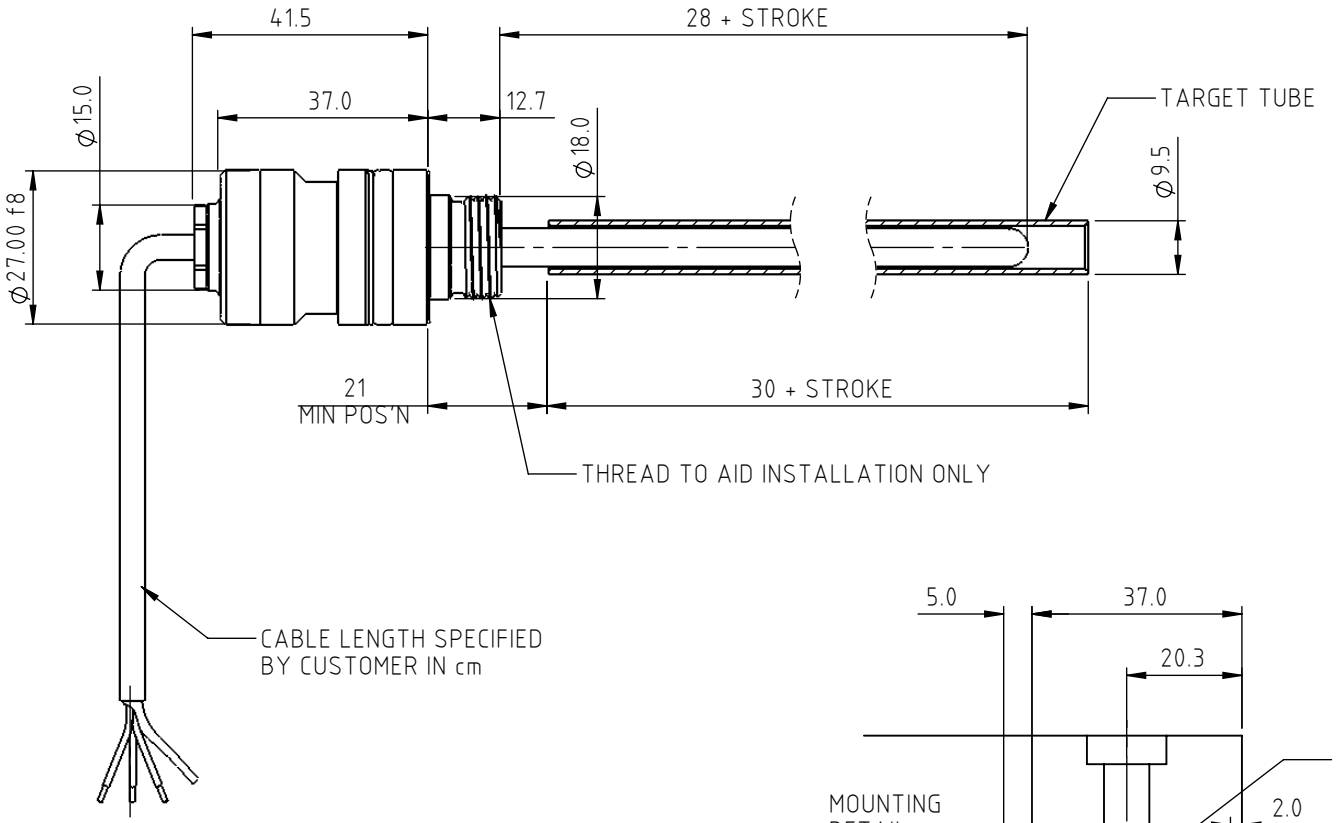

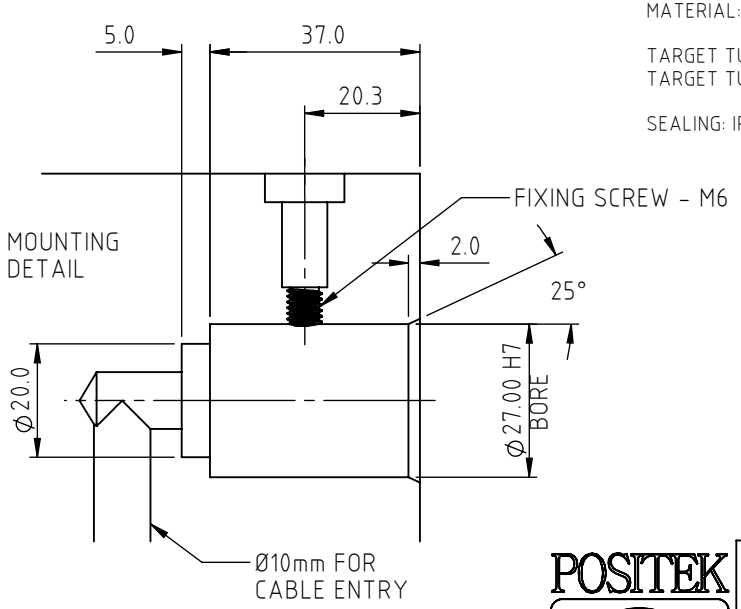

ELECTRICAL OPTIONS/ SPECIFICATIONS

OUTPUT	SUPPLY (NOM.)
'A' 0.5 - 4.5V RATIOMETRIC	5V
'C' 0.5 - 9.5V	24V
'G' 0.5 - 4.5V	24V

SUPPLY CURRENT 12mA TYP. 20mA MAX.

'H' 4 TO 20mA SOURCE§	24V

§ DRIVE 300Ω MAXIMUM TO 0V

CONNECTIONS;	CABLE 3-CORE
+Ve	RED
0V	BLACK
-Ve	-
OUTPUT	WHITE
BODY	SCREEN

CABLE; 0.2mm^2, O/A SCREEN, PUR JACKET. O/D; 3-CORE: Ø4mm

SUPPLIED WITH 50cm OR REQUIRED LENGTH IN cm. e.g. 'L50'
CONNECTORS; MAXIMUM CONDUCTOR CROSS SECTION 0.25mm^2

SENSOR IS MANUFACTURED TO A SPECIFIC LENGTH AND MEASUREMENT RANGE SPECIFIED BY THE CUTSOMER UP TO A MAXIMUM RANGE OF 600mm.

BODY MATERIAL:- STAINLESS STEEL.

TARGET TUBE OPTIONS:
MATERIAL: OPTION 'R' - STAINLESS STEEL Ø9.45
OPTION 'S' - ALUMINIUM 6063 Ø3/8" (9.2-9.8mm)
TARGET TUBE FLANGE OPTIONS: SEE DRAWING TG24-11
TARGET TUBE MOUNTING ARRANGEMENTS: SEE DRAWING P100-12

SEALING: IP67 AS STANDARD
(IP68 VERSION AVAILABLE ON REQUEST)

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
A	FIRST RELEASE	ASC	08/09/2020	-

CE

POSITEK LIMITED

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

DESCRIPTION
LIPS P116 INTERNALLY MOUNTED CYLINDER SENSOR

SCALE	DRAWING NUMBER
3:4	P116-11
A4	SHEET 1 OF 1

P116 INTERNALLY MOUNTED CYLINDER SENSOR

High-resolution position feedback for hydraulic and pneumatic cylinders

- **Non-contacting inductive technology to eliminate wear**
- **Fully integrated electronics**
- **Travel set to customer's requirement**
- **Compact and easy to install**
- **High durability and reliability**
- **High accuracy and stability**
- **Sealing to IP67**
- **Frequency response of 10kHz**
- **Can be modified and supplied as drop in replacements for competitor products**

The P116 linear sensor is designed to be fitted inside hydraulic or pneumatic cylinders allowing the external cylinder design to be unaffected.
It is an extremely durable, high-accuracy device providing position feedback for applications where service life, environmental resistance and cost are important.

It is particularly suitable for OEMs where very competitive volume pricing and unmatched overall performance make it a very attractive option. The sensor has fully integrated electronics with a variety of voltage and current outputs so no need for any external signal conditioning.

Overall performance, repeatability and stability are outstanding over a wide temperature range.
The sensor is compact and responsive along almost its entire probe length. Like all Positek® sensors each unit is supplied with the output calibrated to the exact travel required by the customer, which can be anything from 5mm up to a maximum of 600mm. It also has full EMC protection built in.

The P116 is stainless steel with an inert fluoropolymer-sheathed probe with a stainless steel target tube.
Sealing is to IP67

The sensor is easy to install within cylinders and has a range of mechanical and electrical options.

The P116 can also be modified to match other products that are currently on the market or where the cylinder has already been machined to a specific size.
they have major advantages over LVDT's, such as compact stroke to length ratio, 10kHz frequency response. In addition they have no electrically wearing parts so don't suffer the problems associated with potentiometer based devices. .
Since there are no external electronics, it offers protection against accidental damage which can cause machinery downtime and increased costs.

SPECIFICATION

Dimensions	
Body Diameter:	Ø27 mm
Body Length:	41.5 mm
Probe Length: (nom.)	calibrated travel + 28 mm
Target Tube Length	calibrated travel + 30 mm
For full mechanical details see drawings P116-11	
Independent Linearity	≤ ± 0.25% FSO @ 20°C - up to 600 mm
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
Hydraulic Pressure	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	
P116-11	Sensor Outline
TG24-11	Optional Target Tube Flange details

Drawings; in AutoCAD® dwg or dxf format or 3D .stp are available on request.

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

P116 INTERNALLY MOUNTED CYLINDER SENSOR

High-resolution position feedback for hydraulic and pneumatic cylinders

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: Manufactured mechanically and electrically for any measurement length from 5mm up to 600 mm

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	

CONNECTION

Cable length: Supplied with 50 cm – please specify length required in cm.

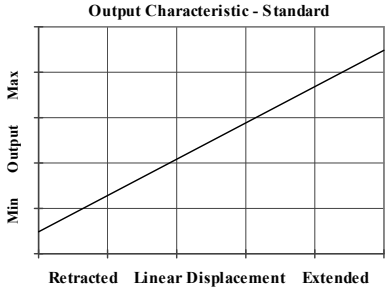
TARGET TUBE OPTIONS

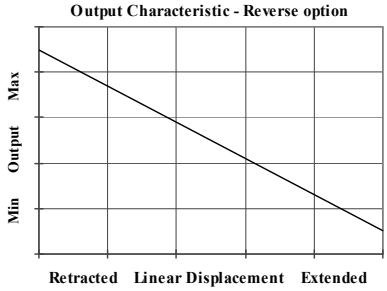
Stainless Steel (316) ID 7.7mm, OD 9.5mm (nom.)
Aluminium (6063) ID 7.1mm, OD 9.5mm (nom.)

FLANGE OPTIONS

Penny & Giles HLP100, Temposonics (M4 fixing) and Parker Hannifin cylinders versions available.
see drawing TG24-11

Sensor is supplied with oring and backup ring for sealing





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P116 Internally Mounted Cylinder Sensor With External Electronics

	a	b	C	d	e
P116	. Displacement	Output	Connections	Option	Option

a **Displacement** (mm)		**Value**
Displacement in mm	e.g. 0 - 254 mm	**254**

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**		**Code**
Cable Gland	IP67	**Lxx**

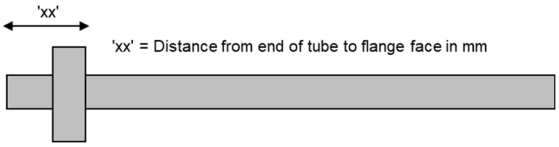
Supplied with 50 cm as standard, specify required cable length specified in cm. e.g. L2000 specifies cable gland with 20 metres of cable. Nb: restricted cable pull strength.

d **Target Tube**		**Code**
Stainless Steel 316	OD: 9.45 mm	**R**
Aluminium 6063	OD: 3/8”	**S**

See P100-12 Drawing for Typical Target Installation details.

e **Target Tube Mounting Flange**		**Code**
None		**U**
Penny & Giles HLP100	Please specify flange position in mm. eg. W17.5 specifies a Tempo style flange fitted 17.5 mm from the front face	**Vxx**
Temposonics (M4 fixing)		**Wxx**
Parker Hannifin		**Xxx**

See TG24-11 Drawing for Target Details.

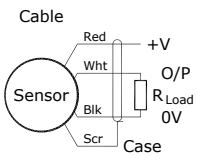


Installation Information

P116 INTERNALLY MOUNTED CYLINDER

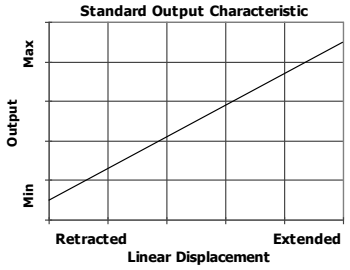
Output Option	Output Description:	Supply Voltage: V_s (tolerance)	Load resistance: (include leads for 4 to 20mA O/Ps)
A	0.5 - 4.5V (ratiometric with supply)	+5V (4.5 - 5.5V)	≥ 5kΩ
C	0.5 - 9.5V	+24V nom. (13 - 28V)	≥ 5kΩ
G	0.5 - 4.5V	+24V nom. (9 - 28V)	≥ 5kΩ
H	4 - 20mA 3 wire Source	+24V nom. (13 - 28V)	≈ 0 - 300Ω max. ~ 1.2 to 6V across 300Ω

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



Mechanical Mounting: The sensor is intended for internal mounting in hydraulic or pneumatic cylinders. Retain with an M6 grub screw, see drawing P116-11 for details. Install the target tube using the flange provided or adhere directly into the piston rod, the end of the target tube can be proud or flush with the piston end face as required.

Output Characteristic: Target position at start of normal travel is 21 mm from sensor body. The output increases as the target is moved away 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.

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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