



LAMINAR FLOW HORIZONTAL FLOW BENCH (LF) OPERATION & MAINTENANCE MANUAL

ENVIRCO Technical Support: 800-884-0002

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Innovators in clean air technology

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Installation & Service Manual

■ WARNING

To reduce the risk of fire, electrical shock, or injury to persons, observe the following:

- Installation work and electrical wiring must be done by qualified person(s) in accordance with all applicable codes and standards, including fire-rated construction.
- When cutting or drilling into wall or ceiling, do not damage electrical wiring and other hidden utilities.
- If this unit is to be installed over a tub or shower, it must be marked as appropriate for the application.
- Use this unit only in the manner intended by the manufacturer. If you have any questions, please contact:

ENVIRCO CORPORATION

101 McNeill Road

Sanford, NC 27330

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- Before servicing or cleaning the unit, switch power off at service panel and lock out service panel to prevent power from being switched on accidentally.

■ INTRODUCTION

The LF Horizontal Laminar Flow Clean Bench is a completely self-contained, multipurpose, vibration-free clean bench that supplies a laminar flow pattern of HEPA filtered air. The clean bench provides a Class 100 (M 3.5) environment.

The unique design concept of the LF Horizontal Laminar Flow Clean Bench consists of separate plenum and table modules that virtually isolates all vibration transmission from the filter/blower console to the work surface.

Air enters the LF Horizontal Laminar Flow Clean Bench through a prefilter which removes most of the large particles. The air is then evenly distributed across the High Efficiency Particulate Air (HEPA) filter by blower. The HEPA filter removes 99.99% of all particles 0.3 microns and larger in size and imparts a unidirectional or laminar flow pattern to the air. The air moves through the work area at a uniform velocity of 90 feet per minute (+/-20%), carrying away all airborne contamination generated by activities within the work area. All samples or equipment within the work area are continually bathed in the ultra-clean air.

■ FEATURES

- Fulfills requirements of current Federal Standard 209.
- Washable polyurethane foam prefilter, easily removable for maintenance.
- “HEPA” final filter, 99.99% efficient on particulates 0.3 microns and larger. Designed to use a permanent non-hardening flexible compound sealant in conjunction with a neoprene gasket. Filters are easily accessible through the front of the cabinet.
- Quiet operation: 65 +/- 3 dbA operator’s station with a 48 dbA ambient.
- Virtually isolates all vibration transmission from the filter/blower console to the work surface.
- Dynamically balanced direct drive blower mounted on vibration dampened, shock absorbent rubber mounts with additional resilient cushion-faced mating surfaces.
- Continuous duty motor(s) with sealed-for-life bearings and built-in thermal overload protection.
- Solid state speed control provides for output of blower.
- Three prong grounded electrical plug for standard 115-volt receptacle.
- Blower and filter plenum is constructed of all welded construction, painted with a non-particulating white polyurethane paint. All seams are sealed.
- All units are factory tested for leaks, sound level, vibration, airflow, light level, and mechanical function.
- The “LF” is a horizontal flow workstation, designed for product protection only.
- The work surface is constructed of pressed wood laminated on all sides with a non-particulating, non-glare white Formica. (Stainless Steel is optional.)
- Adjustable leveling feet are located on the workbench.
- A duplex receptacle is provided on the face of the right hand work surface leg. The blower/motor and light switch are located on front of light canopy for easy access.

■ APPLICATIONS

The high-performance, two-piece LF Clean Bench has successfully demonstrated its versatility in a wide variety of applications and industries.

- Optical Assembly
- Microscopy Analysis
- Critical Sample Preparation
- Pharmaceutical Preparation
- Tissue Culture
- Microelectronic Fabrication and Assembly

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■ ASSEMBLY

1. The “LF” comes completely assembled in a single open framed crate. The unit is comprised of two components, the filter/blower console and the workstation.
2. Carefully remove top and four sides of the crate.
3. Remove the protective plastic covering from the unit.
4. Cut and carefully remove binding straps.
5. Remove wooden blocks holding unit in place.
6. Remove unit from shipping skid.
7. Remove prismatic light diffuser and light tubes (placed in a separate box) and insert on underside of light canopy after removing and cardboard packing.
8. Move the rear console unit into its permanent location.
9. Remove prefilter to expose the motor and blower.
10. Remove cardboard shipping blocks in blower* and replace the prefilter.
11. Slide the front workstation in against the rear console. Adjust leveling feet if necessary to maintain alignment of the two components.
12. Insert the male connector of cord on workstation into the female receptacle on the console.
13. Plug power cord into 115 VAC grounded receptacle.
14. Wipe interior surfaces of the work area with a mild disinfectant solution.
15. Turn on unit and let run for a few hours before using as a “Class 100” clean environment.

Note: If you encounter any problems or need technical assistance, please call 800.884.0002.

Unit is factory tested. On-site test and certification is recommended to assure proper operation.

CAUTION: FAILURE TO REMOVE THE CARDBOARD SHIPPING BLOCK MAY CAUSE DAMAGE TO THE BLOWER AND/OR MOTOR THAT IS NOT COVERED BY THE LIMITED WARRANTY.

■ SERVICE

IMPORTANT: DISCONNECT ELECTRICAL CORD BEFORE ATTEMPTING ANY SERVICE.

Fluorescent Lamp Replacement

1. Remove the prismatic diffuser set on the underside of the lamp canopy.
2. Replace the lamps
3. Reassemble by reversing the above procedure.

Fluorescent Fixture Ballast Replacement

Proceed as above, and then disassemble the fixture by removing the two screws, which hold the plate directly above the lamps. The ballast is then exposed and can be replaced by removing the wire nut connectors and the ballast mounting screws. Install new ballast in reverse order.

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Prefilter Replacement

This filter may be washed or vacuumed. If care is taken to keep the prefilter in good condition, long life may be achieved for the HEPA filter. Never operate the unit without a prefilter.

1. Lift the prefilter out.
2. Clean the prefilter.
3. Reinstall cleaned prefilter or install new prefilter.

HEPA Filter Replacement

Note: Extreme care must be taken when replacing a new filter so as not to puncture media. Filter should be handled by its sides at all times. The life of the HEPA filter depends on prefilter maintenance and the ambient conditions. If the prefilter is clean, the speed control is turned all the way up, and the air drops below 72 FPM, then the filter should be changed.

1. Disconnect the plug from console.
2. Remove the work bench assembly from the front of the console assembly.
3. Lift the perforated air diffuser up and out.
4. Remove the hardware and angle clips, holding the filter in place.
5. Remove the filter by pulling straight out.
6. Clean the sealant from the filter mounting frame.
7. Install new filter by reversing above procedure.

Blower Replacement

1. Disconnect power cord.
2. Lift the foam prefilter up and out.
3. Disconnect wires from motor.
4. Remove screws holding blower mounts to vibration isolators.
5. Remove blower from console.
6. Reassemble by reversing the above procedures.

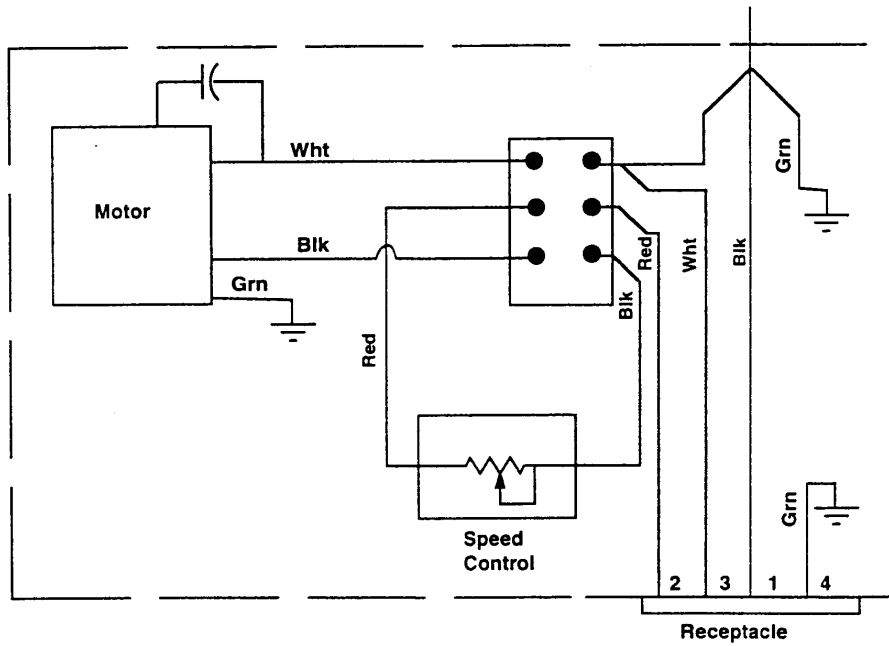
Rate of Flow Adjustment

1. Follow steps 1-2 under "Prefilter Replacement" to expose the speed control.
2. Adjust the speed control knob to obtain desired rate of flow. The solid state speed control is located in the utility box next to the blower.
3. Reassemble by reversing the above procedure.

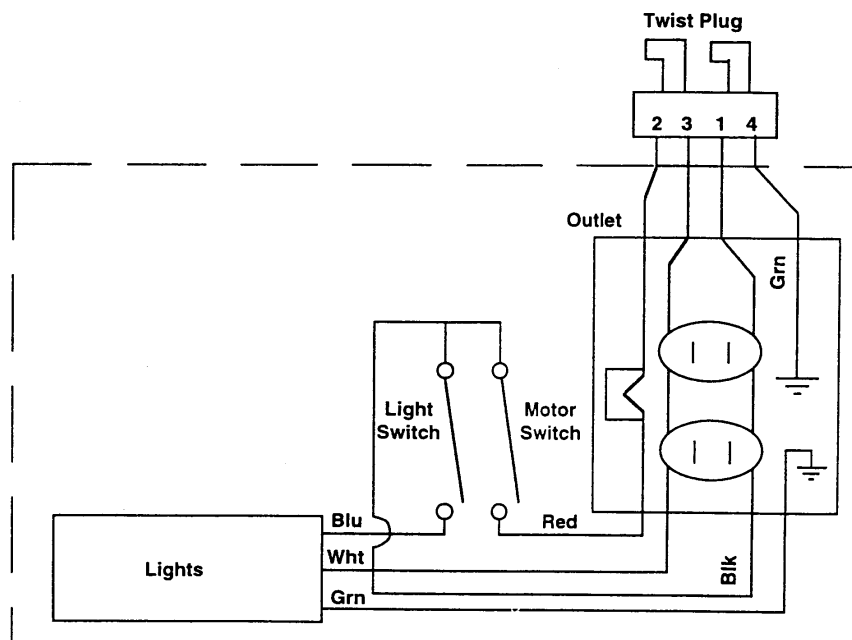
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■ WIRING DIAGRAMS

LF Console



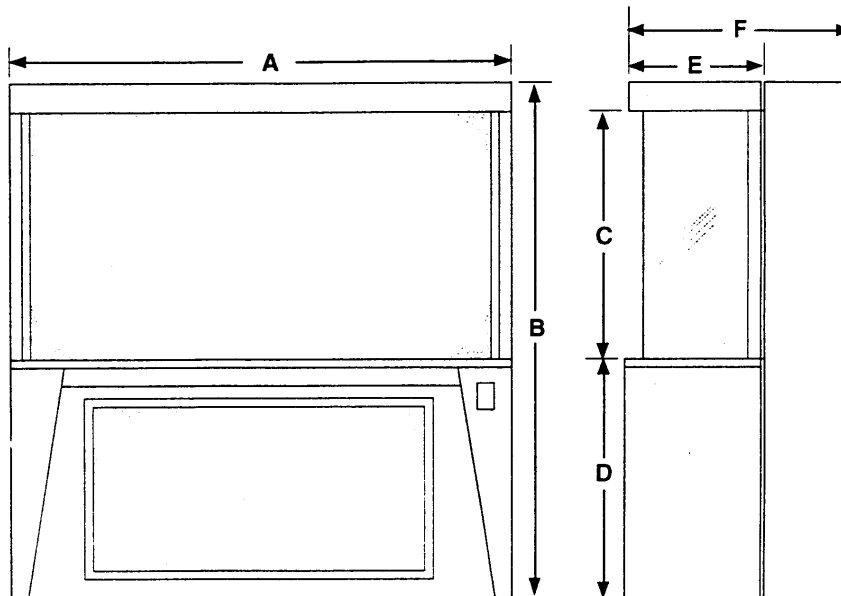
LF Table



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■ ENGINEERING DATA

Model No.	Dimension in Inches (cm)						Avg. CFM @ 90 FPM	BTU/Hr	Power Req'd Amps @ 115V	# of Motor/ Blowers 1/2 HP	Ship Wt. Lbs. (kg)
	A	B	C	D	E	F					
LF-430	51.00 (129.54)	65.00 (165.10)	30.00 (76.20)	30.00 (76.20)	24.00 (60.96)	44.00 (111.76)	900	3000	7.5	1	260 (117.93)
LF-530	63.00 (160.02)	65.00 (165.10)	30.00 (76.20)	30.00 (76.20)	24.00 (60.96)	44.00 (111.76)	1125	3000	7.5	1	280 (127.01)
LF-630	75.00 (190.50)	65.00 (165.10)	30.00 (76.20)	30.00 (76.20)	24.00 (60.96)	44.00 (111.76)	1350	3000	7.5	1	300 (136.17)
LF-830	102.00 (259.08)	65.00 (165.10)	30.00 (76.20)	30.00 (76.20)	24.00 (60.96)	44.00 (111.76)	1800	6000	15	2	315 (142.88)



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■ PARTS LIST

Model LF-430 (P/N 10552)

Item	Description	Qty/Unit	Part No.
A	Light Lens Package	1	33500
B	Control Panel	1	20230
C	Plexiglas Sides	2	33483
D	Diffuser Screen	1	33566
E	HEPA Filter (30x48x5 7/8)	1	69262-008
F	Work Surface	1	33477
G	Duplex Electrical Outlet	1	66750
H	Motor	1	61657
I	Power Cord	1	63042-008
J	Solid State Speed Control	1	63982-002
J*	Solid State Speed Control	1	S23132-15
K	Blower Supports (LH/RH)	2	61812/61813
L	Blower	1	62592
M	Vibration Isolators	4	62605
N	Capacitor	1	61485
O	Prefilter (24x33.75)	1	62981-003
P	Leveling Feet	4	60440
Q	Lamps (T12)	2	61918
Q	Lamps (T8)	2	63849-002
R	Motor/Blower Assy	1	S23091

Model LF-530 (P/N 10553)

Item	Description	Qty/Unit	Part No.
A	Light Lens Package	1	33501
B	Control Panel	1	20230
C	Plexiglas Sides	2	33483
D	Diffuser Screen	1	33567
E	HEPA Filter (30x60x5 7/8)	1	69262-007
F	Work Surface	1	33478
G	Duplex Electrical Outlet	1	66750
H	Motor	1	61657
I	Power Cord	1	63042-008
J	Solid State Speed Control	1	63982-002
J*	Solid State Speed Control	1	S23132-15
K	Blower Supports (LH/RH)	2	61812/61813
L	Blower	1	62592
M	Vibration Isolators	4	62605
N	Capacitor	1	61485
O	Prefilter (24x33.75)	1	62981-003
P	Leveling Feet	4	60440
Q	Lamps (T12)	2	61918
Q	Lamps (T8)	2	63849-002
R	Motor/Blower Assy	1	S23091

* Units built before 06/05

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Model LF-630 (P/N 10554)

Item	Description	Qty/Unit	Part No.
A	Light Lens Package	1	33502
B	Control Panel	1	20230
C	Plexiglas Sides	2	33483
D	Diffuser Screen	1	33568
E	HEPA Filter (30x72x5 7/8)	1	69262-006
F	Work Surface	1	33479
G	Duplex Electrical Outlet	1	66750
H	Motor	1	61657
I	Power Cord	1	63042-008
J	Solid State Speed Control	1	63982-002
J*	Solid State Speed Control	1	S23132-15
K	Blower Supports (LH/RH)	2	61812/61813
L	Blower	1	62592
M	Vibration Isolators	4	62605
N	Capacitor	1	61485
O	Prefilter (24x47.75)	1	62981-019
P	Leveling Feet	4	60440
Q	Lamps (T12)	2	61918
Q	Lamps (T8)	2	63849-002
R	Motor/Blower Assy	1	S23091

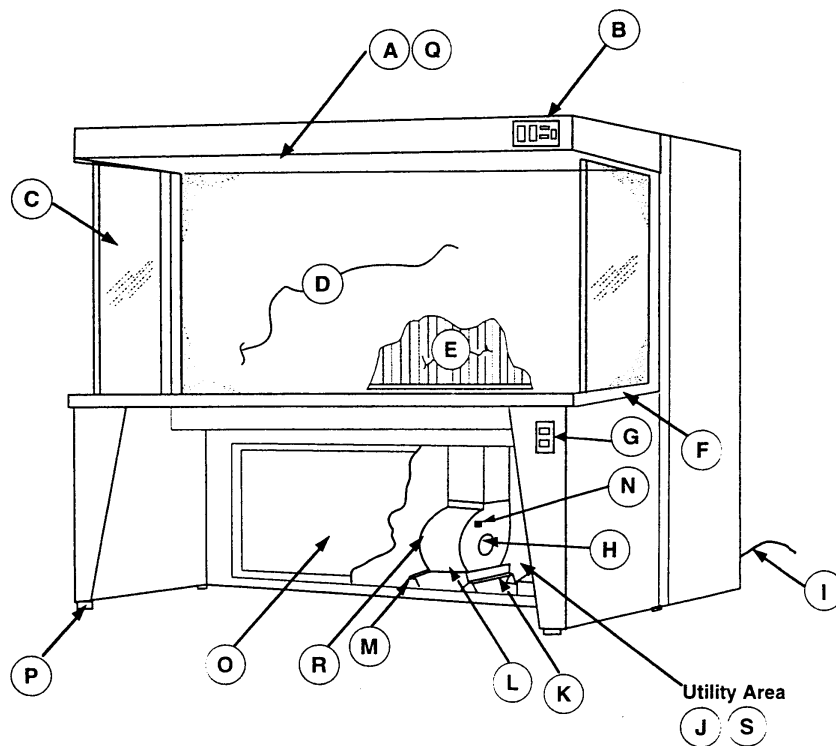
Model LF-830 (P/N 10555)

Item	Description	Qty/Unit	Part No.
A	Light Lens Package	1	33503
B	Control Panel	1	20230
C	Plexiglas Sides	2	33483
D	Diffuser Screen	1	33569
E	HEPA Filter (30x48x5 7/8)	1	69262-008
F	Work Surface	1	33480
G	Duplex Electrical Outlet	1	66750
H	Motor	1	61657
I	Power Cord	1	63042-009
J	Solid State Speed Control	1	24201-002
J*	Solid State Speed Control	1	23132-25
K	Blower Supports (LH/RH)	2	61812/61813
L	Blower	1	62592
M	Vibration Isolators	4	62605
N	Capacitor	1	61485
O	Prefilter (24x33.75)	1	62981-003
P	Leveling Feet	4	60440
Q	Lamps (T12)	2	61918
Q	Lamps (T8)	2	63849-002
R	Motor/Blower Assy	1	S23091

* Units built before 06/05

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■ PARTS LOCATION



■ LIMITED WARRANTY

ENVIRCO CORPORATION warrants all equipment manufactured by it and bearing its name, will be free from defects in materials and workmanship normal use. ENVIRCO's obligation under this warranty is to repair or replace any parts, which are defective for a period of one year after invoice date, provided that ENVIRCO receives written notice of such defect. For a period of 90 days after invoice date, ENVIRCO may effect such repairs or replacement, via ENVIRCO Service Personnel, at the equipment's installation site provided that the equipment is located in the continental United States and that ENVIRCO receives written notice of such defect. In all other cases, Buyer agrees to assume any incidental expenses, including, but not limited to, the cost of transporting the defective equipment to ENVIRCO's repair facilities. It is expressly agreed and understood that repair or replacement of defective parts is Buyer's exclusive remedy under this warranty and that incidental and consequential damages may not be recovered. Excluded from this warranty are certain expendable items such as light tubes, filters, etc., as well as damage due to abuse or accident. **Except for this warranty, ENVIRCO makes no warranty, express or implied, including but not limited to, the Warranty of Merchantability, or the Warranty of Fitness for a Particular Purpose.** ENVIRCO is not responsible for any warranties made by another manufacturer.

Clean air solutions built for you.

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- » MAC 10[®] IQ™ LAF
- » MAC 10[®] LEAC™
- » MAC 10[®] LEAC2™
- » MAC 10[®] LEDC™
- » Ducted Ceiling Module:
DCM & RSR
- » AC or DC Control Systems
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Hospital & Healthcare

- » IsoClean[®] and IsoClean
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- » AirCeil[®]
- » Hospi-Gard[®] Room
Pressure Monitor

Enviramedic Products

- » HOR Horizontal Flow
Enclosure
- » HCF Horizontal Flow
Surgery Room
- » VOR Vertical Flow Surgery
Isolator

Pharmaceutical

Pharmaceutical & Medical Device

- » Unimodule M2 Vertical
Laminar Flow Workstation
- » METD 100% Exhausted
Vertical Flow Workstation
- » Laminar Downflow Module

Laboratory & Research

Laboratory & Research

- » 100-Plus Horizontal or
Vertical Flow Clean Bench
- » Unidirectional Flow
Horizontal Flow Bench (LF)
- » TT Table Top Horizontal
Flow Clean Bench
- » EnviraLab Sterility Module:
ESM

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