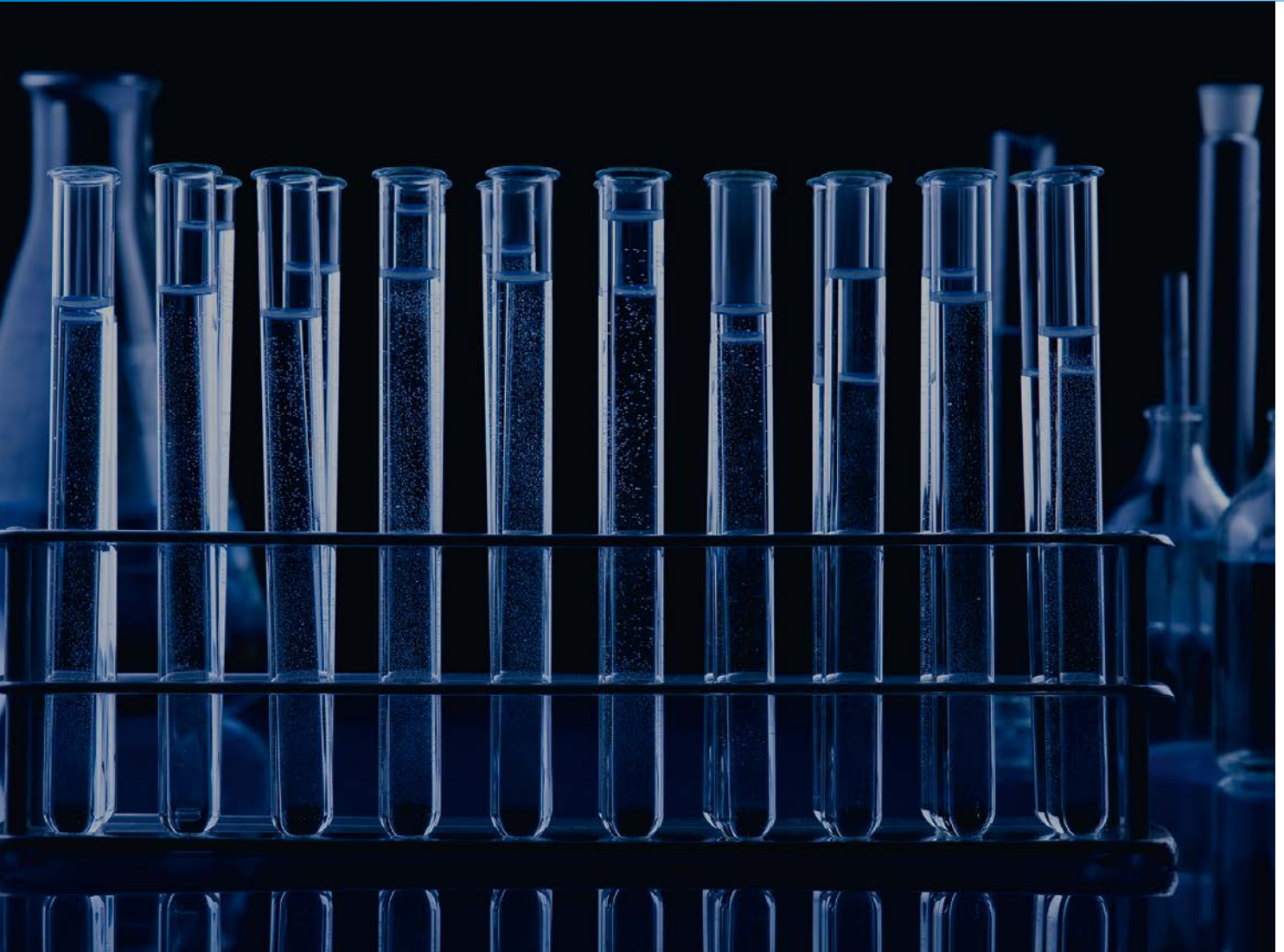# LUTM
SMALL, INTELLIGENT LUMINESCENCE SENSOR

Luminescence sensors

SICK
Sensor Intelligence.

LUTM: AS YOU SEE, YOU CANNOT SEE A THING

Luminescence sensors detect marks that light up exclusively under UV light. This is due to fluorescent substances contained in the mark, which convert UV light into visible light. The reflected light beam is detected and evaluated by the luminescence sensor.

## Reliable detection of fluorescent materials

The LUTM luminescence sensor impresses with its miniature housing and IO-Link function. A cable with M12 male connector and matching holders ensure compatibility with predecessor models. The LUTM can be relied upon to detect fluorescent marks even when the luminescence factor is low.
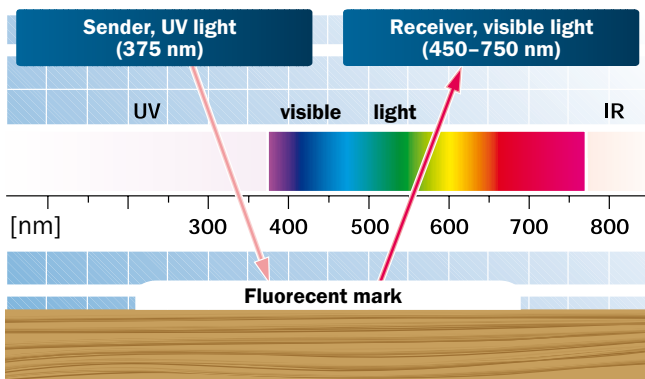
Operating principle

Luminescence sensors emit modulated UV light with a wavelength of 375 nm. Fluorescent substances are excited by this, and send back light with a long wavelength in the visible spectrum (approx. 450 to 750 nm). This light is detected and evaluated by the luminescence sensor.
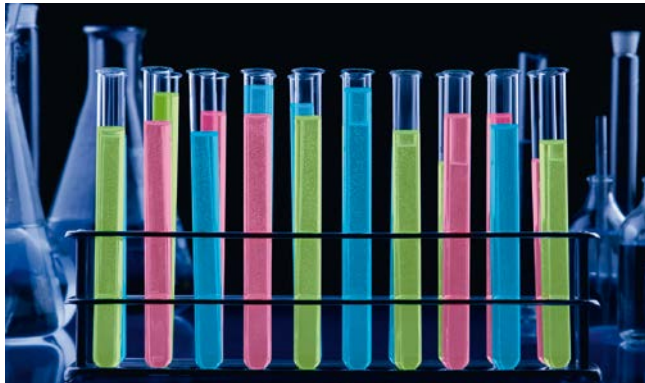
Luminophores

The illumination effect of the fluorescent substances is attributable to admixed luminophores – small particles that convert UV light into visible light in different wavelength ranges and at different intensities. Luminophores can be admixed to almost all substances. Typical examples are chalk or wax crayon, ink, oil, grease, labels, and felt-tip pens.

## Space-saving miniature housing

Thanks to its innovative miniature housing, the LUTM can also be installed in confined spaces. The luminescence sensor is configured through a straightforward teach-in operation and the integrated IO-Link interface facilitates remote control and rapid analysis.

Pharmaceutical industry

Whether inserting package slips into packages or attaching labels to ampules, LUTM luminescence sensors maximize process reliability. They are able to do this by drawing on their additional strengths: high switching frequency and detection reliability.
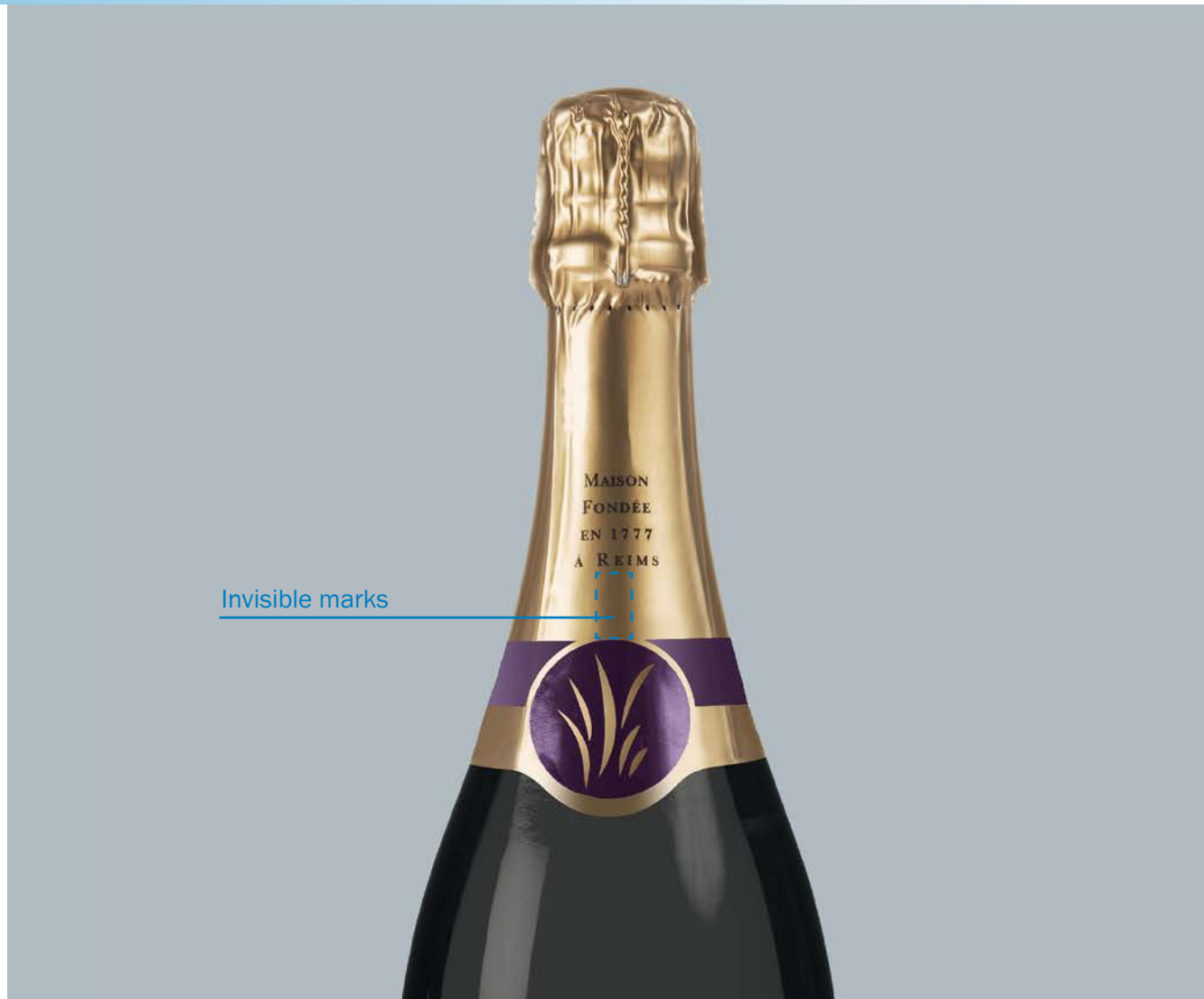
Invisible marks

Food and beverage industry

Manufacturers of luxury goods do not want control marks to impair the visual impact of high-quality label designs. Labels and sealing flaps on these items are aligned with invisible luminescent marks which light up exclusively under UV light and can be detected by the LUTM with ease. Moreover, SICK's luminescence sensors are easy to adjust and put into operation.

SMALL, INTELLIGENT LUMINESCENCE SENSOR
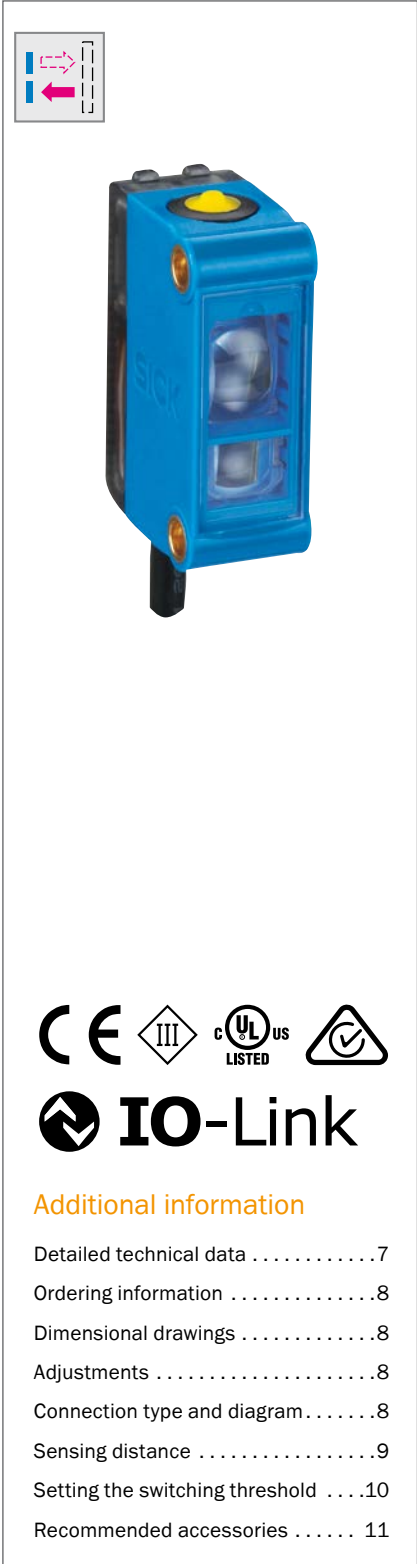
Product description

Enhanced performance for fluorescent materials: The new LUTM luminescence sensor from SICK features a novel miniature housing combined with an IO-Link function. The LUTM is ideal for all applications where fluorescent marks need to be reliably detected in confined spaces. Even when the level of luminescence is low, the LUTM detects the relevant marks using its enhanced system sensitivity. This mini luminescence sensor can be set using a straightforward teach-in method. The innovative IO-Link function enables enhanced, intelligent diagnostics and visualization of sensor parameters, as well as provide quick and easy format changes. Thanks to an increased switching frequency of up to 6 kHz, the LUTM is also suitable for high machine production capacities.

At a glance

- Luminescence sensor in a miniature housing
- Static and dynamic teach-in methods in a single variant
- Reliable detection even at a low level luminescence
- Improved gloss behavior
- Switching frequency of 6 kHz
- 12.5 mm + / - 3 mm sensing distance
- Remote monitoring and rapid analysis using IO-Link function
- Compatibility with older LUT sensors thanks to M12 pigtail

Your benefits

- Miniature housing enables installation in small spaces
- Quick and easy commissioning saves time and costs
- Increased switching frequency for improved machine productivity
- Enhanced process reliability thanks to gloss suppression
- Highly flexible during commissioning thanks to a range of teach-in methods
- Enhanced, intelligent diagnostics and visualization of sensor parameters, as well as quick and easy format changes, thanks to IO-Link function
- Improved tolerance range at longer detection distances
- Rapid conversion thanks to mounting brackets available

→ **www.mysick.com/en/LUTM**

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.

Detailed technical data

Features

Dimensions (L x W x H)	12 mm x 31.5 mm x 21 mm
Light source [1] [2]	UV-LED
Light emission	Long side
Light spot direction	Vertical
Adjustment	2-point teach-in static/dynamic
Output function [3]	Light/dark switching

[1] Average service life of 100,000 h at T_A = +25 °C.

[2] Wave length: 370 nm.

[3] L/D switching via teach-in.

Mechanics/electronics

Supply voltage V_s [1]	DC 12 V … 24 V
Ripple [2]	≤ 5 V_{pp}
Power consumption [3]	≤ 50 mA
Switching frequency [4]	6 kHz depending on the mark intensity
Response time [5]	80 µs
Switching output	PNP: HIGH = V_S− ≤ 2 V / LOW approx. 0 V NPN: HIGH = approx. V_S / LOW ≤ 2 V
Output current $I_{max.}$ [6]	≤ 100 mA
Jitter	40 µs
Input, teach-in (ET)	PNP Teach: U = 10 V … < U_V Run: U < 2 V or open NPN Teach: U < 2 V Run: U = 10 V … < U_V or open
Connection type	Male connector M12, 4-pin
Protection class	III
Circuit protection	V_S connections reverse-polarity protected Output Q short-circuit protected Interference suppression
Enclosure rating	IP 67
Weight	Approx. 70 g
Housing material	ABS

[1] Limit values: DC 12 V (–10 %) … 24 V (+20 %). Operation in short-circuit protected network max. 8 A.

[2] May not exceed or fall short of V_S tolerances.

[3] Without load.

[4] With light/dark ratio 1:1.

[5] Signal transit time with resistive load.

[6] At supply voltage > 24 V, I_{max} = 30 mA. I_{max} is consumption count of all Q_n.

Ambient data

|	
Ambient temperature	Operation: –10 °C … +55 °C Storage: –20 °C … +75 °C
Shock load	According to IEC 60068
UL File No.	NRKH.E181493 & NRKH7.E181493

Ordering information

Scanning range [1]	Sensing distance tolerance	Operating range	Light spot size [2]	Receiving range	Switching output	Type	Part no.
12.5 mm	± 3 mm	8 mm … 20 mm	2 mm x 2.5 mm	450 nm … 750 nm	PNP	LUTM-UP81162P	1067295
					NPN	LUTM-UN81162P	1067296
					PNP, IO-Link	LUTM-UP817A2P	1067297

[1] From front edge of lens.

[2] At sensing distance.

Dimensional drawings (Dimensions in mm (inch))
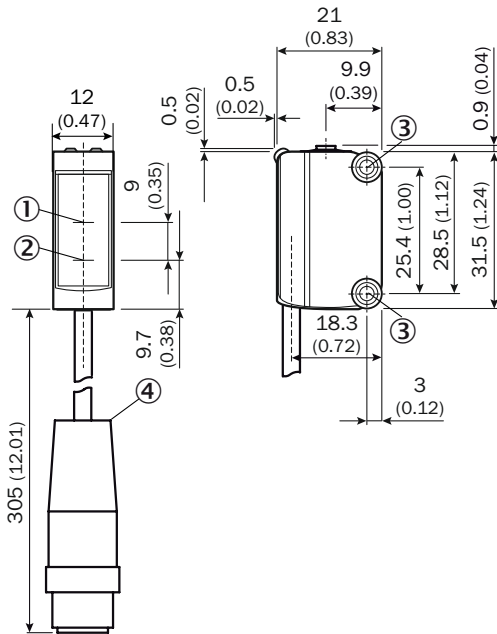
① Optical axis receiver
② Optical axis sender
③ Fixing hole M3
④ Pigtail

Adjustments
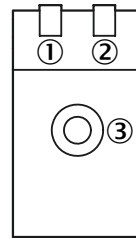
① Status indicator LED, yellow: Status switching output Q
② Status indicator LED green: power on
③ Teach-in button

Connection type and diagram

Cable with connector M12, 4-pin

brn	1	L+
blk	4	Q
wht	2	ET
blu	3	M

Cable with connector M12, 4-pin, IO-Link

brn	1	L+
blk	4	C/Q
blu	3	M
wht	2	Q

Sensing distance

Relative sensitivity in %
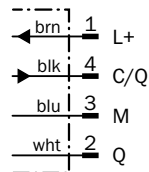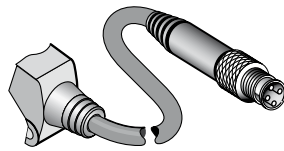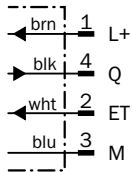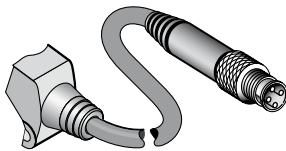
Sensing distance in mm (inch)
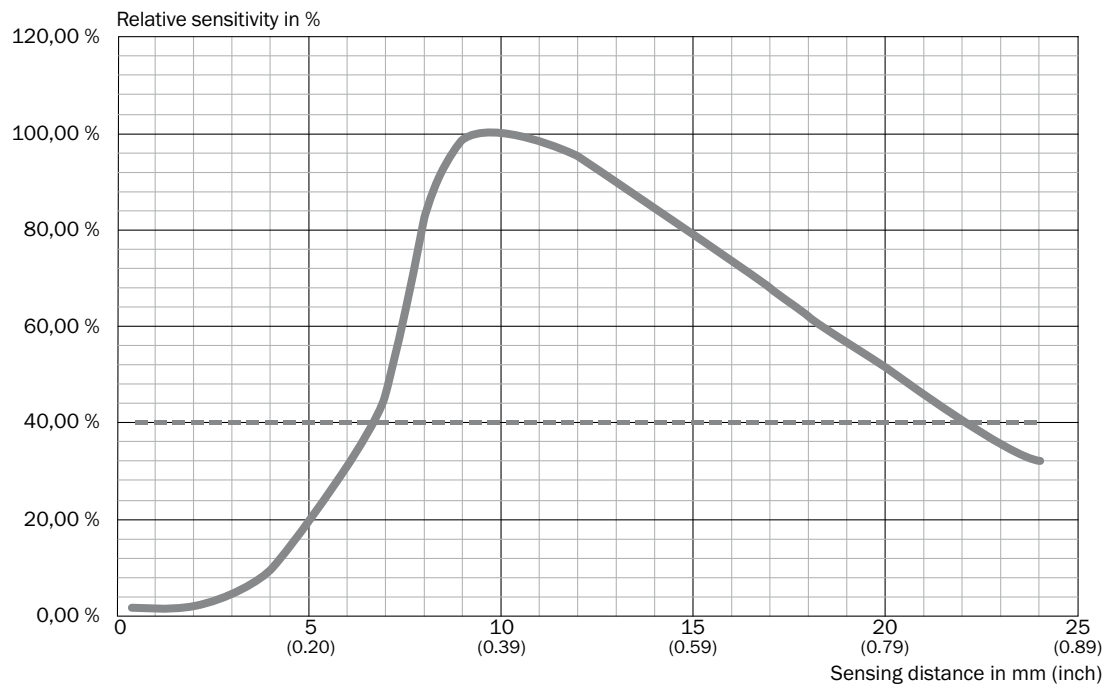
Setting the switching threshold via teach-in (static 2-point teach-in)

1. Position fluorecent mark

2. Position background
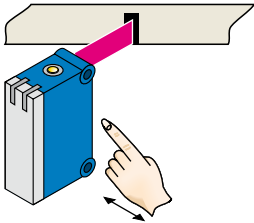
Press and hold teach-in button > 1 < 3 s. Yellow LED flashes slowly.
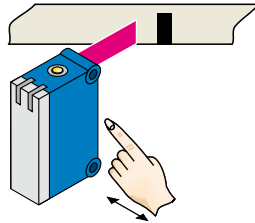
Press and hold teach-in button < 3 s. Yellow LED goes out.

Setting the switching threshold via teach-in (dynamic)

1. Position background

2. Move at least the fluorecent mark and background using the light spot.
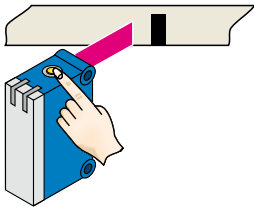
Press the teach-in button and keep it pressed. LED flashing slowly.
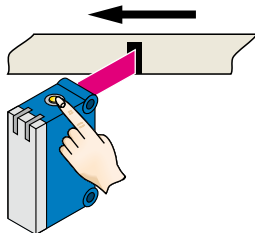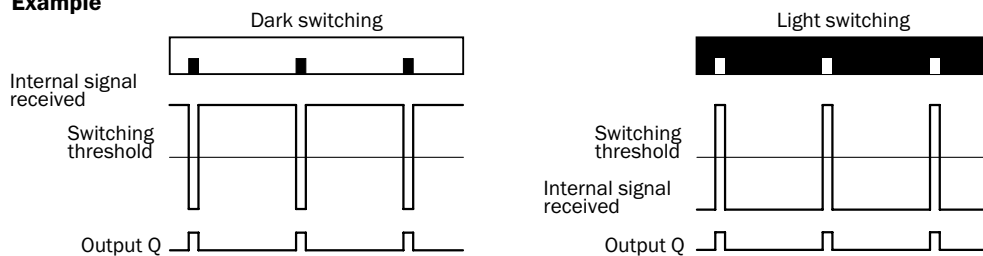
Keep the teach-in button > 3 < 30 s pressed.
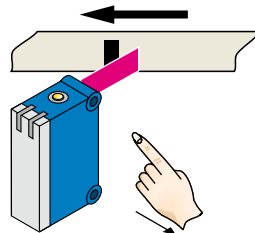
Release the teach-in button.
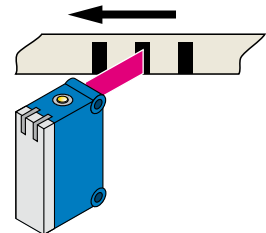
Yellow LED will illuminate, when emitted light is on the fluorecent mark.

Example

Dark switching

Internal signal received

Switching threshold

Output Q

Light switching

Switching threshold

Internal signal received

Output Q

Switching characteristics

Static teach-in: light/dark setting is defined using teach-in sequence.
Dynamic teach-in: switching output active on fluorecent mark, if background is longer in the field of view during the teach-in. The switching threshold is set automatically between the background and the mark.

Teach-in can also be performed using an external control signal (only dynamic teach-in).

Keylock activation and deactivation: hold down teach-in button > 30 s.

Teach-in failure: yellow LED indicator and the transmitted light of the sensor flashing quickly.
For dynamic teach-in with ET signal (5 Hz) via switching output Q.

Recommended accessories

Universal bar clamp systems

Figure	Material	Description	Model name	Part no.
	Steel, zinc coated	Universal clamp bracket for rod mounting	BEF-KHS-KH1	2022726
		Plate L for universal clamp bracket	BEF-KHS-L01	2023057
	Zinc plated steel (sheet), Diecast zinc (clamp)	Plate N08 for universal clamp bracket	BEF-KHS-N08	2051607
	Stainless steel 1.4571 (sheet), Stainless steel 1.4408 (clamp)	Plate N08N for universal clamp bracket	BEF-KHS-N08N	2051616
	Steel, zinc coated	Mounting bar, straight, 200 mm	BEF-MS12G-A	4056054
		Mounting bar, straight, 300 mm	BEF-MS12G-B	4056055
		Mounting bar, L-shaped, 150 mm x 150 mm	BEF-MS12L-A	4056052
		Mounting bar, L-shaped, 250 x 250 mm	BEF-MS12L-B	4056053

Mounting brackets/plates

Mounting brackets

Figure	Material	Description	Model name	Part no.
	Stainless steel	Mounting bracket for wall mounting	BEF-W100-A	5311520
	Steel, zinc coated	Mounting bracket for floor mounting	BEF-W100-B	5311521
			BEF-WN-W100-S01	4073866

Mounting plates

Figure	Material	Description	Model name	Part no.
	Stainless steel	Adapter plate KT3 to KTM	BEF-AP-KTMS01	2068786

Plug connectors and cables

Connecting cable (female connector-open)

M12, 4-pin, PVC

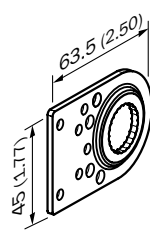| Figure	Connection type head A	Connection type head B	Connecting cable	Model name	Part no.
	Female connector, M12, 4-pin, straight, unshielded	Cable, open conductor heads	2 m, 4-pole	DOL-1204-G02M	6009382
			5 m, 4-pole	DOL-1204-G05M	6009866
	Female connector, M12, 4-pin, angled, unshielded	Cable, open conductor heads	2 m, 4-pole	DOL-1204-W02M	6009383
			5 m, 4-pole	DOL-1204-W05M	6009867

Female connector (ready to assemble)

M12, 4-pin

Figure	Connection type head A	Connection type head B	Model name	Part no.
	Female connector, M12, 4-pin, straight, unshielded	Screw-type terminals	DOS-1204-G	6007302
	Female connector, M12, 4-pin, angled, unshielded	Screw-type terminals	DOS-1204-W	6007303

Universal bar clamp systems
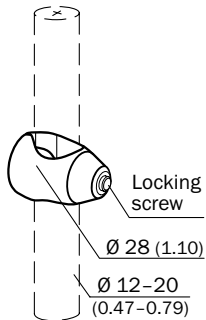
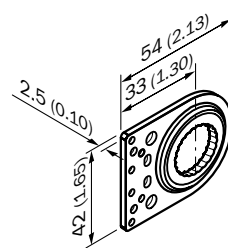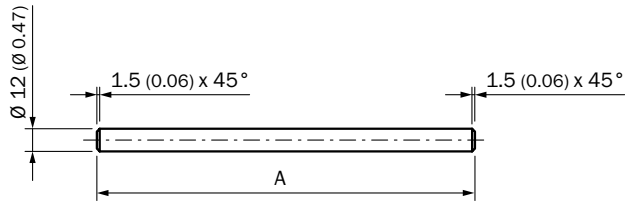BEF-KHS-KH1   BEF-KHS-L01   BEF-KHS-N08 / BEF-KHS-N08N
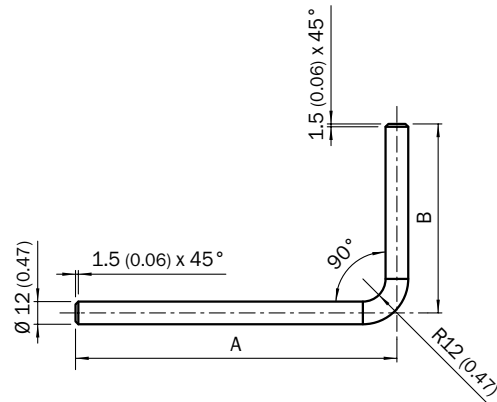

BEF-MS12G-A / BEF-MS12G-B   BEF-MS12L-A / BEF-MS12L-B
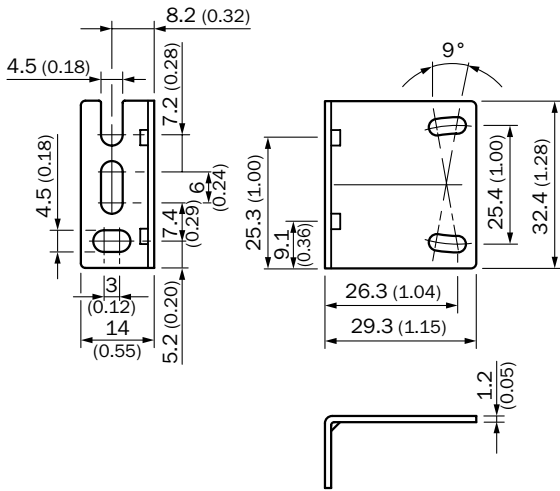

① BEF-MS12G-(N)A: A = 200 mm
② BEF-MS12G-(N)B: A = 300 mm

① BEF-MS12L-(N)A: A = 200 mm, B = 150 mm
② BEF-MS12L-(N)B: A = 250 mm, B = 250 mm

Mounting brackets/plates

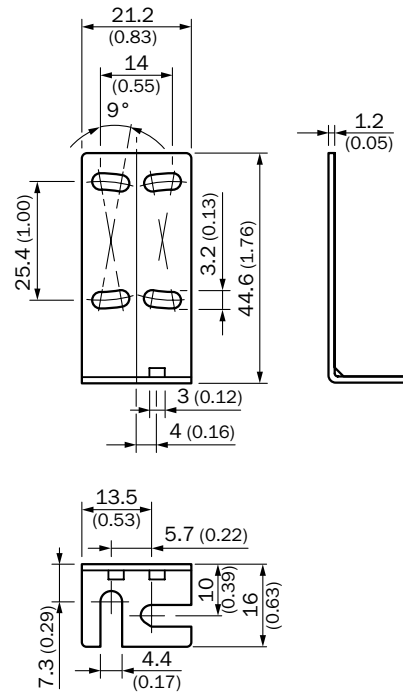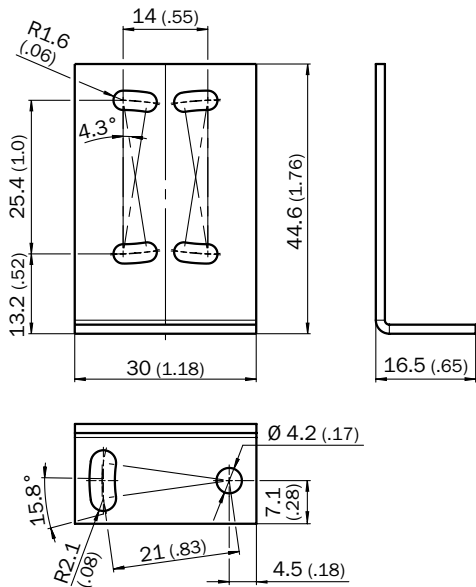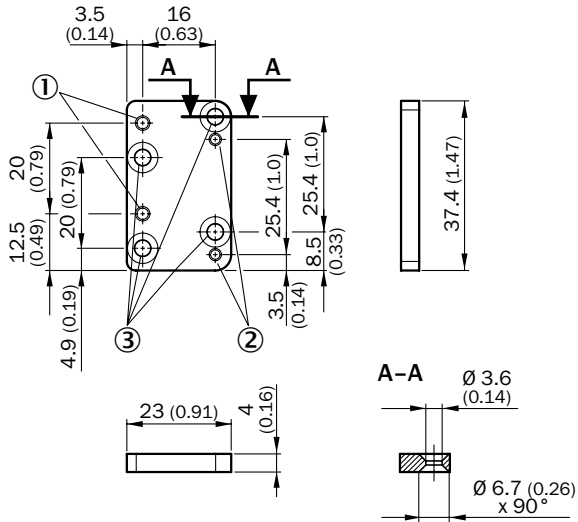## Mounting brackets

BEF-W100-A

BEF-W100-B

BEF-WN-W100-S01

Mounting plates

BEF-AP-KTMS01
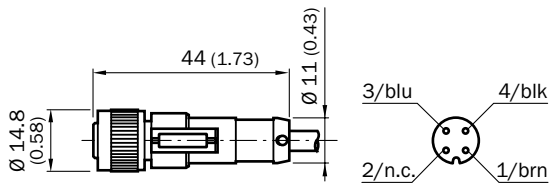

① Threaded mounting hole M3
② Threaded mounting hole M2.5
③ Fixing hole M3

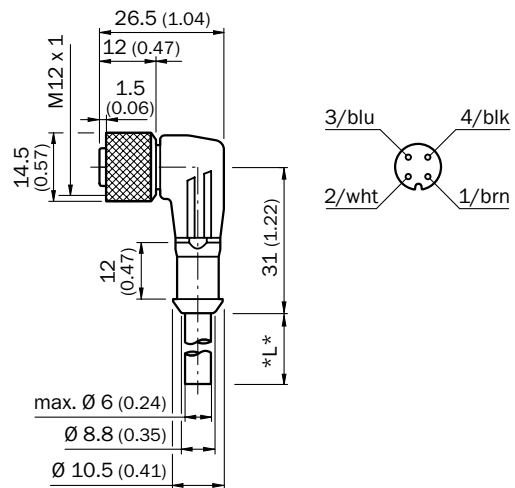## Plug connectors and cables

Connecting cable (female connector-open)

M12, 4-pin, PVC

DOL-1204-GxxM
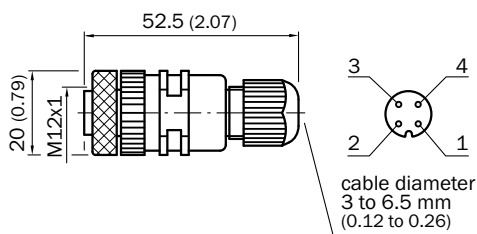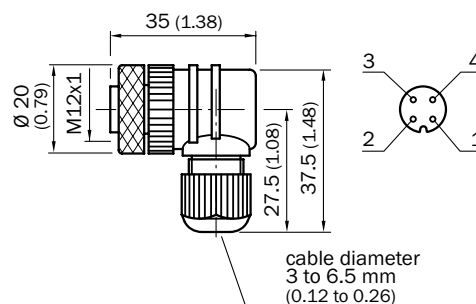

DOL-1204-WxxM

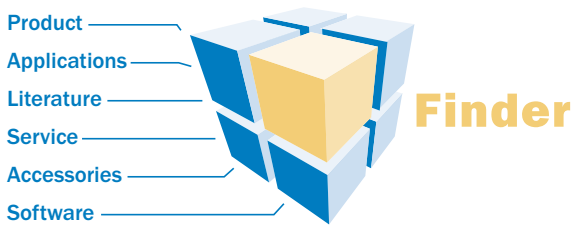Female connector (ready to assemble)

M12, 4-pin

DOS-1204-G

DOS-1204-W

WWW.MYSICK.COM – SEARCH ONLINE AND ORDER

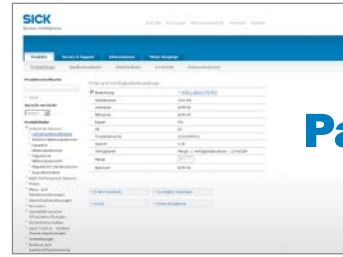**Search online quickly and safely – with the SICK "Finders"**

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Practical, focused and professional

SICK AT A GLANCE

SICK is a leading manufacturer of intelligent sensors and sensor solutions for industrial applications. With more than 6,500 employees and over 50 subsidiaries and equity investments as well as numerous representative offices worldwide, we are always close to our customers. A unique range of products and services creates the perfect basis for controlling processes securely and efficiently, protecting individuals from accidents and preventing damage to the environment.

We have extensive experience in various industries and understand their processes and requirements. With intelligent sensors, we can deliver exactly what our customers need. In application centers in Europe, Asia and North America, system solutions are tested and optimized in accordance with customer specifications. All this makes us a reliable supplier and development partner.

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Detailed addresses and additional representatives ➜ **www.sick.com**

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