AMETEK®
ULTRA PRECISION TECHNOLOGIES

Solartron Metrology
Precision Driven

Displacement Sensors

High Performance Displacement Transducers
S Series



Description

The S Series Displacement Sensor is the accumulation of many years' experience gained from Solartron's pedigree of producing excellent displacement sensors coupled with attention to market feedback.
The result is a large range of sensors both 'off the shelf' and 'customer specials' that are better able to satisfy today's demanding manufacturing and research applications.

Features

- <0.2% Linearity
- Analogue, DC and 4-20mA versions
- 19 mm diameter stainless steel body
- IP65 and IP67 option
- Excellent measuring range for the body length
- Multiple output options with integrated electronics
- Large bore to core clearance for ease of installation
- Excellent magnetic shielding
- Wide range of signal conditioning and instrumentation
- Absolute Positioning

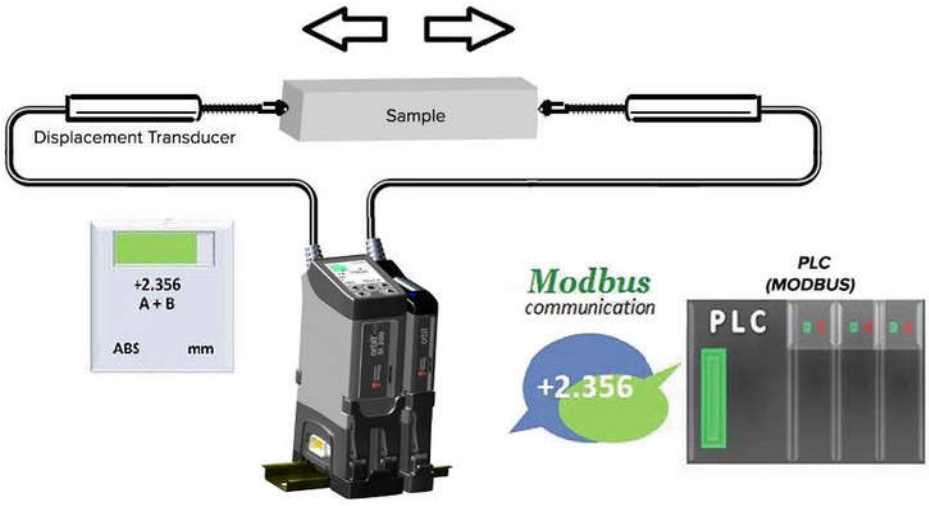


The stainless steel body and IP67 Sealing coupled with polymer bearings and 6 mm diameter carriers ensure the transducers keep working accurately and reliably even in wet and corrosive environments.
The large core to bore clearance enables easier installation.

The S Series product has provided the perfect base for the development of the SR ruggedised transducer range – Please see SR Series data sheet for details.

Precision. Quality. Reliability

Application Example







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Technical Specification

Generic Product Types

LVDT	S002.5	S005.0	S007.5	S010.0	S015.0	S025.0	S050.0	S075.0	S100.0	S150.0
Voltage Output (±DC Bipolar)	V002.5	V005.0	V007.5	V010.0	V015.0	V025.0	V050.0	V075.0	V100.0	V150.0
Voltage Output (DC Unipolar)	V005.0	V010.0	V015.0	V020.0	V030.0	V050.0	V100.0	V150.0	V200.0	V300.0
Current Output (4-20mA)	I005.0	I010.0	I015.0	I020.0	I030.0	I050.0	I100.0	I150.0	I200.0	I250.0
Digital Output (Orbit)	SD005	SD010	SD015	SD020	SD030	SD050	SD100	SD150	SD200	SD250

Measurement

Measurement Range (LVDT/±DC) (mm)	±2.5	±5	±7.5	±10	±15	±25	±50	±75	±100	±150
Measurement Range (4-20mA/DC/ORBIT) (mm)	5	10	15	20	30	50	100	150	200	300
Linearity (% FSO)	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.25
Resolution µm (Note 1)	<0.1	<0.1	<0.1	<0.2	<0.2	<0.3	<0.5	<0.7	<1.0	<2.0
Pre-travel ±0.5 mm (Guided Versions only)	2.0	3.0	1.6	3.1	6.7	6.9	4.9	5.0	8.8	16.2
Post Travel ±0.5 mm (Guided Versions only)	4.3	5.3	3.9	5.6	9.0	9.3	7.3	7.4	11.1	18.6
Temperature Coefficients (%FSO/°C) LVDT	<0.02	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.015	<0.01	<0.01
Temperature Coefficients (%FSO/°C) DC/4-20mA	<0.03	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.03	<0.02	<0.02
Tip Force ±20% (Horizontal at middle of range) N	1.1	1.0	1.0	1.1	1.2	1.5	2.1	1.9	2.3	2.6

Mechanical

Nominal Mass (g) LVDT	58	66	67	80	92	110	153	167	243	344
Nominal Mass (g) (4-20mA/DC)	72	80	81	94	106	124	167	181	257	358
Nominal Mass of Core (g)	2.6	5.0	5.8	7.2	6.4	6.6	9.0	9.0	9.0	9.0
Body diameter (mm)	19 (+0.0, -0.2)									
Case material	300 Series Stainless Steel									
Core material	Nickel Iron									
Cable Standard Type/Length (m)	F.E.P./3									

Electrical Interface (LVDT)

Energising Voltage (Vrms) at 5 kHz	1-10									
Energising Current at 5kHz (mA/V)	1.00	2.60	2.20	0.70	1.50	0.50	0.60	2.50	1.65	1.83
Sensitivity at 5kHz ±5% mv/V/mm	144.0	178.0	121.0	76.0	60.0	21.5	15.0	10.5	6.9	3.9

Electrical Interface (4-20mA & DC)

Input	10 to 30 V @ 30mA (Typ) or 4-20mA loop powered
Noise (DC Output) measured in 500Hz	<0.2 % FSO
Output Change with Power Supply Variation	<0.5 mV
Bandwidth (-3dB)	500Hz

Electrical Interface (ORBIT)

Bandwidth	Up to 460 Hz (selectable)
Output	Solartron Orbit
Power (VDC)	5±0.25 @ 0.06A
Sealing (Orbit Module)	IP43

Note 1: Resolution specification is only applicable to Orbit® digital transducers.
The resolution of LVDT transducers is effectively infinite and is only limited by the conditioning electronics

Technical Specification

Environment

Temperature (Standard LVDT)	-40 to +120 °C
Temperature (HT LVDT)	-40 to +200 °C
Operating/Storage Temperature (4-20mA/DC)	0 to +65 / -20 to 85 °C
Sealing	IP65 or IP67
Vibration Sinusoidal	1 to 10g rms linear 10 to 50 Hz & 10g rms 50Hz to 1kHz
Vibration Random	DO160F Curve D
Shock	Drop test from 1m onto hard surface

S Series Options

Standard Output Options
LVDT
±5V DC
±10V DC
0-5V DC
5-0V DC
0-10V DC
10-0V DC
4-20 mA
20-4 mA
Solartron Orbit (Digital)
TTL

Mechanical Options
Free Core
Free Core/Carrier
Guided Core
Tip
Spring Push
Universal Joints

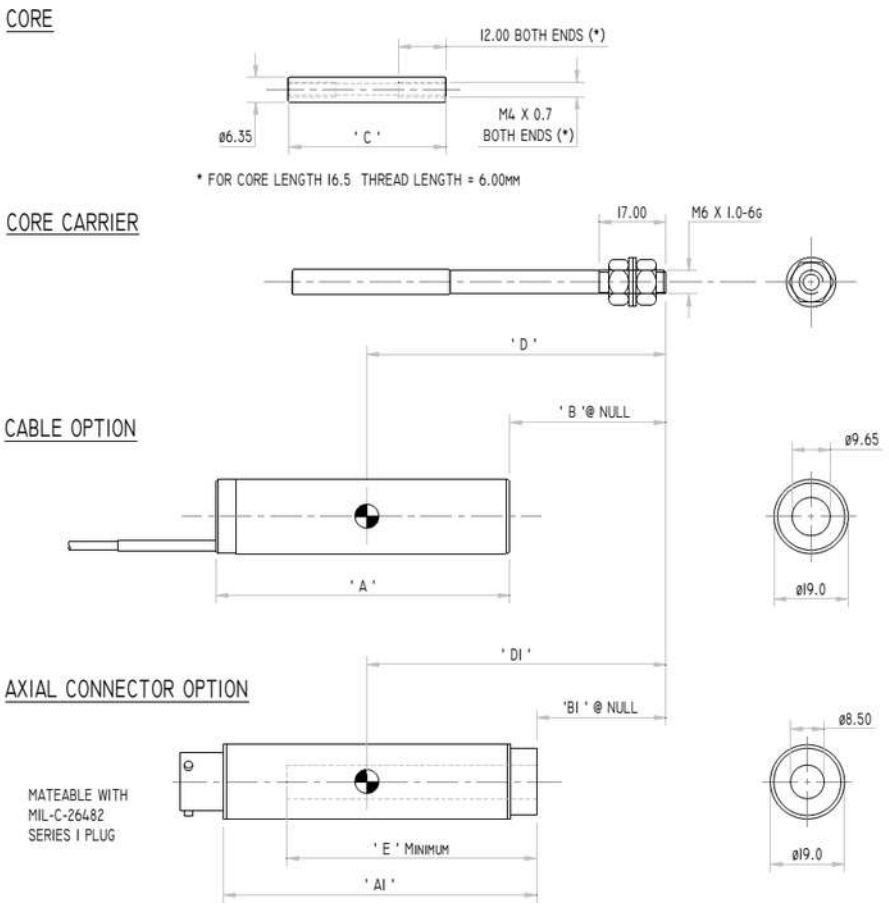
Connection Options
Cable (wire ends)
Cable + Connector
Axial Connector
Orbit Module

For non standard products contact your local Sales Office or Distributor

Solartron can provide a range of LVDT Conditioning Modules and Readouts for use with the LVDT versions of the S Series. Please see the LVDT Conditioning Data Sheet

S Series Dimensions

Free Core, Free Core with Carrier, Cable and Axial Connector Body Types



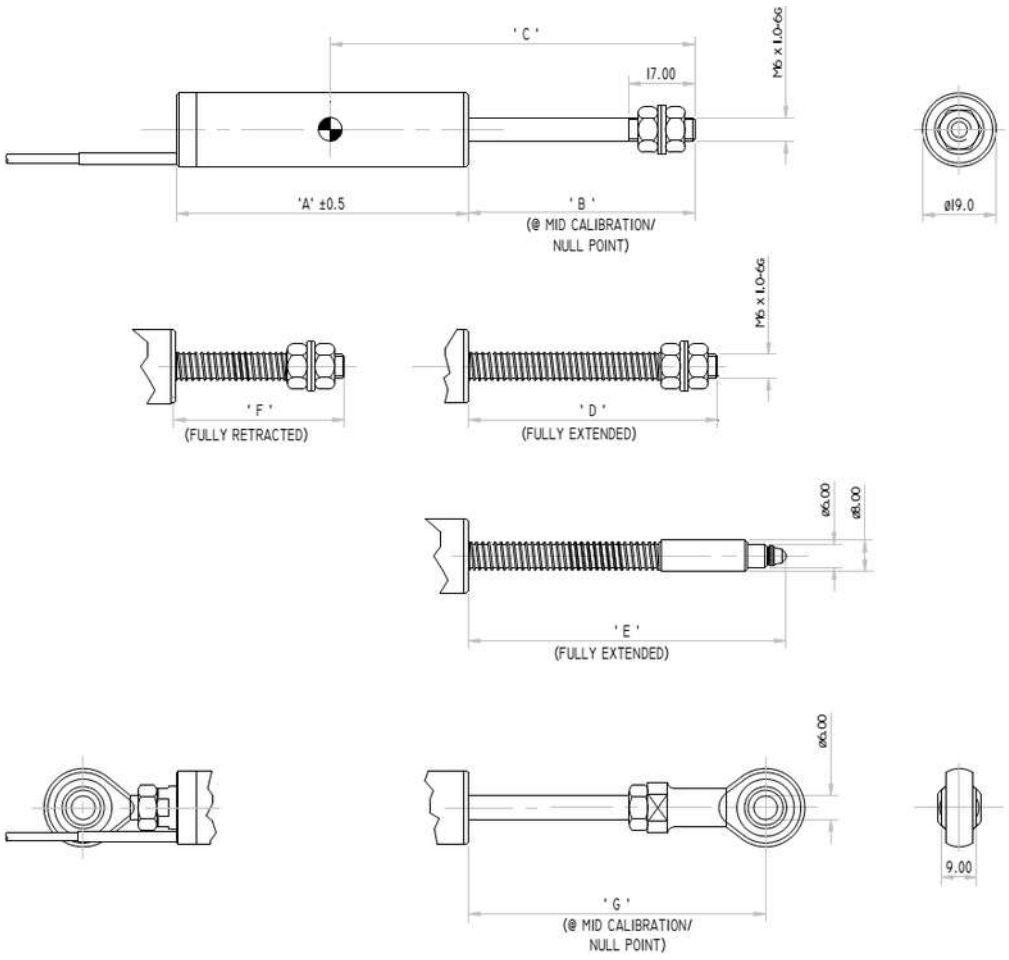
Range (mm)		Free Core and Free Core with Carrier				
LVDT	DC & 4-20mA	LVDT	DC 4-20mA	All		
		A	A	B	C	D
±2.5	5	33.4	72.4	40.5	16.5	55.3
±5	10	53.0	91.9	48.0	29.0	72.5
±7.5	15	60.1	99.1	50.9	34.0	79.0
±10	20	74.5	113.4	57.8	40.0	93.0
±15	30	88.9	127.8	67.3	37.5	109.8
±25	50	110.4	149.3	80.1	38.5	133.3
±50	100	167.9	206.8	115.0	50.0	197.0
±75	150	218.1	257.1	160.9	50.0	268.0
±100	200	275.6	314.7	192.2	50.0	328.0
±150	300	390.4	429.5	300.8	50.0	494.0

Axial Connector Free Core Free Core with Carrier				
LVDT	DC 4-20mA	All		
A1	A1	B1	D1	#E
60.4	93.4	39.1	63.3	41.4
79.4	110.4	46.5	80.5	62.0
86.4	119.9	49.4	87.0	69.1
101.4	134.4	56.3	101.0	83.5
116.4	148.4	65.8	117.8	97.9
137.4	170.4	78.6	141.3	119.4
194.4	227.4	113.6	205.0	176.8
245.4	278.4	159.5	276.0	229.4
301.4	333.4	190.7	336.0	284.6
416.4	448.3	229.3	502.0	399.4

ADD 30mm For DC Types

S Series Dimensions

Guided Core, Spring Push and Universal Joints

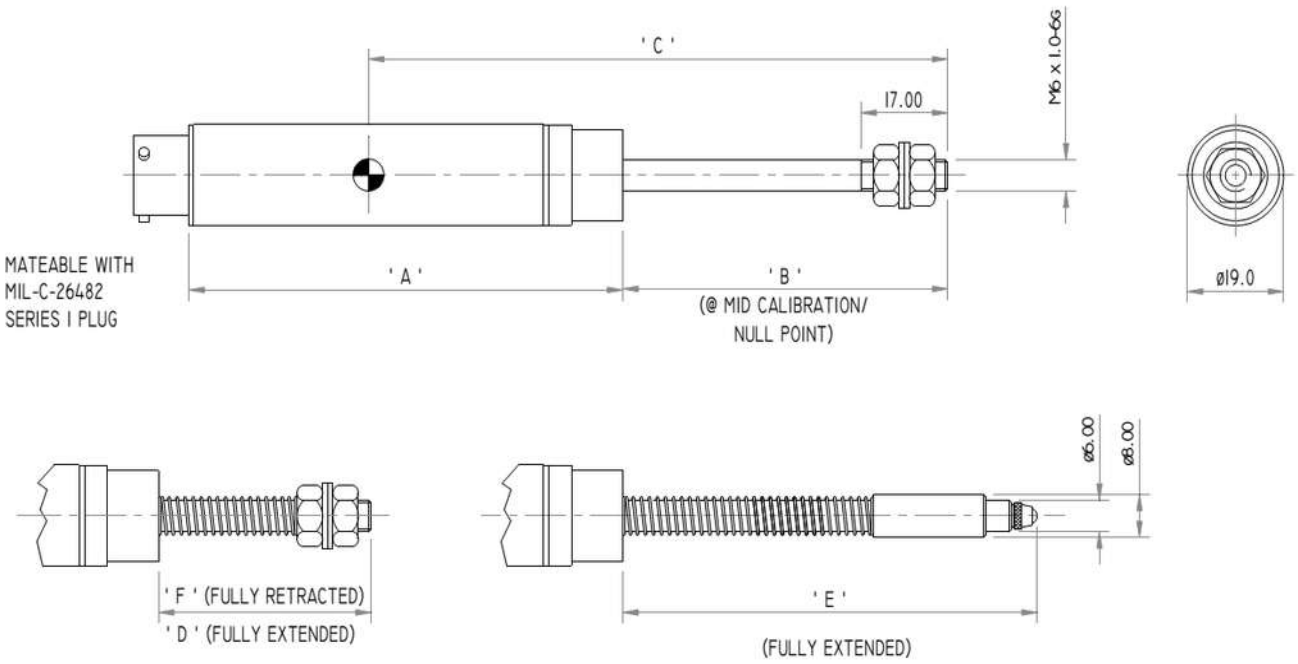


Range (mm)		Guided Core, Spring Push and Universal Joints Cable Type							
LVDT	DC & 4-20mA	LVDT	DC 4-20mA	All					
		A	A	B	C	D	E	F	G
±2.5	5	55.1	94.0	31.2	56.8	35.7	50.7	24.4	49.2
±5	10	74.6	113.5	38.7	74.0	46.7	61.7	28.4	56.7
±7.5	15	81.8	120.7	41.6	80.5	50.7	65.7	30.2	59.6
±10	20	96.1	135.1	48.4	94.5	61.7	76.7	32.8	66.4
±15	30	110.5	149.4	58.0	111.3	79.7	94.7	34.0	76.0
±25	50	132.0	171.0	70.7	134.8	102.7	117.7	36.4	88.7
±50	100	189.5	228.5	105.7	198.5	160.7	175.7	48.5	123.7
±75	150	239.7	278.7	151.6	269.5	231.7	246.7	69.2	169.6
±100	200	297.2	336.2	182.9	329.5	291.7	CF	71.8	CF
±150	300	412.1	449.9	291.5	495.5	457.7	CF	122.9	CF

CF = Consult Solartron for this option

S Series Dimensions

Axial Connector Guided Core, Spring Push



All Dimensions are Nominal for Full Dimensional Detail see website

Range (mm)		Guided Core, Spring Push Axial connector Type						
LVDT	DC & 4-20mA	LVDT	DC 4-20mA	All				
		A	A	B	C	D	E	F
±2.5	5	68.4	101.4	32.6	64.8	40.0	55.0	27.6
±5	10	87.4	118.4	40.0	82.0	51.0	66.0	30.5
±7.5	15	94.4	127.9	42.9	88.5	55.0	70.0	32.4
±10	20	109.4	142.4	49.8	102.5	66.0	81.0	35.0
±15	30	124.4	156.4	59.3	119.3	84.0	99.0	36.1
±25	50	145.4	178.4	72.1	142.8	107.0	122.0	38.6
±50	100	202.4	235.4	107.1	206.5	164.9	179.9	50.7
±75	150	253.4	286.4	153.0	277.5	236.0	251.0	71.4
±100	200	309.4	341.4	184.2	337.5	296.0	CF	CF
±150	300	424.4	456.3	292.8	503.5	462.0	CF	CF

CF = Consult Solartron for this option

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Solartron pursues a policy of continuous development. Specifications in this document may therefore be changed without notice.

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