Model Number

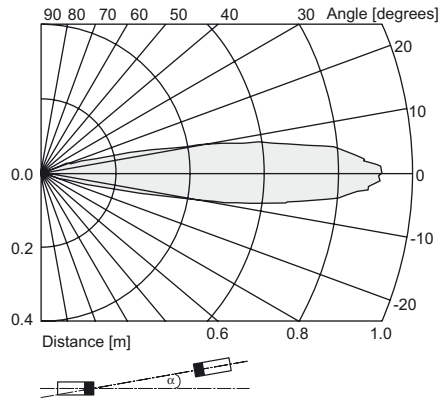
UDBK-18GM35-3E2

Features

- **Ultrasonic system for detection of single and pasted double sheet**
- **Weights of paper from 30 g up to cartons weighing over 1200 g can be detected**
- **It is also possible to detect thin metal and plastic films.**
- **Various materials and thicknesses are programmed in using a TEACH-IN signal**
- **Automatic compensation of the operating point with slowly changing ambient condition**
- **Signal output via short-circuit proof PNP switch outputs**
- **Very high processing speeds are possible.**

Diagrams

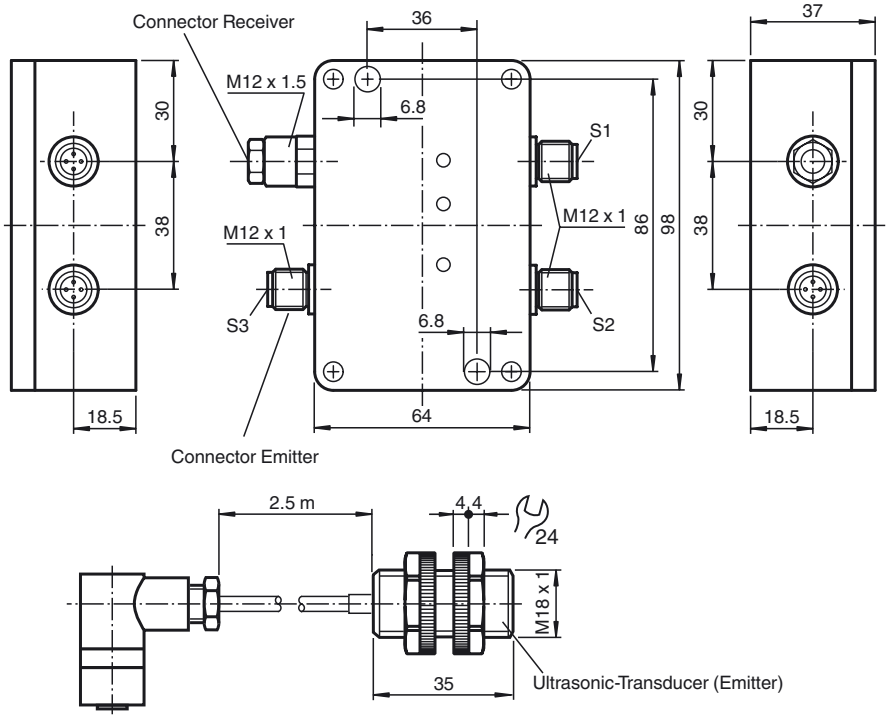
Characteristic response curves



Technical data

General specifications	
Transducer frequency	180 kHz
Indicators/operating means	
LED green	indication: single sheet detected
LED yellow	indication: no sheet detected
LED red	indication: double sheet or contact spot detected
Electrical specifications	
Operating voltage U_B	20 ... 30 V DC , ripple 10 $\%_{SS}$
No-load supply current I_0	< 80 mA
Input	
Input type	1 pulse input for Teach-In
Pulse length	≥ 100 ms
Impedance	≥ 10 kOhm
Voltage	12 ... 30 V
Output	
Output type	3 switch outputs PNP, NO
Rated operating current I_e	3 x 200 mA
Voltage drop U_d	≤ 2 V
Switch-on delay t_{on}	≤ 1 ms
Switch-off delay t_{off}	≤ 100 ms
Ambient conditions	
Ambient temperature	0 ... 60 °C (32 ... 140 °F)
Storage temperature	-40 ... 70 °C (-40 ... 158 °F)
Mechanical specifications	
Connection type	emitter: V1-W connector with 2.5 m cable receiver: 2.5 m fixed cable (not disconnectable) S1,S2: 2 connectors V1-W, M12x1 (included with delivery)
Degree of protection	IP65
Material	
Housing	Makrolon/nickel-plated brass
Mass	370 g
Compliance with standards and directives	
Standard conformity	
Standards	EN 60947-5-2:2007 + A1:2012 IEC 60947-5-2:2007 + A1:2012
Approvals and certificates	
UL approval	cULus Listed, General Purpose
CSA approval	cCSAus Listed, General Purpose
CCC approval	CCC approval / marking not required for products rated ≤36 V

Dimensions



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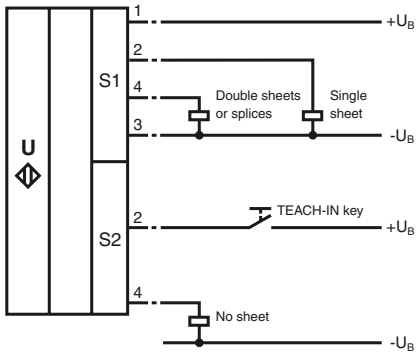
Electrical Connection

Standard symbol/Connection:
Double-sheet-control



Pinout

Connector V1

Accessories

MH-UDB01
Mounting bracket for double sheet monitor

Description of the sensor functions

Ultrasonic double-sheet monitoring to detect splice points is used in all situations in which an automatic distinction must be made between splice points and double sheets in order to protect machines or avoid waste production. Double-sheet monitoring for splice point detection is based on the ultrasonic through-beam principle. The following can be detected:

- No sheet
- Individual sheet
- Splice point or double sheet

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 automatically compensated. The evaluation electronics are installed in a cuboid plastic housing separate from the sensor heads.

Measuring system

A complete system consists of an ultrasonic emitter, an ultrasonic receiver and an evaluation unit. These units have been optimally tuned to one another at the factory and may not be used separately.

Alignment

When adjusting the emitter and receiver, take care to align them as precisely as possible.

Distance of the sensor heads: d = 20 mm ... 80 mm
Angular tolerance: α < +/- 2°
Maximum offset: s < +/- 2 mm

To ensure their correct function, the sensor heads must be aligned at an angle of 20° ... 45° from vertical onto the paper surface. The paper is guided over the emitter at a distance of 5 mm ... 15 mm. The emitter is installed below in order to prevent dust deposits. Install the sensor heads using the included plastic nuts. The sound cone must be completely covered by the paper. This means that the sensor heads must be installed above the sheet of paper and at least 10 mm away from the side edge of the paper.

Feed speed of the sheet (approximate value)

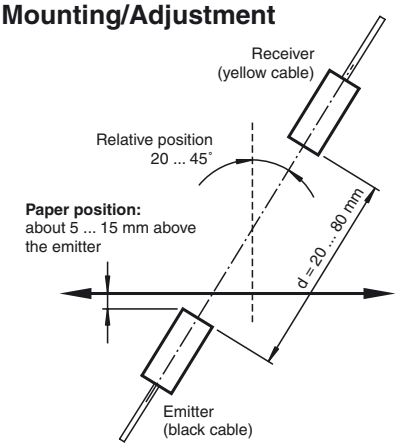
v_{min} = 0.035 m/s

v_{max} [m/s] = overlapping of sheets [mm] / 1 ms (approx. value, overlapping > 20 mm)

Teach-In

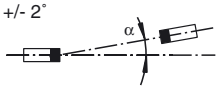
Additional Information

Mounting/Adjustment



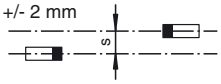
Angular alignment

α < +/- 2°



Sensor offset

s < +/- 2 mm



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1. After the operating voltage has been applied, a single sheet can be fed in as the first sheet. It will automatically be programmed as a reference value by the system.
2. If a single sheet of paper is located between the ultrasonic emitter and receiver when the operating voltage is turned on, it will automatically be programmed as a reference value by the system.

Automatic learning for thinner types of sheets

If you are inserting a thinner type of sheet, you can dispense with the use of the Teach-In signal to program the system. In order to do this, a single sheet of paper must be between the emitter and receiver for at least 2 s.

Automatic learning for thicker types of sheets

If you are inserting a thicker type of sheet but still not one that will result in double-sheet output, you can dispense with learning by means of the Teach-In signal. In order to do this, a single sheet of paper must be between the emitter and receiver for at least 2 s.

Teach-In for new type of sheet

If you are inserting a new type of sheet that will result in double-sheet output, the system must be reprogrammed. To do this, a single sheet must be placed between the emitter and receiver. After the Teach-In signal has been applied, the corresponding reference value will be accepted.

Caution!
The paper sheets may not touch the sensor heads during operation. Depending on physical conditions, reflections on the edge of a single sheet may result in double-sheet output. This is not an error, and can be masked out in the higher-level control system.

Sensor systems for ultrasonic double-sheet monitoring can also be delivered with a customised time response for optimal adaptation to specific applications.

Notes:

When installing, care has to be taken that the ultrasonic signal cannot pass around the material that is to be detected, due to multiple reflections. This can happen if large surfaces are present at right angles to the direction of sound propagation. This can be the case if unsuitable mounting brackets are used, or if assemblies with large surface are part of the machine. In the latter case such machine parts should be covered by sound absorbing material or a different location for the installation should be chosen.

In cases where more than one system is needed per machine, acoustic isolation should be provided to avoid cross-talk. This can be provided, for example, by appropriately positioning isolation panels.

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