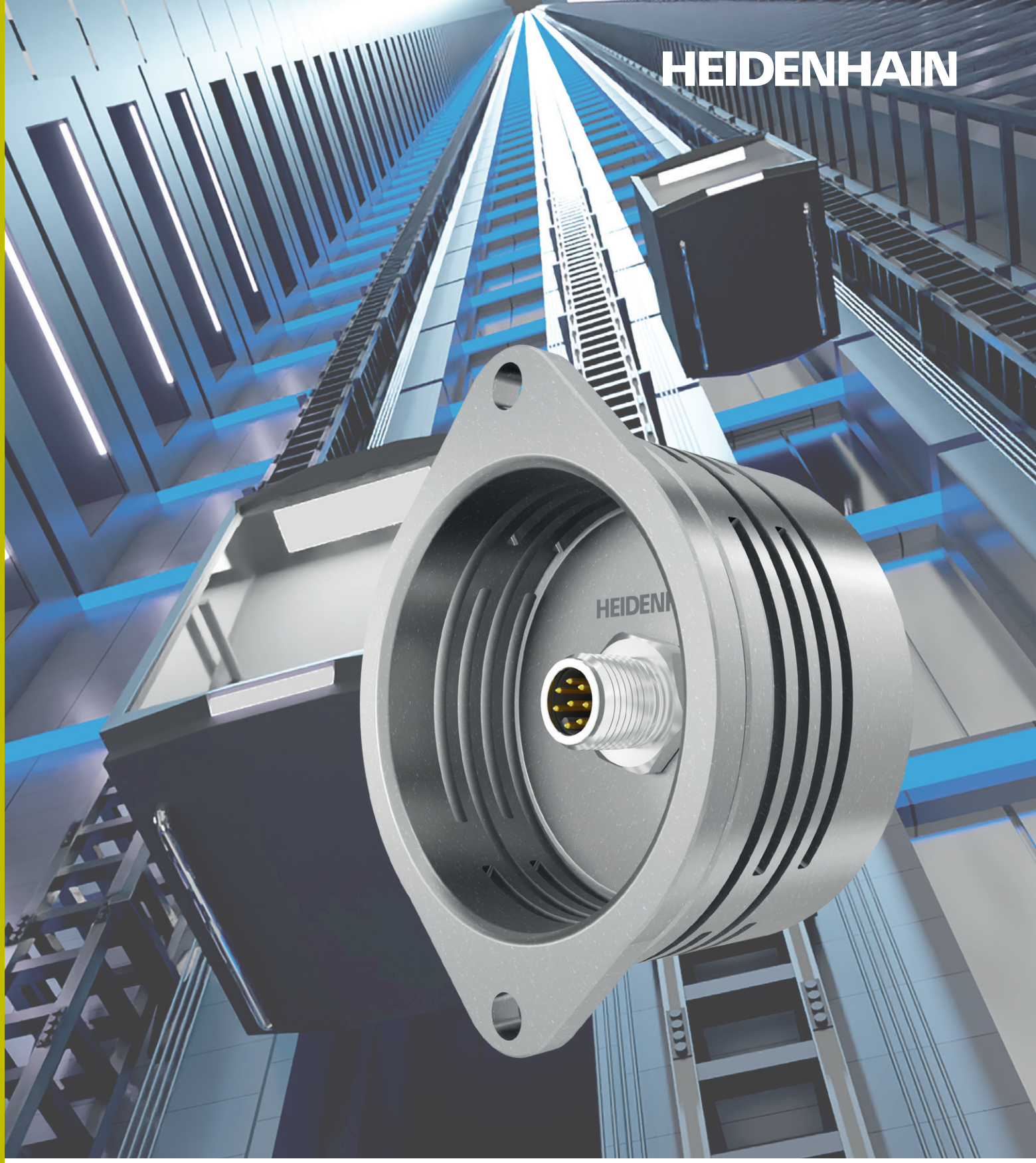
HEIDENHAIN



Encoders for Elevators

HEIDENHAIN Corporate Group solutions for your requirements

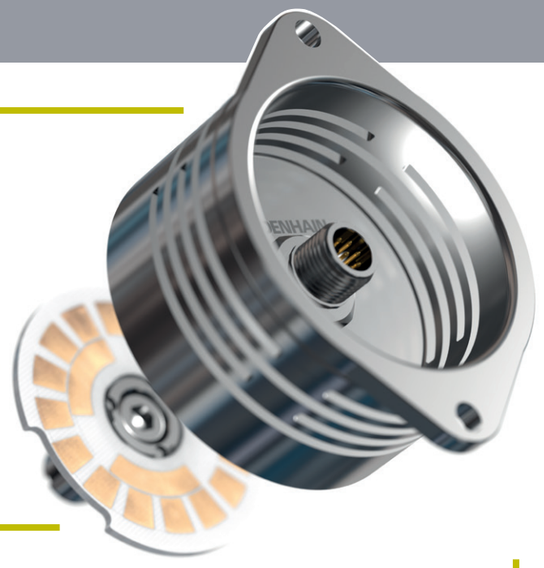
HEIDENHAIN | AMO | RENCO

Solutions with additional benefits for today’s elevator requirements

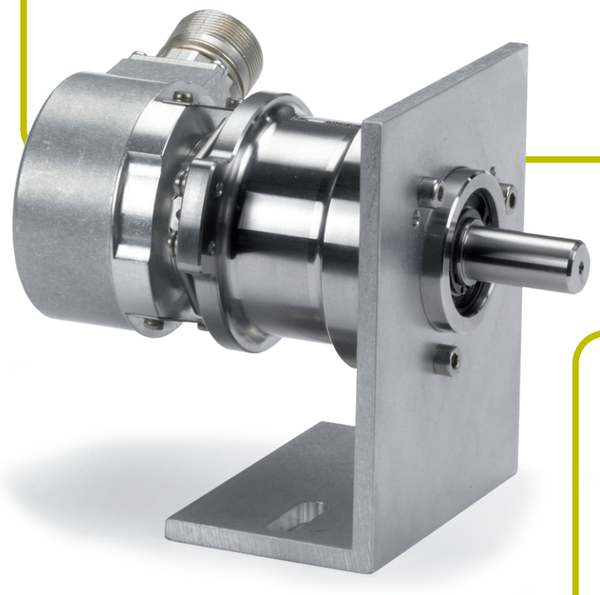
Our encoders ensure full-elevator safety and comfort by monitoring the main motor, door motor and shaft copying system. The HEIDENHAIN, AMO and RENCO brands are specialists for your elevator applications, serving conventional and upcoming elevator technologies.

Main motor

- High signal quality
- Online self-diagnosis
- High reliability



Shaft copying and speed monitoring



- Absolute position measurement
- Large permissible axial and radial loads
- High signal quality

Door motor

- Compact form factor
- Electronic adjustment
- Easy integration

Next-generation elevator technology

The demands on elevator complexity and travel height are growing. Today's elevators have become high-tech passenger transport systems, a far cry from the simple hoists of previous generations.

Safety and comfort are non-negotiable requirements in modern elevators. Vital to meeting these requirements are elevator encoders from HEIDENHAIN, AMO and RENCO. Installed on the main motor, door motor and shaft copying system, our encoders work tirelessly to ensure smooth travel, correct arrival and efficient door operation. Beyond their extreme reliability in these applications, our encoders can also monitor other elevator functions.

The biggest factor in an elevator's speed, comfort and overall performance is its motor control system. More advanced elevator motors, such as gearless designs, require carefully selected encoders and other motion control components. Rotary encoders are also essential in elevator door motors and digital shaft copying systems. With an extensive range of products, HEIDENHAIN, AMO and RENCO offer the optimal solutions for your elevator control needs.

Key requirements for today's elevators:

- Optimal ride comfort
- Accurate car arrival
- Smooth starting and stopping
- Impeccable reliability
- Speed control
- Compatibility with different travel heights

High-performance motor feedback

Robust, reliable and high-resolution

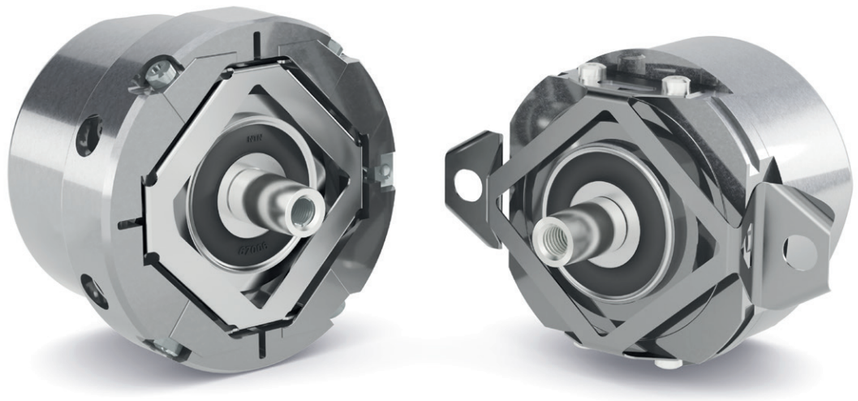
These qualities make HEIDENHAIN and AMO rotary encoders trusted solutions for main motor feedback on conventional traction elevators.

High-resolution rotary encoders are the go-to choice for position feedback on main elevator motors. Rotary encoders from HEIDENHAIN and AMO deliver excellent signal quality and high accuracy for exact positioning and high-quality speed control. A rich selection of form factors, mounting types and scanning technologies make them suitable for a variety of motor types, including disc motors, internal rotor motors and external rotor motors.

Rotary encoder requirements for optimal motion control:

- High positioning accuracy
- Rigid connection to the shaft
- High natural frequency or wide runout tolerances for the coupling
- Easy installation
- Rugged design
- High-performance data interfaces

Rotary encoders for your elevator motor: Analog or serial, with added monitoring data



KCI 419 D*plus:* position feedback and brake monitoring

The KCI 419 D*plus* inductive rotary encoder does more than provide position feedback on traction elevator motors. It also tracks the brake temperature and detects the brake stroke, all without the help of microswitches, making it an alternative for brake monitoring. The encoder's robust EnDat interface relays the extra brake data to downstream electronics, where the brake status (released or engaged) and the level of brake wear can be determined.

Your operation and maintenance benefits:

The KCI 419 D*plus* provides elevator operators with greater system availability and reliability, as well as significantly less maintenance, cabling and installation work.

ERN 400/1300, ECN 400/1300

Rotary encoders with analog output signals

Area of application
- Main-motor control

Characteristics
- Absolute 1 V_{PP} interface or analog 1 V_{PP} output signals
- High signal quality
- Stator coupling for easy axial mounting or for compensation of axial error

Specifications

• Measuring steps per rev.	23 bits after interpolation
• Operating temperature	–40 °C to +100 °C
• Interface	1 V_{PP}, EnDat01

AEF 1300

Rotary encoder with purely serial output signals

Area of application
- Main-motor control

Characteristics
- Absolute interface with purely serial output signals
- Superb EMC robustness thanks to purely serial data transmission
- External and internal temperature measurement
- Stator coupling for easy axial mounting or for compensation of axial error

Specifications

• Position values per rev.	23 bits
• Operating temperature	–40 °C to +100 °C
• Interface	EnDat22

KCI 419 D*plus*

Rotary encoder with purely serial output signals and brake monitoring

Area of application
- Main-motor control

Characteristics
- Absolute interface with purely serial output signals
- Brake release monitoring
- Brake wear monitoring
- Temperature monitoring
- Online self-diagnosis
- Digital data transmission

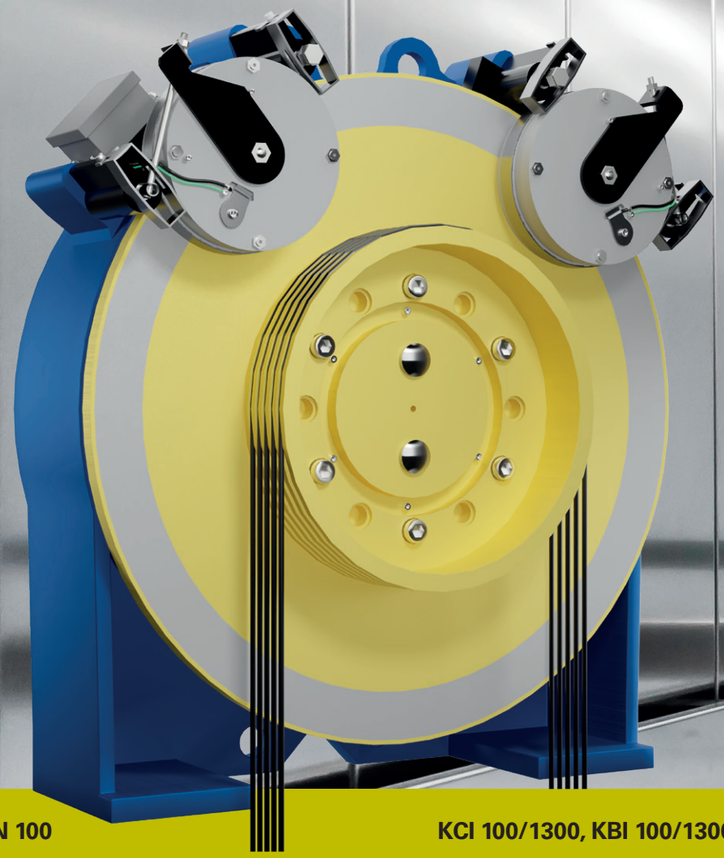
Specifications

• Position values per rev.	19 bits
• Measured axial brake stroke	0.5 mm to 1.6 mm
• Operating temperature	–40 °C to +100 °C
• Interface	EnDat22

Extra functionality: operating data for downstream electronics

- Position feedback
- Functional safety
- Online diagnostics
- Sensor information
- Electronic ID label
- Datum shift
- Production data

EnDat



ERN 100, ECN 100

Absolute rotary encoders for large shafts

Area of application
- Main-motor control

Characteristics
- Absolute interface with purely serial output signals or absolute 1 V_{PP} interface or analog 1 V_{PP} output signals
- High signal quality
- Hollow shaft sizes: 25 mm and 50 mm
- Stator coupling

Specifications

• Measuring steps per rev.	Up to 23 bits after interpolation
• Operating temperature	–40 °C to +100 °C
• Interface	1 V_{PP}, EnDat01, EnDat22

KCI 100/1300, KBI 100/1300

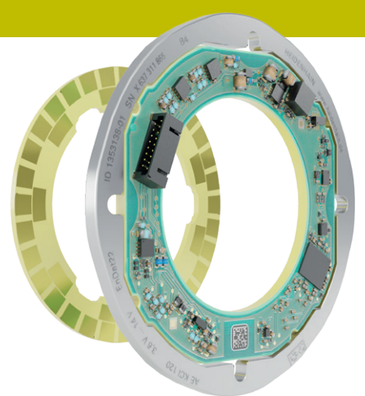
Absolute inductive rotary encoders for large shafts

Area of application
- Main-motor control

Characteristics
- Absolute interface with purely serial output signals
- Compact modular design for easy integration
- Hollow shaft sizes: 25 mm, 30 mm and 40 mm
- Immune to magnetic fields and contamination

Specifications

• Position values per rev.	Up to 20 bits
• Axial motion of motor shaft	≤ ±0.5 mm
• Operating temperature	–40 °C to +115 °C
• Interface	EnDat22



WMK 3010S/WMR 3010A

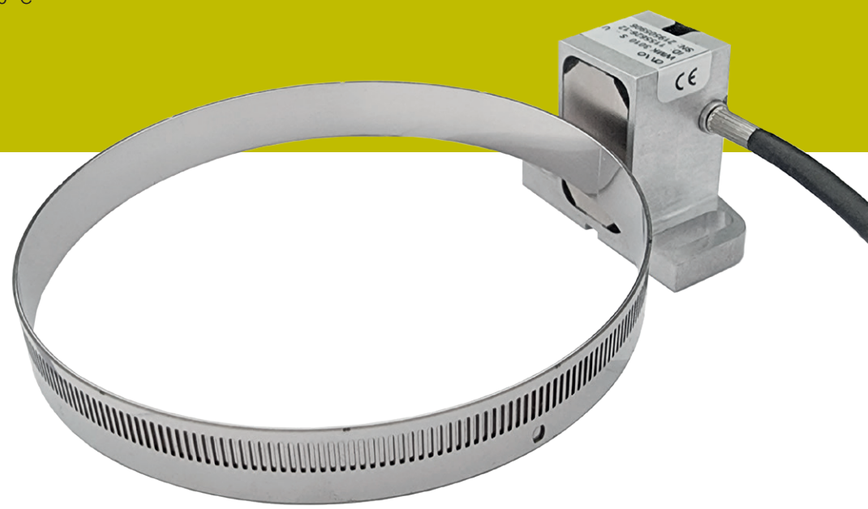
Incremental inductive rotary encoders with additional operating data

Area of application
- Main motors installed in the elevator shaft

Characteristics
- Integrated operating data collection
- Measuring-ring diameter range: 60 mm to 163 mm
- Compact form factor
- Immunity to magnetic fields and contamination

Specifications

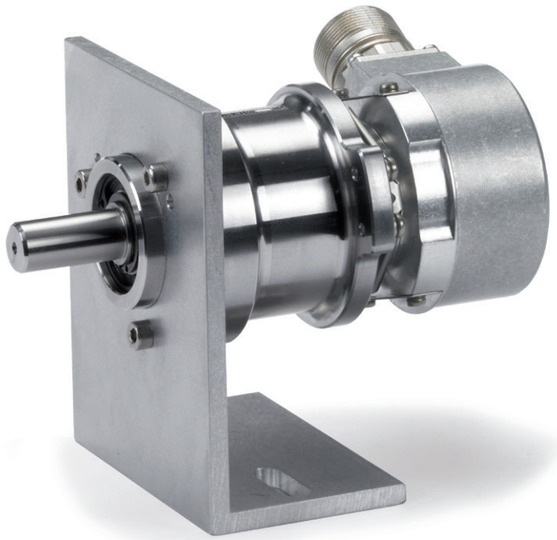
• System accuracy	±25 µm
• Operating temperature	–10 °C to +110 °C
• Interface	1 V_{PP}

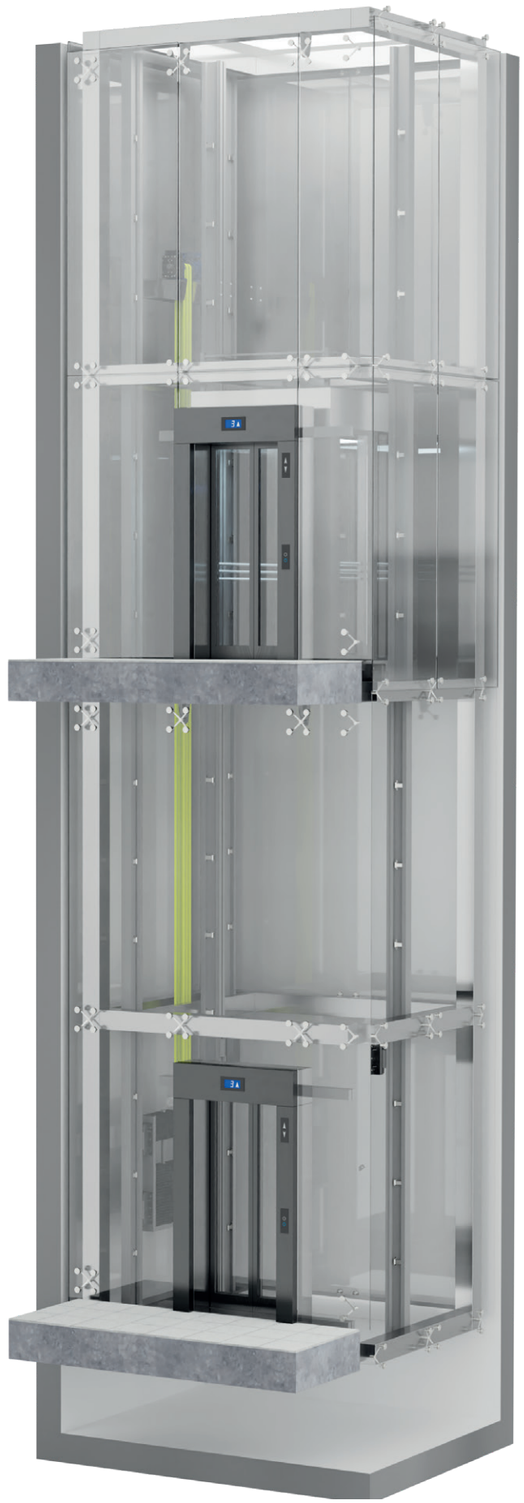


Shaft copying and speed monitoring

Measuring an elevator car's exact position in the shaft, and relaying this data to the controller, is essential for guaranteeing smooth braking and accurate car positioning. This is the job of shaft copying systems, which benefit greatly from HEIDENHAIN absolute rotary encoders. Here's why:

- The car's absolute position isn't lost after a power outage
- Always knowing the car's absolute position enables steady control right up to its arrival point





ExN 400

Rotary encoder unit for high bearing loads

Area of application
- Shaft copying

Characteristics
- Absolute multiturn rotary encoder for position feedback
- High signal quality
- Bearing unit for high axial and radial loads

Specifications

• Measuring steps per rev.	Up to 25 bits
• Revolutions	4096
• Operating temperature	–40 °C to +100 °C
• Interface	EnDat01, EnDat22
• Bearing load	Axial 150 N, radial 350 N

Rotary encoders for door motors

Elevators don't wait as long at their destinations, and can therefore carry more people throughout the day, if their doors open and close with maximum speed and accuracy. This requires accurate and dynamic position measurement on the door motor. HEIDENHAIN rotary encoders for door motors deliver the position feedback and compact form factor needed in these applications. All of these models have an outside diameter of less than 40 mm.

ECI 1118

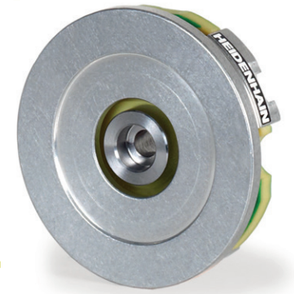
Absolute inductive rotary encoder

Area of application
- Door motors

Characteristics
- Absolute interface with purely serial output signals
- Easy-to-integrate design
- Compact form factor
- Immunity to magnetic fields and contamination

Specifications

• Position values per rev.	18 bits
• Axial motion of motor shaft	≤ ±0.4 mm
• Operating temperature	–20 °C to +115 °C
• Interface	EnDat22



R35iL

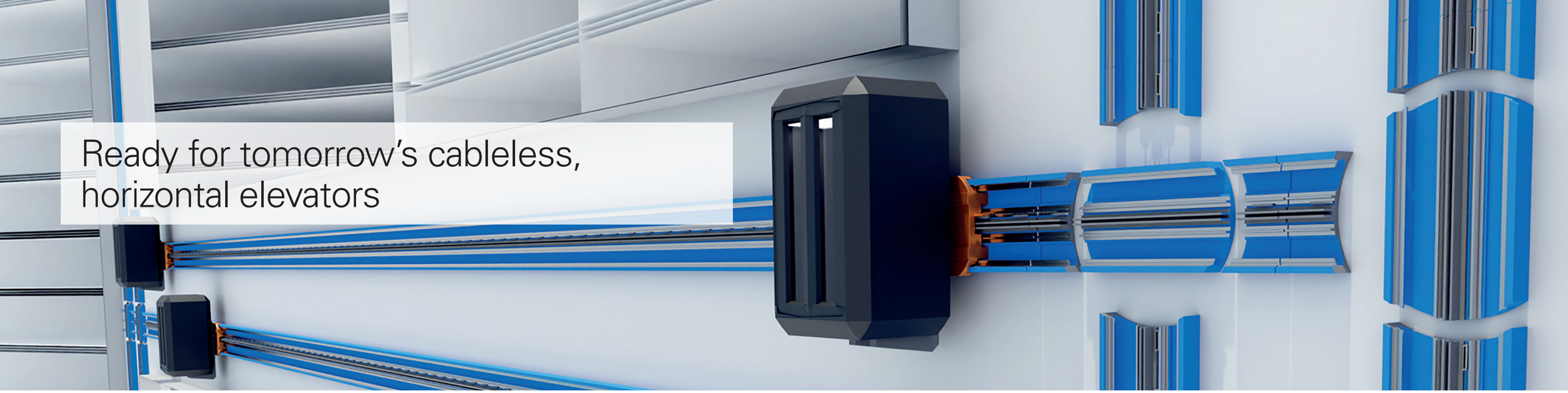
Incremental rotary encoder for block commutation

Area of application
- Door motors

Characteristics
- Feedback system for stepper and BLDC motors
- High signal quality thanks to OPTO-ASIC technology
- Electronic commutation adjustment
- Compact design (height: 8.6 mm)

Specifications

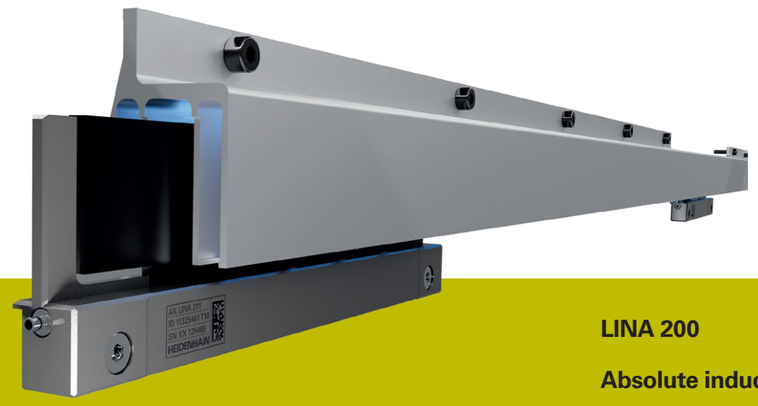
• Signal periods per rev.	Up to 10 000
• Commutation	U, V and W signal tracks for up to 32 motor pole pairs
• Operating temperature	–30 °C to +115 °C



Ready for tomorrow’s cableless, horizontal elevators

HEIDENHAIN: LINA 200
Absolute linear encoder for cableless elevators

Freed from the constraints of a cable, future elevators will be able to travel both vertically and horizontally. HEIDENHAIN has already developed an absolute inductive linear encoder for these applications: the LINA 200. The absolute position is calculated based on different signal periods arising from two scale tracks within the encoder’s graduation carrier.



LINA 200

Absolute inductive linear encoder

Area of application
- Main-motor control (linear actuator)

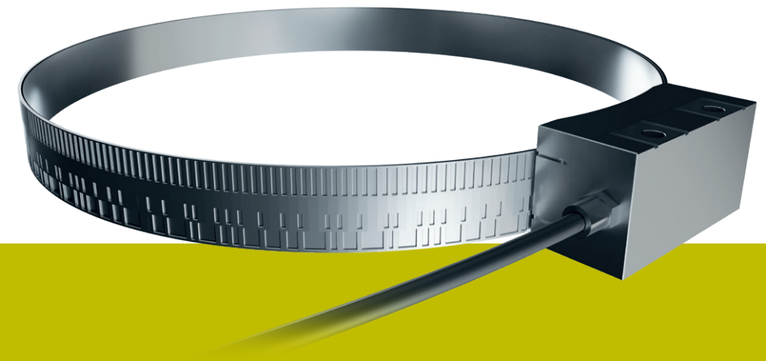
Characteristics
- Absolute encoder for linear motor control
- High signal quality for superb passenger comfort
- Wide runout tolerances thanks to bearingless design

Specifications

• Resolution	18 bits after interpolation
• Operating temperature	+5 °C to +45 °C
• Interface	EnDat22

AMO: WMKA
Switch between vertical and horizontal travel

Future cableless elevators will switch between vertical and horizontal travel at in-shaft swivel joints driven by high-power torque motors. These motors can be controlled using the position feedback provided by WMKA modular angle encoders from AMO or exposed linear encoders such as the LIC series from HEIDENHAIN.



WMKA

Absolute modular angle encoder

Area of application
- Swivel joints in cableless elevators

Characteristics
- Measuring-ring diameter range: 82 mm to 650 mm
- Compact form factor
- Universal scanning head design

Specifications

• Resolution	18 bits to 25 bits
• Operating temperature	–10 °C to +85 °C
• Interface	EnDat22

HEIDENHAIN

HEIDENHAIN specializes in high-accuracy measurement and control technology

RENCO

RENCO is known for its flat-profile, easy-to-mount rotary encoders

AMO

AMO develops highly robust inductive encoders for linear and rotary applications

Discover more about our solutions

- **elevator.heidenhain.com**
- **heidenhain.com/rotary-encoders**
- **structural-monitoring.heidenhain.com**

DR. JOHANNES HEIDENHAIN GmbH
Dr.-Johannes-Heidenhain-Straße 5
83301 Traunreut, Germany
☎ +49 8669 31-0
FAX +49 8669 32-5061
info@heidenhain.de

www.heidenhain.com

DR. JOHANNES HEIDENHAIN GmbH
Dr.-Johannes-Heidenhain-Straße 5
83301 Traunreut, Germany
☎ +49 8669 31-0
FAX +49 8669 32-5061
info@heidenhain.de

www.renco.com

AMO Automatisierung Messtechnik Optik GmbH
Nöfing 4
A-4963 St. Peter am Hart, Austria
☎ +43 7722 658 56-0
FAX +43 7722 658 56-11
office@amo.at

www.amo-gmbh.com

1413512-20 · 1 · 06/2023 · CD · Printed in Germany