α P505

APPLICATION

- 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, Althen has the expertise to supply a sensor to suit a wide variety of applications. Our P505 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 Althen sensors, the P505 provides a linear output proportional with input shaft rotation, which has full 360 degree rotational freedom. Each unit is supplied with the output calibrated to the angle required by the customer, between 15 and 160 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 P505 has long service life and environmental resistance with stainless steel body, shaft, flange and servo mounts. The flange or servo mounting options make the sensor easy to install. The P505 also offers a range of mechanical and electrical options. Environmental sealing is to IP67.

SPECIFICATIONS

Dimensions[1]	
Body diameter	19 mm
Body Length (to mounting face)	45.4 mm standard, 50.4 mm buffered
Shaft	8 mm Ø 4 mm
Independent Linearity	≤ ± 0.25% FSO @ 20°C - up to 100°
Temperature Coefficients	< ± 0.01%/°C Gain & < ± 0.01%FS/°C Offset
Frequency Response	> 10 kHz (-3dB)
Resolution	Infinite
Noise	< 0.02% FSO
Torque	< 15 mNm Static
Environmental Temperature Limits	
Operating	-40°C to +125°C standard -20°C to +85°C buffered
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

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SPECIFICATIONS (CONTINUED)

MTBF	350,000 hrs 40°C Gf
Drawing List[2] **P505-11**	Sensor Outline

[1] *For full mechanical details see drawings P505-11*
[2] *3D models, step or .igs format, available on request*

HOW ALTHEN'S TECHNOLOGY ELIMINATES WEAR FOR LONGER LIFE

Althen'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. An Althen sensor, based on simple inductive coils using Althen'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.

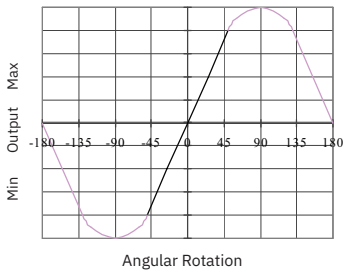
We also offer a range of ATEX-qualified intrinsically-safe sensors.

P505	.	a Displacement	b Output	c Connections	d Option	e Z-code

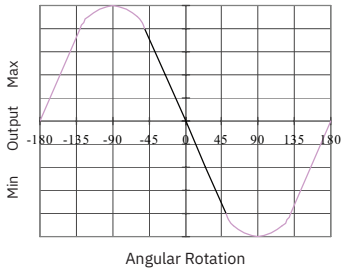
a Displacement		**Value**
Factory set to any angle from 0-16° (±8°) to 0-160° (±80°) (e.g. 0-54°)		**54**
b Output		
Supply V_{dc} (tolerance)	**Output**	**Code**
+5V (4.5 - 5.5V)	0.5 - 4.5V (ratiometric with supply)	**A**
+24V nom. (13 - 28V)	0.5 - 9.5V	**C**
+24V nom. (9 - 28V)	0.5 - 4.5V	**G**
+24V nom. (13 - 28V)	4 - 20mA (3 wire Source)	**H**
Supply Current 'A', 'C', 'G' 10mA typical, 12mA max. 'H' 30mA typical, 35mA max.		
c Connections		**Code**
Connector axial IP67 4 pin M8 IEC 61076-2-104, nylon		**J**
Connector axial IP67 4 pin M8 IEC 61076-2-104, nylon, pre-wired		**Jxx**
Cable gland axial IP67 M8, metal, 3-core cable		**Lxx**
Specify required cable length 'xx' in cm. e.g. L2000 specifies axial cable gland with 20 m of cable, 50 cm supplied as standard.		
d Sensor Mounting		**Code**
Flange default		**blank**
Servo Mount		**P**

e Z-code (optional)	**Code**
≤± 0.1% FSO @20°C Independent Linearity	**Z650**

Output Characteristic - Standard



Output Characteristic - Reverse option



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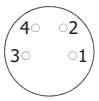
INSTALLATION INFORMATION

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)	≥ 5kΩ
C	0.5 - 9.5V	+24V nom. (13 - 28V)	≥ 5kΩ
G	0.5 - 4.5V	+24V nom. (9 - 28V)	≥ 5kΩ
H	4 –20mA	+24V nom. (13 - 28V)	300Ω max.

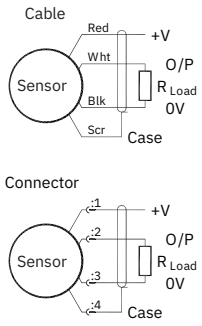
Not all output options available - see product datasheet for full options list

Connector Pinout (Front View)

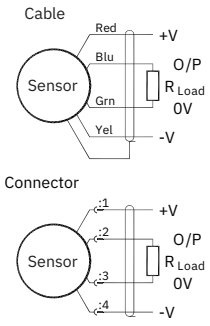
M8 IEC



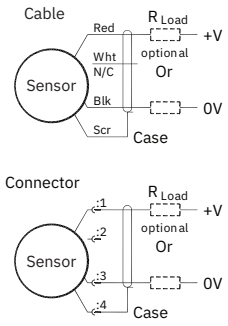
'A', 'C' , 'G' & 'H'



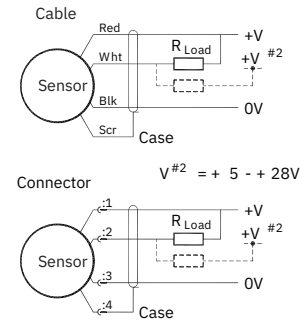
'B' & 'D'



'E'



'F'



MECHANICAL MOUNTING

Flange mounted - see drawing P505-11. 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.

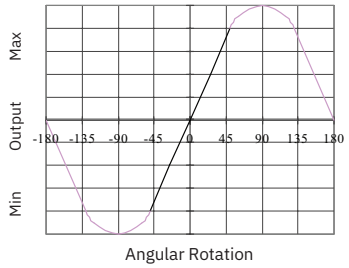
OUTPUT CHARACTERISTIC

The sensor has 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, and the flat on the shaft is aligned with the registration mark in the base of the sensor. 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 15 and 160°.

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.

Standard Output Characteristic



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OUTPUT OPTION	OUTPUT	SUPPLY	
A	0.5 TO 4.5V RATIOMETRIC	5V	STANDARD
C	0.5 TO 9.5V	24V	BUFFERED
G	0.5 TO 4.5V	24V	BUFFERED
H	4 TO 20mA	24V	BUFFERED

SUPPLY CURRENT 12mA TYP. 20mA MAX. PLUS O/P CURRENT
CABLE: 0.2mm², O/A SCREEN, PUR JACKET – SUPPLIED WITH 50cm OR REQUIRED LENGTH IN cm. e.g. 'L50'
3–CORE: JACKET ø4mm

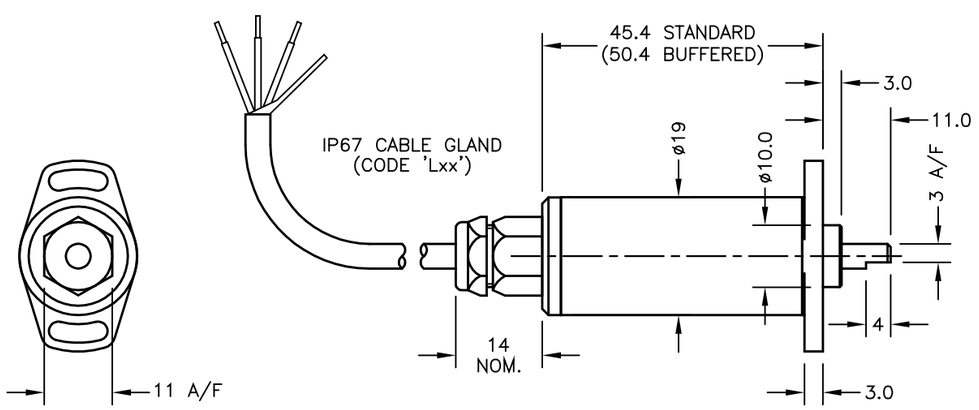
CABLE/CONNECTOR* CONNECTIONS;
3 CORE CONNECTOR

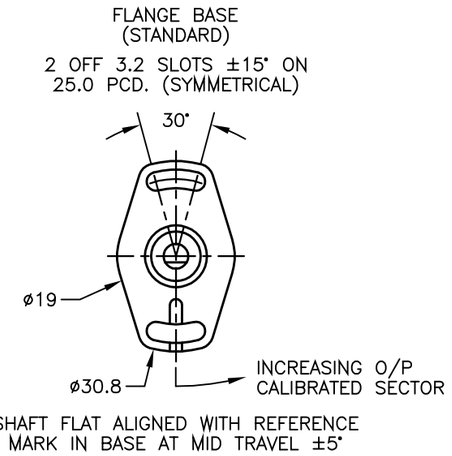
RED	:1	+Ve
BLACK	:3	0V
WHITE	:2	OUTPUT
SCREEN	:4	BODY

*CONNECTORS; MAXIMUM CONDUCTOR CROSS SECTION 0.25mm²

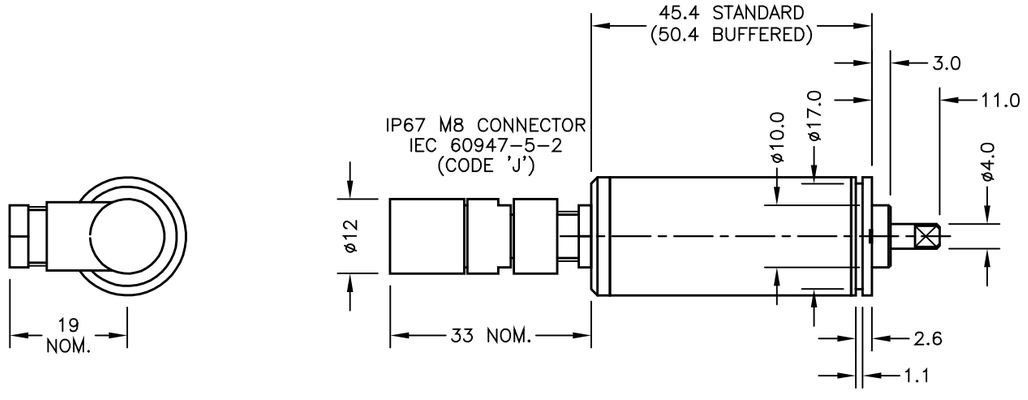
RANGE OF DISPLACEMENT FROM 0–15° TO 0–160° e.g. 76°, IN INCREMENTS OF 1°.

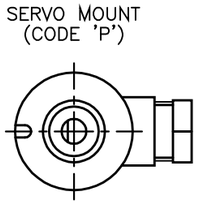
BODY MATERIAL: STAINLESS STEEL.
FLANGE BASE MATERIAL:– STAINLESS STEEL.
SERVO MOUNT MATERIAL:– STAINLESS STEEL.





SHAFT FLAT ALIGNED WITH REFERENCE MARK IN BASE AT MID TRAVEL ±5°





D	SHAFT LENGTH REDUCED 0.5 - RAN538.	PDM
E	SERVO MOUNT SHOWN AT MID POSITION	RDS
F	OPTION 'J' ADDED - RAN1068.	PDM
G	RANGE NOTE AMENDED ~ RAN1200	PDM
H	4 TO 20mA ADDED RAN1256	RDS
J	STAINLESS FLANGE BASE & SERVO MOUNT WAS	
	ALUMINIUM - RAN1218	PDM

CE

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.

D	21/01/15		CHECKED BY	X ±0.4
E	7/4/15		RDM	X.X ±0.2
F	02/12/15			X.XX ±0.1
G	12/09/17			DIMS mm
H	12/09/18	DESCRIPTION		
J	12/09/18	P505 RIPS MINIATURE ROTARY SENSOR		
SCALE 5mm		DRAWING NUMBER P505-11		REV J
				SHEET 1 OF 1