

SONOZAIRE ODOR NEUTRALIZER

Service Instruction Section

ROUTINE MAINTENANCE

The Sonozaire requires routine maintenance for years of service at maximum ozone output. This occasional maintenance requires only minor cleaning and will take only a few minutes. Failing to routinely clean the unit will reduce the ozone output and require longer times for treatment. A complete failure to perform maintenance can cause a total failure of ozone output and a possible failure of Sonozaire components, which voids the warranty.

The amount of time between cleaning will depend upon a few variables. Below is a list of important operating factors that increase the frequency for cleaning:

- ✓ Unit operated 24 hours a day.
- ✓ Unit operated 365 days a year.
- ✓ Unit mounted outdoors.
- ✓ Unit operated in a high moisture or humidity environment.
- ✓ Unit operated in an area of excessive dust or dirt.

The harder the service, the more often the maintenance is required. Sonozaire's, which are mounted outdoors, should be cleaned every 1-3 months. For fire restoration applications, check after every couple of jobs to determine if cleaning is necessary. Notice that if the unit is elevated above floor level, cleaning frequency should be less. This is because at floor level more moisture is drawn into the Sonozaire. Dry cleaners, hotels, motels, vehicles, or air purification applications should require cleaning approximately every 2-3 months. Please note the above cleaning suggestions are averages. Check your equipment more often initially to determine if your use will allow you to go longer or shorter periods between cleanings.

An easy way to determine if your machine is really dirty is to listen to it. With a clean Sonozaire, turn the ozone level knob to zero, and then turn on the machine. The blower will come on, and it has a low volume fan sound. Next, turn up the ozone knob briefly to hear the sound of corona being formed. This corona formation is the result of a high voltage causing an air gap to ionize. The sound is a low tone hissing or buzzing. A really dirty unit will have no corona sound. If a unit has too much moisture in it or is dirty, a snapping or arcing sound occurs. Please shutdown the unit and perform the necessary cleaning.

Routine maintenance consists of cleaning the air filter, cleaning the cabinet interior, cleaning of electrodes and glass, and oiling the blower motor. All of these tasks can be performed by almost anyone with a few simple instructions. The Sonozaire can be cleaned in the shop or on the job site. Cleaning supplies consist of clean water, glass cleaner, abrasive cleaner, abrasive brush, cleaning cloths or pads, and twenty-weight oil.

☞ **Unplug the Sonozaire**, remove and clean the air filter from beneath the Sonozaire. The filter is of a spun polyester material that can be cleaned by washing it out with water and possibly cleansing soap. Wash it out thoroughly and remove as much moisture as possible before reinstalling in the unit.

- Remove the front cover by taking out two or three screws at the bottom and pulling down on the cover. Look at the inside of the cabinet and compare it to the internal drawings of the proper model in this manual. Identify the following components: the high voltage transformer(s), the electrode assembly(s), and the blower motor. The electrode assembly(s) consists of an outer electrode(s), a glass cylinder(s), and a perforated inner electrode(s). See if the glass appears to be broken, dirty, smudged, or has a chalky appearance.

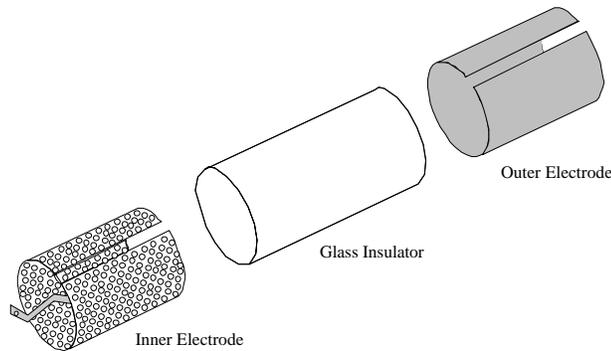
Ž Clean the electrode assembly(s). If possible, the cabinet should be laid on its back with the opening upward. Begin by removing the high voltage wire connected to the inner electrode(s) directly or via the bus bar(s). This requires removing the wing nut from this connection point. **Be careful** not to break the glass insulator tube(s). Next, loosen the generator holder retaining straps around the electrodes. The screw mechanism on the generator holder will swivel and allow the straps to pull all the way out. On the model 115A, only a single electrode is in the cabinet. On the models 330A and 630A, the electrodes are in sets of three. Disconnect the bus bar from the three inner electrodes and remove each individual electrode. They can also be carefully removed, as an assembly. Secure the electrode assembly(s) on a table or counter for cleaning.

- Disassemble the electrodes. Remove the bus bar on the triple electrode assembly to individualize each electrode if not done in step 3. From each assembly remove the outer electrode by slightly springing it open and carefully sliding it off the glass insulator tube. If the outer electrode is stuck to the glass, soak the entire assembly in hot water (soapy if necessary), or in some other solution such as Lime-A-Way. Next, remove the inner electrode by slightly squeezing it together and sliding it out of the glass tube.

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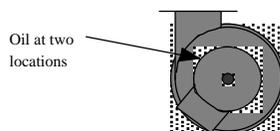
Service Instruction Section

CONT'D - (ROUTINE MAINTENANCE)



SINGLE ELECTRODE ASSEMBLY

- Clean each of the electrode components. Thoroughly clean the glass by normal methods used with glassware such as window cleaner, ammonia cleaners, or detergent and water. If the glass tube is extremely dirty, or appears to have oxidized, then clean thoroughly using a stiff bottlebrush. The inner and outer electrodes should then be cleaned. To remove any oxidization that might have built up on the electrodes, use an abrasive means, such as wire brush, SOS pad, stiff plastic brush with abrasive powders (Ajax or Comet), etc. The chalky substance on the aluminum electrodes is aluminum oxide that is a result of moisture. Clean the electrodes until they are back to the basic metal surfaces. Make sure to wash off any residue. Dry each of the electrode(s) and the glass tube(s) thoroughly.
- ' Reassemble the electrode assembly(s). Spring the inner electrode(s) open slightly to insure a tight fit, and install into the glass tube(s) until it is in the center of the glass (approximately 1-1/2 inches of clear glass on each end). Next, slide the outer electrode(s) over the glass and align it with the inner electrode(s) in the center of the glass. The bus bar can be installed for the model 330A and 630A here, but may be easier to install in next step.
- ' Reinstall the electrode assembly(s) into the cabinet. Look at the gaskets on the blower (115A), or on the plenum (330A & 630A), and verify they are in good shape. If they have any deterioration, order new ones and change out at next cleaning. Next, insert the electrode assembly(s) back into the generator holder and push the end of the glass firmly against the gasket on the blower, or plenum. Align the electrodes with the inner electrode tab down for the 115A and directed toward the back of the cabinet so that the bus bar (330A & 630A) dimples will slip into the holes on the inner electrode strap. Reattach the generator holder retaining straps around the electrode assembly and tighten securely all straps. Duplicate this for remaining electrode assemblies on the 330A and 630A models. Connect the bus bar if not done previously. Connect the high voltage lead wire from the transformer back to the inner electrode tab, or the bus bar. To prevent arcing, do not get the high voltage wire lead, bus bar, or inner electrode tab too close to the side or rear of the cabinet. Please refer to the internal drawing of the cabinet in this manual to verify that all components look as shown.
- " Use a damp cloth to wipe out the interior of the cabinet to remove dust, dirt, etc. If a cleanser is required, use one that does not have an alcohol or hydrocarbon base that might be flammable. Over scrubbing the cabinet's exterior or interior might destroy the paint. Wipe the interior out with a clean, dry, cloth.
- " Oil the blower motor with 10-20 drops of 20W oil or Teflon lubricant at each end of the blower motor. Do not over oil. Once every three months should be adequate. Wipe off the motor and verify that no oil has leaked onto the bottom of the cabinet.



OILING OF BLOWERS

- Replace the cover and test the unit. Test by plugging in the unit and turning it up slowly to raise the ozone level. Determine if the corona sound occurs and the smell of ozone is present. The unit should be ready to put back into operation.

After cleaning, if no ozone is detected, or corona sound is heard, unplug the unit. Remove the door and verify that the glass electrode(s) is up against the gasket(s), and that transformers are connected to the inner electrode, or bus bar. If all appears correct, refer to the troubleshooting section of this manual for directions.

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TROUBLE-SHOOTING

Troubleshooting the Sonozaire models require a familiarity with the machines, as well as general electrical troubleshooting and electrical safety skills. Testing can be done with a volt-ohmmeter, and some troubleshooting can even be done without electrical meters. However, do not attempt to do any troubleshooting until you are familiar with the function and components of the equipment. Do not attempt testing if any test or procedure is not fully understood.

Refer to the appropriate model's internal layout to follow operation and troubleshooting steps. Item numbers in bold will follow the descriptors below.

The Sonozaire units use a blower (**18**) to draw air in through the air filter (**20**) at the bottom of the cabinet (**1**). Air is drawn into the open end of the glass tube(s) (**6**), into the plenum (**35**) on the 330A/630A, into the blower (**18**), and out the top of the cabinet (**1**). The glass tube(s) (**6**) with inner and outer electrode(s) (**4&7**) is the location where the ozone is created. A high voltage field between the inner and outer electrode(s) (**4&7**) generates ozone. The voltage level to the generator is adjusted by the level control on the side of the Sonozaire. On model 115A, a rheostat (**19**), and on models 330A/630A, a variable transformer (**19**) is used to adjust the voltage to the high voltage transformer (**16**). Additional controls are the on-off selector switch (**22**) or the optional timer (**22B**), which controls the blower as well as power to the level control. There is also an optional control configuration that is referred to as the ventilation timer on some models. In this configuration, the ventilation timer controls only the time period that ozone is generated, and has no control over the blower.

Begin by removing the front cover (**2**) and looking inside the Sonozaire. Check for things that seem abnormal such as excessive dirt or film on cabinet, or any components. If a machine is stored for an extended period of time, moisture or humidity can cause a film to develop on some of the electrical components, such as where the brush (wiper) touches the windings on the variable transformer (**19**). Examine items that appear to need cleaning, such as the generator section (glass and electrodes). Look especially for components that appear to have heated or arced. These items can often determine what the cause of the problem is, and how to prevent it in the future.

On a following page is a list of symptoms, probable causes, and solutions to the problems. Please refer to this page for a starting point in troubleshooting the Sonozaire. After extended service of the machine, any component can fail. However, the most common failures come from a lack of cleaning and maintenance.

MOST COMMON ELECTRICAL TROUBLESHOOTING PROCEDURE

If the Sonozaire blower will operate, but no ozone is detected, the first step is to check to see if the unit needs cleaning. Unplug the unit before removing the front cover (**2**) to inspect the electrode(s) (**4&7**), and glass tube(s) (**6**). If they appear dirty or chalky, remove and clean as instructed under Routine Maintenance section of this manual. If the glass tube(s) is not up against the gasket(s) (**39**) on the blower (**18**), or the plenum (**35**), push it up against the gasket(s) firmly. Check the transformer fuse(s) (**34**) on the side of the newer cabinet, or located next to the transformer in the older style cabinets (**16**). Use an ohmmeter to verify the fuse is good. Fuses can look good, but be open in the end region that is not visible. If the fuse is good, place it back in the fuse holder (**25** in new cabinets or **33** in older cabinets). If the fuse is bad, replace it with the correct size and type.

If everything above appears to be correct, test the unit while the door is removed. This can be accomplished by being careful to keep hands out of the inside of the cabinet. Turn down the ozone level control (**19**) to zero, plug in the unit, press in the door safety switch (**21**), and turn on the selector switch or timer (**22** or **22B**). When the blower (**18**) comes on, turn up the ozone level control slowly. Listen for the distinctive "ionization" sound. It should intensify as the level increases. Verify that no arcing or sparking occurs. If an arc occurs, verify its location, turn off and unplug the machine. Determine the reason for the arc and correct it. Typical problems are dirty glass and electrodes, moisture in the glass, misalignment of electrodes, cracked glass, etc. If problem is not located, it is recommended that the high voltage transformer circuit be tested.

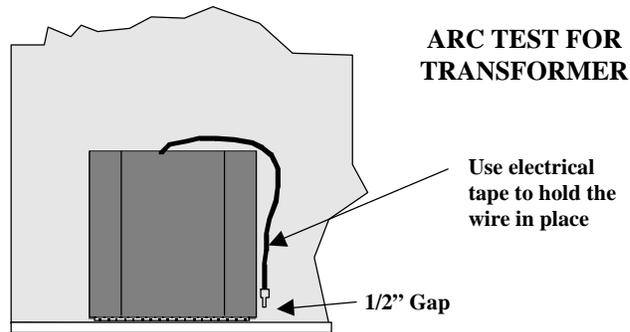
Proper testing of high voltage transformer (**16**) requires an AC voltmeter that will measure approximately 15KV. Actual voltage should be between 10KV and 14KV. If a HV test meter is unavailable, then an "arc" or "spark" test can be performed to determine if high voltage is available. Note that on a model 630A the transformer fuse on the transformer not being tested is to be removed, to prevent it from being energizing while the other HV transformer is tested. With the unit unplugged, disconnect the transformer (**16**) high voltage wire from the inner electrode(s) (**4**). Loop the high voltage wire down in front of the transformer and form it or tape it to the side of the transformer so that the wire is approximately ½ inch from the bottom of the cabinet. Do not hold the wire or use a screwdriver to hold it in place. With the door off, turn the ozone level knob (**19**) to zero, plug the unit in, hold down the door safety switch (**21**) and turn the selector switch or timer (**22** or **22B**) on. The blower should turn on. To "arc" test: raise the ozone level knob (**19**) gradually toward the maximum setting.

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CONT'D - (TROUBLE- SHOOTING)

When the knob approaches the maximum output, an arc should occur from the high voltage wire to the bottom of the cabinet. The arc should be a strong arc, but should not damage the cabinet, other than minor etching to the paint. If a strong arc occurs, then the high voltage and control circuits are good. The problem is in the electrode-glass assembly and can be fixed by cleaning or replacing electrodes or glass.



If the arc does not occur or is very weak, the transformer could be bad. Also, the voltage coming into the transformer might not be present or high enough. Repeat test for second transformer on model 630A. If voltage coming into the HV transformer is suspected not to be correct then a 150VAC voltmeter is required to test the primary voltage coming into the high voltage transformer.

Testing Voltage into HV Transformer on Model 115A

On the model 115A, begin by verifying that the unit is unplugged. Check that the transformer fuse is good as instructed above. Connect a 150VAC voltmeter from the left side (transformer side) of the brown resistor (30) located in the center of the cabinet and attached to the rear, near the bottom. Connect the other voltmeter probe to the cabinet ground. If possible, connect the voltmeter to the resistor with a jumper or alligator clip to hold it in place. If the probe must be held onto the resistor by hand, be very careful not to come near, or in contact with the high voltage transformer lead, or the inner electrode (4) to the left. This may have extremely high voltage present. Plug in the model 115A, set the ozone level control (19) to zero, turn on the selector switch (22), and press in the door safety switch (21). The voltmeter should read approximately 50 volts. Adjust the ozone level knob to mid-scale, and the voltmeter should read approximately 60-65 volts. Adjust the ozone level knob to maximum, and the voltmeter should read approximately 95-100 volts. If these readings are observed, then the rheostat (19) is good. If the rheostat appears to be bad, unplug the 115A, then place a temporary jumper between the two terminals on the rheostat (19) that have wires. This will bypass the rheostat, and the unit will be at full output. Plug in the unit, turn on the selector switch, press in the door safety switch, and the unit should come on at full output. If the "arc" test is being checked, it should produce a hot arc. If a hot arc occurs then the transformer (16) is good and the rheostat (19) is bad. If a hot arc is not seen, then the transformer is bad and should be replaced.

Testing Voltage into HV Transformer(s) on Models 330A and 630A

On the 330A/630A begin by verifying that the unit is unplugged and then remove the fuse(s) to the transformer(s). Check that the transformer fuse(s) is good as instructed above. With the transformer fuse(s) removed, there will be no voltage above 120VAC in the cabinet. Next, the voltage at the line side of the transformer fuse holder should be measured. To do this, connect the 150VAC voltmeter from the line-side of the fuse holder(s) (33) and the cabinet ground, or test between terminals 3 and 4 on the level control variable transformer (19). Plug in the unit's cord, turn the selector switch on, press in the door interlock switch, and turn up the level control knob to mid-scale (50%). The voltmeter should read approximately 60 volts. Turn up the level control knob to maximum (100%), and the voltmeter should read approximately 120 volts. If readings are correct, then the variable transformer (19) is good. If readings are much lower or erratic, then the variable transformer wiper, or variable transformer, is dirty or bad. Clean the area that the wiper (brush) contacts the variable transformer windings with a rubber eraser or electrical contact cleaner. Also, clean the wiper to remove film buildup. If this does not correct, replace the bad component. If the variable transformer (19) tests good, and the HV transformer (16) does not produce a strong arc, then the transformer is bad. Replace the transformer and verify that the unit performs correctly.

Replace all components with factory-approved components only. Failure to replace with factory-approved components could result in damage to equipment or injury to personnel. Do not attempt to repair the machines unless you have a complete understanding of the procedure, and the proper test equipment is used. Call your local distributor for parts and assistance. Call the factory direct if a local distributor is unavailable or unknown.

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TROUBLE- SHOOTING LIST

Note: Before beginning troubleshooting problems, always refer to all diagrams and manual instructions. These units have high voltages in excess of 10KV.

Symptom	Probable Cause	Solution
Machine not working.	Power to the receptacle off.	Check receptacle for power or tripped GFI.
	Cover not on good enough to close the door limit switch.	Tighten or adjust the cover.
	Main fuse blown.	Replace the main fuse with spare fuse.
	Failure of on-off switch or timer.	Replace on-off switch, contacts, or timer.
	Failure of door limit switch.	Replace the limit switch.
No Ozone or Low Ozone Output	Failure of blower motor.	Verify that blower motor will rotate and has not failed. Lubricate or replace if necessary.
	Glass tube(s) not up against the gasket(s) on the blower or the plenum.	Push the glass tube(s) up against the gasket(s) to prevent air from bypassing the generator.
	Ozone level setting too low.	Increase the setting.
	Dirty or oxidized glass tube(s) and electrodes.	Clean the glass and electrodes, or replace them.
	Cracked glass insulator(s).	Replace the glass insulator tube(s).
	Blown HV transformer fuse.	Verify fuse is blown and replace. Check glass.
	HV transformer failed.	Test transformer and replace if required.
	Dirty, worn, or broken variable transformer wiper (brush).	Clean or replace the variable transformer wiper.
Main Fuses Blown	Variac, rheostat or resistor failed.	Test and replace components if required.
	No air movement (blower not operating).	Clean filter. Free the blower from obstructions and oil motor with 20W oil. Replace motor, if necessary.
	Shorted variac or rheostat.	Replace the component.
Transformer Fuses Blown	Shorted blower motor.	Replace the blower motor.
	Transformer shorted.	Replace the transformer.
	Glass insulator tube is very dirty, has excessive moisture in it, or is cracked.	Clean the glass and electrodes, or replace the glass tube and electrodes.
	Wire insulation breakdown.	Locate the wire failure and replace.

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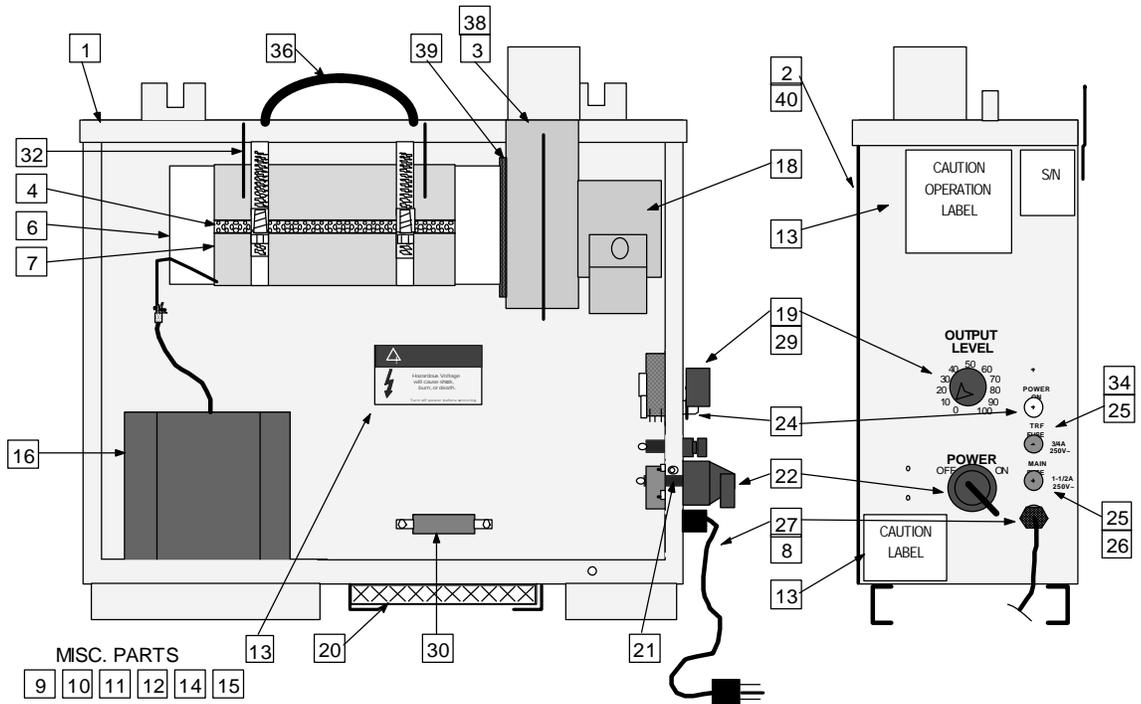
PARTS LIST

ITEM #	SONOZAIRE PARTS DESCRIPTION	115A PARTS #	330A PARTS #	630A PARTS #
1	Enclosure Assembly	1007-91-2	1045-4-2	1045-3-2
2	Cover Assembly	1007-92-1	1045-7-1	1045-6-1
3	Gasket-Blower to Cabinet	1007-25-2	1007-25-2	1007-25-2
4	Inner Electrode	1007-98-1	1007-98-1	1007-98-1
5	Nameplate Decal	1007-40-1	1007-40-1	1007-40-1
6	Glass Insulator Tube	1007-19-2	1007-19-2	1007-19-2
7	Outer Electrode	1007-99-2	1007-99-2	1007-99-2
8	Line Cord	W1	W1	W1
9	Term Lug No. 10	R4161GSF	R4161GSF	R4161GSF
10	Term Lug No. 8	S4166S	S4166S	S4166S
11	Butt Splice	B4071	B4071	B4071
12	Wire Nut 16-18AWG	NP5115	NP5115	NP5115
13	Instruction Decals, Set of 3	1007-85-1	1007-85-1	1007-85-1
14	Cable Ties	ELAM	ELAM	ELAM
15	Cable Anchor	AAABMM	AAABMM	AAABMM
16	Transformer (HV) Step-up	T1	T2	T2,T3
17	Transformer Step-down	TSD1 (150VA)	TSD2 (350VA)	TSD2 (350VA)
18	Blower Motor	1007-71-1	1007-71-1	1007-72-1
19	Rheostat/Variable Transformer	R1	VT1	VT1
20	Air Filter	1007-110-1	1007-110-1	1007-110-1
21	Micro Switch (Door Safety)	S1	S1	S1
22	Selector Switch (On-Off)	S2	S2	S2
23	Lamp, Red	DS1	----	DS1
24	Lamp, White	DS2	DS2	DS2
25	Fuse Holder, Panel Mtd	XF1	XF1	XF1
26	Fuses, Main	F1 (MDL 1-1/2)	F1 (MDL 3)	F1 (MDL 5)
27	Bushing, Strain Relief	8103-375	8103-375	8103-375
28				
29	Knob, Ozone Level	5150	5530	5530
30	Resistor	RS1	----	----
31	Transformer Bracket (old style cab)	1007-79-1	1045-5-1	1045-5-1
32	Strap Support Assembly	1007-80-2	1045-9-2	1045-9-2
33	Fuse Holder, In-Line (Trf old style)	XF2	XF2	XF2
34	Fuses, Transformer	F2 (MDL3/4)	F2 (MDL1-1/4)	F2 (MDL1-1/4)
35	Plenum Chamber	----	1045-10-1	1045-10-2
36	Handles	2644	2644	2644
37	Bus Bar	----	BB2	BB2
38				
39	Gasket-Glass to Blower/Plenum	1007-97-1	1007-97-1	1007-97-1
40	Cover Gasket Set	1007-97-2,-3,-4	1045-8-2,-3,-5	1045-8-1,-2,-3
41	Generator Support Gasket (old style)	----	1045-8-4	1045-8-4
42	Gasket-Blower to Plenum	----	1007-97-7	1007-97-7
43	Fuse Bracket (old style)	1007-93-1	1007-93-1	1007-93-1
44	Standoff	8067-A-10	8067-A-10	8067-A-10
45	Brush for Staco Variac	----	----	----
16A	Hi-Perf. HV Transformer Oil-Filled	TFSPEC	TFSPEC	TFSPEC (2ea)
21A	Micro Switch (240V), DP	S1A	S1A	S1A
22A	Selector Switch (240V), DP	S2A	S1A	S1A
22B	Timer, 12 Hour, 120V, SP	TM1	TM1	TM1
22C	Timer, 12 Hour 240V, DP	TM1A	TM1A	TM1A
45A	Brush for Superior Powerstat	----	----	----

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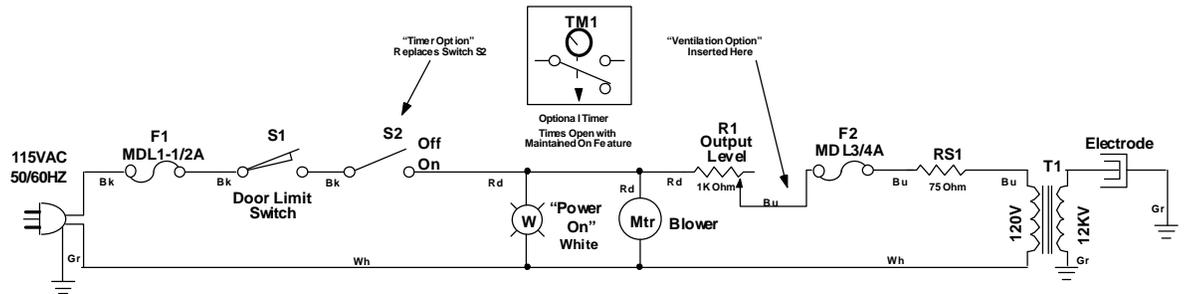
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Model 115A Drawing and Parts

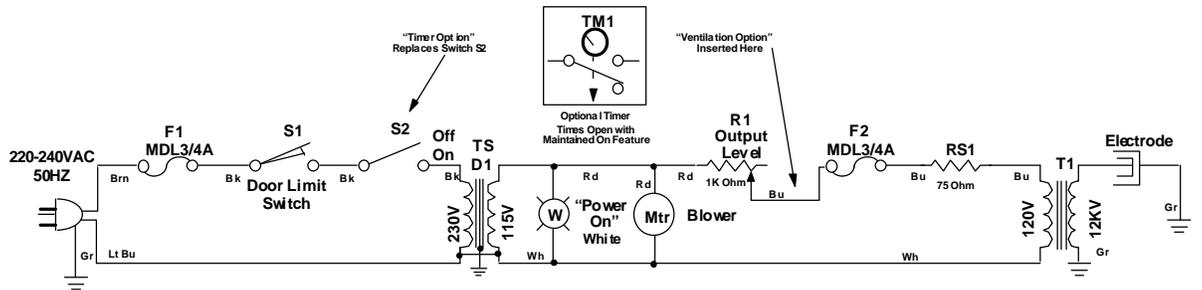


Sonozaire Model 115A

Model 115A Schematic



Schematic for Sonozaire Model 115A (115vac, 50/60hz)

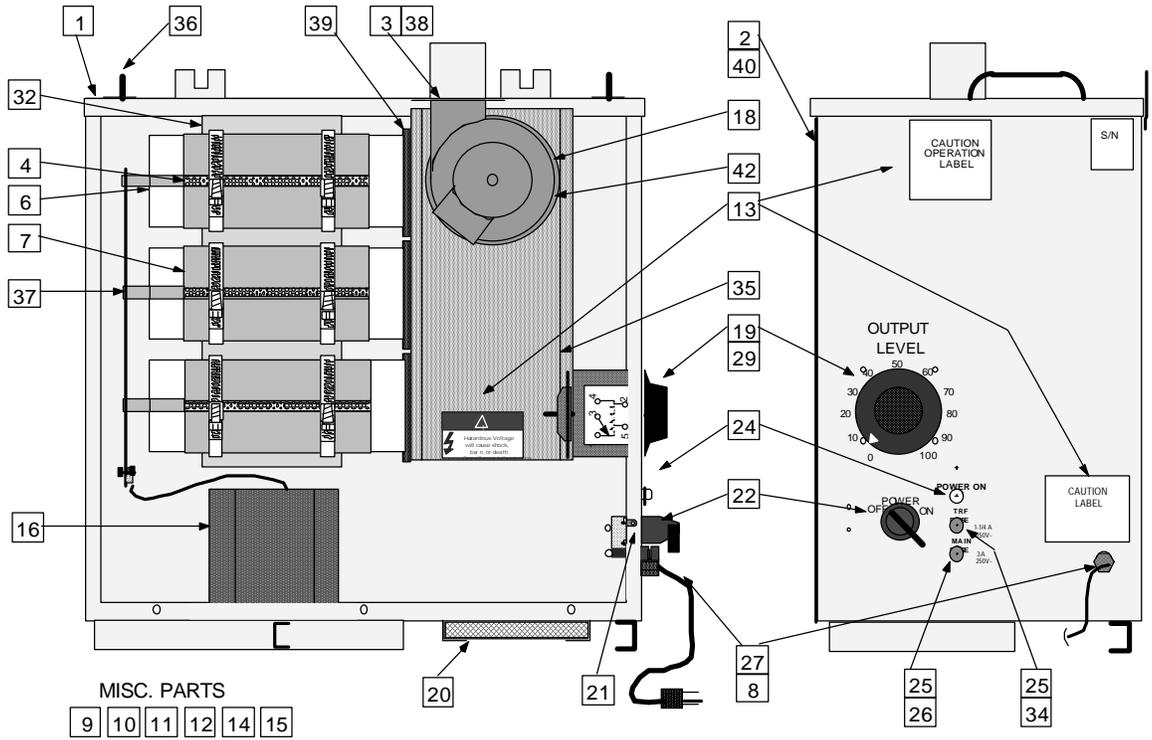


Schematic for Sonozaire Model 115A (230vac, 50hz)

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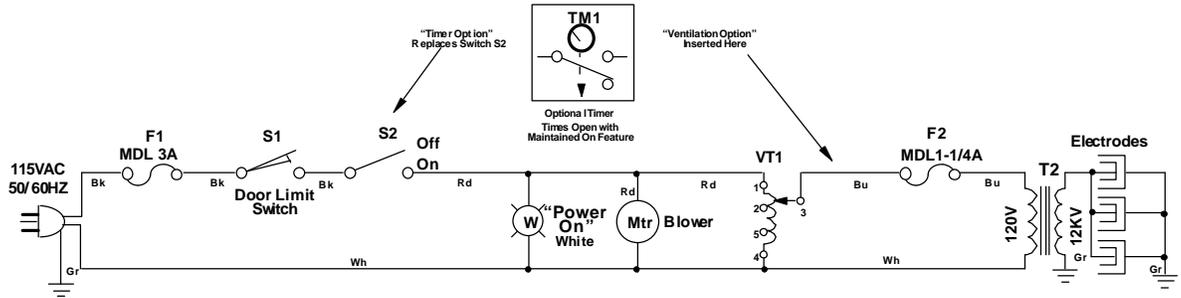
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Model 330A Drawings and Parts

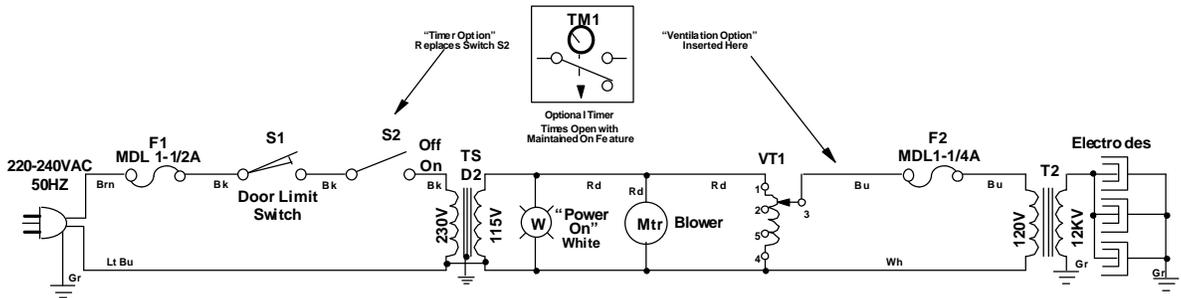


Sonozaire Model 330A

Model 330A Schematic



Schematic for Sonozaire Model 330A (115vac, 50/60hz)

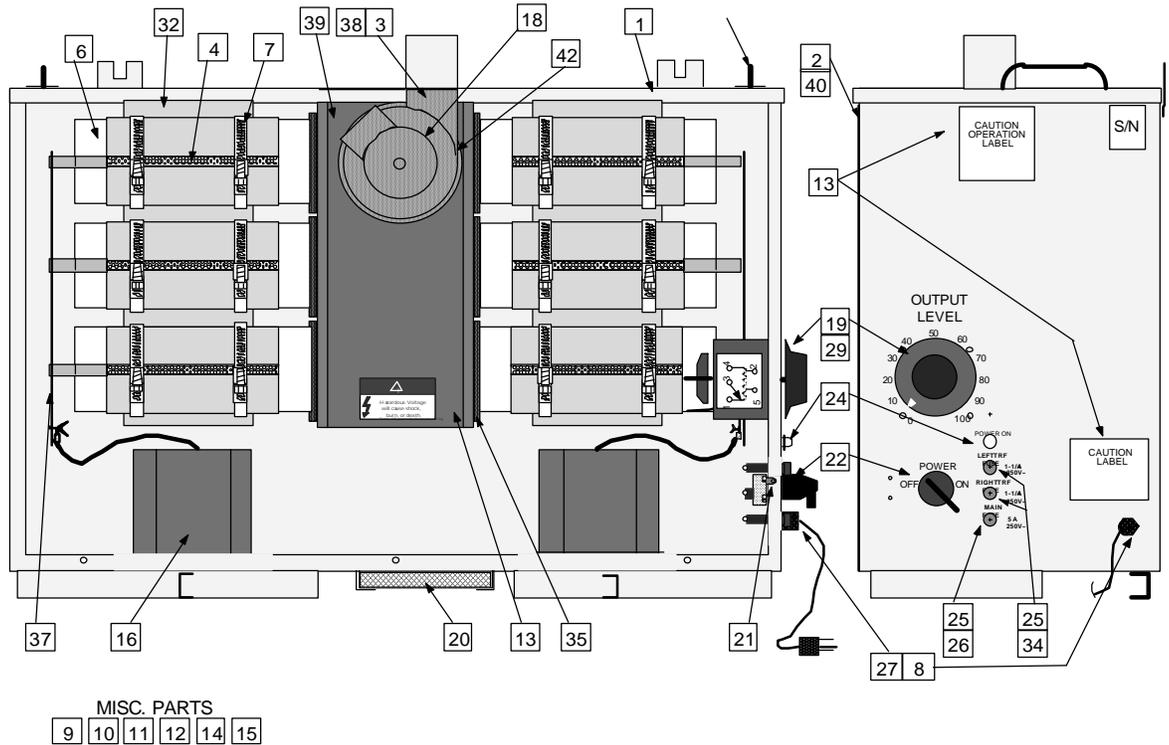


Schematic for Sonozaire Model 330A (230vac, 50hz)

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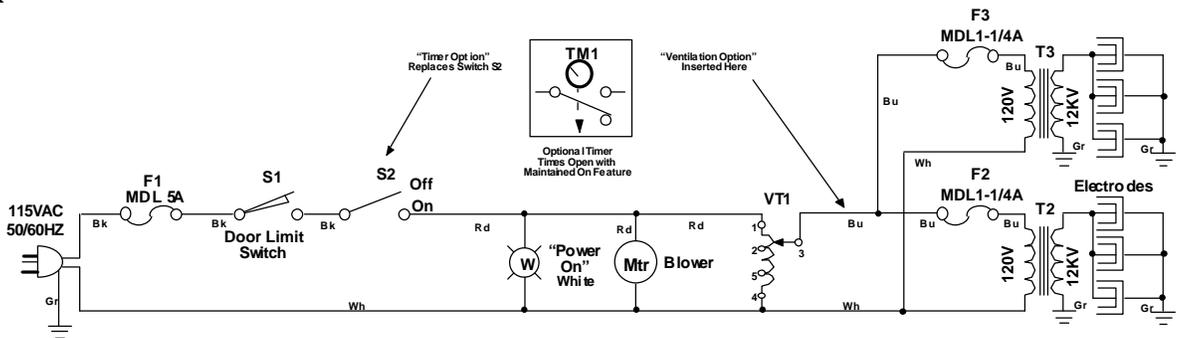
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Model 630A Drawings and Parts

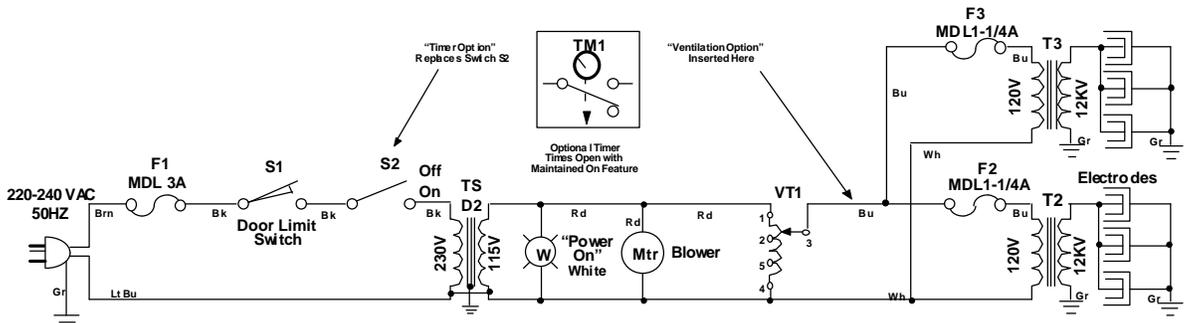


Sonozaire Model 630A

Model 630A Schematic



Schematic for Sonozaire Model 630A (115vac, 50/60hz)



Schematic for Sonozaire Model 630A (230vac, 50hz)