The DL-25 is a member of the DL series of Electric Encoders™, based on Netzer precision proprietary technology. The Electric Encoder™ offers many advantages - some unparalleled

- High resolution and precision
- High tolerance to temperature extremes shock, moisture, EMI, RFI and Magnetic fields.
- Holistic signal generation
- Digital interfaces
- IP65

General

Angular resolution	17-19 bit
Maximum tested static error	±0.030°
Extended accuracy static error	±0.020°
Maximum operational speed	1,500 rpm
Measurement	Single turn absolute position
Rotation direction*	Adjustable CW/CCW
Build In Test BIT	Optional

* Default same direction from bottom side of the encoder

Mechanical

Starting torque	30 x 10^{-4} N.m
Shaft radial force (max)	100 N
Total weight	30 gr (with standard 250 mm cable)
Outer diameter / Profile / Shaft	25 / 24.3 / 4 mm
Material (case, shaft)	Aluminum / Stainless steel

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 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

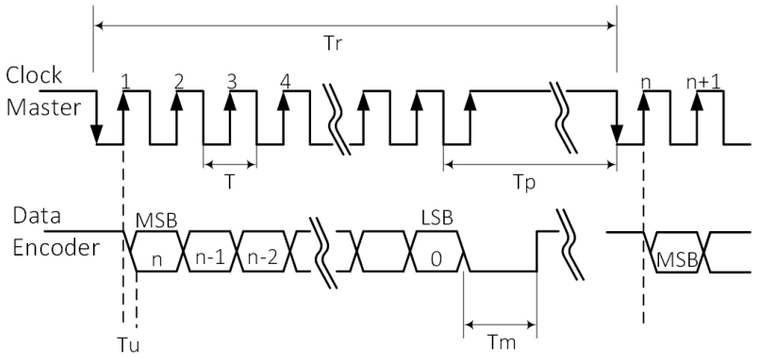
Supply voltage	5V ± 5%
Current consumption	90 mA
Interconnection	Shielded cable
Cable length	1,500 mm MAX

Environmental

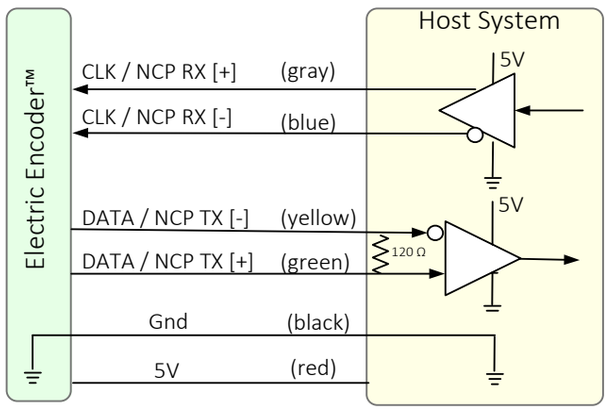
EMC	IEC 6100-6-2, IEC 6100-6-4
Operating temperature range	-40°C to +85°C
Storage temperature	-50°C to +100°C
Shock endurance	100 g for 11 ms
Vibration endurance	20 g 10 – 2000 Hz
Protection	IP 65

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

Output code	Binary
Serial output	Differential RS-422
Clock	Differential RS-422
Clock frequency	0.1 ÷ 5.0 MHz
Position update rate (Max)	35 kHz

SSi / BiSS interface wires color code

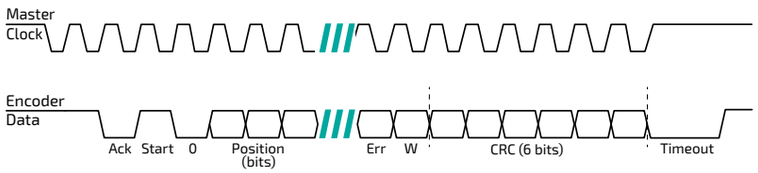
Clock +	Grey	Clock
Clock -	Blue	
Data -	Yellow	Data
Data +	Green	
GND	Black	Ground
+5V	Red	Power supply

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
27	Ack	Period during which the encoder calculates the absolute position , one clock cycle	0	1/clock
26	Start	Encoder signal for "start" data transmit	1	1 bit
25	"0"	"start" bit follower	0	1 bit
8...24	AP	Absolute Position encoder data		
7	Warn.	Warning	1	1 bit
6	Error	Error	1	1 bit
0...5	CRC	The CRC polynomial for position, error and warning data is: $x^6 + x^1 + x^0$. It is transmitted MSB first and inverted. The start bit and "0" bit are omitted from the CRC calculation.		6 bits
	Timeout	Elapse between the sequential "start"request cycle's.		25 µs

Ordering Code

DL - 25 - S F [ ] - S 0 - n n n

DL Product line

Outer Diameter

Output	
S	SSi
I	BiSS

Resolution		
Code	Bit	CPR
F	17	131,072
G	18	262,144
H	19	524,288

BIT (Build In Test): optional	
[ ]	None
B	BIT

EA	Extended Accuracy
nnn	Custom

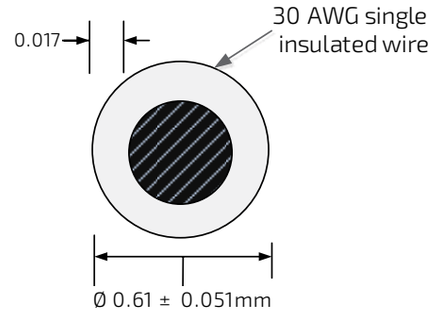
Interconnection	
0	250mm Flying leads (default)
1	500mm Flying leads
2	750mm Flying leads
3	1000mm Flying leads
C	Connector (optional)

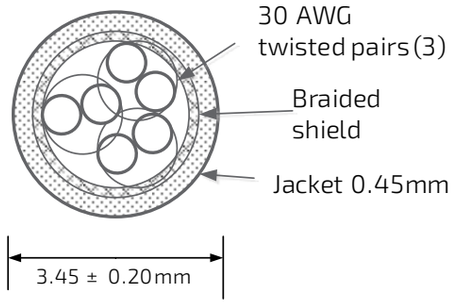
S	Shielded cable 250 mm

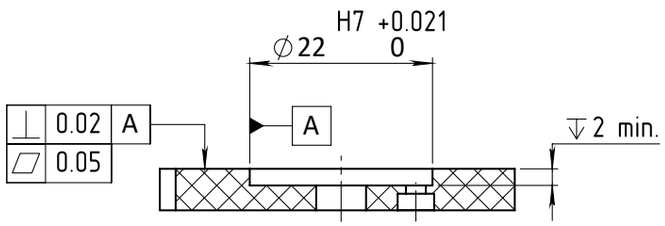
Cable Information

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 Ø0.6 ± 0.05 OD).
Temperature rating: -60 to +150 Deg C.
Braided shield: Thinned copper braided95% min. coverage.
Jacket: 0.45 silicon rubber jacket Ø3.45 ±0.2 OD

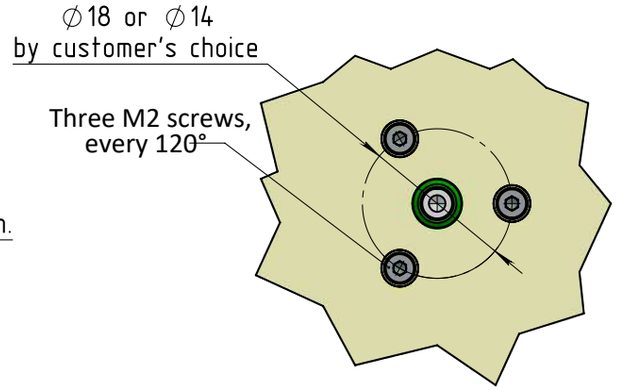
Pair #	Color
1	Red / Black
2	Gray / Blue
3	Green / Yellow

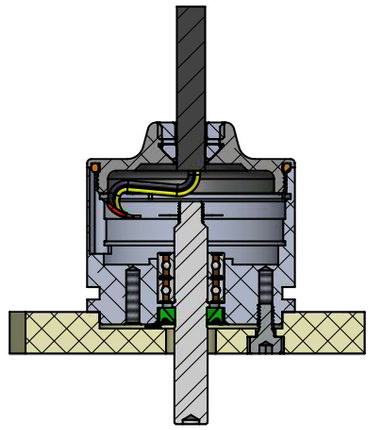


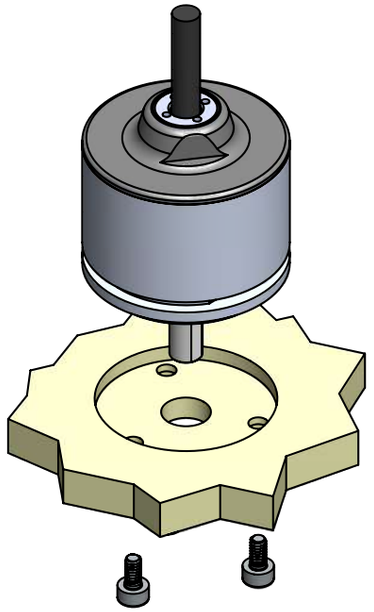




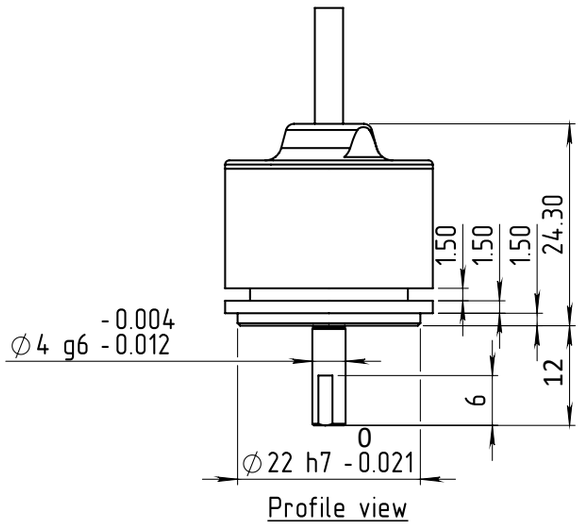
Typical mounting requirements



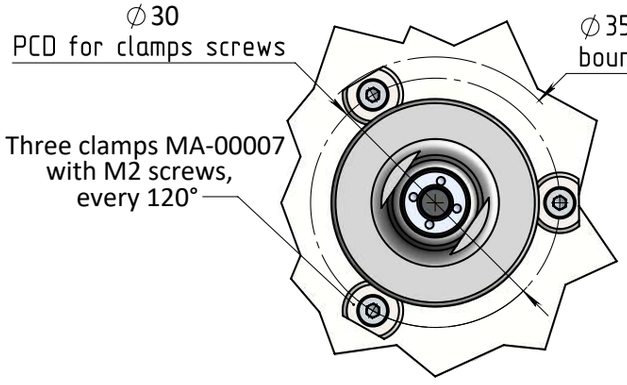


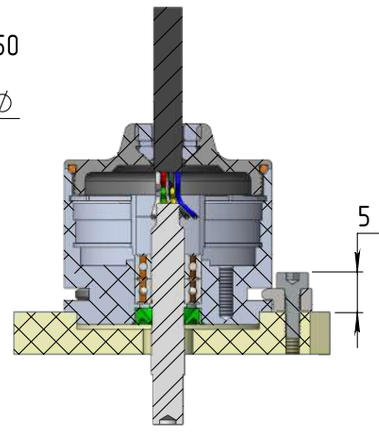


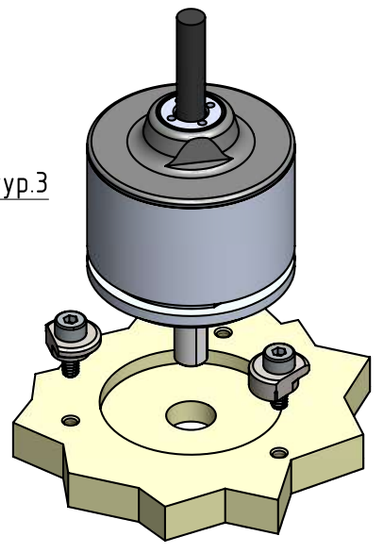
Flange bottom mounting - sample
(with three standard screws)



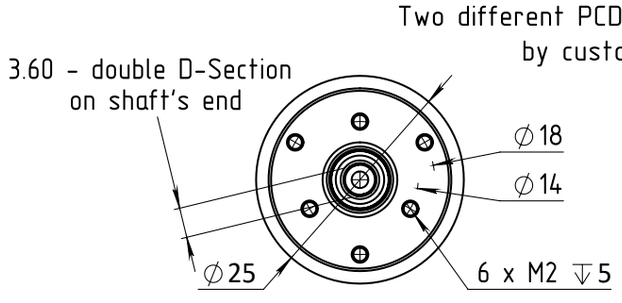
Profile view







Special clamps mounting - sample
(with three clamps supplied as optional kit EAPK005)



Bottom view

ATTENTION

OBSERVE PRECAUTIONS FOR HANDLING
ELECTROSTATIC SENSITIVE DEVICES

Unless otherwise specified	
Dimensions are in: mm	Surface finish: N6
Linear tolerances	
0.5-4.9: ±0.05 mm	5-30: ±0.1 mm
31-120: ±0.15 mm	121-400: ±0.2 mm