



# KHK53-AXT00054

KH53

LINEAR ENCODERS

**SICK**  
Sensor Intelligence.



Illustration may differ

### Ordering information

Type	Part no.
KHK53-AXT00054	1035442

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



### Detailed technical data

#### Safety-related parameters

<b>MTTFd: mean time to dangerous failure</b>	34 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 length</b>	0 m ... 54 m
<b>Measuring range</b>	54 m
<b>Resolution</b>	0.1 mm
<b>Traversing speed</b>	6.6 m/s <sup>1)</sup>
<b>Repeatability</b>	1 mm
<b>Measurement accuracy</b>	± 2000 + 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 (see "Mechanical data" table).

#### 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>MTTFd: mean time to dangerous failure</b>	34 years (EN ISO 13849) <sup>1)</sup>

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Mechanical data

<b>Weight</b>	4.4 kg
<b>Length of measuring element</b>	See calculation example
<b>Position tolerance</b>	± 20 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>	-30 °C ... +70 °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)

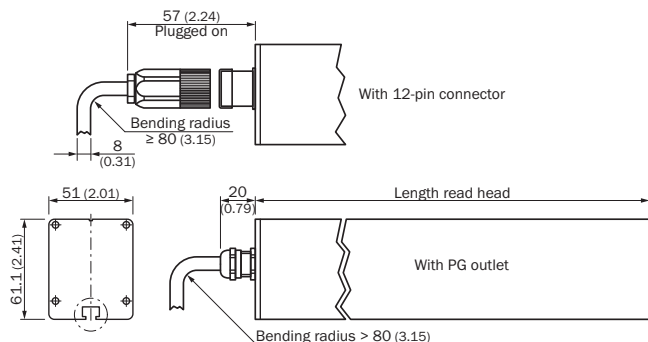
<sup>1)</sup> EMC according to the standards quoted is achieved if shielded cables are used.

Classifications

<b>ECl@ss 5.0</b>	27270705
<b>ECl@ss 5.1.4</b>	27270705
<b>ECl@ss 6.0</b>	27270705
<b>ECl@ss 6.2</b>	27270705
<b>ECl@ss 7.0</b>	27270705
<b>ECl@ss 8.0</b>	27270705
<b>ECl@ss 8.1</b>	27270705
<b>ECl@ss 9.0</b>	27270705
<b>ECl@ss 10.0</b>	27270705
<b>ECl@ss 11.0</b>	27270705
<b>ETIM 5.0</b>	EC002544
<b>ETIM 6.0</b>	EC002544
<b>ETIM 7.0</b>	EC002544
<b>UNSPSC 16.0901</b>	41111613

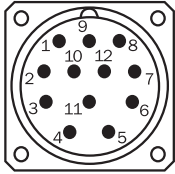
Dimensional drawing (Dimensions in mm (inch))

SSI read head



### PIN assignment

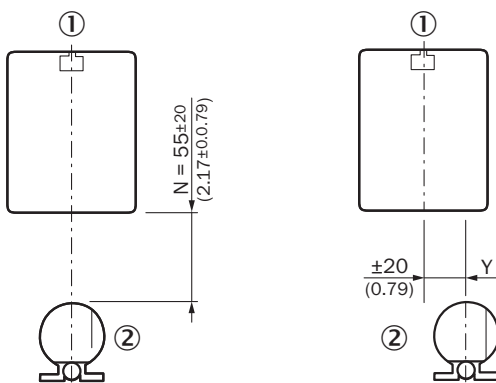
SSI interface, view of M23 male device connector



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 <sub>S</sub>	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 Advanced

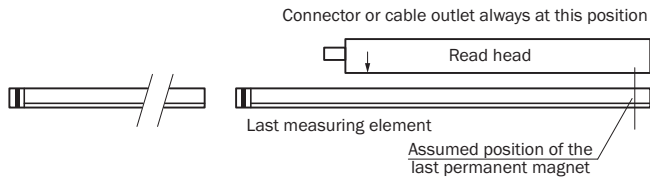


All dimensions in mm (inch)

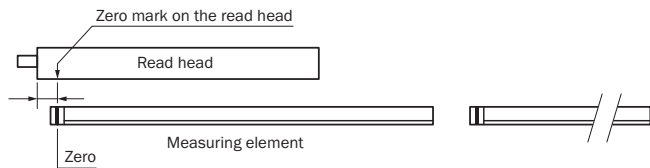
The operating reliability and accuracy of the measuring system depends on (amongst other things) compliance with the position tolerances. Magnetic or magnetizable materials are not permitted within 80 mm of the encoder or the measuring element.

- ① Read head
- ② Measuring element

End of measurement path



Start of measuring path



Assembly note

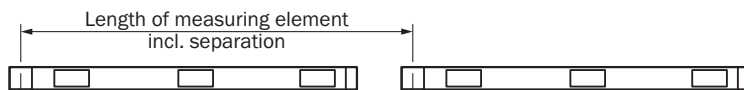
**Montage Lesekopf + Maßverkörperung: Mindestabstand zu ferromagnetischen Materialien einhalten!**

**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






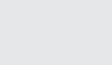
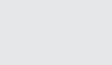




KH53 SSI Advanced



Measuring range up to	Read head length	Length of measuring element including distance	Mounting systems per measuring element (suggestion)
53.50 m	1.58 m	1.408 m Identification letters F1 ... ≤ F39	3 clamp holders or 6 mounting brackets
546.40 m	2.506 m	2.3552 m Identification letters G1 ... ≤ G233	4 clamp holders or 8 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>Mounting brackets and plates</b>			
	Mounting bracket for KH53 measuring elements, without mounting hardware for the background	BEF-WK-KHT53	2029159
<b>Terminal and alignment brackets</b>			
	Spacer for KHT53, without mounting hardware for the background	BEF-KHA-KHT53	2042468
<b>Plug connectors and cables</b>			
	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
<b>Programming and configuration tools</b>			
	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.”

## WORLDWIDE PRESENCE:

Contacts and other locations –[www.sick.com](http://www.sick.com)