

**Models 01165A  
and 01165APP**

# Lafayette Hand-Held Dynamometer

## User Instructions



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The Lafayette Hand-held Dynamometer (HHD) is an ergonomic hand-held device used for objectively quantifying muscle strength. The test is performed with the clinician stabilizing the dynamometer to the limb of a patient. The objective of the test is for the clinician to resist the patient's applied force. The HHD records the peak force and the time required to achieve the force providing reliable, accurate, and stable muscle strength readings.

**Indications:** Evaluation of the strength a muscle or limb

**Contra-indications:** Device has no contra-indications. Clinicians will use discretion to determine when a strength evaluation is appropriate.

**Target Group:** Patients undergoing a strength assessment. The assessment can be pre or post injury.

**Intended Users:** Clinicians and practitioners performing an assessment of a patient's muscle strength.

**Warnings:** None

The HHD also features interactive menus to allow a wide range of options such as data storage, preset test times, and force thresholds to be implemented. While powerful and versatile, the HHD is still small enough to fit comfortably in the palm of the hand. Its ergonomic design allows for both patient and tester comfort while easily conforming to testing protocols.

## Precautions

- When performing repeated tests, inconsistent placement of the HHD will adversely affect scores.
- Extreme temperature, especially heat, may affect the values obtained.
- The HHD cannot tolerate the stress of being used as a floor scale.
- Care should be taken not to drop the HHD, as it may affect the calibration.
- Exceeding the force limit (300lbs/136kg/9999kPa/1335N) may permanently damage and/or invalidate the calibration of the HHD.
- Upon initial receipt of HHD, charge for 2 hours.
- This device uses a Lithium-Ion battery as a power source. It is recommended that the battery be charged at least once every six months. Failure to periodically charge the battery may result in battery damage or device malfunction.
- At device end of life, the HHD should be recycled according to local ordinances regarding electronic waste. If local recycling programs do not exist, the device may be returned to Lafayette Instrument Company or Certain Indexes Limited for proper disposal.
- Any serious incident whereby the health and safety of patients or examiners is compromised due to the usage of this device must be reported immediately to Lafayette Instrument Company and to the competent authority of the Member State where the incident occurred.

## Features

- Designed for high inter and intra instrument reproducibility
- Three, easy to change molded plastic stirrups with pads and a stainless steel algometer stirrup with 7/16" diameter tip
- Force measurements in pounds, kilograms, kilopascals, or Newtons (user selectable)
  - Kilopascals can only be measured accurately using the included algometer attachment.
- Measures peak force, time to reach peak force, total test time, end force, average force from peak to end, percentage decrease from peak force to end force, and the average force
- Data storage for up to 250 tests in on-board memory
- Automatic storage of data
- Measurement range 0-300lbs (136.1kg/9999kPa/1335N)
- Selectable test time from 1 – 10 seconds
- Tone to indicate start and stop
- Microprocessor controlled
- Built-in stored data browsing capability
- Easy to read graphical LCD display
- Automatic shut off after 5 minutes of inactivity
- Battery indicator on LCD display
- Interactive menus allowing users to select device options
- Battery powered: (1) rechargeable lithium-ion battery
- Minimal measurement drift

## Specifications

- Size: 3.16" x 5.11" x 1.6" (8.03cm x 12.98cm x 4.1cm)
- Weight: 312 g
- Range: 0-300 lbs (136.1 kg) (9999 kPa) (1335 N)
- Accuracy:  $\pm 1\%$  over full scale or  $\pm 0.2$  lbs
- Resolution: 0.1lbs/0.1kg/1kPa/0.1N(0-999.9N) / 1N(1000N-1335N)
- Battery Life: 12 hrs powered on, 30 minutes after low battery condition
- Battery Capacity: 1750 mAh Lithium Ion Rechargeable Battery
- Charge Time: 80% charge => 1 hour / Full charge => 3 hours
- Data Storage Capacity: 250 tests
- Preset Test Length: 0.5-10 seconds; in 0.1 second increments
- 25 ms sample rate
- Storage and Handling Temperature: 50-95° F (10-35° C)

## Basic Operations

The Lafayette HHD is small enough to be held in one hand and easily read. The size and weight of the HHD permit the examiner to use the same procedures and break test techniques described in the literature and taught by academic institutions without any modification of technique or positioning. The unit is simply placed between the examiner's hand and the limb being tested. The examiner's downward force is transmitted to the limb through the HHD unit. It can comfortably fit in the right or left hand, with settings for both dexterities. The hand is placed under the strap and around the body of the HHD. This allows easy access to the TOP buttons with the thumb. All of the other buttons are pressed using the opposite hand.

The HHD is activated by pressing and holding the Menu/ Select button. Measurements are taken by positioning the padded stirrup against the muscle being tested on the subject. The force and time data are displayed on the LCD screen. To conserve battery life, the HHD will deactivate itself when not in use for five minutes. All data on the main screen at power down is saved and will be shown when the HHD is activated again.

## Stirrups

The Lafayette HHD includes multiple exchangeable stirrups for meeting various testing needs in addition to an algometer attachment.

When exchanging a stirrup, it is recommended the stirrup be rotated clockwise on and off to reduce friction and wear on the O-ring..



## Function Buttons

The HHD has five function buttons that control the menus and allow the selection of options and settings.

1. **POWER/MENU/SELECT Button:** The round MENU/SELECT button is located on the bottom middle of the HHD. This is the button used to power on the device. Holding the MENU/SELECT button for 5 seconds will power off the unit. It is placed for easy access regardless of right or left hand operation. The MENU/SELECT allows you to enter into the Menu screen and select various options within it.
- 2, 3. **NAVIGATION Buttons:** While on the Test screen the NAVIGATION buttons are used to enlarge the graph and return back to the Test screen from the enlarged graph, or scroll through tests when in test scrolling mode. While in the Menu screen, the NAVIGATION buttons are used to navigate the various menu screens.
- 4, 5. **TOP buttons:** On the Main screen the TOP buttons are used to CLEAR and START tests when applicable. On the menu screen these buttons are used to return back one screen, BACK, or return to the Test screen, TEST. These buttons can be flipped for a specific dexterity by changing the button orientation in the OPTIONS menu.

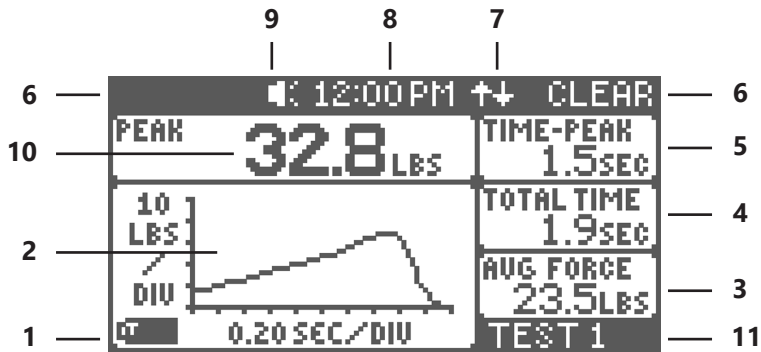


Screens

Test Screen

The Main Measurement Screen shows all measurement information that is being captured. This screen is shown whenever a measurement is in progress.

- 1. Battery Indicator: Indicates the remaining capacity in the charge of the battery.
- 2. Force over Time Graph Area: The graph displays the data for the previously conducted test, and automatically populates the chart to maximize the viewing area. The Y-axis label shows the amount of force (in lbs, kg, kPa, or N), and the X-axis shows the time in seconds.
- 3. Avg Force: Average force exerted over the range.
- 4. Total Time: The total time is the total duration of the test in seconds.
- 5. Time-Peak: Time to peak is the elapsed time in seconds from the start of the test until the maximum force has been reached.
  - Each of these three windows can have any of the following measurements displayed during or after a test is taken:
    - *Real-Time Force*: This displays the real time force that is measured during the test.
    - *End Force*: The force measured at the end of the test.
    - *Avg Pk-End*: Average force exerted from the peak to the end.
    - *% Pk-End*: Percentage decrease of force from peak force to end force.
- 6. Top Button Function: This area shows the current function for the top button. In the Test screen window, the clear function clears the current test, and allows the user to take another test. These elements can move depending on chosen button orientation in Options menu.
- 7. Wireless Communication Indicator: This character indicates when the wireless is enabled.
- 8. Time Display: Time is displayed and can be set manually or synced with a PC in the Options Menu.
- 9. Sound Indicator: Indicates whether beeper is on or off for the current test.
- 10. Peak Force: The peak force displays the maximum force during the test and displays what units the force is being measured in (lbs, kg, kPa, or N).
- 11. Test Number/Setting Abbreviation: Displays the test number while a test is being displayed. Displays the setting abbreviation when a test isn't displayed. This abbreviation can be renamed with the mobile app.



## Test Setup Menu Screen

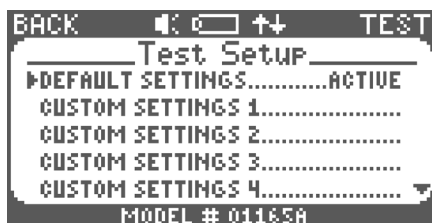
The Test Setup menu screen allows the user to select default or custom settings while also setup various test options for each custom setting.

### DEFAULT SETTINGS

Selecting this will make the default settings ACTIVE. The default settings are not able to be changed. The default settings are as follows:

**Start:** FORCE THRESHOLD  
**Start Force:** 5 LBS  
**Stop Threshold:** ON  
**Stop Force:** 0 LBS  
**Auto Clear:** ON  
**Units:** LBS  
**Test Time:** 3.0 SEC  
**Peak Only:** OFF

**Arrow Function:** SCROLL  
**Metronome:** OFF  
**Sound:** ON  
**Display 1:** TIME-PEAK  
**Display 2:** TOTAL TIME  
**Display 3:** AVG FORCE  
**Button Orientation:** RIGHT



### CUSTOM SETTINGS

Selecting one of the 9 custom settings will bring you to a new screen to change or review the specifics of the settings. It will also set that custom setting as ACTIVE. These settings can be renamed using the DynoData mobile app.

#### START

Starting a test can either be done by passing a FORCE THRESHOLD, after a certain amount of TIME DELAY, or by triggered by the top button.

#### START FORCE/TIME DELAY

These options allow you to select customized force thresholds and time delays.



#### STOP THRESHOLD

If enabled, the test will end when the force applied drops below the value set in STOP FORCE. If disabled, the test will resume for the amount of time set by the TEST TIME.

#### STOP FORCE

If STOP THRESHOLD is enabled, each test will be stopped when the force is less than or equal to this force. Stop force cannot exceed start force.

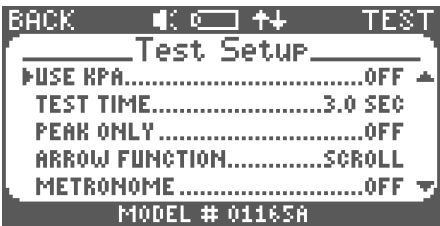
#### AUTO CLEAR

If enabled, manually clearing the data is not required prior to starting new tests.

# Lafayette Hand-held Dynamometer

## USE KPA

Sets force to be measured using kilopascals. **Note:** Kilopascals can only be measured accurately using the included algometer attachment.



## TEST TIME

Allows users to select maximum time for testing.

## PEAK ONLY

Displays only the peak on the main screen, allowing for quick back-to-back testing.

## ARROW FUNCTION

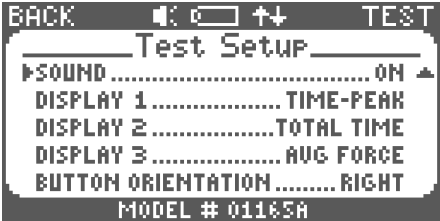
Sets the function of the arrow buttons on the Test Screen. SCROLL allows scrolling through the saved tests. GRAPH allows the graph enlargement.

## METRONOME

Turns on a metronome tone that beeps at a rate of 60 BPM or every second.

## SOUND

Toggles unit's sound on/off.



## DISPLAYS 1, 2, 3

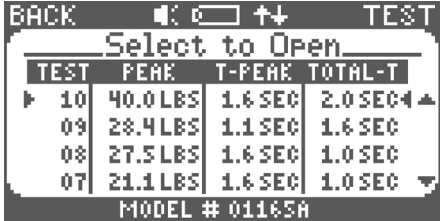
Correspond to the customizable measurement areas on the Test Screen

## BUTTON ORIENTATION

Switches the functionality of the top buttons, allowing for use in either hand.

## Saved Data Menu Screen

The Saved Data menu screen allows users to manage tests that have been saved in the internal memory.





## Options Menu Screen

The Options menu allows user to customize the setup of their unit.

### WIRELESS

Toggles on/off the module for wireless connection.

### BACKLIGHT

Toggles unit's backlight on/off.

### UNITS

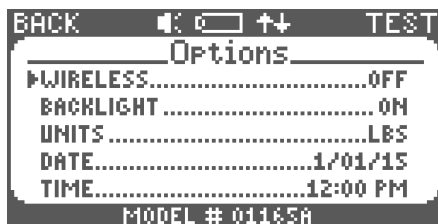
Allows selection of pounds (lbs), kilograms (kg), kilopascals (kPa), or Newtons (N).

### DATE

Updates the HHD system date.

### TIME

Updates the HHD system time.

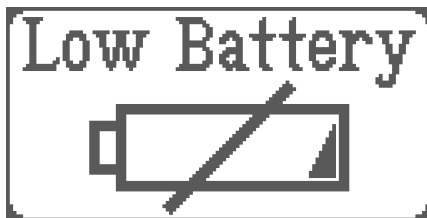


## Information Menu Screen

The Information menu screen provides a contact email and various information about the HHD.

## Low Battery Indicator Screen and Charging

The low battery indicator screen is shown when the battery needs to be charged. The screen will appear and then the system will power off. This screen will re-appear when the power button is pressed until the unit is recharged via the USB connector. The device should take about 1 hour to charge 80% of the capacity, or about 3 hours for a full charge.



## Resets

To restore an HHD to factory defaults, press MENU/SELECT and navigate to the Information screen. Press and hold MENU/SELECT then press the upper left button consecutively until screen reads "Factory reset will delete all tests and all settings". Follow the prompts on screen until the screen reads "Factory reset complete!".

**Hard Reset:** If the HHD freezes press lower down arrow and the upper right button until the unit powers off and back on.

## Firmware Updates

Lafayette Instrument periodically updates the firmware for select products. Visit our website to download our Firmware Updater software. The Hand-held Dynamometer can be updated by plugging in the USB charger into your computer and downloading the current version of the firmware via the Firmware Updater.

## Dynamometer Cleaning

Hard surfaces can be cleaned with a bleach-free sanitizing wipe. Alcohol wipes may also be used. Cloth or foam surfaces can be cleaned with anti-bacterial soap and water and allowed to air dry. Care must be taken to not allow water to penetrate the enclosure as damage to the circuit may occur. Disposable sanitary covers are available on the stirrup pad that comes into direct contact with the patient's skin. Do not reuse disposable covers.

**Disclaimer:** These cleaning instructions for Lafayette Instrument products are a recommendation of compatible cleaning materials only. Product end users are responsible for instituting an appropriate cleaning regimen utilizing best practices and techniques. Lafayette Instrument assumes no responsibility for the cleanliness or sanitation of the products after initial use nor makes any claim that the use of the recommended cleaning materials mitigates all risk of potential cross infection.

## Appendix A: Torque measurements with the HHD

In some research and rehabilitation applications, it is necessary to obtain torque measurements for the limb being tested. Torque is often a more accurate indicator of total strength because it takes into account the length of the muscle being tested. The Lafayette Hand-held Dynamometer (HHD) can be used to obtain torque values through a series of basic calculations.

Torque is measured in units of Newton meters (Nwm) in the Metric system and in foot pounds (ftwlbs) in the English system. Torque is the product of the force applied times the distance between the force and the pivot point (usually a joint).

### Equations for obtaining torque readings with the HHD using metric values:

$$\text{Torque} = \text{Force} * \text{Distance}$$

Where force equals the HHD reading converted to Newtons and distance is the length between where the force is applied and the joint being tested in meters.

**Newtons conversions:** 1 pound = 4.45 Newtons; 1 kilogram = 9.81 Newtons

Newtons are calculated at sea level.

Normative Strength can also be quantified as torque per kilogram bodyweight (Nwm/kg). This value is obtained by dividing the torque by the person's bodyweight in kg.

$$\text{Strength} = \frac{((\text{HHD reading in Newtons}) * \text{distance})}{\text{bodyweight in kilograms}}$$

## Appendix B: Calculating Kilopascals with the HHD

Kilopascals can only be measured accurately using the included algometer attachment. Because the attachment's tip is not precisely 1cm<sup>2</sup>, the firmware and software automatically applies a minor adjustment to the value when converting to kilopascals. Below is a description of how the conversion takes place:

$$1 \text{ lbf/cm}^2 = 44.4822 \text{ kPa}$$

**Algometer tip:** diameter = 7/16" → surface area = 0.96985 cm<sup>2</sup>

$$\text{HHD reading of } 1 \text{ lbf} / 0.96985 \text{ cm}^2 = 1.03109 \text{ lbf/cm}^2$$

$$\text{HHD Conversion to kPa: } 1.03109 \text{ lbf/cm}^2 * 44.4822 \text{ kPa/(lbf/cm}^2) = 45.865 \text{ kPa}$$

**Conversion from lbf to kPa using algometer tip:** 1 lbf → 45.865 kPa

Appendix C: Apps and Upgrading the 01165A

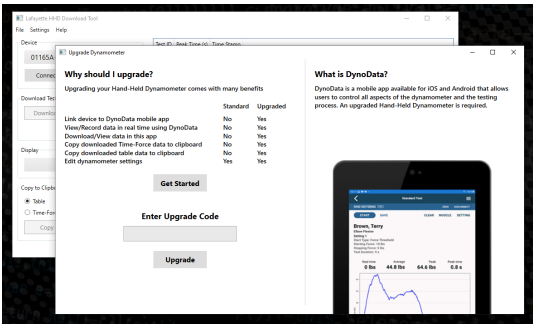
The 01165A Lafayette Hand-held Dynamometer can be upgraded to the 01165APP using the Lafayette Hand-held Dynamometer Utility. Upgrading gives the device access to advanced features via the Lafayette Hand-held Dynamometer Utility or DynoData for iOS/Android devices.

Lafayette Hand-held Dynamometer Utility Features (Windows)

	01165A	01165APP
Edit and store dynamometer settings	Yes	Yes
Download and View data	Yes	Yes
Export data	No	Yes
Copy downloaded Time-Force data to clipboard	No	Yes
Copy downloaded table data to clipboard	No	Yes

DynoData Application Features (iOS/Android)

	01165A	01165APP
Link device to DynoData mobile app	No	Yes
Edit and store dynamometer settings	No	Yes
<b>View and record data in real time</b>	No	Yes
Download and view data	No	Yes

























Upgrading the 01165A Hand-held Dynamometer

1. Connect the 01165A device to the Lafayette Hand-held Dynamometer Utility via USB or Bluetooth.
2. Select "Upgrade my HHD" from the Help Menu in the app.
3. Click "Get Started" to visit our website and complete the web form and payment to receive your Upgrade Code.
4. Enter your Upgrade Code in the provided text area in the app and click "Upgrade."

**Note:** Confirm the 01165A device is still connected before completing the upgrade process.

## Appendix D: Symbol Glossary

The following glossary describes the symbols included on the device label. Some symbols may not apply to this device.

 <p><b>Manufacturer</b> Indicates the medical device manufacturer <i>ISO 15223-1:2016 Ref. 5.1.1</i></p>	 <p><b>Authorized Representative</b> Indicates authorized representative in the EU <i>ISO 15223-1:2016 Ref. 5.1.2</i></p>
 <p><b>Date of Manufacture</b> Indicates date when device was manufactured <i>ISO 15223-1:2016 Ref. 5.1.3</i></p>	 <p><b>Use by Date</b> Indicates date after which the device is not to be used <i>ISO 15223-1:2016 Ref. 5.1.4</i></p>
 <p><b>Batch Code</b> Identifies the manufacturer's lot or batch code <i>ISO 15223-1:2016 Ref. 5.1.5</i></p>	 <p><b>Catalog Number</b> Indicates the manufacturer's part number <i>ISO 15223-1:2016 Ref. 5.1.6</i></p>
 <p><b>Serial Number</b> Identifies the manufacturer's serial number <i>ISO 15223-1:2016 Ref. 5.1.7</i></p>	 <p><b>Sterile</b> Indicates that a device has been subject to sterilization <i>ISO 15223-1:2016 Ref. 5.2.1</i></p>
 <p><b>Do not use if package is damaged</b> Indicates device should not be used if opened <i>ISO 15223-1:2016 Ref. 5.2.8</i></p>	 <p><b>Non-Sterile</b> Indicates a device has not been subject to sterilization <i>ISO 15223-1:2016 Ref. 5.2.7</i></p>
 <p><b>Fragile, handle with care</b> Indicates device that needs careful handling <i>ISO 15223-1:2016 Ref. 5.3.1</i></p>	 <p><b>Keep away from sunlight</b> Indicates a device needs protection from sunlight <i>ISO 15223-1:2016 Ref. 5.3.2</i></p>
 <p><b>Temperature limit</b> Indicates upper and lower temperature limits <i>ISO 15223-1:2016 Ref. 5.3.7</i></p>	 <p><b>Keep dry</b> Indicates device should be protected from moisture <i>ISO 15223-1:2016 Ref. 5.3.4</i></p>
 <p><b>Do not reuse</b> Indicates a single use device <i>ISO 15223-1:2016 Ref. 5.4.2</i></p>	 <p><b>Consult Instructions for use</b> Prompts the user to consult the user manual <i>ISO 15223-1:2016 Ref. 5.4.3</i></p>
 <p><b>Contains latex</b> Indicates the presence of natural rubber latex <i>ISO 15223-1:2016 Ref. 5.4.5</i></p>	 <p><b>Caution</b> Indicates the need to review cautionary information <i>ISO 15223-1:2016 Ref. 5.4.4</i></p>
 <p><b>Humidity Limitation</b> Indicates the upper and lower limits of humidity <i>ISO 15223-1:2016 Ref. 5.3.8</i></p>	 <p><b>CE Mark</b> Product is certified for sale in the EU <i>Regulation (EC) No. 765/2008 Annex II</i></p>
 <p><b>Made in the USA</b> Device was manufactured in the USA <i>No Standard Applicable</i></p>	 <p><b>Medical Device</b> Enclosed equipment is classified as a medical device <i>No Standard Applicable</i></p>

## FCC Compliance Statement

**Contains FCC ID: A8TBM78ABCDEF GH**

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.

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy, and if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

The FCC ID for the HHD is available via the device menu by selecting MENU > INFORMATION.

## CE - Declaration of Conformity

### World Headquarters

Lafayette Instrument Company  
3700 Sagamore Parkway North  
Lafayette, IN 47904  
U.S.A.

### Authorized Representative

AJW Technology Consulting GMBH  
Breite Strasse 3  
40213 Dusseldorf Germany

<b>SRN:</b>	Pending
<b>Product/Trade Name:</b>	Hand-Held Dynamometer
<b>Model Designations:</b>	01165A Lafayette Hand-Held Dynamometer
<b>Basic UDI:</b>	0855170007STRENGTHTESTV9
<b>RISK CLASS:</b>	1
<b>UMDNS Code:</b>	15577

**Conformity Assessment Route:** EU MDR 2017/745 Annex IX

The above listed devices are hereby confirmed to conform to the essential requirements of the European Union Medical Device Regulations (EU 2017/745)

This declaration of conformity is issued under the sole responsibility of the manufacturer.

Effective Date: Future

Expiration date: This declaration of conformity expires 3 years from the signature date limited by the issuance of a new declaration of conformity after the addition/subtraction of product or a change in the scope of the conformity assessment route.

Person responsible for making this declaration:

Name:	Brent E. Smitley
Position/Title:	Quality and Compliance Manager, Lafayette Instrument Company
Place:	Lafayette, Indiana U.S.A.

Legal Signature:



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# Terms and Conditions

## Worldwide Headquarters

Lafayette Instrument Company  
3700 Sagamore Parkway North  
Lafayette, IN 47904, USA

Tel: (765) 423-1505  
Fax: (765) 423-4111  
[sales@lafayetteinstrument.com](mailto:sales@lafayetteinstrument.com)

## European Office

Tel: +44 1509 817700  
Fax: +44 1509 817701  
[eusales@lafayetteinstrument.com](mailto:eusales@lafayetteinstrument.com)

## Placing an Order

All orders need to be accompanied by a copy of your purchase order. All orders must include the following information:

- Quantity
- Part Number
- Description
- Purchase order number or method of pre-payment
- Tax status (include tax-exempt numbers)
- Shipping address for this order
- Billing address for the invoice we'll mail when this order is shipped
- Telephone number
- Email address
- Signature and typed name of person authorized to order these products

## Exchanges and Refunds

No item may be returned without prior authorization from Lafayette Instrument Company and a Return Materials Authorization (RMA#) number which must be affixed to the shipping label of the returned goods. The merchandise should be packed well and insured for the full value. Unopened merchandise may be returned prepaid within thirty (30) days after receipt of the item and in the original shipping carton. Collect shipments will not be accepted. Product must be returned in saleable condition, and credit is subject to inspection of the merchandise.

## Repairs

Instrumentation may not be returned without first receiving a Return Materials Authorization Number (RMA). When returning instrumentation for service, please contact Lafayette Instrument to receive an RMA number. Your RMA number will be good for 30 days. Address the shipment to:

Lafayette Instrument Company  
RMA# XXXX  
3700 Sagamore Parkway North  
Lafayette, IN 47904, USA.

Shipments cannot be received at the PO Box. All items should be packed well and insured for full value. An estimate of repair will be given prior to completion. We must receive a copy of your purchase order via email before non-warranty repair work can commence.

## Damaged Goods

Damaged instrumentation should not be returned to Lafayette Instrument prior to a thorough inspection. If a shipment arrives damaged, note damage on delivery bill and have the driver sign it to acknowledge the damage. Contact the delivery service, and they will file an insurance claim. If damage is not detected at

the time of delivery, contact the carrier/shipper and request an inspection within 10 days of the original delivery. Please contact the Lafayette Instrument Customer Service Department for repair or replacement of the damaged merchandise.

## Limited Warranty

Lafayette Instrument Company warrants equipment to be free of defects in material and workmanship for a period of one year from the date of shipment, except as provided hereinafter. This assumes normal usage under commonly accepted operating parameters and excludes consumable products.

Warranty period for repairs or used instrumentation purchased from Lafayette Instrument is 90 days. Lafayette Instrument Company agrees either to repair or replace, at its sole option and free of part charges to the customer, instrumentation which, under proper and normal conditions of use, proves to be defective within the warranty period. Warranty for any parts of such repaired or replaced instrumentation shall be covered under the same limited warranty and shall have a warranty period of 90 days from the date of shipment or the remainder of the original warranty period whichever is greater. This warranty and remedy are given expressly and in lieu of all other warranties, expressed or implied, of merchantability or fitness for a particular purpose and constitutes the only warranty made by Lafayette Instrument Company.

Lafayette Instrument Company neither assumes nor authorizes any person to assume for it any other liability in connection with the sale, installation, service or use of its instrumentation. Lafayette Instrument Company shall have no liability whatsoever for special, consequential, or punitive damages of any kind from any cause arising out of the sale, installation, service or use of its instrumentation.

All products manufactured by Lafayette Instrument Company are tested and inspected prior to shipment. Upon prompt notification by the Customer, Lafayette Instrument Company will correct any defect in warranted equipment of its manufacture either, at its option, by return of the item to the factory, or shipment of a repaired or replacement part. Lafayette Instrument Company will not be obliged, however, to replace or repair any piece of equipment, which has been abused, improperly installed, altered, damaged, or repaired by others. Defects in equipment do not include decomposition, wear, or damage by chemical action or corrosion, or damage incurred during shipment.

## Limited Obligations Covered by this Warranty

1. Shipping charges under warranty are covered only in one direction. The customer is responsible for shipping charges to the factory if return of the part is required.
2. This warranty does not cover damage to components due to improper installation by the customer.
3. Consumable and/or expendable items, including but not limited to electrodes, lights, batteries, fuses, O-rings, gaskets, and tubing, are excluded from warranty.
4. Failure by the customer to perform normal and reasonable maintenance on instruments will void warranty claims.
5. If the original invoice for the instrument is issued to a company that is not the company of the end user, and not an authorized Lafayette Instrument Company distributor, then all requests for warranty must be processed through the company that sold the product to the end user, and not directly to Lafayette Instrument Company.

