



## **UA18/UA30 Basic Series - Ultrasonic Sensors**

# **Sensors**

# UA18/30 Series

## Ultrasonic sensors

This new 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. Sensing distances go from 50 to 3500 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!



### 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.

### Long sensing distance

The UA sensor family includes a wide range of models covering operational ranges of up to 3500 mm.

### Reduced housing length

The new housing has been made even smaller for better space saving.

### 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)



## Features and functions

### UA18CAD....



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

### UA 30CAD....



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

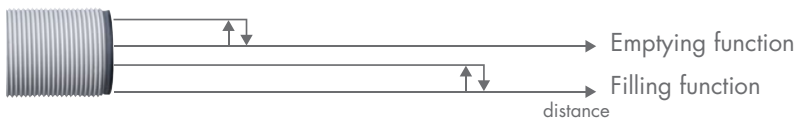
### Locknut



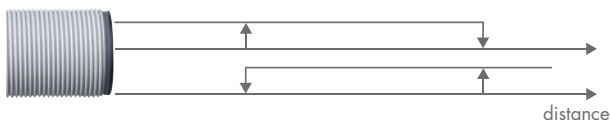
All UA30 models include a locknut with retention grips for tight mounting.

## Digital outputs NPN or PNP

Normal switching operation



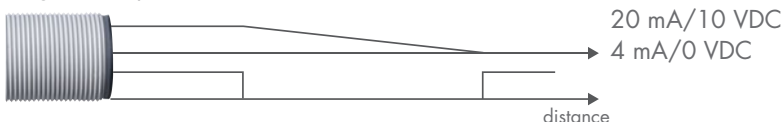
Adjustable hysteresis operation



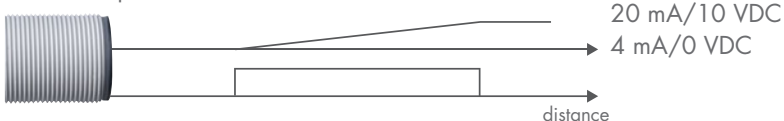
Featuring two digital outputs, the digital UA sensors can operate in two different modes: normal switching or adjustable hysteresis. The outputs are independently teachable via the teach-in button. Modes are easily set and adjusted for on/off or filling/emptying functionality.

## Analogue and Digital outputs NPN or PNP

Negative slope



Positive slope

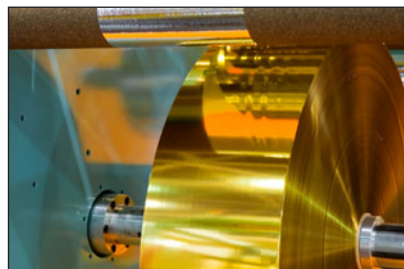


The analogue UA sensors offer a combined output configuration: one digital and one analogue output. The analogue output of 4-20 mA or 0-10 VDC can be configured as either "positive slope" or "negative slope". The slope is defined by two teachable setpoints. The digital output forms a sensing window in 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.

## Applications

### 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/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/UA30 sensors in areas dealing with people, robots, glass, fluids, food & beverage, solid objects, car wash and materials handling.



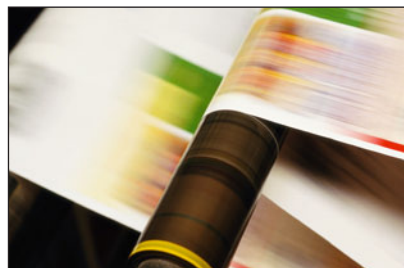
### Level detection

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.



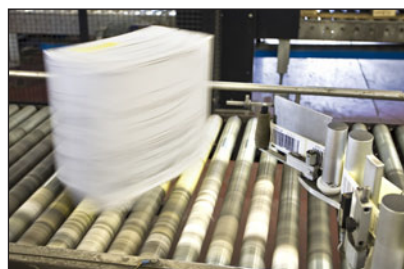
### Tension control

Monitoring and control of speed, position and tension of materials being processed are efficiently and accurately performed by the UA18/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.



## The UA18 and UA30 Basic Family

			2 x Digital outputs		Analogue + Digital output			
			M18	M30	M18		M30	
Conne- ction	Out- put	Distance	UA18CAD...	UA30CAD...	UA18CAD...		UA30CAD...	
Cable	NPN	50 - 400 mm	04NPTI		04NGTI	04NKTI		
		100 - 900 mm	09NPTI		09NGTI	09NKTI		
		200 - 2200 mm	22NPTI		22NGTI	22NKTI		
		250 - 3500 mm		35NPTI			35NGTI	35NKTI
	PNP	50 - 400 mm	04PPTI		04PGTI	04PKTI		
		100 - 900 mm	09PPTI		09PGTI	09PKTI		
		200 - 2200 mm	22PPTI		22PGTI	22PKTI		
		250 - 3500 mm		35PPTI			35PGTI	35PKTI
Plug	NPN	50 - 400 mm	04NPM1TI		04NGM1TI	04NKM1TI		
		100 - 900 mm	09NPM1TI		09NGM1TI	09NKM1TI		
		200 - 2200 mm	22NPM1TI		22NGM1TI	22NKM1TI		
		250 - 3500 mm		35NPM1TI			35NGM1TI	35NKM1TI
	PNP	50 - 400 mm	04PPM1TI		04PGM1TI	04PKM1TI		
		100 - 900 mm	09PPM1TI		09PGM1TI	09PKM1TI		
		200 - 2200 mm	22PPM1TI		22PGM1TI	22PKM1TI		
		250 - 3500 mm		35PPM1TI			35PGM1TI	35PKM1TI
Rated operational voltage (U <sub>o</sub> ) (5 % ripple included)			15 to 30 V DC	12 to 30 V DC	15 to 30 V DC	12 to 30 V DC	15 to 30 V DC	
No load supply current (I <sub>o</sub> )			CAD04: ≤ 45 mA, CAD09: ≤ 45 mA, CAD22: ≤ 50 mA and CAD35: ≤ 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 with windows function and analogue output with positive or negative slope			
Digital output current (I <sub>o</sub> )			≤ 500 mA (max. Load capacity 100 nF), (UL508 ≤ 100 mA)			≤ 100 mA (max. Load capacity 100 nF)		
Minimum operational current, digital (I <sub>m</sub> )			≤ 0,5 mA					
Off-State current, digital (I <sub>o</sub> )			≤ 10 µA					
Voltage drop, digital (U <sub>v</sub> )			≤ 2.2 V DC @ I <sub>o</sub> max					
Output function, analogue			4 to 20 mA		0 to 10 V DC		4 to 20 mA	0 to 10 V DC
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 and CAD35: 250mS					
Power on delay (t <sub>i</sub> )			≤ 900 mS		≤ 500 mS		≤ 300 mS	
Repeatability			0.50%			0.20%		
Linear accuracy			1%	0.5%	1%		0.5%	
Resolution			1 mm					
Beam angle			CAD04: ±8°, CAD09: ±7°, CAD22: ±7° and CAD35: ±6°					
Temperature drift			≤ 0.1% / °C					
Temperature compensation			Yes					
Hysteresis			≥ 1 %			≥ 0.5 %		
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 -40 to +70 °C (-35 to +158 °C )					
Ambient humidity			35 to 85 % RH, storage: 35 to 85 % RH					
CE marking			According to EN 60947-5-2					
Approvals			cULus (UL508)					
Installation category			III (IEC60664/60664A; 60947-1)					
Pollution degree			3(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, PBT light grey; Front Epoxy-glass resin, Backpart Grilamide, Teach-in shaft POM					
Cable			PCV, grey, 2 m, 4 x 0.34 mm <sup>2</sup> , Ø=4.7 mm					
Connector			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					

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