

Ultrasonic double sheet monitor UDB-18GMA-400-3E2- Y181167

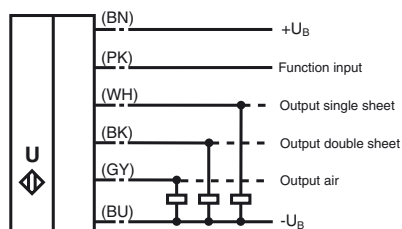


Features

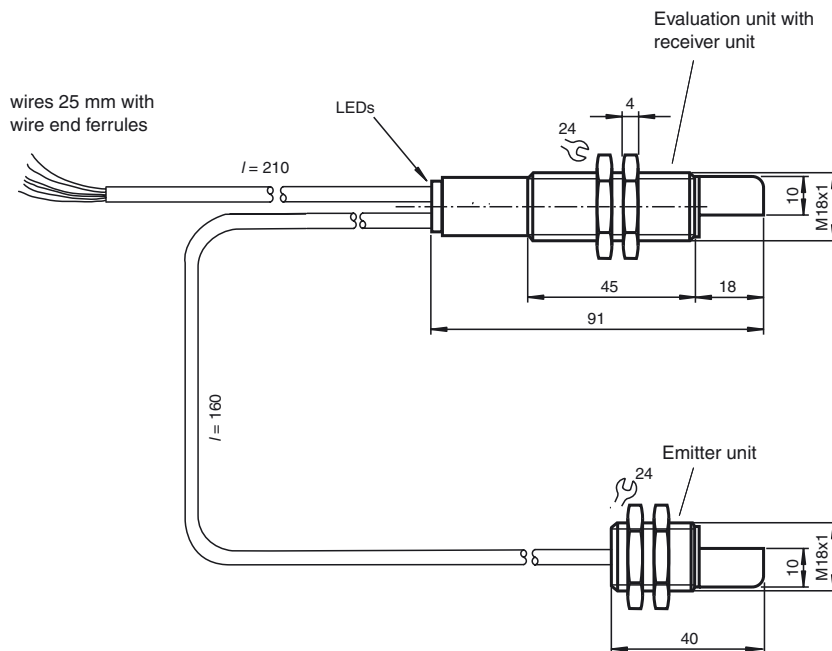
- Ultrasonic system for reliable detection of no, one, or two overlapping sheet materials, preferably papers
- No TEACH-IN required
- Function indicators visible from all directions
- Insensitive to printing, colours and shining surfaces
- Material weight from 10 g/m² up to over 2000 g/m²
- Perpendicular or inclined sensor mounting relative to the sheet plane possible

Electrical connection

Standard symbol/Connection:
Double sheet control



Dimensions



Technical data



General specifications

Sensing range 20 ... 60 mm , optimal distance: 45 mm
Transducer frequency 395 kHz

Indicators/operating means

LED green indication: single sheet detected
LED yellow Display: No sheet detected (Air)
LED red indication: double sheet detected

Electrical specifications

Operating voltage 20 ... 30 V DC , ripple 10 %_{SS}
No-load supply current I₀ < 80 mA

Input

Input type Function input
0-level: -U_B ... -U_B + 1V
1-level: +U_B - 1 V ... +U_B

Pulse length ≥ 100 ms
Impedance ≥ 4 kΩ

Output

Output type 3 switch outputs pnp, NO
Rated operational current I_e 3 x 100 mA , short-circuit/overload protected
Voltage drop U_d ≤ 2 V
Switch-on delay t_{on} approx. 15 ms (shorter response time on request)
Switch-off delay t_{off} approx. 15 ms (shorter response time on request)

Standard conformity

Standards IEC / EN 60947-5-2:2004 C-UL listed: 57M3, IND CONT. EQ., "Powered by Class 2 Power Source"

Ambient conditions

Ambient temperature 0 ... 60 °C (273 ... 333 K)
Storage temperature -40 ... 70 °C (233 ... 343 K)

Mechanical specifications

Protection degree IP67
Connection 210 mm, 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

Description of sensor functions

The ultrasonic double sheet monitor is used for double sheet detection in all situations in which the automatic distinction between double and single sheets is required in order to protect machines or avoid waste production. The double-sheet monitor is based on the ultrasonic through-beam principle. The following can be detected:

- No sheet, i.e. air,
- Individual sheet
- 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 compensated for automatically. The interface electronics is integrated into a compact M18 metal housing together with a sensor head.

Switching on

The sensor is equipped with 6 connections. The functionality of the connections is described in the following table. The function input (PK) is used to assign parameters to the sensor. (See output pulse extension and alignment aid). During normal operation, the function input must always be securely connected with $+U_B$ or $-U_B$, to avoid possible interference or improper functionality.

Colour	Switching on	Comments
BN	$+U_B$	
WH	Switch output for single sheets	Pulse width corresponds to the event
BK	Switch output for double sheets	Pulse width corresponds to the event
GY	Switch output for air	Pulse width corresponds to the event
PK	$-U_B/+U_B$	Function input for parameter assignment of pulse prolongation
BU	$-U_B$	

Normal mode

The sensor is working in normal mode if the function input (PK) is applied to $-U_B$ or $+U_B$ when the power source (Power-On) is supplied, as shown in the output pulse extension table (see below).

Displays:

- LED yellow: Detection of air
- LED green: Detection of single sheets
- LED red: Detection of double sheets

Switch outputs:

The switch outputs are only active in normal operation!

- White: WH Single sheet output
- Black: BK Double sheet output
- Gray: GY Air output

Output pulse extension

Switching the function input (PK) on to $-U_B$ or $+U_B$ makes it possible to select a minimum pulse width of 120 ms for all output pulses of the three switch outputs.

Switching on (PK)	Operating behaviour (after Power-On)
$-U_B$	No output pulse extension for switch outputs
$+U_B$	Output pulse extension of all switch outputs to at least 120 ms

Please note:

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

Alignment aid

During installation, the DSM can provide an adjustment aid for optimal alignment of the emitter to the receiver.

The sensor is working in alignment aid mode if the function input (PK) is unconnected when the power source (Power-On) is supplied.

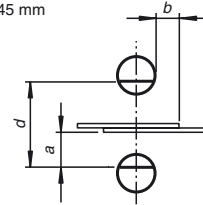
**UDB-18GMA-400-3E2-
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Characteristic curves/additional information

Mounting/Adjustment

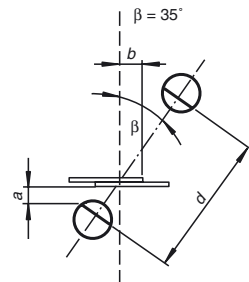
Recommended distances

- $a = 5 \dots 15 \text{ mm}$
- $b \geq 10 \text{ mm}$
- $d = 40 \dots 45 \text{ mm}$



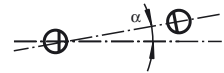
Mounting/Adjustment

(for very thick Papers)

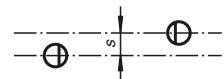


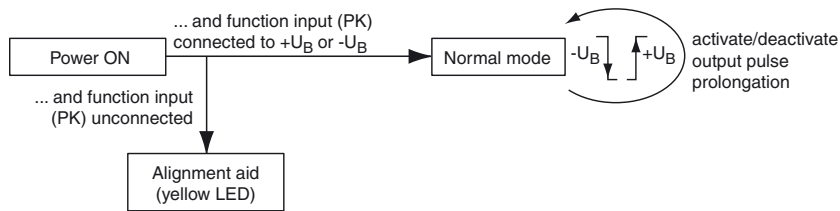
Thin foil detection

$\alpha < +/- 1^\circ$



$s < +/- 1 \text{ mm}$





If the sensor detects an area of air (yellow LED is lit) the DSM will begin to display the intensity of the measured amplitude signal:

- If the signal is weak, the yellow LED will flash at a slow rate
- As the intensity of the signal increases, the rate at which the LED flashes becomes faster
- At optimal alignment (maximum signal intensity), the yellow LED is continuously lit.

The single sheet function (green LED) and double sheet function (red LED) continues to be active. This makes it possible to check for correct functionality of the double sheet control.

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.

Very light papers (for example handkerchiefs) or perforated papers are not always suitable for double sheet detection because of their physical characteristics.

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.