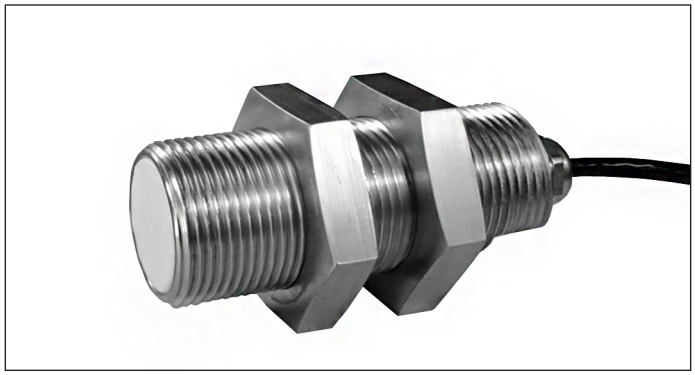
# SPES™-117

## Underwater Eddy Current Proximity Sensor



The SPES-117 proximity sensor is designed to measure the relative distance of an underwater metallic target surface. It is usually used to measure blade tip clearance in Kaplan turbines as well as runner band clearance in Francis turbines. The sensor can sustain high levels of underwater pressure and is equipped with built-in conditioning circuitry allowing it to be directly connected to processing instrumentation.

## General Specifications

### Operation

| | |
|---|---|
| • Measurement Type | Non-contact proximity, eddy current |
| • Measuring Range* | 0 to 17 mm *[0 to 670 mils]* |
| • Outputs* | 6.4 to 20 mA<br>1.5 to 10 V |
| • Sensitivity* | 0.8 mA/mm *[20.3 µA/mil]*<br>0.5 V/mm *[12.7 mV/mil]* |
| • Accuracy | According to correction factor |
| • Repeatability | ± 5% |
| • Bandwidth | DC to 200 Hz (-3dB) |
| • Load at Current Output | 500 Ω max. |
| • Load at Voltage Output | 10 kΩ min. |
| • Temperature Drift | < 10% |
| • Short Circuit Protection | Built-in |

### Power Requirements

| | |
|---|---|
| • Voltage | 24 Vdc ± 15% |
| • Consumption | 30 mA max. |
| • Voltage Reversal Protection | Built-in |
| • Warm-up Time | 5 minutes |

### Connection

| | |
|---|---|
| • Submersible Integral Cable | |
| Type | 4-wire x 0.22mm$^2$ *[24 AWG]* |
| Outer Jacket | PUR / ø 7.5 mm *[0.295 in]* |
| Available Lengths | 20 or 50 m *[66 or 164 ft]* |
| Min. Bending Radius | 40 mm [*1.57 in]* |
| • Maximum Cable Length (Integral + Extension) | |
| For Current Output | 300 m *[984 ft]* |
| For Voltage Output | 100 m *[328 ft]* |

**Target material: FE360 steel*

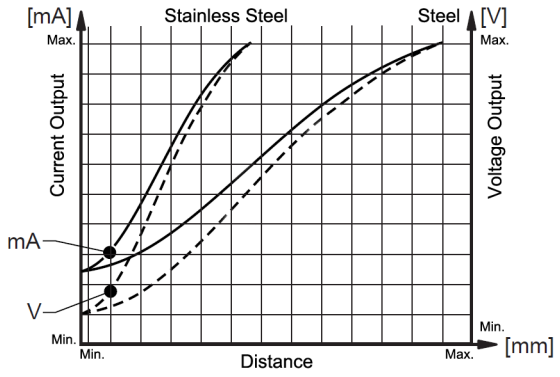
### Environment

| | |
|---|---|
| • Temperature Range | |
| Operating | 0 to 45 °C *[32 to 113 °F]* |
| Storage | -25 to 70 °C *[-13 to 158 °F]* |
| • Max. Submersible Pressure | 10 Bar *[150 psi]* |
| • Protection Rating | IP69 |

### Physical Characteristics

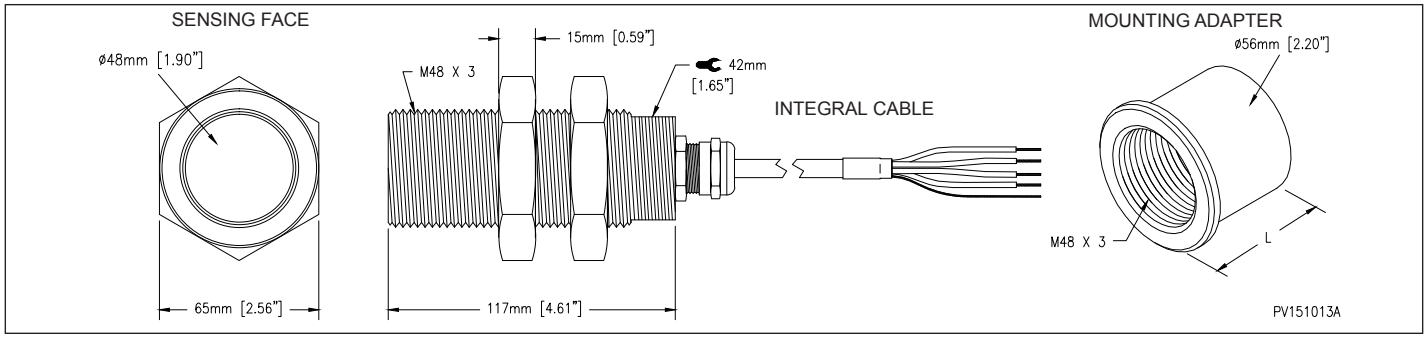
| | |
|---|---|
| • Sealed Sensor Body | Nickel-plated A36 steel |
| • Sensing Face | Ertalyte® PET-P |
| • Mounting Adapter | Weldable |
| Adapter Body | Nickel-plated A36 steel |
| Length | 65 mm *[2.56 in]* |

### Typical Response Comparison (Steel vs. Stainless Steel)




**Warning**: Response of inductive sensors varies with target material, as shown in the graph above. A site calibration is required to calculate the appropriate correction factor to be applied.

## Dimensions

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