

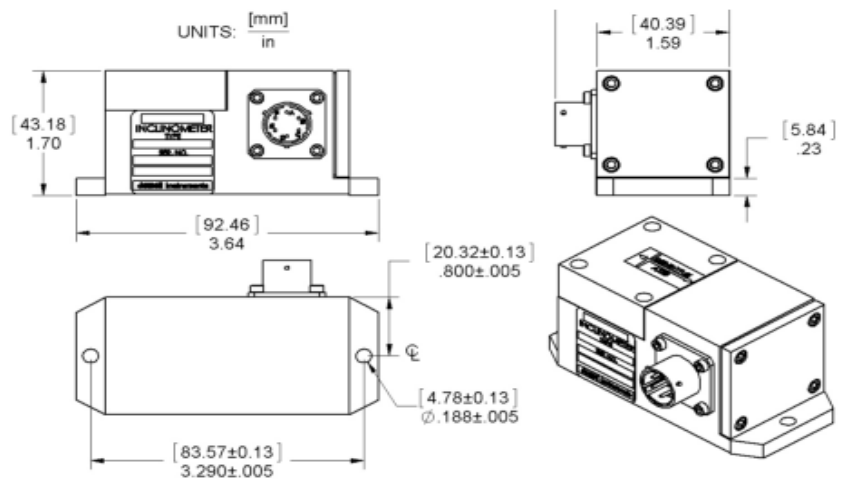
# LSOC/LSOP "L" 4-20 mA Series Inclinometer

## 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



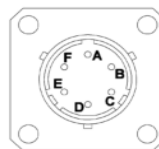
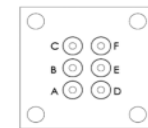
### Features & Benefits

- 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 $\mu$ 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
- Structrural 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

## 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°.

\*Specifications subject to change without notice on account of continued product development

## 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

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