Fuel and Water Senders

1. Senders with aluminum tubing are for oil, diesel, or gasoline of up to 10% ethanol; and senders with PVC tubing are for potable water. We don't make units for non-potable water, because that leaves deposits on the sense wire. Senders come calibrated from the factory for E240/F33 ohms and are ready for use in their stock length. Shortening of the sender will require recalibration. See the instructions below.

2. HOW THE SENDERS MEASURE LIQUID LEVEL Senders work by measuring capacitance without moving parts. Electronics in the head convert this measured capacitance to the programmed output of ohms or volts. In fuel senders, capacitance is measured between the inner sensing tube and the grounded outer tube, and the fluid must be non-conductive. In water senders, capacitance is measured between the inner insulated sense wire and the water, with the water being grounded by a wire wrapped around the outer tube.

3. SHORTENING AND BENDING SENDERS (if required) A fuel sender's outer tube can be shortened using a tubing cutter, and the inner tube snipped. Only senders ordered as bendable, with a black bend circle on the tubing, can be bent. Bend only between the head and the bend circle. Shortening a water sender requires the following steps: 1) unwind the outer ground wire; 2) pull the PVC tube from its friction fit on the head, to expose the white sense wire; 3) use a heat gun to soften and pull the black sealing piece from the white wire; 4) shorten both wires and the tube; 5) put the black sealing piece back on the shortened white wire and heat it to get a good seal again (important!) 6) put the outer tube back on and rewrap the outer ground wire.

4. CONNECTIONS NEG: connect this to DC ground. NOTE: our senders only work with negative-ground systems.
SEND: connect this to the Sender input of your gauge or display. NOTE: this is an electronic output which will confuse your ohmmeter if you try to take a resistance reading. Instead we troubleshoot by voltages, while connected to the gauge.

5. CALIBRATION The output range (E240/F33 ohms) and alarm levels (if ordered) are set at the factory. They cannot be changed by the end user. If you did not need to shorten the sender, the factory Empty and Full settings will be correct and the sender is ready for use! ***ONLY*** if you shortened the sender, must you calibrate it using one of the steps below. ***NOTE: DO NOT calibrate fuel senders in water.***

A. CALIBRATING AUTOCAL SENDERS (Identified with an AutoCal stamp on the head). ***THIS IS NECESSARY ONLY IF THE SENDER HAS BEEN SHORTENED*** EMPTY: after shortening the sender, connect the empty sender to the system wiring, and turn on the power. The gauge needle should bounce between Empty and Full a couple of times and return to Empty as the sender discovers its shorter length. FULL: Turn OFF the power and install the sender into a full tank of the appropriate liquid. Turn ON the power. The reading should go above Full and then finish on Full. This Autocal Full will use Full detection at each fill up.

B. MANUAL CALIBRATION OF AUTOCAL SENDERS If you feel there is a problem or are not comfortable with the automatic calibration method, you can manually calibrate the sender. This is done by jumping or bridging the sender and negative posts with a resister (33 ohm Radio Shack #271-1104, included with the sender) and turning on the power. TIMING: for label dates 4/13 and later: E=10sec, F=20sec. 3/13 and earlier: E=2sec, F=6sec.

B1: TO CALIBRATE MANUAL EMPTY 1) Have the sender out of the tank and wired normally to the gauge, with the ignition switch OFF; 2) have the jumper applied; 3) have someone turn the ignition switch ON and count the Empty seconds (for senders with label dates 4/2013 and later: E=10sec, label dates 3/2013 and earlier: E=2sec) at which point you remove the jumper 4) the reading should bounce several times between Empty and Full over about 5 seconds before finishing on Empty. If you don’t see these multiple bounces or don’t finish on Empty, please email for advice.

B2: MANUAL FULL For fuel senders with 1/2" tubing, Full is set automatically by the Full Detection sensor at powerup each time the tank has been filled. This is useful because it corrects for "dielectric constant" differences between tank-fulls of fuel. But for water senders or fuel senders with 1/4" tubing, or if for some reason you find you need a non-automatic Full:
1) Have the sender in a full tank or container of the appropriate liquid and wired normally to the gauge, with the ignition switch OFF; 2) have the jumper applied; 3) have someone turn the ignition switch ON and count the Full seconds (for senders with label dates 4/2013 and later: F=20sec. For senders with label dates 3/2013 and earlier: F=6sec.) at which point you remove the jumper; 4) the reading should bounce several times between Empty and Full over about 5 seconds before finishing on Full. If you dont see these multiple bounces or dont finish on Full, please email for advice.

6. For technical help, contact help@centroidproducts.com