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OPERATOR'S MANUAL

UNIVAC®

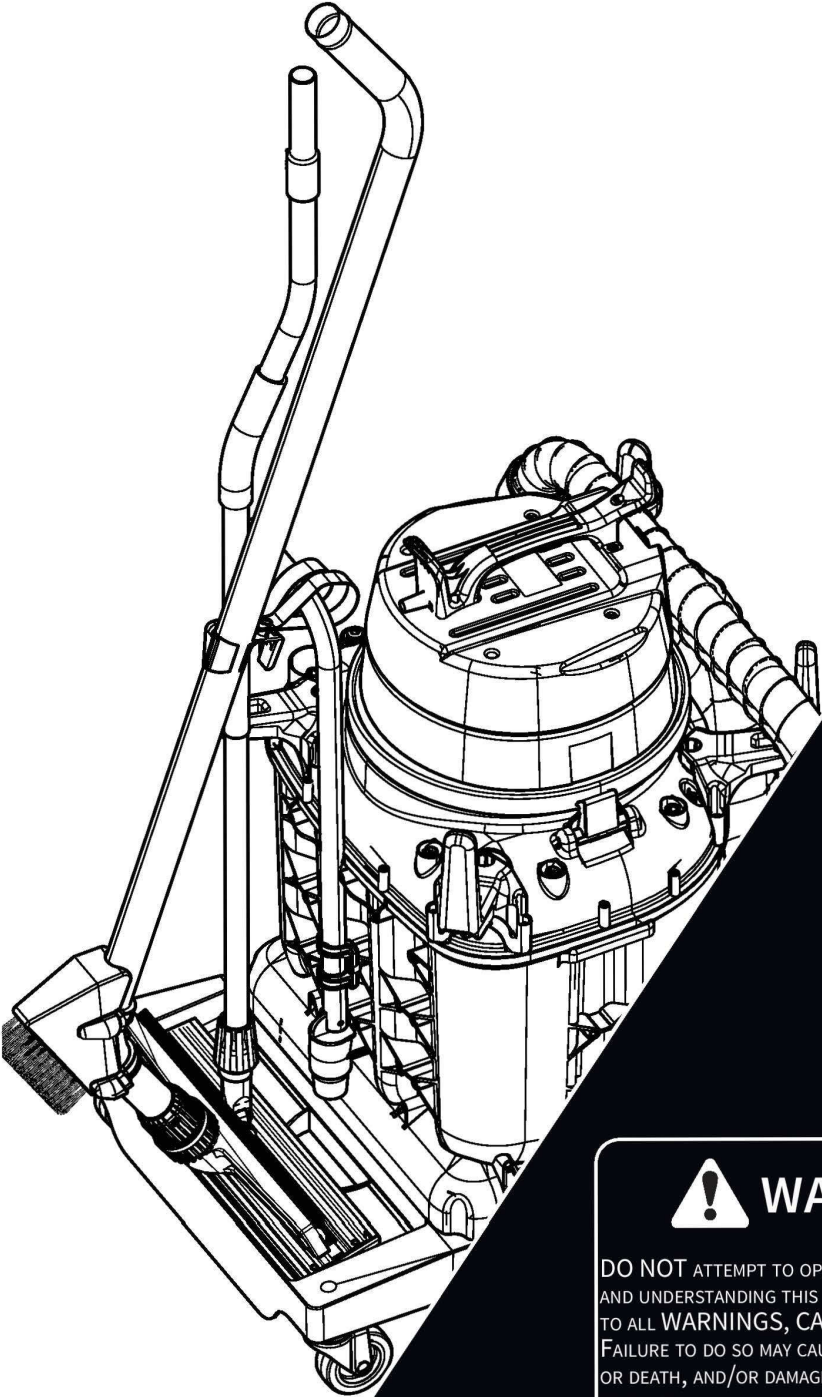


TABLE OF CONTENTS

Getting Started

KAIVAC LIMITED WARRANTY	2-3
IMPORTANT SAFETY INSTRUCTIONS	4-5
BATTERY INFORMATION	6
GROUNDING INFORMATION	7-8

Operation/Assembly

UNIT COMPONENTS	9
SETUP/BASIC OPERATION	10
ILLUSTRATIONS	11-12
UNIVAC OPERATION	13

Maintenance

DAILY & GENERAL MAINTENANCE	14
UNIT & MAINTENANCE	15
DC STANDARD ELECTRICAL DIAGRAM ...	16
AC INTL. ELECTRICAL DIAGRAM	17
AC STANDARD ELECTRICAL DIAGRAM ...	17
TROUBLESHOOTING	18-20

Specification Diagrams

VACUUM TANK ASSEMBLY	21
VACUUM HEAD ASSEMBLY	22
BATTERY INTERFACE ASSEMBLY	22



WARNING

DO NOT ATTEMPT TO OPERATE THE UNIT BEFORE READING AND UNDERSTANDING THIS MANUAL. PAY CLOSE ATTENTION TO ALL WARNINGS, CAUTIONS AND NOTICES. FAILURE TO DO SO MAY CAUSE SERIOUS PERSONAL INJURY OR DEATH, AND/OR DAMAGE TO PROPERTY OR YOUR KAIVAC PRODUCT. SPECIFICATIONS AND PARTS ARE SUBJECT TO CHANGE WITHOUT NOTICE. FOR MOST UP TO DATE SAFETY INFORMATION, VISIT KAIVAC.COM

**SAVE THIS MANUAL FOR
FUTURE REFERENCE
VISIT KAIVAC.COM FOR FULL
SPECIFICATIONS &
TROUBLESHOOTING**

KAIVAC LIMITED WARRANTY

- i. Limited Warranty. Kaivac warrants to the original purchaser that the Products will be free from defects in materials and workmanship when properly assembled, installed, operated, maintained, and stored in accordance with Kaivac's instructions and recommendations (the "Limited Warranty"), subject to the exclusions and limitations set forth in this Limited Product Warranty.
- ii. Limited Warranty Periods. The applicable Limited Warranty periods are as follows:
 - a. **TANK AND TROLLEY LIMITED WARRANTY.** The vacuum tank and trolley components of the Product are warranted for a period of **Five (5) Years** from the date of purchase.
 - b. **VACUUM MOTOR and PUMP LIMITED WARRANTY** (excluding Battery). The battery interface and related components (excluding lithium-ion batteries), vacuum motor, and pump are warranted for a period of **Three (3) Years** from the date of purchase.

A Limited Lifetime Warranty for the OmniFlex vacuum motor is available to customers who purchase a Kaivac chemical subscription concurrently with the initial purchase of the OmniFlex unit and maintain the subscription without interruption for the duration of ownership. Eligibility for the warranty is conditioned upon the exclusive use of Kaivac-supplied chemicals in the OmniFlex unit. Any cancellation, lapse, or discontinuation of the subscription will immediately terminate the Limited Lifetime Warranty. Compliance with the requirements of the OmniFlex Limited Lifetime Warranty shall be determined by Kaivac.
 - c. **LABOR LIMITED WARRANTY.** Labor authorized by Kaivac and performed by a service provider selected or approved by Kaivac is warranted for **One (1) Year** from the date the labor is performed, not to exceed the warranty period applicable to the repaired or replaced component.
 - d. **BATTERY LIMITED WARRANTY.** Lithium-ion batteries are warranted for a period of **Two (2) Years** from the date of purchase.
 - e. **REPLACEMENT PARTS.** Replacement parts, excluding Accessories, are warranted for a period of **ninety (90) days** from the date of purchase.
- iii. Limited Warranty Remedy. For any valid warranty claim, Kaivac shall, at its sole option, repair or replace the defective Product or component. If Kaivac authorizes a repair, such repair shall not extend the original Limited Warranty period. If Kaivac provides a replacement Product or component, the Limited Warranty shall continue only for the remainder of the original Limited Warranty period. The remedies set forth in this Limited Product Warranty are the original purchaser's exclusive remedies and Kaivac's sole liability for any breach of the Limited Warranty.
- iv. Exclusions. The Limited Warranty does not apply to:
 - a. Accessories, including without limitation squeegee blades, wheels, hoses, seals, gaskets, cords, casters, HEPA filter cartridges, chemical feed caps, spray guns, GFCIs, and vacuum wand assemblies (collectively, "Accessories");
 - b. Normal wear and tear;
 - c. Any Product repaired, altered, or modified in a manner that, in Kaivac's judgment, adversely affects operation, performance, durability, or intended use;
 - d. Misuse, abuse, negligence, accidents, or failure to operate, maintain, or store the Product in accordance with Kaivac's instructions, recommendations, and warnings;
 - e. Use of high-foaming or corrosive chemicals;
 - f. Use of non-Kaivac batteries or chargers, or improper battery installation;
 - g. Loss of IoT functionality resulting from failure to maintain required network connectivity or failure to permit installation of Kaivac-issued firmware, security certificate, or software updates
 - h. Use of a lithium-ion battery more than five (5) years from the date of purchase; or
 - i. Modification of, or attempted modification to, the Product by anyone other than Kaivac or a service provider authorized by Kaivac

KAIVAC LIMITED WARRANTY (CONTINUED)

Kaivac shall have sole authority to determine whether a warranty claim is excluded under this Limited Product Warranty.

- v. **Warranty Claim Costs.** The original purchaser shall be responsible for all freight, shipping, travel, and related costs associated with warranty service. For warranty claims made outside the country where the Product was originally purchased, the original purchaser shall also be responsible for all duties, taxes, and import-related charges.
- vi. **Disclaimer of Other Warranties.** EXCEPT AS OTHERWISE EXPRESSLY STATED HEREIN, KAIVAC MAKES NO OTHER WARRANTY OR REPRESENTATION OF ANY KIND, EXPRESSED OR IMPLIED, INCLUDING ANY IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. TO THE EXTENT SUCH WARRANTIES CANNOT BE DISCLAIMED, THE IMPLIED WARRANTIES ARE LIMITED IN DURATION TO THE LIFE OF THE APPLICABLE EXPRESS WARRANTY PERIOD.
- vii. **Exclusion of Damages.** TO THE FULLEST EXTENT PERMITTED BY LAW, KAIVAC SHALL NOT BE LIABLE FOR ANY INDIRECT, INCIDENTAL, CONSEQUENTIAL, SPECIAL, EXEMPLARY, OR PUNITIVE DAMAGES ARISING OUT OF OR RELATING TO ANY PRODUCT OR THE LIMITED WARRANTY, INCLUDING LOSS OF USE, LOSS OF REVENUE, LOSS OF PROFITS, OR PROPERTY DAMAGE, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGES. THESE LIMITATIONS SHALL APPLY EVEN IF ANY EXCLUSIVE REMEDY FAILS OF ITS ESSENTIAL PURPOSE. THE REMEDIES SET FORTH IN THIS WARRANTY ARE THE ONLY REMEDIES AVAILABLE TO ANY PERSON UNDER THIS WARRANTY. SOME STATES/PROVINCES DO NOT ALLOW FOR THE DISCLAIMERS, LIMITATIONS, AND EXCLUSIONS IDENTIFIED ABOVE, AND AS A RESULT, THEY MAY NOT APPLY TO YOU
- viii. **No Other Warranties.** No employee, agent, representative, dealer, or retailer has authority to modify, expand, or create any representation or warranty regarding the Product on behalf of Kaivac unless expressly authorized in writing by Kaivac. Kaivac reserves the right to modify, amend, or discontinue this Limited Warranty at any time. The most current version of the Limited Warranty may be found at www.kaivac.com. The Limited Warranty in effect on the date of purchase shall govern the warranty coverage applicable to the Product.

Consult Kaivac.com for current Product(s) information and Limited Warranty. For any questions or warranty service, please contact Kaivac Customer Service at 1/800-287-1136 (Outside the U.S. Call 513-887-4600).

Version 9-3-2026

PHONE:

United States and Canada: 1-800-287-1136

International: 1-513-887-4600

EMAIL:

info@kaivac.com

For Technical Support Contact Form go to: <https://www.kaivac.com/contactus.php> and choose Technical\Support tab.

2680 Van Hook Avenue, Hamilton, OH 45015 / 800-287-1136 / kaivac.com

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IMPORTANT SAFETY INSTRUCTIONS

SAVE THESE INSTRUCTIONS
CONSULT KAIVAC.COM FOR THE MOST UP TO DATE SAFETY PRECAUTIONS
READ ALL INSTRUCTIONS BEFORE USING (THIS UNIT)



WARNING

SAFETY ALERT WARNING indicates a hazardous situation which, if not avoided, COULD result in serious injury or death



CAUTION

SAFETY ALERT CAUTION indicates a hazardous situation which, if not avoided, COULD result in minor to moderate injury.

NOTICE

NOTICE provides key information by clarifying instructions.

When using an electrical unit, basic precautions should always be followed, including the following:



RISK OF ELECTRIC SHOCK, FIRE, EXPLOSION,
AND SERIOUS PERSONAL INJURY OR DEATH

GENERAL SAFETY INSTRUCTIONS (APPLICABLE TO CORDED AND BATTERY UNITS):

- For commercial use only.
- Use unit only as described in this Manual. Use only Kaivac's recommended attachments.
- Follow the maintenance instructions specified in this Manual.
- For indoor use only. Store indoors.
- Stay alert - watch what you are doing. DO NOT overreach or stand on unstable support. Keep good footing and balance at all times.
- Keep operating area clear of all persons.
- Keep hair, loose clothing, fingers, and all parts of body away from openings and moving parts.
- NO COMBUSTIBLES! Sparks inside the motor can ignite flammable vapors or dust. Do not use unit near combustible liquids and gases, or to pick up explosive dusts or gasoline.
- Know how to stop the unit and bleed pressures quickly. Be thoroughly familiar with the unit's controls before operating.
- DO NOT allow unit to be used as a toy and unit should not be operated by children. Close attention is necessary when used near children.
- Use extra care when cleaning on stairs.
- DO NOT operate the unit when fatigued or under the influence of alcohol or drugs.
- DO NOT put any object into unit's openings. Do not use with any of the unit's opening blocked; keep free of dust, lint, hair, and anything that may reduce air flow.
- DO NOT pick up anything that is burning or smoking, such as cigarettes, matches or hot ashes.
- DO NOT operate without the Vacuum Motor Float Cage installed. If float is removed, reinstall by screwing back into place.
- DO NOT use without filters in place.
- **Personal Protective Equipment (PPE): It is recommended to wear proper personal protective equipment as required by the chemical product label instructions used in conjunction with the unit. For Kaivac chemical products, refer to product label.**

SPRAY SYSTEM SAFETY INSTRUCTIONS:

- DO NOT spray liquid from the unit or attachments onto electrical outlets or any electrical devices.
- Risk of injection or injury to persons - DO NOT direct discharge stream at persons.
- INJECTION HAZARD: Unit can cause serious injury if the spray permeates the skin. Do not point the spray gun at anyone or any part of the body. In case of permeation, seek medical aid immediately.
- THIS UNIT IS CAPABLE OF PRODUCING 500 PSI (3447 kPa). To avoid rupture and injury, do not operate this pump with components rated less than 500 PSI (3447 kPa) working pressure (including but not limited to spray guns, hose, and hose connections); and before servicing, cleaning or removal of any part, shut off power and relieve pressure.
- High pressure cleaners, such as this unit, shall not be used by children, persons with reduced physical, sensory or mental capabilities or lack of experience and knowledge or untrained personnel. Children should not play with the unit. Cleaning and user maintenance should not be performed by children.

CORDED UNITS SAFETY INSTRUCTIONS (APPLICABLE TO CORDED UNITS):

- Inspect cord and plug prior to use. Do not use with damaged cord or plug. If unit is not working as it should, has been dropped, damaged, left outdoors or dropped into water, do not use or charge and return unit to a Kaivac service center.
- This unit may also have been provided with a ground fault circuit interrupter (GFCI) built into the power cord. If replacement of the plug or cord is needed, use only identical replacement parts. Test the unit's ground fault circuit interrupter (GFCI) before each use.
- Turn off the unit before unplugging. Do not leave unit when plugged in. Unplug from outlet when not in use and before servicing.
- Turn off all controls before unplugging.
- Connect to a properly grounded outlet only. Do not remove ground pin on plug. See Grounding Instructions below.
- This unit comes with a grounded attachable extension cord. If cord is damaged, replace with equivalent 120v, 15amps, 14GA rated cord. This cord must be attached and mechanically secured using the provided cord connector to use the unit.
- The unit must be disconnected from any electrical or battery source when the unit is being cleaned or maintenance of unit or when replacing parts
- Keep all connections dry and off the ground. If using extension cord with unit, make sure the connection is above and off the floor and away from exposure to liquid.
- Keep the cord away from heated surfaces.
- DO NOT handle plug or unit with wet hands.
- DO NOT pull or carry by cord, use cord as handle, close a door on cord, or pull cord around sharp edges or corners. Do not run unit over cord. Keep cord away from heated surfaces.
- DO NOT unplug by pulling on cord. To unplug, grasp the plug, not the cord.

IMPORTANT SAFETY INSTRUCTIONS (CONTINUED)

SAVE THESE INSTRUCTIONS
CONSULT KAIVAC.COM FOR THE MOST UP TO DATE SAFETY PRECAUTIONS
READ ALL INSTRUCTIONS BEFORE USING (THIS UNIT)

When using an electrical unit, basic precautions should always be followed, including the following:



BATTERY UNITS SAFETY INSTRUCTIONS (APPLICABLE TO BATTERY UNITS):

- **Never use a battery that has been damaged in any way.** Damaged batteries may exhibit unpredictable behavior.
- **Never use or charge a damaged battery pack.**
- **ONLY USE** with Kaivac, Inc. battery, and charger.
- Inspect the battery before each use for damage, dents, cracks, or holes.
- If included with legacy unit, the battery splash cover must remain in place. Without the battery splash cover, the battery housing may become damaged which may cause the battery to malfunction, which can result a fire, explosion, personal injury, and/or property damage.
- If your unit contains a chemical-resistant plastic protective helmet, consult the Helmet Addendum for additional instructions and warnings.
- Exposure of units to airborne polyunsaturated fats in the food service industry may cause deterioration of battery components. Failure to inspect and use as instructed may result in fire explosion, personal injury, or property damage.
- Under certain conditions, including damage or liquid infiltrating the battery's interior cells, the battery may emit smoke, sparks, or fire. Liquid may be ejected from the battery; avoid contact. If contact accidentally occurs, flush with water. If liquid contacts eyes, additionally seek medical help. Liquid ejected from the battery may cause irritation or burns.
- Stop use immediately if the battery or unit sparks or shows signs of fire. And may result in fire.
- If unit or battery emits fumes, smoke, sparks, or fire, discontinue use immediately. Do not touch battery. If unit can be safely moved, move outside to a well ventilated fire safe area away from people or combustible material.
- **DO NOT** attempt to repair, service or modify the batteries or charger. Contact Kaivac Technical Support with any issues.
- Disconnect the battery from the unit before making any adjustments, changing accessories, or storing unit. Such preventive safety measures reduce the risk of starting the unit accidentally.
- When charging battery, make sure charger or unit has at least 6 inches of clearance on all sides for adequate air flow.
- When battery is not in use, keep it away from other metal objects like paper clips, coins, keys, nails, screws or other small metal objects that can make a connection from one terminal to another. Connecting or shorting the battery terminals together may cause burns or a fire.
- Keep heat sources, sparks, and flames away from batteries.
- Prevent unintentional starting. Ensure the switch is in the off-position before connecting to battery, picking up or carrying the unit. Do not carry the unit with your finger on the switch. Energizing an unit that has the switch on invites accidents.
- **DO NOT** allow battery to be submerged in water.
- **DO NOT** use a battery that has been submerged in water, or if water has infiltrated the battery housing even if it appears to be working.
- **DO NOT** charge batteries outdoors.
- **DO NOT** short-circuit the battery or charger terminals with conductive items such as paper clips. This can deliver high current.
- **DO NOT** crush or drop the battery.
- **DO NOT** expose a battery or unit to fire or excessive temperature. Exposure to fire or temperature above 265°F (130°C) may cause explosion.
- **DO NOT** use or store the NTC System or battery in refrigerated areas, in environments when the battery is in direct contact with liquids, or near flammable or combustible materials.
- **DO NOT** charge or store battery for extended time (1 month or more) in temperatures below 40°F (4°C).
- **DO NOT** remove any part of the battery, charging unit, or unit: If your unit has a chemical-resistant plastic protective helmet, do not remove it.
- **DO NOT** plug battery in while Vacuum Motor is in ON position. It may damage the system.
- **DO NOT** incinerate the battery even if it is non-working or severely damaged. The battery can explode in a fire.
- **DO NOT** leave battery connected to charger once the charger light is green. Leaving battery on charger will diminish the life of the battery
- **Never dispose of the battery in the trash. It is important that your old, damaged battery is disposed of and/or returned as instructed by Kaivac Customer Care/Technical Support at 1-800-287-1136.**



CHARGER/ELECTRICAL WARNINGS:

- Inspect the charger, cords, and connections prior to each use.
- Follow all charging instructions and do not charge the battery or unit outside of the temperature range specified in the instructions. Charging improperly or at temperatures outside of the specified range may damage the battery and increase the risk of fire.
- Connect charging cord to a properly grounded outlet only. See Grounding Instructions.
- **DO NOT** use charger if it has a damaged cord or plug.
- **DO NOT** operate charger if it has received a sharp blow, been dropped, or damaged in any way.
- **DO NOT** handle charger, including charger plug and charger terminals, with wet hands while charger is plugged in or while inserting plug into electrical outlet.
- **DO NOT** leave charger plugged in when not in use.
- **DO NOT** plug in charger while Vacuum Head is in ON position. It may damage the unit's electrical system.
- **DO NOT** pull on charger cord to unplug. Grasp and pull the plug, not the cord.
- **DO NOT** carry charger by cord.

To recycle battery, call Kaivac Customer Care at 1-800-287-1136 to order a recycling box.

Disposal of batteries are regulated by federal law and must be done properly.

BATTERY INFORMATION

Keep Batteries at Room Temperature: Store between 32 and 113 degrees F (0°C to 45°C). Avoid battery exposure to extreme temperatures. If shelving battery longer than (1) month, deplete battery to 50% charge during storage period (two bars on the battery indicator).

Batteries Lose Capacity Over Time: Batteries naturally deteriorate over time whether being used or not. If battery use instructions are properly followed, batteries deteriorate at a rate of approximately 10% run time per year but may vary by patterns of use.

Fully Discharge vs. Partial Discharge and the Effect on Battery Cycles: Unlike lead acid batteries, the Lithium-ion battery used with Kaivac equipment is not damaged by full or partial discharging. The expected battery hours of use are approximately 600 hours and 400 charge cycles. If you discharge battery only to 80%, then the user can expect to get more cycles (500 cycles). With dual batteries make sure to alternate batteries per charge in order to maximize for life capacity.

Extended Storage: It is recommended to discharge to 50% capacity (two bars on the battery indicator) and store in a cool location (between 32°F to 113°F or 0°C to 45°C). To avoid battery impact, store battery laying down on its side on lowest shelf, and secured. If battery is dropped or experiences an impact or damage, discontinue use and replace. Never use a damaged battery, as a damaged battery may act in an unpredictable manner resulting in fire, explosion, property damage, or personal injury.

Battery Gauge: The Kaivac provided battery comes with a built-in Battery Gauge or which shows the approximate run time for the current charge remaining.

Replacement - End of Life: Rechargeable batteries eventually wear out. When your Kaivac Battery run time is less than 55% (i.e. 50 minutes for non-quick change and 33 minutes for Quick Change batteries), Kaivac recommends replacing your battery. Regardless of run time, contact Kaivac to replace your battery after 4 years. Consult kaivac.com for information on recycling your old battery through a licensed disposal facility.



DO NOT DISCARD BATTERY INTO TRASH! It is important to recycle your old batteries at your local authorized battery recycling facility or by calling [1-800-USA-CLEAN \(1-800-872-2532\)](tel:1-800-USA-CLEAN) and selecting Option 3.

Battery Specifications	
Weight	With Box, 11 lbs. (4,9 kg)
Body Material	Injection Mold Polypropylene
Dimensions (H x W x D)	18 x 7 x 5 in. (45,7 x 17,8 x 12,7 cm)
Voltage	36V DC
Battery Capacity	15 A-hr
Battery Current	15 A DC
Battery Type	Lithium-Ion
Approx. Run Time BOL (Beginning of Life)	60 minutes
Approx. Run Time EOL (End of Life)	35 minutes (discontinue use and take to recycling center)
Battery Box Receptacle	IP65 / IP67 (not required for UL)
Run Time Hour Meter	Acts as "odometer for battery" and runs only when motor switch is ON
Approx. Charge Cycles	400 @ 100% discharge / 500 @ 80% discharge
Cut off Voltage (fully discharged)	30V
Charger Specifications	
Approx. Charge Time	5 hours
Charger Amps	4 Amps
Charge Voltage	42V DC
Charger Voltage	110-240VAC / 36VDC (240VAC version only needs correct plug for wall outlet)
Charging Robustness	No special instructions
Battery Charge Memory	None
Battery Charge Gauge	Yes, LED Indicator
Approx. Charge Cycles	400 @ 100% discharge / 500 @ 80% discharge
Storage/Inventory:	
Storage & Operation Ambient Temp	32°F (0°C) to 113°F (45°C)
Storage & Shipping Charge	40-60% Charge (35-38VDC)

GROUNDING INFORMATION



Grounding: Corded Units

GROUND FAULT CIRCUIT INTERRUPTER PROTECTION (*for spray systems only*)

If your unit is a corded unit, it has been supplied with a ground-fault circuit-interrupter (GFCI) built into the plug of the power-supply cord. This GFCI device provides additional protection from the risk of electric shock. Should replacement of the plug or cord become necessary, use only identical replacement parts that include GFCI protection.

If your unit is a corded unit, it is for use on a nominal circuit and has a grounding attachment plug. Make sure that the appliance is connected to an outlet having the same configuration as the plug. No adapter should be used with this unit.

GROUNDING INSTRUCTIONS

If your unit is a corded unit, it must be grounded. If the unit should malfunction or breakdown, grounding provides a path of least resistance for electric current to reduce the risk of electric shock. This unit is equipped with a cord having an equipment-grounding conductor and a grounding plug. The plug must be plugged into an appropriate outlet that is properly installed and grounded in accordance with all local electrical codes and ordinances.



Improper connection of the unit-grounding conductor can result in a risk of electric shock. Check with a qualified electrician or service person if you are in doubt as to whether the outlet is properly grounded. Do not modify the plug provided with the unit by removing the ground pin on the plug – if the plug will not fit the outlet, have a proper outlet installed by a qualified electrician.

This unit comes with a grounded attachable extension cord. If damaged, replace with Kaivac® (OEM) cord, or if necessary an equivalent cord rated 120V, 15 amps, 3-wire, 14 GA. This cord must be attached and mechanically secured using the provided cord connector to use the unit.

Grounding: Battery Units

GROUNDING INSTRUCTIONS

The charger must be grounded. If it should malfunction or breakdown, grounding provides a path of least resistance for electric current to reduce the risk of electric shock. This unit is equipped with a cord having equipment grounding conductor and grounding plug. The plug must be inserted into an appropriate outlet that is properly installed and grounded in accordance with all local codes and ordinances.



Improper connection of the unit-grounding conductor can result in a risk of electric shock. Check with a qualified electrician or service person if you are in doubt as to whether the outlet is properly grounded. Do not modify the plug provided with the unit by removing the ground pin on the plug – if the plug will not fit the outlet, have a proper outlet installed by a qualified electrician.

This unit is for use on a nominal circuit and has a grounding attachment plug. Make sure that the unit is connected to an outlet having the same configuration as the plug. No adapter should be used with this unit.

GROUNDING INFORMATION (CONTINUED)

Make sure your extension cord is in good condition and is the correct size for your unit. Table 1 shows the correct size to use depending on cord length and nameplate ampere rating. If in doubt, use the next heavier gauge. The smaller the gage number, the heavier the cord. An undersized extension cord will cause a drop in line voltage resulting in loss of power and overheating.

Use only three-wire outdoor extension cords that have three-prong grounding receptacles that accept the unit's plug.



To reduce the risk of personal injury due to a loose electrical connection between the unit's plug and extension cord, firmly and fully attach the unit plug to the extension cord. Periodically check the connection while operating the unit to ensure it is fully attached. Do not use an extension cord that provides a loose connection. A loose connection may result in overheating, fire, and increases the risk of a burning.

To reduce the risk of disconnection of the unit's cord from the extension cord during operations:

- Make a knot as shown in Figure 1 below:

Figure 1 - Method of securing the appliance cord to the extension cord set

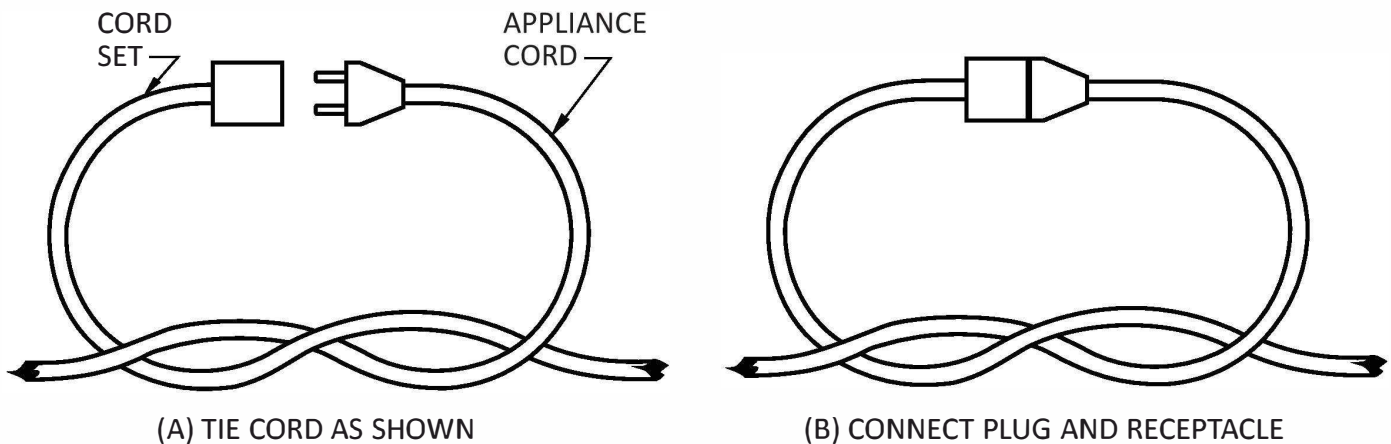
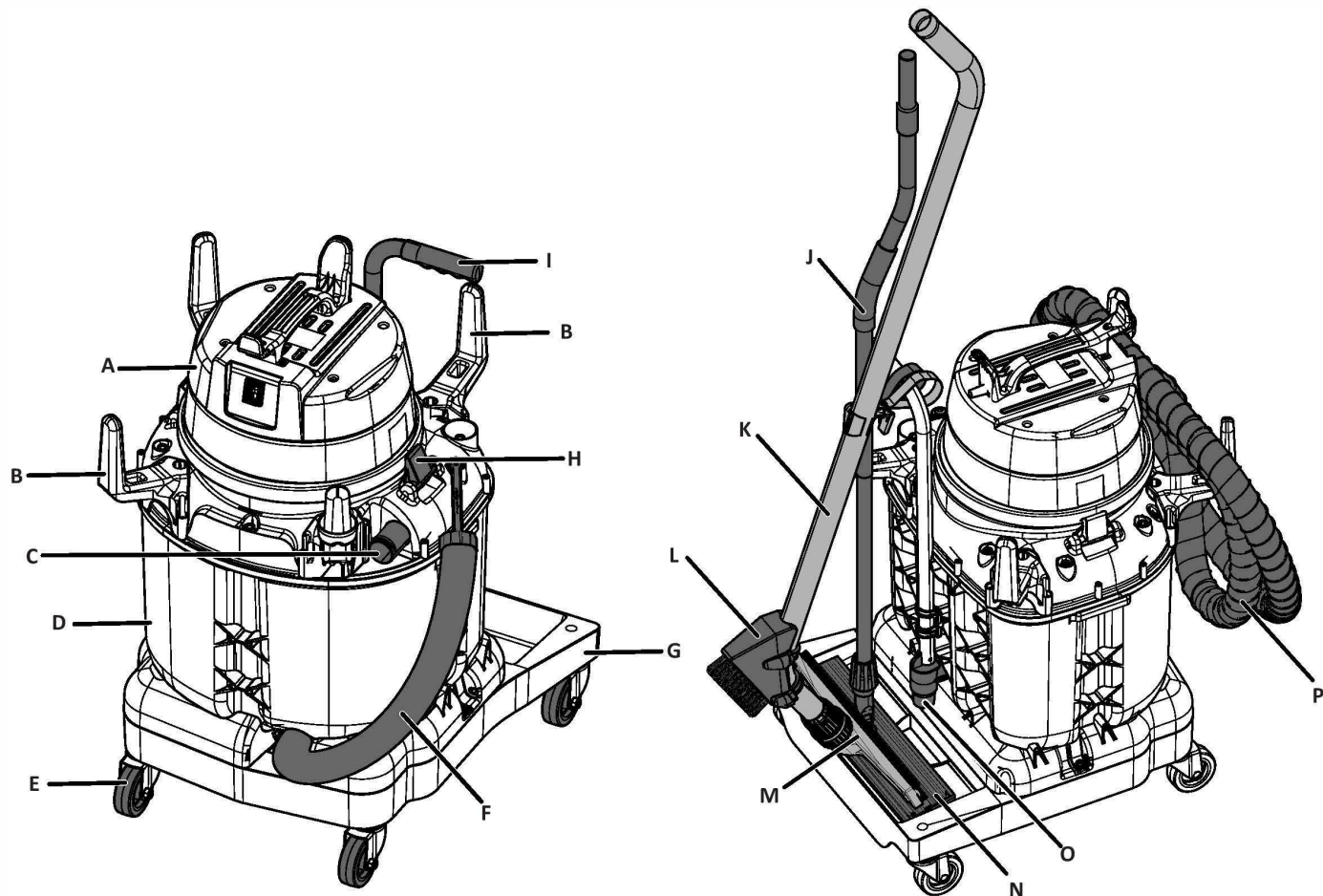


Table 1 - Minimum gauge for extension cords

Ampere rating		Volts	Total length of cord			
			7.62 m (25 ft)	15.24 m (50 ft)	30.48 m (100 ft)	45.72 m (150 ft)
More than, A	Not more than, A	120 V	mm ² (AWG)			
0	6	—	0.82 (18)	1.3 (16)	1.3 (16)	2.1 (14)
6	10	—	0.82 (18)	1.3 (16)	2.1 (14)	3.3 (12)
10	12	—	0.82 (18)	1.3 (16)	2.1 (14)	3.3 (12)

UNIT COMPONENTS

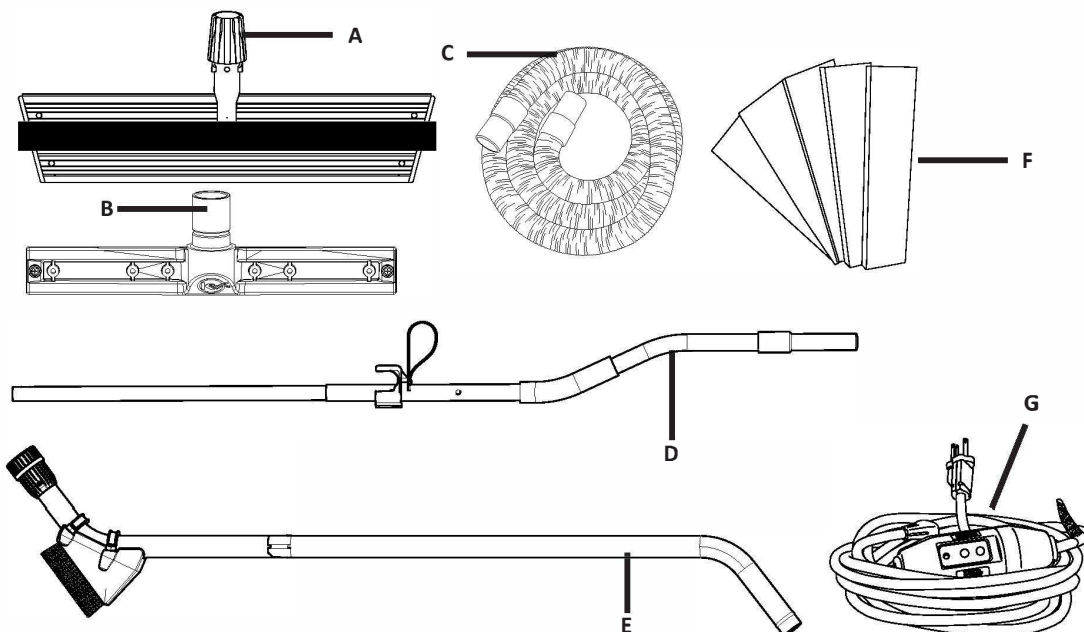


A - Vacuum Head
B - Stob (Corded Units)
C - Vacuum Hose Port
D - Vacuum Tank

E - Casters
F - Dump Hose
G - Chassis
H - Locking Clasps

I - Spigot Handle
J - Spreader Handle
K - Vacuum Wand
L - Grout Brush

M - Squeegee Vac Head
N - Pad Holder
O - Spigot
P - Vacuum Hose



BASE UNITS

A - Spreader Pad Holder
#MFMH

B - Squeegee Vac Head
#CVS12SFS

C - Vacuum Hose
Corded Units - #FS25
Battery Units - #FS8

D - Spreader Handle
#MFHNDLSA

E - Vacuum Wand
#ODVKIT8

F - Spreader Pads
Blue - #WPPB
Green - #WPPG

G - GFCI Cord (Corded Units)
#GFCI25

SETUP/BASIC OPERATION



WARNING

DO NOT use a damaged unit or a unit with a damaged battery. Inspect battery, housing, plug, cord, splash cover (if applicable), and helmet (if applicable) for damage, including cracks, separation, dents, holes, missing, pieces, and fraying cord or wires. Check all cords, hoses, and spray lines for damage prior to use. If damage is found, do not continue until proper repairs are completed. If using a legacy unit equipped with a fabric splash cover, ensure the cover is flipped over the battery top. Newer battery models may also be equipped with a chemical-resistant plastic protective helmet and fabric splash cover, ensure cover is flipped over helmet top. DO NOT remove helmet if included.



WARNING

NEVER USE a damaged unit or a unit with damaged battery. Always check all hoses and spray lines damage prior to use. Using a damaged unit and failure to inspect it prior to use may result in electrical shock, fire, explosion, serious personal injury or even death.

INSTALLING BATTERY AND CHARGING

Battery units only

See Figures 1 - 3, page 11

- Lower battery down into the battery housing.
- To see battery charge, press the charge indicator on the top of the battery.
- Connect the plug from the battery housing into the vacuum motor plug.
- To charge the battery, keep the battery in the battery housing. Locate the cord wrapped around the cleats connected to the battery housing, plug into an outlet to begin charging .

PREPARING UNIT FOR USE

See Figures 4 -8 , page 11-12

- Ensure Vacuum motor is in place on the vacuum tank. Ensure top clasps are secured. Ensure float cage is in place and clean.



Do not use if float cage is not in place.

- Locate switch panel on vacuum head. This is used to operate the vacuum function.
- Note the Chassis, keep the hole clear when dispensing water. Use as tool storage for the vacuum wand and speed spreader as needed.
- Unplug battery from charger if applicable. Avoid getting water on unit.
- Inspect battery, housing, plug, cord, splash cover (if applicable), and helmet (if applicable) for damage, including cracks, separation, dents, holes, missing, pieces, and fraying cord or wires.



WARNING

NEVER spray unit directly with any liquids, water, hose, or spray gun. Corrosive liquids, water, and chemicals may enter battery or unit components which can result in an increased risk of fire and serious personal injury.

NOTICE

Fill the tank with water and recommended amount of Kaivac approved Chemicals. Follow the proper dilution instructions on bottles or dispenser. For accuracy and convenience, use Kaivac proportioned chemical packets. If a chemical is being used, use only KAIKAC APPROVED CHEMICALS AT the recommended dilution.

FILLING THE UNIT

See Figures 9 - 13, pages 11-12

- Note the location of the Fill Marker inside the vacuum tank. The tank can hold up to 10 gallons of water. Do not fill past the Fill Line.
- Ensure spigot is closed before filling.



- To fill the unit, undo the clasps on the vacuum tank and lift the vacuum head off of the unit. Safely place down the vacuum head. Fill the unit with clean, cold water. Avoid getting water on the unit, and ensure the splash guard is in place if applicable. Clean out tank before each use.

NOTICE

- Fill the tank with water and recommended amount of Kaivac approved Chemicals. Follow the proper dilution instructions on bottles or dispenser. For accuracy and convenience, use Kaivac proportioned chemical packets.
- If using a cleaning product that foams, use a foam inhibitor to cut excess. Pour 2 capfuls of inhibitor in the Vacuum Hose with Vac running to coat inside of Vacuum Hose.



- Foaming chemicals in tank may damage Vac Motor.

INSTALLING/REMOVING ATTACHMENTS

See Figures 14 - 16, page 12

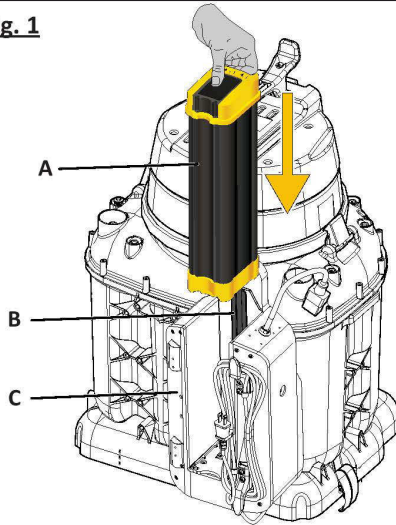
- To attach different accessories to the end of the vacuum wand, start by loosening the coupler nut of the wand. Insert the accessory tool, and tighten the coupler nut.
- Ensure the brass ring inside the coupler nut of the vacuum wand stays in place and does not get lost when changing accessories or taking apart.
- To use accessories without the vacuum wand, push the desired accessory tool directly into the end of the vacuum hose.
- Place the vacuum wand and spreader tool into the chassis when not in use.

VACUUMING

See Figure 17, page 12

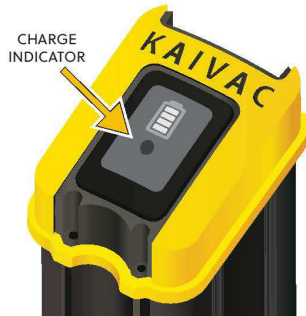
- Locate the vacuum hose on the back of the unit. Ensure hose cuff is connected to the port at the top of the unit. Using the other end of the hose, attach the hose cuff to the vacuum wand or desired accessory, and power on the unit to begin using floor squeegee.

Fig. 1



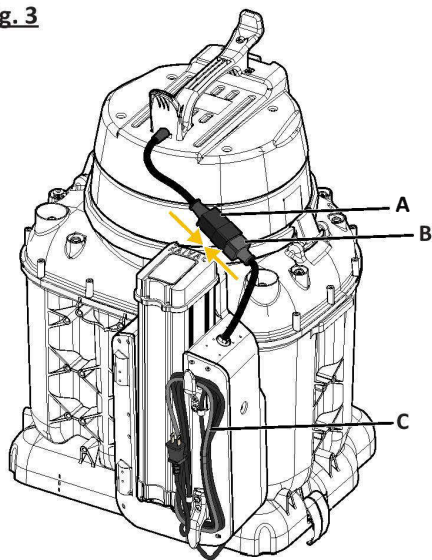
- A - Battery pack
- B - Battery Housing
- C - Guide Rail

Fig. 2



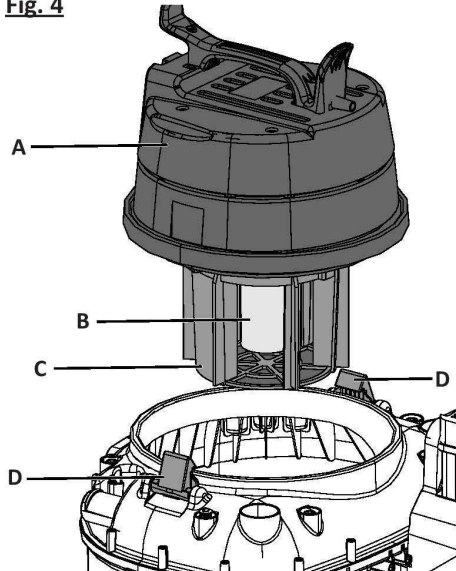
Battery Pack charge indicator

Fig. 3



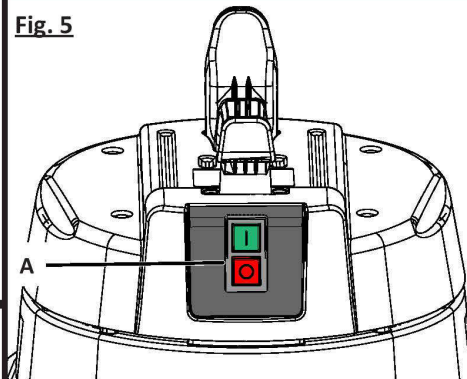
- A - C20 Vacuum head power cord
- B - C19 Battery housing power cord
- C - Battery charging cord

Fig. 4



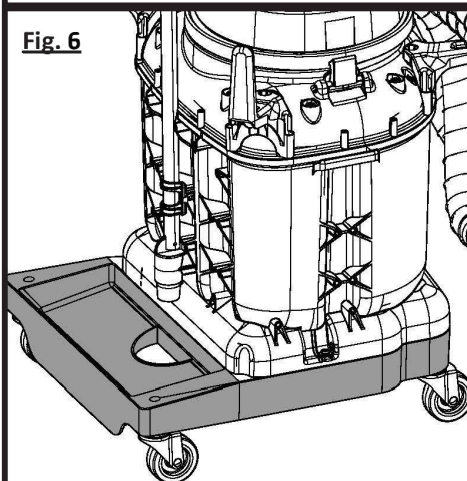
- A - Vacuum Motor
- B - Float Cage
- C - Float Basket
- D - Locking clasps

Fig. 5



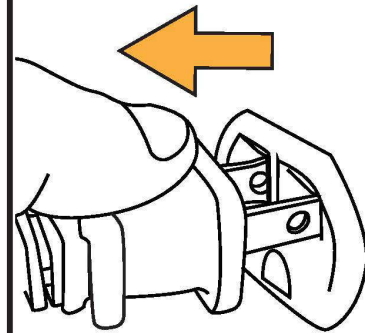
- A - Vacuum Motor Switch Panel

Fig. 6



Chassis

Fig. 7



Battery Charger plug.

Fig. 8

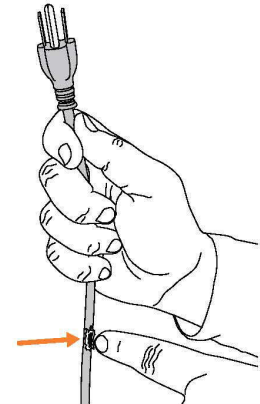
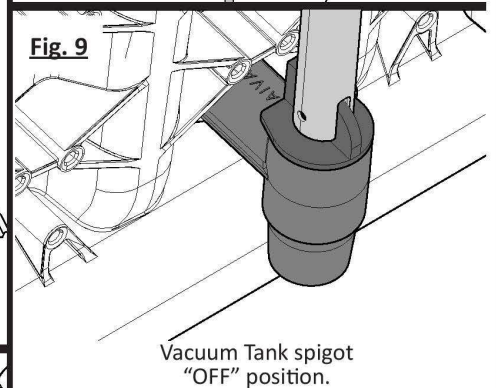
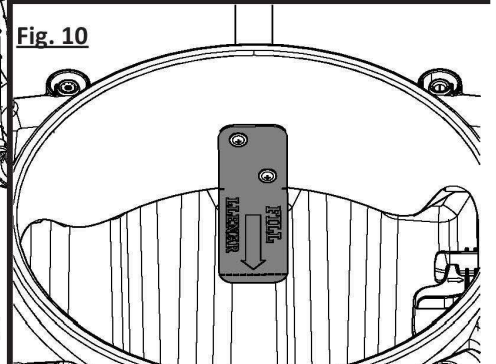


Fig. 9



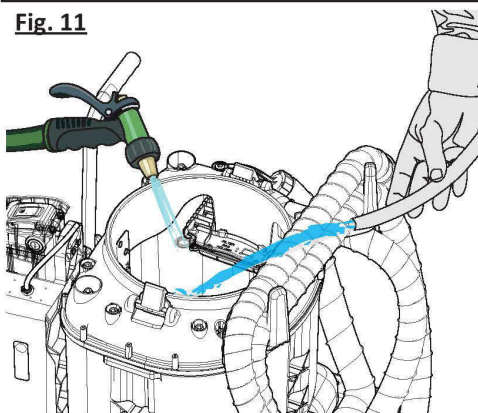
Vacuum Tank spigot
"OFF" position.

Fig. 10



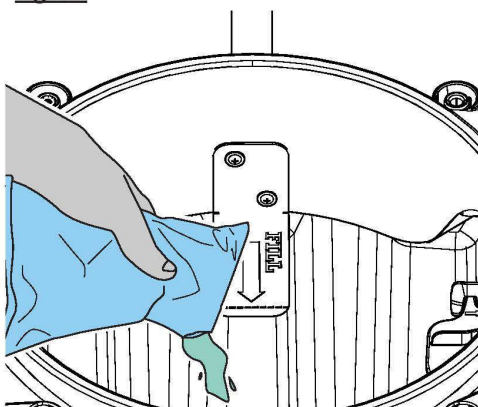
Fill Marker

Fig. 11



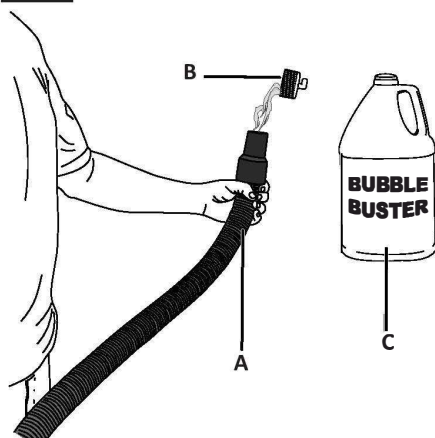
Filling Vacuum Tank with clean water.

Fig. 12



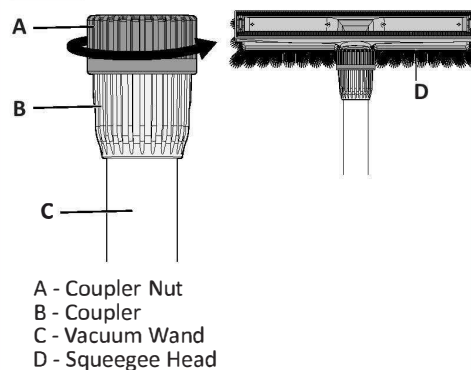
Proportioned Kaivac Approved chemical inside Vacuum Tank.

Fig. 13



Foaming chemicals only.
A - Vacuum Hose
B - Foam Inhibitor
C - Foam Chemical

Fig. 14



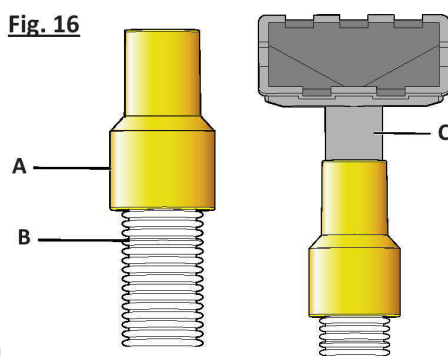
A - Coupler Nut
B - Coupler
C - Vacuum Wand
D - Squeegee Head

Fig. 15



Brass Ring inside Coupler Nut.

Fig. 16



A - Vacuum Hose Cuff
B - Vacuum Hose
C - Desired Accessory

Fig. 17



UNIVAC OPERATION

- After the unit has been filled with the appropriate amount of water/solution, turn the Spigot handle counter clockwise to MAX position. Beginning at the rear of the area, begin dispensing solution, moving towards the front of the area (Fig. 18).
- Beginning at the rear of the area, begin dispensing solution, moving towards the front of the area. Park unit so that it blocks entry to area (Fig. 19).
- Turn Spigot clockwise to the OFF position (Fig. 20).
- Use Spreader Tool in back-and-forth motion to cover floor with cleaning solution. *Agitate Spreader Tool over troubled or extra soiled areas to get a deeper clean* (Fig. 21).
- Attach Vacuum Wand to Vacuum Hose (if not already connected). The yellow portion of the hose will connect to the wand. The black portion will be connected to the tank. (Fig. 22). If corded, plug in provided extension cord to vacuum motor. If battery unit, ensure battery is charged and place into battery housing. Turn Vacuum Motor to ON (I).
- Vacuum floor surface diagonally to grout lines, reaching under shelves, seating etc. (Fig. 23).
- Slap & Tap: Once Vacuuming is complete, keep motor running. Slap Vacuum Wand on floor 3-4 times to dislodge debris from squeegee head. Then, invert Wand and Tap 4-5 times to dislodge any fluids or substance from Wand (Fig. 24).

Fig. 18

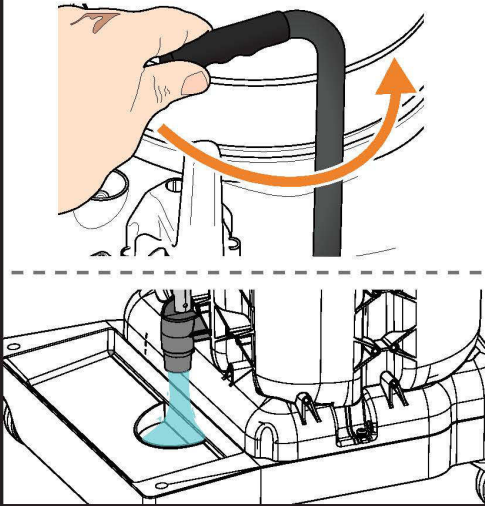


Fig. 21

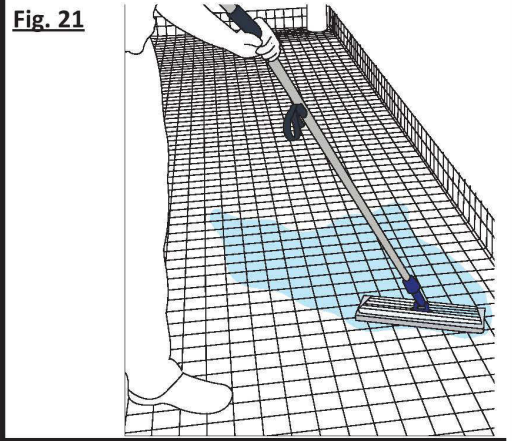


Fig. 22

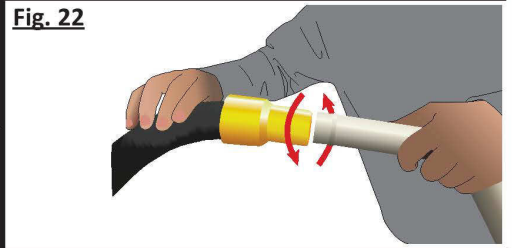


Fig. 19

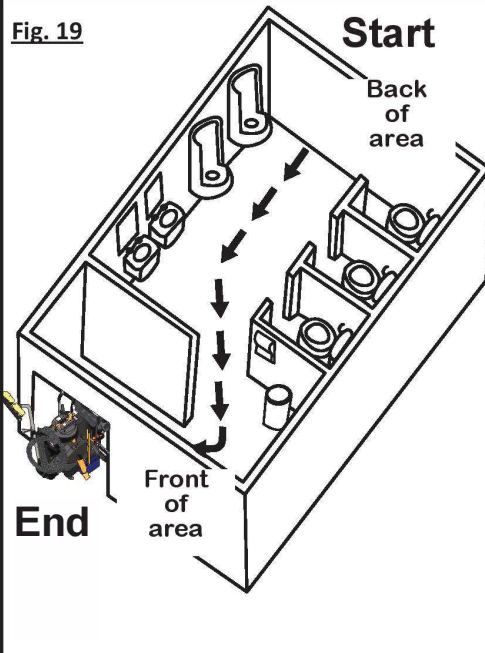


Fig. 23

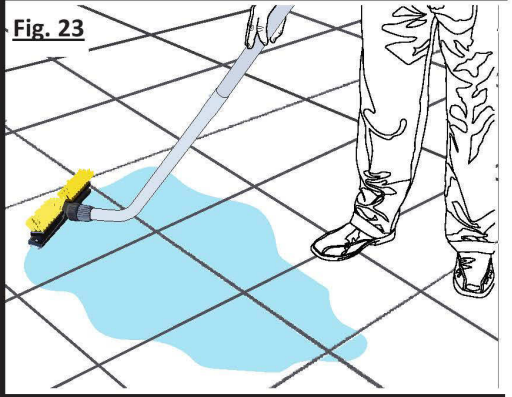


Fig. 24

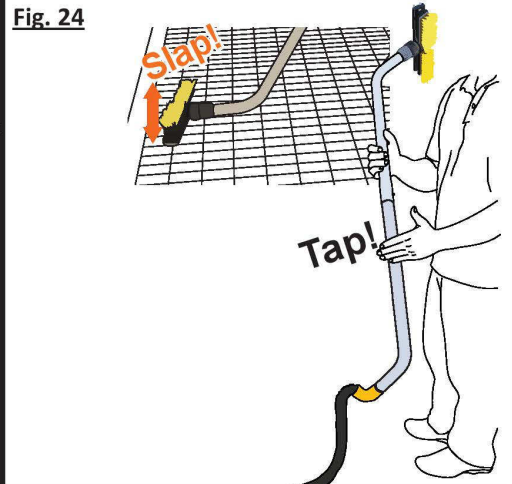


Fig. 20



DAILY & GENERAL MAINTENANCE

The unit should be checked, emptied, and cleaned after each use.

Unit should be turned OFF (O) unless specified.

EMPTYING THE VACUUM TANK

- If the Vacuum Motor shuts off before the job is complete, the Vacuum Tank may be full and need to be emptied. Lift the Vacuum Head to check liquid level inside the Vacuum Tank. If unit is full or your job is complete, follow the instructions below to empty Tank into appropriate sink/drain.
- To begin the dumping process, you must first press down on the Cap and turn counter-clockwise (Fig. 25).
- Once cap is removed, lower Dump Hose into appropriate sink/drain (Fig. 26).

NOTICE

- To prevent an accidental spill or overflow from the Dump Hose, be careful to keep hose end upright until it is over sink/drain.

CLEANING UNIT

- Alternatively, you can also turn the Vacuum ON (I) and dispense solution into Vacuum Hose as shown to clean Hose and Tank (Fig. 27).
- Rinse Vacuum Tank thoroughly at clean-up sink, preferably with hot water. Rinse out Trolley Bucket (Fig. 28).

CLEANING UNIT FILTERS

- Lift the Vacuum Head. Clean and spray the Float Cage located inside the Vacuum Head. Ensure Float Cage is in place. Clean Float Cage regularly. Do not use if Float Cage is not in place (Fig. 29).
- If unit contains mesh Filter Bag located inside the Vacuum Tank, before starting each new cleaning process, remove Filter Bag, dump any debris out, spray clean, and then replace back into the Filter Bag Frame (Fig. 30).

SQUEEGEE BLADES & ACCESSORIES

- Check for worn squeegee blades. Worn blades cause streaking and loss of vacuum suction.
- Replace with new every 6-8 weeks. Ensure squeegee blades are replaced with the ribbed portion facing outwards (Fig. 31).
- Clean off accessories and build-up on parts and tools (Fig. 32).

Fig. 25

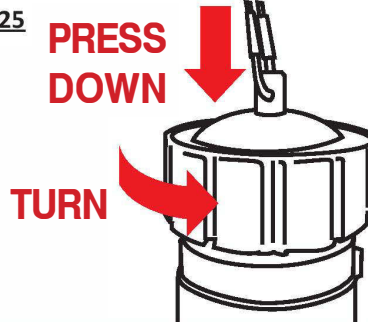


Fig. 29

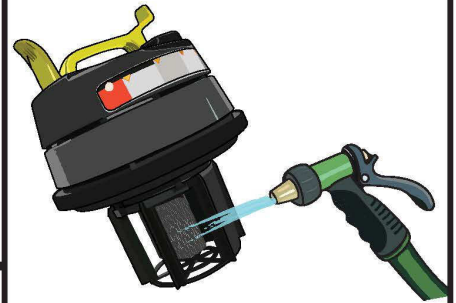


Fig. 26

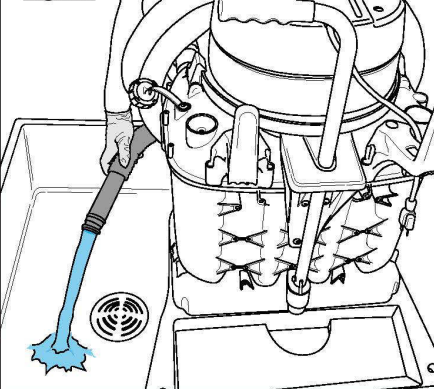


Fig. 30

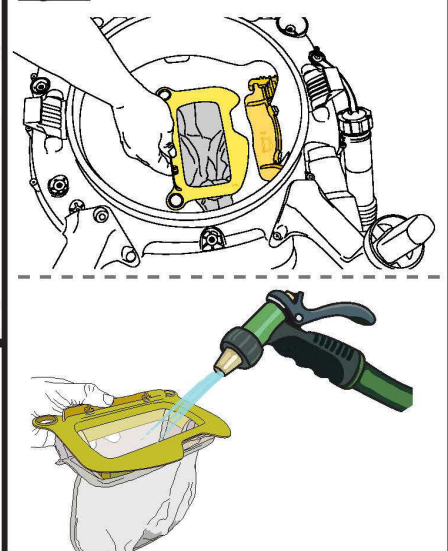


Fig. 27



Fig. 31

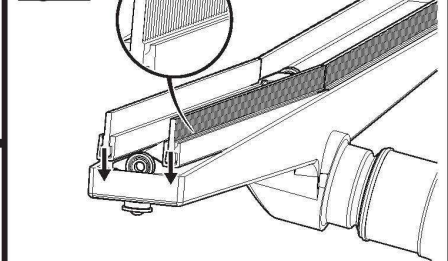


Fig. 28

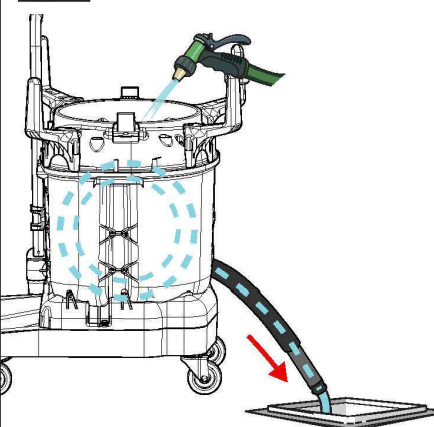
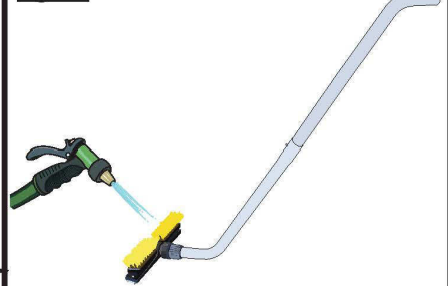


Fig. 32



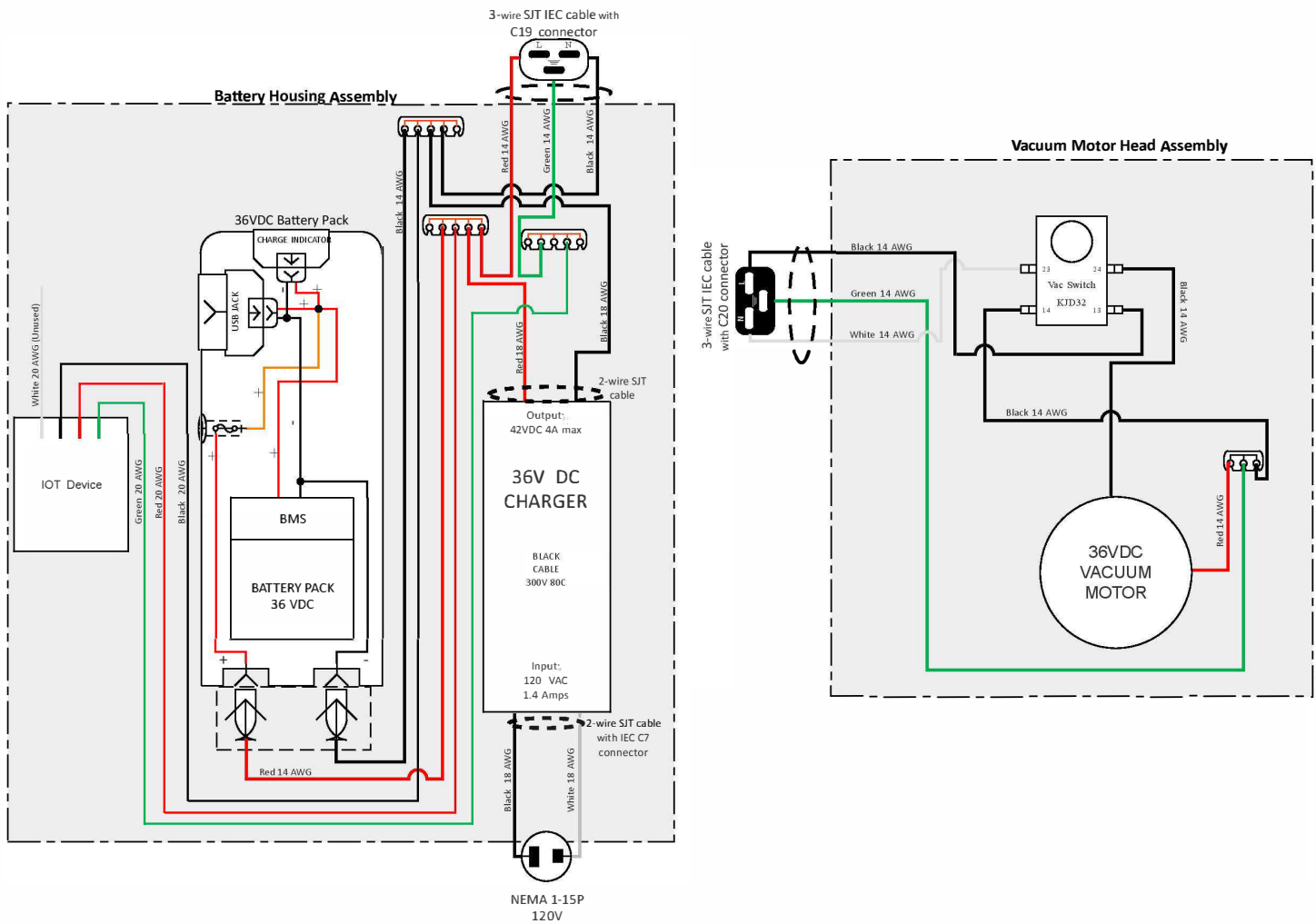
UNIT & MAINTENANCE



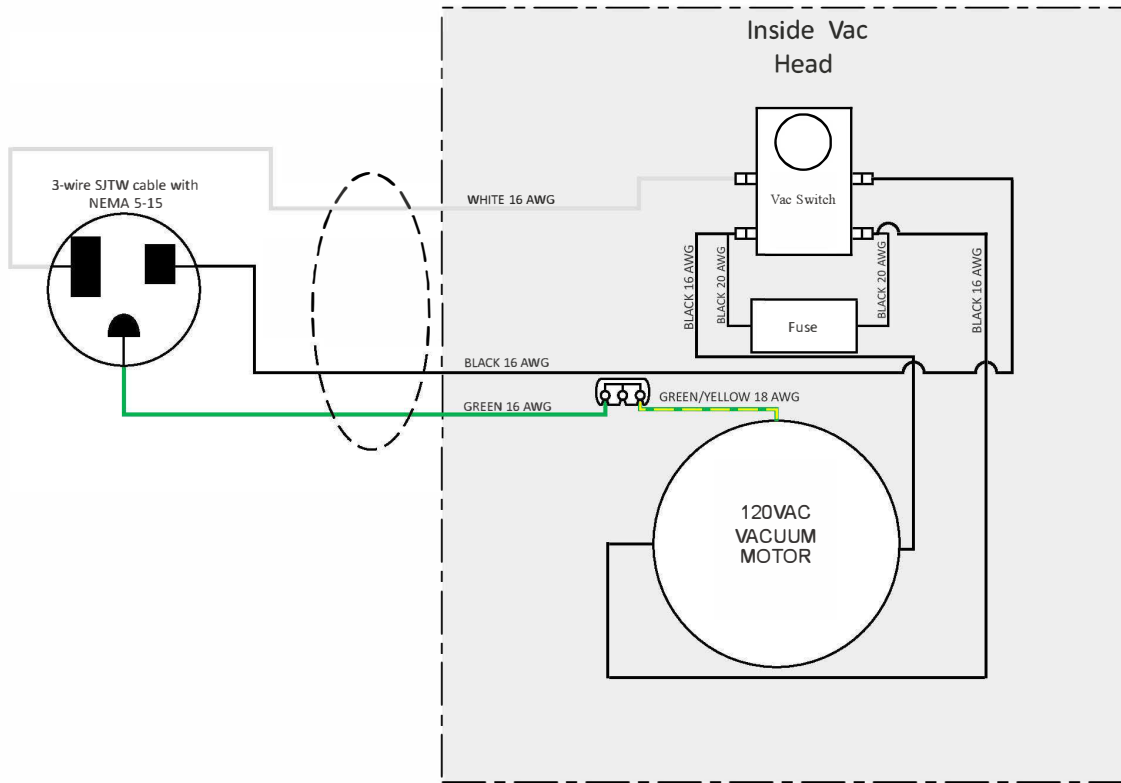
Always unplug unit before servicing unit or inspecting.

ITEM	PROCEDURE
Floor Squeegee	- Check condition of squeegee blades and wheels on the floor tool. - Rough floor surfaces will cause the blades and wheels to wear out more quickly. Replace as necessary.
Spray Gun	- Check spray pattern. If spray pattern will not pinpoint, clean orifice by removing it with an Allen wrench and flushing. Replace if needed. - If nozzle becomes difficult to move from high to low pressure, lubricate nozzle with lithium grease.
Pressure Hose	- Wipe clean after each use. - Check for cuts or frays in the hose jacket, particularly at the end of the fittings. Replace hose if cuts are found.
Water Tank	- Check condition of filter in water tank. Clean as needed. - Empty the water tank to prevent mildew and bacteria growth. Empty tank by dipping the vacuum hose into the water tank and transferring the water to the vacuum tank.
Vacuum Tank	- Empty and flush vacuum tank. - Clean and disinfect. - Check the float shutoff screen to be sure it is not blocked or dirty. A plugged filter screen restricts airflow and results in reduced suction.
Leaks	- Be alert for leaks around hoses, fittings, spray wand, tanks or elsewhere. - Discontinue use until leaks are repaired.
Electrical System	- The ground fault circuit interrupter (GFCI) must be tested before each use. - Electrical cord must be inspected for tears or cuts in the insulation. - Inspect plug and be sure ground pin is in place.
Vacuum Wand	Use a wire or coarse brush with acid cleaner to remove residue from threads on the coupling and coupling nut. Apply grease when done.
HEPA Filter	Replace every 3-6 months depending on use.
Float Cage	Ensure cage is sprayed and cleaned daily to remove debris.
Battery Maintenance	- Inspect battery, plugs, cords, splash cover (if included), and chemical-resistant plastic protective helmet (if included) before charging and after charging. - Charge and store battery indoors. - If included, the battery splash cover must remain in place. Without the battery splash cover, the battery housing may become damaged which may cause the battery to malfunction, which can result a fire, explosion, personal injury, and/or property damage. - Always keep helmet affixed to top of battery if your battery is so equipped. - To view the battery, temporarily move the splash cover (if included). Replace the splash cover after inspection. Do not use unit if battery shows any damage, including cracks, dents, holes, fraying, or missing pieces. - Once your battery run time is less than 55% (50 minutes for non-quick change and 30 minutes for quick change batteries), contact Kaivac to replace your battery. Regardless of run time, replace your battery after 4 years. Consult Kaivac.com for information on recycling your old battery. - DO NOT attempt to repair, service or modify the batteries or charger. Contact Kaivac Technical Support with any issues. - DO NOT use or store the NTC System or battery in refrigerated areas, in environments when the battery is in direct contact with liquids, or near flammable or combustible materials. - DO NOT charge or store battery for extended time (1 month or more) in temperatures below 40°F (4°C). - DO NOT use a battery or appliance that is damaged or modified. Damaged or modified batteries may exhibit unpredictable behavior resulting in fire, explosion or risk of injury. - If unit is smoking or sparking, move outside to a fire-safe location immediately. If possible, disengage battery from unit, notify management, and call Kaivac Technical Support at 800-287-1136, Ext. 2
Splash Cover (if applicable)	- Inspect splash cover for damage. - Clean and dry the splash cover. - Be sure the splash cover is secure.

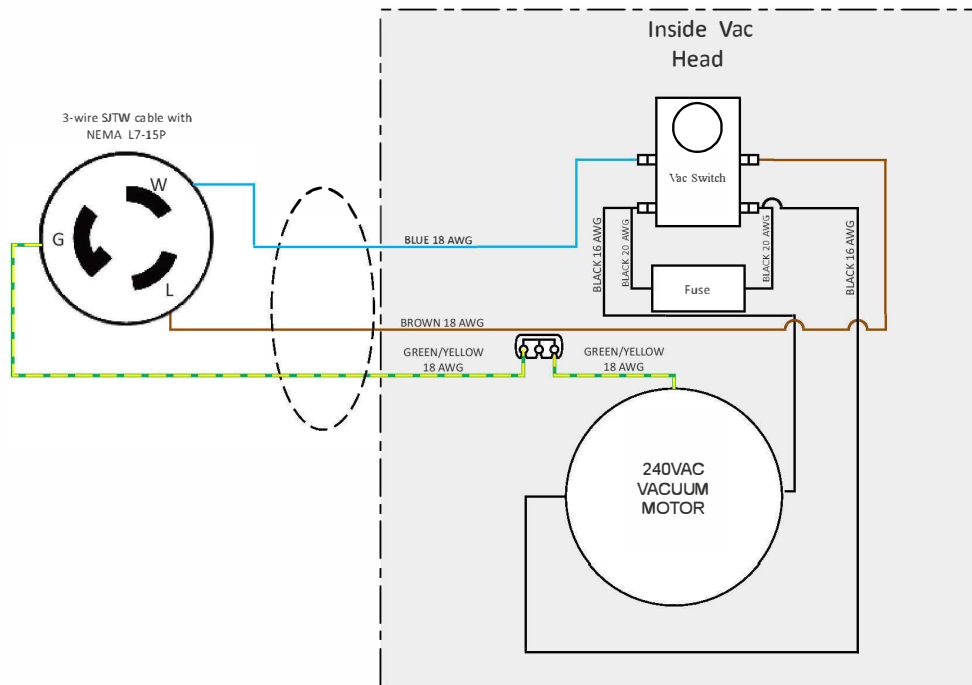
DC STANDARD ELECTRICAL DIAGRAM



AC STANDARD ELECTRICAL DIAGRAM



AC INTL. ELECTRICAL DIAGRAM



TROUBLESHOOTING



Always unplug unit before inspecting or servicing.

AREA	PROBLEM	POSSIBLE CAUSE	
Electrical	No Power to pump or vac motor	Unit not plugged in	Plug unit in
		Switch not "on"	Check switches for "on"
		GFCI tripped	Test and reset GFCI
		Building circuit overloaded	Check and reset circuit
		Switch wires loose	Disconnect power and check for loose wire
		Connections loose	Disconnect power and check for loose wire under panel
	Electrical burning smell TURN UNIT OFF IMMEDIATELY.	Vac motor brushes worn	Remove vac motor and repair
		Vac motor hung up	Release pressure on hose and jog vac switch, or replace
		Pump motor hung up	Release pressure on hose and jog pump switch, or replace
Vacuum System	No/Weak vacuum	Vac tank full	Empty vac tank
		Squeegee blades or wheels worn	Replace wheels or blades and check periodically
		Float shutoff screen dirty	Spray off float screen to clean
		Float ball stuck	Tap float and release/clean
		Damaged hose	Cut and repair/replace
		Dump hose plug missing	Contact dealer and replace
		Access lid not right	Tighten lid hand tight
		Vacuum hose plugged	Flush hose to remove debris
		Too much liquid in vac hose	Allow air in when vacuuming
		Vac hose still wrapped	Unwrap vac hose fully
		Exhaust plugged	Clean exhaust port and HEPA filter
		Leak in vac tank	If repairable, clean and dry affected area and seal with silicone
		HEPA filter clogged	Remove HEPA filter and clean
	Moisture from exhaust	Vac tank full	Dump vac tank
		Float shutoff missing	Replace
		Excessive foam in vac tank	Use defoamer
Blow Dry System	No air flow	Hose disconnected	Reconnect hose
	Moisture from exhaust	Water in blow hose	Dry blow line
	Suction, not blow action	Vacuum hose connected to vac tank	Reconnect to vac motor exhaust hose

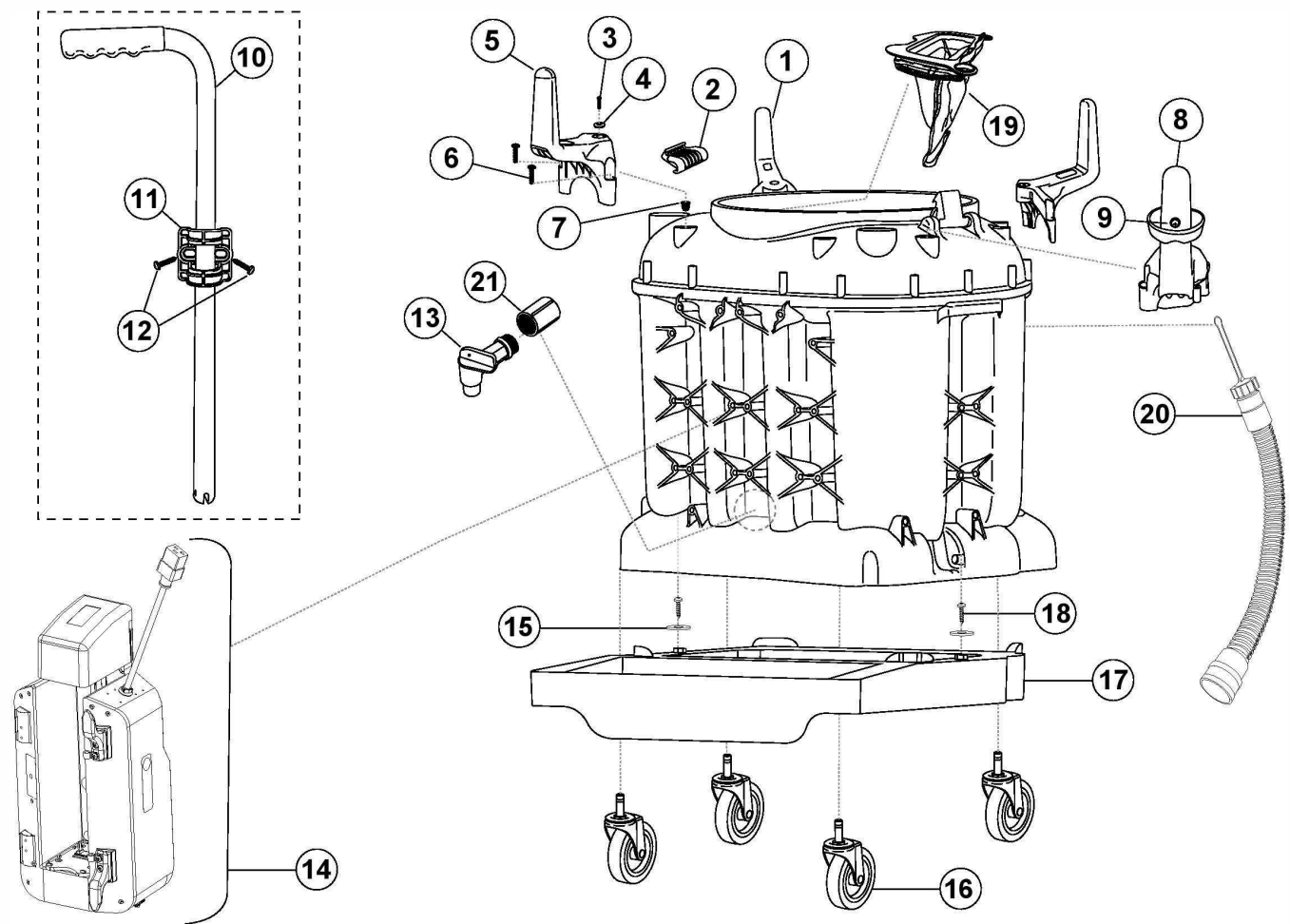
TROUBLESHOOTING

AREA	PROBLEM	POSSIBLE CAUSE	SOLUTION
High Pressure System  WARNING Always unplug unit before inspecting or servicing. RISK OF ELECTRICAL SHOCK, FIRE, SERIOUS INJURY, OR DEATH	No water from pump or low pressure	Out of water	Fill water tank
		Gun nozzle plugged	Remove orifice with Allen wrench and clean
		Air in pump (vapor lock)	Use power prime technique
		Gun orifice missing	Replace orifice
		Water tank filter plugged	Clean tank and filter
		In-line bowl filter plugged	Remove filter cover and clean
		Bowl filter lid loose	Gently tighten bowl cover
		Pressure hose damaged	Repair or replace
		Quick disconnect leaking	Tighten or replace
		Injector plugged	Remove safety cap from chemical and blow small amounts of compressed air into line
		Pulse hose damaged	Repair or replace
		Regulator failed	Replace
		Hose kinked	Unkink and check for damage
		Seals in pump need replaced	Remove and replace seals
	Bad fan pattern or pinpoint pattern on gun	Debris in nozzle	Remove orifice with Allen wrench and clean
		Orifice damaged	Remove and replace
Chemical Injection System  WARNING Always unplug unit before inspecting or servicing. RISK OF ELECTRICAL SHOCK, FIRE, SERIOUS INJURY, OR DEATH	No chemical flow	Out of chemical	Refill chemical
		Safety cap not secure	Check safety cap/tighten
		Chemical valve "off"	Check on/off valve
		Safety cap plugged	Replace cap
		Spray gun in wrong mode	Make sure gun nozzle is pulled out away from gun chemical mode
		Metering tip plugged	Check metering tip for clog
		Injector plugged	Remove safety cap from chemical and blow small amounts of compressed air into line
		Air entering system	Check for air entering system around chemical lines or injector
		Injector installed backwards	If fluttering or pulsing sound can be heard while spraying or when unit is running, it is possible that your injector is in backwards. Remove; reinstall.
		Kink in chemical line	Replace chemical line

TROUBLESHOOTING

AREA	PROBLEM	POSSIBLE CAUSE	SOLUTION
Chemical Injection System continued	Not enough chemical	Metering tip plugged	Remove and clean
		Wrong metering tip	Check and replace per chart
	Chemical line blows off safety cap	Debris in injector	Remove safety cap from chemical and blow small amounts of compressed air into line
	Water back flows into chemical bottle	Bad seat on injector check valve	Check injector o-ring or replace
		Bad safety cap	Replace safety cap
Dump System	Dump hose will not empty tank	Dump hose cap not removed	Remove cap
		Clog in bottom of tank	Tip dump contents, remove debris
	Dump hose leaks	Hose cut	If leak is less than 4" from tank side, cut and reattach, or replace
		Clamp loose	Tighten hose clamp
		Dump cap missing	Replace cap
Wheels and Casters	Wheels will not roll; rubbing	Flat tires	Inflate tires to 30 p.s.i.
		Debris wrapped around axle	Check for debris on axle
		Bearings tight	Grease bearings
		Wheels too loose on axle	Remove wheel, add washers to take up slack
		Bearings falling out	Replace bearing assembly
Squeegee Head	Floor streaks	Worn blades or wheels	Replace wheels and/or blades
	Squeegee head does not easily rotate when installed on wand	Brass ring on wand not in groove	Loosen coupling nut and re-position head on groove
		Coupling nut too tight	Loosen 1/2 turn
	Head will not stay on wand	Coupling nut cracked	Replace
		Brass ring worn	Replace
	Premature blade wear	Squeegee wheels worn	Check wheels for wear/replace
Battery	Sucks to the floor too tightly	Squeegee wheels worn	Check wheels for wear/replace
	Sparks/Burning/Fire/Smoke	Damage to battery or charger	Stop use immediately. Disconnect battery from charger, if possible. Unplug charger, if possible.
 WARNING RISK OF FIRE, EXPLOSION, AND SERIOUS INJURY, OR DEATH		STOP USE IMMEDIATELY	

VACUUM TANK ASSEMBLY



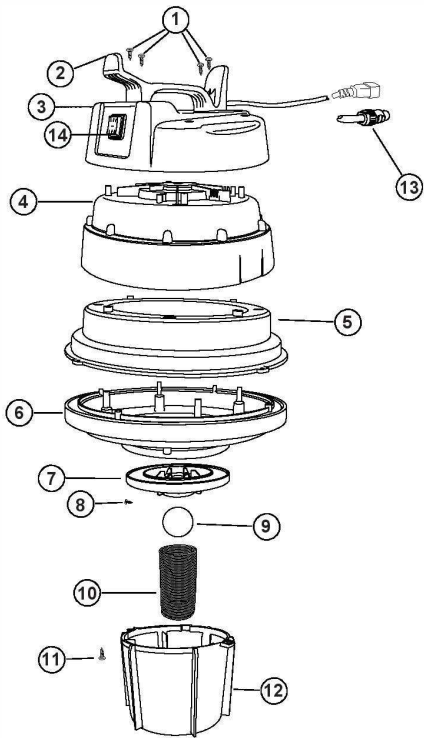
[P/N: VTOF11 (BATTERY), VTOF34 (INTL.), OVTAU2 (CORDED)]

#	PART NO.	PART DESCRIPTION
1	OSTOB2	OMNIFLEX MULTI PURPOSE POST - HOSE PORT
2	CLASP1Y	OMNIFLEX CLASP UPPER YELLOW
3	CSS209	8-32 X 3/4 ROUND HEAD UNIT SCREW (AC ONLY)
4	CSS306	WASHER BONDED NEOPRENE 1/4ID X 5/8OD (AC ONLY)
5	OSTOB	OMNIFLEX MULTI PURPOSE POST
6	CSS322	10 X 3/4 PHL PAN HI-LO (AC ONLY)
7	CSS211	8/32 IN. INSERT FOR MOLDS (AC ONLY)
8	VHDTY	VAC HOSE DRIP TRAY
9	CSS208	8 X 1/2 SS TRUSS SCREW
10	COHA00	POWDER COATED HANDLE

* Battery units only

11	OVTSHB	OMNIFLEX VAC TANK SPIGOT HANDLE BRACKET
12	CSS329	1/4-10 X 1 PLASTITE ZINC PAN TORX 30
13	KMB22A	OMNIFLEX SPIGOT BLACK PLASTIC
14A*	EABT09	QC INTERFACE W/ INTEGRATED CHARGER & IOT
14B*	EABT16	QC INTERFACE W/ INTEGRATED CHARGER & IOT - INTL
14C*	EABT04	QC INTERFACE W/ INTEGRATED CHARGER
15	CSS44	1/4 FLAT WASHER
16	OFCSTR	OMNIFLEX 3 INCH CASTER
17	GP0022	UNIVAC CHASIS FRAME
18	CSS364	1/4-10 X 1 1/4 IN PLASTITE PAN TORX
19	OBAGY	MESH BAG (YELLOW)
20	DH25	DUMPHOSE

VACUUM HEAD ASSEMBLY



[P/N: VM3D00, VM3D02, VM3D05, VMAWDZ2, VMAWDZ240VI, VM-UL-AWDZT2]

#	PART NO.	PART DESCRIPTION
1	CSS17A	8 SST SCREW 3/4 IN
2	OVMHANLP	OMNIFLEX VAC MOTOR HANDLE BLACK LOW
3	ZD10TC	OMNI VAC MOTOR TOP COVER
4	ZD10MC	OMNI VAC MOTOR MIDDLE COVER
5A	ZD10MR	OMNI VAC MOTOR MIDDLE RING
5B	ZD10MR36	OMNI VAC MOTOR MIDDLE RING — 36V
6	ZD10BC	OMNI VAC MOTOR BOTTOM COVER
7	GA0002	FLOAT INTERFACE ASSEMBLY
8	CSS318	5/6" SS PHILLIPS FOR ZD 10/FCINT
9	CVS26	OMNIFLEX FLOAT BALL
10	ZD10	STAINLESS STEEL FLOAT CAGE
11	CSS313	SCREW #7 PANHEAD PHIL SS 1/2 IN
12	ZD10B	OMNI VAC MOTOR BASKET
13A	HEPC02	POWER CORD 22.5 IN - C20 MALE
13B	CSS315DC2	ELEC. MALE PLUG 36VDC 20A
13C	CSS315DC	ELEC. PLUG - INLINE 36VDC PLASTIC TWIST-LOCK
13D	OP3TPR	ELEC. PLUG - INLINE 120VAC W/ETL TWIST-LOCK
14	HESB01	SWITCH - ELECTROMAGNETIC - 25.1A HEAVY DUTY

BATTERY INTERFACE ASSEMBLY

[P/N: EABT09, EABT04, EABT16]

#	PART NO.	PART DESCRIPTION
1	HEPC01	C19 CABLE
2	CSS359	10 X 3/4 FLAT HEAD FORMING SCREW
3	BINTPLUG	BATTERY BASE PLUG
4	GP0008	BATTERY CHARGER HOUSING
5	CES12	3/8 CONDUIT CLAMP
6	HETR01	IOT UNIT
7	GP0009	BATTERY CHARGER HOUSING LID
8	GP0010	CORD WRAP/CLEAT
9	CSS322	10 X 3/4 PHL PAN HI-LO
10	HWM010	CABLE CLAMP 3/16 BLACK
11	HWS000	6 X 3/4 THREAD FORMING SCREW TORX
12	CSS359	10 X 3/4 FLAT HEAD FORMING SCREW
13	HEBT00	GUIDE RAIL FOR BATTERY
14	EACG00	36V BATTERY CHARGER
15	HWM004	3/8 ID SHAFT COLLAR
16	HWM005	3/8 ID X 1/2 RUBBER GROMMET
17	HWM006	SNAP GRIP HOSE CLAMP .30 MIN .36 MAX
18	BINTBASE	PLUG BASE
19*	HEPC07	CHARGER EXTENSION

* International units only

