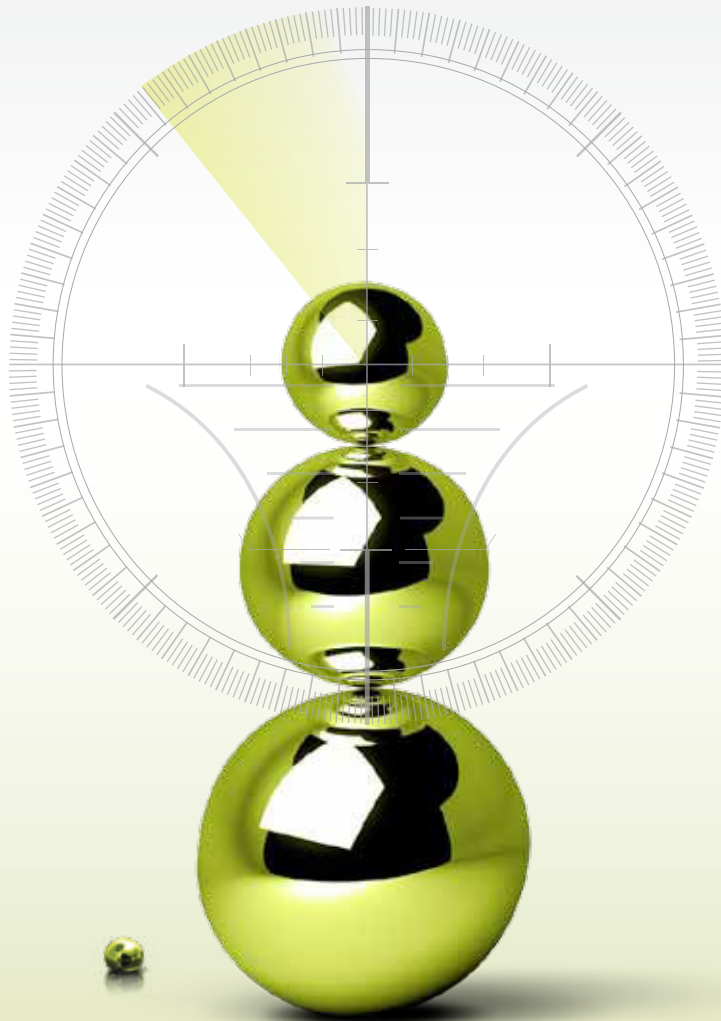




**Netzer**

Precision Motion Sensors Ltd.



Moving Precisely  
With You



Defence



Automotive



Avionic



Medical



Communication



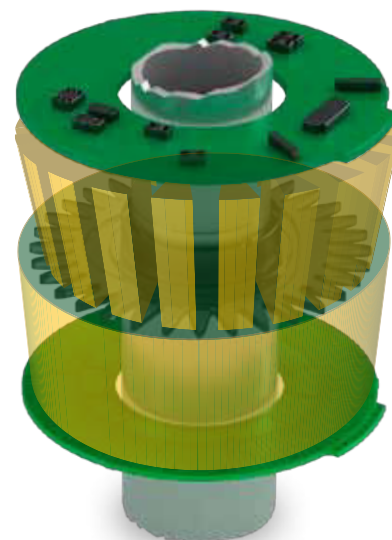
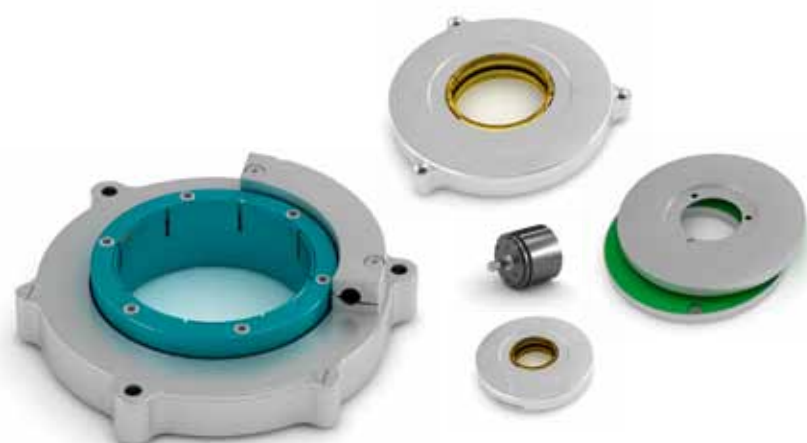
Robotics



Space

## Encoder Technology for 21st Century

Rotary and linear, absolute and incremental, analog and digital, standard and customized, Netzer's worldwide patented ,rugged ,high performance ,Electric Encoder™ technology suits applications ranging from space and avionics, through defense and instrumentation to automotive.



## Electric Rotary Encoders™

High precision absolute position.



## Custom Encoders

Absolute position ultra low profile and mechanical flexibility.



## The Electric Encoder™ Advantages

### Mechanical

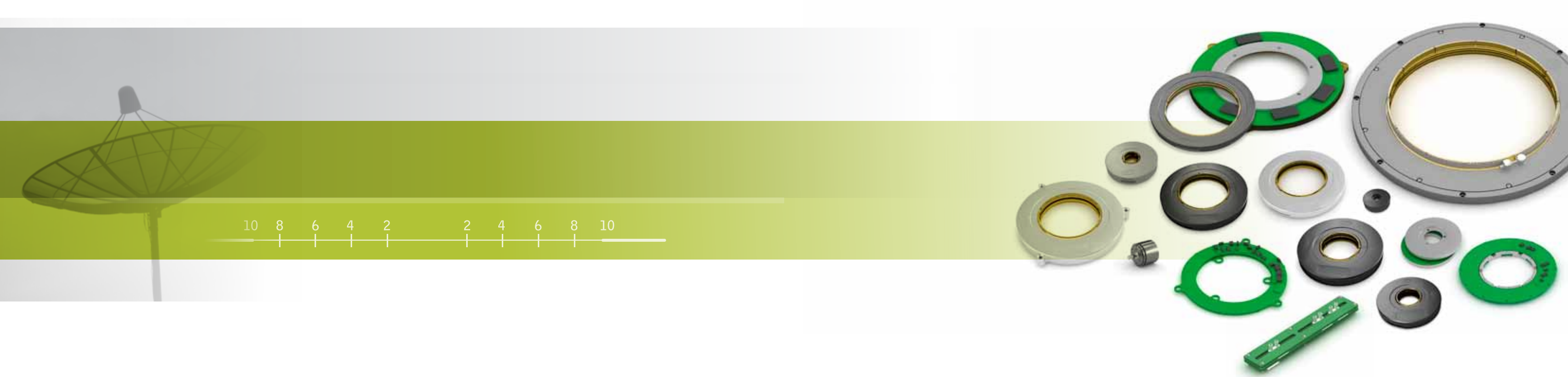
- Low Profile
- Hollow Floating Shaft
- Mounting Tolerant
- Low Weight and Inertia

### Functional

- Absolute Position
- High Resolution
- High Accuracy
- Low Power Consumption
- Redundancy Options

### Reliability

- Extreme Temperatures
- Shock and Vibration Tolerance
- High MTBF
- Tolerant to EMI / RFI / Magnetic Fields



Absolute position extreme condition

ROTARY - Polymer / Metal housing



|                                                 |                                                                                                |             |              |              |                                                                                                 |              |               |                |
|-------------------------------------------------|------------------------------------------------------------------------------------------------|-------------|--------------|--------------|-------------------------------------------------------------------------------------------------|--------------|---------------|----------------|
|                                                 | Contactless floating rotor                                                                     |             |              |              |                                                                                                 |              |               |                |
| Polymer housing                                 | DS-25                                                                                          | DS-37       | DS-58[20]    | DS-70        |                                                                                                 | DS-90        | DS-130        | DS-247         |
| Metal housing                                   | DM-25                                                                                          | DM-37       | DM-58[20]    | DM-70        |                                                                                                 | DM-90        | DM-130        |                |
| Functional                                      |                                                                                                |             |              |              |                                                                                                 |              |               |                |
| Electrical Cycles/Revolution – Fine Mode        | 16                                                                                             | 16          | 32           | 64           |                                                                                                 | 64           | 64            | 128            |
| Angular resolution (using, 12bit A/D converter) | 17 bits                                                                                        | 17 bits     | 18 bits      | 19 bits      |                                                                                                 | 19 bits      | 19 bits       | 20 bits        |
| Accuracy                                        | < ±15mdeg°                                                                                     | < ±15mdeg°  | < ±10mdeg°   | < ±10mdeg°   |                                                                                                 | < ±10mdeg°   | < ±10mdeg°    | < ±6mdeg°      |
| Maximum usable speed                            | 3,000 rpm                                                                                      |             | 1,500 rpm    | 750 rpm      |                                                                                                 |              |               |                |
| Measurement range                               | Full rotation - 360°                                                                           |             |              |              |                                                                                                 |              |               |                |
| Feedback                                        | absolute position - analog Sine/Cosine 1Vp-p, digital - SSI<br>Digital - incremental AqB+Index |             |              |              | absolute position - analog Sine/Cosine 1Vp-p , digital - SSI<br>Digital - incremental AqB+Index |              |               |                |
| Mechanical                                      |                                                                                                |             |              |              |                                                                                                 |              |               |                |
| Mounting eccentricity - operational             | ±0.2 mm                                                                                        |             | ±0.3 mm      |              | ±0.3 mm                                                                                         |              | ±0.2 mm       |                |
| Rotor axial motion - operational                | ±0.2 mm                                                                                        |             | ±0.3 mm      |              | ±0.3 mm                                                                                         |              | ±0.1 mm       |                |
| Rotor inertia (gr*mm²)                          | 11                                                                                             | 76          | 800          | 5200         |                                                                                                 | 5200         | 2400          |                |
| Total weight                                    | 4 gr                                                                                           | 10 gr       | 36 gr        | 50 gr        |                                                                                                 | 50 gr        | 65 gr         | 665 gr         |
| Outer diameter / Inner diameter / Profile (mm)  | 25 / 6 / 7                                                                                     | 37 / 10 / 8 | 58 / 20 / 10 | 70 / 30 / 10 |                                                                                                 | 90 / 50 / 10 | 130 / 90 / 10 | 247 / 170 / 10 |
| Construction material (stator / rotor)          | Ultem or Aluminum / Ultem™                                                                     |             |              |              |                                                                                                 |              |               | Aluminum       |
| Protection                                      | IP40                                                                                           |             |              |              |                                                                                                 |              |               |                |

| Electrical - General  |                                  |
|-----------------------|----------------------------------|
| Supply voltage        | +4.6 to +5.5 v                   |
| Supply current        | < 10 mA                          |
| Maximum load current. | analog - 10 mA , digital - 160mA |
| Output resistance     | < 1 Ω                            |

| Environment - extreme conditions |                                       |
|----------------------------------|---------------------------------------|
| EMC                              | IEC 6100-6-2, IEC 6100-6-4            |
| Operating temperature range      | -55°C to +125°C                       |
| Relative Humidity                | < 98% non condensate                  |
| Shock endurance                  | IEC 60068-2-27; 100 gm for 11 ms      |
| Vibration endurance              | IEC 60068-2-6; 20 gm for 10 – 2000 Hz |

| Available output formats - General |                                |
|------------------------------------|--------------------------------|
|                                    | Type                           |
| Digital                            | Incremental - AqB + index      |
|                                    | Absolute position – SSi        |
| Analog                             | Sine/Cosine (electrical angle) |



Absolute position extreme condition

ROTARY - Metal housing

|  | ROTARY               |                        |                     |
|--|----------------------|------------------------|---------------------|
|  | Metal sealed housing | Metal with shaft clamp | 2 plates Metal case |

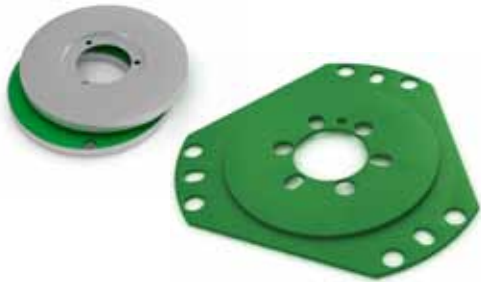


|                                           | Digital - absolute position      |            |                                  |        |                                  |            |
|-------------------------------------------|----------------------------------|------------|----------------------------------|--------|----------------------------------|------------|
|                                           | DL-25                            | DL-60      | DK-90                            | DK-160 | DF-60                            | DF-90      |
| Functional                                |                                  |            |                                  |        |                                  |            |
| Electrical Cycles/Revolution<br>Fine Mode | 16                               | 32         | 32                               | 32     | 32                               | 32         |
| Angular resolution                        | 17 bits                          | 18 bits    | 19 bits                          |        | 18bits                           | 18 bits    |
| Accuracy                                  | < ±15mdeg°                       | < ±10mdeg° | < ±10mdeg°                       |        | < ±20mdeg°                       | < ±15mdeg° |
| Maximum usable speed                      | 3,000 rpm                        | 1,500 rpm  | 1,500 rpm                        |        | 1,500 rpm                        | 1,500 rpm  |
| Measurement range                         | full rotation - 360° singel turn |            | full rotation - 360° singel turn |        | full rotation - 360° single turn |            |
| Feedback                                  | absolute position - digital ssi  |            | absolute position - digital ssi  |        | absolute position - digital ssi  |            |
| Mechanical                                |                                  |            |                                  |        |                                  |            |
| Total weight                              | 40 gr                            | 60 gr      | 120 gr                           | 240 gr | 60 gr                            | 120 gr     |
| Outer diameter                            | 25                               | 60         | 90                               | 160    | 60                               | 90         |
| Construction stator material              | Aluminum                         |            |                                  |        |                                  |            |
| Protection                                | IP65                             |            | IP40                             |        | IP40                             |            |

CUSTOM - VLP - 2 plates

Electrical Rotary Encoders

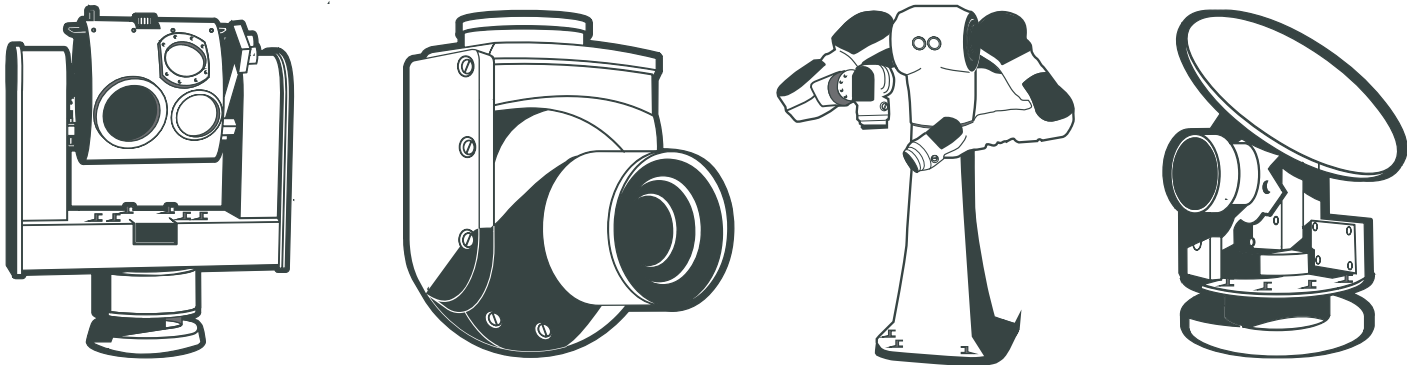
The Netzer Electric Encoder™ flexibility lends itself to easy customization offering unmatched design freedom, performance, and cost effectiveness. The Netzer Electric Encoder can be customized in terms of mechanical dimensions, resolution, accuracy, packaging, power consumption, and adaptation to various environments.



Absolute position industrial automation



| Contactless floating rotor |                                                          |       |            |       |       |        |
|----------------------------|----------------------------------------------------------|-------|------------|-------|-------|--------|
| Polymer housing            | DR-25                                                    | DR-37 | DR-58      | DR-70 | DR-90 | DR-130 |
| Functional                 |                                                          |       |            |       |       |        |
| Angular resolution         | 14 bit                                                   |       |            |       |       |        |
| Accuracy                   | < ±35mdeg°                                               |       | < ±25mdeg° |       |       |        |
| Maximum usable speed       | 3,000 RPM                                                |       |            |       |       |        |
| Measurement range          | Full rotation - 360°                                     |       |            |       |       |        |
| Feedback                   | Absolute position - digital - SSI / Digital -incremental |       |            |       |       |        |
| Environment conditions     | -20 + 65 Deg C                                           |       |            |       |       |        |





**Netzer**

Precision Motion Sensors Ltd.

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