



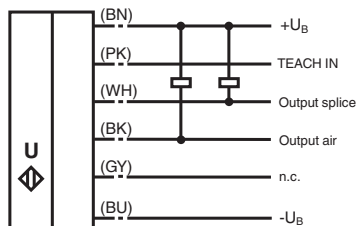
## Technical Data

Time delay before availability	$t_v$	< 500 ms
<b>Input</b>		
Input type		Teach-In input 0-level: $-U_B \dots -U_B + 1V$ 1-level: $+U_B - 1V \dots +U_B$
Pulse length		$\geq 500$ ms
Impedance		$\geq 10$ k $\Omega$
<b>Output</b>		
Output type		2 switch outputs NPN, NC
Rated operating current	$I_e$	2 x 100 mA , short-circuit/overload protected
Voltage drop	$U_d$	$\leq 3$ V
Switch-on delay	$t_{on}$	$\leq 600$ $\mu$ s
Switch-off delay	$t_{off}$	$\leq 600$ $\mu$ s
Pulse extension		$\geq 120$ ms programmable
<b>Compliance with standards and directives</b>		
Standard conformity		
Standards		EN IEC 60947-5-2:2020 IEC 60947-5-2:2019
<b>Approvals and certificates</b>		
UL approval		cULus Listed, General Purpose
CCC approval		CCC approval / marking not required for products rated $\leq 36$ V
<b>Ambient conditions</b>		
Ambient temperature		0 ... 60 °C (32 ... 140 °F)
Storage temperature		-40 ... 70 °C (-40 ... 158 °F)
<b>Mechanical specifications</b>		
Connection type		cabl PVC , 2 m
Core cross section		0.14 mm <sup>2</sup>
Housing diameter		18 mm
Degree of protection		IP67
Material		
Housing		nickel plated brass; plastic components: PBT
Transducer		epoxy resin/hollow glass sphere mixture; polyurethane foam
Mass		150 g

## Connection

### Standard symbol/Connection:

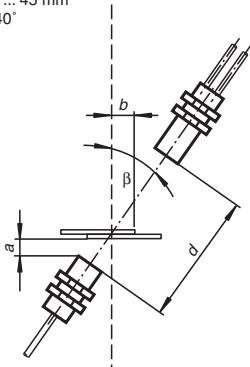
Splice control



Characteristic Curve

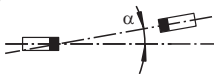
Mounting/Adjustment

Suggestions:  
a = 5 mm ... 15 mm  
b ≥ 10 mm  
d = 40 mm ... 45 mm  
β = 20° ... 40°



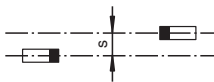
Angular misalignment

α < +/- 1°




Sensor offset

s < +/- 1 mm



Accessories

	MH-UDB01	Mounting bracket for double sheet monitor
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Release date: 2023-02-13 Date of issue: 2023-02-13 Filename: 288454\_eng.pdf

## Operation

### Operation in applications with increased ESD requirements

Using the included metal screw caps, the sensor can be used in applications with increased ESD requirements up to 30 kV (ESD = electrostatic discharge). The metal coupling nuts are screwed on the front of the transmitter and receiver. The installation of the transmitter and receiver must ensure a large area electrical connection to the machine earth.

## Additional Information

### Description of sensor functions

The ultrasonic double sheet monitor for splice detection can be used in all applications, where an automatic detection of glue dots, splices, bondings or the absence of base material is required, to protect machines or to evade waste production. The double-sheet monitor is based on the ultrasonic through-beam principle. The following can be detected:

- No base material, i.e. air,
- glue dots, splices, bondings

A microprocessor system evaluates the signals. The appropriate switch outputs are set as a result of the evaluation. Changes in ambient conditions such as temperature and humidity are compensated for automatically. The interface electronics is integrated into a compact M18 metal housing together with a sensor head.

### Electrical connection

The sensor is equipped with 6 connecting wires. The functionality of the connections is described in the following table. The teach input (PK) is used to teach the sensor.

Colour	Switching on	Comments
BN	+U <sub>B</sub>	
WH	Switch output for splices	Pulse width corresponds to the event
BK	Switch output for air	Pulse width corresponds to the event
GY	not connected	
PK	-U <sub>B</sub> / n.c. / +U <sub>B</sub>	Normal operation / output pulse prolongation / TEACH-IN
BU	-UB	

### Normal mode

The sensor is working in normal mode if the function input (PK) is applied to -U<sub>B</sub> or not connected.

Displays:

LED yellow: Detection of splices

LED green: Power on

LED red: Detection of air (no base material)

Switch outputs:

The switch outputs are only active in normal operation!

White: WH Splice output

Black: BK Air output

### Output pulse extension

If the teach input (PK) is not connected, when switching on the power supply, the sensor operates with output pulse prolongation. Events, shorter than 120 ms cause an output pulse duration of 120 ms at the Splice output. For sensor operation without pulse prolongation, the teach input (PK) has to be connected with -U<sub>B</sub> while power supply is switched on.

Please note:

This can result in a condition in which more than one switch output is switched through!

### TEACH-IN mode

Connecting the teach input (PK) with +U<sub>B</sub> for at least 500 ms causes the sensor to change into TEACH-IN mode. The TEACH-IN procedure has to be carried out with base material. In case of inhomogeneous base materials we suggest to teach the sensor with activated material feeding and a corresponding prolongation of the TEACH-IN procedure.

During the TEACH-IN procedure flashes the yellow LED; the green LED is off.

After returning to the normal operation mode (teach input (PK) detached from +U<sub>B</sub>) the sensor indicates whether the TEACH-IN procedure was successful or not.

TEACH-IN procedure successful: green LED flashes 3 times

TEACH-IN procedure not successful: red LED flashes 3 times

### Notes:

A complete device consists of an ultrasonic emitter and an evaluation unit with an ultrasonic emitter. The sensor heads are optimally adjusted to each other when they leave the factory. Therefore, they must not be used separately or exchanged with other devices of the same type. The plug connector on the emitter/receiver connection cable is only intended to be used for easier mounting, not to replace units.

If two or more double sheet controls are used in the immediate vicinity of each other, there may be mutual interference between them, which can result in improper functionality of the devices. Mutual interference can be prevented by introducing suitable countermeasures when planning systems. Suitable measures can be:

- Mounting of sound absorbers (foam material)
- mounting of sound separators (sheet metal)
- installation of the sensors with different directions of sound transmission.