SeeLevel™

717-R2 Tester Operation Guide

For use with all displays including RVCs.

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1.0 INTRODUCTION

1.1 OVERVIEW

The SeeLeveL 717 Tester is a specialized testing device designed for use with SeeLeveL II and SeeLeveL Soul Tank Monitors. The 717 Tester allows installers to perform various tasks, including testing and calibrating tank senders, diagnosing possible system errors, and verifying display performance.

1.2 FEATURES

- Compatibility with SeeLeveL II Tank Monitors and SeeLeveL Soul models.
- Detailed data information for comprehensive testing and diagnostics.
- Quick and easy setup for efficient testing procedures.
- Built-in diagnostic capabilities for identifying system errors.
- Intuitive interface for user-friendly operation. Compact design for enhanced portability.
- Adjustable LCD screen contrast for optimal viewing.
- Battery-powered with the option to turn off the LCD to conserve power.
- Multi-functional buttons for easy navigation and operation.
- Robust construction for durability in field use.

1.3 SAFETY SYMBOL INFORMATION

Read these instructions carefully and look at the equipment to become familiar with the device before trying to install, operate, service, or maintain it. The following special messages may appear throughout this manual or on the equipment to warn of potential hazards or to call attention to information that clarifies or simplifies a procedure. “Notes”, “Cautions”, and “Warnings” have been used to bring special matters to the immediate attention of the reader.

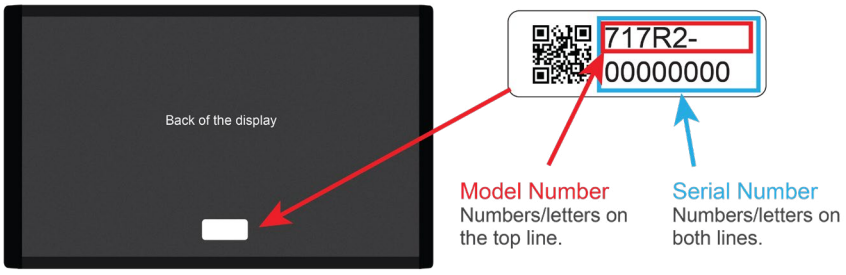
Safety Symbols

⚠ **NOTE:** expands on information for any procedures.
⚠ **CAUTION:** explains safety information that could cause damage to the product, including data loss.
⚠ **WARNING:** explains dangers that might result in personal injury or death.

Changes or modifications not expressly approved by the party responsible for compliance could void the user’s authority to operate the equipment.

1.4 MODEL & SERIAL NUMBER

Before installing your system, look for the model and serial number on the back of the display, as shown below. Write these numbers on the inside cover of this handbook for future reference.



2.0 GETTING STARTED

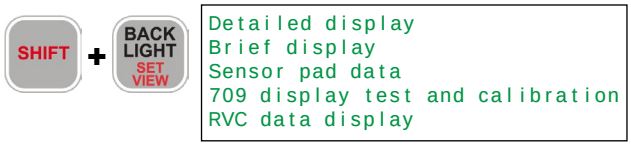
2.1 QUICK GUIDE

POWER ON AND SELECT VIEWING MODE

1. Turn on the tester.
2. Ensure the correct viewing mode and tank settings are selected:

   Press and hold **SHIFT+SET VIEW**.

   Press **SET VIEW** to scroll through modes.



SENDER DIAGNOSTIC CHECK

1. Turn on the tester.
2. Select desired viewing mode.
3. Connect GROUND (black) and Sender SIGNAL (blue) leads to sender bus.
4. Check diagnostic messages for possible errors.

   OPN (Open), SHT (Short), ERR (Error), NTP (No Top), NBO (No Bottom), and STA (Stack Error)

LP SENSOR RESISTANCE CHECK

1. Select desired viewing mode.
2. Connect GROUND (black) and LPG (green) leads to the LP sensor.
3. Check resistance: near zero for empty tank, 70-90 ohms for full tank, "OPN" for open circuit.

709 DISPLAY TEST & CALIBRATION

1. Connect tester PWR (red) leads to display power and ground wires.
2. Calibrate display battery voltage by holding "BATT" display button, then turn on tester power.
3. Calibrate LPG by connecting LPG (green) lead to green wire and following LP calibration procedure.

RVC DATA DISPLAY SETUP

1. Connect RVC (yellow and purple) leads to RVC bus output.
2. Connect GROUND (black) lead to display ground.
3. Ensure a RVC Display or Soul is powered and connected to senders.
4. Optional: Use tester's +13V output for power.

TANK SENDER/CONFIGURATION

1. Turn on desired viewing mode.
2. Press and hold **SHIFT+SET TANKS** to enter tank setup mode.
3. Press **SELECT TANK** to scroll through the available tanks. (*) indicates the selected tank.
4. Press **CHANGE # SEND** button to adjust the number of senders for the selected tank. Setting the tank to 0 senders means that tank will not be read.
5. Press the **EXIT** button to exit.

SENSOR PAD DATA SETTINGS

1. Select Sensor pad data mode
2. Press **SHIFT** + **SET TANKS** to show first 12 pads,
3. Press and hold **SHIFT** to see the remaining 6 pads. If a pad is not present, it will show as "255".
4. Toggle **DOWN** and **UP** to scroll through all tanks.

BUTTON TEST MODE ENTRY AND EXIT

1. Hold **DOWN** and **UP** while powering on to enter test mode.
2. Verify button functionality.
3. Turn off power to exit test mode.

LCD CONTRAST

- Press and hold **SHIFT** and toggle **CONTRAST-DOWN** or **CONTRAST-UP** to adjust.

POWER AND BATTERY CHECK

1. Turn off tester power to conserve battery.
2. Check battery condition.

2.2 BUTTON FUNCTIONS

The buttons on the device have multiple functions. Here's a breakdown of each button's primary and secondary functions:

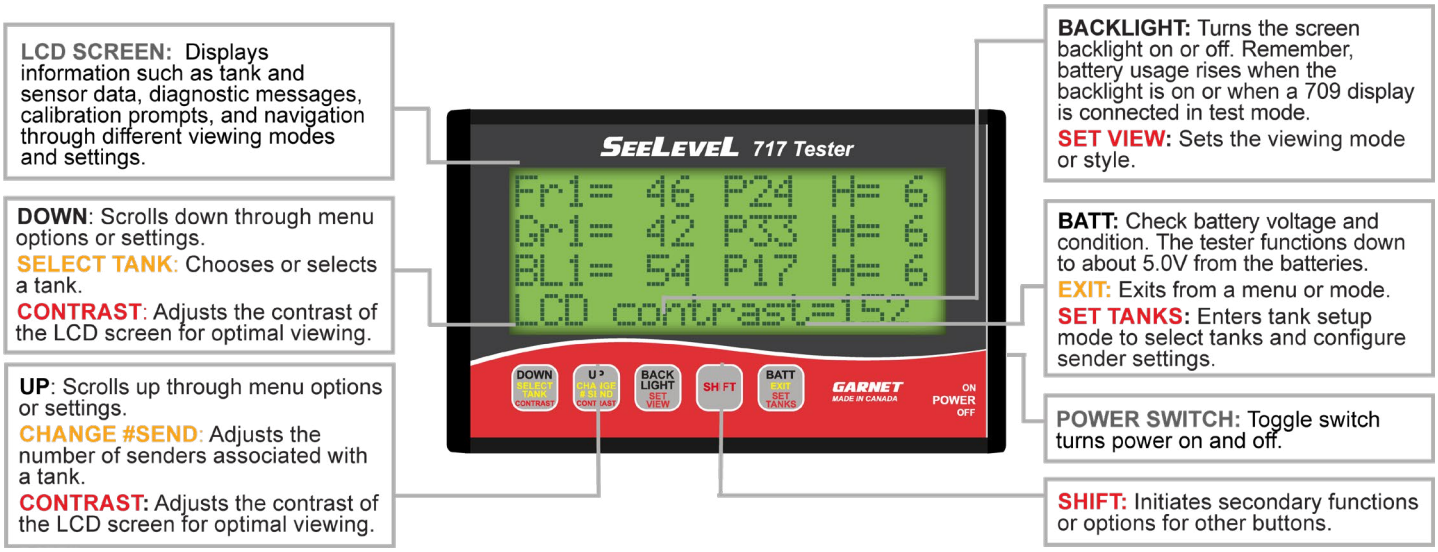


Figure 2.2a Front Panel Display

2.3 CONNECTOR INFORMATION

CONNECTOR	FUNCTION
RED	POWER
GREEN	LPG
BLACK	GROUND
BLUE	SENDER SIGNAL
PURPLE	RV-C Hi
YELLOW	RV-C Lo

Figure 2.3a 717 Tester Connectors

2.4 BATTERY INFORMATION

To operate the tester, you'll need 6 x AA alkaline batteries.

Battery life:

- With backlight off: approximately 250 hours of continuous use.
- With backlight on: around 10 hours of continuous use.

The tester transforms the voltage from the AA cells into:

- 13V to power senders or a display.
- 5V for the backlight.
- 3.3V to run the processor and LCD display screen.

> ⚠ **NOTE:** Expect increased battery consumption when using the "709 display test" viewing mode or connecting a 709 display. Additionally, the power consumption in the "RVC data display" viewing mode takes about twice as much power as the sender testing modes.

Replacing the batteries.

- With a #1 Phillips screwdriver, locate and remove both screws from the side panel with the connectors.
- Slide the enclosure casing off and open the battery compartment.
- Replace the old batteries with new ones, then secure the battery cover and reassemble the enclosure.

Figure 2.4a Replacing Batteries

> ⚠ **NOTE:** For optimal performance, we recommend replacing all batteries at the same time. Using a full set of new batteries helps ensure consistent power delivery, longer battery life, and smooth, uninterrupted operation of your device.

3.0 SETTING UP THE TESTER

3.1 SETTINGS

- Viewing Modes
- LCD Contrast
- Tank Sender Configuration (including whether they are double stacked)

Refer to "Figure 2.3a Front Panel Display" on page 5 for button descriptions.

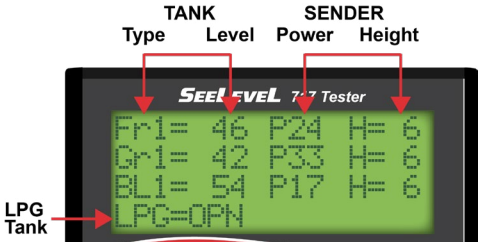
3.2 VIEWING MODES

- Detailed display, Brief display, Sensor pad data, 709 display test and calibration, and RVC data display
  - Press and hold **SHIFT+SET VIEW**.
  - Press **SET VIEW** to scroll through modes.

1. Detailed display Mode

- Display tank type and level, sender power and height.
- The LPG tank displays the actual resistance of the LP sensor, eliminating the need for calibration to get a reading.
- First screen displays up to 4 tanks.
- Use the **DOWN** and **UP** buttons to scroll through additional tanks.

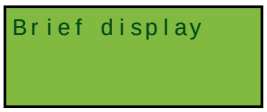
Detailed Display mode screen



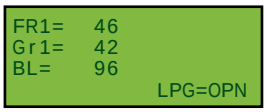
Detailed Display screen

2. Brief display Mode

- Condensed view, showing the tank type and level.
- Can show all 7 tanks and the LPG simultaneously.



Brief display mode screen

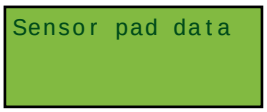


All tanks connected

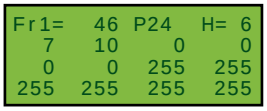
3. Sensor pad data Mode

Detailed information for one tank:

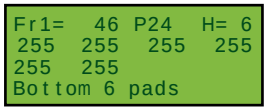
- Level, sender power and height
- Output from each sensor pad (or both senders if they are double stacked).
- Press **SHIFT** + **SET TANKS** to show first 12 pads,
- If a pad is not present, it will show as "255".
- Use **DOWN** and **UP** to scroll through all of the tanks.



Sensor pad data screen



First 12 pads screen



Remaining pads screen

The order of the pads follow a numerical sequence:

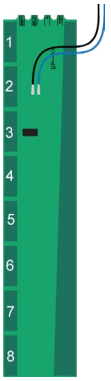
1-2-3-4
5-6-7-8
9-10-11-12

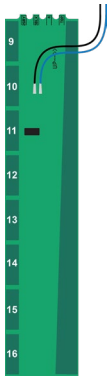
Press and hold **SHIFT** to see the remaining 6 pads:

13-14-15-16
17-18

Sender Pad Locations:

- Top sender pad is number 1.
- The number increases as you go down the sender (see sender positions diagram).
- Double-stacked AR, AR2, or ES3 senders can have up to 18 pads.



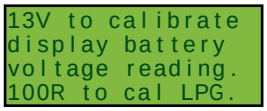


Sender pad positions *bottom double-stacked*

1. 709 display test and calibration Mode

- Outputs 13.0V on the red jack to operate a display and calibrate the battery voltage reading.
- Provides a 100 ohm load on the green jack for calibration of the LPG reading.
- Test and calibrate a 709 display without any other equipment.

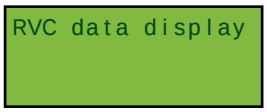
709 display test and calibration screen



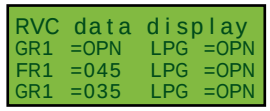
Data output screen

2. RVC data display Mode

- Displays tank level data from the RV-C bus to the screen.
- This option displays the data being sent by either a SeeLeveL Soul or RVC display onto the RVC bus.



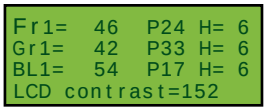
RVC data display screen



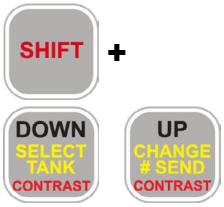
Data being sent screen

3.3 LCD CONTRAST SETTING

- Press and hold **SHIFT** and toggle **CONTRAST-DOWN** or **CONTRAST-UP** to adjust.
- LCD information is displayed on the bottom line of the screen.
- Typically factory-set, however, significant temperature changes may require adjustment for the best viewing.



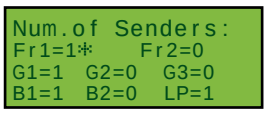
LCD contrast on bottom



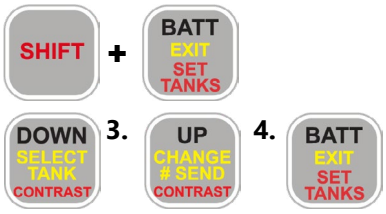
3.4 TANK/SENDER CONFIGURATION SETTING

Customize which tanks are in use and how many senders (single or double stacked) each tank has.

1. Press and hold **SHIFT+SET TANKS** to enter tank setup mode.
2. Press **SELECT TANK** to scroll through the available tanks. (*) indicates the selected tank.
3. Press **CHANGE # SEND** button to adjust the number of senders for the selected tank. Setting the tank to 0 senders means that tank will not be read.
4. Press the **EXIT** button to exit.



Tank and sender configuration screen



4.0 USING THE TESTER

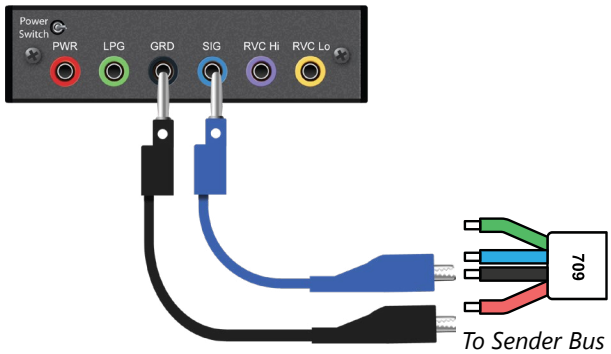
4.1 CONNECTION AND DIAGNOSTICS

The connection and diagnostic section provides instructions for connecting the tester to tank senders, identifying potential errors, and interpreting diagnostic messages.

1. Connect to Sender Bus

1. Turn on the tester and ensure it is set to the desired viewing mode with correct tank and sender configurations.
2. Connect the black and blue leads to the sender bus to read sender information.

> ⚠ **NOTE:** Turn off tester when not in use to conserve battery life, as it doesn't turn off automatically.



To Sender Bus

2. Diagnostic messages

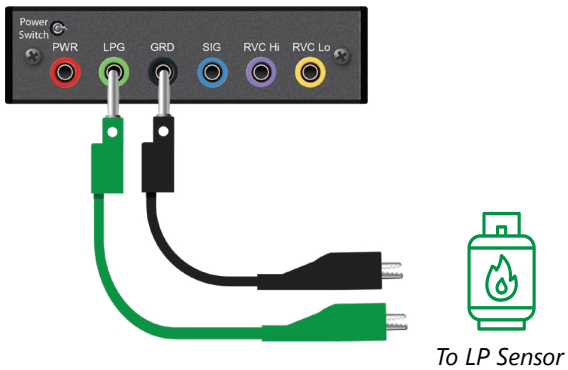
- Check for possible diagnostic messages.
- The tester functions similarly to a 709 display or Soul in displaying tank level and diagnostic values.

CODE	MEANING
OPN	OPEN - Means the sender is disconnected.
SHt	SHORT - Signals a short circuit in the sender or wiring.
Err	ERROR - Indicates invalid sender data or two senders set for the same tank.
ntP	NO TOP - Shows when the tank is set for two senders, but only the bottom one is responding.
nbO	NO BOTTOM - Appears if the tank is set for two senders, but only the top one is responding.
StA	STACK ERROR - Indicates the tank is set for one sender, but two are present.

4.2 READING LP SENSOR RESISTANCE

Connecting the black and green leads to the LP sensor allows you to read its resistance. The number displayed should correspond to the sender's position. Here's what to expect:

- If the tank is empty, the reading should be close to zero ohms.
- For a full tank, the reading should typically range between 70 to 90 ohms.
- If the resistance exceeds 200 ohms, it indicates an open circuit, which will be displayed as "OPN".



To LP Sensor

4.3 709 DISPLAY TEST AND CALIBRATION MODE

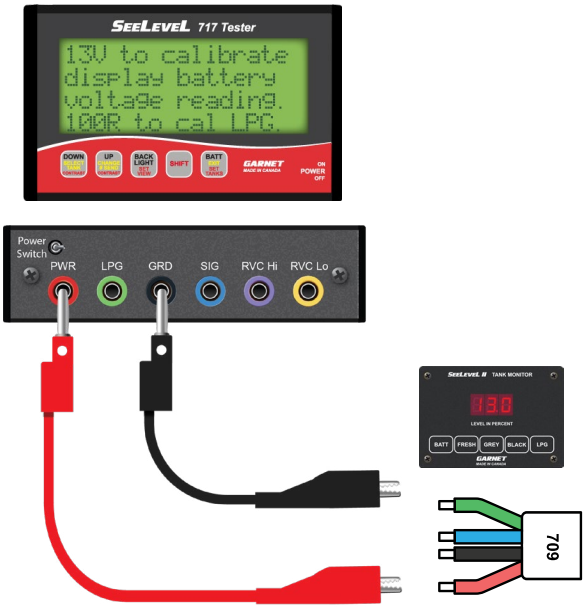
In the 709 display test and calibration mode, the screen will show "***13V to calibrate display battery voltage reading. 100R to cal LPG.***"

1. To operate or calibrate a display
   - Connect the tester's red lead to the red power wire and the black lead to the black ground wire of the display to power the display.

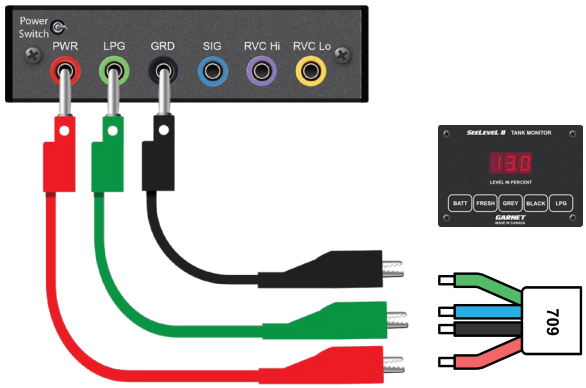
2. To calibrate display battery voltage reading
   - Hold down the BATT button on the 709 display and turn on the tester power. Wait about 5 seconds until the display shows "13.0" for the battery voltage reading calibration.

3. To calibrate the LPG
   - Also connect the green lead to the green wire for calibrating the LPG using the normal LP calibration procedure.
   - Note that the tester settings for tank and sender configuration do not affect the 709 display test mode.

> ⚠ **CAUTION:** Avoid shorting the red and black leads together to prevent stressing the tester and excessive battery consumption.



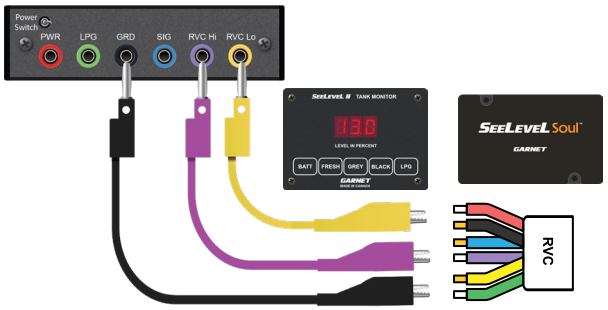
Operate/calibrating display



To calibrate LPG

4.4 RVC DATA DISPLAY MODE

1. Ensure tester is powered on and connected to senders.
2. If the display or Soul are not powered from another source, the +13V output on the red test lead can be used to provide power (this may reduce battery life).
3. Connect yellow and purple RVC leads to RVC bus output, and black ground lead to ground of Soul or 709-RVC.



Connected leads to RVC display or Soul

RVC Bus Data displayed

1. Data is displayed on the screen in one of six positions, such as “FR1=xxx” or “BL2=xxx” located on the left or right side of the bottom three lines of the screen.
2. “xxx” value can range from 0 to 100, indicating the tank level, or display “OPN” if no sender is connected.
3. Data may arrive in a random order or in bursts, which is normal for the RVC bus.
4. If data stops coming in, the screen will be blank after approximately 7 seconds due to a timeout.
5. The RVC specification permits up to 5 seconds between data transmissions, so if the screen goes blank, it suggests an issue with the Soul/709-RVC RVC output.

```
RVC data display
GR1 =OPN   LPG =OPN
FR1 =045   LPG =OPN
GR1 =035   LPG =OPN
```

RVC data displayed

> ⚠ **NOTE:** The tester settings for the number of tanks and senders per tank do not affect the RVC data display mode.

4.5 BUTTON TEST MODE

- Hold down **DOWN** and **UP** on power up to enter the button test mode. This shows the battery condition continuously, as well as the code for each button that is pressed. This can be used to verify that the buttons are working properly.
- Turn off the power to exit the test mode.

5.0 SPECIFICATIONS

717 TESTER	
Enclosure Material	Aluminum
Enclosure size	106 mm wide (4.175") x 160 mm high (6.30") x 28.5 mm deep (1.12")
Display type	LCD, backlit. Can be turned on or off to conserve batteries
Display size	60.96 mm (2.4") x 24.13 mm (0.95")
Battery power	Powered by 6 alkaline AA batteries, field replaceable with no memory loss • With backlight off: approximately 250 hours of continuous use. • With backlight on: around 10 hours of continuous use.
Temperature range	Use in dry, moderate temperature locations
SAFETY INFORMATION	
Compliance and Certifications	CAN ICES-003(B)/NMB-003(B) This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation. Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment. This product can expose you to chemicals including Nickel and Lead, which are known to the State of California to cause cancer, and lead which is known to the State of California to cause birth defects or other reproductive harm. For more information go to www.P65Warnings.ca.gov Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

6.0 WARRANTY & SERVICE INFORMATION

To find warranty claim process information, refer to our support page on our website:

www.garnetinstruments.com/support/

DISCLAIMER OF WARRANTY ON HARDWARE

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. 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, 286 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:

CANADA
Garnet Instruments Ltd.
286 Kaska Road
Sherwood Park, AB T8A 4G7
CANADA

UNITED STATES
Garnet US Inc.
5360 Old Granbury Road
Granbury, TX 76049
USA