

The DL-27 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.
- Digital interfaces
- IP65



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.

General

Angular resolution	17-21 bit
Maximum tested static error	±0.015°
Extended accuracy static error	±0.015°
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
Outer diameter / Profile / Shaft	27 / 40.7 / 4.3 mm
Material (case, shaft)	Stainless steel

Electrical

Supply voltage	5V ± 5%
Current consumption	110 mA
Interconnection	Shielded cable
Cable Length	250mm standard

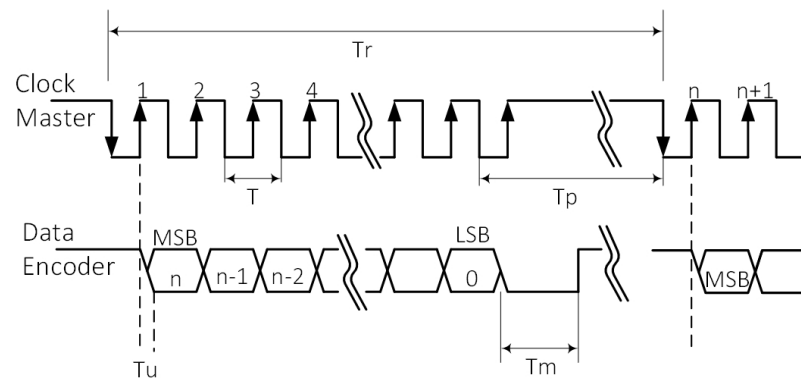
Environmental

EMC	IEC 6100-6-2, IEC 6100-6-4
Operating temperature range	-40°C to +105°C
Storage temperature	-55°C to +105°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.



SSI / BiSS Output signal parameters

Output code	Binary
Serial output	Differential RS-422
Clock	Differential RS-422
Clock Frequency	0.5 ÷ 5.0 MHz
Position update rate (Max)	30 KHz

SSI / BiSS interface wires color code

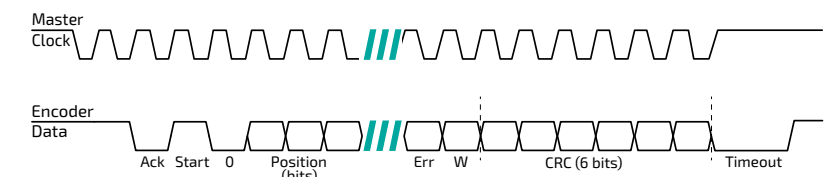
Clock +	Grey	Clock
Clock -	Blue	
Data -	Yellow	Data
Data +	Green	
GND	Black	Ground
+5V	Red	Power supply

	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	

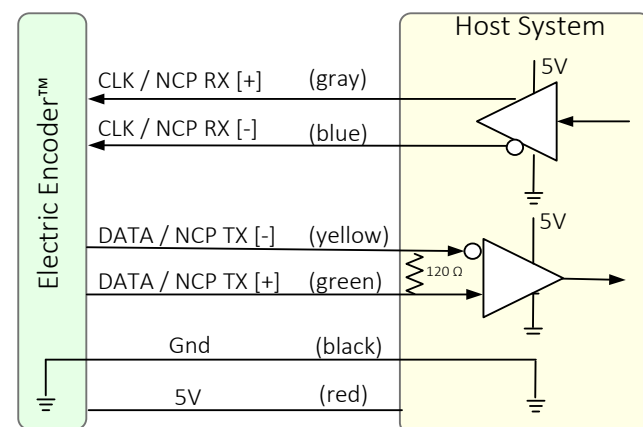


Digital BiSS-C Interface

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 - 27 - S G - S 0 - n n n

DL Product Line

Outer Diameter

27

Output

S	SSi
I	BiSS

Resolution

Code	Bit	CPR
F	17	131,072
G	18	262,144
H	19	524,288
I	20	1,048,578
J	21*	2,097,152

* SSi only

BIT (Built In Test): Optional

[]	None
B	BIT

EA	Extended Accuracy
nnn	Custom

Cable Length

0	250 mm Flying leads - 30AWG
1	500 mm Flying leads - 30AWG
2	750 mm Flying leads - 30AWG
3	1000 mm Flying leads - 30AWG
4	250 mm Flying leads - 28AWG
5	500 mm Flying leads - 28AWG
6	750 mm Flying leads - 28AWG
7	1000 mm Flying leads - 28AWG

To add a connector contact us

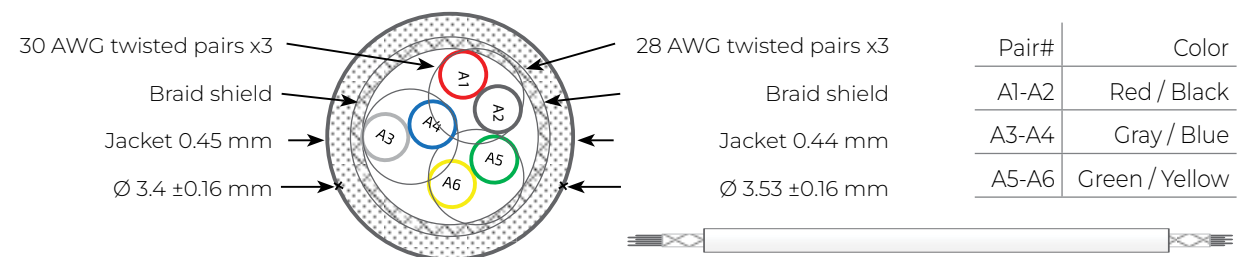
Cable Options

S	Jacket and shielded cable
C	Connector (D38999)

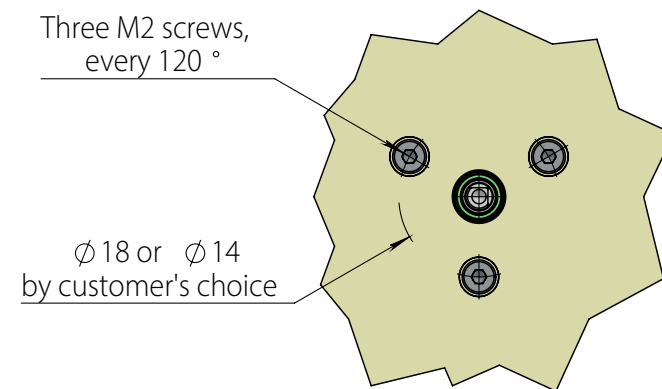
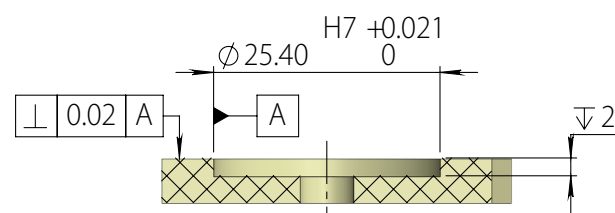
Optional Accessories

Cable options

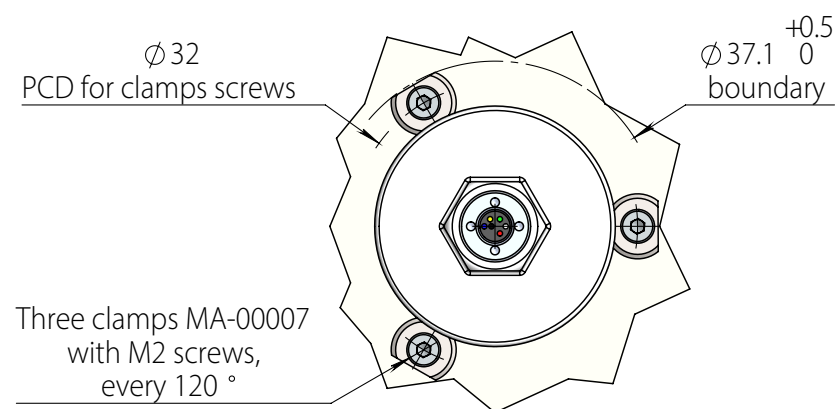
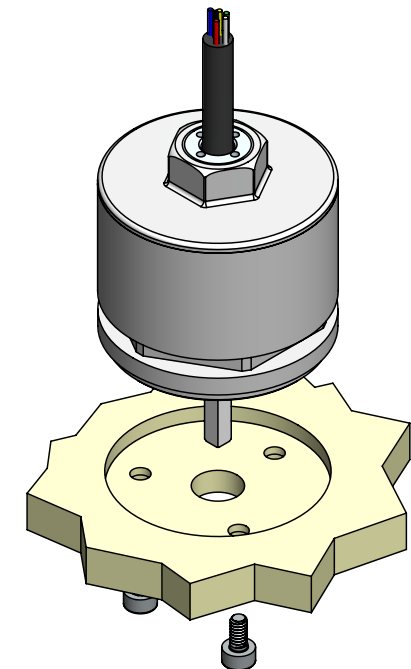
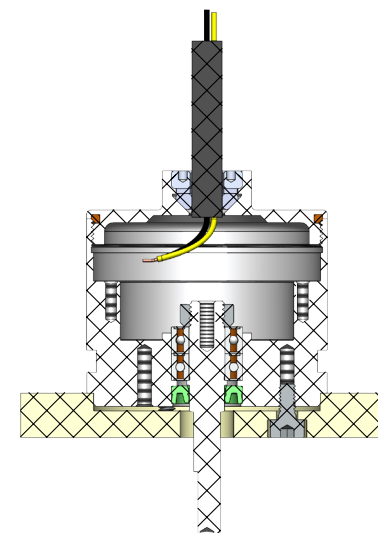
Netzer Cat No.	CB-00014-A	CB-00034
Cable type	30 AWG twisted pair x 3	28 AWG twisted pair x 3
Wire type	2 x 30 AWG tinned copper Insulation: PFE Ø 0.15 FEP OD: Ø 0.6 ± 0.05 mm	2 x 30 AWG 40/44 tinned copper Insulation: PFE Ø 0.12 OD: Ø 0.64 ± 0.05 mm
Temp. Rating	-55°C to +125°C	-55°C to +150°C
Braided shield	Thinned copper braided 95% min. coverage	
Jacket	0.45 TPE	0.44 silicon rubber (NFA 11-A1)
Diameter	Ø 3.4 ± 0.16 mm	Ø 3.53 ± 0.16 mm



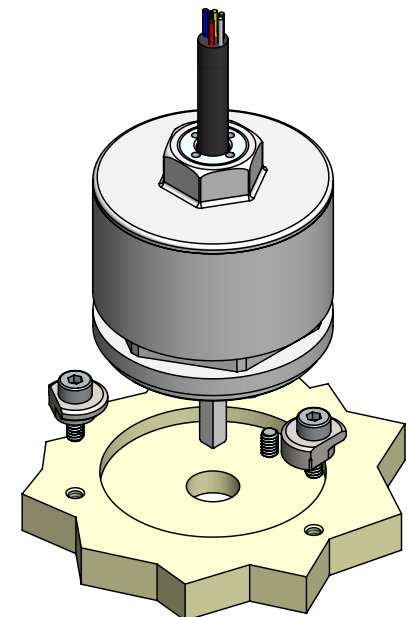
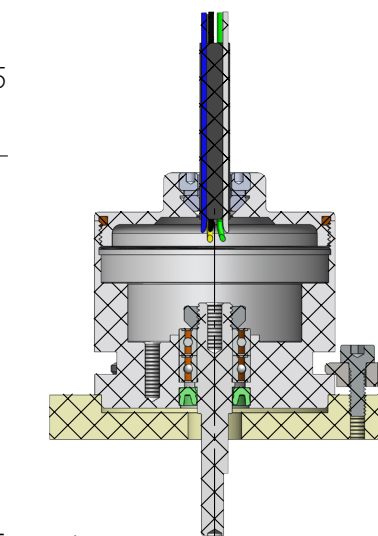
DL-27 Double D-section shaft ICD



Flange bottom mounting - sample
(with three standard screws)



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



Unless otherwise specified

Dimensions are in: mm Surface finish: N6

Linear tolerances

0.5-4.9: ±0.05 mm 5-30: ±0.1 mm

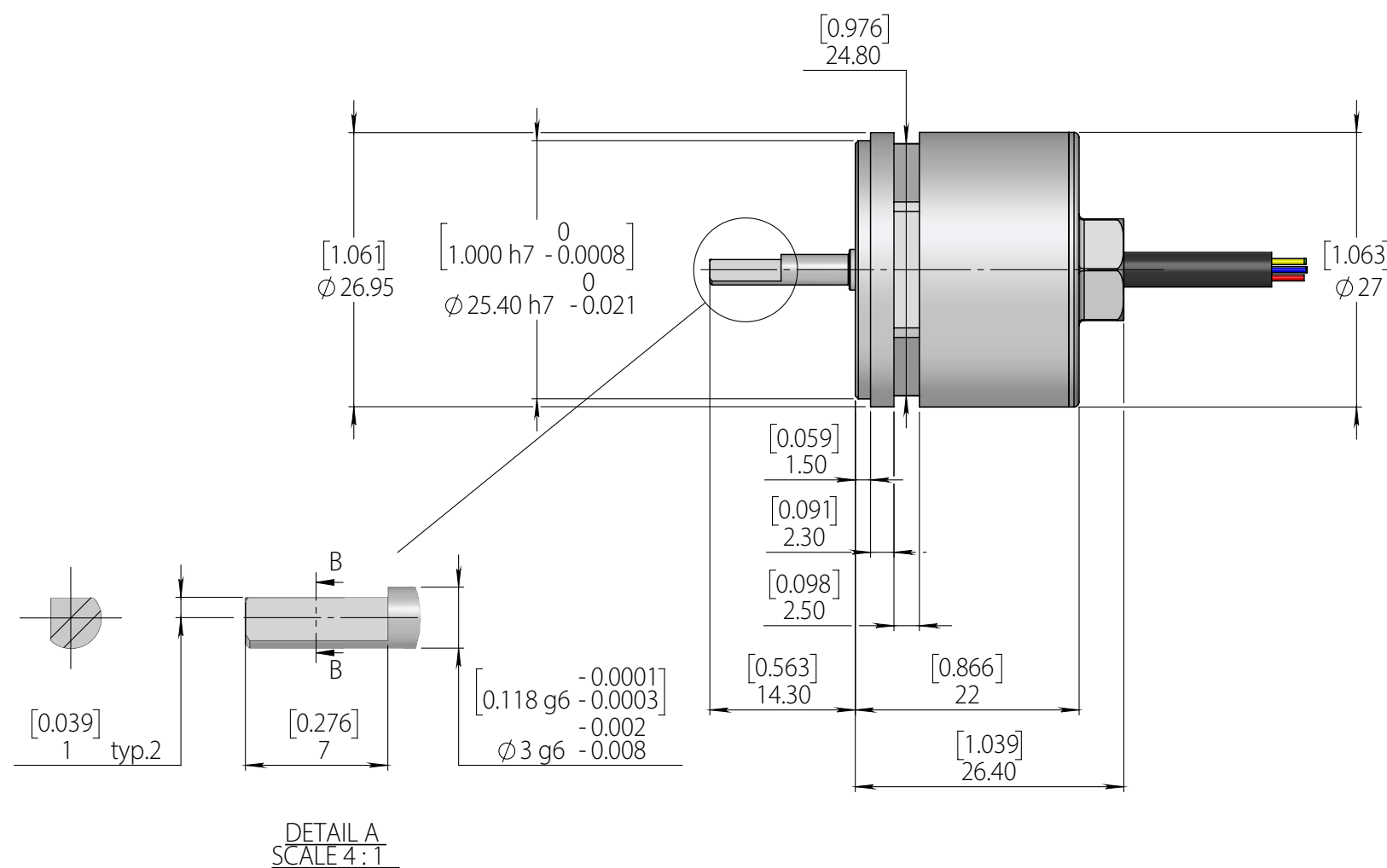
31-120: ±0.15 mm 121-400: ±0.2 mm

ATTENTION



OBSERVE PRECAUTIONS FOR HANDLING
ELECTROSTATIC SENSITIVE DEVICES

DL-27-QR Shaft with double D-Section Sample Inches



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

Body material: AISI 303/304 Stainless Steel
Shaft material: AISI 303/304 Stainless Steel