ALTHEN SENSORS & CONTROLS

mm **P118**

APPLICATION

- Non-contacting inductive technology to eliminate wear
- Travel set to customer's requirement
- Compact 19 mm diameter body
- High durability and reliability
- 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 P118 is an affordable, durable, accurate position sensor designed for a wide range of industrial applications. It is particularly suitable for OEMs seeking good sensor performance in situations where a small diameter, short-bodied sensor is needed and cost is important. The unit is compact and space-efficient, being responsive along almost its entire length, and like all Althen sensors provides a linear output proportional to travel. Each unit is supplied with the output calibrated to the travel required by the customer, from 2 to 50mm and with full EMC protection built in.

Overall performance, repeatability and stability are outstanding over a wide temperature range. The sensor has a compact 19 mm diameter stainless steel body, is easy to install and set up. Mounting options include flange, M5 rod eye bearings and body clamps. The plunger can be supplied free or captive, with a female M4 thread, an M5 rod eye, magnetic tip, or spring-loaded with a dome end. The P118 also offers a range of mechanical and electrical options, environmental sealing is to IP67.

SPECIFICATIONS

Dimensions[1]				
Body diameter	19 mm			
Body length dependant on options				
Calibrated Travel (Standard)	Axial		Radial	
	O/P 'A'	'C', 'G', 'H'	O/P 'A'	'C', 'G', 'H'
2 mm to 10 mm	72.5	77.5	91.5	96.5
11 mm to 20 mm	82.5	87.5	101.5	106.5
21 mm to 30 mm	92.5	97.5	111.5	116.5
31 mm to 50 mm (Flange)	112.5	117.5	131.5	136.5
2 mm to 10 mm	78	83	97	102
11 mm to 20 mm	88	93	107	112
21 mm to 30 mm	98	103	117	122
31 mm to 50 mm	118	123	137	142
Plunger	Ø 6mm			
Independent Linearity	≤ ± 0.25% FSO @ 20°C			
Temperature Coefficients	< ± 0.01%/°C Gain & < ± 0.01%FS/°C Offset			
Frequency Response	> 10 kHz (-3dB)			
Resolution	Infinite			
Noise	< 0.02% FSO			
Environmental Temperature Limits				
Operating	-40°C to +125°C standard -20°C to +85°C buffered			
Storage	-40°C to +125°C			
Sealing	IP67			

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SPECIFICATIONS (CONTINUED)

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[2] **P118-11**	 Sensor Outline

[1] *For full mechanical details see drawings P118-11*
[2] *3D models, step or .igs format, available on request*

HOW ALTHEN'S TECHNOLOGY ELIMINATES WEAR FOR LONGER LIFE

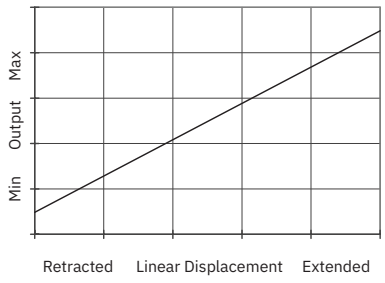
Althen's Inductive technology is a major advance in displacement sensor design. Our displacement transducers have the simplicity of a potentiometer with the life of an LVDT/RVDT.

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.

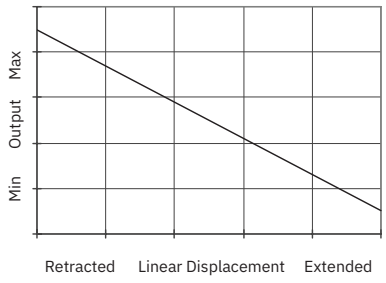
It also overcomes the drawbacks of LVDT technology – bulky coils, poor length-to-stroke ratio and the need for special magnetic materials, no requirement for separate signal conditioning.

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

Output Characteristic - Standard



Output Characteristic - Reverse option



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P118 .	a	b	c	d	e	f	g	h	j
	Displacement	Output	Connections	Option	Option	Option	Option	Option	Z-code

a Displacement	**Value**
Factory set to any length from 0-2 mm to 0-50 mm (e.g. 0-36 mm)	**36**
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 10mA typicaSupply Current 'A', 'C', 'G' 10mA typical, 12mA max. 'H' 30mA typical, 35mA max.

c Connections	**Code**
Cable gland radial IP67 M8, metal	**Ixx**
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**
Connector radial IP67 4 pin M8 IEC 61076-2-104, nylon	**K**
Connector radial IP67 4 pin M8 IEC 61076-2-104, nylon, pre-wired	**Kxx**
Cable gland axial IP67 M8, metal	**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 Housing	**Code**
Standard default	**blank**
Flange Mount 2 off 3.2 mm x 30 degree wide slots, 25 mm P.C.D.	**N**
M5 Rod-eye bearing radial version only	**S**

e Body Fittings	**Code**
None default	**blank**
Body Clamps 1 pair	**P**
f Sprung Plunger	**Code**
Not sprung default	**blank**
Spring extend captive plunger only. Note! Supplied loose without option 'T'	**R**
g Plunger Fittings	**Code**
Female thread M4x0.7x7 deep default	**blank**
Dome end with spring extend option 'R'	**T**
M5 Rod-eye Bearing	**U**
Magnetic Tip	**WA**
h Plunger	**Code**
Captive plunger is retained - default	**blank**
Non-captive plunger can depart body	**V**
j Z-code (optional)	**Code**
≤± 0.1% FSO @20°C Independent Linearity 0 - 10 mm min.	**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)	≥ 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.

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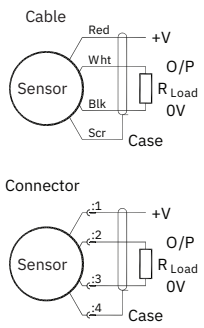
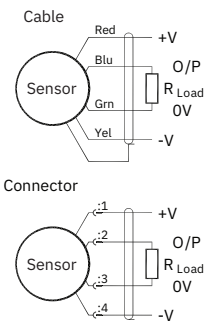
Not all output options available - see product datasheet for full options list

Connector Pinout
(Front View)
M8 IEC

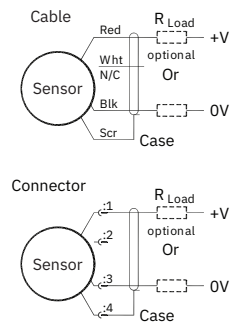
'A', 'C' , 'G' & 'H'



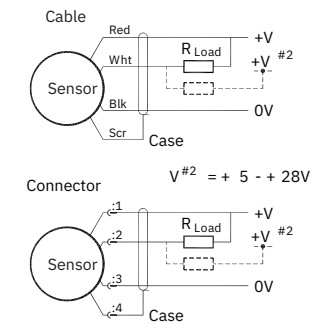
'B' & 'D'



'E'



'F'



OUTPUT CHARACTERISTIC

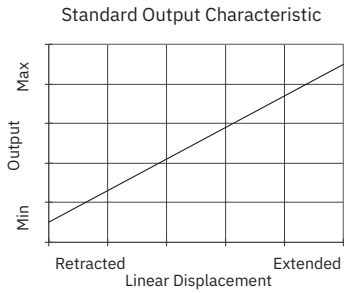
Plunger extended, at start of normal travel:

Standard: 23 mm* from Ø19 mm face

Flange Mount: 16 mm* from flange face

***Note:** where ball end option is fitted add 5 mm.

The output increases as the plunger extends from the sensor body, the calibrated stroke is between 2 mm and 50 mm.



MECHANICAL MOUNTING

Depending on options, body can be mounted by flange, rod eye bearing or clamping the sensor body - body clamps are available, if not already ordered. Plunger mounted by M4x0.7 female thread, rod-eye bearing or magnetic tip - see drawing P118-11.

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.

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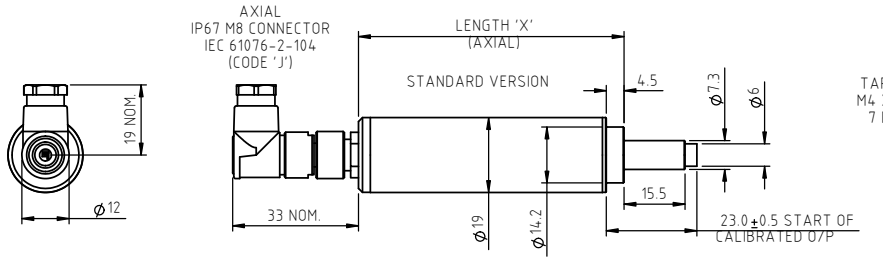
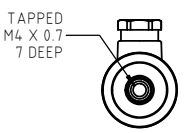
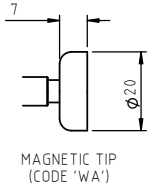
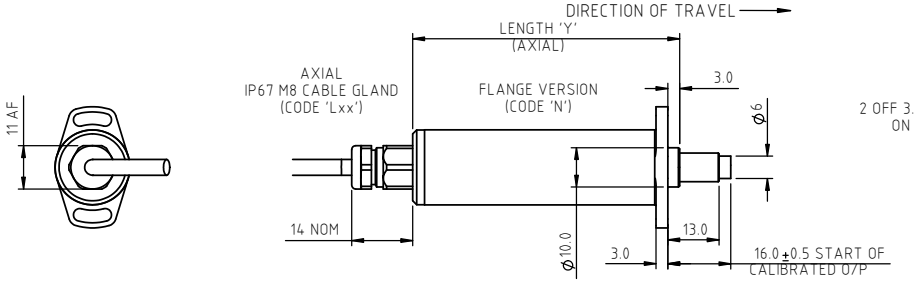
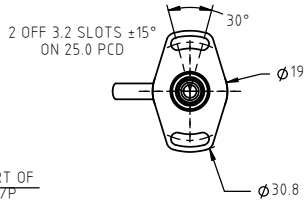
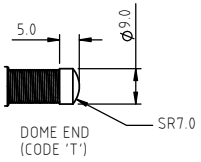












ELECTRICAL OPTIONS/ SPECIFICATIONS

OUTPUT	SUPPLY
A 0.5 - 4.5V RATIOMETRIC	5V
C 0.5 - 9.5V	24V
G 0.5 - 4.5V	24V
H 4 - 20mA	24V

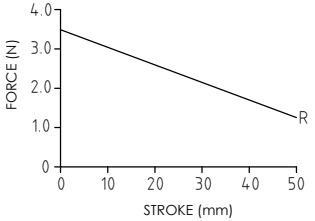
SUPPLY CURRENT 12mA TYP. 20mA MAX. PLUS O/P CURRENT

CONNECTIONS;	CABLE	CONNECTOR
+Ve	RED	:1
0V	BLACK	:3
OUTPUT	WHITE	:2
BODY	SCREEN	:4

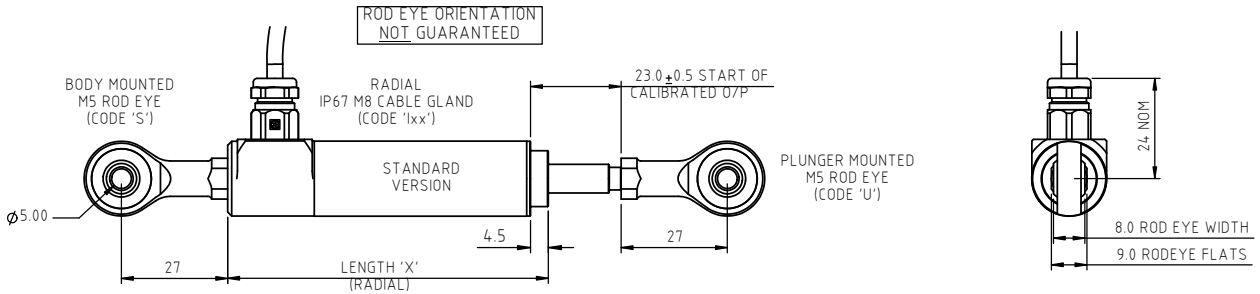
CABLE; 3-CORE 0.2mm², O/A SCREEN, PUR JACKET Ø4mm
SUPPLIED WITH 50cm OR REQUIRED LENGTH IN cm. e.g. 'L50'
CONNECTORS; MAXIMUM CONDUCTOR CROSS SECTION 0.25mm²

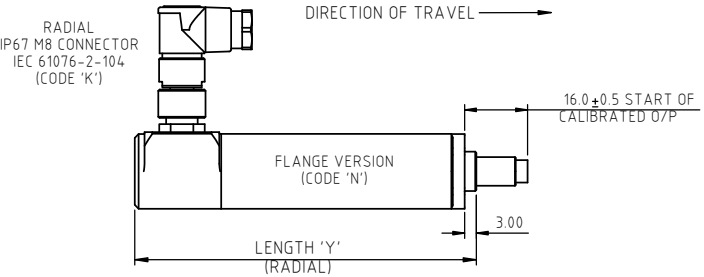
RANGE OF DISPLACEMENT FROM 0-2mm TO 0-50mm IN
INCREMENTS OF 1mm e.g.36.
BODY MATERIAL:- STAINLESS STEEL.
FLANGE BASE MATERIAL:- STAINLESS STEEL (CODE 'N')

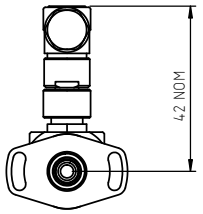
FURTHER OPTIONS:
SINGLE PAIR OF BODY CLAMPS (CODE 'P')
SPRUNG PLUNGER, TO EXTENDED POSITION (CODE 'R')
DOME END (CODE 'T') IN CONJUNCTION WITH SPRUNG PLUNGER (CODE 'R')
PLUNGER FREE (CODE 'V') NOT AVAILABLE WITH SPRUNG OPTION
MAGNETIC TIP (CODE 'WA')



SPRING FORCE VS STROKE
(CODE 'R')







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
F	MAG TIP & RADIAL END/ROD EYES RAN1311/1312	ASC	22/03/2021	PDM

BODY STYLE	NOTE: SENSORS WITH TRAVEL UP TO 50mm ARE MADE IN STANDARD LENGTHS					
	BODY LENGTH (mm)					
	TRAVEL (mm)		'X' STANDARD		'Y' FLANGE	
	CALIBRATED	MECHANICAL	O/P - A	O/P - C,G,H	O/P - A	O/P - C,G,H
AXIAL	0-2 TO 0-10	10	72.5	77.5	78.0	83.0
	0-11 TO 0-20	20	82.5	87.5	88.0	93.0
	0-21 TO 0-30	30	92.5	97.5	98.0	103.0
	0-31 TO 0-50	50	112.5	117.5	118.0	123.0
RADIAL	0-2 TO 0-10	10	91.5	96.5	97.0	102.0
	0-11 TO 0-20	20	101.5	106.5	107.0	112.0
	0-21 TO 0-30	30	111.5	116.5	117.0	122.0
	0-31 TO 0-50	50	131.5	136.5	137.0	142.0

THE PLUNGER RETRACTS 8mm FROM START OF CALIBRATED TRAVEL (2mm FOR SPRUNG VERSIONS) AND EXTENDS 11mm* BEYOND END OF MECHANICAL TRAVEL.
*DOES NOT INCLUDE DIFFERENCE BETWEEN CALIBRATED AND MECHANICAL TRAVEL.
DIMENSIONS ARE NOMINAL.
'V' CODED PLUNGER WILL DEPART SENSOR BODY.

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

DESCRIPTION
P118 SHORT STROKE SLIM-LINE LINEAR POSITION SENSOR

SCALE	DRAWING NUMBER
3:4	P118-11
A3	SHEET 1 OF 1