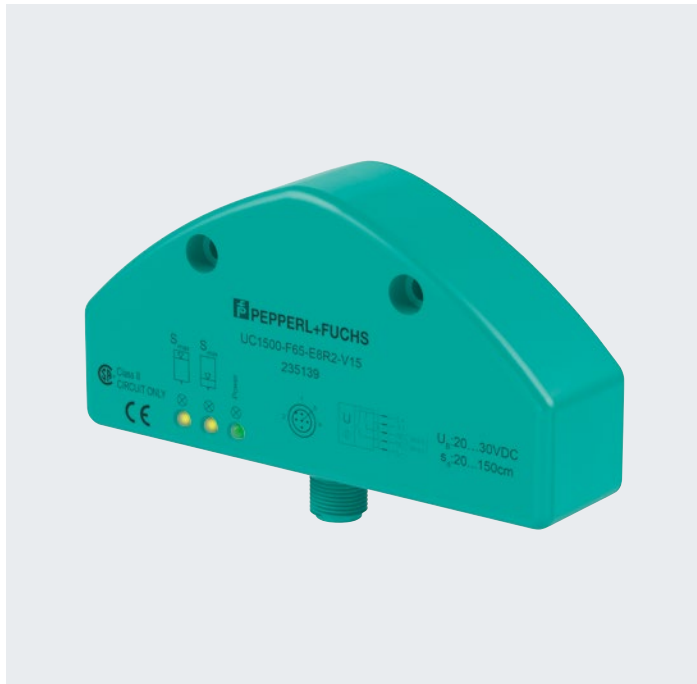
F65 Series

From the housing design to the mounting technology and output, the sophisticated, application-specific concept of the F65 series ultrasonic diffuse mode sensors makes them the ideal solution for fill level detection in containers. The rounded housing design allows easy installation near the side wall of containers.

The sensor seals the tank opening with its integrated O-ring, preventing water and odor leakage from the container. One single device provides the user with both a digital and an analog output, meaning the fill level can be continually measured in the container and limit levels can be detected.

Highlights

- Special sensor design seals the sensor opening on the tank
- Variety of potential applications with a range of up to 2.5 m
- Teach-in on the sensor or via parameterization software for fast configuration
- Analog and switching output in one device for maximum flexibility
- IP65 degree of protection

Technical Data	UC500-F65	UC1500-F65	UC2500-F65
Sensing mode	Diffuse		
Sensing range	60…500 mm	200…1,500 mm	250…2,500 mm
Operating voltage	12…30 V DC / 15…30 V DC (analog voltage output)		
Output type	2 switching outputs (PNP NO contact) / 1 switching output (PNP NO contact) + 1 analog output (current or voltage or frequency)		

Detection range max. 2,500 mm
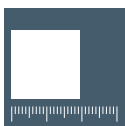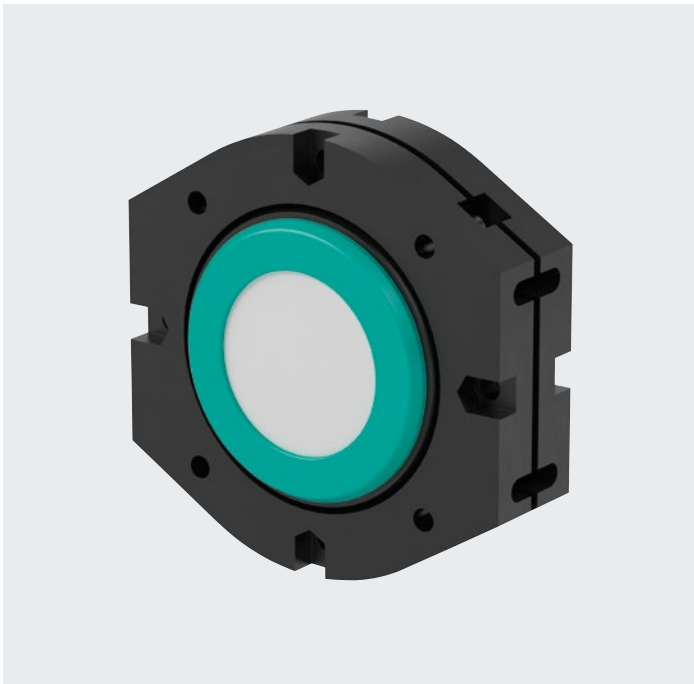
Dimensions 125 x 30 x 65 mm

Synchronizable

Degree of protection

Maximum Range for Heavy-Duty Applications

F260 Series

Heavy-duty applications push many sensors past their limits—but not the F260 series. Whether it's shock and vibration from construction machinery, excavators, and cranes, or dust from gravel and cement, these challenges are no problem for this rugged, diffuse mode ultrasonic sensor.

The sensor can be parameterized via software, and the switching points can be configured using the potentiometer. The extra-long detection range of up to 10 m is ideal for outdoor use in bunkers and silos, and the F260 is perfect for collision protection of crane booms.

Highlights

- Robust design ensures highest level of availability in heavy-duty applications
- Range of up to 10 m enables reliable long-range detection
- Simple adjustment via potentiometer and user-friendly software
- One analog output and two switching outputs

Technical Data	UC10000-F260
Sensing mode	Diffuse
Sensing range	800…10,000 mm
Operating voltage	15…30 V DC
Output type	1 analog output (current or voltage) + 2 switching outputs (PNP, NO, or NC contact)

Detection range max. 10,000 mm
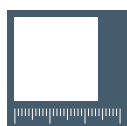
Dimensions Ø 160 x 112 mm

Synchronizable

Degree of protection

17

Cylindrical Housings: Application-Specific Solutions in Standard Designs

With their standard design, our cylindrical ultrasonic sensors are easy to integrate into any machine environment. Special features such as offset or angled transducers increase the possibilities for integration. The product range is well suited to application-specific solutions in hygienic areas and chemically aggressive environments, offering the user maximum flexibility for an optimal application solution—both in standard and specialized industrial applications.

Space-Saving with a Long Service Life

12GM Series

The highly compact cylindrical M12 housing in combination with the extra-small dead bands make 12GM series ultrasonic sensors the ideal solution for tight installations, for example, in ink tanks on printing machines. For applications in harsh environments, the IP67 degree of protection ensures the ultimate in robust construction and availability.

These diffuse mode sensors—available either with switching or analog output—are impressively user-friendly with teach-in configuration.

Highlights

- Minimal space requirement, small dead bands: ideal for tight installations
- IP67 environmental protection: maximum availability in harsh environments
- Simple configuration via teach-in
- Three detection ranges, switching or analog output: the right solution for every requirement

Technical Data	UB120-12GM	UB200-12GM	UB400-12GM
Sensing mode	Diffuse		
Sensing range	15…120 mm	15…200 mm	30…400 mm
Operating voltage	10…30 V DC / 15…30 V DC (analog voltage output)		
Output type	1 switching output (PNP or NPN) / 1 analog output (current or voltage)		

Detection range max. 400 mm

Dimensions Ø 12 x 70 mm

IP67

Degree of protection

Extremely Flexible in Tough Installation Conditions

18GM40 Series

The 18GM40 series of thru-beam and diffuse mode sensors is the ideal solution for tough installation conditions. The extremely short design of the sensors saves space, while the versions with right-angled ultrasonic transducers offer an additional level of flexibility during integration, such as in space-restricted installations.

Their application areas are just as demanding and varied: they can count bottles in filling lines, detect containers on waste collection vehicles, and detect cars and boats on amusement park rides.

Highlights

- Wide variety of integration options through special design and graduated detection areas
- Different output versions offer flexible solutions for measuring or switching applications
- IP67 environmental protection for maximum reliability and availability under tough operating conditions

Technical Data	UB300-18GM40(A)	UB800-18GM40(A)	UBE1000-18GM40(A)
Sensing mode	Diffuse		Thru-beam
Sensing range	35…300 mm	50…800 mm	15…1,000 mm
Operating voltage	10…30 V DC / 15…30 V DC (analog voltage output)		10…30 V DC
Output type	1 switching output (PNP or NPN) / 1 analog output (current or voltage)		1 switching output (PNP NO contact)

Detection range max. 1,000 mm

Dimensions Ø 18 x 40–68 mm

Degree of protection

IP67

Angled transducer

The Standard Design for a Wide Variety of Applications

18GM75 Series

The 18GM75 ultrasonic diffuse mode sensor has proven itself in a range of applications. The width of the sound beam can be easily adjusted to any detection situation. The synchronization option avoids cross-talk between sensors that are installed close together, ensuring reliable measurements.

In constricted mounting conditions, or in applications with interfering machine parts, the sound beam adjustment is especially beneficial. For example, the sound beam width can simply be switched to a narrow setting, thus ensuring reliable object or level detection.

Highlights

- Various detection ranges for different object distances
- Adjustable sound beam increases range of possible sensor applications
- Output variability in the series enables a wide variety of automation solutions

Technical Data	UB500-18GM75	UB1000-18GM75
Sensing mode	Diffuse	
Sensing range	30…500 mm	70…1,000 mm
Operating voltage	10…30 V DC / 15…30 V DC (analog voltage output)	
Output type	1 switching output (PNP or NPN) / 2 switching outputs (both PNP or both NPN) / 1 analog output (current or voltage)	

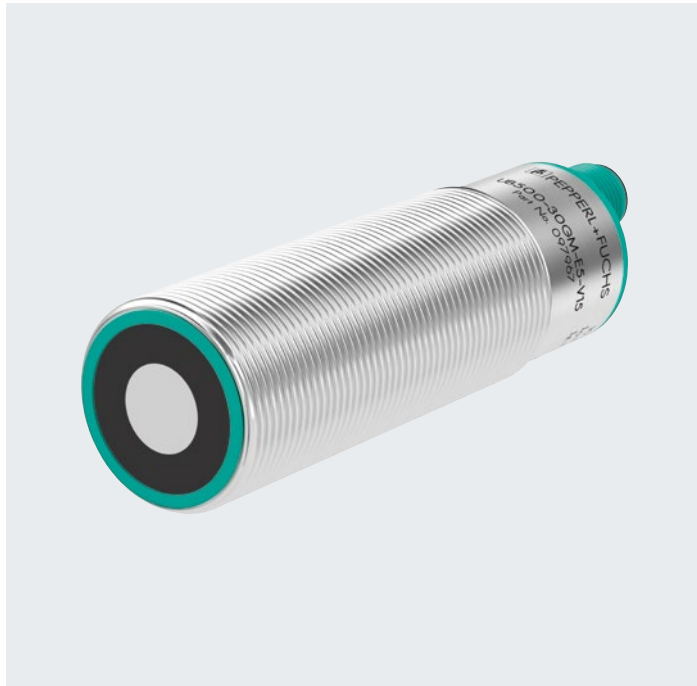Detection range max. 1,000 mm

Dimensions Ø 18 x 75 mm

SYNC Synchronizable

IP67 Degree of protection

Highly Resistant

UB-30GM Series

UB-30GM series diffuse mode sensors are easy to adjust via the teach-in input. They can be synchronized so that maximum detection and switching reliability is guaranteed in mounting situations with several sensors side by side.

The sensors are extremely robust and vibration-resistant, delivering reliable measurements at all times while resisting interference such as compressed air. The diversity of ranges makes this series the ideal solution for monitoring bulk goods in silos of varying sizes, for example.

Highlights

- Varying levels of detection coverage for a variety of applications
- Synchronization and IP65 environmental protection for maximum reliability
- High degree of vibration resistance for use in harsh and mobile applications

Technical Data	UB500-30GM	UB2000-30GM	UB4000-30GM	UB6000-30GM
Sensing mode	Diffuse			
Sensing range	30…500 mm	80…2,000 mm	200…4,000 mm	350…6,000 mm
Operating voltage	10…30 V DC			
Output type	1 switching output (PNP or NPN)			

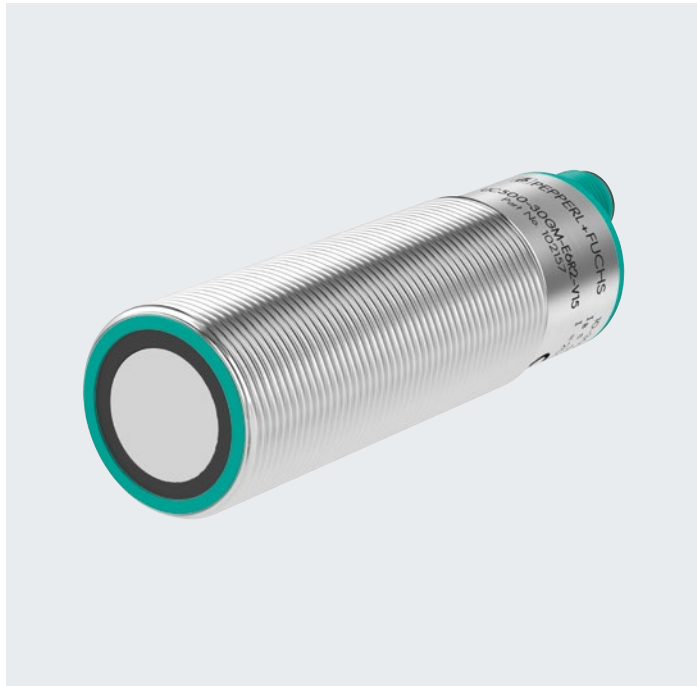Detection range max. 6,000 mm

Dimensions Ø M30

SYNC
Synchronizable

IP65
Degree of protection

Intuitive Programming

UC-30GM Series

Because of their comprehensive parameterization options and easy configuration via integrated programming plug, these diffuse mode sensors are well suited to applications where customized sensor adjustment is necessary. Versions with offset transducers offer an additional level of flexibility during machine integration.

With these features, they offer an impressive array of potential uses, such as measuring the distance between the crane and the container in container spreaders.

Highlights

- Comprehensive parameterization for customized sensor adjustment
- Intuitive programming and configuration for easy commissioning
- Versions with remote transducers increase installation flexibility

Technical Data	UC500-30GM	UC2000-30GM	UC4000-30GM	UC6000-30GM
Sensing mode	Diffuse			
Sensing range	30…500 mm	80…2,000 mm	200…4,000 mm	350…6,000 mm
Operating voltage	10…30 V DC			
Output type	2 switching outputs (both PNP or both NPN) / 2 analog outputs (current and voltage)			

Detection range max. 6,000 mm

Dimensions Ø M30

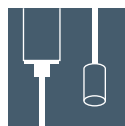SYNC
Synchronizable

IP65
Degree of protection

Separate transducer

Convenient Commissioning and Parameterization

30GM70 Series

The 30GM70 series is easy to customize to any application, such as in difficult installation conditions with interfering objects, and where parameterization is required without interrupting the process. Versions with rotating or remote transducers provide ideal installation flexibility. Where commissioning brings particular challenges, pulse echoes can be visualized in real time to align the sensor precisely and suppress noise.

Diffuse mode sensors are versatile—they can be used to measure fill levels in tanks and silos or to detect gaps between fruit trees to optimize the use of insecticides and herbicides.

Highlights

- Adjustable detection ranges for different object distances
- Infrared interface allows direct sensor access for PC-based parameterization or diagnosis
- Reactionless parameterization during operation avoids process interruptions
- Various transducer orientations to handle any mounting conditions

Technical Data	UC500-30GM70(S)	UC2000-30GM70(S)	UC3500-30GM70(S)	UC6000-30GM70(S)
Sensing mode	Diffuse			
Sensing range	45…500 mm	100…2,000 mm	200…3,500 mm	350…6,000 mm
Operating voltage	12…30 V DC / 20…30 V DC (analog output)			
Output type	2 switching outputs (both PNP) / 1 switching output (PNP) + 1 analog output (current or voltage)			

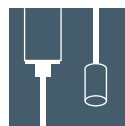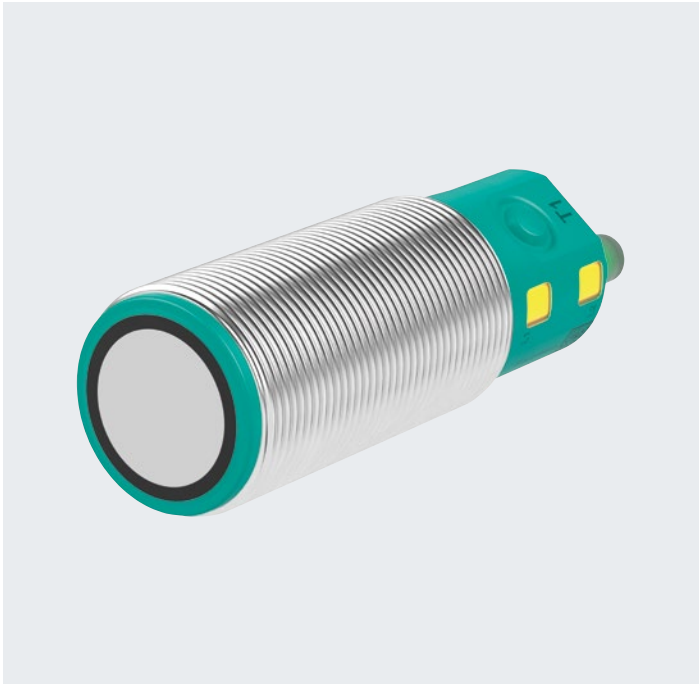|					
Detection range max. 6,000 mm	Dimensions Ø M30	SYNC Synchronizable	IP65 Degree of protection	Swiveling transducer	Separate transducer

Incredibly Simple Integration via IO-Link

30GM-IO Series

30GM-IO series diffuse mode sensors are the multifunctional solutions for a host of applications, from fill level measurement and presence detection to object counting and distance measurement. They are incredibly simple to parameterize, either using the buttons on the sensor or via the IO-Link interface.

Via this communication channel, the sensors can be integrated easily into the control panel to exchange both process and service data. Different sound beam widths can be set via teach-in to suit the respective detection task. IP67 degree of protection ensures maximum availability.

Highlights

- Simple integration into the control panel via IO-Link
- Integrated diagnostics and flexible parameterization
- Maximum process reliability through direct access to process data and diagnostic data
- Wide array of possible detection ranges
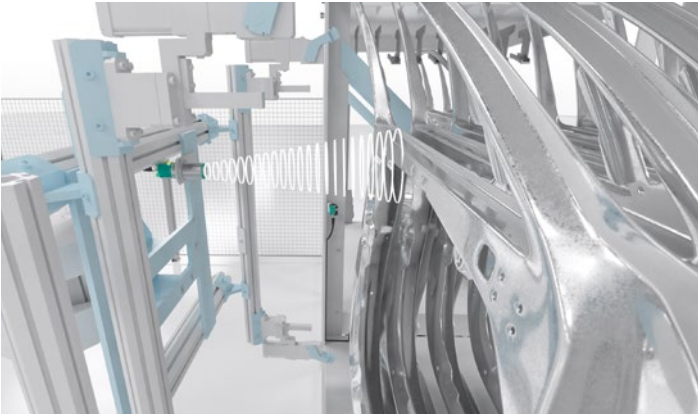
Technical Data	UC500-30GM*IO	UC2000-30GM*IO	UC4000-30GM*IO	UC6000-30GM*IO
Sensing mode	Diffuse			
Sensing range	30…500 mm	90…2,000 mm	200…4,000 mm	350…6,000 mm
Operating voltage	10…30 V DC			
Output type	2 switching outputs (both push-pull) / 1 switching output (PNP) + 1 analog output (current or voltage)			

Detection range max. 6,000 mm

Dimensions Ø M30

SYNC — Synchronizable

IP67 — Degree of protection

IO-Link

Maximum Chemical Resistance

UBC Series

UBC series ultrasonic sensors offer maximum material resistance for ultimate availability even in the toughest operational conditions. The thru-beam and diffuse mode sensors come with the highest degree of protection and are hermetically sealed against aggressive atmospheres, for example, when measuring the fill level of acids. Configuration via the teach-in input is quick and easy.

Highlights

- High level of chemical resistance for maximum durability
- Housing made of high-quality stainless steel (V4A)
- PTFE-coated ultrasonic transducer
- IP68/69K environmental protection
- Easy to configure via teach-in input

Technical Data	UBC250-12GM	UBC400-18GH40	UBEC300-18GH40
Sensing mode	Diffuse		Thru-beam
Sensing range	30…250 mm	40…400 mm	100…300 mm
Operating voltage	10…30 V DC		
Output type	1 switching output (PNP) / 1 analog output (current) / additional versions on request	1 analog output (current) / additional versions on request	1 switching output (PNP NO contact)

Detection range max. 400 mm
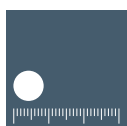
Dimensions Ø M12/M18

IP68 IP69K

Degree of protection

Highly Resistant with Versatile Parameterization Options

UCC Series

Complementing the UBC series, these sensors offer impressive adaptability to a wide range of applications. All of the surfaces that are exposed to aggressive chemicals and atmospheres exhibit a high degree of chemical resistance.

Comprehensive, easy-to-use parameterization functions allow the sensors to be adapted to any application—and synchronized if necessary. The diffuse mode sensors are available with detection ranges of up to six meters. Different output options provide additional flexibility in terms of electrical integration.

Highlights

- Ranges of up to six meters open up a wide field of applications
- Simple parameterization allows optimal adaptation to detection and measuring applications
- High chemical resistance for maximum availability and durability with high-quality stainless steel housing (V2A or V4A) and coated ultrasonic transducer

Technical Data	UCC1000-30GM-...	UCC500-30GH70-...	UCC2000-30GH70-...	UCC3500-30GH70-...	UCC6000-30GH70-...
Sensing mode	Diffuse				
Sensing range	80 … 1,000 mm	45 … 500 mm	100 … 2,000 mm	200 … 3,500 mm	350 … 6,000 mm
Operating voltage	10 … 30 V DC	12 … 30 V DC / 20 … 30 V DC (analog output)			
Output type	2 switching outputs (both PNP) / 2 analog outputs (current and voltage)	2 switching outputs (both PNP) / 1 switching output (PNP) + 1 analog output (current and voltage)			

Detection range max. 6,000 mm

Dimensions Ø M30

SYNC
Synchronizable

IP65
Degree of protection

Hygienic Design in a Compact Housing

UMB800 Series

EHEDG and ECOLAB certificates confirm: the UMB800 meets the highest requirements for hygienic design and easy cleaning. All sensor parts are made of corrosion-resistant and FDA-compliant materials like stainless steel AISI 316L (1.4404). The sensor head and all other parts are laser-welded and hermetically sealed against the ingress of vapor and liquids.

The gapless design ensures that cleaning agents run completely off the sensor and that no microbacterial contamination is left behind. The UMB800 ensures the highest product and process safety during the filling and packaging of food and medicine and is ideal for the chemical and process industries.

Highlights

- Ultracompact, all stainless steel ultrasonic sensor AISI 316L (1.4404)
- EHEDG and ECOLAB certification—specifically designed for use in the food contact zones (hygienic design)
- Resistant against aggressive chemicals and cleaning agents
- IP68/IP69K high-pressure washdown and steam-clean immunity
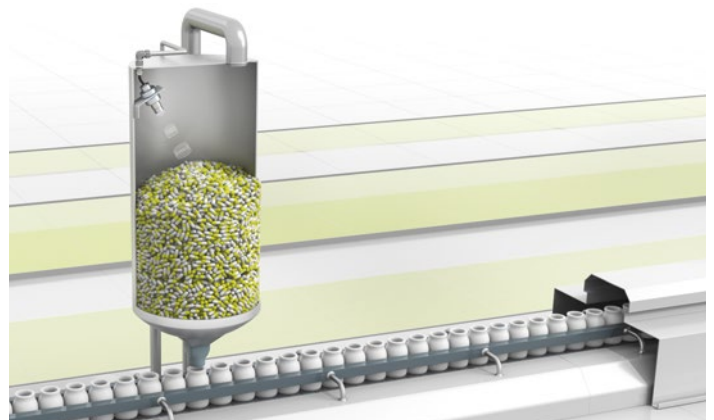
Technical Data	UMB800-18H
Sensing mode	Diffuse
Sensing range	70…800 mm
Operating voltage	10…30 V DC / 15…30 V DC (analog voltage output)
Output type	1 switching output (PNP or NPN) / 1 analog output (current or voltage)

Detection range max. 800 mm

Dimensions Ø 18 x 56 mm

IP68 IP69K

Degree of protection

Hygienic Design and Flexible Parameterization

UMC3000 Series

Like the compact UMB800, the UMC3000 series features a fully stainless steel design, hermetically sealed construction, and food-safe materials in accordance with FDA, ECOLAB, and EHEDG regulations.

In addition, this series offers measuring ranges of up to 3 m and extensive parameterization options. The sensor is easy to parameterize via the teach-in input or serial interface. These features ensure perfect adaptation to a variety of detection and measuring applications, for example, in content control of thermoformed trays in the food industry, or fill level monitoring of pharmaceutical products.

Highlights

- Product and process reliability with hygienic design and FDA-compliant materials
- Flexible parameterization via teach-in input or serial interface for easy commissioning
- EHEDG certificate for sensor and bracket (hygienic design), ideal for use in product-contact zones
- Chemically resistant to aggressive substances and cleaning agents (ECOLAB certified)
- IP68/69K environmental protection

| Technical Data	UMC3000-30H
Sensing mode	Diffuse
Sensing range	200…3,000 mm
Operating voltage	10…30 V DC
Output type	1 switching output (PNP) 1 analog output (current)

Detection range max. 3,000 mm

Dimensions Ø 30 x 100 mm

Degree of protection

EHEDG-compliant mounting concept for UMB800 and UMC3000

Mounting bracket made of high-quality stainless steel and FDA-compliant materials for easy mounting.
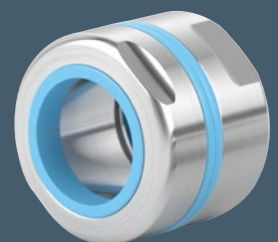
# Double Material Detection: Monitoring Continuous Processes

An accidental, multilayer feed of materials such as paper, card, metal, film, or labels can cause machine downtime, process faults, and waste. Ultrasonic sensors for double material detection help prevent faulty material feed and ensure reliable processes and maximum uptime.

Years of Experience in Sophisticated Sensor Solutions

Double material detection places unique demands on an ultrasonic sensor and requires special expertise. Pepperl+Fuchs has more than 15 years of in-depth development and manufacturing competence in this field and has provided solutions for countless applications. Pepperl+Fuchs now offers tried-and-tested technology that delivers reliable solutions, even in extremely demanding applications.

Ultrasonic double material detection prevents unwanted infeed of multiple materials, ensuring continuous, error-free processes. Two separate ultrasonic transducers are used in this solution, which measure the attenuation of sound by the material between the emitter and receiver. They compare the measured value with the programmed set point and emit a switching signal in the event of an incorrect material feed. This technology can be used in the detection of double sheets, labels, and splices.
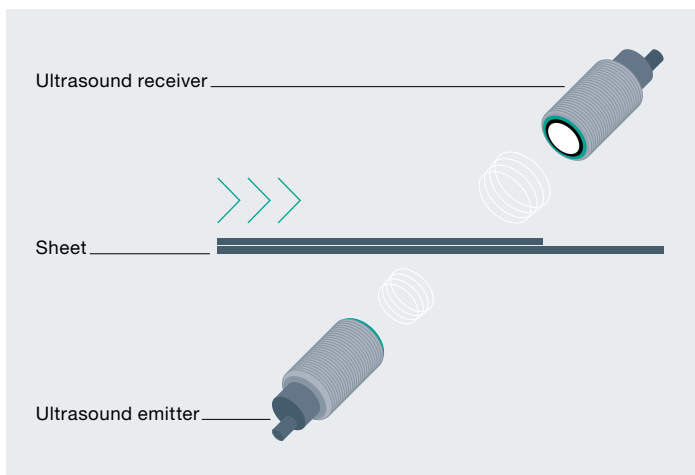

Double Sheet Detection

Double sheet detection guarantees maximum process reliability when only one layer of material is permitted to be fed into a machine. Whether on printing machines, in sheet metal processing, or when veneering chipboard, the double sheet sensors from Pepperl+Fuchs reliably prevent the infeed of double sheets or incorrect sheets.
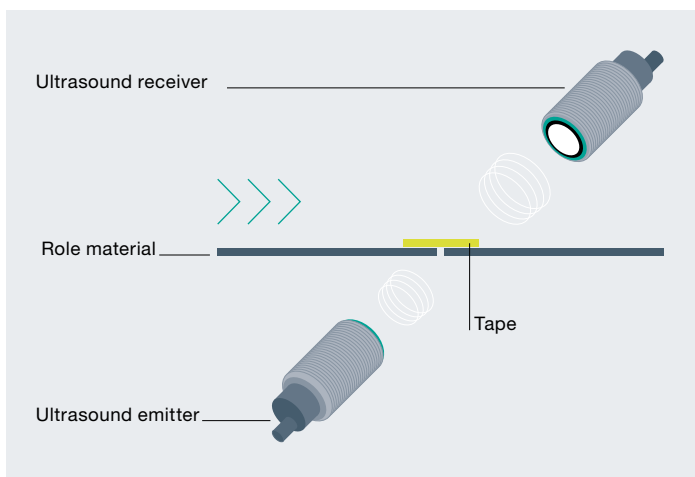
Ultrasonic Splice Detection

When processing material in rolls, the material from a new roll is often spliced to the web of the dwindling roll, avoiding the time-consuming process of feeding a new roll to the machine. Ultrasonic sensors for splice control detect the splice tape, which is undesirable in the final product. The tape is cut out of the web before the subsequent processing stage. In this way, splice detection sensors help ensure continuous material flow and a perfect end product.
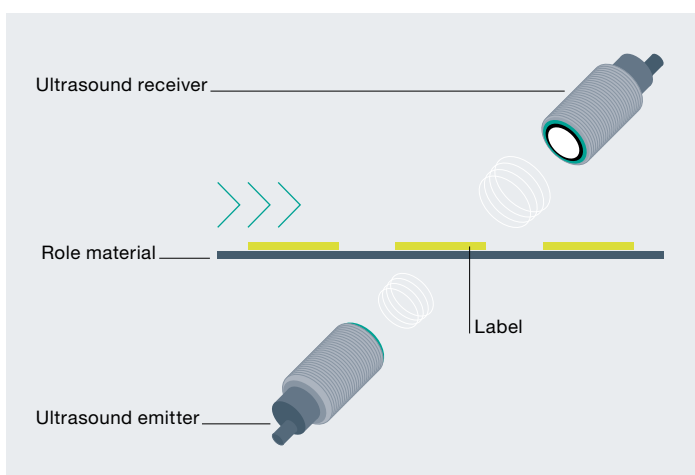
Ultrasonic Label Detection

Ultrasonic sensors for label detection allow labels to be counted during manufacturing and recorded and positioned in the labeling system. Once the sensors have been taught on the material, they are able to detect labels reliably and at high speed.

Adjustable to Any Material or Mounting Position

UDC-18GM50 Series Double Sheet Sensors

UDC-18GM50 series double sheet sensors are ideal for monitoring the material feed in the print and paper industry. Whether thin tissue paper or thick cardboard, the selectable transducer frequency lets you handle the full range of material thicknesses. Its short housing design and straight or angled ultrasonic transducers open up a variety of mounting options.

The devices can be adapted for specific applications via the programming input or via the serial interface. For high-speed applications, models are also available with a 1.5 ms response time.

Highlights

- Can handle wide range of materials and thicknesses
- Two different transmission frequencies (400 kHz and 255 MHz) to handle the most material types possible in any given application
- Ready for immediate use with no teach-in required
- Clearly visible LED for quick status indication

Technical Data	UDC-18GM50	UDC-18GMA
Sensing mode	Double sheet control	
Distance transmitter/receiver	20…60 mm	50 mm
Operating voltage	18…30 V DC	
Response delay	15 ms / versions with 1.5 ms available	15 ms / versions with 1.5 ms available
Output type	3 switching outputs (all of them PNP or all of them NPN, all of them NC or all of them NO contact)	

Detection range max. 60 mm

Dimensions Ø M18

IP67
Degree of protection

Angled transducer

Reliable Monitoring of Thick Materials

UDC(M)-30GM Series Double Sheet Sensors

Double sheet sensors in the UDC(M)-30GM series ensure process reliability when feeding thick materials. For example, double sheet detection allows individual sheets up to a thickness of 3.5 mm to be prepared in the appropriate way for metal-forming presses.

When processing solid and multilayer wood planks in a sawmill, these sensors reliably detect incorrect or double sheets, avoiding machine downtime and material waste. The devices have a short response delay of only 30 ms and thus enable operation in applications with high feeding speeds.

Highlights

- Ideally suited for thick materials: single sheets, corrugated cardboard, wood planks, or particle board
- Easy operation with no teach-in required
- User-friendly adjustment via programming input or serial interface
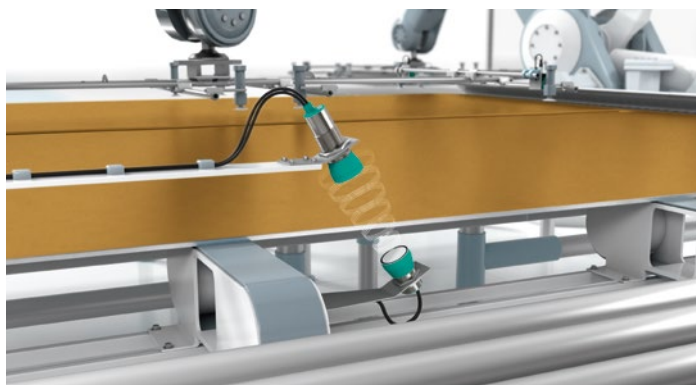
Technical Data	UDC(M)-30GM
Sensing mode	Double sheet control
Distance transmitter/receiver	50 … 150 mm
Operating voltage	18 … 30 V DC
Response delay	30 ms
Output type	3 switching outputs (all of them PNP NC contact)

Detection range max. 150 mm

Dimensions Ø M30

IP65

Degree of protection

Monitoring Web Materials

ULB/UGB-18GM50 Series Label and Splice Detection Sensors

The sensor solutions in the ULB-18GM50 and UGB-18GM50 series have been specially developed to reliably detect materials that are glued together.

The label sensors can precisely determine the transition points between the carrier material and the label and detect, position, or count these reliably.

The material should be fed without interruption to packaging and roller-printing machines. Therefore, in the case of a roll change, the initial material of the new roll is spliced onto the outgoing roll, and thus fed into the machine without interruption. In the subsequent process, the UGB-18GM50 splice detection sensors detect this splice point and enable the targeted removal of the overlay.

Highlights

- Compact design, ideal for compact installations
- Maximum detection reliability even at high process speeds
- Easy operation through teach-in of the web material
- Ideal for transparent materials
- Specially adapted splice detection sensors are available for materials with varying density

| Technical Data	ULB-18GM50	UGB-18GM50
Sensing mode	Label detection sensor	Splice detection sensor
Distance transmitter/receiver	20…60 mm	
Operating voltage	18…30 V DC	
Response delay	600 µs	
Output type	2 switching outputs (all of them PNP NC contacts) 2 switching outputs (all of them NPN NC contacts)	

Detection range max. 60 mm

Dimensions Ø M18

IP67

Degree of protection

The Perfect Addition: Accessories and Other Components
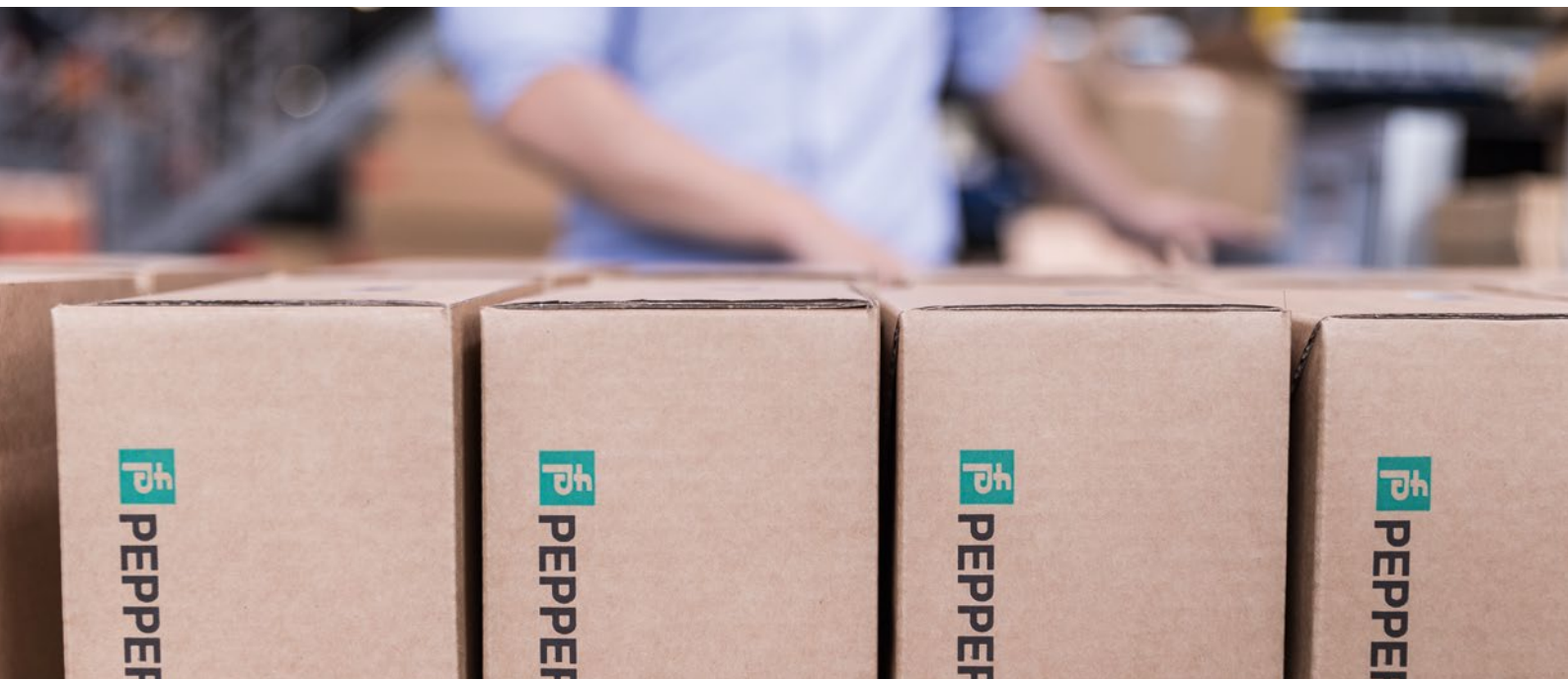
The extensive range of accessories from Pepperl+Fuchs offers the right modules for customized integration, whether in tough installation conditions or for special applications, custom programming, and coordinated connection technology. They turn any sensor application into a high-performance, future-proof system solution.

Alignment and Mounting Aids

Quick and secure alignment and attachment—mounting aids, adjustment aids, and deflectors simplify any installation and commissioning process.

Programming Devices and Adapters

Define switch points, select output functions, optimize parameters—the programming devices and adapters mean essential sensor parameters can be set individually. The sensor configuration can therefore be optimized for the application.

IO-Link Master

As the link between a PC and an IO-Link sensor, the IO-Link USB master allows for convenient, software-supported configuration, parameterization, and diagnostics of the connected device.

Software

PACTware is a user-friendly manufacturer- and fieldbus-independent software that allows ultrasonic sensors to be parameterized for specific applications.

Connectivity

In Pepperl+Fuchs' Connectivity portfolio, sensors and connection technology are perfectly coordinated down to the last detail for seamless integration into your application.

Accessories for ultrasonic sensors are available at:
www.pepperl-fuchs.com/ultrasonicsensors

Your automation, our passion.

Explosion Protection

- Intrinsically Safe Barriers
- Signal Conditioners
- Fieldbus Infrastructure
- Remote I/O Systems
- HART Interface Solutions
- Surge Protection
- Wireless Solutions
- Level Measurement
- Purge and Pressurization Systems
- Industrial Monitors and HMI Solutions
- Electrical Explosion Protection Equipment
- Solutions for Explosion Protection

Industrial Sensors

- Proximity Sensors
- Photoelectric Sensors
- Industrial Vision
- Ultrasonic Sensors
- Rotary Encoders
- Positioning Systems
- Inclination and Acceleration Sensors
- Fieldbus Modules
- AS-Interface
- Identification Systems
- Displays and Signal Processing
- Connectivity

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