

ergoFET500

Push/Pull Force Gauge



ergoFET500 User Manual

Congratulations on becoming the proud owner of the new ergoFET500 with wireless technology, Hoggan Scientific, LLC digital push/pull force gauge. ergoFET500 is one of the latest in Hoggan's highly functional and innovative products for ergonomic assessments, job design and job task analysis, functional assessments and muscle strength testing. Hoggan has been creating innovative measurement solutions since 1984.

The new ergoFET500 wireless allows testing to be done FREE of cords in conjunction with optional FDC FET Data Collection Software. This provides freedom and ease of use performing force measurement tests. Its durable, light weight design with included test attachments for tension and compression testing is excellent for small to heavy push and pull force load applications.

Hoggan Scientific has been creating innovative solutions to real-life measurement issues since 1984, designing evaluation tools to empower Ergonomic, Engineering, Health and Safety, Physical/Occupational Therapists, and other healthcare professionals, to objectify and quantify product design and human performance. Hoggan's products are recognized for innovation, excellent quality, and long-lasting accuracy and reliability. Our highly satisfied customers include automotive, aerospace, consumer products, and food manufacturers, hospitals, clinics, sports teams, pharmaceutical, as well as ergonomics consultants, universities, and research institutions worldwide.

At Hoggan, we are constantly improving our products to better meet your needs. Besides the addition of the new Bluetooth wireless technology incorporated into the ergoFET500 force gauges, we've incorporated rechargeable batteries and charger as a new feature.

We understand the value of customer feedback. Our customers provide us with many of our best product improvement ideas, as well as interesting new measurement applications. As you have comments and suggestions, we'd love to hear from you. Please e-mail us at contact@hogganhealth.net.

In the meantime, we hope you enjoy using your ergoFET500 with new wireless technology capability immediately for use with available software, for many years to come. For more information on our entire lines of innovative ergonomic and medical devices, please visit us at www.hogganhealth.net.

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ergoFET500 Overview

ergoFET 500 is a durable cost effective, digital force gauge for measuring compression and tension forces to a maximum force capacity of 500 pounds. ergoFET500 is excellent for ergonomic assessments , job analysis, musculoskeletal strength testing, functional capacity evaluations, A.D.A. compliance, and any general push and pull test application for use in industrial ergonomics and physical therapy/ healthcare settings. ergoFET500 is part of a growing family of Hoggan Scientific pioneering measurement products for ergonomic, healthcare and engineering professionals.

The ergoFET500 contains an internal load cell which measures Compression (Push) or Tension (Pull) from a single input shaft. Two large diameter handles screw into the sides of the durable aluminum case to provide the operator a convenient place to grip to apply force. The large, easy to read liquid crystal display (LCD) displays real time force and peak force for any Push or Pull test.

The ergoFET500 is powered by a rechargeable 3.7V LI-ION Lithium battery, and features an automatic power shut off to extend battery life. The unit can be set to display force in Pounds, Kilograms, or Newtons.

ergoFET500 offers the following features:

- Displays real time force and peak force
- Two operation test modes:
 - Un-timed test mode: Record and display peak force, average force, and average after peak for tension or compression.
 - Timed (Static Strength Test) Mode: Record and display peak force and a 3 second average force over the last three seconds of a 5 second exertion for tension or compression.
- 4 selectable threshold settings (2 low and 2 high settings) to accommodate a variety of testing applications.
- ergoFET500 was designed as a stand-alone gauge for capturing individual force measurements or can be used in conjunction with available FDC FET data collection software.

What Is Included:

- ergoFET500 Wireless Digital Force Gauge
- (1) Rechargeable Li-ION battery 3.7 Volt
- AC Adapter charger
- Test Attachments – Rubber Pads for industrial/ergonomics, Foam Pads for patient testing/healthcare
 - (2) Round Aluminum Handles
 - (1) Large Round Transducer Pad
 - (1) Large Rectangular Curved Transducer Pad
 - (1) Flat Rectangular Transducer Pad
 - (1) Small Flat Round Transducer Pad
 - (1) # 2 Clasp Hook
 - (1) 16 Inch Nylon Strap with D Rings
- User Guide
- Product/Warranty card
- Calibration certificate
- Carrying case
- Optional – Bluetooth/ FET Stick (included with software when software ordered)

**Specifications:**

- Weight: 2 pounds
- Dimensions: 6" Height x 2 " Width x 1 3/8" Depth
- Power Source: Rechargeable 3.7V Lithium-Ion battery
- Operating Temperature: (52 - 92 F) (11 - 33 C)
- Humidity: 60-80% non-condensing
- Accuracy: 1% Full Scale
- Sampling Rate: 100 Samples per Second
- Load Cell Capacity Test Range:
 - o Tension: 500 lbs. in 0.1 lb. increments
 - o Compression: 500 lbs. in 0.1 lb. increments
- Threshold Setting: 4 selectable threshold settings - 2 low and 2 high:
 - o Low #1 (L1): Tension and Compression at 1.0 lbs.
 - o Low #2 (L2): Tension and Compression at 2.0 lbs.
 - o High #1 (H1): Tension and Compression at 5.0 lbs.
 - o High #2 (H2): Tension and Compression at 10.0 lbs.
- Auto Power Shutoff after 3 Minutes
- Force Unit of Measure: Is selectable by the operator at the time of testing. Measurement can be set in Pounds (lbs), Newtons (N), or Kilograms (kg), by depressing the appropriate button
- Data Storage – Store, save and retrieve/view most recent 30 tests

Operating Features

Turning on Device

Depress the On/Reset keypad button located on the front of the device, to turn on the ergoFET500. Once the On/Reset button is depressed, the LCD window will display zeros in the screen.

Turning Off Device/Battery Saver

ergoFET500 has an automatic shutoff function. The unit will automatically shut off when it has not been used for more than 3 minutes. Auto shutoff ensures that battery power is preserved when the unit is not in use, and avoids the power drainage that can occur when an on/off switch may accidentally be left on. Device can be turned back on by depressing On/Reset keypad button.

NOTE: When using ergoFET500 in wireless mode RF with Bluetooth / FET Stick and software: if the ergoFET500 has not received any input for three minutes or crossed the threshold setting, the auto shutoff function will activate and signal transmission will stop. Simply press the On/Reset button to turn device back on, and the wireless signal will start transmitting again.

The rechargeable lithium ion battery is designed to provide constant power throughout the battery life. As result, performance declines rapidly in the last few percent of battery life. To avoid any interruption of testing capability, due to low battery power, Hoggan Scientific recommends you recharge the battery when the power check reading reaches approximately 15%.

Battery Check

The ergoFET500 battery is rated for 55 hours of operating use in non-wireless mode with Bluetooth function turned off. With Bluetooth function turned on, estimated battery life is 6 hours. The life of the battery may vary depending on your usage pattern. To help you identify when the battery needs recharging the ergoFET500 has a "power check" feature to allow you to see remaining battery power. To conduct power check:

1. Hold the LBS button down, press and release the On/Reset button once.
2. The unit will then display battery power level in LCD display. Power level reading will display number from 1 to 100, indicating the percent of power remaining in the battery. Refer to Image A.

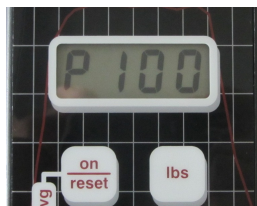


Image A

3. The device will return to normal display/test mode after five seconds.

LCD Window

The large LCD Window (Image B) displays easy to read test results, either peak force or average force depending on the selected operating mode. Results are displayed in whole numbers or decimal measures in tenths, depending on the threshold level selected.

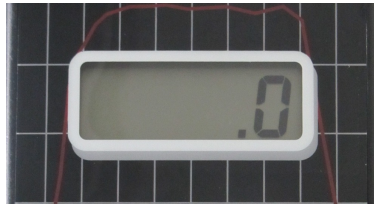


Image B

Bluetooth /FET Stick

Included with your ergoFET500 is a Bluetooth /FET stick (Image C) when software is purchased. The Bluetooth/ FET Stick is needed when the ergoFET500 is used with software for testing. The Bluetooth / FET Stick is included when the software CD disk is ordered. Instructions for using the Bluetooth / FET Stick are included with your software purchase.



Image C

Bluetooth Wireless Mode - On/Off

In order to use ergoFET500 wireless with Bluetooth receiver stick and software, wireless module must be turned on. To toggle to turn Bluetooth wireless module on or off:

Turn On

1. To turn on Bluetooth wireless module, hold down the KGS keypad button, press and release the On/Reset keypad button.
2. Display will show Bluetooth wireless module ON or OFF in the display screen. To turn on wireless module, press the KGS keypad button. Display will now show Bluetooth wireless module turned ON (Image D).

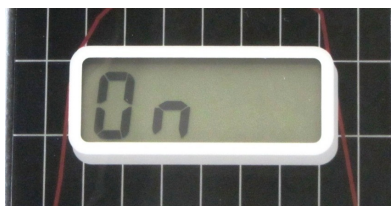


Image D

4. Press On/Reset keypad button to return display to test mode.
5. When Bluetooth wireless module is turned on, a left decimal point will show on the LCD display (Image E).

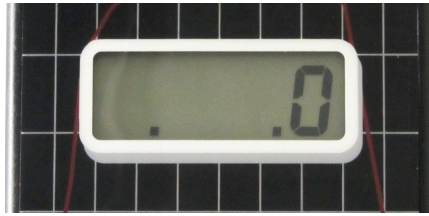


Image E

The decimal point will blink in display on gauge when connected wirelessly to Bluetooth receiver stick .

Turn Off

1. To turn off the Bluetooth wireless mode, hold down the KGS keypad button, press and release the On/Reset keypad button.
2. Display will show Bluetooth wireless module ON in the display screen. To turn OFF, press the KGS keypad button. Display will now show Bluetooth wireless module turned OFF (Image F).



Image F

4. Press On/Reset keypad button to return display to test mode.

Sample Rate

Sampling rate is 100 samples per second.

Main Key Pad Operation



On/Reset Keypad Button

Depress the On/Reset button once to turn on the ergoFET500.

Average Keypad Button

The Average keypad button is used to calculate average force for the duration of a test. Average force can be displayed for either Un-Timed or Timed (Static Strength Test) operating modes. Detailed instructions on using the average function are included in the Testing section of this manual.

Threshold Button

Four selectable threshold settings allow testing flexibility for a variety of applications. Low Threshold settings are for small or sensitive force measurements. Selecting a higher threshold minimizes the potential for false starts or accidental movement of the gauge.

The four preset threshold settings are as follows:

LCD Window

1. Low #1 (L1): Tension and Compression at 1.0 lbs.
2. Low #2 (L2): Tension and Compression at 2.0 lbs.
3. High #1 (H1): Tension and Compression at 5.0 lbs.
4. High #2 (H2): Tension and Compression at 10.0 lbs.

Example: If threshold High #1 (H1) - 5 lbs. is selected, the gauge will begin recording test data when the load cell has detected 5 lbs. of force. The load cell will continue to record test data until the force drops below 70% (in this case, 3.5 lbs.) of the threshold setting. The test will then end and data is no longer recorded.

Setting the Threshold Setting

Depress the Threshold button to select the desired threshold setting. If a "L1" is displayed, this is low setting #1 (1.0 lbs. – tension and compression) (Image G). Each time the Threshold button is depressed the gauge will toggle through to the next preset threshold setting. (L2, H1, H2).

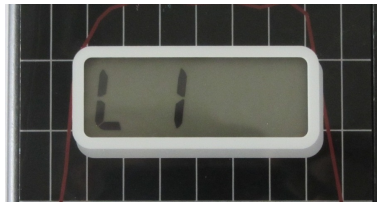


Image G

Units of Measure

The ergoFET500 has dedicated unit keys for selecting unit of measure. The gauge measures either the force load, and displays results in Pounds, Kilograms or Newtons. Depress the desired unit of measure keypad for unit of measure output required. The ergoFET500 will display test results in the unit of measure selected.

Operating Your Gauge

When using the ergoFET500 force gauge, make sure to apply the load axially to the load cell transducer and shaft. Keep the gauge perpendicular to the item being measured to ensure axial loading.

WARNING

The gauge is designed for axial loads only.

Do not apply side loads to the load cell transducer and shaft. Applying side loads could cause damage to the unit, and may increase the risk of operator injury. Take precautions to ensure load is applied axially.

Handheld Operation

The ergoFET500 can be used with or without handles. For high force load capacity testing, screw handles into each side of force gauge housing (Image H).



Image H

Affixing Test Attachments

A variety of attachments are provided to accommodate a wide variety of compression and tension test applications. When affixing test attachments to the load cell shaft, screw the appropriate attachment into the shaft by hand, and tighten until finger tight. Do not use tools to secure or tighten the test attachments. Finger tight torque is sufficient for all attachments (Image I). Over-tightening with tools may damage the load cell.



Image I

Following are examples of the ergoFET500 force gauge in use, for performing compression (push), and tension (pull) tests with handles (Images J, K).



Image J



Image K

Testing

Un-timed Test Operation Mode:

Active Force Reading

The LCD window continuously displays the active (or live) force reading for the duration of the test. The active force display begins when the force exerted reaches the selected threshold setting. The active display will end when the force applied drops below 70% of the threshold setting, or the test has stopped. The Active force display applies to both peak force and average force operating modes.

Peak Force - Tension and Compression

In the Un-Timed Test Mode, perform your push or pull test. During the test, active force readings will be displayed. At the end of the test, a final value will be displayed (Image L). This is the maximum (peak) force measured by the ergoFET500 for the test performed. Peak force is commonly used to measure the force required to complete a task. For example, peak force is necessary to understand the force required to raise the hood of an automobile or a patient performing a pull test.



Image L

Average Force

At the conclusion of any push or pull test, Peak Force is displayed. To obtain the Average Force reading exerted for the entire duration of the test, depress the Avg button once. Average force will be displayed for 5 seconds (Image M). After 5 seconds, the gauge will return to displaying peak force. To view the average force again, simply depress the AVG button. The average force measurement is generally used to measure continuous tasks, such as pushing or pulling a cart across a given distance or sliding an object across a smooth surface.



Image M

Average Force After Peak

In untimed test mode, at the end of a test, the average after peak for sustained force can be displayed. To obtain the average force reading after peak force has been reached, hold down the AVG keypad button, then press the N keypad button to display Average Force After Peak (Image N).

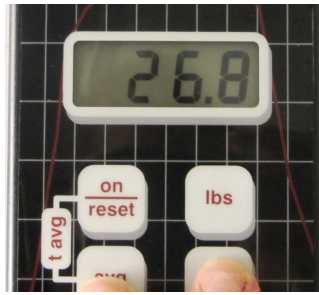


Image N

Timed Test Operation Mode (Static Strength Test)

Setting ergoFET500 To Timed/Static Strength Test Mode

To set the gauge to the timed or static strength test mode, depress the Avg. Button, and while holding down the Avg Button, depress and release the On/Reset Button. When the static strength test begins, four zeros - "0000" will appear in the display window. Then the display will cycle through "1, 2, 3, 4" as the gauge counts the 5 seconds required for the timed test. At the conclusion of the 5 second test, the Peak Force is displayed. This signals the end of the test.

Performing Static Strength Test

For static strength testing, selecting a higher threshold setting will minimize the potential for false starts or accidental movement of the gauge. The ergoFET500 is an ideal gauge for Static Strength Testing.

To prepare the unit for Static Strength Testing, screw the two 1" Diameter 4 7/8" long handles snugly into the sides of the gauge and attach the Small Snap Eye Hook onto the input shaft. Check to make sure the attachments are finger tight.

Have the patient hold the ergoFET500 so the evaluator can view the display. Ensure that the patient is properly positioned, and given instructions for testing. Before handing the patient the ergoFET500, set the gauge to the Timed/Static strength test mode; attach the ergoFET500 to the appropriate chain link and place it in the patient's hands. The ergoFET500 will now read the weight of the chain which is part of the weight the patient is lifting.

To begin a test, instruct the patient to begin pulling. When the force exerted passes the threshold value selected, the 5 second countdown will begin. The LCD will display "0000", then the display will cycle through "1, 2, 3, 4" as the gauge counts the 5 seconds required for the timed test (Image O). At the end of the five second test, the peak force is displayed. This signals the end of the five second static strength test. Instruct the patient to immediately stop pulling. The ergoFET500 should be taken from the patient between exertions so they can relax the tested muscles for a full 30 seconds.



Image O

Peak Force

At the end of the five second timed/static strength test, the peak force recorded for the test is displayed (Image P).



Image P

Average (Last 3 Seconds of 5 Second Test)

To display or show the average force of the last three seconds of the five second test performed, depress the Avg button once. The average force is displayed. After 2 seconds, the gauge will default back displaying peak force. To view the average force again, simply depress the Avg button.

To reset gauge back to Un-Timed Test Mode, depress the Avg Button, and while holding down the Avg Button, depress and release the On/Reset Button. This will set the gauge to the un-timed test mode. To return to the Timed Test Mode, simply repeat the process. Depress and hold the Avg Button and depress and release the On/Reset Button.

Muscle Testing

The ergoFET500 has some limitations for Manual Muscle Testing. The number of muscles that can be tested depends largely on evaluator strength. The ergoFET500 is a large gauge and is difficult to hold in one hand while performing either a Break Test or a Make test. Therefore, some practice will be necessary to develop a technique which works well for each evaluator.

To perform muscle tests, select the appropriate Muscle Testing attachment and screw it into the input shaft.

Muscle Test Attachments:

Large Round Transducer Pad and Large Rectangular Curved Pad – Large Muscle Groups.

Flat Rectangular Transducer Pad – Fingers and Toes as a Grop

Small Flat Round Transducer Pad – Individual finger and toe tests

Recording and Retrieving Test Data

The ergoFET500 is designed to store and retrieve results for the 30 most recent tests. You can manually record each test after performed, recording results on a test record sheet before beginning the next test. Or, you can retrieve stored tests and record all tests performed at once.

In test mode, results are displayed for the most recent test only. Results for each new test, the peak force, will be displayed as soon as the test is completed, replacing results from the previous test.

1. To put the unit in data retrieval mode, hold down the N (Newtons) keypad button and press and release the On/Reset keypad button once.

2. The LCD display will show the test number (1), for last or most recent test performed (Image Q).



Image Q

3. To show force reading for test number displayed, hold down LBS keypad button (Image R).

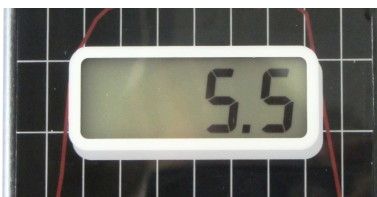


Image R

4. Press the N (Newtons) keypad button to scroll forward through saved tests,
5. Press the AVG keypad button to scroll backward through the tests.
6. Press ON/Reset to return to test mode.

Delete/Clear Saved Tests

To delete or clear saved tests in memory storage, hold N (Newtons) keypad button down and press and release the On/Reset keypad button 2 times.

Using ErgoFET500 with Software

ergoFET500 was designed as a stand-alone gauge for simple measurements. To increase analysis capability, the ergoFET500 gauge is Bluetooth ready, for wireless use with available FDC FET Data Collection software to use cord free. Bluetooth receiver stick comes with software purchased. Using software will increase your evaluation, documentation and research capability.

NOTE: The ergoFET500 does not save test data when the Bluetooth wireless module is turned on.

ErgoFET500 Maintenance

Your ergoFET500 is built to provide long lasting, reliable service. As with any precision instrument, it should be used with care. It should not be dropped, banged against hard surfaces, or used as a scale. ergoFET500's exterior surface can be cleaned with a damp soft cloth. A small amount of household spray cleaner can be used, and any cleaner residue should be removed with a soft cloth dampened with clean water. We recommend that you periodically inspect your unit for wear, and proper functioning.

Low Battery

Blinking readings or units in LCD display indicates that ergoFET500's battery power may be low. If LCD reading or units remain blinking after pressing Reset, the battery should be recharged.

Charging Battery

ErgoFET500 uses (1) rechargeable Lithium-ION battery. To charge battery, take AC adapter plug, and insert into the jack located on the side panel of the housing of the device, and plug adapter into electrical outlet to charge (Image S).



Image S

To see if battery has completed charging, with the ergoFET500 still connected to the AC adapter plugged into the electrical outlet, view the LCD display. Battery is fully charged when the power reading in display shows 100 or 100% charged, with device is turned on. If the device is turned off, press On/Reset keypad button to show battery power level charge. Estimated time required to recharge battery to 100% is 4 hours.

Replacing Battery

If the rechargeable lithium ion battery ever needs replacement, the battery is accessible by removing the display cover of the device to access and change the rechargeable battery. To change the battery:

1. Using a 7/64 inch hex head Allen wrench, loosen the screws on the on the back side of the device (Image T).

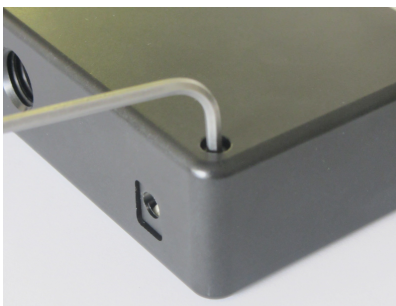


Image T

2. With the screws located on the side panel of the housing that does not have the jack for the AC adapter, push the screws in with the Allen wrench, to push up or raise the top display panel from the housing on that side of the device (Image U).



Image U

Do not raise the top display panel on the other side of device. The top panel display is connected to the electronic board on that side.

3. Carefully lift up and pull out the top panel display from the main housing (Image V).



Image V

4. Lay the top display panel down flat on surface (Image X). The blue rechargeable battery is secured in battery holder on electronic board.



Image X

5. Carefully remove the battery from the holder. When installing a new battery, make sure the positive (+) post aligns with the (+) mark on the battery holder. Place the top display panel back onto the housing and seat properly. Tighten down screws on back side of housing.

If LCD segments in display do not light up after properly installing a new charged battery, please contact Hoggan Scientific LLC Customer Service Department at 1-800-678-7888 / 801-572-6500.

Calibration

ergoFET500 comes with a calibration certificate, ensuring that the unit was properly calibrated at the time of shipment. To ensure continued accuracy and reliability your ergoFET500 unit should be recalibrated annually, by our authorized service technician. A first annual calibration is included (free) as part of the 1 year product warranty.

Transporting ergoFET500

Hoggan Scientific strongly recommends that you store and transport ergoFET500 in the hard sided protective carrying case provided.

Product Warranty Information

ergoFET500 is warranted for a period of one year from the time of shipment. If ergoFET500 fails to operate because of a defect in materials or workmanship at any time within one year of the purchase date, it will be repaired or replaced free of charge by Hoggan Scientific, LLC.

In addition, your first annual re-calibration will be performed without charge as part of your warranty (customer pays shipping). Extended warranties (additional 1 or 2 years) are available at an additional nominal fee.

Warranty Registration

To ensure that your warranty is in force, please complete and mail or fax your warranty card to Hoggan Scientific at 800-915-3439, or visit www.hogganhealth.net to register your warranty information online. Please save proof of your original purchase date, such as your sales slip, invoice, credit card voucher, or cancelled check to establish the warranty period.

Warranty Repairs

Before deciding that your ergoFET500 is inoperable or defective, please review and follow the information in this instruction booklet. In the unlikely event that your ergoFET500 becomes inoperable, please contact Hoggan Scientific LLC to arrange to have the equipment repaired or replaced. Hoggan's Customer Service Department can be contacted at 800- 678-7888 / 801-572-6500, or by email at sales@hogganhealth.net .

When a Hoggan Customer Service Representative authorizes return of the product, you will be given a Return Merchandise Authorization (RMA) number. Please include the RMA number with your unit.

Warranty Exclusions and Limitations

The ergoFET500 warranty does not cover damage by negligence, misuse, or accident. Damage or unit failure caused by modifications or repair other than by Hoggan or its authorized repair agent, or damage to equipment resulting from improper use or operation is not covered. Any warning or instructional labels or decals must remain on the unit for the warranty to be valid. This warranty applies to the original purchaser. Some states do not allow the exclusion or limitation of incidental or consequential damages, in which case the exclusions and limitations may not apply. This warranty gives specific legal rights, and may also have other rights, which vary from state to state. To determine the legal rights in your state, consult your local or state consumer affairs office or State Attorney General.

Customer Service / Repairs

Customer satisfaction is important to Hoggan. We are happy to assist with questions, problems or service issues on any Hoggan products you may own. Our business has grown on the basis of excellent product quality and customer satisfaction. Our full-time customer service representatives are available from 7:30 am to 4:30 pm MST (1-800-678-7888) to meet your needs. Any repairs to the ergoFET500 unit should be completed by a qualified service technician.

Ordering Replacement Parts

Hoggan ergo Products are manufactured to exacting specifications.

When replacing worn or damaged parts, use only original 'Hoggan' manufactured parts. The use of substitute or unauthorized parts will void your warranty and may increase the possibility of injury to the user, or cause additional damage to the unit.

When ordering Replacement Parts, Please take the unit out of service, and complete the following:

1. Identify the brand, model, and serial number, and note the unit's function.
2. Identify and document the problem and the worn or missing parts.
3. Contact Hoggan Scientific LLC.

- Replacement parts (attachments) will be shipped directly from Hoggan.

- All repair services will be performed at Hoggan Scientific, LLC Manufacturing plant.

*Except for replacing batteries, do not attempt to repair the unit on your own. This will void all warranties.

Contact Information

For any questions, Customer Service Representatives are available from 7:30 am to 4:00 pm MST 1-800-678-7888 or sales@hogganhealth.net

Hoggan Scientific, LLC
3653 West 1987 South, Bldg. 7
Salt Lake City, UT 84104
www.hogganhealth.net

Hoggan Scientific , LLC
3653 West 1987 South, Bldg 7
Salt Lake City, UT 84104
Ph: 800-678-7888 / Fax: 800-915-3439
Customer Service: sales@hogganhealth.net
Visit us online: www.hogganhealth.net