

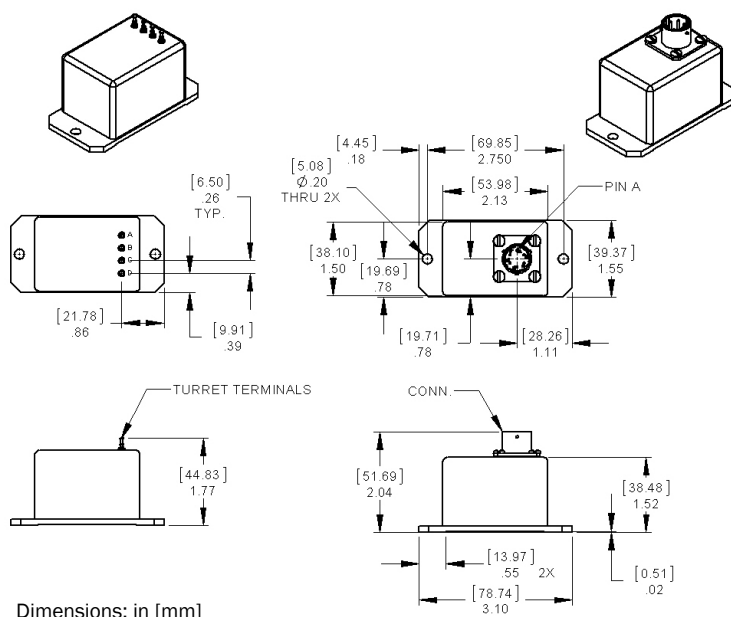
SMI SERIES

Single-Axis Analog Inclinometer

The Jewell SMI Single-Axis Analog Inclinometer series are rugged, high precision force-balanced inclinometers. These RoHS compliant inclinometers are available in three different versions (D, L, & S Series), with either a connector or a pin option, and varying input and output specifications in order to meet your needs.

FEATURES:

- Rugged Design
- Lower Cost than Traditional Forced-Balance Inclinometers
- High Resolution
- Greater Precision than MEMS Technologies
- $\pm 5V$ DC, 0-5V DC, and 4-20mA Outputs Available
- Single-Ended and Dual Power Inputs Available
- RoHS Compliant

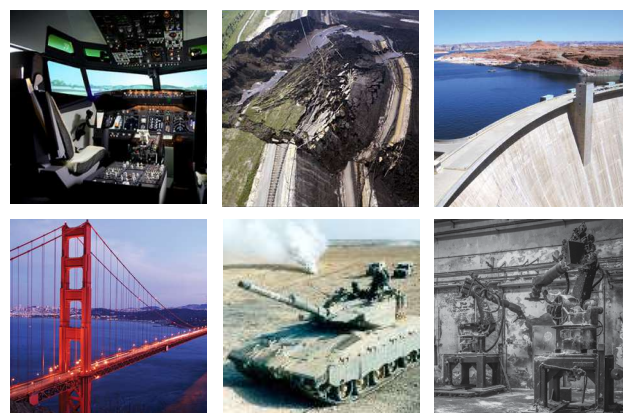


Dimensions: in [mm]



JEWELL EMERALD SERIES

The Jewell Emerald Series inclinometer is a low cost, inclinometer designed with higher precision than comparable MEMS devices.



APPLICATIONS:

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



SMI-D: $\pm 5V$ OUTPUT

The Jewell SMI series version D is a rugged, high precision **dual-ended** power input inclinometer. This version features a $\pm 5V$ DC output and input ranges from $\pm 3^\circ$ to $\pm 90^\circ$. Available with either a connector or a pin option.

APPLICATIONS:

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

PERFORMANCE SPECIFICATIONS

STATIC/DYNAMIC

INPUT RANGE ($^\circ$)	± 3	± 14.5	± 30	± 45	± 60	± 90
FULL RANGE OUTPUT (VDC, FRO $\pm 0.5\%$) ¹	± 5					
NONLINEARITY (% FRO) ² max	0.05	0.02	0.02	0.02	0.04	0.05
SCALE FACTOR (Volts/g) nominal	95.5	20.0	10.0	7.1	5.8	5
SCALE FACTOR TEMP. SENSITIVITY (SFTS) PPM/ $^\circ C$ max	100					
BANDWIDTH (-3dB) Hz, nominal	5.0					
OUTPUT AXIS MISALIGNMENT, $^\circ$ max	0.25	0.50	0.50	0.50	0.50	0.50
PENDULOUS AXIS MISALIGNMENT, $^\circ$ max	0.25	0.50	0.50	0.50	0.50	0.50
0 $^\circ$ OUTPUT (Volts Range)	± 0.05					
0 $^\circ$ OUTPUT TEMP. SENSITIVITY (Volts/ $^\circ C$) max	0.0070	0.0017	0.0010	0.0008	0.0007	0.0007
RESOLUTION & THRESHOLD (μrad) ³	3.5					

PIN OUTS

PIN OPTION

A	POSITIVE INPUT POWER
B	POWER/SIGNAL COMMON
C	NEGATIVE INPUT POWER
D	SIGNAL

CONNECTOR OPTION

A	RED	POSITIVE INPUT POWER
B	WHITE	POWER/SIGNAL COMMON
C	BLACK	NEGATIVE INPUT POWER
D	ORANGE	SIGNAL
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.
3. Full Resolution is achieved with noise reduction techniques



PRODUCT SPECIFICATIONS: SMI-D

ELECTRICAL

NUMBER OF AXES	1
INPUT VOLTAGE RANGE (VDC)	± 12 to ± 18
INPUT CURRENT (mA, max)	40
OUTPUT IMPEDANCE (Ohms, nom)	10
NOISE (Vrms, max)	0.002

ENCLOSURE

SEAL	IP65
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ENVIRONMENTAL

OPERATING TEMP. RANGE	-55° to +85° C
STORAGE TEMP. RANGE	-60° to +90° C
SHOCK	500g, 1 msec, ½ sine

CUSTOM CAPABILITIES

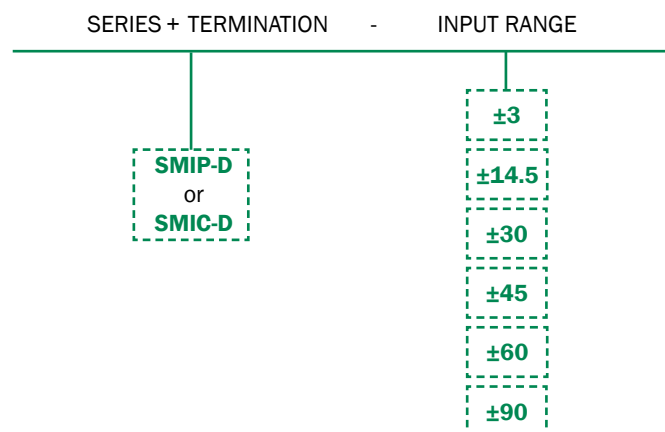
D-SERIES

- Pigtail & Connector alternative options available
- Custom ranges available

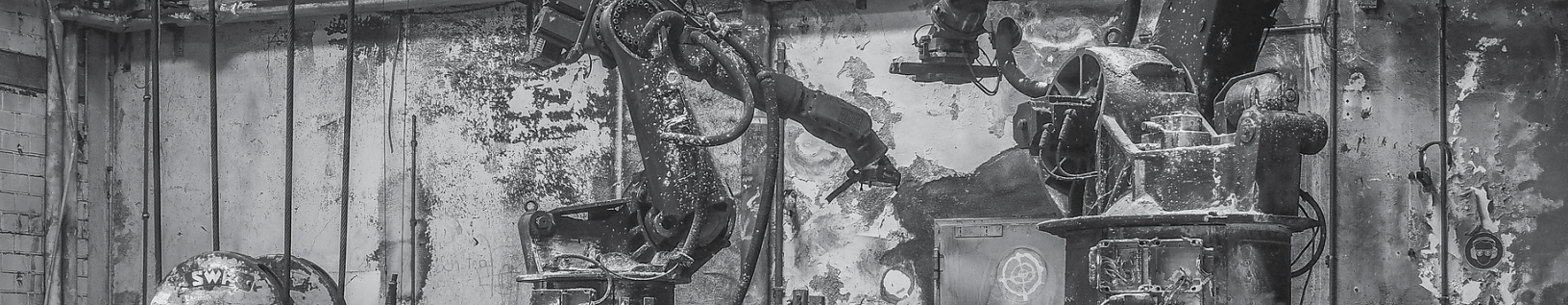
ORDERING INFORMATION

HOW TO ORDER

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



	TERMINATION	MODEL #	PART #
± 3	PIN	SMIP-D-3	02550307-001
	CONNECTOR	SMIC-D-3	02550308-001
± 14.5	PIN	SMIP-D-14.5	02550307-002
	CONNECTOR	SMIC-D-14.5	02550308-002
± 30	PIN	SMIP-D-30	02550307-003
	CONNECTOR	SMIC-D-30	02550308-003
± 45	PIN	SMIP-D-45	02550307-004
	CONNECTOR	SMIC-D-45	02550308-004
± 60	PIN	SMIP-D-60	02550307-005
	CONNECTOR	SMIC-D-60	02550308-005
± 90	PIN	SMIP-D-90	02550307-006
	CONNECTOR	SMIC-D-90	02550308-006



SMI-L: 4-20mA OUTPUT

The Jewell SMI series version L is a rugged, high precision **single-axis 4-20mA** inclinometer. These units operate as a 3-wire current loop for use with any 4-20mA PLC or data logger. This version is ideal for applications requiring long cable runs. Available with either a connector or a pin option.

APPLICATIONS:

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

PERFORMANCE SPECIFICATIONS

STATIC/DYNAMIC

INPUT RANGE (°)	±3	±14.5	±30	±45	±60	±90
FULL RANGE OUTPUT (mA, ±1%) ¹	4-20					
NONLINEARITY (% FRO) ² max	0.05	0.02	0.02	0.02	0.04	0.05
SCALE FACTOR (mA/g) nominal	152.9	32	16	11.3	9.2	8
SCALE FACTOR TEMP. SENSITIVITY (SFTS) PPM/°C max	100					
BANDWIDTH (-3dB) Hz, nominal	5.0					
OUTPUT AXIS MISALIGNMENT, ° max	0.25	0.50	0.50	0.50	0.50	0.50
PENDULOUS AXIS MISALIGNMENT, ° max	0.25	0.50	0.50	0.50	0.50	0.50
0° OUTPUT (mA)	11.7 to 12.3					
0° OUTPUT TEMP. SENSITIVITY (mA/°C) max	0.01	0.003	0.002	0.0015	0.0015	0.0015
RESOLUTION & THRESHOLD (µrad) ³	3.5					

PIN OUTS

PIN OPTION

A	POSITIVE INPUT POWER
B	POWER/SIGNAL COMMON
C	N/C
D	SIGNAL

CONNECTOR OPTION

A	RED	POSITIVE INPUT POWER
B	WHITE	POWER/SIGNAL COMMON
C	BLACK	N/C
D	ORANGE	SIGNAL
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.
3. Full Resolution is achieved with noise reduction techniques

PRODUCT SPECIFICATIONS: SMI-L

ELECTRICAL

NUMBER OF AXES	1
INPUT VOLTAGE RANGE (VDC)	+12 to +28
INPUT CURRENT (mA, max)	55
OUTPUT IMPEDANCE (Ohms, nom)	-
NOISE (Vrms, max)	0.006

ENCLOSURE

SEAL	IP65
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ENVIRONMENTAL

OPERATING TEMP. RANGE	-55° to +85° C
STORAGE TEMP. RANGE	-60° to +90° C
SHOCK	500g, 1 msec, ½ sine

CUSTOM CAPABILITIES

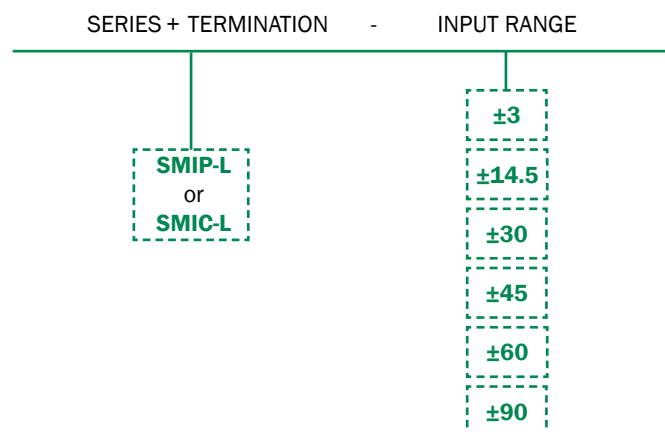
L-SERIES

- Pigtail & Connector alternative options available
- Custom ranges available

ORDERING INFORMATION

HOW TO ORDER

Model numbers are comprised of the series and connectivity, the series version, and the input range.



	TERMINATION	MODEL #	PART #
±3	PIN	SMIP-L-3	02550330-001
	CONNECTOR	SMIC-L-3	02550331-001
±14.5	PIN	SMIP-L-14.5	02550330-002
	CONNECTOR	SMIC-L-14.5	02550331-002
±30	PIN	SMIP-L-30	02550330-003
	CONNECTOR	SMIC-L-30	02550331-003
±45	PIN	SMIP-L-45	02550330-004
	CONNECTOR	SMIC-L-45	02550331-004
±60	PIN	SMIP-L-60	02550330-005
	CONNECTOR	SMIC-L-60	02550331-005
±90	PIN	SMIP-L-90	02550330-006
	CONNECTOR	SMIC-L-90	02550331-006



SMI-S: 0-5V OUTPUT

The Jewell SMI series version S is a rugged, high precision **single-ended** power input inclinometer. This version features a 0-5V DC output and input ranges from $\pm 3^\circ$ to $\pm 90^\circ$. Available with either a connector or a pin option.

APPLICATIONS:

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

PERFORMANCE SPECIFICATIONS

STATIC/DYNAMIC

INPUT RANGE ($^\circ$)	± 3	± 14.5	± 30	± 45	± 60	± 90
FULL RANGE OUTPUT (VDC, FRO $\pm 0.5\%$) ¹	0-5					
NONLINEARITY (% FRO) ² max	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/ $^\circ$ C max	100					
BANDWIDTH (-3dB) Hz, nominal	5.0					
OUTPUT AXIS MISALIGNMENT, $^\circ$ max	0.25	0.50	0.50	0.50	0.50	0.50
PENDULOUS AXIS MISALIGNMENT, $^\circ$ max	0.25	0.50	0.50	0.50	0.50	0.50
0 $^\circ$ OUTPUT (Volts Range)	+2.45 to +2.55					
0 $^\circ$ OUTPUT TEMP. SENSITIVITY (Volts/ $^\circ$ C) max	0.0035	0.0010	0.0007	0.0005	0.0005	0.0005
RESOLUTION & THRESHOLD (μ rad) ³	3.5					

PIN OUTS

PIN OPTION

A	POSITIVE INPUT POWER
B	POWER/SIGNAL COMMON
C	N/C
D	SIGNAL

CONNECTOR OPTION

A	RED	POSITIVE INPUT POWER
B	WHITE	POWER/SIGNAL COMMON
C	BLACK	N/C
D	ORANGE	SIGNAL
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.
3. Full Resolution is achieved with noise reduction techniques

PRODUCT SPECIFICATIONS: SMI-S

ELECTRICAL

NUMBER OF AXES	1
INPUT VOLTAGE RANGE (VDC)	+15 to +30
INPUT CURRENT (mA, max)	40
OUTPUT IMPEDANCE (Ohms, nom)	10
NOISE (Vrms, max)	0.002

ENCLOSURE

SEAL	IP65
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ENVIRONMENTAL

OPERATING TEMP. RANGE	-55° to +85° C
STORAGE TEMP. RANGE	-60° to +90° C
SHOCK	500g, 1 msec, ½ sine

CUSTOM CAPABILITIES

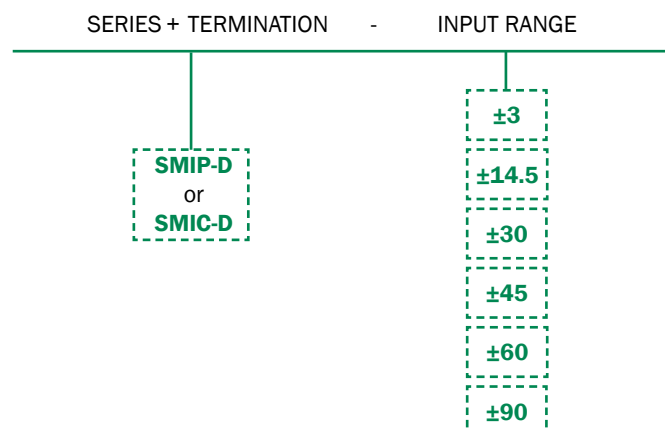
S-SERIES

- Pigtail & Connector alternative options available
- Custom ranges available

ORDERING INFORMATION

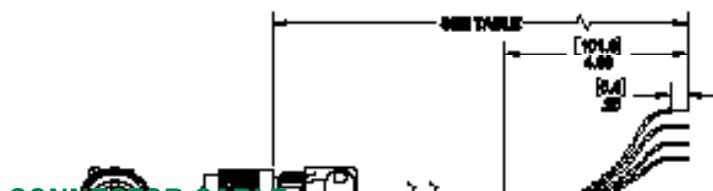
HOW TO ORDER

Model numbers are comprised of the series and connectivity, the series version, and the input range.

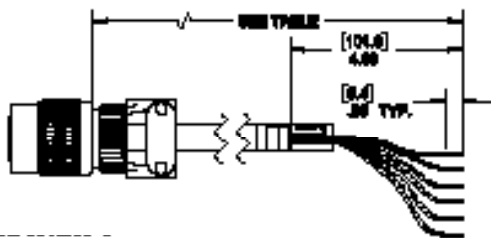


	TERMINATION	MODEL #	PART #
±3	PIN	SMIP-S-3	02550303-001
	CONNECTOR	SMIC-S-3	02550304-001
±14.5	PIN	SMIP-S-14.5	02550303-002
	CONNECTOR	SMIC-S-14.5	02550304-002
±30	PIN	SMIP-S-30	02550303-003
	CONNECTOR	SMIC-S-30	02550304-003
±45	PIN	SMIP-S-45	02550303-004
	CONNECTOR	SMIC-S-45	02550304-004
±60	PIN	SMIP-S-60	02550303-005
	CONNECTOR	SMIC-S-60	02550304-005
±90	PIN	SMIP-S-90	02550303-006
	CONNECTOR	SMIC-S-90	02550304-006

REVISIONS				
REV	DESCRIPTION	DATE	BY	APPROVED
1	ORIGINAL	2019	DSI	
2	ADD 475	2019	DSI	
3	ADD 475	2019	DSI	
4	ADD 475	2019	DSI	
5	ADD 475	2019	DSI	
6	ADD 475	2019	DSI	
7	ADD 475	2019	DSI	
8	ADD 475	2019	DSI	
9	ADD 475	2019	DSI	
10	ADD 475	2019	DSI	



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)
879605-015	DSI-CBL-15M-1	49.21 (15)
879605-016	DSI-CBL-24M-1	78.75 (24)
879605-020	DSI-CBL-05M-1	16.4 (5)
879605-021	DSI-CBL-100M-1	328.1 (100)
879605-022	DSI-CBL-85M-1	278.9 (85)
879605-023	DSI-CBL-82M-1	269.1 (82)
879605-024	DSI-CBL-68M-1	223.1 (68)
9605-025	DSI-CBL-52M-1	170.6 (52)
9605-026	DSI-CBL-40M-1	131.2 (40)
9605-027	DSI-CBL-10M-1	32.8 (10)
9605-028	DSI-CBL-020-1	20 (6.10)

SMI SERIES ORDERING INFORMATION

	VERSION	TERMINATION	MODEL #	PART #
±3	D	PIN	SMIP-D-3	02550307-001
		CONNECTOR	SMIC-D-3	02550308-001
	L	PIN	SMIP-L-3	02550330-001
		CONNECTOR	SMIC-L-3	02550331-001
±14.5	D	PIN	SMIP-D-14.5	02550307-002
		CONNECTOR	SMIC-D-14.5	02550308-002
	L	PIN	SMIP-L-14.5	02550330-002
		CONNECTOR	SMIC-L-14.5	02550331-002
±30	D	PIN	SMIP-D-30	02550307-003
		CONNECTOR	SMIC-D-30	02550308-003
	L	PIN	SMIP-L-30	02550330-003
		CONNECTOR	SMIC-L-30	02550331-003

	VERSION	TERMINATION	MODEL #	PART #
±45	D	PIN	SMIP-D-45	02550307-004
		CONNECTOR	SMIC-D-45	02550308-004
	L	PIN	SMIP-L-45	02550330-004
		CONNECTOR	SMIC-L-45	02550331-004
±60	D	PIN	SMIP-D-60	02550307-005
		CONNECTOR	SMIC-D-60	02550308-005
	L	PIN	SMIP-L-60	02550330-005
		CONNECTOR	SMIC-L-60	02550331-005
±90	D	PIN	SMIP-D-90	02550307-006
		CONNECTOR	SMIC-D-90	02550308-006
	L	PIN	SMIP-L-90	02550330-006
		CONNECTOR	SMIC-L-90	02550331-006

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