

50 Hz Robust-Aire™ DIFFUSED AERATION SYSTEM

Installation &
Operation
Manual

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SAFETY FIRST

IMPORTANT: PLEASE READ THIS MANUAL AND SAVE FOR FUTURE REFERENCE

WARNINGS:



Electrical Shock Hazard

- Use caution when dealing with any electrical equipment.
- All electrical equipment must be Ground fault/leakage current protected. Use of a Ground fault protective device (GFI, RCD, RCBB, or RCBO type device) is required as directed by local and national codes.
- Use caution around water.
- Running the system in conditions below freezing may create open areas of water at the diffuser locations and thin ice in the surrounding area.
- Some areas require warning signs to be posted. The system owner will assume all risks of operating the Robust-Aire™ system during winter months. Check your local laws and ordinances.
- Do not use boats that tip easily, such as canoes, for installation. Follow all boating safety rules and regulations, including wearing a Personal Flotation Device.
- Consult a qualified electrician for electrical installation.

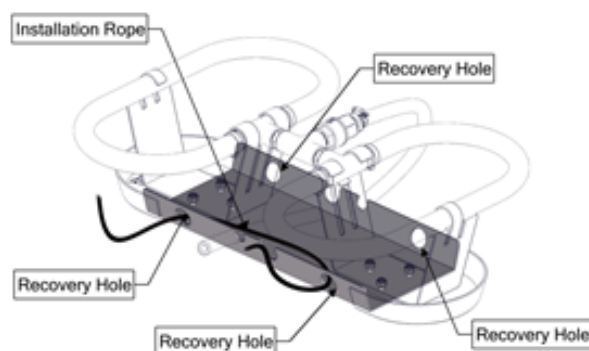
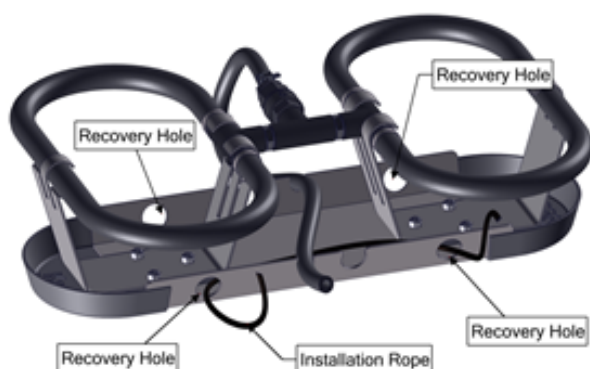
UNIT SPECIFICATIONS

	Compressor(s)	Number of diffusers	Voltage	Compressor HP
No Cabinet, Base Mount, & Post Mount Packages				
RAE1	KM-60HC	1	230	1/4
RAE2	KM-120HC	2	230	1/2
RAE3	KM-120HC	3	230	1/2
Additional Base Mount Packages				
RAE4	KM-120HC (x2)	4	230	1/2
RAE5	KM-120HC (x2)	5	230	1/2
RAE6	KM-120HC (x2)	6	230	1/2

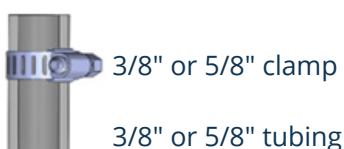
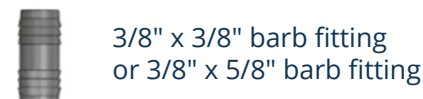
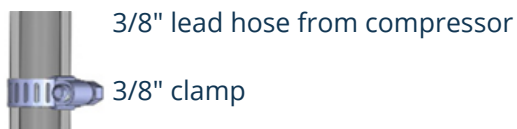
DIFFUSER INSTALLATION

Place the Robust-Aire™ Diffusers equidistant from each other at a depth that is representative for most of the pond.

1. Recommends marking the location of each diffuser at the surface with a buoy.
2. Unroll the SureSink™ Tubing on shore to remove any twists or knots.
3. Each tubing length is 100 feet. If more than one length of tubing is required to reach a diffuser location, connect any additional tubes according to the SureSink™ Tubing instructions. You can connect any number of 100' lengths together. Cut off any excess tubing at the shore before connecting to the compressor.
4. Drop the loose end of the tubing near the compressor cabinet. Allow a few extra feet of tubing to work with so the tube will reach the cabinet after trenching between the shore and the compressor.
5. Keep tubing clear of the propeller and slowly make your way to the marking buoy, placing the tubing as you go.
6. Once you reach the buoy, thread a rope through the two holes of the diffuser base. Pull through until the midpoint of the rope is at the diffuser base.
7. While holding the two ends of the rope, gently lower the diffuser assembly into the water until it reaches the bottom of the pond. The diffuser will always land right-side up.
8. You can remove the rope by pulling on one end, but for ease of future maintenance, Kasco recommends leaving the rope looped through diffuser base and tying both ends to a marker buoy.
9. Repeat the process for additional Robust-Aire™ Diffuser locations.



COMPRESSOR CONNECTIONS



1. Finish connecting the tubing to the lead hose from the compressor with the supplied barb fitting. Tighten clamps to both supply tubing and compressor hose.
2. Bury tubing from the shore to the compressor.

NO-CABINET INSTALLATION

Suggested Tools & Supplies

- Phillips-head screwdriver
- Flat-head screwdriver
- 5/16" socket or nut driver
- 1/4" socket or nut driver
- 9/32" socket or nut driver
- 3/8" socket or nut driver (#10 nuts)
- 7/16" socket or nut driver (1/4" nuts)
- Thread sealant (Teflon tape)

Installation Conditions & Clearances

- Install compressor in a clean, dry location.
- Protect the compressor from dirt, moisture, and any harmful elements of the outdoor environment.
- Ambient air temperature must not exceed 104 °F (40 °C).
- Adequate ventilation and cooling air (airflow across the compressor) is essential to prevent damage to the compressor from overheating. A fan is included for this purpose.
- Easily mount the unit to a wall, floor, or bench with the included bracket.

Packages containing 120V compressors have a NEMA 5-15 plug. Packages containing 240V compressors have flying leads. Hard-wire the leads into 240V service or install an appropriate plug.

Wiring Connections

Brown	—————>	Black
Blue	—————>	White
Green w/ stripe	—————>	Green



NOTE Electrical wiring color codes may vary by country/region. Check local codes before making connections.

NO-CABINET INSTALLATION (CONT.)

Parts Lists

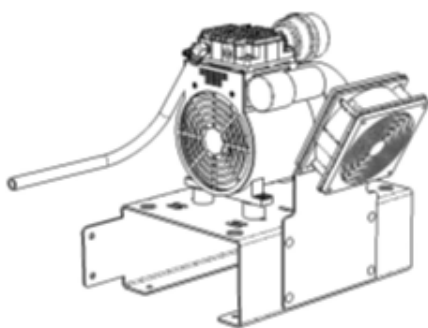
RA1-NC Parts Included	Qty.
Robust-Aire™ Diffuser Assembly	1
Single head compressor	1
1/4" NPT x 3/8" barb brass elbow	2
Compressor vibration isolation feet	4
1/4" flat washer	4
1/4" locknut	4
Cooling fan assembly	1
#10 x 3/4" bolt	4
#10 split washer	4
#10 nut	4
3' length of 3/8" hose	1
Hose clamp	3
Intake hose	1
Intake block	1
Filter minder	1
Air filter	1

RA2-NC Parts Included	Qty.
Robust-Aire™ Diffuser Assembly	2
Single head compressor	1
1/4" NPT x 3/8" barb brass elbow	3
Compressor vibration isolation feet	4
1/4" flat washer	4
1/4" locknut	4
Cooling fan assembly	1
#10 x 3/4" bolt	4
#10 split washer	4
#10 nut	4
Hose clamp	3
Intake hose	1
Intake block	1
Filter minder	1
Air filter	1
Two station manifold assembly	1
Manifold mounting screw	2

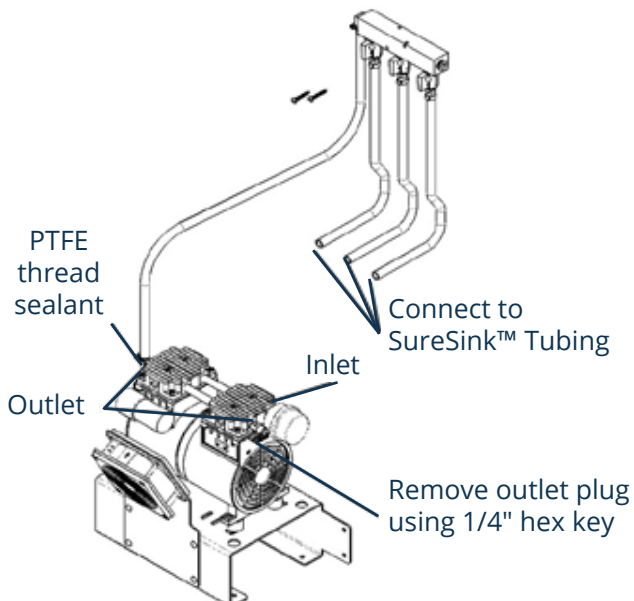
RA3-NC Parts Included	Qty.
Robust-Aire™ Diffuser Assembly	3
Double head compressor	1
1/4" NPT x 3/8" barb brass elbow	3
Compressor vibration isolation feet	4
1/4" flat washer	4
1/4" locknut	4
Cooling fan assembly	1
#10 x 3/4" bolt	4
#10 split washer	4
#10 nut	4
Hose clamp	3
Intake hose	1
Intake block	1
Filter minder	1
Air filter	1
Three station manifold assembly	1
Manifold mounting screw	2

NO-CABINET INSTALLATION (CONT.)

Contact a licensed electrician to install either 230V single-phase power at the compressor location with appropriate human-rated ground fault protection.



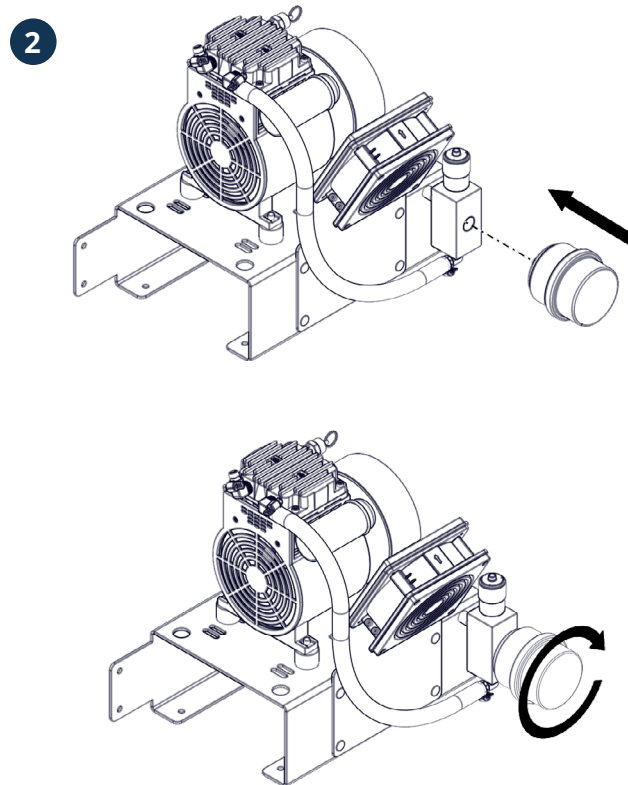
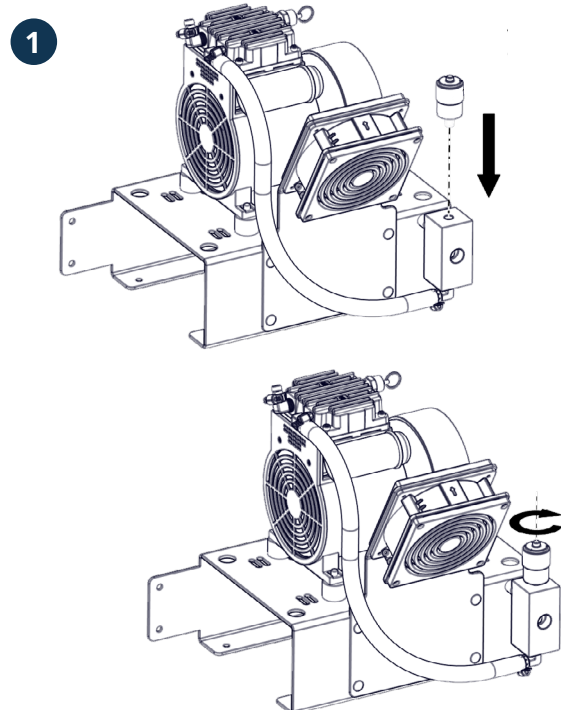
RAE1-NC



RAE3-NC

No-cabinet systems arrive assembled. To prepare for installation:

1. Thread the filter maintenance indicator into the top port of the intake manifold block. Hand-tighten and **DO NOT OVER-TIGHTEN**. Thread until snug.
2. Thread the air filter into the front port of the intake manifold block.

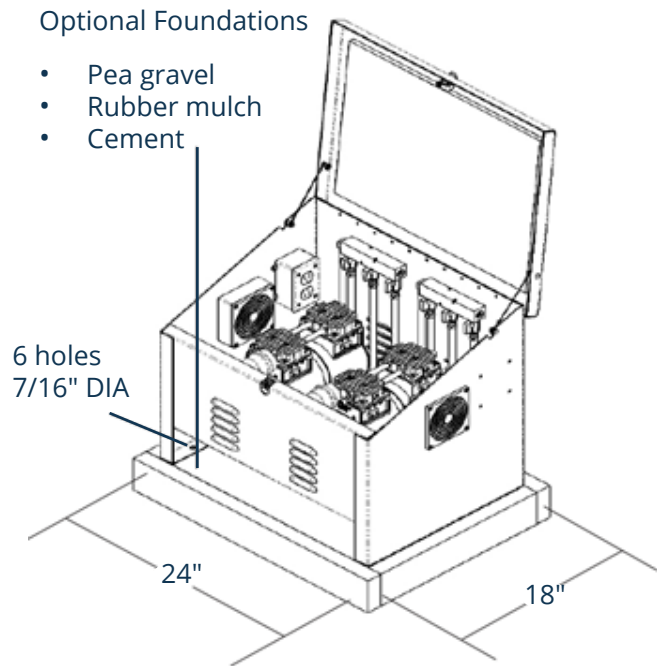


BASE MOUNT CABINET INSTALLATION

Choose a location far enough from shore to avoid potential flooding. Be sure that both the inlet and the outlet vents are clear, as the compressor requires airflow to prevent overheating.

Place the assembly directly on the ground or attach it to a concrete pad. Use the holes on the bottom flanges to anchor the cabinet.

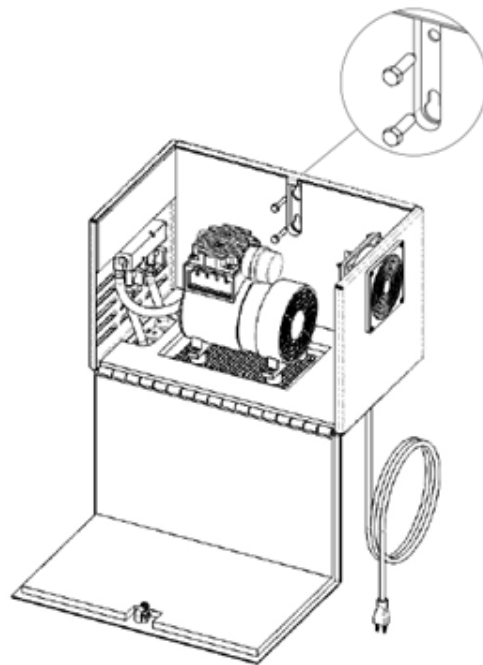
Place the cabinet adjacent to the electrical service which will power the system. The cabinet has 1.8m power cord(s) with plugs. **DO NOT USE EXTENSION CORDS.**



POST MOUNT CABINET INSTALLATION

Attach the post mount cabinet to a post or vertical wall (shed) with electrical service.

Use the two provided lag screws to mount the cabinet to the wall or post. Drill two 3/16" holes vertically spaced 2-3/8" apart. Using a standard 7/16" socket wrench, install one lag screw into the wall or post, leaving the hex head out about 1/4". Hang the cabinet from this screw using the bottom keyhole slot. You may need assistance from a second person to help hold the cabinet. Install the second lag screw in the top mounting hole. Tighten both lag screws.



NOTE No key is required to open either cabinet. Simply use a flat-head screwdriver.

REMOTE MANIFOLD INSTALLATION

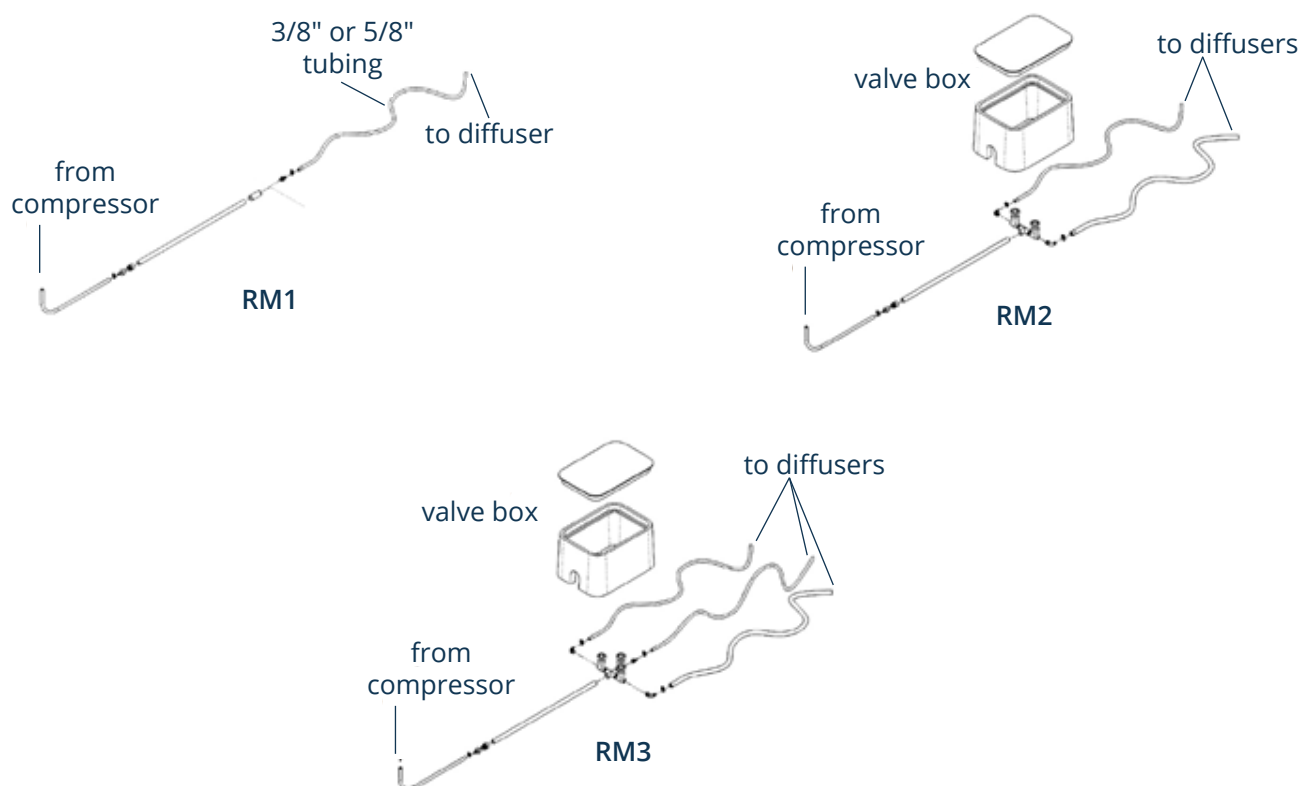
Robust-Aire™ systems with the optional remote manifold have a single air line exiting each compressor. Follow the instructions below to assemble and install the remote manifolds.

Suggested Tools & Supplies

- 3/4" Sch. 40 PVC pipe (amount to be determined by user)
- 3/4" Sch. 40 PVC pipe Couplings (as needed)
- PVC primer and glue
- PVC pipe cutter
- Shovel or other trenching tools
- Pliers (for hose clamp installation)
- Thread sealant

You will need to excavate a trench to bury the PVC air line. Start by determining the path of the trench from the Robust-Aire™ system to an area near the shore. The path should be as straight as possible, with a gentle downward slope from the Robust-Aire™ system towards the water. Dig the trench 6" to 8" deep.

For two or three station valve manifolds, excavate an area large enough to bury the included valve box. You will need an area at least 18" wide x 25" long x 13" deep. Dig the area deeper and add crushed rock to allow for necessary drainage.



REMOTE MANIFOLD INSTALLATION (CONT.)

CAUTION: In northern climates where the ground freezes during winter, be sure there are no high or low spots in the PVC air line. Condensation in the air line may pool, freeze, and block the flow of air to your diffuser. This can also damage your compressor.

RAE1 – RAE3 systems require a single trench.

RAE4 – RAE6 systems require either a single trench or two separate trenches, depending on pond size and diffuser locations.

Connect the brass barb fitting to the PVC adapter, applying thread sealant to male threads on PVC adapter. Connect the barb fitting to the rubber compressor hose lead and secure with a clamp.

Connect the PVC adapter and PVC pipe with primer and glue. Add pipe sections as needed to reach the remote manifold.

Prime and glue the manifold assembly to the PVC pipe supplying the compressor. Install 3/8" or 5/8" barb fittings depending on the size of SureSink™ Tubing to each diffuser. Apply thread sealant to the male threads of the barb fittings. Attach the tubing to each barb fitting and secure with a hose clamp.

When applicable, place a valve box over the manifold assembly and fill around the box and the entire length of the trench with the excavated dirt. The lid of the valve box should be flush with the ground.

Following installation of systems with multiple diffusers, use the valves to balance flow to each diffuser.

STARTUP PROCEDURE

IMPORTANT INSTALLATION WARNING

Thermal stratification refers to layering that occurs in some lakes and ponds when warmer water sits on top of colder, denser water toward the lake bottom.

If you install your unit into a body of water that is extremely stratified, use caution when starting the system. In some cases, colder water sitting on the bottom could hold gases that can be harmful to fish. Often, the colder bottom water also contains little or no dissolved oxygen.

A simple test for thermal stratification is to use a thermometer to gradually check for water temperature changes between the top and bottom of the lake or pond. Measure temperature every two feet of depth. Keep the thermometer at each depth long enough to take an accurate temperature reading. Then quickly bring the thermometer to the surface and record the temperature at each depth.

If the colder water (anything 4 °F colder than surface) represents more than 30% of the overall volume, start aeration at a slower pace by running the system for short intervals only. For a stratified lake, a suggested start-up interval might include running the system one hour per day for one week and gradually increasing the duration until the system is running continuously. Lakes and ponds react differently to diffused aeration, so exact time frames can be difficult to predict. Sunny days are preferable to cloudy days for system start-up, since photosynthesis will supplement oxygen levels as the water is mixed.

WINTER OPERATION



NOTE The system owner assumes all risks of operating the Robust-Aire™ system during winter months.

Operating the Robust-Aire™ system during the winter or in freezing temperatures may create open areas of water at the diffuser locations. Ice surrounding those areas will be thin. Use extreme caution in the area to avoid injury or fatality from falling into the water. Use signs to indicate the danger to others. Check your local laws and ordinances; some areas require warning signs to be posted.

In climates where temperatures fall below freezing, Recommends insulating the air lines from the compressor cabinet a minimum of 3 feet into the water (use low water level for reference). Prevent ice buildup in the lines by using closed cell polyurethane foam to insulate. Ice buildup can block the flow of air to your diffuser and cause damage to your compressor. Insulation should pass through the ice, into the open water below.

Moving the diffusers closer to shore in winter will allow a small area of the shoreline to remain open, preventing winter kill.

MAINTENANCE

Warning! Product surfaces become very hot during operation. Allow compressor to cool before servicing. Disconnect electrical power before performing maintenance.

- Check filter monthly.
- Clean or replace intake filter when filter minder shows a red band.
- Reset by pushing the small button on the minder top.
- Failure to maintain clean air filter will lead to excessive heat and premature failure of the compressor.
- Replacement air filter element part number: 771018



Clean filter



Dirty filter

TROUBLESHOOTING

“Compressor and fan are not running.”

- Ensure the power cord is connected. Check if the user supplied GFCI circuit is tripped. Reset as necessary

“The fan is running but the compressor is not”

- Inspect the compressor and capacitor wiring and connections.

“The compressor and fan are running, but there are no bubbles coming out of any diffusers”

- Check for leaks in line connections and at the compressor. Check connections for tightness.

“The compressor and fan are running. There are bubbles coming out of some diffusers, but not all of them.”

- The valves in the cabinet may need to be balanced. There may be a clogged diffuser that needs to be cleared. The compressor may be due for a rebuild.

“The compressor stops and restarts”

- Ensure the fan is working properly. Capacitor may need replacement.

WARRANTY

Warranty is void if:

- The equipment is not maintained properly according to the maintenance recommendations supplied in this manual.
- The equipment is returned for repair without the power cord, or if the unit, control box, or power cord are altered in any way from the original shipment. Cuts in the power cord are not covered under warranty.
- The equipment is damaged by unauthorized tampering.
- The sacrificial anode around the propeller shaft shows significant deterioration. (The anode must be inspected periodically and replaced as necessary.)

OTHER REPAIRS

Most failed equipment can be repaired at substantially lower costs than that of replacing it with new equipment. Please ship according to the instructions in the previous section.

Kasco does estimates on repairs at the request of the customer. The request for an estimate should be included in the letter that accompanies the returned unit and must include a daytime phone number and/or email address. Estimate options are as follows:

- We will contact the customer with a total estimated cost for repairs after we have evaluated the unit but before we perform the work.
- We will repair the unit only if repair costs are under a dollar amount stated by the customer. Example: "Please repair if total is under \$150.00 before shipping charges."

All estimates that are rejected for repair will be destroyed unless otherwise directed by the customer. If the customer would like the unit returned, we will restore the unit as closely as possible to the condition in which we found it and ship at the customer's expense (including shipping and handling charges).

REPAIR CONTACT FORM

Note: Contact information should be that of the person or company to contact for repair information.

Company name			
Contact name	First name	Last name	
Address	Address line 1		
	Address line 2		
	Country		
	Postal Code		
Phone number	Primary	Alternate	
Email address			
Preferred method of contact (circle one)	Phone	Email	
Purchase order number			
Additional product information	Serial Number	Cord Length	
Information for Repair Technician			
Was this unit used in a chemical treatment or wastewater application? (circle one)		Yes	No
Additional notes			

Postadress:

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