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PRELIMINARY DATASHEET V 1.7
22 MM SSI ENCODER KITS

IXARC 22mm Kit Encoder with SSI Interface

- Absolute single-turn and multi-turn functionality
- No battery, no gear – no maintenance
- Ultra-compact – 22 mm in diameter, 23 mm in height
- Electrical Resolution: Up To 17 bits
- Multiturn Range: Up To 32 bits
- Integrated temperature sensor on board
- Easy Installation with Self-Calibration

Absolute.
Compact.
Revolution.

1. Interface

Interface	SSI
Programming Functions	Electronic Calibration, WIEGAND pulse test, Preset
Min Interface Cycle Time	50 µs

2. Electrical Data

Supply Voltage	4.5 – 5.5 VDC
Current Consumption	Typ. 90 mA (at 5V)
Start-up time	Max. 100 ms
Encoder propagation delay	70 ns
Clock Input	RS 422
Clock Frequency	300 kHz – 10MHz
Reverse Polarity Protection	No
Short Circuit Protection	No
MTTF	@105°C: 41Y
Max. Permissible Electrical Speed	12.000 RPM
EMC	Kit encoder is a sub-assembly and not considered to be an independent system, therefore compliance with CE requirements has to be ensured by the integrator for the overall set-up.

3. Sensor

Singleturn Technology	Magnetic
Electrical Resolution Singleturn	17 bits
Multiturn Technology	Self powered magnetic pulse counter (no battery, no gear)
Multiturn Range	16 bits (up to 32 bits possible)

Accuracy (INL)	With electronic calibration at room temperature:
	  Prototypes - ±0.18° (11 bit)
	  Target - ±0.09° (< 12 bit)
	Without electronic calibration:
	  ±0.5° (< 10 bit)

Acceleration	10^5 rad/s^2
Counting Direction (Default)	Clockwise shaft movement (front view on shaft)

4. Environmental Specifications

Operating Temperature	[-40 °C (-40 °F); +105 °C (221 °F)]
Relative Humidity	90% (+40°C, 96 hours, No condensation)
Shock Resistance	Target: ≤ 100 g (half sine 6 ms, EN 60068-2-27)
Vibration Resistance	Target: ≤ 10 g (10 Hz – 2000 Hz, EN 60068-2-6)

5. Mechanical Data

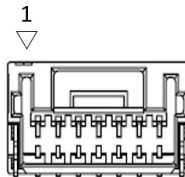|	
Housing Material	Steel
Housing Coating	Cathodic corrosion protection
Shaft Type	Hub
Shaft Dimensions	2, 3, 4 mm (as standard, customized solutions upon request)
Shaft Fastening Options	Shaft Pressed or Set Srews
Inertia Rotor	≈1.5 g cm²

6. Electrical Connection

Connection Orientation	Radial
Connector	BM08B-NSHSS -TBT

7. Connection Plan

Pin	Signal	Wire Color
1	GND	Blue
2	Preset (default 0 position value)	Pink
3	Config (UART)	Gray
4	Data +	Green
5	Data -	Yellow
6	CLOCK -	White
7	CLOCK +	Brown
8	VCC	Red

8. Version Space

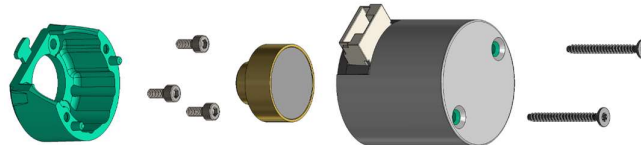| Parameter description		KCD	-	XXXXX	-	XX	XX	-	X	X	X	X	-	XXX
Interface	BiSS C			BC03B										
	SSI binary			S103B										
MT Revolution (Bits)	Single Turn					0								
	Multi Turn (16 384 Revolutions)					16								
ST Resolution (Bits)	131 072 (0.003°)						17							
Shield	without the bottom shield								I					
	with the bottom shield								J					
Shaft Fit	press									P				
	set screw									E				
Shaft Diameter	ø 2 mm										2			
	ø 3 mm										3			
	ø 4 mm										4			
Housing	Steel; clip on design											F		
Connector	Radial 8 pin BM08B-NSHSS-TBT													GRQ

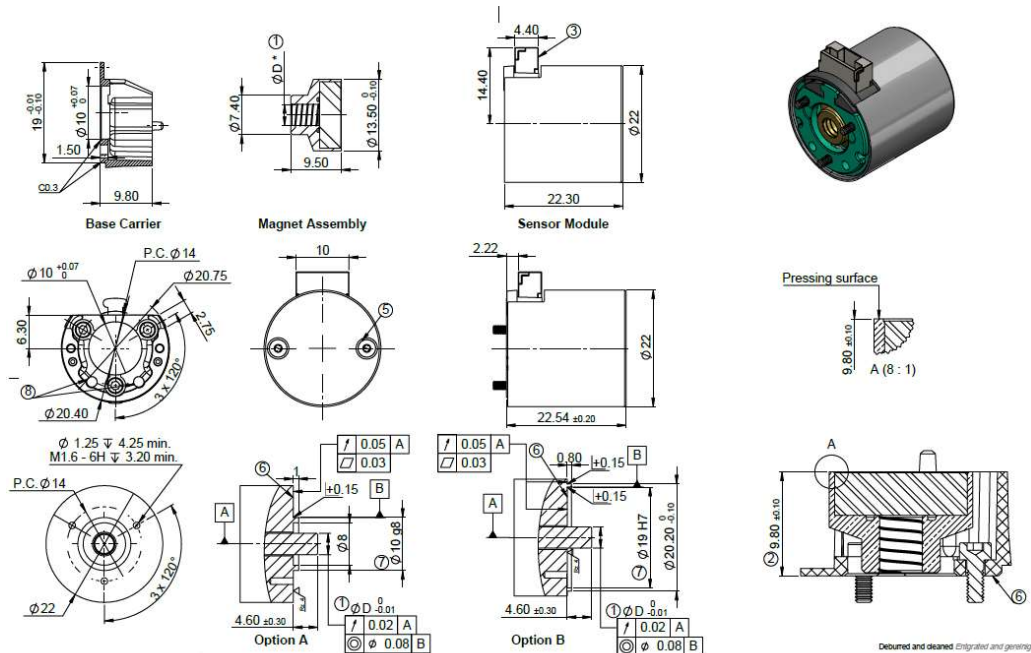*Other mechanical options are available upon request.*
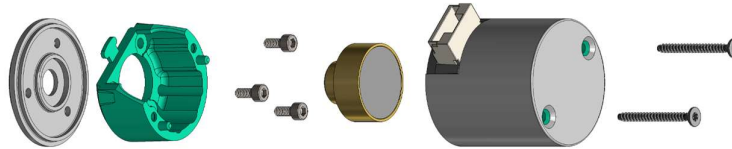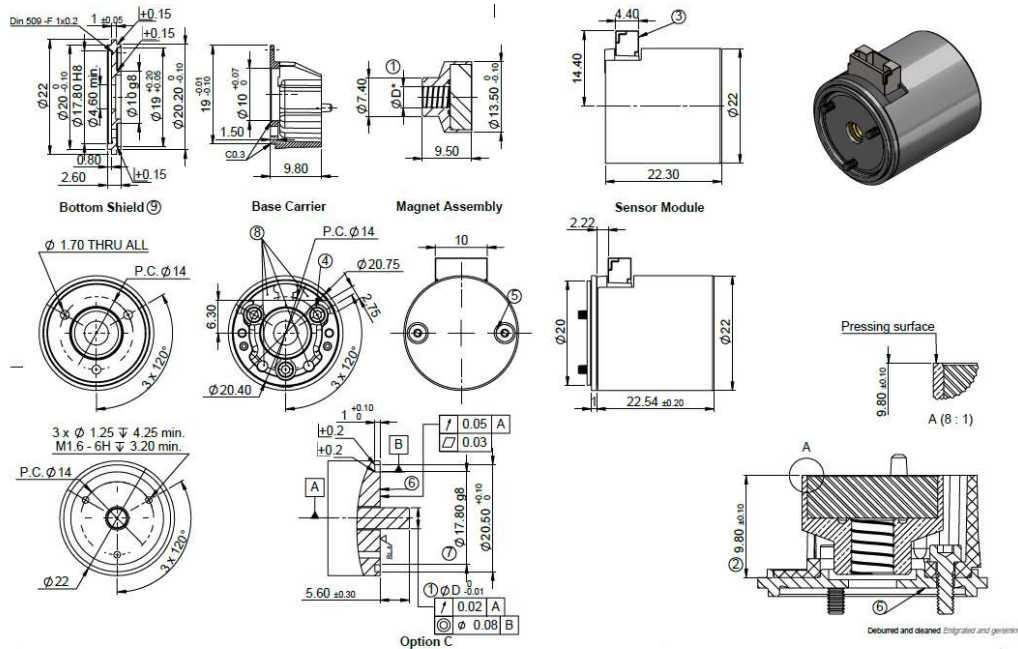
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9. Dimensional drawings for type KCD-S103B-1617-IPxF-GRQ

- Recommended for stepper and DC motors with non-magnetic shafts
- Two mounting options:
  A) Centering via 10 mm shoulder
  B) Centering via 20,5 mm groove

Base Carrier **Magnet Assembly** **Sensor Module**

Option A   Option B

Pressing surface
A (8 : 1)

Deburred and cleaned *Entgratet und gereinigt*

A = Bearing
① = Different shaft sizes can be adapted (D=2,3,4)
② = Magnet assembly mounting position (static setup), tolerance (static+dynamic) ±0.20
③ = JST BM08B-NSHSS-TBT connector
④ = Screw ISO 14583 – M1.6 x 5 – A4, tightening torque 0.12 Nm ±6%
⑤ = Screw KN6041 1.6x16 - T5 – A2, tightening torque 0.20 Nm ±6%
⑥ = Motor flange reference
⑦ = Centering Feature
⑧ = Reference plane for pressing tool
⑨ = Bottom Shield can be customized
⑩ = Screw ISO 4026 – M2 x 3 – A4, tightening torque 0.12 Nm ±6%
Untoleranced dimensions according to DIN ISO 2768-fH
Units *Einheiten:* mm [inch]

D	*
2	-0.022, -0.032
3	-0.026, -0.036
4	-0.023, -0.035

10. Dimensional drawings for type KCD-S103B-1617-JPxF-GRQ

- Recommended for DC motors with magnetic shafts and brake
- Shielding plate increases the length by 1 mm
- Shielding plate is suitable for all shafts from 2-4 mm
- Shielding plate can be incorporated when the motor flange is made of magnetic steel

Bottom Shield ⑨   Base Carrier   Magnet Assembly   Sensor Module

A (8 : 1)

Pressing surface

Option C

Deburred and cleaned *Entgratet und gereinit*

Ⓐ = Bearing
① = Different shaft sizes can be adapted (D=2,3,4)
② = Magnet assembly mounting position (static setup), tolerance static+dynamic ±0.20
③ = JST BM08B-NSHSS-TBT connector
④ = Screw ISO 14583 – M1.6 x 5 – A4, tightening torque 0.12 Nm ±6%
⑤ = Screw KN6041 1.6x16 - T5 – A2, tightening torque 0.20 Nm ±6%
⑥ = Motor flange reference
⑦ = Centering Feature
⑧ = Reference plane for pressing tool
⑨ = Bottom Shield can be customized
Untoleranced dimensions according to DIN ISO 2768-fH
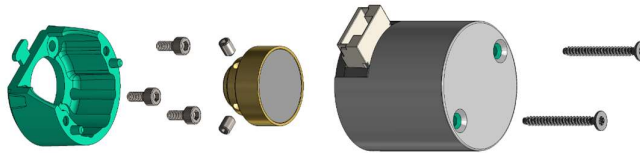Units *Einheiten*: mm [inch]

D	*
2	-0.022, -0.032
3	-0.026, -0.036
4	-0.023, -0.035

11. Dimensional drawings for type KCD-S103B-1617-IExF-GRQ

- Recommended for stepper and DC motors with non-magnetic shafts
- Two mounting options:
  - A) Centering via 10 mm shoulder
  - B) Centering via 20,5 mm groove

Base Carrier

Magnet Assembly

Sensor Module

Option A

Option B

B (8 : 1)

Deburred and cleaned *Entgratet und gereinigt*

A = Bearing
① = Different shaft sizes can be adapted (D=2,3,4)
② = Magnet assembly mounting position (static setup), tolerance (static+dynamic) ±0.20
③ = JST BM08B-NSHSS-TBT connector
④ = Screw ISO 14583 – M1.6 x 5 – A4, tightening torque 0.12 Nm ±6%
⑤ = Screw KN6041 1.6x16 - T5 - A2, tightening torque 0.20 Nm ±6%
⑥ = Motor flange reference
⑦ = Centering Feature
⑧ = Reference plane for pressing tool
⑨ = Bottom Shield can be customized
⑩ = Screw ISO 4026 – M2 x 3 – A4, tightening torque 0.12 Nm ±6%
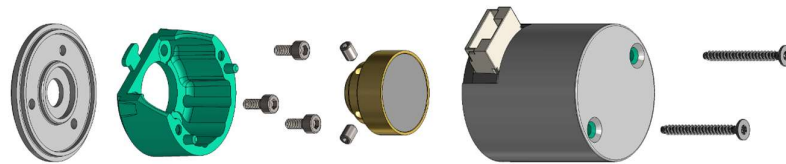Untoleranced dimensions according to DIN ISO 2768-fH
Units *Einheiten*: mm [inch]

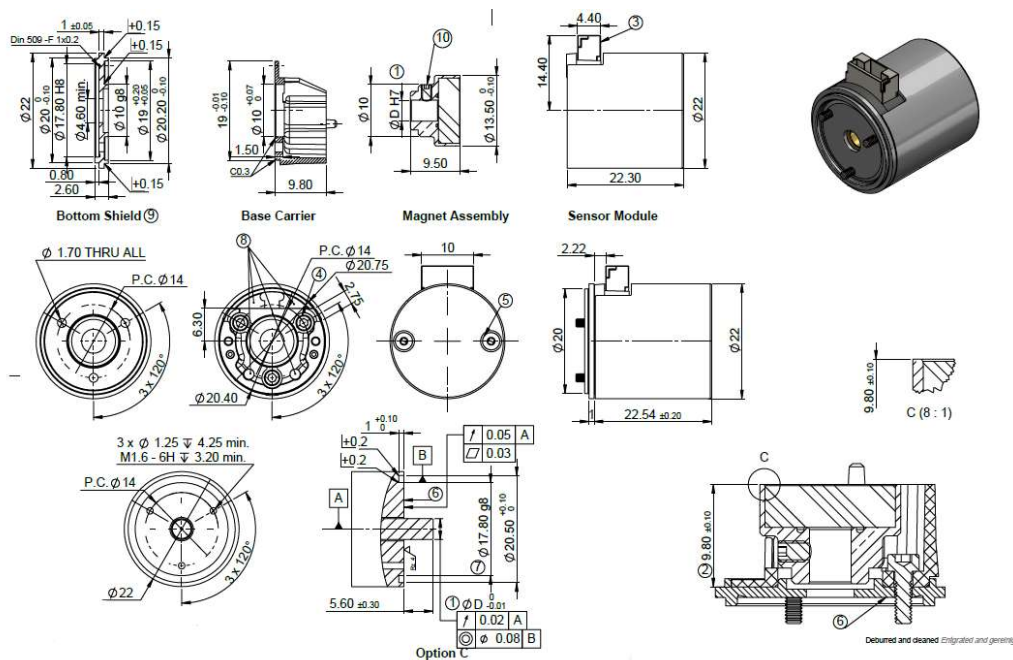| D |
|---|
| 2 |
| 3 |
| 4 |

12. Dimensional drawings for type KCD-S103B-1617-JExF-GRQ

- Recommended for DC motors with magnetic shafts and brake
- Shielding plate increases the length by 1 mm
- Shielding plate is suitable for all shafts from 2-4 mm
- Shielding plate can be incorporated when the motor flange is made of magnetic steel

Bottom Shield ⑨	Base Carrier	Magnet Assembly	Sensor Module

Option C

D
2
3
4

A = Bearing
① = Different shaft sizes can be adapted (D=2,3,4)
② = Magnet assembly mounting position (static setup), tolerance (static+dynamic) ±0.20
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Untoleranced dimensions according to DIN ISO 2768-fH
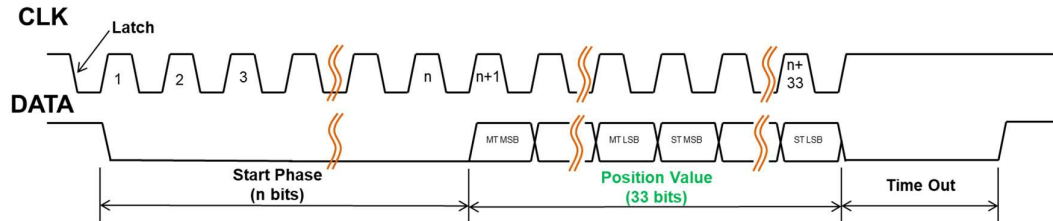Units *Einheiten*: mm [inch]

These drawings and the information contained is for general presentation purposes only. Please refer to the "Download" section for detailed technical drawings.

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13. Interface

Interface	SSI
Software Programming Functions via Config Pin	Electronic Calibration, WIEGAND pulse test, Preset
Min Interface Cycle Time	50 µs
SSI Time out	6 µs (tbd)
Ring Shift Mode	Not available
SSI Data Format	Start Phase (8 starting bits as "0") + Multi-turn (16 bits) + Singe-turn (17 bits) For more details see manual

Preset Function

The preset function can be used to adapt the encoder position to the mechanical alignment of the system. By performing a preset, the actual position value of the encoder (both, singleturn and multiturn) is set to the desired preset value. The preset can be triggered via hardware or software. See manual for more detailed information.

Config Pin

The config pin is used for serial data communication. Via this interface an optional re-calibration and WIEGAND pulse testing of the kit encoder can be conducted after motor installation. A preset value can be applied as a software command. The protocol for communication is described in the manual. As alternative a graphical user interface with a Kit Control Box can be used for easy configuration and hardware setup, see website for more details.

https://www.posital.com/en/products/kit-encoders/kit-control-box.php

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Information provided in this document is valid for products manufactured after the 2nd week of 2021.

In case Kit Control Box is used for configuration, to prevent an encoder kit from electrical damage, please, ensure, that the control box has been produced after the 19th week of 2020 (on the product label indicated as 19/20) and that the appropriate adapter cable is used.
If an older version is available, please, contact us to arrange an update.

Contact

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