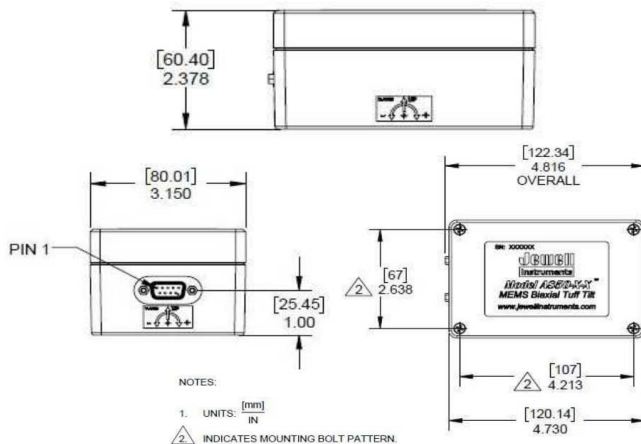


850 Series MEMS Tuff Tilt

This geotechnical MEMS tiltmeter is available in uniaxial and biaxial configurations. It presents a robust and rugged design for outdoor geotechnical use, but with the benefit of low-cost MEMS technology and $\pm 5\text{VDC}$, $0-5\text{ VDC}$, or $4-20\text{ mA}$ output signals. It is an effective tilt sensing solution for platform leveling/positioning, structural monitoring, construction monitoring, industrial machinery positioning, radial gate measurement & control.

FEATURES:

- Robust and Rugged Enclosure
- Uniaxial and Biaxial Models Available
- Low-Cost MEMS Technology
- RoHS Compliant
- Filtering Available
- Temperature Sensor Option Available
- IP65 Seal



Dimensions: in [mm]



APPLICATIONS:

- Platform Leveling/Positioning
- Structural Monitoring
- Construction Monitoring
- Industrial Machinery Positioning
- Radial Gate Measurement & Control

A850-D: $\pm 5V$ OUTPUT

The A850 MEMS Tuff Tilt series is available in uniaxial and biaxial configurations. This presents a robust and rugged design for industrial use, but with the benefit of low-cost MEMS technology.

APPLICATIONS:

- Platform Leveling/Positioning
- Structural Monitoring
- Construction Monitoring
- Industrial Machinery Positioning
- Radial Gate Measurement & Control

PERFORMANCE SPECIFICATIONS

STATIC/DYNAMIC

INPUT RANGE (°)	± 14.5	± 30	± 90
FULL RANGE OUTPUT (VDC) ¹	± 5		
NONLINEARITY (% FRO) ²	0.05		
SCALE FACTOR TOLERANCE (%)	± 1		
SCALE FACTOR SENSITIVITY (PPM/° C max)	150		
BANDWIDTH (-3dB) Hz, nominal	5		
TRANSVERSE AXIS MISALIGNMENT (° max)	± 0.5		
0° OUTPUT (VDC) nominal	± 0.03		
0° OUTPUT TEMP. SENSITIVITY (Volts/° C) max	± 0.004		
RESOLUTION (° max) ³	0.002	0.002	0.004
THRESHOLD (° max)	0.002		
NONREPEATABILITY, HYSTERESIS (% FRO max)	0.014	0.007	0.004
WARM UP TIME (seconds max)	0.5		
VOLTAGE TO RADIAN CONVERSION ⁴	ASIN(<voltage>/20)	ASIN(<voltage>/10)	ASIN(<voltage>/5)
TEMPERATURE SENSOR	PTC Thermistor, Nominal resistance is 1k Ω , +/-2%, dissipation constant 2mW/C		

T OUTS

1	+PWR	7	SIG RTN
2	PWR RTN	8	THRM+
3	N/C	9	THRM-
4	X OUT		
5	Y OUT		
6	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
4. Does not take into account any sources of error.



PRODUCT SPECIFICATIONS: A850-D

ELECTRICAL

NUMBER OF AXES	1 or 2
INPUT VOLTAGE RANGE (VDC)	±12 to ±18
INPUT CURRENT (mA, max)	±6
NOISE (Vrms, max)	0.005
WEIGHT (g)	165 (1 axis), 170 (2 axes)

ENVIRONMENTAL

OPERATING TEMP. RANGE	-40° to +80° C
STORAGE TEMP. RANGE	-40 to +95° C
SHOCK	100 g, 0.011 sec, ½ sine

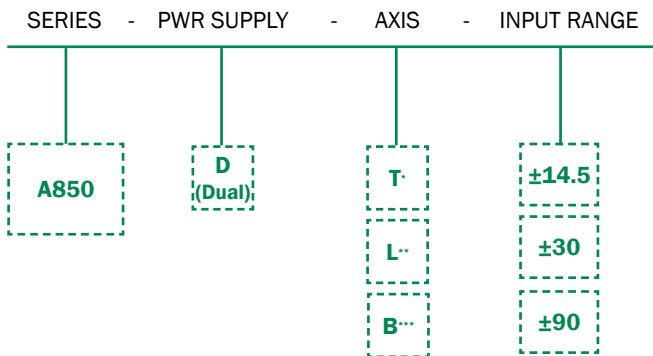
ENCLOSURE

SEAL	IP65
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ORDERING INFORMATION

HOW TO ORDER

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



- *Transverse (Uniaxial)
- **Longitudinal (Uniaxial)
- ***Biaxial

	AXIS	MODEL #	PART #
±14.5	T	A850-D-T-14.5	98850-07
	L	A850-D-L-14.5	98850-13
	B	A850-D-B-14.5	98850-01
±30	T	A850-D-T-30	98850-08
	L	A850-D-L-30	98850-14
	B	A850-D-B-30	98850-02
±90	T	A850-D-T-90	98850-09
	L	A850-D-L-90	98850-15
	B	A850-D-B-90	98850-03

A850-S: 0-5VDC Output

The A850 MEMS Tuff Tilt series is available in uniaxial and biaxial configurations. This presents a robust and rugged design for industrial use, but with the benefit of low-cost MEMS technology.

APPLICATIONS:

- Platform Leveling/Positioning
- Structural Monitoring
- Construction Monitoring
- Industrial Machinery Positioning
- Radial Gate Measurement & Control

PERFORMANCE SPECIFICATIONS

STATIC/DYNAMIC

INPUT RANGE (°)	±14.5	±30	±90
FULL RANGE OUTPUT (VDC) ¹	0-5		
NONLINEARITY (% FRO) ²	0.05		
SCALE FACTOR TOLERANCE (%)	±1		
SCALE FACTOR SENSITIVITY (PPM/°C max)	150		
BANDWIDTH (-3dB) Hz, nominal	5		
TRANSVERSE AXIS MISALIGNMENT (° max)	±0.5		
0° OUTPUT (VDC) nominal	±0.03		
0° OUTPUT TEMP. SENSITIVITY (Volts/°C) max	±0.004		
RESOLUTION (° max) ³	0.002	0.002	0.004
THRESHOLD (° max)	0.002		
NONREPEATABILITY, HYSTERESIS (% FRO max)	0.014	0.007	0.004
WARM UP TIME (seconds max)	0.5		
VOLTAGE TO RADIAN CONVERSION ⁴	ASIN((<voltage> - 2.5)/10)	ASIN((<voltage> - 2.5)/5)	ASIN((<voltage> - 2.5)/2.5)
TEMPERATURE SENSOR	PTC Thermistor, Nominal resistance is 1kohm, +/-2%, dissipation constant 2mW/C		

T OUTS

1	+PWR	7	SIG RTN
2	PWR RTN	8	THRM+
3	N/C	9	THRM-
4	X OUT		
5	Y OUT		
6	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
4. Does not take into account any sources of error.



PRODUCT SPECIFICATIONS: A850-D

ELECTRICAL

NUMBER OF AXES	1 or 2
INPUT VOLTAGE RANGE (VDC)	12 to 30
INPUT CURRENT (mA, max)	7
NOISE (Vrms, max)	0.005
OUTPUT IMPEDANCE (Ohms nom)	1
WEIGHT (g)	165 (1 axis), 170 (2 axes)

ENVIRONMENTAL

OPERATING TEMP. RANGE	-40° to +80° C
STORAGE TEMP. RANGE	-40 to +95° C
SHOCK	100 g, 0.011 sec, ½ sine

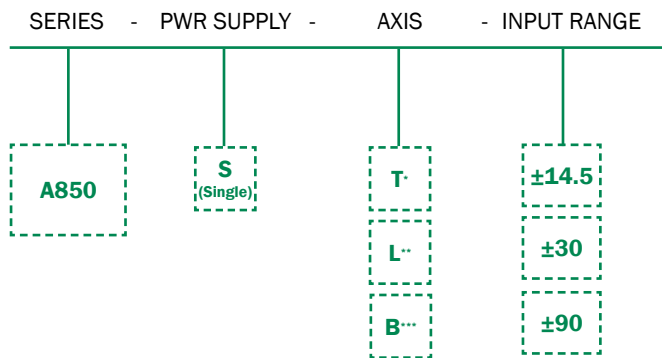
ENCLOSURE

SEAL	IP65
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ORDERING INFORMATION

HOW TO ORDER

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



*Transverse (Uniaxial)
 **Longitudinal (Uniaxial)
 ***Biaxial

	AXIS	MODEL #	PART #
±14.5	T	A850-S-T-14.5	98850-10
	L	A850-S-L-14.5	98850-16
	B	A850-S-B-14.5	98850-04
±30	T	A850-S-T-30	98850-11
	L	A850-S-L-30	98850-17
	B	A850-S-B-30	98850-05
±90	T	A850-S-T-90	98850-12
	L	A850-S-L-90	98850-18
	B	A850-S-B-90	98850-06

C850: 4-20mA Output

The C850 MEMS Tuff Tilt series is available in uniaxial and biaxial configurations. This presents a robust and rugged design for industrial use, but with the benefit of low-cost MEMS technology.

APPLICATIONS:

- Platform Leveling/Positioning
- Structural Monitoring
- Construction Monitoring
- Industrial Machinery Positioning
- Radial Gate Measurement & Control

PERFORMANCE SPECIFICATIONS

STATIC/DYNAMIC

INPUT RANGE (°)	±14.5	±30	±90
FULL RANGE OUTPUT (mA) ¹	4-20		
NONLINEARITY (% FRO) ²	0.05		
SCALE FACTOR TOLERANCE (%)	±1		
SCALE FACTOR SENSITIVITY (PPM/° C max)	150		
BANDWIDTH (-3dB) Hz, nominal	5		
TRANSVERSE AXIS MISALIGNMENT (° max)	±0.5		
0° OUTPUT (mA) nominal	12 ±0.03		
0° OUTPUT TEMP. SENSITIVITY (mA/° C) max	±0.004		
RESOLUTION (° max) ³	0.002	0.002	0.004
THRESHOLD (° max)	0.002		
NONREPEATABILITY, HYSTERESIS (% FRO max)	0.014	0.007	0.004
WARM UP TIME (seconds max)	0.5		
VOLTAGE TO RADIAN CONVERSION ⁴	$\arcsin((\text{output} - 12\text{mA}) / 32\text{mA})$	$\arcsin((\text{output} - 12\text{mA}) / 16\text{mA})$	$\arcsin((\text{output} - 12\text{mA}) / 8\text{mA})$
TEMPERATURE SENSOR	PTC Thermistor, Nominal resistance is 1kohm, +/-2%, dissipation constant 2mW/C		

T OUTS

1	+PWR	7	SIG RTN
2	PWR RTN	8	THRM+
3	N/C	9	THRM-
4	X OUT		
5	Y OUT		
6	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
4. Does not take into account any sources of error.



PRODUCT SPECIFICATIONS: C850

ELECTRICAL

NUMBER OF AXES	1 or 2
INPUT VOLTAGE RANGE (VDC)	12 to 30
INPUT CURRENT (mA, max)	28
OUTPUT IMPEDANCE (Ohms nom)	1
NOISE (Vrms, max)	0.01
WEIGHT (g)	165 (1 axis), 170 (2 axes)

ENVIRONMENTAL

OPERATING TEMP. RANGE	-40° to +80° C
STORAGE TEMP. RANGE	-40 to +95
SHOCK	100 g, 0.011 sec, ½ sine

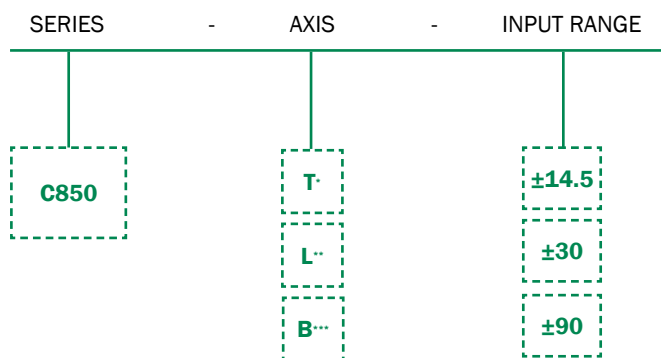
ENCLOSURE

SEAL	IP65
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ORDERING INFORMATION

HOW TO ORDER

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



*Transverse (Uniaxial)
 **Longitudinal (Uniaxial)
 ***Biaxial

	AXIS	MODEL #	PART #
±14.5	T	C850-T-14.5	98850-23
	L	C850-L-14.5	98850-26
	B	C850-B-14.5	98850-20
±30	T	C850-T-30	98850-24
	L	C850-L-30	98850-27
	B	C850-B-30	98850-21
±90	T	C850-T-90	98850-25
	L	C850-L-90	98850-28
	B	C850-B-90	98850-22



ACCESSORIES

PART #	MODEL #	DESCRIPTION
84051-01	84051	Horizontal Mounting Bracket kit w/Mounting Hardware (includes alien wrench, x# mounting studs, washers, and hex nuts)
01454-01	01454-01	Horizontal Mounting Bracket only
81439-01	81439	Vertical Mounting Bracket Kit w/Mounting Hardware (includes alien wrench, x3 expansion anchors and x4 cap screws)
01439	01439	Vertical Mounting Bracket only
00210-49	00210-49	Enclosure Screws Ea. 8-J2x 5/8" (need 4 screws to mount brackets ON: 014545-01, Horizout:11 Mtg Bracket and PN: 01439, Vertical Mtg Bracket)
65050	65050	Connector, O-Sub Mini, Female 9 Pin
65052-01	65052	Connector Hood for a O-Sub, 9 Pin
70304	70304	Power/signal I O-conductor Cable, 24 A WG, polypropylene jacket, price/ft. (Specify total length on order)
879605-008	DSI-CBL-03M-1	9.84 (3)

850 SERIES ORDERING INFORMATION

	VERSION	AXIS	MODEL #	PART #
±14.5	D	T	A850-D-T-14.5	98850-07
		L	A850-D-L-14.5	98850-13
		B	A850-D-B-14.5	98850-01
	S	T	A850-S-T-14.5	98850-10
		L	A850-S-L-14.5	98850-16
		B	A850-S-B-14.5	98850-04
	C	T	C850-T-14.5	98850-23
		L	C850-L-14.5	98850-26
		B	C850-B-14.5	98850-20
±30	D	T	A850-D-T-30	98850-08
		L	A850-D-L-30	98850-14
		B	A850-D-B-30	98850-02
	S	T	A850-S-T-30	98850-11
		L	A850-S-L-30	98850-17
		B	A850-S-B-30	98850-05
	C	T	C850-T-30	98850-24
		L	C850-L-30	98850-27
		B	C850-B-30	98850-21

	VERSION	AXIS	MODEL #	PART #
±90	D	T	A850-D-T-90	98850-09
		L	A850-D-L-90	98850-15
		B	A850-D-B-90	98850-03
	S	T	A850-S-T-90	98850-12
		L	A850-S-L-90	98850-18
		B	A850-S-B-90	98850-06
	C	T	C850-T-90	98850-25
		L	C850-L-90	98850-28
		B	C850-B-90	98850-22

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