

# Incremental Shaft Encoder

## OPE1275S Single Channel (Tachometer)

## OPE2275S Dual Channel



### Features:

- Body O.D. = 28mm [1.10"]
- Shaft Diameter 6.35 mm [0.25"]
- 3/8"-32 UNF Thread
- Pulses per revolution 256 maximum
- Analog Output
- 100 - 5,000 RPM



### Description:

The **OPE1275S** and **OPE2275S** are designed for small shaft motors. The **OPE1275S** provides a single channel analog output for speed of rotation while the **OPE2275S** provides a dual channel analog output for speed and direction of rotation.

The output of the **OPE1275S** provides a rise and fall pulse providing the designer two slopes for each pulse doubling the count capability. The **OPE2275S** provides quadrature rise and fall pulse patterns providing the design engineer 4 times the pulse per revolution count.

Power requirements are 5 volts  $\pm .5$  volts.

Electrical connection is achieved with a 4-pin Molex 53048-0410 connector providing V+, Ground and Output pins. The mating connector is a 4-pin Molex 51021-0400 (Terminal pin 50058 or 50079) or equivalent.

Frequency response is from DC to 25 kHz providing a maximum of 256 cycles per revolution (CPR) and 1024 quadrature states per revolution (PPR).

This product is designed for general encoding for low-speed applications.

The **OPE1275S** and **OPE2275S** are fully assembled and ready to be connected to your application.

### Applications:

- Printer motors
- Machine automation
- Machine safety

### Ordering Information

OPE X 275 S - ZZZ

OPTEK Product Encoder

Channels:

- 1 = Single channel
- 2 = Dual Channel

Motor Diameter- 27.5mm

Resolution per revolution:  
128 holes per revolution  
256 holes per revolution

Shaft Configuration:

S = Extended Shaft



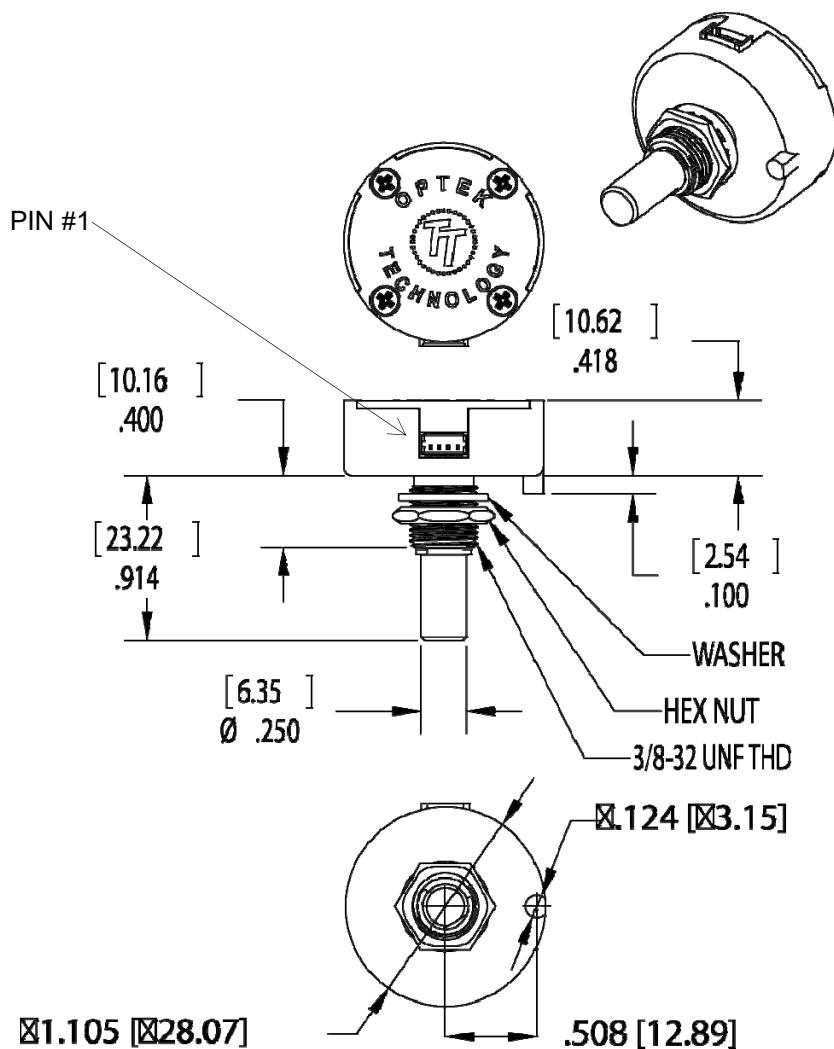
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OPTEK reserves the right to make changes at any time in order to improve design and to supply the best product possible.

Incremental Shaft Encoder  
**OPE1275S Single Channel (Tachometer)**  
**OPE2275S Dual Channel**



**OPE1275S  
OPE2275S**



Pin Out			
1	2	3	4
V <sub>CC</sub>	CH A	CH B	GND

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**Absolute Maximum Ratings (T<sub>A</sub>=25°C unless otherwise noted)**

	Maximum	Units
Storage Temperature Range	-40° C to +85°	C
Operating Temperature Range	0° C to +85°	C
Power Supply Voltage V <sub>cc</sub>	4.5 to 5.5	V <sub>DC</sub>
Power Dissipation <sup>(2)</sup>	250	mW
Vibration (5 Hz to 2 kHz)	20	g
Shaft Axial Play	± 0.51 mm [0.02"]	
Off-Axis Mounting Tolerance	0.254 mm [0.01"]	
Acceleration	250,000	rad/sec <sup>2</sup>

**Mechanical Specifications:**

	Dimensions	Units
Moment of Inertia	6.48 X 10 <sup>-5</sup>	OZ-IN-S <sup>2</sup>
Shaft Length	0.3 to 0.7	Inches

**Electrical Characteristics (T<sub>A</sub> = 25°C unless otherwise noted — for reference only)**

SYMBOL	PARAMETER	MIN	TYP	MAX	UNITS	TEST CONDITIONS
V <sub>cc</sub>	Supply Voltage	4.5	5.0	5.5	V	
I <sub>cc</sub>	Supply Current	-	21	27	mA	V <sub>cc</sub> = 5.0 volts
V <sub>OH</sub>	High Level Output Voltage	V <sub>cc</sub> -0.5	-	-	V	I <sub>C</sub> = 100 μA
V <sub>OL</sub>	Low Level Output Voltage	-	-	0.4	V	I <sub>C</sub> = 20 mA
TR	Rise Time	-	500	-	ns	10% to 90%, V <sub>cc</sub> = 5.0 volts
TF	Fall Time	-	100	-	ns	10% to 90%, V <sub>cc</sub> = 5.0 volts
FR	Frequency Response	-	-	60	kHz	
H.S.	Hole Size	0.10	-	-	inch	
Rotation	Maximum speed of rotation with 1024 holes per rotation	-	-	100	rev/sec	

**Encoding Characteristics:**

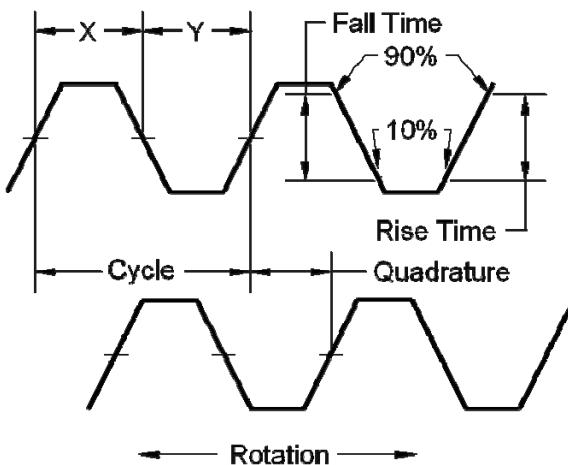
SE	Symmetry Error	0	16	75	°e	
QE	Quadrature Error—OPE2275 only	0	12	60		

Notes:

1. All parameters measured using pulse technique, V<sub>cc</sub> = 5.0 volts and T<sub>A</sub> = 25°C.

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**Timing Diagram:**



**Timing Definitions:**

**PPR** = Pulses Per Revolution

**Electrical Degree** ( $^{\circ}$ e) = 1/360th of 1 cycle

**Cycle** = 360 electrical degrees ( $^{\circ}$ e)

**Symmetry** = Relationship between X & Y in electrical degrees ( $^{\circ}$ e).

**Position Error** = The difference between the actual shaft position and the position indicated by the encoder cycle count.

**Quadrature:** The lead or lag difference between channels "A" and "B" in electrical degrees (normally  $90^{\circ}$ e)

**Cycle Error** = The difference between the actual shaft rotational position and the cycle count rotational position.

**Rise Time** = Time required to switch between 10% and 90% of the highest to lowest signal levels.

**Fall Time** = Time required to switch between 90% and 10% of the highest to lowest signal levels.