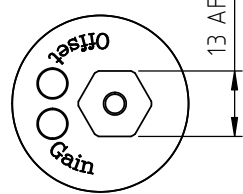
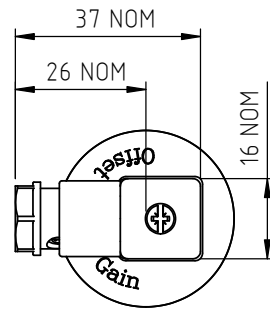
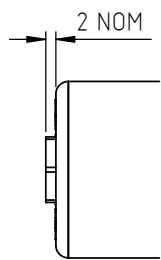


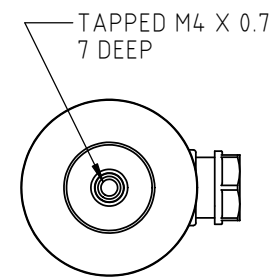
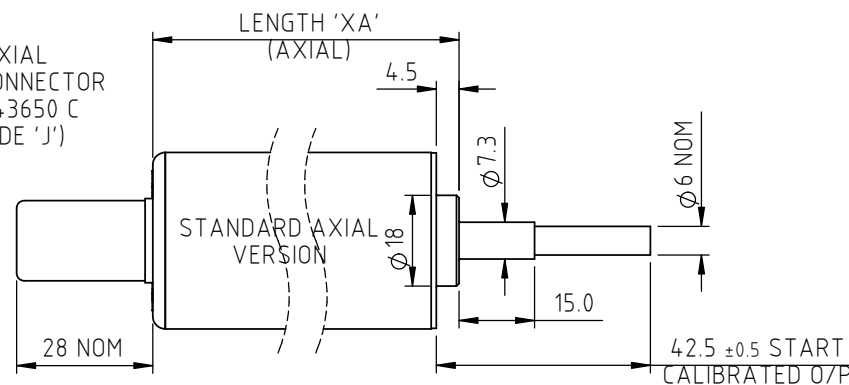
GAIN & OFFSET ADJUSTMENTS SEALED (CODE 'Y')



AXIAL IP67 SHORT CABLE GLAND (CODE 'Mxx')



AXIAL IP65 CONNECTOR DIN 43650 C (CODE 'J')



DIRECTION OF TRAVEL →

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	

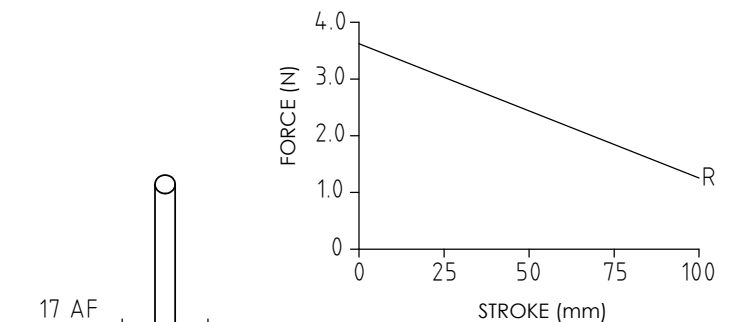
CONNECTIONS; CABLE 3-CORE CABLE 4-CORE CONNECTOR
 +Ve RED RED :1
 0V BLACK GREEN :3
 -Ve - YELLOW :4 O/P 'B' & 'D'
 OUTPUT WHITE BLUE :2
 BODY SCREEN SCREEN :4 NOT O/P 'B' & 'D'

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

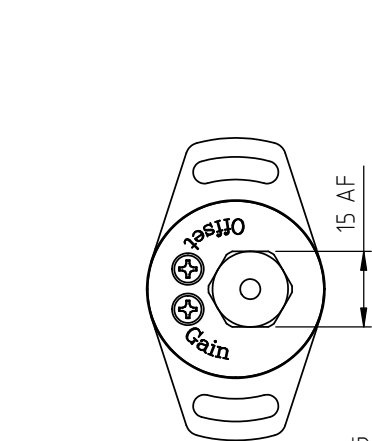
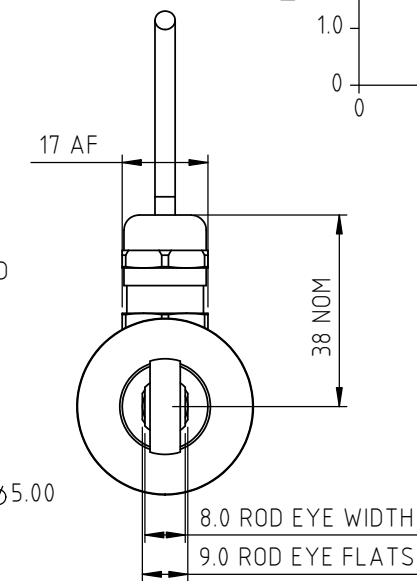
RANGE OF DISPLACEMENT FROM 0-51mm TO 0-100mm IN INCREMENTS OF 1mm e.g.36.
 BODY MATERIAL:- STAINLESS STEEL.
 FLANGE BASE MATERIAL:- ALUMINIUM (CODE 'N')

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')

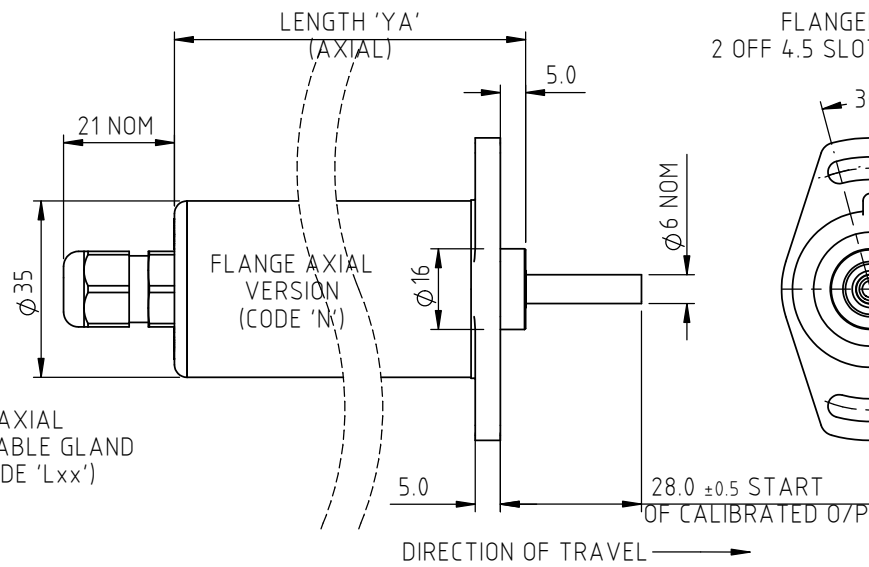
GAIN AND OFFSET ADJUSTMENTS NOT AVAILABLE WITH RADIAL BODY, CODE 'Lxx' AND 'K' OPTIONS



SPRING FORCE VS STROKE (CODE 'R')

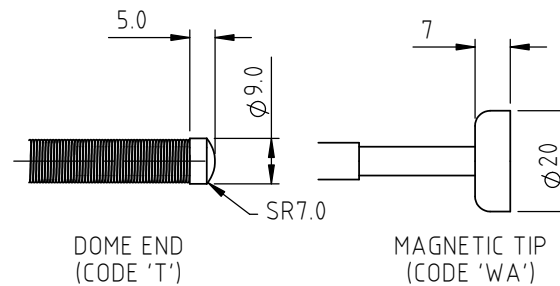
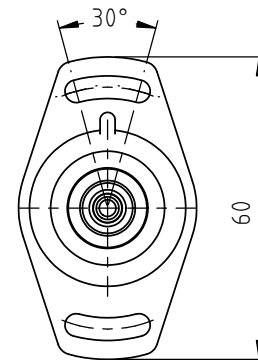


AXIAL IP67 CABLE GLAND (CODE 'Lxx')

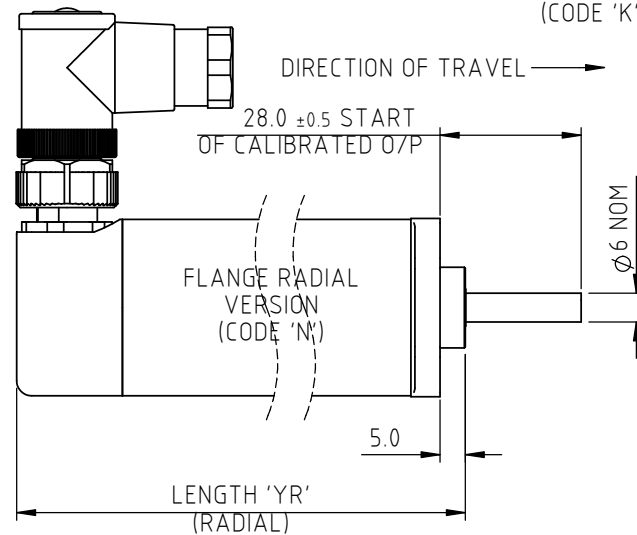


DIRECTION OF TRAVEL →

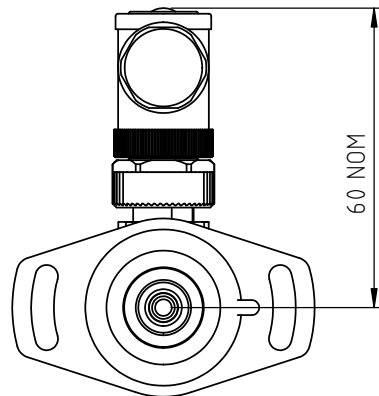
FLANGED BASE 2 OFF 4.5 SLOTS ON 48 PCD



RADIAL IP67 M12 CONNECTOR IEC 61076-2-101 (CODE 'K')

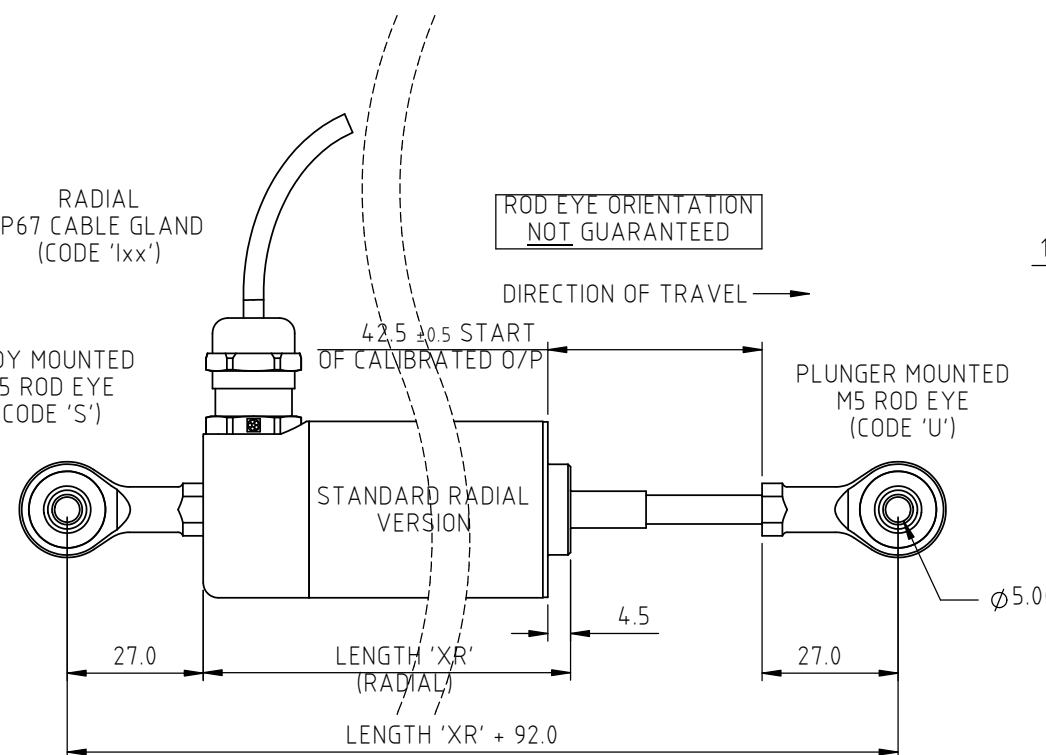


LENGTH 'YR' (RADIAL)



RADIAL IP67 CABLE GLAND (CODE 'Lxx')

BODY MOUNTED M5 ROD EYE (CODE 'S')



ROD EYE ORIENTATION NOT GUARANTEED

DIRECTION OF TRAVEL →

PLUNGER MOUNTED M5 ROD EYE (CODE 'U')

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					
TRAVEL (mm)		BODY LENGTH (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.



APPROVED BY RDM	REV C		X ±0.4 X.X ±0.2 X.XX ±0.1 DIMs mm
DESCRIPTION P133 MID-STROKE LINEAR SENSOR			
SCALE A3	2:3	DRAWING NUMBER 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
Axial version		
51 mm to 70 mm	125 mm	141.3 mm
71 mm to 100 mm	155 mm	171.3 mm
Radial version		
51 mm to 70 mm	143.5mm	159.8 mm
71 mm to 100 mm	173.5 mm	189.8 mm
Plunger	Ø 6mm	
	<i>For full mechanical details see drawing P133-11</i>	
Independent Linearity	≤ ± 0.25% FSO @ 20°C	
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	
<i>3D models, step or .igs 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:

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

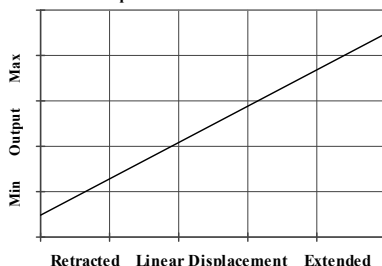
How Positek's technology eliminates wear for longer life

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. It also overcomes the drawbacks of LVDT technology – bulky coils, poor length-to-stroke ratio and the need for special magnetic materials, no requirement for separate signal conditioning. We also offer a range of ATEX-qualified intrinsically-safe sensors.

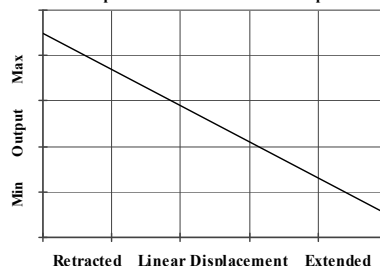
P133	a	b	c	d	e	f	g	h	j	k
	Displacement	Output	Adjustments	Connections	Option	Option	Option	Option	Option	Z-code

a Displacement	Value	e Housing	Code
Factory set to any length from 0-51 mm to 0-100 mm (e.g. 0-76 mm)	76	Standard default	blank
b Output		Flange Mount 2 off 4.5 mm x 30 degree wide slots, 48 mm P.C.D.	N
Supply V_{dc} (tolerance)	Output	M5 Rod-eye bearing radial version only	S
+5V (4.5 - 5.5V)	0.5 - 4.5V (ratiometric with supply)	f Body Fittings	Code
±15V nom. (±9 - 28V)	±5V	None default	blank
+24V nom. (13 - 28V)	0.5 - 9.5V	Body Clamps 1 pair	P
±15V nom. (±13.5 - 28V)	±10V	g Sprung Plunger	Code
+24V nom. (18 - 28V)	4 - 20mA 2 wire	Not sprung default	blank
+24V nom. (13 - 28V)	4 - 20mA 3 wire Sink	Spring extend captive plunger only. Note! Supplied loose without option 'T'	R
+24V nom. (9 - 28V)	0.5 - 4.5V	h Plunger Fittings	Code
+24V nom. (13 - 28V)	4 - 20mA 3 wire Source	Female thread M4x0.7x7 deep default	blank
Supply Current: 'A' 10mA nominal, 12mA max. 'B', 'D' & 'G' 12mA nominal, 15mA max. 'E' 26mA max. 'F' & 'H' 32mA nominal, 35mA max.		Dome end with spring extend option 'R'	T
c Calibration Adjustments	Code	M5 Rod-eye Bearing	U
Accessible default [†]	blank	Magnetic Tip	WA
Sealed	[†] Axial version only. Radial version sealed by default.	j Plunger	Code
d Connections	Code	Captive plunger is retained - default	blank
Cable gland radial IP67 Pg9, metal	Ixx	Non-captive plunger can depart body	V
Connector axial IP65 4 pin (3+earth) DIN 43650 'C'	J	k Z-code (optional)	Code
Connector axial IP65 4 pin (3+earth) DIN 43650 'C', pre-wired	Jxx	Option 'J' with IP67 M12 IEC 61076-2-101 conn. No access to cal. Adjustments, must include option 'Y'	Z600
Connector radial IP67 4 pin M12 IEC 61076-2-101, nylon	K	Option 'J' with IP67 M12 IEC 61076-2-101 conn. with access to cal. adjustments	Z601
Connector radial IP67 4 pin M12 IEC 61076-2-101, nylon, pre-wired	Kxx	≤± 0.1% FSO @20°C Independent Linearity	Z650
Cable gland axial IP67 M12, nylon	Lxx	¼" Rod eyes with options 'S' and/or 'U'	Z827
Cable gland, short [†] axial IP67, metal	Mxx		

Output Characteristic - Standard



Output Characteristic - Reverse option



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.

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)	$\geq 5k\Omega$
B	$\pm 5V$	$\pm 15V$ nom. ($\pm 9 - 28V$)	$\geq 5k\Omega$
C	0.5 - 9.5V	+24V nom. (13 - 28V)	$\geq 5k\Omega$
D	$\pm 10V$	$\pm 15V$ nom. ($\pm 13.5 - 28V$)	$\geq 5k\Omega$
E	4 - 20mA 2 wire Current Loop	+24V nom. (18 - 28V)	$\approx 0 - 300\Omega$ max. @24V ~ 1.2 to 6V across 300 Ω $\{R_L \text{ max.} = (V_s - 18) / 20^{-3}\}$
F	4 - 20mA 3 wire Sink	+24V nom. (13 - 28V)	$\approx 0 - 950\Omega$ max. @24V ~ 3.8 to 19V across 950 Ω $\{R_L \text{ max.} = (V_s - 5) / 20^{-3}\}$
G	0.5 - 4.5V	+24V nom. (9 - 28V)	$\geq 5k\Omega$
H	4 - 20mA 3 wire Source	+24V nom. (13 - 28V)	$\approx 0 - 300\Omega$ max. ~ 1.2 to 6V across 300 Ω

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

Connector Pinout
(Front View)

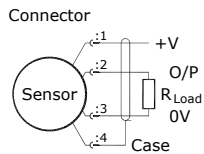
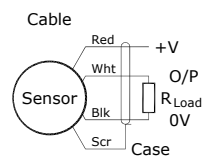
DIN 43650 C



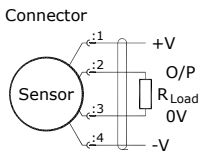
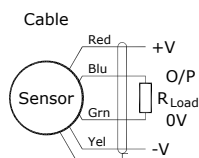
M12 IEC



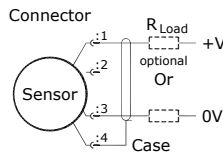
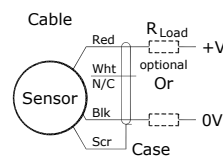
'A', 'C', 'G' & 'H'



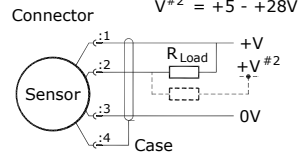
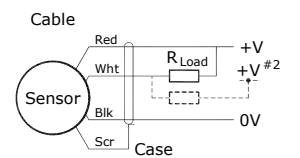
'B' & 'D'



'E'

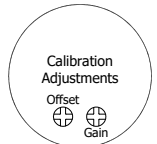


'F'



Gain and Offset Adjustment: (Where accessible - Typically $\pm 10\%$ 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: Depending on options, body can be mounted by flange, rod eye bearing or clamping the sensor body - body clamps are available, if not already ordered. Plunger mounted by M4x0.7 female thread, rod-eye bearing or magnetic tip - see drawing P133-11.

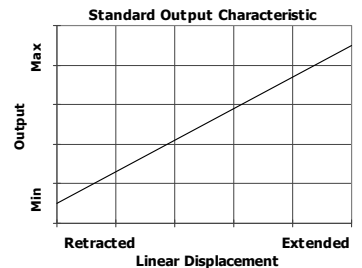
Output Characteristic: Plunger extended by, at start of normal travel:

Standard: 42.5 mm* from $\varnothing 35$ mm face

Flange Mount: 28 mm* from flange face

*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.



Warning - The M12 IEC connector may be rotated for purposes of convenient orientation of the connector and cable, however rotating the connector more than one complete revolution is not recommended. **Repeated rotation of the connector will damage the internal wiring!**

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 $\pm 12V$.

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