

# **TORNADO<sup>®</sup>** **SURGE 500**

## **UPRIGHT EXTRACTOR** OPERATIONS AND MAINTENANCE MANUAL FOR COMMERCIAL USE ONLY



Model No. TE310-G15-U

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# INTRODUCTION

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Your new Tornado unit is a high quality, precision-made product. All parts used in the manufacturing of this unit have passed rigid quality control standards prior to assembly. Please safeguard the original receipt/invoice given at the time of purchase. If you experience any problems with your unit during the warranty period, the original receipt/invoice will act as proof of purchase.

**Upon receipt, inspect outer box for exterior damage. Unpack all internal parts, ensure no hidden damage is found.**

Each unit is tested and thoroughly inspected prior to shipping. If damage is discovered, immediately notify the transportation company that delivered your machine and request an inspection. As a manufacturer, we are unable to act upon any claim for concealed damage and you must originate the claim. Be sure to keep the carton, packing inserts, and carrier's receipt until the inspector has verified your claim.



## **Protect the environment**

Please dispose of packaging materials in an environmentally safe way according to local waste disposal regulations.



**Always remember to recycle.**



### Warranty

Within 30 days of purchase, to activate product warranty, go to:  
<https://tornadovac.com/services/warranty-registration-form.aspx>  
For warranty information go to [www.tornadovac.com](http://www.tornadovac.com).



### Warning Labels

Prior to operating the unit, read and understand completely this owner's manual paying special attention to warning labels. These labels indicate a potentially hazardous situation that could result in death or serious injury if not avoided. Use only as described in this manual.



### Important

There are no owner serviceable parts inside this machine. Removal of screws and accessing internal components will void all warranty claims.



### Flammability Warning

**NEVER** fill unit with flammable chemicals. **DO NOT** use in an area where flammable fumes are present.

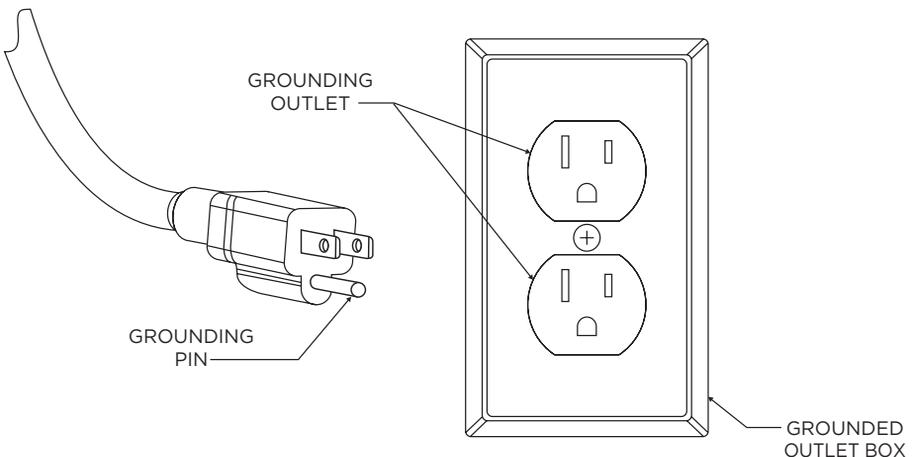
# GROUNDING INSTRUCTIONS

This appliance must be grounded. If it should electrically malfunction, grounding provides a path of least resistance for the current to reduce the risk of electric shock. This machine is equipped with a cord having an 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 equipment 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 appliance. If the plug will not fit the outlet, have the proper outlet installed by a qualified electrician.  
**DO NOT REMOVE THE GROUNDING PIN FOR ANY REASON.**

This appliance is for use on a nominal 115-volt circuit and has a grounding plug that appears as shown below.



# IMPORTANT SAFETY INSTRUCTIONS

Read and understand this owner's manual and all labels on the unit before operating. Safety is a combination of common sense, staying alert, and knowing how your unit works. To reduce the risk of personal injury or damage to your unit use only as indicated in this manual.



## FOR COMMERCIAL USE ONLY

To reduce the risk of fire, electrical shock, or injury, the instructions below must be read and understood completely prior to machine operation

**IMPORTANT:** The manufacturer cannot accept responsibility for damage caused when the appliance is not used according to the instructions, or for uses other than those for which it was intended.

## WARNING:

- This machine must only be used for the manufacturer's approved application as described in this manual.
- The machine must be unpacked and assembled in accordance with these instructions before connecting to the electrical supply.
- Only genuine accessories and spare parts provided with the machine or those approved by the manufacturer should be used. The use of other accessories may impair the safety of the machine. All repairs must be performed by a qualified service agent.
- **DO NOT** modify the machine from its original design.
- Operators must be fully trained in the use of the machine in accordance with these instructions and be able to perform regular user maintenance as outlined in this manual.
- Operators should be physically capable to maneuver, transport and operate the machine.
- Operators should be able to recognize unusual operation of the machine and report any problems.
- This machine is not intended for use by persons (including children) with reduced physical, sensory or mental capabilities, or lack of experience and knowledge unless they have been given instruction concerning use of the machine and are under supervision by a person responsible for their safety.
- Keep children and unauthorized persons away from the machine when in use.  
**DO NOT** use the machine as a toy.
- **DO NOT** use with a damaged cord or plug. If it has been damaged, left outdoors or dropped in water, return it to a service center for inspection and/or repair.
- **DO NOT** use where hazardous dust is present.
- **DO NOT** use in an explosive environment.
- **DO NOT** pick up or use near flammable or combustible fluids, hazardous dusts or vapors.
- **CAUTION** –If it is suspected that there is hazardous dust or flammable/corrosive material, stop cleaning the area immediately and consult your supervisor.

## SAVE THESE INSTRUCTIONS

# IMPORTANT SAFETY INSTRUCTIONS

- **DO NOT** use to clean up any burning or lighted materials such as cigarettes, matches, ashes, or other combustible objects.
- Only use the machine on firm, level surfaces. **DO NOT** use the machine on gradient or slope of more than 2%.
- **CAUTION** – This machine is for dry, indoor use only and should not be used or stored outdoors or in wet conditions. Protect from rain.
- Take care when using this machine near the top of stairs to avoid loss of balance.
- **DO NOT** cover the machine when in use.
- **DO NOT** run the machine dry as this could damage the floor surface and/or the machine itself.
- **DO NOT** leave the machine running unattended.
- Keep hair, loose clothing, hands, feet, and all other parts of the body away from openings and moving parts. Do not put hands under base as rotating parts can cause injury.
- **DO NOT** put any object into openings. **DO NOT** use with any opening blocked. Keep free of dust, debris and anything that may reduce airflow.
- **DO NOT** use volatile or combustible solvents (e.g., diesel, petrol, PA, trichloromethane) nor any corrosive, toxic, or highly irritant substance to wash floors, even if diluted. In the event of accidental contact with any such substances (e.g., due to spills) follow the decontamination procedures in force at the user site. If in any doubt about the condition of the machine, contact Tornado or the dealer/agent who supplied the machine.
- **DO NOT** leave the machine unattended when plugged in. Unplug from outlet when not in use and before changing brushes or attempting any maintenance or adjustment.
- **DO NOT** fill the machine with water hotter than 135°F (57°C).
- When used on escalators, ensure the machine is positioned at the bottom of the escalator with the escalator moving towards the operator.
- **DO NOT** pull or carry by cord, use cord as a handle, close a door on cord, or pull cord around sharp edges on corners.
- **DO NOT** run machine over cord. Keep cord away from heated surfaces.
- **DO NOT** unplug by pulling on cord. To unplug, grasp the plug, not the cord. Do not handle plug or machine with wet hands. Turn off all controls before unplugging.
- Connect only to a properly grounded outlet. See grounding instructions.
- Use care to keep electrical supply cable from contacting moving parts such as floor brushes.
- Make sure voltage and frequency at the wall receptacle correspond with that indicated on nameplate before plugging in machine.
- The machine must be kept clean and in good condition with regular inspections of the power cord and plug for signs of any damage. If any parts are damaged, they shall only be replaced by an approved part by the manufacturer, its service agent or a similar qualified person in order to avoid a hazard.
- Only replace the power cord with original OEM equipment.

## SAVE THESE INSTRUCTIONS

# CLEANING AGENTS

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- When using cleaning and care agents, the manufacturer's danger warnings must be followed, and proper PPE must be worn per manufacturer's instruction.
- Only use low-foaming, non-combustible cleaning agents which DO NOT contain generally health-hazardous substances.
- Please ensure that after each use, any chemical residue is rinsed out with clean water.



The manufacturer cannot accept responsibility for damage caused when the appliance is not used in accordance with the instructions provided or for uses other than those for which it was intended.

# OPERATOR GUIDELINES

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Let the machine do the work. Grip the handle as lightly as possible.

- Wear suitable footwear to avoid slipping.
- Wear suitable clothing to keep dry.
- Do not smoke when using the machine.
- Do not use excessively foaming or highly corrosive cleaning solutions. If operating on a flooded floor, ensure that water depth does not exceed 6mm (1/4 inch).



This machine is heavy. Do not attempt to lift the machine without assistance. Incorrect lifting techniques may result in personal injury.

# TECHNICAL SPECIFICATIONS

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Specification	Value
Voltage	115
Hertz	60
Front Wheels (Casters)	4 in / 102 mm
Rear Wheels	12 in / 305 mm
Length	36.5 in / 927 mm
Width	23.5 in / 597 mm
Height	45.5 in / 1156
Vacuum Motor (Airwatt)	625 Watts
Pump	50 - 500 p.s.i. / 3.4 - 34 bar
CFM / CMM	133 / 3.8
Waterlift	125 in / 0.31 bar
Heater	Single Element
Solution Tank Capacity	15 Gallon / 57 Liters
Recovery Tank Capacity	15 Gallon / 57 Liters
Weight	152 lbs. / 69 kg.
Noise Level	db(A)

- Above values are approximate. Since the company's policy is to continuously improve the product, there could be changes without prior notice.

# CONTROLS

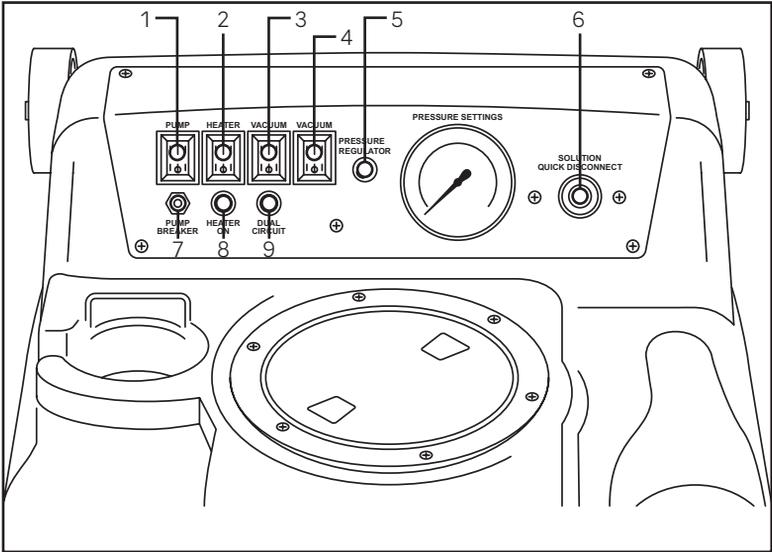


Fig. 1

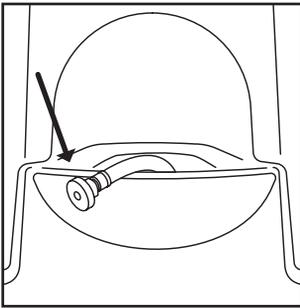


Fig. 2

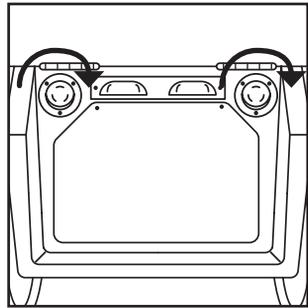


Fig. 3

## General Instructions for the Tornado® Surge 500 Extractor

**Follow these easy step by step instructions to ensure proper operating performance.**

1. If you are not pre-spraying the chemical on the carpet, fill up the fresh water solution tank with tap water that is 120°-135° F (49°-57° C) and approved carpet cleaning chemical, following the mixing instructions for the chemical being used, into the solution tank. If using the EZ Fill hose option, remove the hose from the solution tank, (Fig. 2), and connect the hose to a water faucet.
2. Attach the extension cord to the socket on the back of unit (Fig. 3) and twist it clockwise to lock it in place.
3. Plug the other end of each extension cord into a separate grounded 15 amp wall socket circuit. When this is accomplished, the green indicator light (#9 Fig.1) will be lit.
4. Attach the hose system to the unit and to your carpet wand.
5. Turn the heater switch (#2 Fig. 1) to the "ON" position. The orange indicator light (#8 Fig. 1) is on any time the heater is operating.
6. Turn the pump switch (#1 Fig. 1) to the "ON" position.
7. Turn the vacuum switch (#3 Fig. 1) to the "ON" position to begin cleaning (#4 Fig. 1) is a blank cover.
8. With the solution line attached to the wand and the machine (#6 Fig. 1), prime the pump by squeezing the trigger on the wand and releasing the water (hold wand tip over solution tank to put water back into solution tank). This will pump water into the heater and get any air out of the solution line. Let heater heat up. This will take 3 to 5 minutes.
9. Using the pressure adjustment (#5 on Fig. 1) adjust the pressure of the unit to suit your extraction task.
10. When recovery tank is full, empty by using drain hose on the front of machine. If a pail is used to empty the recovery tank, do not use the same pail to fill the solution tank as this can result in putting dirt and grit into the solution line that can plug filters, orifices, and generally degrade the solution line system (do not reuse solution).
11. To empty solution tank, detach the wand from the end of the vacuum hose and insert the vacuum hose into the solution tank. Turn the vacuum switch to the "ON" position and transfer solution to the recovery tank and dispose of as

# WARNINGS

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- **DO NOT** break off or pull the grounding prong on the plug.
- **DO NOT** attempt repair on a machine that is under warranty unless instructions to perform it by an authorized shop are obtained from the factory.
- **DO NOT** use citrus-based (D-Limonene) cleaners in this machine.
- **DO NOT** use cleaning chemicals in this machine except those recommended for steam-type extraction equipment. The use of any chemicals with abrasive additives voids the warranty.
- **DO NOT** use any replacement parts except those specified on the parts list. Performance of the machine could be affected if substitutions are made.
- **DO NOT** use water in excess of 135° F (57° C) through the pump system. It could damage the diaphragm pump.
- Follow maintenance schedule strictly.
- Failure to comply with the above warnings instructions will void the warranty.



Do not use any sharp or pointed objects to operate the controls on this unit.



Dispose of dirty water in accordance with all local, state, and federal hazardous material disposal regulations.

# TRANSPORT AND STORAGE

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## Transport:

- Take extreme care when moving the machine up or down steps or stairs.
- Incorrect lifting techniques may result in personal injury.
- As stated earlier in this manual, this machine is heavy. Do not attempt to lift the machine without assistance.
- Carefully wrap the power cord and store in a dry, indoor location.
- **DO NOT** expose the machine to rain or moisture.
- When transporting the machine, ensure that all components, tanks and removable parts are securely fastened and that the power cord and plug are not trailing.
- **DO NOT** lift or transport the machine while it contains liquid as this will add considerable weight to the unit.

## Storage:

- Store extractor indoors in a dry area.
- Recovery and solution tank should be empty and clean when the extractor is not in use.
- Leave the recovery lid and drain hose open to air out the recovery tank.
- Do not store in freezing temperature.
- A small amount of windshield washer fluid may be left in the pump and internal solution line for protection against freezing.



Store machine in a dry indoor area only.

# MAINTENANCE

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Prior to performing any maintenance, ensure unit is **OFF** and disconnected from power supply.

## Recommended operator checks prior to use:

To receive reliable service from this equipment, regular daily maintenance is a requirement. Fabric cleaning, both carpet and upholstery, are very dirty environments for any equipment. The following recommendations are offered.

1. Keep the equipment clean, both inside and out.
2. Lubricate brass quick disconnects with a quality lubricant such as WD-40®.
3. Flush solution systems after use with clear, clean water. A white vinegar solution may also be used. This will counter-act hard water and alkaline deposits and aid in keeping orifices clean.
4. Do not allow fluid either in solution or recovery tank to sit overnight. The unit should be emptied and cleaned daily.
5. Clean the strainer in the solution tank daily. (Fig. 4)
6. Do not use the same receptacle (pail) to fill solution tank that has been used to remove waste water from recovery tank.
7. When the unit is not in use, leave the tank lids open.
8. At the end of each day, run the vacuum for 3 minutes with lid open.

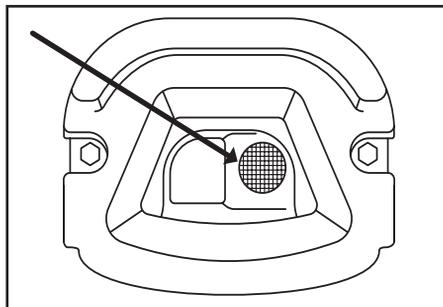


Fig. 4



Besides those outlined above, all additional servicing and repairs should only be performed by an Authorized Tornado Servicing Agent.

# FAULT DIAGNOSIS



The following checks may be performed by the operator.  
Any other service or attempt to service by the operator will void the warranty.

## PUMP SYSTEM

PROBLEM	POSSIBLE CAUSE	SOLUTION
Pump motor runs but no spray through jets.	<ol style="list-style-type: none"> <li>1. Clogged or faulty solution filter.</li> <li>2. Clogged or faulty quick disconnect on housing.</li> <li>3. Punctured pump diaphragm.</li> <li>4. Clogged jets</li> </ol>	<ol style="list-style-type: none"> <li>1. Check filter and remove lint or other foreign material.</li> <li>2. Depress plunger on solution hose against inside wall of solution tank. If solution is flowing at this point, the system is OK. If no solution flows, check the quick disconnect for lint and other foreign matter.</li> <li>3. Replace with diaphragm repair kit.</li> <li>4. Clean jets on wand or tool.</li> </ol>
Uneven spray from jet. Spray weak or uneven.	<ol style="list-style-type: none"> <li>1. Clogged strainer in solution tank.</li> <li>2. Clogged jet.</li> </ol>	<ol style="list-style-type: none"> <li>1. Unscrew strainer and remove lint and any other foreign material from screen.</li> <li>2. Remove and clean.</li> </ol>
Leaking or stuck solution valve.	<ol style="list-style-type: none"> <li>1. Foreign material in valve.</li> <li>2. Loose brass hex nut.</li> <li>3. Valve or seals worn</li> </ol>	<ol style="list-style-type: none"> <li>1. Remove brass hex plug, clean valve and replace.</li> <li>2. Reseal hex and plug.</li> <li>3. Replace worn parts with solution valve repair kit.</li> </ol>
Pump motor not working.	<ol style="list-style-type: none"> <li>1. Loose wiring</li> <li>2. Defective pump pressure switch.</li> <li>3. Motor burnout</li> </ol>	<ol style="list-style-type: none"> <li>1. Tighten wiring</li> <li>2. Replace with new pressure switch assembly.</li> <li>3. Replace pump motor</li> </ol>
Pump pressure low	<ol style="list-style-type: none"> <li>1. Clogged screens on strainer in solution tank.</li> <li>2. Punctured pump diaphragm.</li> </ol>	<ol style="list-style-type: none"> <li>1. Unscrew strainer remove lint and any other foreign material from screen.</li> <li>2. Replace with diaphragm repair kit.</li> </ol>
Pump pressure varies.	<ol style="list-style-type: none"> <li>1. Defective pump pressure control switch.</li> </ol>	<ol style="list-style-type: none"> <li>1. Replace.</li> </ol>

# FAULT DIAGNOSIS

## ELECTRICAL SYSTEM

PROBLEM	POSSIBLE CAUSE	SOLUTION
No electrical power.	<ol style="list-style-type: none"> <li>1. Defective power cord.</li> <li>2. Circuit breaker off or fuse blown.</li> </ol>	<ol style="list-style-type: none"> <li>1. Replace</li> <li>2. Turn circuit breaker on or replace fuse.</li> <li>3. Unplug any equipment using the same circuit.</li> </ol>
Switch is turned on. Intermittent power to motor(s).	<ol style="list-style-type: none"> <li>1. Faulty electrical cable.</li> <li>2. Defective switches.</li> <li>3. Loose terminal.</li> </ol>	<ol style="list-style-type: none"> <li>1. Repair or replace.</li> <li>2. Replace.</li> <li>3. Replace.</li> </ol>
Electrical Shock	<ol style="list-style-type: none"> <li>1. Equipment not grounded.</li> </ol>	<ol style="list-style-type: none"> <li>1. Locate grounded outlet.</li> </ol>

## VACUUM SYSTEM

PROBLEM	POSSIBLE CAUSE	SOLUTION
Vacuum motor on, low or no vacuum at wand.	<ol style="list-style-type: none"> <li>1. Drain hose open.</li> <li>2. Defective vacuum hose Kinks in vacuum hose.</li> <li>3. Vacuum disconnected.</li> <li>4. Damaged recovery tank lid.</li> <li>5. Loose hose connection</li> <li>6. Vacuum motor exhaust blocked.</li> </ol>	<ol style="list-style-type: none"> <li>1. Close drain hose.</li> <li>2. Repair or replace hose.</li> <li>3. Open machine, connect vacuum hose to recovery tank.</li> <li>4. Replace tank lid. Recovery tank lid must be closed.</li> <li>5. Check for leaks around clamps and cuffs vacuum motor. Replace damaged hose(s).</li> <li>6. Check air flow by removing hose from machine and feel the exhaust under the machine. Remove obstruction.</li> </ol>
Motor running and no vacuum and no exhaust from the blowport.	<ol style="list-style-type: none"> <li>1. Faulty vacuum motor.</li> <li>2. Float activated.</li> <li>3. Recovery tank full</li> </ol>	<ol style="list-style-type: none"> <li>1. Replace.</li> <li>2. Clean float.</li> <li>3. Empty recovery tank.</li> </ol>
Premature activation of the recovery tank float.	<ol style="list-style-type: none"> <li>1. Dirty or clogged float.</li> </ol>	<ol style="list-style-type: none"> <li>1. Clean float.</li> </ol>
Foam/dirty solution coming out of vacuum exhaust port.	<ol style="list-style-type: none"> <li>1. Foam bypassing float.</li> <li>2. Elbow in vacuum tank is not positioned correctly.</li> </ol>	<ol style="list-style-type: none"> <li>1. Use additional defoamer.</li> <li>2. The elbow should be pointed directly at the side wall of the tank.</li> </ol>





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**Record of Purchase**

Serial Number: \_\_\_\_\_

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

Dealer: \_\_\_\_\_

Phone Number: \_\_\_\_\_