Model Number

ULB-18GM50-255-2E3

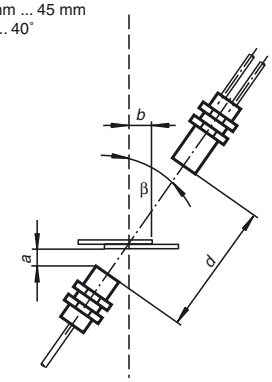
Features

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

Curves

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 0-level: $-U_B$ ... $-U_B$ + 1V 1-level: $+U_B$ - 1 V ... $+U_B$
Pulse length	≥ 500 ms
Impedance	≥ 10 kΩ
Output	
Output type	2 switch outputs pnp, NC
Rated operational 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 (273 ... 333 K)
Storage temperature	-40 ... 70 °C (233 ... 343 K)
Mechanical specifications	
Protection degree	IP67
Connection	2 m, PVC cable 0.14 mm²
Material	
Housing	brass, nickel-plated, 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 IEC 60947-5-2:2007
Approvals and certificates	
UL approval	C-UL listed: 57M3, IND CONT. EQ., "Powered by Class 2 Power Source"

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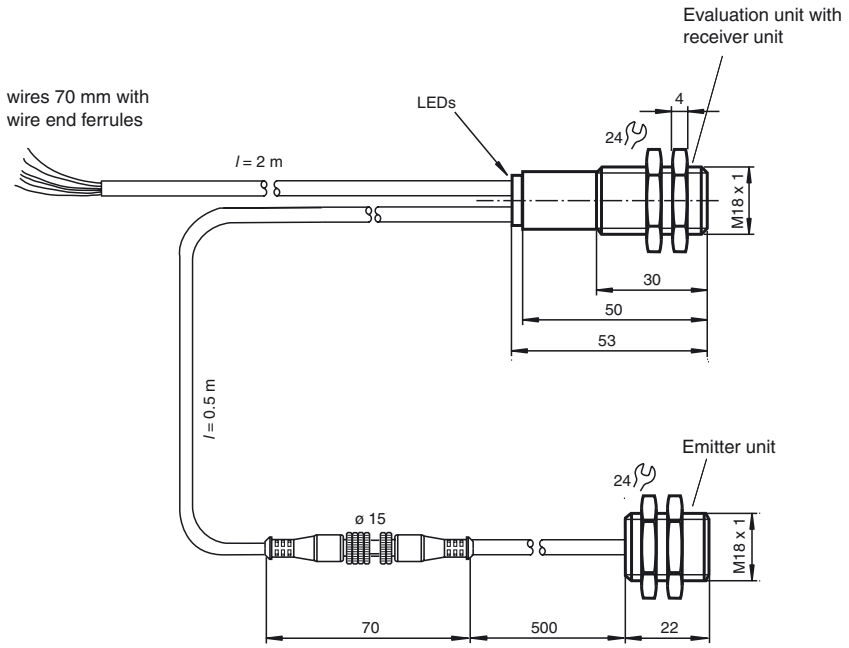
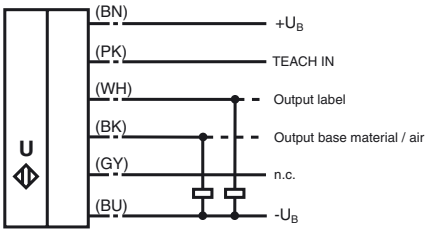
Dimensions



Electrical Connection

Standard symbol/Connection:
Label monitor



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.

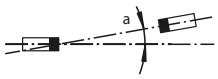
Electrical connection

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.

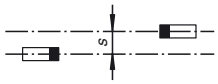
Colour	Switching on	Comments
BN	$+U_B$	
WH	Switch output for labels	Pulse width corresponds to the event

Additional Information

Angular misalignment
a < +/- 1°



Sensor offset
s < +/- 1 mm



Accessories

MH-UDB01
Mounting aid

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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

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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