Ultrasonic sensors
UM18 Double Sheet Detector

UM18-20012
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Model Name > UM18-20012
Part No. > 6025670

At a glance
- Double-sheet detection of foils, metal sheets and corrugated cardboard with F, N and G flute sizes
- Installation distance 37 mm ... 43 mm
- Automatic adjustment, plug and play operation
- Color-independent detection
- Two switching outputs for double and miss-fed sheets

Your benefits
- Increased quality and productivity through reliable double sheet detection
- Fast commissioning since sensor does not require calibration or teaching
- Reliable detection of transparent foils, various paper types and thin metal sheets provide application flexibility

Performance

<table>
<thead>
<tr>
<th>Resolution</th>
<th>Double sheets not completely glued together</th>
</tr>
</thead>
<tbody>
<tr>
<td>Response time</td>
<td>2.5 ms/6.5 ms</td>
</tr>
<tr>
<td>Ultrasonic frequency (typical)</td>
<td>400 kHz</td>
</tr>
<tr>
<td>Installation distance</td>
<td>37 mm ... 43 mm</td>
</tr>
<tr>
<td>Blind zone</td>
<td>7 mm from sender and receiver</td>
</tr>
<tr>
<td>Permissible angle deviation</td>
<td>± 45 ° perpendicular to sheet</td>
</tr>
<tr>
<td>Detectable material</td>
<td>Metal-laminated sheets and films: ≤0.4 mm, Paper grams per square meter: 20 ... 1,200 g/m², Self-adhesive films, metal sheets: ≤0.3 mm, Corrugated cardboard: single wall F, N and G flute sizes</td>
</tr>
</tbody>
</table>

1) Approximate values: should be qualified in the application

Interfaces

<table>
<thead>
<tr>
<th>Switching output 1), 2), 3)</th>
<th>2 x PNP (500 mA)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Off delay</td>
<td>10 ms</td>
</tr>
<tr>
<td>Control input</td>
<td>1 x</td>
</tr>
</tbody>
</table>

1) Output Q short-circuit protected
2) Q1: switching output double sheet, Q2: switching output mis-fed sheet, normally closed
3) PNP: HIGH = V_S - (< 2 V)/LOW = 0 V

Mechanics/electronics
Supply voltage $V_s$ \(^1\): DC 20 V ... 30 V  
Power consumption \(^2\): $\leq 1.35$ W  
Initialization time: $\leq 300$ ms  
Design: Cylindrical, M18  
Housing material: nickel-plated brass  
Connection type:  
- Connection cable: 5-pin, 2 m, PVC  
- Sender: cable with connector, 2-pin, 1 m, PVC  
- Receiver: cable with connector, 2-pin, 1.2 m, PVC  
Indication: 1 x dual LED \(^3\)  
Weight: 280 g \(^3\)  

\(^1\) Limit values, reverse-polarity protected, operation in short-circuit protected network: max. 8 A  
\(^2\) Without load  
\(^3\) Incl. cable

**Ambient data**

Enclosure rating: IP 67 \(^1\)  
Ambient temperature:  
- Operation: +5 ... +60 °C  
- Storage: -40 ... +85 °C

\(^1\) Connector of connection cable between sender and receiver complies with IP 20

**Dimensional drawing**

![Dimensional drawing with annotations](image-url)

All dimensions in mm (inch)

\[1\] Connection cable: 5-pin, 2 m, PVC  
\[2\] Sender: cable with connector, 2-pin, 1 m, PVC  
\[3\] Status indicator of the switching outputs  
\[4\] Receiver: cable with connector, 2-pin, 1.2 m, PVC  
\[5\] Mounting nuts, 5W 24 mm

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Adjustments

[1] Connection cable: 5-pin, 2 m, PVC
[2] Receiver: cable with connector, 2-pin, 1.2 m, PVC
[3] Status indicator of the switching outputs

Connection type receiver
Connection type sender

Connection diagram receiver

- brn
- blk
- blu
- whit
- gra

L+
\bar{Q}_1
M
\bar{Q}_2
E
Characteristic curve

\( \bar{q}_1 \) and \( \bar{q}_2 \) are characteristic curves for different scenarios:

- \( \bar{q}_1 \):
  - High
  - Low
  - OFF delay

- \( \bar{q}_2 \):
  - High
  - Low
  - OFF delay

Double sheet in work area, Single sheet in work area, "Missing sheet"
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