



S508 Submersible Rotary Sensor

High-resolution angle feedback for industrial, vehicle, marine and offshore applications

ALTHEN
SENSORS & CONTROLS

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S508

APPLICATION

- Non-contacting inductive technology to eliminate wear
- Angle set to customer's requirement
- Compact, durable and reliable
- High accuracy and stability
- Sealing to IP68 10 Bar and IP69K
- 316 stainless construction



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 S508 is an affordable, durable, high-accuracy rotary sensor designed for industrial, vehicle, marine and offshore applications where sealing from water jets and submersion are complimented with a 316 stainless construction.

The S508, like all Althen sensors, is supplied with the output calibrated to the angle required by the customer up to a maximum of 160 degrees and 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 S508 has long service life and environmental resistance with a rugged stainless steel body. It also offers a range of mechanical and electrical options.

SPECIFICATIONS

Dimensions¹	
Body diameter	35 mm
Body length (to seal face)	51 mm standard, 56 mm buffered
Shaft	12.5 mm Ø 6 mm
Independent Linearity	$\leq \pm 0.25\%$ FSO @ 20°C - up to 100°
Temperature Coefficients	$< \pm 0.01\%/^{\circ}\text{C}$ Gain & $< \pm 0.01\%\text{FS}/^{\circ}\text{C}$ Offset
Frequency Response	$> 10\text{ kHz}$ (-3dB) $> 300\text{ Hz}$ (-3dB) 2 wire 4 to 20 mA
Resolution	Infinite
Noise	$< 0.02\%$ FSO
Torque	$< 20\text{ mNm}$ Static
Environmental Temperature Limits	
Operating	-40°C to +125°C standard -20°C to +85°C buffered
Storage	-40°C to +125°C
Sealing	IP68 10Bar IP69K
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

06.2025 | version 0001

SPECIFICATIONS (CONTINUED)

Drawing List ² S508-11	Sensor Outline
¹ For full mechanical details see drawings S508-11 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.

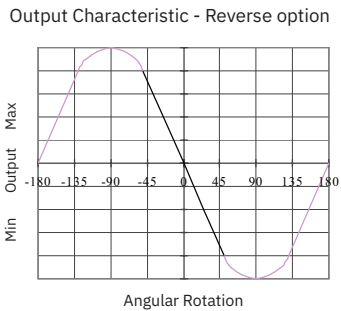
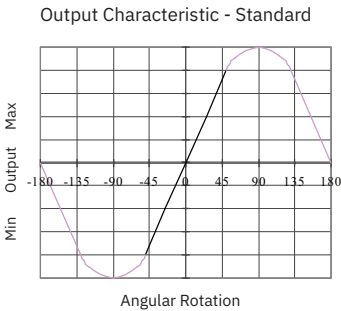
Our technology combines the best in fundamental inductive principles with advanced micro-electronic integrated circuit technology. An Althen sensor, based on simple inductive coils using Althen's ASIC control technology, directly measures absolute position giving a DC analogue output signal. Because 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.

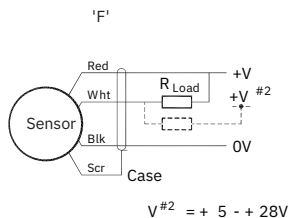
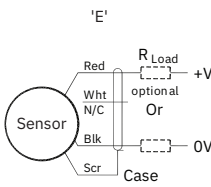
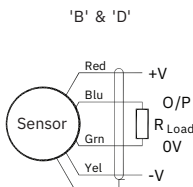
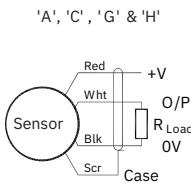
S508	a	b	c	d
	Displacement	Output	Connections	Z-code

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
±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
Supply Current: 'A' 10mA nominal, 12mA max. 'B', 'D' & 'G' 12mA nominal, 15mA max. 'E' 26mA max. 'F' & 'H' 32mA nominal, 35mA max.		
c Connections		Code
Cable gland IP68 10Bar/IP69K Pg7		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 Z-code (optional)		Code
≤± 0.1% FSO @20°C Independent Linearity 0 - 16° min. to 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)	$\geq 5k\Omega$
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 300Ω {RL 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 950Ω {RL 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 300Ω



MECHANICAL MOUNTING

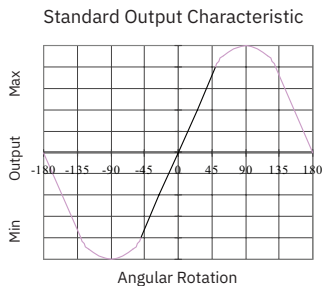
Flange mounted - see drawing S508-11. Sensor is supplied with a 24x2 N70 O-ring face seal. The sensor should be mounted with minimal axial and radial loading on the shaft for optimum life. It is recommended that the shaft is coupled to the drive using a flexible coupling. Tests indicate that life in excess of 16 million cycles can be achieved with 1kg side and end load.

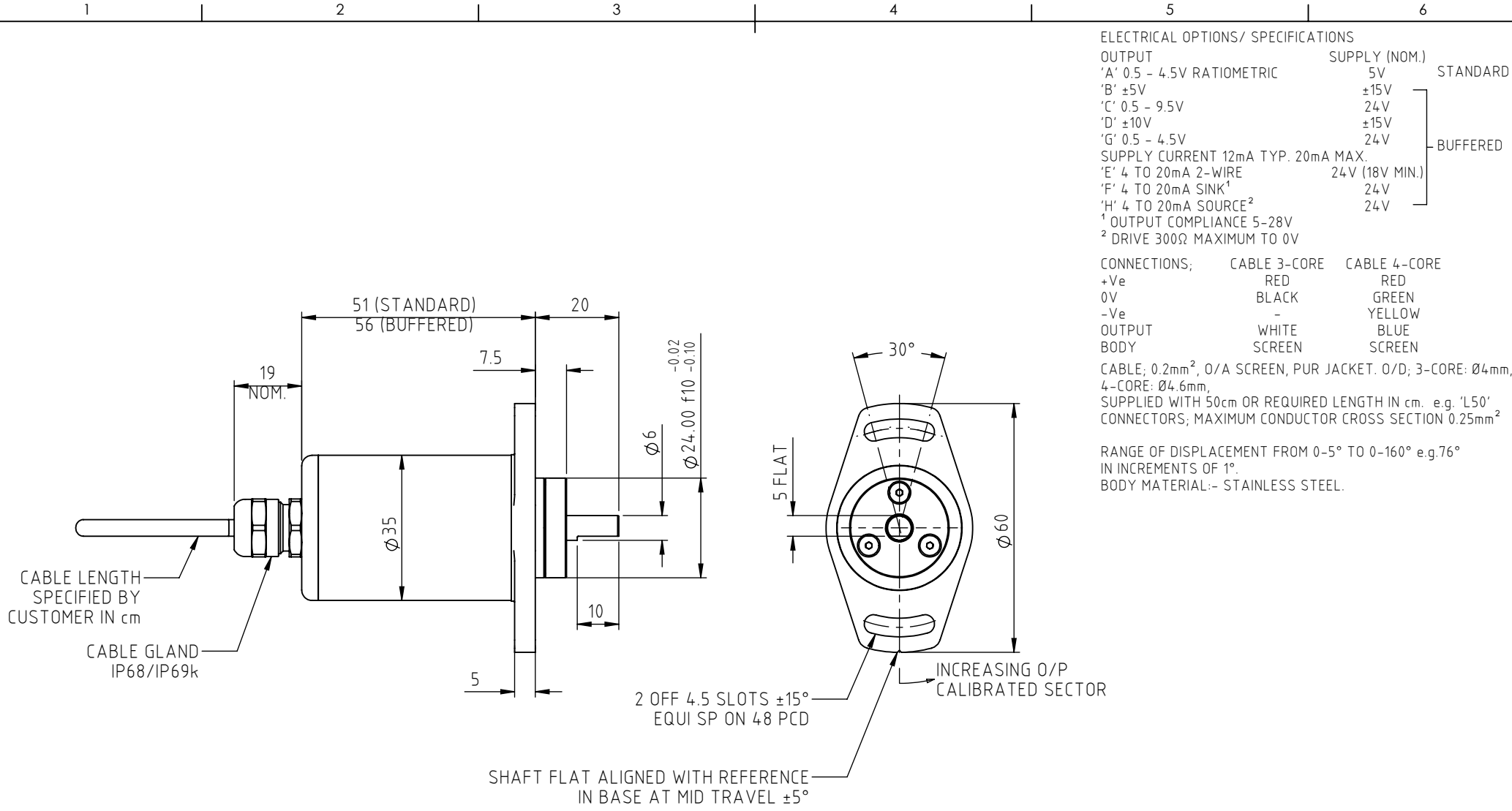
OUTPUT CHARACTERISTIC

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 16 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.
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.





ELECTRICAL OPTIONS/ SPECIFICATIONS		
OUTPUT	SUPPLY (NOM.)	STANDARD
'A' 0.5 - 4.5V RATIO METRIC	5V	} — BUFFERED
'B' ±5V	±15V	
'C' 0.5 - 9.5V	24V	
'D' ±10V	±15V	
'G' 0.5 - 4.5V	24V	
SUPPLY CURRENT 12mA TYP. 20mA MAX.		
'E' 4 TO 20mA 2-WIRE	24V (18V MIN.)	} — BUFFERED
'F' 4 TO 20mA SINK ¹	24V	
'H' 4 TO 20mA SOURCE ²	24V	
¹ OUTPUT COMPLIANCE 5-28V		
² DRIVE 300Ω MAXIMUM TO 0V		

CONNECTIONS;	CABLE 3-CORE	CABLE 4-CORE
+Ve	RED	RED
0V	BLACK	GREEN
-Ve	-	YELLOW
OUTPUT	WHITE	BLUE
BODY	SCREEN	SCREEN
CABLE; 0.2mm ² , O/A SCREEN, PUR JACKET. O/D; 3-CORE: Ø4mm, 4-CORE: Ø4.6mm,		
SUPPLIED WITH 50cm OR REQUIRED LENGTH IN cm. e.g. 'L50'		
CONNECTORS; MAXIMUM CONDUCTOR CROSS SECTION 0.25mm ²		

RANGE OF DISPLACEMENT FROM 0-5° TO 0-160° e.g.76°
IN INCREMENTS OF 1°.
BODY MATERIAL:- STAINLESS STEEL.

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	15/09/2021	ASC



APPROVED BY RDM	REV A		X ±0.4 X.X ±0.2 X.XX ±0.1 DIMS mm
DESCRIPTION 10bar Submersible Rotary Position Sensor			
SCALE A4	3:4	DRAWING NUMBER S508-11	SHEET 1 OF 1