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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).

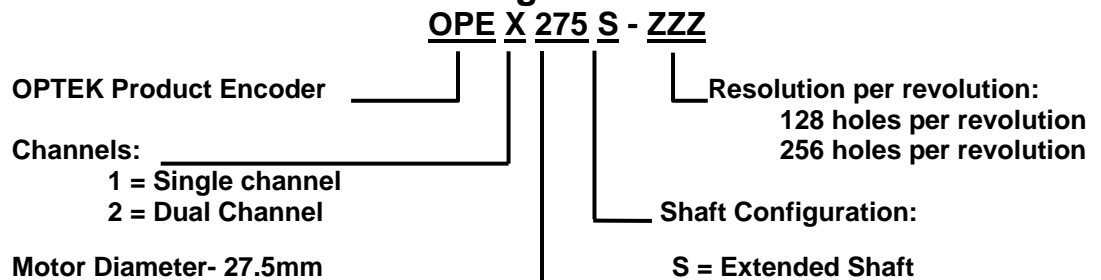
This product is designed for general encoding for low-speed applications.

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

Applications:

- Printer motors
- Machine automation
- Machine safety

Ordering Information



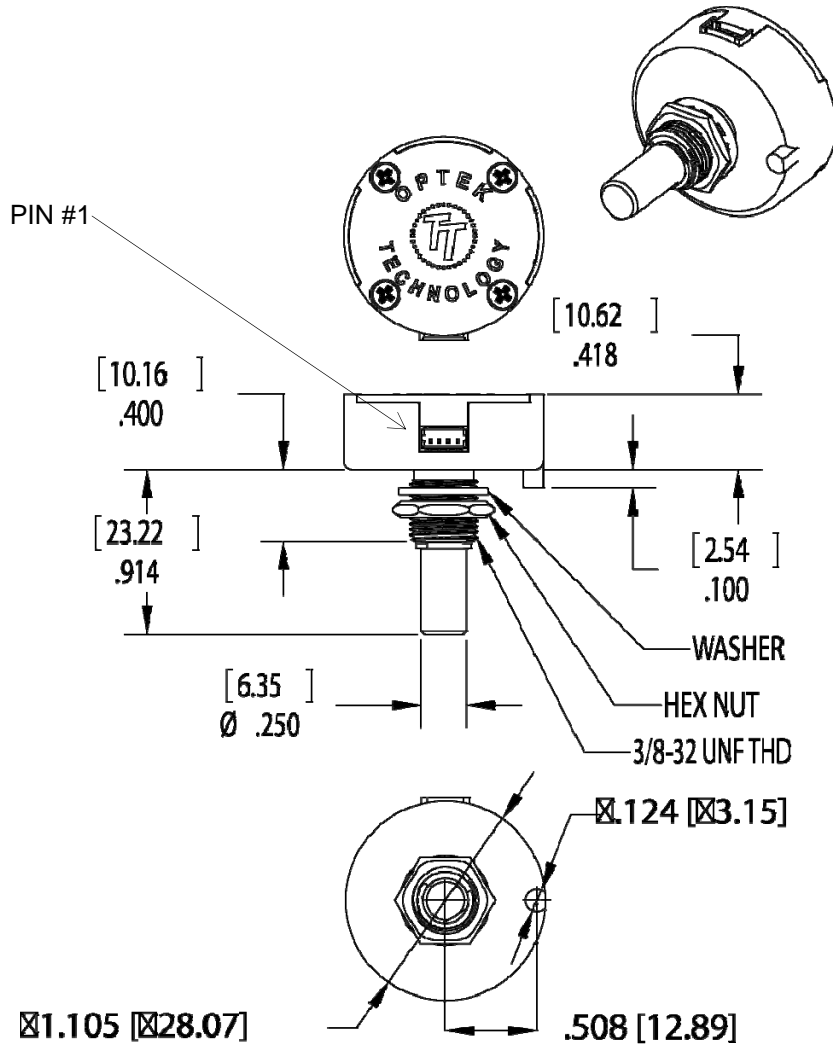
RoHS

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

Incremental Shaft Encoder
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OPE1275S
 OPE2275S



Pin Out			
1	2	3	4
V _{CC}	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° C to +85°	C
Operating Temperature Range	0° C to +85°	C
Power Supply Voltage V_{CC}	4.5 to 5.5	V_{DC}
Power Dissipation ⁽²⁾	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 ²

Mechanical Specifications:

	Dimensions	Units
Moment of Inertia	6.48×10^{-5}	OZ-IN-S ²
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	$V_{CC} = 5.0$ 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	$I_C = 20$ mA
TR	Rise Time	-	500	-	ns	10% to 90%, $V_{CC} = 5.0$ volts
TF	Fall Time	-	100	-	ns	10% to 90%, $V_{CC} = 5.0$ 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:

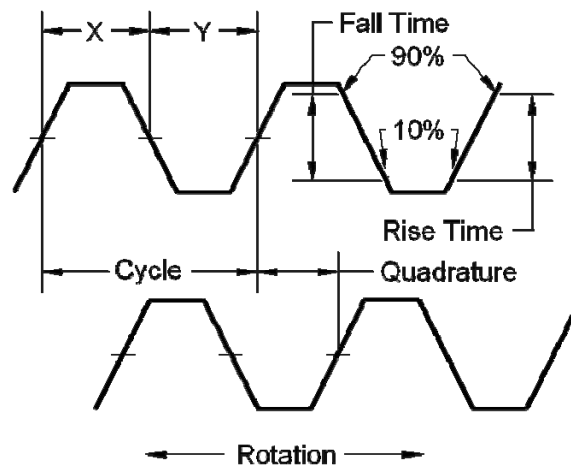
SE	Symmetry Error	0	16	75	°e
QE	Quadrature Error—OPE2275 only	0	12	60	

Notes:

- All parameters measured using pulse technique, $V_{CC} = 5.0$ 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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