Fundamentals of Ultrasonic Detection

Physics and technology of ultrasonic sensors

Sound with a frequency higher than approx. 16 kHz cannot be detected by the human ear–this is referred to as ultrasound. Like sound in the audible frequency range, it propagates at a speed of around 344 m/s in the air. The distance of an object can thus be accurately determined by evaluating the known speed of sound and the measured sound travel time.

Ultrasonic sensors are ideal for consistent object detection, even in harsh and problematic conditions. Objects made from different materials and with different shapes, colors, or consistencies are reliably detected.

Pepperl+Fuchs ultrasonic sensors incorporate a piezoelectric converter as the sonic emitter and receiver. A patented decoupling layer made from a special plastic is used to couple the ultrasonic waves in the surrounding air.

Ultrasonic sensors are available with switching and/or analog outputs. Depending on the model, different output functions are available.

Blind zone

The ultrasonic converter transmits a burst of sound and converts the pulse echo into electric voltage. The integrated microcontroller calculates the distance of the object based upon the echo travel time and speed of sound. The transmission period and delay period of the ultrasonic converter result in a blind zone in which the ultrasonic sensor is not able to detect any objects.

Response curves

The following figure illustrates the response areas for two typical objects. The specified object is detected within this area.

The upper part of the diagram illustrates the response characteristic on a level panel measuring 100 mm x 100 mm, the lower part using a rod with a diameter of 25 mm as the object. Many sensors include a feature for setting the sound beam width. Both sound beam shapes are shown in the diagram.

The information in the type designation relates to a normal level panel measuring 100 mm x 100 mm. This panel must be perpendicular to the propagation direction of the ultrasonic signal. The sound is reflected away from upright objects and the echo does not reach the sensor.
Environmental influences

Due to the physical properties of sound propagation, the detection range and speed of the ultrasonic signal are influenced by the following factors:
- Air temperature
- Relative humidity
- Air pressure

The following diagram illustrates the theoretical relationship between air temperature, air pressure, and the speed of sound.

Daily air pressure fluctuations have a negligible effect on the speed of sound.

Temperature

Fluctuations in air temperature in the object area have an indirect effect upon the propagation of sound waves and therefore upon the accuracy of the sensor. Typically this changes the speed of sound by 0.17%/K. If, for example, the temperature increases from 20 °C...40 °C, the speed of sound increases by approx. 3.5% and a fixed object will appear closer to the sensor. To prevent this from happening, most ultrasonic sensors include temperature compensation; an electric probe measures the ambient temperature.

Ultrasonic sensors incur a certain amount of self-heating, which depends on the housing design and installation. During the first 60 minutes after switching on the sensor, this leads to an additional temperature error of max. 2%.

Erratic temperature changes cannot be compensated for due to the lag in the temperature probe.

The following diagram illustrates the effect of air temperature and humidity on the detection range of an ultrasonic sensor. In principle, the correlations apply to all ultrasonic sensors, in relation to the respective detection range.

Low temperatures increase the detection range regardless of air humidity. At high temperatures, the detection range is reduced and this is increasingly influenced by relative air humidity.

The detection range details included in the data sheets relate to an ambient temperature of 20 °C and 50% relative air humidity.

Rain or snow

Light rain or snow does not affect the operation of ultrasonic sensors. Mounting the sensor at an inclined position prevents water or snow from collecting on the surface of the converter.

Object properties

Ultrasonic sensors can detect solid, liquid, and granular objects. Material properties such as transparency, color, or surface treatment (shiny or matt) do not affect detection reliability.

Level and flat surfaces located at a right angle to the converter axis provide an ideal reflection. The maximum angular deviation of the object from the ideal position is approx. ±3°.

Rough surfaces result in diffuse reflection of a portion of the sound energy and the detection range decreases. The surface roughness does, however, allow for greater angular deviation.

Selecting and Commissioning an Ultrasonic Sensor

1. Operating principle

Ultrasonic diffuse mode sensor

The sender and receiver are located in the same housing. The object acts as a sound reflector.

Features:
- Simple installation, just one sensing head
- The detection range depends on the surface properties and the pitch angle of the object
- Measuring frequency is lower compared with a thru-beam sensor
- Background suppression
Ultrasonic Sensors

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3.2 Ultrasonic Sensors, Diffuse Mode Sensors, cylindrical

3.1 Ultrasonic Sensors, Diffuse Mode Sensors, rectangular types

3.3 Ultrasonic Sensors, Sensors for Separate Evaluation

3.4 Ultrasonic Sensors, Double Sheet Sensors

3.5 Ultraschallsensoren, Ultrasonic Sensor Accessories

Germany: +49 621 776-4411
email: fa-info@de.pepperl-fuchs.com
website: www.pepperl-fuchs.com

USA: +1 330 486 0001
email: fa-info@us.pepperl-fuchs.com

Singapore: +65 6779 9091
email: fa-info@sg.pepperl-fuchs.com

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Ultrasonic retroreflective sensor

The sender and receiver are located in the same housing. The ultrasonic beam is reflected by a fixed reflector. Objects that appear in the sound beam change the measured distance and absorb or deflect the sound.

Features:
• Simple installation, just one sensing head
• Reliable detection of problematic objects (sound-absorbing objects, angled surfaces)

Ultrasonic thru-beam sensor

The emitter and receiver are separate and mounted opposite each other. If the ultrasonic beam is interrupted by an object, the switching output is activated.

Features:
• Large distance between emitter and receiver
• Low susceptibility to interference, suitable for difficult operating conditions
• Fast response times
• Two separate units to wire

Ultrasonic double feed detection

Ultrasonic double feed detection is performed using ultrasonic thru-beam sensors, consisting of an ultrasonic emitter and an ultrasonic receiver with integrated evaluation that are optimized especially for these applications:
• Double sheet control
• Label detection
• Adhesive strip detection
• Double feed detection

Double sheet control can detect three different states:
• No sheet
• Single sheet
• Double sheet

During detection of labels and splices, the system can distinguish the tag material from the labels and the adhesive strip from the basic material. Double feed detection is similar to double sheet control and distinguishes between no, one, or two instances of a material (e.g., sheet metals, wooden boards, glass panels).

2. Output function

Analog distance measurement

The sensor determines the distance from an object by measuring the time interval between emitting an ultrasonic signal and the arrival of the reflected echo. The sensors operate in diffuse mode. Depending on the model, different analog outputs are available:
• Analog output voltage: 0 V ... 10 V
• Analog output current: 4 mA ... 20 mA
• Serial output, RS232
• IO-Link

Trip point mode

In the case of sensors with independent trip points, the output is activated if the object is located within the respective switching area.

This trip point can be set via Teach-in or a potentiometer.

Window mode

In window mode, the output is activated if the object is located in the switching window. The window limits are configurable.
Retroreflective mode
In retroreflective mode, a fixed reflector is positioned.
The sensor output switches in the following cases:

- The sensor detects an object that is located in front of the reflector. The echo from the reflector must not necessarily be suppressed.
- The sensor does not receive an echo.

This can be caused by sound-absorbent material or an inclined reflector. The position of the reference reflector must not be changed.

Hysteresis mode
In hysteresis mode, the evaluation window is limited by two trip points (near and far). If the object approaches the near switch point, the state of the switching output changes. To change the state of the switching output again, the object must reach the far trip point. Both trip points create an adjustable hysteresis window.

This operating mode can be used to control a pump. If the filling level reaches the filler mark, the pump is switched on. The pump then switches off again once the filling level has dropped to below the minimum level.

3. Electric outputs
For an overview of electric output types for our sensors, see page 14 onwards in our catalog.

NPN/PNP/push-pull transistor output
Ultrasonic sensors can have NPN, PNP, or push-pull outputs.

Relay output
Different ultrasonic sensors have relay contact outputs. The maximum switching power and type of voltage are included in the respective data sheet. The mechanical service life data relates to the number of switching operations for the unloaded relay contacts. These values are reached with a low electric load. Under nominal load, the service life reduces to that of the value specified for the electric service life. The service life data relates to MTBF values.

Analog output
Analog outputs are available as current outputs and voltage outputs. The output current and output voltage are proportional to the object’s distance. The limits of the analog window can be programmed within the measuring range.

Serial interface
Sensors with a serial interface can be programmed via this interface. The measured distance of the object and the switching states are transferred.

Parameterization is carried out using the ULTRA 3000 service program for each sensor compatible with ULTRA 3000.

SONPROG
The SONPROG PC interface and associated software enable the ultrasonic sensors in F65 and F260 housing designs to be adjusted individually in line with the needs of the respective application. For example, the following parameters can be set:

- Start and end of the switching range
- Hysteresis
- Switching frequency
- Start and end of the analog characteristic
- Analog characteristic rising or falling
- End of the blind zone
- End of the detection range
- Averaging
- Attenuation
- Multiplex function
- Temperature compensation
- Function as a diffuse mode sensor or ultrasonic sensor
- Level measurement mode

4. Programming
ULTRA 3000
The ULTRA 3000 parameterization software facilitates sensor programming by providing direct communication between an RS232 programmable ultrasonic sensor and a Windows computer. You can easily define and display the sensor parameters, display the commands transferred to and from the sensor, and call up the last measured distance. You also have precise control of functions that are not available in normal sensors, such as:

- Detection range and limits
- Extended detection ranges
- Blind zone
- Sensitivity (sound beam width)
- Number of pulses evaluated per output
- Hysteresis
- Sound burst times
- Temperature offset
- Output mode

You can download ULTRA 3000 free of charge at www.pepperl-fuchs.com (Products -> Software) or via a direct link on the product page for each sensor compatible with ULTRA 3000.
The start and end of the switching range and analog range can be taught at the touch of a button, and parameter sets can be copied from one sensor to another.

You can download SONPROG free of charge in the download area at www.pepperl-fuchs.com or via a direct link on the product page for each sensor compatible with SONPROG.

ULTRA-PROG-IR

The ULTRA-PROG-IR PC program and associated UC-18/30GM-IR programming device enable ultrasonic sensors with an infrared interface to be adjusted easily in line with the application requirements. The existing wiring to the sensor need not be removed as the programming device snaps on to the sensor. The distance and the quality of several echoes can be visualized in real time. Communication with the sensor does not affect the measuring task in the sensor.

Examples of adjustable parameters:
- Start and end of the switching range
- Hysteresis
- Switching frequency
- Start and end of the analog characteristic
- Analog characteristic rising or falling
- End of the blind zone
- End of the detection range
- Averaging
- Attenuation
- Multiplex function
- Temperature compensation
- Function as a diffuse mode sensor or ultrasonic sensor
- Level measurement mode

IO-Link/PACTware

The IO-Link interface enables ultrasonic sensors from the UC-...-18GM-I-O and UC-...-30GM-I-O Series to be configured and parameterized with ease. It is also possible to carry out diagnostics for the connected sensor. The IO-Link Master01 USB is used to communicate between the sensor and the PC. PACTware parameterization and diagnostics software is used together with the corresponding DTM.

PACTware is an open, manufacturer-independent user interface that is used in areas such as the parameterization of ultrasonic sensors.

You can download PACTware free of charge at www.pepperl-fuchs.com or via a direct link on the product page for each sensor with an IO-Link.

5. Resolution/measurement accuracy

Resolution

Pepperl+Fuchs UC-type ultrasonic sensors are fitted internally with an integrated 12-bit D/A converter. A resolution of 12 bits corresponds to 4096 levels. The echo travel time is determined at a resolution of approx. 1 µs. This equates to a distance resolution of around 0.18 mm. This maximum sensor resolution is reached with a maximum measurement window of 750 mm. Up to this window size, the resolution depends solely on the pulse frequency of the microcontroller. The D/A converter determines the resolution by selecting a larger measurement window. This is calculated according to the following formula:

\[
\text{Resolution} = \frac{(\text{Upper limit} - \text{Lower limit})}{4096}
\]

Example:

A UC4000-30GM-IUR2-V1 sensor is set with the following parameters.

- Upper limit: 3500 mm
- Lower limit: 800 mm

With this setting, the sensor resolution is

\[
\frac{(3500 \text{ mm} - 800 \text{ mm})}{4096} = 0.66 \text{ mm}
\]

Measurement accuracy/characteristic deviation

To determine the absolute accuracy of the measured value for an ultrasonic sensor, the following influencing factors must be taken into consideration:
- Temperature
- Atmospheric pressure
- Relative humidity
- Atmospheric turbulence
- Hot spots in the ambient air around the sensor or the object
- Sensor at operating temperature state

Consideration of these influences can provide measurement accuracy of better than 2%. Reproducibility and linearity are better than 0.2% (under constant ambient conditions)
6. Installation and operation

Ultrasonic sensors can be installed and operated in any location. However, the excessive build-up of dust or dirt should be avoided. When cleaning the ultrasonic sensors, make sure that the sensor area (decoupling layer) and the integral foam surrounding the converter are not damaged. Water droplets or crusting on the decoupling layer affect the functioning of the ultrasonic sensor. Minor deposits of dust are not critical.

Actuating direction

The objects to be detected can enter into the sound beam from all sides. The anticipated trip points are defined based on the detection ranges and response curves specified in the data sheets.

Deflection of the beam angle

The beam angle can be deflected using flat, level reflectors. However, the signal may not be deflected more than twice because the signal attenuation that occurs with each deflection reduces the detection range.

Note:

The reflector areas must be accurately aligned. For some of its sensor types, Pepperl+Fuchs offers reflectors designed for 90° angle deflection.

Mutual interference

To prevent mutual interference, the minimum distances between sensors with the same detection range must be taken into account, as specified in the following graphics.

The specified values are to be taken as guidelines. They apply if the beam angles are aligned parallel to one another and the object surfaces are located at right angles to the axes of the beam angle. The actual required distance "X" depends on the alignment, the type of target to be detected, and the conditions relating to other objects that are located in the beam angle.

The distances specified below must be taken into account when mounting sensors opposite one another.

If interference occurs, it may be necessary to increase the distance "X" or activate the synchronization function if required. Pepperl+Fuchs offers a range of sensors that are fitted with synchronization inputs for this purpose. These sensors can be used in synchronous or multiplex mode. Synchronization can be achieved using an external synchronization signal or even through self-synchronization for some sensor types. Synchronized and unsynchronized sensors must not be mounted opposite each other.

Avoiding interference

If several sensors are operated in very close proximity to each other, they can cause mutual interference, meaning that reliable detection is no longer possible. Synchronizing the transfer cycles for all sensors makes it possible to reduce the interference-free minimum distance between the sensors.

Multiplex mode

Operating the sensor in multiplex mode enables ultrasonic bursts to be staggered, which prevents one or more units from emitting signals at the same time.
### Ultrasonic Sensors

**3.1 Ultrasonic Sensors**

- **Materials**
  - Textiles, foams, felt, rubber, plastics, glass, ceramics, metals, wood, and paper are suitable.
  - Materials with temperatures exceeding 100 °C may cause difficulties.

- **Surface Properties**
  - Textures, colors, absorption, and surface treatments do not affect detection reliability.
  - Rough surfaces result in inaccurate switching due to the predominantly diffuse reflection of the ultrasonic signal.

#### Synchronized mode

In this operating mode, the synchronization inputs for all sensors are linked and are controlled collectively by an external clock-pulse source. In contrast to multiplex mode, this does not increase the cycle time. Synchronization mode is suitable for monitoring larger areas but is also useful in confined spaces because little distance is required between the sensors. The distances specified below must be taken into account when mounting sensors opposite one another.

<table>
<thead>
<tr>
<th>Detection Range (mm)</th>
<th>X’ (m)</th>
<th>Detection Range (mm)</th>
<th>X’ (m)</th>
</tr>
</thead>
<tbody>
<tr>
<td>to 500</td>
<td>&gt; 2.0</td>
<td>to 1000</td>
<td>&gt; 16.0</td>
</tr>
<tr>
<td>to 2000</td>
<td>&gt; 8.0</td>
<td>to 6000</td>
<td>&gt; 25.0</td>
</tr>
</tbody>
</table>

**Measuring plates/objects**

Ultrasonic sensors can detect solid, liquid, and granulated objects. The surface properties of the object are important for the evaluation of the echo by the sensor. All level and flat surfaces that are positioned at a right angle to the beam angle enable an ideal reflection. The measuring plate may have a maximum angle deviation of +/- 3° in order to guarantee reliable detection.

**Sensors with an adjustable beam angle width**

Some series offer an adjustable beam angle that enables the sensors to be used in confined spaces where objects can be spread out laterally in the beam angle. Such conditions would result in inaccurate switching characteristics or incorrect readings for sensors that do not include this function. Adjusting the shape of the beam angle does not affect the maximum detection range.

- **Materials**
  - Rod with 25 mm diameter (lower part) and level area measuring 100 mm x 100 mm (upper part).

The graphic above illustrates the characteristic response curve of sensor UB500-F42 for two different objects:

- Rod with 25 mm diameter (lower part) and level area measuring 100 mm x 100 mm (upper part).

It can be seen that the selection of a slim beam reduces the radial detection range. As a result, the sensor can be mounted in confined spaces.

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**Consider the General Notes on the Information in the Pepperl+Fuchs Product Catalogs**

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Special Sensor Properties for Special Applications

Chemically-resistant sensors

The range of UCC-type ultrasonic sensors from Pepperl+Fuchs includes a wide selection of sensors with increased resistance to chemically aggressive vapors and media. The housings of these sensors are made from stainless steel and the converter is coated with a PTFE film.

Sensors with an offset transducer

The solution for applications where it is difficult to use an ultrasonic sensor due to space restrictions. To save space, the transducer is located in a small threaded housing that is connected to the control interface of the sensor via a cable. The sensor at the measurement site requires very little installation space. The rest of the sensor is mounted at another location where there is sufficient space.

A further benefit is the good accessibility to the display and operator elements on the amplifier when the measurement site is located at an inaccessible location within your plant or machine.

Sensors with a rotatable transducer

Sensors with a rotatable transducer offer total flexibility in terms of aligning the measurement beam. Rotatable converters are included in the VariKont, VariKont L, 30GM, and F260 Series.

Sensors for the food industry

The food and drink industry environment places extremely high requirements on machinery and components. Pepperl+Fuchs has therefore developed sensors for this sector in line with current standards. Our sensor solutions fulfill the globally applicable standards and guidelines for the food and drink industry, such as EHEDG and FDA.

Benefits

- Quick and efficient cleaning
- Short cleaning times
- Microbiological safety
- Greater machine availability

Consider the General Notes on the Information in the Pepperl+Fuchs Product Catalogs

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Pepperl+Fuchs Group
www.pepperl-fuchs.com
USA: +1 330 486 0001
fa-info@us.pepperl-fuchs.com

Germany: +49 621 776-4411
fa-info@de.pepperl-fuchs.com

Singapore: +65 6779 9091
fa-info@sg.pepperl-fuchs.com

USA: +1 330 486 0001
fa-info@us.pepperl-fuchs.com

Germany: +49 621 776-4411
fa-info@de.pepperl-fuchs.com

Singapore: +65 6779 9091
fa-info@sg.pepperl-fuchs.com

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**Ultrasonic Sensors**

**Introduction**

**Type Code, Ultrasonic Sensors**

**UC 1000 - 18 GM 90A - E2 - IO - V1**

**Option 1**
- A: Right angled transducer
- S: Rotatable transducer

**Cylindrical**
- Usable threaded length (mm)
- M: Metal (brass, nickel plated)
- H: Stainless steel 1.4435/AISI 316L
- S: Stainless steel 1.4305/AISI 303

**Measurement range**
- 60 mm ... 10 m

**Option 2**
- K: Separate transducer
- IO: Sensor with IO-Link
- R/R2: RS 232 Interface
- FA: Hygienic design, EHEDG (product contact area)
- FB: Hygienic design (splash area)

**Connection Elements**
- A2: 4-wire, DC, PNP, antivalent
- E01: 4-wire, NO/NC NPN, independently adjustable
- E23: 4-wire, NO/NC NPN, independently adjustable
- E2: 3-wire, DC, PNP, NO
- E4: 3-wire, DC, NPN, NO/NC
- E5: 3-wire, DC, NPN, NO/NC
- E6: 4-wire, NO/NC PNP, independently adjustable
- E7: 4-wire, NO/NC NPN, independently adjustable
- E8: 4-wire, DC, PNP, dual, NO
- E9: 4-wire, DC, PNP, dual, NC
- I: Analog current output
- U: Analog voltage output
- UK: AC/DC with relay output
- 2K: 2 relay outputs
- 3K: 3 relay outputs
- F: Frequency output
- PWM: Pulse width modulating output
- BIT: Serial digital output

There are many possible combinations.

**Connection Elements**

- Sensor with cable connection or terminal compartment

**V1**
- M12 x 1 device connector for DC proximity switches, 4-pole

**V15**
- M12 x 1 device connector for DC proximity switches, 5-pole

**V17**
- M12 x 1 device connector for DC proximity switches, 8-pole

**V31**
- M8 device connector for DC proximity switches, 4-pole
  (suitable for snap closure)

**V95**
- 7/8" - 16 UN device connector for AC/DC proximity switches, 5-pole

**V7**
- Connector for AC/DC proximity switches, 7-pole
### General Data
- Operating voltage: 10 ... 30 V DC, ripple 10 %
- No-load supply current: ≤ 30 mA
- Rated operational current: 100 mA, short-circuit/overload protected
- Input type: 1 program input
- LED yellow: indication of the switching state
- LED red: solid red: Error; red, flashing: program function, object not detected
- Ambient temperature: -25 ... 70 °C (-13 ... 158 °F)
- Material: Housing: brass, nickel-plated
- Transducer: epoxy resin/hollow glass sphere mixture; foam polyurethane, cover PBT
- Connection type: Device connector M12 x 1, 4-pin

### Technical Data
#### Electrical Connection

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<thead>
<tr>
<th>Lead</th>
<th>Symbol</th>
<th>Function</th>
</tr>
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<tbody>
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<td>A</td>
<td>U</td>
<td>Switch input</td>
</tr>
<tr>
<td>B</td>
<td>-</td>
<td>Switch output</td>
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</table>

Core colours in accordance with EN 60947-5-2.

### Model Number

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<tr>
<th>Model Number</th>
<th>UB120-12GM-E4-V1</th>
<th>UB200-12GM-E4-V1</th>
<th>UB400-12GM-E4-V1</th>
<th>UB120-12GM-E5-V1</th>
<th>UB200-12GM-E5-V1</th>
<th>UB400-12GM-E5-V1</th>
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</thead>
<tbody>
<tr>
<td>Sensing range</td>
<td>green = preferred type</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>15 ... 120 mm</td>
<td>● ● ● ● ●</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>15 ... 200 mm</td>
<td>● ● ● ● ●</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>30 ... 400 mm</td>
<td>● ● ● ● ●</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Transducer frequency</td>
<td>approx. 850 kHz</td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>approx. 400 kHz</td>
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<td></td>
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<tr>
<td>approx. 310 kHz</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Output type</td>
<td>1 switch output NPN Normally open/ closed , programmable</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 switch output PNP Normally open/ closed , programmable</td>
<td>● ● ● ● ● ●</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Switching frequency</td>
<td>≤ 52 Hz</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>≤ 13 Hz</td>
<td>● ● ● ● ● ●</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>≤ 8 Hz</td>
<td>● ● ● ● ● ●</td>
<td></td>
<td></td>
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### Approvals and Certificates

<table>
<thead>
<tr>
<th>Approval</th>
<th>UL approval</th>
<th>cULus Listed, General Purpose</th>
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<tbody>
<tr>
<td>CSA approval</td>
<td>cCSAus Listed, General Purpose</td>
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</table>

### Dimensions

<table>
<thead>
<tr>
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<th>Value</th>
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</thead>
<tbody>
<tr>
<td>Length L [mm]</td>
<td>64</td>
</tr>
<tr>
<td>Diameter D [mm]</td>
<td>12</td>
</tr>
<tr>
<td>Thread length l1 [mm]</td>
<td>41</td>
</tr>
<tr>
<td>Connector area l2 [mm]</td>
<td>6</td>
</tr>
<tr>
<td>LED position</td>
<td>Pos. B</td>
</tr>
</tbody>
</table>

### Accessories

- UB-PROG2 Programming unit
- BF 5-30 Universal mounting bracket for cylindrical sensors with a diameter of 5 ... 30 mm
- BF 12 Mounting flange, 12 mm
- BF 12-F Mounting flange with dead stop, 12 mm
- V1-G-2M-PVC Cable socket, M12, 4-pin, PVC cable
- V1-W-2M-PUR Cable socket, M12, 4-pin, PUR cable
- UVW90-M12 Ultrasonic -deflector

### Contact Information

- Germany: +49 621 776-4411
- USA: +1 330 486 0001
- Singapore: +65 6779 9091

Ultrasonic sensor cylindrical, Ø 12 mm

Technical Data

For detailed data and product description refer to the data sheets at www.pepperl-fuchs.com

General Data
- No-load supply current ≤ 30 mA
- Resolution 0.17 mm
- Deviation of the characteristic curve ± 1 % of full-scale value
- Input type 1 program input
- LED yellow solid yellow: object in the evaluation range yellow, flashing: program function, object detected
- LED red solid red: Error red, flashing: program function, object not detected
- Ambient temperature -25 ... 70 °C (-13 ... 158 °F)
- Material Housing brass, nickel-plated
- Transducer epoxy resin/hollow glass sphere mixture; foam polyurethane, cover PBT
- Protection degree IP67
- Connection type Device connector M12 x 1, 4-pin

Model Number
- green = preferred type
- Sensing range 15 ... 120 mm
- 15 ... 200 mm
- 30 ... 400 mm
- Transducer frequency approx. 850 kHz
- approx. 400 kHz
- approx. 310 kHz
- Operating voltage 10 ... 30 V DC, ripple 10 %
- 15 ... 30 V DC, ripple 10 %
- Output type 1 analog output 0 ... 10 V
- 1 analog output 4 ... 20 mA

Approvals and Certificates
- UL approval cULus Listed, General Purpose
- CSA approval cCSAus Listed, General Purpose

Dimensions
- Length L [mm] 64
- Diameter D [mm] 12
- Thread length lt [mm] 41
- Connector area lc [mm] 6
- LED position Pos. B

Accessories
- This and more accessories can be found in chapter 3.5 from page 673
- UB-PROG2 Programming unit
- BF 5-30 Universal mounting bracket for cylindrical sensors with a diameter of 5 ... 30 mm
- BF 12 Mounting flange, 12 mm
- BF 12-F Mounting flange with dead stop, 12 mm
- V1-G-2M-PVC Cable socket, M12, 4-pin, PVC cable
- V1-W-2M-PUR Cable socket, M12, 4-pin, PUR cable
- UVW90-M12 Ultrasonic -deflector

Electrical Connection

Core colors in accordance with EN 60947-5-2.
**Ultrasonic Sensor**

**cylindrical, Ø 12 mm**

---

**Technical Data**

For detailed data and product description refer to the data sheets at [www.pepperl-fuchs.com](http://www.pepperl-fuchs.com)

<table>
<thead>
<tr>
<th>Model Number</th>
<th>UBC250-12GM-E5-V1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sensing range</td>
<td>30 ... 250 mm</td>
</tr>
<tr>
<td>Transducer frequency</td>
<td>approx. 310 kHz</td>
</tr>
<tr>
<td>Operating voltage</td>
<td>10 ... 30 V DC, ripple 10 %</td>
</tr>
<tr>
<td>No-load supply current</td>
<td>≤ 30 mA</td>
</tr>
<tr>
<td>Output type</td>
<td>1 switch output PNP Normally open/closed, programmable</td>
</tr>
<tr>
<td>Rated operational current</td>
<td>100 mA, short-circuit/overload protected</td>
</tr>
<tr>
<td>Switching frequency</td>
<td>≤ 8 Hz</td>
</tr>
<tr>
<td>Input type</td>
<td>1 program input</td>
</tr>
<tr>
<td>Ambient temperature</td>
<td>0 ... 70 °C (32 ... 158 °F)</td>
</tr>
</tbody>
</table>

**Material**

- **Housing**: Stainless steel 1.4435 / AISI 316L
- **O-ring for cover sealing**: EPDM
- **Transducer**: PTFE (diaphragm surface)
- **Protection degree**: IP68 / IP69K
- **Connection type**: Device connector M12 x 1, 4-pin

---

**Electrical Connection**

UBC250-12GM-E5-V1

**Properties**

- 250 mm sensing range
- DC, switching output
- Ø12 mm cylindrical housing
- Connector version

**Your Benefit**

- PTFE-coated transducer and 316L stainless steel barrel for maximum chemical resistance
- Teach-wire or UB-PROG2 pushbutton configurable

---

**Accessories**

This and more accessories can be found in chapter 3.5 from page 673 See pages from 972 for cordsets See pages 1068 for mounting aids

**UB-PROG2**

Programming unit

**BF 5-30**

Universal mounting bracket for cylindrical sensors with a diameter of 5 ... 30 mm

**BF 12**

Mounting flange, 12 mm

**BF 12-F**

Mounting flange with dead stop, 12 mm

**V1-G-2M-PVC**

Cable socket, M12, 4-pin, PVC cable

**V1-W-2M-PUR**

Cable socket, M12, 4-pin, PUR cable

---

**Approvals and Certificates**

- UL approval: cULus Listed, General Purpose
- CSA approval: cCSAus Listed, General Purpose

---

**Dimensions**

- Length L [mm]: 65
- Diameter D [mm]: 12
- Cap diameter D1 [mm]: 15
- Thread length l1 [mm]: 41
- Cap length l2 [mm]: 12
- Connector area lc [mm]: 7.5

---

**Core colours in accordance with EN 60947-5-2.**

<table>
<thead>
<tr>
<th>Wire color</th>
<th>Core color</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 (BN)</td>
<td>brown</td>
</tr>
<tr>
<td>2 (WH)</td>
<td>white</td>
</tr>
<tr>
<td>3 (BU)</td>
<td>blue</td>
</tr>
<tr>
<td>4 (BK)</td>
<td>black</td>
</tr>
</tbody>
</table>

---

Date of issue: 04/08/2015

Consider the General Notes on the Information in the Pepperl+Fuchs Product Catalogs

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Pepperl+Fuchs Group

USA: +1 330 486 0001

Germany: +49 621 776-4411

Singapore: +65 6779 9091

www.pepperl-fuchs.com

fa-info@us.pepperl-fuchs.com

fa-info@de.pepperl-fuchs.com

fa-info@sg.pepperl-fuchs.com

605

**Ultrasonic Sensors, Diffuse Mode Sensors, cylindrical**
**Technical Data**

For detailed data and product description refer to the data sheets at [www.pepperl-fuchs.com](http://www.pepperl-fuchs.com)

**Model Number**: UBH60/30-12GM-U-V1

**Measurement range**: object thickness (d): 0 ... 30 mm

**Transducer frequency**: approx. 850 kHz

**Operating voltage**: 15 ... 30 V DC, ripple 10 %SS

**No-load supply current**: ≤ 30 mA

**Output type**: 1 analog output 0 ... 10 V

**Resolution**: 0.17 mm

**Deviation of the characteristic curve**: ± 1 % of full-scale value

**Input type**: 1 function input

**LED yellow**: solid: object in evaluation range

**LED red**: solid red: Error
red, flashing: program function, object not detected

**Ambient temperature**: -25 ... 70 °C (-13 ... 158 °F)

**Material**
- **Housing**: brass, nickel-plated
- **Transducer**: epoxy resin/hollow glass sphere mixture; foam polyurethane, cover PBT

**Protection degree**: IP67

**Connection type**: Device connector M12 x 1, 4-pin

**Approvals and Certificates**
- **UL approval**: cULus Listed, General Purpose
- **CSA approval**: cCSAus Listed, General Purpose

**Dimensions**

- **Length L [mm]**: 64
- **Diameter D [mm]**: 12
- **Thread length l_t [mm]**: 41
- **Connector area l_c [mm]**: 6
- **LED position**: Pos. B

**Accessories**

This and more accessories can be found in chapter 3.5 from page 673

- **BF 5-30**: Universal mounting bracket for cylindrical sensors with a diameter of 5 ... 30 mm
- **BF 12**: Mounting flange, 12 mm
- **BF 12-F**: Mounting flange with dead stop, 12 mm
- **V1-G-2M-PVC**: Cable socket, M12, 4-pin, PVC cable
- **V1-W-2M-PUR**: Cable socket, M12, 4-pin, PUR cable

**Electrical Connection**

UBH60/30-12GM-U-V1

**Standard symbol/Connections:**

- **Up**: Pin 1 (brown)
- **Down**: Pin 4 (black)
- **Left**: Pin 2 (white)
- **Right**: Pin 3 (blue)

Core colors in accordance with EN 60947-5-2.
Ultrasonic Sensors, Diffuse Mode Sensors, cylindrical, Ø 18 mm

**Technical Data**

For detailed data and product description refer to the data sheets at [www.pepperl-fuchs.com](http://www.pepperl-fuchs.com)

### General Data
- Operating voltage: 10 ... 30 V DC, ripple 10 %
- No-load supply current: \( \leq 20 \) mA
- Rated operational current: 200 mA, short-circuit/overload protected
- Input type: 1 program input
- LED green: indication of the switching state
- LED red: permanently red: Error
- Ambient temperature: -25 ... 70 °C (-13 ... 158 °F)
- Material: Housing brass, nickel-plated
- Transducer: epoxy resin/hollow glass sphere mixture; foam polyurethane, cover PBT
- Protection degree: IP67
- Connection type: Device connector M12 x 1, 4-pin

### Sensing range
- UB300-18GM40-E4-V1 30 ... 300 mm
- UB800-18GM40-E4-V1 50 ... 800 mm
- UB800-18GM40-E5-V1 50 ... 800 mm

### Transducer frequency
- UB300-18GM40-E4-V1 approx. 390 kHz
- UB800-18GM40-E5-V1 approx. 255 kHz

### Output type
- UB300-18GM40-E4-V1 1 switch output E4, NPN, NO/NC, programmable
- UB800-18GM40-E5-V1 1 switch output E5, PNP NO/NC, programmable

### Switching frequency
- UB300-18GM40-E4-V1 \( \leq 13 \) Hz
- UB800-18GM40-E5-V1 \( \leq 4 \) Hz

### Model Number
- UB300-18GM40-E4-V1
- UB800-18GM40-E4-V1
- UB800-18GM40-E5-V1

### Approvals and Certificates
- UL approval: cULus Listed, General Purpose
- CSA approval: cCSAus Listed, General Purpose

### Dimensions
- Length \( L \) [mm]: 39.2
- Diameter \( D \) [mm]: 18
- Thread length \( l_t \) [mm]: 24.5
- Connector area \( l_c \) [mm]: 10
- LED position: Pos. C

### Accessories
- UB-PROG2 Programming unit
- OMH-04 Mounting aid for round steel ø 12 mm or sheet 1.5 mm ... 3 mm
- BF 18 Mounting flange, 18 mm
- BF 18-F Mounting flange with dead stop, 18 mm
- BF 5-30 Universal mounting bracket for cylindrical sensors with a diameter of 5 ... 30 mm
- V1-G-2M-PVC Cable socket, M12, 4-pin, PVC cable
- V1-W-2M-PUR Cable socket, M12, 4-pin, PUR cable

This and more accessories can be found in chapter 3.5 from page 673

See pages from 972 ... for cordsets
See pages 1068 ... for mounting aids

### Electrical Connection

- UB300-18GM40-E4-V1
- UB800-18GM40-E4-V1
- UB300-18GM40-E5-V1
- UB800-18GM40-E5-V1

Core colours in accordance with EN 60947-5-2:
- U4 (brown)
- U5 (white)
- U6 (blue)
- U3 (black)

Wire colors in accordance with EN 60947-5-2

1. BN (brown)
2. WH (white)
3. BU (blue)
4. BK (black)
Ultrasonic Sensors, Diffuse Mode Sensors, cylindrical

### General Data
- No-load supply current: ≤ 20 mA
- Resolution: 0.4 mm at max. sensing range
- Deviation of the characteristic curve: ± 1 % of full-scale value
- Input type: 1 program input
- LED green: Power on
- LED yellow: permanently yellow: object in the evaluation range; yellow, flashing: program function, object detected
- LED red: permanently red: Error; red, flashing: program function, object not detected
- Ambient temperature: -25 ... 70 °C (-13 ... 158 °F)
- Material:
  - Housing: brass, nickel-plated
  - Transducer: epoxy resin/hollow glass sphere mixture; foam polyurethane, cover PBT
- Protection degree: IP67
- Connection type: Device connector M12 x 1, 4-pin

### Model Number
- Sensing range:
  - green = preferred type
  - 30 ... 300 mm
- Transducer frequency:
  - approx. 390 kHz
- Operating voltage:
  - 10 ... 30 V DC, ripple 10 %SS
- Output type:
  - 1 analog output 0 ... 10 V
  - 1 analog output 4 ... 20 mA

### Approvals and Certificates
- UL approval: cULus Listed, General Purpose
- CSA approval: cCSAus Listed, General Purpose

### Dimensions
- Length L [mm]: 39.2
- Diameter D [mm]: 18
- Thread length lT [mm]: 24.5
- Connector area lc [mm]: 10
- LED position: Pos. C

### Accessories
- UB-PROG2 Programming unit
- OMH-04 Mounting aid for round steel ø 12 mm or sheet 1.5 mm ... 3 mm
- BF 18 Mounting flange, 18 mm
- BF 18-F Mounting flange with dead stop, 18 mm
- BF 5-30 Universal mounting bracket for cylindrical sensors with a diameter of 5 ... 30 mm
- V1-G-2M-PVC Cable socket, M12, 4-pin, PVC cable
- V1-W-2M-PUR Cable socket, M12, 4-pin, PUR cable

### Electrical Connection

#### Standard symbol/Connections:
<table>
<thead>
<tr>
<th>Wire colors in accordance with EN 60947-5-2:</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 BN (brown)</td>
</tr>
<tr>
<td>2 WH (white)</td>
</tr>
<tr>
<td>3 BU (blue)</td>
</tr>
<tr>
<td>4 BK (black)</td>
</tr>
</tbody>
</table>
Ultrasonic Sensors, Diffuse Mode Sensors, cylindrical

### Technical Data

*For detailed data and product description refer to the data sheets at [www.pepperl-fuchs.com](http://www.pepperl-fuchs.com)*

<table>
<thead>
<tr>
<th>Model Number</th>
<th>UBC400-18GH40-I-V1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sensing range</td>
<td>40 ... 400 mm</td>
</tr>
<tr>
<td>Transducer frequency</td>
<td>approx. 255 kHz</td>
</tr>
<tr>
<td>Operating voltage</td>
<td>10 ... 30 V DC, ripple 10 %SS</td>
</tr>
<tr>
<td>No-load supply current</td>
<td>≤ 20 mA</td>
</tr>
<tr>
<td>Output type</td>
<td>1 analog output 4 ... 20 mA, short-circuit/overload protected</td>
</tr>
<tr>
<td>Resolution</td>
<td>0.4 mm at max. sensing range</td>
</tr>
<tr>
<td>Deviation of the characteristic curve</td>
<td>± 1 % of full-scale value</td>
</tr>
<tr>
<td>Input type</td>
<td>1 program input, lower evaluation limit A1: -UB, upper evaluation limit A2: +4 V, input impedance: &gt; 4.7 kΩ, pulse duration: ≥ 1 s</td>
</tr>
<tr>
<td>Ambient temperature</td>
<td>0 ... 70 °C (32 ... 158 °F)</td>
</tr>
<tr>
<td>Material</td>
<td>Stainless steel 1.4435 / AISI 316L</td>
</tr>
<tr>
<td>Transducer</td>
<td>PTFE</td>
</tr>
<tr>
<td>Protection degree</td>
<td>IP67</td>
</tr>
<tr>
<td>Connection type</td>
<td>Device connector M12 x 1, 4-pin</td>
</tr>
</tbody>
</table>

### Properties

- 400 mm sensing range
- DC, analog output
- Ø18 mm cylindrical housing
- Connector version

### Your Benefit

- Short barrel length for space-restricted mounting
- PTFE-coated transducer and 316L stainless steel barrel for maximum chemical resistance
- Flexible configuration via Teachwire or UB-PROG2 pushbutton

### Dimensions

- Length L [mm]: 43
- Diameter D [mm]: 18
- Head diameter D₁ [mm]: 22
- Head length l₁ [mm]: 13
- Thread length l₂ [mm]: 15
- Connector area l₃ [mm]: 10

### Approvals and Certificates

- UL approval: cULus Listed, General Purpose
- CSA approval: cCSAus Listed, General Purpose

### Accessories

This and more accessories can be found in chapter 3.5 from page 673:

- UB-PROG2: Programming unit
- OMH-04: Mounting aid for round steel ø 12 mm or sheet 1.5 mm ... 3 mm
- BF 18: Mounting flange, 18 mm
- BF 18-F: Mounting flange with dead stop, 18 mm
- BF 5-30: Universal mounting bracket for cylindrical sensors with a diameter of 5 ... 30 mm
- V1-G-2M-PVC: Cable socket, M12, 4-pin, PVC cable
- V1-W-2M-PUR: Cable socket, M12, 4-pin, PUR cable

### Electrical Connection

**UBC400-18GH40-I-V1**

Standard symbol/Connections:

- U₁, U₂: Teach input
- U₃: Analog output

Core colors in accordance with EN 60947-5-2.

Wire colors in accordance with EN 60947-5-2:

1. BN (brown)
2. WH (white)
3. BU (blue)
4. BK (black)

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Pepperl+Fuchs Group

USA: +1 330 486 0001

Germany: +49 621 776-4411

Singapore: +65 6779 9091

www.pepperl-fuchs.com

fa-info@us.pepperl-fuchs.com

fa-info@de.pepperl-fuchs.com

fa-info@sg.pepperl-fuchs.com
Ultrasonic Sensors, Diffuse Mode Sensors, cylindrical

Technical Data
For detailed data and product description refer to the data sheets at www.pepperl-fuchs.com

General Data
- Operating voltage: 10 ... 30 V DC, ripple 10 %
- No-load supply current: ≤ 20 mA
- Rated operational current: 200 mA, short-circuit/overload protected
- Input type: 1 program input
- LED green: Power on
- LED yellow: indication of the switching state, flashing: program function object detected
- LED red: permanently red: Error, red, flashing: program function, object not detected
- Ambient temperature: -25 ... 70 °C (-13 ... 158 °F)
- Material: Housing brass, nickel-plated
- Transducer: epoxy resin/hollow glass sphere mixture; foam polyurethane, cover PBT
- Protection degree: IP67
- Connection type: Device connector M12 x 1, 4-pin

Model Number
- green = preferred type

Sensing range
- UB300-18GM40A-E4-V1: 30 ... 300 mm
- UB800-18GM40A-E4-V1: 50 ... 800 mm
- UB300-18GM40A-E5-V1: approx. 390 kHz
- UB800-18GM40A-E5-V1: approx. 255 kHz
- Output type: 1 switch output E4, NPN, NO/NC, programmable
- UB300-18GM40A-E4-V1: 1 switch output E5, PNP NO/NC, programmable
- Swtiching frequency: ≤ 13 Hz
- Approvals and Certificates: UL approval, cULus Listed, General Purpose
- CSA approval: cCSAus Listed, General Purpose

Dimensions
- Length L [mm]: 57.7
- Diameter D [mm]: 18
- Transducer length l1 [mm]: 18.5
- Thread length lt [mm]: 24.5
- Connector area lc [mm]: 10
- LED position: Pos. C

Accessories
- This and more accessories can be found in chapter 3.5 from page 673
- See pages from 972 ... for cordsets
- See pages 1068 ... for mounting aids

Electrical Connection
- UB-PROG2: Programming unit
- OMH-04: Mounting aid for round steel ø 12 mm or sheet 1.5 mm ... 3 mm
- BF 18: Mounting flange, 18 mm
- BF 18-F: Mounting flange with dead stop, 18 mm
- BF 5-30: Universal mounting bracket for cylindrical sensors with a diameter of 5 ... 30 mm
- V1-G-2M-PVC: Cable socket, M12, 4-pin, PVC cable
- V1-W-2M-PUR: Cable socket, M12, 4-pin, PUR cable

Your Benefit
- Right-angle transducer for space-restricted mounting
- Ultra bright LEDs
- Flexible configuration via Teachwire or UB-PROG2 pushbutton

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**Technical Data**

For detailed data and product description refer to the data sheets at [www.pepperl-fuchs.com](http://www.pepperl-fuchs.com)

### General Data

- **No-load supply current**: \( \leq 20 \text{ mA} \)
- **Resolution**: \( 0.4 \text{ mm at max. sensing range} \)
- **Deviation of the characteristic curve**: \( \pm 1 \% \text{ of full-scale value} \)
- **Input type**: 1 program input
- **LED green**: Power on
- **LED yellow**: permanently yellow: object in the evaluation range yellow, flashing: program function, object detected
- **LED red**: permanently red: Error red, flashing: program function, object not detected

### Ambient temperature

-25 ... 70 °C (-13 ... 158 °F)

### Material

- Housing: brass, nickel-plated
- Transducer: epoxy resin/hollow glass sphere mixture; foam polyurethane, cover PBT

### Connection type

Device connector M12 x 1, 4-pin

### Model Number

- Green = preferred type
- UB300-18GM40A-U-V1
- UB300-18GM40A-I-V1
- UB800-18GM40A-U-V1
- UB800-18GM40A-I-V1

### Sensing range

- 30 ... 300 mm
- 50 ... 800 mm
- 100 ... 1000 mm
- 500 ... 8000 mm

### Transducer frequency

- approx. 390 kHz
- approx. 255 kHz

### Operating voltage

- 10 ... 30 V DC, ripple 10 %
- 15 ... 30 V DC, ripple 10 %

### Output type

- 1 analog output 0 ... 10 V
- 1 analog output 4 ... 20 mA

### Approvals and Certificates

- UL approval: cULus Listed, General Purpose
- CSA approval: cCSAus Listed, General Purpose

### Dimensions

- Length L [mm]: 57.7
- Diameter D [mm]: 18
- Transducer length l1 [mm]: 18.5
- Thread length l2 [mm]: 24.5
- Connector area lc [mm]: 10
- LED position: Pos. C

### Accessories

- This and more accessories can be found in chapter 3.5 from page 673
- See pages from 972 ... for cordsets
- See pages 1068 ... for mounting aids

### Electrical Connection

- UB-PROG2 Programming unit
- OMH-04 Mounting aid for round steel ø 12 mm or sheet 1.5 mm ... 3 mm
- BF 18 Mounting flange, 18 mm
- BF 18-F Mounting flange with dead stop, 18 mm
- BF 5-30 Universal mounting bracket for cylindrical sensors with a diameter of 5 ... 30 mm
- V1+G-2M-PVC Cable socket, M12, 4-pin, PVC cable
- V1-W-2M-PUR Cable socket, M12, 4-pin, PUR cable

### Color Codes

- Core colors in accordance with EN 60947-5-2
- Wire colors in accordance with EN 60947-5-2

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**Technical Details**

- Ultrasonic sensor cylindrical, Ø 18 mm
- 300 mm and 800 mm sensing range versions
- DC, analog output
- Ø18 mm cylindrical housing, angled head
- Connector version

**Your Benefit**

- Right-angle transducer for space-restricted mounting
- Ultra-bright LEDs
- Flexible configuration via Teachwire or UB-PROG2 pushbutton

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**Date of issue** 04/08/2015

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Pepperl+Fuchs Group
USA: +1 330 486 0001
Germany: +49 621 776-4411
Singapore: +65 6779 9091

www.pepperl-fuchs.com
fa-info@us.pepperl-fuchs.com
fa-info@de.pepperl-fuchs.com
fa-info@sg.pepperl-fuchs.com

---

**Ultrasonic Sensors, Diffuse Mode Sensors, cylindrical**
Ultrasonic Sensors, Diffuse Mode Sensors, cylindrical

Technical Data

For detailed data and product description refer to the data sheets at www.pepperl-fuchs.com

General Data
Operating voltage 10 ... 30 V DC, ripple 10 %
No-load supply current ≤ 50 mA
Rated operational current 200 mA, short-circuit/overload protected
Input type 1 program input,
Synchronization 1 synchronous connection, bi-directional
LED yellow indication of the switching state
LED red permanently red: Error
Ambient temperature -25 ... 70 °C (-13 ... 158 °F)
Material Housing brass, nickel-plated
Transducer epoxy resin/hollow glass sphere mixture; foam polyurethane, cover PBT
Protection degree IP65
Connection type Device connector M12 x 1, 5-pin

Model Number
UB500-18GM75-E4-V15
UB500-18GM75-E5-V15
UB1000-18GM75-E4-V15
UB1000-18GM75-E5-V15

Properties
- 500 mm and 1000 mm sensing range versions
- DC, switching output
- Ø 18 mm cylindrical housing
- Connector version

Your Benefit
- Ultra bright rear-view LEDs
- Flexible configuration via Teachwire or UB-PROG2 pushbutton

Your Benefit
- Ultra bright rear-view LEDs
- Flexible configuration via Teachwire or UB-PROG2 pushbutton

Sensing range 30 ... 500 mm
Transducer frequency approx. 380 kHz
Output type 1 switch output NPN Normally open/closed, programmable
Switching frequency max. 8 Hz

Approvals and Certificates
UL approval cULus Listed, General Purpose
CSA approval cCSAus Listed, General Purpose

Dimensions
Length L [mm] 75
Diameter D [mm] 18
Thread length l [mm] 48
Connector area l [mm] 10

Accessories
UB-PROG2 Programming unit
OMH-04 Mounting aid for round steel ø 12 mm or sheet 1.5 mm ... 3 mm
BF 18 Mounting flange, 18 mm
BF 18-F Mounting flange with dead stop, 18 mm
BF 5-30 Universal mounting bracket for cylindrical sensors with a diameter of 5 ... 30 mm
UVW90-K18 Ultrasonic -deflector
V15-G-2M-PVC Cable socket, M12, 5-pin, PVC cable
V15-W-2M-PUR Cable socket, M12, 5-pin, PUR cable

Electrical Connection

UB500-18GM75-E4-V15
UB500-18GM75-E5-V15
UB1000-18GM75-E4-V15
UB1000-18GM75-E5-V15

Wire colors in accordance with EN 60947-5-2
1 BN (brown)
2 WH (white)
3 BU (blue)
4 BK (black)
5 GV (gray)

3.1 Electrical Connection

UB500-18GM75-E4-V15
UB500-18GM75-E5-V15
UB1000-18GM75-E4-V15
UB1000-18GM75-E5-V15

Wire colors in accordance with EN 60947-5-2
1 BN (brown)
2 WH (white)
3 BU (blue)
4 BK (black)
5 GV (gray)
## Technical Data

For detailed data and product description refer to the data sheets at [www.pepperl-fuchs.com](http://www.pepperl-fuchs.com)

### General Data

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating voltage</td>
<td>10 ... 30 V DC, ripple 10 %SS</td>
</tr>
<tr>
<td>No-load supply current</td>
<td>$\leq 50$ mA</td>
</tr>
<tr>
<td>Rated operational current</td>
<td>$2 \times 100$ mA, short-circuit/overload protected</td>
</tr>
<tr>
<td>Input type</td>
<td>1 program input</td>
</tr>
<tr>
<td>LED yellow</td>
<td>Indication of the switching state</td>
</tr>
<tr>
<td>LED red</td>
<td>&quot;Error&quot;, object uncertain</td>
</tr>
<tr>
<td>Ambient temperature</td>
<td>$-25 \ldots 70$ °C ($-13 \ldots 158$ °F)</td>
</tr>
<tr>
<td>Material</td>
<td>Housing: brass, nickel-plated</td>
</tr>
<tr>
<td></td>
<td>Transducer: epoxy resin/hollow glass sphere mixture; foam polyurethane, cover PBT</td>
</tr>
<tr>
<td>Protection degree</td>
<td>IP65</td>
</tr>
<tr>
<td>Connection type</td>
<td>Device connector M12 x 1, 5-pin</td>
</tr>
</tbody>
</table>

### Model Number

- **UB500-18GM75-E6-V15**
- **UB500-18GM75-E7-V15**
- **UB1000-18GM75-E6-V15**
- **UB1000-18GM75-E7-V15**

### Sensing range

- Sensing range: 30 ... 500 mm
- Sensing range: 70 ... 1000 mm

### Transducer frequency

- Transducer frequency: approx. 380 kHz
- Transducer frequency: approx. 255 kHz

### Output type

- Output type: 2 switch outputs NPN, normally open/closed, programmable
- Output type: 2 switch outputs PNP, NO/NC, programmable

### Switching frequency

- Switching frequency: max. 8 Hz
- Switching frequency: max. 3 Hz

### Approvals and Certificates

- UL approval: cULus Listed, General Purpose
- CSA approval: cCSAus Listed, General Purpose

### Dimensions

- Length $L$ [mm]: 75
- Diameter $D$ [mm]: 18
- Thread length $l_t$ [mm]: 48
- Connector area $l_c$ [mm]: 10
- LED position: Pos. C

### Accessories

This and more accessories can be found in chapter 3.5 from page 673. See pages from 972 ... for cordsets See pages 1068 ... for mounting aids

- **UB-PROG3**: Programming unit
- **OMH-04**: Mounting aid for round steel ø 12 mm or sheet 1.5 mm ... 3 mm
- **BF 18**: Mounting flange, 18 mm
- **BF 18-F**: Mounting flange with dead stop, 18 mm
- **BF 5-30**: Universal mounting bracket for cylindrical sensors with a diameter of 5 ... 30 mm
- **UVW90-K18**: Ultrasonic -deflector
- **V15-G-2M-PVC**: Cable socket, M12, 5-pin, PVC cable
- **V15-W-2M-PUR**: Cable socket, M12, 5-pin, PUR cable

### Electrical Connection

- **UB500-18GM75-E6-V15**
- **UB1000-18GM75-E6-V15**
- **UB500-18GM75-E7-V15**
- **UB1000-18GM75-E7-V15**

**Core colors in accordance with EN 60947-5-2.**

1. **BN** (brown)
2. **WH** (white)
3. **BU** (blue)
4. **BK** (black)
5. **GY** (gray)

Wire colors in accordance with EN 60947-5-2.
Ultrasonic Sensor

Technical Data

For detailed data and product description refer to the data sheets at www.pepperl-fuchs.com

General Data
- Operating voltage: 10 ... 30 V DC, ripple 10 %SS
- No-load supply current: ≤ 50 mA
- Rated operational current: 2 x 100 mA, short-circuit/overload protected
- Input type: 1 program input,
- LED yellow: indication of the switching state
- LED red: in program function: No object detected
- Ambient temperature: -25 ... 70 °C (-13 ... 158 °F)
- Material: Housing - brass, nickel-plated
- Transducer - epoxy resin/hollow glass sphere mixture; foam polyurethane, cover PBT
- Protection degree: IP65
- Connection type: Device connector M12 x 1, 5-pin

Model Number

<table>
<thead>
<tr>
<th>UB500-18GM75-E01-V15</th>
<th>UB500-18GM75-E23-V15</th>
<th>UB1000-18GM75-E01-V15</th>
<th>UB1000-18GM75-E23-V15</th>
</tr>
</thead>
</table>

Sensing range
- 30 ... 500 mm
- 70 ... 1000 mm

Transducer frequency
- approx. 380 kHz
- approx. 255 kHz

Output type
- 2 switch outputs NPN, normally open/closed, programmable
- 2 switch outputs PNP, NO/NC, programmable

Switching frequency
- max. 8 Hz
- max. 3 Hz

Approvals and Certificates
- UL approval: cULus Listed, General Purpose
- CSA approval: cCSAus Listed, General Purpose

Dimensions
- Length L [mm]: 75
- Diameter D [mm]: 18
- Thread length l [mm]: 48
- Connector area lc [mm]: 10
- LED position: Pos. C

Accessories
- This and more accessories can be found in chapter 3.5 from page 673
- See pages from 972 ... for cordsets
- See pages 1068 ... for mounting aids

Electrical Connection

UB500-18GM75-E01-V15
UB1000-18GM75-E01-V15

UB500-18GM75-E23-V15
UB1000-18GM75-E23-V15

Wire colors in accordance with EN 60947-5-2

1  BN (brown)
2  WH (white)
3  BU (blue)
4  BK (black)
5  GY (gray)

Consider the General Notes on the Information in the Pepperl+Fuchs Product Catalogs

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Pepperl+Fuchs Group
USA: +1 330 486 5001
Germany: +49 621 776-4411
Singapore: +65 6779 9091

www.pepperl-fuchs.com
fa-info@us.pepperl-fuchs.com
fa-info@de.pepperl-fuchs.com
fa-info@sg.pepperl-fuchs.com

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## Technical Data
For detailed data and product description refer to the data sheets at [www.pepperl-fuchs.com](http://www.pepperl-fuchs.com)

### General Data
- **Deviation of the characteristic curve**: ± 1 % of full-scale value
- **Input type**: 1 program input
- **Synchronization**: 1 synchronous connection, bi-directional
- **LED yellow**: permanently yellow: object in the evaluation range yellow, flashing: program function, object detected
- **LED red**: permanently red: Error red, flashing: program function, object not detected
- **Ambient temperature**: -25 ... 70 °C (-13 ... 158 °F)

### Model Number
- **Sensing range**: 30 ... 500 mm
- **Transducer frequency**: approx. 380 kHz
- **Operating voltage**: 10 ... 30 V DC, ripple 10 %
- **No-load supply current**: ≤ 45 mA
- **Output type**: 1 analog output 0 ... 10 V
- **Resolution**: 0.11 mm at max. sensing range

### Approvals and Certificates
- **UL approval**: cULus Listed, General Purpose
- **CSA approval**: cCSAus Listed, General Purpose

### Dimensions
- **Length L**: 75 mm
- **Diameter D**: 18 mm
- **Thread length l**: 48 mm
- **Connector area l**: 10 mm
- **LED position**: Pos. C

### Accessories
This and more accessories can be found in chapter 3.5 from page 673 See pages from 972 ... for cordsets See pages 1068 ... for mounting aids

### Electrical Connection

### Properties
- **500 mm and 1000 mm sensing range versions**
- **DC, analog output**
- **Ø18 mm cylindrical housing**
- **Connector version**

### Your Benefit
- **Ultra bright rear-view LEDs**
- **Flexible configuration via Teachwire or UB-PROG2 pushbutton**
### Technical Data

**For detailed data and product description refer to the data sheets at www.pepperl-fuchs.com**

<table>
<thead>
<tr>
<th>General Data</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating voltage</td>
<td>10 ... 30 V DC, ripple 10 %SS</td>
</tr>
<tr>
<td>No-load supply current</td>
<td>≤ 50 mA</td>
</tr>
<tr>
<td>Resolution</td>
<td>1 mm</td>
</tr>
<tr>
<td>Deviation of the characteristic curve</td>
<td>± 1 % of full-scale value</td>
</tr>
<tr>
<td>Input type</td>
<td>1 Parameterization input</td>
</tr>
<tr>
<td>Synchronization</td>
<td>1 synchronous connection, bi-directional</td>
</tr>
<tr>
<td>LED green</td>
<td>Power on</td>
</tr>
<tr>
<td>LED red</td>
<td>flashing: error (br&gt;permanent: no object detected</td>
</tr>
<tr>
<td>Ambient temperature</td>
<td>-25 ... 70 ºC (-13 ... 158 ºF)</td>
</tr>
</tbody>
</table>

**Material |

| Housing | brass, nickel-plated |
| Transducer | epoxy resin/hollow glass sphere mixture; foam polyurethane, cover PBT |

**Protection degree | IP65 |

**Connection type | Device connector M12 x 1, 5-pin |

| Sensing range | 30 ... 500 mm |
| Transducer frequency | approx. 380 kHz |
| approx. 255 kHz |

**Output type |

| 1 frequency output, push/pull, programmable |
| 1 PWM output, push/pull, programmable |
| 1 serial output, push/pull, programmable |

### Model Number

<table>
<thead>
<tr>
<th>UB500-18GM75-F-V15</th>
<th>UB500-18GM75-PWM-V15</th>
</tr>
</thead>
<tbody>
<tr>
<td>UB500-18GM75-BIT-V15</td>
<td></td>
</tr>
<tr>
<td>UB1000-18GM75-F-V15</td>
<td></td>
</tr>
<tr>
<td>UB1000-18GM75-PWM-V15</td>
<td></td>
</tr>
<tr>
<td>UB1000-18GM75-BIT-V15</td>
<td></td>
</tr>
</tbody>
</table>

### Sensing range

| 30 ... 500 mm |
| 80 ... 1000 mm |

### Transducer frequency

| approx. 380 kHz |
| approx. 255 kHz |

### Output type

| 1 frequency output, push/pull, programmable |
| 1 PWM output, push/pull, programmable |
| 1 serial output, push/pull, programmable |

### Approvals and Certificates

| UL approval | cULus Listed, General Purpose |
| CSA approval | cCSAus Listed, General Purpose |

### Dimensions

| Length L [mm] | 75 |
| Diameter D [mm] | 18 |
| Thread length l_t [mm] | 52 |
| Connector area l_c [mm] | 10 |
| LED position | Pos. B |

### Accessories

| This and more accessories can be found in chapter 3.5 from page 673 |
| See pages from 972 ... for cordsets |
| See pages 1068 ... for mounting aids |

- OMH-04: Mounting aid for round steel ø 12 mm or sheet 1.5 mm ... 3 mm
- BF 18: Mounting flange, 18 mm
- BF 18-F: Mounting flange with dead stop, 18 mm
- BF 5-30: Universal mounting bracket for cylindrical sensors with a diameter of 5 ... 30 mm
- UVW90-K18: Ultrasonic deflector
- V15-G-2M-PVC: Cable socket, M12, 5-pin, PVC cable
- V15-W-2M-PUR: Cable socket, M12, 5-pin, PUR cable

---

### Electrical Connection

<table>
<thead>
<tr>
<th>UB1000-18GM75-F-V15</th>
</tr>
</thead>
<tbody>
<tr>
<td>UB500-18GM75-F-V15</td>
</tr>
<tr>
<td>UB500-18GM75-PWM-V15</td>
</tr>
<tr>
<td>UB1000-18GM75-PWM-V15</td>
</tr>
<tr>
<td>UB1000-18GM75-BIT-V15</td>
</tr>
<tr>
<td>UB500-18GM75-BIT-V15</td>
</tr>
</tbody>
</table>

**Standard symbol/Connections**

1. Programming input
2. Synchronous
3. Output

Wire colors in accordance with EN 60947-5-2

1. BN (brown)
2. WH (white)
3. BU (blue)
4. BK (black)
5. GY (gray)
Ultrasonic sensor cylindrical, Ø 18 mm

Technical Data

For detailed data and product description refer to the data sheets at www.pepperl-fuchs.com

General Data
- Sensing range: 100 ... 1000 mm
- Transducer frequency: approx. 200 kHz
- Linearity error: ≤ ± 2 mm
- Operating voltage: 12 ... 30 V DC (including ripple)
- No-load supply current: ≤ 50 mA
- Interface type: IO-Link
- Operating current: ≤ 200 mA, short-circuit/overload protected
- LED yellow: on: object within measuring range
- Ambient temperature: -25 ... 70 °C (-13 ... 158 °F)

Material
- Housing: brass, nickel-plated
- Transducer: epoxy resin/hollow glass sphere mixture; foam polyurethane, cover PBT
- Protection degree: IP67
- Connection type: Device connector M12 x 1, 4-pin

Model Number
- UC1000-18GM90-E2-IO-V1
- UC1000-18GM90A-E2-IO-V1

Direction of radiation
- Frontal
- Lateral

Dimensions
- Length L [mm]: 91
- Diameter D [mm]: 18
- Transducer length l₁ [mm]: 28
- Thread length lₜ [mm]: 65
- Connector area lₜ [mm]: 10
- LED position: Pos. C

Accessories
This and more accessories can be found in chapter 3.5 from page 673
See pages from 972 ... for cordsets
See pages 1068 ... for mounting aids
- OMH-04: Mounting aid for round steel ø 12 mm or sheet 1.5 mm ... 3 mm
- BF 18: Mounting flange, 18 mm
- BF 18-F: Mounting flange with dead stop, 18 mm
- BF 5-30: Universal mounting bracket for cylindrical sensors with a diameter of 5 ... 30 mm
- UVW90-K18: Ultrasonic deflector
- V1-G-2M-PVC: Cable socket, M12, 4-pin, PVC cable
- V1-G-2M-PUR: Cable socket, M12, 4-pin, PUR cable
- V1-W-2M-PVC: Cable socket, M12, 4-pin, PVC cable
- V1-W-2M-PUR: Cable socket, M12, 4-pin, PUR cable

Electrical Connection

Wire colors in accordance with EN 60947-5-2
1: BN (brown)
2: WH (white)
3: BU (blue)
4: BK (black)

Properties
- 1000 mm sensing range
- DC, IO-Link / switching output
- Ø18 mm cylindrical housing, angled and straight versions
- Connector version

Your Benefit
- Continuous IO-Link accessibility to output status and configuration parameters

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Date of issue: 04/08/2015

Consider the General Notes on the Information in the Pepperl+Fuchs Product Catalogs

Pepperl+Fuchs Group
USA: +1 330 486 0001
www.pepperl-fuchs.com
fa-info@us.pepperl-fuchs.com

Germany: +49 621 776-4411
fa-info@de.pepperl-fuchs.com

Singapore: +65 6779 9091
fa-info@sg.pepperl-fuchs.com

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Ultrasonic Sensors, Diffuse Mode Sensors, Cylindrical
Ultrasonic Sensors, Diffuse Mode Sensors, cylindrical, Ø 30 mm

Technical Data

For detailed data and product description refer to the data sheets at www.pepperl-fuchs.com

General Data
- Operating voltage: 10 ... 30 V DC, ripple 10 %SS
- No-load supply current: ≤ 50 mA
- Rated operational current: 200 mA, short-circuit/overload protected
- Input type: 1 program input,
- Synchronization: bi-directional
- Ambient temperature: -25 ... 70 °C (-13 ... 158 °F)
- Housing: nickel plated brass; plastic components: PBT
- Transducer: epoxy resin/hollow glass sphere mixture; polyurethane foam
- Protection degree: IP65
- Connection type: Device connector M12 x 1, 5-pin

Model Number
- green = preferred type

<table>
<thead>
<tr>
<th>Sensing range</th>
<th>UB500-30GM-E4-V15</th>
<th>UB500-30GM-E5-V15</th>
</tr>
</thead>
<tbody>
<tr>
<td>30 ... 500 mm</td>
<td></td>
<td></td>
</tr>
<tr>
<td>80 ... 2000 mm</td>
<td></td>
<td></td>
</tr>
<tr>
<td>200 ... 4000 mm</td>
<td></td>
<td></td>
</tr>
<tr>
<td>350 ... 6000 mm</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- Transducer frequency:
  - approx. 380 kHz
  - approx. 180 kHz
  - approx. 85 kHz
  - approx. 65 kHz

- Output type:
  - 1 switch output NPN, Normally open/closed, programmable
  - 1 switch output PNP, Normally open/closed, programmable

Approvals and Certificates
- UL approval: cULus Listed, General Purpose
- CSA approval: cCSAus Listed, General Purpose

Dimensions
- Length L [mm]: 94, 108, 112
- Diameter D [mm]: 30
- Transducer diameter D1 [mm]: 30, 40, 73
- Transducer length l1 [mm]: 0, 25, 32, 5
- Thread length l2 [mm]: 72, 61, 57, 5
- Connector area lc [mm]: 10

LED position: Pos. A

Accessories
- This and more accessories can be found in chapter 3.5 from page 673
- See pages from 972 ... for cordsets
- See pages 1068 ... for mounting aids

- Mounting flange, 30 mm
  - BF 30
  - Mounting flange with dead stop, 30 mm
  - BF 30-F
  - Universal mounting bracket for cylindrical sensors with a diameter of 5 ... 30 mm
  - UB-PROG2
  - Programming unit
  - V15-G-2M-PVC
  - Cable socket, M12, 5-pin, PVC cable
  - UVW90-M30
  - Ultrasonic -deflector
  - V15-W-2M-PUR
  - Cable socket, M12, 5-pin, PUR cable
  - UVW90-K30
  - Ultrasonic -deflector

- Wire colors in accordance with EN 60947-5-2

<table>
<thead>
<tr>
<th>UB500-30GM-E4-V15</th>
<th>UB4000-30GM-E4-V15</th>
</tr>
</thead>
<tbody>
<tr>
<td>UB2000-30GM-E5-V15</td>
<td>UB4000-30GM-E5-V15</td>
</tr>
<tr>
<td>UB6000-30GM-E4-V15</td>
<td>UB6000-30GM-E5-V15</td>
</tr>
</tbody>
</table>

Electrical Connection

Wire colors in accordance with EN 60947-5-2.

1  BN (brown)
2  WH (white)
3  BU (blue)
4  BK (black)
5  GY (gray)
Ultrasonic Sensors, Diffuse Mode Sensors, cylindrical, Ø 30 mm

Technical Data

For detailed data and product description refer to the data sheets at www.pepperl-fuchs.com

General Data
- Operating voltage: 10 ... 30 V DC, ripple 10 %
- No-load supply current: ≤ 50 mA
- Interface type: RS 232, 9600 Bit/s, no parity, 8 data bits, 1 stop bit
- Rated operational current: 200 mA, short-circuit/overload protected
- Synchronization: bi-directional
- Ambient temperature: -25 ... 70 °C (-13 ... 158 °F)
- Material:
  - Housing: stainless steel (1.4305 / AISI 303), PBT plastic parts
  - Transducer: epoxy resin/hollow glass sphere mixture; polyurethane foam
- Protection degree: IP65
- Connection type: Device connector M12 x 1, 5-pin

Model Number
- UC500-30GM-E6R2-V15
- UC500-30GM-E7R2-V15
- UC2000-30GM-E6R2-V15
- UC2000-30GM-E7R2-V15
- UC4000-30GM-E6R2-V15
- UC4000-30GM-E7R2-V15
- UC6000-30GM-E6R2-V15
- UC6000-30GM-E7R2-V15
- UCC1000-30GM-E6R2-V15

Sensing range:
- 30 ... 500 mm
- 80 ... 2000 mm
- 350 ... 6000 mm
- 200 ... 4000 mm
- 80 ... 2000 mm
- 350 ... 6000 mm
- 200 ... 4000 mm
- 350 ... 6000 mm

Transducer frequency:
- approx. 380 kHz
- approx. 180 kHz
- approx. 85 kHz
- approx. 65 kHz

Output type:
- 2 switch outputs NPN, NO/NC, programmable
- 2 switch outputs PNP, NO/NC, programmable

Switching frequency:
- ≤ 0.5 Hz
- ≤ 1 Hz
- ≤ 2.5 Hz
- ≤ 7 Hz

Approvals and Certificates
- UL approval: cULus Listed, General Purpose
- CSA approval: cCSAus Listed, General Purpose

Dimensions
- Length L [mm]: 94, 108, 112
- Diameter D [mm]: 30
- Transducer diameter D1 [mm]: 30, 40, 73
- Transducer length l1 [mm]: 0, 25, 32,5
- Thread length lt [mm]: 72, 61, 57,5
- Connector area lc [mm]: 10
- LED position: Pos. A
- Temperature / program plug: Pos. A, 27,5 mm

Accessories
This and more accessories can be found in chapter 3.5 from page 673
See pages from 972 ... for cordsets
See pages 1068 ... for mounting aids

- BF 30: Mounting flange, 30 mm
- UC-30GM-R2: Programming cable
- ULTRA3000: Software for ultrasonic sensors, comfort line
- UVW90-M30: Ultrasonic deflector
- V15-G-2M-PVC: Cable socket, M12, 5-pin, PVC cable
- V15-W-2M-PUR: Cable socket, M12, 5-pin, PUR cable

Electrical Connection

Consider the General Notes on the Information in the Pepperl+Fuchs Product Catalogs

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Date of issue: 04/08/2015
### Technical Data

**General Data**
- Operating voltage: 10 ... 30 V DC, ripple 10 %
- Power consumption: ≤ 900 mW
- Interface type: RS 232, 9600 Bit/s, no parity, 8 data bits, 1 stop bit
- Output type: 1 current output 4 ... 20 mA, 1 voltage output 0 ... 10 V
- Deviation of the characteristic curve: ≤ 0.2 % of full-scale value
- Synchronization: bi-directional

**Material**
- Housing: stainless steel (1.4305 / AISI 303), PBT plastic parts
- Transducer: epoxy resin/hollow glass sphere mixture; polyurethane foam

**Protection degree:** IP65

**Connection type:** Device connector M12 x 1, 5-pin

**Model Number**
- UC300-30GM-IUR2-V15
- UC500-30GM-IUR2-V15
- UC2000-30GM-IUR2-V15
- UC4000-30GM-IUR2-V15
- UC6000-30GM-IUR2-V15
- UCC1000-30GM-IUR2-V15

**Sensing range**
- 15 ... 300 mm
- 30 ... 500 mm
- 80 ... 2000 mm
- 200 ... 4000 mm
- 350 ... 6000 mm

**Transducer frequency**
- approx. 380 kHz
- approx. 180 kHz
- approx. 85 kHz
- approx. 65 kHz

**Resolution**
- evaluation range [mm]/4000, but ≥ 0.05 mm
- evaluation range [mm]/4000, but ≥ 0.35 mm

**Ambient temperature**
- 0 ... 70 °C (32 ... 158 °F)
- -25 ... 70 °C (-13 ... 158 °F)

**Approvals and Certificates**
- UL approval: cULus Listed, General Purpose
- CSA approval: cCSAus Listed, General Purpose

**Dimensions**
- Length L [mm]: 114
- Diameter D [mm]: 30
- Transducer diameter D1 [mm]: 30
- Transducer length l1 [mm]: 0
- Thread length lt [mm]: 92
- Connector area lc [mm]: 10
- LED position: Pos. A
- Temperature / program plug: Pos. A, 27.5 mm

**Accessories**
- This and more accessories can be found in chapter 3.5 from page 673
- See pages from 972 ... for cordsets
- See pages 1068 ... for mounting aids

**Electrical Connection**

- Wire colors in accordance with EN 60947-5-2
## Technical Data

For detailed data and product description refer to the data sheets at [www.pepperl-fuchs.com](http://www.pepperl-fuchs.com).

### General Data

- **Operating voltage**: 10 ... 30 V DC, ripple 10 %<sub>SS</sub>
- **No-load supply current**: ≤ 50 mA
- **Interface type**: RS 232, 9600 Bit/s, no parity, 8 data bits, 1 stop bit
- **Output type**: 2 switch outputs PNP, NO/NC, programmable
- **Rated operational current**: 200 mA, short-circuit/overload protected
- **Synchronization**: bi-directional
- **Ambient temperature**: -25 ... 70 °C (-13 ... 158 °F)
- **Material**:
  - Housing: stainless steel (1.4305 / AISI 303), PBT plastic parts
  - Transducer: epoxy resin/hollow glass sphere mixture, polyurethane foam
- **Protection degree**:
  - Sensor head: IP67
  - Connector sensor head/controller unit: IP52
- **Connection type**: Device connector M12 x 1, 5-pin

### Model Number

<table>
<thead>
<tr>
<th>Model Number</th>
<th>UC300-30GM-E6R2-K-V15</th>
<th>UC1000-30GM-E6R2-K-V15</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sensing range</td>
<td>30 ... 300 mm</td>
<td>80 ... 1000 mm</td>
</tr>
<tr>
<td>Transducer frequency</td>
<td>approx. 380 kHz</td>
<td>approx. 180 kHz</td>
</tr>
<tr>
<td>Switching frequency</td>
<td>≤ 2.5 Hz</td>
<td>≤ 7 Hz</td>
</tr>
</tbody>
</table>

### Dimensions

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Length L [mm]</td>
<td>93.5</td>
<td>112</td>
</tr>
<tr>
<td>Diameter D [mm]</td>
<td>30</td>
<td></td>
</tr>
<tr>
<td>Transducer diameter D&lt;sub&gt;T&lt;/sub&gt; [mm]</td>
<td>18</td>
<td>30</td>
</tr>
<tr>
<td>Transducer length l&lt;sub&gt;T&lt;/sub&gt; [mm]</td>
<td>25</td>
<td>27</td>
</tr>
<tr>
<td>Thread length l&lt;sub&gt;T&lt;/sub&gt; [mm]</td>
<td>71.5</td>
<td>90</td>
</tr>
<tr>
<td>Connector area l&lt;sub&gt;C&lt;/sub&gt; [mm]</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>LED position</td>
<td>Pos. C</td>
<td></td>
</tr>
<tr>
<td>Temperature / program plug</td>
<td>Pos. C, 27.5 mm</td>
<td></td>
</tr>
</tbody>
</table>

### Accessories

This and more accessories can be found in chapter 3.5 from page 673:

See pages from 972 ... for cordsets
See pages 1068 ... for mounting aids

**BF 30**
- Mounting flange, 30 mm

**BF 30-F**
- Mounting flange with dead stop, 30 mm

**BF 18**
- Mounting flange, 18 mm

**BF 5-30**
- Universal mounting bracket for cylindrical sensors with a diameter of 5 ... 30 mm

**BF 18-F**
- Mounting flange with dead stop, 18 mm

**ULTRA3000**
- Software for ultrasonic sensors, comfort line

**V15-G-2M-PVC**
- Cable socket, M12, 5-pin, PVC cable

**V15-W-2M-PUR**
- Cable socket, M12, 5-pin, PUR cable

---

**Properties**

- 300 mm and 1000 mm sensing range versions
- DC, 2 switching outputs
- Ø30 mm cylindrical housing with separate head
- Connector version

**Your Benefit**

- Provides maximum sensing range in space-restricted mounting areas
- Potentiometer-free configuration via programming plug or ULTRA3000 software

---

**Electrical Connection**

UC300-30GM-E6R2-K-V15
UC1000-30GM-E6R2-K-V15

[Diagram of electrical connection]

**Core colors in accordance with EN 60947-5-2.**

1. **BN** (brown)
2. **WH** (white)
3. **BU** (blue)
4. **BK** (black)
5. **GY** (gray)

---

**Date of issue 04/08/2015**

**Ultrasonic sensor cylindrical, Ø 30 mm**

**Ultrasonic Sensors, Diffuse Mode Sensors, cylindrical**

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Pepperl+Fuchs Group
USA: +1 330 486 0001
www.pepperl-fuchs.com
fa-info@us.pepperl-fuchs.com

Germany: +49 621 776-4411
fa-info@de.pepperl-fuchs.com

Singapore: +65 6779 9091
fa-info@sg.pepperl-fuchs.com

621
Ultrasonic Sensor, Diffuse Mode Sensors, Cylindrical, Ø 30 mm

Technical Data

For detailed data and product description refer to the data sheets at www.pepperl-fuchs.com

General Data
- Operating voltage: 10 ... 30 V DC, ripple 10 %
- Power consumption: ≤ 900 mW
- Interface type: RS 232, 9600 Bit/s, no parity, 8 data bits, 1 stop bit
- Output type: 1 current output 4 ... 20 mA
- 1 voltage output 0 ... 10 V
- Deviation of the characteristic curve: ≤ 0.2 % of full-scale value
- Synchronization: bi-directional
- Ambient temperature: -25 ... 70 °C (-13 ... 158 °F)
- Material: Housing - stainless steel (1.4305 / AISI 303), PBT plastic parts
- Transducer - epoxy resin/hollow glass sphere mixture; polyurethane foam
- Protection degree: Sensor head: IP67, Connector sensor head/controller unit: IP52
- Connection type: Device connector M12 x 1, 5-pin

Model Number
- Sensing range: 30 ... 300 mm
- Transducer frequency: approx. 380 kHz
- Resolution: evaluation range [mm]/4000, but ≥ 0.35 mm

Approvals and Certificates
- UL approval: cULus Listed, General Purpose
- CSA approval: cCSAus Listed, General Purpose

Dimensions
- Length L [mm]: 112
- Diameter D [mm]: 30
- Transducer diameter D1 [mm]: 18
- Transducer length l1 [mm]: 25
- Thread length lT [mm]: 90
- Connector area lc [mm]: 10
- LED position: Pos. C
- Temperature / program plug: Pos. C, 27.5 mm

Accessories
- This and more accessories can be found in chapter 3.5 from page 673
- See pages from 972 ... for cordsets
- See pages 1068 ... for mounting aids

Electrical Connection

UC300-30GM-IUR2-K-V15
UC1000-30GM-IUR2-K-V15

Properties
- 300 mm and 1000 mm sensing range versions
- DC, analog outputs
- Ø30 mm cylindrical housing with separate head
- Connector version

Your Benefit
- Provides maximum sensing range in space-restricted mounting areas
- Potentiometer-free configuration via programming plug or ULTRA3000 software

UI 1 2 3 4 5
Core colors in accordance with EN 60947-5-2.
Technical Data

For detailed data and product description refer to the data sheets at www.pepperl-fuchs.com

**General Data**
- Operating voltage: 12 ... 30 V DC (including ripple)
- No-load supply current: \( \leq 50 \text{ mA} \)
- Potentiometer: Switching output 1 and Switching output 2 adjustable
- Interface type: Infrared
- Output type: 2 switch outputs PNP, NO (NC programmable)
- Operating current: Per 150 mA, short-circuit/overload protected
- Input/output type: 1 synchronization connection, bidirectional / TEACH-IN input, programmable
- Ambient temperature: -25 ... 70 °C (-13 ... 158 °F)
- Material:
  - Housing: brass, nickel-plated
  - Transducer: epoxy resin/hollow glass sphere mixture; polyurethane foam
- Protection degree: IP65
- Connection type: Device connector M12 x 1, 5-pin

**Model Number**
- UC3500-30GM70-2E2R2-V15
- UC2000-30GM70-2E2R2-V15
- UC500-30GM70-2E2R2-V15
- UC6000-30GM70-2E2R2-V15

**Sensing range**
- 45 ... 500 mm
- 100 ... 2000 mm
- 200 ... 3500 mm
- 350 ... 6000 mm
- 100 ... 2000 mm
- 200 ... 3500 mm
- 350 ... 6000 mm
- Transducer frequency:
  - approx. 300 kHz
  - approx. 200 kHz
  - approx. 120 kHz
  - approx. 80 kHz

**Approvals and Certificates**
- UL approval: cULus Listed, General Purpose
- CSA approval: cCSAus Listed, General Purpose

**Dimensions**
- Diameter D (mm): 30
- Length L (mm): 99.3, 121.2
- Thread length \( l_t \) (mm): 74.7, 62
- Transducer diameter \( D_1 \) (mm): 30, 65
- Transducer length \( l_1 \) (mm): 0.3, 0.5, 36.5
- Connector area \( l_c \) (mm): 10, 5

**Accessories**
- BF 30: Mounting flange, 30 mm
- BF 5-30: Universal mounting bracket for cylindrical sensors with a diameter of 5 ... 30 mm
- V15-G-2M-PUR: Cable socket, M12, 5-pin, PUR cable
- V15-W-2M-PUR: Cable socket, M12, 5-pin, PUR cable
- UC-18/30GM-IR: Interface cable
- ULTRA-PROG-IR: Service program

**Properties**
- Up to 6000 mm sensing range versions
- DC, 2 switching outputs
-Ø30 mm cylindrical housing
- Connector version

**Your Benefit**
- Simple potentiometer-based configuration
- Optional, expanded configuration control via ULTRA-PROG-IR software and interface

**Electrical Connection**

Wire colors in accordance with EN 60947-5-2

1. BN (brown)
2. WH (white)
3. BU (blue)
4. BK (black)
5. GY (gray)
Ultrasonic sensor
cylindrical, Ø 30 mm

Technical Data

For detailed data and product description refer to the data sheets at www.pepperl-fuchs.com

General Data
Operating voltage 12 ... 30 V DC (including ripple)
No-load supply current ≤ 50 mA
Potentiometer Switching output 1 and Switching output 2 adjustable
Interface type Infrared
Output type 2 switch outputs PNP, NO (NC programmable)
Operating current Per 150 mA, short-circuit/overload protected
Input/output type 1 synchronization connection, bidirectional / TEACH-IN input, programmable
Ambient temperature -25 ... 70 °C (-13 ... 158 °F)
Material
Housing brass, nickel-plated
Transducer epoxy resin/hollow glass sphere mixture; polyurethane foam
Protection degree IP65
Connection type Device connector M12 x 1, 5-pin

Sensing range
- 45 ... 500 mm
- 100 ... 2000 mm
- 200 ... 3500 mm
- 350 ... 6000 mm
- 100 ... 2000 mm
- 200 ... 3500 mm
- 350 ... 6000 mm
- 45 ... 500 mm

Transducer frequency
- approx. 300 kHz
- approx. 200 kHz
- approx. 120 kHz
- approx. 80 kHz

Approvals and Certificates
UL approval cULus Listed, General Purpose
CSA approval cCSAus Listed, General Purpose

Dimensions
Diameter D (mm) 30
Length L (mm) 126 143,5
Thread length l₁ (mm) 74,4
Transducer diameter D₁ (mm) 30 65
Transducer length l₂ (mm) 28 37,2
Connector area l₃ (mm) 10,5

Accessories
This and more accessories can be found in chapter 3.5 from page 673
See pages from 972 ... for cordsets
See pages 1068 ... for mounting aids
BF 30 Mounting flange, 30 mm
BF 5-30 Universal mounting bracket for cylindrical sensors with a diameter of 5 ... 30 mm
V15-G-2M-PUR Cable socket, M12, 5-pin, PUR cable
V15-W-2M-PUR Cable socket, M12, 5-pin, PUR cable
UC-18/30GM-IR Interface cable
ULTRA-PROG-IR Service program

Properties
- Up to 6000 mm sensing range versions
- DC, 2 switching outputs
- Ø30 mm cylindrical housing with adjustable head
- Connector version

Your Benefit
- Simple potentiometer-based configuration
- Optional, expanded configuration control via ULTRA-PROG-IR software and interface

Electrical Connection

Wire colors in accordance with EN 60947-5-2
1 - BN (brown)
2 - WH (white)
3 - BU (blue)
4 - BK (black)
5 - GY (gray)

Ultrasonic Sensors, Diffuse Mode Sensors, cylindrical...
Ultrasonic Sensor, Diffuse Mode Sensors, Cylindrical

**General Data**
- **Operating voltage**: 12 ... 30 V DC (including ripple)
- **No-load supply current**: ≤ 50 mA
- **Potentiometer**: Switching output 1 and Switching output 2 adjustable
- **Interface type**: Infrared
- **Output type**: 2 switch outputs PNP, NO (NC programmable)
- **Operating current**: Per 150 mA, short-circuit/overload protected
- **Input/output type**: 1 synchronization connection, bidirectional / TEACH-IN input, programmable
- **Ambient temperature**: -25 ... 70 °C (-13 ... 158 °F)

**Model Number**
- **Sensing range**: 45 ... 500 mm
- **Transducer frequency**: approx. 300 kHz
- **Approvals and Certificates**:
  - UL approval: cULus Listed, General Purpose
  - CSA approval: cCSAus Listed, General Purpose

**Dimensions**
- **Diameter D [mm]**: 30
- **Length L [mm]**: 111,3
- **Thread length l [mm]**: 74,4
- **Transducer diameter D1 [mm]**: 18
- **Transducer length l1 [mm]**: 26,7
- **Connector area lc [mm]**: 10,5

**Accessories**
- **BF 30**: Mounting flange, 30 mm
- **BF 5-30**: Universal mounting bracket for cylindrical sensors with a diameter of 5 ... 30 mm
- **V15-G-2M-PUR**: Cable socket, M12, 5-pin, PUR cable
- **V15-W-2M-PUR**: Cable socket, M12, 5-pin, PUR cable
- **UC-18/30GM-IR**: Interface cable
- **ULTRA-PROG-IR**: Service program

**Electrical Connection**
- **UC300-30GM70-2E2R2-K-V15**
- **UC2000-30GM70-2E2R2-K-V15**

**Wire colors in accordance with EN 60947-5-2**
- 1: BN (brown)
- 2: WH (white)
- 3: BU (blue)
- 4: BK (black)
- 5: GY (gray)

**Technical Data**
For detailed data and product description refer to the data sheets at www.pepperl-fuchs.com

**Properties**
- 500 mm and 2000 mm sensing range versions
- DC, 2 switching outputs
- Ø30 mm cylindrical housing with separate head
- Connector version

**Your Benefit**
- Provides maximum sensing range in space-restricted mounting areas
- Simple potentiometer-based configuration
- Optional, expanded configuration control via ULTRA-PROG-IR software and interface
**Technical Data**

For detailed data and product description refer to the data sheets at [www.pepperl-fuchs.com](http://www.pepperl-fuchs.com)

### General Data
- Operating voltage: 20 ... 30 V DC (including ripple)
- No-load supply current: \(\leq 50\) mA
- Potentiometer: switch output adjustable
- Interface type: Infrared
- Output type: 1 switch output PNP, NO (NC programmable)
- Operating current: 300 mA, short-circuit/overload protected
- Input/output type: 1 synchronization connection, bidirectional / TEACH-IN input, programmable
- Ambient temperature: \(-25 \sim 70^\circ\) C (-13 ... 158 °F)
- Material:
  - Housing: brass, nickel-plated
  - Transducer: epoxy resin/hollow glass sphere mixture; polyurethane foam
- Protection degree: IP65
- Connection type: Device connector M12 x 1, 5-pin

### Electrical Connection

- Wiring diagram:
  - Switch output
  - Analog output

### Properties
- Up to 6000 mm sensing range versions
- DC, analog and switching output
- Ø30 mm cylindrical housing
- Connector version

### Your Benefit
- Simple potentiometer-based configuration
- Optional, expanded configuration control via ULTRA-PROG-IR software and interface

### Model Number

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<thead>
<tr>
<th>Model Number</th>
<th>Green = preferred type</th>
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<tbody>
<tr>
<td>UC500-30GM70-IE2R2-V15</td>
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<td>UC500-30GM70-UE2R2-V15</td>
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<tr>
<td>UC2000-30GM70-IE2R2-V15</td>
<td></td>
</tr>
<tr>
<td>UC2000-30GM70-UE2R2-V15</td>
<td></td>
</tr>
<tr>
<td>UC3500-30GM70-IE2R2-V15</td>
<td></td>
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<tr>
<td>UC3500-30GM70-UE2R2-V15</td>
<td></td>
</tr>
<tr>
<td>UC6000-30GM70-IE2R2-V15</td>
<td></td>
</tr>
<tr>
<td>UC6000-30GM70-UE2R2-V15</td>
<td></td>
</tr>
</tbody>
</table>

### Sensing range

- 45 ... 500 mm
- 100 ... 2000 mm
- 200 ... 3500 mm
- 350 ... 6000 mm

### Transducer frequency

- approx. 300 kHz
- approx. 200 kHz
- approx. 120 kHz
- approx. 80 kHz

### Output type

- 1 voltage output 0 ... 10 V, ascending/descending programmable
- 1 current output 4 ... 20 mA, ascending/descending programmable

### Approvals and Certificates

- UL approval: cULus Listed, General Purpose
- CSA approval: cCSAus Listed, General Purpose

### Dimensions

<table>
<thead>
<tr>
<th>Diameter D [mm]</th>
<th>Length L [mm]</th>
<th>Thread length (l_t) [mm]</th>
<th>Transducer diameter (D_1) [mm]</th>
<th>Transducer length (l_1) [mm]</th>
<th>Connector area (l_c) [mm]</th>
</tr>
</thead>
<tbody>
<tr>
<td>30</td>
<td>99.3</td>
<td>74.7</td>
<td>30</td>
<td>0.3</td>
<td>10.5</td>
</tr>
<tr>
<td>30</td>
<td>121.2</td>
<td>62</td>
<td>65</td>
<td>0.5</td>
<td>36.5</td>
</tr>
</tbody>
</table>

### Accessories

This and more accessories can be found in chapter 3.5 from page 673

- BF 30: Mounting flange, 30 mm
- BF 5-30: Universal mounting bracket for cylindrical sensors with a diameter of 5 ... 30 mm
- V15-G-2M-PUR: Cable socket, M12, 5-pin, PUR cable
- V15-W-2M-PUR: Cable socket, M12, 5-pin, PUR cable
- UC-18/30GM-IR: Interface cable
- ULTRA-PROG-IR: Service program

Wire colors in accordance with EN 60947-5-2

1. 
2. 
3. 
4. 
5. 

1. BN (brown)
2. WH (white)
3. BU (blue)
4. BK (black)
5. GY (gray)
Technical Data

For detailed data and product description refer to the data sheets at www.pepperl-fuchs.com

General Data
Operating voltage 20 ... 30 V DC (including ripple)
No-load supply current ≤ 50 mA
Potentiometer switch output adjustable
Interface type Infrared
Output type 1 switch output PNP, NO (NC programmable)
Operating current 300 mA, short-circuit/overload protected
Input/output type 1 synchronization connection, bidirectional / TEACH-IN input, programmable
Ambient temperature -25 ... 70 °C (-13 ... 158 °F)
Material Housing brass, nickel-plated
Transducer epoxy resin/hollow glass sphere mixture; polyurethane foam
Protection degree IP65
Connection type Device connector M12 x 1, 5-pin

Model Number

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Sensing range (mm)</td>
<td>45 ... 500</td>
<td>100 ... 2000</td>
<td>200 ... 3500</td>
<td>350 ... 6000</td>
<td>100 ... 2000</td>
<td>200 ... 3500</td>
<td>350 ... 6000</td>
<td>100 ... 2000</td>
</tr>
<tr>
<td>Transducer frequency (kHz)</td>
<td>approx. 300</td>
<td>approx. 200</td>
<td>approx. 120</td>
<td>approx. 80</td>
<td>approx. 100</td>
<td>approx. 50</td>
<td>approx. 80</td>
<td>approx. 100</td>
</tr>
<tr>
<td>Output type</td>
<td>1 voltage output 0 ... 10 V, ascending/descending programmable</td>
<td>1 current output 0 ... 20 mA, ascending/descending programmable</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Approvals and Certificates
UL approval cULus Listed, General Purpose
CSA approval cCSAus Listed, General Purpose

Dimensions
Diameter D [mm] 30
Length L [mm] 126, 143, 5
Thread length l1 [mm] 74, 4
Transducer diameter D1 [mm] 30, 65
Transducer length l1 [mm] 28, 37, 2
Connector area l2 [mm] 10, 5

Accessories
This and more accessories can be found in chapter 3.5 from page 673
See pages from 672 ... for cordsets
See pages 1068 ... for mounting aids

Electrical Connection
UC500-30GM70S-IE2R2-V15
UC500-30GM70S-UE2R2-V15
UC2000-30GM70S-IE2R2-V15
UC2000-30GM70S-UE2R2-V15
UC3500-30GM70S-IE2R2-V15
UC3500-30GM70S-UE2R2-V15
UC6000-30GM70S-IE2R2-V15
UC6000-30GM70S-UE2R2-V15

Wire colors in accordance with EN 60947-5-2
1 BN (brown)
2 WH (white)
3 BU (blue)
4 BK (black)
5 GY (gray)
**Technical Data**

*For detailed data and product description refer to the data sheets at www.pepperl-fuchs.com*

**General Data**
- Operating voltage: 20 ... 30 V DC (including ripple)
- No-load supply current: ≤ 50 mA
- Potentiometer: switch output adjustable
- Interface type: Infrared
- Output type: 1 switch output PNP, NO (NC programmable)
- Operating current: 300 mA, short-circuit/overload protected
- Input/output type: 1 synchronization connection, bidirectional / TEACH-IN input, programmable
- Ambient temperature: -25 ... 70 °C (-13 ... 158 °F)
- Material: Housing brass, nickel-plated
- Transducer: epoxy resin/hollow glass sphere mixture; polyurethane foam
- Protection degree: IP65
- Connection type: Device connector M12 x 1, 5-pin

**Properties**

- 500 mm and 2000 mm sensing range versions
- DC, analog and switching output
- Ø30 mm cylindrical housing with separate head
- Connector version

**Your Benefit**

- Provides maximum sensing range in space-restricted mounting areas
- Simple potentiometer-based configuration
- Optional, expanded configuration control via ULTRA-PROG-IR software and interface

**Model Number**

![Model Numbers](image)

**Approvals and Certificates**
- UL approval: cULus Listed, General Purpose
- CSA approval: cCSAus Listed, General Purpose

**Dimensions**

<table>
<thead>
<tr>
<th>Dimension</th>
<th>Unit</th>
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</thead>
<tbody>
<tr>
<td>Diameter D [mm]</td>
<td>30</td>
</tr>
<tr>
<td>Length L [mm]</td>
<td>111.3</td>
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<tr>
<td>Thread length lT [mm]</td>
<td>74.4</td>
</tr>
<tr>
<td>Transducer diameter D1 [mm]</td>
<td>18</td>
</tr>
<tr>
<td>Transducer length l1 [mm]</td>
<td>26.7</td>
</tr>
<tr>
<td>Connector area lc [mm]</td>
<td>10.5</td>
</tr>
</tbody>
</table>

**Accessories**

Options for this and more accessories can be found in chapter 3.5 from page 673

- BF 30: Mounting flange, 30 mm
- BF 5-30: Universal mounting bracket for cylindrical sensors with a diameter of 5 ... 30 mm
- V15-G-2M-PUR: Cable socket, M12, 5-pin, PUR cable
- V15-W-2M-PUR: Cable socket, M12, 5-pin, PUR cable
- UC-18/30GM-IR: Interface cable
- ULTRA-PROG-IR: Service program

**Electrical Connection**

![Electrical Connection](image)

Wire colors in accordance with EN 60947-5-2

- 1: (brown)
- 2: (white)
- 3: (blue)
- 4: (black)
- 5: (gray)
Technical Data

For detailed data and product description refer to the data sheets at www.pepperl-fuchs.com

General Data

Operating voltage: 20 ... 30 V DC (including ripple)
No-load supply current: ≤ 50 mA
Potentiometer: switch output adjustable
Interface type: Infrared
Output type: 1 switch output PNP, NO (NC programmable)
Operating current: 300 mA, short-circuit/overload protected
Input/output type: 1 synchronization connection, bidirectional / TEACH-IN input, programmable
Ambient temperature: -25 ... 70 °C (-13 ... 158 °F)

Material:
Housing: High grade stainless steel
Transducer: PTFE coated; epoxy resin/hollow glass sphere mixture; polyurethane foam
Protection degree: IP65
Connection type: Device connector M12 x 1, 5-pin

Model Number

<table>
<thead>
<tr>
<th>Model Number</th>
<th>Dimensions</th>
<th>Approvals and Certificates</th>
</tr>
</thead>
<tbody>
<tr>
<td>UCC500-30GH70-IE2R2-V15</td>
<td>30 mm</td>
<td>cULus Listed, General Purpose</td>
</tr>
<tr>
<td>UCC500-30GH70-UE2R2-V15</td>
<td>30 mm</td>
<td>cCSAus Listed, General Purpose</td>
</tr>
<tr>
<td>UCC2000-30GH70-IE2R2-V15</td>
<td>99.3 mm</td>
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</tr>
<tr>
<td>UCC2000-30GH70-UE2R2-V15</td>
<td>121.2 mm</td>
<td></td>
</tr>
<tr>
<td>UCC3500-30GH70-IE2R2-V15</td>
<td>74.7 mm</td>
<td></td>
</tr>
<tr>
<td>UCC3500-30GH70-UE2R2-V15</td>
<td>62 mm</td>
<td></td>
</tr>
<tr>
<td>UCC6000-30GH70-IE2R2-V15</td>
<td>30 mm</td>
<td></td>
</tr>
<tr>
<td>UCC6000-30GH70-UE2R2-V15</td>
<td>65 mm</td>
<td></td>
</tr>
<tr>
<td>UCC6000-30GH70-UE2R2-V15</td>
<td>0.3 mm</td>
<td></td>
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<tr>
<td>UCC6000-30GH70-UE2R2-V15</td>
<td>0.5 mm</td>
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<tr>
<td>UCC6000-30GH70-UE2R2-V15</td>
<td>36.5 mm</td>
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<tr>
<td>UCC6000-30GH70-UE2R2-V15</td>
<td>10.5 mm</td>
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</tr>
</tbody>
</table>

Accessories

This and more accessories can be found in chapter 3.5 from page 673
See pages from 972 ... for cordsets
See pages 1068 ... for mounting aids

- BF 30: Mounting flange, 30 mm
- BF 5-30: Universal mounting bracket for cylindrical sensors with a diameter of 5 ... 30 mm
- V15-G-2M-PUR: Cable socket, M12, 5-pin, PUR cable
- V15-W-2M-PUR: Cable socket, M12, 5-pin, PUR cable
- UC-18/30GM-IR: Interface cable
- ULTRA-PROG-IR: Service program

Electrical Connection

Wire colors in accordance with EN 60947-5-2
1. BN (brown)
2. WH (white)
3. BU (blue)
4. BK (black)
5. GY (gray)

Properties

- Up to 6000 mm sensing range versions
- DC, analog and switching output
- Ø30 mm cylindrical housing
- Connector version

Your Benefit

- Chemically resistant PTFE-coated sensing face and corrosion resistant high grade stainless steel housing
- Simple potentiometer-based configuration
- Optional, expanded configuration control via ULTRA-PROG-IR software and interface
**Technical Data**

For detailed data and product description refer to the data sheets at www.pepperl-fuchs.com

**General Data**
- Operating voltage: 20 ... 30 V DC (including ripple)
- No-load supply current: ≤ 50 mA
- Potentiometer: switch output adjustable
- Interface type: Infrared
- Output type: 1 switch output PNP, NO (NC programmable)
- Operating current: 300 mA, short-circuit/overload protected
- Input/output type: 1 synchronization connection, bidirectional / TEACH-IN input, programmable
- Ambient temperature: -25 ... 70 °C (-13 ... 158 °F)
- Material:
  - Housing: High grade stainless steel
  - Transducer: PTFE coated; epoxy resin/hollow glass sphere mixture; polyurethane foam
- Protection degree: IP65
- Connection type: Device connector M12 x 1, 5-pin

**Model Number**

<table>
<thead>
<tr>
<th>Model Number</th>
<th>UCC500-30GH70S-IE2R2-V15</th>
<th>UCC500-30GH70S-UE2R2-V15</th>
<th>UCC9000-30GH70S-IE2R2-V15</th>
<th>UCC9000-30GH70S-UE2R2-V15</th>
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<tbody>
<tr>
<td>Sensing range</td>
<td>45 ... 500 mm</td>
<td>100 ... 2000 mm</td>
<td>200 ... 3500 mm</td>
<td>350 ... 6000 mm</td>
</tr>
<tr>
<td>Transducer frequency</td>
<td>approx. 300 kHz</td>
<td>approx. 200 kHz</td>
<td>approx. 120 kHz</td>
<td>approx. 80 kHz</td>
</tr>
<tr>
<td>Output type</td>
<td>1 voltage output 0 ... 10 V, ascending/descending programmable</td>
<td>1 current output 4 ... 20 mA, ascending/descending programmable</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Approvals and Certificates**
- UL approval: cULus Listed, General Purpose
- CSA approval: cCSAus Listed, General Purpose

**Dimensions**

<table>
<thead>
<tr>
<th>Diameter D [mm]</th>
<th>30</th>
</tr>
</thead>
<tbody>
<tr>
<td>Length L [mm]</td>
<td>143.5</td>
</tr>
<tr>
<td>Thread length l₁ [mm]</td>
<td>74.4</td>
</tr>
<tr>
<td>Transducer diameter D₁ [mm]</td>
<td>30</td>
</tr>
<tr>
<td>Transducer length l₂ [mm]</td>
<td>28</td>
</tr>
<tr>
<td>Connector area l₃ [mm]</td>
<td>10.5</td>
</tr>
</tbody>
</table>

**Accessories**

This and more accessories can be found in chapter 3.5 from page 673 See pages from 972 ... for cordsets See pages 1068 ... for mounting aids

**BF 30**
Mounting flange, 30 mm

**BF 5-30**
Universal mounting bracket for cylindrical sensors with a diameter of 5 ... 30 mm

**V1S-G-2M-PUR**
Cable socket, M12, 5-pin, PUR cable

**V1S-W-2M-PUR**
Cable socket, M12, 5-pin, PUR cable

**UC-18/30GM-IR**
Interface cable

**ULTRA-PROG-IR**
Service program

**Electrical Connection**

<table>
<thead>
<tr>
<th>Switch output</th>
<th>Analog output</th>
</tr>
</thead>
<tbody>
<tr>
<td>LN</td>
<td>X3</td>
</tr>
<tr>
<td>LN</td>
<td>X5</td>
</tr>
<tr>
<td>LN</td>
<td>X4</td>
</tr>
<tr>
<td>LN</td>
<td>X2</td>
</tr>
</tbody>
</table>

Wire colors in accordance with EN 60947-5-2

1. BN (brown)
2. WH (white)
3. BU (blue)
4. BK (black)
5. OY (gray)
Ultrasonic Sensors, Diffuse Mode Sensors, cylindrical Ø 30 mm

For detailed data and product description refer to the data sheets at www.pepperl-fuchs.com

Technical Data

General Data
- Operating voltage: 20 ... 30 V DC (including ripple)
- No-load supply current: ≤ 50 mA
- Potentiometer: switch output adjustable
- Interface type: Infrared
- Output type: 1 switch output PNP, NO (NC programmable)
- Operating current: 300 mA, short-circuit/overload protected
- Input/output type: 1 synchronization connection, bidirectional / TEACH-IN input, programmable
- Ambient temperature: -25 ... 70 °C (-13 ... 158 °F)

Material
- Housing: High grade stainless steel
- Transducer: PTFE coated; epoxy resin/hollow glass sphere mixture; polyurethane foam
- Protection degree: IP65
- Connection type: Device connector M12 x 1, 5-pin

Model Number

|--------------|--------------------------|--------------------------|--------------------------|--------------------------|
- Sensing range: 45 ... 500 mm
- Transducer frequency: approx. 300 kHz
- Output type: 1 voltage output 0 ... 10 V, ascending/descending programmable
- Approvals and Certificates: UL approval, cULus Listed, General Purpose
- CSA approval, cCSAus Listed, General Purpose

Dimensions
- Diameter D [mm]: 30
- Length L [mm]: 111,3
- Thread length l [mm]: 74,4
- Transducer diameter D1 [mm]: 18
- Transducer length l1 [mm]: 26,7
- Connector area lc [mm]: 10,5

Accessories

|-------------|-------|---------|--------------|--------------|---------------|---------------|
- Mounting flange, 30 mm
- Universal mounting bracket for cylindrical sensors with a diameter of 5 ... 30 mm
- Cable socket, M12, 5-pin, PUR cable
- Cable socket, M12, 5-pin, PUR cable
- Interface cable
- Service program

Properties
- 500 mm and 2000 mm sensing range versions
- DC, analog and switching output
- Ø30 mm cylindrical housing with separate head
- Connector version

Your Benefit
- Chemically resistant PTFE-coated sensing face and corrosion resistant high grade stainless steel housing
- Provides maximum sensing range in space-restricted mounting areas
- Simple potentiometer-based configuration
- Optional, expanded configuration control via ULTRA-PROG-IR software and interface

Electrical Connection

Wire colors in accordance with EN 60947-5-2

<table>
<thead>
<tr>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>BN</td>
<td>VH</td>
<td>BU</td>
<td>BK</td>
<td>GY</td>
</tr>
</tbody>
</table>

Consider the General Notes on the Information in the Pepperl+Fuchs Product Catalogs Copyright Pepperl+Fuchs
**Ultrasonic Sensors, Diffuse Mode Sensors, cylindrical**

### General Data
- Operating voltage: 10 ... 30 V DC, ripple 10 %
- No-load supply current: ≤ 60 mA
- Power consumption: ≤ 1 W
- Interface type: IO-Link
- SIO mode support
- Output type: 2 Push-pull outputs, short-circuit-protected, reverse polarity protection
- Rated operational current: 200 mA, short-circuit/load protected
- Input/output type: 1 synchronization connection, bidirectional
- Ambient temperature: -25 ... 70 °C (-13 ... 158 °F)
- Housing: Stainless steel 1.4305 / AISI 303, TPU, Polyamides
- Transducer: epoxy resin/hollow glass sphere mixture; polyurethane foam
- Protection degree: IP65/IP67
- Connection type: Device connector M12 x 1, 5-pin

### Electric Connection
- Model Number:
  - UC500-30GM-2EP-IO-V15
  - UC4000-30GM-2EP-IO-V15
  - UC6000-30GM-2EP-IO-V15
- Switching frequency:
  - ≤ 11 Hz
  - ≤ 4 Hz
  - ≤ 2 Hz
  - ≤ 1.5 Hz
- Approvals and Certificates:
  - UL approval: cULus Listed, General Purpose
  - CSA approval: cCSAus Listed, General Purpose
- Dimensions:
  - Diameter D [mm]: 30
  - Length L [mm]: 81, 86, 93
  - Thread length l_t [mm]: 54, 36
  - Transducer diameter D_1 [mm]: 30, 40, 73
  - Transducer length l_1 [mm]: 2, 25, 32
  - Connector area l_c [mm]: 11
- Accessories:
  - BF 30: Mounting flange, 30 mm
  - V15 W-2M-PUR: Cable socket, M12, 5-pin, PUR cable
  - IO-Link-Master: IO-Link Master
  - IO-Link-Master-USB DTM: Communication DTM for use of IO-Link-Master
  - IODD Interpreter: Software for the integration of IODDs in a frame application (e.g. PACTware)
  - PACTware 4.X: FDT frame application

### Properties
- Up to 6000 mm sensing range versions
- DC, IO-Link and switching output
- Ø30 mm cylindrical housing
- Connector version
- Simple pushbutton-based configuration
- Continuous IO-Link accessibility to output status and configuration parameters
- Optional, expanded configuration control via PACTware
- High-visibility LED indicators

### Your Benefit
- Simple pushbutton-based configuration
- Continuous IO-Link accessibility to output status and configuration parameters
- Optional, expanded configuration control via PACTware
- High-visibility LED indicators

---

Consider the General Notes on the Information in the Pepperl+Fuchs Product Catalogs

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Ultrasonic Sensors, Diffuse Mode Sensors, cylindrical, Ø 30 mm
## Technical Data

For detailed data and product description refer to the data sheets at www.pepperl-fuchs.com

### General Data
- **Operating voltage**: 10 ... 30 V DC, ripple 10 %<sub>SS</sub>
- **No-load supply current**: ≤ 60 mA
- **Power consumption**: ≤ 1 W
- **Interface type**: IO-Link
- **SIO mode support**: ✔
- **Output type**: 1 push-pull output, short-circuit protected, reverse polarity protected
- **Rated operational current**: 200 mA, short-circuit/overload protected
- **Deviations of the characteristic curve**: ≤ 0.2 % of full-scale value
- **Input/output type**: 1 synchronization connection, bidirectional
- **Ambient temperature**: -25 ... 70 °C (-13 ... 158 °F)

### Model Number

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Sensing range</td>
<td>green = preferred type</td>
<td>35 ... 500 mm</td>
<td>80 ... 2000 mm</td>
<td>200 ... 4000 mm</td>
</tr>
<tr>
<td>Transducer frequency</td>
<td>approx. 380 kHz</td>
<td>approx. 180 kHz</td>
<td>approx. 85 kHz</td>
<td>approx. 65 kHz</td>
</tr>
<tr>
<td>Resolution</td>
<td>evaluation range [mm]/4000, but ≥ 0.05 mm</td>
<td>evaluation range [mm]/4000, but ≥ 0.35 mm</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Switching frequency</td>
<td>≤ 11 Hz</td>
<td>≤ 4 Hz</td>
<td>≤ 2 Hz</td>
<td>≤ 1.5 Hz</td>
</tr>
</tbody>
</table>

### Approvals and Certificates
- **UL approval**: cULus Listed, General Purpose
- **CSA approval**: cCSAus Listed, General Purpose

### Dimensions
- **Diameter D [mm]**: 30
- **Length L [mm]**: 81 86 93
- **Thread length l<sub>L</sub> [mm]**: 54 36
- **Transducer diameter D<sub>1</sub> [mm]**: 30 40 73
- **Transducer length l<sub>1</sub> [mm]**: 2 25 32
- **Connector area l<sub>c</sub> [mm]**: 11

### Accessories
- **BF 30**: Mounting flange, 30 mm
- **V15-W-2M-PUR**: Cable socket, M12, 5-pin, PUR cable
- **IO-Link-Master01-USB**: IO-Link Master

### Electrical Connection

**Wire colors in accordance with EN 60947-5-2**

<table>
<thead>
<tr>
<th>Wire</th>
<th>Color</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>BN</td>
</tr>
<tr>
<td>2</td>
<td>WH</td>
</tr>
<tr>
<td>3</td>
<td>BU</td>
</tr>
<tr>
<td>4</td>
<td>BK</td>
</tr>
<tr>
<td>5</td>
<td>GY</td>
</tr>
</tbody>
</table>

**Properties**
- **Up to 6000 mm sensing range versions**
- **DC, IO-Link and analog output**
- **Ø30 mm cylindrical housing**
- **Connector version**

**Your Benefit**
- Simple pushbutton-based configuration
- Continuous IO-Link accessibility to output status and configuration parameters
- Optional, expanded configuration control via PACTware
- High-visibility LED indicators
### Technical Data

**General Data**
- Sensing range: 200 ... 3000 mm
- Transducer frequency: approx. 100 kHz
- Operating voltage: 10 ... 30 V DC
- No-load supply current: ≤ 50 mA
- Input type: 1 program input
- Input/output type: 1 synchronization connection, bidirectional
- Ambient temperature: -25 ... 60 °C (-13 ... 140 °F)

**Material**
- Housing: Stainless steel 1.4404 / AISI 316L
- Transducer: Stainless steel 1.4435 / AISI 316L
- Protection degree: IP68 / IP69K

**Connection type**: cable PUR, 5 m

**Electrical Connection**

- **Model Number**: UMC3000-30H-5M-FA
- **Model Number**: UMC3000-30H-3M-FA

**Properties**
- **3000 mm sensing range**
- **DC, analog and switching output versions**
- **Ø30 mm cylindrical housing**
- **Cable version**

### Model Number

- **Output type**: 1 analog output 4 ... 20 mA
- **Rated operational current**: 200 mA, short-circuit/overload protected
- **Resolution**: Evaluation range [mm]/3200, however ≥ 0.4 mm
- **Deviation of the characteristic curve**: ≤ 0.2 % of full-scale value
- **Switching frequency**: ≤ 2.8 Hz

**Dimensions**
- Length L [mm]: 100
- Diameter D [mm]: 30
- Thread length l₁ [mm]: 0
- Connector area l₂ [mm]: 11

### Accessories

- **UC-PROG1**: Programming adapter
- **V15S-G-0.3M-PUR-WAGO**: Male cordset, M12, 5-pin, PUR cable with WAGO terminals
- **MH-30H-01-FA**: Mounting aid, 30 mm acc. to EHEDG

- **This and more accessories can be found in chapter 3.5 from page 673**
- **See pages from 972 ... for cordsets**
- **See pages 1068 ... for mounting aids**

### Electrical Connection

- **UMC3000-30H-5M-FA**
- **UMC3000-30H-3M-FA**

**Wire colors in accordance with EN 60947-5-2**

1. BN (brown)
2. WH (white)
3. BU (blue)
4. BK (black)
5. GY (gray)
Technical Data

For detailed data and product description refer to the data sheets at www.pepperl-fuchs.com

Model Number: UC500-D1-3K-V7

- Sensing range: 60 ... 550 mm
- Transducer frequency: approx. 380 kHz
- Operating voltage: 10 ... 253 V DC
  - 20 ... 253 V AC, 47 ... 63 Hz
- No-load supply current:
  - < 30 mA with UB = 30 V DC
  - < 110 mA at UB = 10 V DC
  - < 25 mA at UB = 220 V AC
- Output type: 3 relay outputs, normally open/closed, selectable
- Contact loading:
  - 253 V AC/150V DC, 3 A (ohm. load)
- Ambient temperature: -20 ... 60 °C (-4 ... 140 °F)

Material

- Housing:
  - cover: PC
  - housing: PBT
  - threaded flange: stainless steel
  - installation connector/cable socket: PETP
- Transducer:
  - epoxy resin/hollow glass sphere mixture; polyurethane foam
- Protection degree: IP65
- Connection: 90° V7 (7-pin) cable connector
- Wire cross section: ≤ 1.5 mm²
- Cable diameter: Ø7 ... 9 mm

Approvals and Certificates

- CCC approval: Certified by China Compulsory Certification (CCC)

Dimensions

- Height H [mm]: 106
- Diameter D [mm]: 75
- Connector area l_c [mm²]: 79

Electrical Connection

Connector V7

U1, U2, U3
A1, A2, A3

Date of issue 04/08/2015

Consider the General Notes on the Information in the Pepperl+Fuchs Product Catalogs

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**Technical Data**

For detailed data and product description refer to the data sheets at www.pepperl-fuchs.com

### General Data
- **Operating voltage**: 20 ... 30 V DC, ripple 10 %
- **No-load supply current**: ≤ 20 mA
- **Output type**: 1 switch output PNP, NO
- **Rated operational current**: 200 mA, short-circuit/overload protected
- **Input type**: 1 program input
- **Ambient temperature**: -25 ... 70 °C (-13 ... 158 °F)
- **Material**: Housing: Polycarbonate
- **Transducer**: epoxy resin/hollow glass sphere mixture; polyurethane foam
- **Protection degree**: IP67
- **Connection type**: M8 x 1 connector, 4-pin

### Operating Voltage
- Switching output
- ET (Teaching input)
- Sensing range
  - 20 ... 250 mm
  - 25 ... 400 mm
- Transducer frequency
  - approx. 400 kHz
  - approx. 300 kHz
- Switching frequency
  - 10 Hz
  - 5 Hz

### Approvals and Certificates
- UL approval: cULus Listed, General Purpose
- CSA approval: cCSAus Listed, General Purpose

### Dimensions
- **Length L [mm]**: 23
- **Width W [mm]**: 12
- **Height H [mm]**: 31
- **Connector area l_c [mm]**: 9

### Accessories
- This and more accessories can be found in chapter 3.5 from page 673
- See pages from 972 ... for cordsets
- See pages 1068 ... for mounting aids

### Model Number
- UB250-F77-E2-V31
- UB400-F77-E2-V31

### Sensing Range
- 20 ... 250 mm
- 25 ... 400 mm

### Transducer Frequency
- approx. 400 kHz
- approx. 300 kHz

### Switching Frequency
- 10 Hz
- 5 Hz

### Approvals and Certificates
- UL approval: cULus Listed, General Purpose
- CSA approval: cCSAus Listed, General Purpose

### Dimensions
- **Length L [mm]**: 23
- **Width W [mm]**: 12
- **Height H [mm]**: 31
- **Connector area l_c [mm]**: 9

### Accessories
- UB-PROG4-V31 Programming unit
- OMH-ML7-01 Mounting bracket
- V31-GM-2M-PVC M8, 4-pin socket, PVC cable
- V31-WM-2M-PVC M8, 4-pin socket, PVC cable

### Switching Output
- Wire colors in accordance with EN 60947-5-2
  - 1: BN (brown)
  - 2: WH (white)
  - 3: BU (blue)
  - 4: BK (black)
Ultrasonic Sensors, Diffuse Mode Sensors, rectangular types

Technical Data

For detailed data and product description refer to the data sheets at www.pepperl-fuchs.com

### General Data
- **Operating voltage**: 20 ... 30 V DC, ripple 10 %\textsubscript{SS} ; 12 ... 20 V DC reduced sensitivity by 90 %
- **No-load supply current**: ≤ 20 mA
- **Rated operational current**: 200 mA, short-circuit/overload protected
- **Input type**: 1 program input
- **Ambient temperature**: -25 ... 70 °C (-13 ... 158 °F)
- **Material**:
  - Housing: Polycarbonate
  - Transducer: epoxy resin/hollow glass sphere mixture; polyurethane foam
- **Protection degree**: IP67
- **Connection type**: M8 x 1 connector, 4-pin

### Model Number

<table>
<thead>
<tr>
<th>Model Number</th>
<th>UBR250-F77-E2-V31</th>
<th>UBR250-F77-E3-V31</th>
<th>UBR400-F77-E2-V31</th>
<th>UBR400-F77-E3-V31</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Sensing range</strong></td>
<td>0 ... 250 mm (●)</td>
<td>0 ... 400 mm (● ●)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Transducer frequency</strong></td>
<td>approx. 400 kHz (●)</td>
<td>approx. 300 kHz (● ●)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Output type</strong></td>
<td>1 switch output PNP, NC (●)</td>
<td>1 switch output PNP, NO (● ●)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Switching frequency</strong></td>
<td>10 Hz (●)</td>
<td>5 Hz (● ●)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Approvals and Certificates
- **UL approval**: cULus Listed, General Purpose
- **CSA approval**: cCSAus Listed, General Purpose

### Dimensions

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Length L [mm]</td>
<td>23</td>
</tr>
<tr>
<td>Width W [mm]</td>
<td>12</td>
</tr>
<tr>
<td>Height H [mm]</td>
<td>31</td>
</tr>
<tr>
<td>Connector area l\textsubscript{c} [mm]</td>
<td>9</td>
</tr>
</tbody>
</table>

### Accessories

This and more accessories can be found in chapter 3.5 from page 673. See pages from 972 ... for cordsets, See pages 1068 ... for mounting aids

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>UB-PROG4-V31</td>
<td>Programming unit</td>
</tr>
<tr>
<td>OMH-ML7-01</td>
<td>Mounting bracket</td>
</tr>
<tr>
<td>V31-GM-2M-PVC</td>
<td>M8, 4-pin socket, PVC cable</td>
</tr>
<tr>
<td>V31-WM-2M-PVC</td>
<td>M8, 4-pin socket, PVC cable</td>
</tr>
</tbody>
</table>

### Properties

- 250 mm and 400 mm sensing range versions
- DC, switching output
- Sub-miniature F77 housing
- Connector version

### Your Benefit

- Retro-reflective operation
- Best-in-class immunity to acoustic interference
- Simple, intuitive range adjustment
- High-end performance and low cost

### Electrical Connection

- UBR250-F77-E2-V31
- UBR250-F77-E3-V31
- UBR400-F77-E2-V31
- UBR400-F77-E3-V31

Wire colors in accordance with EN 60947-5-2

<table>
<thead>
<tr>
<th>Wire Number</th>
<th>Color</th>
<th>Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>BN</td>
<td>(brown)</td>
</tr>
<tr>
<td>2</td>
<td>WH</td>
<td>(white)</td>
</tr>
<tr>
<td>3</td>
<td>BU</td>
<td>(blue)</td>
</tr>
<tr>
<td>4</td>
<td>BK</td>
<td>(black)</td>
</tr>
</tbody>
</table>
# Ultrasonic Sensors, Diffuse Mode Sensors, rectangular types

## Technical Data

For detailed data and product description refer to the data sheets at [www.pepperl-fuchs.com](http://www.pepperl-fuchs.com).

### General Data

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating voltage</td>
<td>10 ... 30 V DC, ripple 10 %</td>
</tr>
<tr>
<td>Output type</td>
<td>Push-pull output, short-circuit protected, reverse polarity protected</td>
</tr>
<tr>
<td>Rated operational current</td>
<td>200 mA, short-circuit/overload protected</td>
</tr>
<tr>
<td>Synchronization</td>
<td>1 synchronous connection, bi-directional</td>
</tr>
<tr>
<td>Ambient temperature</td>
<td>-15 ... 70 °C (5 ... 158 °F)</td>
</tr>
<tr>
<td>Material</td>
<td>Housing: nickel plated, die cast zinc, Lateral: glass-fiber reinforced plastic PC</td>
</tr>
<tr>
<td></td>
<td>Transducer: epoxy resin/hollow glass sphere mixture; foam polyurethane, cover PBT</td>
</tr>
<tr>
<td>Protection degree</td>
<td>IP54</td>
</tr>
<tr>
<td>Connection type</td>
<td>Device connector M12 x 1, 5-pin</td>
</tr>
</tbody>
</table>

### Model Number

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Sensing range</td>
<td>15 ... 150 mm</td>
<td>20 ... 250 mm</td>
<td>30 ... 800 mm</td>
</tr>
<tr>
<td>Transducer frequency</td>
<td>approx. 850 kHz</td>
<td>approx. 400 kHz</td>
<td>approx. 310 kHz</td>
</tr>
<tr>
<td>No-load supply current</td>
<td>≤ 25 mA</td>
<td>≤ 60 mA</td>
<td></td>
</tr>
<tr>
<td>Switching frequency</td>
<td>max. 4 Hz</td>
<td>20 Hz</td>
<td>50 Hz</td>
</tr>
<tr>
<td>Input type</td>
<td>1 input for sound lobe adjustment</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Approvals and Certificates

| UL approval            | cULus Listed, General Purpose |
| CSA approval           | cCSAus Listed, General Purpose |

### Dimensions

<table>
<thead>
<tr>
<th>Dimension</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Length L [mm]</td>
<td>43</td>
</tr>
<tr>
<td>Width W [mm]</td>
<td>15</td>
</tr>
<tr>
<td>Height H [mm]</td>
<td>49</td>
</tr>
<tr>
<td>Connector area lc [mm]</td>
<td>16</td>
</tr>
</tbody>
</table>

### Accessories

- This and more accessories can be found in chapter 3.5 from page 673
- See pages from 972 ... for cordsets
- See pages 1068 ... for mounting aids

<table>
<thead>
<tr>
<th>Accessory</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>OMH-K01</td>
<td>Dovetail mounting clamp</td>
</tr>
<tr>
<td>OMH-K02</td>
<td>Dovetail mounting clamp</td>
</tr>
<tr>
<td>OMH-K03</td>
<td>Dovetail mounting clamp</td>
</tr>
<tr>
<td>OMH-01</td>
<td>Mounting aid for round steel ø 12 mm or sheet 1.5 mm ... 3 mm</td>
</tr>
<tr>
<td>OMH-06</td>
<td>Mounting aid for round steel ø 12 mm or sheet 1.5 mm ... 3 mm</td>
</tr>
<tr>
<td>OMH-MLV12-HWG</td>
<td>Mounting bracket for series MLV12 sensors</td>
</tr>
<tr>
<td>OMH-MLV12-HWK</td>
<td>Mounting bracket for series MLV12 sensors</td>
</tr>
<tr>
<td>V15-G-2M-PVC</td>
<td>Cable socket, M12, 5-pin, PVC cable</td>
</tr>
<tr>
<td>V15-W-2M-PUR</td>
<td>Cable socket, M12, 5-pin, PUR cable</td>
</tr>
</tbody>
</table>

### Electrical Connection

- Standard symbol/Connections: U (version EP, pnp/npn)
  - UB120-F12P-EP-V15
  - UB250-F12P-EP-V15
  - UB800-F12P-EP-V15
  - Core colours in accordance with EN 60947-5-2:
    - U (brown)
    - V (blue)
    - WH (white)
    - BK (black)
    - BU (blue)
    - GY (gray)
  - Wire colors in accordance with EN 60947-5-2:
    - 1 (brown)
    - 2 (blue)
    - 3 (white)
    - 4 (black)
    - 5 (gray)

Consider the General Notes on the Information in the Pepperl+Fuchs Product Catalogs

Pepperl+Fuchs Group
www.pepperl-fuchs.com
fa-info@de.pepperl-fuchs.com
fa-info@us.pepperl-fuchs.com
fa-info@sg.pepperl-fuchs.com

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Date of issue: 04/08/2015

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Ultrasonic Sensors, Diffuse Mode Sensors, rectangular types
Ultrasonic Sensors, Diffuse Mode Sensors, rectangular types

Ultrasonic Sensor F12 series

Properties
- 250 mm and 800 mm sensing range versions
- DC, switching output
- Miniature F12 housing
- Connector version

Your Benefit
- Simple pushbutton configuration
- Selectable wide/narrow beam width
- Universal sinking-sourcing output
- Rugged metal housing

Technical Data

For detailed data and product description refer to the datasheets at www.pepperl-fuchs.com

General Data
- Operating voltage: 10 ... 30 V DC
- No-load supply current: ≤ 30 mA
- Output type: Push-pull output, short-circuit protected, reverse polarity protected
- Rated operational current: 200 mA, short-circuit/overload protected
- Input type: 1 program input
- Synchronization: 1 synchronous connection, bi-directional
- Ambient temperature: -15 ... 70 °C (5 ... 158 °F)
- Material: Housing: Frame: nickel plated, die cast zinc, Laterals: glass-fiber reinforced plastic PC
- Transducer: epoxy resin/hollow glass sphere mixture; foam polyurethane, cover PBT
- Protection degree: IP54
- Connection type: Device connector M12 x 1, 5-pin

Model Number
- UB250-F12-EP-V15
- UB800-F12-EP-V15

Sensing range
- 20 ... 250 mm
- 30 ... 800 mm

Transducer frequency
- approx. 400 kHz
- approx. 310 kHz

Switching frequency
- 20 Hz
- 6 Hz

Approvals and Certificates
- UL approval: cULus Listed, General Purpose
- CSA approval: cCSAus Listed, General Purpose

Dimensions
- Length L [mm]: 43
- Width W [mm]: 15
- Height H [mm]: 49
- Connector area lc [mm]: 16

Accessories

This and more accessories can be found in chapter 3.5 from page 673
See pages from 972 ... for cordsets
See pages 1068 ... for mounting aids

OMH-K01: dove tail mounting clamp
OMH-K02: dove tail mounting clamp
OMH-K03: dove tail mounting clamp
OMH-01: Mounting aid for round steel ø 12 mm or sheet 1.5 mm ... 3 mm
OMH-06: Mounting aid for round steel ø 12 mm or sheet 1.5 mm ... 3 mm
OMH-MLV12-HWG: Mounting bracket for series MLV12 sensors
OMH-MLV12-HWK: Mounting bracket for series MLV12 sensors
V15-G-2M-PVC: Cable socket, M12, 5-pin, PVC cable
V15-W-2M-PUR: Cable socket, M12, 5-pin, PUR cable

Electrical Connection

UB250-F12-EP-V15
UB800-F12-EP-V15

Standard symbol/Connections:
(sixth series, pnp)

1.5V
NC
Vcc
 Winchester
 Switch output

Wire colors in accordance with EN 60947-5-2
1. BN (brown)
2. WH (white)
3. BU (blue)
4. BK (black)
5. GY (gray)

3.1 Ultrasonic Sensors, Diffuse Mode Sensors, rectangular types
Ultrasonic Sensors, Diffuse Mode Sensors, \[ \text{rectangular types} \]

**Technical Data**

For detailed data and product description refer to the data sheets at [www.pepperl-fuchs.com](http://www.pepperl-fuchs.com)

### General Data

- **No-load supply current**: \( \leq 30 \text{ mA} \)
- **Input type**: 1 program input
- **Synchronization**: 1 synchronous connection, bi-directional
- **Ambient temperature**: \(-15 \ldots 70^\circ \text{C} (5 \ldots 158^\circ \text{F})\)

**Material**

- **Housing**: frame: nickel plated, die cast zinc; laterals: glass-fiber reinforced plastic PC
- **Transducer**: epoxy resin/hollow glass sphere mixture; foam polyurethane, cover PBT
- **Protection degree**: IP54
- **Connection type**: Device connector M12 \( \times 1 \), 5-pin

### Model Number

- **UB250-F12-I-V15**
- **UB250-F12-U-V15**
- **UB800-F12-I-V15**
- **UB800-F12-U-V15**

### Sensing range

- 20 ... 250 mm
- 30 ... 800 mm

### Transducer frequency

- approx. 400 kHz
- approx. 310 kHz

### Operating voltage

- 10 ... 30 V DC
- 12 ... 30 V DC

### Output type

- 1 analog output 0 ... 10 V
- 1 analog output 4 ... 20 mA

### Approvals and Certificates

- UL approval: cULus Listed, General Purpose
- CSA approval: cCSAus Listed, General Purpose

### Dimensions

- Length \( L \) [mm]: 43
- Width \( W \) [mm]: 15
- Height \( H \) [mm]: 49
- Connector area \( l_c \) [mm]: 16

### Accessories

This and more accessories can be found in chapter 3.5 from page 673

- **OMH-K01**: dove tail mounting clamp
- **OMH-K02**: dove tail mounting clamp
- **OMH-K03**: dove tail mounting clamp
- **OMH-01**: Mounting aid for round steel \( \phi 12 \text{ mm} \) or sheet 1.5 mm ... 3 mm
- **OMH-06**: Mounting aid for round steel \( \phi 12 \text{ mm} \) or sheet 1.5 mm ... 3 mm
- **OMH-MLV12-HWG**: Mounting bracket for series MLV12 sensors
- **OMH-MLV12-HWK**: Mounting bracket for series MLV12 sensors
- **V15-G-2M-PVC**: Cable socket, M12, 5-pin, PVC cable
- **V15-W-2M-PUR**: Cable socket, M12, 5-pin, PUR cable

**Electrical Connection**

- [Standard symbol/Connections: (version I)]
- [Standard symbol/Connections: (version U)]

**Core colours in accordance with EN 60947-5-2:**

- BN (brown)
- WH (white)
- BU (blue)
- BK (black)
- GF (gray)

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**Consider the General Notes on the Information in the Pepperl+Fuchs Product Catalogs**

**Pepperl+Fuchs Group**

USA: +1 330 486 5001  Germany: +49 621 776-4411  Singapore: +65 6779 9091

[www.pepperl-fuchs.com](http://www.pepperl-fuchs.com)  fa-info@us.pepperl-fuchs.com  fa-info@de.pepperl-fuchs.com  fa-info@sg.pepperl-fuchs.com

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Technical Data

For detailed data and product description refer to the data sheets at www.pepperl-fuchs.com

General Data
 Operating voltage 10 ... 30 V DC
 No-load supply current \( \leq 50 \text{ mA} \)
 Interface type Serial interface (programming adapter required)
 Rated operational current 200 mA, short-circuit/overload protected
 Input type 1 program input
 Input/output type 1 synchronization connection, bidirectional
 Ambient temperature \(-25 \ldots 70 \, ^\circ \text{C} (-13 \ldots 158 \, ^\circ \text{F})\)

Material
 Housing PA-GF35
 Transducer epoxy resin/hollow glass sphere mixture; polyurethane foam
 Protection degree IP67
 Connection type Device connector M12 x 1, 5-pin

Model Number

<table>
<thead>
<tr>
<th>Sensing range</th>
<th>UC500-L2-E4-V15</th>
<th>UC500-L2-E5-V15</th>
<th>UC2000-L2-E4-V15</th>
<th>UC2000-L2-E5-V15</th>
<th>UC4000-L2-E4-V15</th>
<th>UC4000-L2-E5-V15</th>
</tr>
</thead>
<tbody>
<tr>
<td>35 ... 500 mm</td>
<td>( \bullet )</td>
<td>( \bullet )</td>
<td>( \bullet )</td>
<td>( \bullet )</td>
<td>( \bullet )</td>
<td>( \bullet )</td>
</tr>
<tr>
<td>60 ... 2000 mm</td>
<td>( \bullet )</td>
<td>( \bullet )</td>
<td>( \bullet )</td>
<td>( \bullet )</td>
<td>( \bullet )</td>
<td>( \bullet )</td>
</tr>
<tr>
<td>200 ... 4000 mm</td>
<td>( \bullet \bullet )</td>
<td>( \bullet \bullet )</td>
<td>( \bullet \bullet )</td>
<td>( \bullet \bullet )</td>
<td>( \bullet \bullet )</td>
<td>( \bullet \bullet )</td>
</tr>
</tbody>
</table>

Sensing range

Transducer frequency
 approx. 380 kHz
 approx. 175 kHz
 approx. 85 kHz

Output type
 1 switch output E4, NPN, NO/NC, programmable
 1 switch output E5, PNP NO/NC, programmable

Switching frequency
 \( \leq 14 \text{ Hz} \)
 \( \leq 5 \text{ Hz} \)
 \( \leq 2.8 \text{ Hz} \)

Approvals and Certificates
 UL approval cULus Listed, General Purpose
 CSA approval cCSAus Listed, General Purpose

Dimensions
 Length L [mm] 67
 Width W [mm] 40
 Height H [mm] 40

Accessories
 This and more accessories can be found in chapter 3.5 from page 673
 See pages from 972 ... for cordsets
 See pages 1068 ... for mounting aids

PACTware 3.6
 PACTware 4.X
 Ultraschall-Sensoren DTM
 DTM devices for communication with cube style and UMC... sensors
 UC-PROG1 Programming adapter
 V15-G-2M-PVC Cable socket, M12, 5-pin, PVC cable
 V15-W-2M-PUR Cable socket, M12, 5-pin, PUR cable
 UB-PROG2 Programming unit
 Microsoft .NET

Properties
 Up to 4000 mm sensing range versions
 DC, switching output
 Compact VariKont-L housing
 Connector version

Your Benefit
 High-visibility corner LEDs
 Pushbutton and PACTware configurable
 5-way, quick pivot sensing face

VariKont-L series

Electrical Connection

PAC500-L2-E5-V15 PAC200-L2-E4-V15 PAC400-L2-E5-V15
 PAC500-L2-E4-V15 PAC200-L2-E5-V15 PAC400-L2-E4-V15

Wire colors in accordance with EN 60947-5-2

1 BN (brown)
2 WH (white)
3 BU (blue)
4 BK (black)
5 GY (gray)
**Technical Data**

For detailed data and product description refer to the data sheets at www.pepperl-fuchs.com

**General Data**
- Operating voltage: 10 ... 30 V DC
- No-load supply current: \( \leq 50 \text{ mA} \)
- Interface type: Serial interface (programming adapter required)
- Rated operational current: 200 mA, short-circuit/overload protected
- Input/output type: 1 synchronization connection, bidirectional
- Ambient temperature: -25 ... 70 °C (-13 ... 158 °F)

**Material**
- Housing: PA-GF35
- Transducer: epoxy resin/hollow glass sphere mixture; polyurethane foam
- Protection degree: IP67
- Connection type: Device connector M12 x 1, 5-pin

**Model Number**

<table>
<thead>
<tr>
<th>UC9000-L2-E6-V15</th>
<th>UC9000-L2-E7-V15</th>
<th>UC20000-L2-E6-V15</th>
<th>UC20000-L2-E7-V15</th>
<th>UC40000-L2-E6-V15</th>
<th>UC40000-L2-E7-V15</th>
</tr>
</thead>
<tbody>
<tr>
<td>green = preferred type</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Sensing range**
- 35 ... 500 mm
- 60 ... 2000 mm
- 200 ... 4000 mm

**Transducer frequency**
- approx. 380 kHz
- approx. 175 kHz
- approx. 85 kHz

**Output type**
- 2 switch outputs NPN, NO/NC, programmable
- 2 switch outputs PNP, NO/NC, programmable

**Switching frequency**
- \( \leq 14 \text{ Hz} \)
- \( \leq 5 \text{ Hz} \)
- \( \leq 2.8 \text{ Hz} \)

**Approvals and Certificates**
- UL approval: cULus Listed, General Purpose
- CSA approval: cCSAus Listed, General Purpose

**Dimensions**
- Length L [mm]: 67
- Width W [mm]: 40
- Height H [mm]: 40

**Accessories**
- This and more accessories can be found in chapter 3.5 from page 673
- See pages from 972 ... for cordsets
- See pages 1068 ... for mounting aids

**Electrical Connection**

**Properties**
- Up to 4000 mm sensing range versions
- DC, 2 switching outputs
- Compact VariKont-L housing
- Connector version

**Your Benefit**
- High-visibility corner LEDs
- Pushbutton and PACTware configurable
- 5-way, quick pivot sensing face

**VariKont-L series**

- VariKont
  - L series
- Up to 4000 mm sensing range versions
- DC, 2 switching outputs
- Compact VariKont-L housing
- Connector version

- High-visibility corner LEDs
- Pushbutton and PACTware configurable
- 5-way, quick pivot sensing face
Technical Data

For detailed data and product description refer to the data sheets at www.pepperl-fuchs.com

General Data

- No-load supply current: ≤ 50 mA
- Interface type: Serial interface (programming adapter required)
- Deviation of the characteristic curve: ± 0.2 % of full-scale value
- Input type: 1 program input
- Input/output type: 1 synchronization connection, bidirectional
- Ambient temperature: -25 ... 70 °C (-13 ... 158 °F)
- Material: PA-GF35
- Transducer: epoxy resin/hollow glass sphere mixture; polyurethane foam
- Protection degree: IP67
- Connection type: Device connector M12 x 1, 5-pin

Model Number

- green = preferred type
- Sensing range
  - 35 ... 500 mm
  - 60 ... 2000 mm
  - 200 ... 4000 mm
- Transducer frequency
  - approx. 380 kHz
  - approx. 175 kHz
  - approx. 85 kHz
- Operating voltage
  - 10 ... 30 V DC
  - 12 ... 30 V DC
- Output type
  - 1 analog output 4 ... 20 mA
  - 1 analog output 0 ... 10 V
- Resolution
  - Evaluation range [mm]/3200, but ≥ 0.05 mm
  - Evaluation range [mm]/3200, but ≥ 0.4 mm
  - Evaluation range [mm]/4000, but ≥ 0.05 mm
  - Evaluation range [mm]/4000, but ≥ 0.4 mm

Approvals and Certificates

- UL approval: cULus Listed, General Purpose
- CSA approval: cCSAus Listed, General Purpose

Dimensions

- Length L [mm]: 67
- Width W [mm]: 40
- Height H [mm]: 40

Accessories

- This and more accessories can be found in chapter 3.5 from page 673
- See pages 972 ... for cordsets
- See pages 1068 ... for mounting aids

PACTware 3.6
- Frame application

PACTware 4.3
- Frame application

Ultraschall-Sensoren DTM
- DTM devices for communication with cube style and UMC... sensors

UC-PROG1
- Programming adapter

V15-G-2M-PVC
- Cable socket, M12, 5-pin, PVC cable

V15-W-2M-PUR
- Cable socket, M12, 5-pin, PUR cable

UB-PROG2
- Programming unit

Microsoft .NET
- Software

Properties

- Up to 4000 mm sensing range versions
- DC, analog output
- Compact VariKont-L housing
- Connector version

Your Benefit

- High-visibility corner LEDs
- Pushbutton and PACTware configurable
- 5-way, quick pivot sensing face

Electrical Connection

- UC500-L2-I-V15
- UC2000-L2-I-V15
- UC4000-L2-I-V15
- UC500-L2-U-V15
- UC2000-L2-U-V15
- UC4000-L2-U-V15

1 +UB 5
2 4
3 2 4
1 5
2 3 4
1 BN (brown)
2 WH (white)
3 BU (blue)
4 BK (black)
5 GF (gray)

Wire colors in accordance with EN 60947-5-2
**Ultrasonic Sensors, Diffuse Mode Sensors, rectangular types**

### Technical Data

**General Data**
- Operating voltage: 10 ... 30 V DC, ripple 10 %
- No-load supply current: ≤ 55 mA
- Rated operational current: 200 mA, short-circuit/overload protected
- Input type: 1 program input,
- Synchronization: 1 synchronous input
- Ambient temperature: -25 ... 70 °C (-13 ... 158 °F)
- Material: Housing ABS
- Transducer: epoxy resin/hollow glass sphere mixture; polyurethane foam
- Protection degree: IP65
- Connection type: Device connector M12 x 1, 5-pin

**Model Number**

<table>
<thead>
<tr>
<th>Model Number</th>
<th>UB500-F54-E4-V15</th>
<th>UB500-F54-E5-V15</th>
<th>UB2000-F54-E4-V15</th>
<th>UB2000-F54-E5-V15</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sensing range</td>
<td>30 ... 500 mm</td>
<td>80 ... 2000 mm</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Transducer frequency</td>
<td>approx. 380 kHz</td>
<td>approx. 175 kHz</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Output type</td>
<td>1 switch output E4, NPN, NO/NC</td>
<td>1 switch output E5, PNP, NO/NC</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Switching frequency</td>
<td>max. 10 Hz</td>
<td>max. 3 Hz</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Approvals and Certificates**

- UL approval: cULus Listed, General Purpose
- CSA approval: cCSAus Listed, General Purpose

**Dimensions**

<table>
<thead>
<tr>
<th>Dimension</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Length L [mm]</td>
<td>105</td>
</tr>
<tr>
<td>Width W [mm]</td>
<td>32</td>
</tr>
<tr>
<td>Height H [mm]</td>
<td>25</td>
</tr>
<tr>
<td>Connector area l_c [mm]</td>
<td>15</td>
</tr>
</tbody>
</table>

**Accessories**

- Programming unit: UB-PRO2
- Cable socket, M12, 5-pin: V15-G-2M-PVC, PUR cable: V15-W-2M-PUR

**Electrical Connection**

- Wire colors in accordance with EN 60947-5-2.

**Properties**

- 500 mm and 2000 mm sensing range versions
- DC, switching output
- Surface mount F54 housing
- Connector version

**Your Benefit**

- Low mounting profile

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For detailed data and product description refer to the data sheets at [www.pepperl-fuchs.com](http://www.pepperl-fuchs.com)

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Ultrasonic sensor F54 series

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Consider the General Notes on the Information in the Pepperl+Fuchs Product Catalogs

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Pepperl+Fuchs Group

USA: +1 330 486 0001

www.pepperl-fuchs.com fa-info@us.pepperl-fuchs.com

Germany: +49 621 776-4411

fa-info@de.pepperl-fuchs.com

Singapore: +65 6779 9091

fa-info@sg.pepperl-fuchs.com

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Date of issue: 04/08/2015

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644
Ultrasonic sensor

F54 series

Technical Data

For detailed data and product description refer to the data sheets at www.pepperl-fuchs.com

General Data

No-load supply current ≤ 55 mA
Deviation of the characteristic curve ≤ 1 % of full-scale value
Input type 1 program input
Synchronization 1 synchronous input
Ambient temperature -25 ... 70 °C (-13 ... 158 °F)

Material

Housing ABS
Transducer epoxy resin hollow glass sphere mixture; polyurethane foam
Protection degree IP65
Connection type Device connector M12 x 1, 5-pin

Model Number

green = preferred type
UB500-F54-I-V15
UB500-F54-U-V15
UB2000-F54-I-V15
UB2000-F54-U-V15

Sensing range

30 ... 500 mm
80 ... 2000 mm

Transducer frequency

approx. 380 kHz
approx. 175 kHz

Operating voltage

10 ... 30 V DC, ripple 10 % SS
15 ... 30 V DC, ripple 10 % SS

Output type

1 analog output 0 ... 10 V
1 analog output 4 ... 20 mA

Resolution

0.11 mm
0.13 mm
0.47 mm
0.5 mm

Approvals and Certificates

UL approval cULus Listed, General Purpose
CSA approval cCSAus Listed, General Purpose

Dimensions

Length L [mm] 105
Width W [mm] 32
Height H [mm] 25
Connector area lc [mm] 15

Accessories

This and more accessories can be found in chapter 3.5 from page 673
See pages from 972 ... for cordsets
See pages 1068 ... for mounting aids

UB-PROG2 Programming unit
V15-G-2M-PVC Cable socket, M12, 5-pin, PVC cable
V15-W-2M-PUR Cable socket, M12, 5-pin, PUR cable

Electrical Connection

UB500-F54-I-V15
UB2000-F54-I-V15
UB500-F54-U-V15
UB2000-F54-U-V15

Standard symbol/Connections: (version I)

Teaching input
Synchronous
Analog output

Standard symbol/Connections: (version U)

Teaching input
Synchronous
Analog output

Wire colors in accordance with EN 60947-5-2

1 BN (brown)
2 WH (white)
3 BU (blue)
4 BK (black)
5 GY (gray)
Ultrasonic Sensors, Diffuse Mode Sensors, rectangular types

### General Data
- **Operating voltage**: 10 … 30 V DC, ripple ± 10 \%<sub>DS</sub>
- **Power consumption**: ≤ 2 W (all relays pulled-in, current output 20 mA) no-load power consumption ≤ 0.7 W
- **Interface type**: RS 232, 9600 bps, no parity, 8 data bits, 1 stop bit
- **Output type**: 2 relay outputs, 1 analog output 4 … 20 mA
- **Contact loading**: 60 V DC / 1 A (max. 24 W DC), ohmic
- **Deviation of the characteristic curve**: < 0.2 \% of full-scale value
- **Material**:
  - **Housing**: PBT
  - **Transducer**: epoxy resin/hollow glass sphere mixture; polyurethane foam
- **Protection degree**: IP65
- **Connection type**: Device connector M12 x 1, 8-pin
  - Screen connected to pin 8

### Technical Data

#### General Data
- **Operating voltage**: 10 … 30 V DC, ripple ± 10 \%<sub>DS</sub>
- **Power consumption**: ≤ 2 W (all relays pulled-in, current output 20 mA) no-load power consumption ≤ 0.7 W
- **Interface type**: RS 232, 9600 bps, no parity, 8 data bits, 1 stop bit
- **Output type**: 2 relay outputs, 1 analog output 4 … 20 mA
- **Contact loading**: 60 V DC / 1 A (max. 24 W DC), ohmic
- **Deviation of the characteristic curve**: < 0.2 \% of full-scale value
- **Material**:
  - **Housing**: PBT
  - **Transducer**: epoxy resin/hollow glass sphere mixture; polyurethane foam
- **Protection degree**: IP65
- **Connection type**: Device connector M12 x 1, 8-pin
  - Screen connected to pin 8

#### Properties
- **Sensing range**
  - 0 … 300 mm
  - 80 … 2000 mm
- **Transducer frequency**
  - approx. 390 kHz
  - approx. 175 kHz
- **Resolution**
  - 0.2 mm
  - 0.6 mm
- **Ambient temperature**
  - 0 … 70 °C (32 … 158 °F)
  - -25 … 70 °C (-13 … 158 °F)

#### Approvals and Certificates
- **UL approval**
  - cULus Listed, General Purpose
- **CSA approval**
  - cCSAus Listed, General Purpose

#### Dimensions
- Length L [mm]: 134
- Width W [mm]: 52
- Height H [mm]: 30
- Connector area l<sub>c</sub> [mm]: 15

#### Accessories
- **UC-F43-R2**: Configuration Interface
- **ULTRA3000**: Software for ultrasonic sensors, comfort line
- **V17-G-2M-PUR**: Cable socket, M12, 8-pin, shielded, PUR cable
- **V17-G-5M-PUR**: Cable socket, M12, 8-pin, shielded, PUR cable

For detailed data and product description refer to the data sheets at www.pepperl-fuchs.com
### Technical Data

**For detailed data and product description refer to the data sheets at** [www.pepperl-fuchs.com](http://www.pepperl-fuchs.com)

#### General Data

- **Operating voltage**: 10 ... 30 V DC, ripple 10 %
- **Rated operational current**: 200 mA, short-circuit/overload protected
- **Synchronization**: bi-directional
- **Ambient temperature**: -25 ... 70 °C (-13 ... 158 °F)
- **Material**: Housing ABS
- **Transducer**: epoxy resin/hollow glass sphere mixture; foam polyurethane, cover PBT
- **Protection degree**: IP54
- **Connection type**: Device connector M12 x 1, 5-pin

#### Model Number

<table>
<thead>
<tr>
<th>Model Number</th>
<th>Sensing range</th>
<th>Transducer frequency</th>
<th>No-load supply current</th>
<th>Output type</th>
<th>Switching frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>UB500-F42-E4-V15</td>
<td>30 ... 500 mm</td>
<td>approx. 390 kHz</td>
<td>≤ 50 mA</td>
<td>1 switch output E4, NPN, NO/NC, programmable</td>
<td>≤ 0.6 Hz</td>
</tr>
<tr>
<td>UB2000-F42-E4-V15</td>
<td>60 ... 2000 mm</td>
<td>approx. 175 kHz</td>
<td>≤ 60 mA</td>
<td>1 switch output E5, PNP NO/NC, programmable</td>
<td>≤ 1.2 Hz</td>
</tr>
<tr>
<td>UB4000-F42-E4-V15</td>
<td>200 ... 4000 mm</td>
<td>approx. 85 kHz</td>
<td>≥ 0.6 Hz</td>
<td></td>
<td>≤ 2.7 Hz</td>
</tr>
<tr>
<td>UB6000-F42-E4-V15</td>
<td>350 ... 6000 mm</td>
<td>approx. 65 kHz</td>
<td>≥ 8 Hz</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### Dimensions

- **Length L [mm]**: 80
- **Width W [mm]**: 80
- **Height H [mm]**: 34
- **Transducer length l1 [mm]**: 0
- **Connector area lc [mm]**: 16

#### Accessories

- **MH 04-3505**: Mounting aid for FP sensors
- **MHW 11**: Mounting brackets for sensors
- **V15-G-2M-PVC**: Cable socket, M12, 5-pin, PVC cable
- **V15-W-2M-PUR**: Cable socket, M12, 5-pin, PUR cable

This and more accessories can be found in chapter 3.5 from page 673. See pages from 972 ... for cordsets See pages 1068 ... for mounting aids

### Your Benefit

- **Simple pushbutton configuration**

### Electrical Connection

- **UB500-F42-E4-V15**
- **UB2000-F42-E4-V15**
- **UB4000-F42-E4-V15**
- **UB6000-F42-E4-V15**

**Standard symbol/Connections:** (version E4, npn)

<table>
<thead>
<tr>
<th>pin</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td><strong>BN</strong> (brown)</td>
<td><strong>WH</strong> (white)</td>
<td><strong>BU</strong> (blue)</td>
<td><strong>BK</strong> (black)</td>
<td><strong>GY</strong> (gray)</td>
</tr>
</tbody>
</table>

**Wire colors in accordance with EN 60947-5-2.**

- **UB500-F42-E5-V15**
- **UB2000-F42-E5-V15**
- **UB4000-F42-E5-V15**
- **UB6000-F42-E5-V15**

**Standard symbol/Connections:** (version E5, pnp)

<table>
<thead>
<tr>
<th>pin</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td><strong>BN</strong> (brown)</td>
<td><strong>WH</strong> (white)</td>
<td><strong>BU</strong> (blue)</td>
<td><strong>BK</strong> (black)</td>
<td><strong>GY</strong> (gray)</td>
</tr>
</tbody>
</table>

**Wire colors in accordance with EN 60947-5-2.**
### Technical Data

For detailed data and product description refer to the data sheets at [www.pepperl-fuchs.com](http://www.pepperl-fuchs.com)

#### General Data
- **Operating voltage**: 10 ... 30 V DC, ripple 10 %
- **Rated operational current**: 200 mA, short-circuit/overload protected
- **Synchronization**: bi-directional
- **Ambient temperature**: -25 ... 70 °C (-13 ... 158 °F)
- **Material**: Housing ABS, Transducer epoxy resin/hollow glass sphere mixture; foam polyurethane, cover PBT
- **Protection degree**: IP54
- **Connection type**: Device connector M12 x 1, 5-pin

#### Model Number
- **UB500-F42-E6-V15**
- **UB500-F42-E7-V15**
- **UB2000-F42-E6-V15**
- **UB2000-F42-E7-V15**
- **UB4000-F42-E6-V15**
- **UB4000-F42-E7-V15**
- **UB6000-F42-E6-V15**
- **UB6000-F42-E7-V15**

#### Sensing range
- **30 ... 500 mm**
- **60 ... 2000 mm**
- **200 ... 4000 mm**
- **350 ... 6000 mm**

#### Transducer frequency
- **approx. 390 kHz**
- **approx. 175 kHz**
- **approx. 85 kHz**
- **approx. 65 kHz**

#### No-load supply current
- **≤ 50 mA**
- **≤ 60 mA**

#### Output type
- 2 switch outputs NPN, normally open/close selectable
- 2 switch outputs PNP, NO/NC selectable

#### Switching frequency
- **≤ 0.6 Hz**
- **≤ 1.2 Hz**
- **≤ 2.7 Hz**
- **≤ 8 Hz**

#### Approvals and Certificates
- UL approval: cULus Listed, General Purpose
- CSA approval: cCSAus Listed, General Purpose

#### Dimensions
- **Length L [mm]**
- **Width W [mm]**
- **Height H [mm]**
- **Transducer length l1 [mm]**
- **Connector area lc [mm]**

#### Accessories
- MH 04-3505: Mounting aid for FP sensors
- MW 11: Mounting brackets for sensors
- V15-G-2M-PVC: Cable socket, M12, 5-pin, PVC cable
- V15-W-2M-PUR: Cable socket, M12, 5-pin, PUR cable

This and more accessories can be found in chapter 3.5 from page 673. See pages from 972 ... for cordsets. See pages 1068 ... for mounting aids.

### Electrical Connection

<table>
<thead>
<tr>
<th>UB500-F42-E6-V15</th>
<th>UB500-F42-E7-V15</th>
</tr>
</thead>
<tbody>
<tr>
<td>UB2000-F42-E6-V15</td>
<td>UB2000-F42-E7-V15</td>
</tr>
<tr>
<td>UB4000-F42-E6-V15</td>
<td>UB4000-F42-E7-V15</td>
</tr>
<tr>
<td>UB6000-F42-E6-V15</td>
<td>UB6000-F42-E7-V15</td>
</tr>
</tbody>
</table>

Core colours in accordance with EN 60947-5-2.
Ultrasonic Sensors, Diffuse Mode Sensors, rectangular types

### Technical Data

For detailed data and product description refer to the data sheets at www.pepperl-fuchs.com

#### General Data

- Deviation of the characteristic curve: ±1% of full-scale value
- Synchronization: bi-directional
- Ambient temperature: -25 ... 70 °C (-13 ... 158 °F)
- Material: ABS
- Transducer: epoxy resin/hollow glass sphere mixture; foam polyurethane, cover PBT
- Protection degree: IP54
- Connection type: Device connector M12 x 1, 5-pin

#### Model Number

- green = preferred type

|--------------|-----------------|-----------------|-----------------|-----------------|

#### Sensing range

- 30 ... 500 mm
- 60 ... 2000 mm
- 200 ... 4000 mm
- 350 ... 6000 mm

#### Transducer frequency

- approx. 390 kHz
- approx. 175 kHz
- approx. 85 kHz
- approx. 65 kHz

#### Operating voltage

- 10 ... 30 V DC, ripple 10% SS
- 17 ... 30 V DC, ripple 10% SS

#### No-load supply current

- ≤50 mA
- ≤60 mA

#### Output type

- 1 analog output 0...10 V
- 1 analog output 4...20 mA

#### Resolution

- 0.2 mm at max. sensing range
- 0.7 mm

#### Approvals and Certificates

- UL approval: cULus Listed, General Purpose
- CSA approval: cCSAus Listed, General Purpose

#### Dimensions

- Length L [mm]: 80
- Width W [mm]: 80
- Height H [mm]: 34
- Transducer length l₁ [mm]: 0
- Connector area lc [mm]: 16

#### Accessories

This and more accessories can be found in chapter 3.5 from page 673
See pages from 972 ... for cordsets
See pages 1068 ... for mounting aids

- MH 04-3505: Mounting aid for FP sensors
- MHW 11: Mounting brackets for sensors
- DAS-IU-2K-V: Process control and indication equipment
- V15-G-2M-PVC: Cable socket, M12, 5-pin, PVC cable
- V15-W-2M-PUR: Cable socket, M12, 5-pin, PUR cable

#### Electrical Connection

- UB500-F42-V15
- UB2000-F42-V15
- UB4000-F42-V15
- UB6000-F42-V15

- UB500-F42-U-V15
- UB2000-F42-U-V15
- UB4000-F42-U-V15
- UB6000-F42-U-V15

Standard symbol/Connections:

![Standard symbol/Connections:](image)

Core colours in accordance with EN 60947-5-2:

1. BN (brown)
2. WH (white)
3. BU (blue)
4. BK (black)
5. GY (gray)
## Technical Data

For detailed data and product description refer to the data sheets at www.pepperl-fuchs.com

### General Data

- **Operating voltage**: 20 ... 253 V AC
- **No-load supply current**: ≤ 60 mA
- **Output type**: 1 relay output
- **Rated operational current**: 3 A
- **Ambient temperature**: -25 ... 70 °C (-13 ... 158 °F)
- **Material**: PBT
- **Transducer**: epoxy resin/hollow glass sphere mixture; foam polyurethane, cover PBT
- **Protection degree**: IP65
- **Connection**: 5-pin V95 connector (7/8”-16 UN 2A)

### Model Number

<table>
<thead>
<tr>
<th>Model Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>UB400-F42-UK-V95</td>
</tr>
<tr>
<td>UB1500-F42-UK-V95</td>
</tr>
<tr>
<td>UB3000-F42-UK-V95</td>
</tr>
<tr>
<td>UB5000-F42-UK-V95</td>
</tr>
</tbody>
</table>

### Sensing range

- 40 ... 400 mm
- 70 ... 1500 mm
- 350 ... 5000 mm

### Transducer frequency

- approx. 390 kHz
- approx. 175 kHz
- approx. 85 kHz
- approx. 65 kHz

### Switching frequency

- ≤ 0.6 Hz
- ≤ 1.5 Hz
- ≤ 3 Hz
- ≤ 8 Hz

### Accessories

- V95-G: Female connector, 7/8” - 16 UN, 5-pin, field attachable
- V95-W: Field attachable female cordset
- V95-W-5M-PVC: Female connector, 7/8”, 5-pin, PVC cable
- MH 04-3505: Mounting aid for FP sensors
- MHW 11: Mounting brackets for sensors

### Electrical Connection

![Connection Diagram](attachment:image.png)

### Properties

- **Up to 5000 mm sensing range versions**
- **AC/DC, relay output**
- **Surface mount F42 housing, front view**
- **Connector version**

### Your Benefit

- **Simple pushbutton configuration**

---

**Wire colors**

<table>
<thead>
<tr>
<th>Wire</th>
<th>Color</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>WH</td>
</tr>
<tr>
<td>2</td>
<td>RD</td>
</tr>
<tr>
<td>3</td>
<td>GN</td>
</tr>
<tr>
<td>4</td>
<td>OR</td>
</tr>
<tr>
<td>5</td>
<td>BK</td>
</tr>
</tbody>
</table>
Ultrasonic sensor F42 series

Technical Data

For detailed data and product description refer to the data sheets at www.pepperl-fuchs.com

General Data
Operating voltage 10 ... 30 V DC, ripple 10 %SS
No-load supply current ≤ 50 mA
Rated operational current 200 mA, short-circuit/overload protected
Synchronization bi-directional
Ambient temperature -25 ... 70 °C (-13 ... 158 °F)

Material
Housing ABS
Transducer epoxy resin/hollow glass sphere mixture; foam polyurethane, cover PBT
Protection degree IP54
Connection type Device connector M12 x 1, 5-pin

Model Number
Sensing range 30 ... 500 mm
Transducer frequency approx. 390 kHz
Output type 1 switch output E4, NPN, NO/NC, programmable
1 switch output E5, PNP NO/NC, programmable
2 switch outputs NPN, normally open/close selectable
2 switch outputs PNP, NO/NC selectable
Switching frequency ≤ 2.7 Hz
≤ 8 Hz

Approvals and Certificates
UL approval cULus Listed, General Purpose
CSA approval cCSAus Listed, General Purpose

Dimensions
Length L [mm] 80
Width W [mm] 80
Height H [mm] 34
Transducer length l1 [mm] 0
Connector area lc [mm] 16

Accessories
MH 04-3505 Mounting aid for FP sensors
MHW 11 Mounting brackets for sensors
V15-G-2M-PVC Cable socket, M12, 5-pin, PVC cable
V15-W-2M-PUR Cable socket, M12, 5-pin, PUR cable

Electrical Connection

Properties
- 500 mm and 2000 mm sensing range versions
- DC, 1 and 2 switching outputs versions
- Surface mount F42 housing, side view
- Connector version

Your Benefit
- Simple pushbutton configuration
### Technical Data

For detailed data and product description refer to the data sheets at [www.pepperl-fuchs.com](http://www.pepperl-fuchs.com)

**General Data**
- **Operating voltage**: 20 ... 253 V AC
- **No-load supply current**: ≤ 60 mA
- **Output type**: 1 relay output
- **Rated operational current**: 3 A
- **Ambient temperature**: -25 ... 70 °C (-13 ... 158 °F)
- **Material**: Housing: PBT
  - Transducer: epoxy resin/hollow glass sphere mixture; foam polyurethane, cover PBT
- **Protection degree**: IP65
- **Connection**: 5-pin V95 connector (7/8"-16 UN 2A)

**Model Number**

<table>
<thead>
<tr>
<th>Model</th>
<th>UB400-F42S-UK-V95</th>
<th>UB1500-F42S-UK-V95</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sensing range</td>
<td>40 ... 400 mm</td>
<td></td>
</tr>
<tr>
<td></td>
<td>70 ... 1500 mm</td>
<td></td>
</tr>
<tr>
<td>Transducer frequency</td>
<td>approx. 390 kHz</td>
<td>approx. 175 kHz</td>
</tr>
<tr>
<td>Switching frequency</td>
<td>≤ 3 Hz</td>
<td>≤ 8 Hz</td>
</tr>
</tbody>
</table>

**Dimensions**

<table>
<thead>
<tr>
<th>Dimension</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Length L [mm]</td>
<td>80</td>
</tr>
<tr>
<td>Width W [mm]</td>
<td>80</td>
</tr>
<tr>
<td>Height H [mm]</td>
<td>34</td>
</tr>
<tr>
<td>Transducer length l₁ [mm]</td>
<td>0</td>
</tr>
<tr>
<td>Connector area l₅ [mm]</td>
<td>16</td>
</tr>
</tbody>
</table>

**Accessories**

This and more accessories can be found in chapter 3.5 from page 673

- **V95-G**: Female connector, 7/8"-16 UN, 5-pin, field attachable
- **V95-W-5M-PVC**: Female connector, 7/8", 5-pin, PVC cable
- **V95-W**: Field attachable female cordset
- **V95-W-2M-PVC**: Female connector, 7/8", 5-pin, PVC cable
- **MH 04-3505**: Mounting aid for FP sensors
- **MHW 11**: Mounting brackets for sensors

**Electrical Connection**

![Electrical Connection Diagram](image)

**Wire colors**

1. WH (white)
2. RD (red)
3. GN (green)
4. OR (orange)
5. BK (black)
Ultrasonic Sensors, Diffuse Mode Sensors, rectangular types

### Technical Data

For detailed data and product description refer to the data sheets at www.pepperl-fuchs.com

#### General Data
- Deviation of the characteristic curve: ± 1% of full-scale value
- Synchronization: bi-directional
- Ambient temperature: -25 ... 70 °C (-13 ... 158 °F)
- Material: ABS
- Transducer: epoxy resin/hollow glass sphere mixture; foam polyurethane, cover PBT
- Protection degree: IP54
- Connection type: Device connector M12 x 1, 5-pin

#### Model Number

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>30 ... 500 mm</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>60 ... 2000 mm</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>60 ... 2000 mm</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>60 ... 2000 mm</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### Properties
- 500 mm and 2000 mm sensing range versions
- DC, analog output
- Surface mount F42 housing, side view
- Connector version

#### Your Benefit
- Simple pushbutton configuration

#### Model Number
- Sensing range: 30 ... 500 mm
- Transducer frequency: approx. 390 kHz
- Operating voltage: 10 ... 30 V DC, ripple 10% SS
- No-load supply current: ≤ 50 mA
- Output type: 1 analog output 0 ... 10 V
- Resolution: 0.2 mm at max. sensing range
- Approvals and Certificates:
  - UL approval: cULus Listed, General Purpose
  - CSA approval: cCSAus Listed, General Purpose
- Dimensions:
  - Length L [mm]: 80
  - Width W [mm]: 80
  - Height H [mm]: 34
  - Transducer length l₁ [mm]: 0
  - Connector area lc [mm²]: 16
- Accessories:
  - MH 04-3505: Mounting aid for FP sensors
  - MHW 11: Mounting brackets for sensors
  - DAS-1U-2K-V: Process control and indication equipment
  - V15-G-2M-PVC: Cable socket, M12, 5-pin, PVC cable
  - V15-W-2M-PUR: Cable socket, M12, 5-pin, PUR cable
- Electrical Connection

#### Wire colors in accordance with EN 60947-5-2:
- 1: BN (brown)
- 2: WH (white)
- 3: BU (blue)
- 4: BK (black)
- 5: GY (gray)
### Technical Data

**For detailed data and product description refer to the data sheets at www.pepperl-fuchs.com**

#### General Data
- **Operating voltage**: 12 ... 30 V (including ripple)
- **No-load supply current**: \( \leq 60 \text{ mA} \)
- **Output type**: 2 switch outputs PNP, NO
- **Rated operational current**: 150 mA, short-circuit/overload protected
- **Input type**: 1 program input
- **Teach-In of \( S_{\text{min}} \)**
- **Ambient temperature**: -25 ... 70 °C (-13 ... 158 °F)
- **Material**
  - Housing: PBT
  - Transducer: epoxy resin/hollow glass sphere mixture; polyurethane foam
- **Protection degree**: IP65
- **Connection type**: Device connector M12 x 1, 5-pin

#### Model Number
- **Sensing range**: 60 ... 500 mm
  - 200 ... 1500 mm
  - 250 ... 2500 mm

#### Approvals and Certificates
- **UL approval**: cULus Listed, General Purpose
- **CSA approval**: cCSAus Listed, General Purpose

#### Dimensions
- **Length L [mm]**: 64.4
- **Width W [mm]**: 125
- **Height H [mm]**: 30
- **Connector area \( l_c \) [mm]**: 12

#### Accessories
- **This and more accessories can be found in chapter 3.5 from page 673**
  - See pages from 972 ... for cordsets
  - See pages 1068 ... for mounting aids

### Electrical Connection

#### Wire colors in accordance with EN 60947-5-2
- **1**: BN (brown)
- **2**: WH (white)
- **3**: BU (blue)
- **4**: BK (black)
- **5**: GY (gray)
Ultrasonic Sensors, Diffuse Mode Sensors, rectangular types

**Technical Data**

For detailed data and product description refer to the data sheets at www.pepperl-fuchs.com

### General Data

- **Operating voltage**: 15 ... 30 V (including ripple) 
  - In supply voltage interval 15 ... 20 V reduced sensitivity by 20% ... 0%
- **No-load supply current**: ≤ 60 mA
- **Output type**: 1 switch output PNP, NO
- **Operating current**: ≤ 300 mA, short-circuit/overload protected
- **Linearity error**: ≤ 1.5 %
- **Input type**: 1 Function input
- **Ambient temperature**: -25 ... 70 °C (-13 ... 158 °F)
- **Material**: Housing: PBT
  - Transducer: epoxy resin/hollow glass sphere mixture; polyurethane foam
- **Protection degree**: IP65
- **Connection type**: Device connector M12 x 1 , 5-pin

### Model Number

<table>
<thead>
<tr>
<th>Sensing range</th>
<th>UC500-F65-IE2R2-V15</th>
<th>UC500-F65-UE2R2-V15</th>
</tr>
</thead>
<tbody>
<tr>
<td>60 ... 500 mm</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>200 ... 1500 mm</td>
<td>●●</td>
<td>●●</td>
</tr>
<tr>
<td>Transducer frequency</td>
<td>approx. 300 kHz</td>
<td>approx. 200 kHz</td>
</tr>
<tr>
<td></td>
<td></td>
<td>approx. 120 kHz</td>
</tr>
<tr>
<td>Output type</td>
<td>1 voltage output 0 ... 10 V, rising slope</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1 current output 0 ... 10 mA, rising slope</td>
<td></td>
</tr>
</tbody>
</table>

### Approvals and Certificates

- **UL approval**: cULus Listed, General Purpose
- **CSA approval**: cCSAus Listed, General Purpose

### Dimensions

| Length L [mm] | 64.4 |
| Width W [mm]  | 125  |
| Height H [mm] | 30   |
| Connector area l_c [mm] | 12   |

### Accessories

- **This and more accessories can be found in chapter 3.5 from page 673**
- **See pages from 972 ... for cordsets**
- **See pages 1068 ... for mounting aids**

**UC500-F65-IE2R2-V15**
- **V15-G-2M-PUR**: Cable socket, M12, 5-pin, PUR cable
- **V15-G-2M-PVC**: Cable socket, M12, 5-pin, PVC cable
- **V15-W-2M-PUR**: Cable socket, M12, 5-pin, PUR cable
- **V15-W-2M-PVC**: Cable socket, M12, 5-pin, PVC cable
- **3RX4000-PF**: PC interface

### Electrical Connection

- **UC500-F65-IE2R2-V15**
- **UC1500-F65-IE2R2-V15**
- **UC2500-F65-IE2R2-V15**
- **UC500-F65-UE2R2-V15**
- **UC1500-F65-UE2R2-V15**
- **UC2500-F65-UE2R2-V15**

**Wire colors in accordance with EN 60947-5-2**

- **1**: BN (brown)
- **2**: WH (white)
- **3**: BU (blue)
- **4**: BK (black)
- **5**: GY (gray)

---

**Properties**

- Up to 2500 mm sensing range versions
- DC, analog output, switching output and programming interface
- Level measurement optimized F65 housing
- Connector version

**Your Benefit**

- SONPROG programmable sensing limits and filtering
- Ultra-low 30 mm mounting height
- Gasketed transducer seals the tank/container
Ultrasonic Sensors, Diffuse Mode Sensors, rectangular types

**Technical Data**

For detailed data and product description refer to the data sheets at www.pepperl-fuchs.com

### General Data

- **Operating voltage**: 12 ... 30 V (including ripple)
- **No-load supply current**: ≤ 60 mA
- **Rated operational current**: 300 mA
- **Input type**: 1 Function input
- **Ambient temperature**: -25 ... 70 °C (-13 ... 158 °F)
- **Material**:
  - Housing: PBT
  - Transducer: epoxy resin/hollow glass sphere mixture; polyurethane foam
- **Protection degree**: IP65
- **Connection type**: Device connector M12 x 1, 4-pin

### Electrical Connection

**Model Number**

<table>
<thead>
<tr>
<th>Model Number</th>
<th>UC500-F65-RE2R2-V15</th>
<th>UC1500-F65-RE2R2-V15</th>
<th>UC2500-F65-RE2R2-V15</th>
</tr>
</thead>
</table>

- **Sensing range**: 60 ... 500 mm, 200 ... 1500 mm, 250 ... 2500 mm
- **Transducer frequency**: approx. 300 kHz, approx. 200 kHz, approx. 120 kHz
- **Output frequency**: 30 ... 250 Hz (300 ... 2500 Hz), adjustable, 20 ... 150 Hz (200 ... 1500 Hz), adjustable, 12.5 ... 125 Hz (125 ... 1250 Hz), adjustable

### Approvals and Certificates

- **UL approval**: cULus Listed, General Purpose
- **CSA approval**: cCSAus Listed, General Purpose

### Dimensions

- **Length L [mm]**: 64.4
- **Width W [mm]**: 125
- **Height H [mm]**: 30
- **Connector area l_c [mm]**: 12

### Accessories

This and more accessories can be found in chapter 3.5 from page 673

- **V1-G-2M-PUR**: Cable socket, M12, 4-pin, PUR cable
- **V1-G-2M-PVC**: Cable socket, M12, 4-pin, PVC cable
- **V1-W-2M-PUR**: Cable socket, M12, 4-pin, PUR cable
- **V1-W-2M-PVC**: Cable socket, M12, 4-pin, PVC cable
- **3RX4000-PF**: PC interface

### Properties

- **Up to 2500 mm sensing range versions**
- **DC, frequency output, switching output and programming interface**
- **Level measurement optimized F65 housing**
- **Connector version**

### Your Benefit

- **SONPROG programmable sensing limits and filtering**
- **Frequency (Hz) output provides continuous feedback to discrete input controllers**
- **Ultra-low 30 mm mounting height**
- **Gasketed transducer seals the tank/container**

### Wire colors in accordance with EN 60947-5-2

<table>
<thead>
<tr>
<th>Color</th>
<th>Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brown</td>
<td>BN</td>
</tr>
<tr>
<td>White</td>
<td>WH</td>
</tr>
<tr>
<td>Blue</td>
<td>BU</td>
</tr>
<tr>
<td>Black</td>
<td>BK</td>
</tr>
<tr>
<td>Gray</td>
<td>GY</td>
</tr>
</tbody>
</table>

Date of issue: 04/08/2015
Ultrasonic Sensors, Diffuse Mode Sensors, rectangular types

F260 series

**Technical Data**

For detailed data and product description refer to the data sheets at [www.pepperl-fuchs.com](http://www.pepperl-fuchs.com)

**General Data**

- **Sensing range**: 800 ... 10000 mm
- **Transducer frequency**: approx. 60 kHz
- **Operating voltage**: 15 ... 30 V (including ripple)
  
  In supply voltage interval 15 ... 20 V reduced sensitivity by 20% ... 0%
- **No-load supply current**: ≤ 75 mA
- **Linearity error**: ≤ 1.5 %
- **Input/output type**: 1 synchronization connection, bidirectional
- **Ambient temperature**: -25 ... 70 °C (-13 ... 158 °F)

**Material**

- **Housing**: UP 1225 SF/R8
- **Transducer**: epoxy resin/hollow glass sphere mixture; polyurethane foam
- **Protection degree**: IP65
- **Connection type**: screw terminals, PG 13.5 cable gland

**Model Number**

<table>
<thead>
<tr>
<th>UC10000-F260-IE8R2</th>
<th>UC10000-F260-IE9R2</th>
<th>UC10000-F260-UE6R2</th>
<th>UC10000-F260-UE9R2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Output type</td>
<td>2 switch outputs PNP, NC</td>
<td>2 switch outputs PNP, NO</td>
<td></td>
</tr>
<tr>
<td>Operating current</td>
<td>150 mA, short-circuit/overload protected</td>
<td>300 mA, short-circuit/overload protected</td>
<td></td>
</tr>
<tr>
<td>Output type</td>
<td>1 voltage output: 0 ... 10 V rising slope</td>
<td>1 current output 4 ... 20 mA rising slope</td>
<td></td>
</tr>
</tbody>
</table>

**Approvals and Certificates**

- UL approval: cULus Listed, General Purpose
- CSA approval: cCSAus Listed, General Purpose

**Dimensions**

- **Length L [mm]**: 112
- **Width W [mm]**: 160
- **Height H [mm]**: 160

**Accessories**

This and more accessories can be found in chapter 3.5 from page 673

- **DA5-IU-C**: Digital display unit
- **3RX4000-PF**: PC interface
- **V1S-M12-500**: Receptacles, M12/M16, 5-pin

**Electrical Connection**

U1g, Input

- Analog output
- Switch output 1
- Switch output 2

---

**Properties**

- 10 m sensing range
- DC, analog output, switching outputs and programming interface
- Rotatable F260 housing
- Terminal compartment

**Your Benefit**

- SONPROG programmable sensing limits and filtering

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**Consider the General Notes on the Information in the Pepperl+Fuchs Product Catalogs**

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**Date of issue**: 04/08/2015

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**Ultrasonic Sensor**

F260 series

---

**Ultrasonic Sensors, Diffuse Mode Sensors, rectangular types**

657
**Technical Data**

For detailed data and product description refer to the data sheets at www.pepperl-fuchs.com

**Model Number** | UBE1000-18GM40-SE2-V1
---|---
**Sensing range** | 15 ... 1000 mm
**Transducer frequency** | approx. 255 kHz
**Operating voltage** | 10 ... 30 V DC, ripple 10 %<sub>SS</sub>
**No-load supply current** | ≤ 20 mA
**Output type** | PNP, NO
**Rated operational current** | 200 mA, short-circuit/overload protected
**Switching frequency** | ≤ 100 Hz
**Input type** | 1 program input
**LED green** | free air path: -UB ... +1 V, object: +6 V ... +UB
**LED yellow** | input impedance: > 4.7 kΩ, program pulse: ≥ 1 s
**Ambient temperature** | -25 ... 70 °C (-13 ... 158 °F)
**Material** | brass, nickel-plated
**Protection degree** | IP67
**Connection type** | Device connector M12 x 1, 4-pin

**Approvals and Certificates**
- UL approval: cULus Listed, General Purpose
- CSA approval: cCSAus Listed, General Purpose

**Dimensions**
- Length L [mm]: 49.2
- Diameter D [mm]: 18
- Thread length l<sub>t</sub> [mm]: 24.5
- Connector area l<sub>c</sub> [mm]: 10
- LED position: Pos. C

**Accessories**
- UB-PROG2: Programming unit
- OMH-04: Mounting aid for round steel ø 12 mm or sheet 1.5 mm ... 3 mm
- BF 18: Mounting flange, 18 mm
- BF 18-F: Mounting flange with dead stop, 18 mm
- BF 5-30: Universal mounting bracket for cylindrical sensors with a diameter of 5 ... 30 mm
- V1-G-2M-PVC: Cable socket, M12, 4-pin, PVC cable
- V1-W-2M-PUR: Cable socket, M12, 4-pin, PUR cable

**Properties**
- Ø18 mm housing
- 1000 mm sensing range
- DC, 3-wire switching output
- Connector version

**Electrical Connection**

**Standard symbol/Connection:**

- U (brown)
- U (white)
- U (blue)
- U (black)

**Core colours in accordance with EN 60947-5-2.**

Wire colors in accordance with EN 60947-5-2:

1. BN (brown)
2. WH (white)
3. BU (blue)
4. BK (black)
Technical Data

Model Number: UBEC300-18GH40-SE2-V1

- Sensing range: 100 ... 300 mm
- Transducer frequency: approx. 255 kHz
- Operating voltage: 10 ... 30 V DC, ripple 10 %SS
- No-load supply current: ≤ 20 mA
- Output type: PNP, NO
- Rated operational current: 200 mA, short-circuit/overload protected
- Switching frequency: ≤ 100 Hz
- Input type: 1 program input [receiver] switch point 1: -UB ... +1 V, switch point 2: +6 V ... +UB 
  1 test input [emitter] emitter deactivated: +6 V ... +UB

- Ambient temperature: -25 ... 70 °C (-13 ... 158 °F)
- Material:
  - Housing: Stainless steel 1.4435 / AISI 316L
  - O-ring for cover sealing: EPDM
  - Transducer: PTFE (diaphragm surface)
- Protection degree: IP68 / IP69K
- Connection type: Device connector M12 x 1 , 4-pin

Approvals and Certificates
- UL approval: cULus Listed, General Purpose
- CSA approval: cCSAus Listed, General Purpose

Dimensions
- Length L [mm]: 43
- Diameter D [mm]: 18
- Head diameter D1 [mm]: 21
- Thread length l [mm]: 15
- Head length l1 [mm]: 13
- Connector area lc [mm]: 10

Accessories
This and more accessories can be found in chapter 3.5 from page 673
See pages from 972 ... for cordsets
See pages 1068 ... for mounting aids

- UB-PROG2: Programming unit
- V1-GU-BK2M-PVC: Cable socket, M12 Ultra-Lock, 4-pin, PVC cable
- V1-WU-BK2M-PVC: Cable socket, M12 Ultra-Lock, 4-pin, PVC cable

Electrical Connection

UBEC300-18GH40-SE2-V1

Core colours in accordance with EN 60947-5-2.
**Technical Data**

For detailed data and product description refer to the data sheets at [www.pepperl-fuchs.com](http://www.pepperl-fuchs.com)

<table>
<thead>
<tr>
<th>Model Number</th>
<th>UBE1000-18GM40A-SE2-V1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sensing range</td>
<td>15 ... 1000 mm</td>
</tr>
<tr>
<td>Transducer frequency</td>
<td>approx. 255 kHz</td>
</tr>
<tr>
<td>Operating voltage</td>
<td>10 ... 30 V DC, ripple 10 %SS</td>
</tr>
<tr>
<td>No-load supply current</td>
<td>≤ 20 mA</td>
</tr>
<tr>
<td>Output type</td>
<td>PNP, NO</td>
</tr>
<tr>
<td>Rated operational current</td>
<td>200 mA , short-circuit/overload protected</td>
</tr>
<tr>
<td>Switching frequency</td>
<td>≤ 100 Hz</td>
</tr>
<tr>
<td>Input type</td>
<td>1 program input</td>
</tr>
<tr>
<td>LED green</td>
<td>Power on</td>
</tr>
<tr>
<td>LED yellow</td>
<td>switching state</td>
</tr>
<tr>
<td>LED red</td>
<td>error, object uncertain</td>
</tr>
<tr>
<td>Ambient temperature</td>
<td>-25 ... 70 °C (-13 ... 158 °F)</td>
</tr>
<tr>
<td>Material</td>
<td>Brass, nickel-plated</td>
</tr>
<tr>
<td>Transducer</td>
<td>Epoxy resin/hollow glass sphere mixture; foam polyurethane, cover PBT</td>
</tr>
<tr>
<td>Protection degree</td>
<td>IP67</td>
</tr>
<tr>
<td>Connection type</td>
<td>Device connector M12 x 1 , 4-pin</td>
</tr>
</tbody>
</table>

**Dimensions**

<table>
<thead>
<tr>
<th>Length L [mm]</th>
<th>57.7</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diameter D [mm]</td>
<td>18</td>
</tr>
<tr>
<td>Transducer length l1 [mm]</td>
<td>18.5</td>
</tr>
<tr>
<td>Thread length lt [mm]</td>
<td>24.5</td>
</tr>
<tr>
<td>Connector area lc [mm]</td>
<td>10</td>
</tr>
<tr>
<td>LED position</td>
<td>Pos. C</td>
</tr>
</tbody>
</table>

**Accessories**

This and more accessories can be found in chapter 3.5 from page 673

- **Programming unit**: UB-PROG2
- **Mounting aid for round steel Ø 12 mm or sheet 1.5 mm ... 3 mm**: OMH-04
- **Mounting flange, 18 mm**: BF 18
- **Mounting flange with dead stop, 18 mm**: BF 18-F
- **Universal mounting bracket for cylindrical sensors with a diameter of 5 ... 30 mm**: BF 5-30
- **Cable socket, M12, 4-pin, PVC cable**: V1-G-2M-PVC
- **Cable socket, M12, 4-pin, PUR cable**: V1-W-2M-PUR

See pages from 972 ... for cordsets
See pages 1068 ... for mounting aids

**Electrical Connection**

**UBE1000-18GM40A-SE2-V1**

**Standard symbol/Connection:**

- **Teaching input (version E2, pnp)**
- **Switching output**
- **+UB**

**Core colours in accordance with EN 60947-5-2**

1. BN (brown)
2. VIH (white)
3. BU (blue)
4. BK (black)

Wire colors in accordance with EN 60947-5-2
Through-beam ultrasonic barrier
cylindrical, Ø 18 mm

Technical Data
For detailed data and product description refer to the data sheets at www.pepperl-fuchs.com

General Data
Sensing range 15 ... 1000 mm
Transducer frequency 170 kHz
Operating voltage 10 ... 30 V DC, ripple 10 %SS
No-load supply current ≤ 20 mA
Output type 1 switch output E2, PNP, NO
Rated operational current 200 mA, short-circuit/overload protected
Switching frequency ≤ 100 Hz
Input type 1 program input
Ambient temperature -25 ... 85 °C (-13 ... 185 °F)
Material
Housing Stainless steel 1.4435 / AISI 316L
Transducer Stainless steel 1.4435 / AISI 316L
Protection degree IP68 / IP69K

Model Number
UME1000-18H-SE2-FA
UME1000-18H-SE2-FB
UME1000-18GH-SE2-FB

LED green
Power on

LED yellow
Receiver: switching state, uncertain object, Teach-In

LED red
Transducer: test input

Connection type
cable PUR, 2 m
cable PVC, 2 m

Approvals and Certificates
UL approval cULus Listed, General Purpose
CSA approval cCSAus Listed, General Purpose

Dimensions
Length L [mm] 55 66,7
Diameter D [mm] 18
Thread length l [mm] 0 32
Connector area l [mm] 0
LED position - Pos. C

Accessories
This and more accessories can be found in chapter 3.5 from page 673
See pages from 972 ... for cordsets See pages 1068 ... for mounting aids
BF 18
Mounting flange, 18 mm
BF 18-F
Mounting flange with dead stop, 18 mm
MH-18H-01-FA

Electrical Connection

Consider the General Notes on the Information in the Pepperl+Fuchs Product Catalogs
Pepperl+Fuchs Group
USA: +1 330 486 0001
Germany: +49 621 776-4411
Singapore: +65 6779 9091
www.pepperl-fuchs.com
fa-info@de.pepperl-fuchs.com
fa-info@us.pepperl-fuchs.com
fa-info@sg.pepperl-fuchs.com

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Technical Data

For detailed data and product description refer to the data sheets at www.pepperl-fuchs.com

Model Number: UBE4000-30GM-SA2-V15
Sensing range: 0 ... 4000 mm, distance emitter-receiver 500 mm ... 4000 mm
Transducer frequency: 85 kHz
Operating voltage: 18 ... 30 V DC, ripple 10 %SS
No-load supply current: 35 mA emitter, 25 mA receiver
Output type: 2 switch outputs PNP, normally open/closed (complementary)
Rated operational current: 200 mA
Switching frequency: ≤ 15 Hz
LED green: alignment aid
LED yellow: switching state
Ambient temperature: 0 ... 60 °C (32 ... 140 °F)
Material: Housing: nickel plated brass; Plastic components: PBT
Protection degree: IP65
Connection type: Device connector M12 x 1, 5-pin

Approvals and Certificates
UL approval: cULus Listed, General Purpose
CSA approval: cCSAus Listed, General Purpose

Dimensions
Length L [mm]: 90
Diameter D [mm]: 30
Transducer diameter D1 [mm]: 40
Transducer length l1 [mm]: 25
Thread length l2 [mm]: 43
Connector area lc [mm]: 10
LED position: Pos. A

Accessories
This and more accessories can be found in chapter 3.5 from page 673
See pages from 972 ... for cordsets
See pages 1068 ... for mounting aids

FP100: Remote potentiometer
BF 30: Mounting flange, 30 mm
BF 5-30: Universal mounting bracket for cylindrical sensors with a diameter of 5 ... 30 mm
V1-G-2M-PVC: Cable socket, M12, 4-pin, PVC cable
V1-W-2M-PVC: Cable socket, M12, 4-pin, PVC cable

Properties
- Ø30 mm housing
- 4 m sensing range
- DC, 4-wire complementary switching outputs
- Connector version

Electrical Connection

Core colours in accordance with EN 60947-5-2.

Wire colors in accordance with EN 60947-5-2:
1. BN (brown)
2. WH (white)
3. BU (blue)
4. BK (black)
5. GY (gray)
**Technical Data**

For detailed data and product description refer to the data sheets at [www.pepperl-fuchs.com](http://www.pepperl-fuchs.com)

**Model Number**
- UBE800-F77-SE2-V31

**Sensing range**
- 0 ... 800 mm emitter/receiver spacing

**Transducer frequency**
- approx. 300 kHz

**Operating voltage**
- 20 ... 30 V DC, ripple 10 %<sub>GB</sub>; 12 ... 20 V DC reduced sensitivity by 80 %

**No-load supply current**
- ≤ 20 mA

**Output type**
- 1 switch output PNP, NO

**Rated operational current**
- 200 mA, short-circuit/overload protected

**Switching frequency**
- 100 Hz

**Input type**
- 1 program input (receiver)

**LED green**
- Power on (emitter)

**LED yellow**
- Switching state (receiver)

**Ambient temperature**
- -25 ... 70 °C (-13 ... 158 °F)

**Material**
- Housing: Polycarbonate
- Transducer: Epoxy resin/hollow glass sphere mixture; polyurethane foam

**Protection degree**
- IP67

**Connection type**
- M8 x 1 connector, 4-pin

**Electrical Connection**

**Receiver:**
- 1 Ug
- 2 ET (Sensitivity)
- 3 Switching output
- 4 Ug

**Emitter:**
- 1 Ug
- 2 ET (Sensitivity)
- 3 Ug

Wire colors in accordance with EN 60947-5-2

1. BN (brown)
2. WH (white)
3. BU (blue)
4. BK (black)

**Dimensions**

- Length L [mm]: 23
- Width W [mm]: 12
- Height H [mm]: 31
- Connector area l<sub>c</sub> [mm]: 9

**Approvals and Certificates**

- UL approval: cULus Listed, General Purpose
- CSA approval: cCSAus Listed, General Purpose

**Accessories**

- Programming unit: UB-PROG4-V31
- Mounting bracket: OMH-ML7-01
- M8, 4-pin socket, PVC cable: V31-GM-2M-PVC
- M8, 4-pin socket, PVC cable: V31-WM-2M-PVC

This and more accessories can be found in chapter 3.5 from page 673.
Ultrasonic Sensors, Sensors for Separate Evaluation

Technical Data

For detailed data and product description refer to the data sheets at www.pepperl-fuchs.com

General Data
- Operating voltage: 10 ... 30 V DC, ripple 10 %
- No-load supply current: ≤ 30 mA
- Input type: 1 pulse input for transmitter pulse (clock)
- Output type: 1 pulse output for echo run time, short-circuit proof
  - open collector PNP with pulldown resistor = 22 kOhm
  - level 0 (no echo): -UB
  - level 1 (echo detected): ≥ (+UB-2 V)
- Ambient temperature: -25 ... 85 °C (-13 ... 185 °F)
- Material:
  - Housing: nickel plated brass; plastic components: PBT
  - Transducer: epoxy resin/hollow glass sphere mixture; polyurethane foam
- Protection degree: IP67
- Connection type: Device connector M12 x 1, 4-pin

Model Number

<table>
<thead>
<tr>
<th>Model Number</th>
<th>UB500-30GM-H3-V1</th>
<th>UB2000-30GM-H3-V1</th>
<th>UB4000-30GM-H3-V1</th>
<th>UB6000-30GM-H3-V1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sensing range</td>
<td>30 ... 500 mm</td>
<td>80 ... 2000 mm</td>
<td>200 ... 4000 mm</td>
<td>350 ... 6000 mm</td>
</tr>
<tr>
<td>Transducer frequency</td>
<td>approx. 380 kHz</td>
<td>approx. 180 kHz</td>
<td>approx. 85 kHz</td>
<td>approx. 65 kHz</td>
</tr>
</tbody>
</table>

Approvals and Certificates
- UL approval: cULus Listed, General Purpose
- CSA approval: cCSAus Listed, General Purpose

Dimensions
- Length L [mm]: 80, 95, 100
- Diameter D [mm]: 30
- Transducer diameter D1 [mm]: 30, 40, 74
- Transducer length l1 [mm]: 0, 25, 32.5
- Thread length l2 [mm]: 60, 49, 47.5
- Connector area l3 [mm]: 10

Accessories
- This and more accessories can be found in chapter 3.5 from page 673
- See pages from 972 ... for cordsets
- See pages 1068 ... for mounting aids

- BF 30: Mounting flange, 30 mm
- BF 30-F: Mounting flange with dead stop, 30 mm
- BF 5-30: Universal mounting bracket for cylindrical sensors with a diameter of 5 ... 30 mm
- UVW90-M30: Ultrasonic deflector (only UB500... and UB2000...)
- UVW90-K30: Ultrasonic deflector (only UB500... and UB2000...)
- V1-G-2M-PVC: Cable socket, M12, 4-pin, PVC cable
- V1-W-2M-PVC: Cable socket, M12, 4-pin, PVC cable

Electrical Connection

UB2000-30GM-H3-V1
UB4000-30GM-H3-V1
UB500-30GM-H3-V1
UB6000-30GM-H3-V1

Standard symbol/Connection:

1. UB
2. Clock
3. Echo
4. Output (Pulse output)

2 = Emitter pulse input
4 = Echo propagation time output
Core colours in accordance with EN 60947-5-2.

Wire colors in accordance with EN 60947-5-2

1. BN (brown)
2. WH (white)
3. BU (blue)
4. BK (black)

Date of issue: 2015-04-08

Consider the General Notes on the Information in the Pepperl+Fuchs Product Catalogs

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**Technical Data**

*For detailed data and product description refer to the data sheets at [www.pepperl-fuchs.com](http://www.pepperl-fuchs.com)*

**General Data**
- Sensing range: 20 ... 60 mm, optimal distance: 45 mm
- Transducer frequency: 395 kHz
- Operating voltage: 18 ... 30 V DC, ripple 10 %
- No-load supply current: < 80 mA
- Rated operational current: 3 x 100 mA, short-circuit/overload protected
- Switch-on delay: approx. 15 ms (shorter response time on request)
- Switch-off delay: approx. 15 ms (shorter response time on request)
- Pulse extension: min. 120 ms programmable
- Input type: Function input
- LED green: indication: single sheet detected
- LED yellow: indication: No sheet detected (Air)
- LED red: indication: double sheet detected
- Ambient temperature: 0 ... 60 °C (32 ... 140 °F)

**Material**
- Housing: nickel plated brass; plastic components: PBT
- Protection degree: IP67
- Connection type: cable PVC, 2 m

**Model Number**
- Output type: 3 switch outputs NPN, NC
- 3 Switch outputs PNP, NC
- 3 switch outputs PNP, NO

**Approvals and Certificates**
- UL approval: cULus Listed, General Purpose, Class 2 Power Source
- CSA approval: cCSAus Listed, General Purpose, Class 2 Power Source

**Dimensions**
- Receiver length L1 (mm): 74
- Emitter length L2 (mm): 22
- Diameter D (mm): 18
- Receiver thread length lₜ (mm): 45

**Accessories**
- This and more accessories can be found in chapter 3.5 from page 673
- See pages from 972 ... for cordsets
- See pages 1068 ... for mounting aids

**Electrical Connection**

**Properties**
- Ø18 mm housing
- Wide range double sheet detection
- Very fast response
- DC, 3 switching outputs
- Cable version

**Your Benefit**
- 400-series is designed for detection of the broadest range of materials (typically paper)
- One sensor identifies zero-, single- and double-sheets

**Your Benefit**

- Ø18 mm housing
- Wide range double sheet detection
- Very fast response
- DC, 3 switching outputs
- Cable version

**Your Benefit**
- 400-series is designed for detection of the broadest range of materials (typically paper)
- One sensor identifies zero-, single- and double-sheets
**Double sheet sensor**

**Technical Data**

For detailed data and product description refer to the data sheets at www.pepperl-fuchs.com

**General Data**
- Sensing range: 20 ... 60 mm, optimal distance: 45 mm
- Transducer frequency: 395 kHz
- Operating voltage: 18 ... 30 V DC, ripple 10 %
- No-load supply current: < 80 mA
- Rated operational current: 3 x 100 mA, short-circuit/overload protected
- Switch-on delay: approx. 15 ms (shorter response time on request)
- Switch-off delay: approx. 15 ms (shorter response time on request)
- Pulse extension: min. 120 ms programmable
- Input type: Function input
- LED green: Indication: single sheet detected
- LED yellow: Indication: No sheet detected (Air)
- LED red: Indication: double sheet detected
- Ambient temperature: 0 ... 60 °C (32 ... 140 °F)

**Materials**
- Housing: nickel plated brass; plastic components: PBT
- Transducer: epoxy resin/hollow glass sphere mixture; polyurethane foam

**Protection degree**: IP67

**Connection type**: cable PVC, 2 m

**Model Number**
- UDC-18GMA-400-3E1
- UDC-18GMA-400-3E3

**Output type**
- 3 switch outputs NPN, NC
- 3 switch outputs PNP, NC

**Approvals and Certificates**
- UL approval: cULus Listed, General Purpose, Class 2 Power Source
- CSA approval: cCSAus Listed, General Purpose, Class 2 Power Source

**Dimensions**
- Length L [mm]: 87
- Diameter D [mm]: 18
- Height H [mm]: 86
- Width W [mm]: 36

**Accessories**
- This and more accessories can be found in chapter 3.5 from page 673
- See pages from 972 ... for cordsets
- See pages 1068 ... for mounting aids

**Electrical Connection**

**Properties**
- Ø18 mm housing with mounting bracket
- Wide range double sheet detection
- Very fast response
- DC, 3 switching outputs
- Cable version

**Your Benefit**
- 400-series is designed for detection of the broadest range of materials (typically paper)
- One sensor identifies zero-, single- and double-sheets

**UDB-Cable-2M**
- Extension cable

**UDB-Cable-1M**
- Extension cable

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Consider the General Notes on the Information in the Pepperl+Fuchs Product Catalogs

Pepperl+Fuchs Group
USA: +1 330 486 5001
Germany: +49 621 776-4411
Singapore: +65 6779 9091
www.pepperl-fuchs.com
fa-info@us.pepperl-fuchs.com
fa-info@de.pepperl-fuchs.com
fa-info@sg.pepperl-fuchs.com

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**Technical Data**

For detailed data and product description refer to the data sheets at [www.pepperl-fuchs.com](http://www.pepperl-fuchs.com)

### General Data
- **Sensing range**: 20 ... 60 mm, optimal distance: 45 mm
- **Transducer frequency**: 395 kHz
- **Operating voltage**: 18 ... 30 V DC, ripple 10 %SS
- **No-load supply current**: < 50 mA
- **Rated operational current**: 3 x 100 mA, short-circuit/overload protected
- **Switch-on delay**: approx. 15 ms (shorter response time on request)
- **Switch-off delay**: approx. 15 ms (shorter response time on request)
- **Pulse extension**: min. 120 ms programmable
- **Input type**: Function input
- **LED green**: indication: single sheet detected
- **LED yellow**: Indication: No sheet detected (Air)
- **LED red**: indication: double sheet detected
- **Ambient temperature**: 0 ... 60 °C (32 ... 140 °F)

### Material
- **Housing**: nickel plated brass; plastic components: PBT
- **Transducer**: epoxy resin/hollow glass sphere mixture; polyurethane foam
- **Protection degree**: IP67

### Connection type
- **Cable PVC, 2 m**

### Model Number
- **UDC-18GM50-400-3E1**
- **UDC-18GM50-400-3E2**
- **UDC-18GM50-400-3E0**
- **UDC-18GM50-400-3E3**

### Output type
- 3 switch outputs NPN, NC
- 3 switch outputs NPN, NO
- 3 switch outputs PNP, NC
- 3 switch outputs PNP, NO

### Approvals and Certificates
- **UL approval**: cULus Listed, General Purpose, Class 2 Power Source
- **CSA approval**: cCSAus Listed, General Purpose, Class 2 Power Source

### Dimensions
- **Receiver length L1 [mm]**: 53
- **Emitter length L2 [mm]**: 22
- **Diameter D [mm]**: 18
- **Receiver thread length lt [mm]**: 30

### Accessories
- **MH-UD801**: Mounting bracket for double sheet monitor
- **UD8-Cable-2M**: Extension cable
- **UD8-Cable-1M**: Extension cable

### Electrical Connection
- **UDC-18GM50-400-3E1**: Double sheet control
- **UDC-18GM50-400-3E2**: Double sheet control

**Your Benefit**
- **Short Ø18 mm housing**
- **Wide range double sheet detection**
- **Very fast response**
- **DC, 3 switching outputs**
- **Cable version**

**Properties**
- **Short Ø18 mm housing**
- **Wide range double sheet detection**
- **Very fast response**
- **DC, 3 switching outputs**
- **Cable version**

**Ultrasonic Sensors, Double Sheet Sensors**
**General Data**

- Sensing range: 20 ... 60 mm, optimal distance: 45 mm
- Transducer frequency: 255 kHz
- Operating voltage: 18 ... 30 V DC, ripple 10 %
- No-load supply current: < 50 mA
- Rated operational current: 3 x 100 mA, short-circuit/overload protected
- Switch-on delay: approx. 15 ms (shorter response time on request)
- Switch-off delay: approx. 15 ms (shorter response time on request)
- Pulse extension: min. 120 ms programmable
- Input type: Function input
- LED green indication: single sheet detected
- LED yellow indication: No sheet detected (Air)
- LED red indication: double sheet detected
- Ambient temperature: 0 ... 60 °C (32 ... 140 °F)

**Material**
- Housing: nickel plated brass; plastic components: PBT
- Transducer epoxy resin/hollow glass sphere mixture; polyurethane foam
- Protection degree: IP67

**Model Number**

- Output type: 3 switch outputs NPN, NC
- 3 switch outputs NPN, NO
- 3 switch outputs PNP, NC

**Approvals and Certificates**

- UL approval: cULus Listed, General Purpose, Class 2 Power Source
- CSA approval: cCSAus Listed, General Purpose, Class 2 Power Source

**Dimensions**

- Receiver length L1 [mm]: 53
- Emitter length L2 [mm]: 22
- Diameter D [mm]: 18
- Receiver thread length lₜ [mm]: 30

**Accessories**

- UDB-Cable-2M: Extension cable
- MH-UDB01: Mounting bracket for double sheet monitor
- UDB-Cable-1M: Extension cable

**Electrical Connection**

**Properties**

- Short Ø18 mm housing
- Wide range double sheet detection
- Very fast response
- DC, 3 switching outputs
- Cable version

**Your Benefit**

- Short-barrel design
- 255-series is designed for detection of the materials too thick for 400-series monitoring
- One sensor identifies zero-, single- and double-sheets

For detailed data and product description refer to the data sheets at www.pepperl-fuchs.com
### Technical Data

For detailed data and product description refer to the data sheets at [www.pepperl-fuchs.com](http://www.pepperl-fuchs.com).

### General Data
- **Sensing range**: 40 ... 100 mm optimal distance 75 mm
- **Transducer frequency**: 255 kHz
- **Operating voltage**: 18 ... 30 V DC, ripple 10 %
- **No-load supply current**: < 65 mA
- **Rated operational current**: 3 x 100 mA, short-circuit/overload protected
- **Switch-on delay**: approx. 70 ms
- **Switch-off delay**: approx. 70 ms
- **Pulse extension**: min. 120 ms programmable
- **Input type**: Function input
- **LED green**: Indicator: single material detected
- **LED yellow**: Indicator: no material detected (air)
- **LED red**: Indicator: double material detected
- **Ambient temperature**: 0 ... 60 °C (32 ... 140 °F)
- **Material**:
  - **Housing**: nickel plated brass; plastic components: PBT
  - **Transducer**: epoxy resin/hollow glass sphere mixture; polyurethane foam
- **Protection degree**: IP67
- **Connection type**: cable PVC, 2 m

### Model Number
- **Output type**: 3 switch outputs NPN, NC
- **Output type**: 3 switch outputs NPN, NO
- **Output type**: 3 switch outputs PNP, NC

### Approvals and Certificates
- **UL approval**: cULus Listed, General Purpose, Class 2
- **CSA approval**: cCSAus Listed, General Purpose, Class 2

### Dimensions
- **Receiver length L1 [mm]**: 53
- **Emitter length L2 [mm]**: 40
- **Diameter D [mm]**: 18
- **Receiver thread length L1 [mm]**: 30

### Accessories
- **This and more accessories can be found in chapter 3.5 from page 673**
- **See pages from 972 ... for cordsets**
- **See pages 1068 ... for mounting aids**
- **UDB-Cable-2M**: Extension cable
- **MH-UDB01**: Mounting bracket for double sheet monitor
- **UDB-Cable-1M**: Extension cable

### Your Benefit
- **Short Ø18 mm housing**
- **Universal double material detection**
- **Fast response**
- **DC, 3 switching outputs**
- **Cable version**

### Electrical Connection

- **UDC-18GM50-255S-3E0**
- **UDC-18GM50-255S-3E1**

### Properties
- **Short Ø18 mm housing**
- **Universal double material detection**
- **Fast response**
- **DC, 3 switching outputs**
- **Cable version**

### Properties
- **Short Ø18 mm housing**
- **Universal double material detection**
- **Fast response**
- **DC, 3 switching outputs**
- **Cable version**

---

**Note:** Further information and specifications can be found on the Pepperl+Fuchs website at [www.pepperl-fuchs.com](http://www.pepperl-fuchs.com).
### Technical Data

For detailed data and product description refer to the data sheets at [www.pepperl-fuchs.com](http://www.pepperl-fuchs.com)

#### General Data

- Sensing range: 20 ... 60 mm, optimal distance: 45 mm
- Transducer frequency: 255 kHz
- Operating voltage: 18 ... 30 V DC, ripple 10 %
- No-load supply current: < 60 mA
- Rated operational current: 2 x 100 mA, short-circuit/overload protected
- Switch-on delay: ≤ 600 μs
- Switch-off delay: ≤ 600 μs
- Pulse extension: ≥ 120 ms programmable
- Input type: TEACH-IN input
- LED green: Display: readiness
- LED yellow: Display: splice detected
- LED red: Indication: No sheet detected (Air)
- Ambient temperature: 0 ... 60 °C (32 ... 140 °F)
- Material: Housing - nickel plated brass; plastic components: PBT
  - Transducer - epoxy resin/hollow glass sphere mixture; polyurethane foam
- Protection degree: IP67
- Connection type: cable PVC, 2 m

#### Model Number

<table>
<thead>
<tr>
<th>Model Number</th>
<th>Output type</th>
<th>Approvals and Certificates</th>
<th>Dimensions</th>
</tr>
</thead>
<tbody>
<tr>
<td>UGB-18GM50-255-2E1</td>
<td>2 switch outputs NPN, NC</td>
<td>UL approval cULus Listed, General Purpose</td>
<td>Receiver length L1 [mm] 53</td>
</tr>
<tr>
<td>UGB-18GM50-255-2E3</td>
<td>2 switch outputs PNP, NC</td>
<td>CSA approval cCSAus Listed, General Purpose</td>
<td>Emitter length L2 [mm] 22</td>
</tr>
</tbody>
</table>

#### Dimensions

- Diameter D [mm]: 18
- Receiver thread length Lt [mm]: 30
- Receiver length L1 [mm]: 53
- Emitter length L2 [mm]: 22

#### Accessories

This and more accessories can be found in chapter 3.5 from page 673

**Splice sensor cylindrical, Ø 18 mm**

- Short Ø18 mm housing
- Universal splice detection
- Extraordinary fast response
- DC, 2 switching outputs
- Cable version

**General Notes**

- Splice sensor cylindrical, Ø 18 mm
- Optimum for splice detection
- Splice sensor, cylindrical, Ø 18 mm
- Cannot be used as a distance sensor

**Technical Data**

- Sensing range: 20 ... 60 mm, optimal distance: 45 mm
- Transducer frequency: 255 kHz
- Operating voltage: 18 ... 30 V DC, ripple 10 %
- No-load supply current: < 60 mA
- Rated operational current: 2 x 100 mA, short-circuit/overload protected
- Switch-on delay: ≤ 600 μs
- Switch-off delay: ≤ 600 μs
- Pulse extension: ≥ 120 ms programmable
- Input type: TEACH-IN input
- LED green: Display: readiness
- LED yellow: Display: splice detected
- LED red: Indication: No sheet detected (Air)
- Ambient temperature: 0 ... 60 °C (32 ... 140 °F)
- Material: Housing - nickel plated brass; plastic components: PBT
  - Transducer - epoxy resin/hollow glass sphere mixture; polyurethane foam
- Protection degree: IP67
- Connection type: cable PVC, 2 m

**Model Number**

- UGB-18GM50-255-2E1
- UGB-18GM50-255-2E3

**Approvals and Certificates**

- UL approval cULus Listed, General Purpose
- CSA approval cCSAus Listed, General Purpose

**Dimensions**

- Receiver length L1 [mm]: 53
- Emitter length L2 [mm]: 22
- Diameter D [mm]: 18
- Receiver thread length Lt [mm]: 30
Ultrasonic Sensors, Double Sheet Sensors

### Technical Data

For detailed data and product description refer to the data sheets at [www.pepperl-fuchs.com](http://www.pepperl-fuchs.com)

#### General Data
- **Sensing range**: 20 ... 60 mm, optimal distance: 45 mm
- **Transducer frequency**: 255 kHz
- **Operating voltage**: 18 ... 30 V DC, ripple 10 %
- **No-load supply current**: < 60 mA
- **Rated operational current**: 2 x 100 mA, short-circuit/overload protected
- **Switch-on delay**: ≤ 600 μs
- **Switch-off delay**: ≤ 600 μs
- **Input type**: TEACH-IN input
- **LED green**: Display: readiness
- **LED yellow**: indication: label detected
- **LED red**: Display: error
- **Ambient temperature**: 0 ... 60 °C (32 ... 140 °F)

#### Material
- **Housing**: nickel plated brass; plastic components: PBT
- **Transducer**: epoxy resin/hollow glass sphere mixture; polyurethane foam
- **Protection degree**: IP67
- **Connection type**: cable PVC, 2 m

#### Model Number

- Output type: 2 switch outputs NPN, NC
- 2 switch outputs PNP, NC

#### Approvals and Certificates
- UL approval: C-UL listed: 57M3, IND CONT. EQ., "Powered by Class 2 Power Source"

#### Dimensions
- **Receiver length L1 [mm]**: 53
- **Emitter length L2 [mm]**: 22
- **Diameter D [mm]**: 18
- **Receiver thread length lt [mm]**: 30

#### Accessories
- **This and more accessories can be found in chapter 3.5 from page 673**
- **See pages from 972 ... for cordsets**
- **See pages 1068 ... for mounting aids**

- **MH-UDB01**: Mounting bracket for double sheet monitor

### Properties

- Short Ø18 mm housing
- Universal label detection
- Extraordinary fast response
- DC, 2 switching outputs
- Cable version

### Electrical Connection

**ULB-18GM50-255-2E3**

- Standard symbol/Connection: Label monitor
- **U1**: TENnish
- **U2**: Output label
- **U3**: Output base material

**ULB-18GM50-255-2E1**

- Standard symbol/Connection: Label monitor
- **U1**: TENnish
- **U2**: Output label
- **U3**: Output base material

Date of issue 2015-04-08
Technical Data

For detailed data and product description refer to the data sheets at www.pepperl-fuchs.com

Model Number: UDC-30GM-085-3E3
Sensing range: 50 ... 150 mm, optimal distance: 80 mm
Transducer frequency: 85 kHz
Operating voltage: 18 ... 30 V DC, ripple 10 %
No-load supply current: < 200 mA
Output type: 3 switch outputs PNP, NC
Rated operational current: 3 x 100 mA, short-circuit/overload protected
Switch-on delay: approx. 30 ms
Switch-off delay: approx. 30 ms
Pulse extension: min. 120 ms programmable
Input type: Function input
LED green: Display: single-layer material detected
LED yellow: Display: no material (air)
LED red: Display: 2-layer or multi-layer material detected
Ambient temperature: 0 ... 50 °C (32 ... 122 °F)
Material:
- Housing: nickel plated brass; plastic components: PBT
- Transducer: epoxy resin/hollow glass sphere mixture; polyurethane foam
Protection degree: IP65
Connection type: cable PVC, 2 m

Approvals and Certificates
- UL approval: cULus Listed, General Purpose, Class 2 Power Source
- CSA approval: cCSAus Listed, General Purpose, Class 2 Power Source

Dimensions
- Length L [mm]: 88 / 52
- Diameter D [mm]: 30
- Transducer diameter D₁ [mm]: 40
- Transducer length l₁ [mm]: 25
- Thread length l₄ [mm]: 41 / 27
- Connector area l₂ [mm]: 0
- LED position: Pos. C

Your Benefit
- Ø30 mm housing
- Powerful material detection
- Fast response
- DC, 3 switching outputs
- Cable version
- Short-barrel design
- Maximum possible material burn-through power
- Excellent for thick plastics and cardboard
- One sensor identifies zero-, single- and double-sheets

Accessories
See pages from 972 ... for cordsets
MH-UBD02: Mounting bracket for double sheet metal monitor
UDB-Cable-2M: Extension cable
UDB-Cable-1M: Extension cable

This and more accessories can be found in chapter 3.5 from page 673
See pages 1068 ... for mounting aids

Electrical Connection

Standard symbol/Connection:
Double sheet control

BN: Function input
WP: Output single sheet
WB: Output double sheet
UB: Output air
UB:
### Technical Data

**Model number** M-105  
**Material** PTFE  
**Description** Universal mounting bracket for cylindrical sensors with ø 30 mm and a thread that extends to the front end of the sensor (UB/UC300, -500, and -2000).

- Secure fastening  
- Easy installation  
- Robust design  
- Resistant to chemicals

### Technical Data

**Model number** PA-02  
**Material** PVC  
**Description** Mounting flange for all square-shaped sensors in the FP series

- Secure fastening  
- Easy installation  
- Robust design

### Technical Data

**Common data**  
**Material** PA  
**Description** Plastic nuts with centering ring for vibration-free mounting of cylindrical sensors. These plastic nuts must be used in applications where a sensor is affixed at the front third of the housing, and operated at temperatures < 0 °C.

<table>
<thead>
<tr>
<th>Model number</th>
<th>M12K-VE</th>
<th>M18K-VE</th>
<th>M30K-VE</th>
</tr>
</thead>
<tbody>
<tr>
<td>For sensor diameter 12 mm</td>
<td>✔</td>
<td></td>
<td></td>
</tr>
<tr>
<td>For sensor diameter 18 mm</td>
<td></td>
<td>✔</td>
<td></td>
</tr>
<tr>
<td>For sensor diameter 30 mm</td>
<td></td>
<td></td>
<td>✔</td>
</tr>
</tbody>
</table>
## Technical Data

For detailed data and product description, see the data sheet at [www.pepperl-fuchs.com](http://www.pepperl-fuchs.com)

### Common data

<table>
<thead>
<tr>
<th>Material</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>PMMA</td>
<td>Ultrasonic deviation reflector for cylindrical ultrasonic sensors. The ultrasonic deviation reflector has an opening across the entire width at the lower end of the inclined position. Any falling dust particles cannot collect in the ultrasonic deviation reflector. This ensures ongoing operation even in dusty environments.</td>
</tr>
</tbody>
</table>

### Model number

<table>
<thead>
<tr>
<th>Model number</th>
<th>Material</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>UVW90-K18</td>
<td>Stainless steel</td>
<td>Ultrasonic deviation reflector for cylindrical ultrasonic sensors in the -12GM Series.</td>
</tr>
<tr>
<td>UVW90-K30</td>
<td>Stainless steel</td>
<td>Ultrasonic deviation reflector for cylindrical ultrasonic sensors in the -30GM Series.</td>
</tr>
</tbody>
</table>

**Model number UVW90-M12**

- **Material**: Stainless steel
- **Description**: Ultrasonic deviation reflector for cylindrical ultrasonic sensors in the -12GM Series.

**Model number UVW90-M30**

- **Material**: Stainless steel
- **Description**: Focusing ultrasonic deviation reflector for cylindrical ultrasonic sensors in the -30GM Series.

- **Suitable for universal mounting**
- **90° sound deflection for difficult mounting conditions**
- **Universal mounting position**

**Technical Data**

For detailed data and product description, see the data sheet at [www.pepperl-fuchs.com](http://www.pepperl-fuchs.com)

<table>
<thead>
<tr>
<th>Model number</th>
<th>Material</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>UVW90-M12</td>
<td>Stainless steel</td>
<td>Ultrasonic deviation reflector for cylindrical ultrasonic sensors in the -12GM Series.</td>
</tr>
</tbody>
</table>

- **Suitable for universal mounting**
- **90° sound deflection for difficult mounting conditions**
- **Universal mounting position**
- **Ultrasonic focusing effect**
- **Increase in detection range (through focus)**
  - approx. 40% with UB/UC500 (measurement L = 10 mm)
  - approx. 20% with UB/UC2000 (measurement L = 35 mm +/- 5 mm)
Ultrasonic Sensors, Thru-Beam Sensors, cylindrical

3.1

Ultrasonic Sensors, Diffuse Mode Sensors, cylindrical

3.2

Ultrasonic Sensors, Thru-Beam Sensors, rectangular types

3.3

Ultrasonic Sensors, Diffuse Mode Sensors, rectangular types

3.4

Ultrasonic Sensors, Sensors for Separate Evaluation

3.5

Ultrasonic Sensors, Double Sheet Sensors

3.6

Ultrasonic Sensors, Ultrasonic Sensor Accessories

3.7

Accessories for Ultrasonic Sensors


Accessories for Ultrasonic Sensors

Technical Data

For detailed data and product description, see the data sheet at www.pepperl-fuchs.com

Model number UC-30GM-TEMP
Function External temperature probe
Description As an alternative to the supplied temperature probe, the UC-30GM-TEMP external temperature probe can be connected to LUC4T-type ultrasonic sensors. The UC-30GM-TEMP temperature probe can be used to detect the ambient temperature of the measurement path, irrespective of the sensor mounting conditions, with a view to minimizing temperature effects to the greatest extent possible.

For LUC4T-type ultrasonic sensors
8 mm connector
Swivel-free single-hole mounting


Technical Data

For detailed data and product description, see the data sheet at www.pepperl-fuchs.com

Common data
Function External temperature probe
Description As an alternative to the supplied temperature probe, this external temperature probe can be connected to LUC4T-type ultrasonic sensors. The LUC4-Z30 sensor can be used to detect the ambient temperature of the measurement path, in line with the process and irrespective of the mounting conditions of the sensor, with a view to minimizing temperature effects to the greatest extent possible.

For LUC4T-type ultrasonic fill level sensors
8 mm connector.
Single-hole mounting in thread: G½A (LUC4-Z30-G2V) ½NPT (LUC4-Z30-N2V).


Technical Data

For detailed data and product description, see the data sheet at www.pepperl-fuchs.com

Model number LUC4-Z30-G2V LUC4-Z30-N2V
Thread G½A ½NPT

For LUC4T-type ultrasonic fill level sensors
8 mm connector.
Single-hole mounting in thread: G½A (LUC4-Z30-G2V) ½NPT (LUC4-Z30-N2V).


Technical Data

For detailed data and product description, see the data sheet at www.pepperl-fuchs.com

Model number USB-0.8M-PVC ABG-SUBD9
Function USB/RS232 interface adapter
Description Interface adapter USB-0.8M-PVC ABG-SUBD9 provides an RS232 interface at a free USB port. It can be connected to a free USB port on the computer either directly or using the 800 mm USB extension cable provided. The available interface cable can then be connected to the 9-pin SUB-D plug in the usual way.
### Technical Data

For detailed data and product description, see the data sheet at [www.pepperl-fuchs.com](http://www.pepperl-fuchs.com)

<table>
<thead>
<tr>
<th>Model number</th>
<th>UC-F43-R2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Function</td>
<td>RS232 interface</td>
</tr>
<tr>
<td>Description</td>
<td>The device can be switched between the V17 cable connection box and the V17 plug connection at the sensor for the Teach-in process. The parameterized functions are retained after the programming unit has been removed and/or the operating voltage has been turned off at the sensor.</td>
</tr>
</tbody>
</table>

- For sensors **UC300-F43-2KIR2-V17** and **UC2000-F43-2KIR2-V17**.
- Simple intermediate switching in the sensor connection line.

### Technical Data

For detailed data and product description, see the data sheet at [www.pepperl-fuchs.com](http://www.pepperl-fuchs.com)

<table>
<thead>
<tr>
<th>Model number</th>
<th>UC-30GM-R2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Function</td>
<td>Interface cable</td>
</tr>
<tr>
<td>Description</td>
<td>Interface cable UC-30GM-R2 enables type UC...-30GM-R2-V15 ultrasonic sensors to be parameterized using service program ULTRA 2001. The cable establishes a connection between the PC's internal RS232 interface and the connector of the temperature/programming plug at the sensor.</td>
</tr>
</tbody>
</table>

### Technical Data

For detailed data and product description, see the data sheet at [www.pepperl-fuchs.com](http://www.pepperl-fuchs.com)

<table>
<thead>
<tr>
<th>Model number</th>
<th>UC-18/30GM-IR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Function</td>
<td>Interface cable</td>
</tr>
<tr>
<td>Description</td>
<td>Extension cable for ultrasonic double sheet monitors</td>
</tr>
</tbody>
</table>

### Technical Data

For detailed data and product description, see the data sheet at [www.pepperl-fuchs.com](http://www.pepperl-fuchs.com)

<table>
<thead>
<tr>
<th>Model number</th>
<th>UC-30GM-PROG</th>
</tr>
</thead>
<tbody>
<tr>
<td>Function</td>
<td>Extension cable</td>
</tr>
<tr>
<td>Description</td>
<td>Extension cable UC-30GM-PROG enables UC...-30GM-... and LUC-type ultrasonic sensors to be taught in, even at installation locations that are difficult to access. The sensor end of the extension cable is connected to the socket for the temperature plug at the sensor. Sensors can be programmed at the other end of the cable using the temperature plug.</td>
</tr>
</tbody>
</table>

### Technical Data

For detailed data and product description, see the data sheet at [www.pepperl-fuchs.com](http://www.pepperl-fuchs.com)

<table>
<thead>
<tr>
<th>Common data</th>
</tr>
</thead>
<tbody>
<tr>
<td>Connectors</td>
</tr>
<tr>
<td>Cable material</td>
</tr>
<tr>
<td>Cable color</td>
</tr>
<tr>
<td>Description</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Model number</th>
<th>USB-Cable-1M</th>
<th>USB-Cable-2M</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cable length</td>
<td>1 m</td>
<td>2 m</td>
</tr>
</tbody>
</table>
Technical Data

For detailed data and product description, see the data sheet at www.pepperl-fuchs.com

Model number: 3RX4000-PF

Function: PC interface

Description: Using this PC interface and the corresponding software, you can adapt ultrasonic sensors of a specific series to the requirements of your application. It is also possible to parameterize several sensors identically. The start and end of a sensor’s detection range can be stored and copied to other sensors at the press of a button.

Technical Data

For detailed data and product description, see the data sheet at www.pepperl-fuchs.com

Model number: UB-PROG2

Function: Programming unit

Description: The device can be switched between the V15 cable connection box and the V15 plug connection at the sensor for the Teach-in process. The trip points/measurement window and the output function are taught in using sensors A1 and A2 in accordance with the diagram provided. The taught in trip points and functions are retained after the programming unit has been removed and/or the operating voltage has been turned off at the sensor.

- Simple Teach-in of trip points A1/A2 or the measurement window.
- Easy selection of output function: window operation, NO contact/NC contact function.
- One trip point, NO contact/NC contact function.
- Monitoring of detection range.

For the following types of ultrasonic sensors:

<table>
<thead>
<tr>
<th>Model number</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>UB300</td>
<td></td>
</tr>
<tr>
<td>UB400</td>
<td>-12GM</td>
</tr>
<tr>
<td>UB500</td>
<td>-18GM40</td>
</tr>
<tr>
<td>UB800</td>
<td>-18GM75</td>
</tr>
<tr>
<td>UB1000</td>
<td>-30GM</td>
</tr>
<tr>
<td>UB2000</td>
<td>-F42(S)</td>
</tr>
<tr>
<td>UB4000</td>
<td>-F54</td>
</tr>
<tr>
<td>UB6000</td>
<td></td>
</tr>
</tbody>
</table>

... where the Teach-in input is at pin 2.

Technical Data

For detailed data and product description, see the data sheet at www.pepperl-fuchs.com

Model number: UB-PROG3

Function: Programming unit

Description: The unit can be switched between the V15 cable connection box and the V15 plug connection at the sensor for the Teach-in process. The trip points/measurement window and the output function are taught in using sensors A1 and A2 in accordance with the diagram provided. The taught in trip points and functions are retained after the programming unit has been removed and/or the operating voltage has been turned off at the sensor.

- Simple Teach-in of trip points A1/A2 or the measurement window.
- Easy selection of output function: window operation, NO contact/NC contact function.
- One trip point, NO contact/NC contact function.
- Monitoring of detection range.

For the following types of ultrasonic sensors:

<table>
<thead>
<tr>
<th>Model number</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>UB500</td>
<td>-E01</td>
</tr>
<tr>
<td>UB1000</td>
<td>-18GM75</td>
</tr>
<tr>
<td></td>
<td>-E23</td>
</tr>
<tr>
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<td>-E6</td>
</tr>
<tr>
<td></td>
<td>-V15</td>
</tr>
<tr>
<td>UB4000</td>
<td>-E7</td>
</tr>
</tbody>
</table>

... where the Teach-in input is at pin 2.