

Features



- Compact, Robust, Economical
- Up to 256 Pulses Per Revolution (PPR) in a 1" Square Sealed Package
- Bearing Model for High Operating Speeds
- New Low Profile Housing Style and Tachometer Output Available
- Two Channel Quadrature Output
- Pin or Cable Output

The 900 Series offers a full line of low cost, rugged optical encoders with incremental output. Well suited for industrial motion and position sensing, their low profile and high resolution also make them ideal for panel mounted applications. A two-channel quadrature code allows the encoder to detect the direction and magnitude of the input motion applied to its shaft.

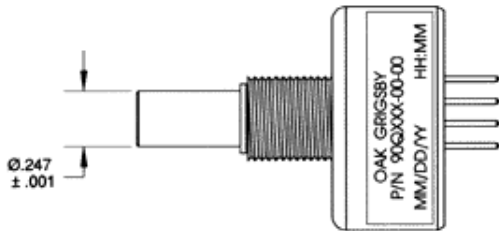
Available in this family of encoders is a new low profile package with internal bearings and integrated mounting holes.

Also new to the 900 Series is a high resolution tachometer style with single channel output. This style is particularly appropriate for applications involving ticket dispensing, card reading, or any speed-sensing function.

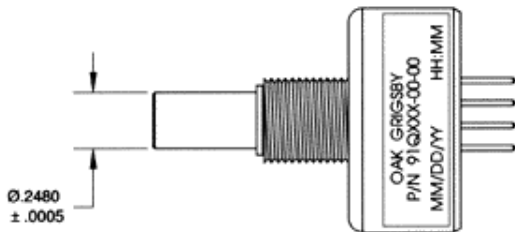
Up to 256 pulses per revolution (PPR) are available in a 1" square package. Working with standard decoding logic provided by the user's application software, the device produces 1024 changes of state per revolution with full quadrature decoding. Output is completely compatible with TTL circuitry, permitting direct entry of digital data without the cost of A/D conversion. On-board Schmitt trigger circuitry produces crisp square wave output.

A sealed metal housing along with available die cast or stainless steel shaft ensure strength and accuracy in harsh environments. The semiconductor-based LED optical technology provides longer life and higher reliability than mechanical encoders or switches. Small in size, the encoder adapts well to new or retrofit applications. Output terminations available to match industry standard 4 or 5 pin configurations. This encoder may be directly coupled to a motor, gear, or axle. The threaded bushing allows easy system integration for these as well as panel mounted applications.

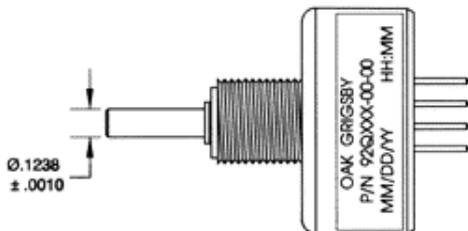
Configurations



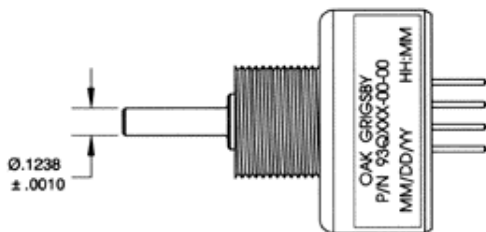
90 Series
Die Cast Shaft
Sleeve Bearing



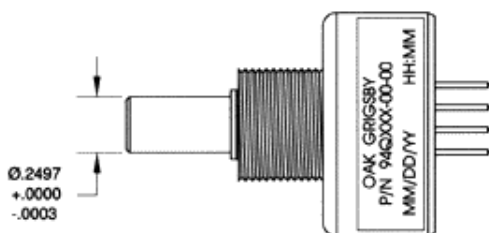
91 Series
Stainless Steel Shaft
Sealed Sleeve Bearing



92 Series
Die Cast Shaft
Ball Bearing

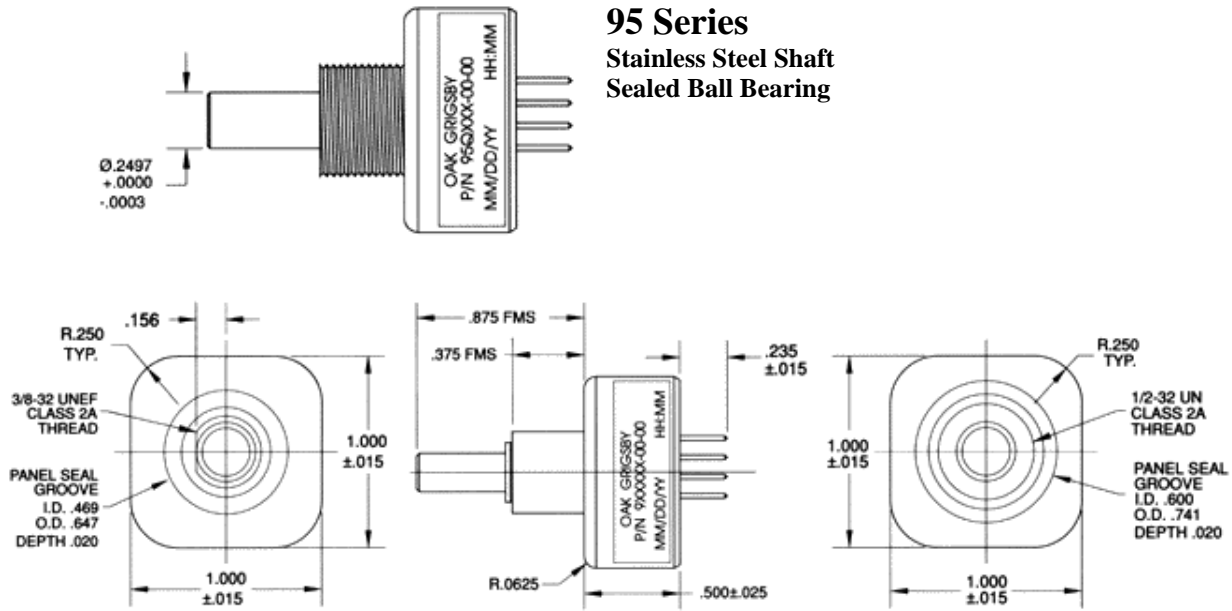


93 Series
Stainless Steel Shaft
Sealed Ball Bearing

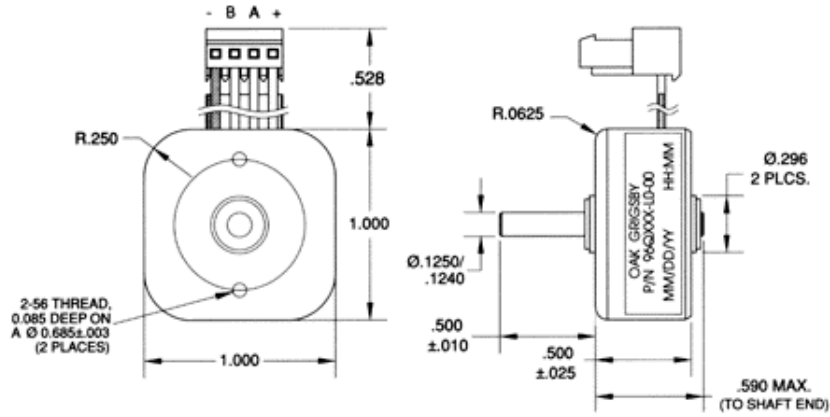


94 Series
Stainless Steel Shaft
Ball Bearing

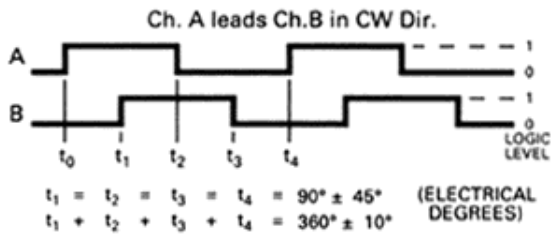
95 Series Stainless Steel Shaft Sealed Ball Bearing



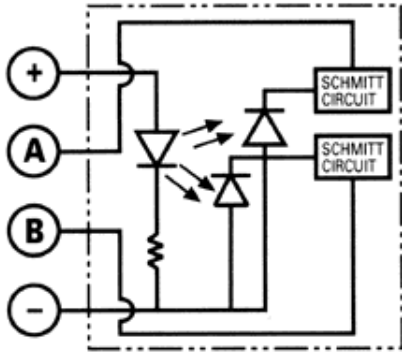
96 Series Stainless Steel Shaft Ball Bearing



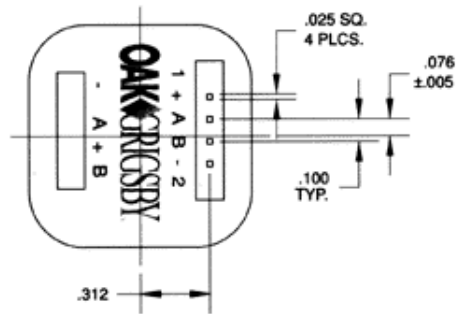
Two Channel Waveform



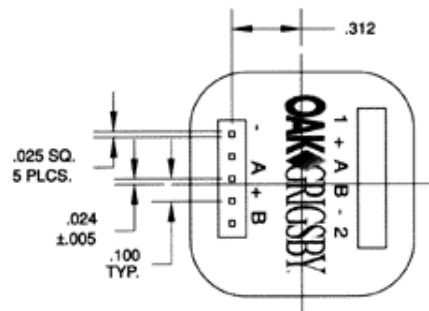
Electrical Schematic



Pin Out & Cable Styles

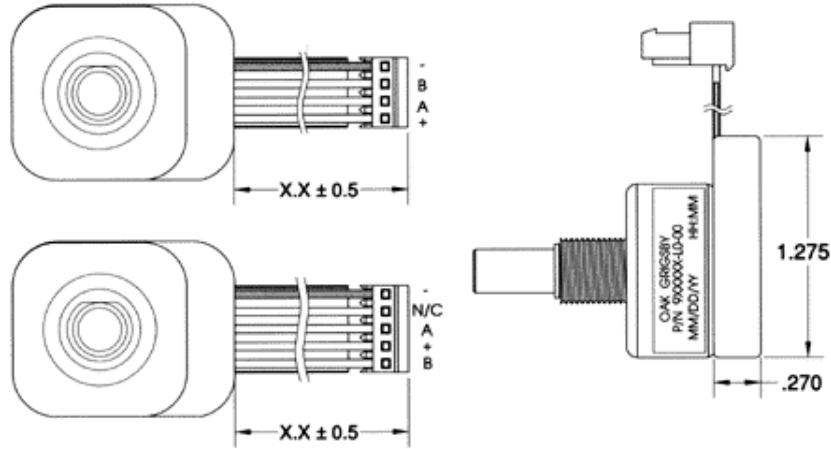


Style 0
Pin Out



Style 2
Pin Out

**Style 0
Cable**



**Style 2
Cable**

Note: 4" cable and connector standard.

Specifications

Electrical Specifications

Parameter	Minimum	Typical	Maximum	Units
Vcc Range	4.75	5	5.25	V
Supply Current @ 5V (Output Low) No Load		30	50	mA
VOH @ 100mA (Vcc = 5V)	3.0	4		V
VOL @ 16mA (Vcc = 4.75V)		290	700	mV
Pull-Up Resistor	7.5	10.5	13.5	KOhm
Output Rise Time (CL-15pF)		500		nS
Output Fall Time (CL-15pF)		14		nS

Output: 2-bit gray code, Channel A leads Channel B by 90° with clockwise rotation

Power Consumption: 250mW max.

Notes:

1: Constant current source available for extended voltage ranges.

2: 12 V and 15V input supply units available.



Environmental Specifications

Parameter	Minimum	Typical	Maximum	Units
Operating Temperature: Vcc = 5V	-40	25	85	°C
Storage Temperature Range: -55°C to +105°C, per MIL STD 202F Method 107 Test Condition A				
Humidity: 85% R.H. @ 40°C, 240 hours, per MIL STD 103B Test Condition A				
Solderability: 95% coverage				

Mechanical Specifications

Vibration: Harmonic motion with amplitude of 15g, varied from 10 to 2000 Hz for 12 hours, per MIL STD 204 Test Method B

Shock: 100g for 6 ms half sine wave with velocity change of 12.3 ft/s, per MIL STD 213 Test Condition C

Rotational Torque: Sleeve bearing: < 1 in. oz. max., Ball bearing: < .25 in. oz. max., higher for sealed unit.

Operating Speed: Sleeve bearing: 200 RPM max., Ball bearing: 3,000 RPM max.

Shaft End Play: 0.005 max.

Shaft Radial Play: 0.010 max. @ .75 from mounting surface

Shaft Push In Force: 50 lbs. max.

Shaft Pull Out Force: 25 lbs. max.

Bushing Mounting Torque: 10 in. lb. max

Weight: 1.1 oz (90Q128-00-00)

Terminal Strength: 3 lbs. max. applied perpendicular to the terminals

Rotational Speed, Rotational Life and Shaft Side Load Rating:

(Load placed at end of standard shaft)

Series Number	Rotational Life	Rotational Speed Rating	Side Load Rating
90	5,000,000 +	200 rpm	0.25 lb.
91	10,000,000 +	300 rpm	0.50 lb
92	100,000,000 +	3,000 rpm	0.25 lb.
93	100,000,000 +	3,000 rpm	5.0 lb.
94	100,000,000 +	3,000 rpm	5.0 lb.
95	100,000,000 +	3,000 rpm	5.0 lb.
96	100,000,000 +	3,000 rpm	3.0 lb.

