

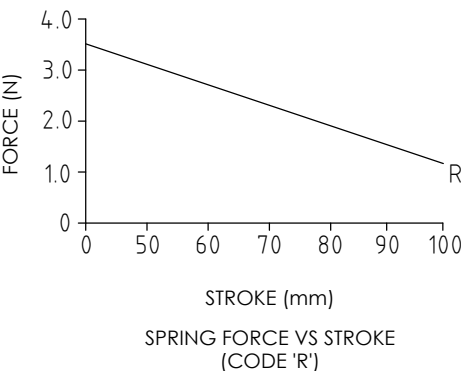
ELECTRICAL OPTIONS/ SPECIFICATIONS

OUTPUT	SUPPLY
A 0.5 - 4.5V RATIOMETRIC	5V
C 0.5 - 9.5V	24V
G 0.5 - 4.5V	24V
H 4 - 20mA	24V
SUPPLY CURRENT 12mA TYP. 20mA MAX. PLUS O/P CURRENT	
CONNECTIONS;	CABLE CONNECTOR
+Ve	RED :1
0V	BLACK :3
OUTPUT	WHITE :2
BODY	SCREEN :4

CABLE; 3-CORE 0.2mm², O/A SCREEN, PUR JACKET Ø4mm
SUPPLIED WITH 50cm OR REQUIRED LENGTH IN cm. e.g. 'L50'
CONNECTORS; MAXIMUM CONDUCTOR CROSS SECTION 0.25mm²

RANGE OF DISPLACEMENT FROM 0-51mm TO 0-100mm IN INCREMENTS OF 1mm e.g.76.
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') NOT AVAILABLE WITH SPRUNG OPTION
MAGNETIC TIP (CODE 'WA')



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.



APPROVED BY	REV		X ±0.4 X.X ±0.2 X.XX ±0.1 DIMS mm
RDM	D		
DESCRIPTION P138 MID STROKE SLIM-LINE LINEAR POSITION SENSOR			
SCALE	3:4	DRAWING NUMBER	
A3		P138-11	

SHEET 1 OF 1

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
D	MAG TIP & RADIAL END CAP/ROD EYES RAN1311/1312	ASC	31/03/2021	PDM

NOTE: SENSORS WITH TRAVEL UP TO 50mm ARE MADE IN STANDARD LENGTHS					
BODY LENGTH (mm)					
TRAVEL (mm)		'X' STANDARD		'Y' FLANGE	
CALIBRATED	MECHANICAL	AXIAL	RADIAL	AXIAL	RADIAL
0-51 TO 0-70	70	137.5	156.5	143.0	162.0
0-71 TO 0-100	100	167.5	186.5	173.0	192.0



P138 MID 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 P138 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 51 to 100mm 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 flange, M5 rod eye bearings and body clamps. The plunger can be supplied free or captive, with a female M4 thread, an M5 rod eye, magnetic tip, or spring-loaded with a dome end. The P138 also offers a range of mechanical 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
51 mm to 70 mm	132.5 mm 138 mm
71 mm to 100 mm	162.5 mm 168 mm

Plunger

Ø 6mm

For full mechanical details see drawing P138-11

Independent Linearity

$\leq \pm 0.25\%$ FSO @ 20°C

$\leq \pm 0.1\%$ FSO @ 20°C available upon request.

Temperature Coefficients

$< \pm 0.01\%/^{\circ}\text{C}$ Gain &

$< \pm 0.01\%$ FS/ $^{\circ}\text{C}$ 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
-40°C to +125°C

Storage

IP67

Sealing

IP67

EMC Performance

EN 61000-6-2, EN 61000-6-3
IEC 68-2-6: 10 g
IEC 68-2-29: 40 g

Vibration

350,000 hrs 40°C Gf

Shock

MTBF

Drawing List

P138-11

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.

For further information please contact:

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P138 MID STROKE SLIM-LINE LINEAR POSITION SENSOR

Position feedback for industrial and scientific applications

How Positek's technology eliminates wear for longer life

Positek's Inductive technology is a major advance in displacement sensor design. Our displacement transducers have the simplicity of a potentiometer with the life of an LVDT/RVDT.

Our technology combines the best in fundamental inductive principles with advanced micro-electronic integrated circuit technology. A Positek 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.

Our technology 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.

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

TABLE OF OPTIONS

CALIBRATED TRAVEL: Factory set to any length from 0-51mm to 0-100mm (e.g. 76mm).

ELECTRICAL INTERFACE OPTIONS

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

CONNECTOR/CABLE OPTIONS

Connector - 4-pole M8 IEC 61067-2-104 Axial/ Radial, IP67
Cable[†] with M8 gland Axial/Radial, IP67
Cable length >50 cm – please specify length in cm

MOUNTING OPTIONS

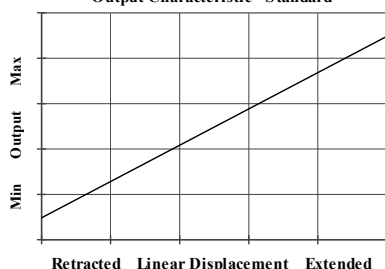
Flange, Body Tube Clamp (axial or radial versions),
M5 rod eye bearings (radial versions only).

PUSH ROD OPTIONS – Retained[†] or Free with M4x0.7 female thread, M5 rod eye bearing or Magnetic tip, Spring loaded with or without[#] Dome end.

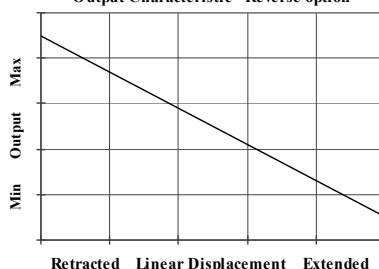
[†] standard, retained with female thread.

[#] spring supplied loose.

Output Characteristic - Standard



Output Characteristic - Reverse option



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P138 Mid Stroke Slim-Line Position Sensor

	a	b	c	d	e	f	g	h	j
P138	.	Displacement	Output	Connections	Option	Option	Option	Option	Z-code

a Displacement (mm)		Value
Displacement in mm	e.g. 0 - 66 mm	66
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
Cable Gland - Radial	IP67 metal	Ixx
Connector - Axial	IP67 M8 IEC 60176-2-104 nylon	J
	pre-wired	Jxx
Connector - Radial	IP67 M8 IEC 60176-2-104 nylon	K
	pre-wired	Kxx
Cable Gland - Axial	IP67 metal	Lxx
Specify required cable length 'xx' in cm. e.g. L2000 specifies cable gland with 20 m of cable, 50 cm supplied as standard.		
d Housing		Code
Standard - default		blank
Flange Mount		N
M5 Rod-eye Bearing	Radial body style only	S
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	Requires option 'R'	T
M5 Rod-eye Bearing		U
Magnetic Tip		WA
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

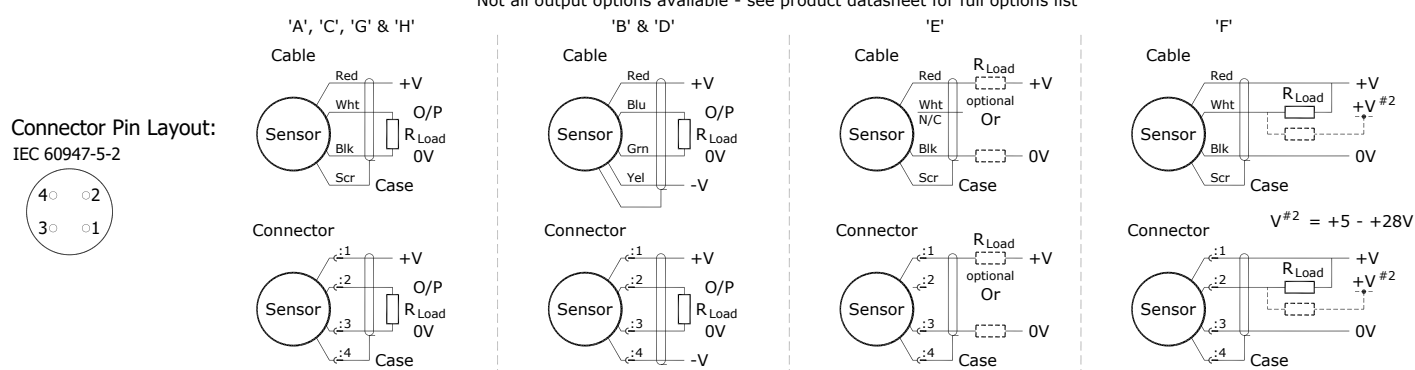


Installation Information

P138 MID 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)	$\geq 5k\Omega$
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

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



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 : 36.5 mm*

Flanged body : 34 mm*

*Note: where ball end option is fitted add 5 mm.

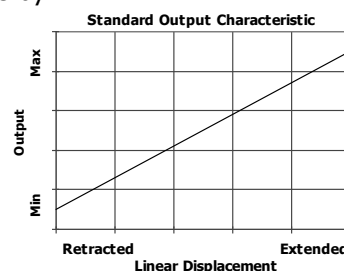
The output increases as the plunger extends from the sensor body, the calibrated stroke is between 51 mm and 100 mm.

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.



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