

# HTU418B

## STANDARD ultrasonic sensors with 1 switching output

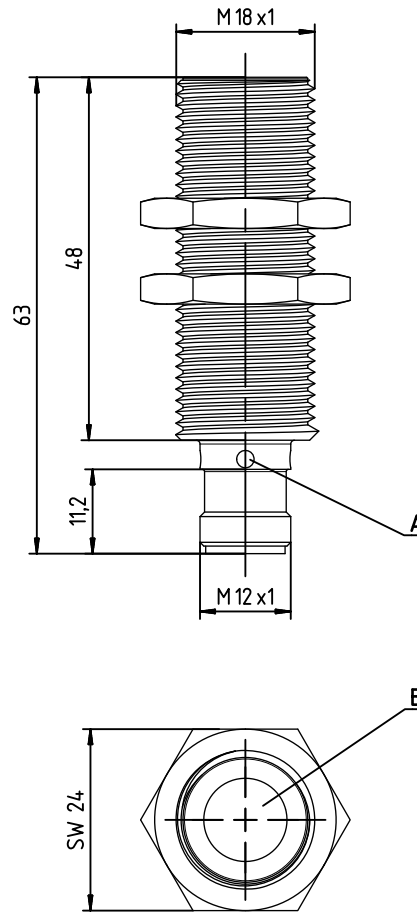
### Dimensioned drawing



25 ... 400mm  
100 ... 700mm  
150 ... 1000mm



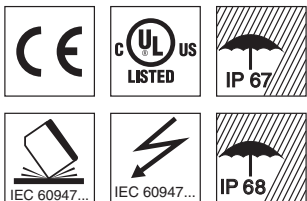
- Largely surface-independent function, ideal for the detection of liquids, bulk materials, transparent media, ...
- Small dead zone at long range
- Adjustment of the switching point can be taught
- NO/NC function reversible
- 1 switching output (PNP)
- Extra short construction
- **NEW** – Stable all-metal design



- A Indicator diodes  
B Active sensor surface

### Electrical connection

|            |   |       |
|------------|---|-------|
| 15-30V DC+ | 1 | br/BN |
| Teach-IN   | 2 | ws/WH |
| GND        | 3 | bl/BU |
| OUT 1      | 4 | sw/BK |
| Teach-IN   | 5 | gr/GY |



### Accessories:

(available separately)

- Mounting systems
- Mounting adapter M18-M30: BTX-D18M-D30 (Part no. 50125860)
- Cables with M12 connector (KD ...)
- Teach adapter PA1/XTSX-M12 (Part no. 50124709)

## Specifications

### Ultrasonic specifications

Scanning range <sup>1)</sup>  
Adjustment range  
Ultrasonic frequency  
Typ. opening angle  
Resolution switching output  
Direction of beam  
Reproducibility  
Switching hysteresis  
Temperature drift

### HTU418B-400/4TX...

25 ... 400mm <sup>2)</sup>  
25 ... 400mm  
310kHz  
9°  
0.5mm  
axial  
± 0.15 % <sup>1) 5)</sup>  
5mm <sup>1)</sup>  
0.17 %/K

### HTU418B-700/4TX...

100 ... 700mm <sup>3)</sup>  
100 ... 700mm  
200kHz  
16°  
1mm  
axial  
± 0.15 % <sup>1) 5)</sup>  
10mm <sup>1)</sup>  
0.17 %/K

### HTU418B-1000/4TX...

150 ... 1000mm <sup>4)</sup>  
150 ... 1000mm  
200kHz  
16°  
1mm  
axial  
± 0.15 % <sup>1) 5)</sup>  
10mm <sup>1)</sup>  
0.17 %/K

### Timing

Switching frequency  
Response time  
Delay before start-up

7Hz  
71ms  
< 300ms

8Hz  
62ms  
< 300ms

8Hz  
62ms  
< 300ms

### Electrical data

Operating voltage  $U_B$  <sup>6)</sup>  
Residual ripple  
Open-circuit current  
Switching output  
Function  
Output current  
Switching range adjustment

15 ... 30V DC (incl. ± 10 % residual ripple)  
± 10 % of  $U_B$   
≤ 50mA  
1 x PNP transistor  
NO contact, reversible  
max. 150mA  
teach-in (Pin 2):  
for OUT1: connected to GND for 2 ... 7s  
teach-in (pin 2):  
for OUT1: connected to  $U_B$  for 2 ... 7s

Changeover NO/NC <sup>7)</sup>

### Indicators

Yellow LED  
Yellow LED, flashing  
Green LED

OUT1: object detected  
teach-in / teaching error  
object within scanning range

### Mechanical data

Housing  
Weight  
Ultrasonic transducer  
Connection type  
Fitting position

all-metal brass, nickel-plated  
50g  
piezoceramic <sup>8)</sup>  
M12 connector, 5-pin  
any

### Environmental data

Ambient temperature  
(operation/storage)  
Protective circuit <sup>9)</sup>  
VDE safety class  
Degree of protection  
Standards applied  
Certifications

-25°C ... +70°C/-30°C ... +85°C  
1, 2, 3  
III  
IP 67 and IP 68  
EN 60947-5-2  
UL 508, C22.2 No.14-13 <sup>6) 10) 11)</sup>

1) At 20°C

2) Target: plate 20mm x 20mm

3) Target: plate 100mm x 100mm

4) Target: plate 100mm x 100mm

5) Of full scale value

6) For UL applications: for use in class 2 circuits according to NEC only

7) Not applicable for Type HTU418B-1000 / 4TX-M12P2 (50130241)

8) The ceramic material of the ultrasonic transducer contains lead zirconium titanate (PZT)

9) 1=short-circuit and overload protection, 2=polarity reversal protection, 3=wire break and inductive protection

10) 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)

11) Ambient temperature 85°C. Use same supply source for all circuits.

## Deviating Specifications for HTU418B-1000 / 4TX-M12P2

Customer-specific parameterization with the following characteristics:

- Dead zone: 350mm
- Switching point: set to 560mm on delivery
- Switching hysteresis: 25mm
- Switch-on/Switch-off delay: 1.8s
- No adjustment of the switching function (NC/NO) via the teach input

## Remarks

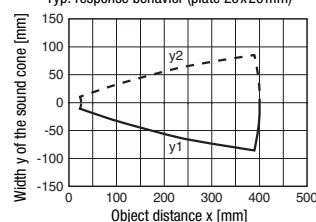
### Operate in accordance with intended use!

- ⚠ 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.

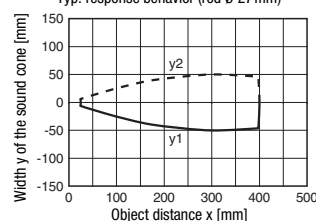
## Diagrams

### HTU418B-400/...-M12

Typ. response behavior (plate 20x20mm)

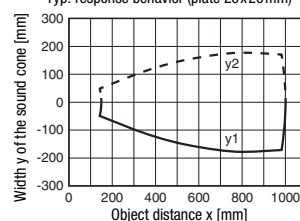


Typ. response behavior (rod Ø 27mm)

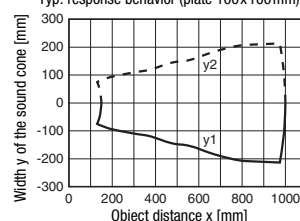


### HTU418B-700/...-M12 HTU418B-1000/...-M12

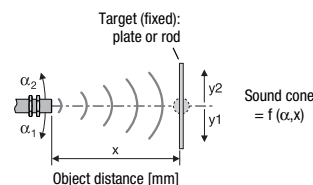
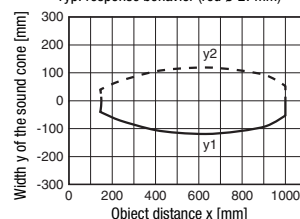
Typ. response behavior (plate 20x20mm)



Typ. response behavior (plate 100x100mm)



Typ. response behavior (rod Ø 27mm)



## HTU418B

## STANDARD ultrasonic sensors with 1 switching output

### Part number code

|   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| H | T | U | 4 | 1 | 8 | B | - | 1 | 0 | 0 | 0 | . | X | 3 | / | 4 | T | X | - | M | 1 | 2 | P | x |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|

#### Operating principle

**HTU** Ultrasonic sensor, scanning principle, with background suppression

**DMU** Ultrasonic sensor, distance measurement

#### Series

**418B** 418B Series, cylindrical M18 construction

#### Scanning range in mm

**400** 25 ... 400

**700** 100 ... 700

**1000** 150 ... 1000

#### Equipment (optional)

**X** "Advanced" design

**3** Teach button on the sensor

#### Pin assignment of connector pin 4 / black cable wire (OUT1)

**4** PNP output, NO contact preset

**P** PNP output, NC contact preset

**L** IO-Link communication or push-pull (SIO)

#### Pin assignment of connector pin 2 / white cable wire (Teach-IN)

**T** teach input

#### Pin assignment of connector pin 5 / gray cable wire (OUT2)

**4** PNP output, NO contact preset

**P** PNP output, NC contact preset

**V** Analog voltage output 1 ... 10V

**C** Analog current output 4 ... 20mA

**X** Connection not assigned (n. c. - not connected)

#### Connection technology

**M12** M12 connector, 5-pin

#### Special devices

**Px** Special device version x = 1 ... 9

**free** Standard device

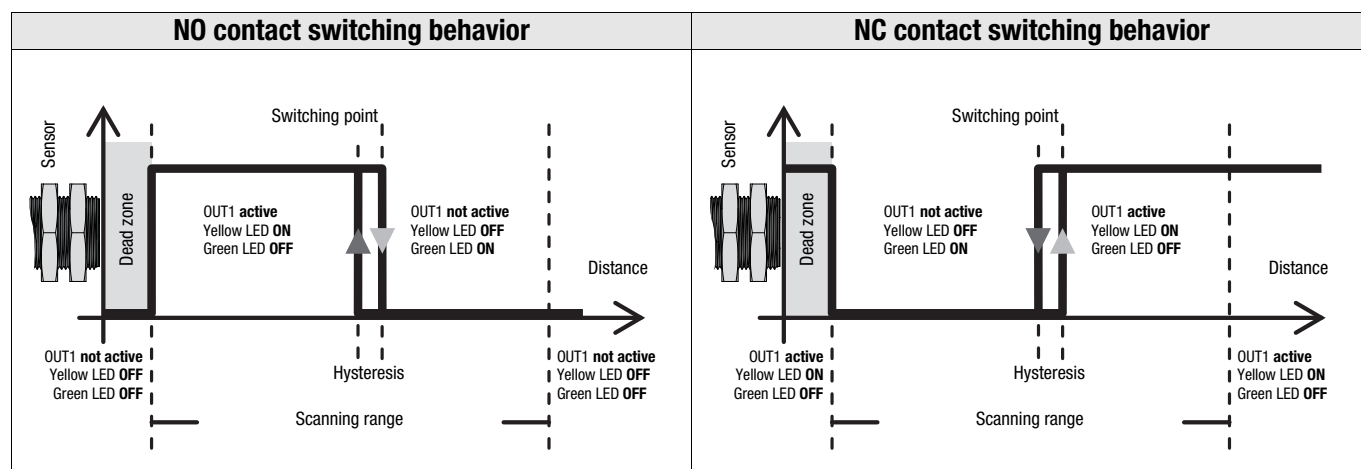
## Order guide

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

|                       | Designation            | Part no. | Remark                             |
|-----------------------|------------------------|----------|------------------------------------|
| <b>Scanning range</b> |                        |          |                                    |
| 25 ... 400mm          | HTU418B-400/4TX-M12    | 50124269 |                                    |
| 100 ... 700mm         | HTU418B-700/4TX-M12    | 50131020 |                                    |
| 150 ... 1000mm        | HTU418B-1000/4TX-M12   | 50124270 |                                    |
| 350 ... 1000mm        | HTU418B-1000/4TX-M12P2 | 50130241 | customer specific parameterization |

## Device functions and indicators

All sensor settings are taught via the **Teach-IN** input. Device status and switching states are indicated by a green and a yellow LED as follows:



## Adjusting the switching point via the teach input

The switching point of the sensor is set to 400mm, 700mm or 1000mm on delivery.

By means of a simple teach event, the switching point can be taught to an arbitrary distance within the scanning range. The Leuze **PA1/XTSX-M12** teach adapter can be used for this purpose. The adapter can also be used to easily switch the output function from NO contact to NC contact.

| 1-point teach                                                                                                                                                                                                                                                                                                                                          |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1. Place object at desired switching distance.                                                                                                                                                                                                                                                                                                         |
| 2. For the adjustment of output <b>OUT1</b> , connect input <b>Teach-IN</b> to <b>GND</b> for 2 ... 7s (Leuze teach adapter: position "Teach-GND").<br>The current state of output <b>OUT1</b> is frozen during the teach event.                                                                                                                       |
| 3. The <b>yellow LED flashes at 3Hz</b> and then <b>remains on</b> .<br>The current object distance has been taught as the new switching point.                                                                                                                                                                                                        |
| 4. Error-free teach: LED states and switching behavior according to the diagram shown above.<br><b>Faulty teach</b> (object may be too close or too far away – please note scanning range):<br><b>yellow LED flashes at 5Hz</b> until an error-free teach event is performed.<br>The output <b>OUT1</b> is inactive as long as there is a teach error. |

## Adjusting the switching function (NC/NO) via the teach input <sup>1)</sup>

The switching function of the sensor is set to normally open (NO) on delivery.

If the switching function is changed, the switching output is changed to the opposite state (toggled).

| Changeover of the switching function                                                                                                                                                                                                                          |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1. To change the switching function, connect input <b>Teach-IN</b> to <b>U<sub>B</sub></b> for 2 ... 7s (Leuze teach adapter: position "Teach-U <sub>B</sub> ").<br>The current state of output <b>OUT1</b> remains frozen while the adjustment is performed. |
| 2. The <b>green and yellow LED flash alternately at 2Hz</b> .<br>The switching function has been reversed.<br>The switching behavior corresponds to the diagram shown above.                                                                                  |



### Notice!

Please note that **pin 2** and **pin 5** are **connected** internally. The **switching point** is taught when **GND** is connected, and the **output function** is reversed when **U<sub>B</sub>** is connected due to the configuration of the input.

**If no sensor action is desired, pin 2 and pin 5 must remain unconnected!**

<sup>1)</sup> Not applicable for Type HTU418B-1000 / 4TX-M12P2 (50130241)