



BIOCLIMATIC

MODEL PRU

PRESSURIZATION UNIT

INSTALLATION, OPERATION

&

MAINTENANCE

MANUAL

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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.

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 firmly secured and palletized, 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.**

All products are shipped F.O.B. (EX Works) Bioclimatic warehouse. Responsibility for all equipment passes to the Buyer at the time equipment is loaded onto the carrier's truck.

1.3 Handling

All equipment must be handled with extreme care. The unit is shipped on wooden pallets to facilitate equipment movement by lift truck without damage. Wooden pallets must be removed once the equipment is in its final location.

Handle equipment with care when removing pallets 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 FIFTEEN (15) MONTHS FROM DATE OF FACTORY SHIPMENT OR ONE (1) YEAR 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 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 Initial Setup

After receiving the PRU, remove the carton and place the unit in a horizontal position. Open the hinged access door and remove the filters and media holding modules. Remove the wooden skid bolted to the base of the unit and inspect all parts for damage. If any parts are damaged contact shipping company to file claim for damaged equipment.

Select a location for the unit where adequate service clearance is provided for removing the filters from the unit. The access door must be able to swing open 90 degrees for service. Ample clearance (about two (2) feet) should also be provided to access the motor starter/disconnect (provided by others).

2.2 Electrical Connections

An electrical wiring diagram is included with these instructions. 230/460 volt, 3 phase systems require a motor starter and disconnect which is installed by others. Refer to the wiring diagram for proper wiring connections. Check for proper motor rotation before operating the unit. All external wiring must be in accordance with National and Local Electrical Codes. Pay particular attention to proper grounding of the unit.

2.3 Filter Installation

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

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

The filters should be installed in the reverse order as they appear on the filter label, that is, the final stage filter should be installed first and so on. Check the filter gaskets and seals to make sure that there is no air bypass.

2.4 Media Holding Modules

Fill the media holding modules as follows:

NOTE: Gloves and a dust mask should be worn when handling media. See MSDS sheet for proper handling requirements.

2.4.1 Remove the access panel from the module.

2.4.2 Fill the module approximately 1/3 full.

2.4.3 Gently vibrate the module in order to make the media settle.

- 2.4.4 Fill the module approximately 2/3 full and vibrate again.
- 2.4.5 Completely fill the module, making sure there are no voids in the media.
- 2.4.6 Replace the access panel.

After 48 to 72 hours of operation, it may be necessary to "top off" the modules because of possible media settlement.

Install the media holding modules and 2 in. pleated post filter carefully so there is no air bypass.

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.

3 PHYSICAL DESCRIPTION

3.1 Principle of Operation

The PRU 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 Prefilter/Media Postfilter

Prefilters are 2 in. or 4 in. deep, disposable type, using preformed pleated design with reinforced fabric media. 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.

3.3 Primary Filter

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

<u>Filter Type</u>	<u>Efficiency</u>
Bag Filter to 21" Deep	60%, 80%, 90%
Lofted Media Filters	60%, 80%, 90%
Ultrafine Glass with Aluminum Separators	60%, 80%, 90%
Ultrafine Glass in Minipleat Configuration	60%, 80%, 90%
HEPA, HEPA Type	99.97%, 95% DOP

3.4 Gas Phase Filtration

Four media holding modules Model BI-12D are installed which have a total capacity of 4 cubic feet (1 ft³ each). Refer to the included Material Safety Data Sheets for more information on the media that was supplied with your unit.

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 door is securely closed.

4.2 Inspection Check List

FILTERS

Complete filter installation _____
Surface continuity between adjacent _____
Filters and seal surfaces. _____
Wipe entire section clean _____

PANELS

Insulation intact _____
Fasteners secure _____
Gaskets intact _____

4.3 Outside Air Ductwork

This unit is designed to pressurize the space being controlled with outside air. Thus, it is necessary to duct this unit to an external air source. The unit will not properly pressurize the room if external ductwork is not connected to the outside air intake on the unit. **Make sure to make this ductwork connection before powering up the unit.**

4.4 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 gas phase filtration media is shipped in 1 cu.ft. (28.3 liter) sealed containers. Once all the duct work is installed, and just before starting up the system, the unit should be filled with the gas phase filtration media using the procedure in section 2.3. The gas phase filtration media is supplied by Bioclimatic and installed by others.

5.2 Damper Adjustment

The outside air damper included with this unit can be manually adjusted to regulate the flow of pressurization air. The damper assembly should be inspected periodically to ensure that the proper pressurization flow is being provided.

5.3 Filter Maintenance

5.3.1 Fibrous Filters

Changing dirty filters must be performed periodically. Filter change out intervals will depend on local conditions and can be determined only by inspection of the filter gauges and the filters. Check filters and gauges weekly until the maintenance interval is established. When the interval is determined, establish a filter replacement program.

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.

5.3.2 Gas Filtration Media

The life of the media will vary depending on the contaminants present and their concentration. A predetermined schedule for media change-outs is NOT recommended since it may result in establishing an incorrect maintenance schedule. In order to obtain the maximum operating time from the gas filtration media, Bioclimatic offers a Laboratory Service to inform the customer of the remaining media life and the correct time to change the media.

5.3.2.1 Special Precautions for Handling Gas Filtration Media

5.3.2.1.1 Inhalation

A well ventilated work area is suggested for changing the media, since dusting from fresh pellets results due to handling abrasion. In closed unventilated spaces, dust masks, such as the 3M No. 8500 are strongly recommended. Avoid direct inhalation of media dust. Refer to Material Safety Data Sheets.

5.3.2.1.2 Water

DO NOT expose the Gas Filtration Media pellets to water or moisture since this will cause leaching of permanganate or other impregnate. Exposure of permanganate solution to the skin will stain but will not burn or blister. The staining condition is temporary. This staining may be neutralized by washing in a solution of sodium bisulfide.

5.3.2.1.3 Eye Contact

If the event that the eyes or other sensitive areas are exposed to media dust, flush thoroughly with water and seek treatment from a physician, for exposure to abrasive dusts. Refer to Material Safety Data Sheets.

5.3.2.2 Laboratory Service (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

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

5.3.2.3 Filling the modules

NOTE: Please read the included MSDS sheets before filling the media modules. Gloves and a dust mask should be worn when handling media. See MSDS sheet for proper handling requirements.

- 5.3.2.3.1 Remove the access panel from the module.
- 5.3.2.3.2 Fill the module approximately 1/3 full.
- 5.3.2.3.3 Gently vibrate the module in order to make the media settle.
- 5.3.2.3.4 Fill the module approximately 2/3 full and vibrate again.
- 5.3.2.3.5 Completely fill the module, making sure there are no voids in the media.
- 5.3.2.3.6 Replace the access panel.
- 5.3.2.3.7 Prior to installation, blow out modules to remove excessive dust. Check modules for voids.

NOTE: If the module is not blown out, excessive dust will be released into the air when the system is started. This will require that the postfilter be replaced after only a few minutes of operation due to excessive pressure loss.

After 48 to 72 hours of operation, it may be necessary to "top off" the modules because of possible media settlement. Media settlement results in air bypass and loss of efficiency.

5.4 Motor Pulley Belt Replacement

Replace motor pulley belt as follows:

- 5.4.1 Place belt around pulleys.
- 5.4.2 Apply tension to drive belt by sliding the motor away from blower.
- 5.4.3 Check the tension in the drive belt by placing a straightedge across the top of the belt. Pull the belt down, noting the deflection from the straightedge. This deflection should be approximately 3/8 in. or 10 mm. The force applied to cause such a deflection should be approximately 1 pound or 0.5 kg.

NOTE: It is extremely important to have the proper tension on the belt.

- 5.4.4 Be certain that the pulleys are aligned as to avoid uneven and accelerated wear on the drive belt and non-uniform power delivery to the blower pulley. A straightedge should be placed across the outside of both pulleys such that it contacts each pulley in two (2) places. If the straightedge does not contact each pulley in two (2) places, the pulleys are not properly aligned. Adjust the pulleys until the straightedge contacts each pulley in two (2) places. Tighten motor bolts.

NOTE: It is extremely important that the pulleys are properly aligned.

5.4.5 Check the actual motor current after pulley adjustment and with all filters in place to ensure full load amperage is not exceeded.

5.5 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.