



# KHK53-AXT01700

KH53

MAGNETIC LINEAR ENCODERS

**SICK**  
Sensor Intelligence.



Illustration may differ

### Ordering information

Type	Part no.
KHK53-AXT01700	1030080

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



### Detailed technical data

#### Safety-related parameters

<b>MTTF<sub>D</sub> (mean time to dangerous failure)</b>	21 years (EN ISO 13849) <sup>1)</sup>
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<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 ... 1,700 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>	SSI
<b>Position forming time</b>	+ 0.8 ms
<b>Interface, digital serial</b>	SSI, 24 Bit, gray
<b>Interface for parametrization</b>	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

<b>Initialization time</b>	2 s
<b>Supply voltage</b>	10 V ... 32 V
<b>Current consumption</b>	250 mA
<b>Connection type</b>	Cable, 12-wire, 5 m
<b>MTTF<sub>d</sub>: mean time to dangerous failure</b>	21 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>	5.2 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>	IP66 (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)

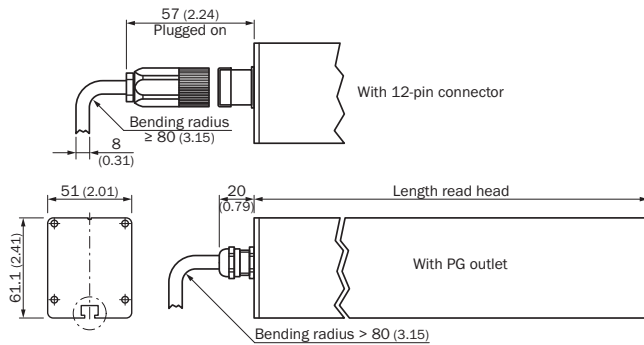
<sup>1)</sup> EMC according to the standards quoted is achieved if shielded cables are used.

## 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

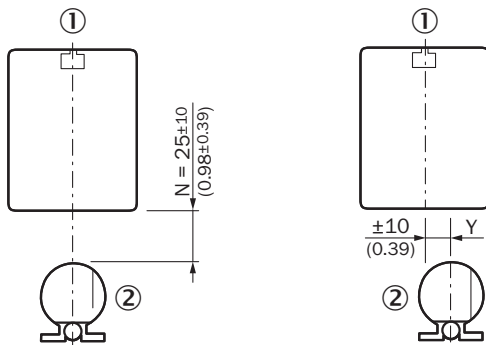
### Dimensional drawing (Dimensions in mm (inch))

#### SSI read head



### Position tolerance

#### KH53

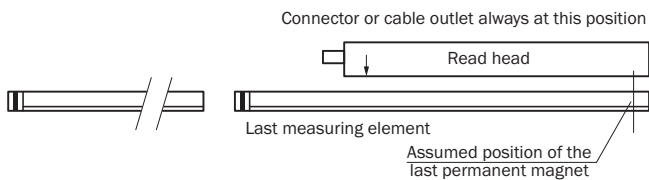


All dimensions in mm (inch)

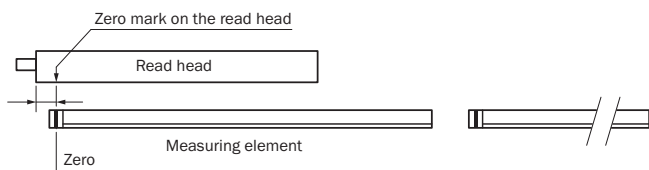
The operating reliability and accuracy of the measuring system depends on (amongst other things) compliance with the position tolerances. Magnetic or magnetizable materials are not permitted within 80 mm of the encoder or the measuring element.

- ① Read head
- ② Measuring element

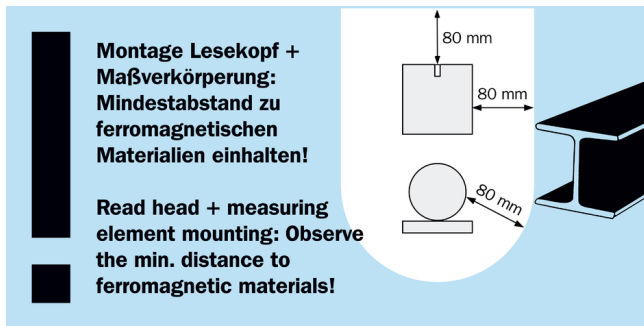
#### End of measurement path



#### Start of measuring path



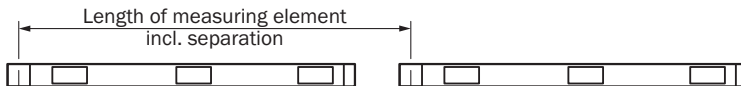
## Assembly note



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 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](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> Female connector, M23, 12-pin, straight</li> <li>• <b>Connection type head B:</b> Flying leads</li> <li>• <b>Signal type:</b> SSI, RS-422, TTL, HTL</li> <li>• <b>Cable:</b> 1.5 m, 12-wire, PUR, halogen-free</li> <li>• <b>Description:</b> SSI, RS-422, TTL, HTL, shielded</li> </ul>	DOL-2312-G1M5MA1	2029200
	<ul style="list-style-type: none"> <li>• <b>Connection type head A:</b> Female connector, M23, 12-pin, straight</li> <li>• <b>Connection type head B:</b> Flying leads</li> <li>• <b>Signal type:</b> SSI, RS-422, TTL, HTL</li> <li>• <b>Cable:</b> 3 m, 12-wire, PUR, halogen-free</li> <li>• <b>Description:</b> SSI, RS-422, TTL, HTL, shielded</li> </ul>	DOL-2312-G03MMA1	2029201
	<ul style="list-style-type: none"> <li>• <b>Connection type head A:</b> Female connector, M23, 12-pin, straight</li> <li>• <b>Connection type head B:</b> Flying leads</li> <li>• <b>Signal type:</b> SSI, RS-422, TTL, HTL</li> <li>• <b>Cable:</b> 5 m, 12-wire, PUR, halogen-free</li> <li>• <b>Description:</b> SSI, RS-422, TTL, HTL, shielded</li> </ul>	DOL-2312-G05MMA1	2029202
	<ul style="list-style-type: none"> <li>• <b>Connection type head A:</b> Female connector, M23, 12-pin, straight</li> <li>• <b>Connection type head B:</b> Flying leads</li> <li>• <b>Signal type:</b> SSI, RS-422</li> <li>• <b>Cable:</b> 20 m, 12-wire, PUR, halogen-free</li> <li>• <b>Description:</b> SSI, RS-422, shielded</li> </ul>	DOL-2312-G20MMA1	2029204
	<ul style="list-style-type: none"> <li>• <b>Connection type head A:</b> Female connector, M23, 12-pin, straight</li> <li>• <b>Connection type head B:</b> Flying leads</li> <li>• <b>Signal type:</b> SSI, RS-422</li> <li>• <b>Cable:</b> 30 m, 12-wire, PUR, halogen-free</li> <li>• <b>Description:</b> SSI, RS-422, shielded</li> </ul>	DOL-2312-G30MMA1	2029205
	<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> SSI, Incremental</li> <li>• <b>Cable:</b> 12-wire, PUR, halogen-free</li> <li>• <b>Description:</b> SSI, Incremental, shielded</li> </ul>	LTG-2512-MW	6027531
	<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> SSI, TTL, HTL, Incremental</li> <li>• <b>Cable:</b> 12-wire, UV and saltwater-resistant, PUR, halogen-free</li> <li>• <b>Description:</b> SSI, TTL, HTL, Incremental, shielded, Head A: cable Head B: cable Cable: suitable for drag chain, PUR, halogen-free, shielded, UV and saltwater resistant, 4 x 2 x 0.25 mm<sup>2</sup> + 2 x 0.5 mm<sup>2</sup> + 2 x 0.14 mm<sup>2</sup>, Ø 7.8 mm</li> </ul>	LTG-2612-MW	6028516
	<ul style="list-style-type: none"> <li>• <b>Connection type head A:</b> Female connector, M23, 12-pin, straight, A-coded</li> <li>• <b>Signal type:</b> HIPERFACE<sup>®</sup>, SSI, Incremental</li> <li>• <b>Description:</b> HIPERFACE<sup>®</sup>, SSI, Incremental, shielded, Head A: female connector, M23, 12-pin, straight, shielded, for cable diameter 5.5 mm ... 10.5 mm Head B: Operating temperature: -20 °C ... +130 °C</li> <li>• <b>Connection systems:</b> Solder connection</li> </ul>	DOS-2312-G	6027538
	<ul style="list-style-type: none"> <li>• <b>Connection type head A:</b> Male connector, M23, 12-pin, straight, A-coded</li> <li>• <b>Signal type:</b> HIPERFACE<sup>®</sup>, SSI, Incremental, RS-422</li> <li>• <b>Description:</b> HIPERFACE<sup>®</sup>, SSI, Incremental, RS-422, shielded, M23 male connector</li> <li>• <b>Connection systems:</b> Solder connection</li> </ul>	STE-2312-G	6027537

	Brief description	Type	Part no.
	<ul style="list-style-type: none"> <li>• <b>Connection type head A:</b> Female connector, M23, 12-pin, angled, A-coded</li> <li>• <b>Signal type:</b> HIPERFACE<sup>®</sup>, SSI, Incremental</li> <li>• <b>Description:</b> HIPERFACE<sup>®</sup>, SSI, Incremental, shielded, Head A: female connector, M23, 12-pin, angled, shielded, for cable diameter 4.2 mm ... 6.6 mm Head B: - Operating temperature: -20 °C ... +130 °C</li> <li>• <b>Connection systems:</b> Solder connection</li> </ul>	DOS-2312-W01	2072580
	<ul style="list-style-type: none"> <li>• <b>Connection type head A:</b> Female connector, M23, 12-pin, straight</li> <li>• <b>Connection type head B:</b> Flying leads</li> <li>• <b>Signal type:</b> SSI, RS-422, TTL, HTL</li> <li>• <b>Cable:</b> 10 m, 12-wire, PUR, halogen-free</li> <li>• <b>Description:</b> SSI, RS-422, TTL, HTL, shielded</li> </ul>	DOL-2312-G10MMA1	2029203
	<ul style="list-style-type: none"> <li>• <b>Connection type head A:</b> Female connector, M23, 9-pin, straight, A-coded</li> <li>• <b>Signal type:</b> HIPERFACE<sup>®</sup>, SSI, Incremental</li> <li>• <b>Description:</b> HIPERFACE<sup>®</sup>, SSI, Incremental, shielded, Head A: female connector, M23, 9-pin, straight, shielded, for cable diameter 5.5 mm ... 10.5 mm Head B: Operating temperature: -20 °C ... +130 °C</li> <li>• <b>Connection systems:</b> Solder connection</li> </ul>	DOS-2309-G	6028533
Magnetic linear encoders			
	<ul style="list-style-type: none"> <li>• <b>System part:</b> Mounting gauge</li> <li>• <b>Measuring range:</b> 0 m ... 1,700 m</li> </ul>	KHM53-XXX01700	1030087
	<ul style="list-style-type: none"> <li>• <b>System part:</b> Measuring element</li> <li>• <b>Measuring range:</b> 0 m ... 1,700 m</li> <li>• <b>Code type:</b> Coded</li> </ul>	KHT53-XXX01700	1030085
	<ul style="list-style-type: none"> <li>• <b>System part:</b> Measuring element</li> <li>• <b>Measuring range:</b> 0 m ... 1,700 m</li> <li>• <b>Code type:</b> Universal configurable</li> </ul>	KHU53-XXX01700	1030086

## 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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