

Operations Manual for the Airbrasive® Model H Series II

S. S. White Technologies, Inc.

Section I: Introduction and Description

1. Introduction

- A. **Scope.** This technical manual contains operation and service instructions, as well as an illustrated parts list for the Airbrasive® Model H Series II manufactured by S. S. White Technologies, Inc.
- B. **Characteristics.** The Airbrasive® Model H Series II is an electrically powered device that incorporates a patented electro-magnetic vibratory feed system for powder delivery. The Model H series II unit has been designed to accommodate both the intermittent and continuous production demands of high volume producers.

Specifications. The specifications of the Airbrasive® Model H Series II are listed in Table 1-1.

SPECIFICATIONS

1. Air Supply Requirements	110 ± 30 psi Minimum 0.5 CFM at 80 psi Maximum 140 psi Dry, clean, compressed air, carbon dioxide, or nitrogen.
2. Electrical Power Requirements	AU208 : 115V, 60HZ, Single Phase, Three Wire The plug supplied is three-prong, polarized, providing an earth ground. AU213 : 220V, 50HZ, Single Phase, Three Wire The plug supplied is three-prong, polarized, providing an earth ground.
3. Weight	60 Lbs. (27.27 kg)
4. Dimensions	Height 22 1/2" (57.15 cm) Width 14 7/8" (37.8 cm) Depth 9 5/8" (24.4 cm)

WARNING

The use of oxygen as a gas supply for the H presents the possibility of an explosion occurring. Under no circumstances should oxygen be used.

IMPORTANT

A suitable dust collector system is required to maintain operator's exposures to powder dusts below permissible exposure limits such as those regulated by OSHA or recommended annually by ACGIH (American Conference of Governmental Industrial Hygienist). Consult the manufacturer of the dust collector equipment for the correct filter for other dusts or air contaminants resulting from material being abraded.

AIR SUPPLY NOTE

Many compressed air lines are contaminated with moisture, oil, and dirt, which are detrimental to the performance and operation of the Unit. Moisture filters and unloaders must be used. These items can be purchased directly from S. S. White Technologies, Inc.

POWDER NOTE

The MODEL H UNIT is designed to use specially prepared powders that are meticulously screened for uniform particle size. These specialty powders insure smooth flow through the many precision ports and feed-throughs. The use of any other type of powder can result in clogging of the internal components and potential damage to the unit. For more information on these powders contact S.S. White Technologies Inc. (1-800-S.S. WHITE) or one of its authorized distributors.

Airbrasive® Model H II: Standard Equipment

<u>Description</u>	<u>Part Number</u>	<u>Quantity</u>
Airbrasive® Model H	AU208	1
Nozzle (Rt. Angle .018" I.D.)	AN118	1
Nozzle (Straight, Round, .018" I.D.)	AN119	1
Nozzle (Straight, Rectangular, .006"x.060")	AN124	1
AccuBrade 27 – Aluminum Oxide	AP101	4 lbs.
AccuBrade 50 – Aluminum Oxide	AP105	4 lbs.

Optional Equipment

<u>Description</u>	<u>Part Number</u>	<u>Quantity</u>
Spare Parts Kit	AK103	1

IMPORTANT:

The Airbrasive® Model H Series II requires a suitable dust-collecting hood placed near the unit to collect used powder. S.S. White offers dust collectors and work chambers for this purpose. See Product Accessories.

WARNING

Do Not Use Oxygen as a gas supply for the unit! An explosion can occur.

INSTALLATION AND UNIT CHECKOUT

A. Attach the **BLOW OFF TUBING** (plastic tubing shipped with the Unit) to the fitting (32) on the rear of the Unit. Attach the other end of the **BLOW OFF TUBING** to an available exhaust system to evacuate excess powder from the Unit.

B. Connect the end of the **AIR IN** fitting (29) to the external air supply (see page 1 for supply requirements).

C. Set the **SYSTEM POWER ON/OFF** switch on the front panel to "Off", and the **POWDER REGULATION SETTING** knob completely counterclockwise.

D. Connect the provided power cord to the unit's power outlet (30) and plug the other end into an available outlet (see page for electrical requirements).

E. Set **SYSTEM POWER ON/OFF** switch to "On".

NOTE: If the SYSTEM POWER ON/OFF switch does not light, it indicates loss of electrical power. Check Unit fuse (30) and if OK, check input power source.

F. Check reading on the **CHAMBER PRESSURE GAUGE**. Set the main air pressure to desired level by adjusting the **CHAMBER PRESSURE ADJUSTMENT** regulator.

G. Set the **CONTINUOUS OR FOOT SWITCH ACTIVATED** switch to **FOOT SWITCH**.

H. Press foot pedal. Air should flow from the handpiece nozzle.
CAUTION: Never direct the nozzle towards the face when operating the foot switch. Always use a suitable dust collector system whenever using the unit.

I. Set **SYSTEM POWER ON/OFF** switch to "Off". This bleeds off any residual air remaining in the mixing chamber.

CAUTION: Keep SYSTEM POWER ON/OFF switch to "Off" for a minimum of 20 seconds each time the Unit is turned off. This will allow enough time to bleed the mixing chamber.

J. Install nozzle in handpiece (14).

K. Place **SYSTEM POWER ON/OFF** switch to "On" and set **POWDER REGULATION ADJUSTMENT** knob to obtain the desired amount of powder flow for the operation to be performed (nominal setting for most operations is in MED range of **POWDER REGULATION GAUGE**).

L. Set unit to **CONTINUOUS OR FOOT SWITCH ACTIVATED** as desired to obtain powder flow through nozzle.

UNIT SHUTDOWN. Place **SYSTEM POWER ON/OFF** switch to " Off". Remove hose connection from air supply source.

OPERATION INSTRUCTIONS

This section includes a description of the operating procedures and controls. The operation instructions also describe the capability and use of the MODEL H UNIT.

TURN-ON PROCEDURE. To turn on Unit, proceed as follows.

NOTE : This procedure applies after the Unit has been installed and checked as described on Page 2.

A. Set **SYSTEM POWER** switch to "Off", and rotate **POWDER REGULATION ADJUSTMENT** knob completely counterclockwise; also set **CONTINUOUS POWDER FLOW/FOOT SWITCH ACTIVATED** to **FOOT SWITCH**.

B. Connect **AIR IN** fitting to an external air supply.

C. Check that power supply cord is plugged into an electrical outlet.

D. Set **SYSTEM POWER** switch to "On". Check that the switch is glowing red.

E. Check psi reading on **CHAMBER PRESSURE SETTING** gauge. Adjust **CHAMBER PRESSURE ADJUSTMENT** knob as required.

F. Check that no air flow is coming from the handpiece. This indicates the pinch valve tube is closed. If necessary, adjust pinch valve regulator until there is no flow of air/powder from nozzle of handpiece. When adjusting the pinch valve regulator (21), the front panel must be opened. This opens the **ELECTRICAL INTERLOCK (19)** which disengages electrical power to the unit. To adjust pressure, the **ELECTRICAL INTERLOCK** must be held in place. This will mimic the front panel being closed. You may now adjust the regulator (21) until there is no air/powder flow from the regulator. **Please adjust slowly. Less pressure will not operate the PINCH VALVE ASSEMBLY, more will result in abnormal wear.**

G. Set **SYSTEM POWER** switch to "Off".

CAUTION : Do not set pinch valve air pressure too high, it will result in excessive tube wear. Do not direct handpiece towards the face.

H. Select and install proper nozzle in handpiece for the operation to be performed.

I. Check powder in auxiliary chamber. Refer to page if necessary to add powder.

J Set POWDER REGULATION ADJUSTMENT knob until POWDER REGULATION SETTING gauge is at desired setting. For normal operation, the gauge should be in MED range.

K. Set SYSTEM POWER ON/OFF switch to "On". The MODEL H UNIT is ready for operation.

L. For continuous powder flow, without actuating footswitch, set CONTINUOUS POWDER FLOW/FOOT SWITCH ACTIVATED switch to CONTINUOUS.

TURN-OFF PROCEDURES: When turning the H off for short periods of time, set the SYSTEM POWER ON/OFF switch to "Off" position. If the H is to be shut down for an extended period of time, proceed as follows:

- A. Set SYSTEM POWER ON/OFF switch to "Off".
- B. Unplug power supply cord.
- C. Disconnect air supply hose from external source.

SERVICE INSTRUCTIONS

PERIODIC INSPECTION

This unit should be inspected periodically for the following signs of wear.

- A. Damaged case or top cover.
- B. Frayed or worn hoses.
- C. Frayed or broken wires.
- D. Blown indicator lamp.
- E. Worn nozzle.
- F. Loose hose connections.

PERIODIC CLEANING

- A. Clean out dust, dirt, and spilled powder from the H interior using low pressure compressed air. Remove stubborn dirt with a brush. Do not use cleaning fluid on the hoses.
- B. Clean the H external surface with a soft lint-free cloth moistened with a suitable non-toxic cleaning solution.

COMPONENT MAINTENANCE

NOZZLE TIPS A 3/64" I.D. nozzle tip supplied with the unit (See page 2), and made of sintered tungsten carbide, must be handled with care. Nozzle tips for special applications are available.

Nozzle tips wear through the bore enlarging the side wall and piercing through. A fuzzy air powder stream, with lack of definition, is a sign that the nozzle is worn and should be replaced. Replace a nozzle by unscrewing the tip from its connector and replace with a new one. Screw the new nozzle securely to the handpiece connector to avoid powder leaks.

CAUTION : Nozzle tips are manufactured of sintered tungsten carbide, and may break if not carefully handled. They should be stored in a safe place when not in use.

On occasion the nozzle will clog due to an excessive flow of powder. Unclog a nozzle as follows:

- A. Remove nozzle from its connector.
- B. Turn the POWDER REGULATION ADJUSTMENT knob completely CCW.
- C. Hold the tip end of the nozzle tight against the connector.
- D. Turn the H on and actuate the foot switch, supplying air to reverse flush the clogged tip. This should be done in an exhaust chamber.

PINCH VALVE TROUBLESHOOTING If the pinch valve fails to operate properly the problem could be caused by the solenoid or foot switch. Low voltage across the solenoid coil will cause it to hum and not click. Check the

voltage across the solenoid coil. If it is low, check the power line voltage. If line voltage is correct check for a drop across the foot switch contacts. If there is a drop replace the foot switch. If not replace the solenoid.

If the pinch valve tube stays open when the unit has air, troubleshoot as follows::

- A. Remove the bottom hose connection from the pinch valve and check if there is air pressure. It should be 40 psi. If the pressure is incorrect adjust the pinch solenoid regulator (See Page 16 for adjustment). If no adjustment is possible replace the regulator.
- B. If pressure is available remove and disassemble the pinch valve assembly. Clean parts and replace any that are worn or damaged. (See drawing: Appendix A)

The rubber pinch valve tube wears and will eventually leak. The valve does not have to be removed from the Unit for tube replacement which is accomplished as follows: (See drawing: Appendix A)

- A. Set SYSTEM POWER ON/OFF switch to "Off" position.
- B. Disconnect hoses from air pinch valve tube.
- C. Remove top block from assembly by removing two knurled screws. Remove worn pinch valve tube from bottom block. Carefully insert the new pinch valve tube into the bottom block indentation. Align the pinch tube's seam to the side of the block.
- D. Carefully replace top block, again making certain that the tube aligns with the indentations in the top block. Secure top block in place with attaching hardware.
- E. Connect hoses removed in step (b) above.
- F. Turn Unit on and check for proper operation with no air leaks.

POWDER REGULATION ADJUSTMENT knob. The powder flow rheostat adjusts the magnetic coil voltage level. If it malfunctions check electrical connections at the rheostat. If this is not the problem then check operation as follows:

- A. Connect a voltmeter across the input to the magnetic coil of the vibrator assembly.
- B. Turn the POWDER REGULATION ADJUSTMENT knob completely counterclockwise.
- C. With the SYSTEM POWER ON/OFF switch set to "On" and the foot switch actuated, observe the reading on the POWDER REGULATION SETTING gauge while slowly turning the POWDER REGULATION ADJUSTMENT knob CW. The range of the gauge reading from completely CCW to fully CW should be from low to high.
- D. If the gauge reading in step (c) above does not indicate any change over a wide range of knob movement and then suddenly jumps to maximum reading, it indicates faulty wiper arm contact or an open winding in the rheostat. Replace rheostat; the item is not field repairable.

VIBRATOR. Each vibrator assembly (22) is factory adjusted to produce the desired vibrating characteristic.

CAUTION

The POWDER REGULATION ADJUSTMENT knob should never be set too high. This will cause audible striking of the pole pieces by the magnetic coil armature. It will create an excessive amount of vibration that could cause damage to the Unit.

If the Vibrator does not function properly while under warranty, it must be removed and returned to S. S. White Technologies, Inc., for readjustment and/or repair. To remove the assembly disconnect all electrical wires and pneumatic hoses (and tag) from the vibrator and mixing chamber (17,22). The vibrator and mixing chamber assemblies can now be lifted directly from the multi-plane mounting shock absorbers. Detach the mixing chamber from the vibrator by removing the attaching hardware. To reassemble and install reverse the above procedure. After installation, check the Unit for proper operation with no leaks.

AUXILIARY CHAMBER AND MIXING CHAMBER. The auxiliary chamber (15) and mixing chamber (17) function together. The purpose of the auxiliary chamber (which is mounted above the mixing chamber) is to store powder and keep the mixing chamber level constant. This allows the mixing chamber to feed a constant amount of

powder into the air stream. The auxiliary chamber doesn't vibrate, mixing chamber vibratory motion is absorbed by the hose assembly (which joins the two chambers together) resiliency. Powder flow rate is determined by air pressure level (set by CHAMBER PRESSURE ADJUSTMENT knob) and vibration amplitude (controlled by the POWDER REGULATION ADJUSTMENT knob) imparted on the mixing chamber by the vibrator assembly.

AUXILIARY CHAMBER AND MIXING CHAMBER MAINTENANCE. The auxiliary chamber (15) does not normally require maintenance unless a new O-ring is needed . When removing the O-ring make certain the old one is completely removed from its groove, and no parts of it fall into the chamber. If they do, remove them. (See detailed drawing: Appendix A).

CAUTION

The O-ring must be seated in its groove when top cover is secured. If the ring is not properly installed, air leaks will occur.

It is normally not necessary to remove the mixing chamber (17) unless the powder cakes (due to excessive moisture in the compressed air) or the orifice plate needs replacement. If it is necessary proceed as follows:

- A. Mark the position of the mixing chamber on the vibrator (22). This is necessary, so when reassembling it, it is not put in another location causing the vibrator to change its vibratory characteristics. This will also prevent stretching and kinking of air and powder hoses.
- B. Remove the one screw that retains the mixing chamber to vibrator via the small cleat. Loosen the other two screws from the larger double cleat.
- C. Loosen the three screws which retain the base cap of the mixing chamber.
- D. Remove hoses going to mixing chamber after tagging them. Make sure you do not lose the fiber washers on the hose nut fittings.
- E. With the mixing chamber upright in the vise, reach into the mixing chamber and grasp the tube portion of the orifice plate assembly and push the assembly out through the base.
- F. Remove the base cap.
- G. Position a container under the chamber and remove the orifice plate, and shake the mixing chamber, causing the powder to fall into the container
- H. Clean the orifice plate, if required, with a fine wire brush and low pressure compressed air. Replace the gasket.

To reassemble reverse the above procedure, making certain the base cap gasket is properly seated and the chamber located to its scribed position. Clean away any powder that has fallen into the vibrator assembly or Unit itself.

SERVICE TIPS

FLOW DIFFICULTIES. Some causes of powder flow difficulties are the following:

- A. Worn or clogged nozzle tips.
- B. Overfilled or nearly empty mixing chambers. Both conditions can cause an increase in powder flow. When the foot switch is first actuated an initial heavy burst of powder is usually seen for a fraction of a second. This momentary heavy mix is normal. It is due to small amounts of settled powder in the line. A slightly heavier than normal flow is also noticeable after the mixing chamber has been filled.
- C. Reused, contaminated, or improper powders. Such powders can decrease flow or clog the Unit completely, especially at the mixing chamber orifices and and at the handpiece nozzle. Never reuse powder. Use of S. S. White Technologies ABRASIVE Powders exclusively is recommended. We strongly recommend against the use of other commercial powders because they are rarely classified adequately for use with the AIRBRASIVE apparatus, causing needless maintenance and repairs. They may also have toxic substances present which could be harmful to your health.
- D. Insufficient nozzle pressure, usually due to leaks, will reduce cutting speed.
- E. Leaks around the mixing chamber, auxiliary chamber cap, and at fittings may increase powder flow. This condition exists especially at low voltage (Powder Flow control knob set at lower range) and when the footswitch is actuated intermittently every second or so.

- F. Leaks around the base of the mixing chamber can result in decreased powder flow.
- G. Visible leaks which can be detected by the pressure of powder.
- H. Inoperative vibrator caused by broken, loose or shorted magnetic coil leads.
- I. Loose or broken vibrator springs or improper vibrator adjustment.

TESTING FOR LEAKS. Unit leakage may affect its performance and cause an excessive use of powder. The following service tips should be observed:

- A. To check for total system leakage, turn on air pressure until the system is pressurized. Shut off the external air supply valve and observe the Chamber Pressure Setting gauge. If pressure does not drop more than 15 psi during five minutes, the system leakage is less than one cubic foot per hour. This is negligible.
- B. Most leaks are traced by ear, touch, or the use of soap and water. The presence of powder can indicate a leak.
- C. To check for leakage at the auxiliary chamber top cover, have the chamber pressurized, and apply soap and water. Look for leakage bubbles. Be certain to wipe off all traces of the soap after test completion.
- D. Auxiliary chamber and mixing chamber gaskets are subject to leakage and require periodic replacement.
- E. Make certain that the small nylon gaskets in the hose fittings are in place.
- F. With the system pressurized and the air pinch valve tube closed, leakage through the pinch valve tube should not exceed three bubbles per second with the nozzle tip immersed in water.

TROUBLESHOOTING

A troubleshooting chart has been provided to aid in repairing a unit which is malfunctioning. Use it with the Unit electrical schematic/wiring diagrams and pneumatic diagram when required.

TROUBLE	POSSIBLE CAUSE	REMEDY
1. With SYSTEM POWER ON/OFF switch "On", switch does not light.	a. Blown back panel fuse. b. Switch burnt out. c. No input power.	a. Replace fuse. b. Replace switch. c. Check external input power.
2. With SYSTEM POWER ON/OFF switch "On" and with external air connected to unit, rotation of Chamber Pressure Adjustment does not change psi reading on Chamber Pressure Setting.	a. Inoperative air pressure regulator. b. Inoperative air pressure gauge.	a. Turn Powder Regulation Adjustment fully CCW. Operate footswitch and check for air flow at nozzle tip. Vary Chamber Pressure from fully CCW to fully CW. A definite change in air flow should be noted at the nozzle tip as the knob is rotated its full range. If not, replace air pressure regulator. b. Replace gauge.
3. Traces of powder at pinch valve.	Ruptured air pinch tube.	Replace tube (see page 19).
4. No air flow at nozzle tip with unit on and foot switch actuated. (Chamber Pressure gauge shows psi.)	a. Nozzle tip clogged. b. Inoperative pinch valve solenoid.	a. Clean nozzle tip. (See page 19). b. Check solenoid operation.
5. Air flow at nozzle tip when Continuous Powder Flow/Foot Switch Activated switch is in foot switch position and foot switch is not actuated.	a. Shorted foot switch. b. Loss of air supply from pinch solenoid regulator to pinch solenoid valve.	a. Check foot switch operation (See Schematic Appendix A). b. Remove hose from bottom of pinch valve and check for air flow. If no air flow try to adjust pinch solenoid regulator; if there is air flow, remove and check pinch valve assembly (See Appendix A).
6. Vibrator Inoperative	a. Open rectifier b. Open Powder Regulation	a. Connect good rectifier in parallel with rectifier on unit (see schematic

	<p>adjustment rheostat.</p> <p>c. Vibrator magnetic coil burnt out.</p>	<p>in appendix A).</p> <p>If vibrator operates, replace bad rectifier.</p> <p>b. Check operation of rheostat (See page 20).</p> <p>c. Replace vibrator assembly (See page 20).</p>
<p>7. No powder flow from mixing chamber.</p>	<p>Clogged orifice plate in mixing chamber.</p>	<p>Remove, disassemble, and clean mixing chamber (see page 21).</p>
<p>8. Powder spray from nozzle tip loses definition.</p>	<p>Worn nozzle tip.</p>	<p>Replace nozzle tip.</p>