## Model Number

**ULB-18GM50-255-2E1-Y193959**

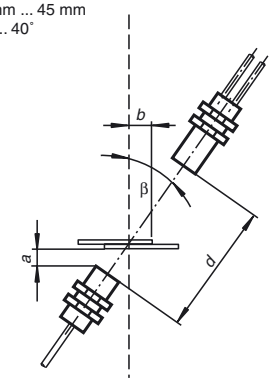
## Features

- **Ultrasonic system for detection of labels and carrier materials.**
- **Short version**
- **Insensitive to printing, colors, and shining surfaces**
- **Automatic compensation of the operating point with slowly changing ambient condition**
- **Very high processing speeds are possible.**

## Diagrams

### Mounting/Adjustment

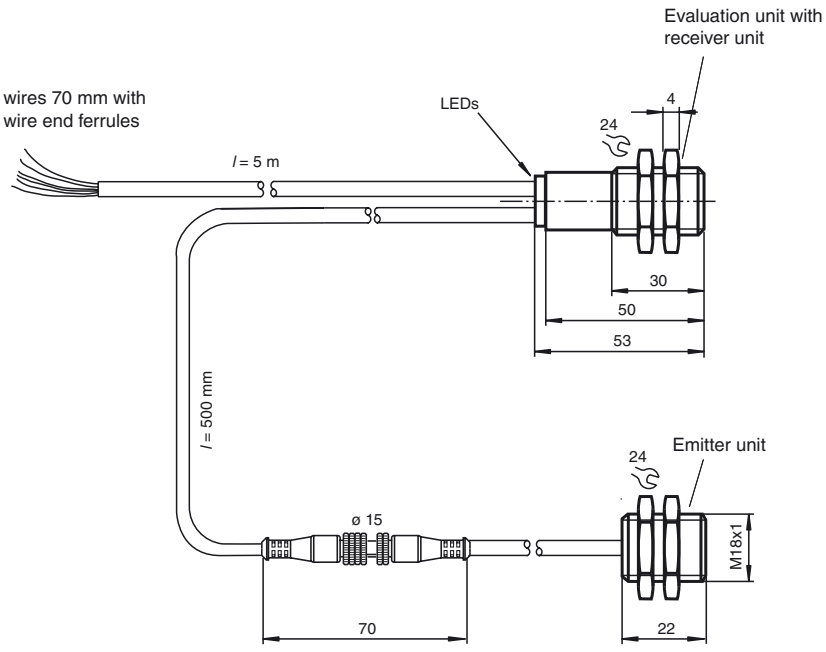
Suggestions:
a = 5 mm ... 15 mm
b ≥ 10 mm
d = 40 mm ... 45 mm
β = 20° ... 40°




## Technical data

| | |
|---|---|
| **General specifications** | |
| Sensing range | 20 ... 60 mm , optimal distance: 45 mm |
| Transducer frequency | 255 kHz |
| **Indicators/operating means** | |
| LED green | Display: readiness |
| LED yellow | indication: label detected |
| LED red | Display: error |
| **Electrical specifications** | |
| Operating voltage $U_B$ | 18 ... 30 V DC , ripple 10 $\%_{SS}$ |
| No-load supply current $I_0$ | < 60 mA |
| Time delay before availability $t_v$ | < 500 ms |
| **Input** | |
| Input type | Teach-In input<br>0-level: $-U_B$ ... $-U_B$ + 1V<br>1-level: $+U_B$ - 1 V ... $+U_B$ |
| Pulse length | ≥ 500 ms |
| Impedance | ≥ 10 kΩ |
| **Output** | |
| Output type | 2 switch outputs NPN, NC |
| Rated operating current $I_e$ | 2 x 100 mA , short-circuit/overload protected |
| Voltage drop $U_d$ | ≤ 3 V |
| Switch-on delay $t_{on}$ | ≤ 600 µs |
| Switch-off delay $t_{off}$ | ≤ 600 µs |
| **Ambient conditions** | |
| Ambient temperature | 0 ... 60 °C (32 ... 140 °F) |
| Storage temperature | -40 ... 70 °C (-40 ... 158 °F) |
| **Mechanical specifications** | |
| Connection type | cable PVC , 5 m |
| Core cross-section | 0.14 $mm^2$ |
| Degree of protection | IP67 |
| Material | |
| Housing | nickel plated brass; plastic components: PBT |
| Transducer | epoxy resin/hollow glass sphere mixture; polyurethane foam |
| Mass | 150 g |
| **Compliance with standards and directives** | |
| Standard conformity | |
| Standards | EN 60947-5-2:2007+A1:2012<br>IEC 60947-5-2:2007 + A1:2012 |
| **Approvals and certificates** | |
| UL approval | C-UL listed: 57M3, IND CONT. EQ., "Powered by Class 2 Power Source" |
| CCC approval | CCC approval / marking not required for products rated ≤36 V |

## Dimensions

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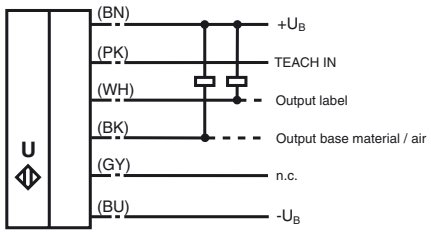
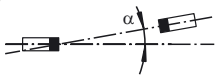
## Electrical Connection

**Standard symbol/Connection:**
Label monitor

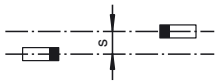



## Additional Information

**Angular misalignment**
α < +/- 1°




**Sensor offset**
s < +/- 1 mm




## Accessories

**MH-UDB01**
Mounting bracket for double sheet monitor

### 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.

### Description of sensor functions

The ultrasonic double sheet monitor for label detection can be used in all applications, where an automatic detection of labels is required, to automatise labelling of goods. Even transparent or metalised labels can be detected without problem. The double-sheet monitor is based on the ultrasonic through-beam principle. The following can be detected:

- No base material, i.e. air,
- Labels

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 | $+U_B$ | |
| WH | Switch output for labels | Pulse width corresponds to the event |
| BK | Switch output for base material / air | Pulse width corresponds to the event |
| GY | not connected | |
| PK | $-U_B$ / n.c. / $+U_B$ | Normal operation / TEACH-IN |
| BU | -UB | |

### Normal mode

The sensor is working in normal mode if the function input (PK) is applied to $-U_B$ or not connected.

Displays:
LED yellow: Detection of labels
LED green: Power on
LED red: Error

Switch outputs:
The switch outputs are only active in normal operation!
White: WH Label output
Black: BK Base material / air output

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## TEACH-IN mode

Connecting the teach input (PK) with $+U_B$ for at least 500 ms causes the sensor to change into TEACH-IN mode. The TEACH-IN procedure takes place by the transition from label to base material. We suggest to accomplish the TEACH-IN procedure with activated material feeding and multiple label/base material transitions.
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 $+U_B$) 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)
- insallation of the sensors with different directions of sound transmission.

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