



# KHK53-PXF00354

KH53

MAGNETIC LINEAR ENCODERS

**SICK**  
Sensor Intelligence.



### Ordering information

| Type           | Part no. |
|----------------|----------|
| KHK53-PXF00354 | 1036165  |

Other models and accessories → [www.sick.com/KH53](http://www.sick.com/KH53)

Illustration may differ



### Detailed technical data

#### Safety-related parameters

|  |                                       |
|--|---------------------------------------|
| <b>MTTF<sub>D</sub> (mean time to dangerous failure)</b> | 28 years (EN ISO 13849) <sup>1)</sup> |
|--|---------------------------------------|

<sup>1)</sup> 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

|                             |  |
|-----------------------------|--|
| <b>Measuring range</b>      | 0 m ... 354 m                              |
| <b>Resolution</b>           | 0.1 mm                                     |
| <b>Traversing speed</b>     | 6.6 m/s <sup>1)</sup>                      |
| <b>Repeatability</b>        | 0.3 mm                                     |
| <b>Measurement accuracy</b> | ± 1000 + ME (Tu-25 °C) Tk μm <sup>2)</sup> |

<sup>1)</sup> 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).

<sup>2)</sup> 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 (28 μm/°C/m).

#### Interfaces

|   |   |
|---|---|
| <b>Communication interface</b>            | PROFIBUS DP <sup>1)</sup>   |
| <b>Bus interface</b>                      | RS-485, according to EN 50 170-2 (DIN 19245 Parts 1–3) electrically isolated by optocoupler |
| <b>Position forming time</b>              | + 1.1 ms  |
| <b>Address setting</b>                    | 0 ... 127, Hex switches or Protocol   |
| <b>Data protocol</b>                      | PROFIBUS DP basic functions (DP-V0)   |
| <b>Bus termination</b>                    | Via external switches   |
| <b>Set (electronic adjustment)</b>        | Via protocol  |
| <b>Encoder profile</b>                    | Profile for encoders (07hex) – Class 2  |
| <b>Data transmission rate (baud rate)</b> | 9.6 kBaud ... 12 MBaud, Automatic detection   |
| <b>Status information</b>                 | Operation (green LED)<br>Bus activity (red LED)   |

<sup>1)</sup> According to EN 50 170-2 (DIN 19245 Parts 1–3) electrically isolated by optocoupler.

## Electrical data

|  |                                       |
|--|---------------------------------------|
| <b>Initialization time</b>                   | 2 s                                   |
| <b>Supply voltage</b>                        | 10 V ... 32 V                         |
| <b>Power consumption</b>                     | 2.5 W                                 |
| <b>Connection type</b>                       | Male connector, 3x, M12               |
| <b>MTTFd: mean time to dangerous failure</b> | 28 years (EN ISO 13849) <sup>1)</sup> |

<sup>1)</sup> 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

|                                    |  |
|------------------------------------|--|
| <b>Weight</b>                      | 3.6 kg                                     |
| <b>Length of measuring element</b> | See calculation example                    |
| <b>Position tolerance</b>          | ± 10 mm, see positional tolerances diagram |
| <b>Read head material</b>          | AlMgSiPbF28                                |

## Ambient data

|                                    |  |
|------------------------------------|--|
| <b>EMC</b>                         | According to EN 61000-6-2 and EN 61000-6-4 <sup>1)</sup> |
| <b>Enclosure rating</b>            | IP67, with mating connector inserted (IEC 60529)         |
| <b>Operating temperature range</b> | -20 °C ... +60 °C  |
| <b>Storage temperature range</b>   | -40 °C ... +85 °C  |
| <b>Resistance to shocks</b>        | 30 g, 10 ms (DIN EN 60 068-2-27)                         |
| <b>Resistance to vibration</b>     | 10 g, 20 Hz ... 250 Hz (EN 60068-2-6)                    |

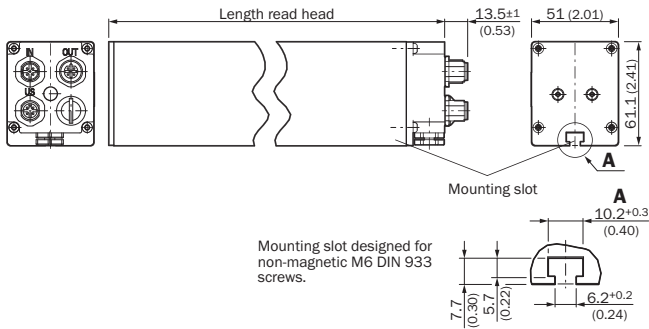
<sup>1)</sup> EMC according to the standards quoted is achieved if shielded cables are used.

## Classifications

|                       |          |
|-----------------------|----------|
| <b>ECLASS 5.0</b>     | 27270705 |
| <b>ECLASS 5.1.4</b>   | 27270705 |
| <b>ECLASS 6.0</b>     | 27270705 |
| <b>ECLASS 6.2</b>     | 27270705 |
| <b>ECLASS 7.0</b>     | 27270705 |
| <b>ECLASS 8.0</b>     | 27270705 |
| <b>ECLASS 8.1</b>     | 27270705 |
| <b>ECLASS 9.0</b>     | 27270705 |
| <b>ECLASS 10.0</b>    | 27270705 |
| <b>ECLASS 11.0</b>    | 27270705 |
| <b>ECLASS 12.0</b>    | 27274304 |
| <b>ETIM 5.0</b>       | EC002544 |
| <b>ETIM 6.0</b>       | EC002544 |
| <b>ETIM 7.0</b>       | EC002544 |
| <b>ETIM 8.0</b>       | EC002544 |
| <b>UNSPSC 16.0901</b> | 41111613 |

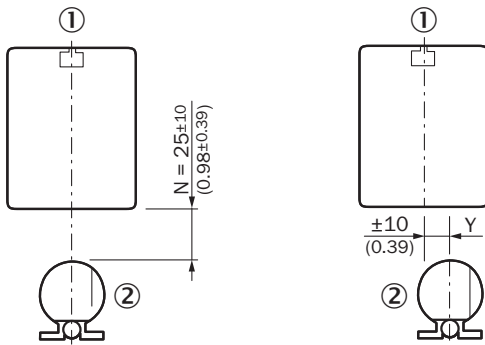
### Dimensional drawing (Dimensions in mm (inch))

Read head PROFIBUS



### Position tolerance

KH53

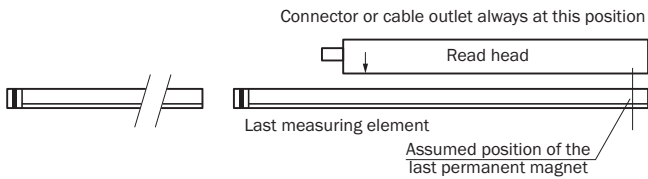


All dimensions in mm (inch)

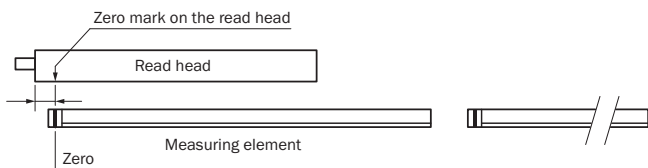
The operating reliability and accuracy of the measuring system depends on (amongst other things) compliance with the position tolerances. Magnetic or magnetizable materials are not permitted within 80 mm of the encoder or the measuring element.

- ① Read head
- ② Measuring element

End of measurement path



Start of measuring path



### Assembly note

**Montage Lesekopf + Maßverkörperung: Mindestabstand zu ferromagnetischen Materialien einhalten!**

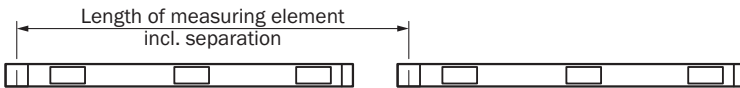
**Read head + measuring element mounting: Observe the min. distance to ferromagnetic materials!**

The diagram illustrates the required 80 mm clearance between the read head and measuring element assembly and any ferromagnetic materials. It shows a cross-section of the assembly with a vertical dimension of 80 mm and a horizontal dimension of 80 mm from the edge of the assembly to the material.

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).

### Length of measuring element

KH53 PROFIBUS



| Measuring range up to | Read head length | Length of measuring element including distance   | Mounting systems per measuring element (suggestion) |
|-----------------------|------------------|--|---|
| 39.90 m               | 0.905 m          | 2.304 m<br>Identification letters A1 ... ≤ A18   | 4 clamp holders or 8 mounting brackets              |
| 107.40 m              | 1.070 m          | 1.8688 m<br>Identification letters B1 ... ≤ B58  | 3 clamp holders or 6 mounting brackets              |
| 351.20 m              | 1.395 m          | 2.5088 m<br>Identification letters C1 ... ≤ C141 | 4 clamp holders or 8 mounting brackets              |
| 1676.40 m             | 2.045 m          | 1.9072 m<br>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](http://www.sick.com/KH53)

|  | Brief description  | Type         | Part no. |
|--|--|--------------|----------|
| <b>Programming and configuration tools</b> |  |              |          |
|  | Programming tool for ATM60, ATM90, and KH53  | PGT-01-S     | 1030111  |
| <b>Mounting brackets and plates</b>        |  |              |          |
|  | Mounting bracket for KH53 measuring elements, without mounting hardware for the background | BEF-WK-KHT53 | 2029159  |

|   | Brief description   | Type               | Part no. |
|---|---|--------------------|----------|
| Terminal and alignment brackets   |   |                    |          |
|    | Spacer for KHT53, without mounting hardware for the background  | BEF-KHA-KHT53      | 2042468  |
| Others  |   |                    |          |
|    | <ul style="list-style-type: none"> <li>• <b>Connection type head A:</b> Flying leads</li> <li>• <b>Connection type head B:</b> Flying leads</li> <li>• <b>Signal type:</b> PROFIBUS DP</li> <li>• <b>Items supplied:</b> By the meter</li> <li>• <b>Cable:</b> 2-wire, PUR</li> <li>• <b>Description:</b> PROFIBUS DP, shielded</li> </ul>  | LTG-2102-MW        | 6021355  |
|    | <ul style="list-style-type: none"> <li>• <b>Connection type head A:</b> Female connector, M12, 4-pin, straight, A-coded</li> <li>• <b>Description:</b> Unshielded, Head A: female connector, M12, 4-pin, straight, unshielded, for power supply, for cable diameter 4 mm ... 6 mm Head B: -</li> <li>• <b>Connection systems:</b> Screw-type terminals</li> <li>• <b>Permitted cross-section:</b> ≤ 0.75 mm<sup>2</sup></li> </ul>  | DOS-1204-G         | 6007302  |
|    | <ul style="list-style-type: none"> <li>• <b>Connection type head A:</b> Female connector, M12, 5-pin, straight, B-coded</li> <li>• <b>Signal type:</b> PROFIBUS DP</li> <li>• <b>Description:</b> PROFIBUS DP, shielded, Head A: M12 female connector, 5-pin, straight, B-coded, PROFIBUS DP, shielded, for cable diameter 4 mm ... 9 mm Head B: -</li> <li>• <b>Connection systems:</b> Screw-type terminals</li> <li>• <b>Permitted cross-section:</b> ≤ 0.75 mm<sup>2</sup></li> </ul> | DOS-1205-GQ        | 6021353  |
|    | <ul style="list-style-type: none"> <li>• <b>Connection type head A:</b> Male connector, M12, 5-pin, straight, B-coded</li> <li>• <b>Signal type:</b> PROFIBUS DP</li> <li>• <b>Description:</b> PROFIBUS DP, shielded, Head A: male connector, M12, 5-pin, straight, B coded, shielded, for cable diameter 4 mm ... 9 mm Head B: -</li> <li>• <b>Connection systems:</b> Screw-type terminals</li> <li>• <b>Permitted cross-section:</b> ≤ 0.75 mm<sup>2</sup></li> </ul>                 | STE-1205-GQ        | 6021354  |
|  | <ul style="list-style-type: none"> <li>• <b>Connection type head A:</b> Male connector, M12, 4-pin, straight, B-coded</li> <li>• <b>Signal type:</b> PROFIBUS DP</li> <li>• <b>Description:</b> PROFIBUS DP, terminal resistor</li> </ul>   | STE-END-Q          | 6021156  |
|  | <ul style="list-style-type: none"> <li>• <b>Connection type head A:</b> Female connector, M12, 5-pin, straight, B-coded</li> <li>• <b>Connection type head B:</b> Flying leads</li> <li>• <b>Signal type:</b> PROFIBUS DP</li> <li>• <b>Cable:</b> 30 m, 2-wire, PUR, halogen-free</li> <li>• <b>Description:</b> PROFIBUS DP, twisted pair, shielded</li> <li>• <b>Connection systems:</b> Flying leads</li> <li>• <b>Application:</b> Zones with oils and lubricants</li> </ul>         | DOL-1205-G30MQ     | 6032639  |
|  | <ul style="list-style-type: none"> <li>• <b>Connection type head A:</b> Female connector, M12, 5-pin, straight, B-coded</li> <li>• <b>Connection type head B:</b> Flying leads</li> <li>• <b>Signal type:</b> PROFIBUS DP</li> <li>• <b>Cable:</b> 50 m, 2-wire, PUR, halogen-free</li> <li>• <b>Description:</b> PROFIBUS DP, twisted pair, shielded</li> <li>• <b>Connection systems:</b> Flying leads</li> <li>• <b>Application:</b> Zones with oils and lubricants</li> </ul>         | DOL-1205-G50MQ     | 6032861  |
|  | <ul style="list-style-type: none"> <li>• <b>Connection type head A:</b> Female connector, M12, 4-pin, straight, A-coded</li> <li>• <b>Connection type head B:</b> Flying leads</li> <li>• <b>Signal type:</b> Sensor/actuator cable</li> <li>• <b>Cable:</b> 5 m, 4-wire, PVC</li> <li>• <b>Description:</b> Sensor/actuator cable, unshielded</li> <li>• <b>Application:</b> Zones with chemicals</li> </ul>   | YF2A14-050VB3XLEAX | 2096235  |
|  | <ul style="list-style-type: none"> <li>• <b>Connection type head A:</b> Male connector, M12, 2-pin, straight, B-coded</li> <li>• <b>Connection type head B:</b> Flying leads</li> <li>• <b>Signal type:</b> Fieldbus, PROFIBUS DP</li> <li>• <b>Cable:</b> 15 m, 2-wire, PUR, halogen-free</li> <li>• <b>Description:</b> Fieldbus, PROFIBUS DP, shielded</li> <li>• <b>Application:</b> Drag chain operation, Zones with oils and lubricants</li> </ul>                                  | YM2B22-150PB1XLEAX | 2106276  |

|   | Brief description  | Type               | Part no. |
|---|--|--------------------|----------|
|    | <ul style="list-style-type: none"> <li>• <b>Connection type head A:</b> Male connector, M12, 2-pin, straight, B-coded</li> <li>• <b>Connection type head B:</b> Flying leads</li> <li>• <b>Signal type:</b> Fieldbus, PROFIBUS DP</li> <li>• <b>Cable:</b> 5 m, 2-wire, PUR, halogen-free</li> <li>• <b>Description:</b> Fieldbus, PROFIBUS DP, shielded</li> <li>• <b>Application:</b> Drag chain operation, Zones with oils and lubricants</li> </ul>    | YM2B22-050PB1XLEAX | 2106270  |
|    | <ul style="list-style-type: none"> <li>• <b>Connection type head A:</b> Male connector, M12, 2-pin, straight, B-coded</li> <li>• <b>Connection type head B:</b> Flying leads</li> <li>• <b>Signal type:</b> Fieldbus, PROFIBUS DP</li> <li>• <b>Cable:</b> 10 m, 2-wire, PUR, halogen-free</li> <li>• <b>Description:</b> Fieldbus, PROFIBUS DP, shielded</li> <li>• <b>Application:</b> Drag chain operation, Zones with oils and lubricants</li> </ul>   | YM2B22-100PB1XLEAX | 2106271  |
|    | <ul style="list-style-type: none"> <li>• <b>Connection type head A:</b> Female connector, M12, 2-pin, straight, B-coded</li> <li>• <b>Connection type head B:</b> Flying leads</li> <li>• <b>Signal type:</b> Fieldbus, PROFIBUS DP</li> <li>• <b>Cable:</b> 10 m, 2-wire, PUR, halogen-free</li> <li>• <b>Description:</b> Fieldbus, PROFIBUS DP, shielded</li> <li>• <b>Application:</b> Drag chain operation, Zones with oils and lubricants</li> </ul> | YF2B22-100PB1XLEAX | 2106269  |
|   | YF2B22-150PB1XLEAX   | YF2B22-150PB1XLEAX | 2106272  |
|   | YF2B22-200PB1XLEAX   | YF2B22-200PB1XLEAX | 2106273  |
|    | <ul style="list-style-type: none"> <li>• <b>Connection type head A:</b> Female connector, M12, 2-pin, straight, B-coded</li> <li>• <b>Connection type head B:</b> Flying leads</li> <li>• <b>Signal type:</b> Fieldbus, PROFIBUS DP</li> <li>• <b>Cable:</b> 5 m, 2-wire, PUR, halogen-free</li> <li>• <b>Description:</b> Fieldbus, PROFIBUS DP, shielded</li> <li>• <b>Application:</b> Drag chain operation, Zones with oils and lubricants</li> </ul>  | YF2B22-050PB1XLEAX | 2121936  |
| Magnetic linear encoders  |  |                    |          |
|  | <ul style="list-style-type: none"> <li>• <b>System part:</b> Mounting gauge</li> <li>• <b>Measuring range:</b> 0 m ... 354 m</li> </ul>  | KHM53-XXX00354     | 1030077  |
|  | <ul style="list-style-type: none"> <li>• <b>System part:</b> Measuring element</li> <li>• <b>Measuring range:</b> 0 m ... 354 m</li> <li>• <b>Code type:</b> Coded</li> </ul>  | KHT53-XXX00354     | 1030075  |
|   | <ul style="list-style-type: none"> <li>• <b>System part:</b> Measuring element</li> <li>• <b>Measuring range:</b> 0 m ... 354 m</li> <li>• <b>Code type:</b> Universal configurable</li> </ul>   | KHU53-XXX00354     | 1030076  |

## 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.”

## WORLDWIDE PRESENCE:

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