

# INSTALLATION, OPERATION & MAINTENANCE

# M A N U A L

Mobile Air Cleaner Unit w / HEPA Filter  
Model MAC-700



Read completely and save these instructions  
for future reference.

 **Nailor**<sup>®</sup>  
Industries Inc.

## CRITICAL OPERATION CONDITIONS OF THE MOBILE AIR CLEANER UNIT W/HEPA FILTER

- **DO NOT TOUCH** the HEPA filter media. Damage to filter media may void the filter warranty. The screen is to protect against accidental contact with the filter. Never place objects on the filter. Always transport or lift the filter by its frame.
- Prior to powering the unit, verify that it is wired to the correct power supply. The rating plate label located on the electrical box cover shows the electrical data.
- For replacement parts refer to the model number and serial number on the rating plate label located on the electrical box.

### REPLACEMENT PART NUMBERS

Part #	Part Description
V H1-1791	Motor
V H1-0900	Blower
MAC700HEPA	24 x 24 x 6 (610 x 610 x 152) HEPA Filter
MAC700PREFILTER	24 x 16 (610 x 406) Pre-Filter
MACUVC20	UV Light
V H1-3004	UV Light Ballast
V H1-3017A	Safety Interlock Switch
V H1-2964	0 - 10 V Speed Controller
V H1-3003 A, B, C & D	Illuminated ON / OFF Switch
V H1-3016	UV-C Hour Counter

When ordering replacement parts, please include unit model & serial number and P.O.# if available.

## **WARNING – TO REDUCE THE RISK OF FIRE, ELECTRIC SHOCK OR INJURY TO PERSONS; ALLOW ONLY QUALIFIED TECHNICIANS TO INSTALL AND SERVICE THE UNIT. ALL PERSONS SHOULD OBSERVE THE FOLLOWING:**

- a) Before servicing or cleaning unit, disconnect and lock-out power at the service panel to prevent electric shock or injury if the power is accidentally turned on.
- Installation work and electrical wiring must be completed by qualified persons in accordance with all applicable codes and standards.
  - If this unit is to be installed within close proximity to water, mark the unit in accordance with applicable codes and standards.
  - This unit is to be used only as intended by the manufacturer. If you have any questions regarding the use, installation or operation of this unit; contact the manufacturer:

Nailor Industries of Texas, Inc.  
4714 Winfield Road, Houston, TX 77039

Tel.: 281-590-1172  
nailor.com

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### **INSTRUCTIONS WARNING!**

**TO REDUCE THE RISK OF FIRE, ELECTRIC SHOCK OR INJURY TO PERSONS; ALL PERSONS SHOULD OBSERVE THE FOLLOWING:**

- a. Eye damage may result from directly viewing the light produced by these lamps. Never look at the lamps while they are on, lit or illuminated. To reduce the risk of exposure to UV radiation, turn off all switches and disconnect power to all UV-C devices before service or take UV-radiation protective measures for personnel during servicing.
- b. Before servicing or cleaning unit, disconnect and lock-out power at the service panel to prevent electric shock or injury if the power is accidentally turned on.
- c. This unit is to be used only as intended by the manufacturer. If you have any questions regarding the use, installation or operation of this unit; contact the manufacturer:

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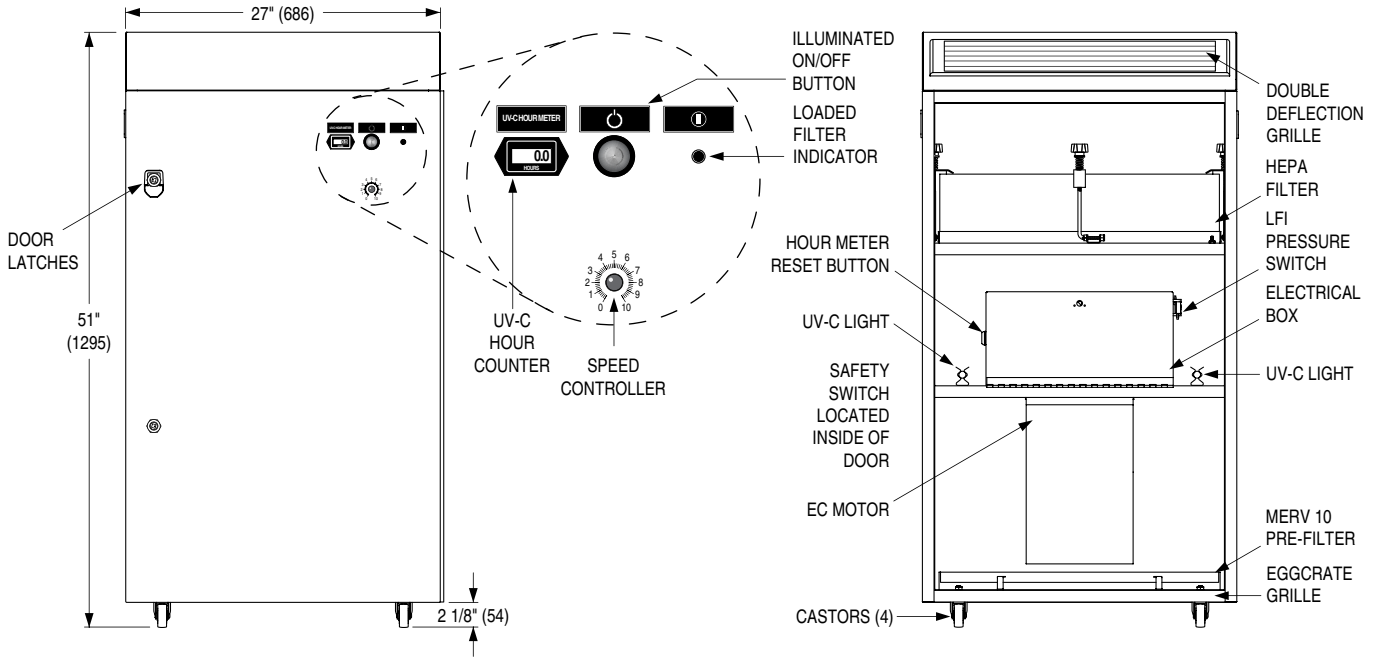
Tel.: 281-590-1172  
[www.nailor.com](http://www.nailor.com)

### **SHIPPING INFORMATION**

Inspect all cartons and boxes for flaws and shipping damages. If anything is discovered to be damaged, contact the shipping company and file a freight claim.

## PRODUCT OVERVIEW

The MAC-700 provides continuous filtration of the space air to help reduce the risk of biological aerosol transmission without the requirement to involve your existing HVAC system. The MAC-700 is designed to pull air from all sides to increase its ability to collect biomass and dust from the floor. The air will travel through a MERV 10 pre-filter, which captures large particles, HEPA filter and UV-C light before recirculating purified near sterile air up into the room. The final 6" (152 mm) HEPA filter provides filtration that is 99.99% effective in the removal of microbial content from the airflow.



## INSTALLATION INSTRUCTIONS FOR THE MAC-700

The MAC-700 is fully assembled from the factory except for the UV lights and the door key which are shipped separately.

- Step 1** Carefully remove the unit from the shipping carton and inspect for damage that may have occurred during shipping. If shipping damage is found, do not install. Call Nailor customer service to report damage.
- Step 2** Wipe down the unit to remove shipping dust and debris.
- Step 3** Plug into the wall outlet. The MAC-700 unit is furnished with a 120 V plug for utilizing in a standard wall outlet. A qualified person should wire the unit to the appropriate power supply and install the UV lights. Refer to the wiring diagram on page 9 or 10.

## AIR FLOW ADJUSTMENT

The MAC-700 contains a highly efficient ECM motor and forward inclined fan. Airflow can be easily adjusted through a 0 - 10 speed controller on the back of the unit. To increase the airflow simply turn the speed controller knob clockwise from 0 to 10. At 10, the maximum 700 CFM will be achieved.



Figure 1. Speed Controller

### Dial To Airflow Guidance

Dial to CFM	
10	700
9	630
8	570
7	520
6	475
5	415
4	360
3	280
2	140
1	80

Dimensions are in inches (mm).

## UV LAMPS INSTALLATION

MAC-700 unit is supplied with two 20" T5 high output UV-C lights that are packed separately and shipped with unit. As the air is pulled through the fan, a UV-C light provides next level air cleaning. The UV-C is long-lasting to reduce the maintenance cost and replacement. The UV-C light is safely placed before the HEPA filter and the door has a safety switch to turn off lamps if the door opens. Please follow the instructions below to install UV-C lights.

### LAMP LIFE:

MAC-700 UV-C lamps are rated at 9,000 hours with no more than a 20% output loss at the end of the lamps life (12 months of continuous use). Lamps are constructed with UV-C resistant bases and will not produce ozone.

### SAFETY INTERLOCK SWITCH:

MAC-700 includes mechanical interlock switches to ensure that the UV-C assembly will be de-energized when the door is opened. Before UV-C installation make sure the interlock switch is installed and properly wired to the control box.



Figure 2. Safety Interlock Switch

### Step 1:

Handle UV-C fixturing wearing soft cloth gloves and safety glasses carefully to avoid damage to components, enclosures and finish. Leave factory shipping covers in place until installation is complete. Do not install any damaged components; instead replace them and return damaged components to equipment manufacturer.

### Step 2:

There are two mounting clips that hold each UV-C light in place. To reach out the clips, remove the screwed plates from the shield. Hold the lamp with two hands and gently push the it into the clips after.

### Step 3:

Connect each lamp from the pin side to the ballast through the plenum wiring loom. Please see below photo. UV-C lamps should be installed in a way that the pin side is close to the control box. Once you make sure the lamps are installed correctly, put the plates back and screw them to the shield.



Step 3. Connection for UV Lamp

## UV LAMPS INSTALLATION

After installing UV-C lamps please make sure the lamps are connected properly. To do that –

- 1 Turn the unit ON while the unit door is open.
- 2 Press the safety switch.

**CAUTION: DO NOT LOOK AT LAMPS DIRECTLY, USE APPROPRIATE PERSONAL PROTECTION EQUIPMENT.**

- 3 If Lamps are not emitting, disconnect the lamp and turn it 180 degree and install again.

## BULB REPLACEMENT:

Recommended: Replace the UV bulbs after 9,000 hours of use continuously or after 9,000 hours of use intermittently. Use replacement bulbs exactly the same specific size and wattage as the original factory supplied bulbs. Note that the ultraviolet radiation emitted by the bulbs will degrade over the 9,000 operating hours time and will no longer provide the intended benefit, however, the characteristic blue glow may still be seen and generated.

## HOURLY METER AND RESET BUTTON:

MAC-700 is equipped with an hour meter that counts the number of hours that unit has been On. The UV-C lamps should be replaced when the hour meter number reaches to 9,000. After removing the old lamps, while pressing the safety switch, hold the reset button for 3 - 4 seconds to reset the hour meter and then install the new lamp.

**Caution: To avoid damage to your eyes, Please make sure to reset the button before installing new lamps.**



Figure 3. Hour Meter Reset Button

**WARNING: SKIN OR EYE DAMAGE MAY RESULT FROM DIRECTLY VIEWING THE LIGHT PRODUCED BY THE LAMP IN THIS APPARATUS.**

**ALWAYS DISCONNECT POWER BEFORE RELAMPING OR SERVICING.**

**REPLACE LAMPS WITH LAMP MODEL NO-1: GPH508T5L/HO/4P, MANUFACTURED BY SHAOXING SHANGYU YUP LIGHTING CO, LTD, NO-2: SEL-20-T5-HO MANUFACTURED BY UV-RESOURCES.**

## HEPA FILTER AND PRE-FILTER REMOVAL AND REPLACEMENT

The MAC-700 contains a MERV 10 pre-filter and a 6" HEPA filter. Both filters can be replaced without any special tools. It is recommended to change the pre-filter every 3 months and HEPA filter every 12 months. However, filter life is variable based on air quality and the speed of blower. Follow steps below to replace the filters.

**Notice: Safety precautions must be taken when changing filters. Always wear personal protective equipment including face mask, gloves, and shoe cover. Once the filter is removed, immediately place the old filter into a plastic bag, twist or tie the bag and dispose the bag in an outdoor trash can.**

### Step 1:

Open the unit door using square head door key shipped with unit. (Two keys shipped with unit).

### Step 2:

To remove the HEPA filter, rotate all three plastic knobs counterclockwise all the way up and loose the filter clips. Lift the HEPA filter out of the unit.

### Step 3:

Unpack the new filter and inspect shipping damage. If damage is found, do not install in unit; call the manufacturer for replacement arrangements.

### Step 4:

Place the new HEPA filter on the deck, inspect all gaskets and seals for integrity.

### Step 5:

Rotate all clips so they are supporting the frame and are at 90° to the frame. Evenly tighten the plastic knobs. Do not over tighten.



Figure 4. HEPA Filter Clips



Figure 5. Pre-filter Replacement

### Step 6:

To replace pre-filter, rotate the pre-filter clips and lift the prefilter and pull it out.

### Step 7:

Unpack the new pre-filter and put on the pre-filter deck. Inspect all gaskets for integrity.

### Step 8:

Rotate all pre-filter clips so they are supporting the frame and are at 90° to the frame.

## CONTROL BOX

The MAC-700 contains a 11" x 8" (279 x 203) control box that includes terminal blocks and transformer, reset button and UV lights ballast.

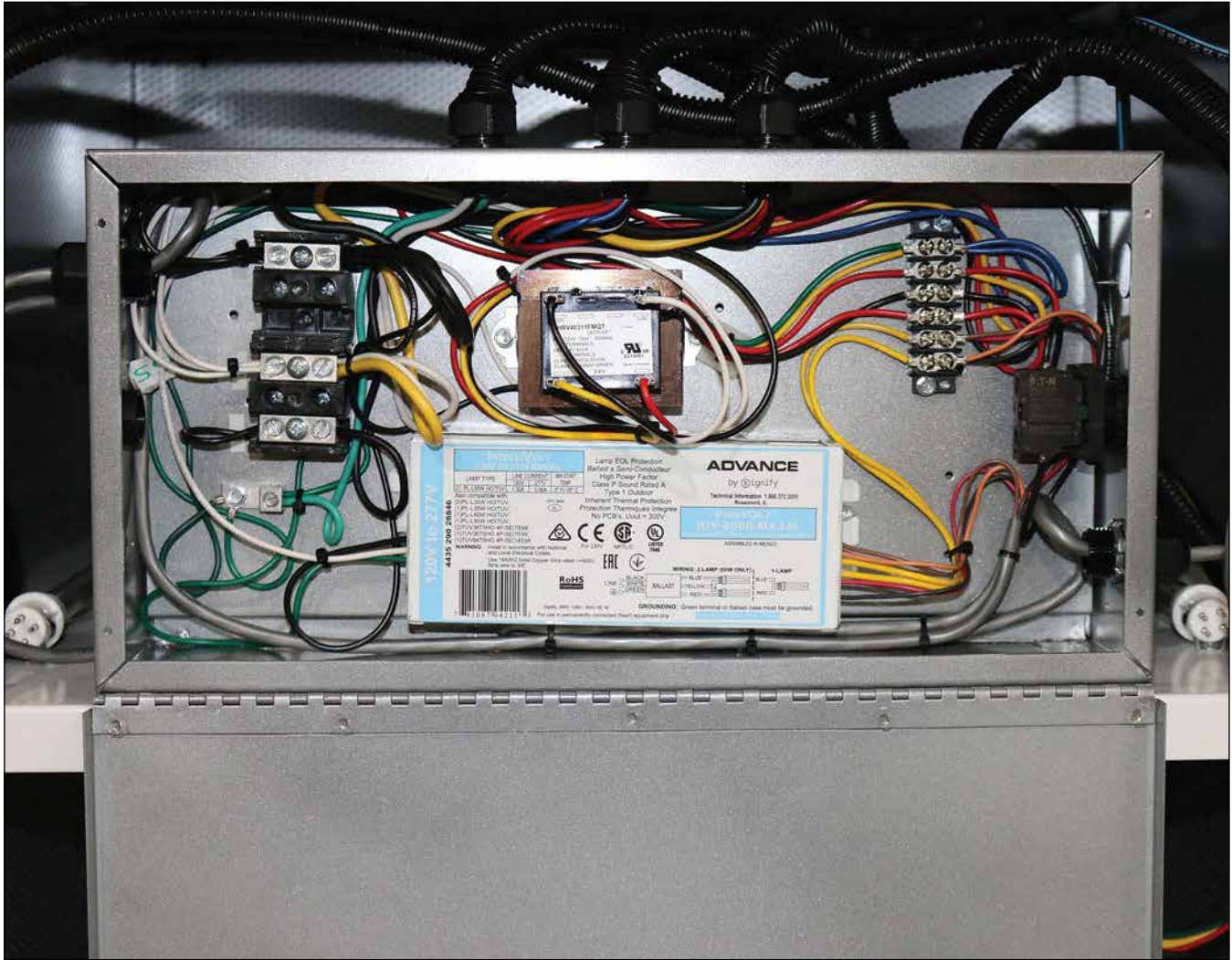
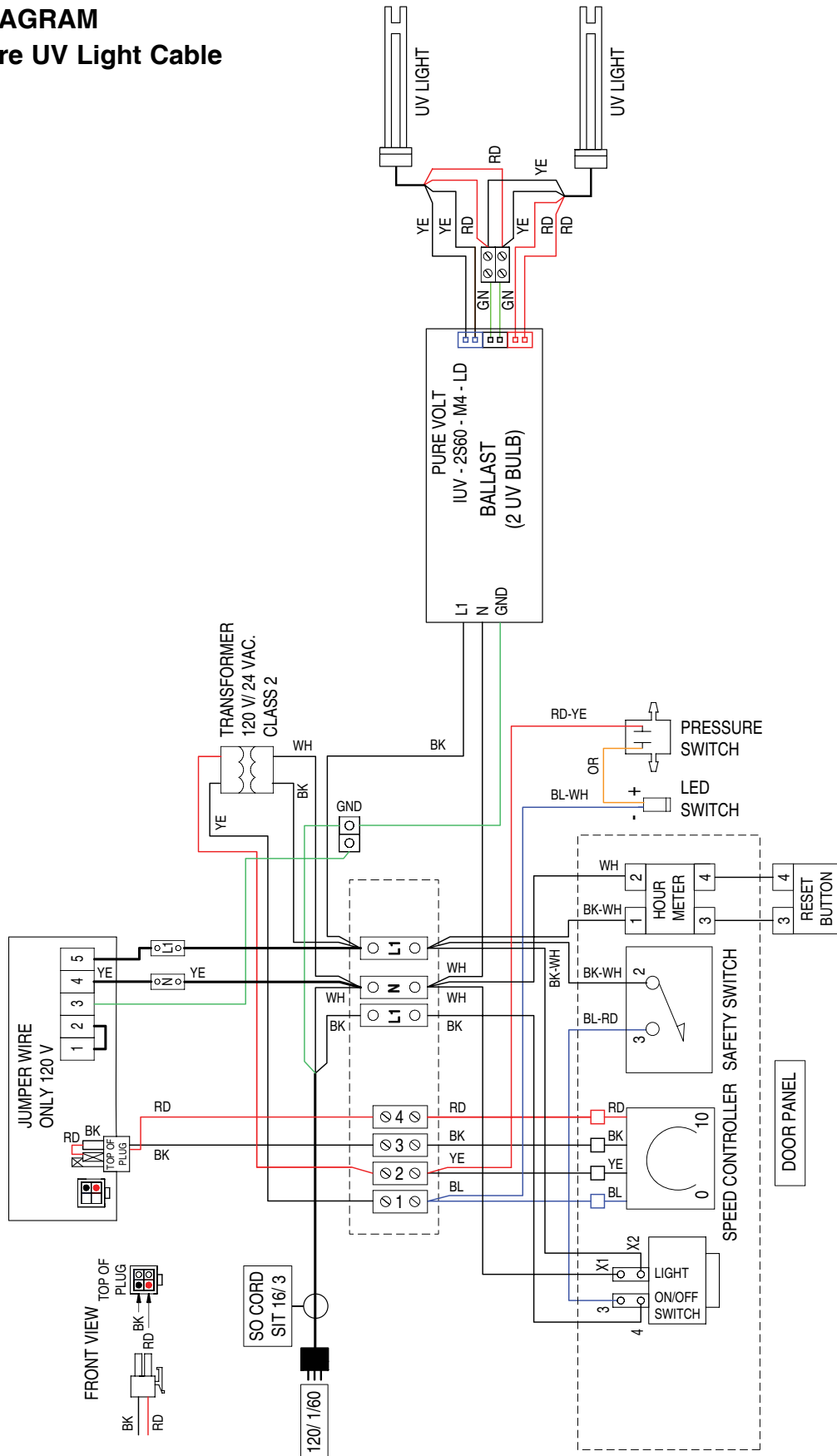


Figure 6. Control Box Layout



# WIRING DIAGRAM

## 2-Color Wire UV Light Cable



## MOTOR / BLOWER REMOVAL AND REPLACEMENT • MODEL MAC-700

**WARNING! Disconnect the unit from the electrical power source before attempting to service the unit.**

- Step 1** Turn off the unit with the ON / OFF button located on the back of the unit.
- Step 2** Disconnect the unit at the power source.
- Step 3** Using Door key; open the unit door.
- Step 4** Disconnect wiring from the control panel.
- Step 5** Using a screwdriver; remove the four screws located around the motor and move the blower-motor assembly out of the unit.
- Step 6** Make sure to reconnect all wiring harnesses according to the wiring diagram. dirt and duct should not be allowed to accumulate on the bower wheel or housing. This can result in an unbalanced blower wheel and damage the wheel or motor.
- Step 7** Reverse above steps to reassemble the motor blower assembly into the unit.

## TROUBLE SHOOTING

**WARNING! Disconnect the unit from the electrical power source before attempting to service the unit.**

### Unit will not run:

Confirm that the power cord is plugged into the building receptacle and power is present.  
Confirm illuminated ON/OFF push button is pushed in.

Check the speed controller and note that:

1. Motor/Blower is delayed by 20 - 30 seconds.
2. Motor turns off below 1.5 scale while the unit is ON.
3. Ensure your speed is above this point.

Check wires connection between control box and motor per wiring diagram provided with unit.  
Check that motor has power at correct voltage.  
Check the motor and replace if necessary.

### Low Air Flow

Check pre-filter media and remove obstruction as necessary.  
Replace dirty pre-filter media.  
Adjust the motor speed by rotating speed controller knob clockwise.  
Check power supply for proper voltage, amperage, and distribution frequency.  
Replace HEPA filter if the velocity remains low.

### High Air Flow

Adjust the motor speed by rotating speed controller knob counterclockwise.  
Verify all filters are properly in place.



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