

SpectraCoat™

*Powder Coating Systems
By Providing System Solutions, Inc.*

**Model # ES02
Operator's Manual**



**For Sales Information and Technical Support call or email
Powder Buy The Pound
615-776-7600
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Specifications:

Item	Description
Input Power	Selectable 110-120 / 220-240 VAC
Watts	50 watts at maximum gun output
Gun Output	0-100 KV 0-150 μ A
Air Pressure	Maximum input air pressure 100 psi-6.8 bar
Fuse	2A

General Safety Rules

Warning!

This system generates HIGH VOLTAGE. Read and understand the directions in this manual before using the system. Electrical shock may occur if improperly used.

Electrical Safety

- This system must be properly grounded for safe operation. Do not bypass the ground plug. This system must be plugged into an AC power source with a proper earth ground. This is necessary for the proper operation of the unit and to help prevent electric shock.
- Operate this unit in a clean and dry work area.
- While spraying avoid touching the tip of the gun as this may cause a static shock which could be painful.
- During the coating operation, always maintain a distance of at least 4" between the gun and the part to be coated. Never touch the tip of the gun to part being coated.

General Safety

- Do not operate this unit near open flame. Powder coating dust can be combustible.
- This system utilizes compressed air. Always use proper eye protection while operating.
- Always use a respirator or particle filter mask while operating.
- It is best to use this system in an area such as a booth that is ventilated and has an air filtration system.

Shop Air

!!!!Moisture In the Shop Air will reduce the static charge to the powder!!!!

The shop air that is used with the SpectraCoat™ system must be clean. It must be free of oil and moisture. It is very important that you have an air dryer in line between you air compressor and the SpectraCoat™ system. Moisture in the compressed air will impede the ability of the system to apply the static charge to the powder.

Unpacking

Carefully open the box and unpack the contents. Lay out the parts to the system and make sure all parts are present. The following pictures show what is included with the SpectraCoat™ ES02 system.



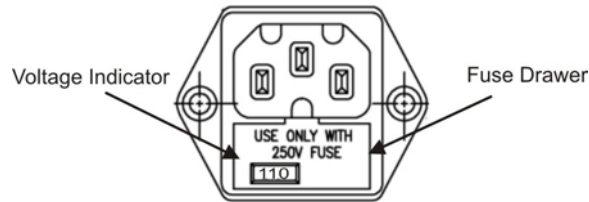
1	ES02 Control Box	8	Standard Tip Electrode
2	Spray Gun	9	6" Extension Electrode
3	Clear Hopper Pressure Hose	10	1.5 lb Pressure Hopper
4	Powder Feed Hose	11	Power Cord
5	Fan Tip Electrode	12	Ground Cable
6	20mm Conical Nozzle - Quantity 3	13	*Hyper Coat Multi Coat Nozzle Kit
7	20mm Conical Nozzle - Quantity 3	14	Rinse Air Hose

*Optional Equipment

Input Voltage Selection and Fuse Replacement

!!!!!!Caution!!!!!!

Always disconnect the unit from the AC power source before changing the fuse.



Input Voltage Selection

Follow this procedure to change the input voltage from 110-120V to 220-240V. If the input voltage selection is setup correctly for your country there is no need to perform this operation.

Example: Voltage Indicator shows 110V but 220-240V is needed.

1. As shown in the photos below, remove the Fuse Draw.
2. Slide the Voltage Selector board out of the Fuse Draw.
3. Flip the Voltage Selector Board over and re-insert in Fuse Draw.
4. Make sure that the Voltage Selection is now indicating 240V.

Fuse Replacement

The Fuse is located in the Fuse Draw of the Power Entry Module.

1. Remove the AC power cord.
2. Insert the tip of a small flat head screw driver into the slot at the top of the fuse draw in the power entry module.
3. With a gentle prying motion pull out the Fuse Draw.
4. Check the Fuse and replace if blown.
5. Reinsert the fuse draw. Make sure that the Voltage Selector is correct.



Fuse Draw



Voltage Selector

Assembly



!!!!Caution!!!!

Check that the Voltage Selection is correct for your country. If the Voltage Selection is not correct, please follow the procedure above titled "Input Voltage Selection". Do not connect the AC power source until all the other connections have been made.

Refer to the SpectraCoat™ System Schematic in the back of the manual.

1. Insert the Clear Hopper Pressure Hose into the Hopper Pressure Fitting directly to the left of the Shop Air fitting in the picture above.
2. Insert the other end of the Clear Hopper Pressure Hose into the 1/4" hose Fitting on the Hopper Top.
3. Connect one end of the Powder Feed Hose to the 1/2" Barb Fitting on the Hopper.
4. Connect the other end of the Powder Feed Hose to the Powder Feed Hose Barb on the Gun.
5. Insert one end of the Auxiliary Air Hose into the Auxiliary Air Fitting directly to the left of the Hopper Pressure Fitting.
6. Connect the other end of the Auxiliary Air Hose to the 1/4" metal barb on the Gun.
7. Remove the gray nose cone from the gun and insert the desired nozzle into the gun. Reinstall the nose cone
8. Connect the Gun cable to the Gun Cable Connector at the extreme left of the picture above.
9. Remove the wing nut from the Ground Lug located between the Power Cord Connector and Gun Cable Connector.

!!Caution!!

Do not remove the hex nut from the Ground Lug.

10. Put the Eye end of the Ground Cable onto the Ground Lug re-tighten

the wing nut onto the Ground Lug.

11. Connect your shop air line to the Shop Air Connector.

!!!!Caution!!!!

Maximum Shop air pressure 100 psi (6.8 bar)

If it is necessary to replace the supplied Quick Disconnect fitting with another that is suited for your shop air connector, be sure to hold the Shop Air Connector base fitting with a wrench while screwing in a new shop air quick connect fitting. This will avoid putting kinks in the internal hoses that are connected to the Shop Air Connector.

12. Make sure the Power Switch is in the **-OFF-** position.
13. Connect the Power Cord to the Power Entry Module.
14. Plug the power cord into a power source.

!!!!Caution!!!!

It is very important that the AC power source is properly grounded.

*****If you are using a SpectraCoat™ Constant Fluidizing Hopper instead of the 1.5 lb pressure hopper and you want to use the Auxiliary Air as your Dosage Air, follow the alternate assembly steps listed below.**

1. Insert the Clear Hopper Pressure Hose into the Hopper Feed Fitting.
2. Insert the other end of the Clear Hopper Pressure Hose into the 1/4" Feed Air fitting on the back of the powder pump atop the SpectraCoat™ Constant Fluidizing Hopper.
3. Connect one end of the Powder Feed Hose to the white injector nozzle sticking out the front of the powder pump atop the SpectraCoat™ Constant Fluidizing Hopper.
4. Connect the other end of the Powder Feed Hose to the Powder Feed Hose Barb on the Gun.
5. Insert one end of the Auxiliary Air Hose into the Auxiliary Air Fitting.
6. Insert the other end of the Auxiliary Air Hose into the 1/4" Dosage Air fitting on the top of the powder pump atop the SpectraCoat™ Constant Fluidizing Hopper.
7. Follow rest of standard set up steps like normal.

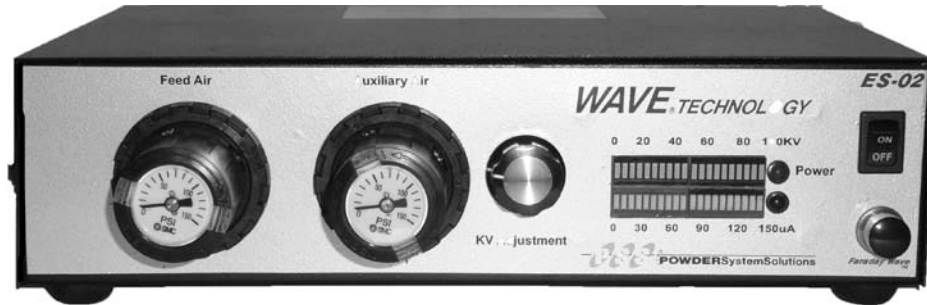
Note: You can also use the SpectraCoat™ Constant Fluidizing Hopper exactly as it comes (with the Dosage Air fitting of the powder pump plugged off) if you want to retain your Rinse Air without additional modification of the controller.

Operation

!!! Important !!!

This system and the parts to be coated must be properly grounded. This is essential to the operation of this unit and the quality of the coating. As the powder particles pass through the electro-static field generated at the

tip of the gun they are energized with a certain polarity. When the parts to be coated are properly grounded they will have an opposite polarity. This allows the powder particles to be attracted to the parts and stick. If the parts to be coated are not grounded properly it may cause uneven coating and poor results.



Over View

Before you start the operation of the unit, take a look at the front panel of the SpectraCoat™ Control Unit and familiarize yourself with it . . .

- On the left side is a knob called Feed Air. This controls the amount of air pressure coming from the Control Unit through the Hopper Pressure Hose to the Hopper. This will determine the amount and speed of the powder coming out the end of the gun. You may need to pull the knob out slightly to unlock it and turn it. When this knob is pushed in it is in the lock position.
- To the right of the Feed Air knob is the Auxiliary Air knob. This regulator can be used for Rinsing Air or Dosage Air depending on how your system is set up.
- At the center of the front panel is the High Voltage Adjustment knob. This adjusts the KV level of the electro-static output of the gun. When the knob is turned all the way counterclockwise the output is 0 KV.
- To the right of the KV Adjustment knob is the LED output display. The top row of LEDs shows relative KV output. The bottom row of LEDs shows relative amperage. Gun to part distance can affect these readings.
- All the way to the right is the Main Power Switch.
- Below the main power switch is the Faraday Wave™ button that operates as an on/off toggle switch. When the Faraday Wave™ function is activated you will see the LED display cycle up and down with the gun trigger pulled.
- The Feed Air output, Auxiliary Air output, Shop Air In fitting, and Gun Cable Connector are all located at the rear of the unit.

General Operation and First Coat

1. Properly ground the parts to be coated or any rack that the parts may be hanging from. The rack and any hooks to be used to hang parts should be metal so as to allow proper grounding. The included ground wire should run from the Ground Lug on the controller to your earth ground, not your part.
2. Unscrew the cap from the Powder Hopper and put the desired amount of powder into the hopper. Reinstall the cap.
3. Turn the High Voltage Adjustment knob all the way down (counterclockwise).
4. Turn the Feed Air adjustment knob all the way down (counterclockwise).
5. Turn the Auxiliary (Rinsing) Air adjustment knob all the way down (counterclockwise).
6. Turn on the main power switch.
7. Point the gun in a safe direction away from yourself and away from any parts to be coated.
8. Pull the trigger on the gun.
9. Slowly increase the Feed Air adjustment until you see the powder coming out the end of the gun with a consistency and speed similar to that of a person exhaling cigarette smoke. An additional means of controlling powder delivery is to raise or lower the copper Feed Air tube in the pressure hopper.
10. Slowly increase the Auxiliary (Rinsing) Air adjustment knob to achieve a low pressure blow by at the tip of the electrode. This is to gently clean the electrode as it charges so powder does not accumulate on the charged electrode tip. You will not need much air pressure to accomplish effective rinsing of the tip; too much rinse air can negatively affect the charging of the powder and the spray pattern.
11. Turn the High Voltage Adjustment knob up (clockwise) until you reach the desired Voltage output. For the first coat this is usually 50-70 KV.

You are now ready to point the gun at the parts to be coated.

Second Coats

Refer to the section on the Hyper Coat™ Multi-Coat Nozzle, if equipped, for procedures on parts to be coated multiple times. Otherwise, use same procedure as with Faraday Areas.

These procedures are meant to be a starting point for the operation of the

SpectraCoat™ system. Some experimentation may need to be done to work with different types of powder and colors.

Faraday Areas

With the Faraday Wave™ feature enabled you will now be able to easily coat those previously challenging & difficult recessed/concave areas that would normally present a Faraday Cage Effect. With the Faraday Wave™ feature enabled and the gun trigger pulled you will see the LED display cycle up and down the selected KV range. On the ES02, the Faraday Wave™ feature is set at a .3 second cycle interval. You can control the KV range that the unit cycles through by adjusting the KV knob as you would for normal operation. How you set the KVs is based on user preference and the specific application at hand. Experiment with your KVs to determine what range works best for your own unique coating style and part geometry.

A good starting point is ~20-30KV with a gun to part distance of ~2-4 inches. You will want to lower your Feed Air pressure so you are not blowing powder off the part while working this close to the substrate.

Color Change and Cleaning

Color change and cleaning is basically the same operation. It is always a good idea to keep the SpectraCoat™ system clean in between jobs. Any powder that is allowed to remain in the hopper, feed lines or the gun can be very difficult to clean out at a later time.

For this procedure you will need an air nozzle on a shop air line to blow any residual powder from the different places in the system as described below. Use an air pressure of 80-100PSI (5-7 bar) for the cleaning process.

Refer to the section below called SpectraCoat™ Gun Parts Identification.

!!!Warning!!!

Never disassemble the gun further than what is described below as this may damage parts of the gun and void any warranties. When blowing powder from the hopper, gun or the hoses, be sure that you aim away from the system.

1. Shut off the main power switch.
2. Disconnect the Powder Feed Hose from the Hopper and from the Spray Gun.
3. Holding both ends of the Powder Feed Hose in one hand, insert your shop air nozzle into one end of the Powder Feed Hose. Make sure that the hose ends are not pointing at you or towards the system. Blow air through the hose. Try to shake the hose while performing this operation as this will aid

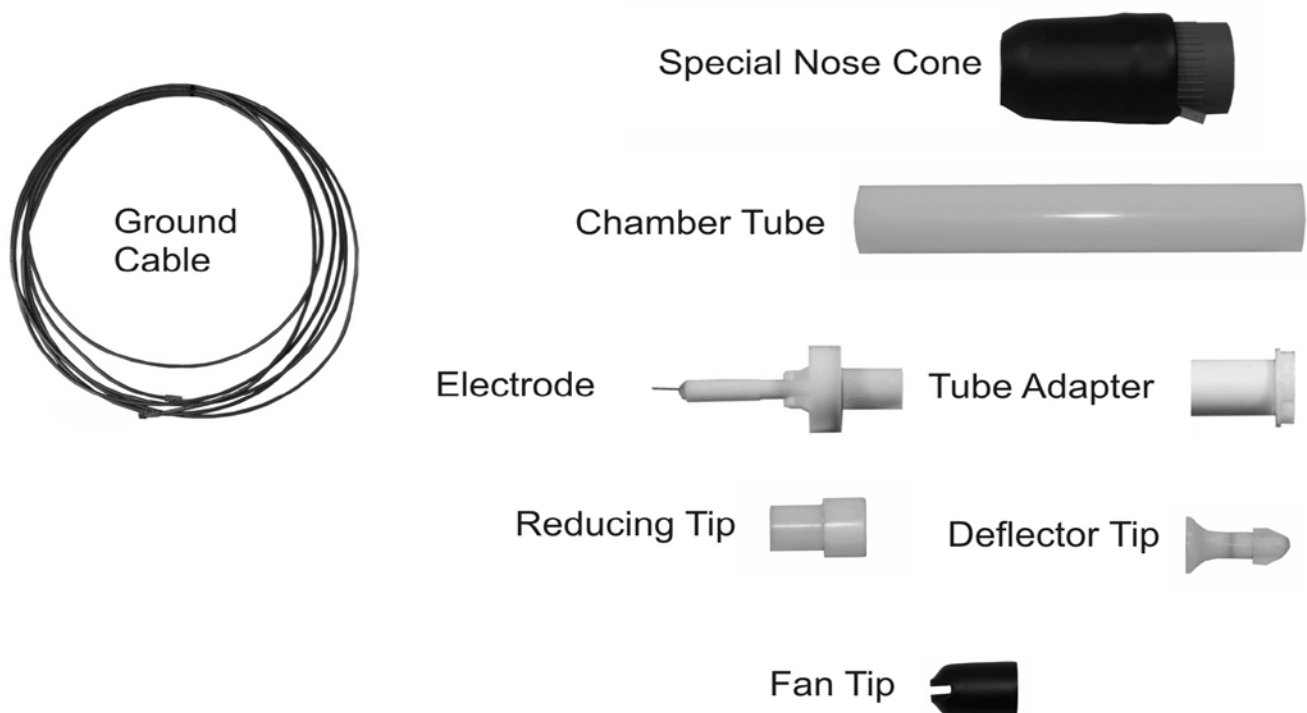
- in loosening any residual powder that may be left in the hose.
4. Remove the Conical Nozzle (if used) from the gun and blow off any residual powder.
 5. Unscrew the Nose Cone from the gun and blow off any residual powder.
 6. Remove the Standard Tip or Fan Tip and blow off any residual powder.
 7. Blow air into the Powder Feed Hose Barb to remove any residual powder from inside the gun.
 8. Reassemble the gun if desired.
 9. Remove the Clear Hopper Pressure Hose from the SpectraCoat™ Hopper Cap. This step is important to insure that no residual powder gets blow back up this clear hose while cleaning the Hopper Cap.
 10. Remove Cap from the Hopper.
 11. Blow off any residual powder from the inside of the Cap and Hopper.

You are now ready to use another color or store the unit for future use.

Hyper Coat™ Multi-Coat Nozzle

Depending on the types of powder being used and the desired thickness of the coating to be achieved, it is sometimes necessary to use the Hyper Coat Nozzle to get the best results. Below is a break out of the parts of the Hyper Coat Nozzle.

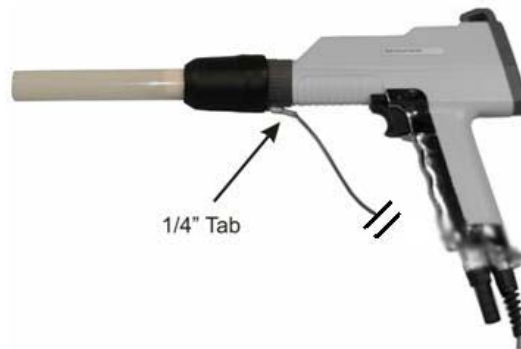
!!!!Turn the Main Power Switch off while installing any Nozzle to avoid electrical shock!!!!



Installation of the Hyper Coat Nozzle.

1. Insert the Electrode into the Tube Adapter.
2. Insert the Electrode/Tube Adapter into an end of the Chamber Tube.
3. Insert the Chamber Tube/Electrode into the Nozzle Nose Cone.
4. Attach the 1/4" Female connector of the Ground Wire to the metal tab on the Nozzle Nose Cone.
5. Connect the eye end of the ground wire to the Ground Lug on the rear of the ES02 controller where you have your regular controller ground wire hooked up to.

Furnished with the Hyper Coat Nozzle is a Deflector Tip, Reducing Tip and a Fan Tip Adapter. The use of these tips is optional depending on your preference for a spraying pattern. Below is a picture of the Hyper Coat Nozzle properly installed on the SpectraCoat™.



Operation of the Hyper Coat™ Multi Coat Nozzle

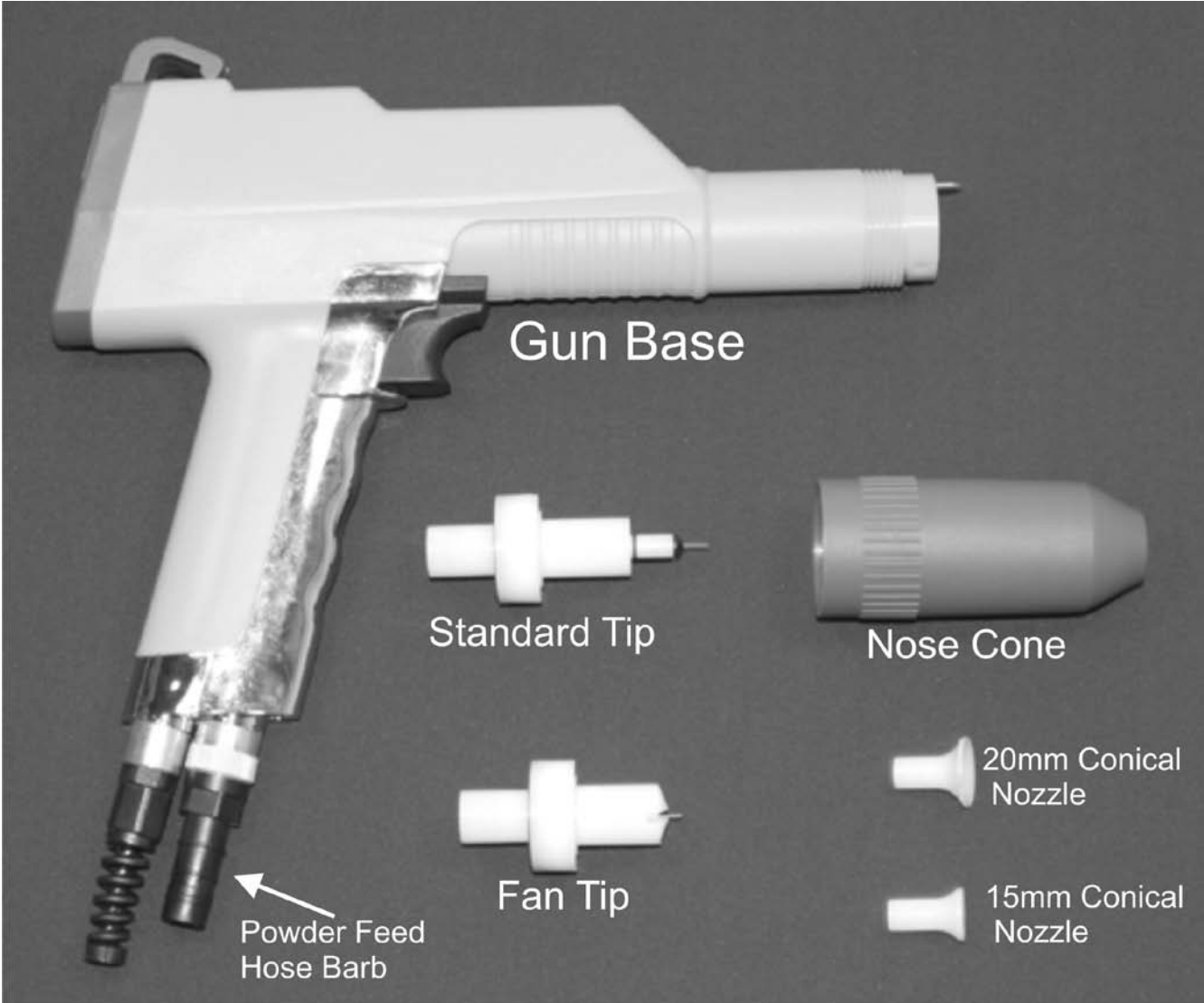
1. Properly ground the parts to be coated or any rack that the parts may be hanging from. The rack and any hooks to be used to hang parts should be metal so as to allow proper grounding.
2. Unscrew the cap from the Powder Hopper and put the desired amount of powder into the hopper. Reinstall the cap.
3. Turn the High Voltage Adjustment knob all the way down (counterclockwise).
4. Turn the Feed Air adjustment all the way down (counterclockwise).

5. Turn on the main power switch.
6. Point the gun in a safe direction away from yourself and away from any parts to be coated.
7. Pull the trigger on the gun.
8. Slowly increase the Feed Air adjustment until you see the powder coming out the end of the gun with a consistency and speed similar to that of a person exhaling cigarette smoke. An additional means of controlling powder delivery is to raise or lower the copper Feed Air tube in the pressure hopper.
9. Turn the High Voltage Adjustment Knob up (clockwise) until you reach the desired Voltage output. If a crackling or popping noise is heard turn the KV adjustment down slightly. This noise is normal. It is excess static being bled off through the ground wire.

!!!!WARNING!!!!

The purpose of the Ground Wire is to reduce the chance of static discharge while operating the Hyper Coat Nozzle with the KV setting over 50KV. If the Hyper Coat Nozzle is operated over 50 KV without the Ground Wire, static discharge can occur between the nozzle and a ground source or a part to be coated. This can be very dangerous in a powder coating environment.

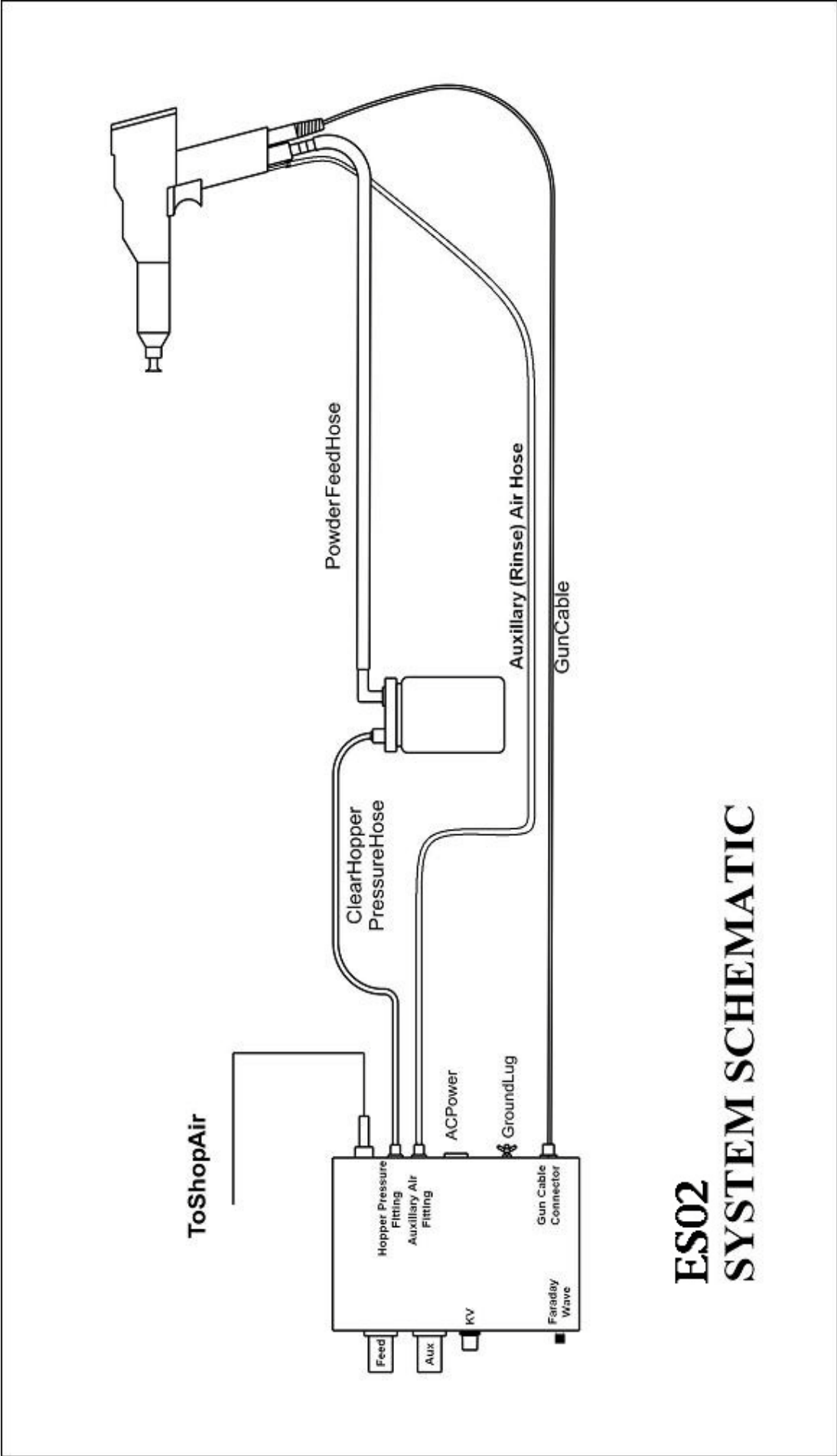
SpectraCoat™ ES02 Gun Parts Identification



Note: In the above photo, the metal Rinse Air barb is not pictured but would be directly in front of the Powder Feed Hose Barb.



Extension Nozzle



ES02 SYSTEM SCHEMATIC

SpectraCoat™ ACCESSORIES & REPLACEMENT PARTS

Item	Description	Part Number	Picture
1	CLEAR HOPPER PRESSURE HOSE	ES-HPH	
2	POWDER FEED HOSE	ES-PFH	
3	POWER CORD	ES-PC	
4	GROUND CABLE	ES-GC	
5	1.5 LB Pressure HOPPER	ES-1LB	
6	FAN SPRAY ELECTRODE	ES-FT	

7	15MM CONICAL DEFLECTOR TIP	ES-CN15	
8	20MM CONICAL DEFLECTOR TIP	ES-CN20	
9	STANDARD ROUND SPRAY ELECTRODE	ES-CNE	
10	6" EXTENSION ELECTRODE	ES-EN	
11	HYPER COAT Ground Cable	ES-HCGC	
12	HYPER COAT Fan Tip	ES-HCFT	
13	HYPER COAT ELECTRODE/TUBE KIT	ES-HCETK	
14	HYPER COAT Nose Cone	ES-HCNC	
15	HYPER COAT Deflector Tip	ES-HCDT	

16

AUXILIARY AIR HOSE

ES-AAH

