The DL-66 is a member of the DL series of Electric Encoders™, a product line based on Netzer Precision Position Sensor proprietary technology. EE products are characterized by features that enable unparalleled performance:

- High resolution and unparalleled precision
- High tolerance to temperature extremes, shock, EMI, RFI and magnetic fields
- IP65
- Holistic signal generation
- Digital interfaces for absolute position
- Build In Test and diagnostic (BIT)

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 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.

### General
- Angular resolution: 18–20 bit
- Maximum tested static error: ±0.010°
- Extended accuracy static error: ±0.005°
- Maximum operational speed: 4,000 rpm
- Measurement range: Single turn, unlimited
- Rotation direction: Adjustable CW/CCW*

* 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: 350 gr
- Outer diameter / Profile: 71 / 29 mm
- Material (case, shaft): Aluminum / Stainless steel

### Electrical
- Supply voltage: 5VDC ± 5% (Optional 24 VDC)
- Current consumption: 90 mA
- Interconnection: Shielded cable

### Environmental
- EMC: IEC 61000-6-2, IEC 61000-6-4
- Operating temperature range: -40°C to +85°C
- Storage temperature: -50°C to +100°C
- Relative humidity: 98% Non condensing
- Shock endurance: 150 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**

<table>
<thead>
<tr>
<th>Description</th>
<th>Default</th>
<th>Length</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total number of data bits</td>
<td>12 - 22</td>
<td></td>
</tr>
<tr>
<td>Clock period</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Clock frequency</td>
<td>0.1 ÷ 5.0 MHz</td>
<td></td>
</tr>
<tr>
<td>Bit update time</td>
<td>200 nsec</td>
<td></td>
</tr>
<tr>
<td>Pause time</td>
<td>26 - ∞ μsec</td>
<td></td>
</tr>
<tr>
<td>Monoflop time</td>
<td>&gt;25 μsec</td>
<td></td>
</tr>
<tr>
<td>Time between 2 adjacent requests</td>
<td>Tr &gt; n*T+26 μsec</td>
<td></td>
</tr>
<tr>
<td>Data request frequency</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**SSI / BiSS interface wires color code**

- **Clock +**: Grey
- **Clock -**: Blue
- **Data -**: Yellow
- **Data +**: Green
- **GND**: Black
- **+5V**: Red
- **Power supply**: 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** |
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>28</td>
<td>Ack</td>
<td>0</td>
<td>1/clock</td>
</tr>
<tr>
<td>27</td>
<td>Start</td>
<td>1</td>
<td>1 bit</td>
</tr>
<tr>
<td>26</td>
<td>“0”</td>
<td>0</td>
<td>1 bit</td>
</tr>
<tr>
<td>8...25</td>
<td>AP Absolute Position encoder data</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Error</td>
<td>1</td>
<td>1 bit</td>
</tr>
<tr>
<td>6</td>
<td>Warn. Warning (non active)</td>
<td>1</td>
<td>1 bit</td>
</tr>
<tr>
<td>0...5</td>
<td>CRC The CRC polynomial for position, error and warning data is: x0 + x1 + x2. It is transmitted MSB first and inverted. The start bit and “0” bit are omitted from the CRC calculation.</td>
<td>6 bits</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Timeout Elapse between the sequential “start” request cycle’s.</td>
<td>25 μs</td>
<td></td>
</tr>
</tbody>
</table>
Ordering Code

- **DL** Product line
- **S** Outer Diameter
- **G** Output
- **S** Resolution
  - **S** Standard
  - **I** Immune
- **B** BIT (Build In Test): optional
  - None
  - BIT
- **n** Extended Accuracy
- **n** Custom Accuracy
- **n** Interconnection
  - 0: 250mm Flying leads (default)
  - 1: 500mm Flying leads
  - 2: 750mm Flying leads
  - 3: 1000mm Flying leads
  - [:] None (for connection option)
- **S**: Shielded cable 250 mm
- **C**: Connector (D38999)

Cable Information

- **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 braided 95% min. coverage
- Jacket: 0.45 silicon rubber jacket Ø3.45 ± 0.2 OD

**Connector**: Amphenol D38999 / 24WB35PB
ICD - Interconnection: Cable

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
ICD - Interconnection: Connector

Unless Otherwise Specified

Dimensions are in: mm  
Surface finish: N6

Linear tolerances:

<table>
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<tr>
<th>Range</th>
<th>Tolerance</th>
</tr>
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<tr>
<td>0.5-4.9</td>
<td>±0.05 mm</td>
</tr>
<tr>
<td>5-30</td>
<td>±0.1 mm</td>
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<tr>
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