



KHK53-AXB00038

KH53

LINEAR ENCODERS

SICK
Sensor Intelligence.



Illustration may differ

Ordering information

| Type | Part no. |
|----------------|----------|
| KHK53-AXB00038 | 1030052 |

Other models and accessories → www.sick.com/KH53



Detailed technical data

Safety-related parameters

| | |
|--|---------------------------------------|
| MTTFd: mean time to dangerous failure | 45 years (EN ISO 13849) ¹⁾ |
|--|---------------------------------------|

¹⁾ This product is a standard product and does not constitute a safety component as defined in the Machinery Directive. Calculation based on nominal load of components, average ambient temperature 40 °C, frequency of use 8760 h/a. All electronic failures are considered hazardous. For more information, see document no. 8015532.

Performance

| | |
|-----------------------------|--|
| Measuring length | 0 m ... 38 m |
| Measuring range | 38 m |
| Resolution | 0.1 mm |
| Traversing speed | 6.6 m/s ¹⁾ |
| Repeatability | 0.3 mm |
| Measurement accuracy | ± 1000 + ME (Tu-25 °C) Tk μm ²⁾ |

¹⁾ If the max. traversing speed is exceeded or if the measuring elements are left, the corresponding error message is triggered (with SSI: FF FF FE hex).

²⁾ If a positional tolerance of ± 1 mm is observed relative to the nominal distance in the N and Y directions within a measuring element relative to the starting point of this element ME = length of measuring element Tu = ambient temperature in °C. Tk = coefficient of thermal expansion (see "Mechanical data" table).

Interfaces

| | |
|--------------------------------------|---|
| Communication interface | SSI |
| Position forming time | + 0.8 ms |
| Interface, digital serial | SSI, 24 Bit, gray |
| Interface for parametrization | RS-422 Default OFF Four wire transmission, asynchrony, full duplex Data format: 1 start bit, 8 data bits, 1 stop bit, no parity Data protocol: ASCII, Baud rate 9600 RS-422 |

Electrical data

| | |
|--|---------------------------------------|
| Initialization time | 2 s |
| Supply voltage | 10 V ... 32 V |
| Current consumption | 250 mA |
| Connection type | Male connector, M23, 12-pin |
| MTTFd: mean time to dangerous failure | 45 years (EN ISO 13849) ¹⁾ |

¹⁾ This product is a standard product and does not constitute a safety component as defined in the Machinery Directive. Calculation based on nominal load of components, average ambient temperature 40 °C, frequency of use 8760 h/a. All electronic failures are considered hazardous. For more information, see document no. 8015532.

Mechanical data

| | |
|------------------------------------|--|
| Weight | 2.4 kg |
| Length of measuring element | See calculation example |
| Position tolerance | ± 10 mm, see positional tolerances diagram |
| Read head material | AlMgSiPbF28 |

Ambient data

| | |
|------------------------------------|--|
| EMC | According to EN 61000-6-2 and EN 61000-6-4 ¹⁾ |
| Enclosure rating | IP65, with mating connector inserted (IEC 60529) |
| Operating temperature range | -20 °C ... +60 °C |
| Storage temperature range | -40 °C ... +85 °C |
| Resistance to shocks | 30 g, 10 ms (DIN EN 60 068-2-27) |
| Resistance to vibration | 10 g, 20 Hz ... 250 Hz (EN 60068-2-6) |

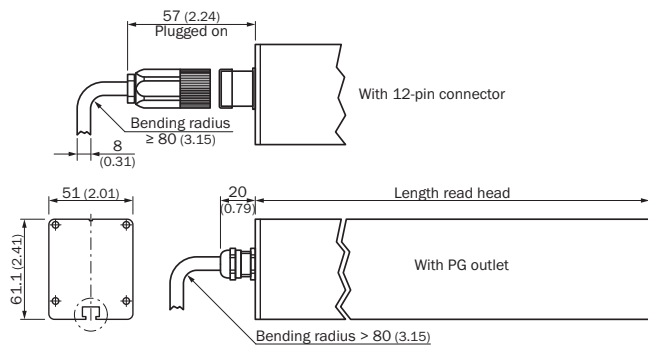
¹⁾ EMC according to the standards quoted is achieved if shielded cables are used.

Classifications

| | |
|-----------------------|----------|
| ECl@ss 5.0 | 27270705 |
| ECl@ss 5.1.4 | 27270705 |
| ECl@ss 6.0 | 27270705 |
| ECl@ss 6.2 | 27270705 |
| ECl@ss 7.0 | 27270705 |
| ECl@ss 8.0 | 27270705 |
| ECl@ss 8.1 | 27270705 |
| ECl@ss 9.0 | 27270705 |
| ECl@ss 10.0 | 27270705 |
| ECl@ss 11.0 | 27270705 |
| ETIM 5.0 | EC002544 |
| ETIM 6.0 | EC002544 |
| ETIM 7.0 | EC002544 |
| UNSPSC 16.0901 | 41111613 |

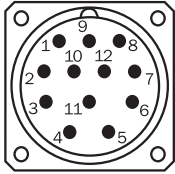
Dimensional drawing (Dimensions in mm (inch))

SSI read head



PIN assignment

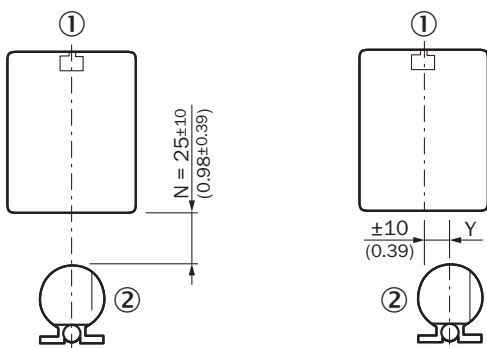
SSI interface, view of M23 male device connector



| PIN | Signal | Wire colors (cable connection) | Explanation |
|-----|----------------|--------------------------------|--------------------------|
| 1 | GND | Blue | Ground connection |
| 2 | Data + | White | Interface signals |
| 3 | Clock + | Yellow | Interface signals |
| 4 | R x D + | Gray | RS-422 programming lines |
| 5 | R x D - | Green | RS-422 programming lines |
| 6 | T x D + | Pink | RS-422 programming lines |
| 7 | T x D - | Black | RS-422 programming lines |
| 8 | U _S | Red | Supply voltage |
| 9 | N.C. | Orange | Not assigned |
| 10 | Data - | Brown | Interface signals |
| 11 | Clock - | Violet | Interface signals |
| 12 | N.C. | | Not assigned |

Position tolerance

KH53

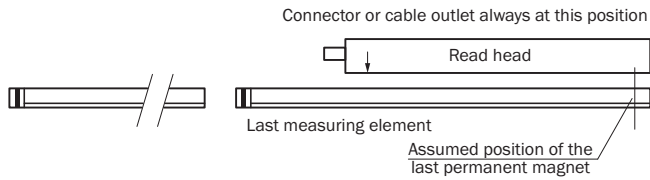


All dimensions in mm (inch)

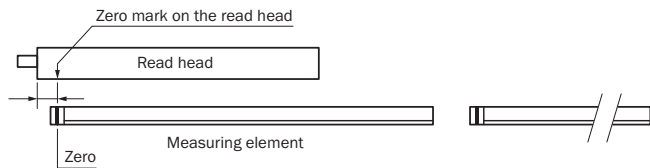
The operating reliability and accuracy of the measuring system depends on (amongst other things) compliance with the position tolerances. Magnetic or magnetizable materials are not permitted within 80 mm of the encoder or the measuring element.

- ① Read head
- ② Measuring element

End of measurement path



Start of measuring path



Assembly note

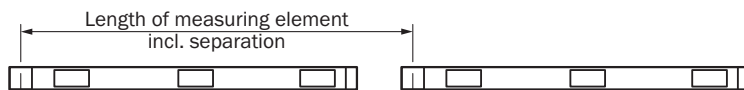
Montage Lesekopf + Maßverkörperung: Mindestabstand zu ferromagnetischen Materialien einhalten!

Read head + measuring element mounting: Observe the min. distance to ferromagnetic materials!

Only use non ferro-magnetic materials for the assembly base of the read head. A separation distance of 80 mm must be observed for ferro-magnetic materials (e.g., iron).

Dimensions and calculation table

KH53 SSI












| Measuring range up to | Read head length | Length of measuring element including distance | Mounting systems per measuring element (suggestion) |
|-----------------------|------------------|--|---|
| 39.90 m | 0.866 m | 2.304 m Identification letters A1 ... ≤ A18 | 4 clamp holders or 8 mounting brackets |
| 107.40 m | 1.051 m | 1.8688 m Identification letters B1 ... ≤ B58 | 3 clamp holders or 6 mounting brackets |
| 351.20 m | 1.376 m | 2.5088 m Identification letters C1 ... ≤ C141 | 4 clamp holders or 8 mounting brackets |
| 1676.40 m | 2.026 m | 1.9072 m Identification letters D1 ... ≤ D880 | 3 clamp holders or 6 mounting brackets |

The dimensions given are slightly rounded.

Recommended accessories

Other models and accessories → www.sick.com/KH53

| | Brief description | Type | Part no. |
|---|---|------------------|----------|
| Mounting brackets and plates | | | |
|  | Mounting bracket for KH53 measuring elements, without mounting hardware for the background | BEF-WK-KHT53 | 2029159 |
| Terminal and alignment brackets | | | |
|  | Spacer for KHT53, without mounting hardware for the background | BEF-KHA-KHT53 | 2042468 |
| Plug connectors and cables | | | |
|  | Head A: cable Head B: Flying leads Cable: SSI, PUR, halogen-free, shielded | LTG-2512-MW | 6027531 |
|  | Head A: cable Head B: Flying leads Cable: SSI, TTL, HTL, PUR, halogen-free, shielded | LTG-2612-MW | 6028516 |
|  | Head A: female connector, M23, 12-pin, straight Head B: Flying leads Cable: SSI, RS-422, TTL, HTL, PUR, halogen-free, shielded, 3 m | DOL-2312-G03MMA1 | 2029201 |
| | Head A: female connector, M23, 12-pin, straight Head B: Flying leads Cable: SSI, RS-422, TTL, HTL, PUR, halogen-free, shielded, 5 m | DOL-2312-G05MMA1 | 2029202 |
| | Head A: female connector, M23, 12-pin, straight Head B: Flying leads Cable: SSI, RS-422, TTL, HTL, PUR, halogen-free, shielded, 10 m | DOL-2312-G10MMA1 | 2029203 |
| | Head A: female connector, M23, 12-pin, straight Head B: Flying leads Cable: SSI, RS-422, TTL, HTL, PUR, halogen-free, shielded, 1.5 m | DOL-2312-G1M5MA1 | 2029200 |
| | Head A: female connector, M23, 12-pin, straight Head B: Flying leads Cable: SSI, RS-422, PUR, halogen-free, shielded, 20 m | DOL-2312-G20MMA1 | 2029204 |
| | Head A: female connector, M23, 12-pin, straight Head B: Flying leads Cable: SSI, RS-422, PUR, halogen-free, shielded, 30 m | DOL-2312-G30MMA1 | 2029205 |
|  | Head A: female connector, M23, 12-pin, straight Head B: - Cable: HIPERFACE®, SSI, Incremental, shielded | DOS-2312-G | 6027538 |
|  | Head A: female connector, M23, 12-pin, angled Head B: - Cable: HIPERFACE®, SSI, Incremental, shielded | DOS-2312-W01 | 2072580 |
|  | Head A: male connector, M23, 12-pin, straight Head B: - Cable: HIPERFACE®, SSI, Incremental, RS-422, shielded | STE-2312-G | 6027537 |
| Programming and configuration tools | | | |
|  | Programming tool for ATM60, ATM90, and KH53 | PGT-01-S | 1030111 |

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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