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

TT electronics
OPTEK Technology

## 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 ± .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:**

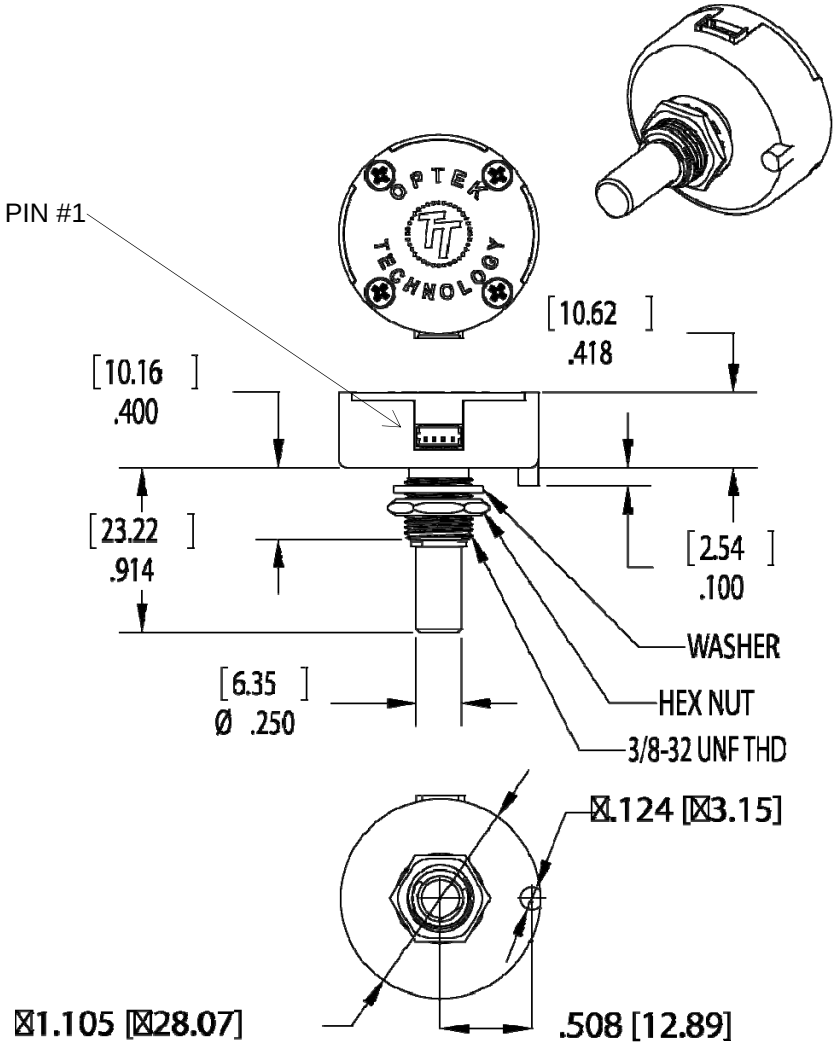
**S = Extended Shaft**

Pb

**RoHS**

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

## OPE1275S
## OPE2275S




| Pin Out | | | |
|---|---|---|---|
| 1 | 2 | 3 | 4 |
| $V_{CC}$ | CH A | CH B | GND |




**OPTEK Technology Inc. —** 1645 Wallace Drive, Carrollton, Texas 75006
Phone: (972) 323-2200 or (800) 341-4747 FAX: (972) 323-2396 sensors@optekinc.com www.optekinc.com

## Absolute Maximum Ratings ($T_A$=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 $V_{CC}$ | 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 X $10^{-5}$ | OZ-IN-S$^2$ |
| Shaft Length | 0.3 to 0.7 | Inches |

## Electrical Characteristics ($T_A$ = 25°C unless otherwise noted — for reference only)

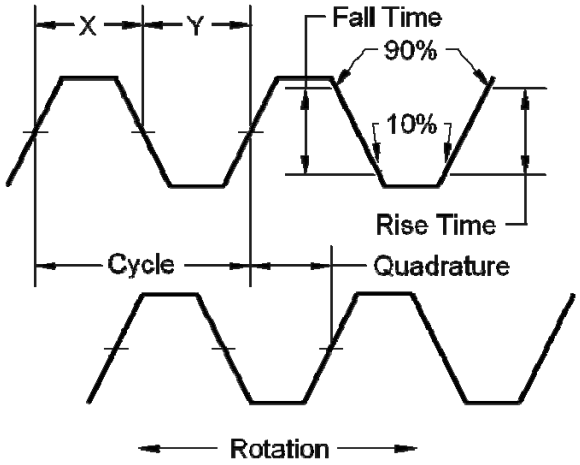
| SYMBOL | PARAMETER | MIN | TYP | MAX | UNITS | TEST CONDITIONS |
|---|---|---|---|---|---|---|
| $V_{CC}$ | Supply Voltage | 4.5 | 5.0 | 5.5 | V | |
| $I_{CC}$ | Supply Current | - | 21 | 27 | mA | $V_{CC}$ = 5.0 volts |
| $V_{OH}$ | High Level Output Voltage | Vcc-0.5 | - | - | V | $I_C$ = 100 µA |
| $V_{OL}$ | 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:
1. All parameters measured using pulse technique, Vcc = 5.0 volts and $T_A$ = 25°C.

**Timing Diagram:**




**Timing Definitions:**

**PPR** = Pulses Per Revolution
**Electrical Degree** (°e) = 1/360th of 1 cycle
**Cycle** = 360 electrical degrees (°e)
**Symmetry** = Relationship between X & Y in electrical degrees (°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°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.




**OPTEK Technology Inc. —** 1645 Wallace Drive, Carrollton, Texas 75006
Phone: (972) 323-2200 or (800) 341-4747 FAX: (972) 323-2396 sensors@optekinc.com www.optekinc.com