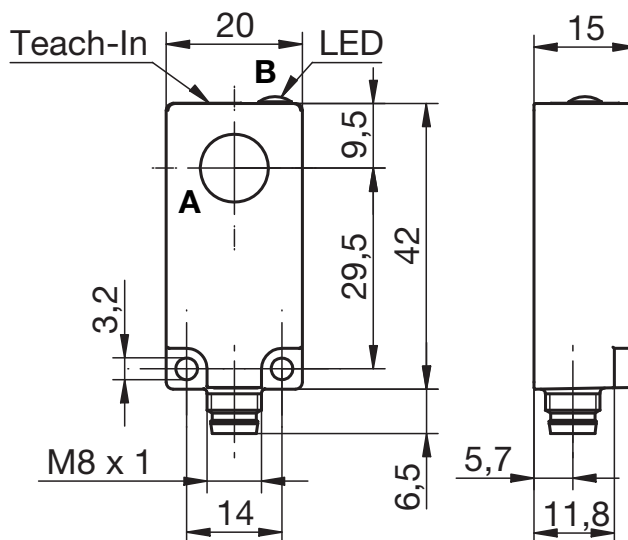


HRTU 420

Ultrasonic scanners with background suppression

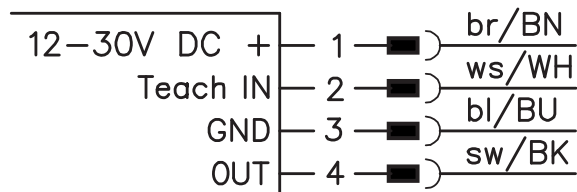


Dimensioned drawing



- 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



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 ... 200 mm	40 ... 400 mm	100 ... 1000 mm
Adjustment range of the switching point	30 ... 200 mm	60 ... 400 mm	100 ... 1000 mm
Opening angle	narrow	standard	wide
Sound frequency	380 kHz	290 kHz	240 kHz
Repeatability	≤ 0.5 mm (relative to the switching point)		
Temperature drift	≤ 0.18 %/K (relative to the switching point)		
Hysteresis	typ. 4 % (relative to the switching point)		

Timing

Switching frequency	50 Hz	20 Hz	10 Hz
Response time	≤ 10 ms	≤ 25 ms	≤ 50 ms
Decay time	≤ 10 ms	≤ 25 ms	≤ 50 ms
Delay before start-up	≤ 200 ms		

Electrical data

Operating voltage U_B 1)	12 ... 30VDC incl. taking into account the residual ripple		
Residual ripple	$\leq 10\%$ of U_B		
Bias current	$\leq 35\text{mA}$		
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	$\leq 200\text{mA}$		
Load	$C_{\text{max}} = 10\text{nF}$, $L_{\text{max}} = 20\mu\text{H}$		
Teach input	Pin 2: active high		
Signal voltage high/low	$\geq (U_B - 2\text{V}) \leq 2\text{V}$		

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 ²⁾	15 x 15 mm	30 x 30 mm	30 x 30 mm
Attachment	through holes for 2 x M3		
Weight	approx. 10 g		
Connection type	M8 connector, 4-pin		

Environmental data

Ambient temp. (operation/storage)	-10 °C ... +60 °C / -40 °C ... +85 °C
Protective circuit ³⁾	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

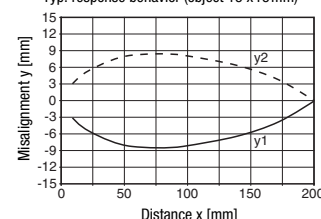
1	HRTU 420/...-L...
2	HRTU 420/...
3	HRTU 420/...-S...

☐ Scanning range [mm]

Diagrams

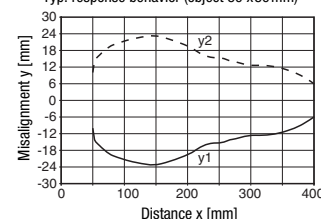
HRTU 420/...-S...

Typ. response behavior (object 15 x 15 mm)



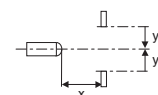
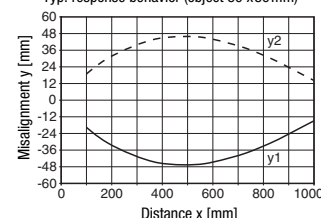
HRTU 420/...

Typ. response behavior (object 30 x 30 mm)



HRTU 420/...-L...

Typ. response behavior (object 30 x 30 mm)



HRTU 420

Ultrasonic scanners with background suppression

Type key

H	R	T	U	4	2	0	/	4	N	0	.	2	-	S	-	S	8
---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

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.

Opening angle of the ultrasonic cone	Designation	Part No.
Narrow	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
Standard	HRTU 420/4NO.2-S8	50113991
	HRTU 420/4NC.2-S8	50113988
	HRTU 420/2NO.2-S8	50113985
	HRTU 420/2NC.2-S8	50113982
Wide	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
① Activate teach-in	
Press the teach button for approx. 2s until the LED flashes - then release the button.	 U_B for approx. 2s, LED flashes
② Place the object at the desired switching position and conclude the teach event	
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
Restoring the factory setting	
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).	 U_B for at least 6s, LED flashes quickly

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!