

# 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).

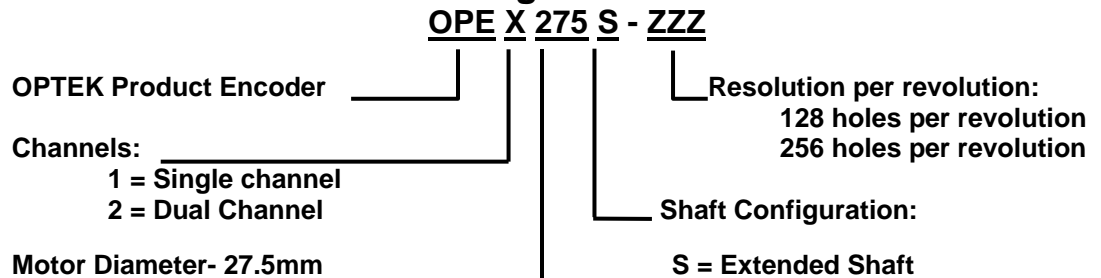
This product is designed for general encoding for low-speed applications.

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

### Applications:

- Printer motors
- Machine automation
- Machine safety

### Ordering Information

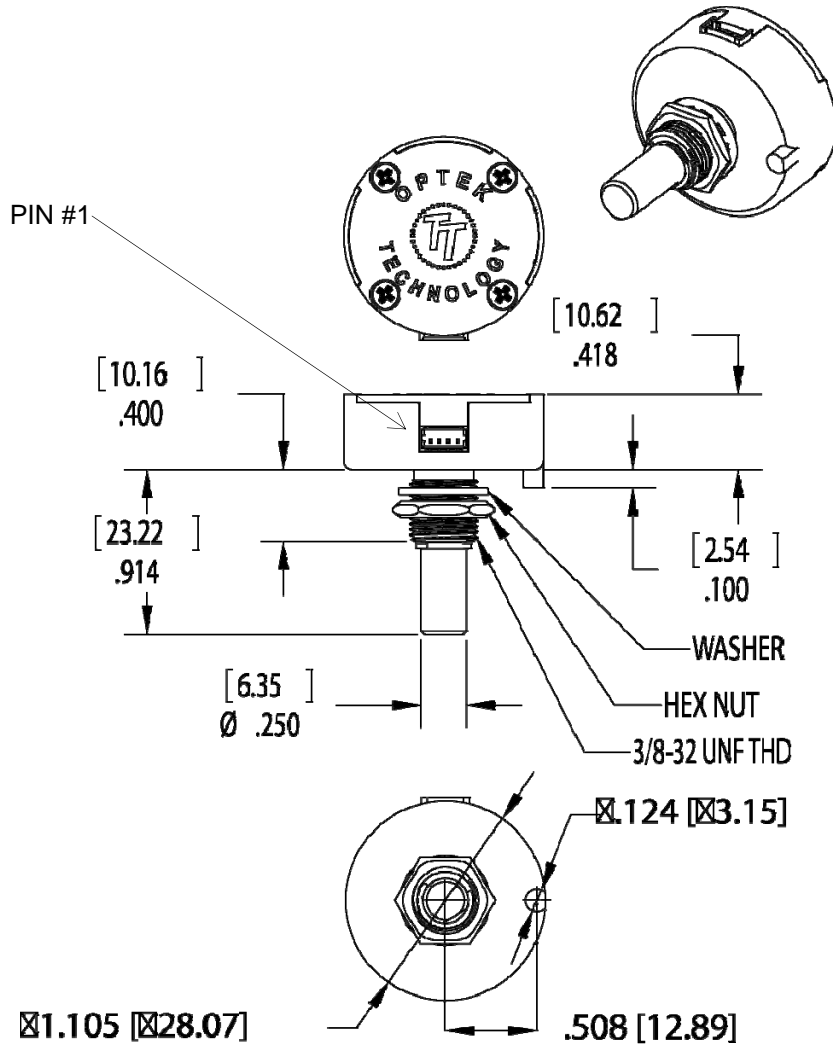


**RoHS**

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

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OPE1275S  
 OPE2275S



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

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### Absolute Maximum Ratings ( $T_A=25^\circ\text{C}$ unless otherwise noted)

	Maximum	Units
Storage Temperature Range	$-40^\circ\text{C}$ to $+85^\circ$	C
Operating Temperature Range	$0^\circ\text{C}$ to $+85^\circ$	C
Power Supply Voltage $V_{CC}$	4.5 to 5.5	$V_{DC}$
Power Dissipation <sup>(2)</sup>	250	mW
Vibration (5 Hz to 2 kHz)	20	g
Shaft Axial Play	$\pm 0.51\text{ mm}$ [0.02"]	
Off-Axis Mounting Tolerance	0.254 mm [0.01"]	
Acceleration	250,000	$\text{rad/sec}^2$

### Mechanical Specifications:

	Dimensions	Units
Moment of Inertia	$6.48 \times 10^{-5}$	OZ-IN-S <sup>2</sup>
Shaft Length	0.3 to 0.7	Inches

### Electrical Characteristics ( $T_A = 25^\circ\text{C}$ unless otherwise noted — for reference only)

SYMBOL	PARAMETER	MIN	TYP	MAX	UNITS	TEST CONDITIONS
$V_{CC}$	Supply Voltage	4.5	5.0	5.5	V	
$I_{CC}$	Supply Current	-	21	27	mA	$V_{CC} = 5.0\text{ volts}$
$V_{OH}$	High Level Output Voltage	$V_{CC}-0.5$	-	-	V	$I_C = 100\ \mu\text{A}$
$V_{OL}$	Low Level Output Voltage	-	-	0.4	V	$I_C = 20\text{ mA}$
TR	Rise Time	-	500	-	ns	10% to 90%, $V_{CC} = 5.0\text{ volts}$
TF	Fall Time	-	100	-	ns	10% to 90%, $V_{CC} = 5.0\text{ volts}$
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:

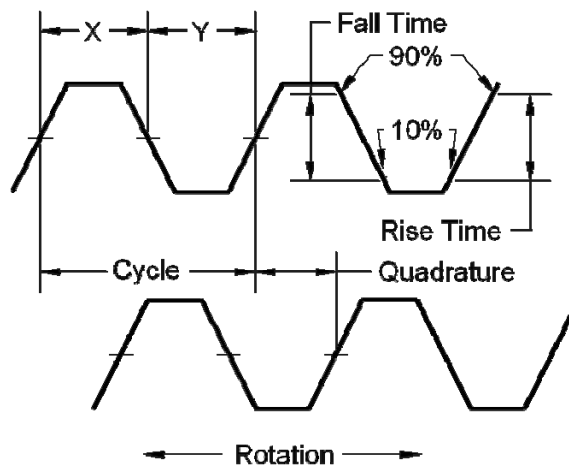
		0	16	75	°e	
SE	Symmetry Error	0	16	75		
QE	Quadrature Error—OPE2275 only	0	12	60		

#### Notes:

- All parameters measured using pulse technique,  $V_{CC} = 5.0\text{ volts}$  and  $T_A = 25^\circ\text{C}$ .

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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.

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