



# P530 ROTARY SENSOR

High-resolution angle feedback for industrial and scientific applications

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

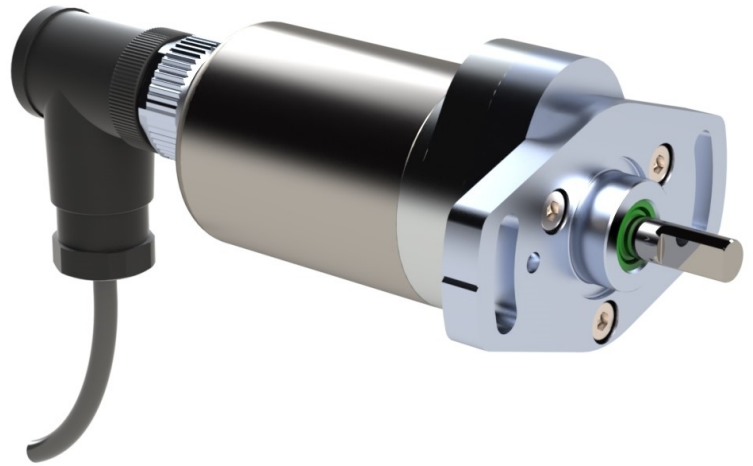
As a leading designer and manufacturer of linear, rotary, tilt and intrinsically safe position sensors, Positek® has the expertise to supply a sensor to suit a wide variety of applications.

Our P530 is an affordable, durable, high-accuracy rotary sensor designed for industrial and scientific feedback applications.

The P530, like all Positek® sensors, is supplied with the output calibrated to the angle required by the customer, up to 360 degrees, with full EMC protection built in. The sensor provides a linear output proportional with input shaft rotation. There is a machined registration mark to identify the calibrated mid point.

It is particularly suitable for OEMs seeking good sensor performance for arduous applications such as industrial machinery where cost is important.

Overall performance, repeatability and stability are outstanding over a wide temperature range. The P530 has long service life and environmental resistance with a rugged stainless steel body and shaft, it also offers a range of mechanical and electrical options. The flange mount makes the sensor easy to install. Environmental sealing is to IP67.



## SPECIFICATION

<b>Dimensions</b>	
Body diameter	35 mm
<i>For full mechanical details see drawing P530-11</i>	
<b>Independent Linearity</b>	$\leq \pm 0.25\%$ FSO @ 20°C
<b>Temperature Coefficients</b>	$< \pm 0.01\%/^{\circ}\text{C}$ Gain & $< \pm 0.01\% \text{FS}/^{\circ}\text{C}$ Offset
<b>Frequency response</b>	$> 10$ kHz (-3dB) $> 300$ Hz (-3dB) 2 wire 4 to 20 mA
<b>Resolution</b>	Infinite
<b>Noise</b>	$< 0.02\%$ FSO
<b>Torque</b>	$< 20$ mNm Static
<b>Environmental Temperature Limits</b>	
Operating	-40°C to +125°C standard -20°C to +85°C buffered -40°C to +125°C
Storage	-40°C to +125°C
<b>Sealing</b>	IP67
<b>EMC Performance</b>	EN 61000-6-2, EN 61000-6-3
<b>Vibration</b>	IEC 68-2-6: 10 g
<b>Shock</b>	IEC 68-2-29: 40 g
<b>MTBF</b>	350,000 hrs 40°C Gf
<b>Drawing List</b>	
P530-11	Sensor Outline
<i>3D models, in 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:

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P530-17b

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## 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:** Factory-set to any angle from  $\pm 50^\circ$  to  $\pm 180^\circ$  in increments of 1 degree.

Full  $360^\circ$  Mechanical rotation.

### ELECTRICAL INTERFACE OPTIONS

OUTPUT SIGNAL	SUPPLY INPUT	OUTPUT LOAD
Standard:		
0.5-4.5V dc ratiometric	+5V dc nom. $\pm 0.5V$ .	5k $\Omega$ min.
Buffered:		
0.5-4.5V dc	+24V dc nom. + 9-28V.	5k $\Omega$ min.
$\pm 5V$ dc	$\pm 15V$ dc nom. $\pm 9-28V$ .	5k $\Omega$ min.
0.5-9.5V dc	+24V dc nom. + 13-28V.	5k $\Omega$ min.
$\pm 10V$ dc	$\pm 15V$ dc nom. $\pm 13.5-28V$ .	5k $\Omega$ min.
Supply Current	10mA typical, 20mA maximum.	
4-20mA (2 wire)	+24 V dc nom. + 18-28V.	300 $\Omega$ @ 24V.
(3 wire sink)	+24 V dc nom. + 13-28V.	950 $\Omega$ @ 24V.
(3 wire source)	+24 V dc nom. + 13-28V.	300 $\Omega$ max.

Sensors supplied with access to output 'zero' and 'span' calibration adjustments as standard. No access option available.

### CONNECTOR/CABLE OPTIONS

Connector - M12 4 pin IP67

Cable with M12 gland or short gland IP67

Cable length >50 cm – please specify length in cm

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# SERIES P530 Rotary Sensor

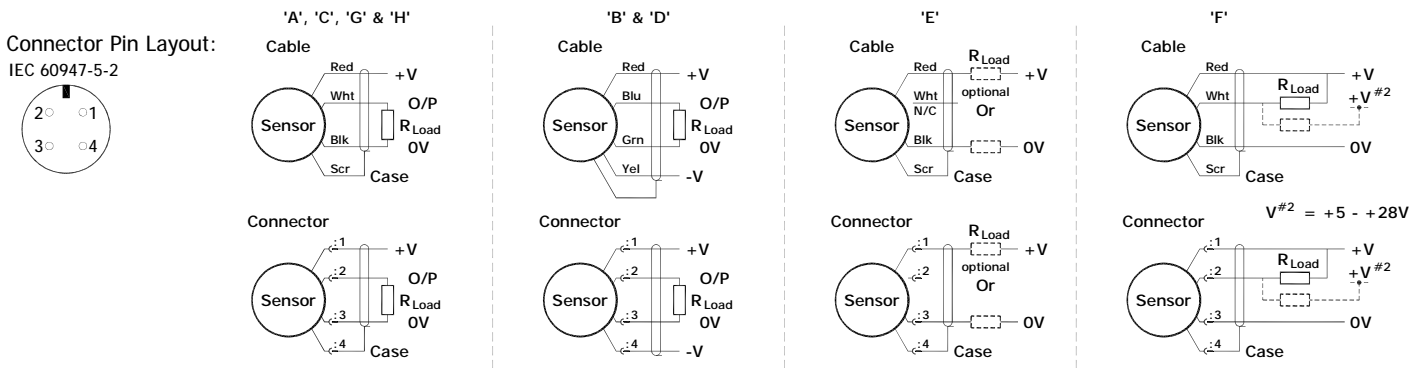
a	b	c	d	e	
P530	Displacement	Output	Adjustments	Connections	Z-code

a Displacement (degrees)		Value
Displacement in degrees	e.g. 0 - 270degrees	270
b Output		
Supply V dc V <sub>s</sub> (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
c Calibration Adjustments		Code
Accessible - default		blank
Sealed		Y
d Connections Cable* or Connector		Code
Connector	IP67 M12 4 pin	J
Connector with cable	IP67 M12 4 pin	Jxx
Cable Gland	IP67 M12	Lxx
Cable Gland	IP67 Short	Mxx
*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.		
e Z-code		Code

# Installation Information

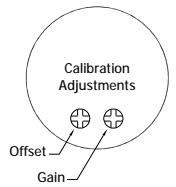
## P530 ROTARY SENSOR

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)	$\geq 5k\Omega$
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 $\Omega$ $\{R_L \text{ max.} = (V_s - 18) / 20^{-3}\}$
F	4 - 20mA 3 wire Sink	+24V nom. (13 - 28V)	$\approx 0 - 950\Omega$ max. @24V ~ 3.8 to 19V across 950 $\Omega$ $\{R_L \text{ max.} = (V_s - 5) / 20^{-3}\}$
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 $\Omega$



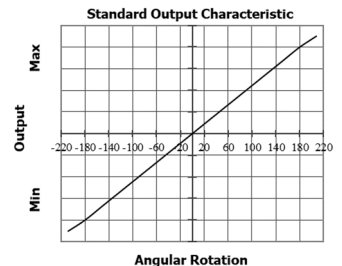
### Gain and Offset Adjustment: (Where accessible - Typically $\pm 10\%$ Min available)

To adjust the gain or offset use a small potentiometer adjuster or screwdriver 2mm across. Do not apply too much force on the potentiometers. The offset is set at mid span at the mid point, within  $\pm 5^\circ$ , of rotation.



**Mechanical Mounting:** Flange mounted, via two slots 4.5mm by 30 degrees wide on a 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, recommended maximum axial load 1kg. Tests indicate that life in excess of 16 million cycles can be achieved with 1kg side and end load.

**Output Characteristic:** The sensor has  $\pm 220^\circ$  mechanical rotation around the mid point. At the mid point the output signal will be half full scale deflection, the shaft flat will be aligned with the registration mark in the base of the sensor  $\pm 5^\circ$ . In the calibrated range the output increases as the shaft is rotated in an anti-clockwise direction viewed from the shaft. The calibrated range is factory set, to between 100 and 360 $^\circ$ .



### 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.

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