mm S613

APPLICATION

- Non-contacting inductive technology to eliminate wear
- Angle set to customer's requirement
- Compact and self-contained
- High durability and reliability
- High accuracy and stability
- Sealing to IP68 10bar/IP69K

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 S613 is an affordable, durable, high-accuracy tilt sensor designed for industrial and scientific feedback applications. The S613, like all Althen sensors, 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. The sensor provides a linear output proportional with the rotation of the sensor.

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 sensor has a rugged stainless steel body and mounting flange, the flange has two slots to simplify mounting and position adjustment. The S613 offers a range of electrical options. Environmental sealing is to IP68 10bar/IP69K.

SPECIFICATIONS

Dimensions[1]	
Body diameter	35mm
Flange Diameter	60 mm
Body Length (to seal face)	44 mm standard, 50 mm buffered
Independent Linearity (combined error)	< ± 0.25° - up to 100°
Temperature Coefficients	< ± 0.01%/°C Gain & < ± 0.01%FS/°C Offset
Frequency Response	> 10 kHz (-3dB) > 300 Hz (-3dB) 2 wire 4 to 20 mA
Response Time	250 mS @ 20°C typ.
Resolution	Infinite
Damping Ratio	0.2 : 1 (0.6 nom. @ 25°C)
Noise	< 0.02% FSO
Environmental Temperature Limits	
Operating	-20°C to +85°C all output options
Storage	-40°C to +125°C
Sealing	Sealing to 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

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SPECIFICATIONS (CONTINUED)

Drawing List[2]	
S613-11	Sensor Outline

[1] *For full mechanical details see drawings S613-11*
[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.

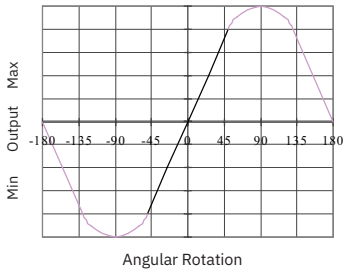
It also overcomes the drawbacks of LVDT technology – bulky coils, poor length-to-stroke ratio and the need for special magnetic materials, no requirement for separate signal conditioning.

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

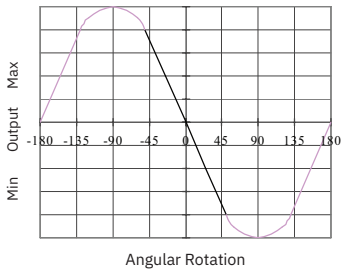
S613	.	a	b	c	d
		Displacement	Output	L50	Z-code

a Displacement		**Value**
Factory set to any angle from 0-15° (±7.5°) 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 cable gland with 20 m of cable, 50 cm supplied as standard.		
d Z-code (optional)		**Code**

Output Characteristic - Standard



Output Characteristic - Reverse option



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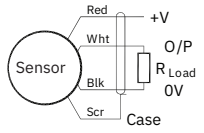
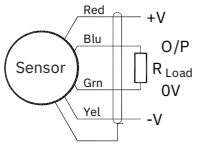
INSTALLATION INFORMATION

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
B	±5V	±15V nom. (±9 - 28V)	≥ 5kΩ
C	0.5 - 9.5V	+24V nom. (13 - 28V)	≥ 5kΩ
D	±10V	±15V nom. (±13.5 - 28V)	≥ 5kΩ
E	4 - 20mA 2 wire Current Loop	+24V nom. (18 - 28V)	≈ 0 - 300Ω 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)	≈ 0 - 950Ω max. @24V ~ 3.8 to 19V across 950Ω {RL max. = (V_s - 5) / 20^{-3}}
G	0.5 - 4.5V	+24V nom. (9 - 28V)	≥ 5kΩ
H	4 - 20mA 3 wire Source	+24V nom. (13 - 28V)	≈ 0 - 300Ω max. ~ 1.2 to 6V across 300Ω

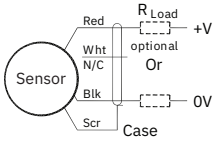
'A', 'C' , 'G' & 'H'



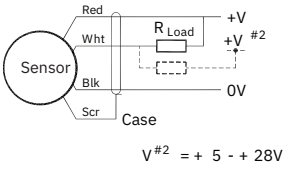
'B' & 'D'



'E'

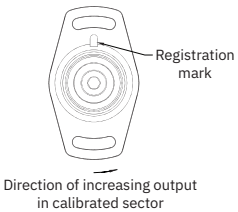


'F'



MECHANICAL MOUNTING

Flange mounted - see drawing S613-11. Note: the sensor should be mounted on a vertical face.



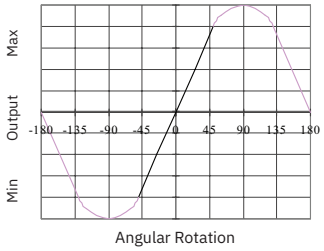
INCORRECT CONNECTION PROTECTION LEVELS

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 ± 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.

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, the mounting flange will be vertical, mid point adjustment is achieved by rotating the sensor in the flange slots. In the calibrated range the output increases as the sensor is rotated in an anti-clockwise direction viewed from the flange face- see sketch above. The calibrated output is factory set to be between 15° and 160°.

Standard Output Characteristic



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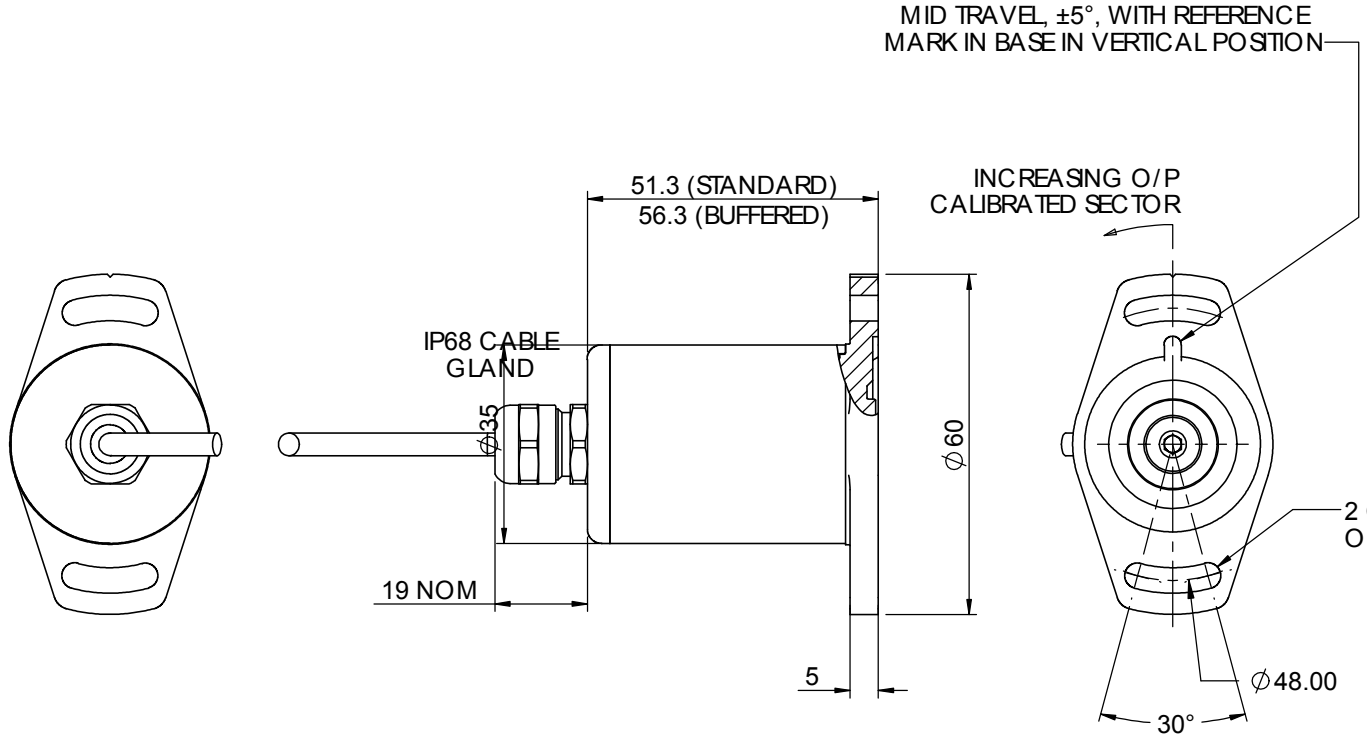

ELECTRICAL OPTIONS/ SPECIFICATIONS

OUTPUT	SUPPLY (NOM.)	
'A' 0.5 - 4.5V RATIOMETRIC	5V	STANDARD
'B' ±5V	±15V	BUFFERED
'C' 0.5 - 9.5V	24V	BUFFERED
'D' ±10V	±15V	BUFFERED
'G' 0.5 - 4.5V	24V	BUFFERED
SUPPLY CURRENT 12mA TYP. 20mA MAX.		
'E' 4 TO 20mA 2-WIRE	24V (18V MIN.)	
'F' 4 TO 20mA SINK†	24V	
'H' 4 TO 20mA SOURCE‡	24V	

† OUTPUT COMPLIANCE 5-28V
‡ 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; 0.2mm², 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 0.25mm²

RANGE OF DISPLACEMENT FROM 0-15° 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	29/05/2020	-

CE

APPROVED BY	REV		
RDM	A		X ±0.4 X.X ±0.2 X.XX ±0.1 DIMS mm

DESCRIPTION
10bar SUBMERSIBLE TILT SENSOR

SCALE	DRAWING NUMBER
3:4	S613-11
A4	SHEET 1 OF 1