The PE-100 is a high speed, high signal to noise ratio optical encoder.

The PE-100 is a high performance encoder ideally suited for any motion control application that requires high bandwidth and high signal to noise ratio.

The PE-100’s optical design offers long life, non-contact measurement and low maintenance along with easy installation.

Applications
- Optical timing clock sensor
- Air bearing spindles
- Linear motor stages
- Rotary Stages
System Specifications
PE-100

Operating Temperature 5 to 70°C
Storage Temperature -20 to 85°C
Humidity 10-90% RH non-condensing
Shock 300G over 400usec
Vibration 3G @ 20Hz
Supply Voltage 5v +/-0.25V
Nominal Supply Current (no output loads) 70mA
Output Format Sin/Cos
Nominal Sin/Cos AC Output Voltage 1.6V p-p differential +/-10%*
Nominal Sin/Cos DC Output Voltage 2.5VDC
Nominal Sin/Cos Output Impedance 50 ohms each side
Min. Load Impedance Between S/C Differential Outputs 2K ohms **
Sin/Cos Period 20µm
Nominal Frequency Response (-3db) 900Khz (Nominal)
Nominal S/N Ratio (50kHz, -1 slope LPF) 12,000/1
Cycle to Cycle Jitter
(@7.2K RPM- 4096CPR- BW 1.25Mhz) < 600 ps RMS (typical)
Index to Timing Track Jitter
(@7.2K RPM- 4096CPR- BW 1.25Mhz) < 3.0 ns RMS (typical)
Index to Timing Track Jitter Drift
(23.8°C to 43.3°C – 24 hr observation) < 150 grads (typical)
Nominal Index Width 14µm
Index Output Levels CMOS (0,5v) each output (differential)
Nominal Index Output Impedance 60 ohms each output
Minimum Differential Index Load 120 ohms
(output termination not required-internal series termination)
Laser Lifetime >100,000 hours MTTF (70C)

*Maximum amplitude drop as measured on a test setup per ID-00331 using 4096CPR grating at a speed of 300RPM.
**Absolute min 120 ohms with no damage. SNR and signal amplitude will be reduced.

System
Grating Period 20 nm
Signal Period 20 nm

Rotary Resolution

<table>
<thead>
<tr>
<th>Model</th>
<th>Scale O.D. [mm]</th>
<th>Scale I.D [mm]</th>
<th>Fundamental Resolution</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.5 [38.1]</td>
<td>0.5 [12.7]</td>
<td>4096 CPR</td>
<td></td>
</tr>
</tbody>
</table>

Sensor Size
W: 0.847* 21.51 mm
L: 1.550* 39.37 mm
H: 0.385* 9.78 mm

Operating and Electrical Specifications
Power Supply +5 VDC ± 5% @ 70 mA
Humidity 10 to 90% RH non-condensing
Operating Temp. 5 to 70 °C

Output Signals
Analog:
Two channels V1 and V2 differential sinusoids [90 degree phase shifted] on 2.5V reference.

Analog

<table>
<thead>
<tr>
<th>1.6Vpp typical ± 10%</th>
</tr>
</thead>
<tbody>
<tr>
<td>90 degree phase shifted</td>
</tr>
</tbody>
</table>

Sine

Cosine

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System Specifications

PE-100

Table 1.

<table>
<thead>
<tr>
<th>Pin</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>IW-</td>
</tr>
<tr>
<td>2</td>
<td>IW+</td>
</tr>
<tr>
<td>3</td>
<td>N/C</td>
</tr>
<tr>
<td>4</td>
<td>N/C</td>
</tr>
<tr>
<td>5</td>
<td>N/C</td>
</tr>
<tr>
<td>6</td>
<td>N/C</td>
</tr>
<tr>
<td>7</td>
<td>COS+</td>
</tr>
<tr>
<td>8</td>
<td>SIN+</td>
</tr>
<tr>
<td>9</td>
<td>N/C</td>
</tr>
<tr>
<td>10</td>
<td>N/C</td>
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<tr>
<td>11</td>
<td>N/C</td>
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<tr>
<td>12</td>
<td>N/C</td>
</tr>
<tr>
<td>13</td>
<td>GND</td>
</tr>
<tr>
<td>14</td>
<td>COS-</td>
</tr>
<tr>
<td>15</td>
<td>SIN-</td>
</tr>
</tbody>
</table>

Optional 15 Pin Connector

LEMO 9 Pin Circular Connector

TABLE 1.

Pin Interface Plug Pinouts

Pin | Function |
--- |----------|
1   | IW-      |
2   | IW+      |
3   | N/C      |
4   | N/C      |
5   | N/C      |
6   | N/C      |
7   | COS+     |
8   | SIN+     |
9   | N/C      |
10  | N/C      |
11  | N/C      |
12  | N/C      |
13  | GND      |
14  | COS-     |
15  | SIN-     |
How to Order PE-100 Encoder Systems

To specify your PE-100 encoder with the desired scale, consult MicroE Systems’ Rapid Customer Response team for more information [781] 266-5700.