

# Ultrasonic sensors

Reliable on almost all surfaces

## UT 20

from Page 564

### UT 20-S – miniature ultrasonic sensors with soundpipe

- Reliable detection through the smallest of openings and drilled holes
  - Ideal for measuring filling levels of microplates and for scanning circuit boards
  - Small housings for installation in smallest of spaces
  - PNP, NPN or analogue output options
- >> Page 564

### UT 20 – miniature ultrasonic sensors

- Small housing for installation in smallest of spaces
  - High scanning distances of up to 700 mm with compact miniature housing
  - PNP, NPN or analogue output options
- >> Page 568

## UT 12

from Page 580

### UT 12 – M12 ultrasonic sensors

- Robust metal housings for harsh operating conditions
  - Simple installation with universal M12 standard thread
  - Simple sensor setting via control input
- >> Page 580

## UT/UM 18

from Page 584

### UT/UM 18 – M18 ultrasonic sensors

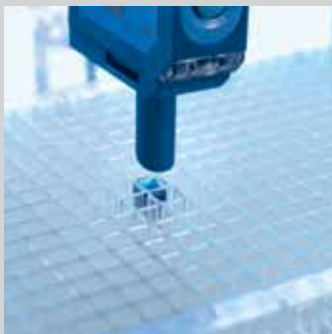
- Robust brass or stainless steel housings for harsh operating conditions
  - Simple installation with universal M18 standard thread
  - Simple sensor setting via control input
- >> Page 584



Ultrasonic sensors may be a useful alternative where optical sensors come up against their physical limits. This applies, for example, for objects with uneven surfaces or under difficult ambient conditions, or with highly transparent media as well as moving, highly reflective liquid surfaces. Typical uses of ultrasonic sensors are therefore checking the presence of highly transparent foils and measuring the filling levels in liquid containers. A major advantage of ultrasonic sensors is the absolutely reliable background suppression resulting from their sound time-of-flight measurement principle.

The new ultrasonic sensor with soundpipe (UT 20S), in its very compact cubic housing, is a special product variant. As a result of its narrow sound cone, it allows the detection of objects even through the smallest of openings and drilled holes with a diameter of less than 5 mm. This makes it ideal for special applications, such as level measurement in the wells of microplates in medical analysis systems or for scanning circuit boards in the electronics industry.

The ultrasonic sensors of the UMT 30 series are real multifunctional artists. A three-digit display makes all sensor settings easy for users. The add-on menu with numerous supplementary functions, e.g. the synchronisation of several sensors or multiplex operation, in which several sensors measure after one another in ascending order, allows the UMT 30 to offer extremely flexible use for a wide range of applications.



The UT 20-S measuring levels in microplate wells.



Deflection mirrors are available for deflecting the sound beam when machine space is limited.

## UMT 30

from Page 594

*UMT 30 – M30 ultrasonic sensors  
with display*

- Long scanning distances up to 6 m
- Simple adjustment and direct measurement value output via display
- Automatic synchronisation and multiplex operation for the simultaneous operation of up to 10 sensors
- Numerous supplementary functions (add-on menu)

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made in Germany

## TYPICAL SENSOPART

- Reliable detection of objects with critical surfaces and highly transparent objects
- Available in cubic (32 × 20 × 12 mm<sup>3</sup>) or cylindrical (M12/M18/M30) housing options
- Simple adjustment via teach-in, control input or display
- PNP, NPN or analogue output options
- Tight metal or plastic housings (IP 67 & IP 65)
- Wide range of mounting accessories

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| Ultrasonic Sensors – Product Overview |                         |                                      |   |      |
|---------------------------------------|-------------------------|--------------------------------------|---|------|
|                                       | Adjustment              | Scanning distances                   | Special features  | Page |
| UT 20                                 | Teach-in                | 140 mm / 150 mm / 240 mm / 700 mm    | Ultrasonic sensors with soundpipe, PNP, NPN, analogue output      | 564  |
| UT 12                                 | Via control input       | 400 mm                               | PNP, NPN, analogue output   | 580  |
| UT/UM 18                              | Via control input       | 250 mm / 300 mm / 800 mm             | Variants with stainless steel housings, PNP, NPN, analogue output | 584  |
| UMT 30                                | Teach-in or display<br> | 350 mm / 1300 mm / 3400 mm / 6000 mm | Display, PNP, 2 × PNP or analogue output                          | 594  |

# Ultrasonic sensors

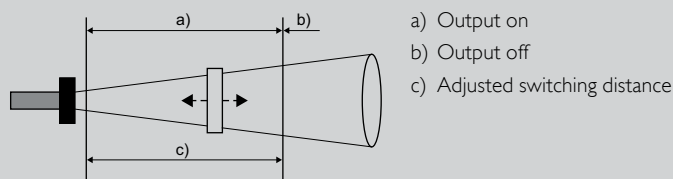
## System description

### Method of function

Ultrasonic proximity switches operate on the basis of echo time-of-flight measurement. An ultrasonic pulse emitted by the sensor is reflected when it hits an object. The sensor calculates the distance from the time elapsed between emission of the ultrasonic pulse and receipt of the echo. Depending on the power

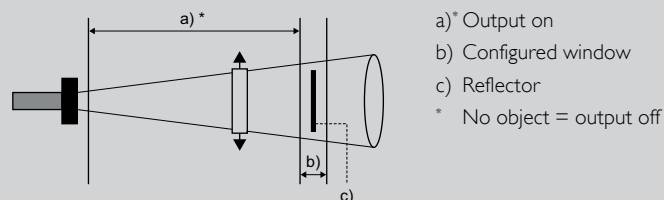
amplifier, the measured distance is converted to a current or voltage signal (analogue sensor) proportional to the distance or the switching output is activated, depending on the set switching point.

### Applications



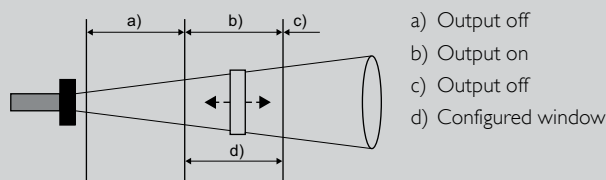
#### As a reflex scanner (proximity switch)

The classic operating mode uses background suppression, superior to other sensor principles. The switching output is activated when the object is located within the set switching distance. The switching point is subject to a hysteresis. This operating mode is suitable, for example, for detecting objects on a conveyor belt or for checking presence.



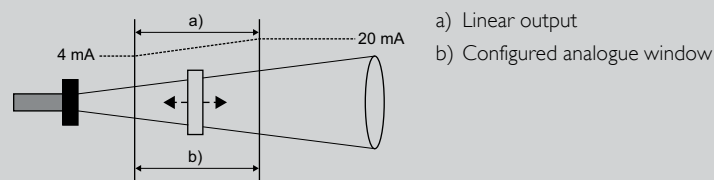
#### As a barrier or reflex switch

An ultrasonic sensor is used like a light barrier here, though no special reflector is employed (a piece of sheet metal is entirely sufficient here). For this purpose, the sensor in window mode is set in such a way that the reflector is located within the window. The ultrasonic reflex switch provides a signal as soon as an object is completely covered by the reflector. Whereby it is irrelevant whether the object absorbs the sound or even deflects it away. This operating mode is used for poorly detected material with irregular surfaces, e. g. foam.



#### In window mode

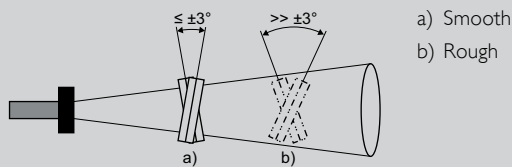
The switching output is only activated when the object is located within a window that has been defined by setting two window limits. This can be used to monitor, for example, the correct bottle size in a crate of drinks. Bottles that are too tall or too short are diverted out.



#### Ultrasonic sensors with analogue output

In these models a voltage (0...10 V) or current (4...20 mA) is transmitted in proportion to the object distance. The window limits can be defined and selected between falling and rising characteristic curves.

## Installation



Ultrasonic sensors can be installed and operated in any orientation. Though installation locations that could lead to contamination of the sensor surface should be avoided because water droplets and encrustation can impair functional performance. Thin layers of dust and paint droplets generally have no effect.

If smooth surfaces are to be detected, sensors should be mounted as vertically as possible, i. e. at an angle of from 87° to 93° to the surface.

Rough surfaces, on the other hand, permit considerably greater angular deviations. A surface whose valley-to-peak depth is greater than or equal to the wavelength of the ultrasonic frequency is considered rough. The sound, however, is then reflected diffusely, which can lead to a reduction of the operating scanning distance. In this case the maximum permissible angular deviation and maximum scanning distance should be determined in trials.

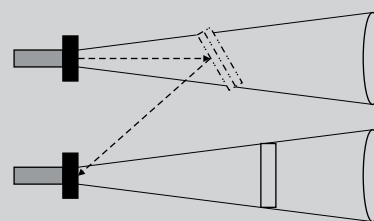
Sound-absorbing materials (such as cotton wool or foam) can further reduce the scanning distance. In contrast, liquids and solid materials are good reflectors.

## Mounting distances

a) Switching distance

| Sensor Range | Vertical Distance (A) | Horizontal Distance (B) |
|--------------|-----------------------|-------------------------|
| 0.25 m       | ≥ 0.35 m              | ≥ 2.50 m                |
| 0.35 m       | ≥ 0.40 m              | ≥ 2.50 m                |
| 1.30 m       | ≥ 1.10 m              | ≥ 8.00 m                |
| 3.40 m       | ≥ 2.00 m              | ≥ 18.00 m               |
| 6.00 m       | ≥ 4.00 m              | ≥ 30.00 m               |

The table provides the minimum distances between non-synchronised ultrasonic sensors. Sensors may mutually influence one another if these distances are not observed.



The above-mentioned mounting distances are only intended as a guide. In the case of tilting, the sound can be reflected towards the neighbouring sensor. The minimum distance should then be determined by means of trials. Some sensors permit synchronisation with one another and thus allow considerably lower scanning distances.

# UT 20-S150

Ultrasonic sensor with soundpipe and switching output



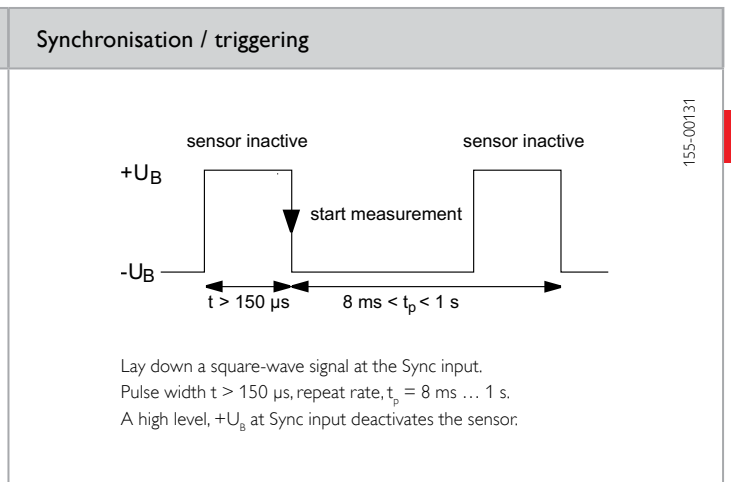
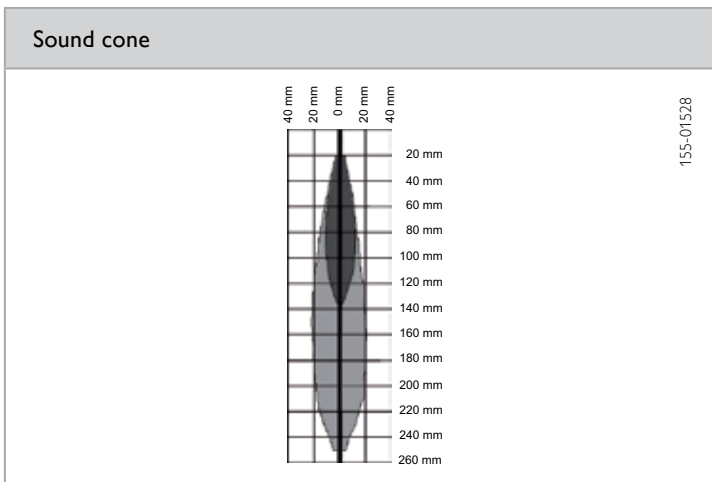
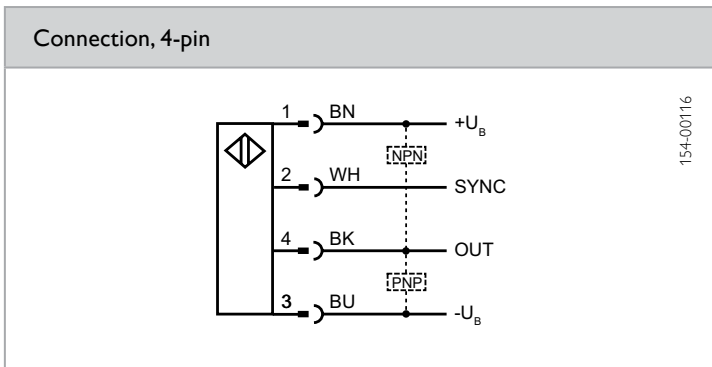
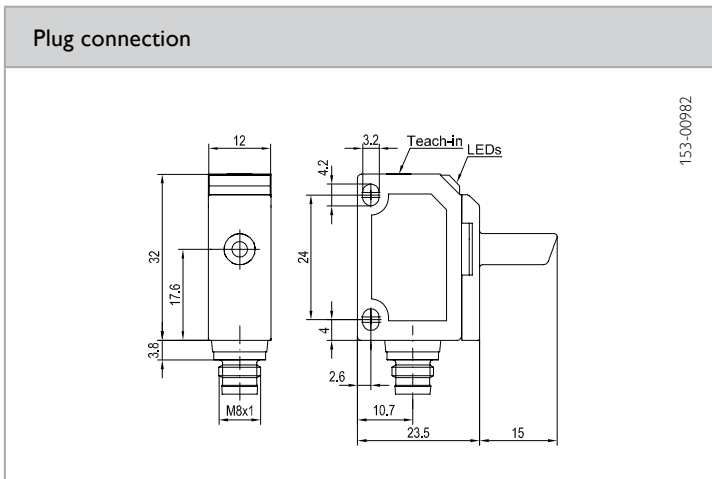
## PRODUCT HIGHLIGHTS

- Ideal for level control, particularly in narrow containers
- Narrow sound beam for precise detection even through small openings and drilled holes
- Reliable detection of highly transparent objects
- Detection independent of object colour and surface
- Compact miniature housings for use when space in machine is limited

| Sensor data                        |  | Functions                       |   |
|------------------------------------|--|---------------------------------|---|
| Limiting scanning distance         | 250 mm   | LED indicator, green            | Operating voltage indicator   |
| Operating scanning distance        | 20 ... 140 mm  | LED indicator, yellow           | Switching output indicator  |
| Ultrasonic frequency               | ~ 380 kHz  | Scanning distance adjustment    | Via Teach-in button   |
| Resolution                         | 0,20 mm  | Teach-in modes                  | Mode 1: set switching point<br>Mode 2: set Window Mode<br>Mode 3: set two-way / reflex switch   |
| Repeatability                      | ± 0.15 % <sup>1</sup>  | Adjustment possibilities        | N.O. / N.C. via Teach-in button<br>Button lock via Teach-in button<br>Synchronisation via control input<br>Default settings via Teach-in button |
| Hysteresis                         | 2 mm   |                                 | Max. sensitivity and N.O.   |
| Temperature drift                  | 0.17 % / °C  | Default settings                |   |
| Electrical data                    |  | Mechanical data                 |   |
| Operating voltage, +U <sub>b</sub> | 20 ... 30V DC <sup>2</sup>   | Dimensions                      | 32 x 38.5 x 12 mm   |
| No-load current, I <sub>0</sub>    | ≤ 25 mA  | Enclosure rating                | IP 67 <sup>3</sup>  |
| Output current, I <sub>e</sub>     | 200 mA   | Material, housing               | ABS   |
| Protective circuits                | Reverse-polarity protection, U <sub>b</sub> / short-circuit protection (Q) | Material, ultrasonic converter  | Polyurethane foam, epoxy resin with glass content   |
| Protection Class                   | 2  | Type of connection              | (See Selection Table)   |
| Power On Delay                     | < 300 ms   | Ambient temperature, operation  | -25 ... +70 °C  |
| Switching output, Q                | PNP / NPN (see Selection Table)  | Ambient temperature, storage    | -40 ... +85 °C  |
| Output function                    | N.O. / N.C.  | Weight                          | 10 g  |
| Switching frequency, f (ti/tp 1:1) | 25 Hz  | Vibration and impact resistance | EN 60947-5-2  |
| Response time                      | 24 ms  |                                 |   |
| Connection, WH                     | Sync.  |                                 |   |

<sup>1</sup> From final value of limit scanning distance    <sup>2</sup> Max. 10 % ripple, within U<sub>b</sub>    <sup>3</sup> With connected IP 67 plug

| Operating scanning distance | Switching output | Type of connection      | Part number     | Article number |
|-----------------------------|------------------|-------------------------|-----------------|----------------|
| 20 ... 140 mm               | PNP              | Metal plug, M8x1, 4-pin | UT 20-S150-PSM4 | 693-11012      |
| 20 ... 140 mm               | NPN              | Metal plug, M8x1, 4-pin | UT 20-S150-NSM4 | 693-11013      |



**Accessories**

|                   |                |
|-------------------|----------------|
| Connection cables | From Page A-34 |
| Brackets          | From Page A-4  |

# UT 20-S150-A

Ultrasonic sensor with soundpipe and analogue output



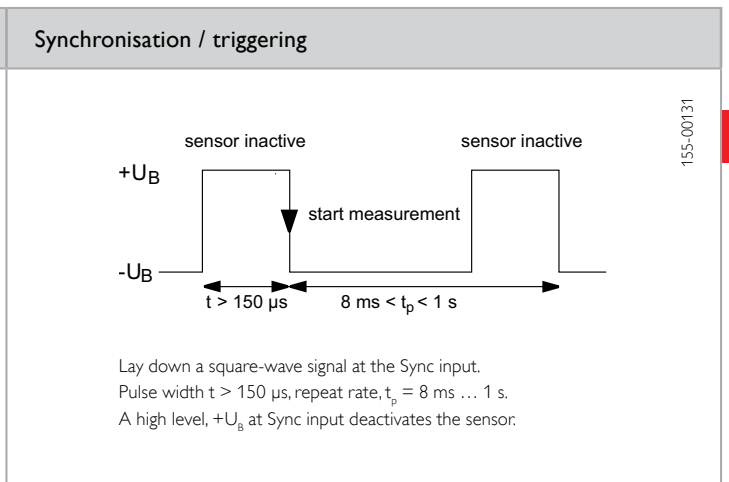
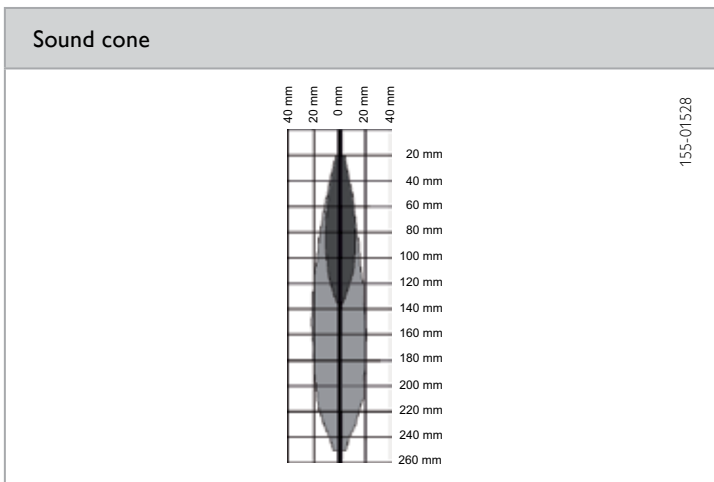
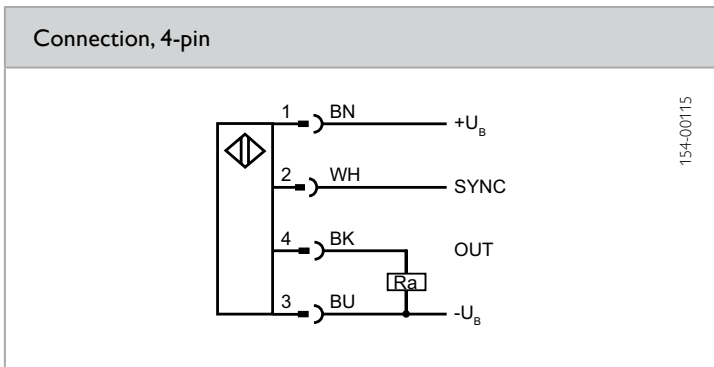
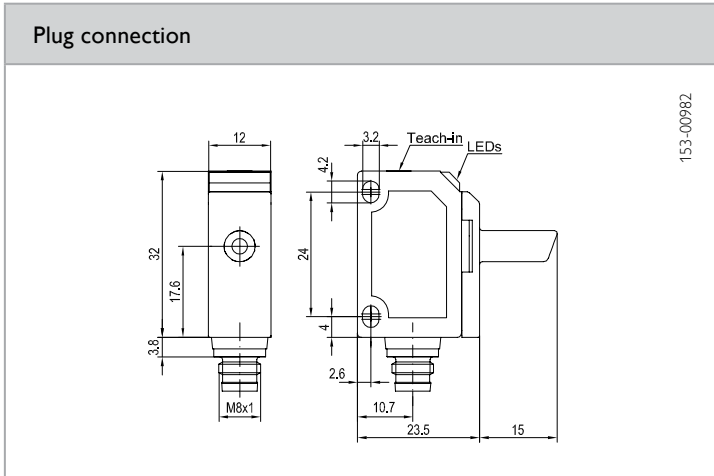
## PRODUCT HIGHLIGHTS

- Ideal for level control, particularly in narrow containers
- Narrow sound beam for precise detection even through small openings and drilled holes
- Reliable detection of highly transparent objects
- Compact miniature housings for use when space in machine is limited
- Analogue output 0 ... 10V or 4 ... 20 mA

| Sensor data <sup>1</sup>           |  | Functions                       |   |
|------------------------------------|--|---------------------------------|---|
| Limiting scanning distance         | 250 mm   | LED indicator, green            | Operating voltage indicator                       |
| Operating scanning distance        | 20 ... 140 mm  | LED indicator, yellow           | Switching output indicator                        |
| Ultrasonic frequency               | ~ 380 kHz  | Set analogue characteristic     | Via Teach-in button                               |
| Resolution                         | 0,20 mm  | Adjustment possibilities        | Rising / falling edge via Teach-in button         |
| Repeatability                      | ± 0.15 % <sup>2</sup>  |                                 | Button lock via Teach-in button                   |
| Temperature drift                  | ≤ 2 %  |                                 | Synchronisation via control input                 |
|                                    |  |                                 | Default settings via Teach-in button              |
| Electrical data                    |  | Mechanical data                 |   |
| Operating voltage, +U <sub>B</sub> | 20 ... 30V DC <sup>3</sup>   | Dimensions                      | 32 x 38,5 x 12 mm                                 |
| No-load current, I <sub>0</sub>    | ≤ 25 mA  | Enclosure rating                | IP 67 <sup>4</sup>                                |
| Current output                     | R <sub>a</sub> < 500 Ω   | Material, housing               | ABS   |
| Voltage output                     | R <sub>a</sub> > 500 Ω   | Material, ultrasonic converter  | Polyurethane foam, epoxy resin with glass content |
| Protective circuits                | Reverse-polarity protection, U <sub>B</sub> / short-circuit protection (Q) | Type of connection              | (See Selection Table)                             |
| Protection Class                   | 2  | Ambient temperature, operation  | -25 ... +70 °C                                    |
| Power On Delay                     | < 300 ms   | Ambient temperature, storage    | -40 ... +85 °C                                    |
| Analogue output                    | 0 ... 10V / 4 ... 20 mA<br>(see Selection Table)                           | Weight                          | 10 g  |
| Response time                      | 30 ms  | Vibration and impact resistance | EN 60947-5-2                                      |
| Connection, WH                     | Sync.  |                                 |   |

<sup>1</sup> After 30 min. settling time    <sup>2</sup> From final value of limit scanning distance    <sup>3</sup> Max. 10 % ripple, within U<sub>B</sub>    <sup>4</sup> With connected IP 67 plug

| Operating scanning distance | Analogue output | Type of connection      | Part number     | Article number |
|-----------------------------|-----------------|-------------------------|-----------------|----------------|
| 20 ... 140 mm               | 0 ... 10V       | Metal plug, M8x1, 4-pin | UT 20-S150-AUM4 | 693-11014      |
| 20 ... 140 mm               | 4 ... 20 mA     | Metal plug, M8x1, 4-pin | UT 20-S150-AIM4 | 693-11015      |



### Accessories

|                   |                |
|-------------------|----------------|
| Connection cables | From Page A-34 |
| Brackets          | From Page A-4  |



# UT 20-150

Ultrasonic sensor with switching output



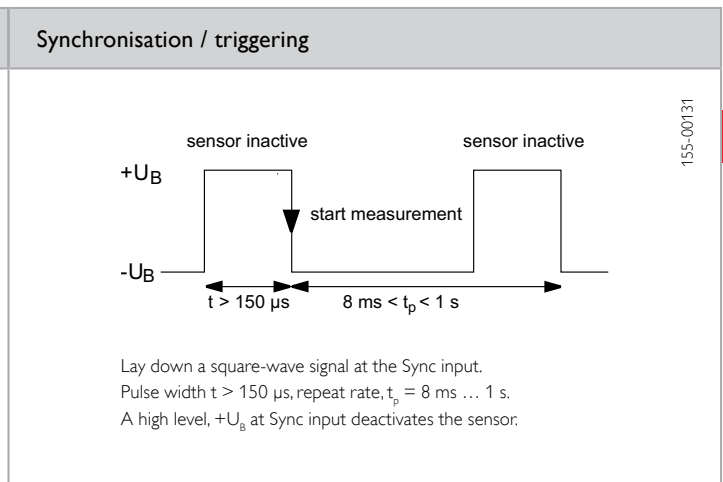
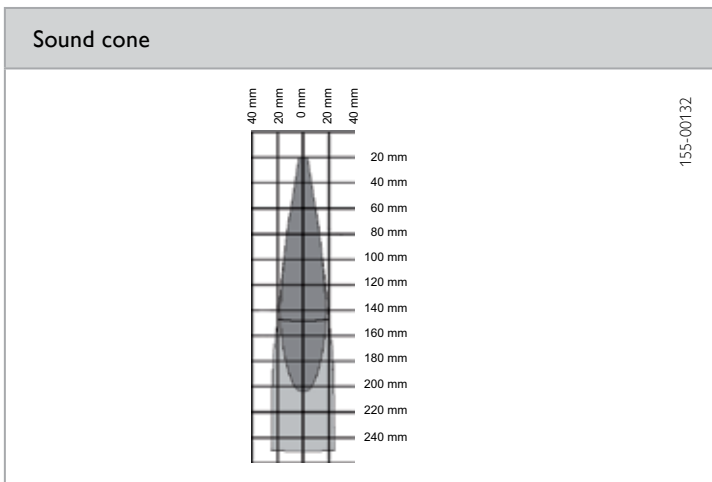
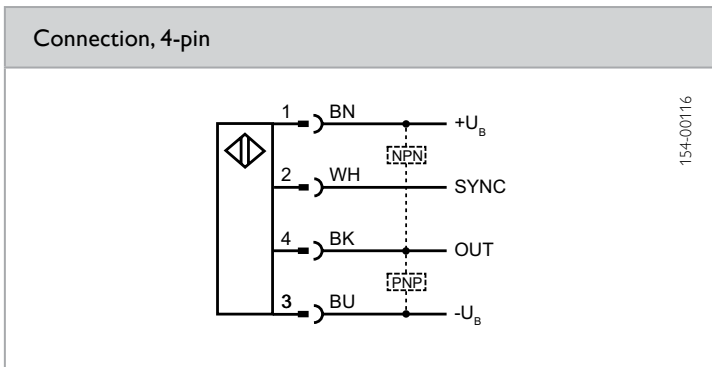
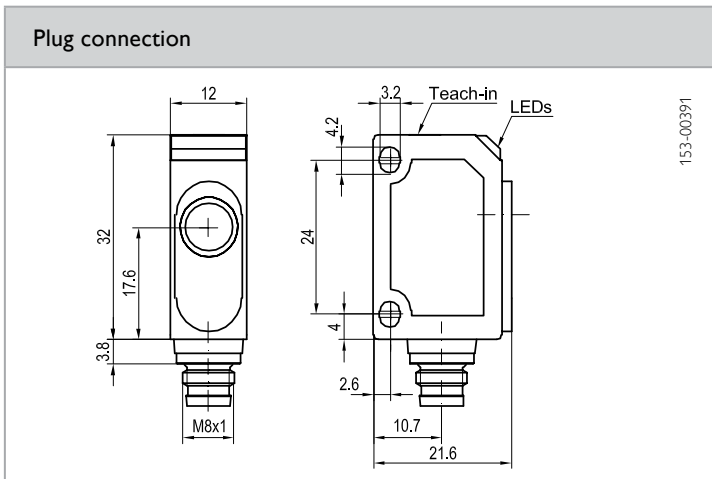
## PRODUCT HIGHLIGHTS

- Detection regardless of object colour and surface
- Compact miniature housing for use when machine space is limited
- Robust ambient conditions have no effect on sensor
- Reliable detection of highly transparent objects

| Sensor data                        |  | Functions                       |   |
|------------------------------------|--|---------------------------------|---|
| Limit scanning distance            | 250 mm   | Indicator LED, green            | Operating voltage indicator   |
| Operating scanning distance        | 20 ... 150 mm  | Indicator LED, yellow           | Switching output indicator  |
| Ultrasonic frequency               | ~ 380 kHz  | Scanning distance adjustment    | Via Teach-in button   |
| Resolution                         | 0.20 mm  | Teach-in modes                  | Mode 1: set switching point<br>Mode 2: set window operation<br>Mode 3: set two-way / retroreflective sensor                                     |
| Repeatability                      | ± 0.15 % <sup>1</sup>  | Adjustment possibilities        | N.O. / N.C. via Teach-in button<br>Button lock via Teach-in button<br>Synchronisation via control input<br>Default settings via Teach-in button |
| Hysteresis                         | 2 mm   | Default settings                | Max. sensitivity and N.O.   |
| Temperature drift                  | 0.17 % / °C  |                                 |   |
| Electrical data                    |  | Mechanical data                 |   |
| Operating voltage, +U <sub>B</sub> | 20 ... 30V DC <sup>2</sup>   | Dimensions                      | 32 x 21.6 x 12 mm   |
| No-load current, I <sub>0</sub>    | ≤ 25 mA  | Enclosure rating                | IP 67 <sup>3</sup>  |
| Output current, I <sub>e</sub>     | 200 mA   | Material, housing               | ABS   |
| Protective circuits                | Reverse polarity protection, U <sub>B</sub> / short-circuit protection (Q) | Material, ultrasonic converter  | Polyurethane foam, epoxy resin with glass content<br>(See Selection Table)  |
| Protection Class                   | 2  | Type of connection              | -25 ... +70 °C  |
| Power On Delay                     | < 300 ms   | Ambient temperature: operation  | -40 ... +85 °C  |
| Switching output, Q                | PNP / NPN (see Selection Table)  | Ambient temperature: storage    | 10 g  |
| Output function                    | N.O. / N.C.  | Weight                          | EN 60947-5-2  |
| Switching frequency, f (ti/tp 1:1) | 25 Hz  | Vibration and impact resistance |   |
| Response time                      | 24 ms  |                                 |   |
| Connection, WH                     | Sync.  |                                 |   |

<sup>1</sup> From end-value of limit scanning distance    <sup>2</sup> Max. 10 % ripple, within U<sub>B</sub>    <sup>3</sup> With connected IP 67 plug

| Operating scanning distance | Switching output | Type of connection      | Part number    | Article number |
|-----------------------------|------------------|-------------------------|----------------|----------------|
| 20 ... 150 mm               | PNP              | Metal plug, M8x1, 4-pin | UT 20-150-PSM4 | 693-11000      |
| 20 ... 150 mm               | NPN              | Metal plug, M8x1, 4-pin | UT 20-150-NSM4 | 693-11001      |



### Accessories

|                   |                |
|-------------------|----------------|
| Connection cables | From Page A-34 |
| Brackets          | From Page A-4  |

# UT 20-150-A

Ultrasonic sensor with analogue output



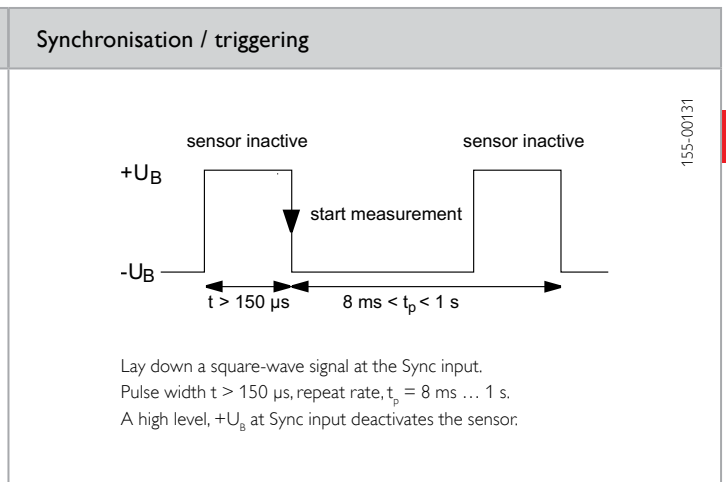
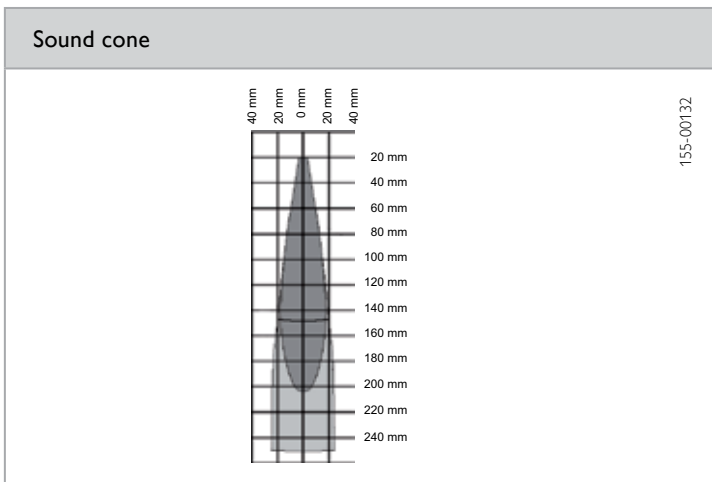
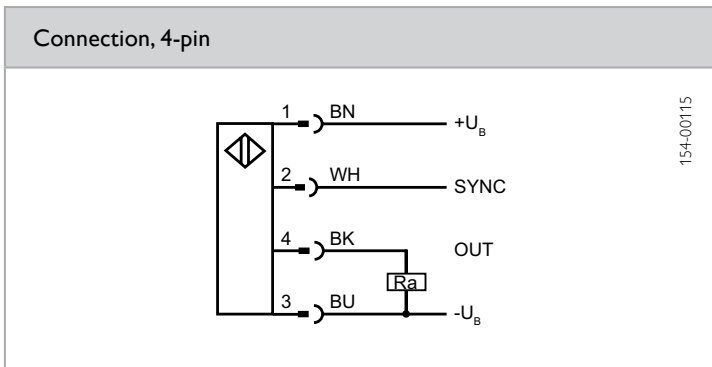
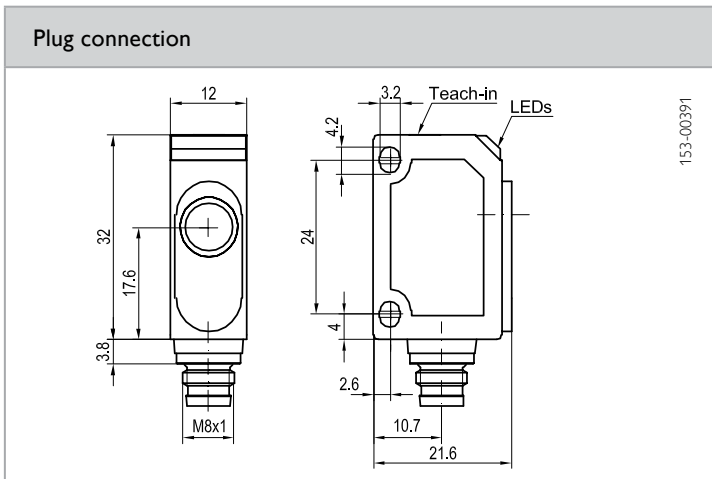
## PRODUCT HIGHLIGHTS

- Detection regardless of object colour and surface
- Compact miniature housing for use when machine space is limited
- Synchronisation input – simultaneous operation of several sensors in highly limited spaces
- Analogue output: 0 ... 10V or 4 ... 20 mA

| Sensor data <sup>1</sup>           |  | Functions                         |   |
|------------------------------------|--|-----------------------------------|---|
| Limit scanning distance            | 250 mm   | Indicator LED, green              | Operating voltage indicator                       |
| Operating scanning distance        | 20 ... 150 mm  | Indicator LED, yellow             | Switching output indicator                        |
| Ultrasonic frequency               | ~ 380 kHz  | Set characteristic analogue curve | Via Teach-in button                               |
| Resolution                         | 0.20 mm  | Adjustment possibilities          | Rising / falling slope via Teach-in button        |
| Repeatability                      | ± 0.15 % <sup>2</sup>  |                                   | Button lock via Teach-in button                   |
| Temperature drift                  | ≤ 2 %  |                                   | Synchronisation via control input                 |
|                                    |  |                                   | Default settings via Teach-in button              |
| Electrical data                    |  | Mechanical data                   |   |
| Operating voltage, +U <sub>B</sub> | 20 ... 30V DC <sup>3</sup>   | Dimensions                        | 32 × 21.6 × 12 mm                                 |
| No-load current, I <sub>0</sub>    | ≤ 25 mA  | Enclosure rating                  | IP 67 <sup>4</sup>                                |
| Current output                     | R <sub>a</sub> < 500 Ω   | Material, housing                 | ABS   |
| Voltage output                     | R <sub>a</sub> > 500 Ω   | Material, ultrasonic converter    | Polyurethane foam, epoxy resin with glass content |
| Protective circuits                | Reverse polarity protection, U <sub>B</sub> / short-circuit protection (Q) | Type of connection                | (See Selection Table)                             |
| Protection Class                   | 2  | Ambient temperature: operation    | -25 ... +70 °C                                    |
| Power On Delay                     | < 300 ms   | Ambient temperature: storage      | -40 ... +85 °C                                    |
| Analogue output                    | 0 ... 10V / 4 ... 20 mA (see Selection Table)                              | Weight                            | 10 g  |
| Response time                      | 30 ms  | Vibration and impact resistance   | EN 60947-5-2                                      |
| Connection, WH                     | Sync.  |                                   |   |

<sup>1</sup> After 30 minutes settling time    <sup>2</sup> From end-value of limit scanning distance    <sup>3</sup> Max. 10 % ripple, within U<sub>B</sub>    <sup>4</sup> With connected IP 67 plug

| Operating scanning distance | Analogue output | Type of connection      | Part number    | Article number |
|-----------------------------|-----------------|-------------------------|----------------|----------------|
| 20 ... 150 mm               | 0 ... 10V       | Metal plug, M8x1, 4-pin | UT 20-150-AUM4 | 693-11004      |
| 20 ... 150 mm               | 4 ... 20 mA     | Metal plug, M8x1, 4-pin | UT 20-150-AIM4 | 693-11005      |



### Accessories

|                   |                |
|-------------------|----------------|
| Connection cables | From Page A-34 |
| Brackets          | From Page A-4  |

# UT 20-240

Ultrasonic sensor with switching output



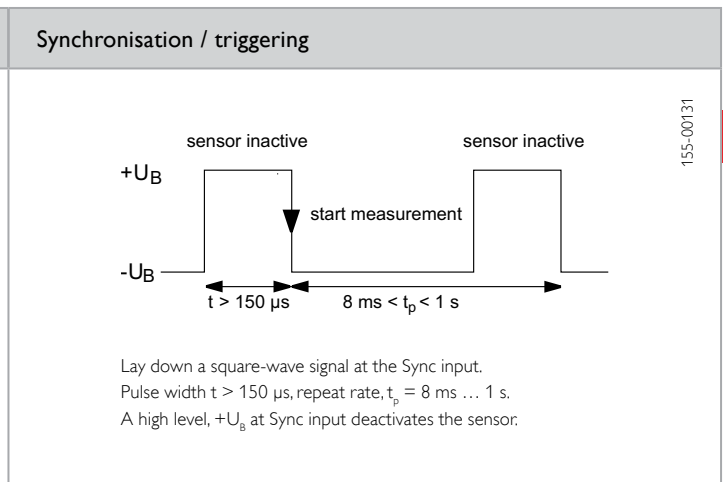
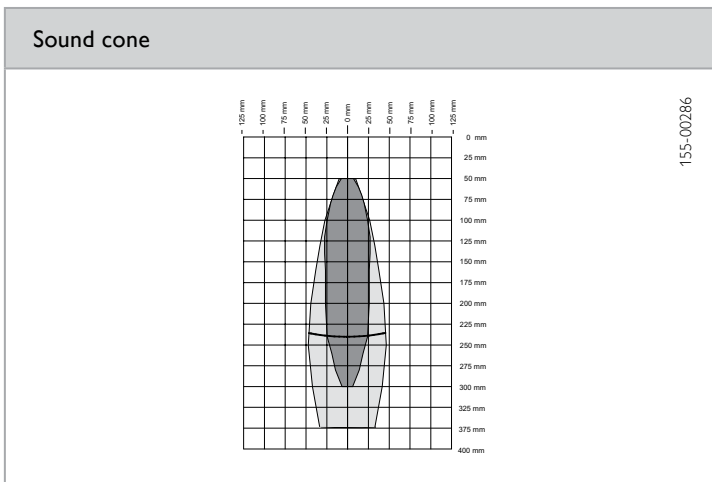
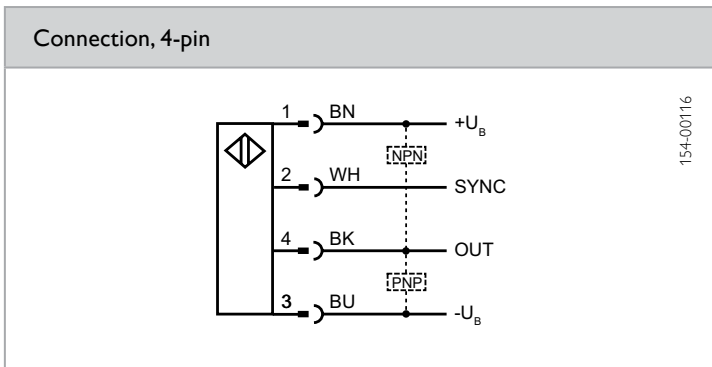
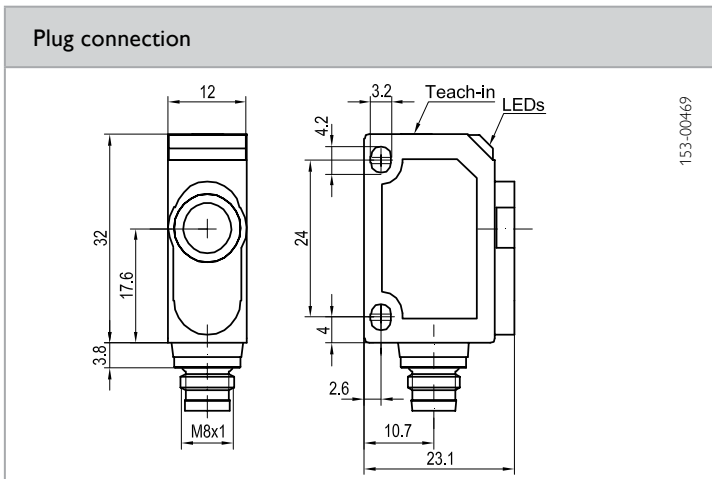
## PRODUCT HIGHLIGHTS

- Ideal for monitoring filling levels, e.g. of liquids
- Reliable detection of highly transparent objects
- Detection regardless of object colour and surface
- Compact miniature housings for use when machine space is limited

| Sensor data                        |  | Functions                       |   |
|------------------------------------|--|---------------------------------|---|
| Limit scanning distance            | 350 mm   | Indicator LED, green            | Operating voltage indicator   |
| Operating scanning distance        | 50 ... 240 mm  | Indicator LED, yellow           | Switching output indicator  |
| Ultrasonic frequency               | ~500 kHz   | Scanning distance adjustment    | Via Teach-in button   |
| Resolution                         | 0.20 mm  | Teach-in modes                  | Mode 1: set switching point<br>Mode 2: set window operation<br>Mode 3: set two-way / retroreflective sensor                                     |
| Repeatability                      | ± 0.15 % <sup>1</sup>  | Adjustment possibilities        | N.O. / N.C. via Teach-in button<br>Button lock via Teach-in button<br>Synchronisation via control input<br>Default settings via Teach-in button |
| Hysteresis                         | 2 mm   | Default settings                | Max. sensitivity and N.O.   |
| Temperature drift                  | 0.17 % / °C  |                                 |   |
| Electrical data                    |  | Mechanical data                 |   |
| Operating voltage, +U <sub>B</sub> | 20 ... 30V DC <sup>2</sup>   | Dimensions                      | 32 x 23.1 x 12 mm   |
| No-load current, I <sub>0</sub>    | ≤ 25 mA  | Enclosure rating                | IP 67 <sup>3</sup>  |
| Output current, I <sub>e</sub>     | 200 mA   | Material, housing               | ABS   |
| Protective circuits                | Reverse polarity protection, U <sub>B</sub> / short-circuit protection (Q) | Material, ultrasonic converter  | Polyurethane foam, epoxy resin with glass content<br>(See Selection Table)  |
| Protection Class                   | 2  | Type of connection              | -25 ... +70 °C  |
| Power On Delay                     | < 300 ms   | Ambient temperature: operation  | -40 ... +85 °C  |
| Switching output, Q                | PNP / NPN (see Selection Table)  | Ambient temperature: storage    |   |
| Output function                    | N.O. / N.C.  | Weight                          | 10 g  |
| Switching frequency, f (ti/tp 1:1) | 25 Hz  | Vibration and impact resistance | EN 60947-5-2  |
| Response time                      | 24 ms  |                                 |   |
| Connection, WH                     | Sync.  |                                 |   |

<sup>1</sup> From end-value of limit scanning distance    <sup>2</sup> Max. 10 % ripple, within U<sub>B</sub>    <sup>3</sup> With connected IP 67 plug

| Operating scanning distance | Switching output | Type of connection      | Part number    | Article number |
|-----------------------------|------------------|-------------------------|----------------|----------------|
| 50 ... 240 mm               | PNP              | Metal plug, M8x1, 4-pin | UT 20-240-PSM4 | 693-11002      |
| 50 ... 240 mm               | NPN              | Metal plug, M8x1, 4-pin | UT 20-240-NSM4 | 693-11003      |



**Accessories**

|                   |                |
|-------------------|----------------|
| Connection cables | From Page A-34 |
| Brackets          | From Page A-4  |

# UT 20-240-A

Ultrasonic sensor with analogue output



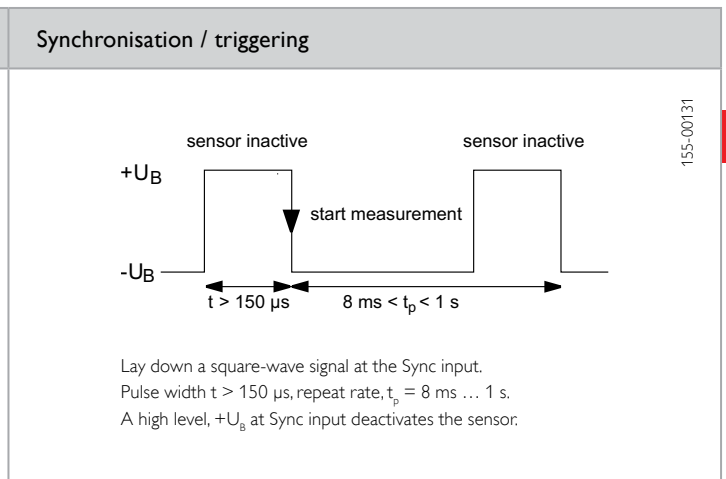
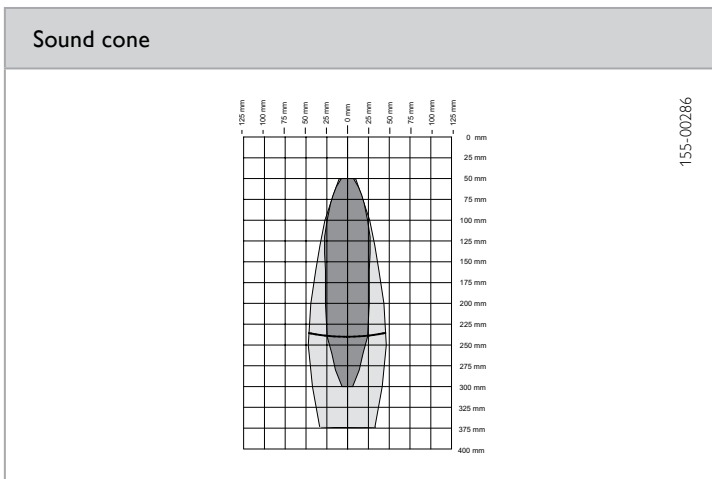
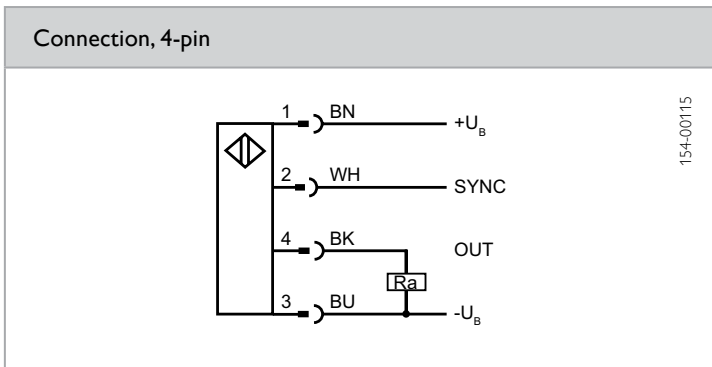
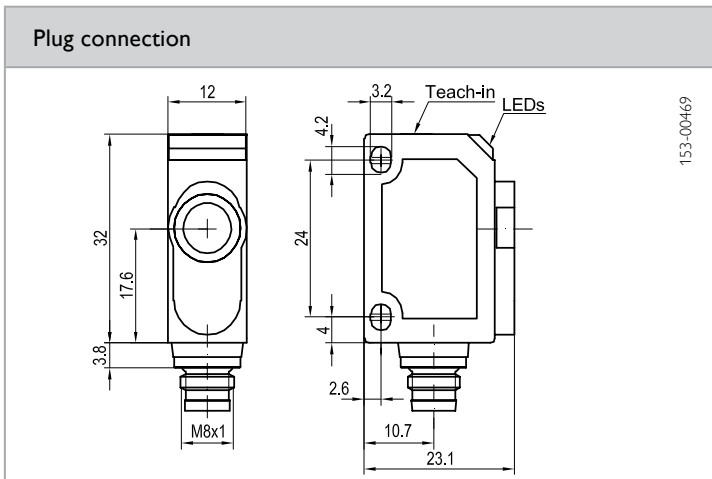
## PRODUCT HIGHLIGHTS

- Detection regardless of object colour and surface
- Compact miniature housing for use when machine space is limited
- Analogue output: 0 ... 10V or 4 ... 20 mA
- Synchronisation input – simultaneous operation of several sensors in highly limited spaces

| Sensor data <sup>1</sup>           |  | Functions                         |   |
|------------------------------------|--|-----------------------------------|---|
| Limit scanning distance            | 350 mm   | Indicator LED, green              | Operating voltage indicator                       |
| Operating scanning distance        | 50 ... 240 mm  | Indicator LED, yellow             | Switching output indicator                        |
| Ultrasonic frequency               | ~ 500 kHz  | Set characteristic analogue curve | Via Teach-in button                               |
| Resolution                         | 0.20 mm  | Adjustment possibilities          | Rising / falling slope via Teach-in button        |
| Repeatability                      | ± 0.15 % <sup>2</sup>  |                                   | Button lock via Teach-in button                   |
| Temperature drift                  | ≤ 2 %  |                                   | Synchronisation via control input                 |
|                                    |  |                                   | Default settings via Teach-in button              |
| Electrical data                    |  | Mechanical data                   |   |
| Operating voltage, +U <sub>b</sub> | 20 ... 30V DC <sup>3</sup>   | Dimensions                        | 32 × 23,1 × 12 mm                                 |
| No-load current, I <sub>0</sub>    | ≤ 25 mA  | Enclosure rating                  | IP 67 <sup>4</sup>                                |
| Current output                     | R <sub>a</sub> < 500 Ω   | Material, housing                 | ABS   |
| Voltage output                     | R <sub>a</sub> > 500 Ω   | Material, ultrasonic converter    | Polyurethane foam, epoxy resin with glass content |
| Protective circuits                | Reverse polarity protection, U <sub>b</sub> / short-circuit protection (Q) | Type of connection                | (See Selection Table)                             |
| Protection Class                   | 2  | Ambient temperature: operation    | -25 ... +70 °C                                    |
| Power On Delay                     | < 300 ms   | Ambient temperature: storage      | -40 ... +85 °C                                    |
| Analogue output                    | 0 ... 10V / 4 ... 20 mA<br>(see Selection Table)                           | Weight                            | 10 g  |
| Response time                      | 30 ms  | Vibration and impact resistance   | EN 60947-5-2                                      |
| Connection, WH                     | Sync.  |                                   |   |

<sup>1</sup> After 30 minutes settling time    <sup>2</sup> From end-value of limit scanning distance    <sup>3</sup> Max. 10 % ripple, within U<sub>b</sub>    <sup>4</sup> With connected IP 67 plug

| Operating scanning distance | Analogue output | Type of connection      | Part number    | Article number |
|-----------------------------|-----------------|-------------------------|----------------|----------------|
| 50 ... 240 mm               | 0 ... 10V       | Metal plug, M8x1, 4-pin | UT 20-240-AUM4 | 693-11006      |
| 50 ... 240 mm               | 4 ... 20 mA     | Metal plug, M8x1, 4-pin | UT 20-240-AIM4 | 693-11007      |



### Accessories

|                   |                |
|-------------------|----------------|
| Connection cables | From Page A-34 |
| Brackets          | From Page A-4  |



# UT 20-700

Ultrasonic sensor with switching output



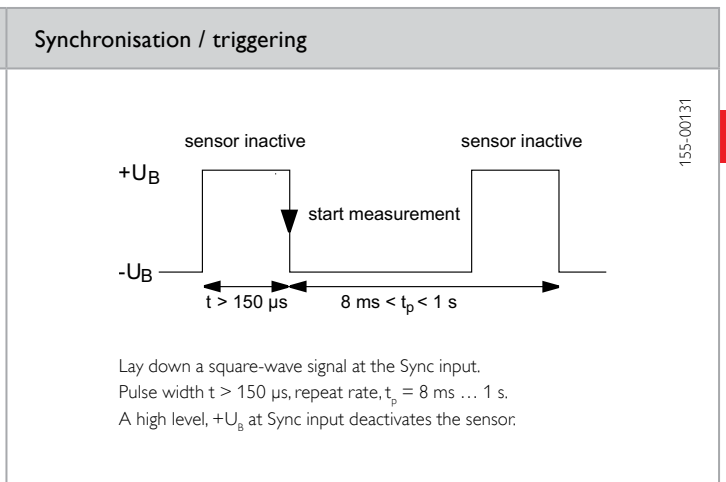
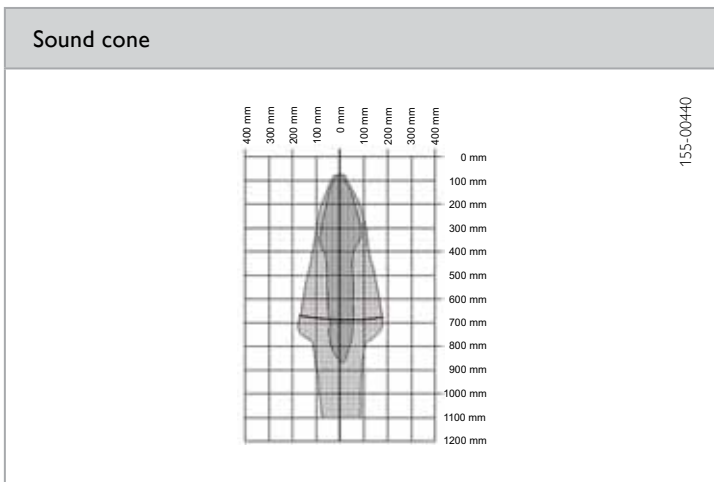
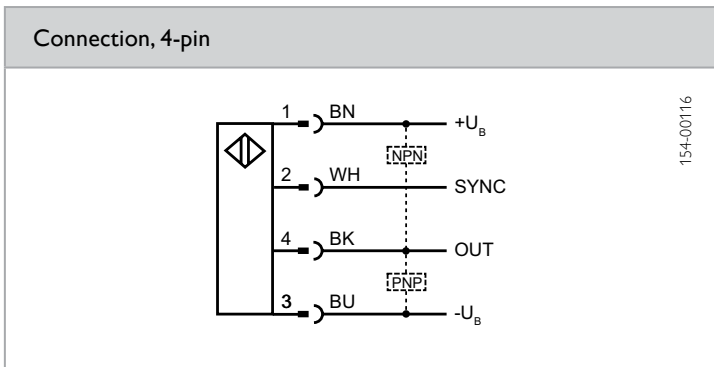
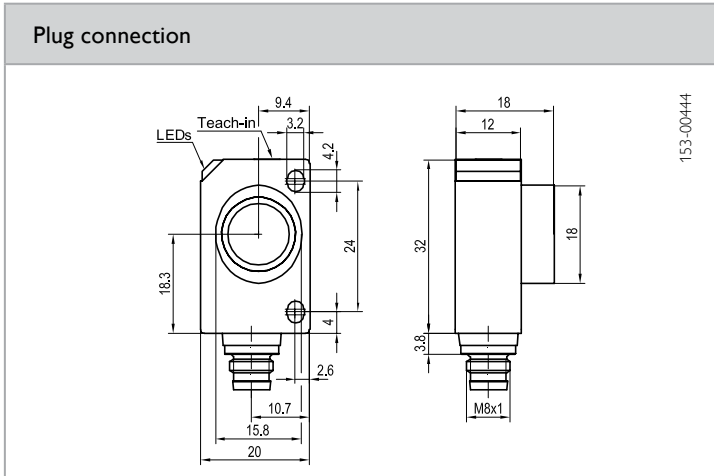
## PRODUCT HIGHLIGHTS

- Long scanning distance of 700 mm with small and compact housing
- Ideal for monitoring filling levels, e.g. of liquids
- Detection regardless of object colour and surface
- Synchronisation input – simultaneous operation of several sensors in highly limited spaces

| Sensor data                        |  | Functions                      |   |
|------------------------------------|--|--------------------------------|---|
| Limit scanning distance            | 1000 mm  | Indicator LED, green           | Operating voltage indicator   |
| Operating scanning distance        | 120 ... 700 mm   | Indicator LED, yellow          | Switching output indicator  |
| Ultrasonic frequency               | ~ 300 kHz  | Scanning distance adjustment   | Via Teach-in button   |
| Resolution                         | 0.20 mm  | Teach-in modes                 | Mode 1: set switching point<br>Mode 2: set window operation<br>Mode 3: set two-way / retroreflective sensor                                     |
| Repeatability                      | ± 0.15 % <sup>1</sup>  | Adjustment possibilities       | N.O. / N.C. via Teach-in button<br>Button lock via Teach-in button<br>Synchronisation via control input<br>Default settings via Teach-in button |
| Hysteresis                         | 2 mm   | Default settings               | Max. sensitivity and N.O.   |
| Temperature drift                  | 0.17 % / °C  |                                |   |
| Electrical data                    |  | Mechanical data                |   |
| Operating voltage, +U <sub>B</sub> | 20 ... 30V DC <sup>2</sup>   | Dimensions                     | 32 x 20 x 18 mm   |
| No-load current, I <sub>0</sub>    | ≤ 35 mA  | Enclosure rating               | IP 67 <sup>3</sup>  |
| Output current, I <sub>e</sub>     | 200 mA   | Material, housing              | ABS   |
| Protective circuits                | Reverse polarity protection, U <sub>B</sub> / short-circuit protection (Q) | Material, ultrasonic converter | Polyurethane foam, epoxy resin with glass content<br>(See Selection Table)  |
| Protection Class                   | 2  | Type of connection             | -25 ... +70 °C  |
| Power On Delay                     | < 300 ms   | Ambient temperature: operation | -40 ... +85 °C  |
| Switching output, Q                | PNP / NPN (see Selection Table)  | Ambient temperature: storage   | 10 g  |
| Output function                    | N.O. / N.C.  | Weight                         | Vibration and impact resistance   |
| Switching frequency, f (ti/tp 1:1) | 14 Hz  |                                | EN 60947-5-2  |
| Response time                      | 42 ms  |                                |   |
| Connection, WH                     | Sync.  |                                |   |

<sup>1</sup> From end-value of limit scanning distance    <sup>2</sup> Max. 10 % ripple, within U<sub>B</sub>    <sup>3</sup> With connected IP 67 plug

| Operating scanning distance | Switching output | Type of connection      | Part number    | Article number |
|-----------------------------|------------------|-------------------------|----------------|----------------|
| 120 ... 700 mm              | PNP              | Metal plug, M8x1, 4-pin | UT 20-700-PSM4 | 693-11008      |
| 120 ... 700 mm              | NPN              | Metal plug, M8x1, 4-pin | UT 20-700-NSM4 | 693-11009      |



### Accessories

|                   |                |
|-------------------|----------------|
| Connection cables | From Page A-34 |
| Brackets          | From Page A-4  |

# UT 20-700-A

Ultrasonic sensor with analogue output



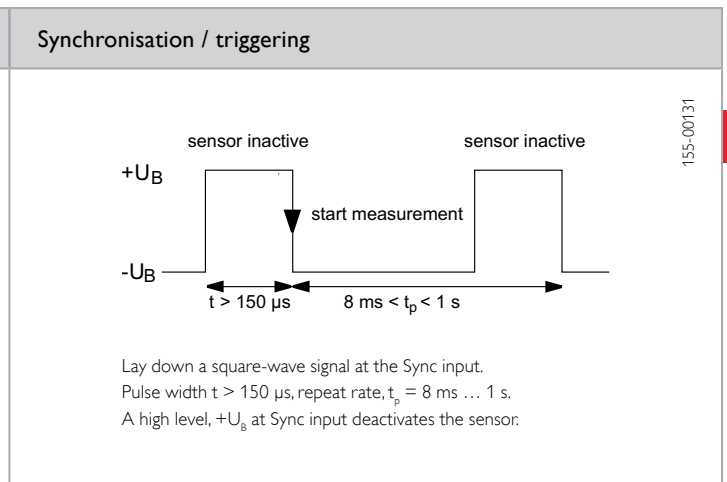
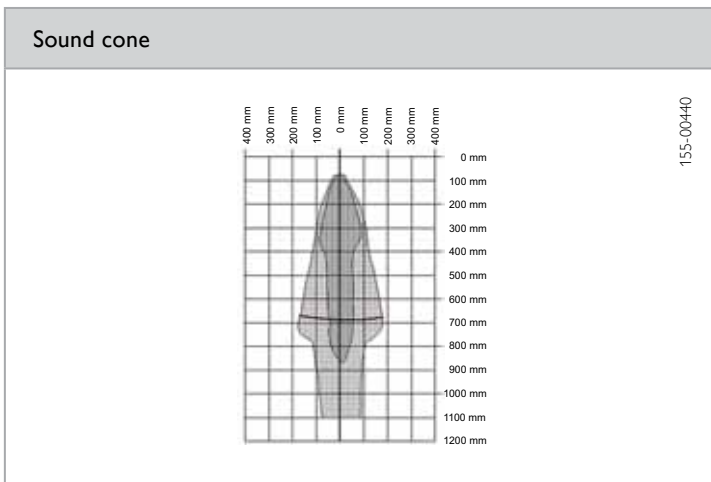
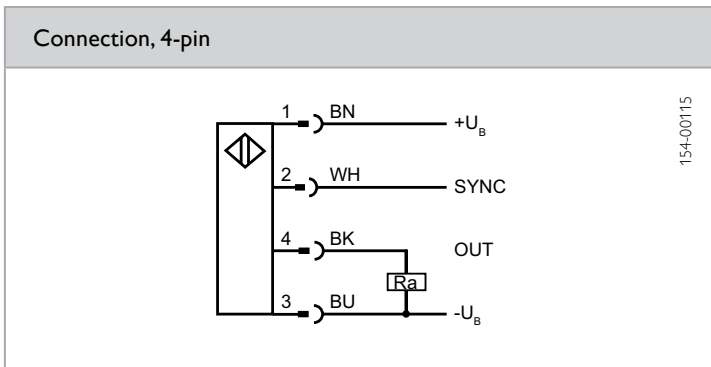
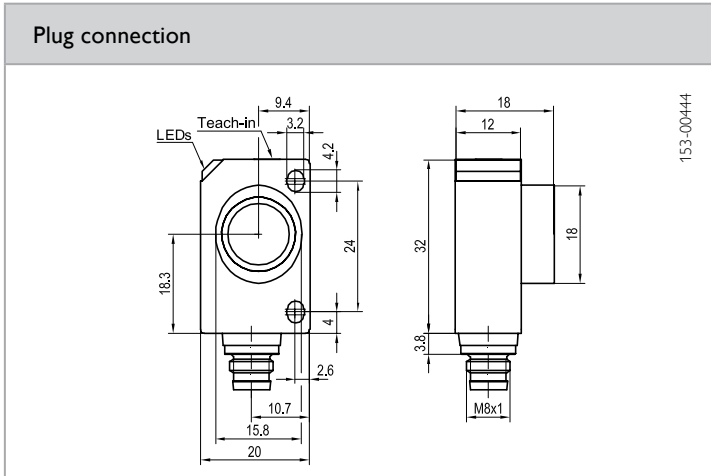
## PRODUCT HIGHLIGHTS

- Long scanning distance of 700 mm with small and compact housings
- Analogue output: 0 ... 10 V or 4 ... 20 mA
- Ideal for monitoring filling levels, e.g. of liquids
- Detection regardless of object colour and surface

| Sensor data <sup>1</sup>           |  | Functions                         |   |
|------------------------------------|--|-----------------------------------|---|
| Limit scanning distance            | 1000 mm  | Indicator LED, green              | Operating voltage indicator                       |
| Operating scanning distance        | 120 ... 700 mm   | Indicator LED, yellow             | Switching output indicator                        |
| Ultrasonic frequency               | ~ 300 kHz  | Set characteristic analogue curve | Via Teach-in button                               |
| Resolution                         | 0.20 mm  | Adjustment possibilities          | Rising/falling edge via Teach-in button           |
| Repeatability                      | ± 0.15 % <sup>2</sup>  |                                   | Button lock via Teach-in button                   |
| Temperature drift                  | ≤ 2 %  |                                   | Synchronisation via control input                 |
|                                    |  |                                   | Default settings via Teach-in button              |
| Electrical data                    |  | Mechanical data                   |   |
| Operating voltage, +U <sub>B</sub> | 20 ... 30V DC <sup>2</sup>   | Dimensions                        | 32 x 20 x 18 mm                                   |
| No-load current, I <sub>0</sub>    | ≤ 35 mA  | Enclosure rating                  | IP 67 <sup>3</sup>                                |
| Current output                     | R <sub>a</sub> < 500 Ω   | Material, housing                 | ABS   |
| Voltage output                     | R <sub>a</sub> > 500 Ω   | Material, ultrasonic converter    | Polyurethane foam, epoxy resin with glass content |
| Protective circuits                | Reverse polarity protection, U <sub>B</sub> / short-circuit protection (Q) | Type of connection                | (See Selection Table)                             |
| Protection Class                   | 2  | Ambient temperature: operation    | -25 ... +70 °C                                    |
| Power On Delay                     | < 300 ms   | Ambient temperature: storage      | -40 ... +85 °C                                    |
| Analogue output                    | 0 ... 10V / 4 ... 20 mA (see Selection Table)                              | Weight                            | 10 g  |
| Response time                      | 30 ms  | Vibration and impact resistance   | EN 60947-5-2                                      |
| Connection, WH                     | Sync.  |                                   |   |

<sup>1</sup> After 30 minutes settling time    <sup>2</sup> Max. 10 % ripple, within U<sub>B</sub>    <sup>3</sup> With connected IP 67 plug

| Operating scanning distance | Analogue output | Type of connection      | Part number    | Article number |
|-----------------------------|-----------------|-------------------------|----------------|----------------|
| 120 ... 700 mm              | 0 ... 10V       | Metal plug, M8x1, 4-pin | UT 20-700-AUM4 | 693-11010      |
| 120 ... 700 mm              | 4 ... 20 mA     | Metal plug, M8x1, 4-pin | UT 20-700-AIM4 | 693-11011      |



**Accessories**

|                   |                |
|-------------------|----------------|
| Connection cables | From Page A-34 |
| Brackets          | From Page A-4  |

# UT 12-370-P

Ultrasonic sensor with switching output



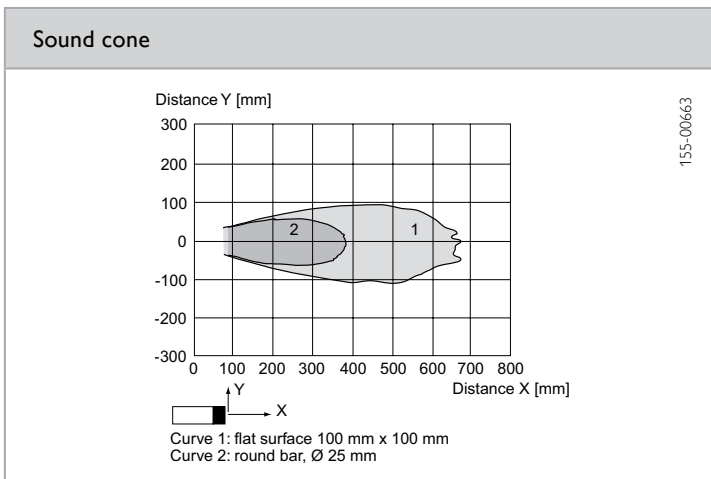
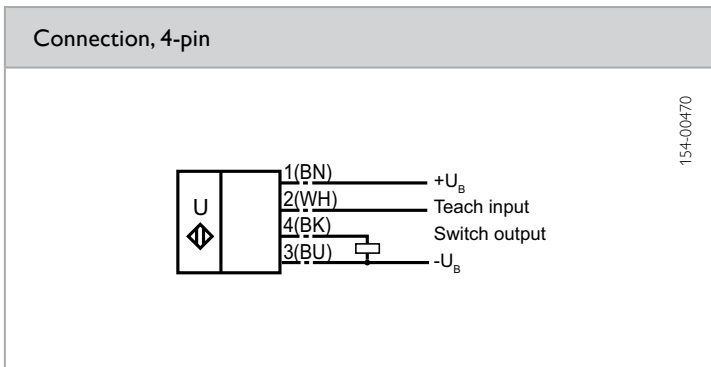
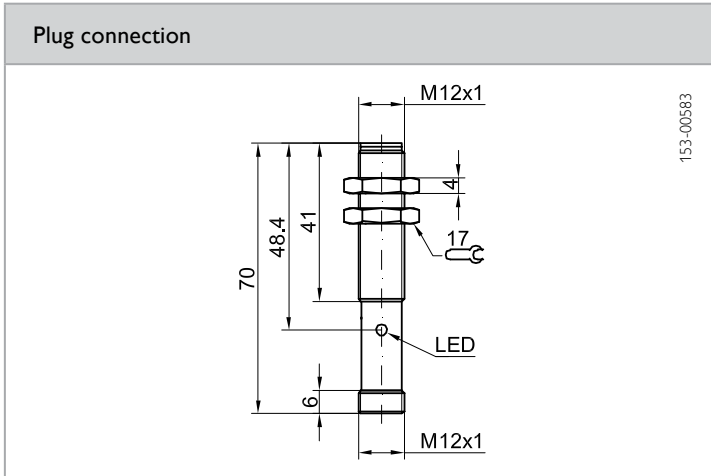
## PRODUCT HIGHLIGHTS

- Robust M12 metal housing for harsh operating conditions
- Detection regardless of object colour and surface
- Simple sensor adjustment via control input

| Sensor data                        |  | Functions                      |  |
|------------------------------------|--|--------------------------------|--|
| Operating scanning distance        | 30 ... 400 mm  | Indicator LED, yellow          | Switching output indicator                                   |
| Adjustment range                   | 50 ... 400 mm  | Indicator LED, red             | Fault indicator  |
| Ultrasonic frequency               | ~ 310 kHz  | Scanning distance adjustment   | Via control input  |
| Hysteresis                         | 1 % <sup>1</sup>   | Teach-in modes                 | Mode 1: set switching point (N.O. / N.C.)                    |
| Temperature drift                  | ± 1.5 % <sup>2</sup>   |                                | Mode 2: set window operation (N.O. / N.C.)                   |
| Repeatability                      | ≤ 1 %  | Default settings               | Switching point 1 = 50 mm,<br>Switching point 2 = 400 mm     |
|                                    |  |                                |  |
| Electrical data                    |  | Mechanical data                |  |
| Operating voltage, +U <sub>b</sub> | 10 ... 30V DC <sup>3</sup>   | Dimensions                     | M12 x 70 mm  |
| No-load current, I <sub>o</sub>    | ≤ 30 mA  | Enclosure rating               | IP 65 <sup>4</sup>   |
| Output current, I <sub>e</sub>     | 100 mA   | Material, housing              | Nickel-plated brass  |
| Voltage drop, U <sub>D</sub>       | ≤ 3V   | Material, ultrasonic converter | Polyurethane foam, epoxy resin with glass content, PBT (lid) |
| Protective circuits                | Short-circuit protection (Q) / overload protection                           | Type of connection             | (See Selection Table)  |
| Switching output, Q                | PNP  | Ambient temperature: operation | -25 ... +70 °C   |
| Output function                    | N.O. / N.C.  | Ambient temperature: storage   | -40 ... +85 °C   |
| Switching frequency, f (ti/tp 1:1) | ≤ 8 Hz   | Weight                         | 25 g   |
| Response time                      | ≤ 50 ms  |                                |  |
| Control input, WH                  | - U <sub>b</sub> = switching point 1<br>+ U <sub>b</sub> = switching point 2 |                                |  |

<sup>1</sup> Relating to set switching distance    <sup>2</sup> From end-value    <sup>3</sup> Max. 10 % ripple, within U<sub>b</sub>    <sup>4</sup> With connected IP 65 plug

| Operating scanning distance | Switching output | Type of connection | Part number    | Article number |
|-----------------------------|------------------|--------------------|----------------|----------------|
| 30 ... 400 mm               | PNP              | Plug, M12x1, 4-pin | UT 12-370-PSL4 | 690-10100      |



### Accessories

|                   |                |
|-------------------|----------------|
| Connection cables | From Page A-34 |
| Brackets          | From Page A-4  |

# UT 12-370-A

Ultrasonic sensor with analogue output



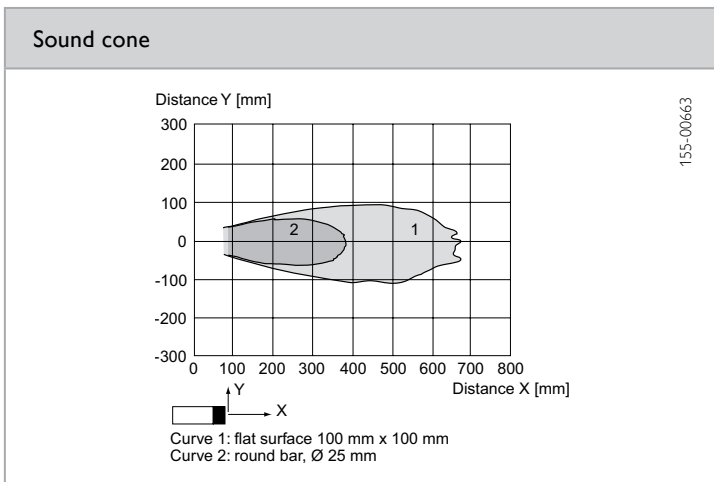
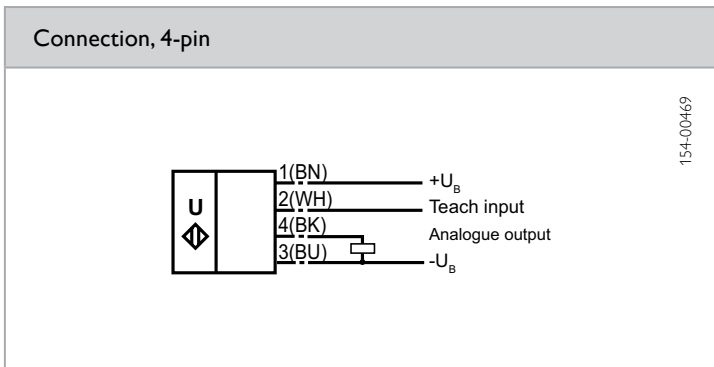
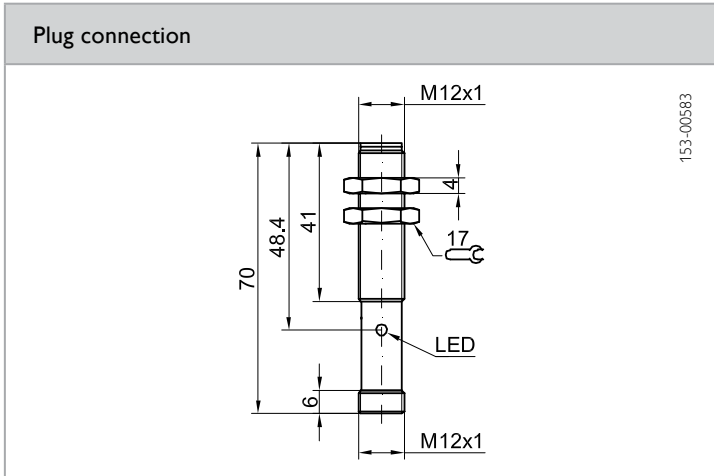
## PRODUCT HIGHLIGHTS

- Robust M12 metal housing for harsh operating conditions
- Analogue output: 4 ... 20 mA
- Simple sensor adjustment via control input

| Sensor data                        |  | Functions                         |   |
|------------------------------------|--|-----------------------------------|---|
| Operating scanning distance        | 30 ... 400 mm  | Indicator LED, yellow             | Switching output indicator                                      |
| Adjustment range                   | 50 ... 400 mm  | Indicator LED, red                | Fault indicator   |
| Ultrasonic frequency               | ~ 310 kHz  | Set characteristic analogue curve | Via control input   |
| Resolution                         | 0,40 mm <sup>1</sup>   | Adjustment possibilities          | Rising / falling slope via control input                        |
| Temperature drift                  | ± 1,5 % <sup>2</sup>   | Default settings                  | Evaluation limit 1 = 50 mm                                      |
| Repeatability                      | ± 0,5 % <sup>2</sup>   |                                   | Evaluation limit 2 = 400 mm                                     |
| Electrical data                    |  | Mechanical data                   |   |
| Operating voltage, +U <sub>B</sub> | 10 ... 30V DC <sup>3</sup>   | Dimensions                        | M12 x 70 mm   |
| No-load current, I <sub>0</sub>    | ≤ 30 mA  | Enclosure rating                  | IP 65 <sup>4</sup>  |
| Current output                     | R <sub>a</sub> < 300 Ω   | Material, housing                 | Nickel-plated brass   |
| Protective circuits                | Short-circuit protection (Q) /<br>overload protection                                  | Material, ultrasonic converter    | Polyurethane foam, epoxy resin with<br>glass content, PBT (lid) |
| Analogue output                    | 4 ... 20 mA  | Type of connection                | (See Selection Table)   |
| Response time                      | ≤ 50 ms  | Ambient temperature: operation    | -25 ... +70 °C  |
| Control input, WH                  | - U <sub>B</sub> = lower evaluation limit<br>+ U <sub>B</sub> = upper evaluation limit | Ambient temperature: storage      | -40 ... +85 °C  |
|                                    |  | Weight                            | 25 g  |

<sup>1</sup> With max. detection range    <sup>2</sup> From end-value    <sup>3</sup> Max. 10 % ripple, within U<sub>B</sub>    <sup>4</sup> With connected IP 65 plug

| Operating scanning distance | Analogue output | Type of connection | Part number     | Article number |
|-----------------------------|-----------------|--------------------|-----------------|----------------|
| 30 ... 400 mm               | 4 ... 20 mA     | Plug, M12x1, 4-pin | UT 12-370-A-IL4 | 690-10101      |



**Accessories**

|                   |                |
|-------------------|----------------|
| Connection cables | From Page A-34 |
| Brackets          | From Page A-4  |



# UT 18-270-P

Ultrasonic sensor with switching output



## PRODUCT HIGHLIGHTS

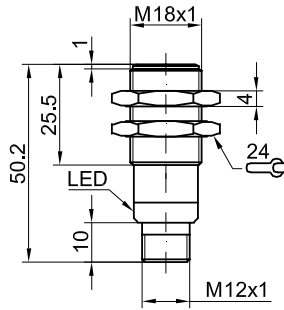
- Robust M18 metal housing for harsh operating conditions
- Detection regardless of object colour and surface
- Adjustable window mode
- Selectable N.O. / N.C.

| Sensor data                        |  | Functions                      |  |
|------------------------------------|--|--------------------------------|--|
| Operating scanning distance        | 35 ... 300 mm  | Indicator LED, green           | Operating voltage indicator                                  |
| Adjustment range                   | 50 ... 300 mm  | Indicator LED, yellow          | Switching output indicator                                   |
| Ultrasonic frequency               | ~ 390 kHz  | Indicator LED, red             | Fault indicator  |
| Hysteresis                         | 1 % <sup>1</sup>   | Scanning distance adjustment   | Via control input  |
| Temperature drift                  | ± 1.5 % <sup>2</sup>   | Teach-in modes                 | Mode 1: set switching point (N.O. / N.C.)                    |
| Repeatability                      | ≤ 1 %  | Default settings               | Mode 2: set window operation (N.O. / N.C.)                   |
|                                    |  |                                | Switching point 1 = 50 mm                                    |
|                                    |  |                                | Switching point 2 = 300 mm                                   |
| Electrical data                    |  | Mechanical data                |  |
| Operating voltage, +U <sub>b</sub> | 10 ... 30V DC <sup>3</sup>   | Dimensions                     | M18 x 50.2 mm  |
| No-load current, I <sub>0</sub>    | ≤ 20 mA  | Enclosure rating               | IP 65 <sup>4</sup>   |
| Output current, I <sub>e</sub>     | 200 mA   | Material, housing              | Nickel-plated brass  |
| Voltage drop, U <sub>D</sub>       | ≤ 3V   | Material, ultrasonic converter | Polyurethane foam, epoxy resin with glass content, PBT (lid) |
| Protective circuits                | Short-circuit protection (Q) / overload protection                           | Type of connection             | (See Selection Table)  |
| Switching output, Q                | PNP  | Ambient temperature: operation | -25 ... +70 °C   |
| Output function                    | N.O. / N.C.  | Ambient temperature: storage   | -40 ... +85 °C   |
| Switching frequency, f (ti/tp 1:1) | ≤ 13 Hz  | Weight                         | 25 g   |
| Response time                      | ≤ 30 ms  |                                |  |
| Control input, WH                  | - U <sub>b</sub> = switching point 1<br>+ U <sub>b</sub> = switching point 2 |                                |  |

<sup>1</sup> Relating to set switching distance    <sup>2</sup> From end-value    <sup>3</sup> Max. 10 % ripple, within U<sub>b</sub>    <sup>4</sup> With connected IP 65 plug

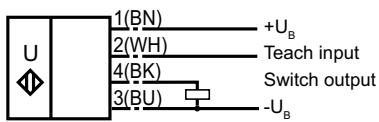
| Operating scanning distance | Switching output | Type of connection | Part number    | Article number |
|-----------------------------|------------------|--------------------|----------------|----------------|
| 30 ... 300 mm               | PNP              | Plug, M12x1, 4-pin | UT 18-270-PSL4 | 690-10102      |

Plug connection



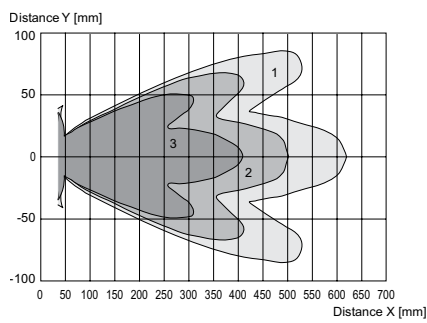
153-00582

Connection, 4-pin



154-00470

Sound cone



Curve 1: flat surface 100 mm x 100 mm  
 Curve 2: flat surface 10 mm x 10 mm  
 Curve 3: round bar, Ø 25 mm

155-00661

11

Accessories

Connection cables

From Page A-34

Brackets

From Page A-4

# UT 18-270-A

Ultrasonic sensor with analogue output



## PRODUCT HIGHLIGHTS

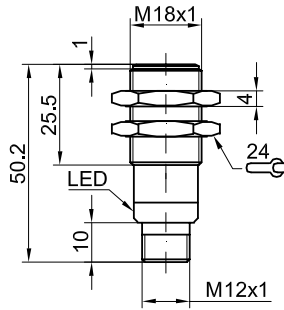
- Robust M18 metal housing for harsh operating conditions
- Detection regardless of object colour and surface
- Analogue output: 4 ... 20 mA
- Rising/falling output characteristic adjustable

| Sensor data                        |  | Functions                         |   |
|------------------------------------|--|-----------------------------------|---|
| Operating scanning distance        | 35 ... 300 mm  | Indicator LED, green              | Operating voltage indicator                                     |
| Adjustment range                   | 50 ... 300 mm  | Indicator LED, yellow             | Switching output indicator                                      |
| Ultrasonic frequency               | ~ 390 kHz  | Indicator LED, red                | Fault indicator   |
| Resolution                         | 0,40 mm <sup>1</sup>   | Set characteristic analogue curve | Via control input   |
| Temperature drift                  | ± 1.5 % <sup>2</sup>   | Adjustment possibilities          | Rising / falling slope via control input                        |
| Repeatability                      | ± 0.5 % <sup>2</sup>   | Default settings                  | Evaluation limit 1 = 50 mm                                      |
|                                    |  |                                   | Evaluation limit 2 = 300 mm                                     |
| Electrical data                    |  | Mechanical data                   |   |
| Operating voltage, +U <sub>b</sub> | 10 ... 30V DC <sup>3</sup>   | Dimensions                        | M18 x 50.2 mm   |
| No-load current, I <sub>0</sub>    | ≤ 20 mA  | Enclosure rating                  | IP 65 <sup>4</sup>  |
| Current output                     | R <sub>a</sub> < 300 Ω   | Material, housing                 | Nickel-plated brass   |
| Protective circuits                | Short-circuit protection (Q) /<br>overload protection                                  | Material, ultrasonic converter    | Polyurethane foam, epoxy resin with<br>glass content, PBT (lid) |
| Analogue output                    | 4 ... 20 mA  | Type of connection                | (See Selection Table)   |
| Response time                      | ≤ 30 ms  | Ambient temperature: operation    | -25 ... +70 °C  |
| Control input, WH                  | - U <sub>b</sub> = lower evaluation limit<br>+ U <sub>b</sub> = upper evaluation limit | Ambient temperature: storage      | -40 ... +85 °C  |
|                                    |  | Weight                            | 25 g  |

<sup>1</sup>With max. detection range    <sup>2</sup>From end-value    <sup>3</sup>Max. 10 % ripple, within U<sub>b</sub>    <sup>4</sup>With connected IP 65 plug

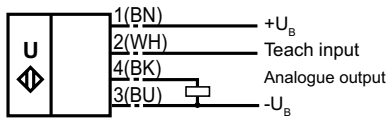
| Operating scanning distance | Analogue output | Type of connection | Part number     | Article number |
|-----------------------------|-----------------|--------------------|-----------------|----------------|
| 30 ... 300 mm               | 4 ... 20 mA     | Plug, M12x1, 4-pin | UT 18-270-A-IL4 | 690-10103      |

Plug connection



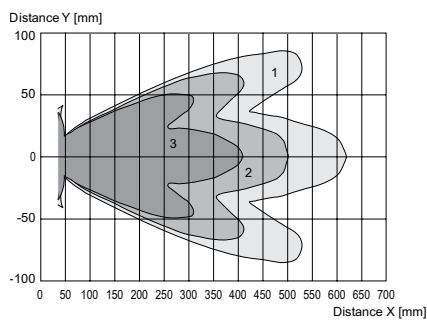
153-00582

Connection, 4-pin



154-00469

Sound cone



Curve 1: flat surface 100 mm x 100 mm  
 Curve 2: flat surface 10 mm x 10 mm  
 Curve 3: round bar, Ø 25 mm



155-00661

Accessories

Connection cables

From Page A-34

Brackets

From Page A-4

# UT 18-750-P

Ultrasonic sensor with switching output



## PRODUCT HIGHLIGHTS

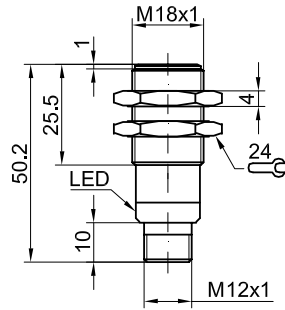
- Long operating scanning distance of 800 mm
- Robust M18 metal housing for harsh operating conditions
- Simple sensor adjustment via control input
- Window mode adjustable
- N.O. / N.C. selectable

| Sensor data                        |  | Functions                      |  |
|------------------------------------|--|--------------------------------|--|
| Operating scanning distance        | 50 ... 800 mm  | Indicator LED, green           | Operating voltage indicator                                  |
| Adjustment range                   | 70 ... 800 mm  | Indicator LED, yellow          | Switching output indicator                                   |
| Ultrasonic frequency               | ~ 205 kHz  | Indicator LED, red             | Fault indicator  |
| Hysteresis                         | 1 % <sup>1</sup>   | Scanning distance adjustment   | Via control input  |
| Temperature drift                  | ± 1.5 % <sup>2</sup>   | Teach-in modes                 | Mode 1: set switching point (N.O. / N.C.)                    |
| Repeatability                      | ≤ 1 %  | Default settings               | Mode 2: set window operation (N.O. / N.C.)                   |
|                                    |  |                                | Switching point 1 = 70 mm                                    |
|                                    |  |                                | Switching point 2 = 800 mm                                   |
| Electrical data                    |  | Mechanical data                |  |
| Operating voltage, +U <sub>B</sub> | 10 ... 30V DC <sup>3</sup>   | Dimensions                     | M18 x 50.2 mm  |
| No-load current, I <sub>0</sub>    | ≤ 20 mA  | Enclosure rating               | IP 65 <sup>4</sup>   |
| Output current, I <sub>e</sub>     | 200 mA   | Material, housing              | Nickel-plated brass  |
| Voltage drop, U <sub>D</sub>       | ≤ 3V   | Material, ultrasonic converter | Polyurethane foam, epoxy resin with glass content, PBT (lid) |
| Protective circuits                | Short-circuit protection (Q) / overload protection                           | Type of connection             | (See Selection Table)  |
| Switching output, Q                | PNP  | Ambient temperature: operation | -25 ... +70 °C   |
| Output function                    | N.O. / N.C.  | Ambient temperature: storage   | -40 ... +85 °C   |
| Switching frequency, f (ti/tp 1:1) | ≤ 4 Hz   | Weight                         | 25 g   |
| Response time                      | ≤ 100 ms   |                                |  |
| Control input, WH                  | - U <sub>B</sub> = switching point 1<br>+ U <sub>B</sub> = switching point 2 |                                |  |

<sup>1</sup> Relating to set switching distance    <sup>2</sup> From end-value    <sup>3</sup> Max. 10 % ripple, within U<sub>B</sub>    <sup>4</sup> With connected IP 65 plug

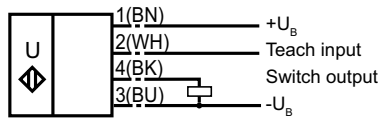
| Operating scanning distance | Switching output | Type of connection | Part number    | Article number |
|-----------------------------|------------------|--------------------|----------------|----------------|
| 50 ... 800 mm               | PNP              | Plug, M12x1, 4-pin | UT 18-750-PSL4 | 690-10104      |

Plug connection



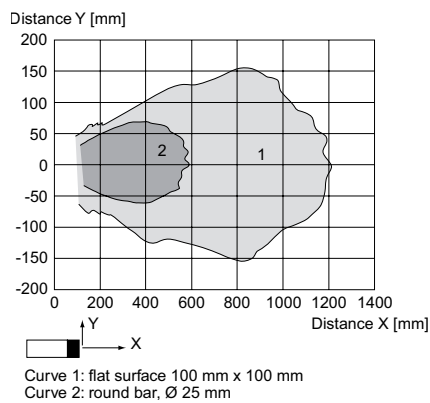
153-00582

Connection, 4-pin



154-00470

Sound cone



155-00662

11

Accessories

Connection cables

From Page A-34

Brackets

From Page A-4

# UT 18-750-A

Ultrasonic sensor with analogue output



## PRODUCT HIGHLIGHTS

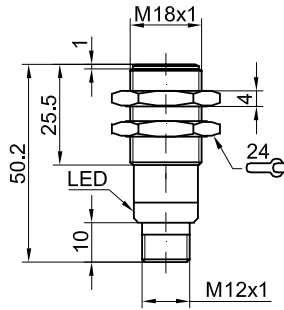
- Long operating scanning distance of 800 mm
- Robust M18 metal housing for harsh operating conditions
- Analogue output: 4 ... 20 mA
- Rising / falling output characteristic adjustable

| Sensor data                        |  | Functions                         |   |
|------------------------------------|--|-----------------------------------|---|
| Operating scanning distance        | 50 ... 800 mm  | Indicator LED, green              | Operating voltage indicator                                     |
| Adjustment range                   | 70 ... 800 mm  | Indicator LED, yellow             | Switching output indicator                                      |
| Ultrasonic frequency               | ~ 205 kHz  | Indicator LED, red                | Fault indicator   |
| Resolution                         | 0,40 mm <sup>1</sup>   | Set characteristic analogue curve | Via control input   |
| Temperature drift                  | ± 1.5 % <sup>2</sup>   | Adjustment possibilities          | Rising / falling slope via control input                        |
| Repeatability                      | ± 0.5 % <sup>2</sup>   | Default settings                  | Evaluation limit 1 = 70 mm                                      |
|                                    |  |                                   | Evaluation limit 2 = 800 mm                                     |
| Electrical data                    |  | Mechanical data                   |   |
| Operating voltage, +U <sub>b</sub> | 10 ... 30V DC <sup>3</sup>   | Dimensions                        | M18 x 50.2 mm   |
| No-load current, I <sub>0</sub>    | ≤ 20 mA  | Enclosure rating                  | IP 65 <sup>4</sup>  |
| Current output                     | R <sub>a</sub> < 300 Ω   | Material, housing                 | Nickel-plated brass   |
| Protective circuits                | Short-circuit protection (Q) /<br>overload protection                                  | Material, ultrasonic converter    | Polyurethane foam, epoxy resin with<br>glass content, PBT (lid) |
| Analogue output                    | 4 ... 20 mA  | Type of connection                | (See Selection Table)   |
| Response time                      | ≤ 100 ms   | Ambient temperature: operation    | -25 ... +70 °C  |
| Control input, WH                  | - U <sub>b</sub> = lower evaluation limit<br>+ U <sub>b</sub> = upper evaluation limit | Ambient temperature: storage      | -40 ... +85 °C  |
|                                    |  | Weight                            | 25 g  |

<sup>1</sup>With max. detection range    <sup>2</sup>From end-value    <sup>3</sup>Max. 10 % ripple, within U<sub>b</sub>    <sup>4</sup>With connected IP 65 plug

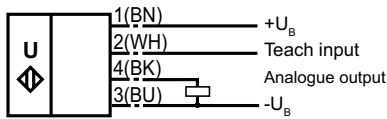
| Operating scanning distance | Analogue output | Type of connection | Part number     | Article number |
|-----------------------------|-----------------|--------------------|-----------------|----------------|
| 50 ... 800 mm               | 4 ... 20 mA     | Plug, M12x1, 4-pin | UT 18-750-A-IL4 | 690-10105      |

Plug connection



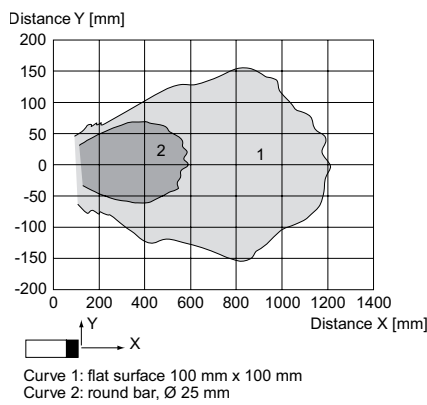
153-00582

Connection, 4-pin



154-00469

Sound cone



155-00662

Accessories

Connection cables

From Page A-34

Brackets

From Page A-4



# UM 18-60/250

Ultrasonic sensor with switching output



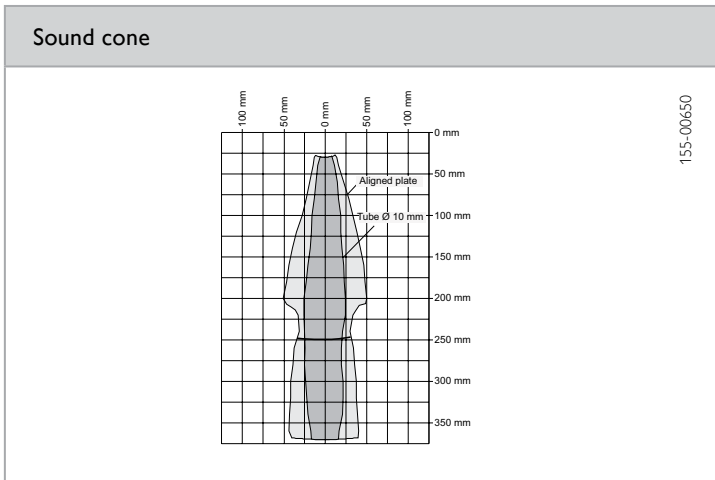
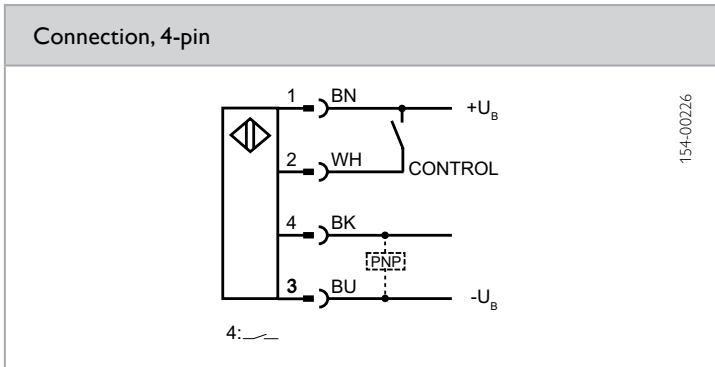
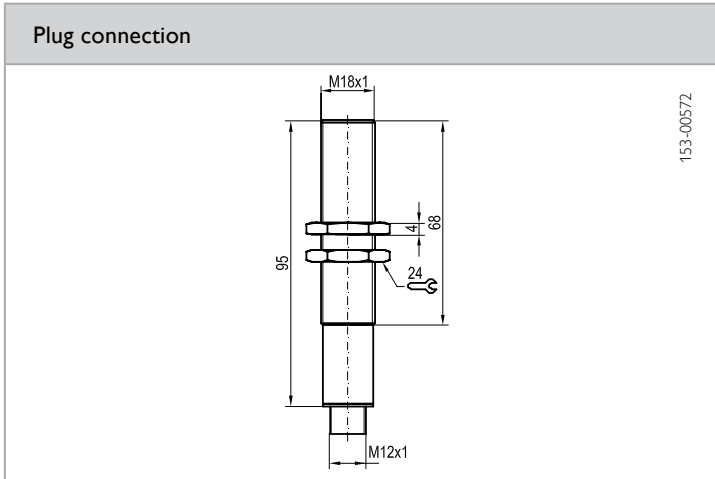
## PRODUCT HIGHLIGHTS

- Robust M18 metal housings for harsh operating conditions
- Optional brass or stainless steel housings
- Operating scanning distance either 60 mm or 250 mm
- Simple sensor settings via control input

| Sensor data                        |  | Functions                      |  |
|------------------------------------|--|--------------------------------|--|
| Limit scanning distance            | 350 mm   | Adjustment possibilities       | Operating scanning distance 60 mm / 250 mm via control input |
| Operating scanning distance        | 30 ... 250 mm  |                                |  |
| Ultrasonic frequency               | ~ 320 kHz  |                                |  |
| Resolution                         | 0.36 mm  |                                |  |
| Repeatability <sup>1</sup>         | < 1 mm   |                                |  |
| Hysteresis                         | 2 mm   |                                |  |
| Temperature drift                  | 0.17 % / K   |                                |  |
| Electrical data                    |  | Mechanical data                |  |
| Operating voltage, +U <sub>B</sub> | 10 ... 30V DC <sup>2</sup>   | Dimensions                     | M18 x 95 mm  |
| No-load current, I <sub>0</sub>    | ≤ 30 mA  | Enclosure rating               | IP 65 <sup>3</sup>   |
| Output current, I <sub>e</sub>     | 500 mA   | Material, housing              | (See Selection Table)  |
| Voltage drop, U <sub>d</sub>       | < 2.4V DC  | Type of connection             | (See Selection Table)  |
| Protective circuits                | Reverse polarity protection, U <sub>B</sub> / short-circuit protection (Q)   | Ambient temperature: operation | -20 ... +70 °C   |
| Switching output, Q                | PNP  | Ambient temperature: storage   | -40 ... +85 °C   |
| Output function                    | N.O.   | Weight                         | 80 g   |
| Switching frequency, f (ti/tp 1:1) | 25 Hz  |                                |  |
| Control input, WH                  | + U <sub>B</sub> = operating scanning distance 250 mm<br>- U <sub>B</sub> / open = operating scanning distance 60 mm |                                |  |

<sup>1</sup>With constant ambient conditions    <sup>2</sup>Max. 10 % ripple, within U<sub>B</sub>    <sup>3</sup>With connected IP 65 plug

| Operating scanning distance | Switching output | Housing material    | Type of connection | Part number          | Article number |
|-----------------------------|------------------|---------------------|--------------------|----------------------|----------------|
| 30 ... 250 mm               | PNP              | Nickel-plated brass | Plug, M12x1, 4-pin | UM 18-60/250-CD-HP   | 690-51541      |
| 30 ... 250 mm               | PNP              | Stainless steel     | Plug, M12x1, 4-pin | UM 18-60/250-CD-HP-E | 690-51542      |



**Accessories**

|                   |                |
|-------------------|----------------|
| Connection cables | From Page A-34 |
| Brackets          | From Page A-4  |

# UMT 30-350

Ultrasonic sensor with switching output



## PRODUCT HIGHLIGHTS

- Ideal for monitoring the filling levels of liquids such as fats and oils
- With one or two switching outputs as option
- Easy pre-setting of sensor via digital display – sensor immediately ready for operation
- Synchronisation of up to 10 devices in restricted spaces
- Additional features with numerous supplementary functions

| Sensor data                                     |   | Functions                       |  |
|---|---|---------------------------------|--|
| Limiting scanning distance                      | 600 mm  | Display                         | Parameterisation   |
| Operating scanning distance                     | 65 ... 350 mm   | LED indicator 1                 | Switching output indicator   |
| Ultrasonic frequency                            | ~ 400 kHz   | LED indicator 2                 | Switching output indicator   |
| Resolution                                      | 0,025 mm  | Scanning distance adjustment    | Via Teach-in buttons and numerically via 7-segment display   |
| Repeatability                                   | ± 0.15 % <sup>1</sup>   | Teach-in modes                  | Mode 1: set switching point<br>Mode 2: set Window Mode<br>Mode 3: set two-way reflex switch  |
| Hysteresis <sup>2</sup>                         | 5 mm  | Adjustment possibilities        | N.O. / N.C. via Teach-in button<br>Button lock via Teach-in button<br>Default settings via Teach-in button   |
| Accuracy <sup>2</sup>                           | ± 1 % (Temperature drift internal compensated, may be deactivated, 0.17 % / K without compensation) | Supplementary functions         | – Energy-saving Mode<br>– Multiplex Mode, device address<br>– Hysteresis<br>– Multiplex Mode, highest address<br>– Measurement value filter<br>– Measurement range<br>– Filter strength<br>– Calibration display<br>– Response delay<br>– Detection range, sensitivity<br>– Foreground suppression |
|   |   | Default settings <sup>3</sup>   | Measurement range: limit scanning distance<br>Switching distances: scanning distance<br>Switching output: N.O.   |
|   |   | Default settings <sup>4</sup>   | Measurement range: limit scanning distance<br>Switching distances: scanning distance and half scanning distance<br>Switching output: N.O.  |
| Electrical data                                 |   | Mechanical data                 |  |
| Operating voltage, +U <sub>B</sub>              | 9 ... 30V DC <sup>5</sup>   | Dimensions                      | M30 x 84 mm  |
| No-load current, I <sub>0</sub>                 | ≤ 80 mA   | Enclosure rating                | IP 67 <sup>6</sup>   |
| Output current, I <sub>e</sub>                  | 200 mA  | Material, housing               | Brass, nickel-plated, plastic content: PBT,TPU   |
| Protective circuits                             | Reverse-polarity protection, U <sub>B</sub> / short-circuit protection (Q)                          | Material, ultrasonic converter  | Polyurethane foam, epoxy resin with glass content  |
| Power On Delay                                  | < 300 ms  | Type of connection              | (See Selection Table)  |
| Switching output, Q                             | 1 x PNP / 2 x PNP (see Selection Table)   | Ambient temperature, operation  | -25 ... +70 °C   |
| Output function                                 | N.O. / N.C.   | Ambient temperature, storage    | -40 ... +85 °C   |
| Switching frequency, f (ti/tp 1:1) <sup>2</sup> | 8 Hz <sup>3</sup> / 12 Hz <sup>4</sup>  | Weight (plug device)            | 150 g  |
| Response time <sup>2</sup>                      | 70 ms <sup>3</sup> / 64 ms <sup>4</sup>   | Vibration and impact resistance | EN 60947-5-2   |
| Connection, GY                                  | Sync. / Com.  |                                 |  |

<sup>1</sup> Related to current measurement value

<sup>2</sup> Parameterisable via control panel

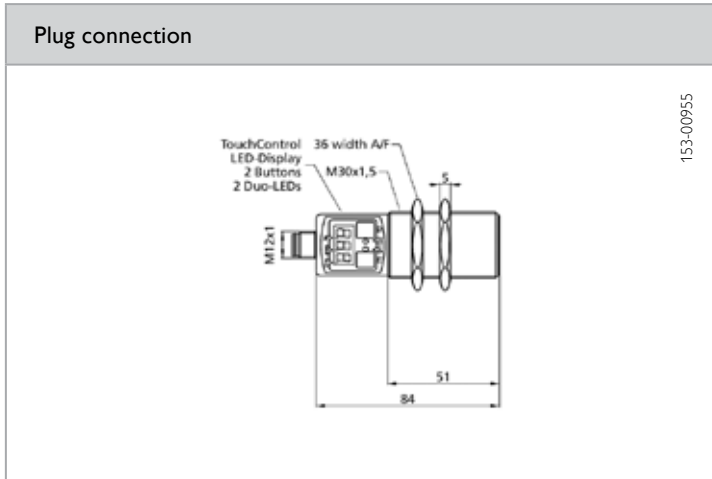
<sup>3</sup> 1 x PNP

<sup>4</sup> 2 x PNP

<sup>5</sup> Max. 10 % ripple, within U<sub>B</sub>

<sup>6</sup> With connected IP 67 plug

| Operating scanning distance | Switching output | Type of connection | Part number        | Article number |
|-----------------------------|------------------|--------------------|--------------------|----------------|
| 65 ... 350 mm               | 1 x PNP          | Plug, M12x1, 5-pin | UMT 30-350-PSD-L5  | 690-51560      |
| 65 ... 350 mm               | 2 x PNP          | Plug, M12x1, 5-pin | UMT 30-350-2PSD-L5 | 690-51561      |



| Connection, 5-pin (1 x PNP)                   |                  | Connection, 5-pin (2 x PNP)                    |                  |
|---|------------------|--|------------------|
| <p>1 PNP switched output</p> <p>154-00322</p> | <p>154-00306</p> | <p>2 PNP switched outputs</p> <p>154-00323</p> | <p>154-00307</p> |

| Sound cone       | Synchronisation / multiplex  |
|------------------|--|
| <p>155-01561</p> | <p>155-01580</p> <p>Mounting distances below which synchronisation / multiplex should be used.</p> |

**Accessories**

|                   |                |
|-------------------|----------------|
| Connection cables | From Page A-34 |
| Brackets          | From Page A-4  |

# UMT 30-350-A

Ultrasonic sensor with analogue output



## PRODUCT HIGHLIGHTS

- Automatic selection to current or voltage output
- Easy pre-setting of sensor via digital display – sensor immediately ready for operation
- Synchronisation of up to 10 devices in restricted spaces
- Additional features with numerous supplementary functions

| Sensor data                        |   | Functions                       |   |
|------------------------------------|---|---------------------------------|---|
| Limiting scanning distance         | 600 mm  | Display                         | Parameterisation  |
| Operating scanning distance        | 65 ... 350 mm   | LED indicator 1                 | Switching output indicator  |
| Ultrasonic frequency               | ~ 400 kHz   | LED indicator 2                 | Switching output indicator  |
| Resolution <sup>1</sup>            | 0,025 ... 0,17 mm   | Set analogue characteristic     | Via Teach-in button and numerically via 7-segment display   |
| Repeatability                      | ± 0,15 % <sup>2</sup>   | Teach-in modes                  | Mode 1: set window limits<br>Mode 2: rising / falling output characteristics  |
| Accuracy <sup>3</sup>              | ± 1 % (Temperature drift internal compensated, may be deactivated, 0,17 % / K without compensation)       | Adjustment possibilities        | Button lock via Teach-in button<br>Default settings via Teach-in button   |
|                                    |   | Supplementary functions         | – Energy-saving Mode<br>– Indicator Mode<br>– Current or voltage output selection<br>– Measurement value filter<br>– Filter strength<br>– Response delay<br>– Foreground suppression<br>– Multiplex Mode, device address<br>– Multiplex Mode, highest address<br>– Measurement range<br>– Calibration display<br>– Detection range, sensitivity |
|                                    |   | Default settings                | Measurement range: limit scanning distance<br>Window limits, analogue signal: blind zone and scanning distance<br>Switching output: rising analogue characteristic  |
|                                    |   |                                 |   |
| Electrical data                    |   | Mechanical data                 |   |
| Operating voltage, +U <sub>b</sub> | 9 ... 30V DC <sup>4</sup>   | Dimensions                      | M30 x 84 mm   |
| No-load current, I <sub>0</sub>    | ≤ 80 mA   | Enclosure rating                | IP 67 <sup>5</sup>  |
| Current output                     | R <sub>L</sub> ≤ 100 Ω with 9V ≤ U <sub>b</sub> ≤ 20V<br>R <sub>L</sub> ≤ 500 Ω with U <sub>b</sub> ≥ 20V | Material, housing               | Brass, nickel-plated, plastic content: PBT,TPU  |
| Voltage output                     | R <sub>L</sub> ≥ 100 kΩ with U <sub>b</sub> ≥ 15V   | Material, ultrasonic converter  | Polyurethane foam, epoxy resin with glass content   |
| Protective circuits                | Reverse-polarity protection, U <sub>b</sub> / short-circuit protection (Q)                                | Type of connection              | (See Selection Table)   |
| Power On Delay                     | < 300 ms  | Ambient temperature, operation  | -25 ... +70 °C  |
| Analogue output                    | 0 ... 10V / 4 ... 20 mA   | Ambient temperature, storage    | -40 ... +85 °C  |
| Response time <sup>3</sup>         | 64 ms   | Weight                          | 150 g   |
| Connection, GY                     | Sync. / Com.  | Vibration and impact resistance | EN 60947-5-2  |

<sup>1</sup> depending on the set analogue window

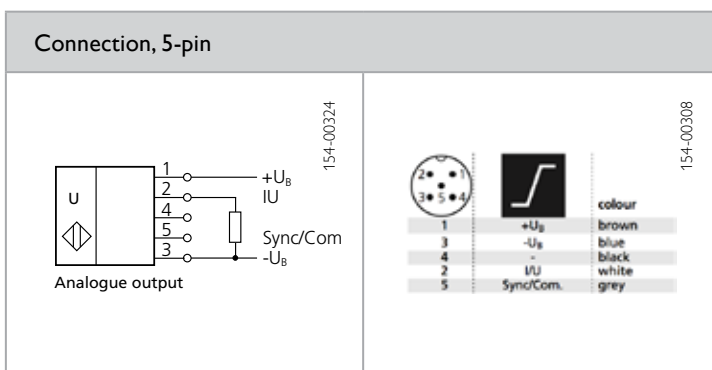
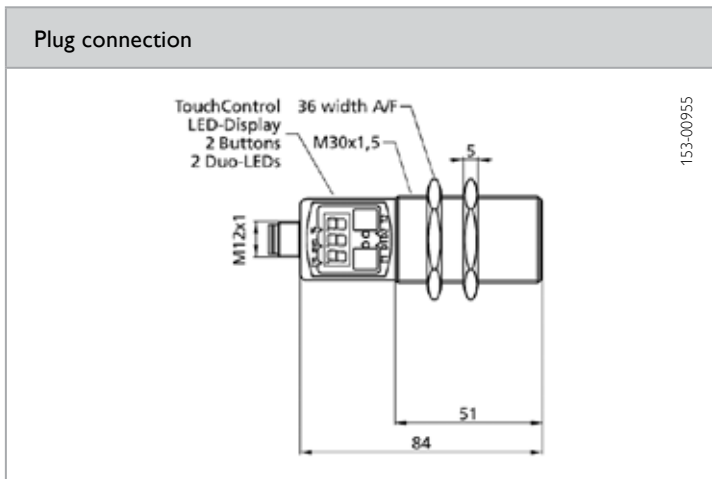
<sup>2</sup> Related to current measurement value

<sup>3</sup> Parameterisable via control panel

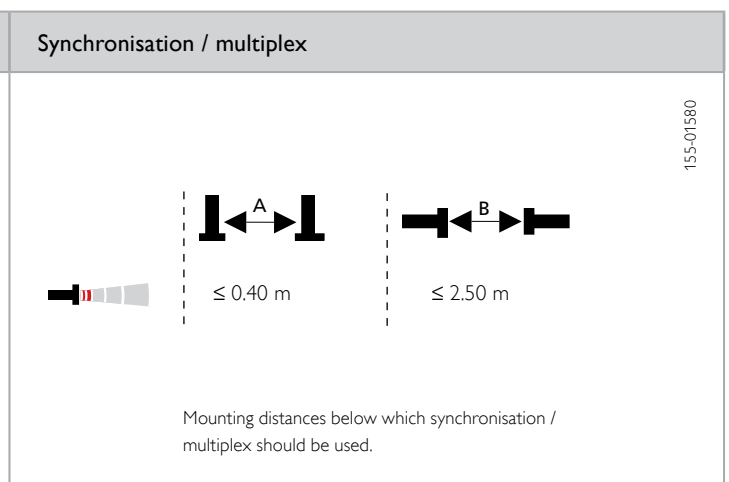
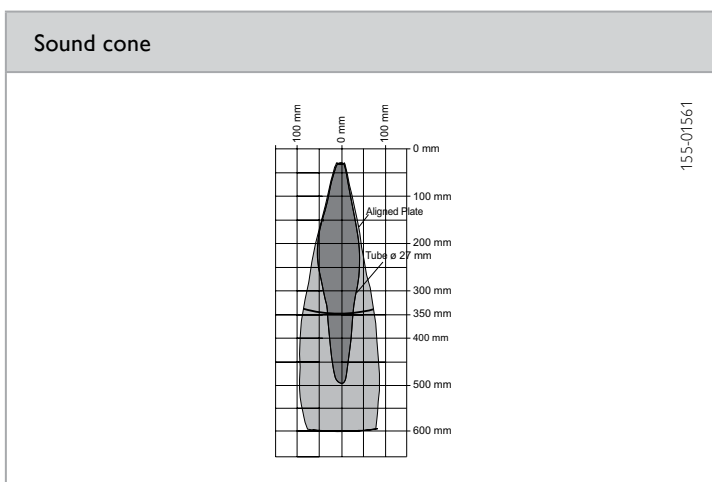
<sup>4</sup> Max. 10 % ripple, within U<sub>b</sub>

<sup>5</sup> With connected IP 67 plug

| Operating scanning distance | Analogue output         | Type of connection | Part number         | Article number |
|-----------------------------|-------------------------|--------------------|---------------------|----------------|
| 65 ... 350 mm               | 0 ... 10V / 4 ... 20 mA | Plug, M12x1, 5-pin | UMT 30-350-A-IUD-L5 | 690-51572      |



11



**Accessories**

|                   |                |
|-------------------|----------------|
| Connection cables | From Page A-34 |
| Brackets          | From Page A-4  |

# UMT 30-1300

Ultrasonic sensor with switching output



## PRODUCT HIGHLIGHTS

- Ideal for monitoring the filling levels of liquids such as fats and oils
- With one or two switching outputs as option
- Sensor adjustment via teach-in or numerically via 7-segment display
- Synchronisation of up to 10 devices in restricted spaces
- Additional features with numerous supplementary functions

| Sensor data                                     |   | Functions                       |  |
|---|---|---------------------------------|--|
| Limiting scanning distance                      | 2000 mm   | Display                         | Parameterisation   |
| Operating scanning distance                     | 200 ... 1300 mm   | LED indicator 1                 | Switching output indicator   |
| Ultrasonic frequency                            | ~ 200 kHz   | LED indicator 2                 | Switching output indicator   |
| Resolution                                      | 0.18 mm   | Scanning distance adjustment    | Via Teach-in buttons and numerically via 7-segment display   |
| Repeatability                                   | ± 0.15 % <sup>1</sup>   | Teach-in modes                  | Mode 1: set switching point<br>Mode 2: set Window Mode<br>Mode 3: set two-way reflex switch  |
| Hysteresis <sup>2</sup>                         | 20 mm   | Adjustment possibilities        | N.O. / N.C. via teach-in button<br>Button lock via teach-in button<br>Default settings via teach-in button   |
| Accuracy <sup>2</sup>                           | ± 1 % (Temperature drift internal compensated, may be deactivated, 0.17 % / K without compensation) | Supplementary functions         | – Energy-saving Mode<br>– Multiplex Mode, device address<br>– Hysteresis<br>– Multiplex Mode, highest address<br>– Measurement value filter<br>– Measurement range<br>– Filter strength<br>– Calibration display<br>– Response delay<br>– Detection range, sensitivity<br>– Foreground suppression |
|   |   | Default settings <sup>3</sup>   | Measurement range: limit scanning distance<br>Switching distances: scanning distance<br>Switching output: N.O.   |
|   |   | Default settings <sup>4</sup>   | Measurement range: limit scanning distance<br>Switching distances: scanning distance and half scanning distance<br>Switching output: N.O.  |
| Electrical data                                 |   | Mechanical data                 |  |
| Operating voltage, +U <sub>B</sub>              | 9 ... 30V DC <sup>5</sup>   | Dimensions                      | M30 x 84 mm  |
| No-load current, I <sub>0</sub>                 | ≤ 80 mA   | Enclosure rating                | IP 67 <sup>6</sup>   |
| Output current, I <sub>e</sub>                  | 200 mA  | Material, housing               | Brass, nickel-plated, plastic content: PBT,TPU   |
| Protective circuits                             | Reverse-polarity protection, U <sub>B</sub> / short-circuit protection (Q)                          | Material, ultrasonic converter  | Polyurethane foam, epoxy resin with glass content  |
| Power On Delay                                  | < 300 ms  | Type of connection              | (See Selection Table)  |
| Switching output, Q                             | 1 x PNP / 2 x PNP (see Selection Table)   | Ambient temperature, operation  | -25 ... +70 °C   |
| Output function                                 | N.O. / N.C.   | Ambient temperature, storage    | -40 ... +85 °C   |
| Switching frequency, f (ti/tp 1:1) <sup>2</sup> | 6 Hz <sup>3</sup> / 8 Hz <sup>4</sup>   | Weight                          | 150 g  |
| Response time <sup>2</sup>                      | 110 ms <sup>3</sup> / 92 ms <sup>4</sup>  | Vibration and impact resistance | EN 60947-5-2   |
| Connection, GY                                  | Sync. / Com.  |                                 |  |

<sup>1</sup> Related to current measurement value

<sup>2</sup> Parameterisable via control panel

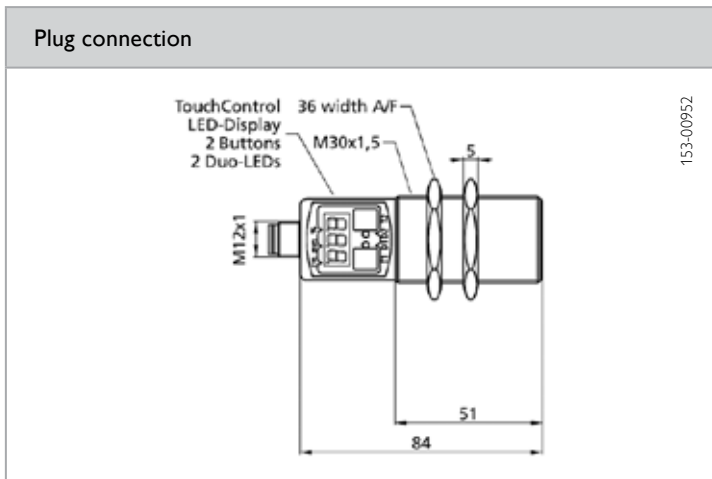
<sup>3</sup> 1 x PNP

<sup>4</sup> 2 x PNP

<sup>5</sup> Max. 10 % ripple, within U<sub>B</sub>

<sup>6</sup> With connected IP 67 plug

| Operating scanning distance | Switching output | Type of connection | Part number         | Article number |
|-----------------------------|------------------|--------------------|---------------------|----------------|
| 200 ... 1300 mm             | 1 x PNP          | Plug, M12x1, 5-pin | UMT 30-1300-PSD-L5  | 690-51563      |
| 200 ... 1300 mm             | 2 x PNP          | Plug, M12x1, 5-pin | UMT 30-1300-2PSD-L5 | 690-51564      |



| Connection, 5-pin (1 x PNP)                   |                  | Connection, 5-pin (2 x PNP)                    |                  |
|---|------------------|--|------------------|
| <p>1 PNP switched output</p> <p>154-00322</p> | <p>154-00306</p> | <p>2 PNP switched outputs</p> <p>154-00323</p> | <p>154-00307</p> |

| Sound cone | Synchronisation / multiplex   |
|------------|---|
|            | <p>Mounting distances below which synchronisation / multiplex should be used.</p> |

**Accessories**

|                   |                |
|-------------------|----------------|
| Connection cables | From Page A-34 |
| Brackets          | From Page A-4  |



# UMT 30-1300-A

Ultrasonic sensor with analogue output



## PRODUCT HIGHLIGHTS

- Ideal for monitoring the filling levels of liquids such as fats and oils
- Automatic selection to current or voltage output
- Easy pre-setting of sensor via digital display – sensor immediately ready for operation
- Synchronisation of up to 10 devices in restricted spaces
- Additional features with numerous supplementary functions

| Sensor data                        |   | Functions                       |   |
|------------------------------------|---|---------------------------------|---|
| Limiting scanning distance         | 2000 mm   | Display                         | Parameterisation  |
| Operating scanning distance        | 200 ... 1300 mm   | LED indicator 1                 | Switching output indicator  |
| Ultrasonic frequency               | ~ 200 kHz   | LED indicator 2                 | Switching output indicator  |
| Resolution <sup>1</sup>            | 0.18 ... 0.57 mm  | Set analogue characteristic     | Via Teach-in buttons and numerically via 7-segment display  |
| Repeatability                      | ± 0.15 % <sup>2</sup>   | Teach-in modes                  | Mode 1: set window limits<br>Mode 2: rising / falling output characteristics  |
| Accuracy <sup>3</sup>              | ± 1 % (Temperature drift internal compensated, may be deactivated, 0.17 % / K without compensation)     | Adjustment possibilities        | Button lock via Teach-in button<br>Default settings via Teach-in button   |
|                                    |   | Supplementary functions         | – Energy-saving Mode<br>– Indicator Mode<br>– Current or voltage output selection<br>– Measurement value filter<br>– Filter strength<br>– Response delay<br>– Foreground suppression<br>– Multiplex Mode, device address<br>– Multiplex Mode, highest address<br>– Measurement range<br>– Calibration display<br>– Detection range, sensitivity |
|                                    |   | Default settings                | Measurement range: limit scanning distance<br>Window limits, analogue signal: blind zone and scanning distance<br>Switching output: rising analogue characteristic  |
|                                    |   |                                 |   |
| Electrical data                    |   | Mechanical data                 |   |
| Operating voltage, +U <sub>b</sub> | 9 ... 30V DC <sup>4</sup>   | Dimensions                      | M30 x 84 mm   |
| No-load current, I <sub>0</sub>    | ≤ 80 mA   | Enclosure rating                | IP 67 <sup>5</sup>  |
| Current output                     | R <sub>L</sub> ≤ 100 Ω with 9V ≤ U <sub>b</sub> ≤ 20V; R <sub>L</sub> ≤ 500 Ω with U <sub>b</sub> ≥ 20V | Material, housing               | Brass, nickel-plated, plastic content: PBT, TPU   |
| Voltage output                     | R <sub>L</sub> ≥ 100 kΩ with U <sub>b</sub> ≥ 15V   | Material, ultrasonic converter  | Polyurethane foam, epoxy resin with glass content   |
| Protective circuits                | Reverse-polarity protection, U <sub>b</sub> / short-circuit protection (Q)                              | Type of connection              | (See Selection Table)   |
| Power On Delay                     | < 300 ms  | Ambient temperature, operation  | -25 ... +70 °C  |
| Analogue output                    | 0 ... 10V / 4 ... 20 mA   | Ambient temperature, storage    | -40 ... +85 °C  |
| Response time <sup>3</sup>         | 92 ms   | Weight                          | 150 g   |
| Connection, GY                     | Sync. / Com.  | Vibration and impact resistance | EN 60947-5-2  |

<sup>1</sup> depending on the set analogue window

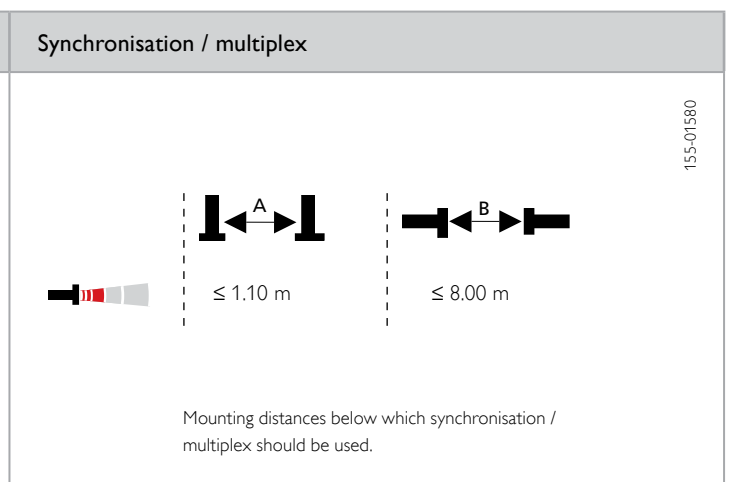
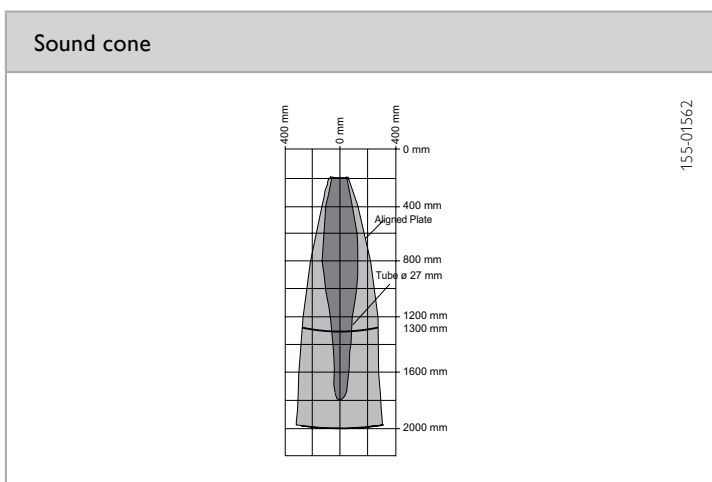
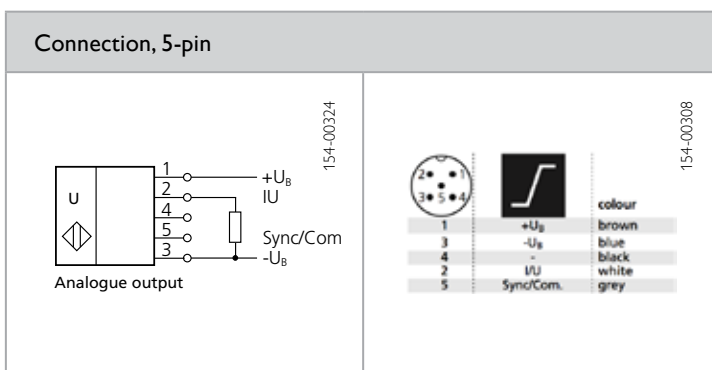
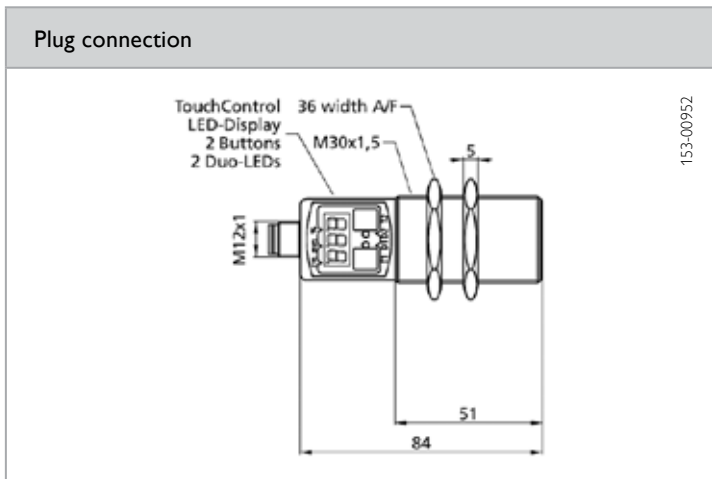
<sup>2</sup> Related to current measurement value

<sup>3</sup> Parameterisable via control panel

<sup>4</sup> Max. 10 % ripple, within U<sub>b</sub>

<sup>5</sup> With connected IP 67 plug

| Operating scanning distance | Analogue output         | Type of connection | Part number          | Article number |
|-----------------------------|-------------------------|--------------------|----------------------|----------------|
| 200 ... 1300 mm             | 0 ... 10V / 4 ... 20 mA | Plug, M12x1, 5-pin | UMT 30-1300-A-IUD-L5 | 690-51562      |



**Accessories**

|                   |                |
|-------------------|----------------|
| Connection cables | From Page A-34 |
| Brackets          | From Page A-4  |

# UMT 30-3400

Ultrasonic sensor with switching output



## PRODUCT HIGHLIGHTS

- With one or two switching outputs as option
- Sensor adjustment via teach-in or numerically via 7-segment display
- Synchronisation of up to 10 devices in restricted spaces
- Additional features with numerous supplementary functions

| Sensor data                                     |   | Functions                       |  |
|---|---|---------------------------------|--|
| Limiting scanning distance                      | 5000 mm   | Display                         | Parameterisation   |
| Operating scanning distance                     | 350 ... 3400 mm   | LED indicator 1                 | Switching output indicator   |
| Ultrasonic frequency                            | ~ 120 kHz   | LED indicator 2                 | Switching output indicator   |
| Resolution                                      | 0.18 mm   | Scanning distance adjustment    | Via Teach-in buttons and numerically via 7-segment display   |
| Repeatability                                   | ± 0.15 % <sup>1</sup>   | Teach-in modes                  | Mode 1: set switching point<br>Mode 2: set Window Mode<br>Mode 3: set two-way reflex switch  |
| Hysteresis <sup>2</sup>                         | 50 mm   | Adjustment possibilities        | N.O. / N.C. via Teach-in button<br>Button lock via Teach-in button<br>Default settings via Teach-in button   |
| Accuracy <sup>2</sup>                           | ± 1 % (Temperature drift internal compensated, may be deactivated, 0.17 % / K without compensation) | Supplementary functions         | – Energy-saving Mode<br>– Hysteresis<br>– Measurement value filter<br>– Filter strength<br>– Response delay<br>– Foreground suppression<br>– Multiplex Mode, device address<br>– Multiplex Mode, highest address<br>– Measurement range<br>– Calibration display<br>– Detection range, sensitivity |
|   |   | Default settings <sup>3</sup>   | Measurement range: limit scanning distance<br>Switching distances: scanning distance<br>Switching output: N.O.   |
|   |   | Default settings <sup>4</sup>   | Measurement range: limit scanning distance<br>Switching distances: scanning distance and half scanning distance<br>Switching output: N.O.  |
| Electrical data                                 |   | Mechanical data                 |  |
| Operating voltage, +U <sub>B</sub>              | 9 ... 30V DC <sup>5</sup>   | Dimensions                      | M30 x 102 mm   |
| No-load current, I <sub>0</sub>                 | ≤ 80 mA   | Enclosure rating                | IP 67 <sup>6</sup>   |
| Output current, I <sub>e</sub>                  | 200 mA  | Material, housing               | Brass, nickel-plated, plastic content: PBT,TPU   |
| Protective circuits                             | Reverse-polarity protection, U <sub>B</sub> / short-circuit protection (Q)                          | Material, ultrasonic converter  | Polyurethane foam, epoxy resin with glass content  |
| Power On Delay                                  | < 300 ms  | Type of connection              | (See Selection Table)  |
| Switching output, Q                             | 1 x PNP / 2 x PNP (see Selection Table)   | Ambient temperature, operation  | -25 ... +70 °C   |
| Output function                                 | N.O. / N.C.   | Ambient temperature, storage    | -40 ... +85 °C   |
| Switching frequency, f (ti/tp 1:1) <sup>2</sup> | 3 Hz <sup>3</sup> / 4 Hz <sup>4</sup>   | Weight                          | 210 g  |
| Response time <sup>2</sup>                      | 180 ms <sup>3</sup> / 172 ms <sup>4</sup>   | Vibration and impact resistance | EN 60947-5-2   |
| Connection, GY                                  | Sync. / Com.  |                                 |  |

<sup>1</sup> Related to current measurement value

<sup>2</sup> Parameterisable via control panel

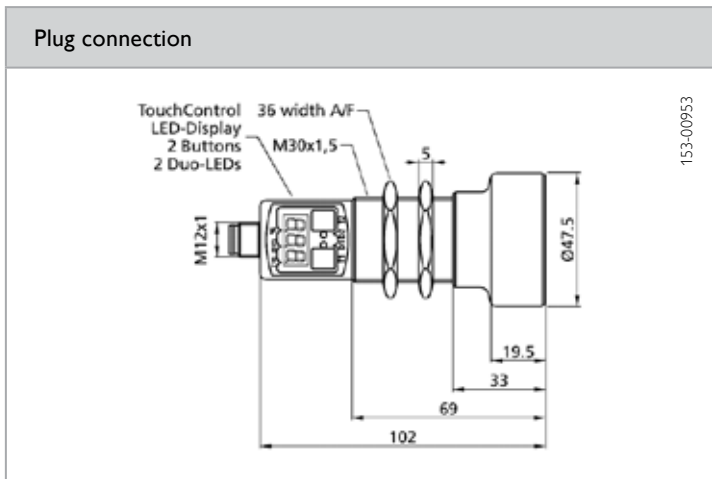
<sup>3</sup> 1 x PNP

<sup>4</sup> 2 x PNP

<sup>5</sup> Max. 10 % ripple, within U<sub>B</sub>

<sup>6</sup> With connected IP 67 plug

| Operating scanning distance | Switching output | Type of connection | Part number         | Article number |
|-----------------------------|------------------|--------------------|---------------------|----------------|
| 350 ... 3400 mm             | 1 x PNP          | Plug, M12x1, 5-pin | UMT 30-3400-PSD-L5  | 690-51567      |
| 350 ... 3400 mm             | 2 x PNP          | Plug, M12x1, 5-pin | UMT 30-3400-2PSD-L5 | 690-51568      |



| Connection, 5-pin (1 x PNP)                   |                  | Connection, 5-pin (2 x PNP)                    |                  |
|---|------------------|--|------------------|
| <p>1 PNP switched output</p> <p>154-00322</p> | <p>154-00306</p> | <p>2 PNP switched outputs</p> <p>154-00323</p> | <p>154-00307</p> |

| Sound cone       | Synchronisation / multiplex  |
|------------------|--|
| <p>155-01563</p> | <p>155-01580</p> <p>Mounting distances below which synchronisation / multiplex should be used.</p> |

**Accessories**

|                   |                |
|-------------------|----------------|
| Connection cables | From Page A-34 |
| Brackets          | From Page A-4  |

# UMT 30-3400-A

Ultrasonic sensor with analogue output



## PRODUCT HIGHLIGHTS

- Automatic selection to current or voltage output
- Easy pre-setting of sensor via digital display – sensor immediately ready for operation
- Synchronisation of up to 10 devices in restricted spaces
- Additional features with numerous supplementary functions
- Choice of brass or stainless steel housings

| Sensor data                        |   | Functions                       |   |
|------------------------------------|---|---------------------------------|---|
| Limiting scanning distance         | 5000 mm   | Display                         | Parameterisation  |
| Operating scanning distance        | 350 ... 3400 mm   | LED indicator 1                 | Switching output indicator  |
| Ultrasonic frequency               | ~ 120 kHz   | LED indicator 2                 | Switching output indicator  |
| Resolution <sup>1</sup>            | 0.18 ... 1.5 mm   | Set analogue characteristic     | Via Teach-in buttons and numerically via 7-segment display  |
| Repeatability                      | ± 0.15 % <sup>2</sup>   | Teach-in modes                  | Mode 1: set window limits<br>Mode 2: rising / falling output characteristics  |
| Accuracy <sup>3</sup>              | ± 1 % (Temperature drift internal compensated, may be deactivated, 0.17 % / K without compensation)     | Adjustment possibilities        | Button lock via Teach-in button<br>Default settings via Teach-in button   |
|                                    |   | Supplementary functions         | – Energy-saving Mode<br>– Indicator Mode<br>– Current or voltage output selection<br>– Measurement value filter<br>– Filter strength<br>– Response delay<br>– Foreground suppression<br>– Multiplex Mode, device address<br>– Multiplex Mode, highest address<br>– Measurement range<br>– Calibration display<br>– Detection range, sensitivity |
|                                    |   | Default settings                | Measurement range: limit scanning distance<br>Window limits, analogue signal: blind zone and scanning distance<br>Switching output: rising analogue characteristic  |
|                                    |   |                                 |   |
| Electrical data                    |   | Mechanical data                 |   |
| Operating voltage, +U <sub>b</sub> | 9 ... 30V DC <sup>4</sup>   | Dimensions                      | M30 x 102 mm  |
| No-load current, I <sub>0</sub>    | ≤ 80 mA   | Enclosure rating                | IP 67 <sup>5</sup>  |
| Current output                     | R <sub>L</sub> ≤ 100 Ω with 9V ≤ U <sub>b</sub> ≤ 20V; R <sub>L</sub> ≤ 500 Ω with U <sub>b</sub> ≥ 20V | Material, housing               | (See Selection Table)<br>Plastic content: PBT,TPU   |
| Voltage output                     | R <sub>L</sub> ≥ 100 kΩ with U <sub>b</sub> ≥ 15V   | Material, ultrasonic converter  | Polyurethane foam, epoxy resin with glass content   |
| Protective circuits                | Reverse-polarity protection, U <sub>b</sub> / short-circuit protection (Q)                              | Type of connection              | (See Selection Table)   |
| Power On Delay                     | < 300 ms  | Ambient temperature, operation  | -25 ... +70 °C  |
| Analogue output                    | 0 ... 10V / 4 ... 20 mA   | Ambient temperature, storage    | -40 ... +85 °C  |
| Response time <sup>3</sup>         | 172 ms  | Weight                          | 210 g   |
| Connection, GY                     | Sync. / Com.  | Vibration and impact resistance | EN 60947-5-2  |

<sup>1</sup> depending on the set analogue window

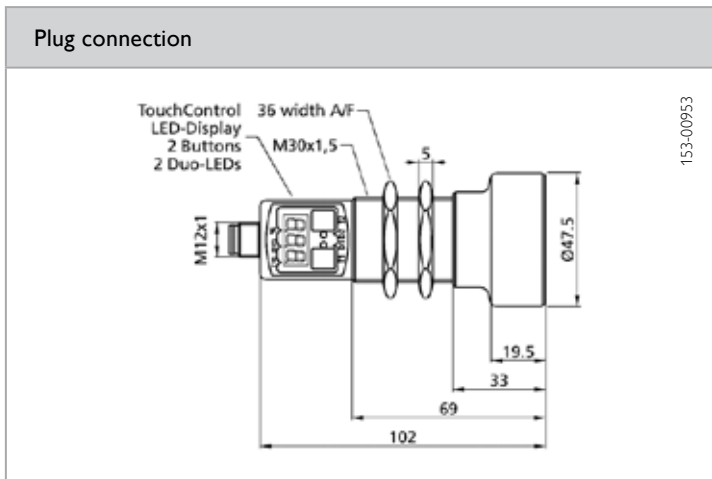
<sup>2</sup> Related to current measurement value

<sup>3</sup> Parameterisable via control panel

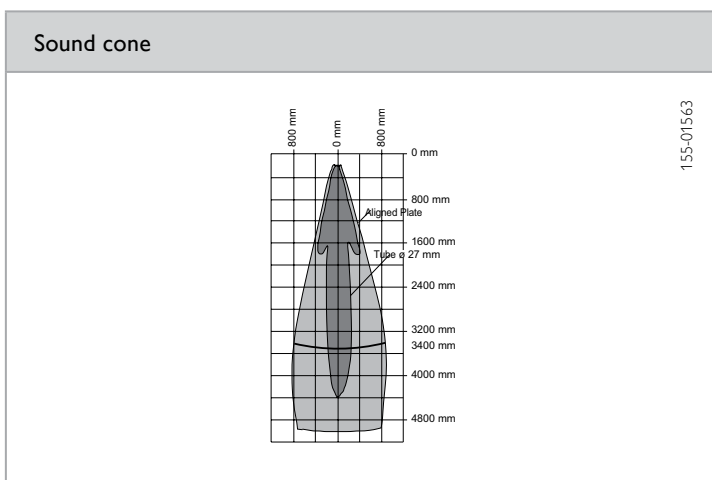
<sup>4</sup> Max. 10 % ripple, within U<sub>b</sub>

<sup>5</sup> With connected IP 67 plug

| Operating scanning distance | Analogue output         | Material, housing       | Type of connection | Part number           | Article number |
|-----------------------------|-------------------------|-------------------------|--------------------|-----------------------|----------------|
| 350 ... 3400 mm             | 0 ... 10V / 4 ... 20 mA | Brass, nickel-plated    | Plug, M12x1, 5-pin | UMT 30-3400-A-IUD-L5  | 690-51565      |
| 350 ... 3400 mm             | 0 ... 10V / 4 ... 20 mA | Stainless steel, 1.4571 | Plug, M12x1, 5-pin | UMT 30-3400-AE-IUD-L5 | 690-51566      |



**Connection, 5-pin**



**Synchronisation / multiplex**

Mounting distances below which synchronisation / multiplex should be used.

**Accessories**

|                   |                |
|-------------------|----------------|
| Connection cables | From Page A-34 |
| Brackets          | From Page A-4  |

# UMT 30-6000

Ultrasonic sensor with switching output



## PRODUCT HIGHLIGHTS

- Long scanning range of 6 m
- With one or two switching outputs as option
- Sensor adjustment via teach-in or numerically via 7-segment display
- Additional features with numerous supplementary functions

| Sensor data                                     |   | Functions                       |  |
|---|---|---------------------------------|--|
| Limiting scanning distance                      | 8000 mm   | Display                         | Parameterisation   |
| Operating scanning distance                     | 600 ... 6000 mm   | LED indicator 1                 | Switching output indicator   |
| Ultrasonic frequency                            | ~ 80 kHz  | LED indicator 2                 | Switching output indicator   |
| Resolution                                      | 0.18 mm   | Scanning distance adjustment    | Via Teach-in buttons and numerically via 7-segment display   |
| Repeatability                                   | ± 0.15 % <sup>1</sup>   | Teach-in modes                  | Mode 1: set switching point<br>Mode 2: set Window Mode<br>Mode 3: set two-way reflex switch  |
| Hysteresis <sup>2</sup>                         | 100 mm  | Adjustment possibilities        | N.O. / N.C. via Teach-in button<br>Button lock via Teach-in button<br>Default settings via Teach-in button   |
| Accuracy <sup>2</sup>                           | ± 1 % (Temperature drift internal compensated, may be deactivated, 0.17 % / K without compensation) | Supplementary functions         | – Energy-saving Mode<br>– Multiplex Mode, device address<br>– Hysteresis<br>– Multiplex Mode, highest address<br>– Measurement value filter<br>– Measurement range<br>– Filter strength<br>– Calibration display<br>– Response delay<br>– Detection range, sensitivity<br>– Foreground suppression |
|   |   | Default settings <sup>3</sup>   | Measurement range: limit scanning distance<br>Switching distances: scanning distance<br>Switching output: N.O.   |
|   |   | Default settings <sup>4</sup>   | Measurement range: limit scanning distance<br>Switching distances: scanning distance and half scanning distance<br>Switching output: N.O.  |
| Electrical data                                 |   | Mechanical data                 |  |
| Operating voltage, +U <sub>B</sub>              | 9 ... 30V DC <sup>5</sup>   | Dimensions                      | M30 x 105 mm   |
| No-load current, I <sub>0</sub>                 | ≤ 80 mA   | Enclosure rating                | IP 67 <sup>6</sup>   |
| Output current, I <sub>e</sub>                  | 200 mA  | Material, housing               | Brass, nickel-plated, plastic content: PBT,TPU   |
| Protective circuits                             | Reverse-polarity protection, U <sub>B</sub> / short-circuit protection (Q)                          | Material, ultrasonic converter  | Polyurethane foam, epoxy resin with glass content  |
| Power On Delay                                  | < 300 ms  | Type of connection              | (See Selection Table)  |
| Switching output, Q                             | 1 x PNP / 2 x PNP (see Selection Table)   | Ambient temperature, operation  | -25 ... +70 °C   |
| Output function                                 | N.O. / N.C.   | Ambient temperature, storage    | -40 ... +85 °C   |
| Switching frequency, f (ti/tp 1:1) <sup>2</sup> | 2 Hz <sup>3</sup> / 3 Hz <sup>4</sup>   | Weight                          | 270 g  |
| Response time <sup>2</sup>                      | 240 ms  | Vibration and impact resistance | EN 60947-5-2   |
| Connection, GY                                  | Sync. / Com.  |                                 |  |

<sup>1</sup> Related to current measurement value

<sup>2</sup> Parameterisable via control panel

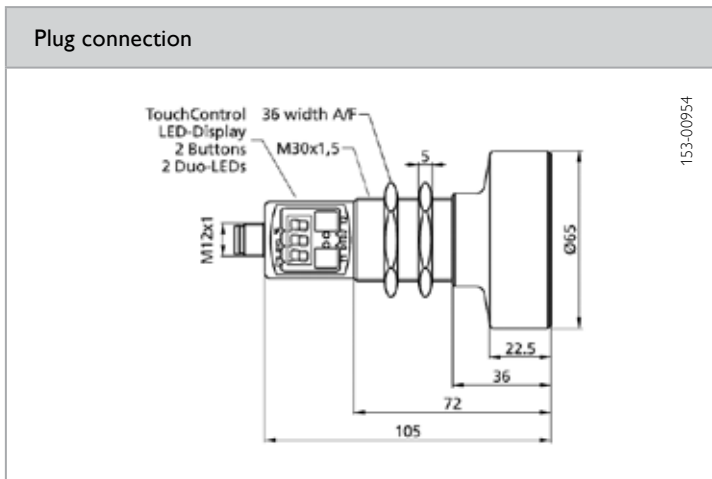
<sup>3</sup> 1 x PNP

<sup>4</sup> 2 x PNP

<sup>5</sup> Max. 10 % ripple, within U<sub>B</sub>

<sup>6</sup> With connected IP 67 plug

| Operating scanning distance | Switching output | Type of connection | Part number         | Article number |
|-----------------------------|------------------|--------------------|---------------------|----------------|
| 600 ... 6000 mm             | 1 x PNP          | Plug, M12x1, 5-pin | UMT 30-6000-PSD-L5  | 690-51570      |
| 600 ... 6000 mm             | 2 x PNP          | Plug, M12x1, 5-pin | UMT 30-6000-2PSD-L5 | 690-51571      |



| Connection, 5-pin (1 x PNP)                   |                  | Connection, 5-pin (2 x PNP)                    |                  |
|---|------------------|--|------------------|
| <p>1 PNP switched output</p> <p>154-00322</p> | <p>154-00306</p> | <p>2 PNP switched outputs</p> <p>154-00323</p> | <p>154-00307</p> |

| Sound cone       | Synchronisation / multiplex  |
|------------------|--|
| <p>155-01564</p> | <p>155-01580</p> <p>Mounting distances below which synchronisation / multiplex should be used.</p> |

**Accessories**

|                   |                |
|-------------------|----------------|
| Connection cables | From Page A-34 |
| Brackets          | From Page A-4  |



# UMT 30-6000-A

Ultrasonic sensor with analogue output



## PRODUCT HIGHLIGHTS

- Long scanning range of 6 m
- Automatic selection to current or voltage output
- Easy pre-setting of sensor via digital display – sensor immediately ready for operation
- Synchronisation of up to 10 devices in restricted spaces
- Additional features with numerous supplementary functions

| Sensor data                        |   | Functions                       |   |
|------------------------------------|---|---------------------------------|---|
| Limiting scanning distance         | 8000 mm   | Display                         | Parameterisation  |
| Operating scanning distance        | 600 ... 6000 mm   | LED indicator 1                 | Switching output indicator  |
| Ultrasonic frequency               | ~ 80 kHz  | LED indicator 2                 | Switching output indicator  |
| Resolution <sup>1</sup>            | 0.18 ... 2.4 mm   | Set analogue characteristic     | Via Teach-in button and numerically via 7-segment display   |
| Repeatability                      | ± 0.15 % <sup>2</sup>   | Teach-in modes                  | Mode 1: set window limits<br>Mode 2: rising / falling output characteristics  |
| Accuracy <sup>3</sup>              | ± 1 % (Temperature drift internal compensated, may be deactivated, 0.17 % / K without compensation)     | Adjustment possibilities        | Button lock via Teach-in button<br>Default settings via Teach-in button   |
|                                    |   | Supplementary functions         | – Energy-saving Mode<br>– Indicator Mode<br>– Current or voltage output selection<br>– Measurement value filter<br>– Filter strength<br>– Response delay<br>– Foreground suppression<br>– Multiplex Mode, device address<br>– Multiplex Mode, highest address<br>– Measurement range<br>– Calibration display<br>– Detection range, sensitivity |
|                                    |   | Default settings                | Measurement range: limit scanning distance<br>Window limits, analogue signal: blind zone and scanning distance<br>Switching output: rising analogue characteristic  |
|                                    |   |                                 |   |
| Electrical data                    |   | Mechanical data                 |   |
| Operating voltage, +U <sub>b</sub> | 9 ... 30V DC <sup>4</sup>   | Dimensions                      | M30 x 105 mm  |
| No-load current, I <sub>0</sub>    | ≤ 80 mA   | Enclosure rating                | IP 67 <sup>5</sup>  |
| Current output                     | R <sub>L</sub> ≤ 100 Ω with 9V ≤ U <sub>b</sub> ≤ 20V; R <sub>L</sub> ≤ 500 Ω with U <sub>b</sub> ≥ 20V | Material, housing               | Brass, nickel-plated, plastic content: PBT,TPU  |
| Voltage output                     | R <sub>L</sub> ≥ 100 kΩ with U <sub>b</sub> ≥ 15V   | Material, ultrasonic converter  | Polyurethane foam, epoxy resin with glass content   |
| Protective circuits                | Reverse-polarity protection, U <sub>b</sub> / short-circuit protection (Q)                              | Type of connection              | (See Selection Table)   |
| Power On Delay                     | < 300 ms  | Ambient temperature, operation  | -25 ... +70 °C  |
| Analogue output                    | 0 ... 10V / 4 ... 20 mA   | Ambient temperature, storage    | -40 ... +85 °C  |
| Response time <sup>3</sup>         | 240 ms  | Weight                          | 270 g   |
| Connection, GY                     | Sync. / Com.  | Vibration and impact resistance | EN 60947-5-2  |

<sup>1</sup> depending on the set analogue window

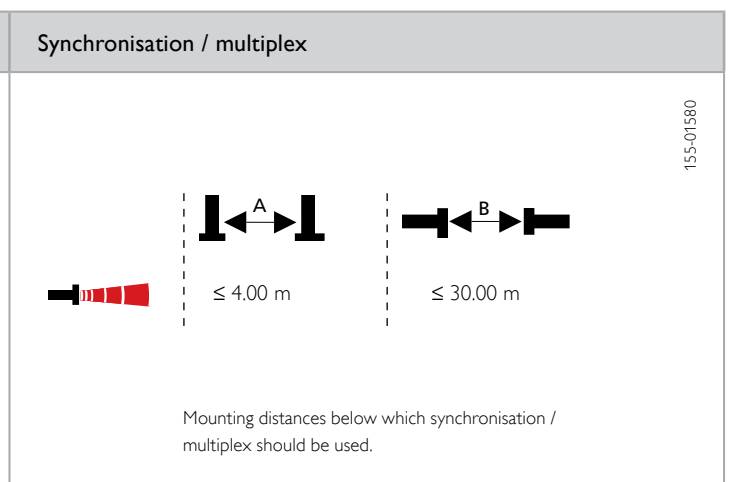
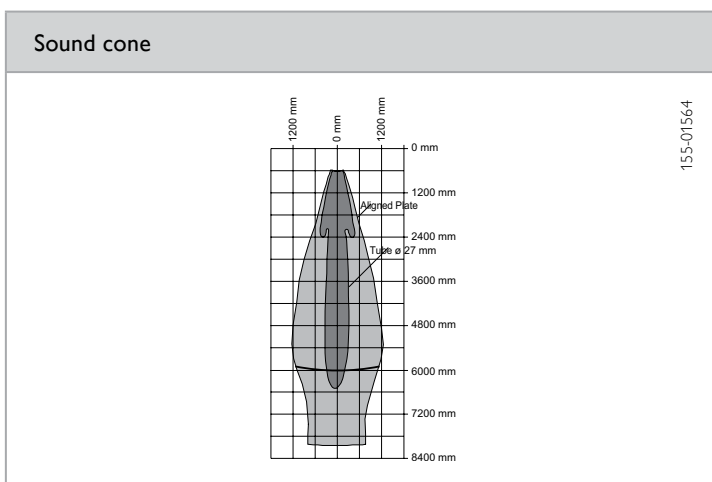
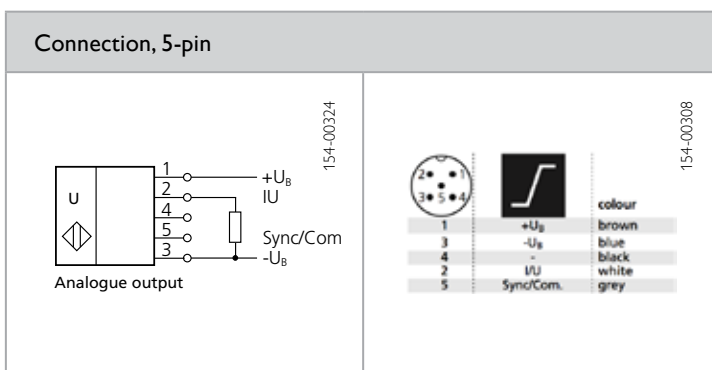
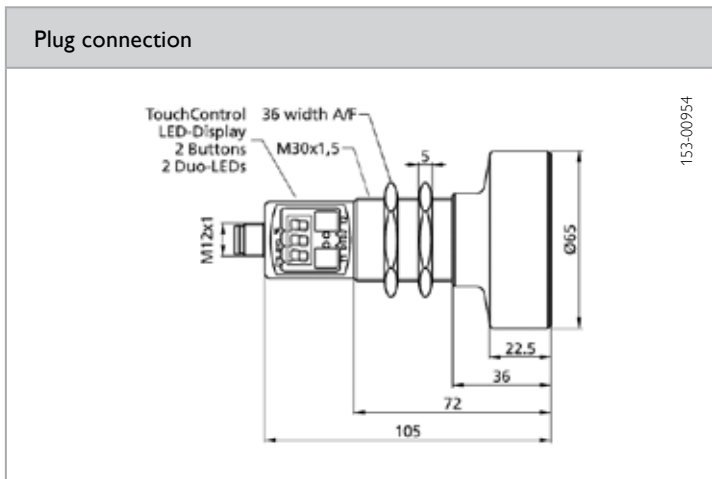
<sup>2</sup> Related to current measurement value

<sup>3</sup> Parameterisable via control panel

<sup>4</sup> Max. 10 % ripple, within U<sub>b</sub>

<sup>5</sup> With connected IP 67 plug

| Operating scanning distance | Analogue output         | Type of connection | Part number          | Article number |
|-----------------------------|-------------------------|--------------------|----------------------|----------------|
| 600 ... 6000 mm             | 0 ... 10V / 4 ... 20 mA | Plug, M12x1, 5-pin | UMT 30-6000-A-IUD-L5 | 690-51569      |



**Accessories**

|                   |                |
|-------------------|----------------|
| Connection cables | From Page A-34 |
| Brackets          | From Page A-4  |