Order Code

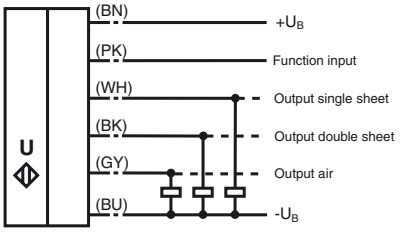
UDC-18GMA-400-3E2-Y203877

Features

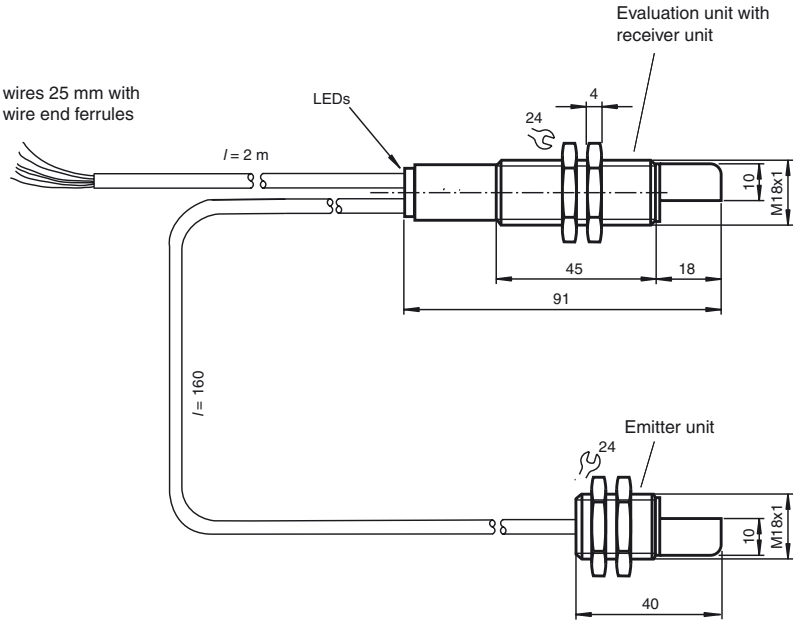
- Ultrasonic system for reliable detection of no, one, or two overlapping sheet materials, preferably papers
- Function indicators visible from all directions
- Insensitive to printing, colours, and shining surfaces
- Material weight from 10 g/m^2 up to over 2000 g/m^2
- Perpendicular or inclined sensor 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	Indication: No sheet detected (Air)
LED red	indication: double sheet detected
Electrical specifications	
Operating voltage U_B	20 ... 30 V DC , ripple 10 %$_{SS}$
No-load supply current I_0	< 80 mA
Time delay before availability t_v	< 3 s
Input	
Input type	Function input 0-level: -U_B ... -U_B + 1V 1-level: +U_B - 1 V ... +U_B
Pulse length	≥ 1 s
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	≤ 3 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)
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

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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.

Connection

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 activate the automatic program selection. During normal operation, the function input must always be securely connected with $-U_B$, 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 automatic program selection
BU	-UB	

Normal mode

The sensor is working in normal mode if the function input (PK) is applied to $-U_B$ when the power source (Power-On) is supplied.

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

Automatic program selection

Place the sheet to be detected in between the both sensor heads. To activate the automatic selection mode, connect the function input PK (wire colour pink) with $+U_B$ longer than 1 s, but shorter than 5 s. During this period, the yellow LED flashes.

After opening this connection the green LED indicates the selected program (number of blinking pulses = program number).

If there was no sheet in between the sensor head during the automatic program selection mode was activated, the red LED flashes. The sensor continues normal operation with the previously set program.

If the function inputPK is connected with $+U_B$ longer than 5 s, a sensor reset to the initial factory setting is performed.

A connection of the function input PK with $+U_B$ less than 1 s causes no action.

Programs

Program #	Description
1	standard papers
2	thick and heavy papers
3	thin and light papers

Note

Program 1 is the program, which covers the wides material spectrum.

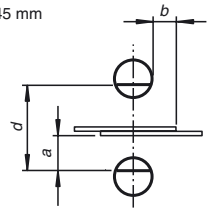
The standard setting program 1 is designed that way, that for the very most applications no adjustment changes are necessary.

Characteristic Curves/Additional Information

Mounting/Adjustment

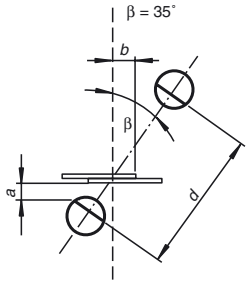
Recommended distances

a = 5 ... 15 mm
b ≥ 10 mm
d = 40 ... 45 mm



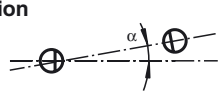
Mounting/Adjustment

(for very thick Papers)

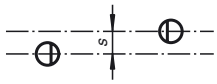


Thin foil detection

α < +/- 1°



s < +/- 1 mm



Accessories

UDB-Cable-2M
Accessories

UDB-Cable-1M
Accessories

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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.

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.

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.

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