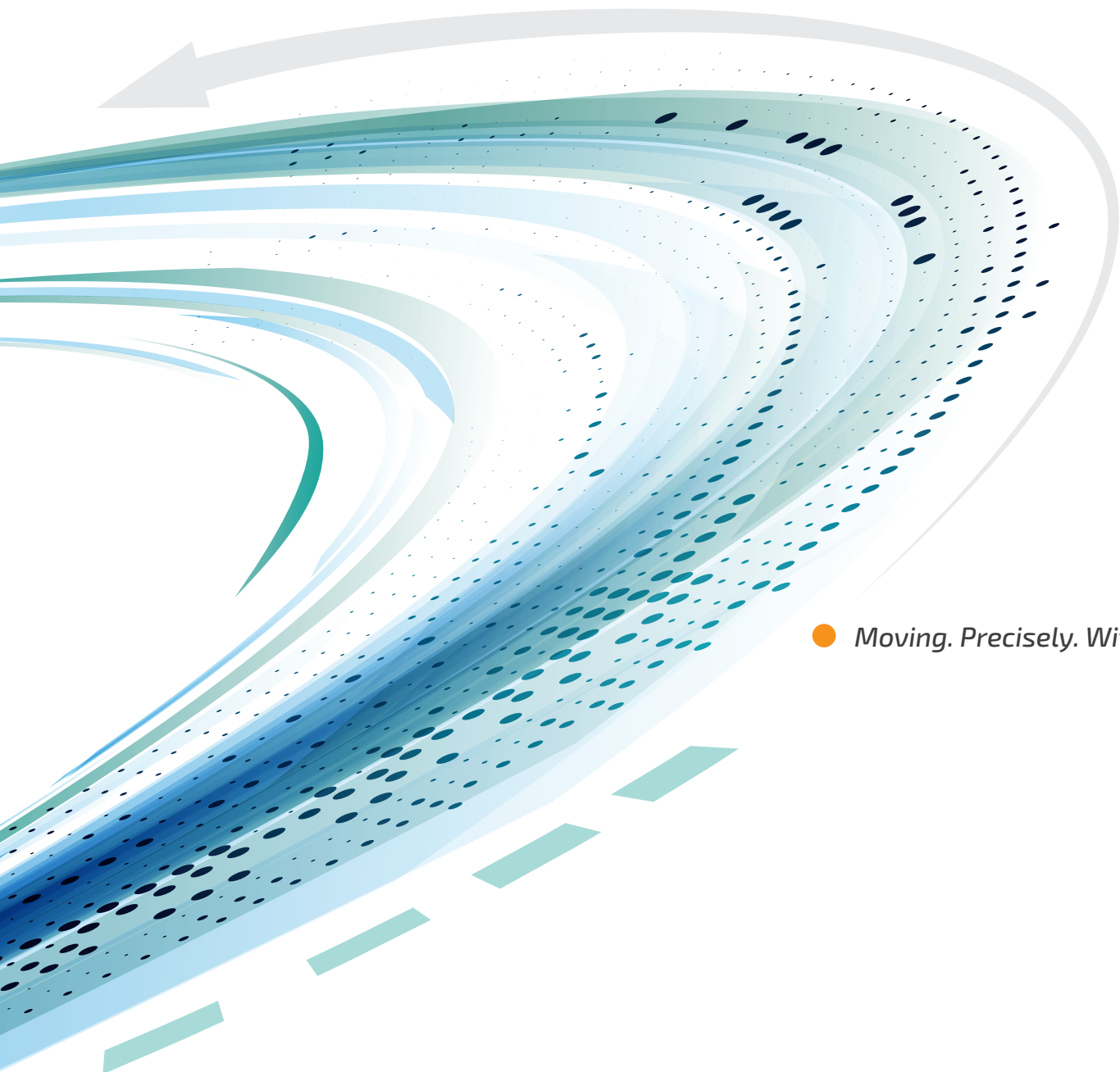




High Precision Rotary Electric Encoders™



● *Moving. Precisely. With You.*

PRECISION IN MOTION

The Electric Encoder™ - the line of capacitive absolute rotary encoders patented by Netzer Precision Position Sensors.

The line of the robust and reliable Electric Encoders™ includes both analog and digital, standard or customized, high-performance absolute rotary encoders which are suitable for applications ranging from space and avionics, harsh environment, as well as industrial, instrumentation, medical and automotive applications.

The Electric Encoder's unique hollow-shaft contactless structure, meets the minimum possible space requirements and enhances reliability by eliminating degradation and failure mechanisms.

The advanced Electric Encoders™ adds intelligence to position-sensing and its high capabilities makes it a leading sensor to integrate with modern motion control applications, meeting their strict requirements.



SMALL SIZE



LOW PROFILE



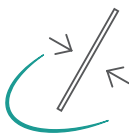
HOLLOW SHAFT

THE ELECTRIC ENCODER™ BENEFITS



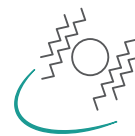
FUNCTIONAL

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



STRUCTURAL

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

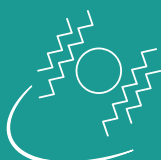


ENVIRONMENTAL

- Extreme Temperatures
- Shock and Vibration Tolerance
- Tolerance to EMI / RFI
- Immunity to Magnetic Fields



IMMUNITY TO
MAGNETIC FIELDS



DURABILITY

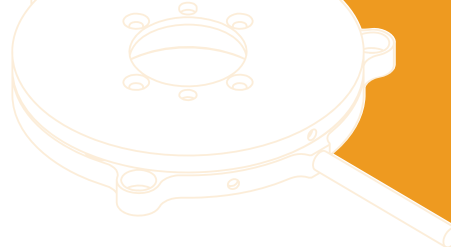


HIGH PRECISION

Moving. Precisely. With You. ●



Moving Precisely in
**HARSH
ENVIRONMENT**



HARSH ENVIRONMENT

Netzer's Electric Encoders™ meet the requirements for use in a wide variety of harsh environment applications, including space, avionics and defense. The contactless core with its holistic structure is extremely durable and resistant to vibrations and shocks. The low profile, hollow shaft structure, suits compact, high-density designs.

Electrical

Supply voltage	5V ±5%
Current consumption	90 mA
Interface	Digital: SSI / BiSS
Build In Test - BIT	Optional

Environment - extreme conditions

EMC	IEC 6100-6-2, IEC 6100-6-4
Operating temperature range	-40°C to +85°C
Relative humidity	98% non condensing
Shock endurance	100 g for 11 ms
Vibration endurance	20 g for 10 to 2000 Hz
Protection	IP 40 - IP 65

PRODUCT FEATURES



HIGH PRECISION



LOW PROFILE



HOLLOW SHAFT



IMMUNITY TO
MAGNETIC FIELDS

HOLLOW SHAFT CONTACTLESS ENCODERS



Polymer housing	DS-16	DS-25	DS-37	DS-40	DS-58	DS-70	DS-90	DS-130
Functional								
Angular resolution	16 bit	17-19 bit	17-19 bit	17-19 bit	18-20 bit	19-21 bit	19-21 bit	19-21 bit
Accuracy	± 0.020°	± 0.010°	± 0.015°	± 0.010°	± 0.008°	± 0.006°	± 0.006°	± 0.006°
Maximum operational speed	4,000 rpm					2,000 rpm		
Measurement range	Absolute position - Single turn							
Mechanical								
Weight	3.1 gr	10 gr	10 gr	20 gr	30 gr	49 gr	55 gr	81 gr
Outer Ø / Inner Ø / Height (mm)	16/4/8	25/6/7	37/10/8	40/10/10	58/20/10	70/30/10	90/50/10	130/90/10
Material (stator, rotor)	Ultem™ / TRVX-50 Polymer's							



HOLLOW SHAFT CONTACTLESS ENCODERS - TWO-PLATE RING



Polymer housing	VLP-60	VLP-100
Functional		
Angular resolution	18-20 bit	18-20 bit
Accuracy	± 0.010°	± 0.006°
Maximum operational speed	4,000 rpm	
Measurement range	Absolute position - Single turn	
Interface	Digital: SSI / BiSS	
Mechanical		
Weight	16 gr	42 gr
Outer Ø / Inner Ø / Height (mm)	60/25/6	100/48/7
Material (stator, rotor)	PCB (FR4)	
Protection	IP 40	

DF-60	DF-100	DF-150
Functional		
18-20 bit	18-20 bit	18-20 bit
$\pm 0.010^\circ$	$\pm 0.010^\circ$	$\pm 0.006^\circ$
1,500 rpm	1,500 rpm	1,500 rpm
Absolute position - Single turn		
Digital: SSI/ BiSS		
Mechanical		
40 gr	126 gr	307 gr
60/27/9	100/57/10	150/110/13.6
Aluminum		
IP 40		

PRODUCT FEATURES



LIGHT WEIGHT



HIGH PRECISION



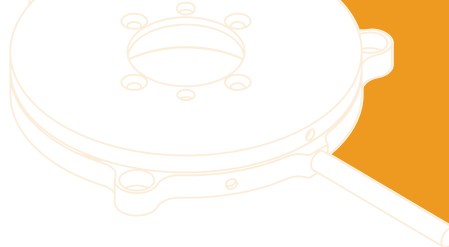
HOLLOW SHAFT



LOW PROFILE



DURABILITY



SHAFT ENCODERS

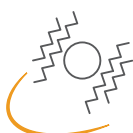


Metal Case	DL-25	DL-66
Functional		
Angular resolution	17-19 bit	18-20 bit
Accuracy	± 0.020°	± 0.005°
Maximum operational speed	4,000 rpm	
Measurement range	Absolute position - Single turn	
Interface	Digital: SSI / BiSS	
Mechanical		
Weight	30 gr	350 gr
Outer Ø / Height (mm)	25/24.3	71/29
Material (stator, rotor)	Aluminum	
Protection	IP 65	

PRODUCT FEATURES



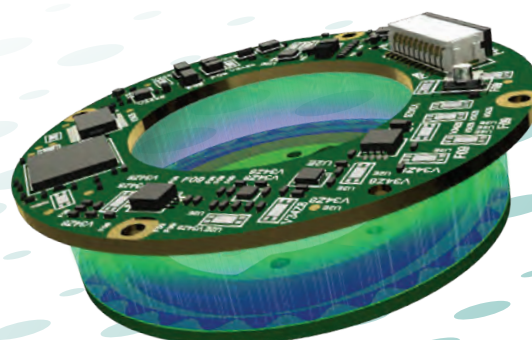
HIGH PRECISION




DURABILITY

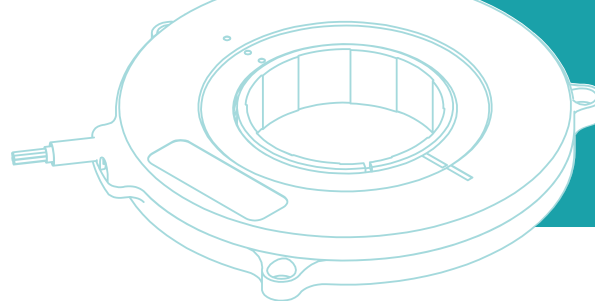


IMMUNITY TO
MAGNETIC FIELDS



A close-up photograph of an industrial robotic arm. The arm is primarily white and grey, with blue protective caps on the joints. It has a black gripper at the end. The background is a blurred industrial setting with various lights and machinery. A semi-transparent teal banner is at the bottom, containing the text.

Moving Precisely in
**INDUSTRIAL
AUTOMATION**



INDUSTRIAL
AUTOMATION

INDUSTRIAL AUTOMATION

The VLX and VLM encoders are state-of-the-art position sensors designed for both industrial automation including cobots and servo motors as well as a broad range of robotic applications in the medical and semi-conductor industries.

The VLX single-turn absolute encoder provides the reliability and accuracy required by the most advanced high-end medical devices, as well as by automotive, robotics and industrial automation applications.

The VLM multi-turn absolute encoder is implemented with a revolution counter. The master reads the multiturn position from the encoder at power-up and during operation. In order to keep turn-count and absolute position in case of power disconnect or shut-down, the VLM includes an internal battery and/or an external battery connection.

PRODUCT FEATURES



HIGH PRECISION



LOW PROFILE



HOLLOW SHAFT



IMMUNITY TO
MAGNETIC FIELDS

Electrical

Supply voltage	5V \pm 5%
Current consumption	VLX: 90 mA (VLM: <100 mA)
Interface	Digital: SSI / BiSS
Build In Test - BIT	Optional

Environment

EMC	IEC 6100-6-2, IEC 6100-6-4
Operating temperature range	-25°C to +65°C
Relative humidity	98% Non condensing
Shock endurance	100 g for 11 ms
Vibration endurance	20 g 10 – 2000 Hz
Protection	IP 40

TWO-PLATE RING ENCODERS

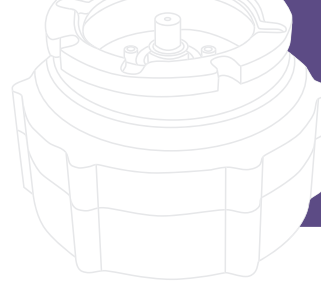


Polymer housing	VLX-60	VLM-60
Functional		
Angular resolution	18-20 bit	17 bit - Single / 15 bit - Multi
Accuracy	$\pm 0.010^\circ$	$\pm 0.015^\circ$
Maximum operational speed	4,000 rpm	4,000 rpm
Measurement range	Absolute position - Single turn	Absolute position - Multi turn
Mechanical		
Weight	14 gr	15 gr
Outer Ø/ Inner Ø/ Height (mm)	60/25/8	60/25/8
Material (stator, rotor)	PCB (FR4)	PCB (FR4)



Moving Precisely in
SPACE

SPACE



Netzer Precision Sensors is offering custom encoders for low-orbit & deep-space applications. The space encoders are application-dedicated while the specifications and configuration are built in close cooperation with the customer. The space encoders are based on Netzer's unique capacitive technology which provides high absolute accuracy with extremely high shock and vibration resistance.

SPACE ENCODERS ARE OFFERED IN VARIOUS CONFIGURATIONS

- Absolute analog output (Sine + Cosine in two or three channels)
- Absolute digital encoders with a resolution of up to 21 bit
- Combined configuration with separate analog and digital boards to be installed separately
- Standard component or Mil / EEE / ESA standards.
(RoHS Vs Non RoHS)
- Rad hardened or Non-Rad hardened (45 -100 Krad)
- Enclosed spindle configuration or "Two plates" contactless configuration

SPACE REQUIREMENT CAPABILITIES

Environmental testing

- Shock - up to 100 g 10 ms
- Vibrations - MIL-STD-810F
- Thermal cycles under vacuum (10^{-5} -Torr)

Clean – environment components assembly (SMT)

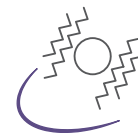
Dedicated mechanical assembly - design, and production

Note: It should be taken into account that some specific configurations might be included under the export control regulations.

PRODUCT FEATURES



HIGH PRECISION



DURABILITY



IMMUNITY TO
MAGNETIC FIELDS



IMMUNITY TO
COSMIC RADIATION

Typical Environment Conditions

Supply voltage	15V $\pm 10\%$ / -15V $\pm 10\%$ / 5V $\pm 5\%$
Current consumption	370mA (3.3W) max
Interface	Analog: Sine / Cosine; Digital: SSI / BiSS
Angular resolution	Up to 21 bit
Accuracy	$\pm 0.001^\circ$
Maximum operational speed	1000 rpm
Measurement range	Absolute position - Single turn
Operating temperature range	-55°C - 125°C
Radiation hardened	100 KRAD (Non-shielded)



NETZER PRECISION POSITION SENSORS

Established in 1998, Netzer Precision Position Sensors, designs, manufactures and supplies high-quality performance position sensors based on proprietary Electric Encoder™ technology invented by Mr. Yishay Netzer.

The contactless, absolute position Electric Encoder™ sensor technology relies on interactions between the measured displacement and an internally shielded, space/time modulated electric field. It offers features unsurpassed by traditional optical and magnetic encoders.

Netzer Precision Position Sensors holds worldwide patents for high precision, absolute position systems with analog or digital outputs.



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