

**MAN733**

**Model 80391**

# **Sleep Fragmentation Chamber**

## User's Manual



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## Description

The Lafayette Instrument Company model 80391 Sleep Fragmentation Chamber is used to provide researchers with the necessary tools for sleep fragmentation studies in both mice and rats. The 80391 maintains an animal environment that is virtually identical to that used in the original 80390 Chamber. The divider wall has been removed since a much faster sweep time is now possible. The sweep bar, food hopper, ad lib water and ventilated lid remain the same. The living environment is now independent of the drive mechanism to reduce noise and greatly facilitate cleaning. It resembles a standard living environment that includes food and water support. The cycle time selector includes a variety of different cycle times. The continuous sweep setting now takes just 7.5 seconds. Selectable inter-sweep cycle values start at 0.25 minutes (15 seconds) all the way up to 30 minutes. Alternately, sweeps may be initiated from a remote device.

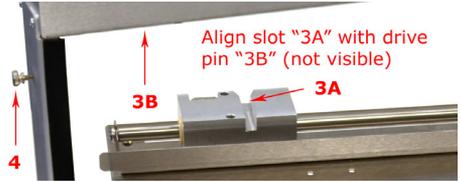
## Technical Specifications

- Power Supply: 9 VDC @ 2A center positive supply (included)
- Cycle Times:
  - Continuous: Approximately 7.5 seconds
  - Selectable (min): 0.25, 0.5, 1, 1.5, 2, 3, 4, 5, 10, 15, 20, 25, 30
- External Initiate/Event Output: 2.5mm connection, 3 conductor
  - Base: Ground
  - Ring: Event output, Open collector, Pull up if needed (30 VDC max)
  - Tip: Ext Initiate, active low switch closure (30 VDC max) Contact Lafayette Instrument for more information
- Dimensions:
  - Outside: 16.0"L x 10.5"W x 14.5" H
  - Inside Living Space: 9.24"L x 7.49"W x 7.52"H (23.5 x 19.0 x 19.1 cm)

## Operating Instructions

The chamber, including cover and sweeper arm, may be removed from the drive mechanism for cleaning and animal husbandry.

1. Orient the chamber on the base so the sweep arm carriage is facing the drive mechanism.
2. Align the top slot of the sweep arm carriage (3A) with the drive pin extending from the bottom of the drive mechanism (3B). This is done by sliding the sweep arm carriage until the slot lines up with the pin as shown at right.



3. Loosen the thumbscrew (4) on each side of the uprights and slide the chamber between the uprights and beneath the drive mechanism until stopped by contact between the chamber cover wings and the uprights. The pin extending beneath the drive mechanism fits inside the slot on top of the sweep arm carriage.

**NOTE:** The drive pin extending from beneath the drive mechanism must be located within the slot on top of the sweep arm carriage. If the drive pin is not engaged with the carriage slot, then the sweeper arm will not operate.

4. Lightly tighten the thumbscrews on both uprights against the sides of the chamber.

**NOTE:** The thumbscrews are not intended to be a "lock" but rather a restraint to prevent the chamber from moving side-to-side due to reversing motion of the sweeper arm. It is also intended to prevent the chamber from "walking" out from under the drive due to vibration. The ends of the thumbscrews are intended to be adjusted right up to the plastic face of the chamber but not to exert any significant pressure on the sides. If the thumbscrews are flexing, they are too tight.

5. Turn the cycle time selector switch to the desired cycle time.
6. Use the provided 9 VDC power supply and connect it to the power connector on the side of the drive mechanism.
7. Turn the power on by pressing the power button on the side of the drive mechanism. Power ON is indicated by a green light adjacent to the power button.
8. Upon power turning on, the sweeper arm will move to the home location at the wall nearest the food and water support. Once at the home location, the unit will begin its first sweep and the cycle timer will start timing.
9. To change the cycle time, first turn off power by pressing the power button. Make the necessary change, and turn power back on.

**NOTE:** Changes to the cycle time when the unit is turned ON will result in an unpredictable first sweep. After the first complete cycle, the sweep intervals will reliably follow the new set value. This unpredictable first sweep may be avoided by simply turning OFF the power (recommended) when making changes to the cycle time value.

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10. Turning power off to the 80391 will cause the sweeper arm to reset, come back to the home location and restart a new sweep and cycle time when power is reapplied.
11. To remove the chamber, first turn power off. Loosen the thumbscrews on both sides of the uprights and pull the chamber straight back from beneath the drive mechanism.

### Definitions

*Cycle Time:* The time from start of a sweep to start of the next sweep.

*Sweep:* A single sweep consists of the following:

- a. The sweeper arm moves a short distance towards the nearest wall,
- b. The sweeper arm moves across the chamber to the opposite wall.
- c. The sweeper arm moves a short distance away from the opposite wall.

The time to complete all movements of a sweep is approximately 7.5 seconds.

*CONT:* Continuous sweep of the chamber. Sweeps, as defined above, are executed one immediately following another and take approximately 7.5 seconds per sweep. A small pause at each end is possible and considered normal.

*External Initiate:* A 2.5 mm jack is provided for initiating a sweep from a remote device. Connect a simple push button, relay or momentary switch between the base and the tip of a suitable plug. A momentary pulse of 20ms will initiate a single sweep of the sweeper arm. A mating connector or cable is not provided. Contact Lafayette Instrument Co. for more information.

*Event Mark:* A 50ms active low signal is generated at the start of each sweep. Connection may be made through the same 2.5 mm jack used for an external initiate. Connect the base to ground, and the ring to an acceptable current limited pulled up input. (30 VDC max) Contact Lafayette Instrument for more information.

### Cleaning

The chamber and cover including all attachments (sweep arm carriage, sweeper arm, guide bar and support, feeder wall, food and water support) may be submerged in water and are cage washer safe.

Clean the drive mechanism, base and stand by hand with cloth moistened with water, mild soap solution, or disinfectant.

**NOTE:** DO NOT submerge or spray the drive mechanism with water or other cleaning solvents. Do not clean the drive mechanism or base in a cage washer.

## Polycarbonate Cleaning Instructions

The life of polycarbonate can be prolonged by following these Usage/Cleaning Instructions.

### Care

Contact between animal waste and cages should be kept to a minimum by using a sufficient quantity of an absorbent bedding material and replacing it with fresh material as often as possible. Residues left by adhesive tape or writing used for identifying cages can be removed with ethyl alcohol. Other solvents should not be used. Avoid using felt-tipped pens, as their solvents can damage plastic.

### Cleaning

Plastic spatulas are useful for removing bedding from a cage. Do not bang on cages; banging cages can weaken them. Wash cages with hot water and detergent (keep the pH of the washing solution between 4.5- 7.5). Soft water minimizes formation of whitish-grey film on cages that are washed frequently.

### Disinfection

First, check with the disinfectant manufacturer regarding safety of the product for polycarbonate cages. Many disinfectants have the potential to damage polycarbonate. Never heat cages wetted with disinfectant materials.

### Sterilization

All bedding must be removed from cages prior to thermal sterilization since heat can release potentially damaging substances from bedding material.

*Hot Air Treatment:* Polycarbonate cages are heat stable up to about 250°F. Do not exceed that temperature, and avoid hot air sterilization that permits development of localized hotspots in excess of 250°F.

*Steam Treatment:* Polycarbonate cages can be autoclaved at 245<sup>o</sup>-250°F. Do not stack cages in heights exceeding 30 inches. Effective steam sterilization depends upon proper temperature controls and an adequate steam supply. Alkaline corrosion inhibitors from boiler feed water may destroy plastic materials or dull the cage surface layer.

### Additional Autoclaving Polycarbonate Instructions

1. If cages are washed prior to autoclaving, it is important to be certain no detergent residue remains on the surfaces. The extreme heat and pressure of autoclaving can cause the residue to become "baked on" causing a loss of clarity/transparency.

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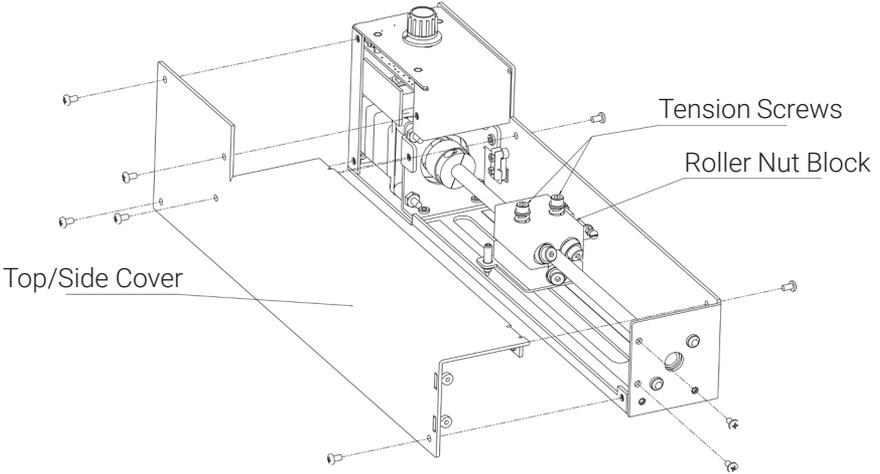
2. Use as short of a cycle as possible. Exposure of 15 minutes at 15-17psi and 250°F is recommended.
3. Do not stack cages in heights exceeding 30 inches.
4. Effective steam sterilization depends upon proper temperature controls and an adequate steam supply. Alkaline corrosion inhibitors from boiler feed water may destroy plastic materials or dull the cage surface layer

### Drive Assembly Cover Removal and Sweep Arm Force Adjustment

The sweep arm is set at the factory to slip when resisting force exceeds approximately 500 grams. This is set specifically for mice in order to avoid injury to the animal. However, higher forces may be needed to disturb the sleep of larger animals, e.g. rats. The sweep arm slip force may be increased or decreased by following this procedure. The drive assembly may remain mounted to the stands, the chamber may remain under the drive assembly, and the sweep arm may remain engaged to the drive assembly while cover removal and tension adjustments are made.

1. Operate the unit in continuous mode and test the sweep arm force by applying an opposing force by hand against the sweep arm until the drive slips and the sweep arm fails to move in the direction it was traveling. Check sweep arm force in both drive directions.
2. Remove the Top/Side cover from the drive assembly by removing 5 screws from the left side, 2 screws from the end, and 2 screws from the right side as shown below.
3. Sweep arm tension screws (2) are located on top of the roller nut block.
4. Turn both tension screws counter-clockwise to loosen screws which reduces sweep arm drive force. Loosen both screws until very loose but do not remove the screws. Operate the unit in continuous mode. If the screws are fully loose, the roller nut will fail to move and the sweep arm will not move in either direction. Stop the unit.
5. Finger tighten both tension screws equally by turning clockwise by hand about 1/2 turn. Operate the unit and apply an opposing force by hand against the sweep arm to test sweep arm force. Stop the unit.
6. Again tighten both tension screws equally by 1/2 turn and operate the unit to test the sweep arm force. Continue tightening both tension screws equally until the desired sweep arm force is achieved.
7. If the sweep arm force is higher than desired, loosen both tension screws equally until the desired force is achieved.
8. When desired sweep arm force is achieved, replace the Top/Side cover.

**NOTE:** Small adjustments in the tension screws result in large changes in sweep arm force. Typically the tension screws should never need to be tightened beyond finger tight. Do not increase the sweep arm force beyond the drive motor capability, which is indicated by severe vibration and buzzing sound.



## Sweep Arm Height Adjustment

The sweep bar is currently set 1/2 inch above the bare floor. For rats, it is recommended to raise the sweep bar as high as possible, which is about 3/4 inch above the floor. This can be achieved by loosening 2 screws securing the leg of the sweep-arm to the drive block. Raise the leg up about 1/4 inch and retighten the screws. The top of the sweep-arm leg should not touch the underside of the drive assembly throughout the full sweep.

# Terms and Conditions

## LIC Worldwide Headquarters

Toll-Free: (800) 428-7545 (USA only)  
Phone: (765) 423-1505  
Fax: (765) 423-4111  
sales@lafayetteinstrument.com  
export@lafayetteinstrument.com (Outside the USA)

## Mailing Address:

Lafayette Instrument Company  
PO Box 5729  
Lafayette, IN 47903, USA

## Lafayette Instrument Europe

Phone: +44 1509 817700  
Fax: +44 1509 817701  
Email: eusales@lafayetteinstrument.com

## Phone, Fax, Email or Mail-in Orders

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

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

## Domestic Terms

There is a \$50 minimum order. Open accounts can be extended to most recognized businesses. Net amount due 30 days from the date of shipment unless otherwise specified by us. Enclose payment with the order; charge with VISA, MasterCard, American Express, or pay COD. We must have a hard copy of your purchase order by mail, E-mail or fax. Students, individuals and private companies may call for a credit application.

## International Payment Information

There is a \$50 minimum order. Payment must be made in advance by: draft drawn on a major US bank; wire transfers to our account; charge with VISA, MasterCard, American Express, or confirmed irrevocable letter of credit. Proforma invoices will be provided upon request.

## Exports

If ordering instrumentation for use outside the USA, please specify the country of ultimate destination, as well as the power requirements (110V/60Hz or 220V/50Hz). Some model numbers for 220V/50Hz will have a \*C\* suffix.

## Quotations

Quotations are supplied upon request. Written quotations will include the price of goods, cost of shipping and handling, if requested, and estimated delivery time frame. Quotations are good for 30 days, unless otherwise noted. Following that time, prices are subject to change and will be re-quoted at your request.

## Cancellations

Orders for custom products, custom assemblies or instruments built to customer specifications will be subject to a cancellation penalty of 100%. Payment for up to 100% of the invoice value of custom products may be required in advance. Cancellation for a standard Lafayette Instrument manufactured product once the product has been shipped will normally be assessed a charge of 25% of the invoice value, plus shipping charges. Resell items, like custom products, will be subject to a cancellation penalty of 100%.

## Exchanges and Refunds

Please see the cancellation penalty as described above. No item may be returned without prior authorization of Lafayette Instrument Company and a Return Goods Authorization (RGA#) number which must be affixed to the shipping label of the returned goods. The merchandise should be packed well, insured for the full value and returned along with a cover letter explaining the reason for return. 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 Goods Authorization Number (RGA). When returning instrumentation for service, please call Lafayette Instrument to receive a RGA number. Your RGA number will be good for 30 days. Address the shipment to:

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

Shipments cannot be received at the PO Box. The items should be packed well, insured for full value, and returned along with a cover letter explaining the malfunction. An estimate of repair will be given prior to completion ONLY if requested in your enclosed cover letter. We must have a hard copy of your purchase order by mail or fax, or repair work cannot commence for non-warranty repairs.

## 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 call the Lafayette Instrument Customer Service Department for repair or replacement of the damaged merchandise.

## Limited Warranty

Lafayette Instrument Company warrants equipment manufactured by the company to be free of defects in material and workmanship for a period of one year from the date of shipment, except as provided hereinafter. The original manufacturer's warranty will be honored by Lafayette Instrument for items not manufactured by Lafayette Instrument Company, i.e. resell items. 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. In the case of instruments not of Lafayette Instrument Company manufacture, the original manufacturer's warranty applies.
2. 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.
3. This warranty does not cover damage to components due to improper installation by the customer.
4. Consumable and/or expendable items, including but not limited to electrodes, lights, batteries, fuses, O-rings, gaskets, and tubing, are excluded from warranty.
5. Failure by the customer to perform normal and reasonable maintenance on instruments will void warranty claims.
6. 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.

## Export License

The U.S. Department of Commerce requires an export license for any polygraph system shipment with an ULTIMATE destination other than: Australia, Japan, New Zealand or any NATO Member Countries. It is against U.S. law to ship a Polygraph system to any other country without an export license. If the ultimate destination is not one of the above listed countries, contact us for the required license application forms.