UA18/UA30 - Ultrasonic sensors

Sensors
UA18/30 Series
Ultrasonic sensors

This ultrasonic sensor series of UA18 and UA30 sensors provides superior sensing solutions with a good price-performance-ratio for a variety of industry applications. The UA sensors are excellent at contactless position and distance measurement and they are able to detect any target regardless of its colour, transparency or surface.

Because of their resistance to high and low temperatures and immunity against dust, steam and fumes, these UA sensors are especially well suited to harsh environments.

The UA18 and UA30 come in a two digital output version and a combined version with one digital and one analogue output. Also, the sensor range is supplemented with a short-body version of the UA18 with either an analog or a digital output.

Sensing distances go from 40 to 6000 mm and both cable and plug versions are available.

Due to improved technology, an extended sensing distance and a reduced housing length, these sensors make for a state of the art sensor family with high accuracy, versatility and resilience!

Sensing solutions for industry applications

**Short blind zone**
The new UA sensors offer a reduced blind zone which improves the mounting flexibility and minimizes the space required for reliable detection.

**Easy teach-in**
Sensing modes are easily set by two simple clicks on the teach-in button or by use of the teach-by-wire function.

**Long sensing distance**
The UA sensor family includes a wide range of models covering operational ranges of up to 6000 mm.

**Housing**
The sensors come in a standard housing length or a short-body version in both thermoplastic and high-grade stainless steel.

**Harsh environments**
The robust, solid-cast housing is specifically designed and well suited to industries where environmental conditions such as lighting, dust, fumes and steam challenge the sensing performance.

**Approvals**
CE (EN60947-5-2)
cULus (UL508)
Applications

Detection of trees in mobile spraying systems

Thanks to its 6 m sensing distance, our ultrasonic sensor UA30CAD60 is ideal for tree detection in agricultural spraying equipment used in for instance fruit orchards. A sensor is mounted in front of each sprayer, and its information is used to ensure that only trees are sprayed. As a result, the quantities of pesticides are reduced for the benefit of costs as well as the environment.

Level detection in large storage silos

In the animal feed industry, feed manufacturers and animal producers share a common interest in solutions that optimize handling of animal feed at the lowest possible cost. Our ultrasonic sensor UA30CAD60 with a 6 m sensing distance is superb at measuring levels in large feed silos. Knowing the feed level in the silo and the required output of animal feed for a certain period is a powerful instrument. Thus, the feed supplier will know the exact quantity necessary for each refill, overstocking is avoided, and each feed portion will be fresher.

Distance measurement in street sweepers

Because it is highly resistant to salt water and mechanical stress, our ultrasonic sensor with a stainless steel housing is an excellent choice for distance measurement in street sweepers. This sensor detects the distance to the pavement while ignoring its colour or shape. By knowing the exact distance, the performance of the brushes is optimized.

Detecting people in front of ATMs

Our short-body UA18CSD/ESD sensors can detect up to 800 mm, and they are not affected by the colour of for instance clothes or vehicles. Therefore, these sensors are highly appropriate for detection of customers in front of an ATM (automatic teller machine) or a drive-through ATM. Moreover, the sensors are very resistant to adverse conditions, and they offer a reliable detection that facilitates communication between customer and machine.

Ink level measurement in offset printing

In modern offset printers the ink level is automatically monitored and adjusted for the specific print job. The ink fountain controls the amount of ink that enters the inking system. Our short-body UA18CSD/ESD sensors can detect from 40 to 300 mm, and they offer a precise detection of the ink level in the ink fountain. The ink distribution rollers will receive only the requisite quantity of ink, and unnecessary waste is thereby avoided.
Types of detection

Diameter measurement

The UA18 and UA30 sensors are ideal for accurate measurement of changing diameters, such as reels and drums in paper, aluminium and other metal manufacturing, textile, plastics and packaging industries. The sensors provide a precise output of the diameter in rolls or drums as it changes when materials wind or unwind.

Parts counting & presence detection

Because of their superior ability to detect clear, transparent objects and to measure distance, the UA18 and UA30 sensors are a perfect choice for a wide range of applications. Parts are precisely detected and positioned and objects or persons are counted by the UA18 and UA30 sensors in areas dealing with people, robots, glass, fluids, food & beverage, solid objects, car wash and materials handling.

Level detection

The UA18 and UA30 sensors are superb at detecting the level of fluids, semi fluids and solids, such as water in a tank or grain in a container. Typical applications include printing machines, hoppers, agricultural manufacturing, food & beverage, water treatment, chemical industry, analysis work and power plants.

Tension control

Monitoring and control of speed, position and tension of materials being processed are efficiently and accurately performed by the UA18 and UA30 sensors. The sensors monitor the slope of loops and synchronise the speed between machines, securing a stable working flow. These features are useful in metal working, paper, aluminium, textile and plastics manufacturing as well as packaging and chemical industries.

Height and size measurement

The UA18 and UA30 sensors are successfully used in applications which measure the height or size of objects moving past the sensor or for stacking operations in industries such as the automotive industry, printing machines, metal working, package & distribution, food & beverage, bottle sorting, agriculture, robots, the electronics industry, glass and materials handling.
Materials to be detected

Hard foam

Wood

Glass

Liquid / water

Metal

Plastic

Paint / lacquer

Bulk material / rock
**UA18/30 Series**

**Ultrasonic sensors**

**Features and functions UA18/30 CAD/EAD - long housing**

**PBT housing**

**UA18CAD....**

UA18: M18 x 83.6 mm (Cable)
UA18: M18 x 77.7 mm (Plug)

**UA30CAD35..**

UA30: M30 x 89.5 mm (Cable)
UA30: M30 x 89.5 mm (Plug)

**UA30CAD60..**

UA30: M30 x 93 mm (Cable)
UA30: M30 x 100 mm (Plug)

**Stainless steel housing**

**UA18EAD....**

UA18: M18 x 83.6 mm (Cable)
UA18: M18 x 91.7 mm (Plug)

**UA30EAD....**

UA30: M30 x 93 mm (Cable)
UA30: M30 x 100 mm (Plug)

**Locknut**

All UAxxCAD models include two lock-nuts with retention grips for tight mounting.

**Nut**

All UAxxEAD models includes two nuts for tight mounting.

**PBT and stainless steel housing**

CARLO GAVAZZI Automation Components. Specifications are subject to change without notice. Illustrations are for example only.
Digital outputs NPN or PNP

Normal switching operation

Adjustable hysteresis operation

Featuring two digital outputs, the digital UA sensors can operate in two different modes: normal switching or adjustable hysteresis. The outputs are independently teachable via the teach-in button. Modes are easily set and adjusted for on/off or filling/emptying functionality.

Analogue and digital outputs NPN or PNP

Negative slope

Positive slope

The analogue UA sensors offer a combined output configuration: one digital and one analogue output. The analogue output of 4-20 mA or 0-10 VDC can be configured as either “positive slope” or “negative slope”. The slope is defined by two teachable setpoints. The digital output forms a sensing window in which the output is either active or inactive between the setpoints (P2 and P1). These are useful features for distance measurement, level measurement, diameter measurement or loop control.
### UA18CAD and UA30CAD PBT Housing

**2 x Digital outputs**

<table>
<thead>
<tr>
<th>Connection</th>
<th>Output</th>
<th>UA18CAD...</th>
<th>UA30CAD...</th>
<th>UA18CAD...</th>
<th>UA30CAD...</th>
</tr>
</thead>
<tbody>
<tr>
<td>NPN</td>
<td>50 - 400 mm</td>
<td>04NPTI</td>
<td>04NPTI</td>
<td>04NPTI</td>
<td>04NPTI</td>
</tr>
<tr>
<td></td>
<td>100 - 900 mm</td>
<td>09NPTI</td>
<td>09NPTI</td>
<td>09NPTI</td>
<td>09NPTI</td>
</tr>
<tr>
<td></td>
<td>200 - 2200 mm</td>
<td>22NPTI</td>
<td>22NPTI</td>
<td>22NPTI</td>
<td>22NPTI</td>
</tr>
<tr>
<td></td>
<td>250 - 3050 mm</td>
<td>35NPTI</td>
<td>35NPTI</td>
<td>35NPTI</td>
<td>35NPTI</td>
</tr>
<tr>
<td></td>
<td>350 - 6000 mm</td>
<td>60NPTI</td>
<td>60NPTI</td>
<td>60NPTI</td>
<td>60NPTI</td>
</tr>
<tr>
<td>PNP</td>
<td>50 - 400 mm</td>
<td>04PPTI</td>
<td>04PPTI</td>
<td>04PPTI</td>
<td>04PPTI</td>
</tr>
<tr>
<td></td>
<td>100 - 900 mm</td>
<td>09PPTI</td>
<td>09PPTI</td>
<td>09PPTI</td>
<td>09PPTI</td>
</tr>
<tr>
<td></td>
<td>200 - 2200 mm</td>
<td>22PPTI</td>
<td>22PPTI</td>
<td>22PPTI</td>
<td>22PPTI</td>
</tr>
<tr>
<td></td>
<td>250 - 3050 mm</td>
<td>35PPTI</td>
<td>35PPTI</td>
<td>35PPTI</td>
<td>35PPTI</td>
</tr>
<tr>
<td></td>
<td>350 - 6000 mm</td>
<td>60PPTI</td>
<td>60PPTI</td>
<td>60PPTI</td>
<td>60PPTI</td>
</tr>
</tbody>
</table>

**Analogue + Digital output**

<table>
<thead>
<tr>
<th>Model</th>
<th>Digital output</th>
<th>Distance</th>
<th>Connection</th>
<th>Output</th>
<th>UA18CAD...</th>
<th>UA30CAD...</th>
<th>M18</th>
<th>M30</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Open collector, NPN or PNP by sensor type</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Standard 2 switchpoint or adjustable hysteresis for Level control</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Digital output with windows function and analogue output with positive or negative slope</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Rated operational voltage \( (U_B) \) (5 % ripple included)**

- M18: 15 to 30 V DC
- M30: 12 to 30 V DC

**Blind Zone**

- CAD04: ≤ 50 mm
- CAD09: ≤ 100 mm
- CAD22: ≤ 200 mm
- CAD35: ≤ 250 mm
- CAD60: ≤ 350 mm

**No load supply current \( (I_o) \)**

- CAD04: ≤ 45 mA
- CAD09: ≤ 45 mA
- CAD22: ≤ 50 mA
- CAD35: ≤ 50 mA
- CAD60: ≤ 50 mA

**Digital output current \( (I_e) \)**

- ≤ 500 mA (max. Load capacity 100 nF), \( (UL508 ≤ 100 \text{ mA}) \)
- CAD60: ≤ 300 mA

**Minimum operational current, digital \( (I_m) \)**

- ≤ 0.5 mA

**Off-State current, digital \( (I_r) \)**

- ≤ 10 μA

**Voltage drop, digital \( (U_d) \)**

- ≤ 2.2 V DC @ \( I_{max} \)

**Minimum resistive load, analogue**

- ≥ 3 kΩ

**Sensor protection, digital output**

- Shortcircuit (A), reverse polarity (B) and transients (C)

**Response time**

- CAD04: ≤ 45 ms
- CAD09: ≤ 125 ms
- CAD22: ≤ 500 ms
- CAD35: 250 ms and CAD60: 500 ms

**Power on delay \( (t_v) \)**

- CAD04: ≤ 2 ms
- CAD09: ≤ 4 ms
- CAD22: ≤ 8 ms
- CAD35: ≤ 10 ms
- CAD60: ≤ 5 ms

**Repeatability**

- 0.50%, CAD60: 1%
- 0.20%, CAD60: 1%
- 0.10%, CAD60: 1%

**Linear accuracy**

- 1%
- 0.5%
- 1%
- 0.5%

**Resolution**

- 1 mm

**Beam angle**

- CAD04: ±8°, CAD09: ±7°, CAD22: ±7° and CAD35: ±6°, CAD60: ±7°

**Temperature drift, compensation**

- ≤ 0.1%/°C, Yes

**Hysteresis**

- ≥ 1%, CAD60: ≥ 2%
- ≥ 0.5%

**LED indicators**

- Target detected (Yellow LED), Echo received (Green LED M30 sensor only)

**Sensitivity control**

- Teach-in button for setpoint P1 and P2

**Degree of protection**

- IP67 (IEC 60529; 60947-1)

**Ambient temperature**

- 20 to +60°C (CAD60: 70°C)
  - (4 to +140°F) (CAD04: 70°F to +140°F)
  - No condensation
  - Storage -35 to +70°C (CAD60: 70°F to +140°F)

**CE marking**

- According to EN 60947-5-2

**Approvals**

- CAD04: 07, 22 and 35: cULus (UL508)

**Installation category**

- III (IEC60664/60664A; 60947-1)

**Pollution degree**

- 3 (IEC60664/60664A; 60947-1)

**Vibration**

- 10 to 150 Hz

**Shock**

- 30G / 11 ms, 3 positive and 3 negative in X, Y, and Z direction

**Material**

- Body, PBT light grey; Front Epoxy-glass resin; Backpart Grilamide; Teach-in shaft POM

**Cable / Connector**

- PCV, grey, 2 m, 4 x 0.34 mm², Ø=4.7 mm / M12, 4-pin

**Dimensions**

- UA18 cable: M18 x 83.6 mm, UA18 plug: M18 x 77.7 mm, UA30 cable/plug: M30 x 89.5 mm

**Weight incl. packaging**

- M18 cable version ≤ 100 g, plug version ≤ 35 g, M30 cable version ≤ 160 g, plug version ≤ 90 g

**Accessories, additional**

- Connectors: CONM14NF-... Types

---

**Ultrasonic sensors**

The UA18CAD and UA30CAD PBT housing provide 2 x Digital outputs and Analogue + Digital output with options for various connection distances and output types. The housing is designed for use in various industrial applications, ensuring reliable performance under challenging conditions. CARLO GAVAZZI Automation Components. Specifications are subject to change without notice. Illustrations are for example only.
### The UA18EAD and UA30EAD stainless steel housing

<table>
<thead>
<tr>
<th>Connection</th>
<th>Out-put</th>
<th>Distance</th>
<th>UA18EAD...</th>
<th>UA30EAD...</th>
<th>UA18EAD...</th>
<th>UA30EAD...</th>
</tr>
</thead>
<tbody>
<tr>
<td>NPN Cable</td>
<td></td>
<td>50 - 400 mm</td>
<td>04NPTI</td>
<td>04NGTI</td>
<td>04NPTI</td>
<td>04NGTI</td>
</tr>
<tr>
<td></td>
<td></td>
<td>100 - 900 mm</td>
<td>09NPTI</td>
<td>09NGTI</td>
<td>09NPTI</td>
<td>09NGTI</td>
</tr>
<tr>
<td></td>
<td></td>
<td>200 - 1500 mm</td>
<td>15NPTI</td>
<td>15NGTI</td>
<td>15NPTI</td>
<td>15NGTI</td>
</tr>
<tr>
<td></td>
<td></td>
<td>350 - 3500 mm</td>
<td>35NPTI</td>
<td>35NGTI</td>
<td>35NPTI</td>
<td>35NGTI</td>
</tr>
<tr>
<td>PNP Plug</td>
<td></td>
<td>50 - 400 mm</td>
<td>04PPTI</td>
<td>04PGTI</td>
<td>04PPTI</td>
<td>04PGTI</td>
</tr>
<tr>
<td></td>
<td></td>
<td>100 - 900 mm</td>
<td>09PPTI</td>
<td>09PGTI</td>
<td>09PPTI</td>
<td>09PGTI</td>
</tr>
<tr>
<td></td>
<td></td>
<td>200 - 1500 mm</td>
<td>15PPTI</td>
<td>15PGTI</td>
<td>15PPTI</td>
<td>15PGTI</td>
</tr>
<tr>
<td></td>
<td></td>
<td>350 - 3500 mm</td>
<td>35PPTI</td>
<td>35PGTI</td>
<td>35PPTI</td>
<td>35PGTI</td>
</tr>
</tbody>
</table>

- **Rated operational voltage (U<sub>B</sub>)** (5% ripple included): 15 to 30 V DC, 12 to 30 V DC, 15 to 30 V DC
- **Blind zone**: EAD04: ≤ 50 mm, EAD09: ≤ 100 mm, EAD15: ≤ 200 mm, EAD35: ≤ 350 mm
- **No load supply current (I<sub>i</sub>):** ≤ 50 mA
- **Digital output**: Open collector, NPN or PNP by sensor type
- **Digital output function**: Standard 2 switchpoint or adjustable hysteresis for level control
- **Digital output current (I<sub>e</sub>):** UA18: ≤ 500 mA, UA35: ≤ 300 mA (max. Load capacity 100 nF), UL508 ≤ 100 mA
- **Minimum operational current, digital (I<sub>m</sub>):** ≤ 0.5 mA
- **Off-State current, digital (I<sub>r</sub>):** ≤ 10 µA
- **Voltage drop, digital (U<sub>d</sub>):** ≤ 2.2 V DC @ I<sub>e</sub> max
- **Minimum resistive load, analogue**: ≤ 500 Ω, > 3 kΩ, < 500 Ω, ≥ 3 kΩ
- **Sensor protection, digital output**: Shortcircuit (A), reverse polarity (B) and transients (C)
- **Response time**: EAD04: ≤ 50 ms, EAD09: ≤ 125 ms, EAD15: ≤ 500 ms and EAD35: 250ms
- **Power on delay (t<sub>v</sub>):** ≤ 900 ms, ≤ 1500 ms, ≤ 500 ms
- **Repeatability**: 0.5%, 1%
- **Linear error**: 0.5%, 1%
- **Resolution**: 1 mm, 2 mm
- **Beam angle**: EAD04: ±10°, EAD09: ±7°, EAD15: ±7° and EAD35: ±7°
- **Temperature drift**: ≤ 0.1% / °C
- **Temperature compensation**: Yes
- **Hysteresis**: ≥ 1%
- **Led indications**: Target detected (Yellow LED), Echo received (Green LED M30 sensor only)
- **Sensitivity control**: Teach-in button for setpoint P1 and P2
- **Degree of protection**: IP67 (IEC 60529; 60947:1)
- **Ambient temperature**: -20 to +60 °C (4 to +140 °F) no condensation, Storage 35 to +70 °C (31 to +158 °C)
- **CE marking**: According to EN 60947-5-2
- **Approvals**: cULus (UL508)
- **Installation category**: III (IEC60664/60664A; 60947-1)
- **Pollution degree**: 3G (IEC60664/60664A; 60947-1)
- **Vibration**: 10 to 150 Hz, (1,0 mm/15G; IEC 60068-2-6) in X, Y and Z direction
- **Shock**: 30G / ±11 mS, 3 positive and 3 negative in X, Y and Z direction
- **Material**: Body: AISI 316L; Front: Epoxy-glass resin, Backpart: Grilamide, Teach-in shaft: POM
- **Cable**: PCV, grey, 2 m, 4 x 0.34 mm², Ø=4.7 mm
- **Connector**: M12, 4-pin (CONM14NF-... Types)
- **Dimensions**: UA18 cable/plug: M18 x 83.6/91.7 mm, UA30 cable/plug: M30 x 93/100 mm
- **Weight incl. packaging**: M18 cable version ≤ 125 g, plug version ≤ 55 g, M30 cable version ≤ 220 g, plug version ≤ 150 g
- **Accessories, additional**: Connectors: CON.14-series

Specifications are subject to change without notice. Illustrations are for example only.
UA18/30 Series

Ultrasonic sensors

Features and functions UA18 CSD/ESD - short housing

PBT housing

UA18CSD....

UA18: M18 x 52.9 mm (Cable)
UA18: M18 x 60.4 mm (Plug)

LED indication

Stainless steel housing

UA18ESD....

UA18: M18 x 52.9 mm (Cable)
UA18: M18 x 60.4 mm (Plug)

LED indication

Locknut

All UA18CSD models include two lock-nuts with retention grips for tight mounting.

Nut

All UA18ESD models includes two nuts for tight mounting.

Digital outputs NPN or PNP

Normal switching operation

BK4 Output N.O.

Features one digital output, the digital UA sensors can be configured as N.O. or N.C.
A windows detection is achieved by teaching two setpoints - P1 and P2.
An object detection is achieved by teaching only one setpoint - P1.

BK4 Output N.C.

Analogical output

Negative slope

The analogue UA sensors offer one analogue output.
The analogue output of 4-20 mA or 0-10 VDC can be configured as either “positive slope” or “negative slope”.
The slope is defined by two teachable setpoints.

Positive slope

The analogue UA sensors offer one analogue output.
The analogue output of 4-20 mA or 0-10 VDC can be configured as either “positive slope” or “negative slope”.
The slope is defined by two teachable setpoints.
<table>
<thead>
<tr>
<th>Connection</th>
<th>Output</th>
<th>Distance</th>
<th>PET Housing</th>
<th>Stainless Steel Housing</th>
<th>PET Housing</th>
<th>Stainless Steel Housing</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Cable</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>NPN</td>
<td>40 - 300 mm</td>
<td>UA18CSD03NPTI</td>
<td>UA18ESD03NPTI</td>
<td>40 - 300 mm</td>
<td>UA18CSD03AGTI</td>
<td>UA18ESD03AGTI</td>
</tr>
<tr>
<td></td>
<td>80 - 800 mm</td>
<td>UA18CSD08NPTI</td>
<td>UA18ESD08NPTI</td>
<td>80 - 800 mm</td>
<td>UA18CSD08AGTI</td>
<td>UA18ESD08AGTI</td>
</tr>
<tr>
<td>PNP</td>
<td>40 - 300 mm</td>
<td>UA18CSD03PPTI</td>
<td>UA18ESD03PPTI</td>
<td>40 - 300 mm</td>
<td>UA18CSD03AKTI</td>
<td>UA18ESD03AKTI</td>
</tr>
<tr>
<td></td>
<td>80 - 800 mm</td>
<td>UA18CSD08PPTI</td>
<td>UA18ESD08PPTI</td>
<td>80 - 800 mm</td>
<td>UA18CSD08AKTI</td>
<td>UA18ESD08AKTI</td>
</tr>
<tr>
<td><strong>Plug</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>NPN</td>
<td>40 - 300 mm</td>
<td>UA18CSD03NPM1TI</td>
<td>UA18ESD03NPM1TI</td>
<td>40 - 300 mm</td>
<td>UA18CSD03AGM1TI</td>
<td>UA18ESD03AGM1TI</td>
</tr>
<tr>
<td></td>
<td>80 - 800 mm</td>
<td>UA18CSD08NPM1TI</td>
<td>UA18ESD08NPM1TI</td>
<td>80 - 800 mm</td>
<td>UA18CSD08AGM1TI</td>
<td>UA18ESD08AGM1TI</td>
</tr>
<tr>
<td>PNP</td>
<td>40 - 300 mm</td>
<td>UA18CSD03PPM1TI</td>
<td>UA18ESD03PPM1TI</td>
<td>40 - 300 mm</td>
<td>UA18CSD03AKM1TI</td>
<td>UA18ESD03AKM1TI</td>
</tr>
<tr>
<td></td>
<td>80 - 800 mm</td>
<td>UA18CSD08PPM1TI</td>
<td>UA18ESD08PPM1TI</td>
<td>80 - 800 mm</td>
<td>UA18CSD08AKM1TI</td>
<td>UA18ESD08AKM1TI</td>
</tr>
</tbody>
</table>

- **Rated operational voltage** (U_B): 10 to 30 V DC (≤ 5% ripple included)
- **Blind zone**: UA18..D03: ≤ 40 mm, UA18..D08: ≤ 80 mm
- **No load supply current** (I_o): 35 mA @ U_B max
- **Digital output**: Open collector, NPN or PNP by sensor type
- **Output switching function**: One open collector transistor output to be configured as N.O. or N.C.
- **Analogue output with positive or negative slope**: -
- **Digital output current** (I_e): ≤ 100 mA (max. load capacity 100 nF)
- **Minimum operational current** (I_m): ≤ 0.5 mA
- **Voltage drop** (U_d): ≤ 2.2 V DC @ I_e max
- **Output function, analogue**: AG.. types: 4 to 20 mA, AK.. types: 0 to 10 V DC
- **Resistive load, analogue**: AG.. types: ≤ 500 Ω, AK.. types: ≥ 3 kΩ
- **Sensor protection**: Shortcircuit, overvoltage and reverse polarity
- **Shortcircuit and overvoltage**: -
- **Response time**: UA18..D03: ≤ 60 mS, UA18..D08: ≤ 100 mS
- **Power on delay** (t_v): ≤ 100 mS
- **Repeatability**: 0.5% 1.0%
- **Linear accuracy**: 0.5% 1.0%
- **Resolution**: 3 mm
- **Beam angle**: UA18..D03: 7°±2°, UA18..D08: 8°±2°
- **Temperature drift**: ≤ 0.1%/°C @ -20°C to +60°C
- **Temperature compensation**: Yes
- **Hysteresis**: ≥ 1%
- **Led indications**: Output ON (Yellow LED), Echo ON (Green LED)
- **Sensitivity control**: Teach by wire for setpoint P1 and P2
- **Degree of protection**: IP67 [IEC 60529, 60947-1]
- **Ambient temperature**: Operating: -20 to +60 °C (<4 to +140 °F) no condensation, Storage: -35 to +70 °C (31 to +158 °F)
- **CE marking**: According to EN 60947-5-2
- **Approvals**: cULus [UL508]
- **Installation category**: III [IEC60664/60664A, 60947-1]
- **Pollution degree**: 3J [IEC60664/60664A, 60947-1]
- **Vibration**: 10 to 55 Hz, 1.0 mm/6G [IEC/EN 60668-2-6]
- **Shock**: 30G /11 mS, 3 directions [IEC/EN 60668-2-27]
- **Material**: Body: ESD: AISI 316L, CSD: PBT; Front: Epoxy-glass resin, Backpart: Grilamide, Push-button: POM
- **Cable**: PCV, grey, 2 m, 4 x 0.32 mm², Ø=4.7 mm
- **Connector**: M12, 4-pin [CON. 14-series]
- **Dimensions**: UA18 cable: M18 x 52.9 mm, UA18 plug: M18 x 60.4 mm
- **Weight incl. packaging**: UA18CSD cable version ≤ 135 g, plug version ≤ 65 g
- **M18ESD cable version ≤ 160 g, plug version ≤ 55 g
- **Accessories, additional**: Connectors: CON.14NF-series