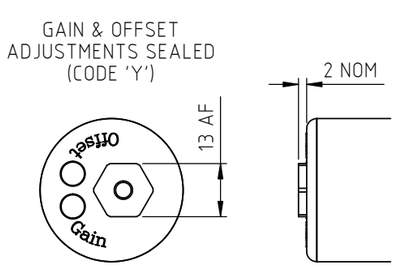
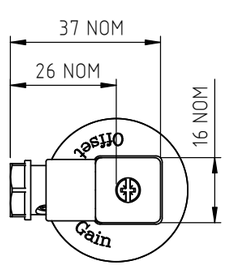
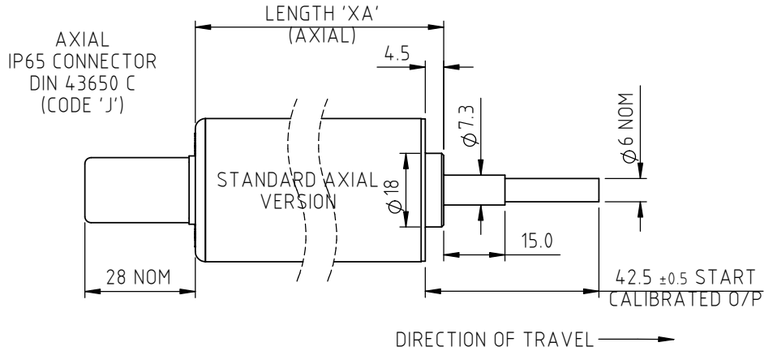
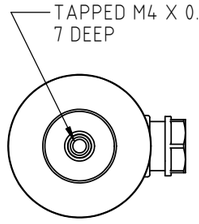
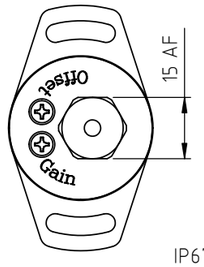
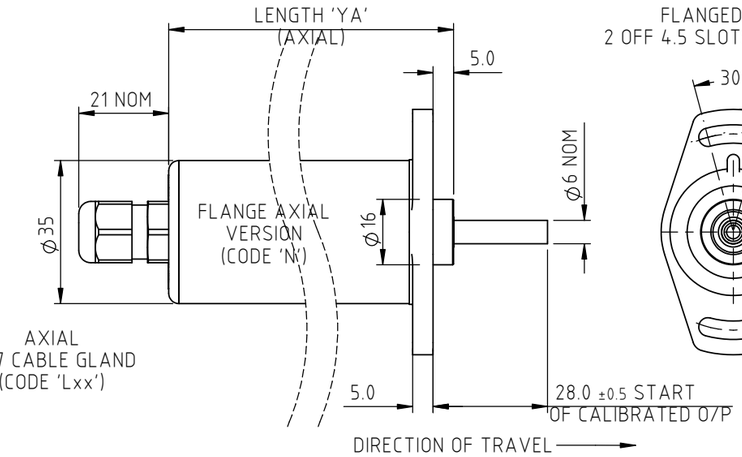


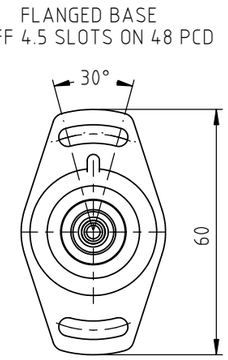


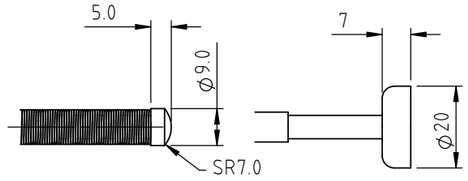












ELECTRICAL OPTIONS/ SPECIFICATIONS

OUTPUT	SUPPLY (NOM.)
'A' 0.5 - 4.5V RATIOMETRIC	5V
'B' ±5V	±15V
'C' 0.5 - 9.5V	24V
'D' ±10V	±15V
'G' 0.5 - 4.5V	24V
SUPPLY CURRENT 12mA TYP. 20mA MAX.	
'E' 4 TO 20mA 2-WIRE	24V (18V MIN.)
'F' 4 TO 20mA SINK†	24V
'H' 4 TO 20mA SOURCE‡	24V

† OUTPUT COMPLIANCE 5-28V
‡ DRIVE 300Ω MAXIMUM TO 0V

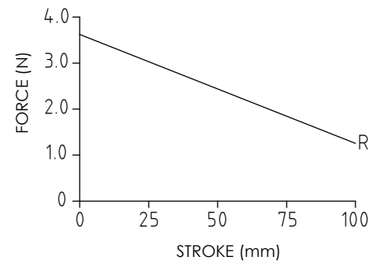
CONNECTIONS;	CABLE 3-CORE	CABLE 4-CORE	CONNECTOR
+Ve	RED	RED	:1
0V	BLACK	GREEN	:3
-Ve	-	YELLOW	:4 O/P 'B' & 'D'
OUTPUT	WHITE	BLUE	:2
BODY	SCREEN	SCREEN	:4 NOT O/P 'B' & 'D'

CABLE: 0.2mm², O/A SCREEN,
PUR JACKET O/D; 3-CORE: Ø4mm, 4-CORE: Ø4.6mm,
SUPPLIED WITH 50cm OR REQUIRED LENGTH IN cm. e.g. 'L50'
CONNECTORS; MAXIMUM CONDUCTOR CROSS SECTION 0.75mm²

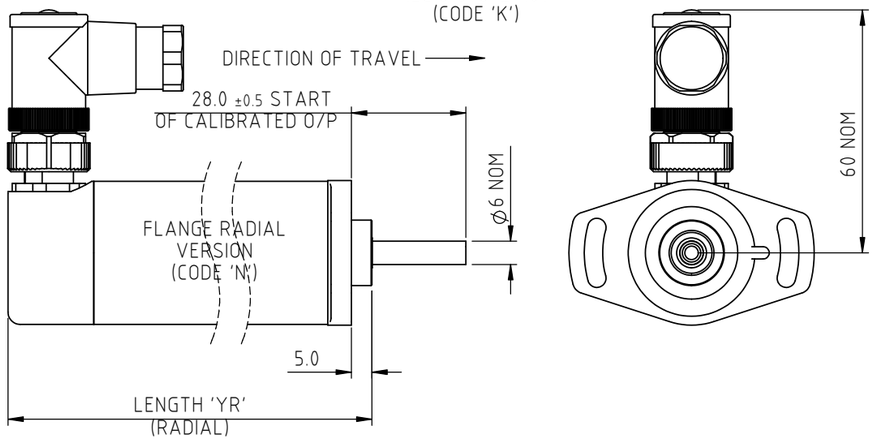
RANGE OF DISPLACEMENT FROM 0-51mm TO 0-100mm IN INCREMENTS OF 1mm e.g.36.
BODY MATERIAL:- STAINLESS STEEL.
FLANGE BASE MATERIAL:- ALUMINIUM (CODE 'N')

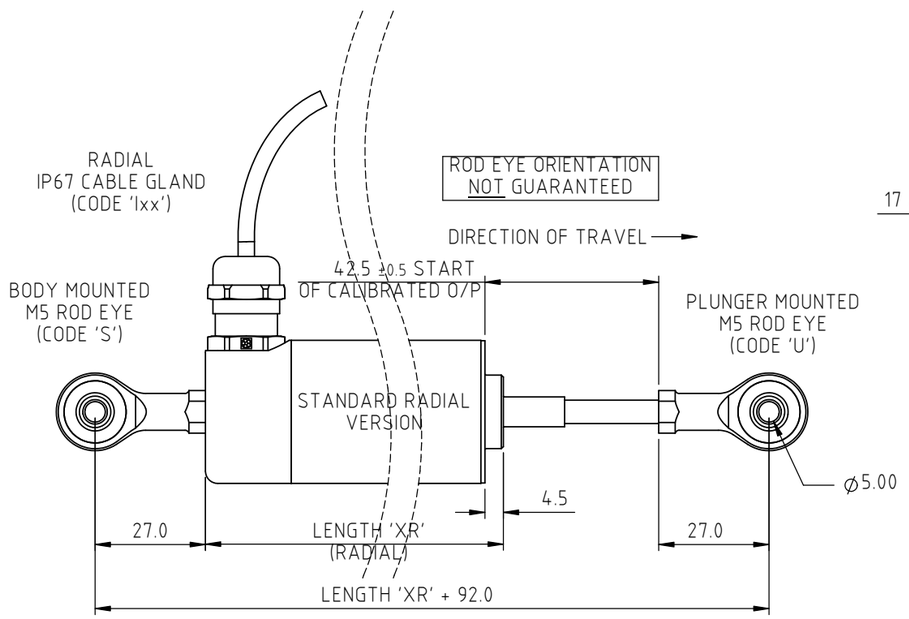
FURTHER OPTIONS:
SINGLE PAIR OF BODY CLAMPS (CODE 'P')
SPRUNG PLUNGER, TO EXTENDED POSITION (CODE 'R')
DOME END (CODE 'T') IN CONJUNCTION WITH SPRUNG PLUNGER (CODE 'R')
PLUNGER FREE (CODE 'V') NOT AVAILABLE WITH SPRUNG OPTION
MAGNETIC TIP (CODE 'WA')

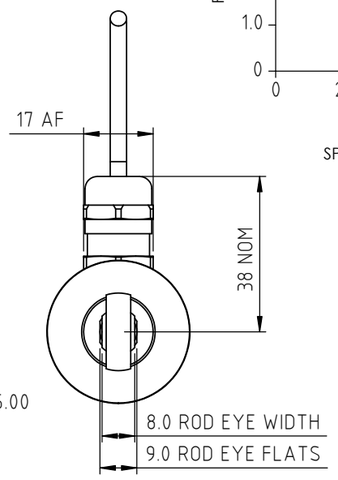
GAIN AND OFFSET ADJUSTMENTS NOT AVAILABLE WITH RADIAL BODY, CODE 'Ixx' AND 'K' OPTIONS



SPRING FORCE VS STROKE
(CODE 'R')







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
C	MAG TIP & RADIAL END/ROD EYES RAN 1311/1312	ASC	20/04/2021	ASC

NOTE: SENSORS WITH TRAVEL UP TO 50mm ARE MADE IN STANDARD LENGTHS					
BODY LENGTH (mm)					
TRAVEL (mm)		STANDARD		FLANGE	
CALIBRATED	MECHANICAL	'XA' AXIAL	'XR' RADIAL	'YA' AXIAL	'YR' RADIAL
0-51 TO 0-70	70	125.0	143.5	141.3	159.8
0-71 TO 0-100	100	155.0	173.5	171.3	189.8

THE PLUNGER RETRACTS 5mm FROM START OF CALIBRATED TRAVEL (2mm FOR SPRUNG VERSIONS) AND EXTENDS 9.5mm* BEYOND END OF MECHANICAL TRAVEL.
*DOES NOT INCLUDE DIFFERENCE BETWEEN CALIBRATED AND MECHANICAL TRAVEL.
DIMENSIONS ARE NOMINAL.
'V' CODED PLUNGER WILL DEPART SENSOR BODY.

Positek

APPROVED BY	REV		X ±0.4 X.X ±0.2 X.XX ±0.1 DIMS mm
RDM	C		

DESCRIPTION
P133 MID-STROKE LINEAR SENSOR

SCALE 2:3	DRAWING NUMBER
A3	P133-11 SHEET 1 OF 1

P133 MID STROKE LINEAR POSITION SENSOR

Position feedback for industrial and scientific applications

- **Non-contacting inductive technology to eliminate wear**
- **Travel set to customer's requirement**
- **Short body length**
- **High durability and reliability**
- **High accuracy and stability**
- **Sealing to IP65/IP67 as required**

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 P133 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 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 rugged stainless steel body and plunger. It 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 P133 also offers a wide range of mechanical and electrical options, environmental sealing is to IP65 or IP67 depending on selected cable or connector options.

SPECIFICATION

Dimensions		
Body diameter	35 mm	
Body Length:	Dependant on calibrated travel & mounting option	
Calibrated Travel	Standard	Flange mounted
51 mm to 70 mm	125 mm	141.3 mm
71 mm to 100 mm	155 mm	171.3 mm
Plunger	Ø 6mm	
For full mechanical details see	drawing P133-11	
Power Supply	+5V dc nom. ± 0.5V, 10mA typ 20mA max	
Output Signal	0.5-4.5V dc ratiometric, Load: 5kΩ min.	
Independent Linearity	≤ ± 0.25% FSO @ 20°C ≤ ± 0.1% FSO @ 20°C available upon request.	
Temperature Coefficients	< ± 0.01%/°C Gain & < ± 0.01%FS/°C Offset	
Frequency Response	> 10 kHz (-3dB) > 300 Hz (-3dB) 2 wire 4 to 20 mA	
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	IP65/IP67 depending on connector / cable option	
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		
P133-11	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:
www.positek.com sales@positek.com
Tel: +44(0)1242 820027 fax: +44(0)1242 820615
Positek, Andoversford Industrial Estate, Cheltenham GL54 4LB. U.K.

P133 MID STROKE 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. ± 0.5V.	5kΩ min.
Buffered:		
0.5-4.5V dc	+24V dc nom. + 9-28V.	5kΩ min.
±5V dc	±15V dc nom. ± 9-28V.	5kΩ min.
0.5-9.5V dc	+24V dc nom. + 13-28V.	5kΩ min.
±10V dc	±15 V dc nom. ± 13.5-28V.	5kΩ min.
Supply Current	10mA typical, 20mA maximum.	
4-20mA (2 wire)	+24 V dc nom. + 18-28V.	300Ω @ 24V.
(3 wire sink)	+24 V dc nom. + 13-28V.	950Ω @ 24V.
(3 wire source)	+24 V dc nom. + 13-28V.	300Ω max.

Sensors supplied with access to output 'zero' and 'span' calibration adjustments as standard. No access option available.

CONNECTOR/CABLE OPTIONS

Connector - 4-pole DIN 43650 C	Axial, IP65
Connector - 4-pole M12 IEC 61076-2-101	Radial, IP67
Cable with M12 gland or short gland	Axial, IP67
Cable with Pg 9 gland	Radial, IP67

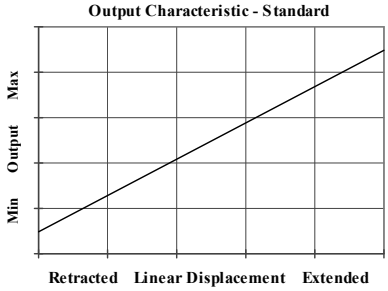
Cable length >50 cm – please specify length in cm

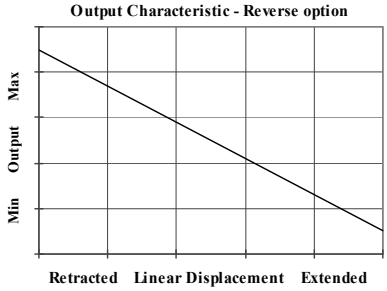
MOUNTING OPTIONS

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.





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Positek, Andoversford Industrial Estate, Cheltenham GL54 4LB. U.K.

P133 Mid Stroke Position Sensor

a	b	c	d	e	f	g	h	j	k
P133	.	Displacement	Output	Adjustments	Connections	Option	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**
±15V nom. (±9 - 28V)	±5V	**B**
+24V nom. (13 - 28V)	0.5 - 9.5V	**C**
±15V nom. (±13.5 - 28V)	±10V	**D**
+24V nom. (18 - 28V)	4 - 20mA 2 wire	**E**
+24V nom. (13 - 28V)	4 - 20mA 3 wire Sink	**F**
+24V nom. (9 - 28V)	0.5 - 4.5V	**G**
+24V nom. (13 - 28V)	4 - 20mA 3 wire Source	**H**

c **Calibration Adjustments**		Code
Accessible - default†	†Axial body style only. Radial body style sealed by default.	blank
Sealed		**Y**

d **Connections** Cable or Connector		Code
Cable Gland - Radial	IP67 metal	**Ixx**
Connector - Axial	IP65 DIN 43650 'C'	**J**
	pre-wired	**Jxx**
Connector - Radial	IP67 M12 IEC 60176-2-101 nylon	**K**
	pre-wired	**Kxx**
Cable Gland - Axial	IP67 nylon	**Lxx**
Cable Gland†- Axial	IP67 Short	**Mxx**

Specify required cable length **'xx'** in cm. e.g. L2000 specifies cable gland with 20 m of cable, 50 cm supplied as standard. †Nb: restricted cable pull strength.

e **Housing**		Code
Standard - default		blank
Flange Mount		**N**
M5 Rod-eye Bearing	Radial body style only	**S**

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

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

h **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**

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

k **Z-code**	Code
Connector IP67 M12 IEC 60176-2-101 must have options 'Y' & 'J'	**Z600**
Connector IP67 M12 IEC 60176-2-101 must have option 'J'	**Z601**
≤± 0.1% @20°C Independent Linearity displacement between	**Z650**

Installation Information

P133 MID STROKE LINEAR POSITION SENSOR

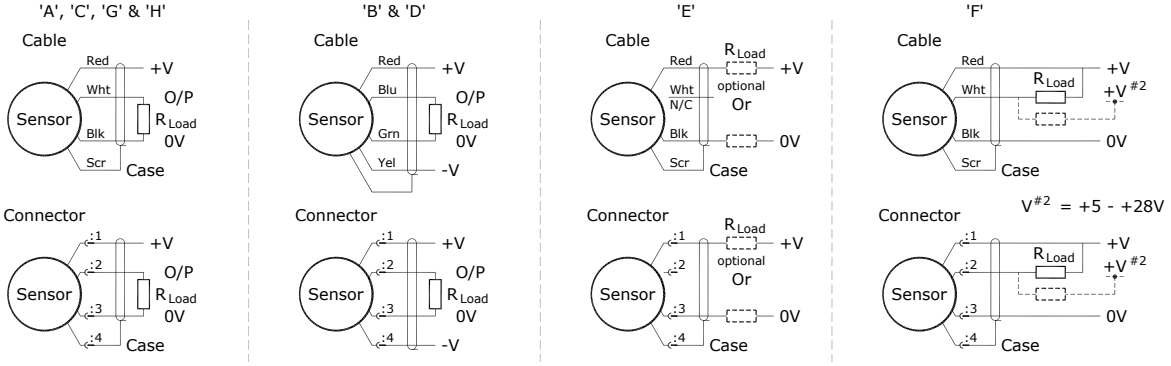
Output Option	Output Description:	Supply Voltage: V_s (tolerance)	Load resistance: (include leads for 4 to 20mA O/Ps)
A	0.5 - 4.5V (ratiometric with supply)	+5V (4.5 - 5.5V)	≥ 5kΩ
B	±5V	±15V nom. (±9 - 28V)	≥ 5kΩ
C	0.5 - 9.5V	+24V nom. (13 - 28V)	≥ 5kΩ
D	±10V	±15V nom. (±13.5 - 28V)	≥ 5kΩ
E	4 - 20mA 2 wire Current Loop	+24V nom. (18 - 28V)	≈ 0 - 300Ω max. @24V ~ 1.2 to 6V across 300Ω {R_L max. = (V_s - 18) / 20^{-3}}
F	4 - 20mA 3 wire Sink	+24V nom. (13 - 28V)	≈ 0 - 950Ω max. @24V ~ 3.8 to 19V across 950Ω {R_L max. = (V_s - 5) / 20^{-3}}
G	0.5 - 4.5V	+24V nom. (9 - 28V)	≥ 5kΩ
H	4 - 20mA 3 wire Source	+24V nom. (13 - 28V)	≈ 0 - 300Ω max. ~ 1.2 to 6V across 300Ω

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

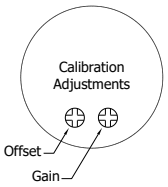
Connector Pin Layout:

DIN 43650 C

Earth = Pin '4'.

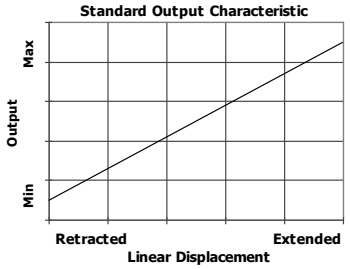


Gain and Offset Adjustment: (Where accessible - Typically ± 10% Min available)
To adjust the gain or offset use a small potentiometer adjuster or screwdriver 2mm across. Do not apply too much force on the potentiometers.



Mechanical Mounting: Flange mounted or by clamping the sensor body - body clamps are available, if not already ordered. The flange slots are 4.5 mm by 30 degrees wide on a 48 mm pitch.

Output Characteristic: Plunger extended, at start of normal travel, from mounting face by:
Standard body : 42.5 mm*
Flanged body : 28 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.
B & D	Supply leads diode protected. Output must not be taken outside ± 12V.
C & G	Supply leads diode protected. Output must not be taken outside 0 to 12V.
E, F & H	Protected against any misconnection within the rated voltage.

For further information please contact:
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