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

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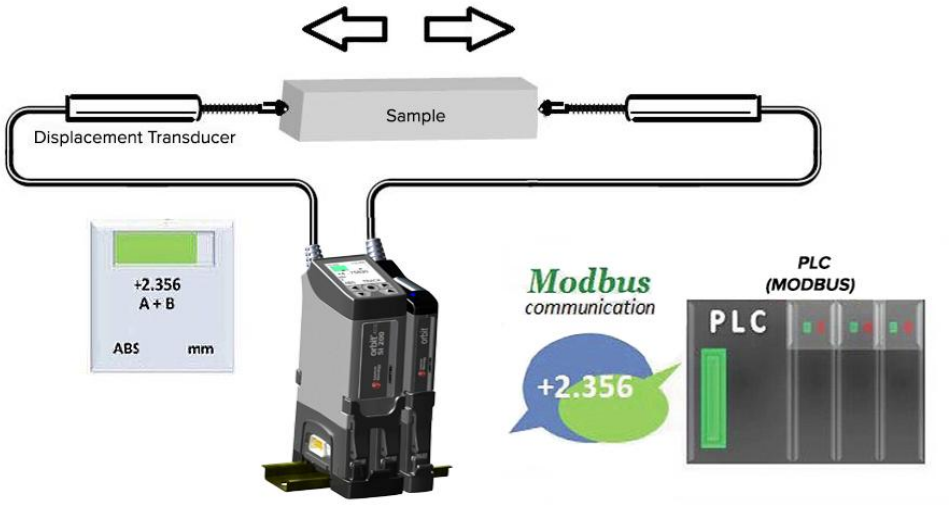
Application Example



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

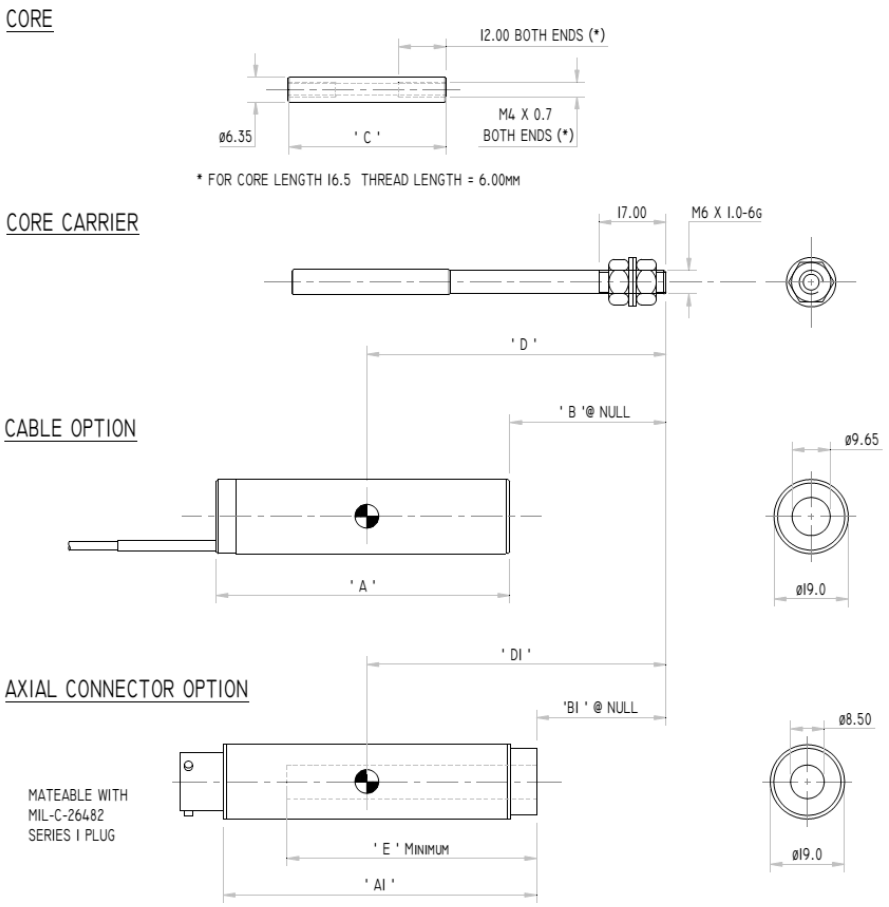
Connection Options
Cable (wire ends)
Cable + Connector
Axial Connector
Orbit Module

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

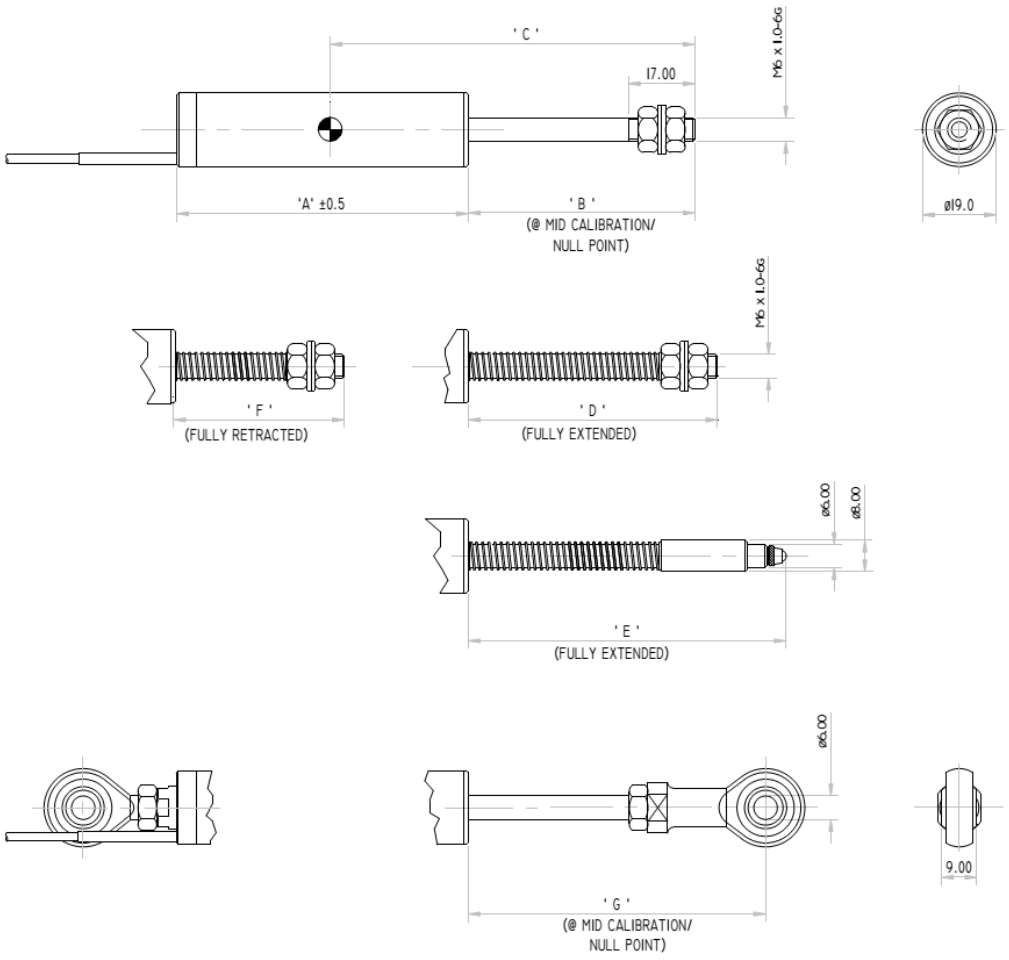


Range (mm)		Free Core and Free Core with Carrier					Axial Connector Free Core Free Core with Carrier				
LVDT	DC & 4-20mA	LVDT	DC 4-20mA	All			LVDT	DC 4-20mA	All		
		A	A	B	C	D	A1	A1	B1	D1	#E
±2.5	5	33.4	72.4	40.5	16.5	55.3	60.4	93.4	39.1	63.3	41.4
±5	10	53.0	91.9	48.0	29.0	72.5	79.4	110.4	46.5	80.5	62.0
±7.5	15	60.1	99.1	50.9	34.0	79.0	86.4	119.9	49.4	87.0	69.1
±10	20	74.5	113.4	57.8	40.0	93.0	101.4	134.4	56.3	101.0	83.5
±15	30	88.9	127.8	67.3	37.5	109.8	116.4	148.4	65.8	117.8	97.9
±25	50	110.4	149.3	80.1	38.5	133.3	137.4	170.4	78.6	141.3	119.4
±50	100	167.9	206.8	115.0	50.0	197.0	194.4	227.4	113.6	205.0	176.8
±75	150	218.1	257.1	160.9	50.0	268.0	245.4	278.4	159.5	276.0	229.4
±100	200	275.6	314.7	192.2	50.0	328.0	301.4	333.4	190.7	336.0	284.6
±150	300	390.4	429.5	300.8	50.0	494.0	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

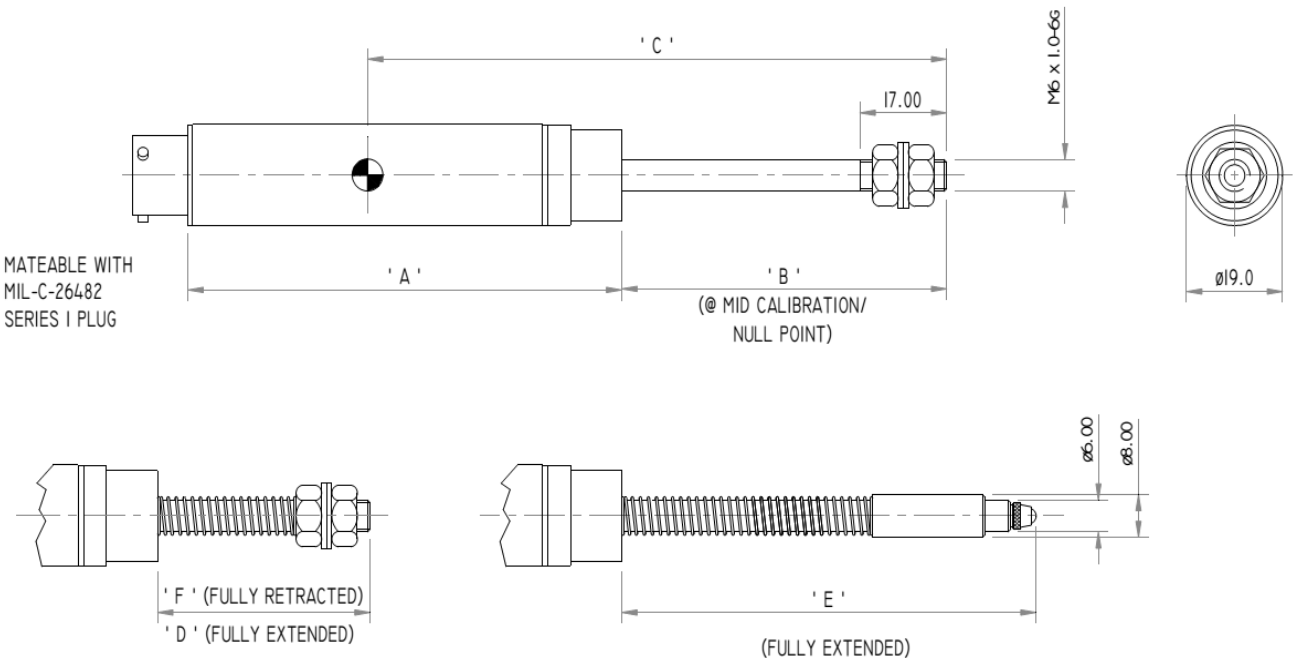


Range (mm)		Guided Core, Spring Push and Universal Joints Cable Type							
LVDT	DC & 4-20mA	LVDT	DC 4-20mA	All					
		A	A	B	C	D	E	F	G
±2.5	5	55.1	94.0	31.2	56.8	35.7	50.7	24.4	49.2
±5	10	74.6	113.5	38.7	74.0	46.7	61.7	28.4	56.7
±7.5	15	81.8	120.7	41.6	80.5	50.7	65.7	30.2	59.6
±10	20	96.1	135.1	48.4	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

For 3D drawings, please contact sales.solartronmetrology@ametek.co.uk

United Kingdom - Head Office
Solartron Metrology
Steyning Way
Bognor Regis
West Sussex
PO22 9ST
Tel: +44 (0) 1243 833333
Fax: +44 (0) 1243 833322
Sales.solartronmetrology@ametek.com

France
Solartron Metrology
Rond-point de l'Espine des Champs
Buroplus - Bat. D
Elancourt 78990
Tel: +33 (0)1 30 68 89 50
Fax: +33 (0)1 30 68 89 59
france.solartronmetrology@ametek.com

Germany
Ametek GmbH
Solartron Metrology Division
Rudolf-Diesel-Strasse 16
40670 Meerbusch
Tel: +49 (0) 2159 9136 500
Fax: +49 (0) 2159 9136 505
vertrieb.solartron@ametek.de

Brazil
Ametek do Brasil, Ltda
Rod. Eng Ermenio de Oliveira Penteado, Km 57, SP75
Bairro Tombadouro
13337-300, Indaiatuba, SP, Brazil
Tel: +55 19 2107 4126

India
Ametek Instruments India Private Limited
1st Floor, Left Wing
Prestige Featherlite Tech Park
Plot #148, EPIP II Phase
Whitefield, Bengaluru 560 066
Karnataka, India
Tel: +91 80 6782 3200
Fax: +91 80 6782 3232

USA
Solartron Metrology
USA Central Sales Office
915 N.New Hope Road, Suite C
Gastonia, NC 28054
Tel: +1 800 873 5838
Fax: +1 704 868 8466
usasales.solartronmetrology@ametek.com

China
AMETEK Commercial Enterprise (Shanghai) Co. Ltd
No. 155 Puhui Road
Ju Ting Economic Development Zone
Shanghai 200131, China
Tel: +86 21 5763 2509
Fax: +86 21 5866 0969 Ext. 261/262
china.solartronmetrology@ametek.com

Solartron Metrology
Precision Driven

Offices worldwide
Agent and distributor details
available at
www.solartronmetrology.com

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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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