

# UK1 and UKR1 series

## M18 Ultrasonic Sensor with Teach-In button

### Key Features

- Models with adjustable digital output
- Models with current or voltage analogue outputs
- Working area adjusting (single point teach, standard window, adjustable hysteresis) by Teach-in button
- Multifunction LED indicator: output state, echo presence, fw identification, teach block
- Plastic or metallic (AISI 316L) housing, M12 plug exit and PVC cable
- Sync / MUX function



### Options & Ordering Codes

<b>UK</b>		<b>1</b>	<b>A / G</b>	<b>1 - 0</b>	<b>E</b>	<b>IO</b>
<b>Body Style</b>						<b>IO-Link</b>
M18 Ultrasonic Sensor						<b>IO</b> IO-Link models
						<b>Connection Type</b>
						<b>A</b> Axial cable exit (2 m)
						<b>E</b> M12 plug cable exit
						<b>Housing Materials</b>
						<b>0</b> Plastic housing
						<b>1</b> AISI 316L (DIN 1.4404) stainless steel housing (axial)
						<b>2</b> 90° emission, plastic housing
						<b>Output</b>
						<b>1</b> 0...10 V single voltage analogue output
						<b>2</b> 4...20 mA single current analogue output
						<b>4</b> NPN - NO/NC digital output + 4...20 mA current analogue output
						<b>6</b> PNP - NO/NC digital output + 4...20 mA current analogue output
						<b>7</b> PNP - NO/NC digital output + 0...10 V voltage analogue output
						<b>9</b> NPN - NO/NC digital output + 0...10 V voltage analogue output
						<b>N</b> NPN - NO/NC single digital output
						<b>P</b> PNP - NO/NC single digital output
						<b>W</b> PNP - two digital outputs with adjustable firmware (standard window, coded window, adjustable hysteresis)
						<b>M</b> NPN - two digital outputs with adjustable firmware (standard window, coded window, adjustable hysteresis)

<b>Function</b>	
Direct diffuse models	
Background suppression	<b>R</b>

<b>Body Size</b>	
Standard housing	<b>1</b>

<b>Nominal Sensing Distance (mm)</b>	
50 - 400 mm (150 - 900 mm) Background Suppression	<b>A</b>
100 - 900 mm (150 - 800 mm) Background Suppression	<b>C</b>
150 - 1600 mm (250 - 1600 mm) Background Suppression	<b>D</b>
200 - 2200 mm (300 - 2200 mm) Background Suppression	<b>F</b>

<b>Sensitivity</b>	
Adjustment by Teach-In button	<b>G</b>

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## M18 Ultrasonic Sensor with Teach-In button

### Available Models Single Output

Housing	Output	Distance (mm)	Analogue Output 0...10 V	Analogue Output 4...20 mA	1 x PNP - NO/NC	1 x NPN - NO/NC
Plastic	M12 Connector	50...400	UK1A/G1-0E	UK1A/G2-0E	UK1A/GP-0E	UK1A/GN-0E
		100...900	UK1C/G1-0E	UK1C/G2-0E	UK1C/GP-0E	UK1C/GN-0E
		150...1600	UK1D/G1-0E	UK1D/G2-0E	UK1D/GP-0E	UK1D/GN-0E
		200...2200	UK1F/G1-0E	UK1F/G2-0E	UK1F/GP-0E	UK1F/GN-0E
Stainless Steel AISI 316L		50...400	UK1A/G1-1E	UK1A/G2-1E	UK1A/GP-1E	UK1A/GN-1E
		100...900	UK1C/G1-1E	UK1C/G2-1E	UK1C/GP-1E	UK1C/GN-1E
		150...1600	UK1D/G1-1E	UK1D/G2-1E	UK1D/GP-1E	UK1D/GN-1E
		200...2200	UK1F/G1-1E	UK1F/G2-1E	UK1F/GP-1E	UK1F/GN-1E
Plastic	Cable	50...400	UK1A/G1-0A	UK1A/G2-0A	UK1A/GP-0A	UK1A/GN-0A
		100...900	UK1C/G1-0A	UK1C/G2-0A	UK1C/GP-0A	UK1C/GN-0A
		150...1600	UK1D/G1-0A	UK1D/G2-0A	UK1D/GP-0A	UK1D/GN-0A
		200...2200	UK1F/G1-0A	UK1F/G2-0A	UK1F/GP-0A	UK1F/GN-0A
Stainless Steel AISI 316L		50...400	UK1A/G1-1A	UK1A/G2-1A	UK1A/GP-1A	UK1A/GN-1A
		100...900	UK1C/G1-1A	UK1C/G2-1A	UK1C/GP-1A	UK1C/GN-1A
		150...1600	UK1D/G1-1A	UK1D/G2-1A	UK1D/GP-1A	UK1D/GN-1A
		200...2200	UK1F/G1-1A	UK1F/G2-1A	UK1F/GP-1A	UK1F/GN-1A

### Available Models Double Digital Output

Housing	Output	Distance (mm)	2 x PNP - NO/NC	2 x NPN - NO/NC
Plastic	M12 Connector	50...400	UK1A/GW-0E	UK1A/GM-0E
		100...900	UK1C/GW-0E	UK1C/GM-0E
		150...1600	UK1D/GW-0E	UK1D/GM-0E
		200...2200	UK1F/GW-0E	UK1F/GM-0E
Stainless Steel AISI 316L		50...400	UK1A/GW-1E	UK1A/GM-1E
		100...900	UK1C/GW-1E	UK1C/GM-1E
		150...1600	UK1D/GW-1E	UK1D/GM-1E
		200...2200	UK1F/GW-1E	UK1F/GM-1E
Plastic	Cable	50...400	UK1A/GW-0A	UK1A/GM-0A
		100...900	UK1C/GW-0A	UK1C/GM-0A
		150...1600	UK1D/GW-0A	UK1D/GM-0A
		200...2200	UK1F/GW-0A	UK1F/GM-0A
Stainless Steel AISI 316L		50...400	UK1A/GW-1A	UK1A/GM-1A
		100...900	UK1C/GW-1A	UK1C/GM-1A
		150...1600	UK1D/GW-1A	UK1D/GM-1A
		200...2200	UK1F/GW-1A	UK1F/GM-1A

### Available Models Analogue & Digital Output




Housing	Output	Distance (mm)	1 x PNP - NO/NC + 1 x 4...20 mA	1 x NPN - NO/NC + 1 x 4...20 mA	1 x PNP - NO/NC + 1 x 0...10 V	1 x NPN - NO/NC + 1 x 0...10 V
Plastic	M12 Connector	50...400	UK1A/G6-0E	UK1A/G4-0E	UK1A/G7-0E	UK1A/G9-0E
		100...900	UK1C/G6-0E	UK1C/G4-0E	UK1C/G7-0E	UK1C/G9-0E
		150...1600	UK1D/G6-0E	UK1D/G4-0E	UK1D/G7-0E	UK1D/G9-0E
		200...2200	UK1F/G6-0E	UK1F/G4-0E	UK1F/G7-0E	UK1F/G9-0E
Stainless Steel AISI 316L		50...400	UK1A/G6-1E	UK1A/G4-1E	UK1A/G7-1E	UK1A/G9-1E
		100...900	UK1C/G6-1E	UK1C/G4-1E	UK1C/G7-1E	UK1C/G9-1E
		150...1600	UK1D/G6-1E	UK1D/G4-1E	UK1D/G7-1E	UK1D/G9-1E
		200...2200	UK1F/G6-1E	UK1F/G4-1E	UK1F/G7-1E	UK1F/G9-1E
Plastic	Cable	50...400	UK1A/G6-0A	UK1A/G4-0A	UK1A/G7-0A	UK1A/G9-0A
		100...900	UK1C/G6-0A	UK1C/G4-0A	UK1C/G7-0A	UK1C/G9-0A
		150...1600	UK1D/G6-0A	UK1D/G4-0A	UK1D/G7-0A	UK1D/G9-0A
		200...2200	UK1F/G6-0A	UK1F/G4-0A	UK1F/G7-0A	UK1F/G9-0A
Stainless Steel AISI 316L		50...400	UK1A/G6-1A	UK1A/G4-1A	UK1A/G7-1A	UK1A/G9-1A
		100...900	UK1C/G6-1A	UK1C/G4-1A	UK1C/G7-1A	UK1C/G9-1A
		150...1600	UK1D/G6-1A	UK1D/G4-1A	UK1D/G7-1A	UK1D/G9-1A
		200...2200	UK1F/G6-1A	UK1F/G4-1A	UK1F/G7-1A	UK1F/G9-1A

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## M18 Ultrasonic Sensor with Teach-In button



### Technical Specifications

	UK1A/G*..**	UK1C/G*..**	UK1D/G*..**	UK1F/G*..**
				
Maximum sensing distance	400 mm <sup>(1)</sup>	900 mm <sup>(2)</sup>	1600 mm <sup>(2)</sup>	2200 mm <sup>(2)</sup>
Minimum sensing distance	50 mm	100 mm	150 mm	200 mm
Sensing range (Sd)	50...400 mm	100...900 mm	150...1600 mm	200...2200 mm
Beam angle	10° ± 2°	10° ± 2°	15° ± 2°	14° ± 2°
Switching frequency (digital output)	10 Hz	4 Hz	3 Hz	2 Hz
Response time analogue output (10...90% final value)	500 ms			
Hysteresis	1%			
Repeatability	0.5%			
Resolution	± 1 mm	± 2 mm	± 3 mm	± 3 mm
Linearity error	1%			
Temperature range	-20°C...+70°C			
Temperature compensation	●			
Operating voltage	10 - 30 Vcc			
Temperature drift	± 2%			
Ripple	5%			
Leakage current	10 µA @ 30 Vcc			
Output voltage drop	2.2 V max. (IL = 100 mA)			
No-load supply current	≤ 50 mA			
Output current (digital output)	100 mA			
Minimum load resistance (analogue voltage output)	3 k Ω			
Set point adjustment	Teach-In button			
Power on delay	≤ 300 ms			
Short-circuit protection	●			
Induction protection	●			
Voltage reversal protection	●			
EMC	Conforming to EMC Directive, according to EN 60947-5-2			
Protection degree	IP67 (EN60529) <sup>(3)</sup>			
Housing material	PBT/Stainless Steel AISI 316L			
Active head material	Epoxy-Glass resin			
Tightening torque	1 Nm plastic housing / 50 Nm metallic housing			
Weight	Plastic version: 70 g connector - 110 g cable Metallic version: 100 g connector - 170 g cable			
Storage temperature	-35°C...+70°C without freezing			
LEDs	Green: echo - yellow: output			

(1) Metallic target 100 x 100 mm (2) Metallic target 200 x 200 (3) Protection guarantee only with plug cable well mounted

# UK1 and UKR1 series

## M18 Ultrasonic Sensor with Teach-In button



### Available Models

#### 90° Emission Models

Housing	Material	Output	Distance (mm)	1 x PNP - NO/NC + 1x4...20 mA	1 x NPN - NO/NC + 1x4...20 mA	1 x PNP - NO/NC + 1x0...10 V	1 x NPN - NO/NC + 1 x 0...10 V	2 x PNP	2 x NPN
M18	Plastic	M12	50...400	UK1A/G6-2E	UK1A/G4-2E	UK1A/G7-2E	UK1A/G9-2E	UK1A/GW-2E	UK1A/GM-2E
			100...900	UK1C/G6-2E	UK1C/G4-2E	UK1C/G7-2E	UK1C/G9-2E	UK1C/GW-2E	UK1C/GM-2E
			150...1600	UK1D/G6-2E	UK1D/G4-2E	UK1D/G7-2E	UK1D/G9-2E	UK1D/GW-2E	UK1D/GM-2E
			200...2200	UK1F/G6-2E	UK1F/G4-2E	UK1F/G7-2E	UK1F/G9-2E	UK1F/GW-2E	UK1F/GM-2E

### Technical Specifications

#### 90° Emission Models

	UK1A/G*-2E	UK1C/G*-2E	UK1D/G*-2E	UK1F/G*-2E
				
Nominal sensing distance	400 mm <sup>(1)</sup>	900 mm <sup>(2)</sup>	1600 mm <sup>(2)</sup>	2200 mm <sup>(2)</sup>
Minimum sensing distance	50 mm	100 mm	150 mm	200 mm
Sensing range (Sd)	50...400 mm	100...400 mm	150...1600 mm	200...2200 mm
Beam angle	10° ± 2°	10° ± 2°	15° ± 2°	14° ± 2°
Hysteresis	1%			
Repeatability	0.5%			
Resolution	± 1 mm	± 2 mm	± 3 mm	± 3 mm
Linearity error	1%			
Switching frequency	10 Hz	4 Hz	3 Hz	2 Hz
Response time analogue output (10...90% final value)	500 ms			
Operating voltage	10...30 Vdc			
Max. ripple content	5%			
Output current	100 mA (digital output)			
Minimum load resistance (analogue voltage output)	3 k Ω			
Set point adjustment	Teach-In button			
Output voltage drop	≤ 2.2 V (@ I = 100 mA)			
No-load supply current	≤ 50 mA			
Leakage current	≤ 10 μA @ 30V			
Power on delay	≤ 300 ms			
Ambient temperature range	-20°C...+70°C			
Temperature drift of Sr	± 2%			
Short-circuit protection	● (autoreset)			
Induction protection	●			
Voltage reversal protection	●			
EMC	Conforming to EMC Directive, according to EN 60947-5-2			
Weight	75 g			
LEDs	Green: echo - yellow: output			
Protection degree	IP67 (EN 60529) <sup>(3)</sup>			
Housing material	Plastic housing: PBT			
Active head material	Epoxy glass resin			
Connection	M12 plug cable exit			
Storage temperature	-35°C...+70°C without freezing			
Tightening torque	1 Nm			

(1) Metallic target 100 x 100 mm (2) Metallic target 200 x 200 (3) Protection guarantee only with plug cable well mounted

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### Available Models

#### Background Suppression Models

Housing	Material	Output	Distance (mm)	PNP - NO/NC	NPN - NO/NC
M18	Plastic	M12 Connector	100...400	UKR1A/GW-0E	UKR1A/GM-0E
			150...900	UKR1C/GW-0E	UKR1C/GM-0E
			250...1600	UKR1D/GW-0E	UKR1D/GM-0E
			300...2200	UKR1F/GW-0E	UKR1F/GM-0E
	Stainless Steel AISI 316L		100...400	UKR1A/GW-1E	UKR1A/GM-1E
			150...900	UKR1C/GW-1E	UKR1C/GM-1E
			250...1600	UKR1D/GW-1E	UKR1D/GM-1E
			300...2200	UKR1F/GW-1E	UKR1F/GM-1E

### Technical Specifications

#### Retroreflective Models

	UKR1A/G*-*	UKR1C/G*-*	UKR1D/G*-*	UKR1F/G*-*
				
Nominal sensing distance	400 mm	900 mm	1600 mm	2200 mm
Minimum sensing distance	100 mm	150 mm	250 mm	300 mm
Beam angle	10° ± 2°	10° ± 2°	15° ± 2°	14° ± 2°
Switching frequency	10 Hz	4 Hz	3 Hz	2 Hz
Operating voltage	10...30 Vdc			
Max. ripple content	5%			
Output type	PNP or NPN			
Output current	100 mA (digital output)			
Output voltage drop	≤ 2.2 V (@ I = 100 mA)			
No-load supply current	≤ 50 mA			
Leakage current	≤ 10 μA @ 30V			
Power on delay	≤ 300 ms			
Ambient temperature range	-20°C... +70°C			
Temperature drift of Sr	± 2%			
Short-circuit protection	● (autoreset)			
Induction protection	●			
Voltage reversal protection	●			
LEDs	Green: echo - yellow: output			
Protection degree	IP67 (EN 60529) <sup>(3)</sup>			
EMC	Conforming to EMC Directive, according to EN 60947-5-2			
Housing material	Plastic housing: PBT			
Active head material	Epoxy glass resin			
Connection	M12 plug cable exit			
Weight	Plastic version: 70 g - Metallic version: 100 gr			
Storage temperature	-35°C... +70°C without freezing			
Set point adjustment	Teach-In Button			
Tightening torque	1 Nm Plastic housing / 50 Nm Metallic housing			

### Adjustment

**Reflector detection (Sd)** Install the sensor in the correct position. Install or use existing background (any solid, flat, fixed surface) perpendicularly to the sensor's axes. Press the Teach-In button. Yellow LED blink for 5 times, after that, the sensor acquires the background position (Sd distance).

**Operating distance (Sr)** The effective operating distance (Sr) is equivalent to background distance (Sd) decreases of 10%. This hysteresis allows the correct detection of the target even if the background is vibrating during the machine normal operations.

# UK1 and UKR1 series

## M18 Ultrasonic Sensor with Teach-In button

### Available Models

#### IO-Link

Housing	Output	Output	Distance (mm)	Model
Stainless Steel AISI 316L	M12 Connector	IO-Link or push-pull	50...400	UK1A/GW-1EIO
			200...2200	UK1F/GW-1EIO

### Technical Specifications

#### IO-Link Models

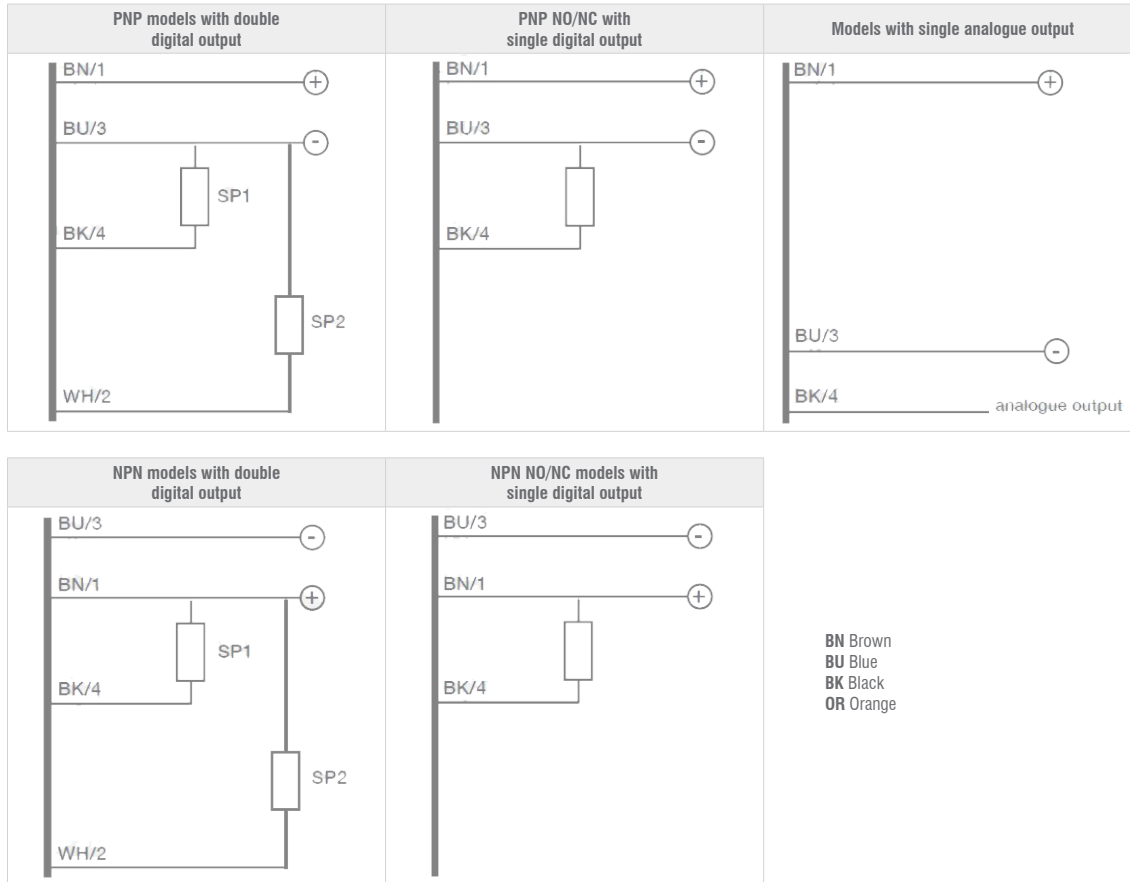
	UK1A/GP-1EIO	UK1F/GP-1EIO
		
Nominal sensing distance (Sn)	50 - 400 mm <sup>(1)</sup>	200 - 2200 mm <sup>(2)</sup>
Minimum sensing distance (Sd)	50 - 400 mm <sup>(1)</sup>	200 - 2200 mm <sup>(2)</sup>
Background min distance in BGS mode	100 mm	300 mm
Sensitivity adjustment	Teach-In button	
Beam angle	10° ± 2°	14° ± 2°
Repeatability	0.5%	
Resolution	1 mm	
Operating voltage	10 - 30 Vdc	
Ripple	5%	
No-load current	≤50 mA	
Transducer frequency	300 kHz	200 kHz
Power on delay (digital output)	≤500 ms	
Power supply protections	Polarity reversal, transient	
Digital output electrical protections	Short circuit (autoreset), over voltage pulses	
Max. current analogical voltage output	40 mA	
LEDs	Green: echo - yellow: output	
Temperature range	-20°C... +70°C	
Temperature compensation	●	
Temperature drift (Digital output)	± 2%	
Housing material	AISI316L	
Active head material	Epoxy - Glass resin	
Protection degree	IP67 (EN 60529) <sup>(3)</sup>	

(1) Metallic target 100 x 100 mm (2) Metallic target 200 x 200 (3) Protection guarantee only with plug cable well mounted

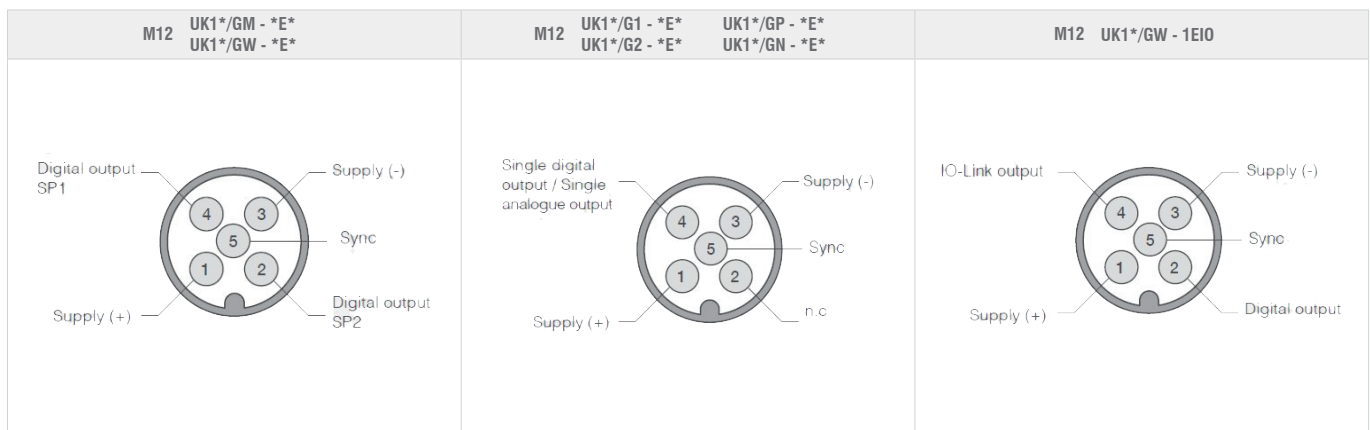
# UK1 and UKR1 series

## M18 Ultrasonic Sensor with Teach-In button

### Connection Drawings



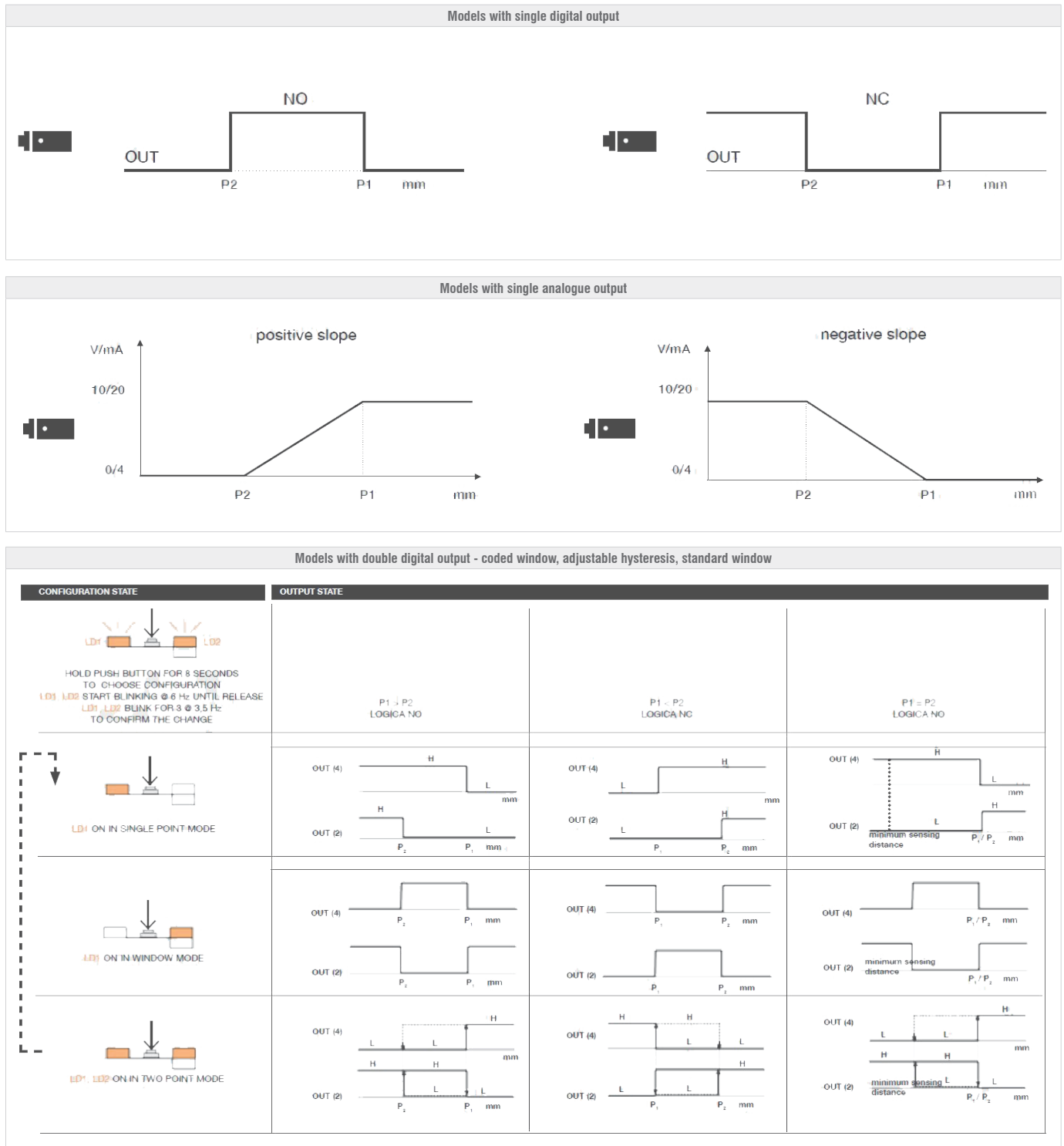
### M12 Plug



# UK1 and UKR1 series

## M18 Ultrasonic Sensor with Teach-In button

### Available Outputs



P1 Maximum selected working distance and first point to select

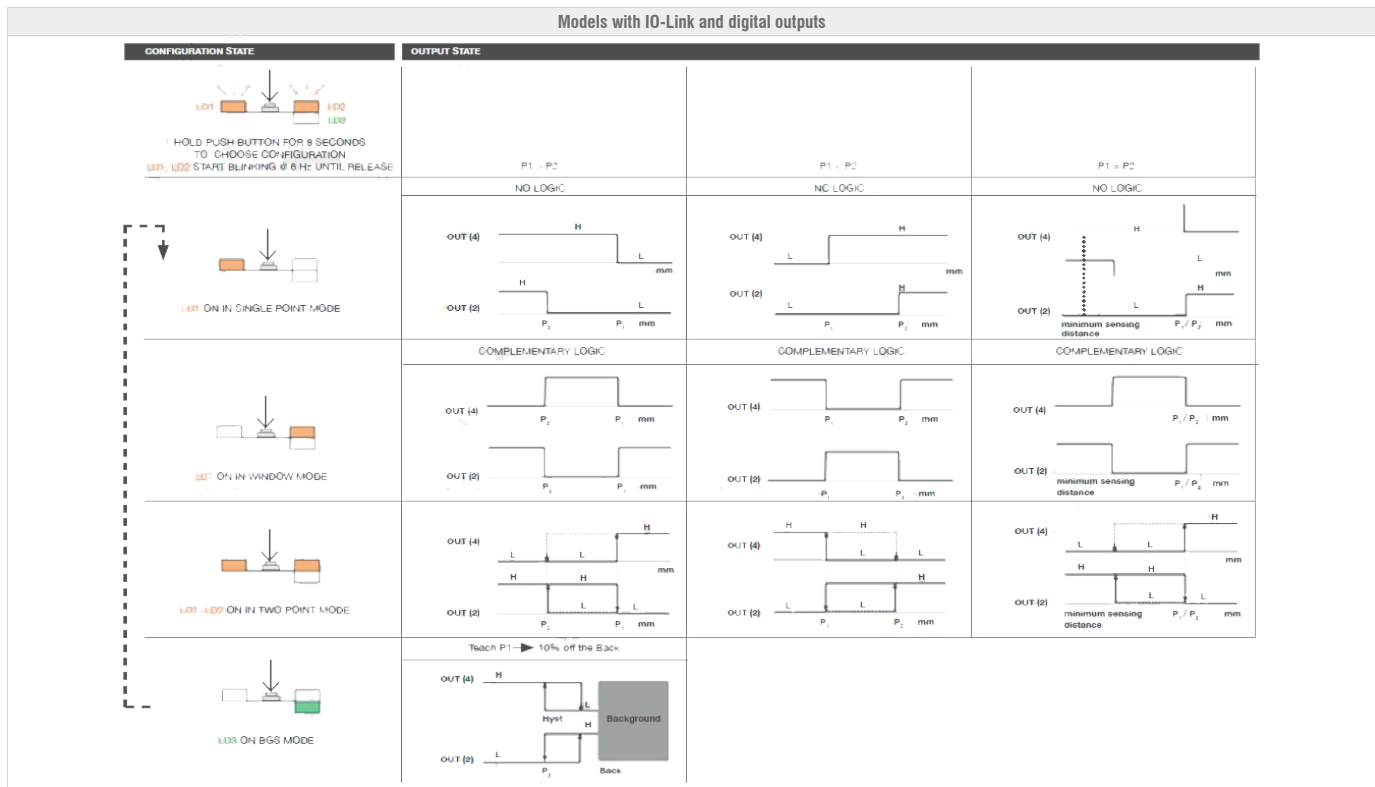
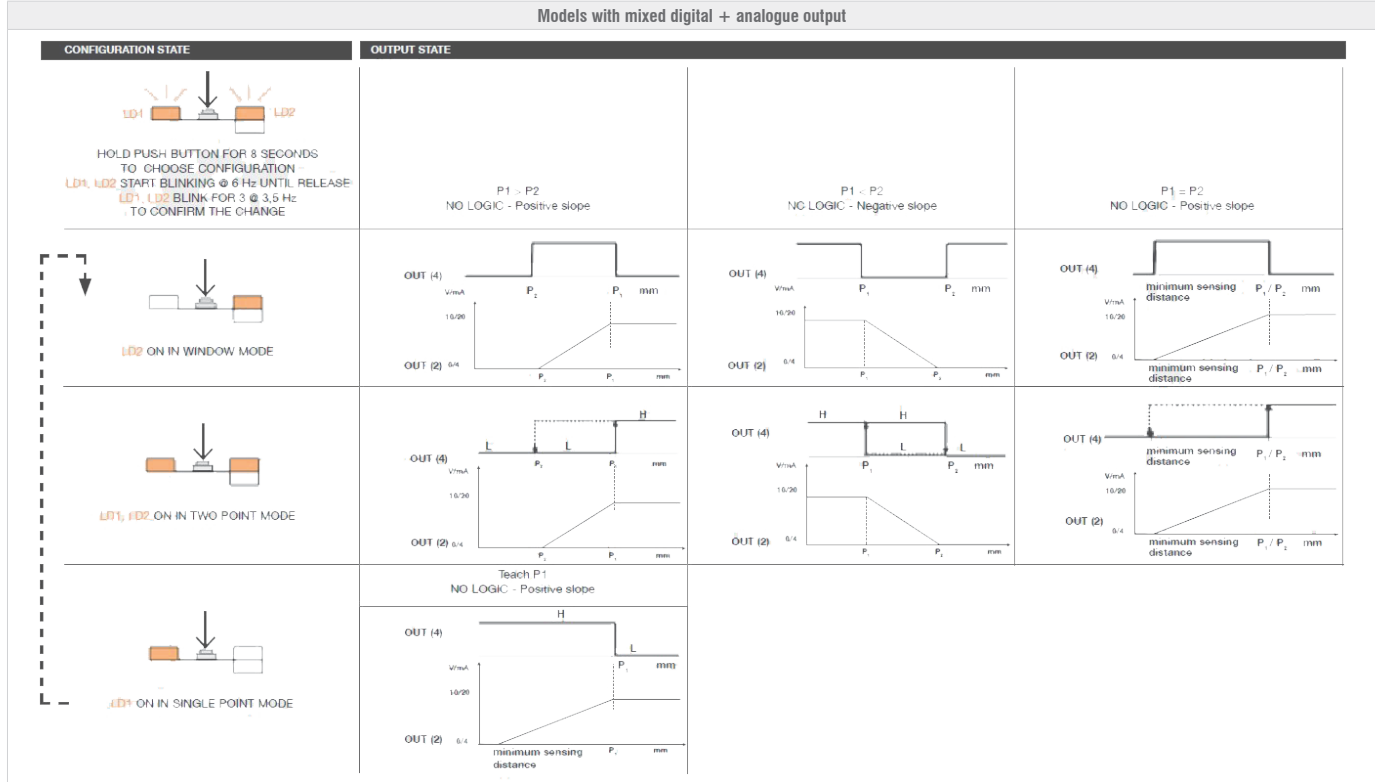
P2 Minimum selected working distance and second point to select



# UK1 and UKR1 series

## M18 Ultrasonic Sensor with Teach-In button

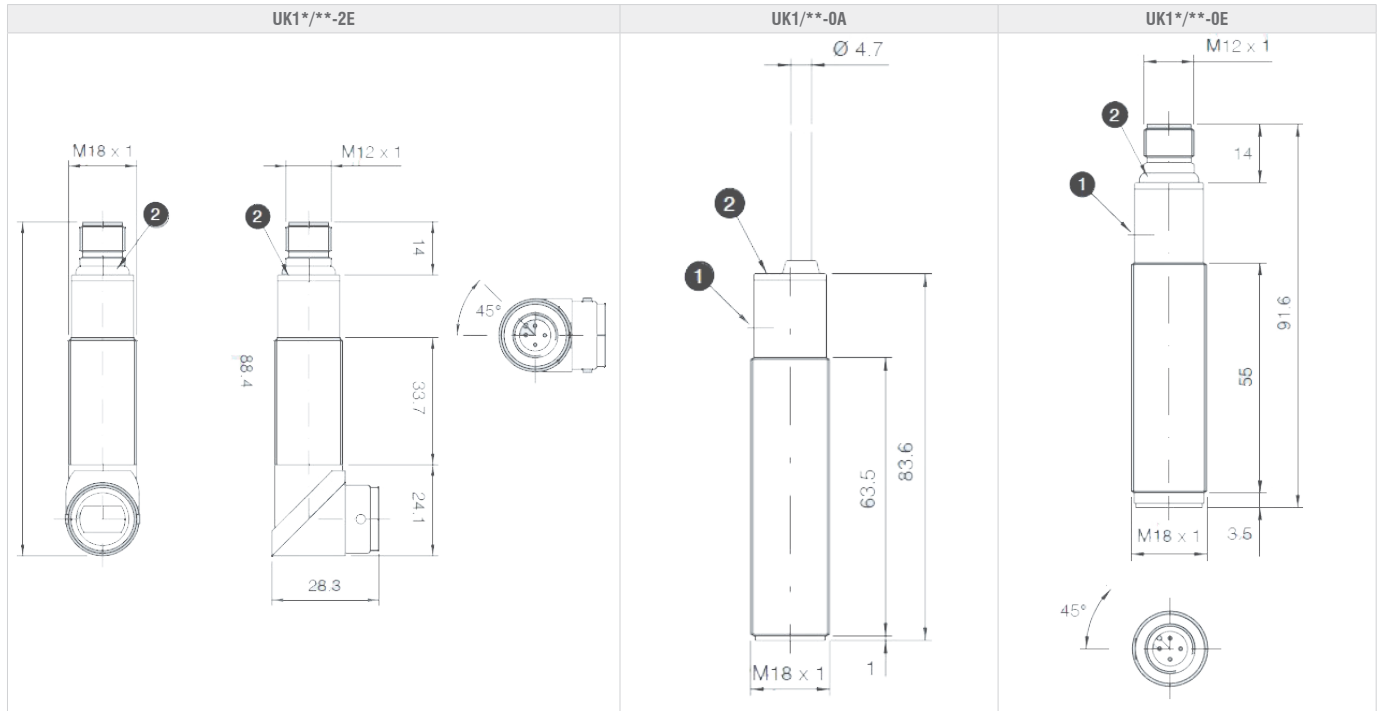
### Available Outputs



# UK1 and UKR1 series

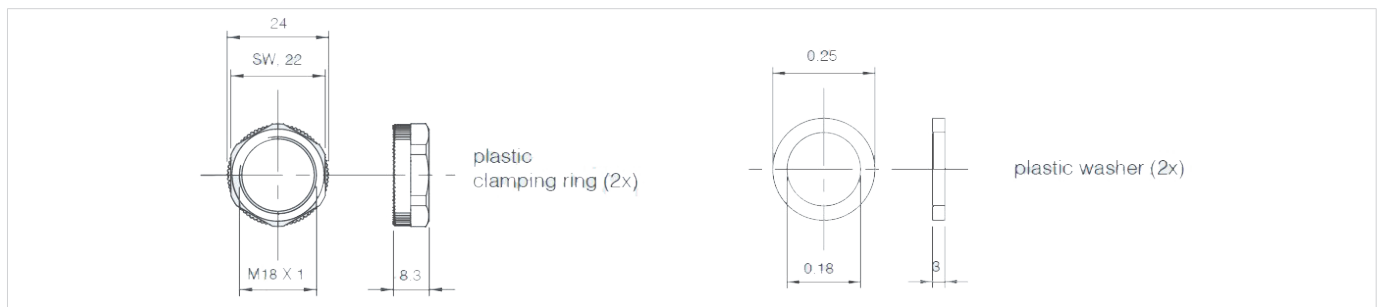
## M18 Ultrasonic Sensor with Teach-In button

### Dimensions (mm) Plastic Models



1 Teach-In button  
2 LED

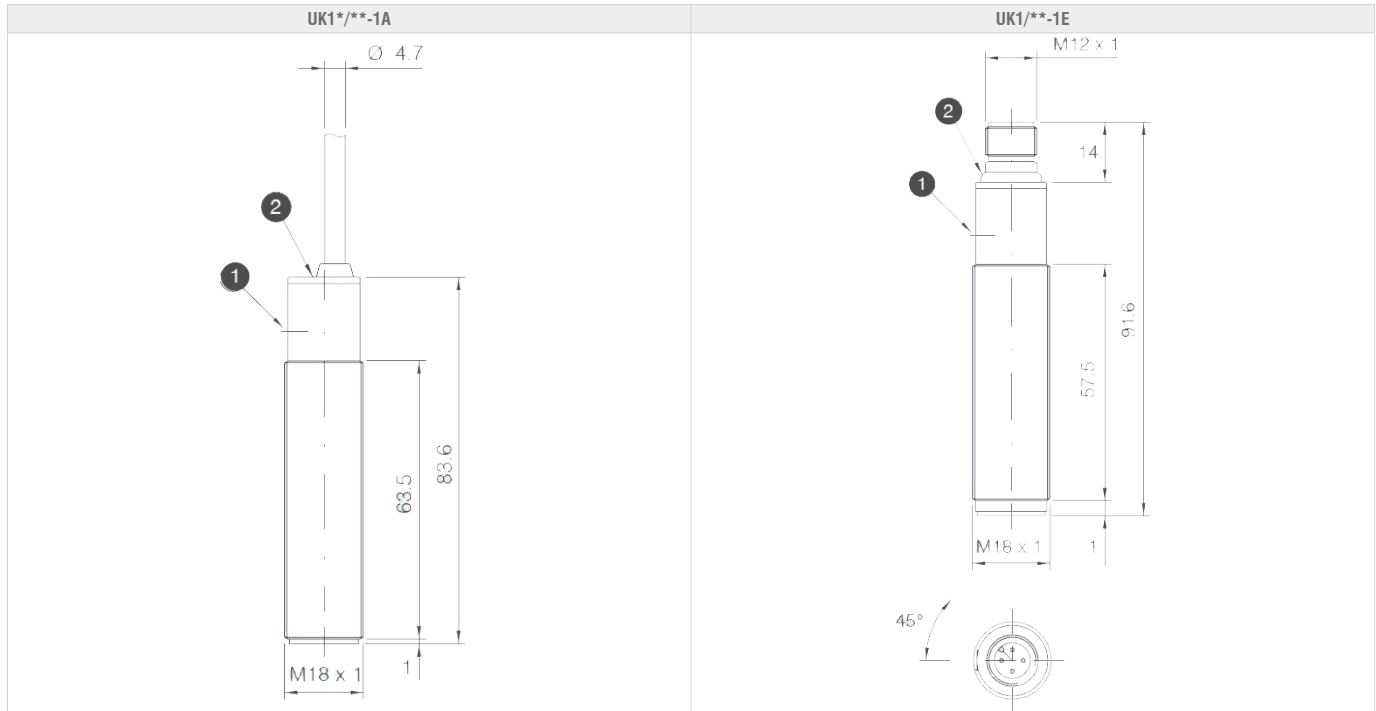
### Dimensions (mm) Accessories included in all plastic models



# UK1 and UKR1 series

## M18 Ultrasonic Sensor with Teach-In button

### Dimensions (mm) Metallic Models



1 Teach-In button  
2 LED

### Dimensions (mm) Accessories included in all Metallic models

