

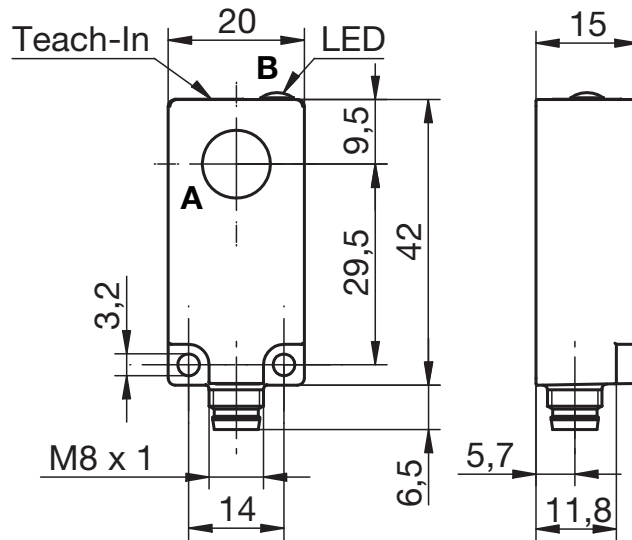
**HRTU 420**

**Ultrasonic scanners with background suppression**

en 02-2010/09 50112875

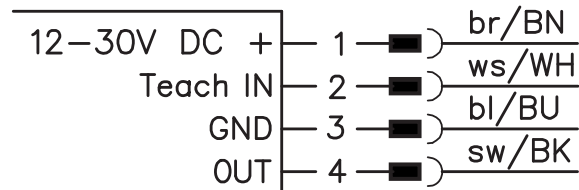


**Dimensioned drawing**

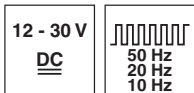


- A** Active surface
- B** Green indicator diode

**Electrical connection**

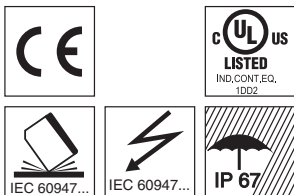


**10 ... 200mm**  
**40 ... 400mm**  
**100 ... 1000mm**



- Small ultrasonic scanner in plastic housing with protection class IP67
- Various opening angles and sound cone geometries
- Switching behavior largely independent of surface properties
- Precise switching point adjustment through teach-in on the device and via a cable
- Protection against erroneous operation by automatically locking teach button

We reserve the right to make changes • DS\_HRTU420\_en.fm



**Accessories:**

(available separately)

- M8 connectors (D M8...)
- Ready-made cables (K-D ...)

## Specifications

Ultrasonic data	HRTU 420/...-S...	HRTU 420/...	HRTU 420/...-L...
Scanning range	10 ... 200mm	40 ... 400mm	100 ... 1000mm
Adjustment range of the switching point	30 ... 200mm	60 ... 400mm	100 ... 1000mm
Opening angle	narrow	standard	wide
Sound frequency	380kHz	290kHz	240kHz
Repeatability	≤ 0.5mm (relative to the switching point)		
Temperature drift	≤ 0.18%/K (relative to the switching point)		
Hysteresis	typ. 4% (relative to the switching point)		
<b>Timing</b>			
Switching frequency	50Hz	20Hz	10Hz
Response time	≤ 10ms	≤ 25ms	≤ 50ms
Decay time	≤ 10ms	≤ 25ms	≤ 50ms
Delay before start-up	≤ 200ms		

Electrical data	
Operating voltage $U_B$ <sup>1)</sup>	12 ... 30VDC incl. taking into account the residual ripple
Residual ripple	≤ 10% of $U_B$
Bias current	≤ 35mA
Switching output/function	.../4NO... pin 4: PNP transistor, make-contact (NO) .../4NC... pin 4: PNP transistor, break-contact (NC) .../2NO... pin 4: NPN transistor, make-contact (NO) .../2NC... pin 4: NPN transistor, break-contact (NC)
Output current	≤ 200mA
Load	$C_{max} = 10nF, L_{max} = 20\mu H$
Teach input	Pin 2: active high
Signal voltage high/low	≥ ( $U_B - 2V$ ) / ≤ 2V

Indicators	
Green LED	switching state (on = object detected)
Green LED slowly flashing	teach event active
Green LED quickly flashing	teaching error

Mechanical data			
Housing	plastic (PE), color: red (RAL 3000)		
Active surface	plastic (PC)		
Standard measurement object <sup>2)</sup>	15 x 15mm	30 x 30mm	30 x 30mm
Attachment	through holes for 2 x M3		
Weight	approx. 10g		
Connection type	M8 connector, 4-pin		

Environmental data	
Ambient temp. (operation/storage)	-10°C ... +60°C / -40°C ... +85°C
Protective circuit <sup>3)</sup>	1, 2, 3
VDE safety class	III
Protection class	IP 67
Standards applied	IEC/EN 60947-5-2
Certifications	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	100	1000
2	40	400
3	10	200

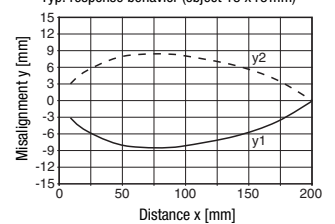
1	HRTU 420/...-L...
2	HRTU 420/...
3	HRTU 420/...-S...

Scanning range [mm]

## Diagrams

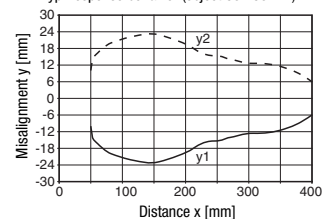
### HRTU 420/...-S...

Typ. response behavior (object 15 x 15mm)



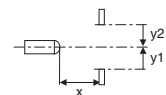
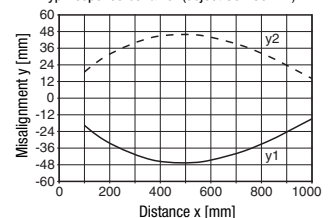
### HRTU 420/...

Typ. response behavior (object 30 x 30mm)



### HRTU 420/...-L...

Typ. response behavior (object 30 x 30mm)



## HRTU 420

## Ultrasonic scanners with background suppression

### Type key

H	R	T	U	/	4	2	0	/	4	N	0	.	2	-	S	-	S	8
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#### Operating principle / construction

**HRTU** Ultrasonic scanner (proximity switch) with background suppression

#### Series

**420** Small cubic construction with housing width of 20mm

#### 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

**-L** Sound cone with wide opening angle

#### Electrical connection

**S8** M8 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 420/4NO.2-S-S8	50113992
	HRTU 420/4NC.2-S-S8	50113989
	HRTU 420/2NO.2-S-S8	50113986
	HRTU 420/2NC.2-S-S8	50113983
<b>Standard</b>	HRTU 420/4NO.2-S8	50113991
	HRTU 420/4NC.2-S8	50113988
	HRTU 420/2NO.2-S8	50113985
<b>Wide</b>	HRTU 420/2NC.2-S8	50113982
	HRTU 420/4NO.2-L-S8	50113990
	HRTU 420/4NC.2-L-S8	50113987
	HRTU 420/2NO.2-L-S8	50113984
	HRTU 420/2NC.2-L-S8	50113981

## Switching point adjustment via teach-in

Teach button	Teach-in input PIN 2
<b>① Activate teach-in</b>	
Press the teach button for approx. 2s until the LED flashes - then release the button.	
<b>② Place the object at the desired switching position and conclude the teach event</b>	
LED flashes. Once the object is at the desired switching position, briefly press the teach button once again. 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 switch off.	

## 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 button	Teach-in input PIN 2
<b>Restoring the factory setting</b>	
Press the teach button for at least 6s until the LED flashes quickly - then release the button. The sensor setting now corresponds to the factory setting (switching point at the max. scanning range).	

## Locking the teach button

The sensor automatically locks the teach button 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!