❖ GARNET
INSTRUMENTS LTD.

SEELEVEL III ™ AUTO eVac SYSTEM

Model 720
Revision D Display

Shop Manual

IMPORTANT OPERATOR INFORMATION

DATE INSTALLED:_____

	Signal	Tank Height
Black Water Tank		
Grey Water Tank		
Fresh Water Tank		

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SEELEVEL III™ AUTO eVac SYSTEM

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CHAPTER 1
OVERVIEW

The SeeLeveL III Auto eVac System represents a massive leap forward in holding tank level measurement technology for the Recreational Vehicle industry. The SeeLeveL has a combination of features, accuracy, reliability, and diagnostic capability that have never been available before.

The SeeLeveL will simultaneously monitor all three holding tanks, showing the percent water or sewage level on a digital alpha-numeric LCD display with a level accuracy of +/-2% or better (if the tank is not a regular shape this may affect volume accuracy). The tanks can be from 6 inches to 33 inches high. In addition, the system can display the operating characteristics of each of the tank sending units, giving it unsurpassed diagnostic capability.

The system also automates the dumping of the black and grey sewage tanks, so that the operator does not need to stand and watch the dumping process.

CHAPTER 2
SYSTEM DESCRIPTION

The SeeLeveL system consists of two main components: display units and sender panels. Each holding tank uses a sender panel to measure the water or sewer level and to transmit this information to the displays. Inside the coach a display unit allows easy and convenient viewing of the tank levels. Outside the coach another display also shows tank levels and controls the grey and black sewage tank drain valves.

The Senders: Each sender panel is a flexible self adhesive printed circuit board which is adhered to the side of the holding tank. The sender panel can be cut to length to match the height of the tank, and it auto calibrates itself so that it can read from 0 to 100% regardless of the height of the tank. The sender scans the water level through the tank wall using advanced digital techniques programmed into the sender microprocessor. When the sender transmits the water level information to the display, it sends a digital code that has built in error detection, making it highly unlikely for the display to read an incorrect level, even if the wiring is marginal. In addition to the level, the sender also transmits diagnostic information about its operation. This information can be used to determine if there is buildup of sludge on the inside of the tank, or to determine if the sender is damaged or delaminating from the side of the tank. If sludge buildup in the tank becomes extreme the gauge will cease to operate (the tank will always read empty), so by monitoring the signal power level the tank can be cleaned before the buildup gets excessive. If the tank is more than 16 inches tall, two senders can be stacked to allow measurement of levels up to 32 inches.

The Displays: The displays are housed in flush mount panels, with switches on the front panel to control operations. Each display receives the information from the three sender panels via a signal/power wire and the ground wire. Either display can access the sender at any time regardless of whether the other display is on or not.

The inside display is used for viewing tank levels and diagnostic information, and has START and DIAGNOSTIC switches. When the START switch is pressed, the display turns on and displays all three holding tank levels, the battery voltage, and the temperature inside the coach. The display will remain on for about 2 minutes and then will shut down automatically, or it can be shut off manually at any time. When the display is shut down, it draws virtually no power so that the RV battery is not drained. Pressing the DIAGNOSTIC switch while the display is on allows the user to view the diagnostic information.

The outside display is used for viewing tank levels and for controlling the dump valves. It has the START switch, a DIAGNOSTIC switch, an AUTO DUMP switch for automatic dump valve control, and manual grey and black valve control switches.

If a sender is operating properly and connected to the display with good wiring, then the display will show the levels normally. If the wiring for a tank is disconnected, cut, or shorted, or if the sender panel is damaged or dead, then the display will show error messages to alert the user to the problem. The display can also show diagnostic information so the user knows how well the senders are working.

With these diagnostic features, and the digital nature of the tank level sensing technology, it is almost impossible for the system to indicate an incorrect water level, and in the very unlikely event it does occur, the user can verify what is happening with the diagnostic information.

CHAPTER 3
OPERATING INSTRUCTIONS

The displays are the only system component that are accessed by the user. All user input to the display is done using the rocker switches at the bottom of the displays.

Inside display operation:

To read the tank levels:

1. Press the START switch and release it, the display will power up and the top two lines will show the Fresh, Grey, and Black Water levels in percent, and the battery voltage. The system auto calibrates itself so that regardless of the height of the tank, the percentage is always correct. The third line show the temperature inside the coach in degrees Fahrenheit. The fourth line shows the tank status. If the fresh water tank level drops below 20% then the status line will show "**Fill fresh water**". If either of the sewer tank levels rise above 85%, then the status line will show "**Dump sewer tanks**". If both situations are present, then the status line will show "**Dump sew/Fill fr**". So, for example, the top line might read "**Fr=100% Gry= 67%**", the second line might read "**Blk= 67% 14.5V**", the third line might read "**Inside temp= 72F**" and the fourth line might read "**Tank levels OK**".
2. To turn the display off, press the START switch and hold it down until the top line changes to "**Turn off display**". Release the switch at this point to turn off the display. If the switch is not pressed then the display will shut itself off in about 2 minutes.
3. If there is fault with the sender or the wiring, the display will show an error code to indicate this. These are the fault conditions and the codes:
    a. Open circuit, sender(s) not connected or not functioning: **open**
    b. Short circuit, wiring shorted to ground or sender(s) shorted: **shrt**
    c. Data error, bad wiring, faulty sender(s), or electrical interference: **err**
    d. Display programmed for one sender, top sender connected: **top**
    e. Display programmed for one sender, bottom sender connected: **bott**
    f. Display programmed for two senders, single sender connected: **sing**
    g. Display programmed for two senders, only bottom sender working: **notp**
    h. Display programmed for two senders, only top sender working: **nobo**
4. The inside temperature is measured with a digital temperature sensor mounted inside the display panel. It reads in degrees Fahrenheit and is accurate to within 3 degrees. Any sensor failure will be shown on the display.

To review the sender diagnostics:

1. The sender diagnostics should be reviewed periodically to check for any degradation of the tank senders. If a sender appears to be malfunctioning, reviewing the diagnostics should be the first step.
2. Press the START switch and release it, the display will power up. Wait until all the tank level values are shown. Press the DIAGNOSTICS switch, the bottom line will change to "**Show diagnostics**". Releasing the switch will cause the display to enter the diagnostic mode.
3. When the switch is released, the monitor will show the fresh water sender diagnostics. Note that the diagnostic values shown in **bold** in this description are examples only, the text describes the range of allowable values. The diagnostics are as follows:

a. The first line will show "**Fresh signal=22%**" which indicates the power of the received signal used to determine the water level. The receiver segments on the sender that are below the water level will be providing this information. The sender must have at least 5.0% signal level to function, the maximum possible signal level is 99%. Normal signal levels should be in the 10% to 50% range. If the signal level is low, check for buildup inside the tank, the sender peeling off the side of the tank, or low voltage (less than 10V) to the display. If the signal level is over 90%, incorrect readings may occur. Check for water or mud buildup right on the sender.
b. The second line will show "**Interference= 1%**" which indicates the amount received signal from the sender segments that are above the water level. The tank must be no more than 80% full for this number to be valid. Normal interference levels should be in the 0% to 2% range. If the interference level is high, incorrect readings may occur. Check for water or mud buildup right on the sender, or large a large buildup of debris on the inside of the tank.
c. The third line will show "**Level=10.25 inch**" which indicates the water or sewer level in inches.
d. The fourth line will show "**Tank height=15in**" which indicates the length of the sender, which is used for calculating the percent level. If the actual sender length does not match this then the sender is defective. Under normal circumstances the sender length should be within one inch of the tank height. You can verify the percent level by dividing the level by the tank height and multiplying by 100. In our example it would be10.25 divided by 15 times 100 which is 68%. The display will round to the nearest 1%.

4. Press the DIAGNOSTICS switch again to show the grey water diagnostics next. The first line will show "**Grey signal=22%**", and the rest of the lines will be similar to the fresh water diagnostics.
5. Press the DIAGNOSTICS switch again to show the black water diagnostics next. The first line will show "**Black signal=22%**", and the rest of the lines will be similar to the fresh and grey water diagnostics.
6. Press the DIAGNOSTICS switch again to return the display to normal operation. To turn off the display, press the START switch until the bottom line changes to "**Turn off display**", then release the switch to shut the display off.

Please note that the bottom position of the START switch has no function at this time. The bottom position of the DIAGNOSTICS switch is only used for programming.

Outside display operation:

To read the tank levels:

1. Press the START switch and release it, the display will power up and the top two lines will show the Fresh, Grey, and Black Water levels in percent, and the battery voltage. The system auto calibrates itself so that regardless of the height of the tank, the percentage is always correct. The bottom two lines show the status of the drain valves. So, for example, the top line might read "**Fr=100% Gry= 67%**", the second line might read "**Blk= 67% 14.5V**", the third line might read "**Gry valve open** " and the fourth line might read "**Blk valve closed**".
2. To turn the display off, press the START switch and hold it down until the top line changes to "**Turn off display**". Release the switch at this point to turn off the display. If the switch is not pressed then the display will shut itself off in about 2 minutes.
3. When the display is shut off, the top two lines are cleared but the valve status information in the bottom two lines remains.
4. If there is fault with the sender or the wiring, the display will show an error code to indicate this. These are the fault conditions and the codes:
    a. Open circuit, sender(s) not connected or not functioning: **open**
    b. Short circuit, wiring shorted to ground or sender(s) shorted: **shrt**
    c. Data error, bad wiring, faulty sender(s), or electrical interference: **err**
    d. Display programmed for one sender, top sender connected: **top**
    e. Display programmed for one sender, bottom sender connected: **bott**
    f. Display programmed for two senders, single sender connected: **sing**
    g. Display programmed for two senders, only bottom sender working: **notp**
    h. Display programmed for two senders, only top sender working: **nobo**
5. If a drain valve shows "**Blk valve midway**" then that valve is stuck partway between being open and shut. Try using the manual switch to open or close the valve. If the valve is still stuck use a screwdriver to open or close the valve.

To review the sender diagnostics:

1. The sender diagnostics should be reviewed periodically to check for any degradation of the tank senders. If a sender appears to be malfunctioning, reviewing the diagnostics should be the first step.
2. Press the START switch and release it, the display will power up. Wait until all the tank level values are shown. Press the DIAGNOSTICS switch, the bottom line will change to "**Show diagnostics**". Releasing the switch will cause the display to enter the diagnostic mode.
3. When the switch is released, the monitor will show the fresh water sender diagnostics. Note that the diagnostic values shown in **bold** in this description are examples only, the text describes the range of allowable values. The diagnostics are as follows:
    a. The first line will show "**Fresh signal=22%**" which indicates the power of the received signal used to determine the water level. The receiver segments on the sender that are below the water level will be providing this information. The sender must have at least 5.0% signal level to function, the maximum possible signal level is 99%. Normal signal levels should be in the 10% to 50% range. If the signal level is low, check for buildup inside the tank, the sender peeling off the side of the tank, or low voltage (less than 10V) to the display. If the signal

level is over 90%, incorrect readings may occur. Check for water or mud buildup right on the sender.

b. The second line will show "**Interference= 1%**" which indicates the amount received signal from the sender segments that are above the water level. The tank must be no more than 80% full for this number to be valid. Normal interference levels should be in the 0% to 2% range. If the interference level is high, incorrect readings may occur. Check for water or mud buildup right on the sender, or large a large buildup of debris on the inside of the tank.
c. The third line will show "**Level=10.25 inch**" which indicates the water or sewer level in inches.
d. The fourth line will show "**Tank height=15in**" which indicates the length of the sender, which is used for calculating the percent level. If the actual sender length does not match this then the sender is defective. Under normal circumstances the sender length should be within one inch of the tank height. You can verify the percent level by dividing the level by the tank height and multiplying by 100. In our example it would be10.25 divided by 15 times 100 which is 68%. The display will round to the nearest 1%.

4. Press the DIAGNOSTICS switch again to show the grey water diagnostics next. The first line will show "**Grey signal=22%**", and the rest of the lines will be similar to the fresh water diagnostics.
5. Press the DIAGNOSTICS switch again to show the black water diagnostics next. The first line will show "**Black signal=22%**", and the rest of the lines will be similar to the fresh and grey water diagnostics.
6. Press the DIAGNOSTICS switch again to return the display to normal operation. To turn off the display, press the START switch until the bottom line changes to "**Turn off display**", then release the switch to shut the display off.

Please note that the bottom position of the START switch has no function at this time.

To manually open or close a drain valve:

1. Press the START switch and release it, the display will power up. Press the appropriate GREY WATER or BLACK WATER, OPEN or CLOSE switch and release it. The display will apply power to the valve to actuate it, and shut off the power as soon as the valve is fully open or shut. During valve actuation (which may be very brief) the display will show the operation, for example "**Opening black drain valve**". The display will show the valve status upon completion, for example "**The black water drain valve is now fully closed**". This status will show for 4 to 5 seconds or until a switch is pressed.
2. If the valve is stuck, the display will try for 3 seconds to move the valve (the normal valve actuation time is less than one second). If the valve cannot be fully actuated in that time, the display will give up and display the appropriate error message, such as "**The black water drain valve is jammed closed. Use screwdriver.**" Try pressing the switch again to see if the valve will move. If that does not work, use a screwdriver.
3. If the drain valve motor draws too much current, or if there is a short in the wiring to the valve motor, then the display will immediately shut off power to the valve and will show "**Hi current drain on black water drain valve. Service required**". In this case the cause of the high current drain will need to be found and corrected.
4. If the coach battery voltage drops below 10 volts during valve actuation, the power to the valve is immediately shut off and the display will show "**Battery voltage is too low. Service required**". This prevents possible damage to the display.

5. When the display is shut off, the top two lines are cleared but the valve status information in the bottom two lines remains.

To perform the automatic dump cycle:

1. Press the START switch and release it, the display will power up. Press the AUTO SEWER DUMP switch and release it. The display will show "**Verify drain hose in place. Press "START" to proceed**", at which point the drain hose connection should be verified. Press the START switch within 5 seconds to proceed with the automatic dump cycle.
2. If the START switch is pressed in time then the display will show "**Auto dump ready. Press "START" to abort dump at any time.**" and after about 10 seconds the system will proceed with the automatic cycle. Pressing the START switch at any time during the automatic cycle will terminate the automatic dump cycle and close any open valves.
3. The cycle starts by making sure the grey water drain valve is closed. This is to prevent a backwash of black water into the grey tank in the event that someone had left the grey tank drain valve open. Next, the black water drain valve is opened. For the valve actuation, the display will show the same messages as for manual valve operation. During the time that the black tank is dumping, the display will show tank levels on the top two lines and "**Auto dumping now.**" on the third line and "**Black tank dump.**" on the fourth line. The display will check the black water level every 10 seconds until the tank is below 1.25 inches of level, then after an additional 20 seconds the black valve will be closed. The 1.25" is used instead of empty to avoid the valve staying open forever if the tank cannot completely drain. Then the grey valve will be opened, and the display will show "**Grey tank dump.**" on the fourth line. The grey level will be checked every 10 seconds, and the valve closed using the same criterion as the black tank.
4. If a black or grey tank sender or its wiring fails during the auto dump, that valve will close as though the tank were empty.
5. When the grey valve is closed, the cycle is complete and the display top line will show "**Auto dump done.**" and the bottom two lines will show the valve status. The display will then shut off, but it will retain this message until it is restarted.
6. If a valve does not operate properly during the automatic cycle, then the cycle will be terminated and the top two lines of the display will show the error message "**Valve problem. Auto dump abort.**" and the bottom two lines will show the valve status. The display will shut off, but it will retain this message until it is restarted.

CHAPTER 4
DISPLAY PROGRAMMING

The inside and outside displays are designed for use with either one or two senders per tank. If the tank is taller than 17 inches, two senders are stacked to increase the measurement height. The installer must program both the displays so they know whether to expect one or two senders for each of the tanks. If the display is programmed for a different number of senders than are installed, the display will show an error code as indicated in the previous chapter.

Follow these steps to program a display:

1. Press and hold the START switch when power is first applied to the system.
2. The display will enter the programming mode and the first line will show "Program #Senders". Release the START switch and the second line will show the currently selected tank and its mode. For example, the fresh tank will show either "Fresh=1 Sender" or "Fresh=2 Sender" indicating that 1 or 2 senders, respectively, are expected.
3. Pressing and releasing the START switch will cycle through the rest of the tanks, as indicated on the display.
4. To change the mode, press the switch to the right of the START switch. Pressing the top of the switch (DIAGNOSTICS) will put that tank to 2 sender mode, and pressing the bottom of the switch (AUTO SEWER DUMP on the outside display) will put that tank to 1 sender mode. The mode is stored as soon as the switch is pressed.
5. To exit programming mode, make sure that no switch is pressed, then shut off the power to the system.

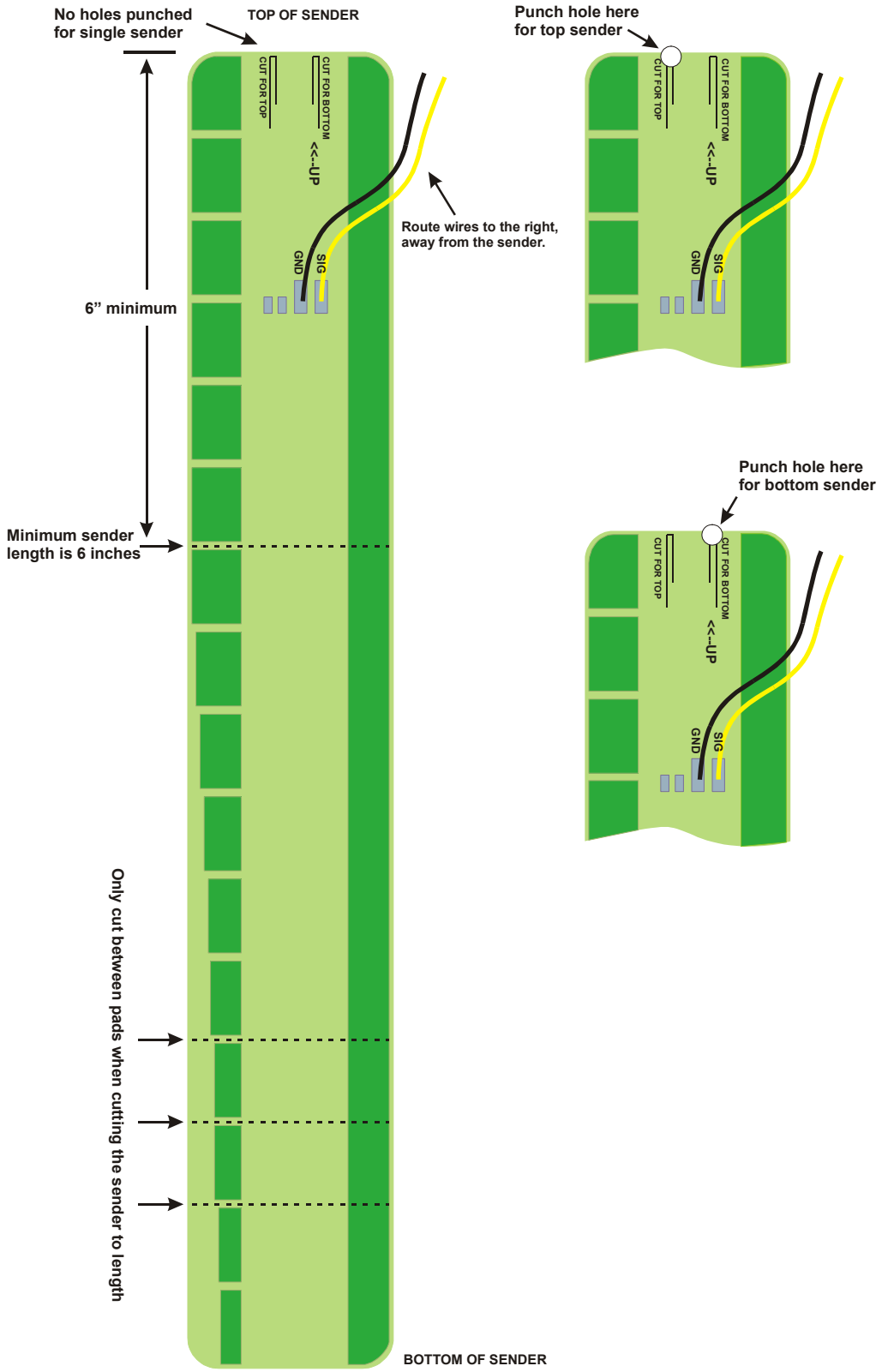
CHAPTER 5
INSTALLATION GUIDE (NEW OEM INSTALLATIONS ONLY)

1. The installation consists of mounting the display inside the RV, cutting and fastening the senders to the sides of the holding tanks, connecting wiring, and programming the display.
2. Mount the display by cutting a hole in the wall 4 1/4" wide by 4 1/2" high and bringing the wiring out through the hole to connect to the display panel connector.
3. Connect the wiring according to the following table. Note that the inside display does not have any wires for connecting the drain valves, so only the first 5 wires are present. The connectors can be unplugged from the displays during installation to make wiring easier. One pair of wires is required to connect each of the senders. Alternatively, the senders can be grounded locally with a single wire running to the display for each tank.

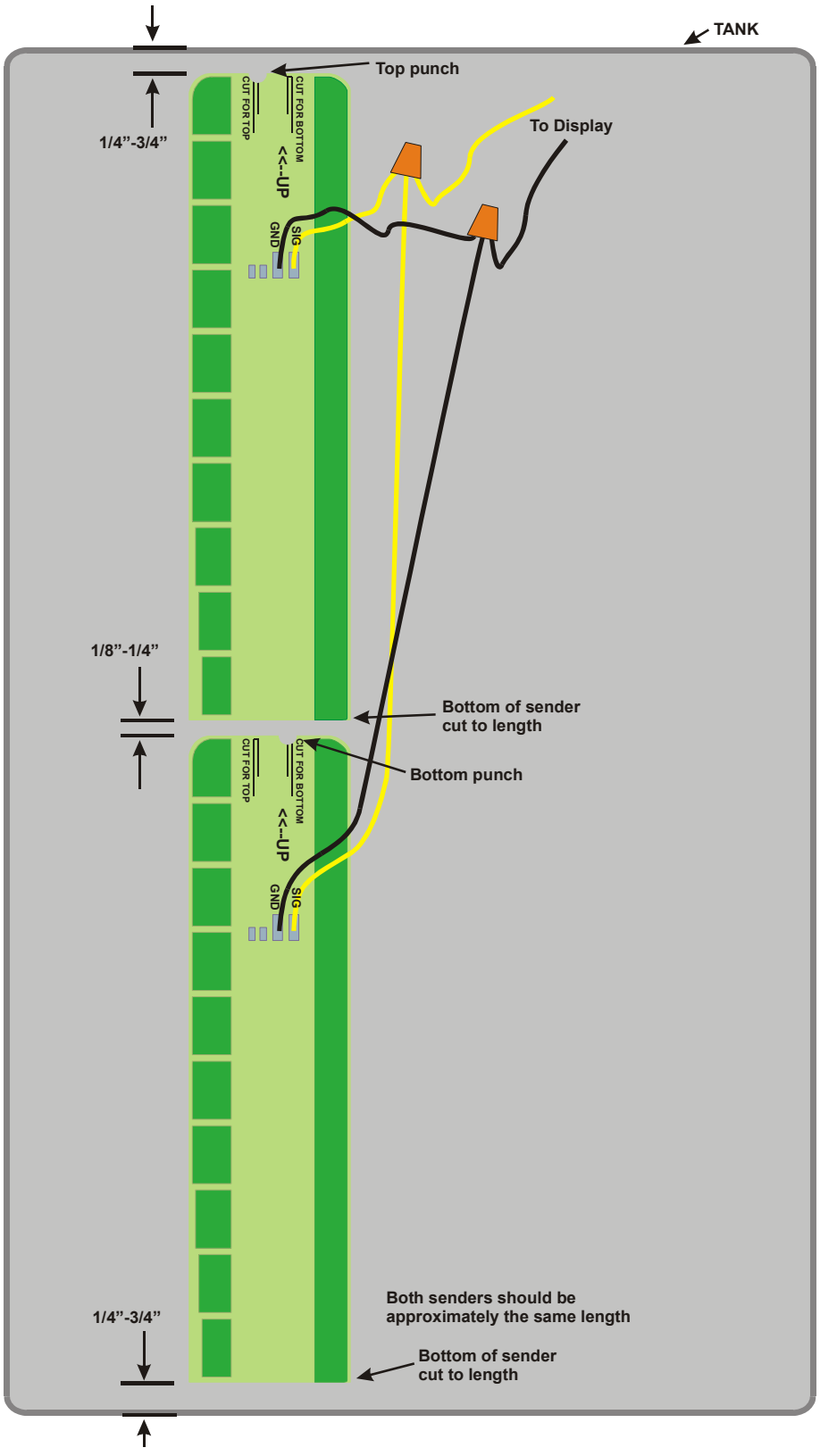
Wire Color	Function
Red 18 gauge	+12V power input to gauge
Black 18 gauge	Ground (one from each connector, hook both up)
Blue 22 gauge	Fresh water tank sender
Grey 22 gauge	Grey water tank sender
Black 22 gauge	Black water tank sender
Yellow 18 gauge	Grey water tank valve red motor wire
Orange 18 gauge	Black water tank valve red motor wire
Purple 18 gauge	Grey & Black water tank valves white motor wires
Orange 22 gauge	Grey water tank valve closed sensor wire
Brown 22 gauge	Grey water tank valve open sensor wire
White 22 gauge	Grey water tank valve open & closed sensor wires
Green 22 gauge	Black water tank valve closed sensor wire
Purple 22 gauge	Black water tank valve open sensor wire
Yellow 22 gauge	Black water tank valve open & closed sensor wires

4. Determine where to mount the senders on the tanks. They will need to have a flat area on the side of the tank large enough so the whole width of the sender is in contact with the side of the tank, all the way from the top to the bottom of the tank. Make sure that any metal is at least an inch away from the sender. Clean the area well so that there is no dust, grease, oil, water, etc., that would prevent the adhesive on the sender from sticking.
5. Measure the height of the tank to determine how long the senders should be. For tanks less than 17" tall, follow step 6. For tanks greater than 17" tall, follow step 7.
6. For tanks less than 17" tall, a single sender is used. The sender ends should be 1/4" to 3/4" away from the top and bottom of the tank, to allow for the thickness of the tank top and bottom and any bows in them (see the diagrams). The senders are calibrated to account for this distance from the bottom of the tank. The sender is cut to the nearest even inch in length, for example, a system with a tank height of 11.75 inches, cut the sender to be 11 inches long, this allows 3/8" at each end when the sender is centered vertically on the tank. **IMPORTANT: Do not cut the sender shorter than 6 inches! The sender will not work if it is cut less than 6 inches.**
7. For tanks greater than 17" tall, two stacked senders are used. The sender ends should be 1/4" to 3/4" away from the top and bottom of the tank, to allow for the thickness of the tank top and bottom and any bows in them (see the diagrams). The senders are calibrated to account for this distance from the bottom of the tank. In addition, there needs to be a gap of 1/8" to 1/4" between the two senders. Therefore total length of both senders will be: tank height-1/4"-1/4"-1/8", then rounded down to the nearest whole inch. The top and bottom senders should be approximately the same length for best results. For example, if

the tank height is 22”, then 22”-1/4”-1/4”-1/8”=21 3/8”, so the total length of both senders will be 21 inches. Make one sender 10” long and the other 11” long.



8. To make the senders the right length (assuming they are too long) they will need to cut off with a pair of scissors. The end to be cut is the bottom end, which is the opposite end from the top where the wires come out (see the diagrams). DO NOT cut the sides, and DO NOT cut the sender shorter than 6 inches. The cut must be in between the sensor pads, and the cut must be made parallel to the existing bottom end. Double check your measurements, if the sender is cut too short, it cannot be lengthened.
9. For two stacked sender systems, the senders need to be programmed so they know that they are being used as top or bottom senders. As shown in the diagrams, punch a hole or snip a bit of the sender away to cut the line on the sender corresponding to its position. For the bottom sender, cut the line next to the text "CUT FOR BOTTOM", and for the top sender, cut the line next to the text "CUT FOR TOP". DO NOT cut any lines for single sender systems!
10. Once the sender is cut to length, carefully peel the backing paper off the adhesive. Do this slowly to prevent the adhesive from being ripped off the sender, and to prevent the backing paper from ripping. Be careful not to bend the sender sharply in the process. Position the sender over the side of the tank and carefully stick it down. MAKE SURE THAT THE END WITH WIRES IS POINTING UP!! Position the bottom of the sender at least 1/4" above the bottom of the tank, and more if required to equalize the space at the top and bottom of the tank. Make sure that the sender is square with the tank. You only have one shot at this, if you try to peel it off the tank once it is stuck the sender may be damaged by the sharp bending. Carefully press the sender down to the tank so that all of the adhesive is contacting the tank wall.
11. Connect the yellow wire to the wire from the display corresponding to that tank. For two stacked sender systems, connect the two yellow wires together, then connect these to the display (see the diagrams). Connect the black wire from each sender to ground. Use Marrette or crimp connectors to fasten the wires together. Make sure that the wires from the sender are routed away from the sender, if they drape over the sender they could affect the reading. Secure the wires with tie wraps or something similar so that the wires do not rattle or press against the sender, this may result in sender damage or wires breaking over time.
12. Do steps 4 to 12 for the other two holding tanks.
13. All that remains now is calibration and testing. The tank senders will self calibrate to whatever length they are cut, so they will always read from 0 to 100%. The display needs to be set to a one or two sender system for each tank. Follow the directions under the display programming section for this. Make sure you do it for each tank. For the initial test, have the tank at least 1/4 full of water or sewage, and verify that the percent level reading looks correct (see the section ***To read a tank level***) and that the signal power is at least 12% (see the section ***To review the sender diagnostics***). If the signal power is too low, make sure that the sender is well stuck to the side of the tank and that the tank is reasonably clean inside, as a large buildup will reduce signal strength. The gauge will work with maximum signal strengths as low as 5%, but it is good to have at least 12% at installation so that there is some margin available for buildup in the tank. Note that the system "learns" about the characteristics of the tank with use, so the readings may be inaccurate when the tank is empty or almost empty when the system is first tested. Once the tank has been filled at least 1/4 full the system will be properly "taught" and should read correctly after that.
14. Verify that the battery voltage reads correctly. If it appears low, make sure you have good wiring for the 12 volt power and the ground.



Typical Two Stacked Sender Installation

CHAPTER 6
TROUBLESHOOTING GUIDE

THIS SECTION PENDING

CHAPTER 7
SERVICE AND WARRANTY INFORMATION

The warranty will apply only if the warranty card shipped with the equipment has been returned to Garnet Instruments Ltd.

Garnet Instruments Ltd. warrants equipment manufactured by Garnet to be free from defects in material and workmanship under normal use and service for a period of one year from the date of sale from Garnet or an Authorized Dealer. The warranty period will start from the date of purchase or installation as indicated on the warranty card. Under these warranties, Garnet shall be responsible only for actual loss or damage suffered and then only to the extent of Garnet's invoiced price of the product. Garnet shall not be liable in any case for labor charges for indirect, special, or consequential damages. Garnet shall not be liable in any case for the removal and/or reinstallation of defective Garnet equipment. These warranties shall not apply to any defects or other damages to any Garnet equipment that has been altered or tampered with by anyone other than Garnet factory representatives. In all cases, Garnet will warrant only Garnet products which are being used for applications acceptable to Garnet and within the technical specifications of the particular product. In addition, Garnet will warrant only those products which have been installed and maintained according to Garnet factory specifications.

LIMITATION ON WARRANTIES

These warranties are the only warranties, expressed or implied, upon which products are sold by Garnet and Garnet makes no warranty of merchantability or fitness for any particular purpose in respect to the products sold. Garnet products or parts thereof assumed to be defective by the purchaser within the stipulated warranty period should be returned to the seller, local distributor, or directly to Garnet for evaluation and service. Whenever direct factory evaluation, service or replacement is necessary, the customer must first, by either letter or phone, obtain a Returned Material Authorization (RMA) from Garnet Instruments directly. No material may be returned to Garnet without an RMA number assigned to it or without proper factory authorization. Any returns must be returned freight prepaid to: Garnet Instruments Ltd, 284 Kaska Road, Sherwood Park, Alberta, T8A 4G7. Returned warranted items will be repaired or replaced at the discretion of Garnet Instruments. Any Garnet items under the Garnet Warranty Policy that are deemed irreparable by Garnet Instruments will be replaced at no charge or a credit will be issued for that item subject to the customer's request.

If you do have a warranty claim or if the equipment needs to be serviced, contact the installation dealer. If you do need to contact Garnet, we can be reached as follows:

Garnet Instruments Ltd.
284 Kaska Road
Sherwood Park, Alberta
Canada T8A 4G7
Toll Free North America 1-877-RVGAUGE (784-2843)
Email: service@rvgauge.com

CHAPTER 8
SPECIFICATIONS

Resolution:	1/4 inch (6 mm)
Accuracy:	+/- 2% for senders at least 6 inches (15mm) long. Volume accuracy may be affected by tank shape.
Operating temperature range:	+32 to +140 ^{O}F (0 to + 60^{O}C)
Sender materials:	0.008” thick glass epoxy circuit board with coating for circuit protection. Laminated on the back with Scotch Laminating Adhesive.
Display enclosure:	Flush mount panel with exterior dimensions of 5.25” wide by 5.5” high. Wall hole cutout required is 4.25” wide by 4.5” high.
System power requirements:	Display requires 12 volts from RV battery, system will function from 10 volts to 18 volts. Current drain is less than 150 milliamps with all senders operating, not including current drawn by valve motors.
Wiring:	Two wire conductor required from the display to each sender. 12 V power and ground required for display.