

The DS-90 is a member of the DS series of Electric Encoders™, based on Netzer Precision proprietary technology. The Electric Encoder™ offers many advantages - some unparalleled

- Low profile (10 mm)
- Hollow, floating shaft
- No bearings or other contacting elements
- High resolution and precision
- High tolerance to temperature extremes, shock, moisture, EMI, RFI and Magnetic fields
- Very low weight
- Holistic signal generation
- Analog or Digital interfaces

General

Angular resolution	19 bits ; 524,288 CPR
Maximum tested static error	≤ 0.010°
Maximum operational speed	750 rpm
Measurement range	Unlimited rotation
Power On - Max. operational speed	3.3 RPM , <=20°/sec
Build In test BIT	Optional

Mechanical

Allowable mounting eccentricity	±0.1 mm
Allowable rotor axial motion	±0.1 mm
Rotor inertia	2,812 gr · mm ²
Total weight	50 gr
Outer Ø /Inner Ø/ Height	90 / 50 / 10 mm
Material (stator, rotor)	Ultem™ polymer

The Electric Encoder™ is unique in being holistic, i.e., its output reading is the averaged outcome of the whole area of the rotor, This feature makes the Electric Encoder™ forgiving to mounting tolerances, mechanical wander etc.

The absence of components such as ball bearings, flexible couplers, glass disc, light sources and detectors, along with very low power consumption makes the Electric Encoder™ virtually failure free.

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

The output signals of Electric Encoder™ are analog Sine / Cosine representing the rotation angle. The digital outputs are obtained by further processing - which may be either internal or external to the encoder.

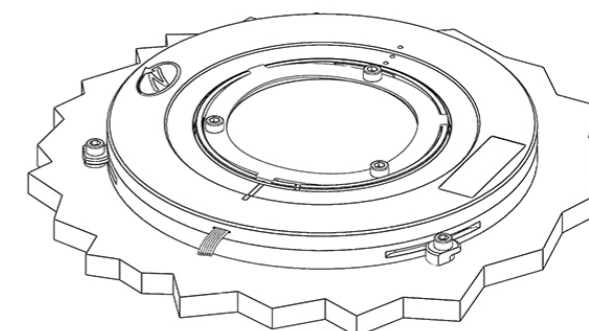
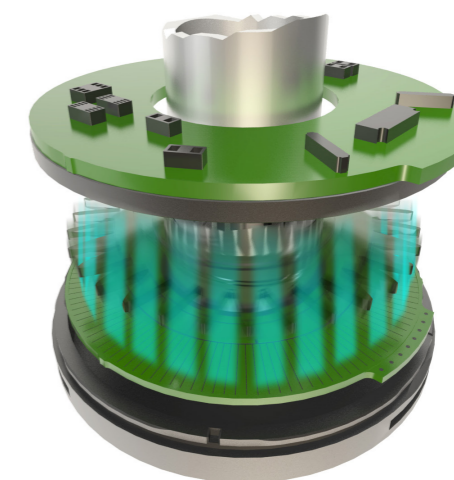
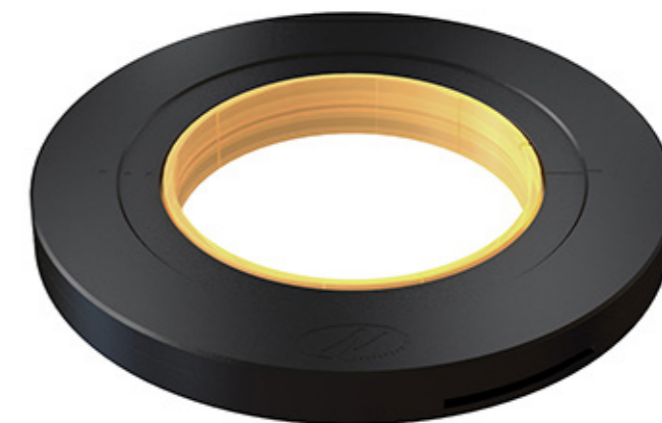
The combination of precision, low profile, low weight and high reliability have made Netzer Precision encoders particularly suitable to a wide variety of critical applications including, but not limited to medical equipment and aerospace.

Electrical

Supply voltage	5V ± 5%
Interconnection	Shielded cable or
Cable Length	1,500 mm MAX

Environmental

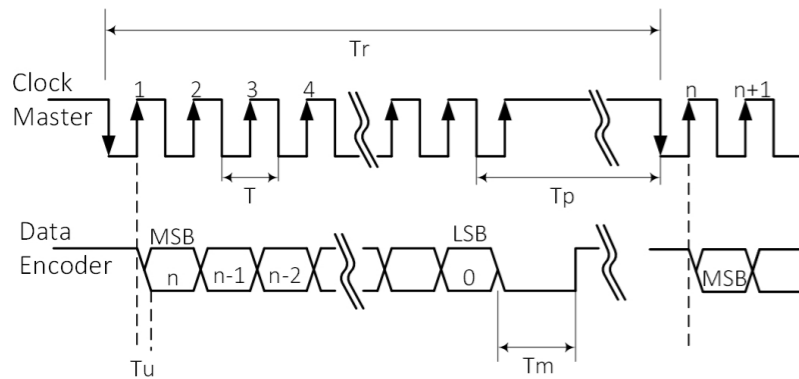
EMC	IEC 6100-6-2, IEC 6100-6-4
Operating temperature range	Digital: -40°C to +85°C
Relative humidity	98% Non condensing
Shock endurance	100 g for 11 ms
Vibration endurance	20 g 10 – 2000 Hz
Protection	IP 40



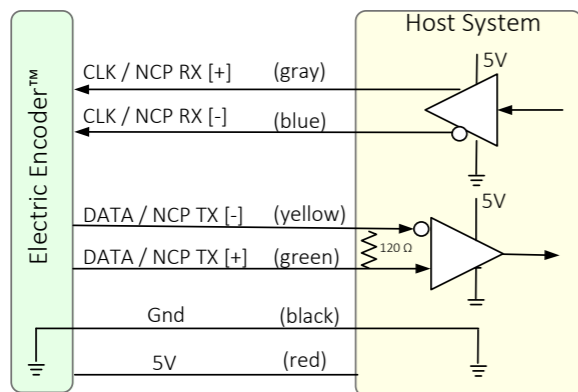


Digital SSI Interface

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	0.5 - 2.0 MHz
Tu	Bit update time	200 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

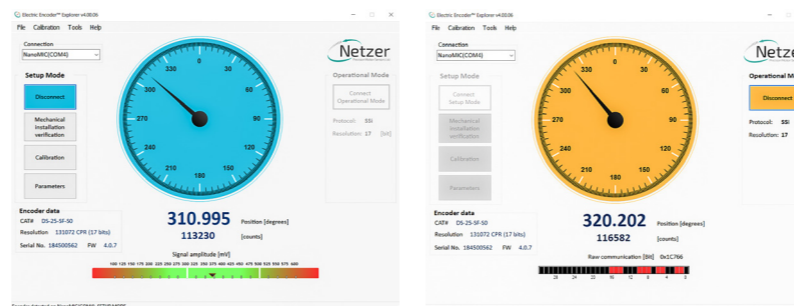
Signal latency	~250 µSec
Output code	Binary
Serial output	Differential RS-422
Clock	Differential RS-422
Clock Frequency	0.5 ÷ 2.0 MHz
Position update rate (Max)	30 KHz
Current consumption	180 mA
SSi	
Monoflop time	25 µSec

SSi / BiSS interface wires color code

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

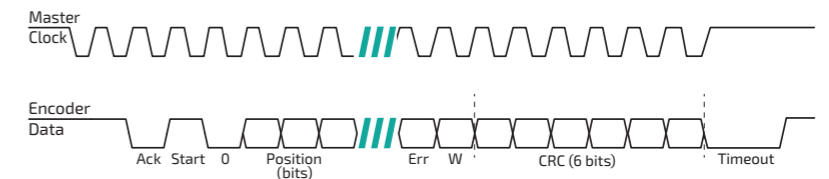
Software tools: (SSi / BiSS - C)

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	Period during which the encoder calculates the absolute position, one clock cycle	0	1/clock
28	Start	Encoder signal for “start” data transmit	1	1 bit
27	“0”	“start” bit follower	0	1 bit
8...26	AP	Absolute Position encoder data		
7	Error	Error (amplitude levels)	1	1 bit
6	Warn.	Warning (non active)	1	1 bit
0...5	CRC	The CRC polynomial for position, error and warning data is: x6 + x1 + x0. It is transmitted MSB first and inverted. The start bit and “0” bit are omitted from the CRC calculation.		6 bits
	Time-out	Elapse between the sequential “start” request cycle's.		25 µs

Ordering Code

DS - 90 - 64 - 3 S H - S 0 - n n n

DS Product line

Outer Diameter

Fine ECR

Outputs

S - Digital: SSi

I - Digital: BiSS-C

Resolution

Code	Bit	CPR
H	19	524,288

BIT (Build In Test): optional

[] - none

B - BIT

nnn - Custom

C - Connector (optional)

0 - Flying leads (default)

Interconnection

S - shielded cable 250 mm (default)

R - Strain relief & shielded cable

Cable Information

Netzer Cat No.: CB-00014

Provider: Ray-Q USA. wire CAT No: RQ213210

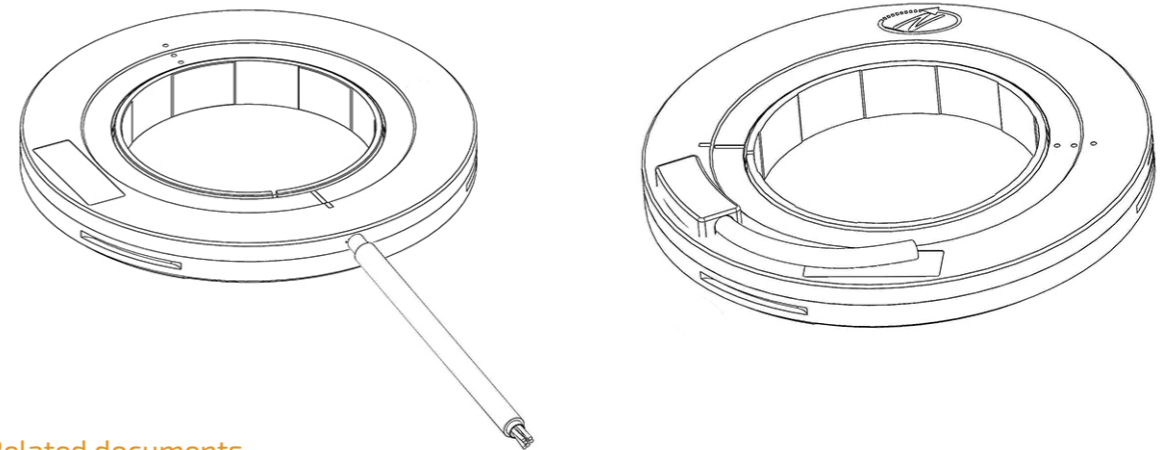
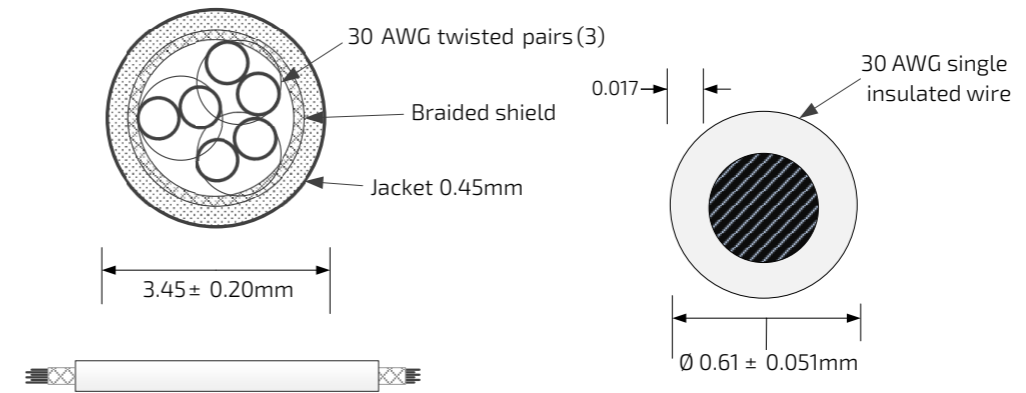
Cable: 30 AWG twisted pair(3):2 (30 AWG 25/44 finned copper, 0.15 PFE to $\varnothing 0.6 \pm 0.05$ OD).

Temperature rating: -60 to +150 Deg C.

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

Jacket: 0.45 silicon rubber jacket $\varnothing 3.45 \pm 0.2$ OD

Pair#	Color
1	Red / Black
2	Gray / Blue
3	Green / Yellow



Related documents

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

Optional Accessories

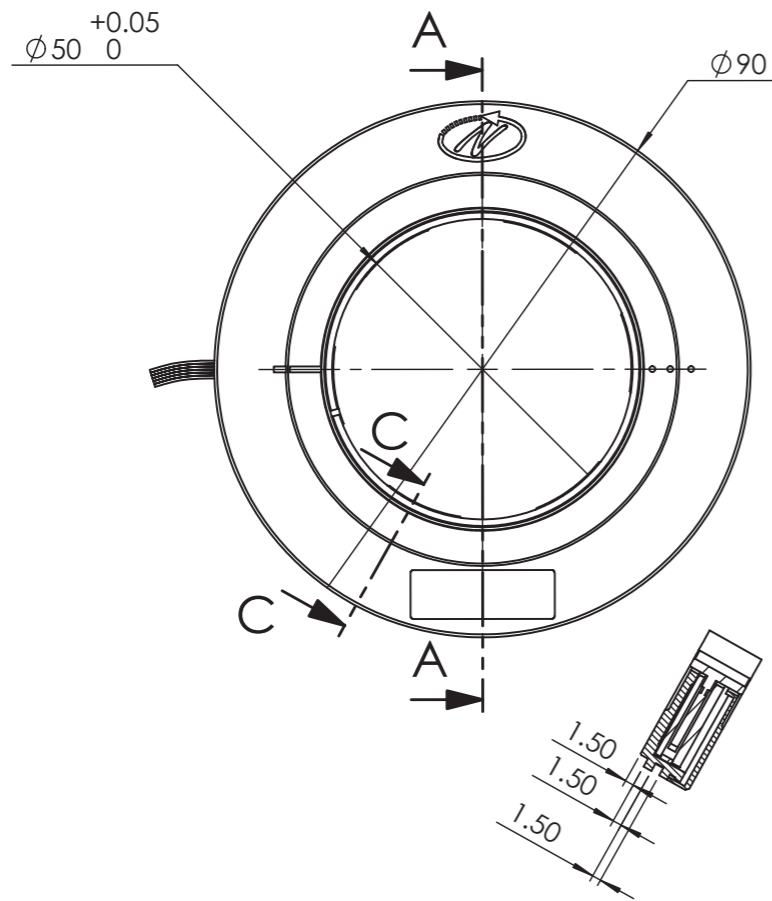
Demonstration Kit

DKIT-DS-90-64-3SH-S0: (SSi Interface)

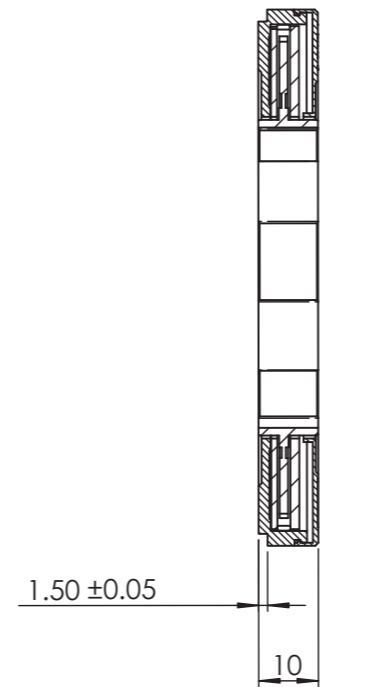
DKIT-DS-90-64-3IH-S0: (BiSS interface)

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

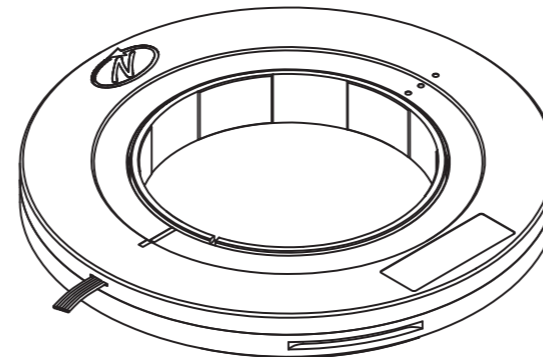
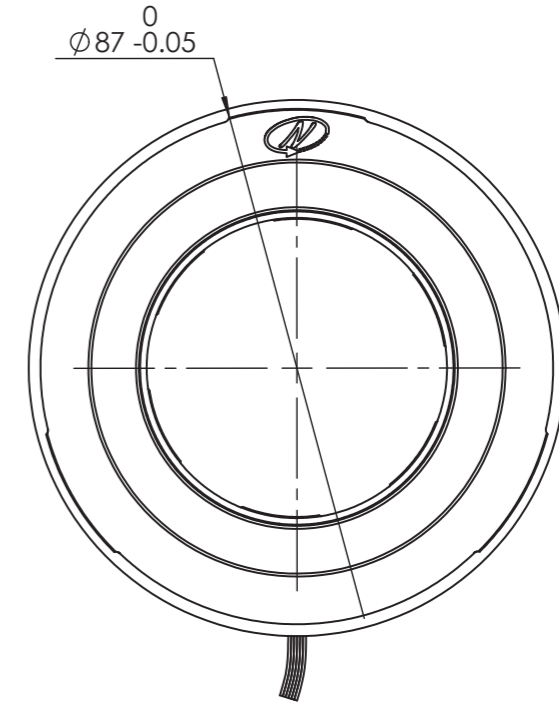
ICD
DS-90-64-3SH-S0 / DS-90-64-3IH-S0



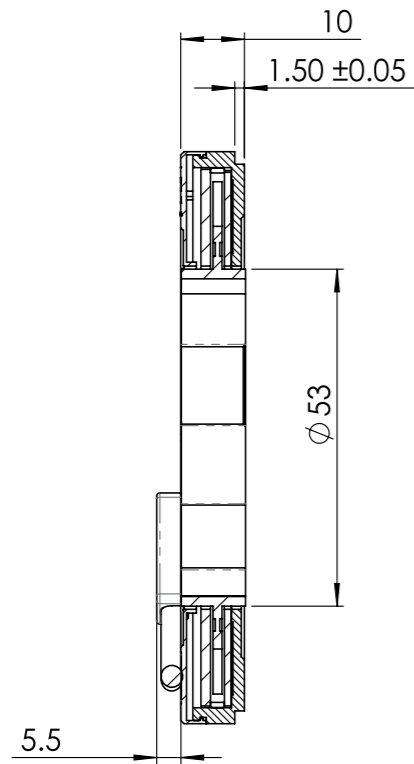
SECTION C-C
3 PLACES



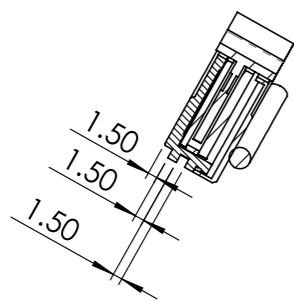
SECTION A-A



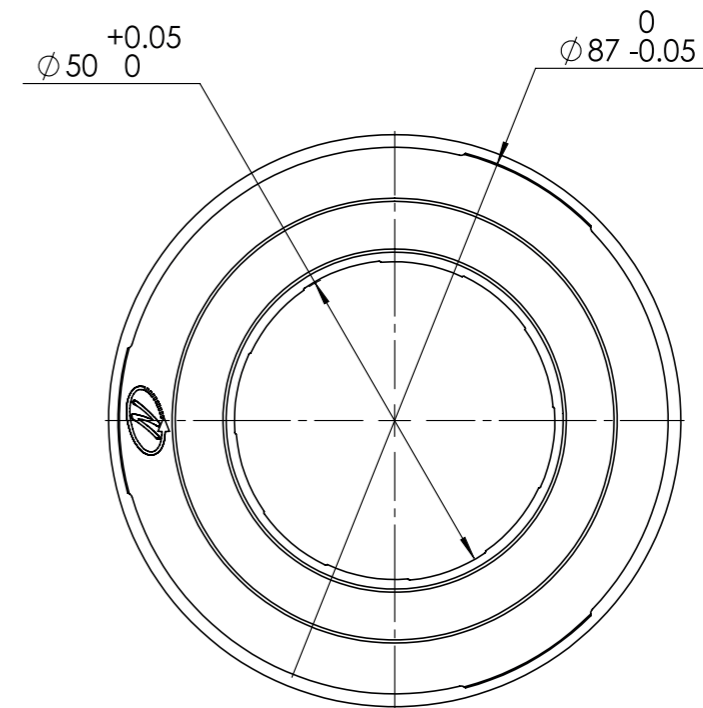
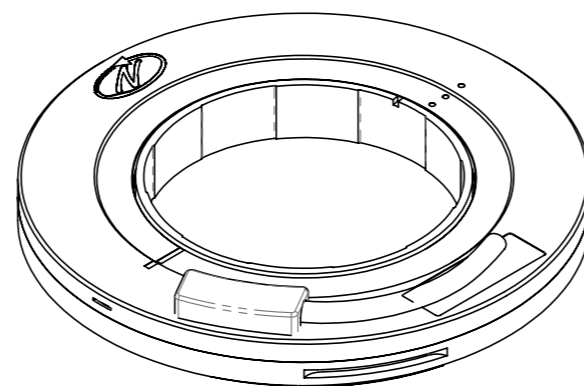
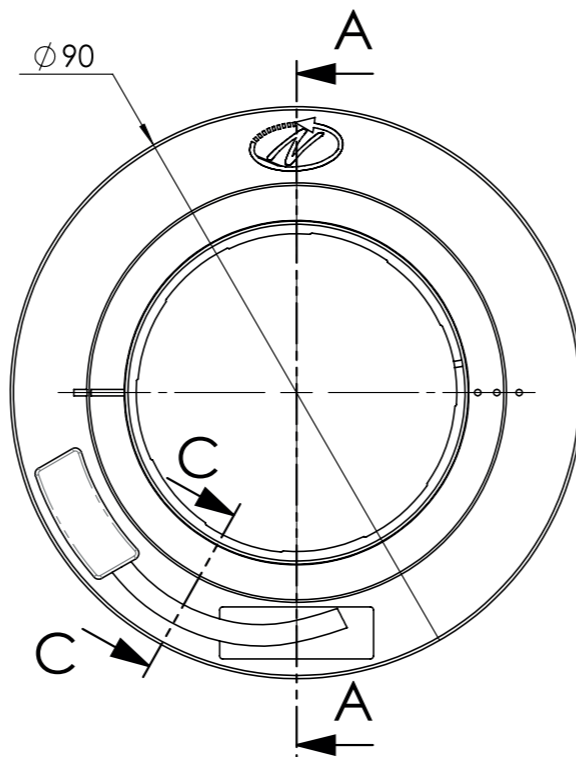
ICD
DS-90-64-3SH-R0 / DS-90-64-3IH-R0

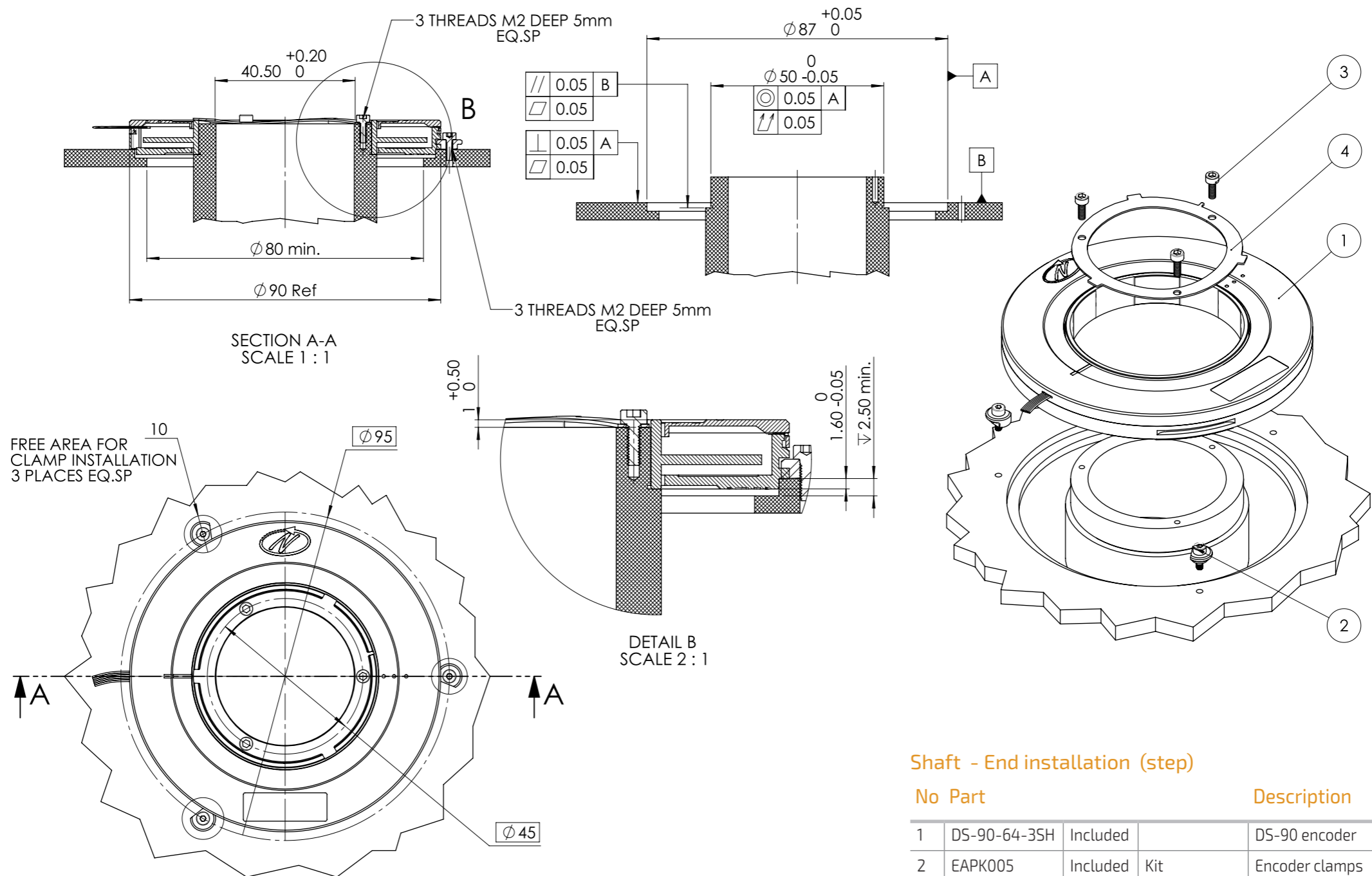


SECTION A-A



SECTION C-C
3 PLACES

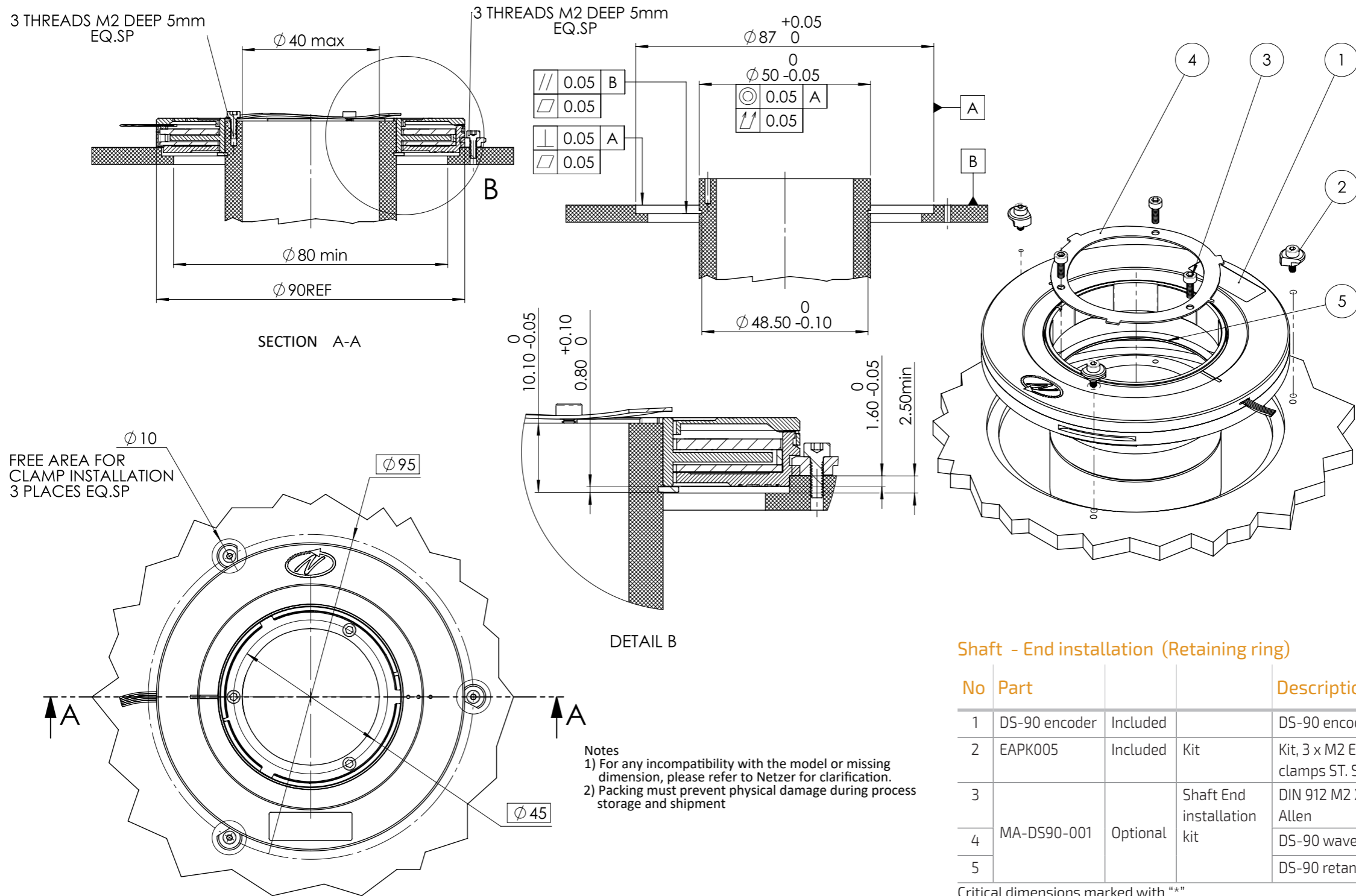




Shaft - End installation (step)

No	Part	Description	QTY. per kit
1	DS-90-64-35H	Included DS-90 encoder	1
2	EAPK005	Included Kit Encoder clamps	3
3	MA-DS90-004	Optional Shaft End installation kit Bolt DIN 912 M2×4 SIMP	4
4		Optional DS-90 wave spring	1

Critical dimensions marked with "**"



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