

**ELECTRICAL OPTIONS/ SPECIFICATIONS**

OUTPUT	SUPPLY (NOM.)
'A' 0.5 - 4.5V RATIOMETRIC	5V
'C' 0.5 - 9.5V	24V
'G' 0.5 - 4.5V	24V
SUPPLY CURRENT 12mA TYP. 20mA MAX.	
'H' 4 TO 20mA SOURCE†	24V
‡ DRIVE 300Ω MAXIMUM TO 0V	
CONNECTIONS: CABLE 3-CORE	
+Ve RED	
0V BLACK	
-Ve -	
OUTPUT WHITE	
BODY SCREEN	

CABLE: 0.2mm<sup>2</sup>, O/A SCREEN, PUR JACKET, SUPPLIED WITH 50cm OR REQUIRED LENGTH IN cm (15000cm MAX).  
STANDARD 3-CORE: BLACK Ø4mm JACKET e.g. L50

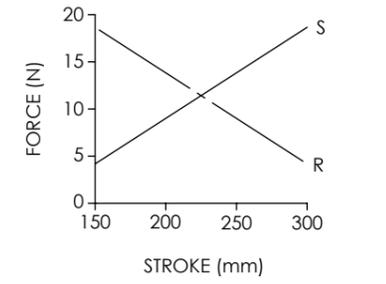
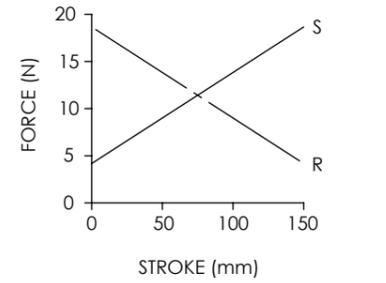
RANGE OF DISPLACEMENT FROM 0-2mm TO 0-350mm IN INCREMENTS OF 1mm e.g.36.  
BODY MATERIAL:- STAINLESS STEEL.

FURTHER OPTIONS:  
SINGLE PAIR OF BODY CLAMPS (CODE 'P')  
TWO PAIRS OF BODY CLAMPS (CODE 'P2')  
SPRING RETURN PUSH-ROD, TRAVEL ≤ 300mm  
RETURN TO EXTENDED POSITION (CODE 'R')  
RETURN TO RETRACTED POSITION (CODE 'S')

DOMES END\* (CODE 'T') IN CONJUNCTION WITH SPRUNG PUSH-ROD (CODE 'R')  
PUSH-ROD FREE (CODE 'V') N.b. NOT AVAILABLE WITH SPRUNG OPTION.  
MAGNETIC TIP (CODE 'WA')

NOTE: ROD-EYE ORIENTATION RELATIVE TO GLAND/CONNECTOR NOT GUARANTEED.  
THE PUSH-ROD RETRACTS AND EXTENDS 2mm NOM. AT EITHER END OF CALIBRATED TRAVEL.  
'V' CODED PUSH-ROD WILL DEPART SENSOR BODY

MAXIMUM WORKING DEPTH: 100m/325ft.  
WHERE THR FREE END OF THE CABLE IS TO BE TERMINATED IN A SUBMERGED POSITION, ADEQUATE SEALING MUST BE PROVIDED TO PROTECT CONNECTIONS.



DRAWINGS NOT TO BE CHANGED WITHOUT REFERENCE TO THE CHANGE PROCEDURE.  
CHANGES TO PARTS USED IN INTRINSICALLY SAFE PRODUCT MUST BE APPROVED BY THE AUTHORISED PERSON.  
THIS IS AN UNCONTROLLED PRINT AND WILL NOT BE UPDATED.

REV	CHANGE HISTORY	DR'WN	DATE	CHK'D
A	FIRST RELEASE	ASC	14/07/2021	-



APPROVED BY	REV		X ±0.4
RDM	A		X.X ±0.2
DESCRIPTION			X.XX ±0.1
10BAR SLIM-LINE SUBMERSIBLE LINEAR POSITION SENSOR			DIMS mm
SCALE	3:4	DRAWING NUMBER	
A3		S119-11	
			SHEET 1 OF 1

# LIPS<sup>®</sup> S119 SUBMERSIBLE SLIM-LINE LINEAR POSITION SENSOR

Position feedback for industrial, marine, mobile and harsh environmental applications

- Sealing to IP68 10 bar / IP69K
- Stainless steel 316 construction
- Travel set to customer's requirement
- Compact 19 mm diameter body,
- High accuracy and stability
- Non-contacting inductive technology to eliminate wear



As a leading designer and manufacturer of linear, rotary, tilt and intrinsically safe position sensors, Positek<sup>®</sup> has the expertise to supply a sensor to suit a wide variety of applications. Our S119 LIPS<sup>®</sup> (Linear Inductive Position Sensor) is an affordable, durable, high-accuracy position sensor designed for industrial, marine, mobile and harsh environmental applications.

It is particularly suitable for OEMs seeking good sensor performance for arduous applications such as wash down, marine, agricultural, mobile and industrial machinery.

Overall performance, repeatability and stability are outstanding over a wide temperature range. The unit is very compact and space-efficient with a small 19mm diameter body. The sensor is very robust and has a complete 316 stainless steel construction. The sensor is easy to install with mounting options including M5 male stud and M5 rod eye bearing. The push rod can be supplied free or captive, with male M5 thread or M5 rod eye or dome end. Captive push rods can be sprung loaded in either direction. Like all Positek<sup>®</sup> sensors, the S119 provides a linear output proportional to travel. Each unit is supplied with the output calibrated to the travel required by the customer, up to 350mm and with full EMC protection built in. The S119 offers a range of mechanical and electrical options, environmental sealing is IP68 10 bar / IP69K.

## SPECIFICATION

<b>Dimensions</b>	
Body diameter	19 mm
Body Length	
(Axial version)	calibrated travel + 109.75 mm
(Axial version - sprung)	calibrated travel + 147.75 mm up to 150 mm travel
	calibrated travel + 192.75 mm over 150 mm travel
(Radial version)	calibrated travel + 125 mm
(Radial version - sprung)	calibrated travel + 163 mm up to 150 mm travel
	calibrated travel + 208 mm over 150 mm travel
	For full mechanical details see drawing S119-11
<b>Independent Linearity</b>	≤ ± 0.25% FSO @ 20°C
	≤ ± 0.1% FSO @ 20°C* available upon request.
	*Sensors with calibrated travel of 10 mm and above.
<b>Temperature Coefficients</b>	< ± 0.01%/°C Gain &
	< ± 0.01%FS/°C Offset
<b>Frequency Response</b>	> 10 kHz (-3dB)
<b>Resolution</b>	Infinite
<b>Noise</b>	< 0.02% FSO
<b>Environmental Temperature Limits</b>	
Operating	-40°C to +125°C standard
	-20°C to +85°C buffered
Storage	-40°C to +125°C
<b>Sealing</b>	IP68 10 bar/IP69K
<b>EMC Performance</b>	EN 61000-6-2, EN 61000-6-3
<b>Vibration</b>	IEC 68-2-6: 10 g
<b>Shock</b>	IEC 68-2-29: 40 g
<b>MTBF</b>	350,000 hrs 40°C Gf
<b>Drawing List</b>	
S119-11	Sensor Outline
	<i>Drawings, in AutoCAD<sup>®</sup> dwg or dxf format, available on request.</i>

Do you need a position sensor made to order to suit a particular installation requirement or specification? We'll be happy to modify any of our designs to suit your needs - please contact us with your requirements.

For further information please contact:

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# LIPS<sup>®</sup> S119 SUBMERSIBLE SLIM-LINE LINEAR POSITION SENSOR

Position feedback for industrial, marine, mobile and harsh environmental applications

## How Positek's PIPS<sup>®</sup> technology eliminates wear for longer life

Positek's PIPS<sup>®</sup> technology (Positek Inductive Position Sensor) is a major advance in displacement sensor design. PIPS<sup>®</sup>-based displacement transducers have the simplicity of a potentiometer with the life of an LVDT/RVDT.

PIPS<sup>®</sup> technology combines the best in fundamental inductive principles with advanced micro-electronic integrated circuit technology. A PIPS<sup>®</sup> sensor, based on simple inductive coils using Positek's ASIC control technology, directly measures absolute position giving a DC analogue output signal. Because there is no contact between moving electrical components, reliability is high and wear is eliminated for an exceptionally long life.

PIPS<sup>®</sup> overcomes the drawbacks of LVDT technology – bulky coils, poor length-to-stroke ratio and the need for special magnetic materials. It requires no separate signal conditioning.

Our LIPS<sup>®</sup> range are linear sensors, while RIPS<sup>®</sup> are rotary units and TIPS<sup>®</sup> are for detecting tilt position. Ask us for a full technical explanation of PIPS<sup>®</sup> technology.

We also offer a range of ATEX-qualified intrinsically-safe sensors.

## TABLE OF OPTIONS

**CALIBRATED TRAVEL:** Factory set to any length from 0-5mm to 0-350mm (e.g. 76mm).

### ELECTRICAL INTERFACE OPTIONS

OUTPUT SIGNAL	SUPPLY INPUT	OUTPUT LOAD
Standard:		
0.5-4.5V dc ratiometric	+5V dc nom. ± 0.5V.	5kΩ min.
Buffered:		
0.5-4.5V dc	+24V dc nom. + 9-28V.	5kΩ min.
0.5-9.5V dc	+24V dc nom. + 13-28V.	5kΩ min.
4-20mA	+24V dc nom. + 13-28V.	300R Max.
Supply Current	10mA typical, 20mA max. plus O/P current	

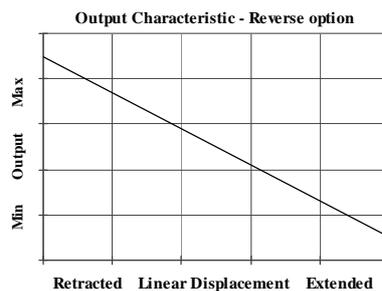
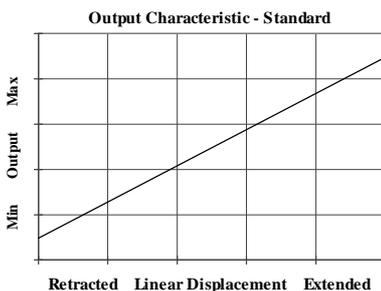
### CABLE OPTIONS

Cable with Pg 7 gland Axial or Radial, IP68 10 bar / IP69K  
 Cable length >50 cm – please specify length in cm

### MOUNTING OPTIONS

M5 rod eye bearing or M5x0.8 male thread ( radial version), Body Tube Clamp/s (axial or radial versions).

**PUSH ROD OPTIONS** – standard retained with M5x0.8 male thread, M5 rod eye bearing, Dome end, Sprung loaded (retraction or extension), Magnetic Tip Ø20mm x 7mm Neodymium 15.8kg Pull or Free.



For further information please contact:

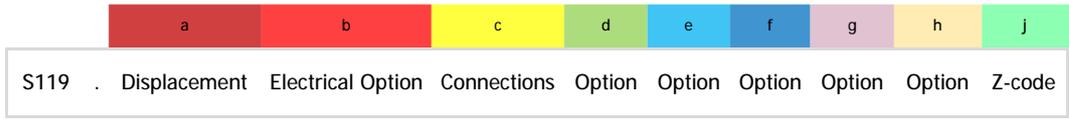
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# LIPS® SERIES S119 Slim-Line Linear Position Sensor

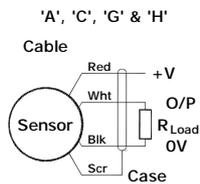


a Displacement (mm)		Value
Displacement in mm	e.g. 0 - 254 mm	254
b Electrical Option		
Supply V dc V <sub>s</sub> (tolerance)	Output	Code
+5V (4.5 - 5.5V)	0.5 - 4.5V (ratiometric with supply)	A
+24V nom. (13 - 28V)	0.5 - 9.5V	C
+24V nom. (9 - 28V)	0.5 - 4.5V	G
+24V nom. (13 - 28V)	4 - 20mA 3 wire Source	H
c Connections Cable* or Connector		Code
Cable Gland- Radial	IP68 10bar / IP69K	Ixx
Cable Gland - Axial	IP68 10bar / IP69K	Lxx
*Supplied with 50 cm as standard, specify required cable length specified in cm. e.g. L2000 specifies cable gland with 20 metres of cable.		
d Body Fittings		Code
None - default	Male Thread M5x0.8x10 long - Radial body (option I) only.	blank
M5 Rod-eye Bearing	Radial body (option I) only	N
e Body Clamps		Code
None - default		blank
Body Clamps - 1 pair		P
f Sprung Push Rod		Code
None - default		blank
Spring Extend	Captive push rod only.	R
Spring Retract		S
g Push Rod Fittings		Code
None - default	Male Thread M5x0.8x10 long	blank
M5 Rod-eye Bearing		U
Dome End	Required for option 'R'	T
Magnetic Tip		WA
h Push Rod Options		Code
Captive - default	Push rod is retained	blank
Non-captive	Push rod can depart body	V
j Z-code		Code
≤± 0.1% @20°C Independent Linearity Available for ≥ 10mm displacement		Z650

# Installation Information

## LIPS<sup>®</sup> S119 SUBMERSIBLE SLIM-LINE LINEAR POSITION SENSOR

Output Option	Output Description:	Supply Voltage: $V_s$ (tolerance)	Load resistance: (include leads for 4 to 20mA O/Ps)
A	0.5 - 4.5V (ratiometric with supply)	+5V (4.5 - 5.5V)	$\geq 5k\Omega$
C	0.5 - 9.5V	+24V nom. (13 - 28V)	$\geq 5k\Omega$
G	0.5 - 4.5V	+24V nom. (9 - 28V)	$\geq 5k\Omega$
H	4 - 20mA	+24V nom. (13 - 28V)	300R MAX

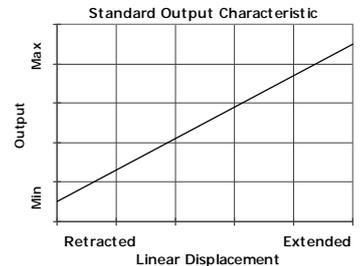


### Mechanical Mounting: Depending on options:

Body can be mounted by M5x0.8 male thread, M5 rod eye or by clamping the sensor body - body clamps are available, if not already ordered. Target by M5x0.8 male thread or M5 rod eye. It is assumed that the sensor and target mounting points share a common earth.

Where the free end of the cable is to be terminated in a submerged position, adequate sealing must be provided to protect connections.

**Output Characteristic:** Target is extended 2 mm from end of body at start of normal travel. The output increases as the target extends from the sensor body, the calibrated stroke is between 5 mm and 350 mm.



### Incorrect Connection Protection levels:-

- A **Not protected** – the sensor is **not** protected against either reverse polarity or over-voltage. The risk of damage should be minimal where the supply current is limited to less than 50mA.
- C & G Supply leads diode protected. Output must not be taken outside 0 to 12V.
- H Supply and output lead diode protected. Do take output negative of 0 volts.