

α P501
Miniature Rotary Sensor

FEATURES

- Non-contacting inductive technology to eliminate wear
- Angle set to customer's requirement
- Compact, durable and reliable
- High accuracy and stability
- Sealing to IP67

The P501 is an affordable, durable, high-accuracy rotary sensor designed for industrial and scientific feedback applications, but requires a smaller footprint than the P500.

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. Overall performance, repeatability and stability are outstanding over a wide temperature range. It is particularly suitable for OEMs seeking good sensor performance for applications where space is important.

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.

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.



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 m
For full mechanical details see drawing P501-11	
Independent Linearity	≤ ± 0.31% FSO @ 20°C - 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
3D models, step or .igs format, available on request	



High-resolution angle feedback for industrial and scientific applications

■ ELIMINATES WEAR FOR LONGER LIFE

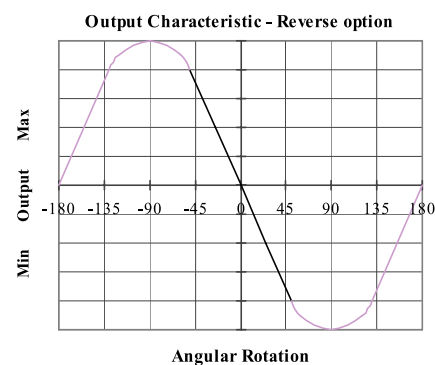
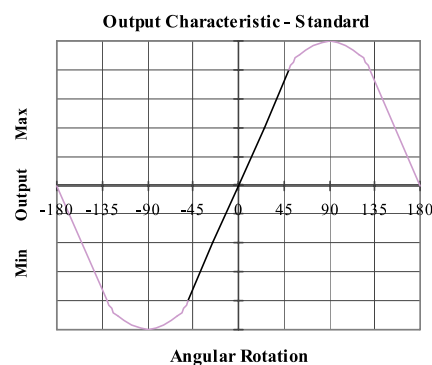
Our displacement transducers have the simplicity of a potentiometer with the life of an LVDT/RVDT.

Our technology combines the best in fundamental inductive principles with advanced micro-electronic integrated circuit technology. The P501 sensor, based on simple inductive coils using 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.

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

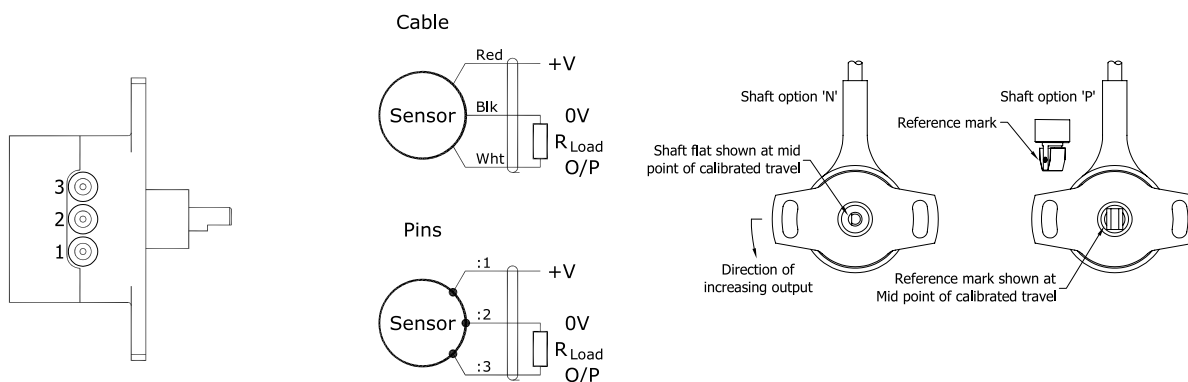
a	Displacement	Value
	Factory set to any angle from 0-30° (±15°) to 0-140° (±70°) (e.g. 0-54°)	54
b	Output	Code
	Supply V_{dc} (tolerance)	
	+5V (4.5 - 5.5V)	0.5 - 4.5V (ratiometric with supply)
	Supply Current: 'A' 10mA nominal, 12mA max.	A
c	Connections	Code
	Solder Pins requires option 'U'	L0
	Cable requires option 'T'	Lxx
	Specify required cable length 'xx' in cm. e.g. L2000 specifies cable gland with 20 m of cable, 50 cm supplied as standard.	
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 (optional)	Code
	± 0.1% FSO @20°C Independent Linearity 0 - 100° max.	Z650





INSTALLATION INFORMATION

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)	5k!

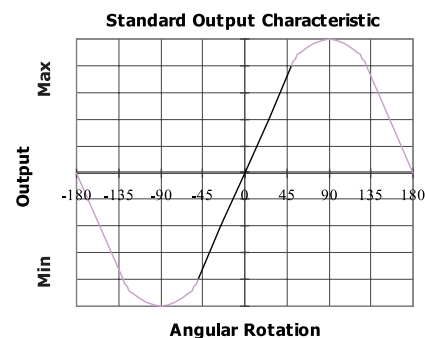


MECHANICAL MOUNTING

Flange mounted. The sensor should be mounted with minimal axial and radial loading on the shaft for optimum life. It is recommended that the Ø 4 mm shaft option is coupled to the drive using a flexible coupling - see drawing P501-11.

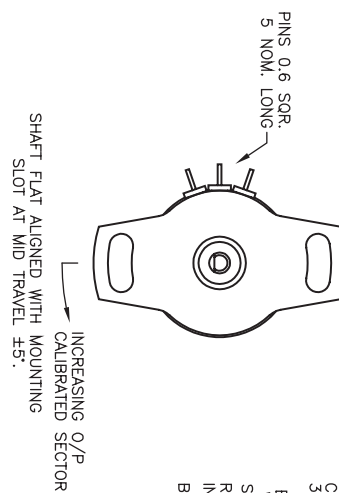
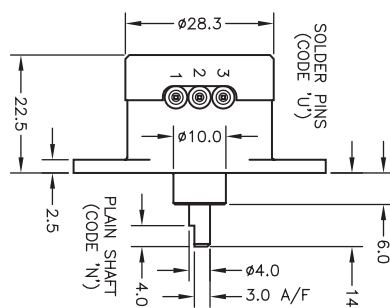
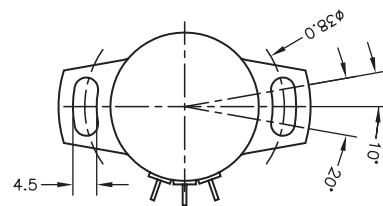
OUTPUT CHARACTERISTIC

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°.



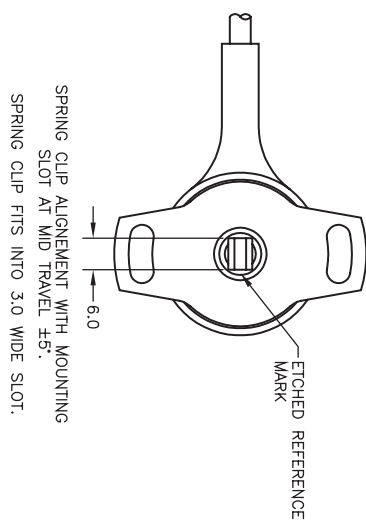
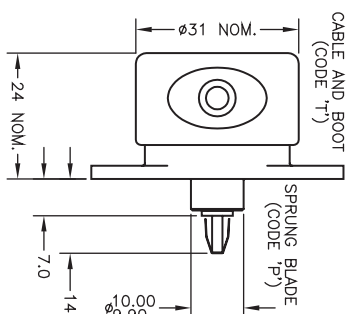
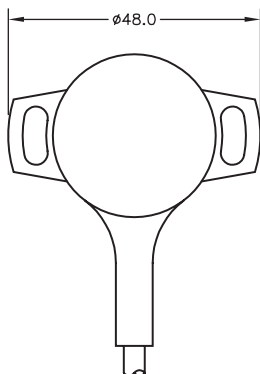
INCORRECT CONNECTION PROTECTION LEVELS

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 RATIO-METRIC 5V
	SUPPLY CURRENT 12mA TYP. 20mA MAX.
CABLE: 3 CORE 0.2mm ² , 0/A SCREEN, Ø4mm PUR JACKET	
- SUPPLIED WITH 50cm OR REQUIRED LENGTH IN cm.	
e.g. 'L50'	
CONNECTIONS:	
3 CORE PINS	+1ve
RED '1'	0V
BLACK '2'	OUTPUT
WHITE '3'	BODY
SCREEN	
RANGE OF DISPLACEMENT FROM 0-30° TO 0-140° e.g. 76°	
IN INCREMENTS OF 1°.	
BODY MATERIAL:- ALUMINIUM ALLOY.	



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



DRAWINGS NOT TO BE CHANGED WITHOUT REFERENCE TO THE CHANGE PROCEDURE.
CHANGES TO PARTS USED IN INTRINSICALLY SAFE PRODUCT MUST BE APPROVED
BY THE AUTHORIZED PERSON.
THIS IS AN UNCONTROLLED PRINT AND WILL NOT BE UPDATED.

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	DESCRIPTION			
		P501 RIPS MINIATURE			
		ROTARY SENSOR			
SCALE	10:1	DRAWING NUMBER	P501-11	REV	K
		SHEET	1	OF	1