

Small Size Liquid Capacitive Electronic Analog Output Inclinometer Sensors



Description

The N Series inclination sensors are liquid capacitive gravity based sensors with integrated sensor electronics. These sensors provide Analog DC output; the measuring principle assures a linear angle output equal to the measuring range of the sensor.

The sensor electronics require only minimal power - power consumption is very low (approx. 1mA) - and are in conjunction with the capacitive primary transformer, which is characterized by high accuracy, a high signal-to-noise ratio and long-term stability.

Applications

These inclinometers are suitable for applications requiring a small, light sensor for measurement of relatively large inclinations.

Typical areas of application include measuring instruments and inspection systems, vehicle tilt monitoring, automation and safety engineering, scientific devices, medical and communications equipment as well as navigational systems. Commonly used as a component combined with OEM electronics.

Features

- *Small housing, less than 1" dia.*
- *Measuring Ranges: ±10, ±30, ±70°*
- *Linear output characteristics*
- *Minimal zero offset drift*
- *Hysteresis free output signal*
- *High measurement accuracy*
- *Very low relative linearity errors*
- *Integrated sensor electronics*
- *Long-term stability*
- *Low power consumption*
- *Analog mV output signal*
- *Hermetically sealed to IP65*
- *Zero offset mechanically adjustable through 360 within mounting ring*
- *No interference by ambient electromagnetic fields*
- *Shockproof to 10,000g - no moving mechanical parts*
- *Sensor electrically isolated from point of measurement using high quality PBT plastic housing - no ground connections*

MECHANICAL CHARACTERISTICS

MECHANICAL CHARACTERISTICS	
HOUSING	30% Glass Filled PBT Plastic
MOUNTING	Supplied Mounting Ring
MOUNTING PLANE	Vertical Surface
OUTLINE DIMENSIONS	Ø 0.976" (Ø 24.8mm) X .46" (11.7mm) h
	With Mounting Ring: Ø 1.46" (Ø 37mm) X .46" (11.7 mm) h
ELECTRICAL CONNECTION	3 highly flexible, color-coded wires Ø 0.04" (Ø 1.0mm) x 7.0" (18cm)
	Optional: Shielded cable Ø 0.083" (Ø 2.1mm) x 1.65" (0.5m)
WEIGHT	Approx. 0.653 ounces (18.5 grams) (not including mounting ring)
OPERATING TEMPERATURE	-40°F to +185°F (-40° to +85°C)
STORAGE TEMPERATURE	-49°F to +194°F (-45° to +90°C)

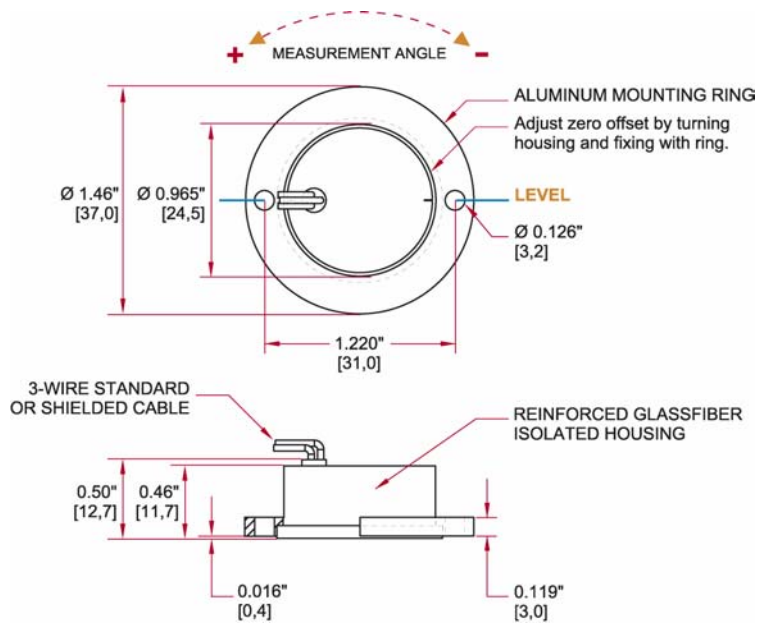
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N Model Specifications	N2	N3	N4
Measuring range	±10°	±30°	±70°
Resolution	< 0.002°	< 0.005°	0.01°
Max. Non-linearity	< 0.5% Full Range for ±10° model < 0.2% Full Range for ±30°, ±70° models		
Transverse Sensitivity	<1% at 30° tilt		
Response Time	< 0.3 Sec. (<300mSec)		
Power Supply U_b	5 Volt regulated		
Min ... Max. Supply U_{bz}	3 ... 6 Volt		
Current consumption U_b=5Volt	Approx. 1mA		
Protection Degree	IP65		
VALUES FOR ANALOG DC OUTPUT MODEL AT U_{BN}=5VOLT			
Sensitivity	Approx. 12mV/°	Approx. 5mV/°	Approx. 3.2mV/°
Temperature Drift of Sensitivity	-0.17%/C	< -0.12%/C	
Temperature Drift of Zero	< ±0.05mV/C	< ±0.025mV/C	
Zero Offset at U_b=5V	2.5 ±0.1 Volt - generally: 0.5U _b ±4%		
Output Impedance	10kΩ		
<i>Digital pulse-width modulated output signal - linear to the degree of angle - available upon request.</i>			
CABLE WIRING TABLE:			
3-WIRE (standard)		SHIELDED CABLE (optional)	
RED	+5VDC Stable	RED	+5VDC Stable
WHITE	Output Signal	BLUE	Output Signal
BLUE	GND (Inside Shield)	SHIELD	GND (Inside Shield)

Figure 1: Dimensions and Mounting Position (inches [mm])



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