



The OE2 Series Optical Encoder has been developed for customers who require switches that are more reliable and longer lasting than conventional rotary switches. Advanced optical technology uses no mechanical contacts, which reduces noise and eliminates contact bounce.

An important advantage of the OE2 Series is its complete compliance to MIL-STD 202 for humidity, vibration, thermal and mechanical shock and performance which is unique for the switch industry. The OE2 features rotary action, with or without a push-button option. A popular application of the switch uses this dual mode feature to produce a “scroll and select” function for many different types of display screens, including LCD and CRT.

Standard output is incremental two-bit quadrature. Termination Options include straight pin out or a ribbon cable with connector.

The OE2 Series offers the advantages of low power consumption, small size and digital output compatible with TTL and CMOS circuitry.

## FEATURES

- **No Mechanical Contacts**
- **Input Device Ideal for Tuning, Menu Scrolling, and Selecting Functions**
- **Push button Feature Allows Dual Function and Reduced Input Panel Part Count**
- **Vibration and Mechanical Shock Approved Per MIL-STD-202**
- **Exceeds Performance for Humidity and Thermal Shock Per MIL-STD-202**

## BENEFITS

- **Extends Life**
- **Push button Allows Dual Functions to be Performed in a Single Switch**
- **Excellent for Rugged and Harsh Environments**
- **Low Power Consumption**
- **Excellent for Products Involving Critical Functions**

## APPLICATIONS

### Medical

- Ultrasound Equipment
- Rehab Treadmills
- Analytical Equipment
- Defibrillators- Voltage control
- X-Ray Equipment – Intensity Input
- Dermatology Equipment

### Test Equipment

- Oscilloscopes – Scale Input Control
- Current Transformer Tester

### Transportation

- Automotive Diagnostic
- Automotive Radios
- Automotive GPS

### Avionics

- Radio Channel Select
- Auto Pilot select
- Flight Simulators
- Co-ordinates input

### Communication Equipment

- GPS – Co-ordinates Input
- Commercial / Military Radio – Channel Select

### Military

- Helicopter Controls
- Pilot less Vehicles
- Vehicle Displays

### Audio/ Music

- Recording/ Mixing Consoles
- Lighting Controls
- Channel Select
- Electronic Organs

# Specifications

## Electrical Specifications

Parameter	Minimum	Typical	Maximum	Units
Vcc Range	4.5	5.0	5.5	V
Supply Current			25	mA
Vol @ (1mA)		150		mV
Suggested Pull-Up Resistor		4.7k		Ohm
Output Rise Time (measured at 90 rpm) C=16 pF	1.0		6.0	ms
Output Fall Time (measured at 90 rpm) C=16 pF	.5		6.0	ms
V <sub>CEO</sub>			32	V
Push-button Contact Resistance (end of life)			.5	Ohm
Push-button Contact Bounce	4ms @ close / 10 ms @ open			ms

## Environmental Specifications

Parameter	Minimum	Maximum	Units
Operating Temperature	-40	85	°C
Storage Temperature:	-55	105	°C
Humidity: 95% R.H. per MIL-STD 202, Method 103B, Test Condition B			

## Mechanical Specifications

Parameter	Minimum	Typical	Maximum	Units
Rotational Life Rated with less than 8 oz. side load applied at end of shaft				
Detented		3,000,000 rotations		
Non-Detented		10,000,000 rotations		
Rotational Torque @ 20°C				
Detented	1.0	1.5	2.0	in.-oz.
Non-Detented	0.10	0.40	0.70	in.-oz.
Torque Test Speed		6 rpm		
Push-button Life		1,000,000 Actuations		
Push-button Actuation Force (Where Applicable)	375	500	625	gram
Push-button Travel		0.035 ± 0.015		in.
Bushing Mounting Torque		7.5		in.-lb.
Shaft end play		.015		in.
Shaft Push-In Force		50		lbs.
Shaft Pull-Out Force		25		lbs.
Shaft Radial Play		.010 max. T.I.R.		(measured from the end of the bushing)
Shock		100 (g) for 6 ms half sine wave		
Vibration		15 (g) Amplitude 10-2000 (Hz) for 12 (hr)		
Terminal Strength		3 lbs. (applied perpendicular to the terminals)		
Weight		0.04		lbs.

## Ordering Information

**OE2 - 16 1 1 - Q O - 000**

**Termination**  
 0: Straight Pins (see drawing)  
 4: Standard 4" cable and connector  
 L: Custom cable length. Call factory for lengths over 9".

**Hardware or Surface Mount Adaptor Bracket Available. Call Factory For Details.**

**Code**  
 Q = Quadrature

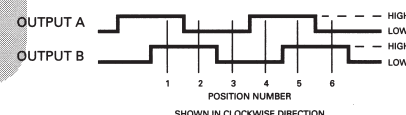
**Output Truth Table available. Call factory for details.**

**Postitions Per Rotation**  
 16  
 24  
 32

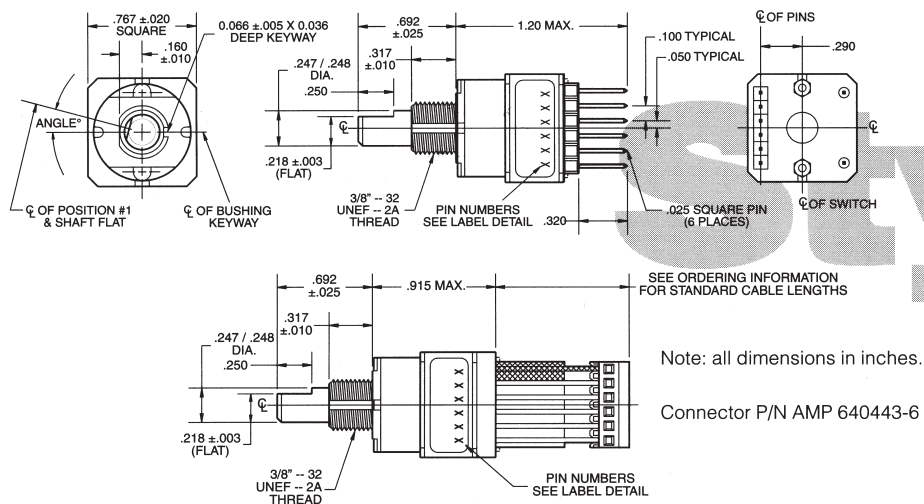
**Detent**  
 1 = Yes  
 0 = No

**Push-button**  
 1 = Yes  
 0 = No

## Output Waveforms Quadrature Versions



## OE2 Series Encoder Configurations



## Electrical Schematic

