



Driven by performance. Powered by design.<sup>TM</sup>

4201 Lien Rd • Madison, WI 53704



# Owner's Manual — Phoenix Mini-Guardian HEPA System

## Installation, Operation & Service Instructions

### Read and Save These Instructions

The Phoenix Mini-Guardian HEPA System is the compact, variable air speed version of our popular Phoenix Guardian HEPA System.

Maximum delivered air flow with 3-stage filtering in place is over 415 CFM and will clean one air change of a 14 x 14 foot room in less than four minutes while drawing less than two amps of power. This makes the Mini-Guardian HEPA System perfect for smaller remediation projects where space is at a premium and reduced air flow essential. A template on the intake grill makes it possible to take air-flow measurements with the Phoenix Reed LM 8000 Multi-Function Meter.

The Mini-Guardian HEPA System's 3-stage filter design with true HEPA filtration will remove virtually all hazardous particles from the air and an optional fourth stage filter of activated carbon and potassium permanganate will absorb a wide range of odors and gases. The unique 24" canister HEPA, manufactured for the Phoenix Mini-Guardian HEPA System, contains nearly 200 square feet of surface area. This allows maximum air-flow and significantly extends filter life.



Phoenix Mini-Guardian HEPA System  
PN 4024774

#### The Phoenix Mini-Guardian HEPA System

- Less than 2 amps
- Compact design
- Variable speed flow
- Multiple ducting options
- Stainless steel cabinet
- Optional fourth stage carbon filter
- Wheeled cart design

Specifications subject to change without notice.

Toll-Free 1-800-533-7533

[www.UsePhoenix.com](http://www.UsePhoenix.com) • [sales@UsePhoenix.com](mailto:sales@UsePhoenix.com)

TS-261

05/17 Rev. A

## Table of Contents

Introduction .....	1
1. Specifications.....	2
2. Operation .....	2
2.1 Handle Assembly Procedure.....	2
2.2 Transporting the Phoenix Mini-Guardian HEPA System.....	3
2.3 Location .....	3
2.4 Electrical Requirements .....	3
2.5 Air Ducting.....	4
2.5A Inlet Ducting .....	4
2.5B Outlet Ducting.....	4
2.6 Negative Air Ducting .....	4
2.7 Power Switch .....	4
2.8 Hour Meter .....	5
3. Maintenance .....	5
3.1 Air Filters.....	5
3.1A Carbon/Potassium Permanganate Filter .....	5
3.2 Checking Airflow.....	5
4. Service .....	7
4.1 Warranty .....	7
4.2 Impeller fan Replacement .....	7
5. Wiring Diagram .....	8
6. Service Parts .....	9
Warranty.....	11

Serial No.\_\_\_\_\_

Purchase Date\_\_\_\_\_

Dealer's Name\_\_\_\_\_

Read the operation and maintenance instructions carefully before using this unit. Proper adherence to these instructions is essential to obtain maximum benefit from your Phoenix Mini-Guardian HEPA System.

## 1 Specifications

Part No.	4024774		
Power	110-120 Vac, 1.96 amps; 215 watts		
Blower	Up to 415 CFM (delivered air flow w/3-stage filter operation)		
Filters:	1-stage	1" Spun Polyester, 16" x 16"	
(optional)	2-stage	2" Pleated Media, 16" x 16"	
	3-stage	14" dia. x 24" Canister HEPA	
	4-stage	2" Carbon and Potassium Permanganate	
Warranty	One Year, 100% Parts and Labor		
Dimensions			
	Cabinet	w/Cart	Shipping
Width	16"	19-1/2"	20-1/2"
Height	40"	40"	47"
Depth	16"	19"	20-1/2"
Weight	65 Lbs		
	70 Lbs		

## 2 Operation

### 2.1 Handle Assembly Procedure

Tools Required: Hex Key, 8mm (Supplied with packed parts)

1. Remove the handle assembly (consists of two handle brackets and handle tube), two metric socket head cap screws M10 x 35mm length, and 8mm hex key from the packed parts supplied with the unit.



Figure 1: Handle assembly

- Locate the two mounting holes for the handle assembly on the Mini-Guardian HEPA System cabinet. They are located in close proximity to the top of the cabinet near the corners. A lock nut should be visible through each of the mounting holes and is held in place by a retainer plate secured to the cabinet shell. Verify lock nut is visible in each mounting hole.

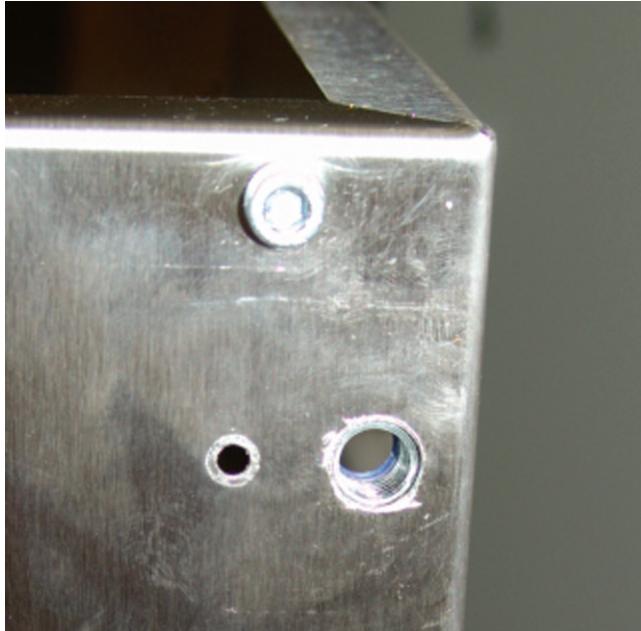


Figure 2: Mounting holes

- Place a socket head cap screw (M10 x 35mm) into each of the holes in the handle end brackets. Position the handle assembly up against the Phoenix Mini-Guardian HEPA System cabinet so as to align the cap screws with the mounting holes in the cabinet.

It may be necessary to tilt the handle assembly up at a slight angle in order to align the screws with the lock nuts. Use the 8mm hex key to press the cap screws into the mounting holes and engage the threads of the lock nuts.



Figure 3: Handle tilting for assembly

- Tighten each of cap screws using the 8mm hex key until the handle assembly is secured against the cabinet surface and all space between parts is eliminated.



Figure 4: Tightening screws

## 2.2 Transporting the Phoenix

The Phoenix Mini-Guardian HEPA System should be upright when transported by vehicle. It may be tipped on to its back for loading and moving by hand or for use on location.

## **!CAUTION**

### 2.3 Location

*Note the following precautions when locating the Phoenix Mini-Guardian HEPA System:*

- It is designed to be used INDOORS ONLY.
- If used in a wet area, plug it into a GROUND FAULT INTERRUPTER.
- DO NOT use the Phoenix Mini-Guardian HEPA System as a bench or table.
- The air inlet on top & the side outlets should be at least 1 foot from walls and other obstructions to airflow.

### 2.4 Electrical Requirements

The Phoenix Mini-Guardian HEPA System can be plugged into a grounded 15 Amp circuit. It draws about 2 Amps with clean filters and no ducting. The amp draw will decrease slightly with added ducting and as the filters load with particulate.

If an extension cord is required, it must have a minimum of 18 gauge conductors if 25 feet long or less and 16 gauge conductors if greater than 25 feet long.

## 2.5 Air Ducting

### 2.5A Inlet Ducting

Occasionally the area to be filtered is difficult to access and/or the unit cannot be located in the area. In such cases, the air can be ducted to the unit's inlet.

A round 12" diameter flexible duct can be attached to the unit inlet on top. It connects by placing the wire in the duct under the four tabs on the top. It may be removed after use for easier transport and storage. Flexible 12" duct is available from Therma-Stor LLC.



Figure 5: Inlet ducting

### 2.5B Outlet Ducting

A detachable rectangular exhaust collar is supplied that will allow 10" round lay-flat plastic duct to be attached to the Phoenix Mini-Guardian HEPA System outlet. Lay-flat plastic ducting is available from Therma-Stor LLC.

To attach ducting to a collar, remove the collar from the unit by sliding the collar upward out of the guide. Put the plastic duct end through the collar center. Roll the duct end outward so that it over-laps the outside of the collar. The duct will hook over the collar, preventing it from slipping off.



Figure 6: Outlet ducting

## 2.6 Negative Air Ducting

The Phoenix Mini-Guardian HEPA System can be used to filter and exhaust air from a space. By exhausting to outside the space, the space will be under a slight negative pressure. This will help prevent airborne particles from leaving the space, since the negative pressure will draw air in through openings in the space's exterior.

The quantity of air exhausted depends on how the unit is ducted and what speed is used. A duct can be directed outside. Cover the other exhaust openings to direct all the filtered air outside. This would result in up to 400 CFM being exhausted on high speed and an equal amount of fresh air being drawn in.

### !CAUTION

**CAUTION:** Exhausting too much air from a space with open combustion devices (e.g. furnace, fireplace or water heater) can cause those devices to backdraft. This can contaminate the space with potentially fatal gases.

In such cases, the Phoenix Mini-Guardian HEPA System must be used in one of the following three ways:

- A. As a filtering unit only. Exhausting no air from the space and thus causing no negative pressure or backdrafting.
- B. Exhausting a very limited amount of air which does not cause backdrafting. In case B, the open combustion devices must be thoroughly checked to guarantee that they do not backdraft while the Phoenix Mini-Guardian HEPA System is running.
- C. Direct the outlet duct from the Mini-Guardian HEPA System to the room with the open combustion device(s). This will positively pressurize the room, thus preventing backdrafting. As in case B, those combustion devices must be checked after the Mini-Guardian HEPA System is running to guarantee that they are not backdrafting.

The duct can be directed outside, exhausting a portion of the filtered air. The rest of the filtered air is recirculated inside the space. Blocking the other supply holes will determine the amount of air that is exhausted. By adjusting the blocking plates over the supply openings, the quantity exhausted can be adjusted down to no flow.

## 2.7 Power/Speed Control

The power/speed switch is located in the recessed cavity on the unit front. When turned on to any speed, it powers the impeller fan and hour meter.

Occasionally the impeller fan may not start on low speed. If this occurs, rotate the speed control to high speed until the impeller fan starts, then adjust it to a lower speed.

## **! CAUTION**

**CAUTION:** Do not remove the top to access the filters with the unit on. Removing the top and filters while running can:  
(A) expose potentially fatal high voltage electrical parts, and  
(B) expose the dangerous rotating impeller fan.

### **2.8 Hour Meter**

A digital hour meter is located near the power/speed control on the unit front. It measures the cumulative time that the unit is turned on to tenths of an hour. It stores its total when the unit is unplugged. The previous total will be displayed when the unit is next turned on.

It resets to zero after 99,999.9 hours of operation.

## **3 Maintenance**

### **! WARNING**

**Use extreme caution when changing the HEPA filter as hazardous material could be trapped in the media. Always make sure to dispose of filters in the appropriate way. If you are unsure of how to safely dispose of any filter-consult an industrial hygienist to ensure that all hazardous materials are contained and disposed of properly.**

### **3.1 Air Filters**

The standard Phoenix Mini-Guardian HEPA System is equipped with three filters that progressively filter out smaller particles. An optional activated carbon/potassium permanganate filter can be used, giving a fourth stage of filter media (see Section 3.1A). These filters must be checked regularly. Operating the unit with dirty filters will reduce the airflow, but will do no harm to the unit. The unit can be run indefinitely with dirty filters.

The three standard filters used are listed below (as installed in the unit from top to bottom):

- A. Polyester media pad pre-filter. Actual size 15-3/4" x 15-3/4" x 1" thick. The white side faces up. This filter should be replaced when the airflow is reduced, it is visibly dirty or when it is contaminated by a previous job.
- B. 25 to 30% efficient (per ASHRAE 52.1-1992), MERV-7, pleated fabric filter. Actual size is 15-3/4" x 15-3/4" x 1-3/4". This filter should be changed when airflow is reduced or it is contaminated by a previous job.
- C. 99.97% DOP efficient HEPA filter. Actual size is 13-7/8" OD x 24" x 8-7/8" ID. This filter should be changed when airflow is reduced or it is contaminated by a previous job.

### **3.1A Activated Carbon/Potassium Permanganate Filters**

Optional gas phase filters are available from Therma-Stor. They use a blend of activated carbon and potassium permanganate. This blend removes the vast majority of contaminants encountered in most filtering applications. The activated carbon removes the heavier volatile organics while the potassium permanganate removes lower molecular weight contaminants. This is well suited to the smoke odors present after fire damage.

The life of the media blend depends upon both the hours used and the contamination level. Another advantage of the blended media versus activated carbon only is that part of the blend changes color as it loads up with contaminants. It starts out black, then turns pink, then brown, and finally white. It is best changed when it passes the brown stage and begins to turn white. It has lost most of its effectiveness at that point. When these filters are installed, the pad filter does not need to be installed above them. This allows the operator to check the media color through the top grill of the unit without removing the top.

The filter is the same size as the pleated fabric filter. Install it above the pleated fabric filter. The pleated fabric filter catches carbon dust that comes off the carbon filter before it reaches the HEPA filter.

The refillable carbon filter is metal-framed and can be refilled with carbon blend media purchased in 5-gallon buckets. The amount of carbon blend media loaded into the filter can be adjusted to the particular amount of gas/odor removal required.

### **3.2 Checking Airflow**

The airflow is checked using a Phoenix Reed LM 8000 Multi-Function Meter placed on the designated area on the top of the unit.

To check airflow:

- Remove any inlet ducting, but leave the top and all filters in place.
- Turn the unit on high. The airflow meter will indicate an air speed. Please set the air meter to read FPM (refer to the meter instructions to set the mode). To determine CFM see the chart below:

FPM											
700	650	600	550	500	450	400	350	300	250	200	150
400	371	343	320	286	263	235	208	182	153	120	87
CFM											

Airflow on high speed with all filters clean and no ducting is about 400 CFM. The unit can be run with very dirty filters and virtually no flow without harming the unit. The operator's decision to change filters should be based on filter cost vs. the unit's filtering effectiveness. If airflow is 200 CFM vs. 400 CFM, the unit will filter particles from a space at half the rate. The operator must judge if that is acceptable.

If the operator determines the filters should be changed due to low airflow, it is most economical to change them in the following order:

Change the pad pre-filter (top) first. This is the least expensive filter. Recheck the airflow. If the airflow is acceptable, no other filters need to be changed.

Change the pleated fabric filter (middle) second. It is the second least expensive filter. Recheck the airflow.

If acceptable, the HEPA filter does not need changing.

If the airflow is still too low, the HEPA filter must be changed. To remove the HEPA filter, follow these steps:

1. Loosen the two 3/8" thumbscrews that secure the HEPA filter.



Figure 8: Loosen thumb screws

2. Push down on the filter hold-down bar and out on the back of the cabinet to disengage the two "ears" from the back of the cabinet. Rock the filter hold-down bar



Figure 9: Push down on the filter hold-down bar

3. Disengage the screw and spacer from the hole in the front of the cabinet and remove the filter hold-down bar.

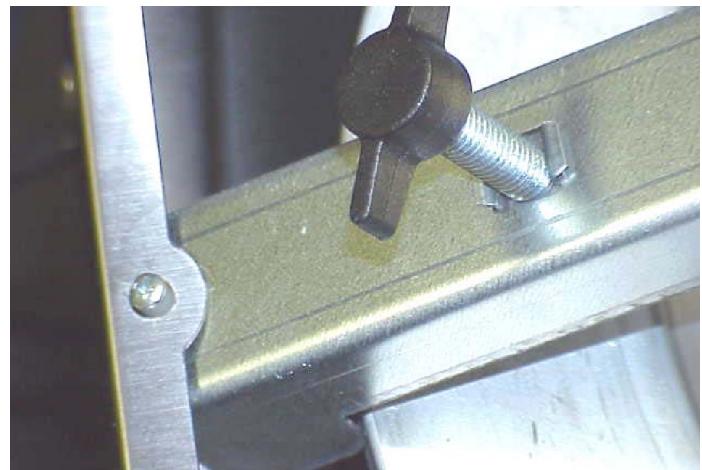


Figure 10: Disengage screw and spacer

4. Lift the old filter straight up and out of the cabinet. Place the new HEPA filter with the open side down, into the cabinet. Be sure the four bumpers on the base



Figure 11: Lift filter straight up

## 4 Service

### ⚠ CAUTION

**CAUTION:** Servicing the Phoenix Mini-Guardian HEPA System with its high voltage circuitry presents a health hazard that could result in death, serious bodily injury, and/or property damage. Only qualified service people should service this unit.

#### 4.1 Warranty

A warranty certificate has been enclosed with this unit. Read it before any repair is initiated. If a warranty repair is required, call the factory first at 1-800-533-7533 for warranty claim authorization and technical assistance.

#### 4.2 Impeller Fan Replacement

### ⚠ CAUTION

*Occasionally the impeller fan may not start on low speed. If this occurs, rotate the speed control to high speed until the impeller fan starts, then adjust it to low speed.*

Follow the steps below to change the impeller fan:

1. Unplug the power cord.
2. Remove the top and all air filters.
3. Remove the rear electrical guard held inside the unit by four mm machine screws and nuts.



Figure 12: Remove guard

4. Remove the cable clamp holding the impeller fan cable and ground terminals. Remove the ground wire from the mounting screw. Disconnect the black and brown wires from the run capacitor, and cut the blue wire near the wire nut.

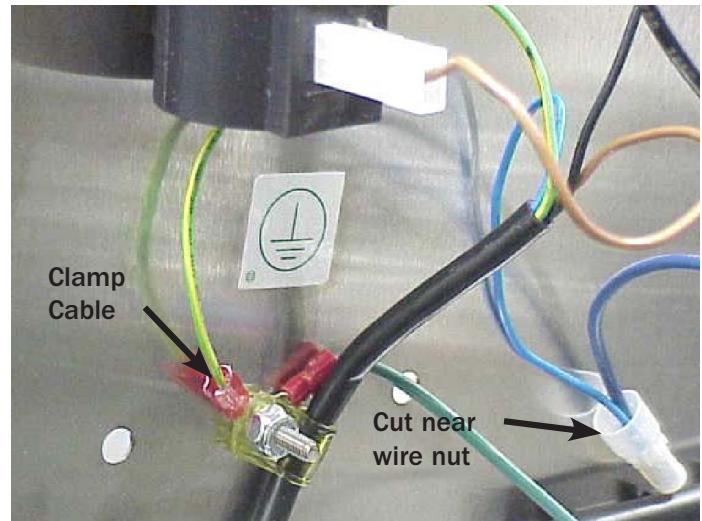


Figure 13: Remove cable clamp

5. Remove the 1/4" machine screws holding the base to the cabinet. Remove the base from the cabinet.
6. Remove the four 4 mm machine screws that hold the motor to the lower base. Remove the cable clamp that holds the impeller fan cable to the bottom of the base.

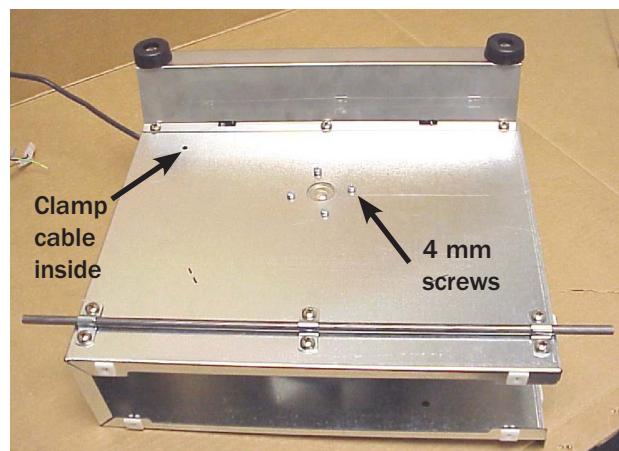


Figure 14: Remove screws

7. Remove the strain relief bushing holding the impeller fan cable in the top of the base.



Figure 15: Remove strain relief

- Using a pliers, twist the tabs of the base supports to align with the slots. Remove only one of the base supports (see below). Spread the base apart slightly to remove the impeller fan.
- Remove the four 4 mm machine screws and lock washers securing the impeller fan.
- Reverse this procedure to reassemble with the new impeller fan.

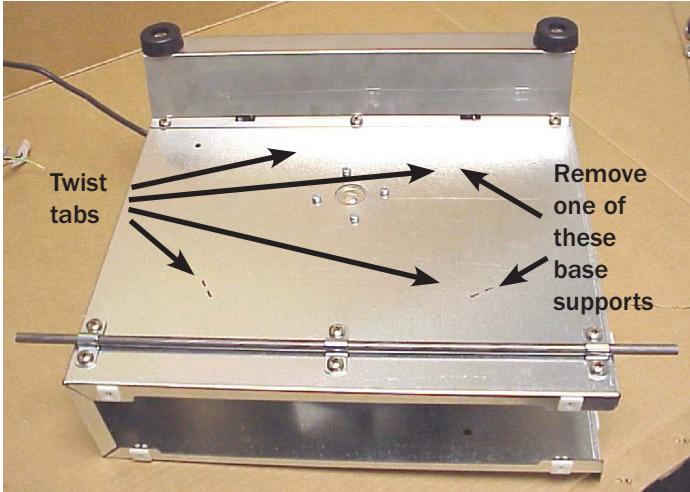
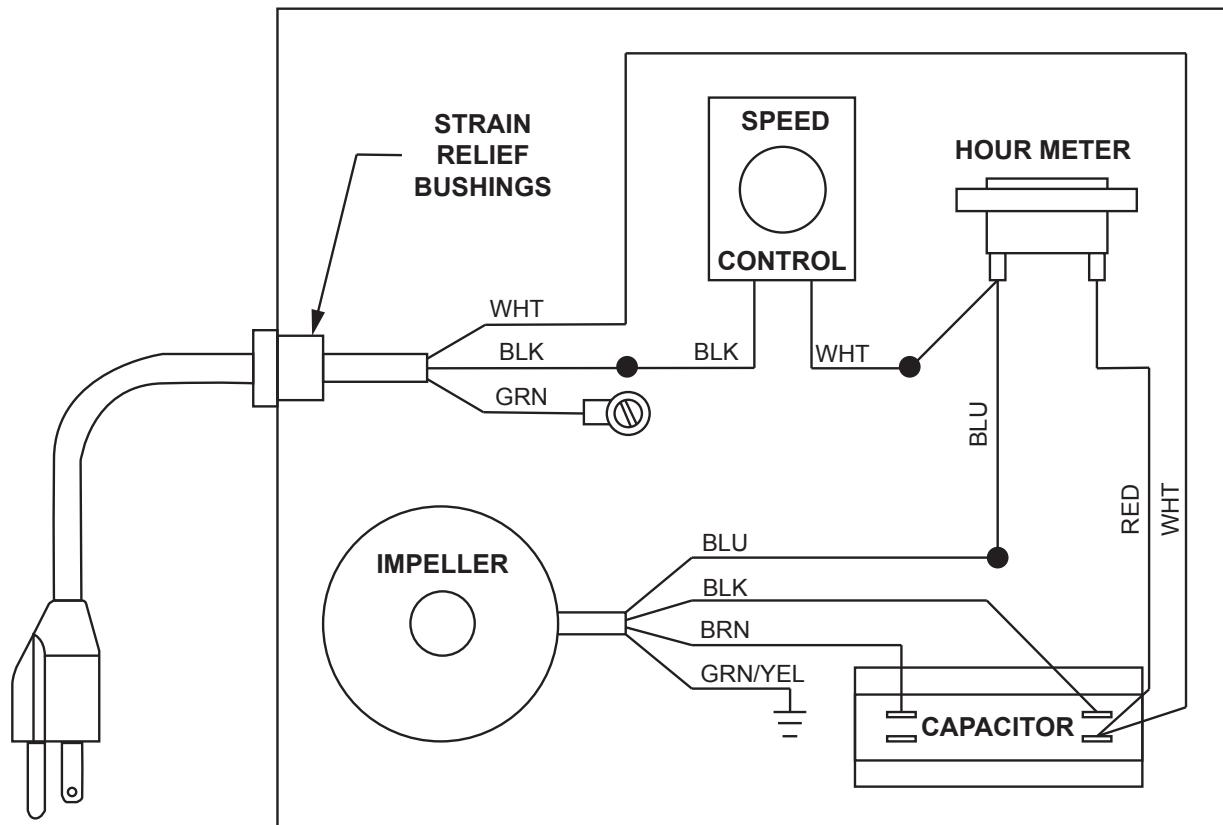


Figure 16: Twist tabs

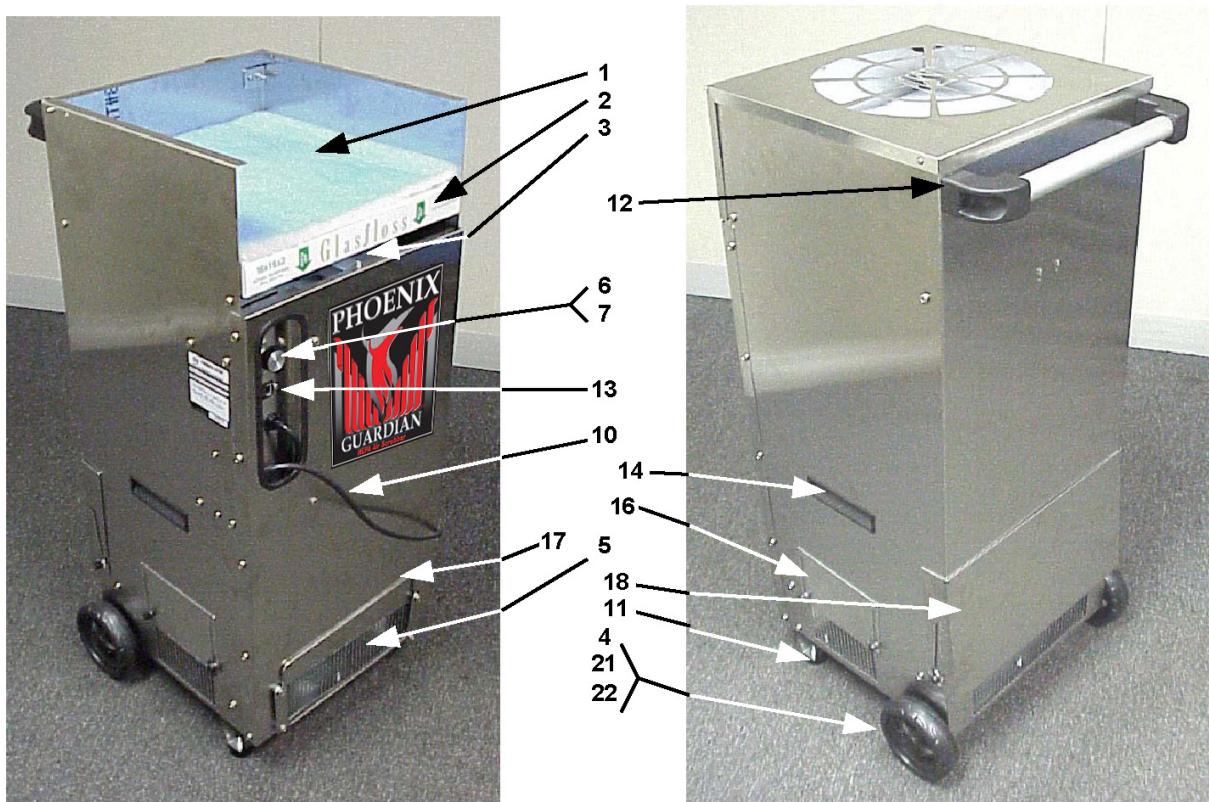
## 5 Wiring Diagram

Figure 17: Electrical schematic



## 6 Service Parts

Item	Part No.	Qty.	Description	Optional Parts
1	4024824	1	Air Filter, Polyester, 1" x 16" x 16"	4021950 Ground Fault Interrupter
2	4021799	1	Air Filter, Pleated, 2" x 16" x 16"	4024879 Air Filter, Disposable Carbon/Potassium Permanganate
3	4024667	1	Air Filter, HEPA, 14" OD x 24" (99.97% Efficient)	4024891 Air Filter, Refillable Carbon/Potassium Permanganate
4	4024830	1	Axle	4024528 Carbon/Potassium Permanganate, 5 gal Pail
5	4024684	1	Impeller Fan	4024750 Duct, Flex, 12" x 25'
6	4024773	1	Impeller Fan Speed Control	4022537 Duct, Lay Flat, 10" x 500'
7	4024825	1	Impeller Fan Speed Control Knob	4030115 Reed LM 8000 Multi-Function Meter
8	4024820	4	Bumper (.59 Dia. X .35 High)	
9	4022465	6	Bumper (1.13 Dia. x 1" High)	
10	4033011	1	Cord & Wire Harness	
11	4024073	2	Foot	
12	4026093	1	Handle Assembly	
13	4028795	1	Hour Meter	
14	4021700	1	Pocket Handle	
15	4033031-08	1	Run Capacitor, 20 mfd, 370 VAC	
16	4024070	2	Outlet Cover, Side	
17	4024078	1	Outlet Duct Collar	
18	4024822	1	Outlet Cover/Guard, Rear	
19	4024827	6	Thumb Screw, 1/4"	
20	4024828	2	Thumb Screw, 3/8"	



Specifications subject to change without notice.

This page intentionally left blank.

## Phoenix Mini-Guardian HEPA System Limited Warranty

**Warrantor:**

Therma-Stor LLC  
4201 Lien Rd  
Madison, WI 53704  
Telephone: 1-800-533-7533

**Who Is Covered:** This warranty extends only to the original end-user of the Mini-Guardian HEPA System, and may not be assigned or transferred.

**First Year Warranty:** Therma-Stor Products warrants that, for one (1) year the Mini-Guardian HEPA System will operate free from any defects in materials and workmanship, or Therma-Stor Products will, at its option, repair or replace the defective part(s), free of any charge.

**End-User Responsibilities:** Warranty service must be performed by a Servicer authorized by Therma-Stor Products. If the end-user is unable to locate or obtain warranty service from an authorized Servicer, he should call Therma-Stor Products at the above number and ask for the Therma-Stor Products Service Department, which will then arrange for covered warranty service. Warranty service will be performed during normal working hours.

The end-user must present proof of purchase (lease) upon request, by use of the warranty card or other reasonable and reliable means. The end-user is responsible for normal care. This warranty does not cover any defect, malfunction, etc. resulting from misuse, abuse, lack of normal care, corrosion, freezing, tampering, modification, unauthorized or improper repair or installation, accident, acts of nature or any other cause beyond Therma-Stor Products' reasonable control.

**Limitations and Exclusions:** If any Mini-Guardian HEPA System part is repaired or replaced, the new part shall be warranted for only the remainder of the original warranty period applicable thereto (but all warranty periods will be extended by the period of time, if any, that the Mini-Guardian HEPA System is out of service while awaiting covered warranty service).

UPON THE EXPIRATION OF THE WRITTEN WARRANTY APPLICABLE TO THE Mini-Guardian HEPA System OR ANY PART THEREOF, ALL OTHER WARRANTIES IMPLIED BY LAW, INCLUDING MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, SHALL ALSO EXPIRE. ALL WARRANTIES MADE BY THERMA-STOR PRODUCTS ARE SET FORTH HEREIN, AND NO CLAIM MAY BE MADE AGAINST THERMA-STOR PRODUCTS BASED ON ANY ORAL WARRANTY. IN NO EVENT SHALL THERMA-STOR PRODUCTS, IN CONNECTION WITH THE SALE, INSTALLATION, USE, REPAIR OR REPLACEMENT OF ANY Mini-Guardian HEPA System OR PART THEREOF BE LIABLE UNDER ANY LEGAL THEORY FOR ANY SPECIAL, INDIRECT OR CONSEQUENTIAL DAMAGES INCLUDING WITHOUT LIMITATION WATER DAMAGE (THE END-USER SHOULD TAKE PRECAUTIONS AGAINST SAME), LOST PROFITS, DELAY, OR LOSS OF USE OR DAMAGE TO ANY REAL OR PERSONAL PROPERTY.

Some states do not allow limitations on how long an implied warranty lasts, and some do not allow the exclusion or limitation of incidental or consequential damages, so one or both of these limitations may not apply to you.

**Legal Rights:** This warranty gives you specific legal rights, and you may also have other rights which vary from state to state.

