



**BIOCLIMATIC**

**MODEL MC-880 SYSTEM**

**INSTALLATION, OPERATION**

**&**

**MAINTENANCE**

**MANUAL**

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# BIOCLIMATIC

## MICRO/CLIMATIC MODEL MC-880 SYSTEM

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### APPENDIX

## 1 INTRODUCTION

### 1.1 Disclaimer

These instructions are provided under the following conditions:

- 1.1.1 This manual is to guide the user of Bioclimatic equipment in the proper installation, operation and maintenance procedures to insure maximum equipment life with efficient operation.
- 1.1.2 The customer has assigned competent maintenance and operating personnel to the system described herein and will assume operational and maintenance responsibility upon start-up of the system.
- 1.1.3 The customer will read and thoroughly examine the foregoing instructions and will notify the seller of any points not fully understood, points of conflict or error.
- 1.1.4 The customer, in lieu of any notification to the contrary, has read and fully understands the operation of the System and is aware of the hazards of corrosion, abrasion and fire or explosion and shall take the necessary steps in the operation of equipment to control such hazards to the maximum extent possible.
- 1.1.5 Start-up assistance or field engineering service provided by Bioclimatic, or its authorized representative, shall in no way relieve the customer of responsibility for the proper operation of the System.

**IMPORTANT: Any modifications to the unit by unauthorized personnel will void ETL listing and factory warranty. The unit must be installed in accordance with the manufacturer's instructions to preserve warranty and ETL label.**

**The manufacture of this equipment reserves the right to make modifications, revisions, or changes to it without notification or documentation updates.**

### 1.2 Receiving

Products leaving the Bioclimatic factory are inspected and in satisfactory operating condition. All equipment should be thoroughly inspected when received. Although all units are appropriately packaged, rough handling in transit can cause breakage. Any shortage or damage should be reported at once to the transportation company. Note the damage on the bill of lading before signing for shipment. **No equipment may be returned to Bioclimatic without written authorization.**

After receiving the MC-880, remove the carton and place the unit in its operating location. Remove the access panel and remove the ionization tubes and filters. Inspect all parts for

damage. If any parts are damaged, contact the shipping company immediately to file a claim for damaged equipment. Note the damage on the bill of lading before signing for the shipment. **All products are shipped F.O.B. Bioclimatic warehouse. Responsibility for all equipment passes to the Buyer at the time equipment is loaded onto the carrier's truck.**

### 1.3 Handling

Handle equipment with care when removing external packaging or moving equipment to prevent damage to special paints and surface coating. A small chip in the paint or coating will break the continuity of the surface treatment and destroy its protective value. Always touch-up scratched surfaces prior to installation and start-up.

### 1.4 Storage

When storing equipment, care must be taken to protect bearings, shafts, electrical connections, leads and finished surfaces from moisture, and contamination. Do not store unit outdoors. Do not store any other material on top of equipment. Periodic inspections of the equipment should be made until it is ready to be put into service. Remove all filters from equipment when storing.

**NOTE: If equipment is not installed upon delivery, it must be stored in a weather protected area.**

### 1.5 Warranty

THE SELLER WARRANTS THE EQUIPMENT AGAINST DEFECTIVE WORKMANSHIP AND MATERIAL FOR ONE (1) YEAR FROM DATE OF FACTORY SHIPMENT OR 15 MONTHS FROM COMMISSIONING, WHICHEVER OCCURS FIRST. IN THE FULFILLMENT OF ITS WARRANTY, THE SOLE OBLIGATION OF SELLER SHALL BE TO REPAIR OR REPLACE, AT ITS OPTION, F.O.B. ITS FACTORY, ANY PART OR PARTS WHICH ARE RETURNED F.O.B. ITS FACTORY, SHIPPING CHARGES PREPAID, AND WHICH AFTER INSPECTION BY SELLER ARE FOUND TO BE DEFECTIVE. BUYER SHALL NOTIFY SELLER OF DEFECT IN WRITING, PROMPTLY UPON DISCOVERY AND WITHIN THE WARRANTY PERIOD. THIS WARRANTY DOES NOT COVER DEFECTS CAUSED BY CORROSION OR NORMAL DETERIORATION; IT DOES NOT EXTEND TO CONSEQUENTIAL DAMAGE, LOSS OR DELAY ASSOCIATED WITH A WARRANTY DEFECT; AND IT DOES NOT COVER ANY COST OF LABOR, TRAVEL, OR OTHER EXPENSE ASSOCIATED WITH THE REPAIR OR REPLACEMENT OF DEFECTIVE PARTS. SELLER ASSUMES NO LIABILITY FOR PRODUCT LOSS OR OTHER CLAIMS WHATSOEVER ARISING OUT OF THE USE OR APPLICATION OF THE EQUIPMENT IN ANY OPERATIONS, WHETHER THE MACHINE IS USED ALONE OR IN CONJOINT USE WITH OTHER EQUIPMENT OR PROCESSES. NOTWITHSTANDING THE FOREGOING, SELLER'S WARRANTY OBLIGATIONS WITH RESPECT TO ANY ITEMS NOT MANUFACTURED BY SELLER SHALL NOT EXCEED THE OBLIGATIONS UNDERTAKEN BY THE

MANUFACTURER THEREOF UNDER EXPRESS WARRANTY TO THE SELLER. THIS EXPRESS WARRANTY IS IN LIEU OF ALL OTHER WARRANTIES OF FITNESS OF THE MACHINE FOR ANY PARTICULAR PURPOSE.

THERE ARE NO OTHER REPRESENTATIONS, WARRANTY OF CONDITION IN ANY RESPECTS EITHER EXPRESS OR IMPLIED, STATUTORY OR OTHERWISE IN CONTRACT OR TORT, OTHER THAN WHAT IS STATED ABOVE.

THE SELLER SHALL NOT BE HELD LIABLE IN ANY WAY FOR CONSEQUENTIAL DAMAGES, HOWEVER CAUSED.

THIS WARRANTY WILL NOT APPLY IF THE SELLER'S EQUIPMENT HAS BEEN DAMAGED DUE TO IMPROPER INSTALLATION, ALTERATION, ABUSE OR MISUSE, ACCIDENT, FIRE, FLOOD OR ACT OF GOD. FURTHER, THIS WARRANTY WILL NOT APPLY IF REPAIRS, REPLACEMENTS, OR ALTERATIONS ARE MADE BY OTHERS WITHOUT THE SELLER'S PRIOR WRITTEN AUTHORIZATION.

IN THE EVENT THE STATE IN WHICH THE EQUIPMENT IS INSTALLED DOES NOT PERMIT THE LIMITATION OR EXCLUSION OF IMPLIED WARRANTIES OR CONDITIONS UNDER GIVEN CIRCUMSTANCES, THE PROVISIONS OF THIS WRITTEN WARRANTY ARE IN ADDITION TO AND NOT A MODIFICATION OF THE STATUTORY WARRANTIES AND OTHER RIGHTS AND REMEDIES PROVIDED BY SUCH LAWS.

**NOTE:**

“ANY MODIFICATION TO ORIGINAL EQUIPMENT BY ANY COMPANY OR PERSON OTHER THAN THE MANUFACTURER WILL SERVE TO CANCEL AND VOID ALL OF THE SELLER'S LIABILITY UNDER THE MANUFACTURER'S WARRANTY. ENCLOSURES CONTAINING ELECTRONIC COMPONENTS ARE NORMALLY SEALED BY THE MANUFACTURER TO PREVENT UNAUTHORIZED TAMPERING OR ADJUSTMENTS. ONLY AUTHORIZED SERVICE PROVIDES MAY BREAK SEALS TO COMPLETE CALIBRATION OR TO TROUBLE SHOOT THE UNIT. UNAUTHORIZED TAMPERING OR BREAKING SEALS WILL RELEASE THE SELLER FROM ANY FUTURE LIABILITY UNDER THE WARRANTY”

## 2 INSTALLATION

### 2.1 Unit Location

Select a location for the unit that best suits the application. Odor control and unit efficiency can be significantly affected if the unit is located improperly. When in position, the unit is designed to draw contaminated air from one direction, and discharge purified air in three directions from the adjustable curved blade diffusers located on the supply side. Clean air is thrown about 20 feet in a conical pattern along the ceiling in order to provide thorough mixing with room air, while also preventing uncomfortable drafts on occupants within the room. The adjustable curved diffuser blades may be opened or closed to create the desired circulation patterns.

The units' effectiveness will be determined by the ability of the established air pattern to "push" or "blow" the polluted air. Contrary to popular belief, the suction or pulling power of any system is limited to a small area near the units' intake. The "blow", however, is effective up to 30 times further away from the machine than is the suction.

When selecting a location for the MC-880, it should be located such that air currents are established which displaces the pollute air from the source back to the intake on the MC-880, it is not necessary to install the unit directly above the pollution source. Because of the push-suction capability, it is always important to position the unit such that it is offset in the room with the intake grille positioned toward the nearest wall. The 3 way supply grille should then be aligned so that air is directed at the farthest point in the room.

While the noise level generated by the MC-880 is acceptable for most general office and commercial applications, it is not advisable to place the unit directly over a work station when ceiling heights are 9 ft. or less. The measured noise level at 1 meter below and 1 meter to the side with a 95% HEPA and 30% prefilter is 48 dBa. Operation on low speed will result in a noise reduction of 8-10 dBa compared with operation on high speed. This noise level is suitable for most quiet office areas and conference rooms. For additional noise data, refer to Bulletin 150/030.

When installing multiple units, divide the room (with imaginary lines) into equal parts and locate the MC-880 units to establish the desired circulation patterns. Locate the MC-880 such that its air supply grille is at least 12 ft. from a building supply or return air grille/diffuser. i.e. a 12 ft. radius, 180 degrees arc on the supply side of the MC-880.

### 2.2 Unit Installation (Figure 1)

The MC-880 is designed to flush mount within the standard drop ceiling T-bar grid system commonly found in most commercial buildings. The unit should be mounted as follows:

- 2.2.1 Four mounting plates (with holes) are attached to the upper portion of the long sides. Remove the two outside screws and loosen the center screw on the mounting plates. Pivot the mounting plate into a vertical position so the hole is exposed. Install two screws and tighten the center screw.

**NOTE: Do not support the MC-880 by any other means except the four mounting plates provided. Do not make any penetrations into the MC-880 cabinet. Alterations to the MC-880 housing may affect System performance.**

- 2.2.2 Heavy duty wire (60 lbs. rating) or electrician's chain should be used to support the unit by securing the upper end to a roof support joist or beam, capable of supporting a minimum load equal to two (2) times the weight of the completely loaded unit. In this manner, the weight of the unit is not placed directly on the ceiling grid supports. Four turn buckles may also be used if desired to obtain precise vertical adjustment and level.
- 2.2.3 In order to reduce noise and vibration, the MC-880 should be isolated from the ceiling system by installing 1/4 in. W x 1/16 in. thick PVC stripping (supplied with the unit) on the horizontal and vertical sections of the T-bar. Continuous coverage on the T-bar is recommended to prevent metal to metal contact.

**NOTE: Consult with local building authorities to insure compliance with local building code ordinances.**

## 2.3 Electrical Connections

### 2.3.1 Unit Power (Figure 2, 3)

Power input is 115 volt, 1 phase, 60 Hz (230 volt, 1 phase, 50/60 Hz). One circuit breaker on the right side of the unit (when facing the end with the discharge grille) controls the blower and ionization settings. The lamp indicates operation of the bi-polar ionization unit. High and low settings will adjust both blower speed and ionization levels simultaneously. Adjust the blower setting (high or low) depending on the room size, amount of contamination and noise criteria. For units designed for 220/240 volts, 1 phase, 50/60 Hz; the high-low setting will adjust only ionization levels. The blower for 220/240 volt systems operates at one speed only.

Power is provided to the unit by means of a three prong power cord connected to any standard 115 volt electrical outlet.

### 2.3.2 Remote Control Connection (Optional)

Refer to the appendix for the schematic MC-880 Full Function Remote Control and complete all connections between remote control from TB-3. Use 22÷20 AWG stranded copper wire. Electrical codes must be followed for installing this cable.

2.3.2.1 Place System master switch (circuit breaker) to the "Off" position. This switch is located on the side of the MC-880 unit.

2.3.2.2 Connect 115 volt(220/240), single phase service lines to terminals 1,2 and 3 on TB-1. These are line, ground and neutral respectively.

2.3.2.3 Double check that wire #9 on remote control, is grounded to the 2-gang electrical box and also to the aluminum face plate.

## 2.4 Filter Installation

When installing filters, refer to the filter label located on the unit. This label itemizes all filters in the unit and their arrangement.

**NOTE: Make sure that airflow arrow on each filter points in the direction of airflow through the unit.**

**NOTE: Unit should not be operated without filters in place because the lack of adequate static pressure will cause the motor to draw too much current and consequently burn out.**

### 2.4.1 Prefilters

2.4.1.1 Loosen the four thumbscrews on the return (intake) grille (two on each side) and remove the entire intake assembly. On the backside, you will find a three position filter rack with various combinations of prefilters and a metal tray (chemical filter).

2.4.1.2 Remove the wing nuts that hold the filter retainer in place

2.4.1.3 Slide the filter(s) into their respective track(s).

2.4.1.4 Move the filter retainer back into operating position and replace the wing nuts.

2.4.1.5 Replace the return (intake) grille and tighten the four thumbscrews.

### 2.4.2 Primary Filter

Primary Filter installation is accomplished through the supply or discharge (adjustable louvered) grille as follows:

- 2.4.2.1 The discharge grille is held in place with four thumbscrews and must always be installed such that center row of diffuser blades points away from the return grille. This will prevent short cycling of air. Remove the discharge grille.
- 2.4.2.2 The Primary Filter tracking can be removed by loosening the four wing nuts holding the two angles in place.
- 2.4.2.3 Slide the filter into its track.
- 2.4.2.4 Move the two angles back into operating position and replace the wing nuts.
- 2.4.2.5 Replace the supply (discharge) grille and tighten the four thumbscrews.

**CAUTION! Whenever handling the primary filter, be careful to hold it by the frame. Prevent any sharp objects or fingers from coming into contact with the media pack as it is fragile and can be damaged easily.**

#### 2.4.3 Chemical Media Tray

The chemical tray is installed in the same way as the prefilters. The life of the chemical is dependent on the type of chemicals present and their concentration. It is recommended that a spare tray be kept on hand, and that experience with a media be reported to your representative. Bioclimatic can analyze spent media and often improve life expectancy through use of special blends of chemicals for certain severe applications.

#### 2.4.4 Ionization Tube Installation

- 2.4.4.1 Screw tube(s) into socket by holding the leaf spring clear of tube surface.
- 2.4.4.2 Turn tube into socket by the polycarbonate base.
- 2.4.4.3 After tube contacts base, tighten an additional 1/8 to 1/4 turn. Do not use hand tools to tighten tubes, as they will damage the glass tubes.
- 2.4.4.4 Ensure leaf spring is in contact with outer mesh.
- 2.4.4.5 Replace access panel.

**NOTE: The ionization tubes are fragile - Handle With Care.**

### 3 PHYSICAL DESCRIPTION

#### 3.1 Principle of Operation

The MC-880 System is designed for filtration of environmental air so as to control particulate and gaseous contaminants for new or retrofit HVAC applications. Please

refer to the filter arrangement drawings for proper filter orientation. The filter stage designation refers to the installation sequence in the direction of airflow.

### 3.2 Remote Control (Optional)

These are the options which are available to the basic MC-880 Micro/Climatic Purification System:

- Full Function Remote Control Option (24 VDC)  
(MC-8847A, Recessed Wall Mount)
- Multiple Remote Control
- Building Management System Control (BMSC)

#### 3.2.1 Full Function Remote Control (Figure 4)

This option permits full operational control and status monitoring of the MC-880 from any remote location. Included are the following functions:

##### *Control Functions*

- On/off control of System power (Selector switch “Local-BMS” on “Local” position)
- High/Low motor speed selection
- High/Low ionization level selection
- Filter alarm test
- Generator alarm test

##### *Visual Indicators*

- Prefilter static pressure
- Final Filter static pressure
- Motor/Ionization System High
- Motor/Ionization System Low
- Local/BMS Control
- Ion generator fault (alarm)

All of the operating controls and visual status indicators are arranged in a functional grouping on a 4" x 4" aluminum plate. The plate is mounted to a standard two gang recessed electrical box using a tile ring adapter and connected using wires 20-22 AWG to TB3 PCB 31036 in MC-880 control center box.

#### 3.2.2 Multiple Remote Control

This option permits simultaneous operational control of multiple units, ranging from two to five, from any remote location.

Full function remote control is connected to the unit named “Master”. (Figure 6)

Control Functions:

- “On/Off” control of system power (Selector switch “Local-BMS” for Master unit on “Local” position, for other unit(s) – on “BMS” position).
- High/Low motor speed selection
- High/Low ionization level selection
- Filter alarm test (for master unit)
- Generator alarm test (for master unit)

Visual Indicators:

Visual indicators for Master unit are located on the FF Remote control panel.

The Master unit “Prefilter” and “Final Filter” lights are used also as an indication to determine the filter service for the rest of the units.

3.2.3 Building Management System Control (BMSC) (Figure 7)

This option also provides full operation control and filter and ionization alarm observation from any location with one or multiple units.

The functions and indicators for the BMSC are the same as instructed previously for simple and multiple units with FF Remote Control.

3.3 Filter Change Indicator (Lights)

As the MC-880 operates, it collects and retains particles from the air such as dust, pollen and smoke. Over a period of time, filters installed in the MC-880 (particularly the first and second stage filters) become contaminated. As they do, the static pressure increases across the filters in proportion to the amount of dirt collected and air flow becomes restricted. Eventually, unless filters are replaced, air flow through the System will drop below acceptable efficiency levels.

Each MC-880 has two pressure control switches mounted inside the of the air handling unit. These devices sense static pressure across both filter sections. They are individually adjusted at the factory to operate when differential pressure across respective filters drops below a minimum preset threshold. Two visual indicators (Red LED) on the front louvered panel of the MC-880 respond independently to the pressure switches in the MC-880. When either of these filter alarm indicators comes "on", its time to change the corresponding filter.

3.4 Prefilter/Media Postfilter

Prefilters are 1 in. or 2 in. deep, disposable type, using preformed pleated or 3-ply panel design. Filters have a rated average efficiency of not less than 30% by

ASHRAE Standard 52.2 test method, using atmospheric dust. Filters are listed Class 2 by Underwriters' Laboratories.

### 3.5 Primary Filter

There are different types of primary particulate filters available in different efficiency ratings. The available space in the filter section along with the desired efficiency will determine the filter type.

<u>Filter Type</u>	<u>Efficiency</u>
4 in. DOP/HEPA type	95%
4 in. HEPA	99.97%
4 in. ASHRAE DS	60%, 90%
6 in. ASHRAE DS	90%

### 3.6 Bi-Polar Ionization

The Bi-polar ionization unit consists of a power generator, ionization tubes and power regulator.

The power generator takes the electric power and converts it to the proper state for use in the ionization tubes. Externally, the power generator includes ionization tube sockets, spring contacts, and indicator green LED.

The ionization tube consists of two electrodes, a glass tube and a plastic base with a male threaded connector. The external electrode is shrunk fit over the glass tube and under no circumstances should it be removed from the tube. The glass tubing material is fragile and should be handled with care. Cracked or damaged glass will cause a system malfunction and require tube replacement.

The power regulator provides control of the output of the ionization tubes. This unit can be operated in either high or low mode.

**NOTE: Ozone is a by-product of any ionization process. When installed and operated in accordance with manufacturers instructions, the Bioclimatic System will not generate ozone in excess of the safety standards specified by OSHA and FDA. In most cases, there will not be chemically detectable levels of ozone generated.**

## 4 SYSTEM START-UP

### 4.1 General

Before starting the System, a complete inspection should be made to ensure that all the equipment is installed for safe and proper operation. It is particularly important

that the system is free of all foreign objects. Be sure that the access panel is securely attached.

4.2 Inspection Check List

FILTERS		PANELS	
Complete filter installation	_____	Insulation intact	_____
Surface continuity between adjacent Filters and seal surfaces.	_____	Fasteners secure	_____
Wipe entire section clean	_____	Gaskets intact	_____

BI-POLAR IONIZATION

Check system fuse	_____	Inspect tubes for damage	_____
Holder for the presence of The properly rated fuse.		All tubes properly installed	_____

4.3 Electrical Connection and Power Up

Provide electrical connection to the system. All external wiring must be in accordance with National and Local Electrical Codes. Pay particular attention to proper grounding of the system. After checking that all filters are in place, input electrical power is correct, and all electrical connections are as per the National and Local codes, energize the unit. The current being supplied to the unit should be checked after powering up the unit. It should not exceed the full load amperage.

5 OPERATION & MAINTENANCE OF UNIT

5.1 General

The initial set of particulate filters is included and shipped with the unit. The power to the unit can be controlled using the power master switch (circuit breaker) on the right side of the unit. When the power switch is “On”, the unit is ready to operate using:

- a) “Hi/Off/Lo” control switch on the top side of the generator (basic or standard MC-880) (Figure 5), or
- b) “Set” pushbutton on the remote control panel (Full Function MC-880) (Figure 4),  
or
- c) Multiple Remote Control
- d) Building Management System Control (BMSC) (Full Function MC-880) -

To energize the fan-motor, and ionization generator of the unit. The user should determine the best mode of operation for any individual application.

5.2 Standard Control

- 5.2.1 Turn master switch on MC-880 "ON". This is a thermal reset switch providing overload protection to the motor and power to the rest of the System.
- 5.2.2 Turn control switch on the generator to "Hi" or "Low" position. This will cause the motor speed and ionization generator to alternately switch from high to low, or low to high status.
- 5.2.3 Observe visual Green LED indicator on the top of the generator confirm the operational status.

5.3 Remote Control (Optional)

- 5.3.1 Turn master switch on MC-880 "ON". (Selector switch "Local-BMS" on "Local" position)
- 5.3.2 Push button "Set" first time – "High", "Local", "Fan" and "Ion" lights will be "ON". Unit will be ON (High – motor speed/ionization level). Push button "Set" second time – "Low", "Local", "Fan", and "Ion" Lights will be ON. Unit will be ON (Low – motor speed/ionization level). Push button "Set" third time – No lights. Unit OFF.
- 5.3.3 Push, momentarily, each of the three buttons marked "Test" (when unit is ON). This will cause the visual indicators marked "Alarm", "Prefilter and "Final Filter" to briefly illuminate. This test will confirm that the three systems are armed and that three visual fault indicators are functioning normally.

5.4 Multiple Remote Control (Optional)

The following must be done before the units are started:

- interconnect wiring between Remote Control and Master unit, between units
- SW8 (Master unit) on PCB 31036(C) - on "Local" position
- SW8 (units: 1-4) on PCB 31036(C) - on "BMS" position
- connect power (all units) to TB1 on PCB 31036(C)
- turn ON circuit breakers.

To start units – follow 5.3.2.

5.5 Building Management System Control (BMSC) (Optional)

The following must be done before the unit(s) are started:

For single unit:

- interconnect wiring between remote control panel and unit.
- SW8 on PCB 31036(C) - on "BMS" position

- connect power to TB1 on PCB 31036(C)
- turn ON circuit breaker.

For multiple units:

- interconnect wiring between remote control and master unit, between master unit and other units.
- SW8 (all units) on PCB 31036(C) - on “BMS” position
- connect power (all units) to TB1 on PCB 31036(C)
- turn ON circuit breakers.

To start unit(s) – follow 5.3.2.

## 5.6 Filter Change Light Adjustment

**CAUTION: Disconnect all power before opening doors for service or maintenance. Observe routine safety precautions when servicing unit.**

The fibrous filters and optional gas phase filtration section require periodic maintenance in order to ensure satisfactory system performance over an extended period. The filter change light indicates the need to replace fibrous filters. The differential pressure switch which activates the filter change light is preset at the factory to light when a static pressure increase of approximately 1 in. WC (249 Pa) occurs.

It is possible to calibrate the static pressure differential which illuminates the filter change light as follows:

- 5.6.1 Remove the hole plug in the top of the unit for access to the adjustment screw.
- 5.6.2 With clean filters, turn the unit on cover approximately 67% of the return grille with cardboard. The light should come on.
- 5.6.3 For more time between filter changes (less air flow), cover more of the opening and for less time between changes (more air flow), cover less of the opening.
- 5.6.4 With a standard screwdriver, turn the adjustment screw clockwise until the light goes off, or counterclockwise until the light comes on.

## 5.7 Filter Maintenance

### 5.7.1 Fibrous Filters

When the filter change light illuminates, it is time to replace the fibrous filters. It is important to use high quality filters with the same specifications as those provided with the unit. The filter label affixed on the inside of the access door lists the part number of the filters supplied with the unit. Refer to

the specifications for optional features for the specifications of the proper replacement filters for your unit.

### 5.7.2 Ionization Tubes

The ionization tubes must be washed on a periodic basis to ensure operating efficiency. At minimum, they should be washed any time that the primary filter is serviced, but not longer than one year. The tubes can be washed using the following procedure:

**IMPORTANT: Make sure all power to the unit is disconnected before performing this or any maintenance procedure.**

5.7.2.1 Remove the tubes from the unit by lifting the leaf spring from the surface of the tube and unscrew each tube. Hold tube by its plastic base while removing.

5.7.2.2 A solution of warm water and non-abrasive detergent can be used to clean the tubes.

5.7.2.3 A soft nylon brush may be used to remove embedded material within the external electrode.

**NOTE: Do not attempt to remove the tube's outer electrode.**

5.7.2.4 Rinse with clean water after washing.

5.7.2.5 Replace ionization tubes only after they are completely dry. Pay special attention to removing moisture from the polycarbonate base.

5.7.2.6 Screw tube into socket by holding the leaf spring clear of tube surface. Turn tube into socket by the plastic base. After tube contacts base, tighten an additional 1/8 to 1/4 turn.

**NOTE: Do not use hand tools to tighten tubes, as they will damage the glass tubes.**

5.7.2.7 Make sure that the leaf spring is in contact with tube surface.

**REMEMBER: The tubes are fragile - Handle With Care.**

### 5.7.3 Laboratory Service (Gas Filtration Media Life Analysis)

Laboratory Service is a support system offered to our customers, free of charge. This service will ensure timely media change out for cost effective and efficient system operation.

Media sampling procedure:

- 5.7.3.1 Remove module from filter bank. (Tag module as "Test" module). Empty contents of module into a box.
- 5.7.3.2 Take four separate one cup samples from different areas of box.
- 5.7.3.3 Place samples of media into a clean container.
- 5.7.3.4 Mix contents thoroughly.
- 5.7.3.5 Fill a plastic lined sample bag from the prepared media sample. Label bag. Refill and reinstall module. Obtain sample bags from Bioclimatic.
- 5.7.3.6 Enter the date on the media sampling label located on the inside of the housing door.
- 5.7.3.7 Label the sample bag and ship to:
  - Bioclimatic Air Systems
  - 600 Delran Parkway
  - Delran, NJ 08075
  - Attn: Laboratory Supervisor

## 5.8 Fuse Replacement

If the fuse blows on the side of the MC-880 generator (Green LED indicator will be off), it is indicative of a defective tube or generator problem. The problem can be accurately identified as follows:

- 5.8.1 Remove all tubes, replace fuse and test. If the fuse blows, the generator is probably defective. If the fuse does not blow, inspect tubes for signs of cracked glass or arcing.

**NOTE: Do not use damaged tubes.**

- 5.8.2 Insert one (1) tube at a time and test. Continue independently testing each tube until the defective tube is identified. A Tube Test Unit (TTU) may also be used to quickly and efficiently identify defective ionization tubes. TTU's are available from Bioclimatic, Inc.
- 5.8.3 If the generator is found to be defective, remove and return it to Bioclimatic for repairs. Please Note: **No equipment may be returned to Bioclimatic without written authorization.** Turn master switch on MC-880 "OFF". Disconnect electrical connections by turning the lock nut on the quick connect fitting counterclockwise and gently pull connector free from generator. Remove the four machine screws that hold the generator in place. When making the electrical connections, align the key on the cable connector with the slot in the mating half on the generator. Gently push into place then turn the lock nut clockwise approximately 1/2 turn until both halves on the connector are locked. The pin connections on the electrical connector will only permit installation in one way.

5.9 Gasket Replacement

After a period of operation, the gasketing on the unit may need to be replaced. It is important to replace it only with **closed cell neoprene gasketing**. Do not use rubber gasketing as it is not suitable for use in this application.