

Programmable Fuel Senders Installation and Calibration

1. How The Senders Measure Liquid Level

Senders work by measuring capacitance. This means no moving parts are required. 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 requires the fluid to be nonconductive.

2. Connections (see Figure 1 & 2)

NEG: Connect this to DC ground. NOTE: these senders work with negative-ground systems only.

SEND: Connect this to the Send 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.

POS: Most senders have an ignition-voltage POS terminal to run their electronics. A fused voltage between 11-28vdc should be wired to the POS connection. The voltage should turn off when the system is turned off, both for safety and to avoid running down the battery.

3. Calibration

The output range (eg 240/33 ohms) levels are set at the factory per the customer's order. They cannot be changed by the end user. They can be changed back at the factory if needed, however.

A. AUTOCAL

For senders with an AutoCal stamp on the head. (see Figure 2)

EMPTY: With tank empty, connect the 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.

FLAMMABLE LIQUID

Could cause series injury or death.

Diesel fuel is flammable. Never smoke while handling fuel or working on the fuel system. Keep open flames and sparks away.

FULL: Turn OFF the power and install the sender into a full tank of diesel fuel. 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 CAL

For senders not stamped AutoCal. Manual cal is done via jumpering or bridging Send to Neg and turning on power (see Figure 1 & 2).

TIMING: For label dates (see Figure 2): <u>4/13 and later:</u> E=10sec, F=20sec. <u>3/11 to 4/13:</u> E=2sec, F=6sec. <u>11/09 to 3/11:</u> E=2sec, F=5sec.

B1: 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 listed above, 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 do not see these multiple bounces or do not finish on Empty, please contact Allied Service department for advice.



B2: MANUAL FULL

Full is set automatically by the Full Detection sensor at power up each time the tank has been filled. This is useful because it corrects for "dielectric constant" differences between tank-fulls of fuel. If for some reason you find you need a non-automatic Full, see steps below:

1) Have the sender in a full tank or container of diesel fuel 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 listed on page 1, 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 do not see these multiple bounces or do not finish on Full, please contact Allied Service department for advice.



Figure 2 - Fuel Sender