

# T435 L

4-20mA Output, Gravity-Referenced  
Miniature Servo Inclinometer

## Introduction

The Sherborne Sensors T435 'L' series is a family of single axis, high-precision, closed loop, gravity referenced servo inclinometers, ideal for use within a variety of application environments, and where space is at a premium.

Available in ranges from  $\pm 3^\circ$  to  $\pm 90^\circ$ , with a form factor measuring only 61mm (2.41 inches) high and a diameter of less than 37mm (1.46 inches), the Series T435 'L' offers a high-level 4-20mA signal, proportional to the sine of the angle of tilt. Units are fully self-contained, and able to be connected to a DC power source and readout or control device, to form a complete operating system. Units are extremely rugged, and can withstand a 1500g shock event. Solder pin terminations are standard.

The 4-20mA output of the T435 'L' series is specifically designed for electrically noisy environments, or where inclinometer output signals must be transmitted over a long distance. T435 'L' series inclinometers operate on a single 24Vdc supply and the output series load resistance can be as high as 400 $\Omega$ .



## Applications

- ❑ Bore hole mapping, dam and rock shifts and other geophysical, seismic & civil engineering studies
- ❑ Downhole logging
- ❑ Any precision measurement application where space is at a premium
- ❑ Precision angle measurement remote from signal conditioning electronics

## Features

- ❑ Available in ranges from  $\pm 3^\circ$  to  $\pm 90^\circ$
- ❑ Fully self-contained, able connect to a DC power source and a readout or control device for a complete operating system
- ❑ High level 4-20mA output signal proportional to sine of the angle of tilt
- ❑ Extremely rugged, withstands 1500g shock

## Performance Specifications by Range @ +20°C (+ 68°F)

Range		±3°	±14.5°	±30°	±90°
Excitation Voltage	Volts DC	24 ±10%			
Current Consumption	mA (nom)	35			
Full Range Output (FRO)	(See Note 1) mA (nom)	16			
Output Load Resistance	Ohms (max)	400			
Output Standardisation	% FRO	±2			
Output Noise (DC to 10kHz)	mA (max)	0.020			
Non-linearity	(See Note 2) % FRO (max)	0.08	0.05	0.05	0.08
Non-repeatability	% FRO (max)	0.02	0.004	0.004	0.004
Resolution	arc seconds	0.2	1.0	2.0	4.0
-3 dB Frequency	Hz (nom)	15	30	40	55
Sensitive Axis-to-Case Misalignment	deg (max)	±0.15	±0.25	±0.5	±1.0
Cross-axis Sensitivity	(See Note 3) % FRO (max)	0.2			
Output at Zero Angle	(See Note 4) mA (nom)	12			
Zero Angle Output Tolerance	mA (max)	±0.10	±0.07	±0.07	±0.07
Thermal Zero Shift	%FRO/°C (max)	±0.05	±0.02	±0.01	±0.01
Thermal Sensitivity Shift	%Reading/°C (max)	±0.05	±0.02	±0.01	±0.01

## Environmental Specifications

EMC Directive	EN 61326: 1998	
EMC Emissions	EN 55022: 1998	30 MHz to 1 GHz
EMC Immunity	EN61000-4-2: 1995 inc A1: 1998 & A2: 2001	±4 kV
	EN61000-4-3: 2002	10 V/m
	EN61000-4-4: 2004	± 1 kV
	EN61000-4-6 1996 inc A1: 2001	3 Vrms
	EN61000-4-6: 2007	10 Vrms
	EN61000-4-8: 1994 inc A1: 2001	30 A/m
Constant Acceleration Overload	50g	
Shock Survival	1500g, 0.5 ms, ½ sine	
Vibration Endurance	35g RMS, 20 Hz to 2000 Hz sinusoidal	
Environmental Sealing	IP65	

## Notes

1. Full Range Output is defined as the full angular excursion from positive to negative, i.e. ±90° = 180°
2. Non-linearity is determined by the method of least squares.
3. Cross axis sensitivity is the output of the unit when tilted to full range angle in cross axis
4. Zero offset is specified under static conditions with no vibration inputs

### How To Order: Example T435-0001-14.5L

T435 L -14.5 is a standard T435 series sensor with a range of ±14.5° and a 4-20mA output

