DESCRIPTION
The DWD38 operates reliably from –40 to +100°C. Its Hard Anodized finish exceeds IP66/IP67 and NEMA 6 enclosure requirements.
It is a preferred choice as a DrawWorks encoder by the Oil Field industry and is also ideal for use in high shock and vibration applications such as Food Processing, Material Handling and Packaging Equipment.
The DWD38 is also available in Stainless Steel to meet NEMA 4x and 6P requirements. A labyrinth double-sealed housing allows operation in washdown with high pressure steam, or caustic chemical environments.
It is also available in an Intrinsically Safe version, certified to ATEX EEx ia IIB T4, when used with the appropriate IS Barrier.

STANDARD OPERATING CHARACTERISTICS
Code: Incremental
Resolution: 1 to 5000 PPR (pulses/revolution)
Format: Two channel quadrature (AB) with optional Index (Z), and complementary outputs
Phase Sense: A leads B for CCW shaft rotation viewing the shaft clamp end of the encoder
Quadrature Phasing: 90° ± 15° electrical
Symmetry: 50% ± 5%
Waveforms: Squarewave with rise and fall times less than 1 microsecond into a load capacitance of 1000 pf

ELECTRICAL
Input Power: 5-26VDC; 50 mA max., not including output loads. ATEX: 5VDC, 5-26VDC
Outputs: 2N2222, ET7272, ET7273
Frequency Response: 125 kHz (data & index)
Termination: 6, 7, or 10 pin MS Connector; 18” cable exit w/seal
Mating Connector:
6 pin, style MS3106A-14S-6S (MCN-N4);
7 pin, style MS3106A-16S-1S (MCN-N5);
10 pin, style MS3106A-18-1S (MCN-N6)

DATA AND INDEX
Not all complements shown.
A shown for reference

(180°ELEC) A (90°ELEC)
Data A
Data A
Data B
Index
A Leads B CCW

MECHANICAL
Shaft Material: 300 series stainless steel
Bore loading: Up to 20 lbs axial and radial
Bore runout: 0.0005 TIR at midpoint
Starting/Running torque: 4.5/4.0 in-oz. maximum (at 25°C)
Bearings: 61806-ZZ
Bearing life: 5 x 10⁶ revs at rated shaft Loading, 5 x 10⁶ revs at 10% of rated shaft loading.(manufacturers’ specs)
Housing and cover: Hard Anodized Aluminum. Also available in Electroless Nickel finish and Stainless Steel.
Disc material: Metal or mylar
Weight: 35 ounces, typical

ENVIRONMENTAL
Operating Temperature: -40 to 100°C
Operating Temperature ATEX: -40 to 80°C
Storage temperature: -40 to 100°C
Shock: 50Gs for 11msec duration
Vibration: 5 to 2000Hz @ 20 Gs
Humidity: 100%
Enclosure Rating: NEMA 4X, NEMA 6, IP66, IP67. NEMA 6P upon request
IMPORTANT ENCODER INSTALLATION INFORMATION

Mounting the Encoder: The encoder should be mounted such that its shaft is in close as possible alignment with the axis of the driving machine or motor shaft.

**CAUTION:** The loads applied to the encoder shaft must be in accordance with the specifications of this device.

Important Wiring Instructions: Use of shielded cable is recommended for all encoder installations. The shield should be connected to signal-ground at the receiving device only. **Connecting the shield at both ends can cause grounding problems that degrade system performance.**

If possible, run the encoder cable through a dedicated conduit (not shared with other wiring). Use of conduit will protect the cable from physical damage and provide a degree of electrical isolation. Do not run the cable in close proximity to other conductors that carry current to heavy loads such as motors, motor starters, contactors, solenoids, etc. This practice can induce electrical transients in the encoder cable, potentially interfering with reliable data transmission.

Refer to Electrical Connections table for wiring information. To avoid possible damage, do not connect or disconnect the encoder connector or wiring while power is applied to the system.

**CAUTION:** Unused encoder signal wires must be individually insulated and under no circumstances be in contact with ground, voltage sources, or other signal lines.
Dimensions
inches [mm]

- With Convertable Shaft
  - 3X 10-32 UNF x .38 DEEP ON A Ø3.000 BOLT CIRCLE
- 1\(^\text{st}\) 14 UNS FEMALE INTERNAL THREAD O-RING SEALED
- 5/8-18 UNS MALE THREAD
- REMOVEABLE HOLLOW SHAFT EXTENSION INCLUDED WITH ENCODER

- With Non-Convertable Shaft
  - 1\(^\text{st}\) 14 UNS MALE THREADS
  - Ø 2.25
  - Ø 3.75

- Redundant Version
  - 3X 10-32 UNF x .38 DEEP ON Ø 3.000 BOLT CIRCLE
  - 1\(^\text{st}\) 14 UNS FEMALE INTERNAL THREAD O-RING SEALED
  - Ø 2.25
  - Ø 3.75

- ON A 3.000 BOLT CIRCLE
- 10-32 UNF x .38 DEEP
- 5/8-18 UNS MALE THREAD
- Ø 2.25
- Ø 3.75
- 3X 10-32 UNF x .38 DEEP
- 3X 10-32 UNF x .38 DEEP
- 3X 10-32 UNF x .38 DEEP
## Models Information

### Models Information

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>DWD38</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Wiring Information

**Models Information**

- **6, 7 & 10 Pin MS Connectors and Cables**
  - Connector & mate/accessory cable assembly pin numbers and wire color information is provided here for reference. Models with direct cable exit carry the color coding as shown in the right hand column.

### Wiring Information

#### Models Information

<table>
<thead>
<tr>
<th>Encoder Function</th>
<th>Cable # 108594-6 Pin Single Ended</th>
<th>Cable # 108595-7 Pin Single Ended</th>
<th>Cable # 108596-7 Pin Diff Line Drv w/o Idx</th>
<th>Cable # 1400635-10 Pin Diff Line Drv w/ Idx</th>
<th>Cable Exit with Seal</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Pin</td>
<td>Wire Color</td>
<td>Pin</td>
<td>Wire Color</td>
<td>Pin</td>
</tr>
<tr>
<td>Sig. A</td>
<td>E</td>
<td>BRN</td>
<td>A</td>
<td>BRN</td>
<td>A</td>
</tr>
<tr>
<td>Sig. B</td>
<td>D</td>
<td>ORG</td>
<td>B</td>
<td>ORG</td>
<td>B</td>
</tr>
<tr>
<td>Sig. Z</td>
<td>C</td>
<td>YEL</td>
<td>C</td>
<td>YEL</td>
<td>—</td>
</tr>
<tr>
<td>Power +V</td>
<td>B</td>
<td>RED</td>
<td>D</td>
<td>RED</td>
<td>D</td>
</tr>
<tr>
<td>Com</td>
<td>A</td>
<td>BLK</td>
<td>F</td>
<td>BLK</td>
<td>F</td>
</tr>
<tr>
<td>Case</td>
<td>—</td>
<td>G</td>
<td>GRN</td>
<td></td>
<td>G</td>
</tr>
<tr>
<td>N/C</td>
<td>F</td>
<td>—</td>
<td>—</td>
<td></td>
<td>—</td>
</tr>
<tr>
<td>SigA</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td></td>
<td>—</td>
</tr>
<tr>
<td>SigB</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td></td>
<td>E</td>
</tr>
<tr>
<td>SigZ</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td></td>
<td>—</td>
</tr>
</tbody>
</table>

**Wiring Information**

- **Models Information**
  - **6, 7 & 10 Pin MS Connectors and Cables**
  - Connector & mate/accessory cable assembly pin numbers and wire color information is provided here for reference. Models with direct cable exit carry the color coding as shown in the right hand column.

- **Ordering Information**

**Application Assistance 1.800.234.8731**

1675 Delany Road
Gurnee, IL 60031-1282
Phone: 847.662.2666
Fax: 847.662.6633