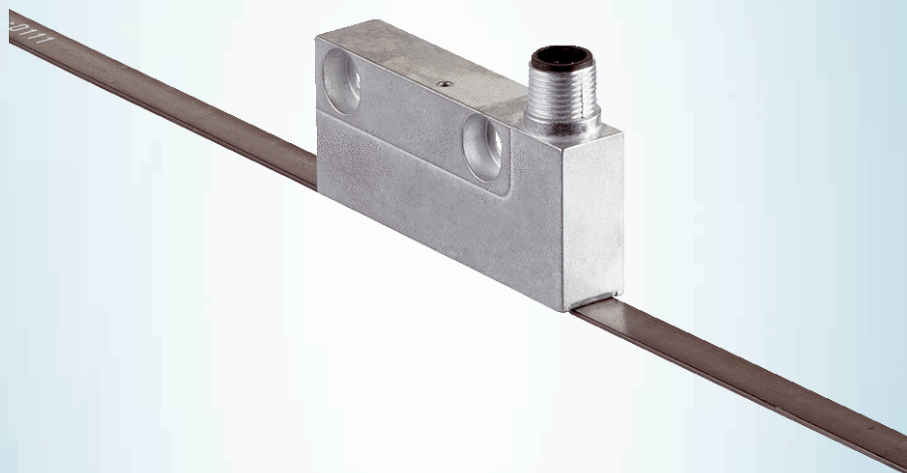


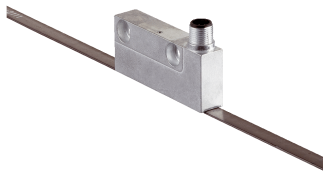


TTK70-AXA0-K02

TTK70

MAGNETIC LINEAR ENCODERS

SICK
Sensor Intelligence.



Ordering information

Type	part no.
TTK70-AXA0-K02	1038033

Illustration may differ

Other models and accessories → www.sick.com/TTK70



Detailed technical data

Features

Items supplied	Magnetic tape not included with delivery
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Safety-related parameters

MTTF_D (mean time to dangerous failure)	65 years (EN ISO 13849) ¹⁾
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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 range	0 mm ... 3,920 mm
Resolution	1 µm
Length of period	1 mm
Traversing speed	< 10 m/s, < 2 m/s dynamic operation (Sin/Cos), static operation (SSI)
Repeatability	≤ ± 2 µm

Interfaces

Communication interface	SSI ¹⁾
Interface, digital serial	SSI, 24 Bit, gray Sin/Cos 1.0 V _{PP}

¹⁾ HIPERFACE® interface described in publication 8015021.

Electronics

Supply voltage	4.5 V ... 30 V
Operating current	55 mA (without load)
Power consumption	≤ 1.2 W
Connection type	Male connector, M12, 12-pin

Mechanics

Dimensions	See dimensional drawing
Scope of delivery	Magnetic tape not included with delivery
Weight	0.08 kg
Read head material	Zinc diecast

Ambient data

EMC	According to EN 61000-6-2 and EN 61000-6-3
Enclosure rating	IP67, with mating plug inserted (IEC 60529)
Operating temperature range	-30 °C ... +85 °C
Storage temperature range	-40 °C ... +85 °C
Permissible relative humidity	100 %, condensation permitted
Resistance to shocks	30 g, 6 ms (EN 60068-2-27)
Resistance to vibration	20 g, 10 Hz ... 2,000 Hz (EN 60068-2-6)
Maximum permitted ambient field strength	< 3 kA/m ... 4 kA/m (3.8 mT ... 5 mT), to guarantee compliance with the quoted accuracy values ¹⁾
Maximum permitted field strength	< 150 kA/m (< 190 mT), to ensure that the magnetic tape is not permanently damaged

¹⁾ The maximum permitted external field influence is reached when the position value deviates from the original value (without external field influence) by more than 5 µm. This value is reached when, at the sensor location, a field strength of 3 kA/m to 4 kA/m (3.8 mT to 5 mT) occurs in addition to the field strength of the magnetic tape.

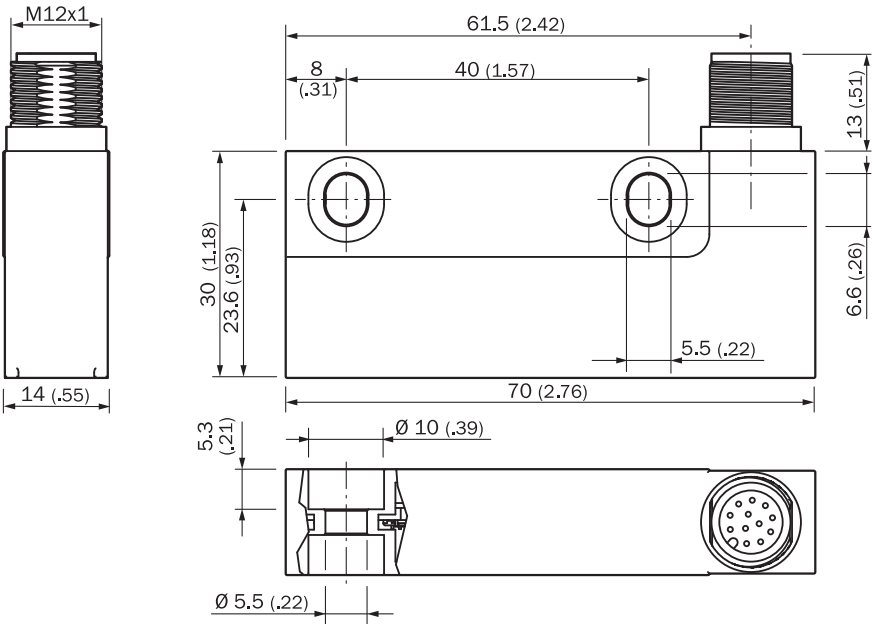
Certificates

EU declaration of conformity	✓
UK declaration of conformity	✓
ACMA declaration of conformity	✓
China RoHS	✓
Information according to Art. 3 of Data Act (Regulation EU 2023/2854)	✓

Classifications

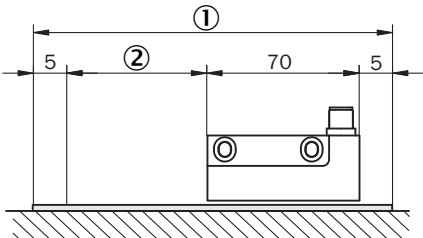
ECLASS 5.0	27270705
ECLASS 5.1.4	27270705
ECLASS 6.0	27270705
ECLASS 6.2	27270705
ECLASS 7.0	27270705
ECLASS 8.0	27270705
ECLASS 8.1	27270705
ECLASS 9.0	27270705
ECLASS 10.0	27270705
ECLASS 11.0	27270705
ECLASS 12.0	27274304
ETIM 5.0	EC002544
ETIM 6.0	EC002544
ETIM 7.0	EC002544
ETIM 8.0	EC002544
UNSPSC 16.0901	41111613

Dimensional drawing Read head, male connector



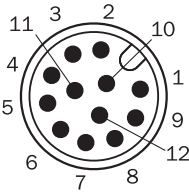
Dimensions in mm (inch)

Order note for magnetic tape length



- ① Required band length = measurement path + 80 mm
- ② Measurement path

PIN assignment View of the M12 male connector plug-in face

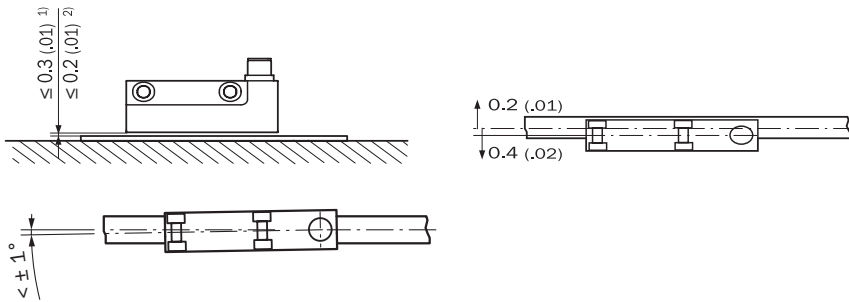


PIN	Color	Signal	Explanation
1	Orange-black	Balancing	For internal purposes only / connect to GND
2	White	SSI data +	Signal
3	Brown	SSI data -	Signal
4	Violet	SSI clock -	Signal

PIN	Color	Signal	Explanation
5	Red	U_S	Supply voltage
6	Gray	/SIN	Signal
7	Green	SIN	Signal
8	Pink	/COS	Signal
9	Black	COS	Signal
10	Orange	SET ¹⁾	Electronic adjustment
11	Yellow	SSI clock +	Signal
12	Blue	GND	Ground connection

¹⁾This input activates the electronic zero set. If the SET wire is connected to U_S for more than 1.2 seconds after it had previously been unassigned or connected to GND, the position of the encoder above the magnetic tape corresponds to the value 0. Warning! The SET input must be connected to GND or not be connected when the encoder is switched on. If electronic zeroing is performed using the SET input, the synchronization between the SSI and Sin/Cos signals is lost. Screen connected to encoder housing. Connected to ground on control side.

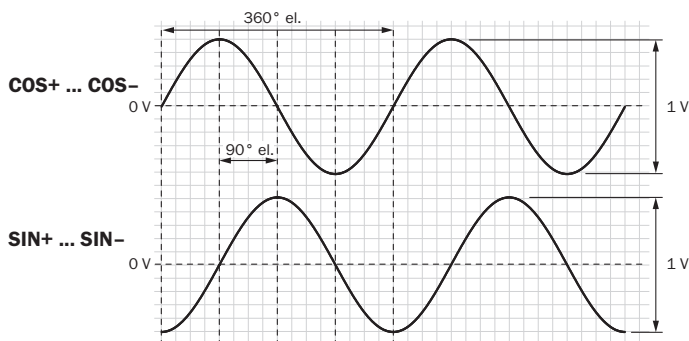
Position tolerance



General tolerances according to DIN ISO 2768-mk

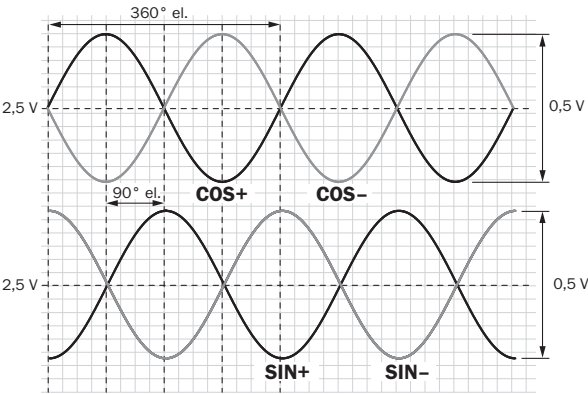
- ① Without cover strip
- ② With cover strip

Diagrams Signal SIN/COS after differential generation



Signal diagram with read head moving in direction of arrow at 120 Ω load with $U_S = 5\text{ V}$

Diagrams Signal before differential generation

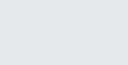
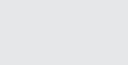


Signal diagram with read head moving in direction of arrow at 120 Ω load with US = 5 V

Signal	Interface signals	Signal before differential generationAt load 120 Ω	Signal offset	Supply voltage	Output
+ SIN- SIN+ COS- COS	Analog, differential	0,5 V _{SS} ± 10 %	2,5 V ± 5 %	4,5 V ... 30 V	Sinus 0.5 V _{pp}

Recommended accessories

Other models and accessories → www.sick.com/TTK70

	Brief description	Type	part no.
magnets			
	Product segment: Magnets Product: Magnetic tapes Description: Magnetic tape length: 0.5 m, magnetic tape width: 10 mm, weight: 0.18 kg/m, magnetic tape material: 17410 hard ferrite 9/28 P, substrate tape material: steel, period length 1 mm, operating temperature range: -20 °C ... 100 °C, storage temperature range: -30 °C ... 100 °C, temperature coefficient: (11 ± 1) µm/K/m Material: Covering tape: V2A, magnetic tape: 17410 hard ferrite 9/28 P, substrate tape: spring steel (11± 1) µm/K/m	MVM-OM5-2MC-MKLB	6037415
	Product segment: Magnets Product: Magnetic tapes Description: Magnetic tape length: 1 m, magnetic tape width: 10 mm, weight: 0.18 kg/m, magnetic tape material: 17410 hard ferrite 9/28 P, substrate tape material: steel, period length 1 mm, operating temperature range: -20 °C ... 100 °C, storage temperature range: -30 °C ... 100 °C, temperature coefficient: (11 ± 1) µm/K/m Material: Covering tape: V2A, magnetic tape: 17410 hard ferrite 9/28 P, substrate tape: spring steel (11± 1) µm/K/m	MVM-O1M-2MC-MKLB	6037417
	Product segment: Magnets Product: Magnetic tapes Description: Magnetic tape length: 2 m, magnetic tape width: 10 mm, weight: 0.18 kg/m, magnetic tape material: 17410 hard ferrite 9/28 P, substrate tape material: steel, period length 1 mm, operating temperature range: -20 °C ... 100 °C, storage temperature range: -30 °C ... 100 °C, temperature coefficient: (11 ± 1) µm/K/m Material: Covering tape: V2A, magnetic tape: 17410 hard ferrite 9/28 P, substrate tape: spring steel (11± 1) µm/K/m	MVM-O2M-2MC-MKLB	6037419
	Product segment: Magnets Product: Magnetic tapes Description: Magnetic tape length: 3 m, magnetic tape width: 10 mm, weight: 0.18 kg/m, magnetic tape material: 17410 hard ferrite 9/28 P, substrate tape material: steel, period length 1 mm, operating temperature range: -20 °C ... 100 °C, storage temperature range: -30 °C ... 100 °C, temperature coefficient: (11 ± 1) µm/K/m Material: Covering tape: V2A, magnetic tape: 17410 hard ferrite 9/28 P, substrate tape: spring steel (11± 1) µm/K/m	MVM-O3M-2MC-MKLB	6037421
	Product segment: Magnets Product: Magnetic tapes Description: Magnetic tape length: 4 m, magnetic tape width: 10 mm, weight: 0.18 kg/m, magnetic tape material: 17410 hard ferrite 9/28 P, substrate tape material: steel, period length 1 mm, operating temperature range: -20 °C ... 100 °C, storage temperature range: -30 °C ... 100 °C, temperature coefficient: (11 ± 1) µm/K/m Material: Covering tape: V2A, magnetic tape: 17410 hard ferrite 9/28 P, substrate tape: spring steel (11± 1) µm/K/m	MVM-O4M-2MC-MKLB	6037423
	Product segment: Magnets Product: Magnetic tapes Description: Magnetic tape length: 1.5 m, magnetic tape width: 10 mm, weight: 0.18 kg/m, magnetic tape material: 17410 hard ferrite 9/28 P, substrate tape material: stainless steel, period length 1 mm, operating temperature range: -20 °C ... 100 °C, storage temperature range: -30 °C ... 100 °C, temperature coefficient: (11 ± 1) µm/K/m Material: 17410 Hard ferrite 9/28 P	MVM-1M5-2MC-MKLB	6037418
	Product segment: Magnets Product: Magnetic tapes Description: Magnetic tape length: 2.5 m, magnetic tape width: 10 mm, weight: 0.18 kg/m, magnetic tape material: 17410 hard ferrite 9/28 P, substrate tape material: steel, period length 1 mm, operating temperature range: -20 °C ... 100 °C, storage temperature range: -30 °C ... 100 °C, temperature coefficient: (11 ± 1) µm/K/m Material: 17410 Hard ferrite 9/28 P	MVM-2M5-2MC-MKLB	6037420
	Product segment: Magnets Product: Magnetic tapes Description: Magnetic tape length: 3.5 m, magnetic tape width: 10 mm, weight: 0.18 kg/m, magnetic tape material: 17410 hard ferrite 9/28 P, substrate tape material: steel, period length 1 mm, operating temperature range: -20 °C ... 100 °C, storage temperature range: -30 °C ... 100 °C, temperature coefficient: (11 ± 1) µm/K/m Material: Covering tape: V2A, magnetic tape: 17410 hard ferrite 9/28 P, substrate tape: spring steel (11± 1) µm/K/m	MVM-3M5-2MC-MKLB	6037422

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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