en 01-2017/02 50124859

M18

40 … 300 mm
80 … 1200 mm

10 - 30 V
DC

- Function largely independent of surface properties, ideal for detection of liquids, bulk materials, transparent media, …
- Small dead zone at long scanning range
- Adjustment of the switching point can be taught
- NO/NC function reversible
- 1 switching output (PNP or NPN)
- Extra short construction
- **NEW** – Stable plastic design
- **NEW** – Temperature-compensated scanning range

CE
c UL us LISTED
IP 67
IEC 60947…
IEC 60947…

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)

We reserve the right to make changes • PAL_HTU318_300_1200_1SWO_en_50124859.fm

Dimensioned drawing

M18x1

60,3

39,3

14

M12x1

SW22

B

A
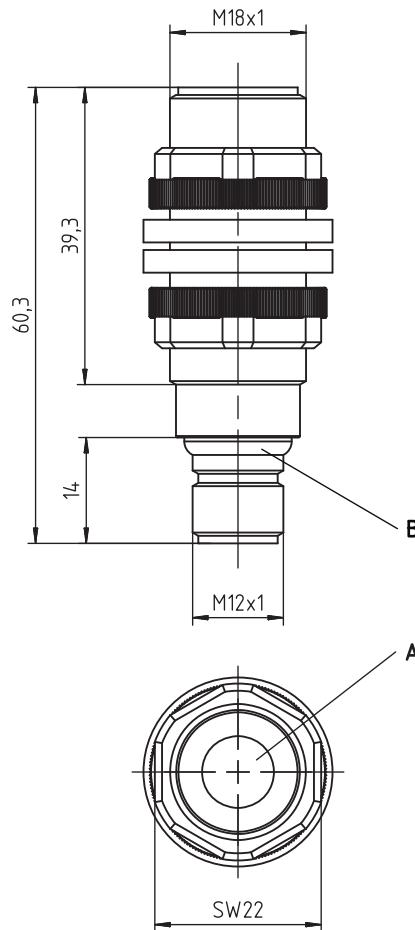
A Active sensor surface
B Indicator diodes

Electrical connection

10-30 V DC +	1	BR / BN
Teach-IN	2	WS / WH
GND	3	BL / BU
OUT 1	4	SW / BK

Technical data

Ultrasonic specifications	HTU318-300/…-M12	HTU318-1200/…-M12
Scanning range [1]	40 … 300 mm [2]	80 … 1200 mm [2]
Adjustment range	40 … 300 mm	80 … 1200 mm
Ultrasonic frequency	300 kHz	200 kHz
Typ. opening angle	7° ± 2°	8° ± 2°
Resolution	< 2 mm	< 2 mm
Direction of beam	Axial	Axial
Reproducibility	± 0.5 % [1] [3]	± 0.5 % [1] [3]
Switching hysteresis	1 % [3]	1 % [3]
Temperature drift	≤ 5 % [4]	≤ 5 % [4]

Timing		
Switching frequency	8 Hz	5 Hz
Response time	62 ms	100 ms
Readiness delay	< 100 ms	< 100 ms

Electrical data

Operating voltage U_B [5]	10 … 30 V DC (incl. ± 5 % residual ripple)
Residual ripple	± 5 % of U_B
Open-circuit current	≤ 35 mA
Switching output …/4…	1 PNP transistor switching output
…/2…	1 NPN transistor switching output
Function	NO (normally open), preset
Output current	Max. 150 mA
Switching range adjustment	1-point teach: teach-in (pin 2) 2 … 7 s to U_B, 2-point teach: teach-in (pin 2) 7 … 12 s to U_B
Changeover NO/NC	Teach-in (pin 2) > 12 s to U_B

Indicators

Yellow LED	OUT1: object detected
Yellow LED, flashing	Teach-in
Green and yellow LEDs flashing	Teaching error
Green LED	Object within the scanning range

Mechanical data

Housing	Plastic (PBT)
Active surface	Epoxy resin, glass fiber reinforced
Weight	65 g
Ultrasonic transducer	Piezoceramic [6]
Connection type	M12 connector, 4-pin
Fitting position	Any

Environmental data

|	
Ambient temp. (operation/storage)	-20° … +70°C/-20° … +70°C
Protective circuit [7]	1, 2, 3
VDE protection class	III
Degree of protection	IP 67
Standards applied	EN 60947-5-2
Certifications	UL 508, CSA C22.2 No.14-13 [5] [8]

1) At 20°C
2) Target: 100 mm x 100 mm plate
3) From end value
4) Over the temperature range -20°C … +70°C
5) For UL applications: use is permitted exclusively in Class 2 circuits according to NEC
6) The ceramic material of the ultrasonic transducer contains lead zirconium titanate (PZT)
7) 1=short-circuit and overload protection, 2=polarity reversal protection, 3=wire break and inductive protection
8) 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

HTU318-300/…-M12

Typ. response behavior (plate 100 x 100 mm)

Typ. response behavior (rod Ø 25 mm)

HTU318-1200/…-M12

Typ. response behavior (plate 100 x 100 mm)

Typ. response behavior (rod Ø 25 mm)

Target (fixed): plate or rod
Sound cone = f (α,x)
Object distance [mm]
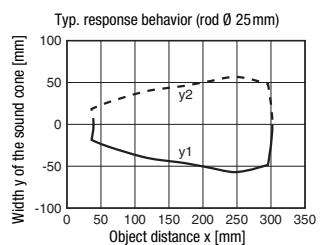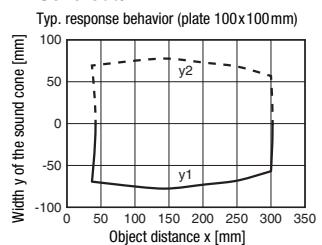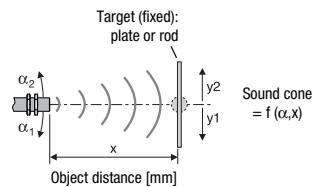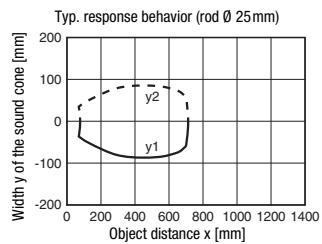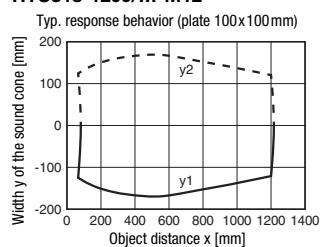
Notes

Observe 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 its intended use.

Part number code

```
H T U 3 1 8 - 1 2 0 0 . 3 / 4 T - M 1 2
```

Operating principle

| HTU | Ultrasonic sensor, scanning principle, with background suppression |
| DMU | Ultrasonic sensor, distance measurement |

Series

| 318 | 318 series, cylindrical short M18 design |

Scanning range in mm

| 300 | 40 … 300 |
| 1200 | 80 … 1200 |

Equipment (optional)

| .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
2	NPN output, NO contact preset
N	NPN output, NC contact preset
C	Analog output 4 … 20 mA
V	Analog output 0 … 10V

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

| T | Teach input |

Connection technology

| M12 | M12 connector, 4-pin |

Order guide

The sensors listed here are preferred types; current information at **www.leuze.com**.

	Designation	Part no.
Scanning range / switching output		
40 … 300 mm / PNP	HTU318-300/4T-M12	50136070
40 … 300 mm / NPN	HTU318-300/2T-M12	50136071
80 … 1200 mm / PNP	HTU318-1200/4T-M12	50136074
80 … 1200 mm / NPN	HTU318-1200/2T-M12	50136075

Device functions and indicators

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

Switching behavior

1-point teach (1 switching point)	
Switching behavior NO contact	**Switching behavior NC contact**

2-point window-teach (2 switching points)	
Switching behavior NO contact	**Switching behavior NC contact**
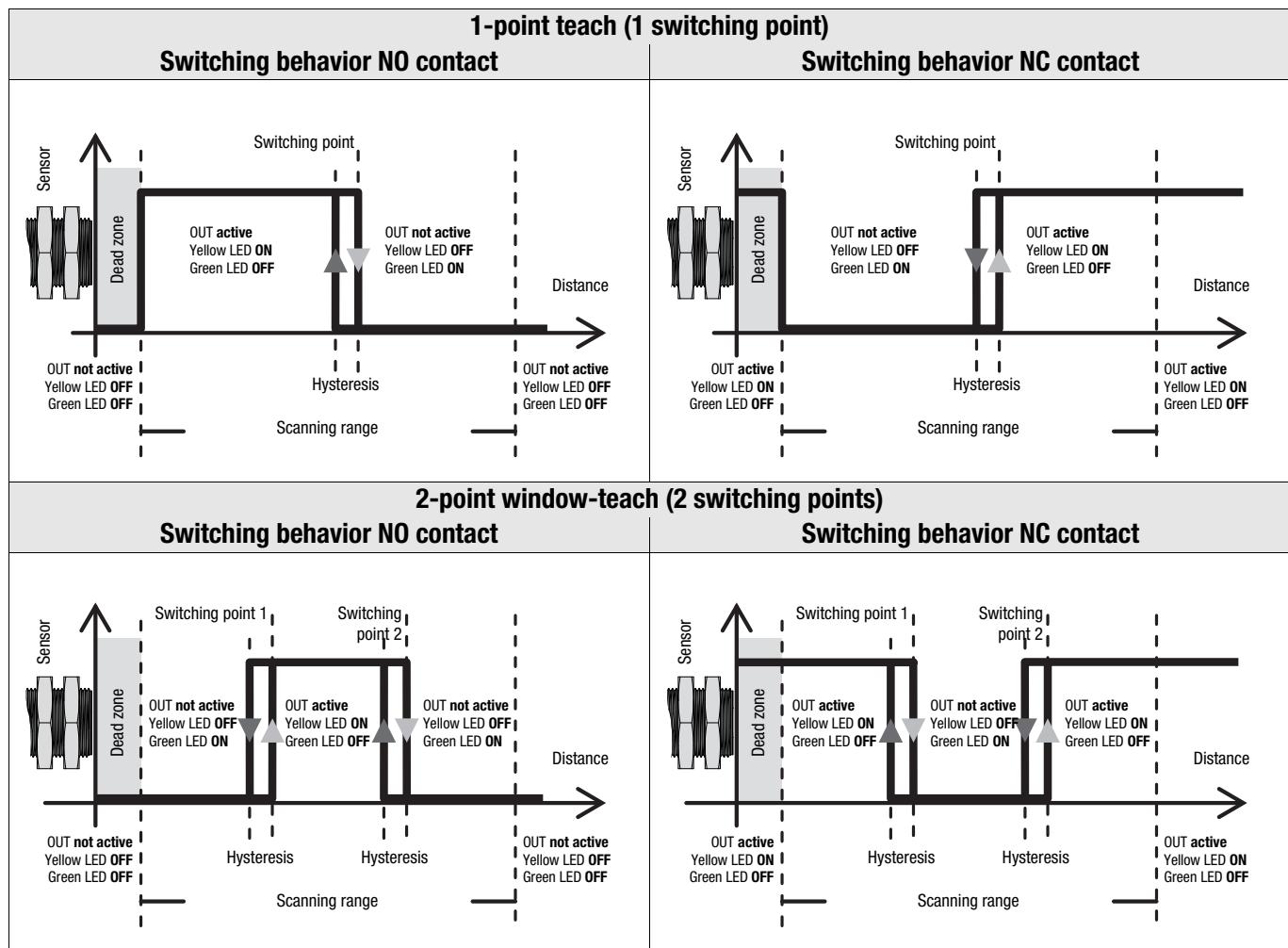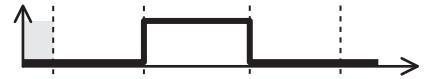
> **Note!**
> The switching behavior is not defined in the dead zone.

Switching behavior with 2-point window-teach as a function of the switching function

Switching function configured as	First taught object distance	Second taught object distance	Output switching behavior
NO (normally open)	Far	Close	
	Close	Far	
NC (normally closed)	Far	Close	
	Close	Far	

Adjusting the switching point via the teach input

The switching point of the sensor is set to 300 mm or 1200 mm on delivery.

By means of a simple teach event, the switching points can be individually taught to an arbitrary distance within the scanning range with 1-point teach (static) or 2-point window-teach (static). 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 (static)	2-point window-teach (static)
1. Place object at desired switching distance.	**1.** First, **place** object at desired switching distance for **switching point 1**.
2. To adjust output **OUT1**, **connect** the **Teach-IN** input to U_B for **2 … 7s** (Leuze Teach Adapter: position "Teach-U_B"). The current state of output **OUT1** is frozen while the adjustment is made.	**2.** To adjust output **OUT1**, **connect** the **Teach-IN** input to U_B for **7 … 12s** (Leuze Teach Adapter: position "Teach-U_B") until the **yellow and green LEDs flash alternately at 3Hz**.
3. The **yellow LED flashes at 3Hz** and is then **ON**. The current object distance has been taught as the new switching point.	**3. Release the button**. The sensor remains in teach mode and the LEDs continue to flash.
4. Error-free teach: **LED** states and switching behavior according to the diagram shown above. **Faulty teach** (object may be too close or too far away – please note scanning range)**: green and yellow LEDs flash at 8Hz** until an error-free teach event is performed. The output **OUT1** is inactive as long as there is a teaching error.	**4.** Then, **place** the object at the desired switching distance for **switching point 2**. **Note**: The **minimum distance between the switching points** is as follows: scanning range of 400 mm:**40 mm** scanning range of 1200 mm:**120 mm**
	5. To complete the teach event, briefly **connect** the **Teach-IN** input to U_B again (Leuze Teach Adapter: position "Teach-U_B"). The switching window was taught in.
	6. Error-free teach: LED states and switching behavior according to the diagram shown above. **Faulty teach** (object may be too close or too far away – please note scanning range)**: green and yellow LEDs flash at 8Hz** until an error-free teach event is performed.

Adjusting the switching function (NC/NO) via the teach input

The switching function of the sensor is preset as follows on delivery:

● **OUT 1: NO contact**

The output function can be switched from NO contact (NO - normally open) to NC contact (NC - normally closed) and vice versa. Leuze Teach Adapter **PA1/XTSX-M12** can be used for this purpose. 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** the **Teach-IN** input to U_B for **more than 12s** (Leuze Teach Adapter: position "Teach-U_B"). The current state of output **OUT1** is frozen while the adjustment is made.
2. The **green and yellow LEDs flash alternately at 2Hz**. The switching function was changed over. The switching behavior corresponds to the diagram shown above.

Resetting to factory settings

The sensor can be reset to the factory setting (one switching point at 300 mm or 1200 mm). Leuze Teach Adapter **PA1/XTSX-M12** can be used for this purpose.

Resetting to factory settings
1. When switching on the supply voltage (during Power-On), connect the **Teach-IN** input to U_B for **> 5s** (Leuze Teach Adapter position "Teach-U_B"). The **green and yellow LEDs** flash **alternately and very quickly** for a brief time.
2. Disconnect the **Teach-IN** input from U_B. The sensor was reset to the factory setting: 1 switching point at 300 mm or 1200 mm (1-point teach, static).