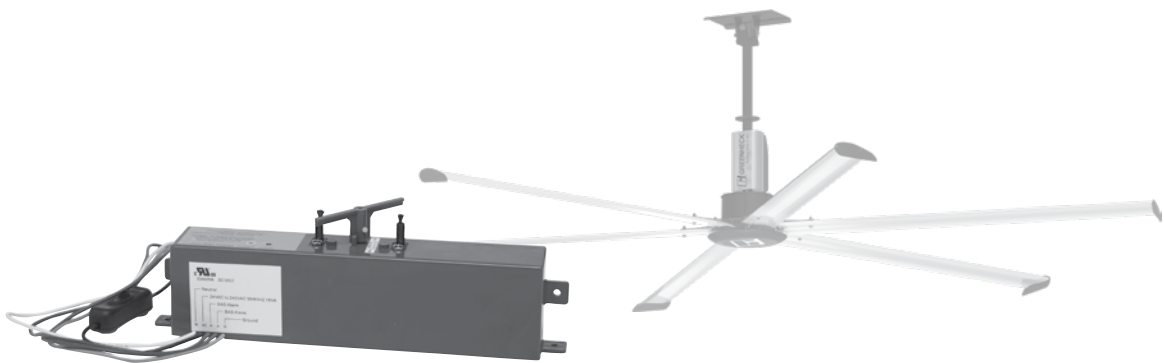


## Installation, Operation and Maintenance Manual

**Please read and save these instructions for future reference.** Read carefully before attempting to assemble, install, operate or maintain the product described. Protect yourself and others by observing all safety information. Failure to comply with these instructions will result in voiding of the product warranty and may result in personal injury and/or property damage.



**IMPORTANT:** The following instructions only apply to HVLS fans and needlepoint bipolar ionization (NPBI®) devices that were provided by Greenheck. Do not use these instructions with HVLS fans or NPBI devices from other manufacturers as performance of the system may vary.



Needlepoint bipolar ionization (NPBI) devices produce a high concentration of positive and negative ions that help clean indoor air. Combined with the high volume air movement provided by Greenheck's HVLS fans, NPBI technology is an effective solution for improving indoor air quality in any application.

### Required Tools

The following tools will be required to complete the installation of every NPBI device. Additional tools may be required depending on the application and installation location of the device.

- #2 Phillips Screwdriver
- Adjustable Wrench
- Knockout Tool

## General Safety Information

Only qualified personnel should install this NPBI device. Personnel should have a clear understanding of these instructions and should be aware of general safety precautions. Improper installation can result in electric shock, possible injury due to coming in contact with moving parts, as well as other potential hazards. Other considerations may be required if high winds or seismic activity are present. If more information is needed, contact a licensed professional engineer before moving forward.

1. Follow all local electrical and safety codes, as well as the National Electrical Code (NEC) and the National Fire Protection Agency (NFPA), where applicable. Follow the Canadian Electric Code (CEC) in Canada.
2. NPBI device must be securely and adequately grounded.
3. Do not allow the power cable to kink or come in contact with oil, grease, hot surfaces or chemicals. Replace cord immediately if damaged.
4. Verify that the power source is compatible with the equipment.

### WARNING

Never touch emitter brushes while the unit is in operation, as electric shock may occur.

### WARNING

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

1. Use this unit only in the manner intended by the manufacturer. If you have questions, contact the manufacturer.
2. Before servicing or cleaning unit, switch power off at service panel and lock the service disconnecting means to prevent power from being switched on accidentally. When the service disconnecting means cannot be locked, securely fasten a prominent warning device, such as a tag, to the service panel.

### WARNING

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

1. Installation work and electrical wiring must be done by qualified person(s) in accordance with all applicable codes and standards, including fire rated construction.
2. When cutting or drilling into wall or ceiling, do not damage electrical wiring and other hidden utilities.

### DANGER

Always disconnect, lock and tag power source before installing or servicing. Failure to disconnect power source can result in fire, shock or serious injury.

## Components

Verify that all of the following parts and hardware have been received prior to beginning installation. Contact your local representative or the manufacturer if replacement parts are required.

**NOTE:** Additional parts (provided by others) may be required to complete the NPBI device installation, including additional wiring or hardware for connecting the NPBI device to the building structure.

- NPBI Device Assembly with Gray, Plastic Enclosure
- Beam Clamps (2)
- Beam Clamp Bolts (2)

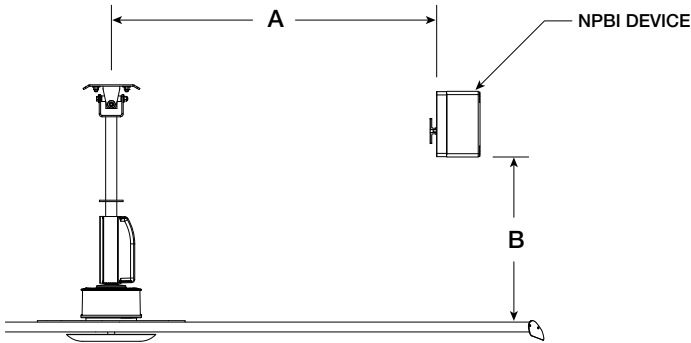
# Mechanical Installation

## DANGER

Always disconnect, lock and tag power source before installing or servicing. Failure to disconnect power source can result in fire, shock or serious injury.

### Mounting With Supplied Beam Clamps

1. After HVLS fan installation is complete, identify an appropriate mounting location for the NPBI device as detailed in the drawing and table below.



Fan Diameter (ft)	A Horizontal Distance from Center of HVLS Fan (ft)	B Vertical Distance from HVLS Fan Blades (ft)
8	3.25	2 – 3.5
10	4	2 – 3.5
12	5	2 – 3.5
14	5.5	2 – 3.5
16	6.5	3.5
18	7.25	3.5
20	8	3.5
24	9.5	3.5

2. Remove the cover of the gray, plastic enclosure using a #2 Phillips screwdriver and set aside.
3. Attach the supplied beam clamps to the enclosure using the pre-drilled holes and included bolts.
4. Mount the NPBI device on the building structure using the beam clamps. Make sure to mount the NPBI device so that the carbon fiber brush emitters are parallel to the floor. Verify that the emitters have a minimum 2 inch clearance from all wiring, metal objects or surfaces, and other conductive materials before proceeding.
5. Secure the beam clamps to the building structure using an adjustable wrench. Ensure that the NPBI device is securely attached to the building structure to prevent swaying during HVLS fan operation.
6. Verify that the self-cleaning wiper arm has room to rotate freely.

### Alternate Mounting

If desired, the NPBI device enclosure can be directly fastened to the building structure using 2 or more appropriate fasteners and anchors (provided by others) that can support the weight of the NPBI device (finished assembly weighs 5 lbs.). Alternatively, the NPBI device enclosure can also be suspended from the building structure using threaded rod (provided by others) if necessary to maintain appropriate vertical distance from HVLS fans blades. For either alternative mounting style, ensure that all minimum clearances are maintained (refer to Mounting With Supplied Beam Clamps section above) and that the NPBI device is securely attached to the building structure to prevent swaying during HVLS fan operation.

# Electrical Installation

## DANGER

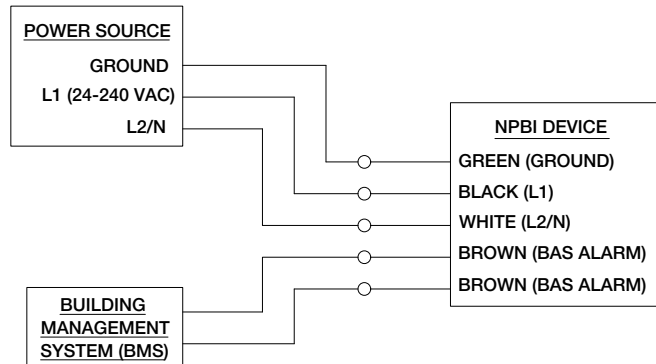
Always disconnect, lock and tag power source before installing or servicing. Failure to disconnect power source can result in fire, shock or serious injury.

1. Using a knockout tool, create the required number of holes in the gray, plastic NPBI enclosure to route wiring. If using both high and low voltages, route wires in separate conduit. Be sure to follow all national and local electrical codes.
2. Connect supply power wiring to the factory-installed power leads on the NPBI device using the wiring diagram to the right. NPBI device can be powered using any voltage from 24VAC to 240VAC and will self-adjust based on the connected power supply. Choice of supply power voltage will not affect the device's ion output or performance.

**IMPORTANT:** To ensure best performance, it is highly recommended to wire the NPBI device so that it is powered constantly and is not powered on/off with the HVLS fan.

3. If the building is equipped with a building management system (BMS), connect the brown factory-installed BMS monitoring leads on the NPBI device to the BMS using the wiring diagram to the right. The NPBI device is equipped with normally open, dry contacts that close when the NPBI device is operating without any faults to provide run status to BMS.

**IMPORTANT:** The BMS monitoring leads are connected to normally open, dry contacts that can only be used to provide run status to BMS. Do not apply voltage to the BMS monitoring leads as this may damage the NPBI device.



4. Once all wiring is complete, verify that the inline power switch on the black factory-installed power lead is in the “on” position.
5. Reinstall the cover of the gray, plastic NPBI device enclosure using a #2 Phillips screwdriver.

# Operation

## WARNING

Never touch emitter brushes while the unit is in operation, as electric shock may occur.

1. Verify that the inline power switch on the black factory-installed power lead is in the on position, then apply power to the NPBI device.

2. Once powered, the NPBI device will initiate an internal check of all systems. If the self-cleaning wiper arm is not in the home position, it will move to the home position before ion generation begins. After initial checks are complete, the operation status LED will illuminate to indicate that the NPBI device is powered on.

## Maintenance

---

**NOTE:** Installation and maintenance are to be performed only by qualified personnel who are familiar with local codes and regulations, and have experience with this type of equipment.

Once the NPBI device has been put into operation, a periodic maintenance program should be set up to ensure reliable performance. A proper maintenance program will help deliver years of dependable service. Items to be included in this program are as follows:

1. Verify that all fasteners are tight and that the NPBI device is securely connected to the building structure.
2. Verify that the self-cleaning wiper arm is capable of contacting the carbon fiber brush emitters, but does not stick or stop rotating while touching the emitters. If necessary, adjust the height of the brush emitters using the following instructions:
  - a. Loosen the screw at the base of the emitter.
  - b. Gently pull or push the emitter to a height where the self-cleaning wiper arm barely contacts the top of the emitter.
  - c. Hold the emitter in place and tighten the screw at the base of the emitter.
  - d. Verify that the self-cleaning wiper arm contacts the emitter, but can still rotate freely.
3. Inspect carbon fiber brush emitters for signs of wear or degradation. If the emitter is worn to the point that it is not possible to adjust its height, contact your local representative or the manufacturer for a replacement. Use the following instructions to replace worn emitters:
  - a. Remove the screw at the base of the emitter.
  - b. Remove the emitter base and unplug the emitter from the connector on the NPBI device.
  - c. Plug in the new emitter and reinstall the emitter base.
  - d. Adjust the emitter height so that the self-cleaning wiper arm contacts the emitter, but can still rotate freely.
  - e. Tighten the screw at the base of the emitter.
4. Inspect carbon fiber brush emitters for signs of dust or dirt accumulation. NPBI device is equipped with a self-cleaning wiper arm that is designed to clean the emitters every three days. The cleaning process may be activated by pushing the test button located on the top of the NPBI device. If necessary, adjust the cleaning cycle frequency using the following instructions:
  - a. Press the cleaning cycle test button once.
  - b. While cleaning is in progress, press and hold the cleaning cycle test button for 5 seconds. The operation status LED on the NPBI device will begin flashing.
  - c. Press the cleaning cycle button again to change the cleaning cycle frequency. The operation status LED will flash to indicate the current setting, with the number of flashes indicating the cleaning interval in days (3 flashes = 3 days, 5 flashes = 5 days, etc.).

# Troubleshooting

## DANGER

Disconnect and secure to the 'OFF' position all electrical power to the fan prior to inspection or servicing. Failure to comply with this safety precaution could result in serious injury or death.

PROBLEM	CAUSE	CORRECTIVE ACTION
NPBI device will not power on; operation status LED is not illuminated	No supply power to device	Verify that supply power is on at the breaker and disconnect switch Verify that the inline power switch on the black factory-installed power lead is in the on position
	Incorrect supply power voltage applied	Correct supply power Supply power must be 24VAC to 240VAC
	Incorrect supply power wiring	Verify that proper voltage is applied to the correct power wiring leads as shown in the wiring diagram on page 4
Operation status LED on NPBI device is flashing continuously	NPBI device is not properly grounded	Correct ground wire connection
NPBI device is not providing run status to BMS	Incorrect BMS monitoring contact wiring	Verify that BMS monitoring leads are wired as shown in the wiring diagram on page 4
Self-cleaning wiper arm sticks or stops on brush emitters	Incorrect brush emitter height	Adjust height of brush emitters using the instructions on page 5
Self-cleaning wiper arm does not clean or contact brush emitters	Incorrect brush emitter height	Adjust height of brush emitters using the instructions on page 5



# Maintenance Log

Date \_\_\_\_\_ Time \_\_\_\_\_ AM/PM

Notes: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Date \_\_\_\_\_ Time \_\_\_\_\_ AM/PM

Notes: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Date \_\_\_\_\_ Time \_\_\_\_\_ AM/PM

Notes: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Date \_\_\_\_\_ Time \_\_\_\_\_ AM/PM

Notes: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Date \_\_\_\_\_ Time \_\_\_\_\_ AM/PM

Notes: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Date \_\_\_\_\_ Time \_\_\_\_\_ AM/PM

Notes: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Date \_\_\_\_\_ Time \_\_\_\_\_ AM/PM

Notes: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Date \_\_\_\_\_ Time \_\_\_\_\_ AM/PM

Notes: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Date \_\_\_\_\_ Time \_\_\_\_\_ AM/PM

Notes: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Date \_\_\_\_\_ Time \_\_\_\_\_ AM/PM

Notes: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Date \_\_\_\_\_ Time \_\_\_\_\_ AM/PM

Notes: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Date \_\_\_\_\_ Time \_\_\_\_\_ AM/PM

Notes: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_



## Our Commitment

---

*As a result of our commitment to continuous improvement, Greenheck reserves the right to change specifications without notice.*

Product warranties can be found online at [Greenheck.com](http://Greenheck.com), either on the specific product page or in the literature section of the website at [Greenheck.com/Resources/Library/Literature](http://Greenheck.com/Resources/Library/Literature).

