HRTU 418 RM/WM — Ultrasonic sensors

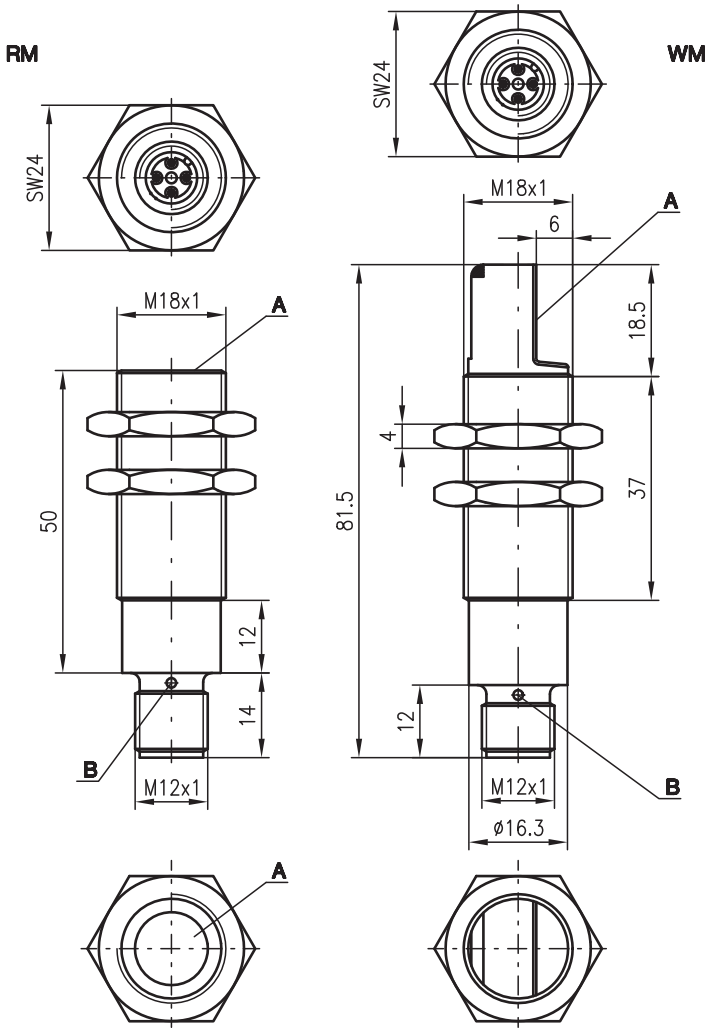
en 03-2014/11 50108367

25 … 400mm
50 … 700mm

20 - 30 V
DC

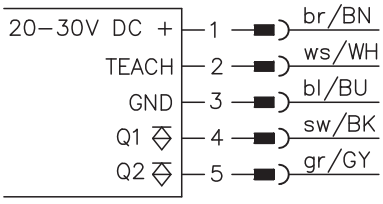
- Colour and transmission independent detection of objects
- Switching behaviour largely independent of surface properties
- Two mutually independent switching points
- Distance teachable
- Small construction

Dimensioned drawing



A Active surface
B Indicator diode Q1, Q2

Electrical connection



IEC 60947... IEC 60947... IP 65

Accessories:

(available separately)

- Mounting systems
- Cable with M12 connector (K-D …)

Specifications

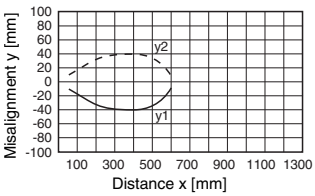
Ultrasonic specifications	HRTU 418 …-400-S12	HRTU 418…-700-S12
Operating range [1]	25 … 400mm	50 … 700mm
Adjustment range	40 … 400mm	75 … 700mm
Ultrasonic frequency	300kHz	200kHz
Typ. opening angle	see diagrams	
Resolution	1mm	
Direction of beam	HRTU 418RM/P…: straight, HRTU 418WM/P…: angular, 90°	
Reproducibility	± 1mm	
Switching hysteresis	10mm	
Temperature drift	± 0.17%/K	
Timing		
Switching frequency	10Hz	5Hz
Response time	50ms	100ms
Delay before start-up	20ms	
Electrical data		
Operating voltage U_B [2]	20 … 30V DC (incl. ± 10% residual ripple)	
Residual ripple	± 10% of U_B	
Bias current	≤ 20mA	
Switching output	2x PNP transistor	
Function characteristics	switching in case of object recognition	
Output current	300mA	
Switching range adjustment	teach-in Q1: teach input (pin 2) connected to GND for 3 … 6s teach-in Q2: teach input (pin 2) connected to GND for 6 … 9s	
Indicators		
Yellow LED	output Q1, output Q2	
Flashing yellow LED	teaching procedure	
Mechanical data		
Housing	metal/brass nickel-plated	
Weight	50g	
Ultrasonic transducer	piezoceramic [3]	
Connection type	M12 connector, plastic, 5-pin	
Environmental data		
Ambient temp. (operation/storage)	-25°C … +70°C/-40°C … +85°C	
Protective circuit [4]	1, 2, 3	
VDE safety class	III	
Protection class	IP 65	
Standards applied	IEC 60947-5-2	
Fitting position	any	
Certifications	UL 508, C22.2 No.14-13 [2] [5]	

1) For the complete temperature range, measured object ≥ 20x20mm
2) For UL applications: for use in class 2 circuits according to NEC only
3) The ceramic material of the ultrasonic transducer contains lead zirconium titanate (PZT)
4) 1=short-circuit and overload protection, 2=polarity reversal protection, 3=wire break and inductive protection
5) These proximity switches shall be used with UL Listed Cable assemblies rated 30V, 0.5A min, in the field installation, or equivalent (categories: CYJV/CYJV7 or PVVA/PVVA7)

Diagrams

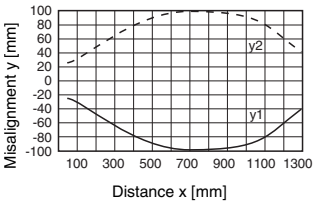
HRTU 418 …-400-S12

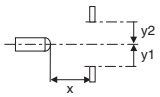
Typ. response behaviour (object 20x20mm)

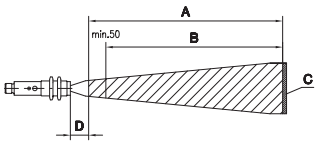


HRTU 418 …-700-S12

Typ. response behaviour (object 20x20mm)







A Operating range
B Adjustment range
C Object
D Dead zone

Remarks

Operate in accordance with intended use!

- This product is not a safety sensor and is not intended as personnel protection.
- The product may only be put into operation by competent persons.
- Only use the product in accordance with the intended use.

- **Temperature drift**
  ± 0.17%/K

Order guide

	Designation	Part No.
Operating range: 25 … 400mm, direction of beam: straight	HRTU 418RM/P-5220-400-S12	50109016
Operating range: 25 … 400mm, direction of beam: 90°	HRTU 418WM/P-5220-400-S12	50109017
Operating range: 50 … 700mm, direction of beam: straight	HRTU 418RM/P-5220-700-S12	50109018
Operating range: 50 … 700mm, direction of beam: 90°	HRTU 418WM/P-5220-700-S12	50109019

Teach-in via input

1. Position measurement object at the desired distance.
2. The respective teach function is activated by applying GND to the teach input (pin 2).
   The teach event is signalled by slow flashing of the LEDs.

Teach function	Teach phase / duration of the teach signal	LED Q1	LED Q2
Teach preparation	A / 0 … 3s	off	off
switching output Q1	B / 3 … 6s	flashes	off
switching output Q2	C / 6 … 9s	off	flashes

3. To finish the teach event, disconnect the teach input from GND or switch it to $+U_B$ after the desired time. If the teach event has not completed after 9s, it begins again with phase B.
4. A successful teach event is signalled by the end of the flashing.

Error messages

LEDs which continuously flash fast signal an unsuccessful teach event (sensor not ready):

LED Q1	LED Q2	Error
flashes rapidly	switching state output Q2	teach switching output Q1 unsuccessful
switching state output Q1	flashes rapidly	teach switching output Q1 unsuccessful

Remedy:

- Disconnect sensor from voltage to restore the old values.
- Repeat teach event