

# SEK160-HN110AK02

SEK160

**MOTOR FEEDBACK SYSTEMS**

**SICK**  
Sensor Intelligence.

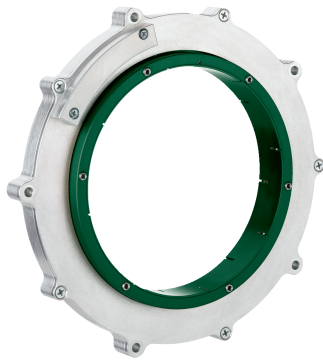


Illustration may differ

### Ordering information

Type	part no.
SEK160-HN110AK02	1038272

Other models and accessories → [www.sick.com/SEK160](http://www.sick.com/SEK160)

### Detailed technical data

#### Safety-related parameters

<b>MTTF<sub>D</sub> (mean time to dangerous failure)</b>	147.7 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 60 °C, frequency of use 8760 h/a. All electronic failures are considered hazardous. For more information, see document no. 8015532.

#### Performance

<b>Sine/cosine periods per revolution</b>	128
<b>Number of the absolute ascertainable revolutions</b>	1
<b>Total number of steps</b>	4,096 via RS485
<b>Measuring step</b>	2.5 " For interpolation of the sine/cosine signals with, e. g., 12 bits
<b>Integral non-linearity</b>	± 72 ", Error limits for evaluating sine/cosine period, typical values at nominal position ± 0.1 mm und +20 °C
<b>Differential non-linearity</b>	± 21 ", Non-linearity within a sine/cosine period, typical values at nominal position ± 0.1 mm und +20 °C
<b>Operating speed</b>	≤ 1,500 min <sup>-1</sup> , up to which the absolute position can be reliably produced
<b>Latency</b>	100 µs
<b>Available memory area</b>	1,792 Byte
<b>System accuracy</b>	± 57 "

#### Interfaces

<b>Type of code for the absolute value</b>	Binary
<b>Code sequence</b>	Increasing, when turning the shaft For clockwise rotation, looking in direction "A" (see dimensional drawing), For clockwise shaft rotation, looking in direction "A" (see dimensional drawing)
<b>Communication interface</b>	HIPERFACE®

#### Electrical data

<b>Connection type</b>	Male connector, 8-pin
<b>Supply voltage</b>	7 V DC ... 12 V DC
<b>Recommended supply voltage</b>	8 V DC

<sup>1)</sup> Without load.

<b>Current consumption</b>	150 mA <sup>1)</sup>
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<sup>1)</sup> Without load.

## Mechanical data

<b>Shaft version</b>	Through hollow shaft
<b>Shaft diameter</b>	110 mm
<b>Dimensions</b>	See dimensional drawing
<b>Weight</b>	≤ 0.27 kg
<b>Moment of inertia of the rotor</b>	2,860 gcm <sup>2</sup>
<b>Operating speed</b>	3,000 min <sup>-1</sup>
<b>Angular acceleration</b>	≤ 28,000 rad/s <sup>2</sup>
<b>Permissible radial shaft movement</b>	± 0.2 mm
<b>Permissible axial shaft movement</b>	± 0.5 mm <sup>1)</sup>

<sup>1)</sup> Relative to the installation position, as described in the assembly instructions (order nr. 8013609) and in the proposed customer fitting.

## Ambient data

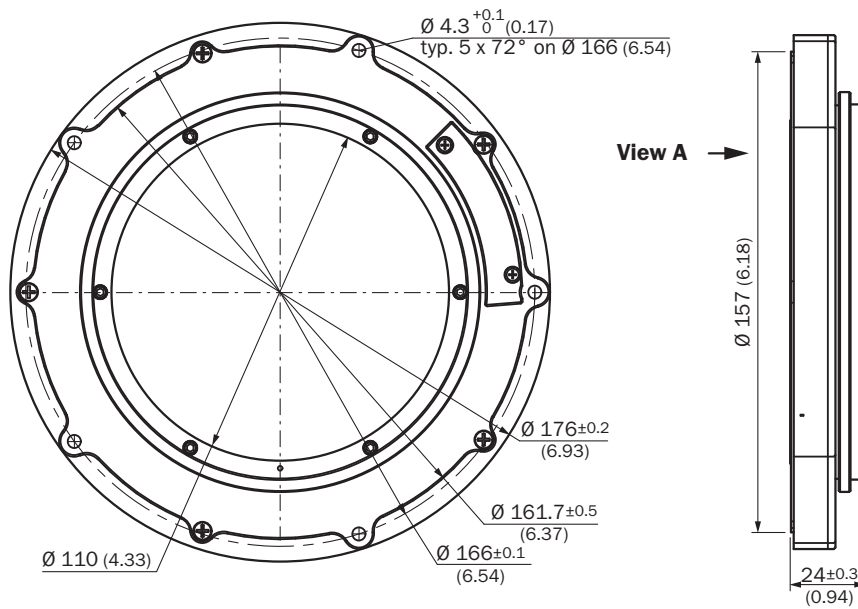
<b>Operating temperature range</b>	-30 °C ... +115 °C
<b>Storage temperature range</b>	-50 °C ... +125 °C, without package
<b>Relative humidity/condensation</b>	90 %, Condensation not permitted
<b>Resistance to shocks</b>	100 g, 10 ms (according to EN 60068-2-27)
<b>Frequency range of resistance to vibrations</b>	30 g, 10 Hz ... 2,000 Hz (EN 60068-2-6)
<b>EMC</b>	According to EN 61000-6-2 and EN 61000-6-3 <sup>1)</sup>
<b>Enclosure rating</b>	IP40, with mating connector inserted and closed cover (IEC 60529)

<sup>1)</sup> The EMC according to the standards quoted is achieved when the motor feedback system is mounted in an electrically conductive housing, which is connected to the central earthing point of the motor controller via a cable screen. If other shielding concepts are used, users must perform their own tests.

## Classifications

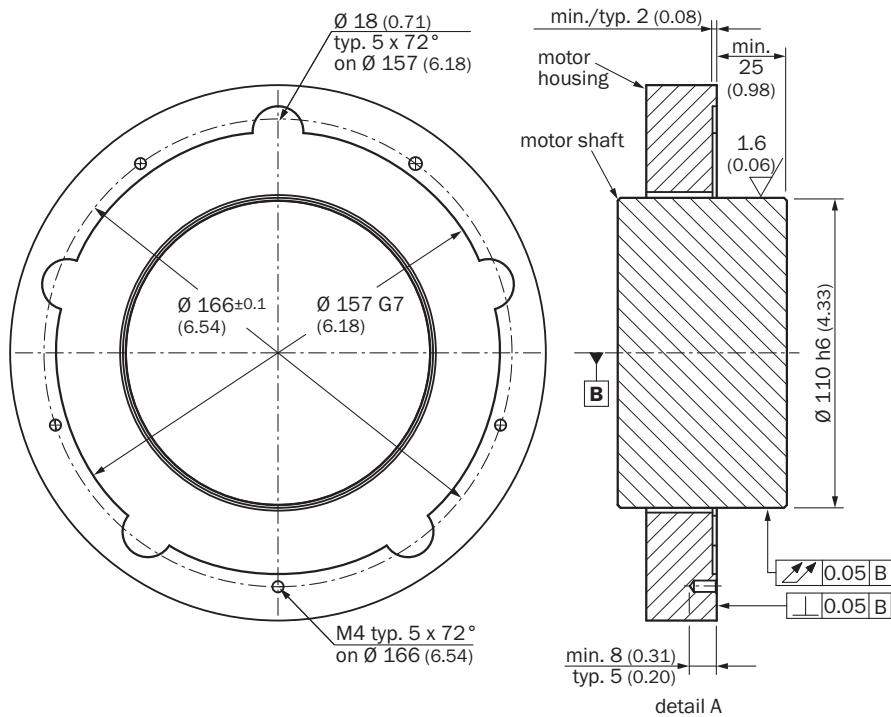
<b>ECLASS 5.0</b>	27270590
<b>ECLASS 5.1.4</b>	27270590
<b>ECLASS 6.0</b>	27270590
<b>ECLASS 6.2</b>	27270590
<b>ECLASS 7.0</b>	27270590
<b>ECLASS 8.0</b>	27270590
<b>ECLASS 8.1</b>	27270590
<b>ECLASS 9.0</b>	27270590
<b>ECLASS 10.0</b>	27273805
<b>ECLASS 11.0</b>	27273901
<b>ECLASS 12.0</b>	27273901
<b>ETIM 5.0</b>	EC001486
<b>ETIM 6.0</b>	EC001486
<b>ETIM 7.0</b>	EC001486
<b>ETIM 8.0</b>	EC001486
<b>UNSPSC 16.0901</b>	41112113

### Dimensional drawing



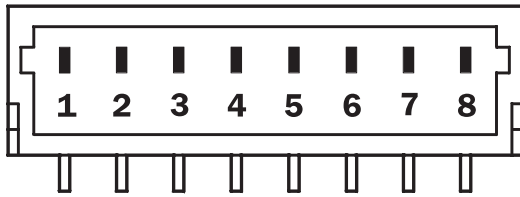
Dimensions in mm (inch)

### Attachment specifications



All dimensions in mm (inch)

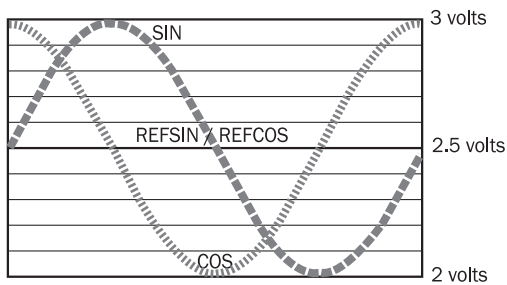
## PIN assignment View of the plug-in face



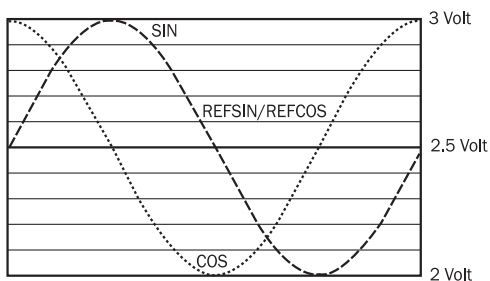
PIN	Signal	Wire colors (cable connection)	Explanation
1	$U_S$	Red	Supply voltage
2	+ SIN	White	Process data channel
3	REFSIN	Brown	Process data channel
4	+ COS	Pink	Process data channel
5	REFCOS	Black	Process data channel
6	GND	Blue	Ground connection
7	Data +	Gray or yellow	Parameter channel RS 485
8	Data -	Green or purple	Parameter channel RS 485

The GND connection (0 V) of the supply voltage is not connected to the housing

## Diagrams Signal diagram for clockwise shaft rotation, looking in direction "A" (see dimensional drawing) 1 period = $360^\circ$ : 64/128/256

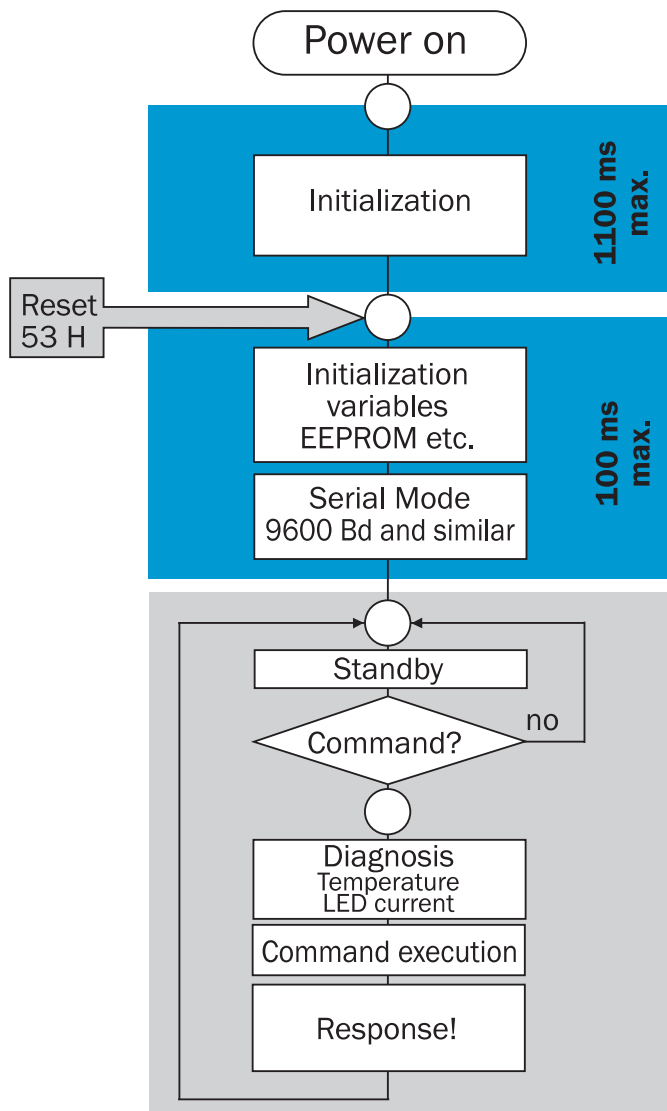


## Diagrams Signal specification of the process channel



Signal diagram for clockwise rotation of the shaft looking in direction "A" (see dimensional drawing)  
1 period =  $360^\circ$  : 1024

### Diagrams



### CAUTION:

No **RS485 communication** is possible during the phases highlighted in blue

After a software reset, it will take approx. 150 ms until the SIN/COS signals reach an amplitude of  $1 \text{ Vpp} \pm 20 \%$ .

## 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)