LIPS® P118 SHORT STROKE SLIM-LINE LINEAR POSITION SENSOR

Position feedback for industrial and scientific applications

- **Non-contacting inductive technology to eliminate wear**
- **Travel set to customer's requirement**
- **Compact 19 mm diameter body**
- **High durability and reliability**
- **High accuracy and stability**
- **Sealing to IP67**

As a leading designer and manufacturer of linear, rotary, tilt and intrinsically safe position sensors, Positek® has the expertise to supply a sensor to suit a wide variety of applications.

Our P118 LIPS® (Linear Inductive Position Sensor) is an affordable, durable, accurate position sensor designed for a wide range of industrial applications. It is particularly suitable for OEMs seeking good sensor performance in situations where a small diameter, short-bodied sensor is needed and cost is important. The unit is compact and space-efficient, being responsive along almost its entire length, and like all Positek® sensors provides a linear output proportional to travel. Each unit is supplied with the output calibrated to the travel required by the customer, from 2 to 50mm and with full EMC protection built in.

Overall performance, repeatability and stability are outstanding over a wide temperature range.

The sensor has a compact 19 mm diameter stainless steel body, is easy to install and set up. Mounting options include body clamps or a stainless steel mounting flange with two 3.2 mm by 30 degree wide slots on a 25 mm pitch. The stainless steel plunger can be supplied free or captive, with female M4 thread, or spring-loaded with a ball end. The P118 also offers a range of mechanical and electrical options, environmental sealing is to IP67.

SPECIFICATION

Dimensions		
Body diameter	19 mm	
Body Length:	Dependant on calibrated travel & mounting option	
Calibrated Travel	Standard	Flange mounted
2 mm to 10 mm	72.5 mm	78 mm
11 mm to 20 mm	82.5 mm	88 mm
21 mm to 30 mm	92.5 mm	98 mm
31 mm to 50 mm	112.5 mm	118 mm
Plunger	Ø 6mm	
For full mechanical details see drawing P118-11		
Independent Linearity	≤ ± 0.25% FSO @ 20°C	
	≤ ± 0.1% FSO @ 20°C* available upon request.	
*Sensors with calibrated travel of 10 mm and above.		
Temperature Coefficients	< ± 0.01%/°C Gain &	
	< ± 0.01%FS/°C Offset	
Frequency Response	> 10 kHz (-3dB)	
Resolution	Infinite	
Noise	< 0.02% FSO	
Environmental Temperature Limits		
Operating	-40°C to +125°C standard	
	-20°C to +85°C buffered	
Storage	-40°C to +125°C	
Sealing	IP67	
EMC Performance	EN 61000-6-2, EN 61000-6-3	
Vibration	IEC 68-2-6: 10 g	
Shock	IEC 68-2-29: 40 g	
MTBF	350,000 hrs 40°C Gf	
Drawing List		
P118-11	Sensor Outline	

Drawings, in AutoCAD® dwg or dxf format, available on request.

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.

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LIPS® P118 SHORT STROKE SLIM-LINE LINEAR POSITION SENSOR

Position feedback for industrial and scientific applications

How Positek's PIPS® technology eliminates wear for longer life

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

PIPS® technology combines the best in fundamental inductive principles with advanced micro-electronic integrated circuit technology. A PIPS® 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® 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® range are linear sensors, while RIPS® are rotary units and TIPS® are for detecting tilt position. Ask us for a full technical explanation of PIPS® technology.

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

TABLE OF OPTIONS

CALIBRATED TRAVEL: Factory set to any length from 0-2mm to 0-50mm (e.g. 36mm).

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	

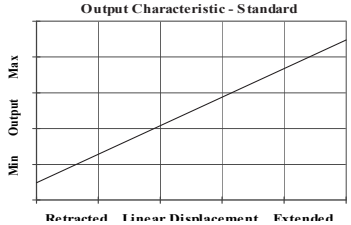
CONNECTOR/CABLE OPTIONS

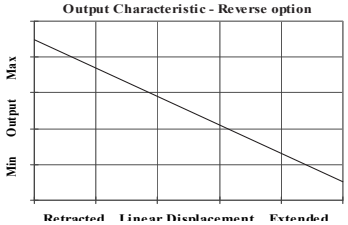
Connector - M8 IEC 60947-5-2	IP67
Cable with M8 gland	IP67

Cable length >50 cm – please specify length in cm

MOUNTING OPTIONS
Flange, Body Tube Clamp.

PUSH ROD OPTIONS – standard retained with M4x0.7 female thread
Sprung loaded (spring supplied loose), Dome end (sprung loaded) or Free.





LIPS® SERIES P118 Short Stroke Slim-Line Position Sensor

	a	b	c	d	e	f	g	h	j
P118	. Displacement	Output	Connections	Option	Option	Option	Option	Option	Z-code

a **Displacement** (mm)		**Value**
Displacement in mm	e.g. 0 - 22 mm	**22**

b **Output**		
Supply V dc V_s (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**
Connector	IP67 M8 IEC 60947-5-2	**J**
Cable Gland	IP67 M8	**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. Nb: restricted cable pull strength.

d **Housing**		**Code**
Standard - default		blank
Flange Mount		**N**

e **Body Fittings**		**Code**
None - default		blank
Body Clamps - 1 pair		**P**

f **Sprung Plunger**		**Code**
None - default		blank
Spring Extend	Captive plunger only.	**R**

g **Plunger Fittings**		**Code**
None - default	Female Thread M4x0.7x7 deep	blank
Dome end	Required for option 'R'	**T**

h **Plunger Options**		**Code**
Captive - default	Plunger is retained	blank
Non-captive	Plunger can depart body	**V**

j **Z-code**	**Code**
≤± 0.1% @20°C Independent Linearity displacement between 10mm & 50mm only!	**Z650**
Connector with cable option 'J' with length required in cm i.e. J100 specifies connector with 100cm of cable.	**Z999**

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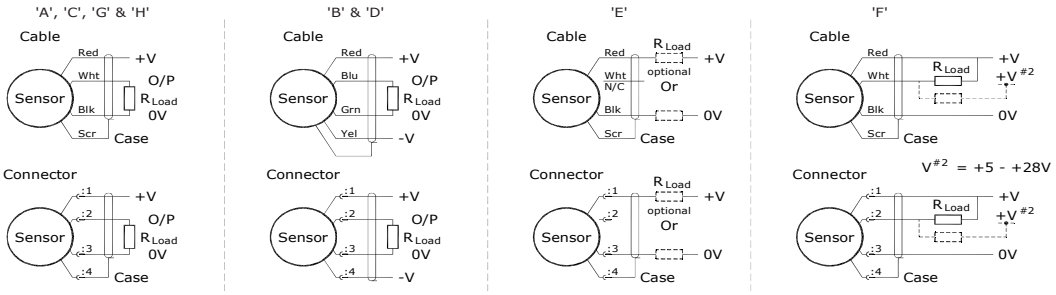
Installation Information

LIPS® P118 SHORT STROKE 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)	≥ 5kΩ
C	0.5 - 9.5V	+24V nom. (13 - 28V)	≥ 5kΩ
G	0.5 - 4.5V	+24V nom. (9 - 28V)	≥ 5kΩ
H	4 –20mA	+24V nom. (13 - 28V)	300R MAX

Not all output options available - see product datasheet for full options list

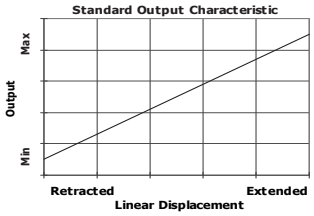
Connector Pin Layout:
IEC 60947-5-2



Gain and Offset Adjustment: Not available.

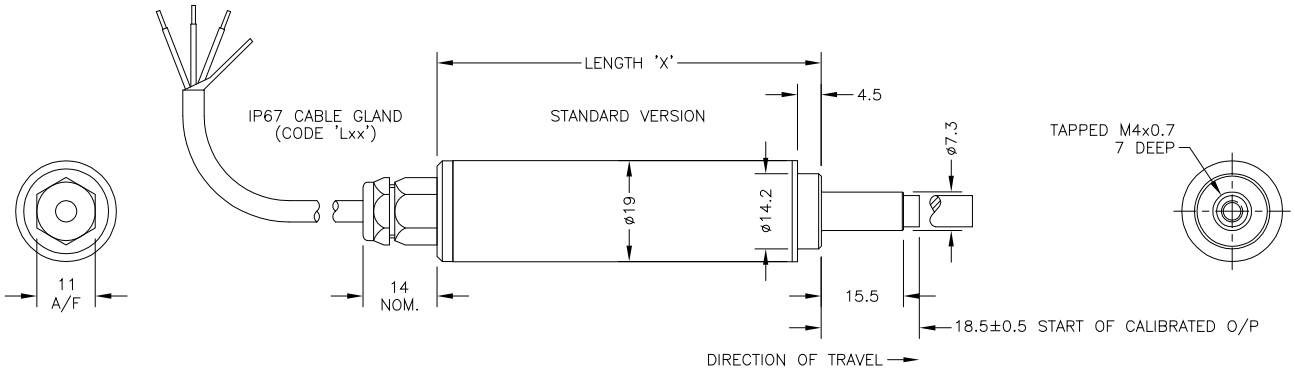
Mechanical Mounting: Flange mounted or by clamping the sensor body - body clamps are available, if not already ordered. The flange slots are 3.2 mm by 30 degrees wide on a 25 mm pitch.

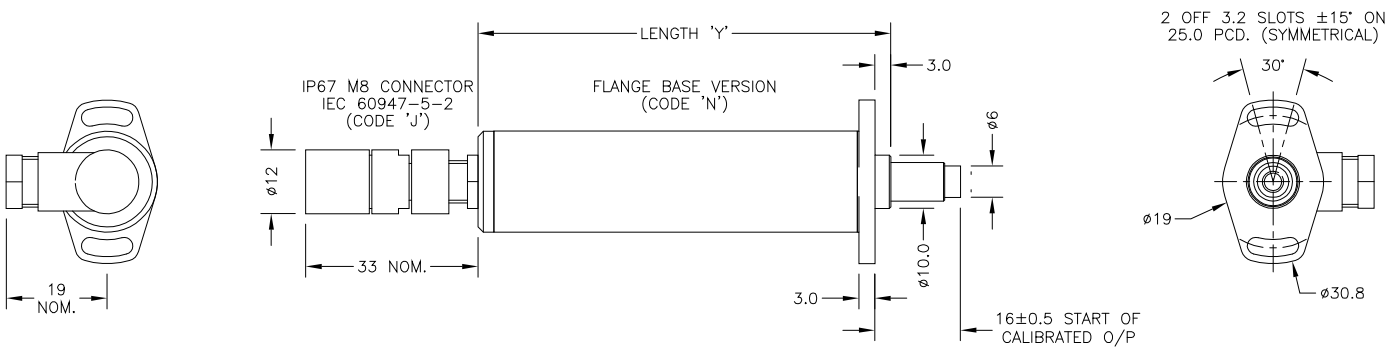
Output Characteristic: Plunger extended, at start of normal travel, from mounting face by:
Standard body : 18.5 mm*
Flanged body : 16 mm*
*Note: where ball end option is fitted add 5 mm.
The output increases as the plunger extends from the sensor body, the calibrated stroke is between 2 mm and 50 mm.



Incorrect Connection Protection levels:-

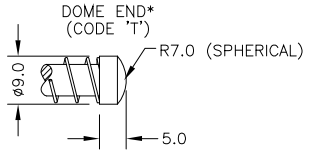
A	**Not protected** – the sensor is **not** protected against either reverse polarity or over-voltage. The risk of damage should be minimal where the supply current is limited to less than 50mA.
C & G	Supply leads diode protected. Output must not be taken outside 0 to 12V.
H	Supply and output lead diode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





NOTE: SENSORS WITH TRAVEL UP TO 50mm ARE MADE IN STANDARD LENGTHS.

TRAVEL: (mm)		BODY LENGTH: (mm) 'X' STANDARD		'Y' FLANGE	
CALIBRATED	MECHANICAL	O/P 'A'	O/P 'C'/'G'	O/P 'A'	O/P 'C'/'G'
0–2 TO 0–10	10	72.5	77.5	78.0	83.0
0–11 TO 0–20	20	82.5	87.5	88.0	93.0
0–21 TO 0–30	30	92.5	97.5	98.0	103.0
0–31 TO 0–50	50	112.5	117.5	118.0	123.0



OUTPUT OPTION

ELECTRICAL OPTIONS/ SPECIFICATIONS

OUTPUT OPTION	OUTPUT	SUPPLY	
A	0.5 TO 4.5V RATIOMETRIC	5V	STANDARD
C	0.5 TO 9.5V	24V	BUFFERED
G	0.5 TO 4.5V	24V	BUFFERED
H	4 TO 20mA	24V	BUFFERED

SUPPLY CURRENT 12mA TYP. 20mA MAX. PLUS O/P CURRENT

CABLE: 0.2mm², O/A SCREEN, PUR JACKET – SUPPLIED WITH 50cm OR REQUIRED LENGTH IN cm. e.g. 'L50'
3–CORE: JACKET ø4mm

CABLE/CONNECTOR* CONNECTIONS;

3 CORE CONNECTOR		
RED	:1	+Ve
BLACK	:3	0V
WHITE	:2	OUTPUT
SCREEN	:4	BODY

*CONNECTORS; MAXIMUM CONDUCTOR CROSS SECTION 0.25mm²

RANGE OF DISPLACEMENT FROM 0–2mm TO 0–50mm e.g.36, IN INCREMENTS OF 1mm.

BODY MATERIAL:– STAINLESS STEEL.
FLANGE BASE MATERIAL:– STAINLESS STEEL (CODE 'N')

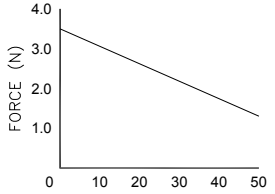
FURTHER OPTIONS:

SINGLE PAIR OF BODY CLAMPS (CODE 'P')

SPRUNG PLUNGER, TO EXTENDED POSITION (CODE 'R')

DOME END (CODE 'T') IN CONJUNCTION WITH SPRUNG PLUNGER (CODE 'R')*

PLUNGER FREE (CODE 'V')
N.b. NOT AVAILABLE WITH SPRUNG OPTIONS.



SPRING FORCE v STROKE
(CODE 'R')

THE PLUNGER RETRACTS 8mm FROM START OF CALIBRATED TRAVEL (2mm FOR SPRUNG VERSIONS) AND EXTENDS 11mm* BEYOND END OF MECHANICAL TRAVEL. *DOES NOT INCLUDE DIFFERENCE BETWEEN CALIBRATED AND MECHANICAL TRAVEL, DIMENSIONS ARE NOMINAL. 'V' CODED PLUNGER WILL DEPART SENSOR BODY.

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.

A	FIRST ISSUE	PDM
B	LENGTHS MODIFIED - RAN498	PDM
C	STROKE 2-10 WAS 10 - RAN1063, OPTION 'J' ADDED - RAN1068.	PDM
D	RANGE NOTE AMENDED ~ RAN1200	PDM
E	4 TO 20mA ADDED RAN1256	RDS

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A	21/11/13		CHECKED BY -	X ±0.4
B	21/05/14			X.X ±0.2
C	25/11/15			X.XX ±0.1
D	06/09/17	DESCRIPTION		DIMS mm
E	06/09/18	P118 SHORT STROKE SLIM-LINE LINEAR POSITION SENSOR		

SCALE 10mm

DRAWING NUMBER P118-11 REV E

SHEET 1 OF 1