

Precision-Box

Additional electronics for the
Precision-System

GEL SDA10

Technical information

Version 2023-04-12

General

- Precision-Box as part of the system for the minimisation of the eccentricity error
- Increasing the system accuracy of incremental measuring systems
- Physically compatible with existing M23 connectors
- Easy commissioning using the testing and programming unit GEL 211CS0

Features

- High accuracy possible even at high rotational speed
- Frequency range from 0 to 200 kHz

Advantages

- Function with standard MiniCODERs
- Looping through of 4 temperature signals or other signals
- Maintenance and wear-free
- Easy installation and commissioning
- Independent of tooth wheel

Field of application

Applications with increased accuracy requirements,
e.g.:

- Simple positioning solution for small to medium rotary tables or rotary axes in machine tools
- Turning and milling centres



Precision-Box

Description

Precision-System

The Precision-System combines rotational speed measurement and high-accuracy positioning applications.

The system comprises:

- 2 MiniCODERs 2444K____P or 2449K____P
- 1 target wheel with even number of teeth
- 1 Precision-Box GEL SDA10

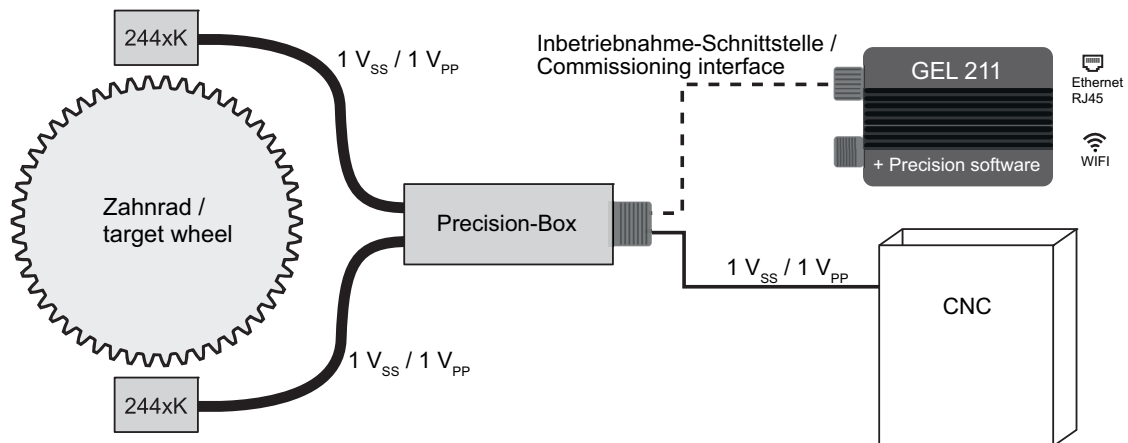
Example:

- 2 MiniCODERs 2444KZPG3P050
- 1 target wheel with 256 teeth, module 0.3 - such as ZFZ1122
- 1 Precision-Box SDA10A1KK0K0001

A testing and programming unit GEL 211CS0 is required for commissioning. A GEL 211BS0 is not suitable for this application.



You will find information about the MiniCODERs in the Technical information GEL 2444 and GEL 2449. You will find the Technical information on our homepage www.lenord.com.



MiniCODER

The two MiniCODERs are mounted at 180° in relation to each other and connected to the Precision-Box.

Precision-Box

The Box is mounted directly on the spindle and replaces the M23 connector normally used there.

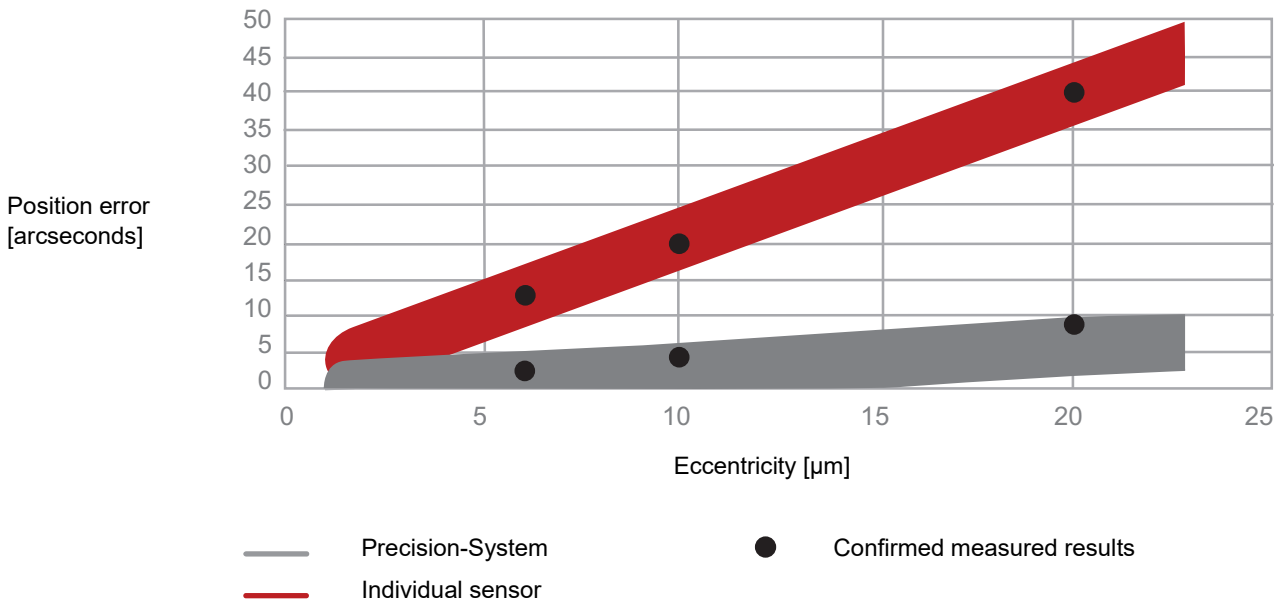
The Box acquires the signals from the two MiniCODERs, prepares them and passes them to the control system (CNC). Optionally available signals (e.g. temperature sensors) can be connected directly to the Box. The signals are output unchanged on the M23 connector. A suitable female connector is included in the scope of supply.

Before commissioning the Precision-System, the MiniCODER data and the Precision-Box data are to be adjusted using the testing and programming unit GEL 211CS0.

Eccentricity error

The eccentricity error is a measure of the concentricity of the target wheel. The eccentricity error is minimised and the total system error significantly reduced by means of the Precision-System with the two MiniCODERs mounted at 180° to each other and the Precision-Box. The system accuracy that can be achieved depends on the quality and the number of teeth of the target wheel used.

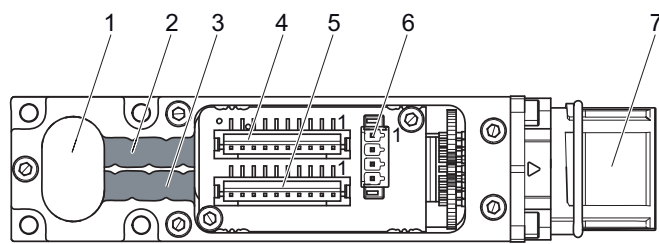
Eccentricity error of individual sensor and Precision-System



Comparison of individual sensor and Precision-System

Technical data


Electrical data	
Supply voltage +U _B	5 V DC ± 5 %
Current consumption	Approx. 100 mA
Output level	1 V _{pp} Differential signal
Output signal	Two sinusoidal signals offset by 90° and their inverse signals, reference pulse
Output frequency	0 to 200 kHz
Dielectric strength	500 V, DIN EN 61439-1:2012-06
EMC	Electromagnetic immunity DIN EN 61000-4-4:2013-04
Mechanical data	
Degree of protection	IP 54
Housing material	Aluminium
Weight	Approx. 160 g
Dimensions (length × width × height)	113.6 mm × 25.5 mm × 45.5 mm
Vibration resistance	200 m/s ² , in accordance with DIN EN 60068-2-6:2008-10
Shock resistance	2000 m/s ² , in accordance with DIN EN 60068-2-27:2010-02
MTTF FIT	5,000,000 h at 55 °C 204 10 ⁻⁹ h ⁻¹ at 55 °C
Ambient data	
Working temperature range	-20 °C to +85 °C
Operating and storage temperature range	-20 °C to +85 °C
Maximum relative humidity of air	< 95 %
Condensation	Not permitted



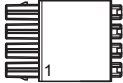
- 1 Cable entry
- 2 Cable duct and contact surface for cable screens
- 3 Cable duct and contact surface for cable screens
- 4 MiniCODER 1
- 5 MiniCODER 2
- 6 Temperature sensor or other signals
- 7 GEL 211CS0 / CNC


Connections

MiniCODER 1 / MiniCODER 2

10-pin female connector	Pin	Signal / function	
	1	U_B	+ 5 V supply voltage
	2	U_{1+}	Signal track 1
	3	U_{1-}	Inverse signal track 1
	4	U_{2+}	Signal track 2
	5	U_{2-}	Inverse signal track 2
	6	U_{Sense}	5 V Sense
	7	U_{N+}	Signal reference track N
	8	U_{N-}	Inverse signal reference track N
	9	0 V	GND
	10	Not used	

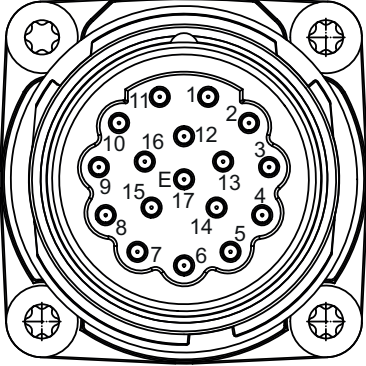
Optional spindle signals

4-pin female connector	Pin	Signal / function		Appropriate for cross-section:
	1	Temp2 +	Temperature sensor 2 + (or other signals)	0.14 - 0.25 mm ²
	2	Temp2 –	Temperature sensor 2 - (or other signals)	
	3	Temp1 +	Temperature sensor 1 + (or other signals)	
	4	Temp1 –	Temperature sensor 1 - (or other signals)	

 Use only screened cables!

Connections

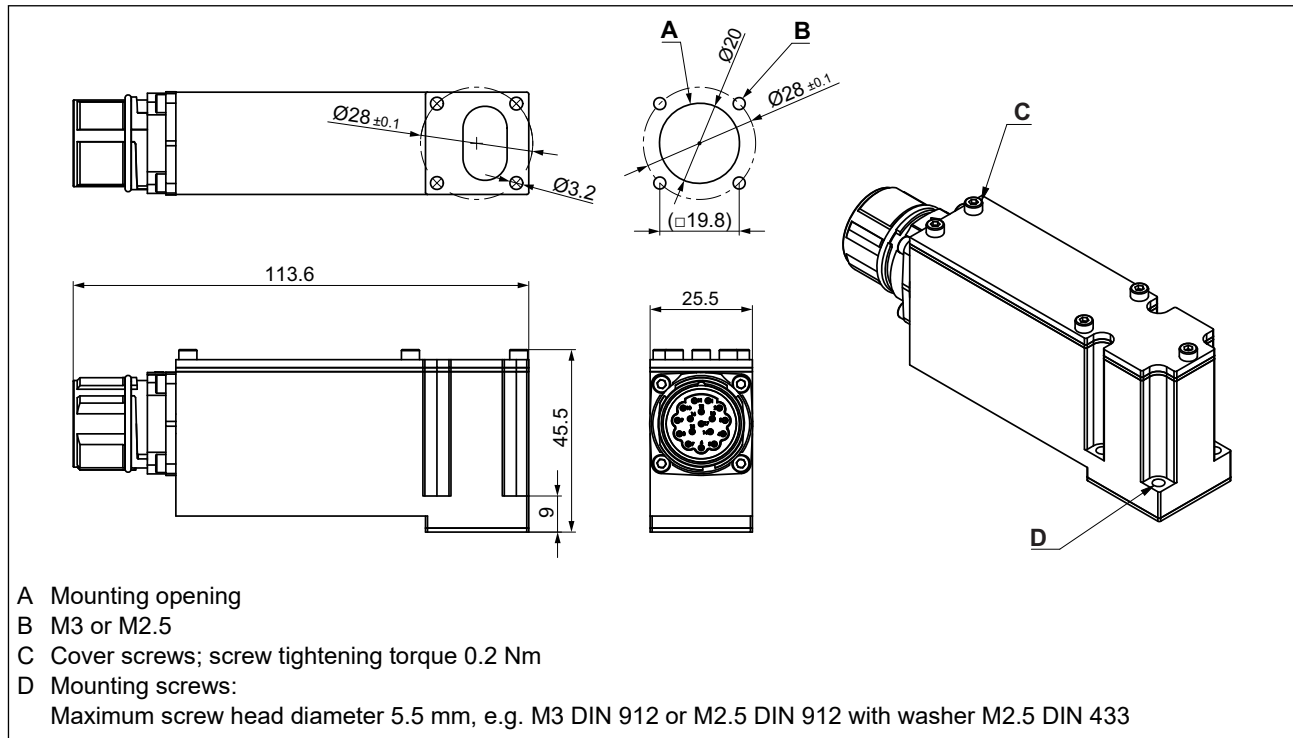
GEL 211CS0 / CNC

17-pin panel-mounting socket with pin contacts (M23)	Pin	Signal / function	
 <p>View of pin contact side</p>	1	U_{1+}	Signal track 1
	2	U_{1-}	Inverse signal track 1
	3	U_{N+}	Signal reference track N
	4	Not used	
	5	Temp2 –	Temperature sensor 2 -
	6	Temp2 +	Temperature sensor 2 +
	7	0 V	GND
	8	Temp1 +	Temperature sensor 1 +
	9	Temp1 –	Temperature sensor 1 -
	10	U_B	+ 5 V supply voltage
	11	U_{2+}	Signal track 2
	12	U_{2-}	Inverse signal track 2
	13	U_{N-}	Inverse signal reference track N
	14	Not used	
	15	0 V	GND (jumper pin 7)
	16	U_{Sense}	5 V Sense
	17	Not used	

Dimensional drawing

All dimensions stated in mm; general tolerance DIN ISO 2768 -mK

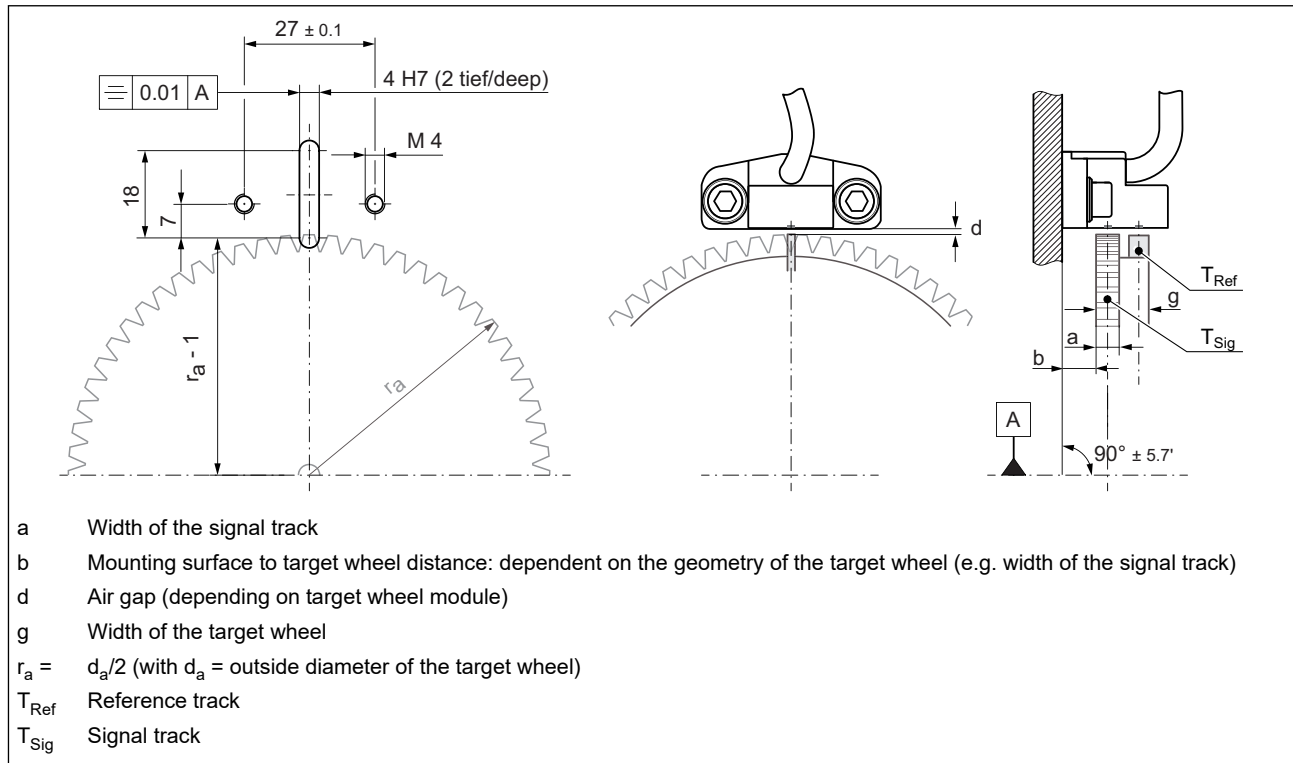
Dimensional drawing Precision-Box



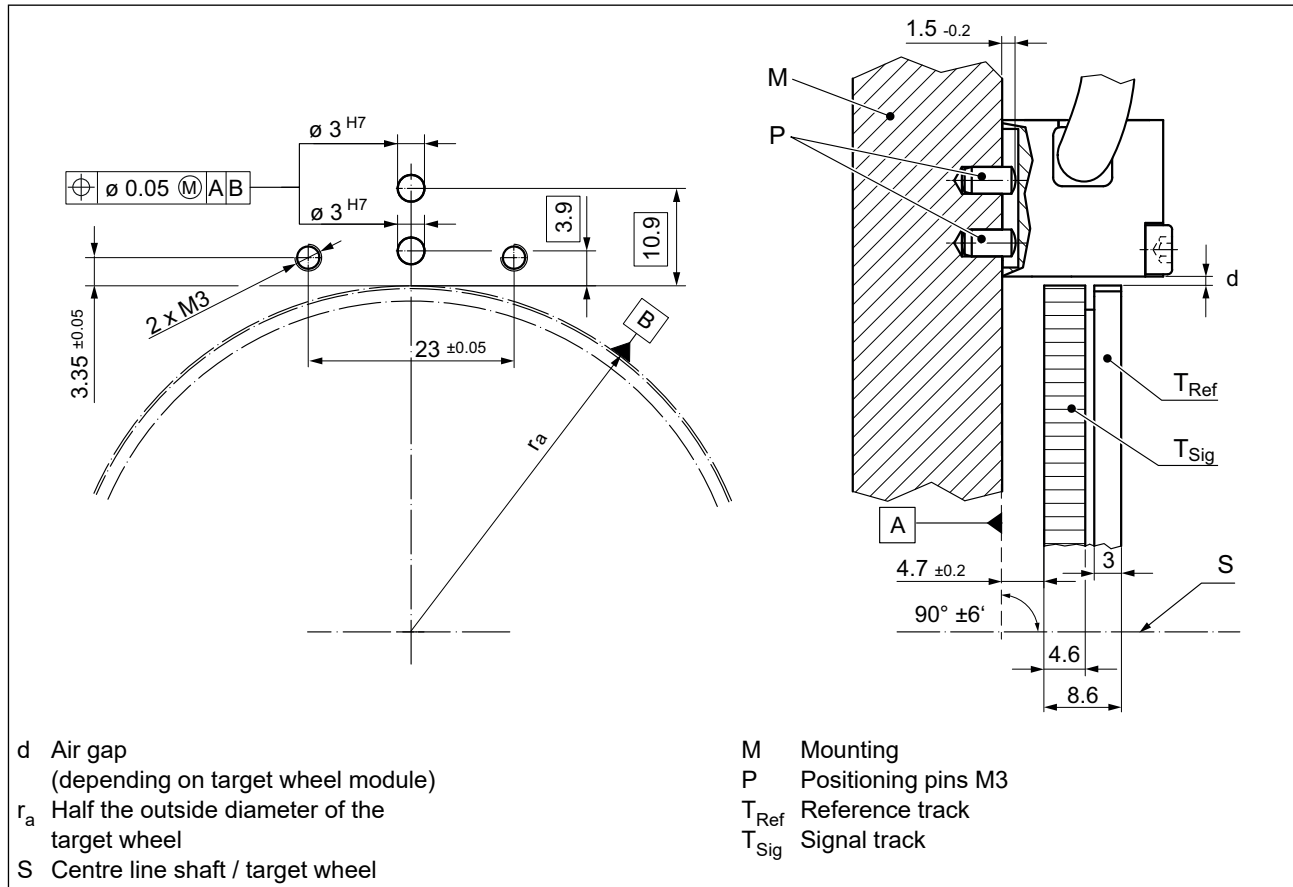
Mounting instructions MiniCODER

All dimensions stated in mm; general tolerance DIN ISO 2768 -mK

Hole pattern and installation dimensions GEL 2444

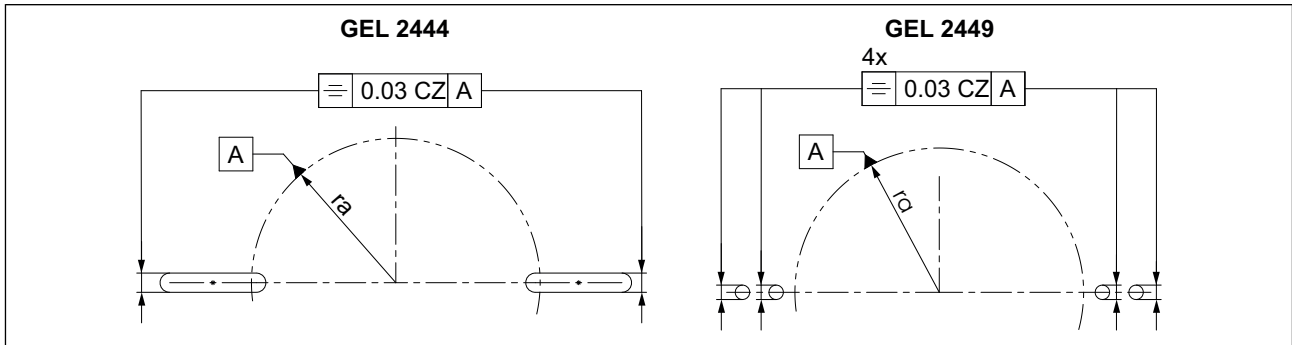


Hole pattern and installation dimensions GEL 2449



Mounting instructions MiniCODER

Position tolerances



Type code and accessories

Type code

SDA10	Design		
	A1	Angular housing attachment to the drive	
	KK	Input	
		2 × sin/cos sensors (MiniCODER GEL 2444K or 2449K)	
	0K	Output	
		1 × sin/cos output M23	
	0001	Device function	
		High-accuracy angle signal	

Accessories

Testing and programming unit



- Testing Lenord+Bauer sensors with sin/cos output 1 V_{pp}, e.g. MiniCODER
- Transmitting the data via WLAN or Ethernet to mobile terminal devices (tablet, PC, etc.)
- Display of the data in a web browser, independent of the operating system
- Adjustment of the Precision-Box using the commissioning wizard

Accessories

Item no.:	Identifier:
PK211C-244XK-E	PK211C-244XK-E (Ethernet), comprising: <ul style="list-style-type: none"> ▪ Testing and programming unit GEL 211CS04E2M ▪ Sensor connection cable GG211 ▪ Power supply unit 5 V, ZB211CB ▪ Operating instructions D-71B-211CS0 ▪ Case, XW1303
PK211C-244XK-W	PK211C-244XK-W (WLAN), comprising: <ul style="list-style-type: none"> ▪ Testing and programming unit GEL 211CS04W2M ▪ Sensor connection cable GG211 ▪ Power supply unit 5 V, ZB211CB ▪ Operating instructions D-71B-211CS0 ▪ Case, XW1303
GG211-17POL-M23	Adapter cable GEL 211 — Precision-Box GEL SDA10

Notes:

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