THE CLEAR CHOICE FOR DETECTING TRANSPARENT LABELS

Product description

The UF ultrasonic sensors reliably detects labels and materials, regardless of printed design, transparency or surface characteristics. Unlike optical sensors, the UF3 relies on damping – a process where the thickness of a material determines the degree to which the sensor absorbs sound waves. A high level of positioning accuracy and stable response times make the fork sensor suitable for nearly any environment. Due to its small, compact metal housing, the UF can be used in harsh conditions and where space is limited. As a result, the UF3 can distinguish between labels located just 2 mm apart from one another on an adhesive tape. Applications include detecting transparent labels on transparent substrates, detecting labels with different printed designs or differentiating between single- and two-ply materials.

At a glance

- Detection of transparent, opaque or printed labels
- Unaffected by metallic foils and labels
- Fast response time of 250 µs
- Simple and accurate adjustment via “+”/”–”-buttons or teach-in
- Rugged, IP 65 aluminum housing

Your benefits

- Reliable label detection, regardless if labels are transparent, opaque or have a printed design, ensuring greater flexibility with one sensor
- Fast response times enable precise detection – even at high web speeds
- The aluminum housing meets all requirements for use in harsh industrial conditions
- Setting the switching threshold using the +/- push buttons or teach-in
- Ultrasonic technology prevents false detection, which may be caused by ambient light or shiny surfaces

Additional information

→ www.sick.com/de/en/UF

For more information, just enter the link or scan the QR code and get direct access to technical data, CAD design models, operating instructions, software, application examples and much more.

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Subject to change without notice

Detailed technical data

Features

Dimensions (W x H x D)	18 mm x 47.5 mm x 92.5 mm
Functional principle	Ultrasonic detection principle
Housing design (light emission)	Fork shaped
Fork width	3 mm
Fork depth	69 mm
Minimum detectable object (MDO)	Gap between labels: 2 mm Size of labels: 2 mm
Label detection	✔
Adjustment	Dynamic teach-in, Static teach-in
Output function	Light/darkswitching, selectable via button

Mechanics/electronics

Supply voltage [1]	10 V DC ... 30 V DC
Ripple [2]	< 10 %
Power consumption [3]	40 mA
Switching frequency [4]	1.5 kHz
Response time [5]	250 µs
Switching output	PNP: HIGH = V_S– ≤ 2 V / LOW approx. 0 V NPN: HIGH = approx. V_S / LOW ≤ 2 V (depending on type)
Output type	PNP / NPN (depending on type)
Output current $I_{max.}$ [6]	100 mA
Input, teach-in (ET)	Teach: U > 7 V ... < U_V; Run: U < 2 V
Initialization time	100 ms
Connection type	Connector M8, 4-pin
Protection class [7]	III
Circuit protection	Output Q short-circuit protected, Interference suppression
Enclosure rating	IP 65
Weight	95 g
Housing material	Metal, aluminum

[1] Limit values, reverse-polarity protected, operation in short-circuit protected network: max. 8 A.
[2] May not exceed or fall below U_v tolerances.
[3] Without load.
[4] With light/dark ratio 1:1, typical, dependent on material and speed.
[5] Signal transit time with resistive load.
[6] Output current minimal 0.03 mA.
[7] Reference voltage DC 50 V.

Ambient data

Ambient operating temperature [1]	+5 °C ... +55 °C
Ambient storage temperature	–20 °C ... +70 °C
Shock load	According to EN 60068-2-27
EMC [2]	EN 60947-5-2

[1] Do not bend below 0 °C.
[2] The UFN complies with the Radio Safety Requirements (EMC) for the indus-trial sector (Radio Safety Class A). It may cause radio interference if used in residential areas.

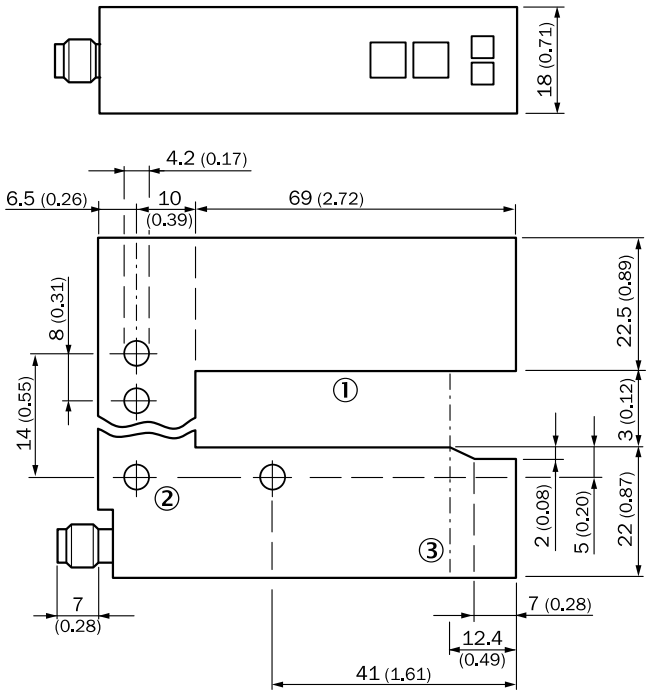
Ordering information

Other models ➜ www.sick.com/de/en/UF

- **Connection type:** Connector M8, 4-pin

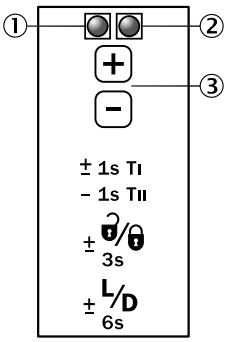
Fork width	Fork depth	Teach-in	Output type	Connection diagram	Type	Part no.
3 mm	69 mm	–	PNP/NPN	Cd-086	UFN3-70B413	6049678
		Teach: U > 7 V ... < U_V, Run: U < 2 V	NPN	Cd-092	UFN3-70N415	6049680
			PNP	Cd-092	UFN3-70P415	6049679

Dimensional drawing (Dimensions in mm (inch))



① Fork opening: fork width 3 mm, forks depth 69 mm
② Mounting hole, Ø 4.2 mm
③ Detection axis

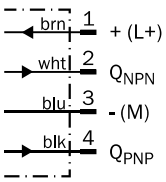
Adjustments



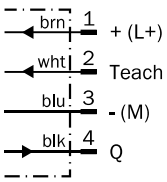
① Function signal indicator (yellow), switching output
② Function indicator (red)
③ "+"/"–" buttons and function button

Connection diagram

Cd-086



Cd-092



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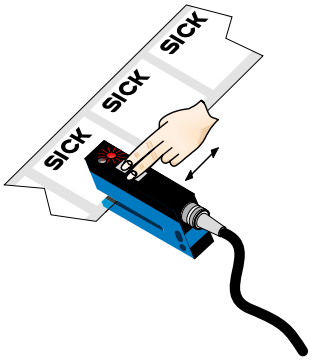
Setting the switching threshold

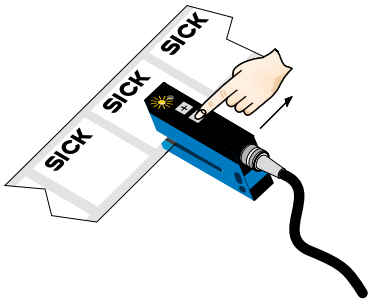
Teach-in dynamic

1. Position label or substrate in the active area of the fork sensor



Press both the “+” and “–” buttons together, hold > 1 s and than release the teach-in buttons. The red LED flashes.

2. Move multiple labels through the fork sensor



Press “–” button, teach-in process is finished.

Notes

Switching threshold adaptation:
Only, the first teach-in procedure after switching on is permanently stored. Teach-in can be repeated cyclically. Switching output also during teach-in active.

[+] [–] Once teach-in process is complete, the switching threshold can be adjusted at any time using the “+” or “–” button. To make minor adjustments, press the “+” or “–” button once. To configure settings quickly, keep the “+” or “–” button pressed for longer.

± 3s Press both the “+” and “–” buttons together (3 seconds) to lock the device and prevent unintentional actuation.

± L/D 6s Press both the “+” and “–” buttons together (6 seconds) to define the switching function (light/dark switching). Standard setting: Q = light switching.

Teach-in (static): Setting the switching threshold without movements of label, cf. operating instruction.

Recommended accessories

Plug connectors and cables

Connecting cables with female connector

M8, 4-pin, PVC, chemical resistant

Figure	Connection type head A	Connection type head B	Connecting cable	Type	Part no.
	Female connector, M8, 4-pin, straight, unshielded	Cable, open conductor heads	2 m, 4-wire	DOL-0804-G02M	6009870
			5 m, 4-wire	DOL-0804-G05M	6009872
			10 m, 4-wire	DOL-0804-G10M	6010754
	Female connector, M8, 4-pin, angled, unshielded	Cable, open conductor heads	2 m, 4-wire	DOL-0804-W02M	6009871
			5 m, 4-wire	DOL-0804-W05M	6009873
			10 m, 4-wire	DOL-0804-W10M	6010755

➜ For additional accessories, please see page K-240

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