

# ***MICROFET3***

## ***MICROFET3***

***Hoggan Health Industries***

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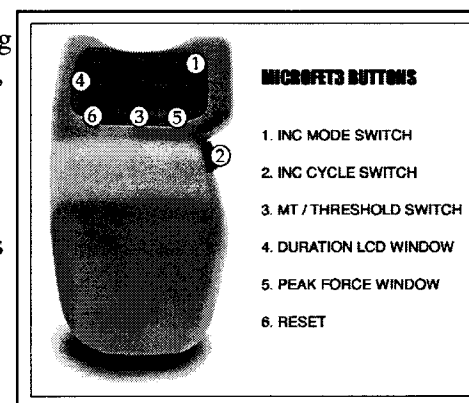
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## What is the MicroFET3?

MICROFET3 is an accurate, portable Force Evaluation and Range of Motion testing system. It is a battery operated, hand held device weighing less than one pound and fits comfortably in the palm of your hand. MICROFET3 provides you with objective, quantifiable data from the time-tested art of "hands-on" manual muscle and range of motion testing. MICROFET3 aids in the differential diagnosis, prognosis and treatment protocols for neuromuscular and musculoskeletal disorders.

### MICROFET3

Recessed into the main outer shell is a polycarbonate overlay with clear lenses for the LCD displays (Liquid Crystal Display), and 3 membrane switches. A switch is located to one side of the unit in proximity to where the thumb or the index finger is positioned during use. As information from the gauges is processed, it is displayed in two LCD windows. During manual muscle testing, the Peak Force LCD shows the force being applied against the transducer pad during the test, and it displays the highest force reached when the test is concluded.



The Duration/Secs

LCD shows the duration of the test from the time the testing threshold was crossed until the test is concluded. For inclinometer use the unit is placed on the starting point and an angle is set. The patient moves through the range of motion and the second angle is set. Then by clicking the cycle switch one more time the difference between both angles will appear in the left hand LCD window.

### Accessories Included

- MICROFET3 with serial port
- Durable carrying case
- Curved transducer pad (Slip-In Dent Ball Retainer Shaft)
- Flat transducer pad (Slip-In Dent Ball Retainer Shaft)
- Digit testing transducer pad (Slip-In Dent Ball Retainer Shaft)
- Muscle Testing Positions chart
- Inclinator Testing Position chart
- Upper body test record tablet
- Lower body test record tablet
- Inclinator testing tablet
- Warranty card (to be returned to Hoggan Health Industries)
- Serial Port is located on the unit and may be used in conjunction with testing software on a computer.

### Specifications

- WEIGHT: 1 lb.
- POWER SOURCE: 1 each 9Volt (alkaline battery)
- CONTROLS: Reset, Muscle Testing Threshold and Inclinator Testing
- OPERATING TEMPERATURE: (52° - 92° F) (11° - 33° C)
- HUMIDITY: 10-40% non-condensing
- MUSCLE TESTER RANGE:
- Low Threshold - .8 lbs. to 200 lbs. in .2 lb. increments (3.6N- 890N Newton increments)
- High Threshold - 3 lb. to 200 lbs. in 1 lbs. Increments (4.4N-890N Newton increments)
- LOAD CELL CAPACITY - 200 lbs.
- A/D CONVERTER - 10 bit (200 pounds by .2)
- INCLINOMETER RESOLUTION - 0.1 degree increments from 0 degrees to 360 degrees.
- WARRANTY One (1) Year (Limited)

### Operating Features

#### Batteries

MICROFET3 has a self-activating "sleep" mode designed to extend battery life. MICROFET3 goes into sleep mode when the unit has not received any input for three minutes. You wake MICROFET3 from sleep mode by pressing the Reset button. Do NOT leave unit on in Inclinator Mode. It will drain the batteries prematurely.

#### Reset Button (activates unit)

Pressing the RESET button activates the unit. The unit will power-up in the mode that was last used. The unit will turn itself off after 3 minutes of inactivity. The RESET button can be used to clear the displays and re-initialize the unit. This may be necessary occasionally.

### LCD Windows

#### Peak Force

During muscle testing the Peak Force LCD numerically shows the actual force being applied to the transducer pad. At the completion of a test the highest force value, or peak force, is displayed. MICROFET3 shows peak force reading in either pounds or metric newtons, depending on what you specified at purchase. If you wish to change the settings in the field please call Hoggan Health Customer Service.

#### Duration/Sec.

This LCD window shows the muscle test duration in tenths of a second from the time the threshold was crossed until pressure was released. Monitoring test duration is an important element in maintaining consistency from test to test. The Duration LCD window also shows the threshold setting. When the unit is in inclinator mode for inclinator testing, numerical readings or data are displayed in the LCD windows.

## **Muscle Testing/Threshold Button**

Pressing the MT-THRESH button will cause the unit to enter "Muscle Testing" mode. Each successive press of the MT-THRESH button will alternate the high/low threshold feature

- High: display "H" in the "time" display and whole units in the "force" display
- Low: display "L" in the "time" display and fractional units in the "force" display.

High is the most commonly used threshold setting. In the high setting, three pounds of force must be exerted before MICROFET3 begins recording test results. High threshold displays in 1-lb. increments during testing.

## **Inclinometer Button**

Pressing the INCL button will cause the unit to enter "inclinometry" mode.

Using a "two button" approach The right display shows the "live" readings until the side button is pressed, at which time that reading is moved to the left display, and the right display contains the "live" readings.

Pressing the side button again then "freezes" the data in the right display. Pressing the INCL button at this time causes the number in the left display to be subtracted from the number in the second display and the final results are then displayed in the left display. Then by pressing the INCL button again will zero both displays and begin the cycle again.



## **Testing With MicroFET 3**

### **Manual Muscle Testing**

The purpose of manual muscle testing is to identify areas of muscular weakness due to injury or disease. By locating weakness, not by confirming strength, manual muscle testing provides clinicians with a useful diagnostic tool. The problem with traditional manual muscle testing is that the results, or scores, have traditionally been subjective in nature.

MICROFET3 was developed to eliminate the subjective nature of manual muscle testing by giving clear, accurate, objective, quantified results. As a result, MICROFET3 makes manual muscle testing a more reliable diagnostic tool.

MICROFET3 is designed to be used with a form of manual muscle testing called "break" testing. Break testing is done by carefully positioning the patient to specifically isolate and contract the muscle being tested. The clinician stabilizes the patient in the isolated position with one hand while placing the other in a position to exert force against the limb associated with the muscle. The test begins with the clinician gradually applying force and the patient trying to resist. The object of the test is for the clinician to overcome or "break" the patient's resistance. Left-to-right comparisons are often used in this type of testing to help determine if weakness is present.

"What happens if the patient's muscle cannot be overcome?" is one of the most commonly asked questions about manual muscle testing. First, remember that the purpose of this type of manual muscle testing is to identify weakness. An isolated muscle that cannot be overcome by a clinician shows a significant amount of strength. However, each incident must be evaluated individually based on the patient, such as a professional athlete, and the strength and ability of the clinician.

Positioning should also be evaluated because it is extremely important in manual muscle testing. In the majority of manual

muscle tests if the target muscle is isolated and the clinician is in a leverage position, the muscle should be overcome.

Without MICROFET3, the clinician normally assigns a value to the test result, such as 1-5 or good-fair-poor, depending on how much force he or she thought the patient exerted. Problems arise, however, trying to assign a score based on feel, especially when the patient is re-tested at a later date.

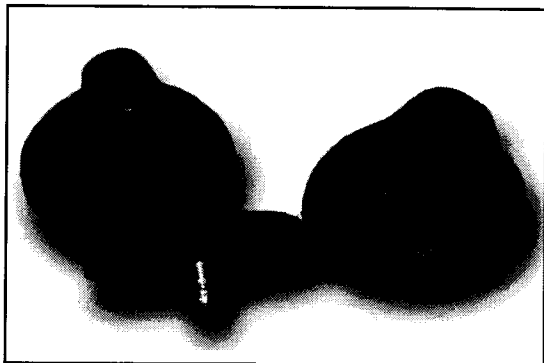
MICROFET3 eliminates the guesswork by measuring the actual force produced during the test.

To use your MICROFET3 when performing manual muscle test, install the proper pad for the area of the body being tested: large pad for flat surfaces, curved pad for rounded surfaces and digit pad for fingers and toes.

You can hold MICROFET3 in either your right or left hand, or you may wish to switch hands from test to test depending on the stabilization requirements.

Use your free hand to stabilize the patient and place the MICROFET3 on the limb associated with the muscle being tested, being careful not to test across a joint. Exert force through the MICROFET3 just like you would in a "hands-on" break test.

For more information on positions and manual muscle testing, see the Hoggan FET Systems Manual Muscle Testing Positions chart included with your MICROFET3 or a manual such as Daniels and Worthingham.



### **Inclinometer Testing**

An Inclinometer is a device that measures a static angle in relationship to the horizontal or vertical or in relationship to a determined zero starting point. The MICROFET3 Inclinometer is a gauge that uses a sensor to accurately measure to within 0.1 degrees. When the inclinometer is moved, the sensor will settle to a stable position in 0.1 seconds which means you can click the button to mark the angle as soon as the patient stops moving. This feature makes the measurement process more comfortable for the patient because they do not have to remain in an uncomfortable posture for any significant amount of time. Single inclinometers provide a simple and accurate method of measuring range of motion. One hand holds the inclinometer and one hand is free to either stabilize or assist the patient through the range of motion. The single inclinometer is placed on the starting point and an angle is set. The patient moves through the range of motion and the second angle is set. Then by clicking the cycle switch one more time the difference between both angles will appear in the left hand LCD window.

### **Stabilization of Inclinometer**

Proper gauge placement and stabilization is critical for accurate measurements. One location that is extremely difficult to locate, especially on obese patients, is the sacral landmark. With a thick adipose layer, one may not be able to feel a bony location and the gauge may "rock" on the adipose layer. When this occurs, the pelvis must be stabilized with the free hand over the anterior pelvis for counter pressure while the gauge is pressed firmly into the soft tissue over the sacrum with an attempt to hold the gauge flat as possible against the sacrum. It is important to assure that the inclinometer remains flat against the patient's body part at all times. If one foot, of the inclinometer, is not in good contact with the bony landmark, the angle marked will be erroneous and all subsequent calculations will be inaccurate.

### **Validity Requirements**

Repeat trial consistency is the main validity criteria for spinal inclinometry. Consistency is based on the cervical, thoracic or lumbar range of motion numbers only. Three consecutive measurements should fall within 5 degrees or 10% (whichever is greater) of the mean (average) of the three measurements in order to meet validity.

If the mean is below 50 degrees, then each measurement must fall within 5 degrees of the mean and if the mean is over 50 degrees, then all three measurements must fall within 10% of the mean.

Example:	TRIAL	1	2	3
Total ROM at T12.....		110	110	110
Total Hip ROM.....		50	55	60
Total Lumbar ROM.....		60	55	50
Mean Lumbar.....		55 degree		
10%.....		5.5 degree or 6 degrees		
Valid.....		Yes, 50 & 60 are both within 6 degrees of 55.		

If the patient does not meet validity, then instruct the patient that they are failing the validity criteria which is invalidating the measurements and tell them that they must move further in order to achieve valid results. You may record up to 6 repeat trials and if validity is not met, then invalidate that portion of the evaluation. The test may be performed at a later date.

### **Normative Data – The AMA Guides**

Norms for spinal inclinometry were developed and published in the American Medical Associations Guides to Evaluation of Permanent Impairment. These norms are very aggressive, i.e., based on a young population and they are not age or sex adjusted. A copy of the AMA Guides can be purchased from the AMA office.

American Medical Association  
515 North State Street  
Chicago, IL 60610  
1-800-621-8335

### **Repeat Trial Consistency**

The values used for repeat trial consistency, which have been determined from six years of testing, is a calculation of the percentage between the peak forces of two consecutive exertions. For example:

Consistency	
Trial One:	40.0 lbs.                      2.5% - Valid
Trial Two:	39.0

The criteria used for interpretation of validity is as follows:

Intrinsic Hand Muscles	
VALID	0-15.0%
EQUIVOCAL	15.1-20.0%
INVALID	>20.0%

The criteria used for all other muscles is:

VALID	0-10.0%
EQUIVOCAL	10.1-15.0%
INVALID	>15.0%

### **FCC Instructions**

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.

Any changes or modifications not expressly approved by Hoggan Health Industries voids the users authority to operate the equipment.

### **Recording Test Data**

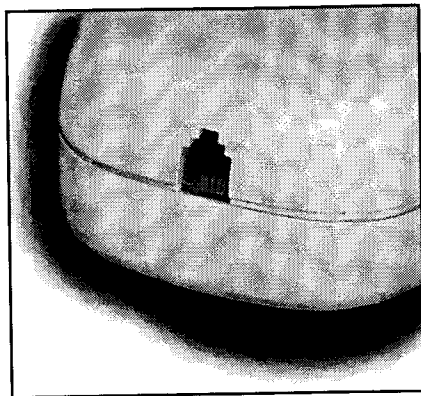
MICROFET3 is a measuring device and does not save test data. Results are displayed for the last test attempt only. Initiating a new test attempt, pushing the reset button or turning the unit off erases the previous results. Therefore, if you desire a record of the test results, they must be manually recorded on a test record sheet immediately after each attempt. Three test record tablets are included with your MICROFET3. Sheets in the tablets provide space for writing the peak force and the test duration and range of motion data. Additional tablets can be ordered through Hoggan Health Industries. A serial port located on the end allows the unit to be utilized with software programs and store data on a computer.

### **Low Battery**

Fading LCD and unlit segments of LCD are indications that the power of your MICROFET3 battery may be getting low. If LCD segments remain unlit after pressing RESET, the battery should be changed. A Lo-Lo reading may be a indication that the battery needs changing. Pressing and holding the INCL mode button and then pressing the reset button puts the MICROFET3 in battery check mode. In this mode the number display is the percentage of battery voltage. A reading of 100 is 100% ( 8volts or more). Pressing reset returns the unit to inclinometer mode.

### **Changing Battery**

MICROFET3 uses 1 each 9Volt high quality alkaline battery. These batteries can be purchased from Hoggan Health Industries. To change the battery, turn the unit over and remove the attachment. Unscrew the 4 screws, remove bottom of unit, replace the battery and re-tighten the screws. (If segment does not light up after installing a new battery, contact Hoggan Customer Service.)



### **Care and Cleaning**

Your MICROFET3 is designed and built to provide long, 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. Dropping or abuse will void the warranty. Always store MICROFET3 in its protective carrying case.

When cleaning your MICROFET3 do not immerse it in water or liquid cleaners. Clean MICROFET3's exterior surfaces with a damp soft cloth. A small amount of household spray cleaner can be used, but it should be followed with a soft cloth dampened with clean water.

### **Transporting MICROFET3**

MICROFET3 should be transported in its carrying case to protect it from damage. If your MICROFET3 is exposed to temperatures outside its operating range during transportation, open the carrying case and allow the unit to return to room temperature before using. This will ensure accuracy of the data.

**Notice:**

Hoggan Health Industries products are manufactured by Hoggan Health Industries to exacting specifications. When replacing worn or damaged parts, use only original "Hoggan" manufactured parts. The use of substitute or unauthorized parts will automatically void your warranty and may increase the possibility of injury to the user or cause additional damage to the unit. Any warning or instructional labels or decal's that have been removed or damaged should be replaced immediately. A qualified service technician should do all repairs.

Customer service and satisfaction are major concerns of Hoggan Health Industries. We are proud of the service we provide and will be happy to assist with questions, problems, and service on any Hoggan Health Industries products you may have. Our business has grown on product quality and customer satisfaction. We also have full-time customer service representatives to meet your needs. Use only Hoggan replacement parts for Hoggan Health Industries products. Use of other parts voids your warranty and could lead to unsafe units..

**Customer Service**

*Hoggan Health Industries*

P.O. Box 957

12411 South 265 West Units D & E

Draper, UT 84020-0957

Phone 800-678-7888 / 801-572-6500

Fax 801-572-6514

E-mail: [customerservice@hogganhealth.com](mailto:customerservice@hogganhealth.com)

**MicroFET3 Warranty****Exclusions and Limitations**

Your warranty does not cover damage by negligence, misuse or accident; damage or failure caused by modifications or repair other than by Hoggan or its authorized repair agent; damage to the equipment resulting from improper installation or operation. Please have the serial number of the unit and date of purchase available when calling. Before deciding that your MICROFET3 is inoperable or defective, please review the information in this instruction booklet. This warranty applies in the U.S.A. and Canada 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 right, 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.

**Service & Warranty Information**

Complete and mail or fax your warranty card back to Hoggan Health Industries. Save proof of original purchase date such as your sales slip, invoice, credit card voucher or canceled checks to establish warranty period. If MICROFET3 fails to operate because of a defect in materials or workmanship within one year of the date purchased it will be repaired or replaced free of charge by Hoggan Health Industries. Before contacting Hoggan, contact your distributor to determine whether they will replace it or arrange to have it repaired. If they will not, call Hoggan to arrange to have the equipment repaired or replaced. Hoggan Health expressly reserves the right to repair or replace this equipment with new or refurbished parts or equipment. In the event that your MICROFET3 becomes inoperable, please contact Hoggan Health Industries Medical Products Division at 800-678-7888 or 801-572-6500.

Warrantor: Hoggan Health Industries, Inc.

For Customer Service

Hoggan Health Industries

800-678-7888 or 801-572-6500; 801-572-6514 (fax);

If a Hoggan Customer Service representative authorizes return of the product, the product should be sent with your RMA# to:

Customer Service

Hoggan Health Industries

PO Box 957 12411 South 265 West

Draper, Utah 84020

Or e-mail requests to: [customerservice@hogganhealth.com](mailto:customerservice@hogganhealth.com)



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