



Manufacturer's Suggested Annual Maintenance Protocol

For

High Level Alarm testing using transducers with the test port*

(Manual activation of the high level alarm by direct simulation of a high liquid level)

Back Ground: The EFG-8000 series of liquid level gauges operate as a very simple gauging device with level alarm options that require almost no maintenance. Measuring the current liquid level in the tank and comparing the gauge reading to the charted amount can confirm normal gauge accuracy. The comparison between the gauge readout and the charted amount should differ no more than 2%, and typically operates with less than 1 % error.

The High and Low liquid level alarms are user set points in the gauge programming as a percent of the total tank capacity. Access to these alarm values may be reviewed by stepping through the setup program as detailed in the owners' manual*. The Low-level alarm may be set to "off" at a zero value or any value 5% under the High-level alarm value. The High-level alarm cannot be turned off and may not exceed 95% of tank capacity. We strongly recommend against setting the High-level alarm any higher than 90% in normal conditions.

Preferred Method of Testing

1. Make note of the current gallons displayed. (Needed in step 5) The tank needs to be less than 75% full to perform repeatable tests, otherwise you may only get one alarm test until lower tank levels.
2. Go up on top of the tank to locate the transducer and unscrew the small hex nut. If your transducer does not have a test port one can be ordered to replace yours.
3. Carefully and slowly pull up (NEVER should more than 3 pounds of pulling force be applied) to the nut which is attached to a very small S.S. bead chain, which in-turn is connected to the probe down inside the tank. This needs to trigger a High-level alarm as you pull up (about 1 ½") and before it reaches the full length of pull. Depending on your current tank liquid level, you may have to reset the alarm for each pull up on the nut doing multiple tests. If you have a person in front of the gauge reading the display you can determine the quantity at which it alarms. It will be the percent setting of The High-level in the gauge program. The alarm trip point is set as a corresponding percentage of total tank capacity. IF THE HIGH LEVEL ALARM FAILS TO ACTIVATE PLEASE PROCEED TO THE SECOND PAGE, otherwise after successful tests proceed to step 4.
4. Feed the chain back down into the hole (checking placement and condition of the small O-ring, use a small amount of silicone grease if needed) and screw the hex nut carefully back into place. ONLY tighten it down enough to make firm contact against the o-ring to seal out the elements. If it is damaged or missing it MUST be replaced. If the o-ring has been damaged or it is missing, you must tape or keep in place a sealing cover over the transducer to keep the elements away from the nut until a replacement o-ring or replacement of the transducer can be made. Call Greenleaf Gauge for the protocol to replace this o-ring. It is serviceable in the field, but it is a delicate procedure. After considering all the conditions at your tank site, as an example; extreme cold, very tall tank, very remote location, it may be best just to order a new part and change out the existing transducer.
5. The last step is to check the current reading on the gauge display to see if it reads within 2% on the reading taken for step one. See back page for a example. If not you may try repeating steps two thru five to get the correct results or proceed to the last option.

Alternate Test Method: Although this is not the preferred method, High Level alarms may always be observed during filling as the liquid level reaches the set percentage of fill. This method is not preferred only because it is not always practical to be present to observe this event. You also only have one alarm event to observe. The *preferred method* of a High level alarm activation is provided on the transducer on top of the tank by means of a small hex nut assembly mounted on the 2" bell reducer.

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Last Option: transducer removal

1. The last option starts again with reading and making note of the current gauge display.
 2. Next go up on top of the tank and temporarily un-wire and un-screw the transducer just up off the 2" pipe nipple on top of the tank. Depending on the site wiring means, it may require a small additional length of wire to re-connected to the gauge.
 3. After temporarily re-connecting the three transducer wires and losing the 0--0 error code, very gently and slowly pull up on the beaded chain or the top of the probe sticking down in the tank. To do this it usually requires the transducer to be above the tank nipple about 5 inches Pulling up on the chain or probe will simulate an actual High-level liquid tank condition and will activate the High-level alarm. DO NOT handle the movable transducer rod which will normally only travel about 5/8 of an inch empty to full. Lifting up must activate the High-level alarm before the rod stops moving into the top up most position while lifting up on the bead chain or top of the probe. **IF THE HIGH LEVEL ALARM FAILS TO ACTIVATE PLEASE PROCEED TOWARDS THE BOTTOM OF THIS PAGE.**
 4. Next you must test to make sure the transducer rod moves very freely in and out of the base. You can do this test by lift up slowly on the bead chain or probe top and let back down slowly several times just before re-assembly to the pipe nipple. If the transducer rod does not move freely and you can not clean it so it does, the transducer **MUST** be replaced.
 5. Just before returning the transducer to the original position on the tank nipple make sure the small bead chain is loose. After screwing the transducer back down on to the tank pipe nipple and connecting the wires, check the current reading on the gauge display to see if it reads with-in 2% of the total tank capacity compared to the first reading you noted before you started this procedure.
- % of Error Example:** Total tank capacity 10,000 gallons. $10,000 \times .02$ would equal 200 gallons. The difference would then need to be less than 200 gallons plus or minus of the first and current reading.
6. If you are within the percentage of error then finish securing all wire and wiring means. If it is not, repeat the steps above because the rod may have been twisted and needs to be moved back and forth to the extreme ends again and then the transducer can be re-mounted carefully back into place and checked again for the % of error.

IF THE HIGH LEVEL ALARM FAILS TO ACTIVATE

1. Determine if the annunciator operates on the alarm plate, if not replace it.
2. Determine if there is moisture present behind the alarm plate. Dry out the cavity. Seal off all the conduit openings and replace alarm connector board if needed. DO NOT use any alarm board with any corrosion on it. It **MUST** be replaced.
3. Determine if gauge displays the correct quantity in the tank, if not, check the program settings in the gauge. Call if you need assistance determining the setup values.
4. If steps 1 thru 3 are found correct then the gauge may need removed and replaced.

IF YOU CAN NOT DETERMINE THE PROBLEM AND THEN ACTIVE THE HIGH LEVEL ALARM, PLACE A SIGN OF "NO HIGH LEVEL ALARM, OUT OF SERVICE" ON THE GAUGE FACE AND NOTIFY THE TANK OPERATOR. LEAVE THE SIGN ON THE GAUGE FACE UNTIL REPLACEMENT PARTS ARE AVAILABLE TO RETURN THE GAUGE TO NORMAL SERVICE. If you can determine that the gauge is reading the tank quantity correctly, but the High-level alarm is not sounding, make note of that to the tank operator.

*Owners' manuals are always available on the web at www.solargauge.com

*Pictures are available on the web site for clarification as to the different styles of transducers that have been produced.