



Made in the USA

Owner's Manual SC-EB



Electrostatic
Spraying Systems

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www.maxcharge.com



OWNER'S MANUAL
SC-EB
SPRAYER

Electrostatic Spraying Systems, Inc.
62 Morrison St. · Watkinsville, GA 30677-2749

CE certification applied for

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ESS SC-EB OWNER'S MANUAL



CONGRATULATIONS!

You have just purchased one of the most advanced spraying systems on the market today. Electrostatic Spraying Systems, Inc.¹ (ESS) is committed to providing you with powerful spraying systems that are easy to operate and maintain.

The ESS electrostatic sprayers are the result of the efforts and creativity of a variety of people. In addition to input from engineering, marketing, and manufacturing personnel, suggestions from our customers have been implemented into the design of our equipment. We would like to hear your ideas as well! If you have any suggestions or comments regarding the products or service of ESS, write or call us at:

Electrostatic Spraying Systems, Inc.

62 Morrison Street
Watkinsville, GA 30667-2749
Phone: 706-769-0025
1-800-213-0518
Fax: (760) 769-8072
Email: support@maxcharge.com

Please take time to read this manual before operating your new ESS SC-EB Sprayer. This manual contains important instructions for the safe operation of this equipment. It also includes helpful suggestions to maximize productive use of the SC-EB. Essential cleaning instructions should be followed to maintain your spraying at peak efficiency. Please carefully read and follow all instructions for your own safety and the safety of those around you.

Thank you!

We appreciate your business, and we are proud that you have selected an ESS sprayer for your operation.

Your new sprayer has been thoroughly tested and calibrated at our factory. If you have problems with it, please get in touch with us immediately. We will be glad to answer any questions you have concerning our equipment or service. ESS strives to support its customers with efficient, helpful, and friendly service. We appreciate your business and sincerely hope that Electrostatic Spraying Systems can meet your present and future spraying equipment needs.



For your personal records

Please record the model and serial numbers of your new sprayer here.

SC-EB

Model Serial Number

Spraywand Serial Number

Date of Purchase

¹ ESS SC-EB HD Sprayer™, MaxCharge™ and the ESS logo are copyrights or registered trademarks of Electrostatic Spraying Systems, Inc.



Notes



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Your SC-EB HD sprayer may appear slightly different than the photographs and drawings in this manual. We at ESS are constantly listening to customer input and we make frequent improvements to our sprayer designs.



Overview of the ESS Model SC-EB Air Assisted Electrostatic Sprayer

Air-assisted electrostatic sprayers produce electrically charged spray drops that are carried to the target in a low pressure, gentle, air stream. The heart of the SC-EB sprayer is the patented MaxCharge™ nozzle.

Air and liquid enter separately at the rear of the nozzle. Just before leaving the nozzle, the air hits the liquid stream to make many thousands of tiny spray droplets are blown out of the nozzle and move onto the target where they are attracted to surfaces by electrostatic forces. The electrostatic charge induced by the MaxCharge™ nozzle is strong enough to allow the droplets to move in any direction to cover surfaces, even defying gravity to coat the underside of leaves and the back side of the target objects. The result is uniform spray coverage on hidden surfaces that other sprayers miss. Air-assisted electrostatic sprayers give more than twice the deposition efficiency of hydraulic sprayers and non electrostatic types of air-assisted sprayers. The grower benefits in terms of significant reductions in application costs and optimized insect and disease control, sanitization of beef or other coverage.

The MaxCharge™ nozzle is easy to clean and corrosion-proof. The interior ceramic outlet resists the wear three times better than stainless steel outlets. These features combine to give the best spray coverage on the market. This quality product is virtually maintenance free, and assures you of savings in the application of chemical.

The comparison of air-assisted electrostatic spraying versus conventional spraying is dramatic.

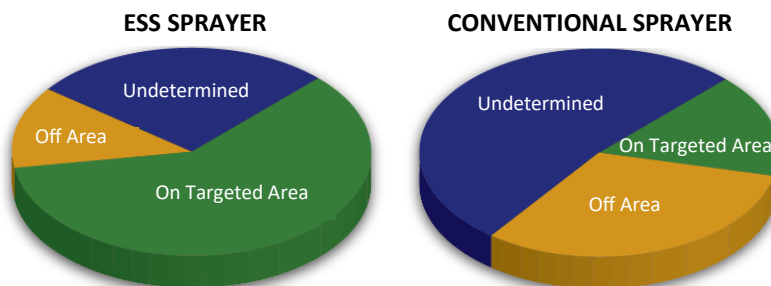


The Maxcharge™ spray nozzle is what makes ESS the industry leader in the production of electrostatic spraying equipment .



Electrostatically charged droplets are strongly attracted to the underside of surfaces.

Where Does The Spray Go?



The University of California completed a series of tests to investigate what happens to spray liquid after it leaves the nozzle.

Conclusion: ESS technology places over 4 times the amount of spray onto the plant surface using 1/2 the amount of chemicals. Furthermore, they also reported that ESS sprayers send 2/3 less chemicals to the ground and into the air. Less chemical used overall, less waste, and less drift than conventional equipment.

Imagine the environmental benefit!



A Picture Worth A Thousand Words...
In this test, fluorescent dye has been sprayed on two round knobs. The left knob was sprayed with the electrostatic system ON; the right knob was sprayed with the same sprayer, but with the electrostatic system OFF. Note how even the coverage is on the electrostatic knob.

Safe Operation of the SC-EB Sprayer

Operators Responsibility

Read the Owner's Manual! Failure to do so is considered a misuse of the equipment.

It is the responsibility of the user to read the Operator's Manual to understand the safe and correct operating procedures for the sprayer and to maintain the sprayer according to the manufacturer's recommendations. It is the operator's responsibility to ensure that all who are using this equipment read this manual.

The operator is responsible for inspecting the equipment and for repairing and replacing damaged or worn parts to prevent damage or excessive wear to other parts. It is also the operator's responsibility to deliver the machine for service or to replace defective parts which are covered by the standard warranty.

Lack of attention to safety can result in reduction of efficiency, accident, personal injury, or death. Watch for safety hazards and correct deficiencies promptly. Use the following safety precautions as a guide when using the machine.

- ➔ Read the Owner's Manual. Failure to read the manual is considered a misuse of the equipment.
- ➔ Use the SC-EB sprayer ONLY for its intended use as described in this manual.
- ➔ Do not allow a child to operate the SC-EB sprayer. Do not allow adults to operate the sprayer without proper instruction.
- ➔ Use extra care when spraying on stairs. Do not place sprayer on stairs.
- ➔ Do not use without liquid bottle in place.
- ➔ Always empty liquid bottle after use and before transporting the sprayer.
- ➔ Store sprayer in a dry place. Do not expose to freezing temperatures.
- ➔ Do Not leave fully charged spraywand plugged into the charger for extended periods of time.
- ➔ Do Not plug a charger into a fully charged spraywand.

CAUTION: SHOCK HAZARD

The SC-EB sprayer has been engineered to be very safe during normal operation. However, as with all line-powered electrical equipment and tools, certain safety procedures need to be followed:

- ➔ Use a GFCI (Ground Fault Circuit Interrupter) power outlet whenever possible.
- ➔ If an extension cord is necessary, use a three wire extension cord with a 3-prong grounding type plug.
Turn off sprayer before unplugging.
- ➔ Unplug sprayer when not in use.
- ➔ Always unplug by grasping the plug. Do not unplug by pulling on the cord.
- ➔ Never pull plug with wet hands.
- ➔ Do not pull or carry the sprayer by its power cord. Do not crimp the cord or cause it to be damaged
- ➔ by straining it around Sharp edges. Keep power cord away from heat sources.
- ➔ Do not use the SC-EB sprayer with a damaged power cord. Call ESS for a replacement.
- ➔



CAUTION: HOT SURFACES

Be aware that the compressor inside the SC-EB, along with the metal connections to the air compressor, all become hot enough to burn you. DO NOT TOUCH, until time has been allowed for cooling down.

- ➔ The compressor becomes hot to the touch during normal use. Do not touch the SC-EB compressor after it has been running. Allow compressor to cool down before risking a touch.
- ➔ The metal air connection on the top or side of the case, along with the metal quick connection to the air hose, both become very hot to the touch, and can burn you. Do not touch until times has been allowed for them to cool down.
- ➔ Stay clear of the hot compressor when making adjustments inside the SC-EB case or replacing the bottles.
- ➔ The sprayer's compressor is equipped with a thermal overload switch. If it overheats, the compressor will stop running. Unplug the sprayer and let it stand for one hour with the door open. The unit should then be able to restart.

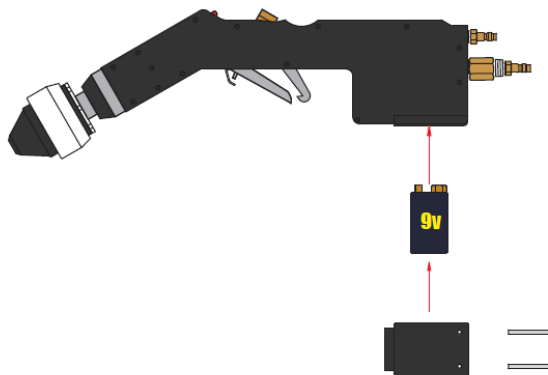
CHEMICAL SAFETY PRECAUTIONS

Read and follow all instructions on the chemical or pesticide manufacturer's label.

- ➔ Use protective clothing, eye protection and gloves when mixing chemicals to be sprayed with the SC-EB sprayer.
- ➔ Some of the chemicals that can be used in the BP1 may be harmful to the skin or if inhaled. When in doubt, use a respirator and eye protection when spraying with the spraywand.
- ➔ Follow the chemical's manufacturer's recommendations in handling, mixing, applying, storing and disposing of chemicals.
- ➔ Be aware of poisoning symptoms and know the appropriate first aid.
- ➔ Know the length of time needed to pass before allowing people and pets to go back into the sprayed area.

About the low-voltage system of the MaxCharge™ Spraywand

For operator safety, the power supply for the MaxCharge™ spraywand is entirely separate from the power supply for the sprayer's compressor. The spraywand is powered by 9-volt batteries in the handle of the SC-EB sprayer. This low-voltage charge is not enough to harm people. Some people report feeling a "tingle" or a slight stinging sensation when the spray from the spraywand falls on their bare skin.



Pacemaker Disclaimer:

If you have a pacemaker, we would recommend that you **not operate an electrostatic sprayer**, or if you elect to do so, know that you are accepting any risk associated therewith. Just to be clear, no one, with a pacemaker, has ever had a problem using our electrostatic sprayers, however, several years ago a physician expressed concern, even though his opinion was un-tested and not founded in any research. Since that time, we have taken the ultimate safe approach and recommended that those with pacemakers not operate our electrostatic sprayers.

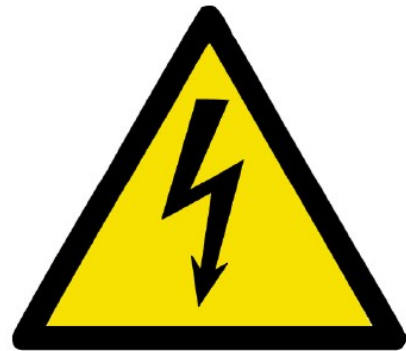
Safety Decals

Appropriate safety decals are placed on ESS equipment in order to alert the operator to possible dangers.



The SC-EB compressor becomes hot during normal operation.

DO NOT TOUCH



There will be a small shock when using our sprayers. To avoid this shock place your thumb on the bolt at the top of the spraywand.



This label is wrapped around the hose to remind you to clean the filters regularly. The number one cause of poor sprayer performance is a clogged or dirty filter.




READ AND FOLLOW THE CHEMICAL MANUFACTURER'S INSTRUCTIONS CAREFULLY.

It is extremely important for the owner/operator's safety as well as the safety of other people in the vicinity that all chemical safety precautions are followed.

This label is placed on top of the SC-EB Sprayer near the quick connect sockets.




Charger for
Electrostatic Spraying Systems

LED	MODE
●	Battery initialization & analysis
●	Fast charge
● ● ● ● ●	Top-off charge
●	Trickle charge
● ● ● ● ●	Error

With the mains connected, the LED will be orange the first 5-7 seconds, and be orange when the initialization and analysis starts. If a battery is connected, the actual charging will start a few seconds later when the LED changes to red/orange.



This label is placed on the charger of all spray-wands.

If you use a pacemaker, use our electrostatic sprayer at our own risk.

Troubleshooting

Sprayer will not turn on:

- Is the electrical cord plugged securely into the outlet & case?
- Is the electrical outlet faulty? Try a different outlet.
- Are there 15 amps available at the electrical outlet?
- Has the compressor overheated? Be careful, it may be hot. Let the sprayer cool with the case open. Try again in one hour.

Spray quality problems:

- Depress the trigger on the spraygun, and while spraying water, place your finger over the nozzle blocking the liquid and air. This will force air back through the spraygun and possibly clear any obstructions in the liquid line.
- Check that all hose "quick connections" are connected including hoses connected to spraygun, to the case and inside the case, to the tank.
- Is the nozzle cover dirty? Unscrew the nozzle cover and wash inside nozzle cover with water. With the nozzle cover removed, check to see if liquid port is clogged. Clean out with paper clip.
- Nozzle can freeze up when the ambient temperature is below 50°F.
- If the spraygun has a liquid filter, check if it is clogged. If clogged, remove and rinse clean. The spraygun, tank and hose should be cleaned and rinsed with water each day.
- Check to make sure that the pressure relief valve on the compressor has not been tripped and remains open.
- If your spraygun model has a liquid filter and a flow disc, check to make sure you have a "flow disc" in the liquid line. This is a small disc that is in the liquid line next to the filter. A spare flow disc comes with the parts kit.

Charging Light will not come on:

- If the red LED on the handle of the spraygun does not come on, it indicates that the spray is not receiving an electrostatic charge, or that the light has burned out.
- Make sure the batteries are charged. Fully charged batteries will last for about 5 continuous hours of use. If in doubt, remove the cover from the spraygun battery compartment, and replace the two rechargeable 9-volt batteries with 2 regular 9-volt batteries.

Other Comments:

- Always refer to the "Troubleshooting Guide" in your manual.
- Be aware that with an electrostatic sprayer, the operator at times will experience a slight static build up, and the nozzle will drip at times due to the accumulation of charged droplets.
- If you continue to experience problems, please contact your distributor.

This label is placed inside the SC-EB case for handy reference.



ESS is currently redesigning all sprayer labels. Your sprayer may not have the same version of these decals. If you desire an updated decal, please contact Customer Service at 1-800-213-0518.

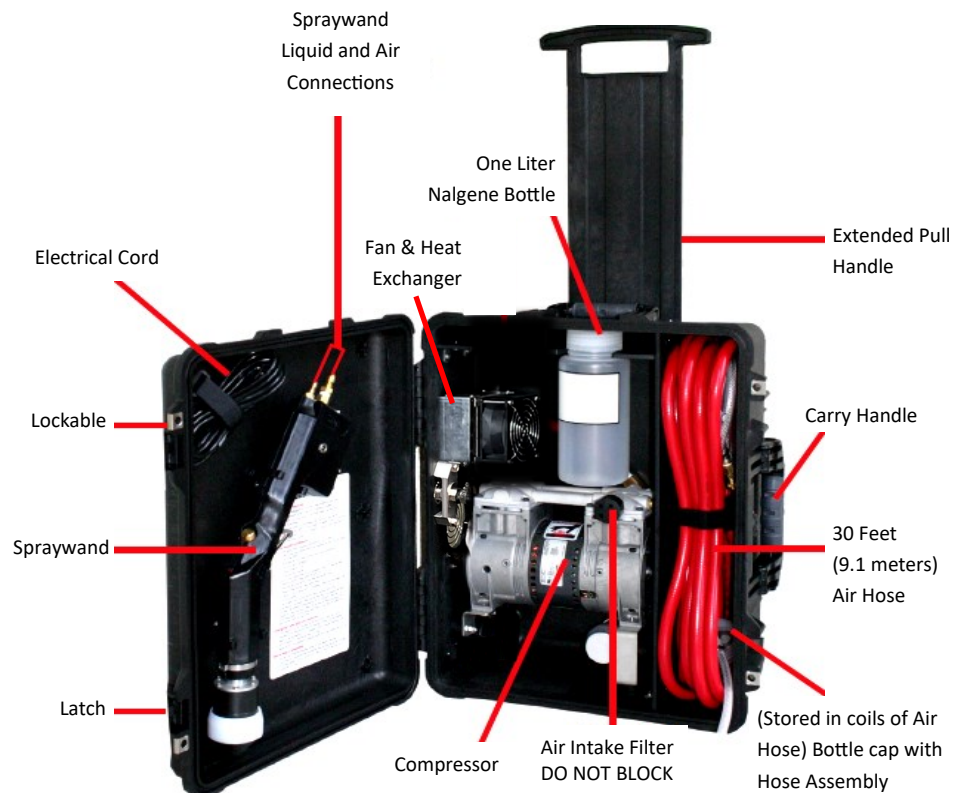
Labeled Diagrams of the SC-EB (side views)



Labeled Diagrams of the Spraywand & Nalgene Bottle Connections, & SC-EB (inside view)



Spraywand Connections



Quick List: Operating Instructions

Steps for Operation

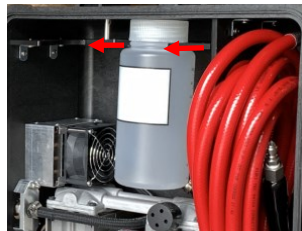
1. Prepare the tank mix.
2. Fasten the Liquid Hose/Bottle Cap Assembly tightly on the Nalgene Bottle.
3. Connect the red Air Hose to the sprayer air connection on the side of the SC-EB sprayer.
4. Connect the Liquid Hose to the liquid leader on the spraywand. Connect the air hose to the spray wand air leader.
5. Plug the power cord into an appropriate receptacle. Turn on the air compressor.
6. While either clipping the Nalgene bottle to your belt or holding the nalgene bottle with one hand, spray with the other hand.

Thermal overload switch

The SC-EB compressor has a built-in thermal overload switch. If the SC-EB overheats, the compressor will cut off. If this should happen, let the unit cool for one hour with the case open.

Helpful Hints:

It's easy to quickly switch between two chemical mixtures. Make sure the SC-EB is turned off, then unscrew the hose assembly cap from one bottle and place it in the second bottle. Tighten securely. (Also make sure to cap the first bottle.) Turn the SC-EB on. You are ready to spray again. The unused bottle may be stored inside the SC-EB case



The one-liter bottle is easy to remove. Just pull straight out in the direction of the arrows above.

Extended Pull Handle

The latch for the Pull Handle simply pulls out to release the Pull Handle. Extend the Pull Handle fully. To stow the handle again release the latch, then push the Pull Handle in.

DO NOT BLOCK any of the vents or the Air Intake Filter. Doing so will cause the SC-EB compressor to overheat and trip the thermal overload switch.

Detailed instructions on maintaining each of the SC-EB components follow in the next sections.



Cautions:

ESS recommends that you use an outlet with a Ground-Fault Circuit Interrupter (GFCI).

Do not operate the SC-EB in standing water

Do not immerse the SC-EB compressor

The SC-EB compressor becomes hot enough to burn during normal operation.

DO NOT TOUCH .



How to tell if you have a 1st Gen or 2nd Gen spraywand:

1st Gen Spraywand

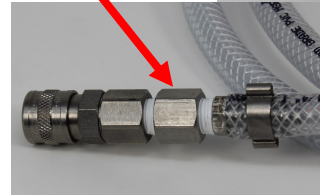
Liquid strainer &
flow disc



A 1st Gen spraywand has a liquid strainer and removable flow disc on the back of the spraywand

2nd Gen Spraywand

Flow
adaptor



A 2nd Gen spraywand has a flow adaptor in the liquid hose.

Quick List: To clean the SC-EB w/1st Gen Spraywand after operation:

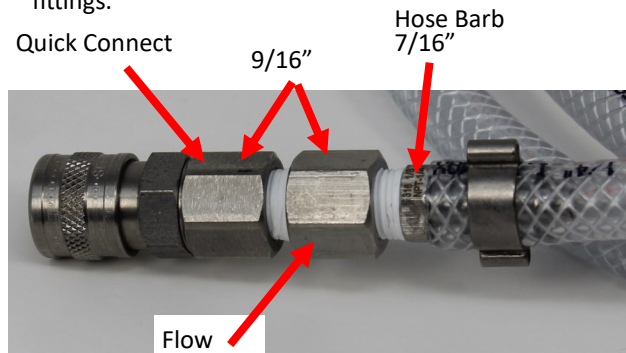
1. Clean the exterior of the sprayer with a damp cloth.
2. Clean the nalgene bottles and Hose/Cap assembly with clean water. Triple rinse.
3. Disassemble and clean the liquid filter. Be careful not to lose the flow disc.
 - A) Unthread the quick connect plug from the spraywand liquid line leader. Use a 7/16" wrench on the plug and an 11/16" wrench on the 1/8" NPT body.
4. Reassemble the liquid filter.
5. Fill one bottle with a liter of clean hot water.
6. Turn on the air compressor and engage the trigger to flush the spraywand and liquid line.
7. After the bottle is empty run keep the trigger engaged for a few seconds to make sure all liquid is flushed out of the liquid hose and spraywand.
8. Apply silicone spray or similar lubricating oil to all quick connect fittings.

Detailed instructions on maintaining each of the SC-EB's components follow in the next sections.



Quick List: To clean the SC-EB w/2nd Gen Spraywand after operation:

1. Clean the exterior of the sprayer with a damp cloth.
2. Clean the nalgene bottles and Hose/Cap assembly with clean water. Triple rinse.
3. Fill one bottle with a liter of clean hot water.
4. Turn on the air compressor and engage the trigger to flush the spraywand and liquid line.
5. After the bottle is empty keep the trigger engaged for a few seconds to make sure all liquid is flushed out of the liquid hose and spraywand.
6. Apply silicone spray or similar lubricating oil to all quick connect fittings.

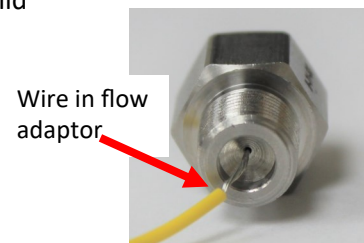


Note: Adaptor



The 2nd Gen spraywand does not have a removeable flow disc and strainer. It has a flow adaptor in the liquid hose.

Make sure to thoroughly flush the system after use to prevent build up from clogging the flow adaptor.



How to inspect flow adaptor for a clog:

1. Use a 9/16" wrench on the flow adaptor and a 7/16" on the hose barb to remove the hose from the flow adaptor.
2. Check the orifice in the flow adaptor to see if it is clogged. To clear the clog use a pin or small wire.
3. You might need to also remove the quick connect from the flow adaptor if the clog is severe. To do this, use a 9/16" wrench on both the quick connect and the flow adaptor.
4. To reassemble use the corresponding wrenches to tighten the flow adaptor back to the quick connect and the hose barb. It is recommended to use Teflon tape (Brass or Stainless Steel) or pipe thread sealant (Brass) to prevent any leaks.

Detailed instructions on maintaining each of the SC-EB's components follow in the next sections.

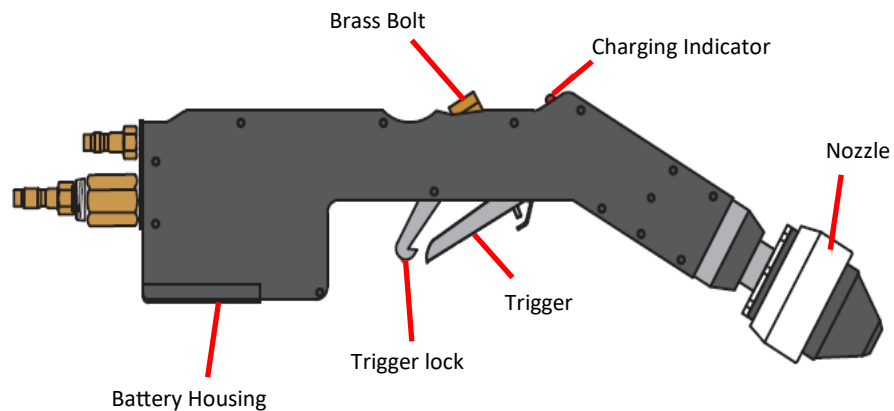


REFERENCE

Spraywand

The spraywand is held by the operator during spraying. Activation of the trigger causes liquid to spray. The Spraywand has the following user-serviceable parts: the liquid filter assembly, the nozzle assembly, and the batteries. Except for batteries, which are accessed by removing the battery cover, nothing inside the spraywand shell is user-serviceable. **Do not open the spraywand shell;** doing so will void the warranty on the spraywand.

NOTE



The Spraywand

See also:

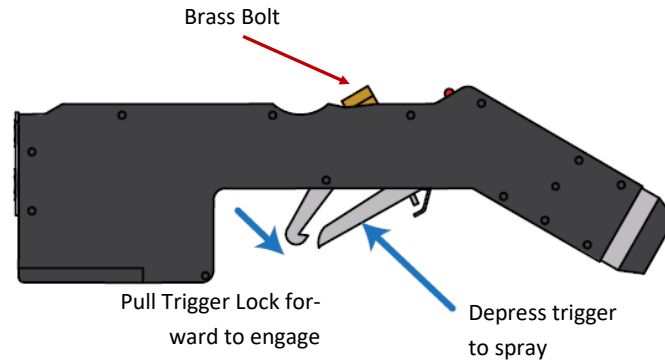
Changing the batteries

Yearly spraywand service

Spray technique

Trigger

The trigger turns the spray on and off. It can be continuously held for operation or it can be locked in place.



To engage/disengage the trigger:

1. Depress the trigger up towards the body of the spraywand to start spraying.
2. To keep spraying, either keep holding the trigger or lock it in place by pulling up the lock and hooking the trigger.
3. To stop spraying when the trigger is not locked, let go of the trigger.

To clean the trigger:

1. Unthread the brass bolt on the top of the spraywand with a 5/8 ". Be careful not to lose the spring, plunger, copper washer, and small brass bushing inside the trigger. Note how they fit inside so they may be replaced properly.
2. Check inside the trigger for blockage. Clean out any debris with compressed air and warm, soapy water.
3. Replace the spring and plunger; rethread the brass bolt into the top of the spraywand until tight.

Hose

To maintain optimal use of your sprayers hose, please remember the following;

- Do not kink or cut the hose
- Inspect the hose regularly for cuts, ruptures, tears or breaks.
- Do not pull the case around with the hose.
- Use the handles to move the case from one place to another.

Should you notice anything wrong with your hose, please contact ESS to have this hose replaced.



Nozzle Assembly

It is very important to follow all the maintenance and cleaning procedures to ensure that the electrostatic sprayer will function properly. Although the MaxCharge™ nozzle will outperform all electrostatic spray technology on the market, regular cleaning will ensure peak operating performance.

The nozzle assembly is located at the end of the spraywand wand. It is composed of a nozzle body, internal o-ring, Teflon ring, cover, external o-ring, and a hood (see labeled drawing). To access the nozzle components, just unscrew the nozzle cover by hand.

Cleaning the Spraywand

Always rinse the spraywand out with clean soapy water after every day's spraying. That is the most important thing you can do to ensure trouble free operation of your SC-EB sprayer. By cleaning after each and every working day you will avoid the long-term chemical buildup that eventually causes clogs, poor spray patterns and shortens nozzle life.

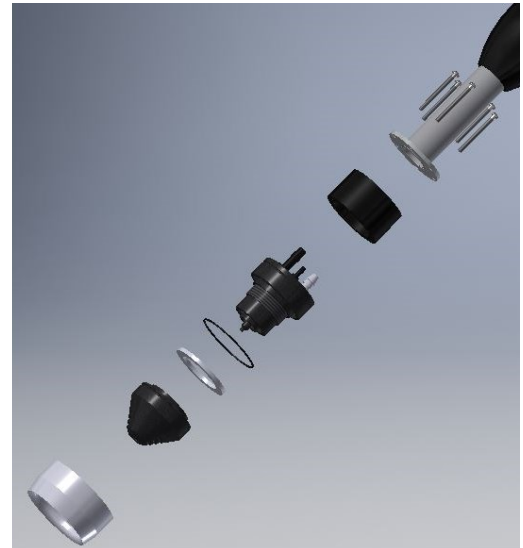
Establish maintenance intervals to disassemble and clean the nozzle. Your nozzle maintenance schedule will vary depending on the types of chemicals used and adherence to pre-and post-spray checks. In general it is sufficient to thoroughly clean nozzles after 50 hours. If heavy loads of wettable powders are used, the cleaning schedule should be sooner.

To Clean the Nozzle Assembly

1. Slide the hood over the nozzle cover.
2. Unscrew the cover from the nozzle base and remove the teflon ring. Clean any debris from around the nozzle tip.
NOTE: There is a small o-ring in the nozzle around the base of the tip take caution that it doesn't fall off. If it does, clean it and press back into place. Also, take care not to damage the nozzle tip when the cover is removed.
3. Soak the ring, cover and hood in a mild detergent solution. Use a small brush (soft or mild bristle) to clean the inside of the cover and the hold through it. Also, be sure to clean the hood. It is important to clean inside the hood and the two cavities. Rinse thoroughly.
4. Scrub the nozzle base with the detergent solution using a soft bristle brush. Clean the ceramic outlet. Be sure to thoroughly clean the base cavity and take care not to damage the nozzle tip. Rinse and make sure the small o-ring is in place.
5. Reassemble nozzle by placing the teflon ring on the base and screwing the cover on **hand tight**. Next slide the hood over the nozzle and seat it securely against the external o-ring. Wipe clean the exterior of all hoses and fittings connected to the nozzle.

The electrode cover should be hand tight. Never use pliers or other tools to tighten it. The insulating ring should be loose.

NOTE: There will be a drip effect from the nozzle. The drip results from the accumulation of tiny electrostatically charged droplets wrapping back and coating the spraywand nozzle.



Pre-Spray Check

1. Inspect Nozzles

Check nozzle cover to make sure it is on hand tight (do not overtighten or use a wrench). Make sure the hood is seated firmly to the nozzle base and against the external o-ring.

2. Preparing the Tank Mix

If you will be spraying Wettable powders it is a good idea to use a compatibility agent with the water and tank mix. Compatibility agents are chemicals mixed with the water that make mixing easier and keep heavy concentrations uniformly in suspension. Some brand name additives are COMPLIMENT™, UNITE®, and BALANCE™. Check with your local chemical supplier for others that are available.

Post-Spray Check

After each spray it is essential that hoses and spraywand be flushed with clean soapy water. This will help prevent chemical build-up that can clog lines and nozzles.

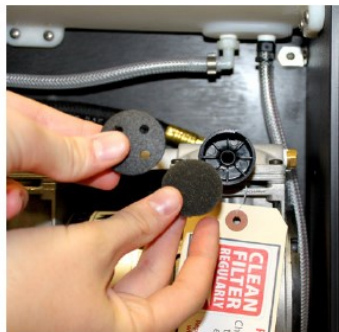
The Air & Liquid Delivery System

The air compressor

The air compressor produces compressed air which atomizes and propels the liquid. It plugs into a 110 or 220 volt electrical source. Use the SC-EB™ with a three pronged extension cord of no more than 50 feet and rated for no less than 15 amp service. The On/Off switch is on the back of the case. Check the fans on the side of the case for debris build up.

Cleaning the air filter

To clean the air filter, pull off the filter cap. Inside, remove foam filter, and wash in warm, soapy water.



It is important to inspect the filter for deterioration. When handling, if the filter begins to break apart or crumble, replace immediately.



Cautions:

The SC-EB compressor becomes hot enough to burn during normal operation.

DO NOT TOUCH.

The compressor has a built in thermal overload switch. If the SC-EB overheats, the compressor will cut off. If this should happen, let the unit cool for one our with the case open.

Quick Connects

There are four sets of quick connects (plug and socket) on the sprayer:

- Compressor (air) outlet
- Bottle Cap/ Hose (liquid outlet)
- Spraywand air inlet
- Spraywand liquid inlet

In all cases, the plug is on the outlet side of the connection.

To connect the quick connects at the spraywand leaders:

1. Slide the sleeve of the quick connect socket up.
2. While holding the sleeve up, push the socket onto the quick connect plug.
3. Release the sleeve.
4. Pull on the socket body to ensure that it is properly seated and cannot be pulled off the plug when the sleeve is down.

To disconnect the quick connects at the spraywand leaders:

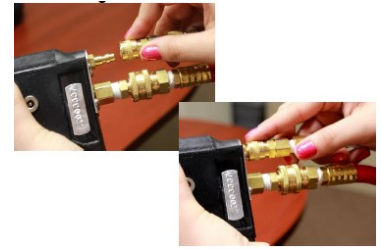
1. Slide the sleeve on the quick connect socket up.
2. While holding the sleeve up, pull the socket off the quick connect plug.

One-liter bottle cap connector:

To disconnect push the gray latch at the side of the socket to release the plug. Pull the plug out of the socket. Similarly, to connect, push the latch at the side of the socket while pushing the plug in until you feel it latch. Test the connection by tugging gently on the clear hose.

Air Connection to the Base

To connect or disconnect the air connection at the side of the base push back the quick connect and insert to the Base. (images below)



To connect or disconnect the air or liquid connections on the spraywand, pull back the outer sleeve of the socket to release

Note:

If the small brass rings are visible once the socket is placed on the quick connect plug, the connection is not secure.

Be sure to connect the quick connect and the socket securely.



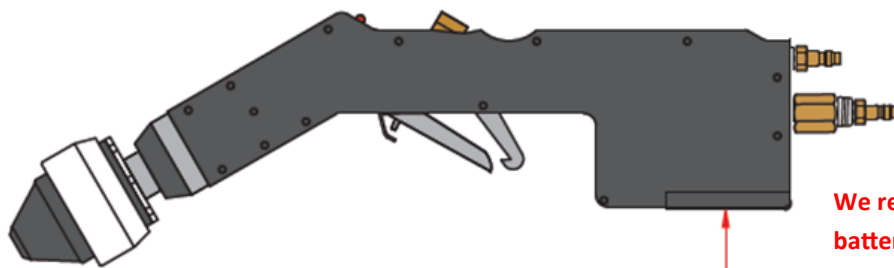
One-liter bottle cap connector

Nalgene Bottles

The nalgene bottles should be thoroughly rinsed and cleaned immediately after each use. A clean mild soapy water can be used.

Batteries

The nozzle charging system operates on two 9-volt rechargeable batteries which are located in the base of the spraywand. Please charge the batteries fully before the first use. In average conditions, the batteries will perform 5-6 hours of operation on an individual charge. The batteries should be recharged when the charging indicator light on top of the spraywand shell fails to glow even though air continues to flow through the spraywand. After approximately 800-1000 hours of service, the batteries will no longer be able to hold an adequate charge and will need to be replaced. Substitute with 9-volt nickel-hydride rechargeable batteries, until the SC-EB's replacement rechargeable battery pack from ESS can be ordered.

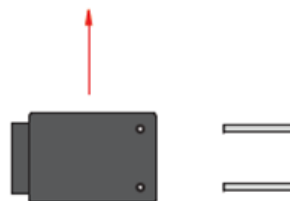


We recommend charging depleted batteries for 4-6 hours.

We do not recommend plugging a charger into a fully charged spraywand. This may cause batteries to over heat or swell.

To change the batteries:

1. Unscrew the two 6-32 x $\frac{1}{2}$ " Phillips head machine screws which hold the battery cover in place.
2. While holding the leads in one hand, gently disconnect the batteries from the leads. Be careful not to tear the leads off the wires or tear the lead wires out of the power supply.
3. Connect the fresh battery pack to the leads.
4. Reconnect the battery cover. Screw the two 6-32 x $\frac{1}{2}$ " Phillips head machine screws back in to secure the battery cover.
5. Charge the spraywand before attempting to use it.



Remember to charge the spraywand batteries after every work session!

Be advised: Non-rechargeable 9-volt batteries can be used, however do not plug the battery charger into the spraywand while non-rechargeable batteries are installed. This will result in serious damage to the nozzle's charging system and void the warranty.

Spraying with your ESS Sprayer

Note: When using unfamiliar equipment or chemicals, always test on a small area before treating the entire surface. Do not use a chemical with the ESS sprayer if the label prohibits use in low-volume sprayers. This unit is for heavy-duty use. During operation the hose will heat up naturally, therefore, be aware of heat and periodically allow for breaks if it gets too hot.

Spray Technique

As in spray painting, the goal is to achieve even coverage over the surface. The ESS MaxCharge™ spraywand is designed to help you do just that by propelling the chemical spray with a gentle air flow, you can stay well away from the target surface and let the electrostatic attraction do the rest of the work.

Please note: the spray droplets are very, very fine- about 40 microns each. If you are used to working with a conventional sprayer, you may make the mistake of thinking the target is not wet enough because you do not see large beads of liquid. In fact, after a pass with the SC-EB's MaxCharge™ spraywand, the surface of the target should just barely glisten with moisture. The fine droplets will evaporate quickly.

Here are some tips to achieve the best possible coverage with the ESS SC-EB sprayer.

1. Before each job, ensure that your sprayer is in good working order (see the pre-spray checklist on page 11 of this manual).
2. The optimal spraying distance is at least 24 inches away from the target surface, however, 30 to 36 inches may provide a more even coating. This gives the fine mist produced by the by the MaxCharge™ nozzle room to develop into a chaotic cloud that will be attracted to the target surface.
3. Hold the spraywand at right angles to the target surface. Starting at the highest point and using zig-zag horizontal strokes about 1 meter (3ft.) wide, spray down to the lowest point. Try to have each stroke overlap the previous stroke by about 50%.
4. You can use vertical stokes if it suits the area better. Just make sure to work in a methodical pattern and let your strokes overlap.
5. When moving to the next section, allow it to overlap the previous section by a few inches. Do not leave a gap.
6. The target surface should just barely glisten with the spray. Do not over-saturate the surface; if you see runs or puddles it means you are wasting chemicals. Do check to make sure the newly sprayed surface is very slightly damp.
7. Be careful to keep the spraywand barrel as level as possible. If you allow the nozzle to point down too much, it may drip occasionally.
8. Unlike spray painting, you don't have to stop the spray on every return stroke. Just engage the trigger lock and concentrate on the regular pattern of spraying.
9. Periodically check to make sure the red light is illuminated on the spraywand.



Note:
If you lift the spraywand above chest height, it will most likely start to sputter or even stop spraying.

Preparing a Tank Mix

The tank mix depends on two factors: water requirement and dosage. Water requirement is the amount of water needed to cover the given treatment area. Dosage is the amount of chemical which should be applied in a given treatment area.

First determine the water requirement for your sprayer over known area. An easy way to determine water requirement is to spray a trial application with water. Put clean water in the ESS SC-EB and thoroughly spray a known area. After spraying the known area, determine how much water was used from the amount left in the tank. This is the water requirement for the given area. Next measure the known area to determine how many square feet were sprayed. Write down both values for future reference.

_____ (gallons) Water Requirements
For _____ (size of know area in ft²)

Next determine the dosage. This is the amount of chemical you wish to dispense in a given area. Appropriate dosage depends upon chemical label recommendations, disinfection or sanitization goals, level of pest or disease infestation, past experience with particular chemicals, and other variables.

Because electrostatic spraying is much more effective spraying method, ESS recommends that you experiment to find the optimum chemical concentration. Start spraying using the same chemical rate used in the past with other sprayers. Test to ensure that infective agent levels have been reduced to desired levels. At the next application, start reducing the amount of chemical used for each spray. Keeping the amount of water in the tank constant, cut the amount of chemical mixed in by 15% to 25% for each spray, testing after each experiment to see if the desired results are being accomplished. If you are planning to cut rates then it is very important to conduct these experiments to determine the optimum chemical concentration.

A note about operating temperatures

The Maxcharge nozzle should always be operated at temperatures above 10° Celsius (50° Fahrenheit). When the ambient temperature is colder than this, the evaporative cooling caused as the spray is atomized will freeze the nozzle opening.

Nozzle freeze-up can also occur when the liquid to be sprayed is colder than 10° C (50°F).

How to Conduct a Jar Test

Needed:

Solutions of chemicals in
approximate dilutions
Jar with lid
Gloves and Safety
Glasses

After mixing solutions of chemicals, place them in a large jar, cap it securely, and shake vigorously. Carefully observe the interaction between the chemical compounds. If the water becomes milky or cloudy, the combined solution may plug the nozzles. Let the jar sit for one to two hours. If there is precipitate on the bottom of the jar, then seek another combination of chemicals.

IMPORTANT

Water temperature must be at least 10° C (50° F). When the liquid and air meet in the nozzle, the temperature of the liquid decreases. As a result, water at temperatures below 10° C (50° F) may freeze and clog the nozzle



Troubleshooting Guide

When you encounter the problems listed below, use the suggested troubleshooting methods. If you can not solve the problem. Or have a problem with the spraywand that is not addressed in this manual, contact ESS at (706) 769-0025, 1-800-213-0518.

Sprayer will not turn on:

- Is your sprayer plugged in? Make sure there are 13 amps available at the outlet.
- Is the electrical outlet faulty? Try a different outlet.
- Are you using an extension cord? Is the extension cord the correct size?
- Is your sprayer power button on?
- Has the compressor overheated? Be careful, it may be hot. Let the sprayer cool with the case open try again in an hour.
- Did your fuse burn out? If so replace it. A spare fuse is attached to the compressor frame.

Spray quality problems:

- Depress the trigger on the spraywand and while spraying water, place your finger over the nozzle blocking the liquid and air. This will force air back through the spraywand and possibly clear any obstructions in the liquid line.
- Check that all the hose “quick connections” are connected including hoses connected to the spraywand to the case/base and the liquid bottle.
- Is the nozzle cover dirty? Unscrew the nozzle cover and wash inside nozzle cover and wash inside cover with water. With the nozzle cover removed, check to see if liquid port is clogged. Clean out with paper clip or small wire.
- Is the liquid ambient temperature too cold? The nozzle can freeze up when the ambient temperature is less than 50 ° F.
- Is the trigger mechanism dirty? See page 9 for trigger assembly and cleaning. Trigger may require replacing the trigger plunger mechanism.

Charging light will not come on:

- If the red LED light on the handle of the spraywand does not come on, it indicated that the spray is not receiving an electrostatic charge, or on rare occasions that the light is burned out.
- Make sure the spraywand batteries are charged. Fully charged batteries will last for about 5 continuous hours of use. If in doubt, take the cover off from the spraywand battery compartment, and replace the two rechargeable 9 volt batteries with regular 9 volt batteries.



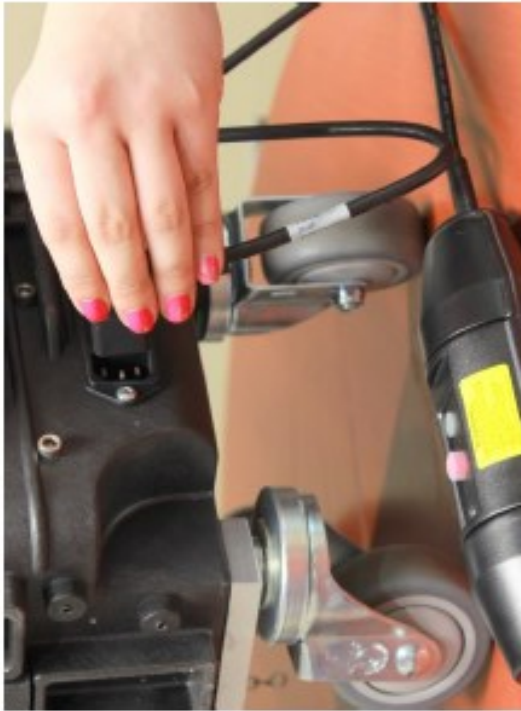
Quick Start Training Reference Guide



2.) Plug GFCI into electrical extension cord.



4.) Plug extension into wall sockets (15 amps).



1.) Plug electrical GFCI plug into suitcase.

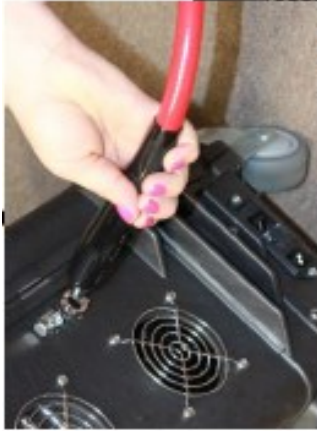


3.) Check GFCI, and push "reset" if necessary.

Quick Start Training Reference Guide (cont.)



5.) Thread red air hose through the hole in the handle.



6.) Attached red air hose to side of suitcase.



7.) Extend red air hose.

Quick Start Training Reference Guide (cont.)



9.) Attach liquid hose to spraywand.



11.) Fill Nalgene bottle with chemical.



8.) Attach red air hose to spraywand.



10.) Attach liquid hose to Nalgene bottle cap.



13.) Hold Nalgene bottle in hand... or attach to belt loop.



12.) Screw lid on Nalgene bottle.

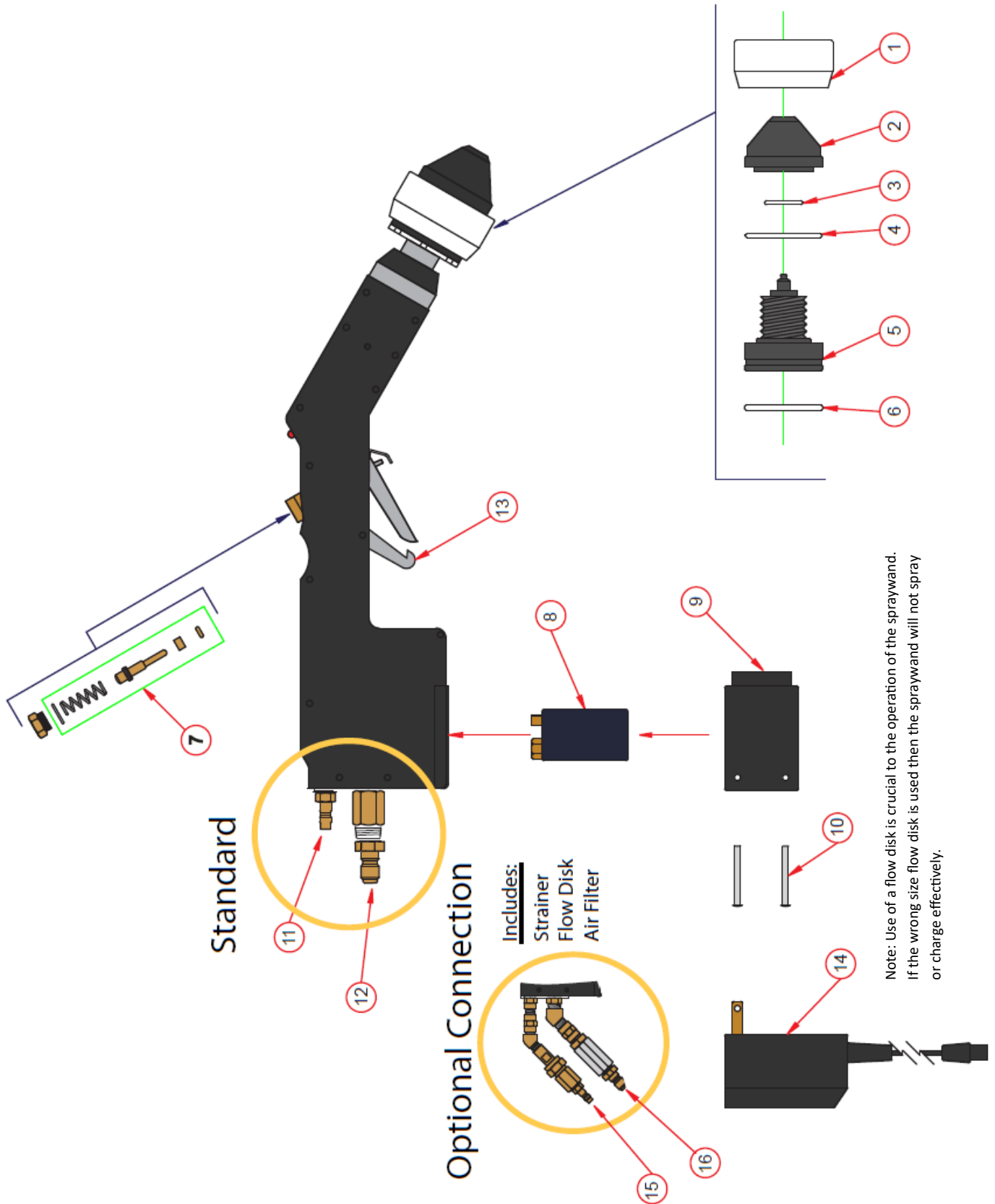


15.) Turn on power, and spray by depressing trigger.



14.) Make sure spraywand has been charged.

SC-EB Spraywand Parts



SC-EB Spraywand Service Parts

Item Number	ESS Part Number	Description	Quantity Ordered
1	5795	Hood	1
2	5764	Nozzle Cover	1
3	5771	O,Ring, Internal	1
4	5694	Teflon Ring	1
5	5777	Nozzle body, Greenhouse	1
		Note: Must send Spraywand in for Repair	
6	5770	O-ring, External	1
7	3731	Repair kit, Trigger	1
8	4512	9v (Battery, Alkaline, 9v	1
9	118	Battery Cover, Spraywand Shell	1
10	316	Screw, #6-32 x 3/8 long, Phillips SS	1
11	239	QC Plug, 1/8" MPT, Brass (Spraywand Liquid)	1
12	240	QC Plug, 1/4", 1/4" MPT, Brass (Spraywand)	1
13	6518	Trigger Pawl	1
14	4430	Battery Charger	1
15	1748	Spraywand Leader Assembly Liquid	1



Base Unit (Standard 110v)



P/N 1087: Tee- 1/4" NPT- Male Branch-BR



P/N 17782: "Tornado" 80mm Case Fan-12 VDC-84 CFM



P/N 1489: Wire-16 ga Green - PVC Hook-Up



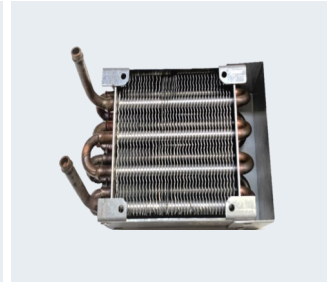
P/N 1662: Hose Clamp Worm- Size 4-SS



P/N 16984: Tool Holder



P/N 16998: Vibration Dampening Sandwich



P/N 17794: Heat Exchanger



P/N 17105: Extension Cord



P/N 17120: Compressor



P/N 17140: Fan Guards for Compressor



P/N 17144: Cooling Fan



P/N 17145: Steel Fan Guard



P/N 17154: Clamp



P/N 17218: Pelican Case



P/N 17228: DF11 IEC Appliance Connector for SC



P/N 17231: Angle Bracket

Parts



P/N 17238: One Wrap-Strap



P/N 17239: "Velstrap"
Clinching Strap



P/N 17279: Bottle Belt Holder



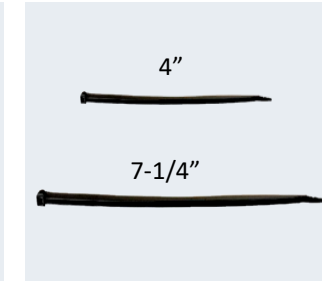
P/N 17282: Aluminum Carabiner



P/N 1229: Nalgene Bottle
1000ML



P/N AS17283: Lid and Short Hose
P/N AS17283-2: Long Hose to Wand
P/N AS17283-2-SS: Long Hose to
Wand (stainless steel)



P/N 181: Wire/Cable Tie-Nylon 4"
P/N 410: Wire / Cable Tie-Nylon 7-
1/4"



P/N 370: Grounding Chain



P/N 4945: Pop-Off Valve



P/N 6564: Connector Ring-Male
Grounding Chain



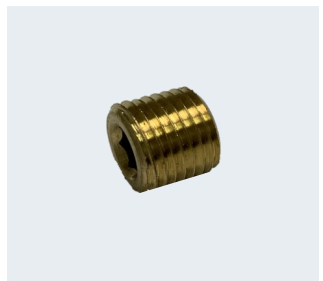
P/N 959: Connector Tab-Female



P/N 9003: Heat Shrink Connector
Blue



P/N 663: Hose Clamp, Two
Ear 1/4" SS



P/N 9856: Plug—Socket Head 1/4"



P/N AP17235: Bottle Holder
Support Pin



P/N 411: 3/8" BH x 1/8" MPT Brass

Parts



P/N 92: QC Socket to
Spraywand-Air BR



P/N 10032: QC Socket on
Spraywand—Air SS



P/N 90: QC Socket to
Spraywand-Liquid BR



P/N 10033: QC Socket to
Spraywand-Liquid SS



P/N 109: Fitting—
1.4” HB x 1/4” MPT-BR



P/N 10109: Hose Barb 1/4” x 1/4” SS



P/N 17006: Coupling Panel Mount
Chrome—(old style)



P/N 17007: Coupling Panel Mount
Chrome—(old style)



P/N 19898: Coupling Insert



P/N 17500: Ferrule—3/8” SS



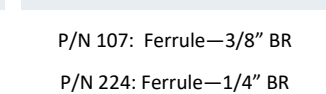
P/N 107: Ferrule—3/8” BR



P/N 17151: Hose Bend Restrictor



P/N 17501: Ferrule—1/4” SS



P/N 224: Ferrule—1/4” BR



P/N AS17137-12: Hose Assembly
25 Feet (Air) - BR Fittings
P/N AS17137-13: Hose Assembly
25 Feet (Air) - SS Fittings



P/N 216: Hose-3/8” ID
Conductive Red Hose



P/N 17212: Hose-3/8” ID 300PSI Black



P/N 17784: Air Hose Fabric-1/4” ID



Parts



P/N 17779: Single Output Sealed
AC-DC Power Supply
12 VDC @ 1.67 Amp

220V Parts



P/N 17139: 220V Compressor

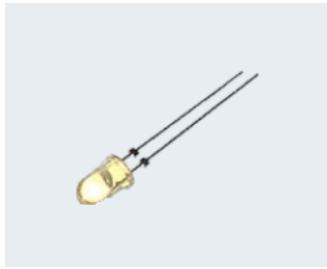


P/N 17191: Extension Cord 220V



P/N 17192: Cooling Fan 23 CFM
220V

Spraywand Parts



P/N 129: LED-Light-Red



P/N 130: Battery 9v



P/N 137: Air Switch



P/N 17152: Battery-Rechargeable



P/N 239: Quick Connect
Spraywand Liquid



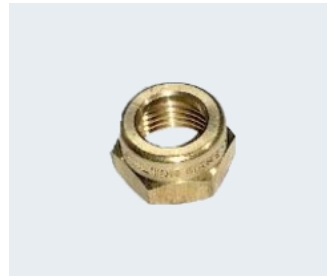
P/N 240: Quick Connect
Spraywand Air



P/N 41: 3/8" BH x 1/8" MPT Brass



P/N 437: Liquid Filter



P/N 767: Cap-Flow Regulator



P/N 768: Adaptor-Flow Regulator



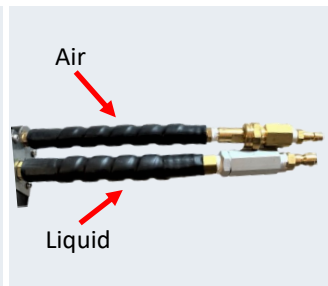
P/N 770: Body-Flow Regulator



P/N 3731: Trigger Repair Kit



P/N AS3239: Flow Regulator



P/N AS1953: Air Line Leader
P/N AS3238: Liquid Line
Spraywand with the longer barrel



P/N AS1957: Trigger Assembly



P/N PP6518: Trigger Pawl

Spraywand Parts (continued)



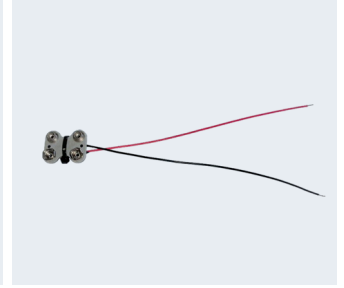
P/N AP4227: Spraywand Shell
Left



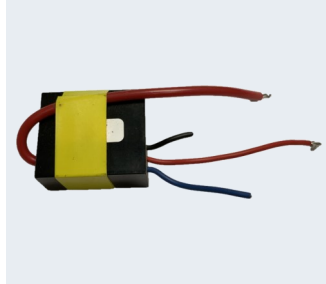
P/N AP4228: Spraywand Shell Right



P/N AP4229: Battery Cover

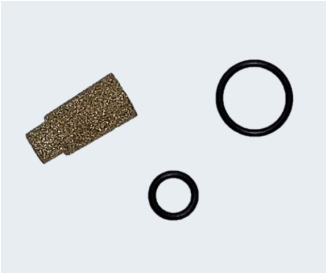


P/N 835: Battery Terminal



P/N PS-9141: Power Supply

Misc Parts



P/N 231: Filter Kit



P/N AS4430: Charger



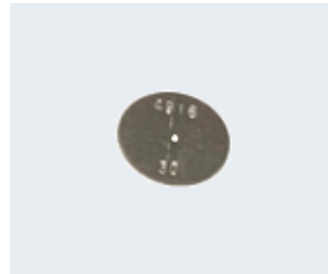
P/N 17520: Plug Adaptor– US



P/N 17521: Plug Adaptor-Euro



P/N 17522: Plug Adaptor



P/N 1755: Flow Disk #30



P/N 227: Filter, - Air In Line



DECLARATION OF CONFORMITY
(According to ISO/IEC Guide 22 And EN 45014)



Unique Product No.: XT, SC-1, SC-ET, SC-EB, EPS-5

Manufacturer: Electrostatic Spraying Systems, Inc.
Company name: Electrostatic Spraying Systems, Inc.
Street: 62 Morrison St.
City: Watkinsville
Postal Code: 30677
State/County: Georgia
Country: United States
Telephone: 1(706) 769-0025
Email bruce@maxcharge.com

Tester: Peter Gans
Date of Test: January 5, 2011
Authorized Representative: BSL Technologies Inc.

This declaration of conformity is issued under the sole responsibility of the manufacturer.

Object(s) of the declaration:
Electrostatic Sprayer Model numbers
XT-3/110 XT-3/220
SC-1/110 SC-1/220
SC-ET/110 SC-ET/220
SC-EB/110 SC-EB/220
EPS-5/220

The object of the declaration described above is in conformity with the relevant Community harmonization legislation:
Directive 2004/108/EC EMC
Directive 2006/95/EC Low Voltage

References to the relevant harmonised standards used or references to the specifications in relation to which conformity is declared:
EN 1953:1998 + A1:2009 EN 60204-1:2006 + A1:2009
EN 62479:2010 EN 61140:2002 + A1:2006
EN 61293:1994

Signed for and on behalf of Electrostatic Spraying Systems, Inc.
Watkinsville, GA, USA on July 26, 2011.

Bruce Whiting, President

ESS
Bruce Whiting



ESS WARRANTY:

Electrostatic Spraying Systems, Inc. warrants to the original purchaser of any Electrostatic Spraying Systems equipment shall be free from defects in material and workmanship for a period of one year after date of delivery.

Disclaimer of Implied Warranties and Consequential Damages

Electrostatic Spraying Systems' obligation under this warranty, to the extent allowed by law, is in lieu of all warranties, implied or expressed, including implied warranties of merchantability and fitness for a particular purpose and any liability for incidental and consequential damages with respect to the sale or use of the items warranted. Such incidental and consequential damages shall include, but not limited to: transportation , charges other than normal freight charges cost of installation other than cost approved by Electrostatic Spraying Systems, Inc., duty taxes, charges for normal service or adjustments, or any other loss of income, expenses due to loss, damage, detention or delay in the delivery of equipment or parts resulting from acts beyond the control of Electrostatic Spraying Systems, Inc.

THIS WARRANTY SHALL NOT APPLY:

1. To vendor items which carry their own warranties such as, but not limited to, engines, air compressors, and liquid pumps. Electrostatic Spraying Systems, Inc. shall supply replacement parts at list price pending the warranty investigation of the vendor item. Vendor items parts such as air compressors, liquid pumps, solenoids, and other such items must be returned before warranty credit.
2. If the unit has been subject to misapplication, abuse, misuse, negligence, fire or other accident.
3. If parts not made or supplied by Electrostatic Spraying Systems, Inc. have been used in connection of the unit, if, in the sole judgement of Electrostatic Spraying Systems, Inc. such parts affect its performance, stability or reliability.
4. If the unit has been altered or repaired in a manner which, in the sole judgement of Electrostatic Spraying Systems, Inc. such alteration or repair affects its performance, stability or reliability. This shall include but not be limited to opening of the spraywand shell by anyone not authorized by Electrostatic Spraying systems, Inc. to do so.
5. **To normal maintenance, service and replacement items such as, but not limited to, engine lubricant, filters, or to parts that normally deteriorate. Belts, 9V rechargeable batteries, and exterior finishes due to use and exposure are also not covered under the warranty.**

**NO EMPLOYEE OR REPRESENTATIVE OF
ELECTROSTATIC SPRAYING SYSTEMS, INC.
IS AUTHORIZED TO CHANGE THIS WARRANTY
IN ANY WAY OR GRANT ANY OTHER WARRANTY
UNLESS SUCH CHANGE IS MADE IN WRITING
AND IS SIGNED BY A CORPORATE OFFICER OF
ELECTROSTATIC SPRAYING SYSTEMS, INC.**

YEARLY SPRAYWAND SERVICE

Electrostatic Spraying Systems, Inc. offers and recommends yearly services on ESS spraywands. For a nominal fee plus the cost of replacement parts, ESS will thoroughly clean the spraywand, replace any worn parts and recalibrate the electronics and nozzle. The Yearly Service also extends the spraywand warranty for another year. Consistent yearly service by ESS will increase spraying performance and prolong the life of the spraywand.

Contact ESS at (706) 769-0025 to schedule a spraywand service. Then package the spraywand securely since it can be damaged in shipment. Ship the spraywand in its original packing material if possible. If the original packing material is not available, wrap the spraywand in bubble wrap, place it in a strong cardboard box and surround the handle with foam packing. Please obtain a tracking number, and recommended insurance for your shipment and include a return shipping address with a telephone number.

A form is provided for you at the back of the manual

**Ship the spraywand via courier to:
Electrostatic Spraying Systems, Inc.
62 Morrison St.
Watkinsville, GA 30677**

Yearly service will be conducted within one day of receipt by ESS. If any parts need to be replaced, the owner will be contacted for authorization before replacement. The spraywand will be returned via UPS, COD, or return shipping costs may be invoiced, contingent upon credit approval. ESS also accepts Visa and Master Card.

**As an additional benefit, the Yearly Spraywand Service “turns back the clock.”
The original 1 Year Warranty on the spraywand is renewed for another year.
Yet another good reason to send your spraywand in to ESS for
factory-authorized service!**



Airline Kit (optional)

Kit Includes:

- 100 foot heavy duty extension cord
- GFCI cord for protection
- Extra bottle and hose connection
- Drip sleeve
- Heavy duty bolster



SPRAYWAND RETURN FORM

When returning a spraywand for warranty or repair services to ESS, please pack it securely and include the following form with the your spraywand. We require you to fill out all information completely. With many changes to companies our records may not have the correct contact information. We at ESS want to expedite the process quickly but communication is the key to a quick repair.

Spraywand Serial Number: _____

RETURNED FROM:

Company: _____

Contact Person: _____

Phone number: _____

Email Address: _____

Shipping Address: _____

Mailing Address: _____

(if different) _____

Date last serviced: _____

Problems with the Spraywand or is this just a yearly service?

Method of Payment:

Account (must be an approved account)

COD

Credit Card (Visa)

(Master Card)



(American Express)

Card Number: _____ CCV: _____

Card Holders Name: _____ Expiration Date _____

Full Mailing Address: _____

