**J150/J158 J1 Line**  Shafted rotary position sensor

- 100% moisture resistant electronic package (IP67)
- Multiple shaft and connector options available
- Shaft and captive bearing package resistant to shaft push out forces, withstands extreme mechanical vibration
- LED indicators for power and output feedback
- Incremental or Absolute position
- Outputs: Quadrature, Step and Direction, SSI, PWM, Analog, Modicon MODBUS, & J1939 Can Bus

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**STANDARD OPERATING CHARACTERISTICS**

**ELECTRICAL**

<table>
<thead>
<tr>
<th>Outputs</th>
<th>A - [PPPP] - SEPP</th>
<th>Incremental 13 bit Quadrature w/ Single Ended Output</th>
<th>A B Z</th>
</tr>
</thead>
<tbody>
<tr>
<td>A - 1939</td>
<td>J1939 13 bit @1000 positions (8192 positions max)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>A - MOD1</td>
<td>Modicon MODBUS@8192 positions</td>
<td></td>
<td></td>
</tr>
<tr>
<td>B - PWM</td>
<td>PWM absolute position</td>
<td></td>
<td></td>
</tr>
<tr>
<td>A - SSI</td>
<td>SS absolute position @8192 positions</td>
<td></td>
<td></td>
</tr>
<tr>
<td>V1</td>
<td>Voltage Out / 5 VDC IN, 0-5 VDC OUT (code V3 for 2x redundant output)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>V2</td>
<td>Voltage Out / 6-36 VDC IN, 0-5 VDC OUT</td>
<td></td>
<td></td>
</tr>
<tr>
<td>I1</td>
<td>Current Out / 0-24 VDC IN, 4-20 mA OUT (code I1 for 2x redundant output)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- **Input Power**: 6 to 30 VDC at approx 60 mA max, *not including output loads*
- **Electrical Protection**: Over-voltage, reserve-voltage, output short-circuit protected
- **LED Indicators**: Power and output channels
- **Connections**: Terminal Rug, M8, M12, M12 Flt, Flying Lead Cable, Shielded Flying Lead, or Deutsch - 4 or 6 pin
- **Resolution**: 0.3°
- **Repeatability**: 0.30%
- **Nonlinearity**: <1%

**MECHANICAL**

<table>
<thead>
<tr>
<th>Housing Diameter</th>
<th>50mm (J150) or 58mm (J158)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Housing Material</td>
<td>Aluminum</td>
</tr>
<tr>
<td>Housing Height</td>
<td>J150 - 1.53” body; 2.1” w/ M12 (and) J158 - 1.55” body; 2.1” w/ M12</td>
</tr>
<tr>
<td>Mounting</td>
<td>Mounting holes or servo groove</td>
</tr>
<tr>
<td>Weight</td>
<td>J150 - 6 oz / J158 - 8 oz</td>
</tr>
<tr>
<td>Shaft Form Factor</td>
<td>6mm w/ flat, Extended 6mm w/ flat, 1/4” (0.250”) w/ flat, 10mm round, 3/8” slotted, Extended 3/8” slotted</td>
</tr>
<tr>
<td>Shaft Material</td>
<td>Non-magnetic stainless steel</td>
</tr>
<tr>
<td>Bearing Material</td>
<td>Dual chrome ball-bearings</td>
</tr>
<tr>
<td>Shaft Speed</td>
<td>3000 RPM max</td>
</tr>
</tbody>
</table>

**ENVIRONMENTAL**

| Operating Temperature | -30° to +80° C |
| Storage Temperature   | -40° to +90° C |
| Humidity              | 100% |
| Shock                 | 400g/6ms (MIL STD 202) |
| Vibration             | 5 to 3000 Hz, 20g (MIL STD 202) |
| Protection Class      | IP67 (connection dependent) |

General ordering guide found on next page (St; I3 / 2)
J150/J158 General Ordering Guide

Build part number first by selecting Housing Style (code 1), MagElec (code 2), and Connection (code 3). Add Special Codes (code 4) to the end of the Joral part number. Refer to ‘Special Part Number Information’ for explanation of modifiers.

Examples:
- J150-A-0080-SEPP-M12-41 - 50mm Red aluminum (J150), 10mm round shaft (modifer 41), 13 bit incremental quadrature @ 80 PPR
- J150-A-1939-SC72-90 - 50mm Red aluminum (J150), 72° Shielded cable (SC72), 13 bit J1939 @ 8192 counts per rotation (modifier 90)
- J158-V1-0-180-0-5-CW-C72 - 58mm Red alu. (J158), 72" Cable (C72), 5v input (V1) @ 0-180°, 0v to 5v out, clockwise direction (CW)

Special Part Number Information

Review below code sections for important P/N build information

<table>
<thead>
<tr>
<th>Code 1: Housing Style</th>
<th>Code 2: MagElec (Sensor Output)</th>
<th>Code 3: Connection</th>
<th>Code 4: Special Codes</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>J150</strong></td>
<td>A - 1939</td>
<td>TRM</td>
<td>40 1/4&quot; (0.250&quot;) w/ flat</td>
</tr>
<tr>
<td></td>
<td>13 bit single ended quadrature - A B Z</td>
<td>INS</td>
<td>41 10mm round</td>
</tr>
<tr>
<td></td>
<td>A - MOD1</td>
<td>M0</td>
<td>42 3/8&quot; slotted</td>
</tr>
<tr>
<td></td>
<td>13 bit Modicon MODBUS @8192 positions</td>
<td>M12P</td>
<td>43 Extended 3/8&quot; slotted</td>
</tr>
<tr>
<td></td>
<td>A - 1939</td>
<td>M12</td>
<td>44 Extended 6mm w/ flat</td>
</tr>
<tr>
<td></td>
<td>13 bit J1939 @1000 positions</td>
<td>COX</td>
<td>45 6mm w/ flat</td>
</tr>
<tr>
<td></td>
<td>B - PWM</td>
<td>SCXX</td>
<td>51 Black aluminum</td>
</tr>
<tr>
<td></td>
<td>Absolute position PWM</td>
<td></td>
<td>63 Range Mount</td>
</tr>
<tr>
<td></td>
<td>A - SSI1</td>
<td>CSP</td>
<td>90 13 bit @8192 counts per rotation (Typical J1939 option)</td>
</tr>
<tr>
<td></td>
<td>Absolute position SSI @8192 positions</td>
<td>DE4</td>
<td>91 13 bit @1000 counts per rotation (Typical MODBUS option)</td>
</tr>
<tr>
<td>J158</td>
<td>V1 5VDCIN, 0-5 VDC OUT</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>V2 6-36 VDCIN, 0-5 VDC OUT</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>V3 0-24 VDCIN, 4-20 mA OUT x2 (Redundant output)</td>
<td>DEB</td>
<td></td>
</tr>
<tr>
<td></td>
<td>I1 0-24 VDCIN, 4-20 mA OUT</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>I2 0-24 VDCIN, 4-20 mA OUT x2 (Redundant output)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* More outputs and connection options available, contact Joral if desired configuration is not listed

Code 1: Housing Style
- **Modifier 63** - For flange mount (J150 only) add code 63 to end of Joral P/N
- **J150** - 50mm, Red aluminum / Back exit connections only
- **J158** - 58mm, Red aluminum / Back exit connections only

Code 2: MagElec

(A - _____ - SEPP) or
(A - _____ - DIPP)
- Enter Quadrature PPR place of _____
- A = 13 bit PPR
- Available 13 bit PPR: 0008, 0010, 0016, 0020, 0025, 0032, 0040, 0050, 0064, 0080, 0100, 0125, 0128, 0200, 0250, 0256, 0400, 0500, 1024, 2048

A - 1939
- Standard J1939 output is 1000 positions
- A = 13 bit
- MODIFIER 90 - for 8192 positions (max resolution) add code 90 to end of J150/J158 P/N

A - MOD1
- Standard MOD1 output is 8192 positions
- A = 13 bit
- MODIFIER 91 - for 1000 positions: add code 91 to end of J150/J158 P/N

V1, V2, and I1 (Analog MagElec P/N Guide)
- First select MagElec code (V1, V2 or I1) then Angle Range (A1-A2), Voltage Range (VR1-VR2) and Signal Direction (Clockwise [CW] or Counter [CCW])
- **PART NUMBER FORMULA**
  (MagElec)-(A1-A2)-(VR1-VR2)-(CW or CW)
- **EXACT** V1, V2, and I1 EXAMPLES
  J150 - V1 - 0-360 - 0.5-4.5 - CW - C72
  J158 - V1 - 0-180 - 0-5 - CW - C72
  J158 - I1 - 180-270 - 4-20 - CW - M12

Code 3: Connections
- **All Outputs, All Connections** - Connector exit back exit only (sensor epoxy side) for housing style J150 and J158
- **J1939 Output** - Addressing via varying value resistor in connection requires at least five conductors (M12, DE4 and Cables addressing compatible)
- **All Outputs w/ Deutsch** - DE4 and DEB connection Deutsch connectors add $20 to J150/J158 list
**Shafted Rotary Position Sensors**

**J1 Line**
Shafted rotary position sensor

**J150 Dimensions & General Pin-outs**
Shafted; J150/J158 / 3 of 5

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**J150 Dimensions & General Pin-outs**

- **Dimensions informative only**
- **For most recent dimensions please consult factory**

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**DT04-4P Male**
**J1939 Output**

1. YELLOW = CAN HIGH
2. GREEN = CAN LOW
3. RED = +VDC (VIN)
4. BLACK = COMMON/GROUND

**DT04-6P Male**
**J1939 Output**

1. YELLOW = CAN HIGH
2. GREEN = CAN LOW
3. RED = +VDC (VIN)
4. BLACK = ADDRESS/GROUND
5. WHITE = ADDRESS PROGRAM RESISTOR
6. BLACK = COMMON/GROUND

**M12-5P Male**
**Face View**

- **Quadrature Output**
  1. BROWN = +VDC (VIN)
  2. WHITE = CHANNEL B
  3. BLUE = COMMON/GROUND
  4. BLACK = CHANNEL A
  5. GRAY = CHANNEL Z

- **Proportional (Analog) Output**
  1. BROWN = +VDC (VIN)
  2. WHITE = CAN HIGH
  3. BLUE = COMMON/GROUND
  4. BLACK = CAN LOW
  5. GRAY = OPTIONAL ADDRESS PROGRAMMING RESISTOR

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**DT04-4P Male**
**J1939 Output**

- **M12-5P/Cable/Flying Lead**

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**Dimensions**

- 1.020 MAX.
- 1.74
- 1.25
- 0.89
- 0.69
- 0.21
- 0.48
- 0.95

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**6mm Shaft with Flat End Detail**

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**St; I3 / 3**

Joral, LLC • 640 Perkins Drive • Mukwonago, WI 53149 • (262)378-5500 • www.JORALLLC.com
For Flange mount add special code 63 to end of Joral P/N

Example:
J150-A-0080-SEPP-M12-63

Dimensions informative only
For most recent dimensions please consult factory