

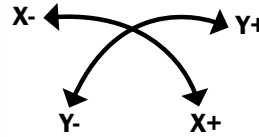
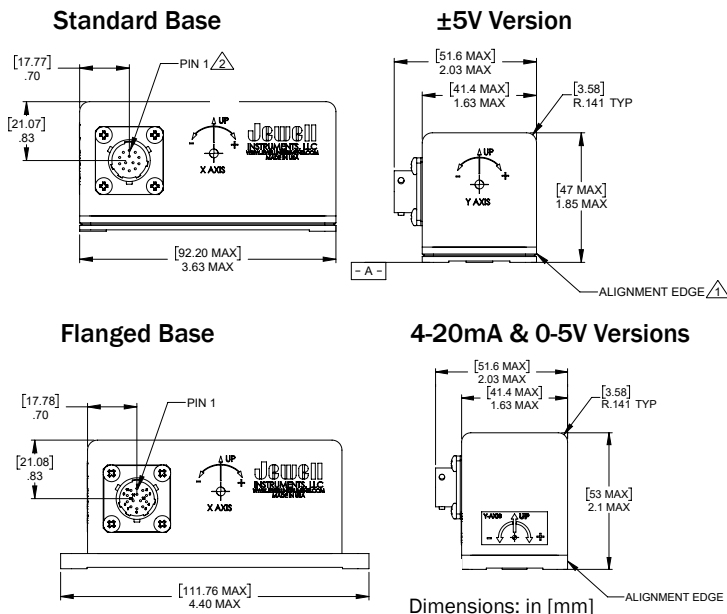
## LCF-2330

### Dual-Axis Analog Inclinometer

The Jewell LCF-2330 Series Inclinometer is a dual axis version of the rugged, high accuracy LCF Series. The design of the LCF-2330 was optimized to provide the high accuracy and superior repeatability of Jewell's rugged, fluid damped, flexure suspension, servo technology in a small and convenient package for applications requiring a compact dual axis solution. With many options to choose from, including a flange base, metric threads, and temperature sensor, this product can be customized to suit your individual needs.

#### FEATURES:

- $\pm 1^\circ$  to  $\pm 90^\circ$  Input Full Range
- Micro Radian Resolution
- Internal Temp Sensor
- $\pm 5$  Vdc Output, 4-20mA Output, or 0-5V Output
- Superior  $0^\circ$  Output Stability Over Temperature
- RoHS Compliant



#### APPLICATIONS:

- Radar & Antenna Leveling
- Weapons Platform Leveling
- Barge and Offshore Platform Control
- Deviation Surveys
- 2-Axis Machine Tool Leveling
- Bridge Structural Monitoring
- Submersible Control Feedback
- Offshore Platform Stability
- Production/Manufacturing Process
- Equipment for Aerospace Industry

# LCF-2330: ±5V OUTPUT

## PERFORMANCE SPECIFICATIONS

### PERFORMANCE

INPUT RANGE (°)	±1	±3	±14.5	±30	±60	±90
FULL RANGE OUTPUT (VDC) <sup>1</sup>	±5.00					
NONLINEARITY (% FRO) <sup>2</sup> max	0.05	0.05	0.02	0.02	0.02	0.02
SCALE FACTOR (V/g) nominal	286.5	95.5	20.0	10.0	5.77	5.0
SCALE FACTOR TEMP SENSITIVITY (PPM/°C max)	300	300	100	100	100	100
BANDWIDTH (-3dB) Hz, nominal	0.5	2	15	20	30	30
TRANSVERSE AXIS MISALIGNMENT, ° max	±0.25	±0.50	±0.50	±1.00	±1.00	±1.00
OUTPUT AT 0° TILT (V) max	±0.10	±0.04	±0.02	±0.02	±0.02	±0.02
0° OUTPUT TEMP. SENSITIVITY (Volts/°C) max	0.015	0.005	0.001	0.0005	0.0003	0.0003
RESOLUTION & THRESHOLD (µradians) max	1					

#### NOTES:

1. Full range is defined as "from negative full input angle to positive full input angle."
2. Nonlinearity is specified as deviation of output referenced to theoretical sine function value, independent of misalignment.  
\*Specifications subject to change without notice on account of continued product development

### ELECTRICAL

NUMBER OF AXES	2
INPUT VOLTAGE RANGE (VDC)	±12 to ±18
INPUT CURRENT (mA, max)	30
OUTPUT IMPEDANCE (Ohms) nominal	100
NOISE (V <sub>rms</sub> , max)	0.002

### ENVIRONMENTAL

OPERATING TEMP. RANGE	-40° to +80°C
STORAGE TEMP. RANGE	-60° to +90°C
VIBRATION	20 grms
SHOCK	1000g, 1 msec, ½ sine

### ENCLOSURE

WEIGHT	280 g
SEAL	IP65

### PIN OUTS

1	RED	+12 to +18 VDC
2	BLACK	-12 to -18 VDC
3	WHITE	POWER COMMON
4	ORANGE	X-AXIS OUTPUT SIGNAL
5	GREEN	X-AXIS OUTPUT RETURN
6	RED/BLACK	Y-AXIS OUTPUT SIGNAL
7	BLUE	Y-AXIS OUTPUT RETURN
8	WHITE/BLACK	TEMP SENSOR OUT
9-13		N/C

(Color codes correspond to cable assembly.)

### OPTIONS

- Temperature Sensor  
Type: AD590  
Scale Factor: 1µA/K  
Spec @ Room Ambient  
Temperature: 298.2 ±10.5 µA
- Flange Base (unthreaded)
- RoHS Compliance
- 0-5V Output

# LCF-2330-LC: 4-20mA OUTPUT

## PERFORMANCE SPECIFICATIONS

### STATIC/DYNAMIC

<b>INPUT RANGE (°)</b>	<b>±1</b>	<b>±3</b>	<b>±14.5</b>	<b>±30</b>	<b>±90</b>
<b>FULL RANGE OUTPUT (FRO) mA ±1.0%<sup>1</sup></b>	4-20				
<b>NONLINEARITY (% FRO) max</b>	0.05	0.05	0.02	0.03	0.04
<b>SCALE FACTOR (mA/g) nominal</b>	458.40	152.90	31.95	16.00	8.00
<b>SCALE FACTOR SENSITIVITY (PPM/°C max)</b>	300	300	100	100	100
<b>BANDWIDTH (-3dB) Hz, nominal</b>	0.5	2.0	15	20	30
<b>TRANSVERSE AXIS MISALIGNMENT, ° max</b>	±0.5				
<b>OUTPUT AT 0° TILT (mA, max)</b>	12 ±0.6	12 ±0.6	12 ±0.3	12 ±0.3	12 ±0.3
<b>OUTPUT AT 0° TILT TEMP. SENSITIVITY (mA/°C) max</b>	0.024	0.009	0.002	0.001	0.001
<b>RESOLUTION &amp; THRESHOLD (µrad)</b>	1				

#### NOTES:

1. Full range is defined as "from negative full input angle to positive full input angle."
2. Nonlinearity is specified as deviation of output referenced to theoretical sine function value, independent of misalignment.  
\*Specifications subject to change without notice on account of continued product development

### ELECTRICAL

<b>NUMBER OF AXES</b>	2
<b>INPUT VOLTAGE RANGE (VDC)</b>	20 to 30
<b>INPUT CURRENT (mA, nominal)</b>	90
<b>NOISE (mA rms, max)</b>	0.01

### ENVIRONMENTAL

<b>OPERATING TEMP. RANGE</b>	-40° to +80°C
<b>STORAGE TEMP. RANGE</b>	-60° to +90°C
<b>VIBRATION</b>	20 grms
<b>SHOCK</b>	1000g, 1 msec, ½ sine

### ENCLOSURE

<b>WEIGHT</b>	280 g
<b>SEAL</b>	IP65

### PIN OUTS

<b>1</b>	RED	+20 to +30 VDC
<b>2</b>	BLACK	N/C
<b>3</b>	WHITE	POWER RETURN
<b>4</b>	ORANGE	X-AXIS OUTPUT SIGNAL
<b>5</b>	GREEN	SIGNAL COMMON
<b>6</b>	RED/BLACK	Y-AXIS OUTPUT SIGNAL
<b>7</b>	BLUE	SIGNAL COMMON
<b>8</b>	WHITE/BLACK	TEMP SENSOR OUT
<b>9-13</b>		N/C

(Color codes correspond to cable assembly.)

### OPTIONS

- Temperature Sensor  
Type: AD590  
Scale Factor: 1µA/K  
Spec @ Room Ambient  
Temperature: 298.2 ±10.5 µA
- Flange Base (unthreaded)
- RoHS Compliance
- 0-5V Output

# LCF-2330-SC: 0-5V OUTPUT

## PERFORMANCE SPECIFICATIONS

### STATIC/DYNAMIC

INPUT RANGE (°)	±1	±3	±14.5	±30	±90
FULL RANGE OUTPUT (VDC) <sup>1</sup>	0-5				
NONLINEARITY (% FRO) max	0.05	0.05	0.02	0.02	0.02
SCALE FACTOR (V/g) nominal	143.2	47.8	10	5	2.5
SCALE FACTOR TEMP SENSITIVITY (PPM/°C max)	300	300	100	80	80
BANDWIDTH (-3dB) Hz, nominal	0.5	2.0	15	20	30
TRANSVERSE AXIS MISALIGNMENT, ° max	±0.2	±0.5	±0.5	±1	±1
OUTPUT AT 0° TILT (V) max	±0.1	±0.04	±0.02	±0.02	±0.02
0° OUTPUT TEMP. SENSITIVITY (Volts/°C) max	0.015	0.005	0.001	0.0005	0.0003
RESOLUTION & THRESHOLD (µrad)	1				

#### NOTES:

1. Full range is defined as "from negative full input angle to positive full input angle."
2. Nonlinearity is specified as deviation of output referenced to theoretical sine function value, independent of misalignment.  
\*Specifications subject to change without notice on account of continued product development

### ELECTRICAL

NUMBER OF AXES	2
INPUT VOLTAGE RANGE (VDC)	±9 to ±18
INPUT CURRENT (mA, max)	80
OUTPUT IMPEDANCE (Ohms) nominal	100
NOISE (Vrms, max)	0.002

### ENVIRONMENTAL

OPERATING TEMP. RANGE	-40° to +80°C
STORAGE TEMP. RANGE	-60° to +90°C
VIBRATION	20 grms
SHOCK	1000g, 1 msec, ½ sine

### ENCLOSURE

WEIGHT	280 g
SEAL	IP65

### PIN OUTS

1	RED	+9 to +18 VDC
2	BLACK	N/C
3	WHITE	POWER COMMON
4	ORANGE	X-AXIS OUTPUT SIGNAL
5	GREEN	X-AXIS OUTPUT RETURN
6	RED/BLACK	Y-AXIS OUTPUT SIGNAL
7	BLUE	Y-AXIS OUTPUT RETURN
8	WHITE/BLACK	TEMP SENSOR OUT
9-13		N/C

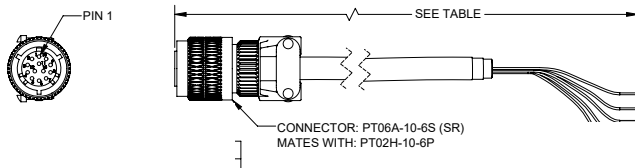
(Color codes correspond to cable assembly.)

### OPTIONS

- Temperature Sensor  
Type: AD590  
Scale Factor: 1µA/K  
Spec @ Room Ambient  
Temperature: 298.2 ±10.5 µA
- Flange Base (unthreaded)
- RoHS Compliance
- 0-5V Output

# MATING CONNECTOR AND CABLE ASSEMBLIES

## CONNECTOR CABLE



PART #	MODEL #	LENGTH m (ft)
F847774-001	13-Pin Mating Connector	-
879605-009	DSI-CBL-02M-2	2 (6.56)
879605-010	DSI-CBL-03M-2	3 (9.84)
879605-0XX	DSI-CBL-05M-2	5 (16.4)
Contact manufacturer for custom lengths		

# LCF-2330 SERIES ORDERING INFORMATION

SERIES	VERSION	INPUT RANGE	BASE & THREADING	TEMP SENSOR	ROHS COMPLIANT
LCF-2330	[blank] = ±5V LC = 4-20mA SC = 0-5V	1/1 = ±1° X&Y axis 3/3 = ±3° X&Y axis 14.5/14.5 = ±14.5° X&Y axis 30/30 = ±30° X&Y axis 60/60 = ±60° X&Y axis 90/90 = ±90° X&Y axis	[blank] = standard base with imperial threading M = metric base with M3 threading FB = flanged base with 3 unthreaded mounting holes	TS = yes	ROHS = yes

### EXAMPLE:

**Model:** LCF-2330-30/30-M-TS-ROHS

**Description:** ±5V output, ±30° range, metric threads, temperature sensor, and RoHS compliant

850 Perimeter Road Manchester, NH 03103 USA

1.800.227.5955

www.jewellinstruments.com | sensors@jewellinstruments.com

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