

The DS-130 is a member of the DS series of Electric Encoders™ a product line based on Netzer Precision Motion Sensor proprietary technology. EE products are characterized by features that enable unparalleled performance:

- Low profile (10 mm)
- Hollow, floating shaft
- No bearings or other contact elements
- High resolution and unparalleled precision
- High tolerance to temperature extremes, shock, EMI, RFI and magnetic fields
- Very low weight
- Holistic signal generation
- Digital interfaces for absolute position

### General

Angular resolution <sup>1</sup>	19 bits ; 262,144 CPR
Static error <sup>2</sup>	< 0.010°
Maximum operational speed	4,000 rpm
Measurement range	Single turn, Absolute Position

### Mechanical

Allowable mounting eccentricity	±0.1 mm
Allowable rotor axial motion	±0.1 mm
Rotor inertia	25,962 gr · mm <sup>2</sup>
Total weight	65 gr
Outer Ø / Inner Ø / Height	130 / 90 / 10 mm
Material (stator, rotor)	Ultem™ polymer

### Notes - Optional (Call)

1	Angular resolution	19 - 20 bit
2	Static Error	< 0.005°
3	Operating temperature	-55 °C to +125 °C

The holistic structure of the Electric Encoder™ makes it unique: Its output reading is the averaged outcome of the entire area of the rotor. This feature allows the EE a tolerant mechanical mounting and to deliver outstanding precision.

Due to the absence of components such as ball bearings, flexible couplers, glass discs, light sources and detectors along with very low power consumption enables the EE to deliver virtually failure-free performance in nearly all types of conditions.

The internally shielded, DC- operated EE includes an electric field generator, a field receiver, sinusoidal-shaped dielectric rotor, and processing electronics.

The EE output is a digital serial synchronous with absolute position single turn.

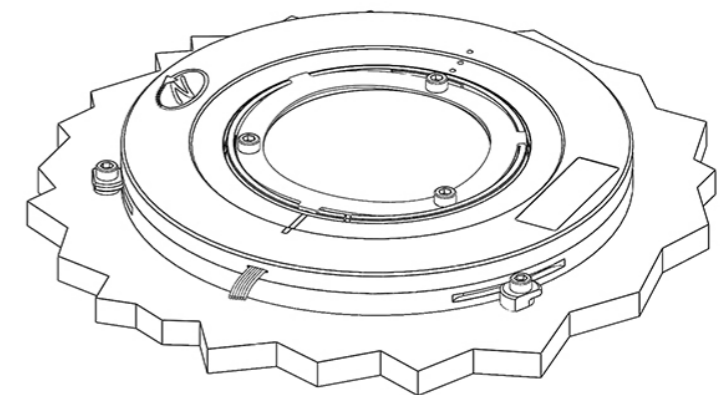
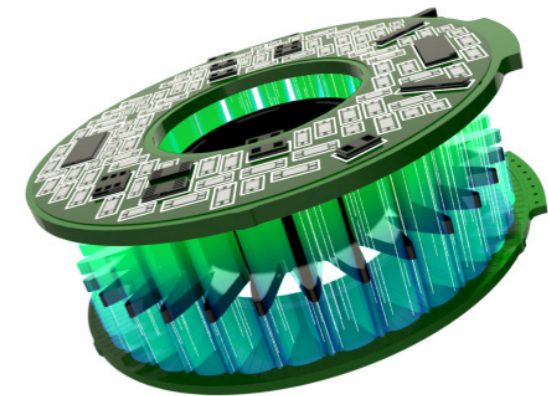
This combination of high precision, low profile and, low weight has made Netzer Precision encoders highly reliable and particularly well suited to a wide variety of industrial automation and harsh environment applications.

### Electrical

Supply voltage	5V ± 5%
Current consumption	<70 mA
Interconnection	Shielded cable

### Environmental

EMC	IEC 6100-6-2, IEC 6100-6-4
Operating temperature <sup>3</sup>	-55°C to +85°C
Storage temperature	-60°C to +125°C
Relative humidity	98% Non condensing
Shock endurance	100 g for 11 ms
Vibration endurance	20 g 10 – 2000 Hz
Protection	IP 40

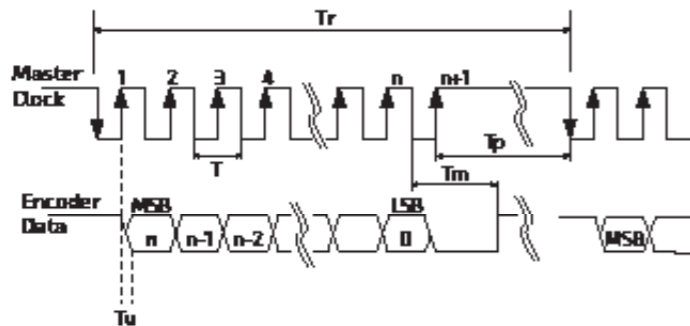


● Moving. Precisely. With You.



## Digital SSI Interface

Synchronous Serial Interface (SSI) is a point to point serial interface standard between a master (e.g. controller) and a slave (e.g. sensor) for digital data transmission.



	Description	Recommendations
n	Total number of data bits	12 - 22
T	Clock period	
f= 1/T	Clock frequency	0.1 - 5.0 MHz
Tu	Bit update time	90 nsec
Tp	Pause time	26 - ∞ μsec
Tm	Monoflop time	>25 μsec
Tr	Time between 2 adjacent requests	Tr > n*T+26 μsec
fr=1/Tr	Data request frequency	

## SSI / BiSS output signal parameters

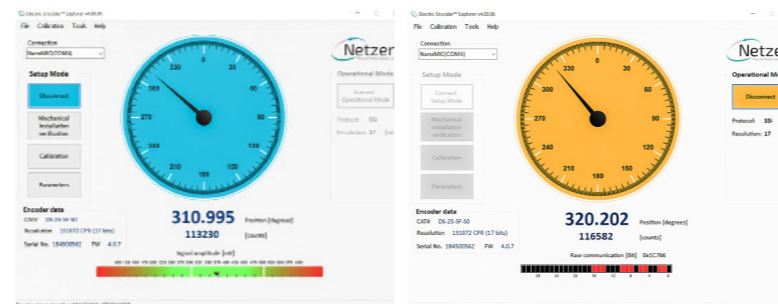
Signal latency	50 μSec
Output code	Binary
Serial output	Differential RS-422
Clock	Differential RS-422
Clock Frequency	0.1 ÷ 5.0 MHz
Position update rate	30 KHz

## SSI / BiSS interface wires color code

Clock +	Grey	Clock
Clock -	Blue	
Data -	Yellow	Data
Data +	Green	
GND	Black	Ground
+5V	Red	Power supply

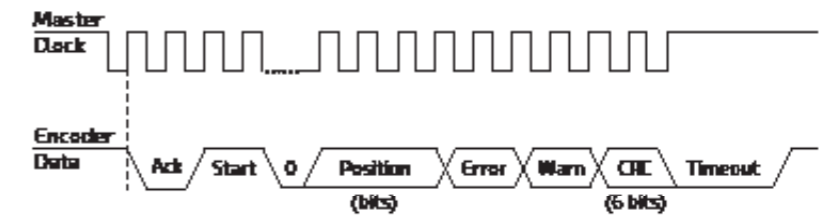
## Software tools: (SSI / BiSS - C)

Advanced calibration and monitoring options are available by using the factory supplied **Electric Encoder Explorer** software. This facilitates proper mechanical mounting, offsets calibration and advanced signal monitoring.

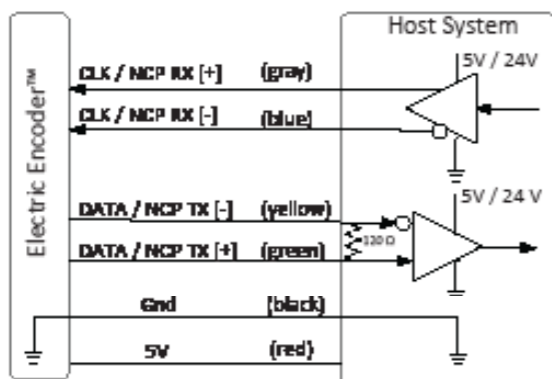


## Digital BiSS-C Interface

BiSS - C Interface is unidirectional serial synchronous protocol for digital data transmission where the Encoder acts as "slave" transmits data according to "Master" clock. The BiSS protocol is designed in B mode and C mode (continuous mode). The BiSS-C interface as the SSI is based on RS-422 standards.



Bit #	Description	Default	Length
29	Ack	0	1/clock
28	Start	1	1 bit
27	"0"	0	1 bit
8...26	AP		
7	Error	1	1 bit
6	Warn.	1	1 bit
0...5	CRC		6 bits
	Timeout		25 μs



● Moving. Precisely. With You.

## Ordering Code

DS - 130 - S H - S O

DS Product line

Outer Diameter

Output

S	SSi
I	BiSS

Resolution

Code	Bit	CPR
H	19	524,288

BIT (Build In Test): optional

[ ]	None
B	BIT

Interconnection

0	Flying leads
S	Shielded cable 250 mm
R	Strain relief & shielded cable

## Optional Accessories

Netzer Cat No.: CB D0014

Provider: Ray-Q USA. CAT No.: HQ 213210

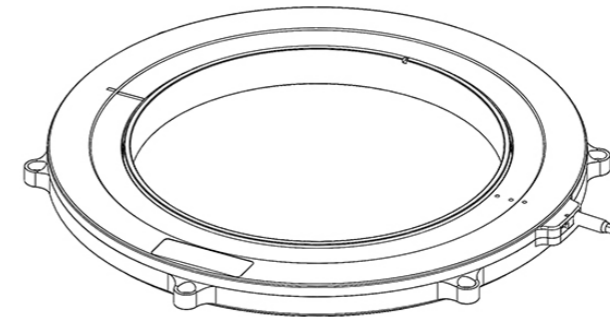
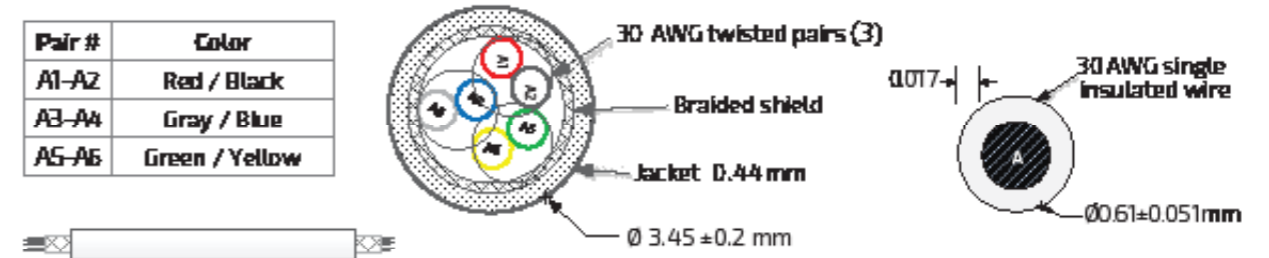
Cable: 30 AWG twisted pair (3): 2 (30 AWG 25/44 tinned copper, insulation: PFE  $\varnothing$  0.15 to  $\varnothing$  0.6  $\pm$  0.05 OD).

Temperature rating: -60 to +150 Deg C.

Braided shield: Thinned copper braided 95% min. coverage.

Jacket: 0.44 silicon rubber (NFA 11-A1)  $\varnothing$  3.45  $\pm$  0.2 OD

Pair #	Color
A1-A2	Red / Black
A3-A4	Gray / Blue
A5-A6	Green / Yellow



### Related documents

DS-90 User Manual : Mechanical , Electrical and calibration setup.

### Demonstration Kit

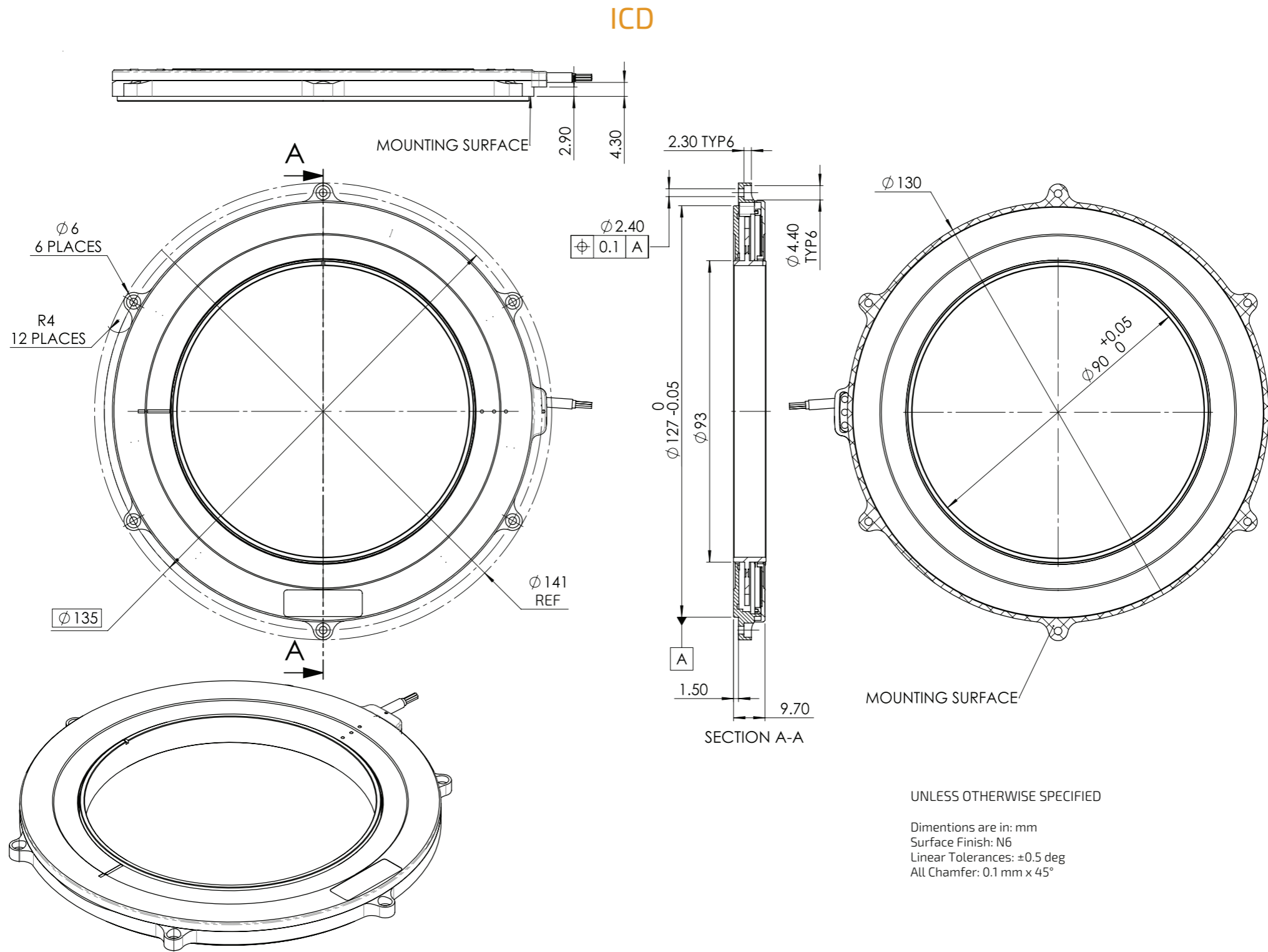
DKIT-DS-90-SG with SSi interface

DKIT-DS-90-IG with BiSS interface

Includes, mounted encoder on rotary jig, and RS-422 to USB converter.

Corporate Headquarters

Netzer Precision Motion Sensors Ltd. | Misgav Industrial Park, P.O. Box 1359 | D.N. Misgav, 2017400 Israel  
Tel : +972 4 999 0420 | global-info@netzerprecision.com | www.netzerprecision.com



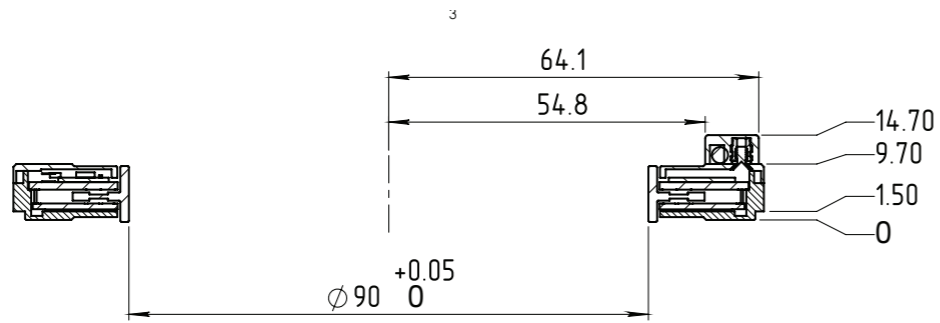
UNLESS OTHERWISE SPECIFIED

Dimensions are in: mm  
Surface Finish: N6  
Linear Tolerances:  $\pm 0.5$  deg  
All Chamfer: 0.1 mm x 45°

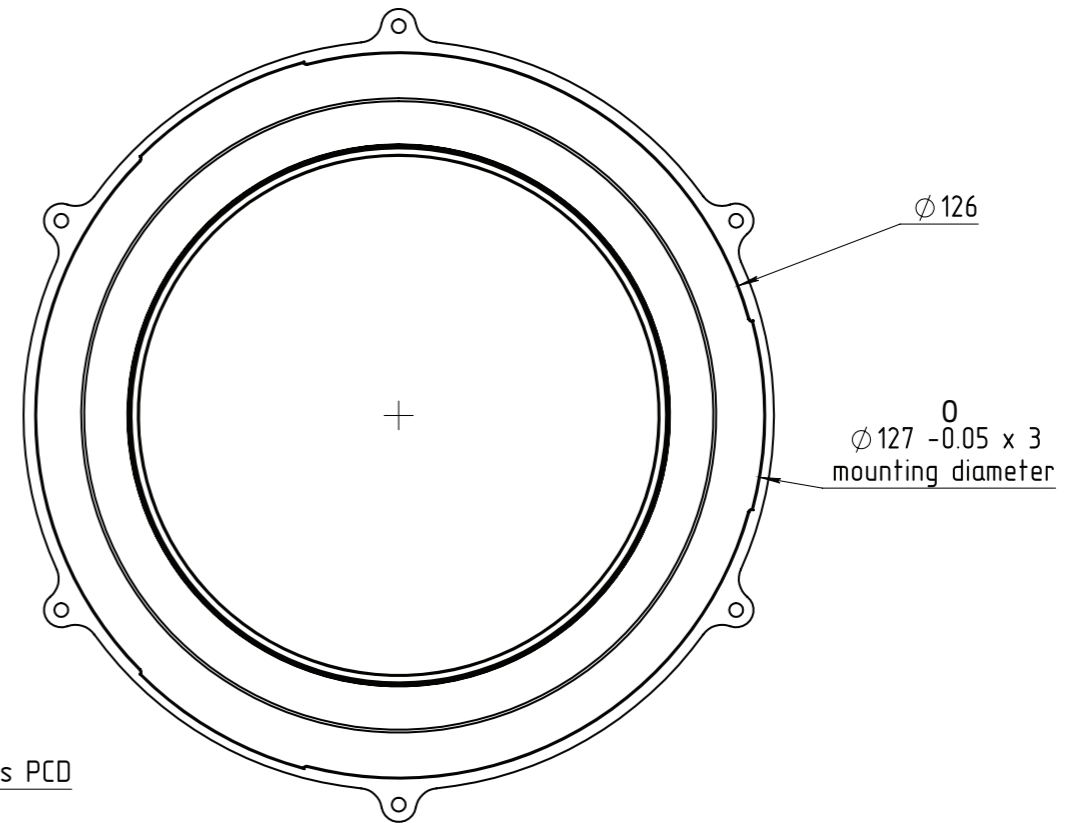
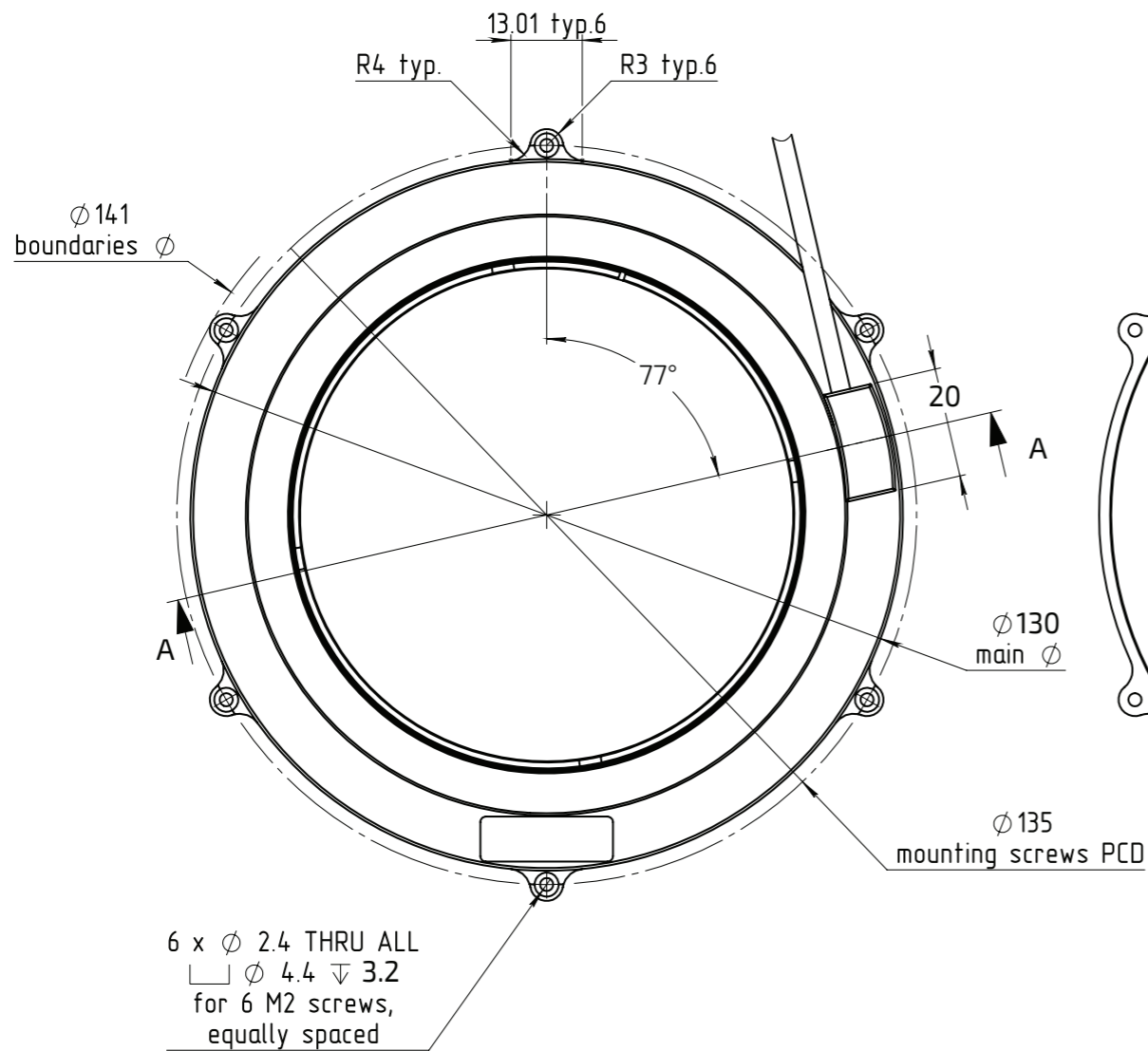
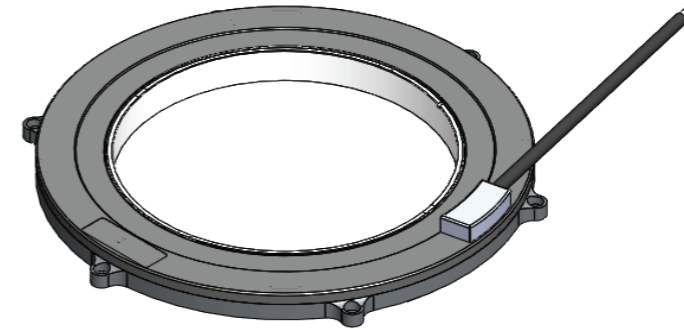
DS-130-Q-2019-V01

● Moving. Precisely. With You.





SECTION A-A

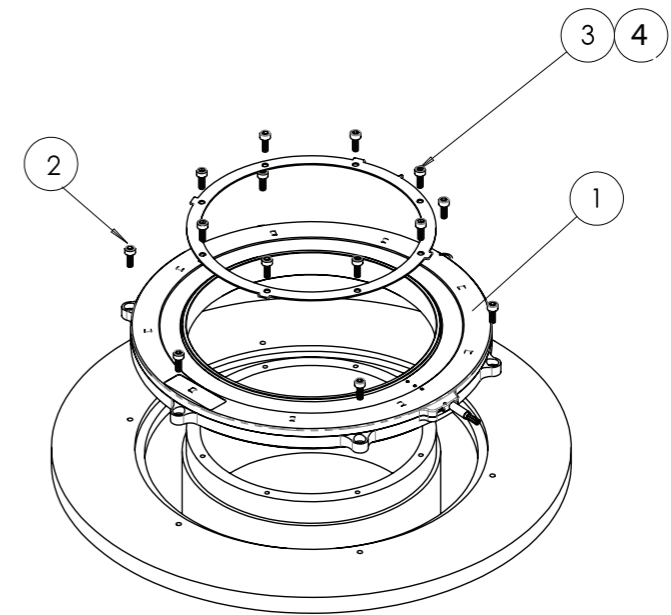
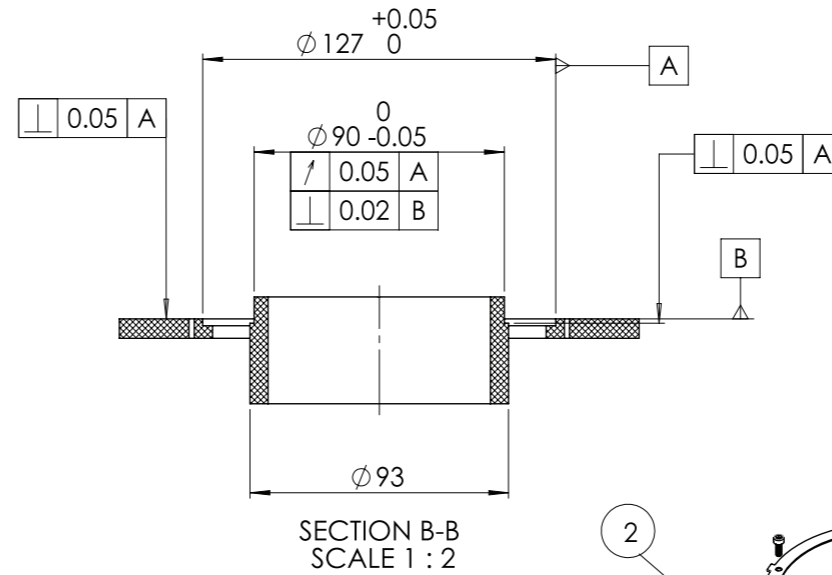
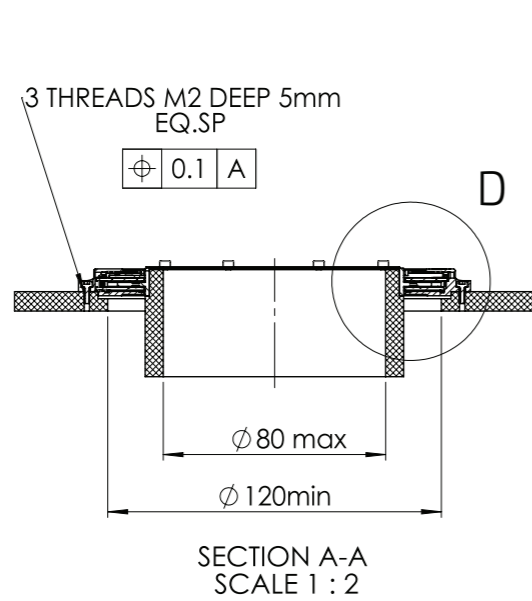


UNLESS OTHERWISE SPECIFIED

Dimensions are in: mm  
Surface Finish: N6  
Linear Tolerances: ±0.5 deg  
All Chamfer: 0.1 mm x 45°

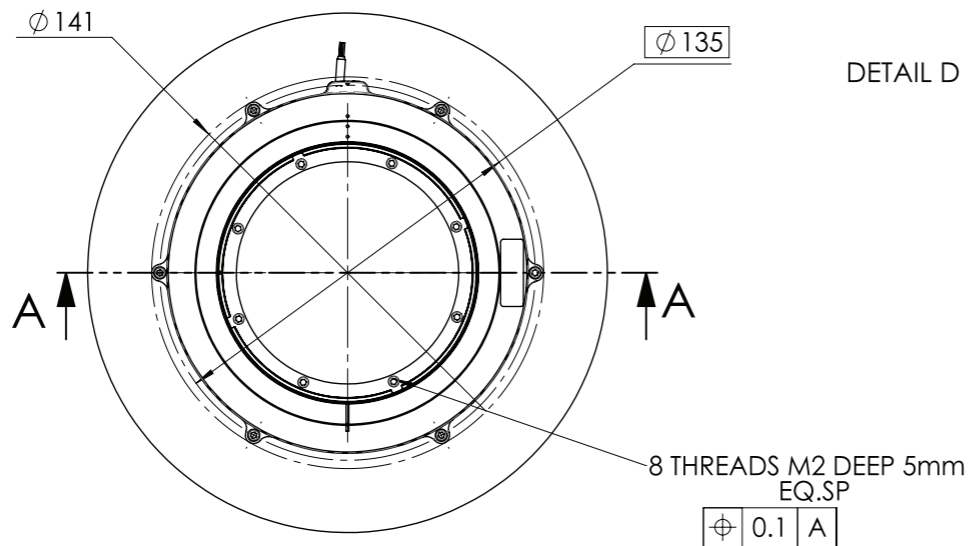
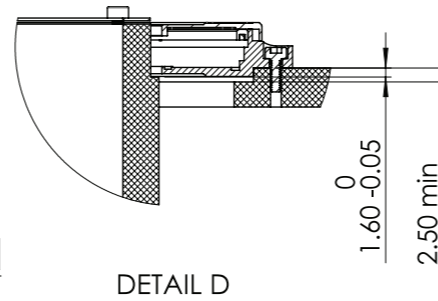
6 x  $\phi$  2.4 THRU ALL  
 $\square$   $\phi$  4.4  $\nabla$  3.2  
for 6 M2 screws,  
equally spaced

Moving. Precisely. With You.



UNLESS OTHERWISE SPECIFIED

Dimensions are in: mm  
Surface Finish: N6  
Linear Tolerances:  $\pm 0.5$  deg  
All Chamfer: 0.1 mm x 45°

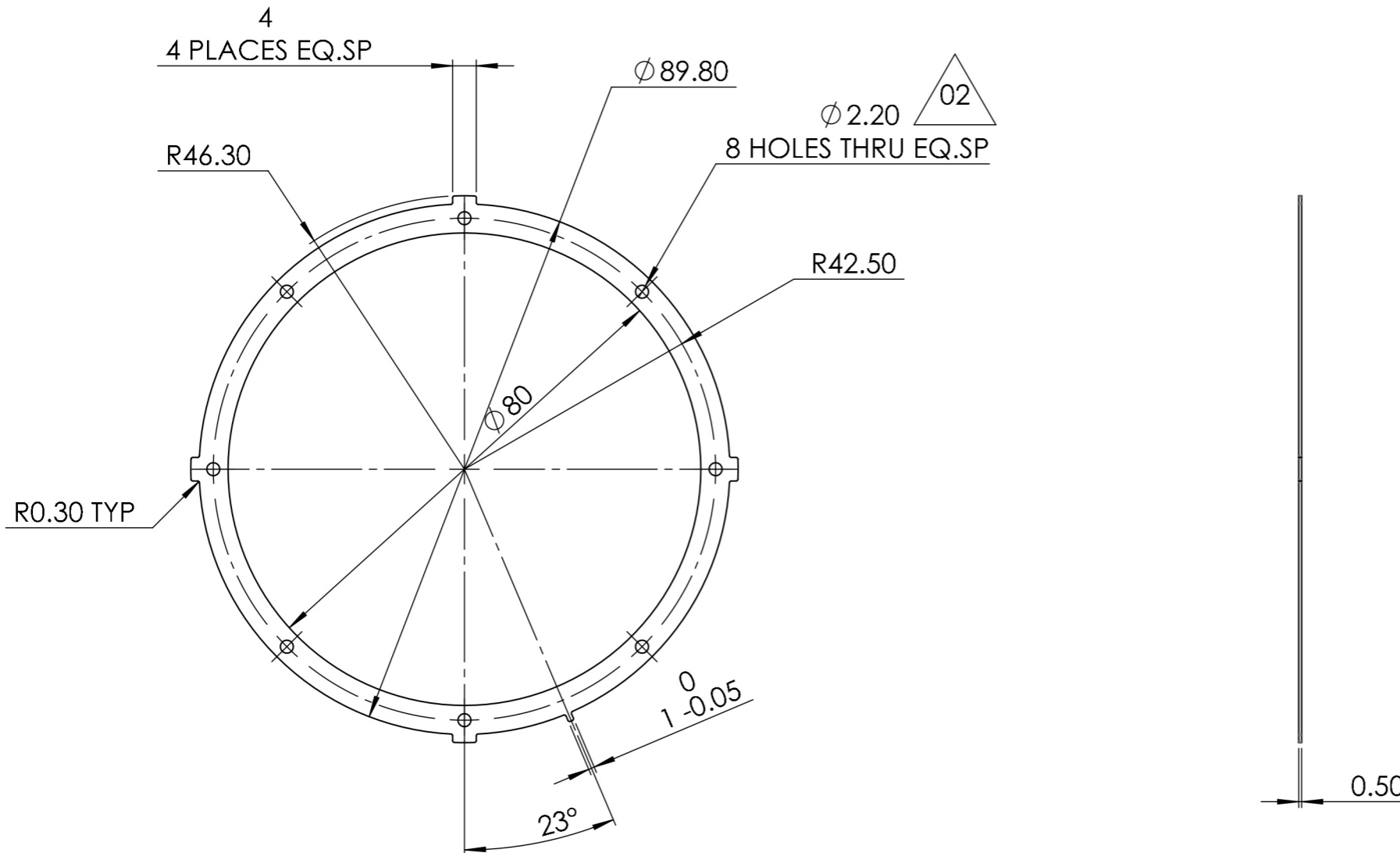


Shaft - End installation (step)

No	Part			Description	QTY.
1	DS-130-64-3SH	Included		DS-130 encoder	1
2	EAPK008	Optional	Kit	Kit , 3 M2x6	2
3	MA-DS130-004	Optional	Shaft End installation kit	MP-00016 DIN 912 M2 X 8 Alen	1
4				DS-130 wave spring	1

Critical dimensions marked with "\*\*"

## Spring - Shaft - End Installation



**Notes:**

- 1) For any incompatibility with the model or missing dimension, please refer to Netzer for clarification.
- 2) Burrs are not allowed
- 3) Packing must prevent physical damage during process storage and shipment

DS-130-0.2019-V01

● Moving. Precisely. With You.