The H38 Incremental Optical Encoder is available with the following certifications:

- EN 61000-6-4 and EN 61000-6-2
- IECEx (Exd IIB T4)
- UL 14.0006X
- IECEx (Exd IIB T4)
- Class I, Group C & D; Class II, Groups E, F & G
- Class I, Group C & D; Class II, Groups E, F & G
- Class I, Group C & D; Class II, Groups E, F & G
- Class I, Group C & D; Class II, Groups E, F & G
- Class I, Group C & D; Class II, Groups E, F & G

The H38 Incremental Encoder is available with the following certifications:

- MSHA = Mine Safety and Health Administration Certified
- UL = Underwriters Laboratories Listed
- CEN = UL, Cenelec, IECEx

The Mine Safety and Health Administration (MSHA) is an organization that operates in the United States and enforces compliance with safety and health standards in the Nation’s mines. Consult factory for MSHA rated product.

**Mechanical Specifications**

- **Shaft Diameter:** 3/8” nominal
- **Shaft Loading:** Up to 40 pounds axial and 20 pounds radial applied 1/4” from housing
- **Shaft Runout:** 0.0005 T.I.R.
- **Starting Torque at 25° C:** 4.0 in-oz (max)
- **Bearings:** Class ABEC 7 standard
- **Shaft Material:** 303 stainless steel
- **Enclosure:** Die cast aluminum, hard anodized with sealed finish. Shaft seals and sealed bearings are standard to achieve environmental ratings.
- **Bearing Life:** 2 X 10⁶ revs (1300 hrs at 2500 RPM) at rated load; 1 X 10⁶ revs (67,000 hrs at 2500 RPM) at 10% of rated load
- **Maximum RPM:** 10,000 RPM (see Frequency Response, below)
- **Moment of Inertia:** 4.1 X 10⁻⁴ oz-in-sec² UL & MSHA/1.7 X 10⁻³ oz-in-sec² CEN
- **Weight:** 64 oz typical (approx 4 lbs)

**Electrical Specifications**

- **Code:** Incremental
- **Output Format:** 2 channels in quadrature, 1/2 cycle index gated with negative B channel
- **Cycles per Shaft Turn:** 1 to 72,000 (see table 2, back page). For resolutions above C channel, 1/2 cycle index gated with negative B channel
- **Frequency Response:** 100 KHz Typical, 5 to 2000 Hz @ 20 g’s
- **Voltage/Output:**
  - 2X, 15V/V: Line Driver, 5–28 VDC in, Vout = Vin
  - 2X, 28V/V: Line Driver, 5–28 VDC in, Vout = 28 VDC
  - 2X, 28V/OC: Open Collector, 28VDC in, OOut
- **Protection Level:** Reverse, overvoltage and output short circuit (see note 3)
- **Termination Type:** Compression type, UL recognized. Accepts AWG 14 to 22, stranded wire, strap 1/4”
- **Note:** Consult factory for other electrical options

**Specifications**

- **Hazardous Area Rating:** UL listed for use in hazardous locations. Class I, Group D, or Class I, Groups C & D, and Class II, Groups E, F & G. NEMA Enclosure 7
- **NOTES & TABLES:**
  - All notes and tables referred to in the text can be found on the back page.

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**H38 Explosion Proof Ordering Options**

Use this diagram, working from left to right to construct your model number (example: H38D-2000-ABZC-28V-V-SC-CEN).

All notes and tables referred to can be found on the back of this page.

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**Features**

- **Type:** H = Heavy Duty
- **Housing Configuration:** D = Standard, (see dimensions, back page)
- **Cycles per Turn:** Enter Cycles, See Table 2
- **No. of Channels:** A = Single Channel, AB = Dual Quad. Ch., ABZ = Dual with Index
- **Voltage/Output:**
  - 15V/V: Line Driver, 5–15 VDC in, Vout = Vin
  - 28V/V: Line Driver, 5–28 VDC in, Vout = 28 VDC
  - 28V/OC: Open Collector, 28VDC in, OOut
- **Certification:**
  - UL = Class I Group D Environments
  - MSHA = Mine Safety and Health Administration Certified
- **Special Features:**
  - S = Special features specified on purchase order (consult factory)

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**Specifications**

- EN 61000-6-4 and EN 61000-6-2
- IECEx (Exd IIB T4)
- UL 14.0006X
- IECEx (Exd IIB T4)
- Class I, Group C & D; Class II, Groups E, F & G
- Class I, Group C & D; Class II, Groups E, F & G
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- Class I, Group C & D; Class II, Groups E, F & G
- Class I, Group C & D; Class II, Groups E, F & G

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**Notes & Tables:**

- All notes and tables referred to in the text can be found on the back page.
H38 Incremental Optical Encoder

Dimensions

Table 1 - Output Terminations

<table>
<thead>
<tr>
<th>TERMINAL PIN NO.</th>
<th>OUTPUT</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>CASE GROUND</td>
</tr>
<tr>
<td>2</td>
<td>0V</td>
</tr>
<tr>
<td>3</td>
<td>+V</td>
</tr>
<tr>
<td>4</td>
<td>A</td>
</tr>
<tr>
<td>5</td>
<td>B</td>
</tr>
<tr>
<td>6</td>
<td>7</td>
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<tr>
<td>7</td>
<td>A</td>
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<tr>
<td>8</td>
<td>B</td>
</tr>
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<td>9</td>
<td>10</td>
</tr>
<tr>
<td>10</td>
<td>SPARE</td>
</tr>
<tr>
<td>11</td>
<td>SPARE</td>
</tr>
</tbody>
</table>

Table 2 - Disc Resolutions for Incremental Encoder Model H38


Notes

1. Non-standard index widths and multiple indices are available by special order. Consult factory.
2. Complementary outputs are recommended for use with line driver type (source/sink) outputs. When used with different receivers, this combination provides a high degree of noise immunity.
3. Output IC’s: Output IC’s are available as either Line Driver (LD) or NPN Open Collector (OC) types. Open Collectors require pull-up resistors, resulting in higher output source impedance (sink impedance is similar to that of line drivers). In general, use of a Line Driver style output is recommended. Line Drivers source or sink current and their lower impedance mean better noise immunity and faster switching times. Warning: Do not connect any line driver outputs directly to circuit common/0V. Those may damage the driver. Unused outputs should be isolated and left floating. Our applications specialists would be pleased to discuss your system requirements and the compatibility of your receiving electronics with Line Driver type outputs. 28V/V: Multi-voltage Line Driver (7272*): 100 mA source/sink. Input voltage 5 to 28 VDC +/- 5% standard (Note: Vout = Vin). This driver is TTL compatible when used with 5 volt supply. Supply lines are protected against overvoltage to 60 volts and reverse voltage. Outputs are short circuit protected for one minute. Supply current is 120 mA typical. This replaces prior IC’s with designations of 3904, 2540, 3000, 3125, 3600, 4200, 4600, 4680, 5000, 502, 508, 512, 522, 530, 550, 560*, 576, 598, 600, 604, 625, 628, 635, 638, 640, 660, 672, 676, 680, 687, 690, 700, 720, 725, 735, 740, 744, 748, 750, 762, 768, 780, 785, 800, 812, 825, 850, 864, 878, 888, 900, 912, 914, 938, 942, 965, 960, 1000, 1016, 1024, 1030, 1035, 1036, 1040, 1054, 1056, 1074, 1076, 1080, 1088, 1100, 1101, 1125, 1136, 1200, 1237, 1250, 1257, 1270, 1280, 1300, 1314, 1332, 1333, 1390, 1400, 1414, 1427, 1440, 1484, 1500, 1562, 1570, 1596, 1600, 1650, 1666, 1718, 1745, 1774, 1800, 1840*, 1850, 1855, 1875, 1894, 1920, 1952, 1968, 1979, 1995, 2000, 2048, 2080, 2094, 2100, 2106, 2164, 2199, 2200, 2250, 2356, 2400, 2485, 2500, 2514, 2519, 2540, 3000, 3125, 3600, 4000, 4096, 5000

*AB or ABC output only.

NOTE: Resolutions up to 72,000 are available. See Note 7.