

LCF-300 SERIES Single-Axis Analog Inclinometer

The Jewell LCF-300 Series flexure suspension servo fluid damped inclinometer is a $\pm 1^\circ$ to $\pm 90^\circ$ device designed for applications where high levels of shock and vibration are present. LCF-300 units are characterized by excellent turn on repeatability and very low hysteresis. It is available in three different versions (D, L, or S), varying input and output, and with either a 6 pin connector or a pin-terminal option in order to meet your specific needs.

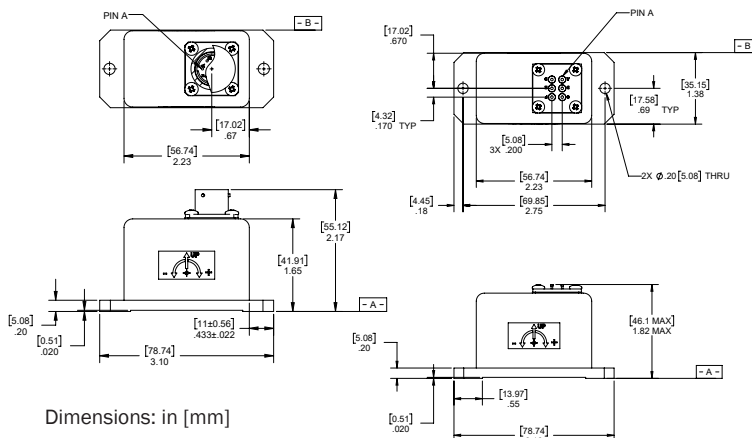
FEATURES:

- Resolution of 1 μ rad
- Internal Temperature Sensor Available
- $\pm 5V$ DC, 0-5V DC, and 4-20mA Outputs Available
- Various Input Power Options Available
- RoHS Compliant



Connector Version

Pin-Terminal Version



APPLICATIONS:

- High-precision Geotech
- Oil and Gas, Riser Tilt Monitoring
- Railroad MOW Equipment
- Pavement Profiling Rigs
- Vehicle Wheel Alignment
- Robotics

LCF-300-D: $\pm 5V$ OUTPUT

The LCF-300-D Series Inclinometer is a rugged, high performance, single-axis tilt sensor designed for peak performance in extreme conditions. The fluid damped mechanism delivers superior noise rejection in high shock and vibration environments as well as excellent output stability. Units are available with a 6-pin connector or pin-terminals. This version features +/-5V output.

APPLICATIONS:

- High-precision Geotech
- Oil and Gas, Riser Tilt Monitoring
- Railroad MOW Equipment
- Pavement Profiling Rigs
- Vehicle Wheel Alignment
- Robotics

PERFORMANCE SPECIFICATIONS

STATIC/DYNAMIC

INPUT RANGE (°)	± 1	± 3	± 14.5	± 30	± 45	± 60	± 90
FULL RANGE OUTPUT (VDC) $\pm 5\%^1$	± 5.00						
NONLINEARITY (% FRO max) ²	0.05	0.05	0.02	0.02	0.02	0.02	0.03
SCALE FACTOR (Volts/g) nominal	286.5	95.5	20.0	10.0	7.071	5.8	5.0
SCALE FACTOR TEMP. SENSITIVITY (PPM/°C) max	300	100	100	100	100	100	100
BANDWIDTH (-3dB) Hz, nominal	0.5	2	15	20	20	30	30
TRANSVERSE AXIS MISALIGNMENT, ° max	± 0.25	± 0.15	± 0.5	± 0.5	± 0.5	± 0.5	± 0.5
0° OUTPUT (Volts Range)	± 0.10	± 0.04	± 0.02	± 0.02	± 0.02	± 0.02	± 0.02
0° OUTPUT TEMP. SENSITIVITY (Volts/°C) max	0.015	0.002	0.001	0.0005	0.0005	0.0004	0.0003
RESOLUTION & THRESHOLD (μ rad) max	1						

PIN OUTS

PIN OPTION

A	POSITIVE INPUT POWER
B	NEGATIVE INPUT POWER
C	POWER/SIGNAL COMMON
D	SIGNAL OUT
E	N/C
F	N/C

CONNECTOR OPTION

A	RED	POSITIVE INPUT POWER
B	WHITE	POWER/SIGNAL COMMON
C	BLACK	NEGATIVE INPUT POWER
D	ORANGE	SIGNAL OUT
E	N/C	N/C
F	BLUE	N/C

NOTES:

1. Full Range is defined "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

PRODUCT SPECIFICATIONS: LCF-300-D

ELECTRICAL

NUMBER OF AXES	1
INPUT VOLTAGE RANGE (VDC)	±12 to ±18
INPUT CURRENT (mA, max)	±15
OUTPUT IMPEDANCE (Ohms, nom)	1
NOISE (Vrms, max)	0.002
MASS (g) max	230

ENVIRONMENTAL

OPERATING TEMP. RANGE	-40° to +80°C
STORAGE TEMP. RANGE	-60° to +90°C
SHOCK	1500g, 0.5 msec, ½ sine

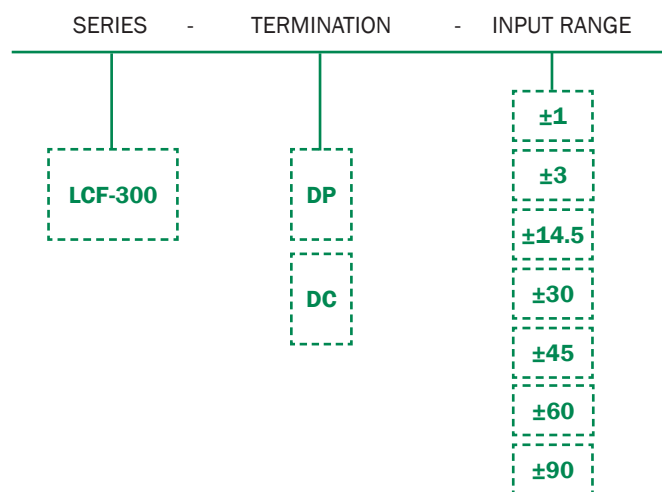
ENCLOSURE

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ORDERING INFORMATION

HOW TO ORDER

Model Numbers are comprised of the series, the series version, connection option, and the input range.



	TERMINATION	MODEL #	PART #
±1	PIN	LCF-300-DP-1	02550361-201
	CONNECTOR	LCF-300-DC-1	02550363-201
±3	PIN	LCF-300-DP-3	02550361-202
	CONNECTOR	LCF-300-DC-3	02550363-202
±14.5	PIN	LCF-300-DP-14.5	02550361-203
	CONNECTOR	LCF-300-DC-14.5	02550363-203
±30	PIN	LCF-300-DP-30	02550361-204
	CONNECTOR	LCF-300-DC-30	02550363-204
±45	PIN	LCF-300-DP-45	02550361-207
	CONNECTOR	LCF-300-DC-45	02550363-207
±60	PIN	LCF-300-DP-60	02550361-205
	CONNECTOR	LCF-300-DC-60	02550363-205
±90	PIN	LCF-300-DP-90	02550361-206
	CONNECTOR	LCF-300-DC-90	02550363-206

LCF-300-L: 4-20mA

The LCF-300-L Series Inclinometer is a rugged, high performance, single-axis tilt sensor designed for peak performance in extreme conditions. The fluid damped mechanism delivers superior noise rejection in high shock and vibration environments as well as excellent output stability. Units are available with a 6-pin connector or pin-terminals. This version features 4-20mA output.

APPLICATIONS:

- High-precision Geotech
- Oil and Gas, Riser Tilt Monitoring
- Railroad MOW Equipment
- Pavement Profiling Rigs
- Vehicle Wheel Alignment
- Robotics

PERFORMANCE SPECIFICATIONS

STATIC/DYNAMIC

INPUT RANGE (°)	±1	±3	±14.5	±30	±60	±90
FULL RANGE OUTPUT (mA) ±1.0% ¹	4-20					
NONLINEARITY (% FRO) max ²	0.05	0.05	0.03	0.02	0.03	0.05
SCALE FACTOR (mA/g) nominal	458.4	152.9	32.0	16.0	9.2	8.0
SCALE FACTOR TEMP. SENSITIVITY (PPM/°C) max	300	300	100	60	60	60
BANDWIDTH (-3dB) Hz, nominal	0.5	2	15	20	30	30
TRANSVERSE AXIS MISALIGNMENT, ° max	±0.25	±0.25	±0.5	±0.5	±0.5	±0.5
0° OUTPUT (mA) nominal	12 ±0.3	12 ±0.6	12 ±0.3	12 ±0.3	12 ±0.3	12 ±0.3
0° OUTPUT TEMP. SENSITIVITY (mA/°C) max	0.024	0.01	0.002	0.001	0.001	0.0008
RESOLUTION & THRESHOLD (µrad) max	1					

PIN OUTS

PIN OPTION

A	POSITIVE INPUT POWER
B	POWER/SIGNAL COMMON
C	N/C
D	SIGNAL OUT
E	N/C
F	N/C

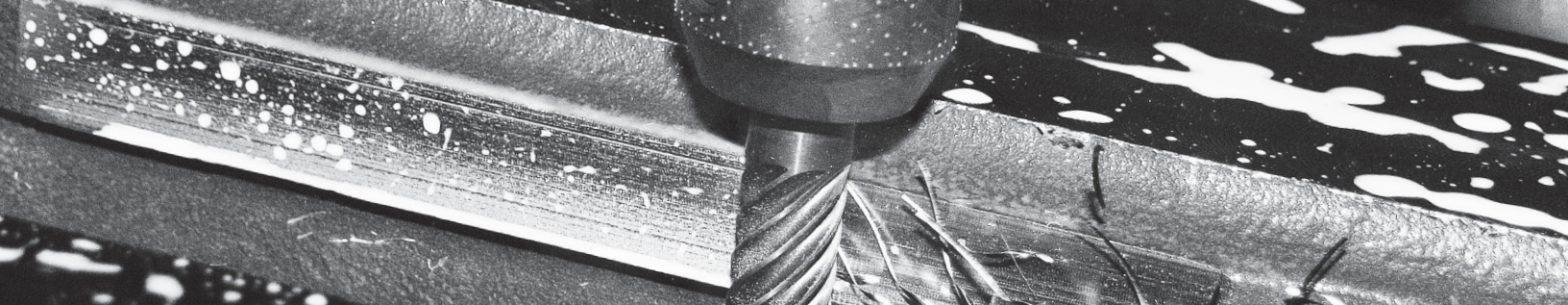
CONNECTOR OPTION

A	RED	POSITIVE INPUT POWER
B	WHITE	POWER/SIGNAL COMMON
C	BLACK	N/C
D	ORANGE	SIGNAL OUT
E	N/C	N/C
F	BLUE	N/C

NOTES:

1. Full Range is defined "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



PRODUCT SPECIFICATIONS: LCF-300-L

ELECTRICAL

NUMBER OF AXES	1
INPUT VOLTAGE RANGE (VDC)	+20 to +30
INPUT CURRENT (mA, max)	50
NOISE (mArms, max)	0.01
MASS (g) max	240

ENVIRONMENTAL

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

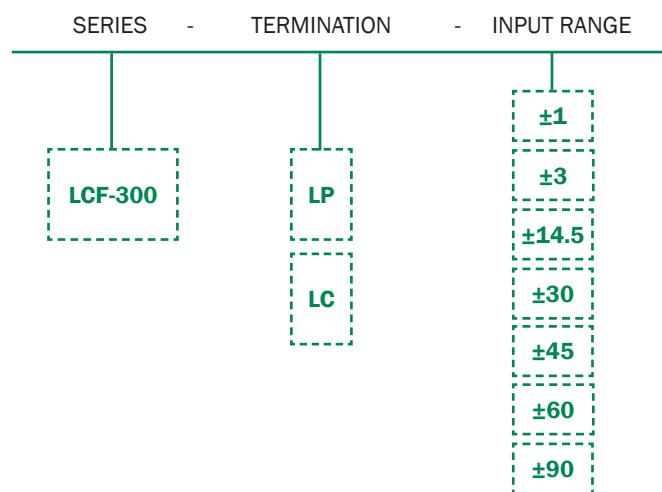
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ORDERING INFORMATION

HOW TO ORDER

Model Numbers are comprised of the series, the series version, connection option, and the input range.



	TERMINATION	MODEL #	PART #
±1	PIN	LCF-300-LP-1	02550361-301
	CONNECTOR	LCF-300-LC-1	02550363-301
±3	PIN	LCF-300-LP-3	02550361-302
	CONNECTOR	LCF-300-LC-3	02550363-302
±14.5	PIN	LCF-300-LP-14.5	02550361-303
	CONNECTOR	LCF-300-LC-14.5	02550363-303
±30	PIN	LCF-300-LP-30	02550361-304
	CONNECTOR	LCF-300-LC-30	02550363-304
±45	PIN	LCF-300-LP-45	02550361-307
	CONNECTOR	LCF-300-LC-45	02550363-307
±60	PIN	LCF-300-LP-60	02550361-305
	CONNECTOR	LCF-300-LC-60	02550363-305
±90	PIN	LCF-300-LP-90	02550361-306
	CONNECTOR	LCF-300-LC-90	02550363-306

LCF-300-S: 0-5V OUTPUT

The LCF-300-S Series Inclinometer is a rugged, high performance, single-axis tilt sensor designed for peak performance in extreme conditions. The fluid damped mechanism delivers superior noise rejection in high shock and vibration environments as well as excellent output stability. Units are available with a 6-pin connector or pin-terminals. This version features 0-5V output.

APPLICATIONS:

- High-precision Geotech
- Oil and Gas, Riser Tilt Monitoring
- Railroad MOW Equipment
- Pavement Profiling Rigs
- Vehicle Wheel Alignment
- Robotics

PERFORMANCE SPECIFICATIONS

STATIC/DYNAMIC

INPUT RANGE (°)	±1	±3	±14.5	±30	±60	±90
FULL RANGE OUTPUT (VDC) ¹ ±0.5%	0-5					
NONLINEARITY (% FRO) ² max	0.05	0.04	0.02	0.02	0.02	0.05
SCALE FACTOR (V/g) nominal	143.2	47.8	10.0	5.0	2.9	2.5
SCALE FACTOR TEMP. SENSITIVITY (PPM/°C) max	350	150	100	60	60	60
BANDWIDTH (-3dB) Hz, nominal	0.5	2	15	20	30	30
TRANSVERSE AXIS MISALIGNMENT, ° max	0.25	0.25	0.5	0.5	0.5	0.5
0° OUTPUT (V) nominal	2.48 to 2.52					
0° OUTPUT TEMP. SENSITIVITY (V/°C) max	0.015	0.005	0.001	0.0005	0.0004	0.0003
RESOLUTION & THRESHOLD (µrad) max	1					

PIN OUTS

PIN OPTION

A	POSITIVE INPUT POWER
B	N/C
C	POWER/SIGNAL COMMON
D	SIGNAL OUT
E	N/C
F	N/C

CONNECTOR OPTION

A	RED	POSITIVE INPUT POWER
B	WHITE	POWER/SIGNAL COMMON
C	BLACK	N/C
D	ORANGE	SIGNAL OUT
E	N/C	N/C
F	BLUE	N/C

NOTES:

1. Full Range is defined "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



PRODUCT SPECIFICATIONS: LCF-300-S

ELECTRICAL

NUMBER OF AXES	1
INPUT VOLTAGE RANGE (VDC)	+9 to +18
INPUT CURRENT (mA, max)	40
OUTPUT IMPEDANCE (Ohms, nom)	1
NOISE (Vrms, max)	0.002
MASS (g)	230

ENVIRONMENTAL

OPERATING TEMP. RANGE	-40° to +80°C
STORAGE TEMP. RANGE	-60° to +90°C
SHOCK	1500g, 0.5 msec, ½ sine

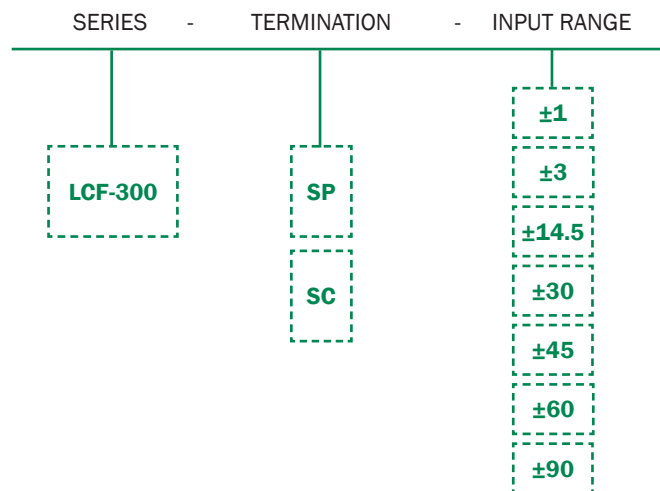
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ORDERING INFORMATION

HOW TO ORDER

Model Numbers are comprised of the series, the series version, connection option, and the input range.

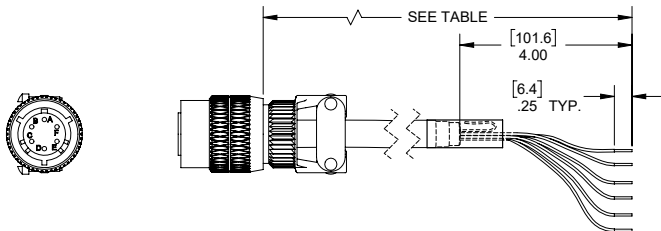


	TERMINATION	MODEL #	PART #
±1	PIN	LCF-300-SP-1	02550361-101
	CONNECTOR	LCF-300-SC-1	02550363-101
±3	PIN	LCF-300-SP-3	02550361-102
	CONNECTOR	LCF-300-SC-3	02550363-102
±14.5	PIN	LCF-300-SP-14.5	02550361-103
	CONNECTOR	LCF-300-SC-14.5	02550363-103
±30	PIN	LCF-300-SP-30	02550361-104
	CONNECTOR	LCF-300-SC-30	02550363-104
±45	PIN	LCF-300-SP-45	02550361-107
	CONNECTOR	LCF-300-SC-45	02550363-107
±60	PIN	LCF-300-SP-60	02550361-105
	CONNECTOR	LCF-300-SC-60	02550363-105
±90	PIN	LCF-300-SP-90	02550361-106
	CONNECTOR	LCF-300-SC-90	02550363-106



ACCESSORIES

CONNECTOR CABLE



PART #	MODEL #	LENGTH ft (m)
879605-001	DSI-CBL-006-1	6 (1.83)
879605-002	DSI-CBL-010-1	10 (3.05)
879605-007	DSI-CBL-02M-1	6.56 (2)
879605-008	DSI-CBL-03M-1	9.84 (3)

LCF-300 SERIES ORDERING INFORMATION

	VERS.	CONNECTION	MODEL #	PART #
±1	D	PIN	LCF-300-DP-1	02550361-201
		CONNECTOR	LCF-300-DC-1	02550363-201
	L	PIN	LCF-300-LP-1	02550361-301
		CONNECTOR	LCF-300-LC-1	02550363-301
	S	PIN	LCF-300-SP-1	02550361-101
		CONNECTOR	LCF-300-SC-1	02550363-101
±3	D	PIN	LCF-300-DP-3	02550361-202
		CONNECTOR	LCF-300-DC-3	02550363-202
	L	PIN	LCF-300-LP-3	02550361-302
		CONNECTOR	LCF-300-LC-3	02550363-302
	S	PIN	LCF-300-SP-3	02550361-102
		CONNECTOR	LCF-300-SC-3	02550363-102
±14.5	D	PIN	LCF-300-DP-14.5	02550361-203
		CONNECTOR	LCF-300-DC-14.5	02550363-203
	L	PIN	LCF-300-LP-14.5	02550361-303
		CONNECTOR	LCF-300-LC-14.5	02550363-303
	S	PIN	LCF-300-SP-14.5	02550361-103
		CONNECTOR	LCF-300-SC-14.5	02550363-103
±30	D	PIN	LCF-300-DP-30	02550361-204
		CONNECTOR	LCF-300-DC-30	02550363-204
	L	PIN	LCF-300-LP-30	02550361-304
		CONNECTOR	LCF-300-LC-30	02550363-304
	S	PIN	LCF-300-SP-30	02550361-104
		CONNECTOR	LCF-300-SC-30	02550363-104

	VERS.	CONNECTION	MODEL #	PART #
±45	D	PIN	LCF-300-DP-45	02550361-207
		CONNECTOR	LCF-300-DC-45	02550363-207
	L	PIN	LCF-300-LP-45	02550361-307
		CONNECTOR	LCF-300-LC-45	02550363-307
	S	PIN	LCF-300-SP-45	02550361-107
		CONNECTOR	LCF-300-SC-45	02550363-107
±60	D	PIN	LCF-300-DP-60	02550361-205
		CONNECTOR	LCF-300-DC-60	02550363-205
	L	PIN	LCF-300-LP-60	02550361-305
		CONNECTOR	LCF-300-LC-60	02550363-305
	S	PIN	LCF-300-SP-60	02550361-105
		CONNECTOR	LCF-300-SC-60	02550363-105
±90	D	PIN	LCF-300-DP-90	02550361-206
		CONNECTOR	LCF-300-DC-90	02550363-206
	L	PIN	LCF-300-LP-90	02550361-306
		CONNECTOR	LCF-300-LC-90	02550363-306
	S	PIN	LCF-300-SP-90	02550361-106
		CONNECTOR	LCF-300-SC-90	02550363-106

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