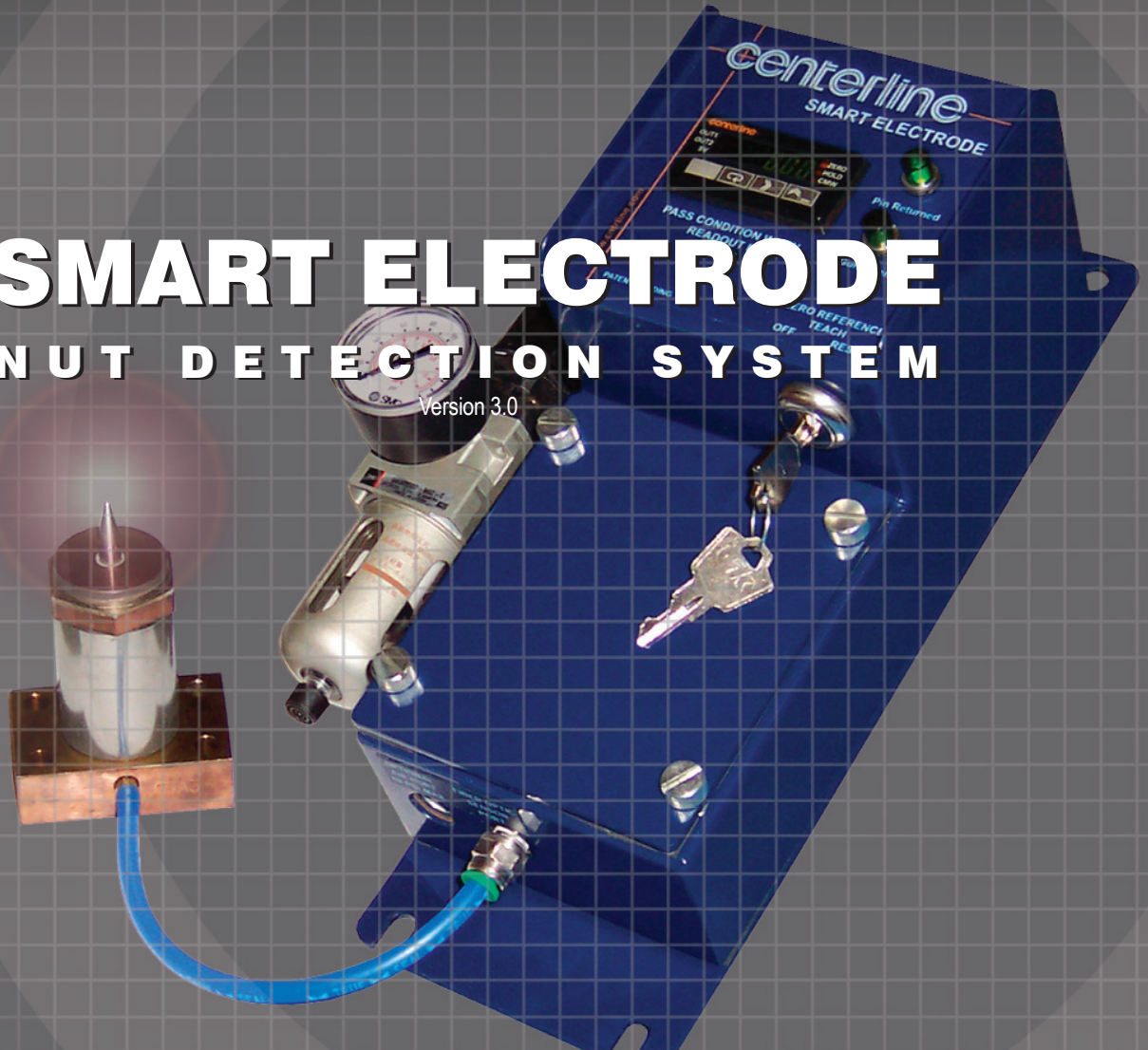


# SMART ELECTRODE NUT DETECTION SYSTEM

Version 3.0



centerline®  
(WINDSOR) LIMITED

# SMART ELECTRODE

## NUT DETECTION SYSTEM

PATENT PENDING

CenterLine (Windsor) Limited has combined its proven nut electrode technology with proven sensing technology to create the Smart Electrode. The Smart Electrode system can help you determine if a weld nut is present and in the correct orientation. This diagnostic device provides a reliable method for enhancing the quality of the projection welding process.

### System Features

- Available for CenterLine® nut weld units 2, 3 and 4 series.
- Fiber optics communicate data directly from electrode to the monitoring system.
- No PLC or PC is required and there is no software to purchase.
- Able to sense the presence of a single nut at the point-of-weld.
- Capable of sensing piloted and non-piloted nuts.
- Bypass switches to deactivate “gun open” and “single nut” sensors.
- Able to detect when the weld gun has returned to the open position.
- Available for “special electrodes” at a modest additional cost.
- Standard components for quick turnaround time.

The CenterLine® Smart Electrode can be integrated into simple, stand-alone applications or fully integrated monitoring systems. It is compact and easy to install with the aid of the detailed installation manual included with every unit and the tooling change required to incorporate the Smart Electrode is minimal. Set-up and calibration are maintained electronically – no mechanical adjustments are necessary.

### GENERATING YOUR SMART ELECTRODE

- Step 1: Select a CenterLine® nut weld body type.
- Step 2: Calculate the following required measurements:
- Hole in stamping
  - Hole in nut
  - Stamping thickness
  - Nut thickness
  - Measurement from center of nut to outermost edge
  - Projection height (if applicable)
- Step 3: Select the appropriate nut weld pin and head  
See CenterLine Resistance Welding Product Guide Version 7.0 for assistance.

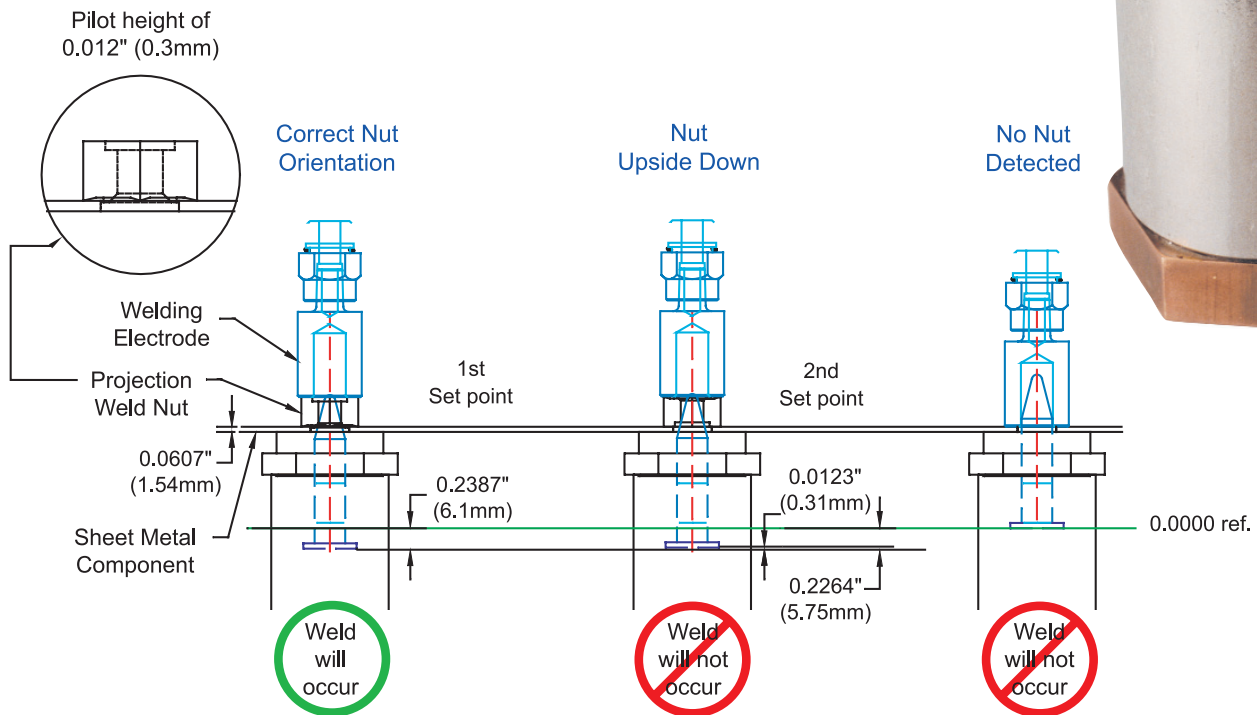


**CenterLine can assist in designing a**

# Here's how it works...

The Smart Electrode system's fiber optic sensor is calibrated to measure the distance traveled by the nut weld pin and compares it with pre-programmed set point values. The example below shows a piloted nut application. It demonstrates the difference between correct orientation, an upside down nut 0.0123" (0.31mm) and a missing nut.

The system is capable of detecting non-piloted nut applications as well as weld stud applications. The Smart Electrode has the ability to detect differences as small as 0.004" (0.1mm).



centerline<sup>®</sup>  
SMART ELECTRODE

# SE-01

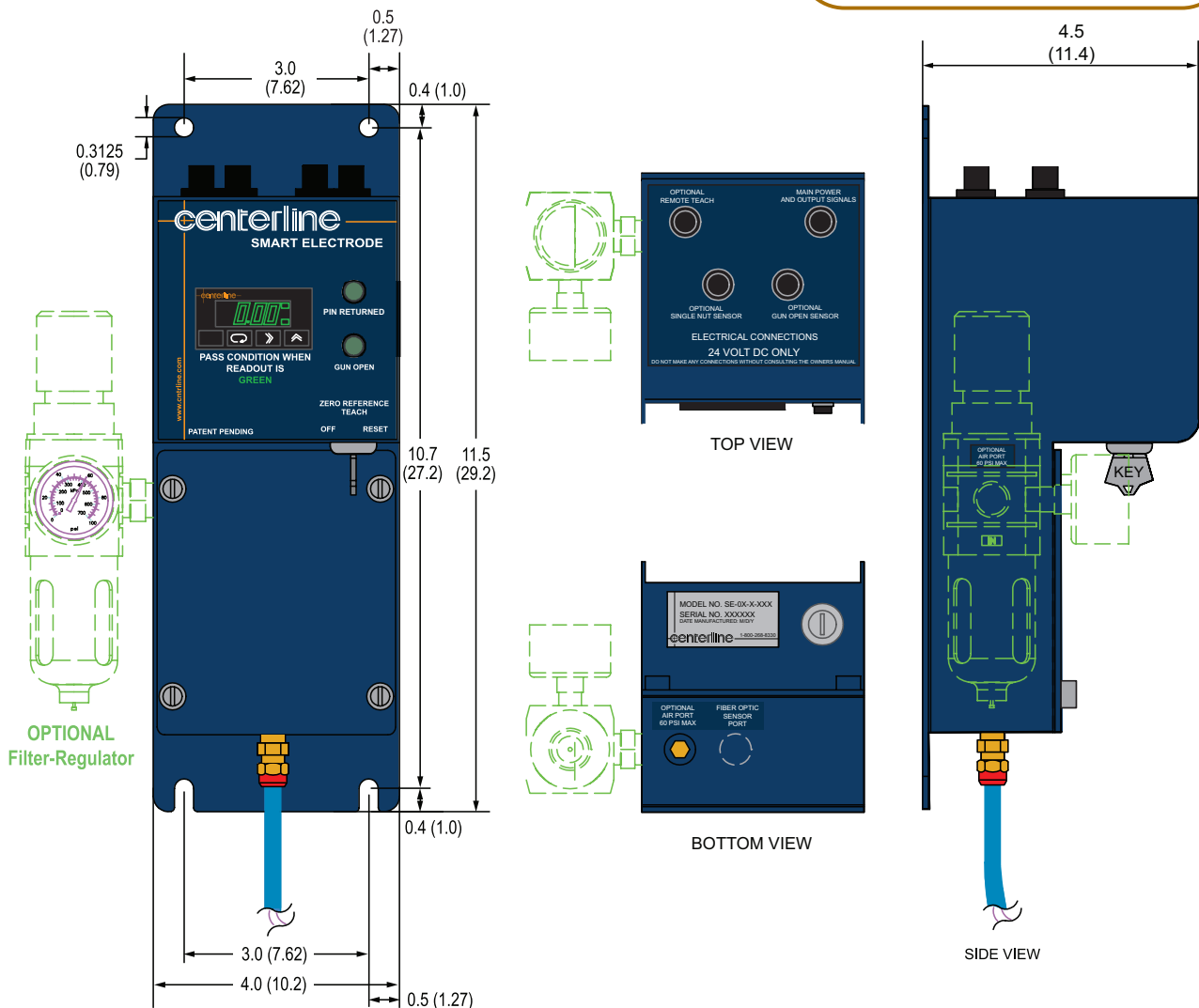
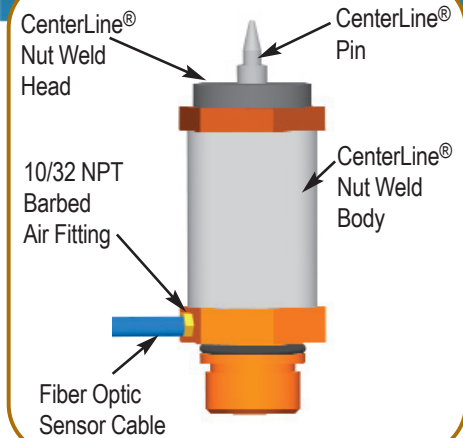
## SMART ELECTRODE UNIT WITH INTEGRATED AMPLIFIER

### SE-01 Components

- Fiber optic sensor up to 5' (1.5m)
- Fiber optic integrated control interface (24 volt DC versions available)
- Optional filter regulator
- CenterLine® nut weld unit (2, 3 and 4 series available)

Custom CenterLine® nut weld bodies and/or copper details are available to suit if required.

All dimensions are in inches (centimeters) unless otherwise indicated.



**Smart Electrode system for nearly any nut**

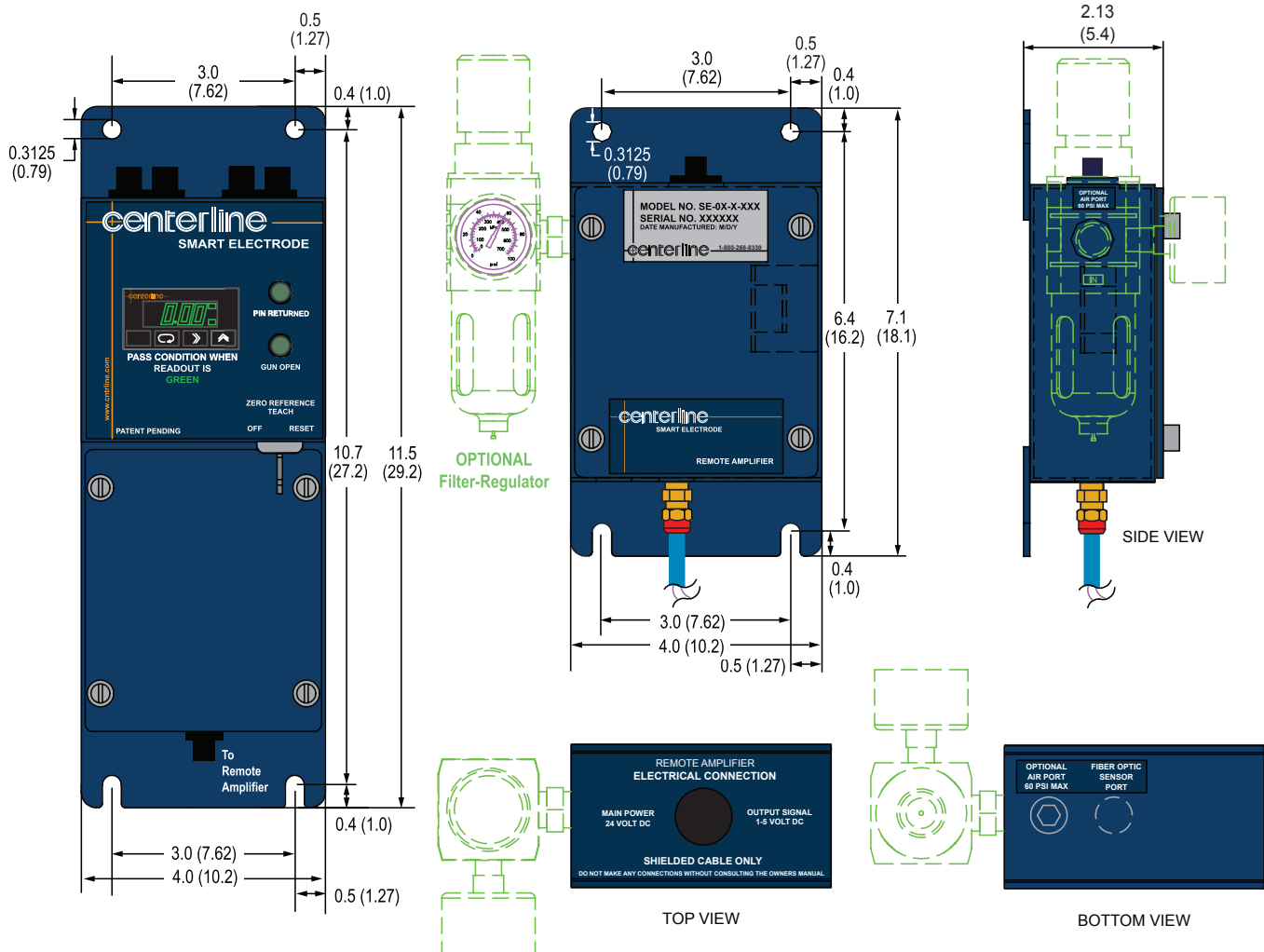
# SE-02

## SMART ELECTRODE UNIT WITH REMOTE AMPLIFIER

### SE-02 Components

- Fiber optic sensor up to 5' (1.5m)
- Fiber optic non-integrated control interface (24 volt DC versions available)
- Smart Electrode Remote Amplifier (additional Remote Amplifiers available – Model SE-03)
- Optional filter regulator
- M-12 five pin shielded cord 16.4' (5m)
- CenterLine® nut weld unit (2, 3 and 4 series available)

Custom CenterLine® nut weld bodies and/or copper details are available to suit if required.



**weld or stud weld application.**



**CenterLine (Windsor) Limited**

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