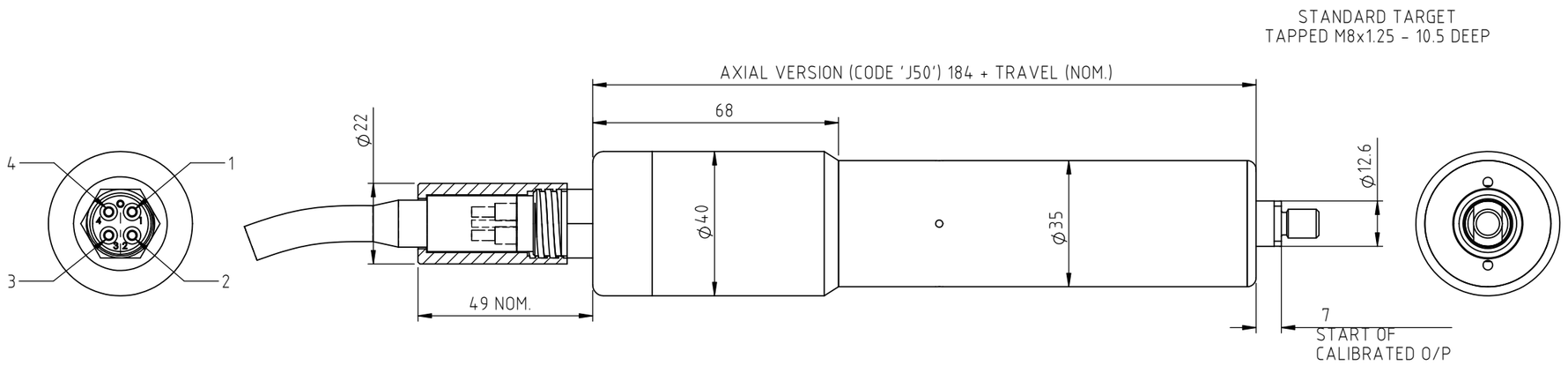
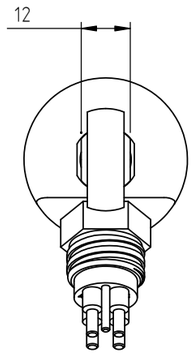
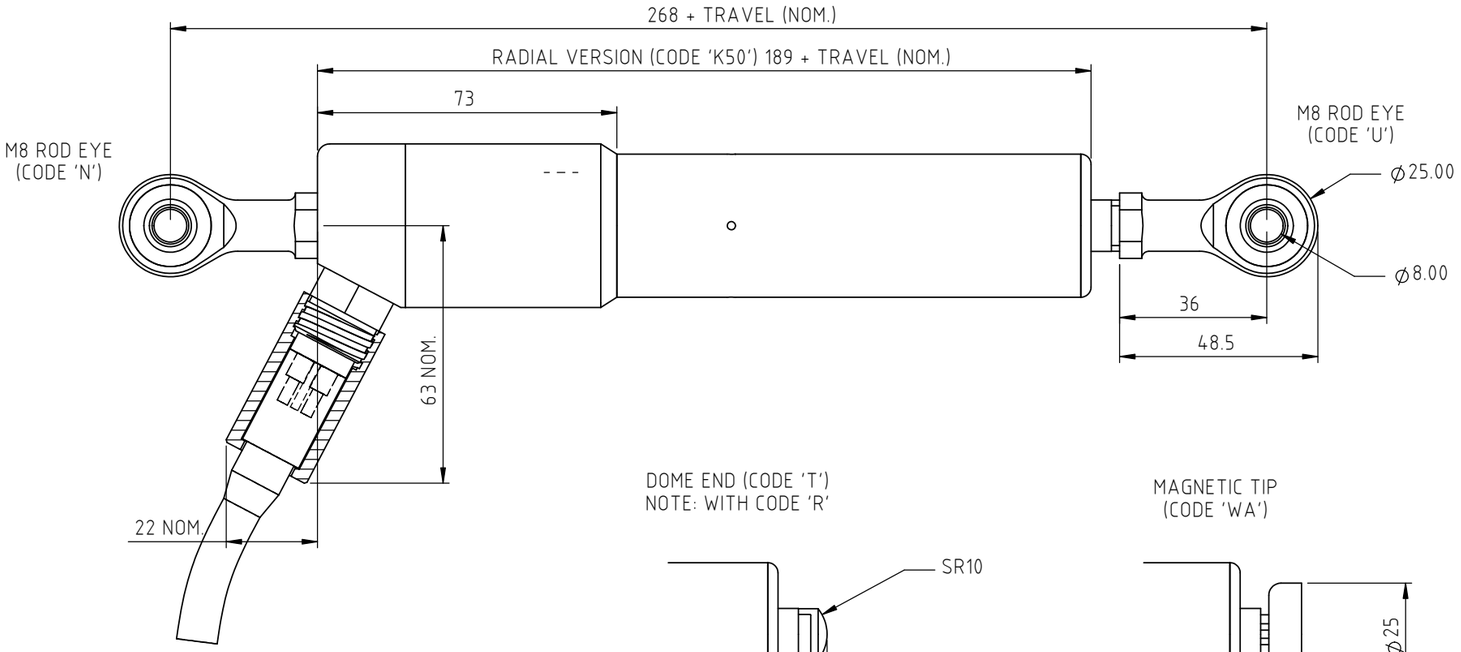
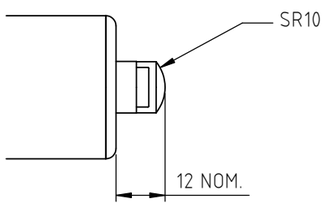
NOTE: ROD-EYE ORIENTATION NOT GUARENTEED
CONNECTORS: MICRO WET-MATE, 4 POLE.
BULKHEAD: MCBH-4-MP-SS, STAINLESS STEEL/MOLDED NEOPRENE, SEALING: 340bar OPEN FACE, 600bar MATED.
IN-LINE: MCIL4-FS, MOLDED NEOPRENE WITH CABLE. LOCKING SLEEVE: MCDLS-F, DELRIN



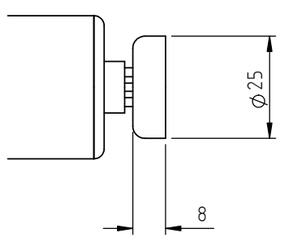




DOME END (CODE 'T')
NOTE: WITH CODE 'R'



MAGNETIC TIP
(CODE 'WA')



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:

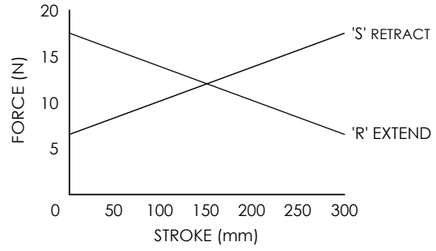
1	BLACK	OUTPUT
2	WHITE	0V
3	RED	BODY (OPTIONS: A, C, E, F, G, H) -Ve (OPTIONS: B, D)
4	GREEN	+Ve
	SCREEN	NOT CONECTED TO SENSOR

MATING CONNECTOR (CODE 'J50' OR 'K50') SUPPLIED WITH 50cm MOULDED CABLE AS STANDARD
4-CORE SCREENED: 0.5mm², Ø7.5mm MAX.
JACKET AND CORE INSULATION: EPDM

RANGE OF DISPLACEMENT FROM 0-5mm TO 0-800mm e.g.76, IN INCREMENTS OF 1mm

BODY MATERIAL:- STAINLESS STEEL 316.

FURTHER OPTIONS:
SINGLE PAIR OF BODY CLAMPS 'P'
TWO PAIRS OF BODY CLAMPS 'P2'
SPRING RETURN PUSH-ROD, TRAVEL ≤300mm
RETURN TO EXTENDED POSITION (CODE 'R')
RETURN TO RETRACTED POSITION (CODE 'S')
PUSH-ROD FREE (CODE 'V') - NOT AVAILABLE WITH SPRUNG OPTIONS.



SPRING FORCE vs STROKE
(CODE 'R' OR 'S')

MAXIMUM WORKING DEPTH: 3500m 350bar.
WHERE THE 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
J	RAN 1311 - MAGNETIC TIP OPTION 'WA' ADDED	ASC	02/06/2023	ASC

THE PUSH-ROD RETRACTS 4mm NOM. BACK FROM THE START OF CALIBRATED TRAVEL.
THE PUSH-ROD EXTENDS 8mm NOM. BEYOND THE END OF CALIBRATED TRAVEL.
SPRUNG OPTIONS:- CODE 'R': 1mm, CODE 'S': 2mm.
CODE 'V': PUSH-ROD NOT RETAINED.

Positek

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

DESCRIPTION:
S125 350bar SUBMERSIBLE STANDALONE LINEAR POSITION SENSOR

SCALE	DRAWING NUMBER
2:3	S125-11
A3	SHEET 1 OF 1

S125 350 BAR SUBMERSIBLE STAND-ALONE LINEAR POSITION SENSOR

Position feedback for industrial and scientific applications

- **Non-contacting inductive technology to eliminate wear**
- **Travel set to customer's requirement**
- **Compact and self-contained**
- **High durability and reliability**
- **High accuracy and stability**
- **Sealing to IP68 350Bar**



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 S125 is an affordable, durable, high-accuracy linear sensor designed for arduous underwater applications such as ROVs. The unit is highly compact and space-efficient, being responsive along almost its entire length. Like all Positek® sensors, the S125 provides a linear output proportional to travel. Each sensor is supplied with the output calibrated to the travel required by the customer, from 5 to 800mm and with full EMC protection built in. The sensor is very robust, the body and push rod being made of stainless steel for long service life and environmental resistance. Overall performance, repeatability and stability are outstanding over a wide temperature range.
The sensor is easy to install with mounting options including stainless steel M8 rod eye bearings and body clamps. The push rod can be supplied free or captive with male M8 thread, an M8 rod eye, dome end or magnetic tip. M12 and 1/2" rod eye option available. Captive push rods can be spring extended or retracted on sensors with up to 300mm of travel. The S125 also offers a wide range of mechanical and electrical options, environmental sealing is to IP68 350Bar.

SPECIFICATION

Dimensions	
Body diameter	40 mm electronics & 35 mm
Body length (Axial version)	calibrated travel + 184 mm
Body length (Radial version)	calibrated travel + 189 mm
Push rod extension	calibrated travel + 7 mm, OD 12.6 mm
For full mechanical details see drawing S125-11	
Independent Linearity	≤ ± 0.25% FSO @ 20°C - up to 450 mm
	≤ ± 0.5% FSO @ 20°C - over 450 mm
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 (Non Icing)	
Operating	-4°C to +50°C
Storage	-4°C to +50°C
Sealing	IP68 350Bar
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	
S125-11	Sensor Outline

3D models, step or .igs 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.

S125 350 BAR SUBMERSIBLE STAND-ALONE 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.

S125 .	a	b	c	d	e	f	g	h	j
	Displacement	Output	Connections	Option	Option	Option	Option	Option	Z-code

a **Displacement**	**Value**
Factory set to any length from 0-5 mm to 0-800 mm (e.g. 0-254 mm)	**254**

b **Output**

Supply V_{dc} (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**

Supply Current: 'A' 10mA nominal, 12mA max. 'B', 'D' & 'G' 12mA nominal, 15mA max. 'E' 26mA max. 'F' & 'H' 32mA nominal, 35mA max.

c **Connections**	**Code**
Connector axial IP68 350 Bar Wet mate 4 pin MC BH-4-M	**J50**
Connector radial IP68 350 Bar Wet mate 4 pin MC BH-4-M	**K50**

Supplied with an over-moulded MC IL-4-F connector with 0.5 m, 4-core 20 AWG (0.5mm^2) EPDM cable assembly, and locking collar as standard.

d **Body Fittings**	**Code**
None default	blank
M8 Rod-eye bearing radial version only	**N**

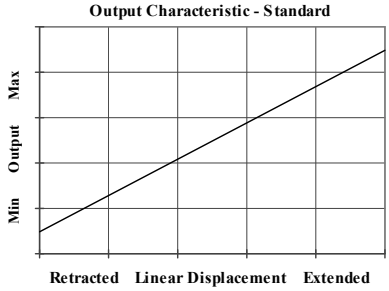
e **Body Clamps**	**Code**
Body Clamps 1 pair	**P**
Body Clamps 2 pairs	**P2**

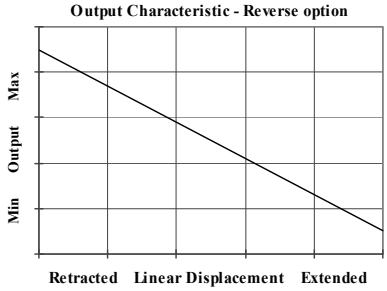
f **Sprung Push Rod**		**Code**
Not sprung default		blank
Spring extend	300 mm maximum displacement and captive push rod only.	**R**
Spring retract		**S**

g **Push Rod Fittings**	**Code**
Male thread M8x1.25x10 long default	blank
Dome end with spring extend option 'R'	**T**
M8 Rod-eye Bearing	**U**
Magnetic Tip	**WA**

h **Push Rod**	**Code**
Captive push rod retained default	blank
Non-captive push rod can depart body	**V**

j **Z-code (optional)**	**Code**
Tighter Independent Linearity; ≤± xx% FSO @20°C ≤± 0.1% 0 - 10 mm min. to 0 - 450 mm ≤± 0.25% 0 - 451 mm to 0 - 600 mm ≤± 0.5% 0 - 601 mm to 0- 800 mm max.	**Z650**
½" Rod eyes with options 'N' and/or 'U'	**Z825**
M12 Rod eyes with options 'N' and/or 'U'	**Z826**





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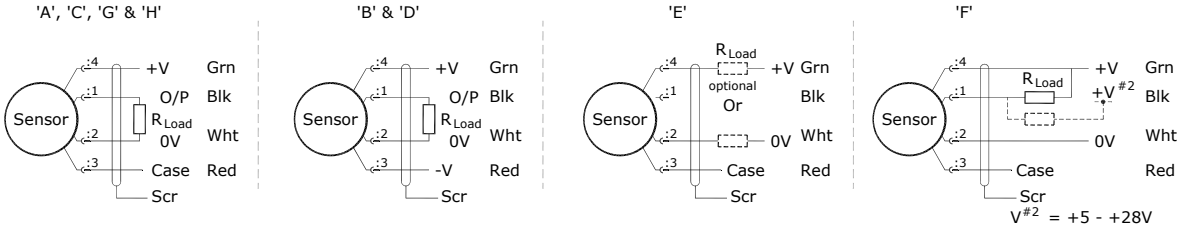
Installation Information

S125 350 BAR SUBMERSIBLE STAND-ALONE 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

Connector Pin Layout:
MC BH 4 M (face view)

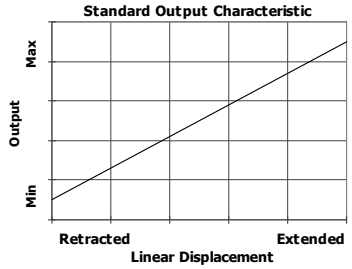




Mechanical Mounting: Depending on options; Body can be mounted by rod eye or by clamping the sensor body - body clamps are available, if not already ordered. Target by M8x1.25 male thread, rod eye or magnetic tip. It is assumed that the sensor and target mounting points share a common earth.

N.b. cable free end must be appropriately terminated to prevent water ingress into the cable. See page 2 for connector handling instructions.

Output Characteristic: Target is extended 7 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 800 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:
www.positek.com sales@positek.com
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Positek Ltd, Andoversford Industrial Estate, Cheltenham GL54 4LB. U.K.

Installation Information

S125 350 BAR SUBMERSIBLE STAND-ALONE LINEAR POSITION SENSOR

Connector Mating Instructions

Handling

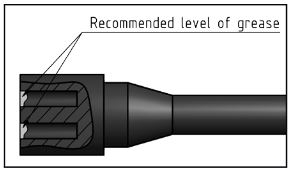
- Always apply grease mating
- Disconnect by pulling straight, not at an angle
- Do not pull on the cable and avoid sharp bends at cable entry
- When using bulkhead connector, ensure that there are no angular load
- Do not over-tighten the bulkhead nuts
- Connectors should not be exposed to extended periods of heat or direct sunlight. If a connector becomes very dry, it should be soaked in fresh water before use

Cleaning

- General cleaning to remove any accumulated sand or mud on a connector should be performed using spray based contact cleaner (isopropyl alcohol)
- New grease must be applied again prior to mating

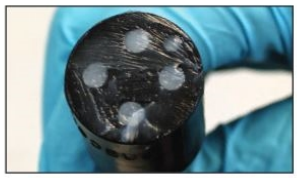
Greasing and mating above water (dry mate)

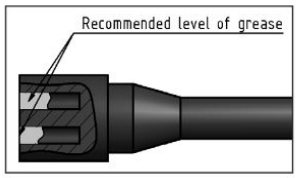




- Connectors must be greased with Molykote 44 Medium before every mating
- A layer of grease corresponding to approximately 1/10 of the socket depth should be applied to the female connector
- The inner edge of all the sockets should be completely covered, and a transparent layer of grease left visible on the face of the connector
- After greasing, fully mate the male and female connector in order to secure optimal distribution of grease on pins and in sockets
- To confirm that the grease has been sufficiently applied, de-mate and check for grease on every male min. Then re-mate the connector

Greasing and mating under water (wet mate)





- Connectors must be greased with Molykote 44 Medium before every mating
- A layer of grease corresponding to approximately 1/3 of the socket depth should be applied to the female connector
- All sockets should be completely sealed, and a transparent layer of grease left visible on the face of the connector
- After greasing, fully mate the male and female connector and remove any excess grease from the connector joint

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