

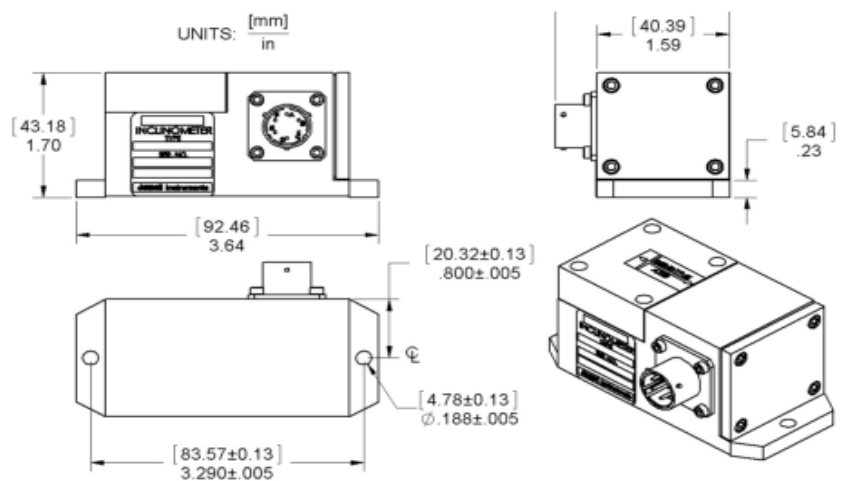
LSOC/LSOP "L" 4-20 mA Series Inclinometer

Input Ranges From $\pm 1.0^\circ$ to $\pm 90^\circ$ With High Reliability, High Resolution and Low Non-Linearity

The Jewell **LSOC/LSOP "L" Series** 4-20 mA Output Flexure Suspension Servo Fluid Damped Inclinometer is designed for applications where high levels of shock, vibration and electrical noise are present and/or long cable runs are required.



Outline Diagram



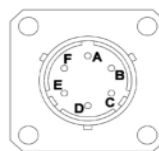
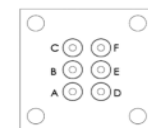
Features & Benefits

- Extremely high resolution and low hysteresis of less than 0.0005% of full range output.
- Extremely robust designed to withstand shocks in excess of 1500g and vibration of 20 grms.
- Responds to changes of slope as small as 0.000006"/ft.
- High accuracy closed-loop force balanced sensor technology.
- Low white noise spectral density of better than 0.15 μ V/Sq Root HZ

Pin Out (Options C-connector, P-pin)

Applications

- Steel processing: continous casting, electric arc furnance and idle control
- Heavy construction: paving, grading, mining, tunneling, and overturn detection
- Strucrtural monitoring: walls of dams, support, columns, bridges, and others
- Railway: automated train controls, rail leveling and grinding, and rail bed analysis
- Military Applications: Measuring of angular tilt where high levels of shock and vibration are present



| | |
|-------|-----------------------|
| Pin A | +VDC Power |
| Pin B | Power/Signal Common |
| Pin C | Not Used |
| Pin D | 4-20 mA Signal Output |
| Pin E | Self Test Return |
| Pin F | Self Test |

Jewell Instruments LLC, 850 Perimeter Road, Manchester, NH 03103
sales@jewellinstruments.com • www.jewellinstruments.com • Tel (800) 227-5955

Performance Specifications

STATIC/DYNAMIC

| | | | | | |
|--|----------|----------|----------|----------|----------|
| Input Range (°) (Note 1) | ± 1.0 | ± 3.0 | ± 14.5 | ± 30.0 | ± 90.0 |
| Full Range Output (FRO), mADC ± 1.0% | 4 to 20 | 4 to 20 | 4 to 20 | 4 to 20 | 4 to 20 |
| Non Linearity (%FRO' Max.) (Note 2) | 0.05 | 0.05 | 0.10 | 0.10 | 0.05 |
| Scale Factor, Ma/G (Nominal) | 458 | 152.8 | 31.3 | 16.0 | 8.0 |
| Scale Factor Temp Sens (PPM/°C, Max.) | 400 | 300 | 100 | 100 | 100 |
| Natural Frequency, Hz (Nominal) (Note 3) | 0.3 | 2.0 | 15 | 20 | 30 |
| Bandwidth (-3dB), Hz (Nominal) | 0.3 | 2.0 | 15 | 20 | 30 |
| Transverse Axis Misalignment, ° Max. | 0.15 | 0.25 | 0.50 | 1.00 | 1.00 |
| Output at Zero Tilt, Ma | 12 ± 0.6 | 12 ± 0.6 | 12 ± 0.3 | 12 ± 0.3 | 12 ± 0.3 |
| Zero Tilt Temp Sens, mA/°C Max. | 0.015 | 0.01 | 0.0032 | 0.0032 | 0.0016 |
| Resolution and Threshold, µ rad Max. | 1 | 1 | 1 | 1 | 1 |

ELECTRICAL

| | |
|---------------------------|-----------------------|
| Input Voltage, VDC | 20 to 30 (24 Nominal) |
| Input Current (mA, Max.): | 40 |
| Noise, mA rms Max. | 0.01 |

ENVIRONMENTAL

| | |
|----------------------|-------------------------|
| Operating Temp Range | -18 to +71°C |
| Survival Temp Range | -40 to +71°C |
| Vibration | 20 grms |
| Shock | 1500g, 0.5 msec, ½ sine |
| Seal | MIL-STD 202, Method 112 |

Notes: 1 - Full range is defined as "from negative full input angle to positive full input angle."

The inclinometer output is proportional to the sine of the tilt angle.

2 - Referenced to theoretical sine value independent of misalignment.

3 - Output phase angle = -90°.

Custom Capabilities

- Internal temperature sensor and thermal modeling for the highest levels of accuracy over a wide temperature range
- Available in LSR Series package configuration for applications requiring a more compact solution
- Factory set zero biasing for non-horizontal measurements
- Solder terminals and flying leads in place of military connector
- Custom input ranges from ±0.5° to ±90° available
- Custom output impedances available

How to Order

| | |
|------------|--------------|
| LCOC-1L | 02550278-506 |
| LSOC-3L | 02550278-507 |
| LSOC-14.5L | 02550278-508 |
| LSOC-30L | 02550278-509 |
| LSOC-90L | 02550278-510 |

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