RIPS® P501 MINIATURE ROTARY SENSOR

High-resolution angle feedback for industrial and scientific applicatior

- **Non-contacting inductive technology to eliminate wear**
- **Angle set to customer's requirement**
- **Compact, durable and reliable**
- **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 P501 RIPS® (Rotary Inductive Position Sensor) is an affordable, durable, high-accuracy rotary sensor designed for industrial and scientific feedback applications, but requires a smaller footprint than the P500.

Like all Positek® sensors, the P501 provides a linear output proportional with input shaft rotation. Each unit is supplied with the output calibrated to the angle required by the customer, between 30 and 140 degrees and with full EMC protection built in.

It is particularly suitable for OEMs seeking good sensor performance for applications where space is important.

Overall performance, repeatability and stability are outstanding over a wide temperature range. The sensor has a rugged nickel plated aluminium body and integrated mounting flange. The flange has two 4.3mm by 20 degree wide slots on a 48mm pitch to simplify mounting and position adjustment. Environmental sealing is to IP67 on the cable version.

SPECIFICATION

Dimensions	
Body diameter	28.3 mm (solder pins) 30.8 mm (with cable boot)
Body Length (to seal face)	23.2 mm
Shaft	8.5 mm Ø 4 mm
For full mechanical details see drawing P501-11	
Power Supply	+5V dc nom. ± 0.5V, 10mA typ 20mA max
Output Signal	0.5-4.5V dc ratiometric, Load: 5kΩ min.
Independent Linearity	≤ ± 0.31% FSO @ 20°C - up to 80° ≤ ± 0.1% FSO @ 20°C* available upon request.
*Sensors with calibrated travel up to 80°.	
Temperature Coefficients	< ± 0.01%/°C Gain & < ± 0.01%FS/°C Offset
Frequency response	> 10 kHz (-3dB)
Resolution	Infinite
Noise	< 0.02% FSO
Torque	< 20 mNm Static
Environmental Temperature Limits	
Operating	-40°C to +125°C
Storage	-40°C to +125°C
Sealing	IP67
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	
P501-11	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.

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RIPS® P501 MINIATURE ROTARY SENSOR

High-resolution angle feedback for industrial and scientific applications

How Positek's PIPS® technology eliminates wear for longer life

Positek's **PIPS®** technology (Positek Inductive Position Sensor) is a major advance in displacement sensor design. PIPS®-based displacement transducers have the simplicity of a potentiometer with the life of an LVDT/RVDT.

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

PIPS® 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.

Our LIPS® range are linear sensors, while RIPS® are rotary units and TIPS® are for detecting tilt position. Ask us for a full technical explanation of PIPS® technology.

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

TABLE OF OPTIONS

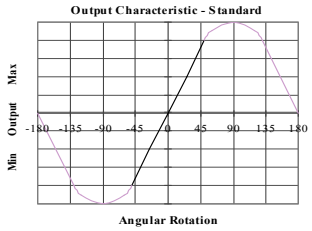
CALIBRATED TRAVEL: Factory-set to any angle from ±15° to ±70° in increments of 1 degree.
Full 360° Mechanical rotation.

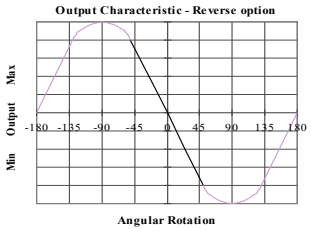
ELECTRICAL INTERFACE

OUTPUT SIGNAL	SUPPLY INPUT	OUTPUT LOAD
0.5-4.5V dc ratiometric	+5V dc nom. ± 0.5V.	5kΩ min.

CONNECTOR/CABLE OPTIONS
Solder pins
Cable with boot IP67
Cable length >50 cm – please specify length in cm

MOUNTING OPTIONS
Plain 4 mm diameter shaft with flat or tongue with spring clip .





RIPS® SERIES P501 Miniature Rotary Sensor

	a	b	c	d	e	f
P501	. Displacement	A	Connections	Option	Option	Z-code

a **Displacement** (degrees)		**Value**
Displacement in degrees	e.g. 0 - 54 degrees	**54**

b **Output**		
Supply V dc V_s (tolerance)	**Output**	**Code**
+5V (4.5 - 5.5V)	0.5 - 4.5V (ratiometric with supply)	**A**

c **Connections** Cable* or Connector		**Code**
Solder Pins	requires option 'U'	**L0**
Cable	requires option 'T'	**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 **Shaft Option**	**Code**
Plain Shaft	**N**
Sprung Blade	**P**

e **Housing Options**		**Code**
Heatshink Boot	IP67 requires option 'Lxx'	**T**
None	requires option 'L0'	**U**

f **Z-code**	**Code**
≤± 0.1% @20°C Independent Linearity displacement up to 80 degrees only!	**Z650**

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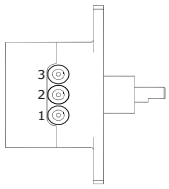
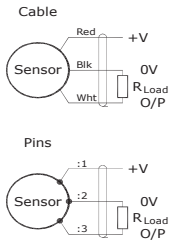
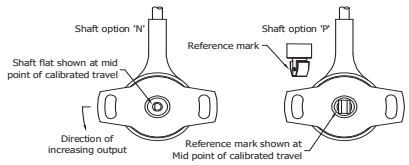
Installation Information
RIPS® P501 MINIATURE ROTARY SENSOR

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

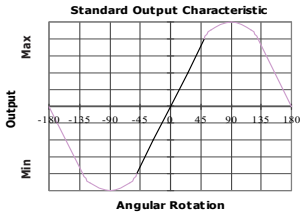






Mechanical Mounting: Flange mounted. The flange slots are 4.5mm by 20 degrees wide, 48mm pitch. The sensor should be mounted with minimal axial and radial loading on the shaft for optimum life. It is recommended that the shaft is coupled to the drive using a flexible coupling.
Option 'N' shaft: Ø 4 mm x 8 mm long, flat 3 mm A/F x 4 mm. Option 'P' shaft: fits 6 x 3 mm slot.

Output Characteristic: The sensor has full rotational freedom and two sectors, 180° apart, over which linear response can be achieved. At the mid point of the calibrated range the output signal will be half full scale deflection, shaft alignment as sketch above. In the calibrated range the output increases as the shaft is rotated in an anti-clockwise direction viewed from the shaft. The calibrated output is factory set to be between 30 and 140°.



Incorrect Connection Protection levels: 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.

ELECTRICAL OPTIONS/ SPECIFICATIONS

	OUTPUT	SUPPLY
CODE 'A'	0.5 TO 4.5V RATIOMETRIC	5V
	SUPPLY CURRENT 12mA TYP. 20mA MAX.	

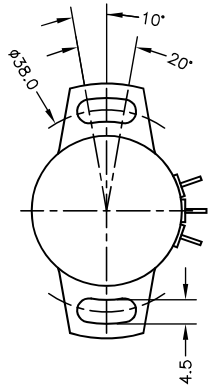
CABLE: 3 CORE 0.2mm², O/A SCREEN, ø4mm PUR JACKET – SUPPLIED WITH 50cm OR REQUIRED LENGTH IN cm. e.g. 'L50'

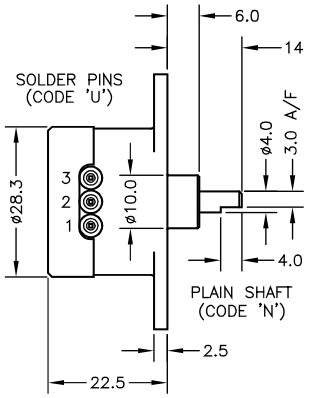
CONNECTIONS;

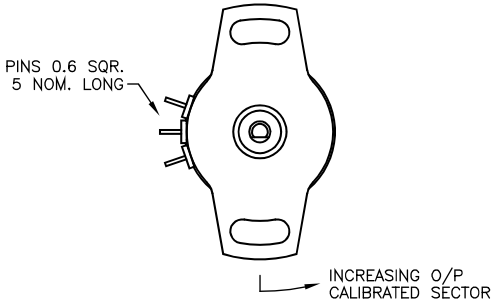
3 CORE	PINS	
RED	'1'	+Ve
BLACK	'2'	0V
WHITE	'3'	OUTPUT
SCREEN		BODY

RANGE OF DISPLACEMENT FROM 0–30° TO 0–140° e.g. 76°, IN INCREMENTS OF 1°.

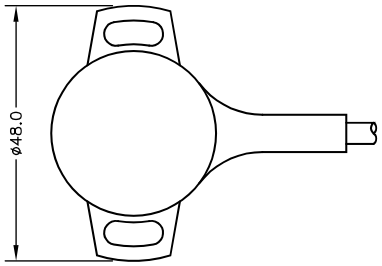
BODY MATERIAL:– ALUMINIUM ALLOY.

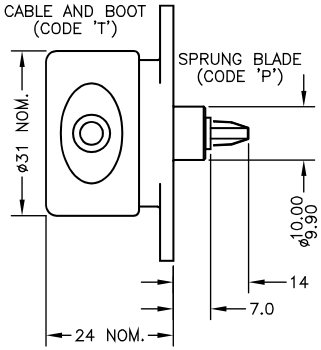


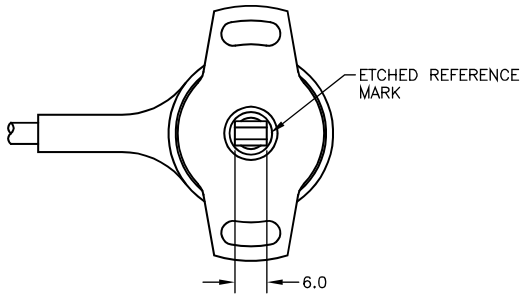




SHAFT FLAT ALIGNED WITH MOUNTING SLOT AT MID TRAVEL ±5°.







SPRING CLIP ALIGNEMENT WITH MOUNTING SLOT AT MID TRAVEL ±5°.

SPRING CLIP FITS INTO 3.0 WIDE SLOT.

H	REDRAWN	PDM
I	BOSS Ø10.00 ADDED	PDM
J	ADDITIONAL DIMS/VIEWS ADDED.	PDM
K	RANGE NOTE AMENDED ~ RAN1200	PDM

CE

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H	19/10/06		CHECKED BY	X ±0.4
I	15/01/09		RDS	X.X ±0.2
J	06/07/11			X.XX ±0.1
K	11/09/17			DIMS mm
		DESCRIPTION		
		P501 RIPS MINIATURE ROTARY SENSOR		
SCALE	10mm	DRAWING NUMBER	P501-11	REV K
				SHEET 1 OF 1