

Differential Encoders With Index Channel

FEATURES

- **Small Size, Pre-Mounted to Dual Shaft Motor**
- **32 to 1250 Cycles per Revolution (CPR)**
- **Tracks 0 to 100,000 Cycles per Second**
- **2-Channel Quadrature Differential Squarewave Outputs**
- **Third Index Channel**
- **Accepts +/- 0.010" Axial Shaft Play**
- **Operating Temperature of -40° to + 100° C**



DESCRIPTION

Our Differential Encoders with Index Channel are transmissive optical encoder modules. These modules are designed to detect rotary position with a codewheel when added to the end of an Anaheim Automation dual shaft motor. These Differential Encoders consist of a lensed LED source and a monolithic detector IC enclosed in a small polymer package. These modules use phased array detector technology to provide superior performance and greater tolerances over traditional aperture mask type encoders. They provide digital quadrature differential outputs on all resolutions. These encoders are powered from a single +5VDC power supply. Also, they are RoHS compliant and REACH certified.

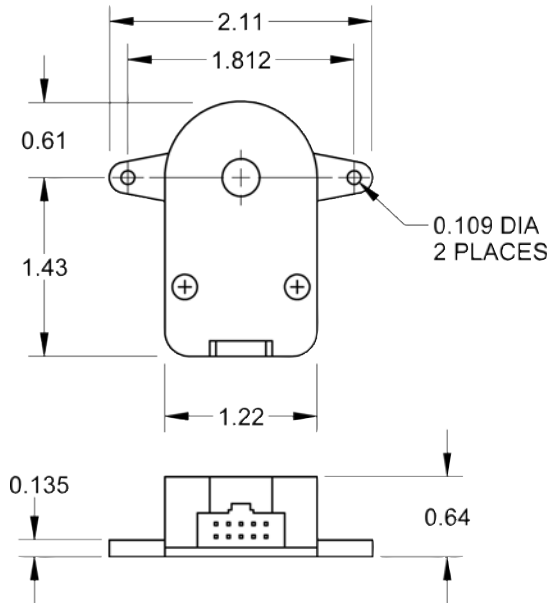
DIMENSIONS AND PINOUTS

Example: To order an encoder, add a “-”, the CPR number and a DI on the end of any Anaheim Automation dual shaft motor. For example, to place a 400 CPR encoder on a 23Y106D-LW8, the part number would be 23Y106D-LW8-400DI.

23Y106D-LW8-400DI

| Table 1 | 32DI | 50DI | 96DI | 100DI | 192DI | 200DI | 250DI | 256DI | 360DI | 400DI | 500DI | 512DI | 720DI | 900DI | 1000DI | 1024DI | 1250DI |
|-----------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|--------|--------|--------|
| Fits NEMA Size | 11-42 | 11-42 | 11-42 | 11-42 | 11-42 | 11-42 | 11-42 | 11-42 | 11-42 | 11-42 | 11-42 | 11-42 | 11-42 | 11-42 | 11-42 | 11-42 | 11-42 |
| Cycles Per Revolution | 32 | 50 | 96 | 100 | 192 | 200 | 250 | 256 | 360 | 400 | 500 | 512 | 720 | 900 | 1000 | 1024 | 1250 |

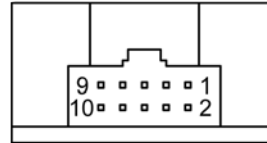
DIMENSIONS



Note: All dimensions are in inches.

DIFFERENTIAL ENCODER PINOUT

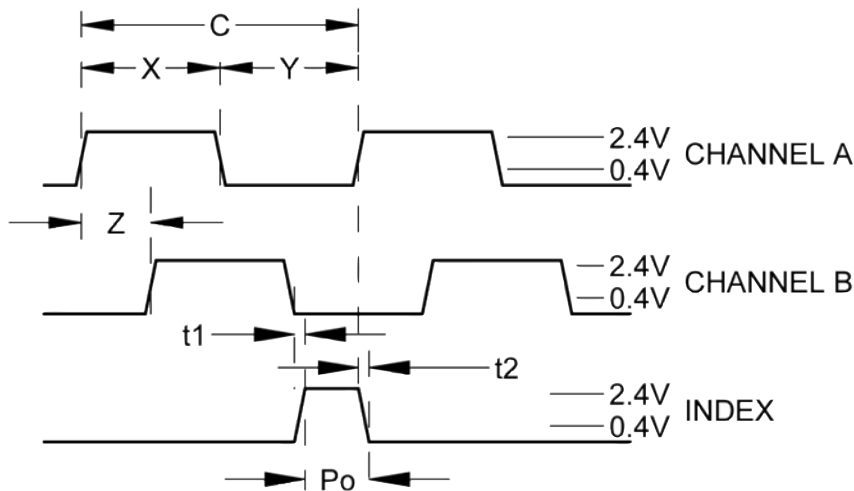
TOP OF ENCODER FACING PLUG



| PIN | NAME | COLOR |
|-----|-----------|-----------------------|
| 1 | GROUND | DRAIN (CON. ONE END) |
| 2 | GROUND | GREEN W/ WHT. STRIPE |
| 3 | I-CHANNEL | WHITE W/ ORG. STRIPE |
| 4 | I+CHANNEL | ORANGE W/ WHT. STRIPE |
| 5 | A-CHANNEL | WHITE W/ BLUE STRIPE |
| 6 | A+CHANNEL | BLUE W/ WHT. STRIPE |
| 7 | POWER | WHITE W/ GREEN STRIPE |
| 8 | POWER | NO CONNECTION |
| 9 | B-CHANNEL | WHITE W/ BRN. STRIPE |
| 10 | B+CHANNEL | BROWN W/ WHT. STRIPE |

| Parameter | Max | Units |
|-------------------------------------|------------|----------------------|
| Vibration (5 to 2kHz) | 20 | g |
| Shaft Axial Play | + / - 0.01 | in. |
| Shaft Eccentricity Plus Radial Play | 0.004 | in. |
| Acceleration | 250,000 | rad/sec ² |

SINGLE-END ENCODER TIMING DIAGRAMS



Rotation:

CW - B leads A
CCW - A Leads B

| Model # | Description |
|-----------------------------|---|
| CPR(N): | The Number of Cycles Per Revolution |
| One Shaft Rotation: | 360 mechanical degrees, N cycles |
| One Electrical Degree (°e): | 1/360th of one cycle |
| One Cycle (C): | 360 electrical degrees (°e). Each cycle can be decoded into 1 or 4 codes, referred to as X1 or X4 resolution multiplication |
| Symmetry: | A measure of the relationship between (X) and (Y) in electrical degrees, nominally 180 °e |
| Quadrature (Z): | The phase lag or lead between channels A and B in electrical degrees, nominally 90°e |
| Index (CH I): | The index output goes high once per revolution, coincident with the low states of channels A and B, nominally 1/4 of one cycle (90°e) |

| Description | Symbol | Min | Typ | Max | Units |
|---|--------|------|-----|------|-------|
| Index Pulse Width | | | | | |
| All Resolutions | Po | 60 | 90 | 120 | °e |
| Ch. I Rise After Ch. B or Ch. A Fall | | | | | |
| 32, 720, 1000, 1224 and 1250 CPR Only | t1 | 10 | 100 | 250 | ns |
| All Other Resolutions | t1 | -300 | 100 | 250 | ns |
| Ch. I Fall After Ch. A or Ch. B Rise | | | | | |
| 32, 720, 1000, 1224 and 1250 CPR Only | t2 | 70 | 150 | 300 | ns |
| All Other Resolutions | t2 | 70 | 150 | 1000 | ns |

| Parameter | Min | Typ | Max | Units |
|----------------------------|-----|-----|-----|-------|
| Supply Current | 4.5 | 5.0 | 5.5 | Volts |
| Current Consumption | | | | |
| 32 CPR Only | - | 28 | 53 | mA |
| 720, 1250 CPR | - | 56 | 59 | mA |
| All Other Resolutions | - | 58 | 88 | mA |
| Output High | | | | |
| Sourcing to +5 | 2.4 | 3.4 | - | Volts |
| Sinking to Ground | - | 0.2 | 0.4 | Volts |

| Recommended Operating Conditions | Min | Max | Units |
|----------------------------------|-----|-----|-------|
| Temperature | -40 | 100 | °C |
| Supply Volatage | 4.5 | 5.5 | Volts |
| Load Capacitance | - | 100 | pF |
| Count Frequency | - | 100 | kHz |

| Cable Ordering Info | Length |
|---------------------|--------|
| ENC-CBL-AA4706 | 1 ft. |
| ENC-CBL-CA4217-6 | 6 ft. |
| ENC-CBL-CA4217-10 | 10 ft. |