

**HRTU 412**

**Ultrasonic scanners with background suppression**

**Dimensioned drawing**

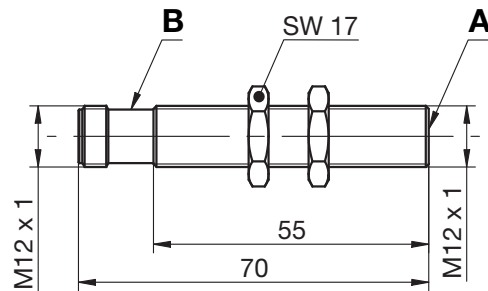
en 02-2010/11 50113349



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

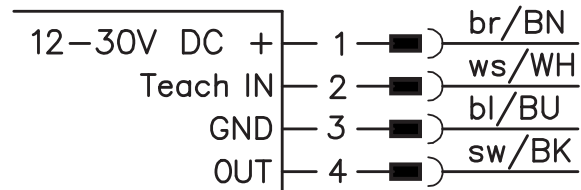


- Small ultrasonic scanner in M12 round housing in protection class IP 67
- Various opening angles and sound cone geometries
- Switching behavior largely independent of surface properties
- Precise switching point adjustment through teach-in via a cable



- 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  $U_B$  <sup>1)</sup>  
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 <sup>2)</sup>  
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 <sup>3)</sup>  
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

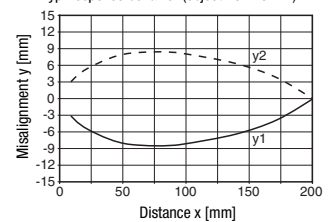
1	HRTU 412/...-S...
2	HRTU 412/...

Scanning range [mm]

**Diagrams**

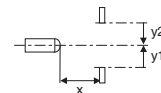
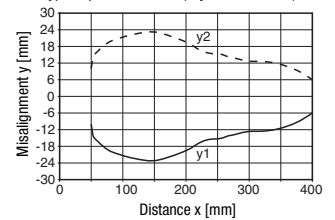
**HRTU 412/...-S...**

Typ. response behavior (object 15 x 15mm)



**HRTU 412/...**

Typ. response behavior (object 30 x 30mm)



## HRTU 412

## Ultrasonic scanners with background suppression

### Type key

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

#### 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

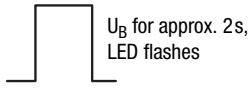
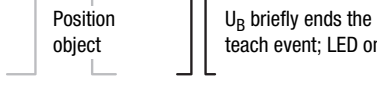
**S12** M12 connector, 4-pin, axial

### Order guide

The sensors listed here are preferred types; current information at [www.leuze.com](http://www.leuze.com).

Opening angle of the ultrasonic cone	Designation	Part No.
<b>Narrow</b>	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
<b>Standard</b>	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><math>U_B</math> for approx. 2s, LED flashes</p>
② Place the object at the desired switching position and conclude the teach event	 <p>Position object      <math>U_B</math> 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><math>U_B</math> 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!