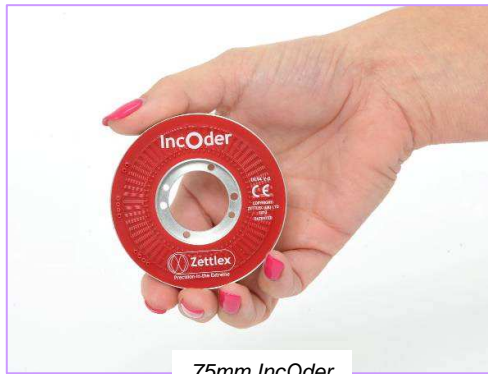


# OUTLINE TECHNICAL DESCRIPTION

## Zettlex Rotary Encoders



75mm IncOder

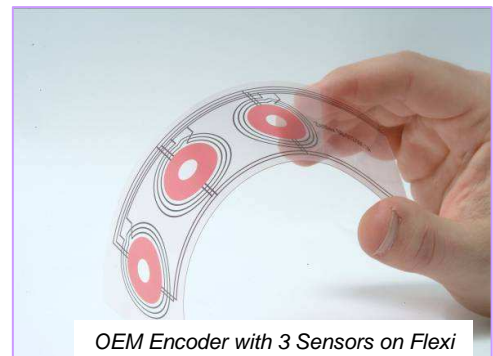
Zettlex rotary encoders are non-contacting, absolute, angle and speed measuring devices.

They work like a rotary transformer, using a unique inductive technique and comprise two main components – a Rotor and a Stator. The Stator is usually stationary and is electrically powered. The Rotor is passive. An electrical output from the Stator shows the (absolute) position of the Rotor relative to the Stator. The Rotor has no electrical connections and is usually the item which rotates.

**Zettlex devices offer *no contacts, no bearings, no bushes, no fine wires.....just reliable measurements all day, every day.***

Zettlex rotary encoders offer a cost effective alternative to resolvers, synchros, magnetic or optical encoders. The units are bearingless, do not require precision mounting and can operate reliably in harsh environments. Most devices offer true absolute position measurement but some devices are also available with incremental output.

Zettlex makes lots of different shapes, sizes & specifications of rotary encoders. We offer a standard range called IncOder™ (*Inductive Encoder*) as well as a range of custom or 'OEM' encoders which we engineer to customer specifications. Many of the OEM devices that we produce are unoused.



OEM Encoder with 3 Sensors on Flexi

The standard IncOder range offers >30,000 different product variants ranging in size, resolution, voltage supply and electrical interface. The detailed Product Guide is available on <http://www.zettlex.com/en/store>

Unoused, OEM units are typically conformally coated or potted and their operation is generally unaffected by fluids, dust, dirt, temperature, shock, vibration or electromagnetic noise. Most OEM units are produced using printed circuit boards from 0.1 to 6mm thick.



OEM 16-bit encoder

Control electronics can be provided onboard the Stator or away from the sensor so that they may be located in more benign environments. Sensing area temperature limits range from -70 to >230Celsius.

All rotary units can be readily engineered to specific customer requirements in terms of accuracy, speed, size, electrical characteristics, temperature range etc. - simply contact Zettlex for further details.

**The following table should not be taken as a definitive product data sheet but rather as a guide to realistic technical limits for OEM devices:-**

Measurement range	Absolute over 0 to 360 degrees (continuous) Multi-turn achievable with reduction gearbox or turn counting Incremental measurement as an option
Output signal	Analogue or digital. Options include RS232, RS485, I <sup>2</sup> C, PWM, SPI, pulse train, SSI, 0-5VDC, 0-10VDC, 4...20mA (3 wire), 4...20mA (2 wire), 1V <sub>pk</sub> sin/cos
Power supply	5, 12 or 24VDC as standard Most supplies can be accommodated including mains 110/220 or 240VAC as options
Nominal size	12 to 800mm outer diameter Through hole (annular) arrangements achievable On precision units an annular or radial thickness of >15mm is recommended
Mechanical fitting	General tolerance of +/-0,2mm on axial position and concentricity
Resolution	≤ 24 bits with 20, 18, 14, 12 or 10 bits as standard
Repeatability	≤1 LSB
Hysteresis	0 (repeat – there is zero hysteresis)
Linearity	≤10 arc-seconds achievable with in-situ calibration Standard (uncalibrated) linearity dependent on diameter (e.g. ≤200 arc-seconds or ≤1 milli-radians on 2" nominal device)
Ingress protection	IP68 achievable with potted units. Standard product is 'open board' with conformal spray coat which is unaffected by temporary submersion to 1m
Operating temperature	-40 to +85 or 125 Celsius as standard. Upper limits of 230 Celsius achievable with displaced electronics module. Lower limits of -55 or -65Celsius available.
Storage temperature	-40 to 100 or 150 Celsius as standard
Reverse polarity protection	Standard
Over Voltage protection	Available as an option up to aerospace lightning strike spec.
Electrical redundancy	Simplex standard Options for dual, triplex & quadruplex
Temperature coefficient	<1ppm/K over full-scale and usually <0,25ppm/K over full-scale
Measurement frequency	1000Hz standard with options to 60kHz
ITAR Restrictions	Units can be supplied with non-ITAR restricted parts
Software Class	Software to aerospace DO178B (DAL B) can be supplied
Electromagnetic emissions	Complies with EN61326
Electromagnetic immunity	Complies with EN61326
Vibration	20g/6ms per IEC 68-2-27
Shock	To 1000g/6ms achievable with potted units To 100g/6ms standard
ATEX approval	Contact Zettlex – ATEX approval to 'intrinsically safe' (ia) EN13980 achievable
Connectors	Solder pads standard on open board units Most surface mount or through hole connectors as options either screw terminals, headers, friction or screw lock connectors
Mechanical mounting	Through board ≥3 screws + 2 dowels as standard Any mountings permissible as an option

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