S series

High performance displacement sensors

- <0.2% Linearity
- 19mm Stainless Steel body
- IP65 and IP67 option
- Excellent measuring range to body length
- Multiple output options with integrated electronics
- Large bore to core clearance for ease of installation
- Excellent magnetic screening
- Wide range of signal conditioning and instrumentation

The S Series Displacement Sensor is the cumulation of many years experience gained from Solatron's pedigree of a history of 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 is better able to satisfy today's demanding manufacturing and research applications.

The S base series has been expanded to include the SR (Rugged range).

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
Universal Joints

Connection options
Cable (wire ends)
Cable + Connector
Axial Connector
PIE (Orbit digital only)

For non-standard sensors please contact your local Solartron Sales Office or Distributor (see back cover)

Also see...	
Sensor dimensions/drawings	Page 28
Orbit interface dimensions/drawings	Page 41

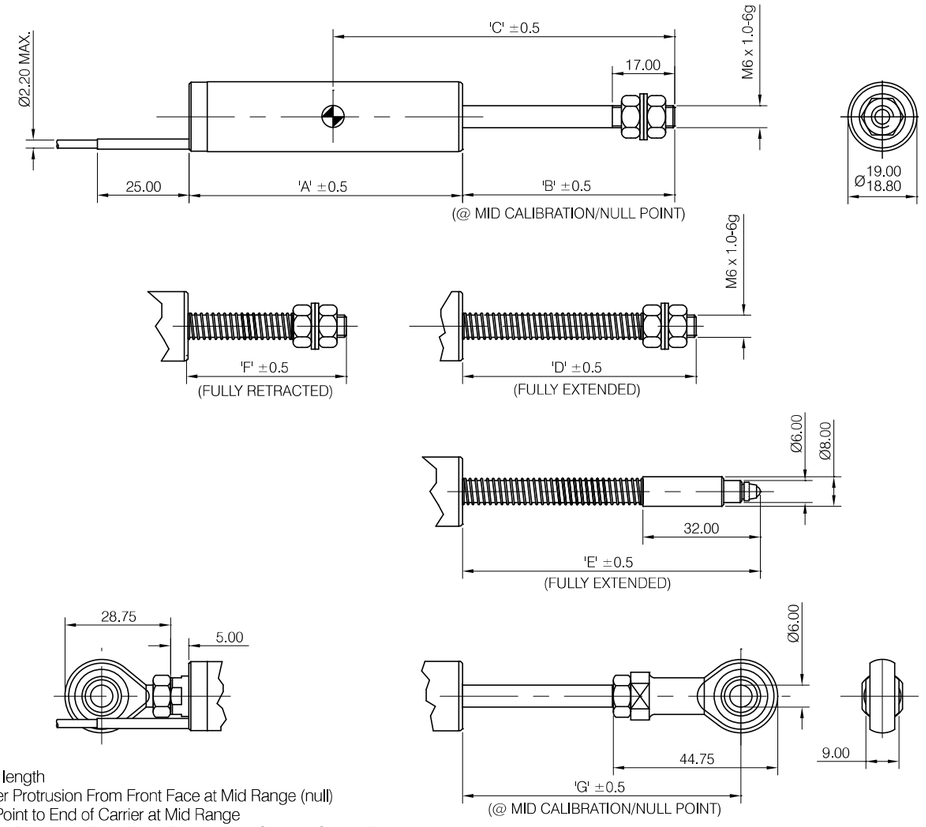
Generic Sensor types										
LVDT Voltage Output (±DC Bipolar) Voltage Output (DC Unipolar) Current Output (4-20mA) Digital Output (Orbit)	AS/2.5 VS/2.5 VS/5 IS/5 DS/5	AS/5 VS/5 VS/10 IS/10 DS/10	AS/7.5 VS/7.5 VS/15 IS/15 DS/15	AS/10 VS/10 VS/20 IS/20 DS/20	AS/15 VS/15 VS/30 IS/30 DS/30	AS/25 VS/25 VS/50 IS/50 DS/50	AS/50 VS/50 VS/100 IS/100 DS/100	AS/75 VS/75 VS/150 IS/150 DS/150	AS/100 VS/100 VS/200 IS/200 DS/200	AS/150 VS/150 VS/300 IS/300 DS/300
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
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
Linearity (% FSO)	<0.20									<0.25
Resolution μm[1]	<0.1	<0.1	<0.1	<0.2	<0.2	<0.3	<0.5	<0.7	<1.0	<2.0
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	< 0.01									
Mechanical										
Body diameter (mm)	19 (+0.0, -0.2)									
Case material	300 Series Stainless Steel									
Core material	Nickel Iron									
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
Cable Type	F.E.P.									
Standard cable Length (m)	3									
Standard cable Style	B									
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
Environment										
Temperature (Standard LVDT) (°C)	-40 to +120									
Temperature (HT LVDT)) (°C)	-40 to +200									
Operating/Storage Temperature (4-20mA/DC) (°C)	0 to +65 / -20 to 85									
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									
Electrical Interface (LVDT)										
Energising Voltage	1-10 (Vrms)									
Energising Current at 5kHz (mA/V)	1.0	2.6	2.2	0.7	1.5	0.5	0.6	2.5	1.65	1.83
Sensitivity at 5kHz ±10% mV/V/mm	144	178	121	76	60	21.5	15	10.5	6.9	3.9
Electrical Interface (4-20mA & DC)										
Input	10 to 30 V or 4-20mA loop powered									
Noise (DC Output) measured in 500Hz	<0.2 mV									
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	IP43									
Weight (grams) Probe Interface electronics T connector (including DIN rail adaptor)	52 46									

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

Cable Style A comprises of individual twisted cores. **Cable Style B** comprises a sheathed and screened cable

S series
Dimensions (mm)

Guided Core, Spring Push and Universal Joints

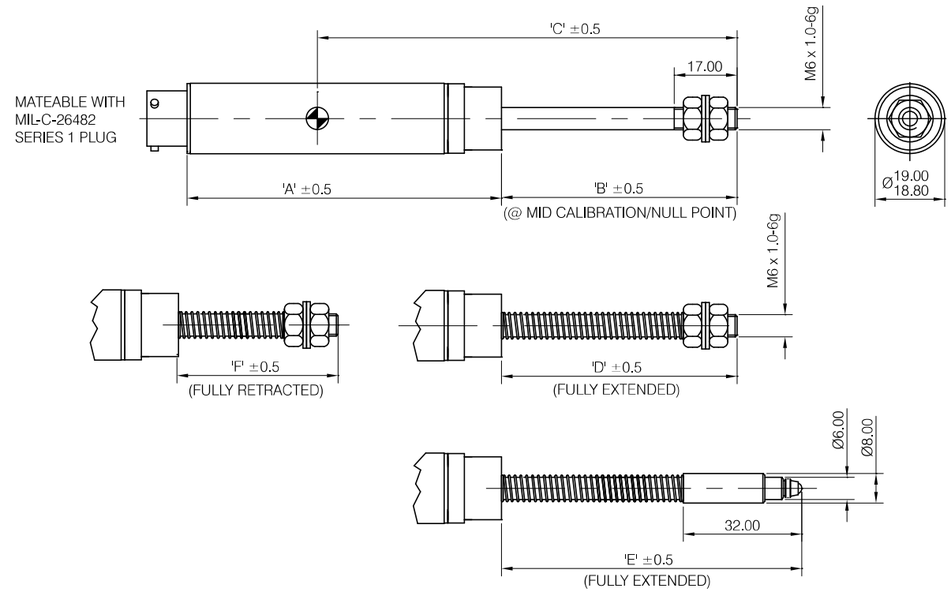


A = Body length
B = Carrier Protrusion From Front Face at Mid Range (null)
C = Null Point to End of Carrier at Mid Range
D = Carrier Protrusion From Front Face at Fully Out with Spring Fitted
E = Carrier Protrusion From Front Face at Fully Out with Tip Fitted
F = Carrier Protrusion From Front Face Fully Retracted
G = Distance from centre of UJ to front face at Mid Range
CF = Consult Solartron for this option

Range (mm)		Guided Core, Spring Push and Universal Joints							
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	50.8	24.4	49.5
±5	10	74.6	113.5	38.7	74.0	46.7	61.8	28.4	57.0
±7.5	15	81.8	120.7	41.6	80.5	50.7	65.8	30.2	59.9
±10	20	96.1	135.1	48.4	94.5	61.7	76.8	32.8	66.8
±15	30	110.5	149.4	58.0	111.3	79.7	94.8	34.0	76.3
±25	50	132.0	171.0	70.7	134.8	102.7	117.8	36.4	89.1
±50	100	189.5	228.5	105.7	198.5	160.7	175.8	48.5	124.0
±75	150	239.7	278.7	151.6	269.5	231.7	246.8	69.2	169.9
±100	200	297.2	336.2	182.9	329.5	291.7	CF	71.8	201.2
±150	300	412.1	449.9	291.5	495.5	458.7	CF	122.9	309.5

S series
Dimensions (mm)

Axial Connector / Guided Core

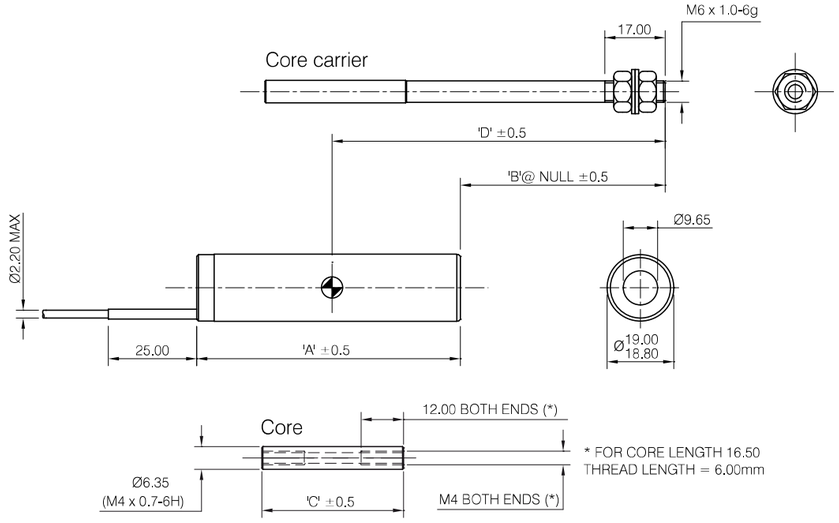


A = Body length
B = Carrier Protrusion From Front Face at Mid Range (null)
C = Null Point to End of Carrier at Mid Range
D = Carrier Protrusion From Front Face Fully Extended
E = Carrier Protrusion From Front Face Fully Extended + Tip Fitted
F = Carrier Protrusion From Front Face Fully Retracted
CF = Consult Solartron for this option

Range (mm)		Axial Connector Guided Core						
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	55.1	27.6
±5	10	87.4	118.4	40.0	82.0	51.0	66.1	30.5
±7.5	15	94.4	127.9	42.9	88.5	55.0	70.1	32.4
±10	20	109.4	142.4	49.8	102.5	66.0	81.1	35.0
±15	30	124.4	156.4	59.3	119.3	84.0	99.1	36.1
±25	50	145.4	178.4	72.1	142.8	107.0	122.1	38.6
±50	100	202.4	235.4	107.1	206.5	164.9	180.1	50.7
±75	150	253.4	286.4	153.0	227.5	236.0	251.1	71.4
±100	200	309.4	341.4	184.2	337.5	296.0	CF	73.9
±150	300	424.4	456.3	292.8	503.5	462.0	CF	125.0

S series dimensions (mm)

Free Core and Free Core with Carrier

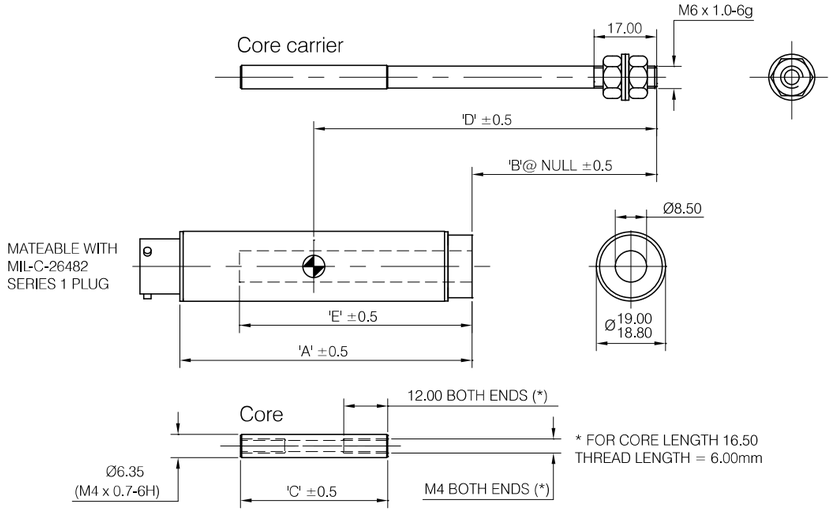


A = Body length
B = Carrier Protrusion From Front Face at Mid Range (null)
C = Core Length
D = Null Point to End of Carrier at Mid Range

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	91.4	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	103.3
±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	294.0

S series dimensions (mm)

Axial Connector / Free Core and Free Core with Carrier



A = Body length
B = Carrier Protrusion From Front Face at Mid Range (null)
C = Core Length
D = Null Point to End of Carrier at Mid Range
E = Bore Depth (minimum)

Range (mm)		Axial Connector Free Core and Free Core with Carrier					
LVDT	DC & 4-20mA	LVDT	DC & 4-20mA	All			
		A	A	B	C	D	E
±2.5	5	60.4	93.4	39.0	16.5	63.3	41.4
±5	10	79.4	110.4	47.0	29.0	80.5	62.0
±7.5	15	86.4	119.9	49.0	34.0	57.0	69.1
±10	20	101.4	134.4	56.0	40.0	101.0	83.5
±15	30	116.4	148.4	66.0	37.5	117.3	97.9
±25	50	137.4	170.4	79.0	38.5	141.3	119.4
±50	100	194.4	227.4	114.0	50.0	205.0	176.8
±75	150	245.4	278.4	159.0	50.0	276.0	229.4
±100	200	301.4	333.4	191.0	50.0	336.0	284.6
±150	300	416.4	448.3	299.0	50.0	502.0	399.4