

HRTU 412

Ultrasonic scanners with background suppression

Dimensioned drawing

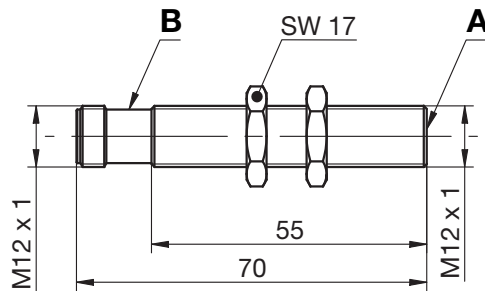
en 02-2010/11 50113349



10 ... 200 mm
40 ... 400 mm

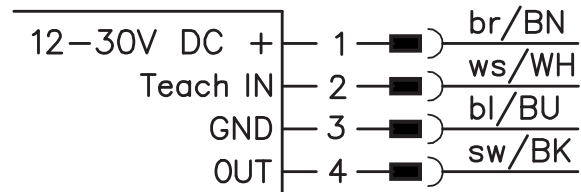


- Small ultrasonic scanner in M12 round housing in protection class IP 67
- Various opening angles and sound cone geometries
- Switching behavior largely independent of surface properties
- Precise switching point adjustment through teach-in via a cable



- A Active surface
- B Green indicator diode

Electrical connection

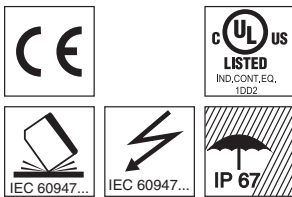


Accessories:

(available separately)

- M12 connectors (KD ...)
- Ready-made cables (K-D ...)

We reserve the right to make changes • DS_HRTU412_en.fm



Specifications

Ultrasonic data

Scanning range
Adjustment range of the switching point
Opening angle
Sound frequency
Repeatability
Temperature drift
Hysteresis

HRTU 412/...-S...

10 ... 200mm
30 ... 200mm
narrow
380kHz
≤ 0.5mm (relative to the switching point)
≤ 0.18%/K (relative to the switching point)
typ. 4% (relative to the switching point)

HRTU 412/...

40 ... 400mm
60 ... 400mm
standard
290kHz

Timing

Switching frequency
Response time
Decay time
Delay before start-up

50Hz
≤ 10ms
≤ 10ms
≤ 200ms

20Hz
≤ 25ms
≤ 25ms

Electrical data

Operating voltage U_B ¹⁾
Residual ripple
Bias current
Switching output/function .../4NO...
.../4NC...
.../2NO...
.../2NC...

12 ... 30VDC incl. taking into account the residual ripple
≤ 10% of U_B
≤ 35mA
pin 4: PNP transistor, make-contact (NO)
pin 4: PNP transistor, break-contact (NC)
pin 4: NPN transistor, make-contact (NO)
pin 4: NPN transistor, break-contact (NC)
≤ 200mA
 $C_{max} = 10nF, L_{max} = 20\mu H$
pin 2: active high
≥ $(U_B - 2V) / \leq 2V$

Output current
Load
Teach input
Signal voltage high/low

Indicators

Green LED
Green LED slowly flashing
Green LED quickly flashing

switching state (on = object detected)
teach event active
teaching error

Mechanical data

Housing
Active surface
Standard measurement object ²⁾
Attachment
Weight
Connection type

brass nickel-plated
plastic (PC)
15 x 15mm
30 x 30mm
in through hole or thread M12 x 1
approx. 10g
M12 connector, 4-pin

Environmental data

Ambient temp. (operation/storage)
Protective circuit ³⁾
VDE safety class
Protection class
Standards applied
Certifications

-10°C ... +60°C / -40°C ... +85°C
1, 2, 3
III
IP 67
IEC/EN 60947-5-2
UL 508

- 1) Observe the safety regulations and installation instructions regarding power supply and wiring; for UL applications: only for use in "Class 2" circuits acc. to NEC
- 2) Aligned perpendicular to sensor reference axis
- 3) 1=polarity reversal protection, 2=short circuit protection, 3=overload protection for all outputs

Remarks

● **Approved purpose:**

This product may only be used by qualified personnel and must only be used for the approved purpose. This sensor is not a safety sensor and is not to be used for the protection of persons.

Tables

1	10	200	
2	40		400

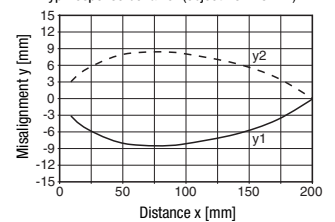
1	HRTU 412/...-S...
2	HRTU 412/...

Scanning range [mm]

Diagrams

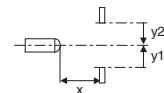
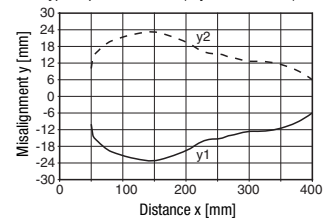
HRTU 412/...-S...

Typ. response behavior (object 15 x 15mm)



HRTU 412/...

Typ. response behavior (object 30 x 30mm)



HRTU 412

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Type key

H	R	T	U	/	4	1	2	/	4	N	0	.	2	-	S	-	S	1	2
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Operating principle / construction

HRTU Ultrasonic scanner (proximity switch) with background suppression

Series

412 Cylindrical sensor design with thread M12x1

Output function

4NO PNP transistor, make-contact (NO)

4NC PNP transistor, break-contact (NC)

2NO NPN transistor, make-contact (NO)

2NC NPN transistor, break-contact (NC)

Equipment

.2 Teach input

Sound cone geometry

N/A Sound cone with standard opening angle

-S Sound cone with narrow opening angle

Electrical connection

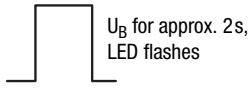
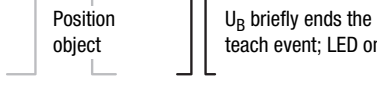
S12 M12 connector, 4-pin, axial

Order guide

The sensors listed here are preferred types; current information at www.leuze.com.

Opening angle of the ultrasonic cone	Designation	Part No.
Narrow	HRTU 412/4NO.2-S-S12	50113993
	HRTU 412/4NC.2-S-S12	50113995
	HRTU 412/2NO.2-S-S12	50113997
	HRTU 412/2NC.2-S-S12	50113999
Standard	HRTU 412/4NO.2-S12	50113994
	HRTU 412/4NC.2-S12	50113996
	HRTU 412/2NO.2-S12	50113998
	HRTU 412/2NC.2-S12	50114000


Switching point adjustment via teach-in

Teach-in input PIN 2	
① Activate teach-in	 <p>U_B for approx. 2s, LED flashes</p>
② Place the object at the desired switching position and conclude the teach event	 <p>Position object U_B briefly ends the teach event; LED on</p> <p>The teach event ends after 2s, the sensor detects the object at this position and the LED is on. If the object is removed, the LED must be switched off.</p>

Teaching error

If the object is located outside of the scanning range during the teach event, a teaching error occurs. The LED flashes quickly and the switching output is reset to the factory setting (switching point at the max. scanning range).

Resetting the sensor to factory setting

Teach-in input PIN 2	
Restoring the factory setting	 <p>U_B for at least 6s, LED flashes quickly</p>

Locking the teach input

The sensor automatically locks the teach input after either 5 min. after power-on or 5 min. after the last teach event is ended. A new teach event is only possible after disconnecting the sensor from voltage.



If the **Teach-IN** input is not used, it must be connected to GND!