

## Input Ranges From $\pm 3^\circ$ to $\pm 90^\circ$ Rugged, High Precision, Low Cost, Single-Ended Power Input Inclinometer

The Jewell **Emerald Series** inclinometer is a low cost, high precision inclinometer designed with higher accuracy than comparable MEMS devices. Applications include robotics, construction equipment, industrial measurement and control, and precision machining. All Emerald Series inclinometers are RoHS compliant.

### Features

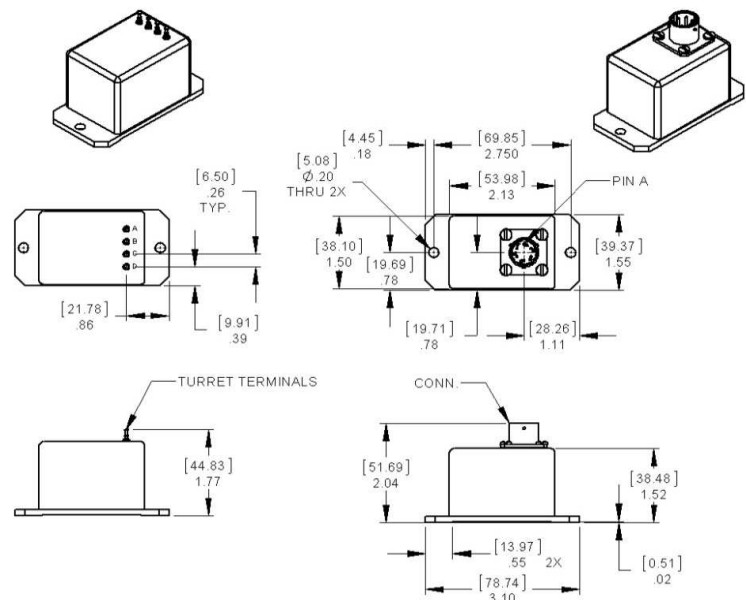
- Extremely Rugged
- Lower Cost than traditional Force-Balanced Inclinometers
- High Accuracy
- Greater Precision than MEMS Technologies
- 0-5V DC Output
- Single-Ended Power Input
- RoHS Compliant

### Applications

- Aerospace
- Military
- Robotics
- Academic Research
- Geotechnical Monitoring
- Track Monitoring and Testing
- Vehicle Wheel Alignment



### Outline Diagram



Dimensions in inches [mm]

### Pin Out (Options: C-connector, P-Pin)

| Pin Option |                     | Connector Option |                     |
|------------|---------------------|------------------|---------------------|
| A          | Input Power         | A                | Input Power         |
| B          | Power/Signal Common | B                | Power/Signal Common |
| C          | N/C                 | C                | N/C                 |
| D          | Signal              | D                | Signal              |
|            |                     | E                | N/C                 |
|            |                     | F                | N/C                 |

## Performance Specifications

### STATIC/DYNAMIC

|                                                         |                |        |        |        |        |        |
|---------------------------------------------------------|----------------|--------|--------|--------|--------|--------|
| Input Range, °:                                         | ±3             | ±14.5  | ±30    | ±45    | ±60    | ±90    |
| Full Range Output (FRO -Note 1) VDC ±0.5%:              | 0-5            | 0-5    | 0-5    | 0-5    | 0-5    | 0-5    |
| Nonlinearity (Note 2) % FRO maximum:                    | 0.05           | 0.02   | 0.02   | 0.02   | 0.04   | 0.05   |
| Scale Factor, Volts/g, nominal:                         | 47.8           | 10.0   | 5.0    | 3.5    | 2.9    | 2.5    |
| Scale Factor Temp. Sensitivity (SFTS), PPM /°C maximum: | 100            | 100    | 100    | 100    | 100    | 100    |
| Bandwidth (-3 dB), Hz nominal:                          | 5.0            | 5.0    | 5.0    | 5.0    | 5.0    | 5.0    |
| Output Axis Misalignment, ° maximum:                    | 0.25           | 0.50   | 0.50   | 0.50   | 0.50   | 0.50   |
| Pendulous Axis Misalignment, ° maximum:                 | 0.25           | 0.50   | 0.50   | 0.50   | 0.50   | 0.50   |
| 0° Output, Volts range:                                 | +2.45 to +2.55 |        |        |        |        |        |
| 0° Output Temp. Sensitivity, Volts /°C maximum:         | 0.0036         | 0.0010 | 0.0007 | 0.0005 | 0.0005 | 0.0005 |
| Resolution and Threshold, µradians maximum:             | 3.5            | 3.5    | 3.5    | 3.5    | 3.5    | 3.5    |

### ELECTRICAL

|                              |            |
|------------------------------|------------|
| Number of Axes:              | 1          |
| Input Voltage Range, (VDC):  | +15 to +30 |
| Input Current, mA, max:      | 40         |
| Output Impedance, Ohms, nom: | 10         |
| Noise, Vrms, maximum:        | 0.002      |

### ENCLOSURE

|       |      |
|-------|------|
| Seal: | IP65 |
|-------|------|

### ENVIRONMENTAL

|                       |                      |
|-----------------------|----------------------|
| Operating Temp Range: | -55°C to +85°C       |
| Storage Temp Range:   | -60°C to +90°C       |
| Shock:                | 500g, 1 msec, ½ sine |

#### Notes:

Note 1: Full Range is defined "from negative full input angle to positive full input angle."

Note 2: Nonlinearity is specified as deviation of output referenced to theoretical sine function value, independent of misalignment.

Note 3: Full Resolution is achieved with noise reduction techniques.

## Custom Capabilities

- ±15V bipolar input option available
- Pigtail and Connector alternative options available
- Custom ranges and bandwidths available

## How to Order

| Connector Version |              | Pin Version |              |
|-------------------|--------------|-------------|--------------|
| Model #           | Part #       | Model #     | Part #       |
| SMIC-S-3          | 02550304-001 | SMIP-S-3    | 02550303-001 |
| SMIC-S-14.5       | 02550304-002 | SMIP-S-14.5 | 02550303-002 |
| SMIC-S-30         | 02550304-003 | SMIP-S-30   | 02550303-003 |
| SMIC-S-45         | 02550304-004 | SMIP-S-45   | 02550303-004 |
| SMIC-S-60         | 02550304-005 | SMIP-S-60   | 02550303-005 |
| SMIC-S-90         | 02550304-006 | SMIP-S-90   | 02550303-006 |