UK1 M18 CYLINDRICAL ULTRASONIC SENSOR

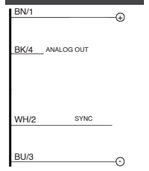
Installation manual - CAT8EUK1995701 - ENG - Created: 13/06/2019

SUPPLIED MATERIAL

- Installation manual
- 2 plastic nuts SW22, h 8,3 mm (plastic version)
- 2 flexible washers (only plastic version)
- 2 metallic nuts SW24, h 4 mm (metallic version)

ELECTRICAL DIAGRAMS OF THE CONNECTIONS

analog output

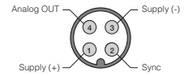


In case of combined load, resistive and capacitive, the maximum admissible capacity (C) is 0,1 µF for maximum output voltage and current.

KEY: BN = brown; BK = black; BU = blue; WH = white; GY = grey

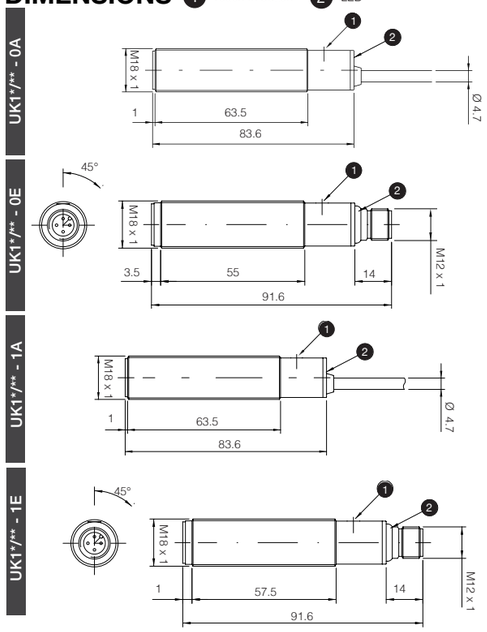
PLUGS

M12



DIMENSIONS

1 Teach-In button 2 LED



TECHNICAL SPECIFICATIONS

	UK1A	UK1C	UK1D	UK1F
maximum sensing distance	400 mm (1)	900 mm (2)	1,600 mm (2)	2,200 mm (2)
minimum sensing distance	50 mm	80 mm	150 mm	200 mm
sensing range (Sd)	50...400 mm	80...900 mm	150...1,600 mm	200...2,200 mm
beam angle	10° ± 2°	10° ± 2°	7° ± 2°	8° ± 2°
switching frequency (digital output)	10 Hz	3 Hz	2 Hz	2 Hz
response time analogue output (10...90% final value)	500 ms			
hysteresis	1%			
repeatibility	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 (analog voltage output)	3 k Ω			
set point adjustment	Teach-In button			
power on delay	≤ 300 ms			
short-circuit protection	● (autoreset)			
induction protection	●			
voltage reversal protection	●			
EMC	conforming to EMC Directive, according to EN 60947-5-2			
protection degree	IP67 (EN60529) (3)			
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: 30 g connector - 100 g cable metallic version: 55 g connector			
storage temperature	- 30°C...+ 80°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

INSTALLATION CONDITION

The installation of the sensor has to be done using nuts and flexible washers supplied with ultrasonic sensor (see Supplied Material) (standard condition). In the case of non-standard installation conditions, as for example, sensor fixed directly into metal block through threaded or not- threaded hole or using metallic nuts, both metallic block and nuts have to be connected to ground. Moreover, both nut and metallic block have to be minimum 5 mm from the edge of the active face and it is necessary that the first 5 mm of threaded housing are not screwed.

STATES PRESERVATION

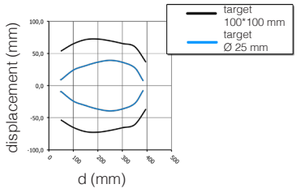
The sensor preserves the last adjustment made, therefore removing the voltage supply and restoring it, the sensor works in according to last value of P1 and P2 point.

ATTENTION

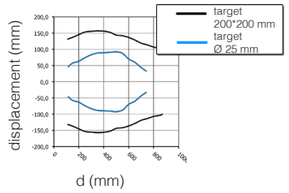
Make sure that the supply voltage is correctly set with a ripple corresponding to the values indicated on the catalogue. In case the noise produced by the power lines exceeds the values foreseen by the EMC directive (interference immunity), separate the sensor cables from both the power and high tension lines and insert it in a grounding metal raceway. Moreover it is advisable to connect the sensor directly to the supply source and not to other devices. To extend the supply and output cables, it is necessary to use a cable having conductors with a minimum size of 1 mm². The maximum length of extension is 100 m (this value is referred to a minimum tension and power supply at the load of 100 mA). In industrial environments, we recommend to use shielded cables in order to prevent possible disturbances on the devices caused by electromagnetic fields induced. Do not expose sensor head to hot water > 50 °C, water steam, acids or solvents. Clean the active face of the sensor with a wet cloth and then dry it. If the sensor is measuring across a temperature gradient, the compensation will be less efective. The temperature warm up drift upon power-up influence the measurement of the sensing distance. After 20 minutes, the sensing distance will be stable.

CHARACTERISTIC CURVES

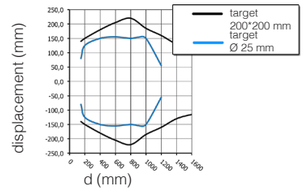
UK1A



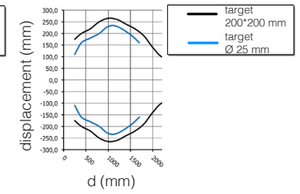
UK1C

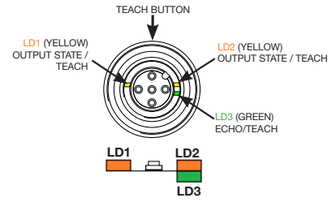


UK1D



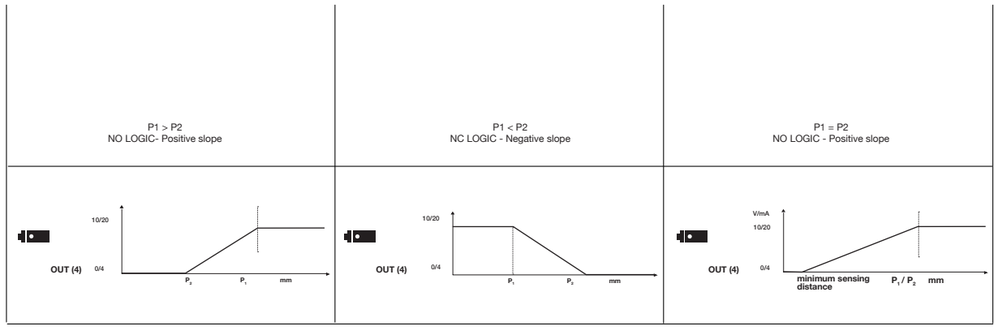
UK1F





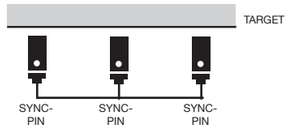
SINGLE ANALOG OUTPUT MODELS

OUTPUT STATE

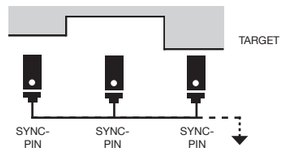


SYNCHRONIZATION /MULTIPLEXING

Synchronization
In this condition all the sensors are linked together and they work and measure at the same time. To enable this functionality, the sync-pin of all the sensors have to be connected together and then the system has to be power-on. The target has to be flat and at the same distance from all the sensors; this condition is mandatory to let the sensors work properly.



Multiplexing
In this condition the sensors work in a chain. To enable this functionality, the sync-pin of all the sensors have to be connected together, connected to the GND line, then the system has to be power-on and the connection with the GND line has to be released.
This situation enable the user to use target even not flat and with different distances from sensor to sensor.



CONNECT TO GND, THEN POWER-ON, HOLDING FOR 5 SECONDS AND RELEASE

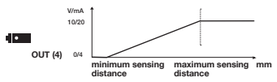
The sensors must be individually adjusted before the Sync/Mux connections.

RESTORE PROCEDURES

Restore of SP1 and SP2 to default values. Press the teach button without the target on P1. The yellow LD1 and LD2 blink 5 times @3.5Hz to show the success of this procedure. This restore involve only MAX_SP1 and MIN_SP2; logic (NO/NC) and functioning mode are not affected (Exception: performing this restore type in Single Point Mode, the logic will be always NO).

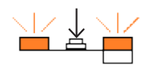
Full Restore of the Factory Calibration Data. Press the teach button without the target on P2 after the proper acquisition of P1. The green LD3 blink 5 times @3.5Hz to show the success of this procedure. This restore re-set MAX_SP1 and MIN_SP2, logic (NO) and the functioning mode is set to windows.

NO LOGIC - Positive slope



To ensure the proper sync/mux functionalities, every time the user perform a Full Restore it is advisable to power-off and power-on all the sensors working together in sync/mux modality.

TEACH BLOCK



PRESS FOR ▷ 8 SECONDS
LD1-LD2 ON BLINKING ALTERNATING @ 10 Hz
TO ENABLE/DISABLE THE TEACH BUTTON
LD1, LD2 BLINK x 3 @ 3,5 Hz TO CONFIRM

ERROR CONDITIONS

Teaching under the limit or over the limit of the sensing range is not allowed.
In this condition, no lamping will be shown, means error occurred.

Micro Detectors
Italian Sensors Technology

CE cULus

WARNING These products are NOT safety sensors and are NOT suitable for use in personnel safety application

Declaration of conformity
M.D. Micro Detectors S.p.A. con Unico Socio declare under our sole responsibility that these products are in conformity with the following EMC directive.

Micro Detectors
Italian Sensors Technology
a company of
FINMASI GROUP

M.D. Micro Detectors S.p.A. con Unico Socio
Strada S. Caterina, 235 - 41122 Modena Italy
Tel. +39 059 420411 Fax +39 059 253973
www.microdetectors.com
info@microdetectors.com