Data sheet

# WL9L-3P2432S03

W9

PHOTOELECTRIC SENSORS

SICK
Sensor Intelligence.

Illustration may differ

## Ordering information

| Type | part no. |
|---|---|
| WL9L-3P2432S03 | 1078396 |

Other models and accessories ➜ www.sick.com/W9

## Detailed technical data

### Features

| | |
|---|---|
| **Functional principle** | Photoelectric retro-reflective sensor |
| **Functional principle detail** | Without reflector minimum distance (autocollimation/coaxial optics) |
| **Dimensions (W x H x D)** | 12.2 mm x 52.2 mm x 23.6 mm |
| **Housing design (light emission)** | Rectangular |
| **Mounting hole** | M3 |
| **Sensing range max.** | 0 m ... 12 m [1] |
| **Sensing range** | 0 m ... 8 m [1] |
| **Type of light** | Visible red light |
| **Light source** | Laser [2] |
| **Light spot size (distance)** | Ø 1 mm (500 mm) |
| **Wave length** | 650 nm |
| **Laser class** | 1 (IEC 60825-1 / CDRH 21 CFR 1040.10 & 1040.11) [3] |
| **Adjustment** | Single teach-in button |
| **Special applications** | Detecting small objects |
| **Special features** | Off delay 130 ms |

[1] Reflector PL80A.
[2] Average service life: 50,000 h at $T_U$ = +25 °C.
[3] Do not intentionally look into the laser beam. Never point the laser beam at people's eyes.

## Mechanics/electronics

| | |
|---|---|
| **Supply voltage $U_B$** | 10 V DC ... 30 V DC [1] |
| **Ripple** | < 5 $V_{pp}$ [2] |
| **Current consumption** | 30 mA [3] |
| **Switching output** | PNP [4] |
| **Output function** | Complementary |
| **Switching mode** | Light/dark switching [4] |
| **Output current $I_{max.}$** | ≤ 100 mA |
| **Response time** | ≤ 0.5 ms [5] |
| **Switching frequency** | 7 Hz [6] |
| **Connection type** | Male connector M12, 4-pin |
| **Circuit protection** | A [7]<br>B [8]<br>C [9] |
| **Protection class** | III |
| **Weight** | 13 g |
| **Polarizing filter** | ✓ |
| **Housing material** | Plastic, VISTAL® |
| **Optics material** | Plastic, PMMA |
| **Enclosure rating** | IP66<br>IP67<br>IP69K |
| **Ambient operating temperature** | –10 °C ... +50 °C |
| **Ambient operating temperature extended** | –30 °C ... +55 °C [10] [11] |
| **Ambient temperature, storage** | –30 °C ... +70 °C |
| **UL File No.** | NRKH.E181493 |

[1] Limit values when operated in short-circuit protected network: max. 8 A.

[2] May not fall below or exceed $U_V$ tolerances.

[3] Without load.

[4] Q = light switching.

[5] Signal transit time with resistive load.

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

[7] A = $V_S$ connections reverse-polarity protected.

[8] B = inputs and output reverse-polarity protected.

[9] C = interference suppression.

[10] As of $T_a$ = 50 °C, a max. supply voltage $V_{max.}$ = 24 V and a max. load current $I_{max.}$ = 50 mA is permitted.

[11] Operation below Tu –10 °C is possible if the sensor is already switched on at Tu > –10 °C, then cools down, and the supply voltage is subsequently not switched off. Switching on below Tu –10 °C is not permissible.

## Safety-related parameters

| | |
|---|---|
| **$MTTF_D$** | 723 years (EN ISO 13849-1) [1] |
| **$DC_{avg}$** | 0 % |

[1] Mode of calculation: Parts-Count-calculation.

## Certificates

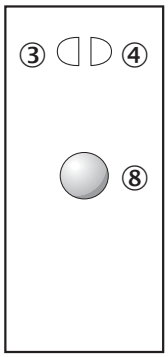
| | |
|---|---|
| **EU declaration of conformity** | ✓ |

| | |
|---|---|
| **UK declaration of conformity** | ✓ |
| **ACMA declaration of conformity** | ✓ |
| **Moroccan declaration of conformity** | ✓ |
| **China RoHS** | ✓ |
| **ECOLAB certificate** | ✓ |
| **cULus certificate** | ✓ |
| **Laser safety (IEC 60825-1) certificate** | ✓ |

## Classifications

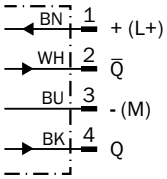
| | |
|---|---|
| **ECLASS 5.0** | 27270902 |
| **ECLASS 5.1.4** | 27270902 |
| **ECLASS 6.0** | 27270902 |
| **ECLASS 6.2** | 27270902 |
| **ECLASS 7.0** | 27270902 |
| **ECLASS 8.0** | 27270902 |
| **ECLASS 8.1** | 27270902 |
| **ECLASS 9.0** | 27270902 |
| **ECLASS 10.0** | 27270902 |
| **ECLASS 11.0** | 27270902 |
| **ECLASS 12.0** | 27270902 |
| **ETIM 5.0** | EC002717 |
| **ETIM 6.0** | EC002717 |
| **ETIM 7.0** | EC002717 |
| **ETIM 8.0** | EC002717 |
| **UNSPSC 16.0901** | 39121528 |

## Adjustments Single teach-in button

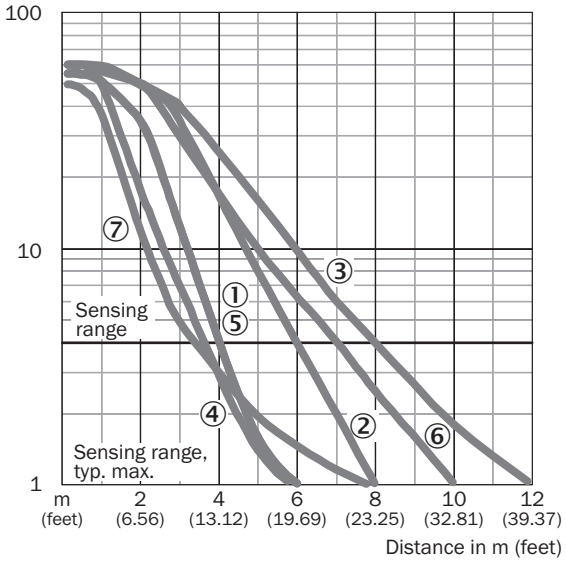



③ LED indicator yellow: Status of received light beam
④ LED indicator green: power on
⑧ Teach-in button

## Connection diagram Cd-083

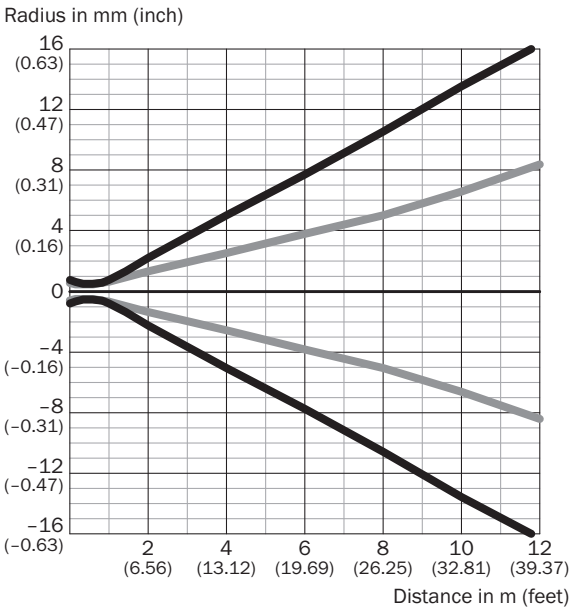



## Characteristic curve




① Reflector PL20A
② Reflector PL40A
③ Reflector PL80A
④ PL10F reflector
⑤ Reflector PL20F
⑥ Reflector P250F
⑦ Reflective tape REF-AC1000

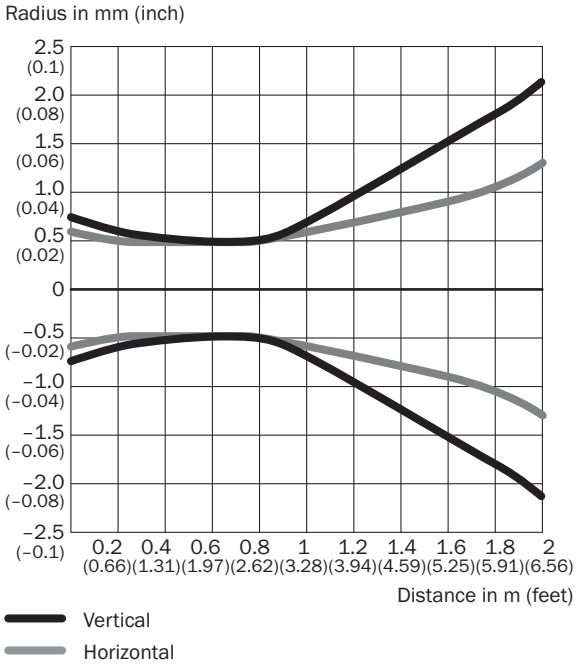
## Light spot size



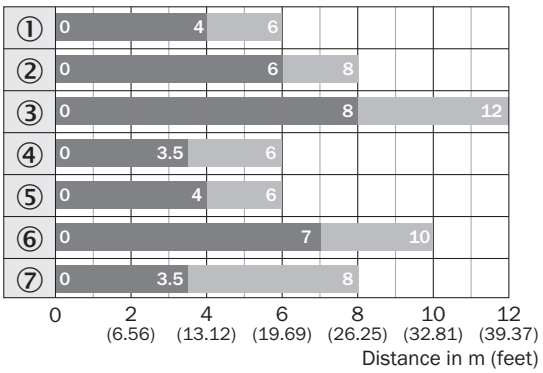

**Dimensions in mm (inch)**

| Sensing range | Vertical | Horizontal |
|---|---|---|
| **0.5 m (1.64 feet)** | < 1.0 (0.04) | < 1.0 (0.04) |
| **1 m (3.28 feet)** | 1.5 (0.06) | 1.2 (0.05) |
| **6 m (19.69 feet)** | 15.2 (0.60) | 7.6 (0.30) |
| **12 m (39.37 feet)** | 32.4 (1.28) | 16.4 (0.65) |

## Light spot size (detailed view)



## Sensing range diagram




Sensing range  Sensing range typ. max.

① Reflector PL20A
② Reflector PL40A
③ Reflector PL80A
④ PL10F reflector
⑤ Reflector PL20F
⑥ Reflector P250F
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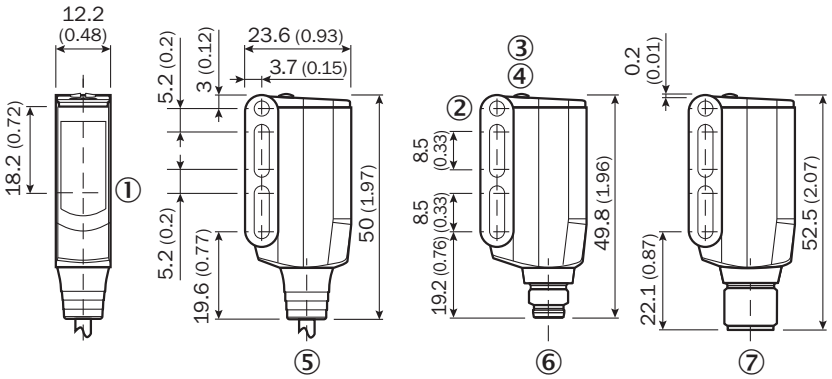
## Dimensional drawing WL9L-3




Dimensions in mm (inch)
① Sender and receiver optical axis center
② Mounting hole M3 (Ø 3.1 mm)
③ LED indicator yellow: Status of received light beam
④ LED indicator green: power on
⑤ Connecting cable or connecting cable with connector
⑥ male connector M8, 4-pin
⑦ male connector M12, 4-pin

## Recommended accessories

Other models and accessories ➜ www.sick.com/W9

| | Brief description | Type | part no. |
|---|---|---|---|
| **Mounting systems** | | | |
| | • **Description:** Plate N08 for universal clamp bracket<br>• **Material:** Steel, zinc diecast<br>• **Details:** Zinc plated steel (sheet), Zinc die cast (clamping bracket)<br>• **Items supplied:** Universal clamp (5322626), mounting hardware<br>• **Usable for:** W100, W150, W4S, W4F, W8, W9-3, W8G, W8 Laser, W8 Inox, G6, W100 Laser, W100-2, W10, G6 Inox, RAY10, W4SLG-3, W9, GR18, MultiPulse, Reflex Array, MultiLine, LUT3, KT5, KT8, KT10, CS8 | BEF-KHS-N08 | 2051607 |
| | • **Description:** Mounting bracket<br>• **Material:** Steel<br>• **Details:** Steel, zinc coated<br>• **Items supplied:** Mounting hardware included<br>• **Suitable for:** W9-3 | BEF-WN-W9-2 | 2022855 |
| | • **Description:** Plate N11N for universal clamp bracket<br>• **Material:** Stainless steel<br>• **Details:** Stainless steel 1.4571 (sheet), Stainless steel 1.4408 (clamp)<br>• **Items supplied:** Universal clamp (5322627), mounting hardware<br>• **Usable for:** DeltaPac, Glare, WTD20E | BEF-KHS-N11N | 2071081 |
| **reflectors and optics** | | | |
| | • **Description:** Fine triple reflector, screw connection, suitable for laser sensors<br>• **Dimensions:** 20 mm 32 mm<br>• **Ambient operating temperature:** –30 °C ... +65 °C | PL10F | 5311210 |
| **connectors and cables** | | | |
| | • **Connection type head A:** Female connector, M12, 4-pin, straight, A-coded<br>• **Connection type head B:** Flying leads<br>• **Signal type:** Sensor/actuator cable<br>• **Cable:** 5 m, 4-wire, PVC<br>• **Description:** Sensor/actuator cable, unshielded<br>• **Application:** Zones with chemicals, Uncontaminated zones | YF2A14-050VB3XLEAX | 2096235 |
| | • **Connection type head A:** Male connector, M12, 4-pin, straight, A-coded<br>• **Description:** Unshielded<br>• **Connection systems:** Screw-type terminals<br>• **Permitted cross-section:** ≤ 0.75 mm² | STE-1204-G | 6009932 |
| | • **Connection type head A:** Female connector, M12, 4-pin, straight, A-coded<br>• **Connection type head B:** Flying leads<br>• **Signal type:** Sensor/actuator cable<br>• **Cable:** 5 m, 4-wire, PUR, halogen-free<br>• **Description:** Sensor/actuator cable, unshielded<br>• **Application:** Uncontaminated zones, Zones with oils and lubricants, Robot, Drag chain operation | YF2A14-050UB3XLEAX | 2095608 |

# SICK AT A GLANCE

SICK is one of the leading manufacturers of intelligent sensors and sensor solutions for industrial applications. 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 a wide range of 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.

Comprehensive services complete our offering: SICK LifeTime Services provide support throughout the machine life cycle and ensure safety and productivity.

**For us, that is “Sensor Intelligence.”**

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