



# BOSS PNEUMATIC PROPORTIONER PLURAL COMPONENT PROPORTIONER

OPERATORS MANUAL

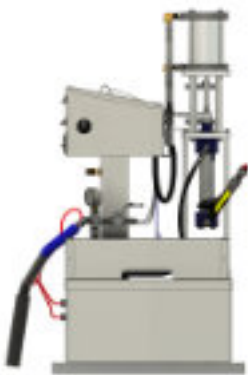
SERIAL NO.

1705 Beulah Church Rd. | Calhoun, LA 71225 | 888.640.BOSS

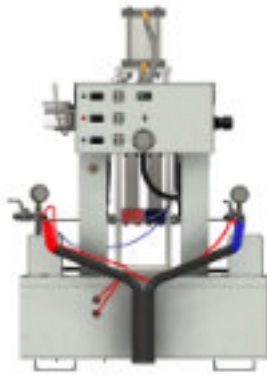
[BOSSMFG.NET](http://BOSSMFG.NET)

## BOSS PNEUMATIC PROPORTIONER

RIGHT



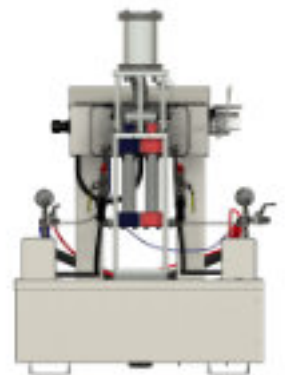
FRONT



LEFT



BACK



Not approved for use in explosive atmosphere locations.

December 11, 2024



### Important Safety Instructions:




Carefully read this manual before operating any BOSS PNEUMATIC Series Proportioner. All of the information is provided for the proper operation and troubleshooting of the BOSS PNEUMATIC Series Proportioner. Pay close attention to any safety warnings and save these instructions for further technical and informational reference.

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# SAFETY PRECAUTIONS AND WARNINGS

 <p>Elevated Temperatures</p>	<p style="text-align: center;">Burn Hazard</p> <p>This equipment is used with heated fluid which is hot and will cause some surfaces on equipment to become very hot. To avoid burns:</p> <ul style="list-style-type: none"> <li>• Do not touch fluid or equipment.</li> <li>• Allow fluid and equipment to completely cool before touching or servicing.</li> <li>• Wear gloves and protective clothing.</li> </ul>
 <p>WARNING</p>	<p style="text-align: center;">Toxic Fumes and Fluid Hazard</p> <ul style="list-style-type: none"> <li>• Read Material Safety Data Sheet (MSDS) to know specific hazards of fluid you are using.</li> <li>• Handle and store hazardous fluids according to applicable guidelines.</li> </ul>
	<p style="text-align: center;">Misuse of Equipment Hazard</p> <p>Misuse can cause serious injury or death!</p> <ul style="list-style-type: none"> <li>• For professional use only.</li> <li>• Do not exceed the maximum temperature rating or working pressure of equipment.</li> <li>• Check equipment daily replacing worn or damaged parts immediately.</li> <li>• Read manuals, warnings, and labels before operating equipment.</li> <li>• Use only compatible fluids/solvents.</li> <li>• Keep hoses away from traffic areas, sharp edges and hot surfaces.</li> <li>• Comply with all safety warnings and labels.</li> <li>• Service of equipment should be done by qualified personnel only.</li> </ul>

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## Container Delivery, Storage, and Handling

- A. Delivery: Deliver materials in originally sealed, unopened containers. All containers must contain: product identification, color, lot number, expiration date or shelf life, manufacturer's name and product labels.
- B. Location: Storage of drums must be in a dry location at a temperature below 100°F (38°C). Stacking of drums is not recommended unless shelf-weight capacities have been thoroughly checked. Remember, one full tote/pod weighs approximately five hundred pounds (500 lbs. or 227 kg.).
- C. Empty Totes/Pods: Avoid pressure build-up by leaving empty drums unsealed.
- D. Temperature: Do not place drums near excess heat or flame. Container cannot withstand internal pressure build-up that can be caused by heat.
- E. Handling Full Drums: Full drums should be moved using fork lifts or barrel dollies. Chain hoists are not satisfactory without the use of approved barrel slings.

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## Equipment Clean-Up Solvents

- A. Cleaning Agents: Recommended solvent for cleaning BOSS PNEUMATIC PROPORTIONER components and equipment is isopropyl alcohol.
- B. Solvent Storage: No more liquid solvent that is absolutely necessary to perform operation is permissible in service area at any given time.
- C. Vapor Concentration: When containers are not in use, keep covered and use general exhaust ventilation.
- D. Fire Safety: Remember, most solvents are highly flammable. "NO SMOKING" signs must be posted and enforced. Transfer of solvents from drums must be done by a UL-approved pump into approved safety cans and/or an approved closed system. When transferring flammable liquids, all proper grounding and bonding procedures must be followed.

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## Waste Disposal

Please consult the product Safety Data Sheet. Any disposal of the waste, solvent should be done in strict compliance to the applicable local laws/State and Federal laws and regulations.

Any Hazardous waste should be contained and disposed by a licensed operator in compliance with the Local, State and Federal laws and regulations.

# IMPORTANT PLURAL COMPONENT INFORMATION

## WARNINGS



### Isocyanate Conditions

Spraying or dispensing fluids that contain isocyanates creates potentially harmful mists, vapors, and atomized particulates.



- Read and understand the fluid manufacturer's warnings and Safety Data Sheet (SDS) to know specific hazards and precautions related to isocyanates.



- Use of isocyanates involves potentially hazardous procedures. Do not spray with this equipment unless you are trained, qualified, and have read and understood the information in this manual and in the fluid manufacturer's application instructions and SDS.




- Use of incorrectly maintained or mis-adjusted equipment may result in improperly cured material, which could cause off gassing and offensive odors. Equipment must be carefully maintained and adjusted according to instructions in the manual.

- To prevent inhalation of isocyanate mists, vapors and atomized particulates, everyone in the work area must wear appropriate respiratory protection. Always wear a properly fitting respirator, which may include a supplied-air respirator. Ventilate the work area according to instructions in the fluid manufacturer's SDS.

- Avoid all skin contact with isocyanates. Everyone in the work area must wear chemically impermeable gloves, protective clothing and foot coverings as recommended by the fluid manufacturer and local regulatory authority. Follow all fluid manufacturer recommendations, including those regarding handling of contaminated clothing. After spraying, wash hands and face before eating or drinking.

- Hazard from exposure to isocyanates continues after spraying. Anyone without appropriate personal protective equipment must stay out of the work area during application and after application for the time period specified by the fluid manufacturer. Generally this time period is at least 24 hours.

- Warn others who may enter work area of hazard from exposure to isocyanates. Follow the recommendations of the fluid manufacturer and local regulatory authority. Posting a placard such as the following outside the work area is recommended:

<b>WARNING</b>	
	<b>TOXIC FUMES HAZARD</b>
<b>DO NOT ENTER DURING SPRAY FOAM APPLICATION OR FOR HOURS AFTER APPLICATION IS COMPLETE</b>	
<b>DO NOT ENTER UNTIL:</b>	
DATE: _____	
TIME: _____	



### **Keep Components A and B Separate**

Cross-contamination can result in cured material in fluid lines which could cause serious injury or damage equipment. To prevent cross-contamination:

- Never interchange component A and component B wetted parts.
  - Never use solvent on one side if it has been contaminated from the other side.
- 

### **Moisture Sensitivity of Isocyanate**

Exposure to moisture (such as humidity) will cause ISO to partially cure, forming small, hard, abrasive crystals that become suspended in the fluid. Eventually a film will form on the surface and the ISO will begin to gel, increasing in viscosity.

#### **NOTICE**

Partially cured ISO will reduce performance and the life of all wetted parts.

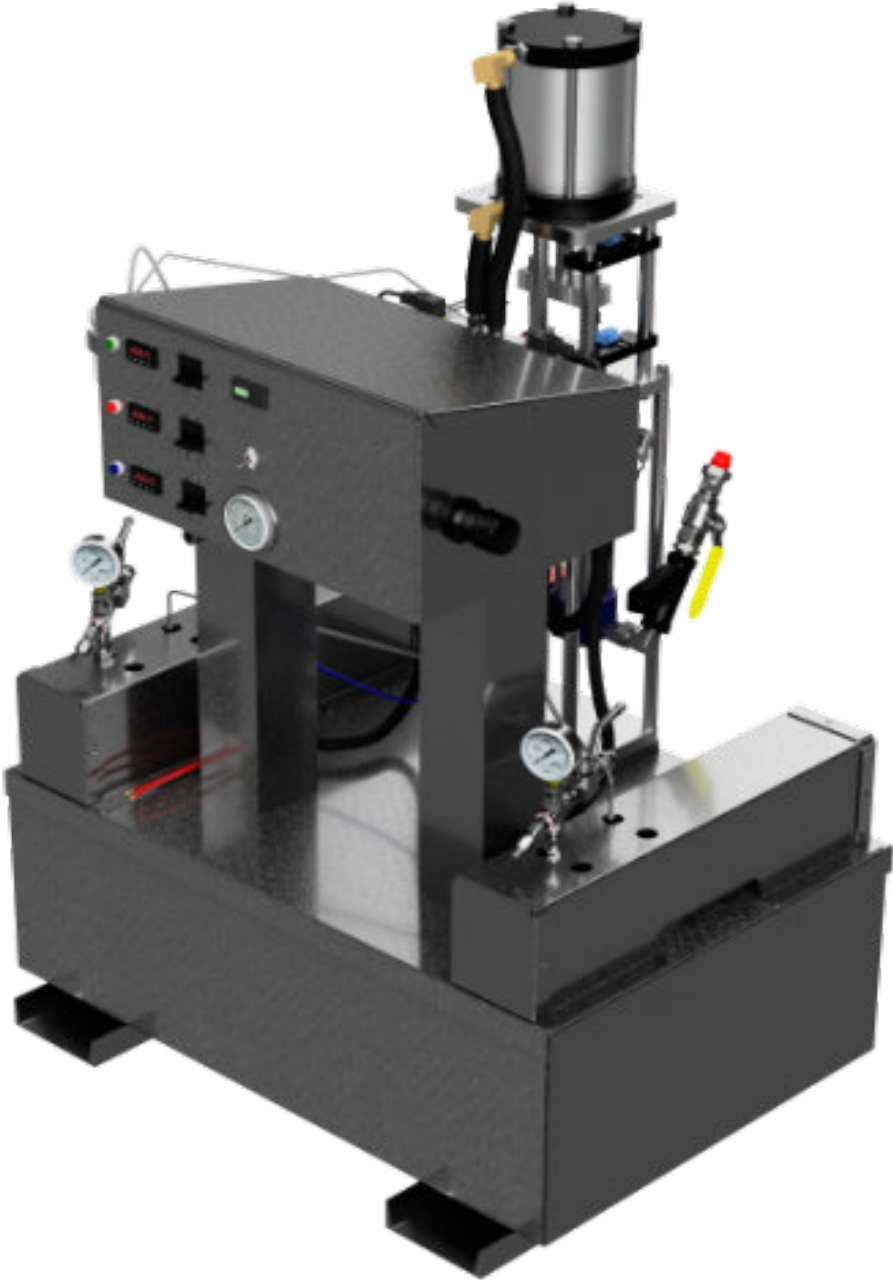
- Always use a sealed container with a desiccant dryer in the vent, or a nitrogen atmosphere. Never store ISO in an open container.
- Keep the ISO pump wet cup or reservoir (if installed) filled with appropriate lubricant. The lubricant creates a barrier between the ISO and the atmosphere.
- Use only moisture-proof hoses compatible with ISO.
- Never use reclaimed solvents, which may contain moisture. Always keep solvent containers closed when not in use.
- Always lubricate threaded parts with an appropriate lubricant when reassembling.

NOTE: The amount of film formation and rate of crystallization varies depending on the blend of ISO, the humidity, and the temperature.

# COMPONENT IDENTIFICATION

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## PNEUMATIC PROPORTIONER FULL MACHINE ASSEMBLY



# COMPONENT IDENTIFICATION

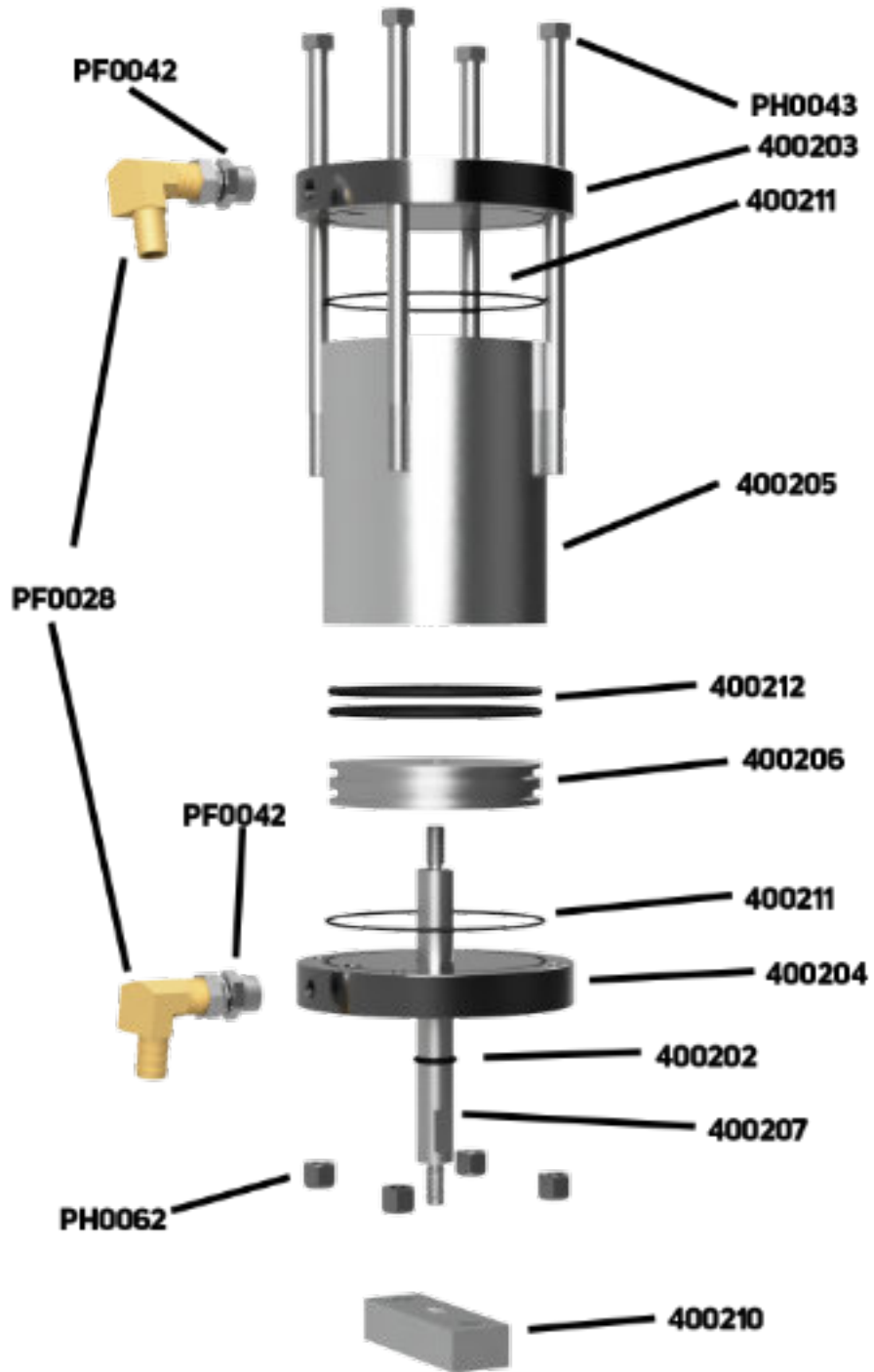
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## PNEUMATIC MACHINE AIR TOWER



# COMPONENT IDENTIFICATION

## PNEUMATIC MACHINE AIR MOTOR



# COMPONENT IDENTIFICATION

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## PNEUMATIC MACHINE FLUID PUMP

### FELT WIPER FLUID PUMP 400320 A/B



### PUMP SHAFT ASSEMBLY

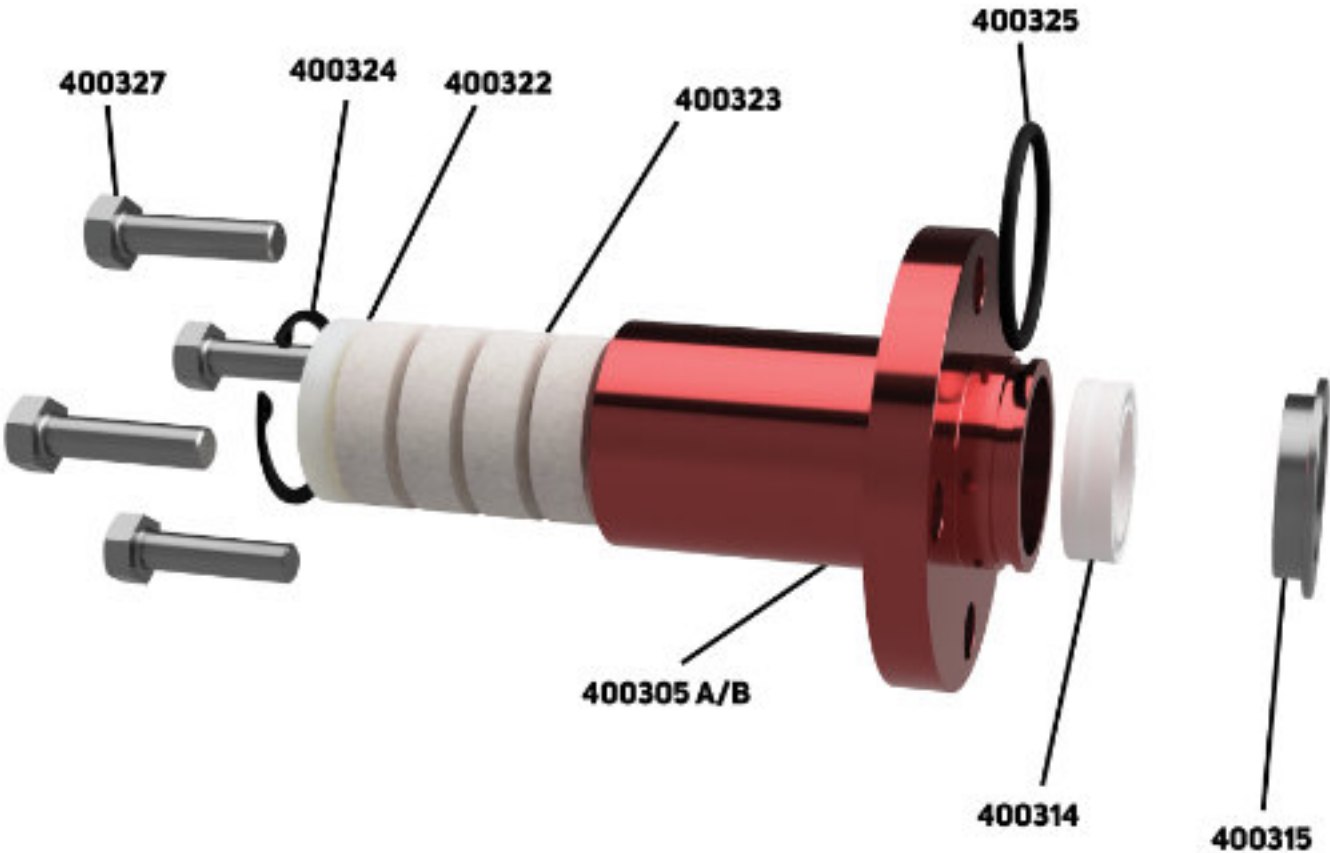


### PUMP BODY ASSEMBLY



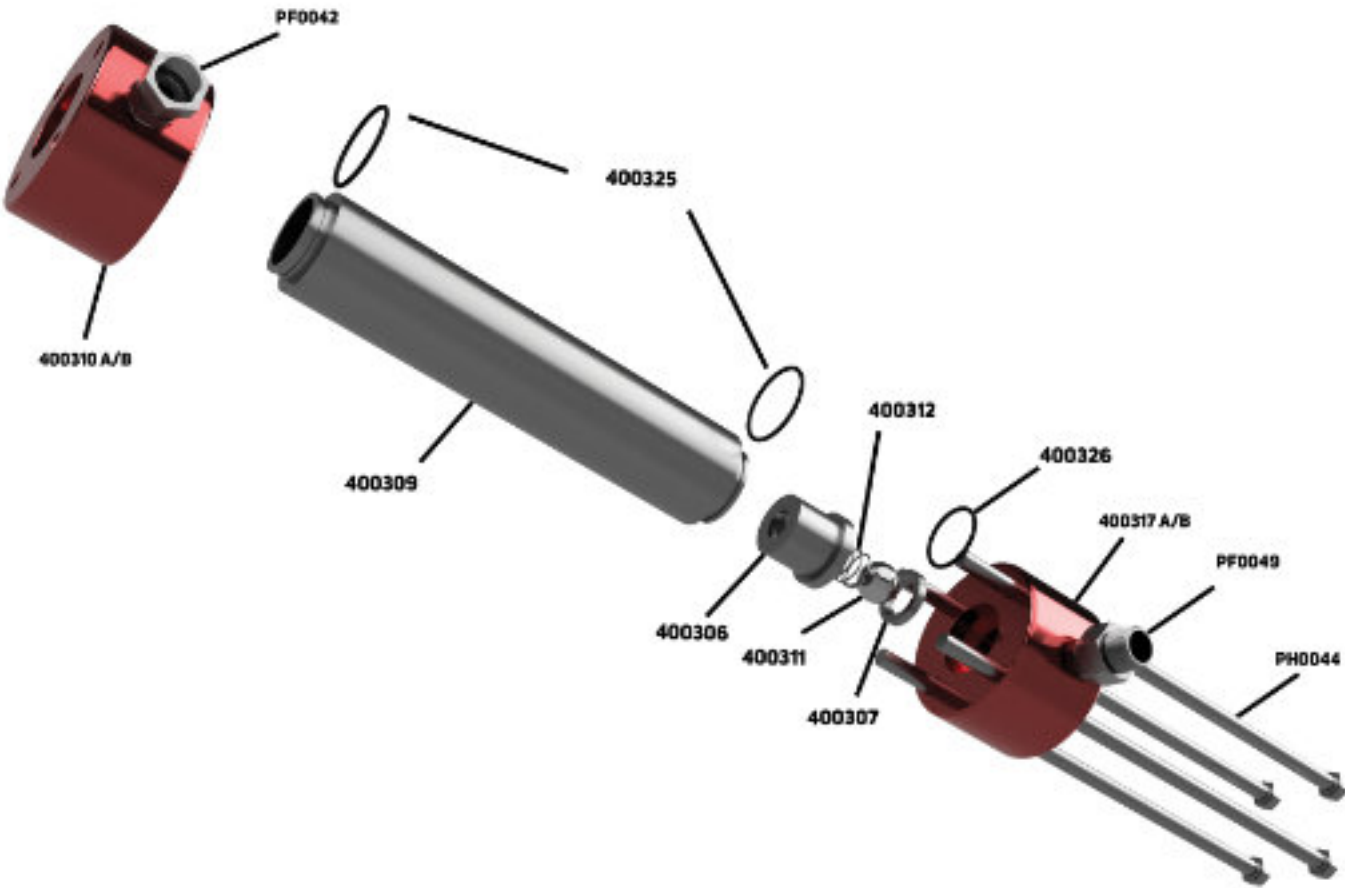
# COMPONENT IDENTIFICATION

## PNEUMATIC MACHINE FLUID PUMP - SOLVENT CUP SECTION



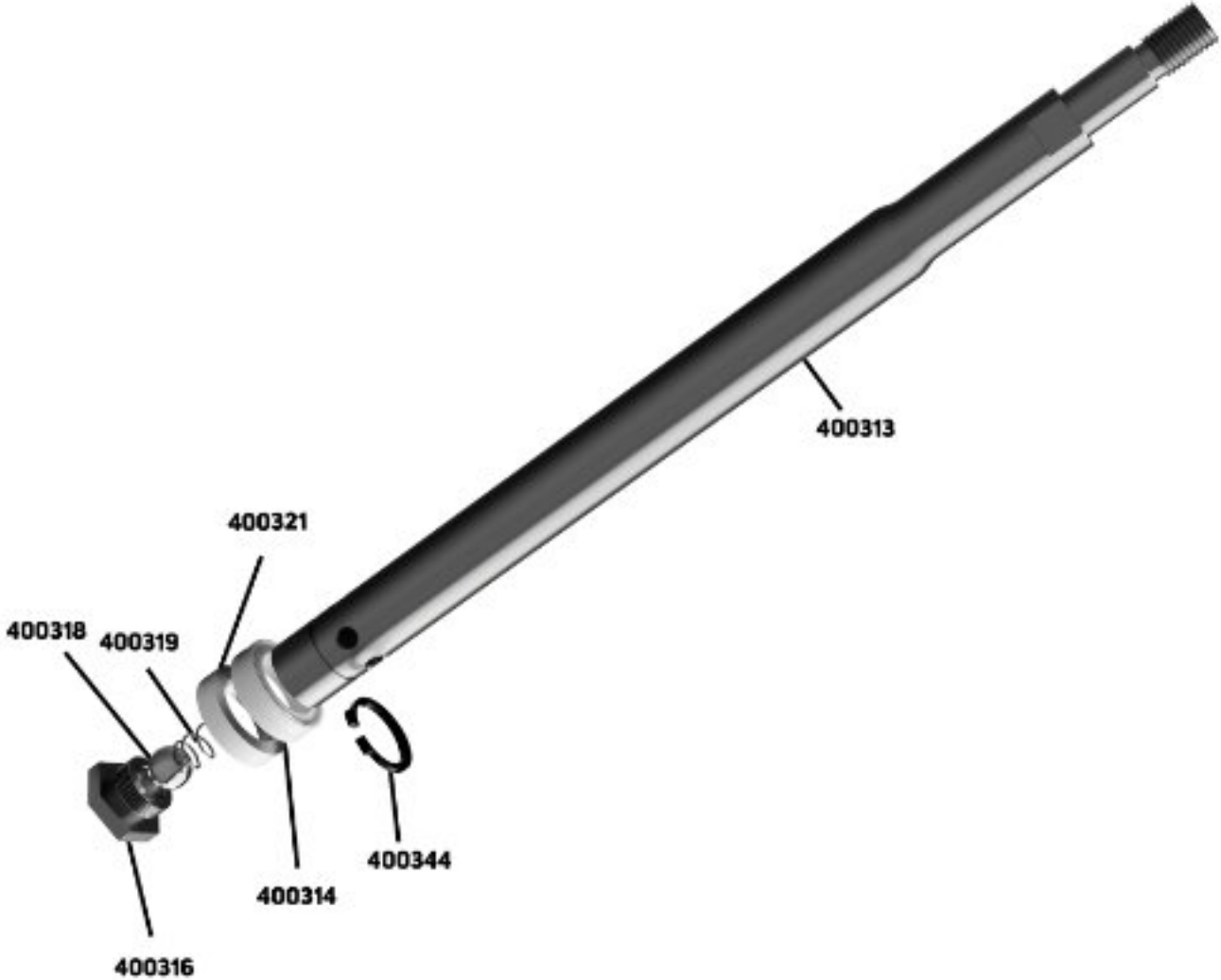
# COMPONENT IDENTIFICATION

## PNEUMATIC MACHINE FLUID PUMP - PUMP BODY SECTION



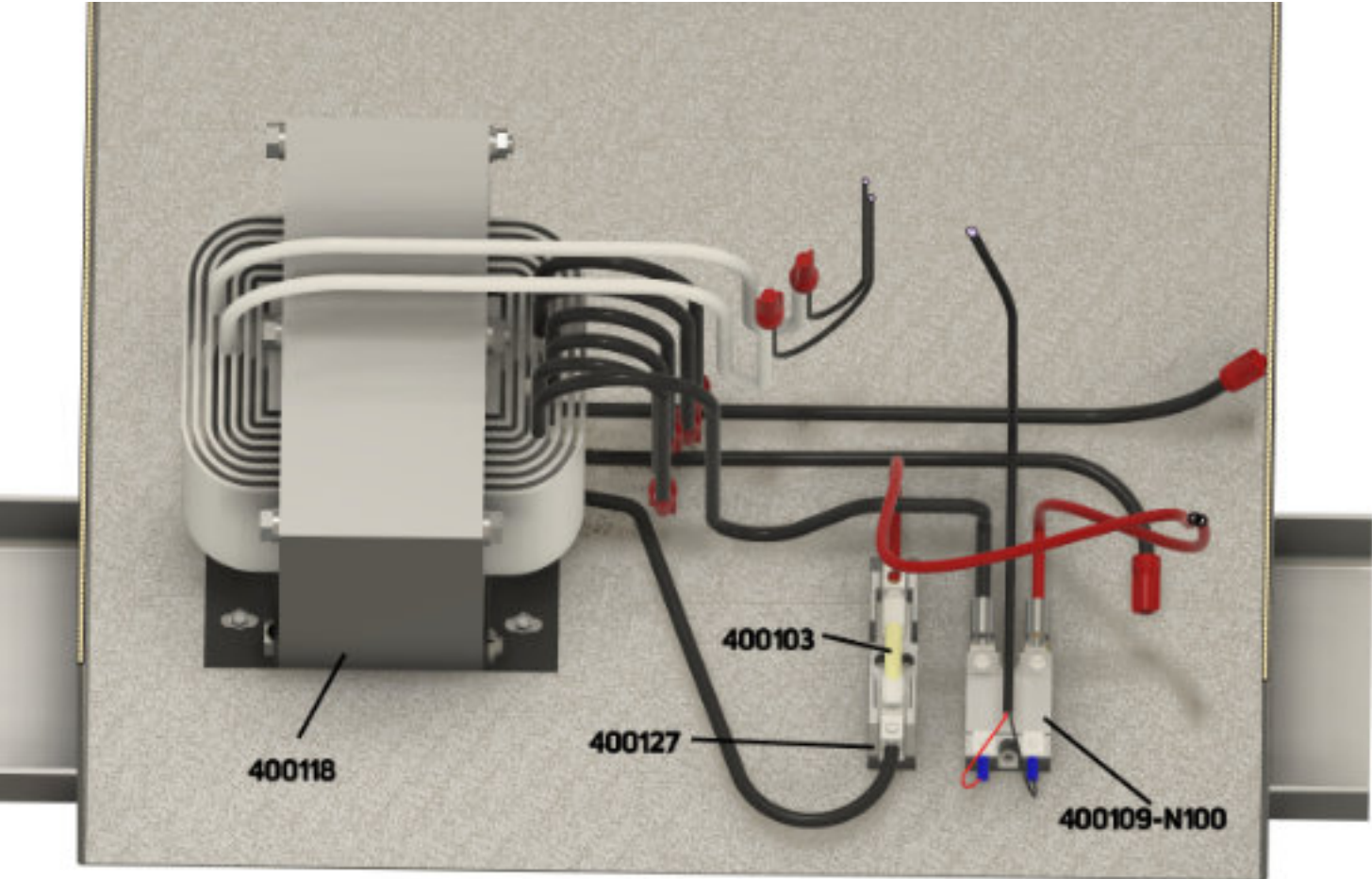
# COMPONENT IDENTIFICATION

## PNEUMATIC MACHINE FLUID PUMP - SHAFT SECTION



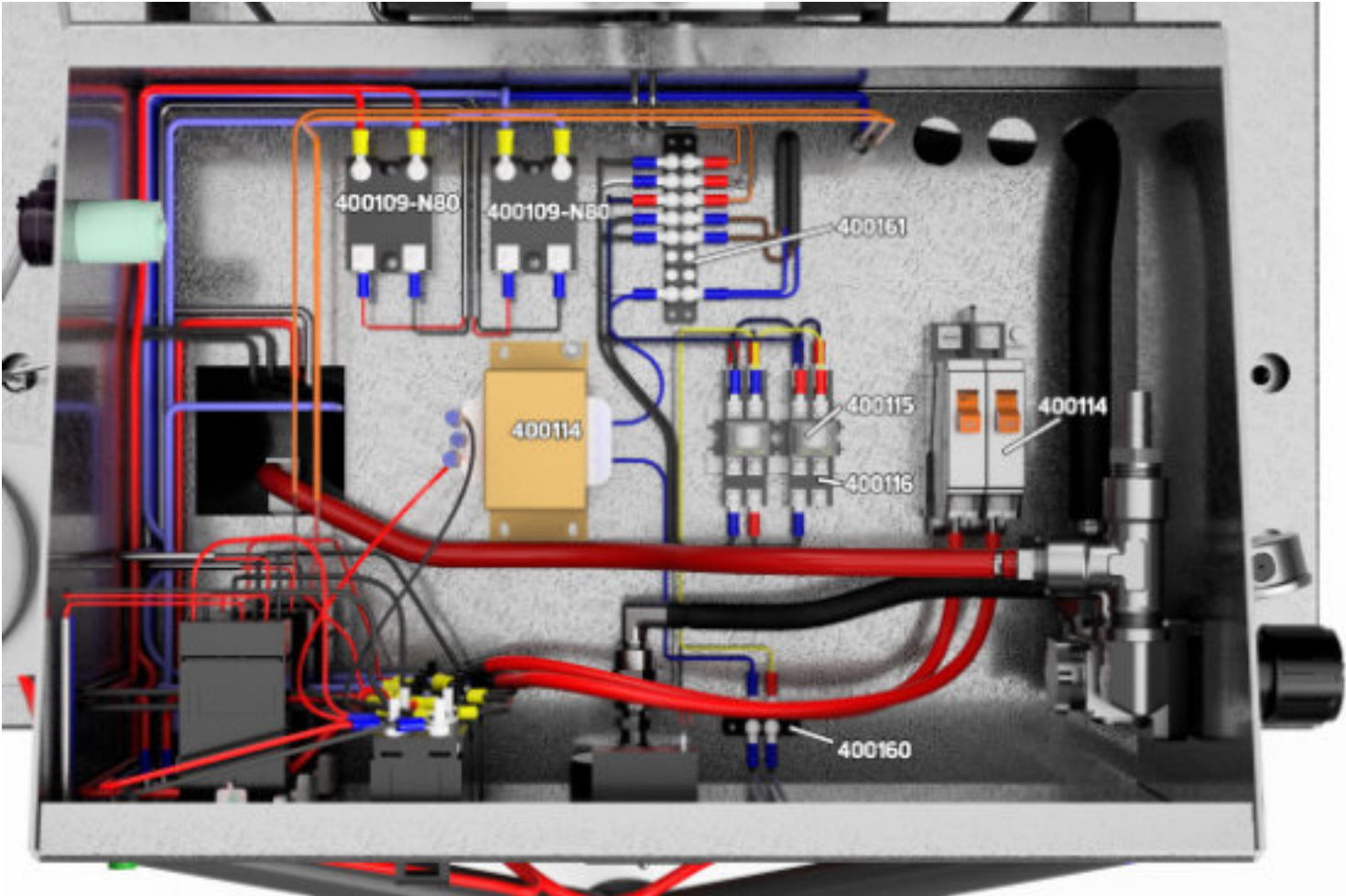
# COMPONENT IDENTIFICATION

## HOSE HEAT COMPARTMENT



# COMPONENT IDENTIFICATION

## CONTROL BOX WIRING



# COMPONENT IDENTIFICATION

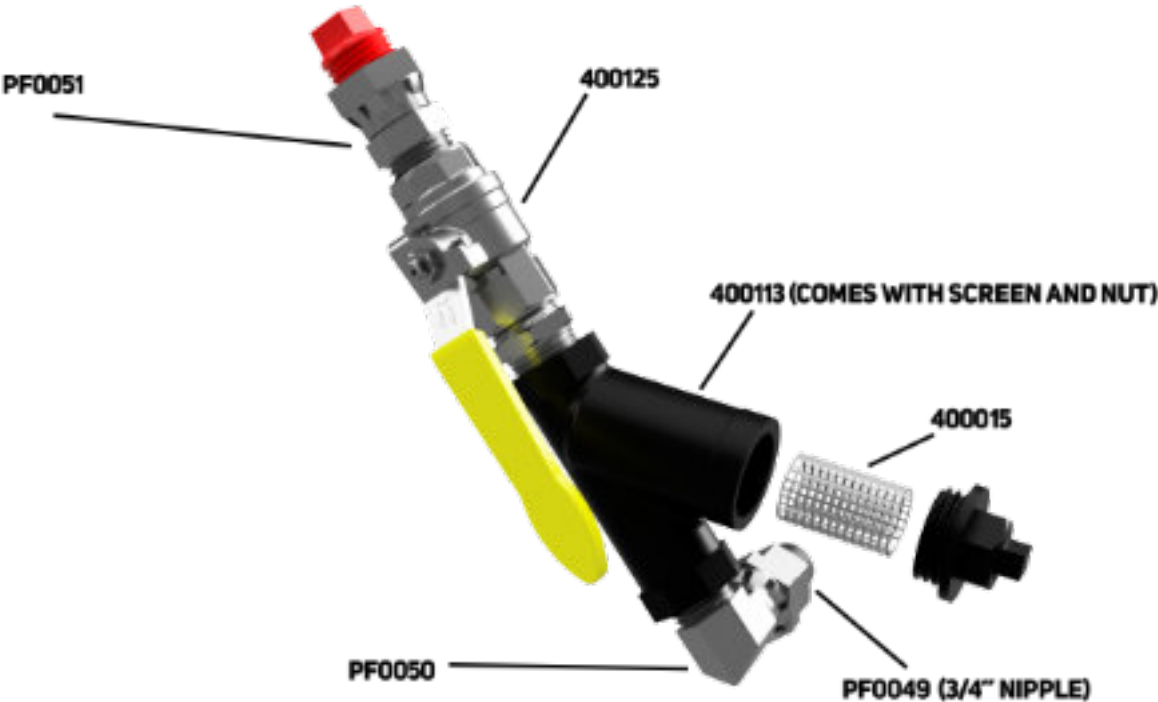
## CONTROL BOX - FRONT PANEL



# COMPONENT IDENTIFICATION

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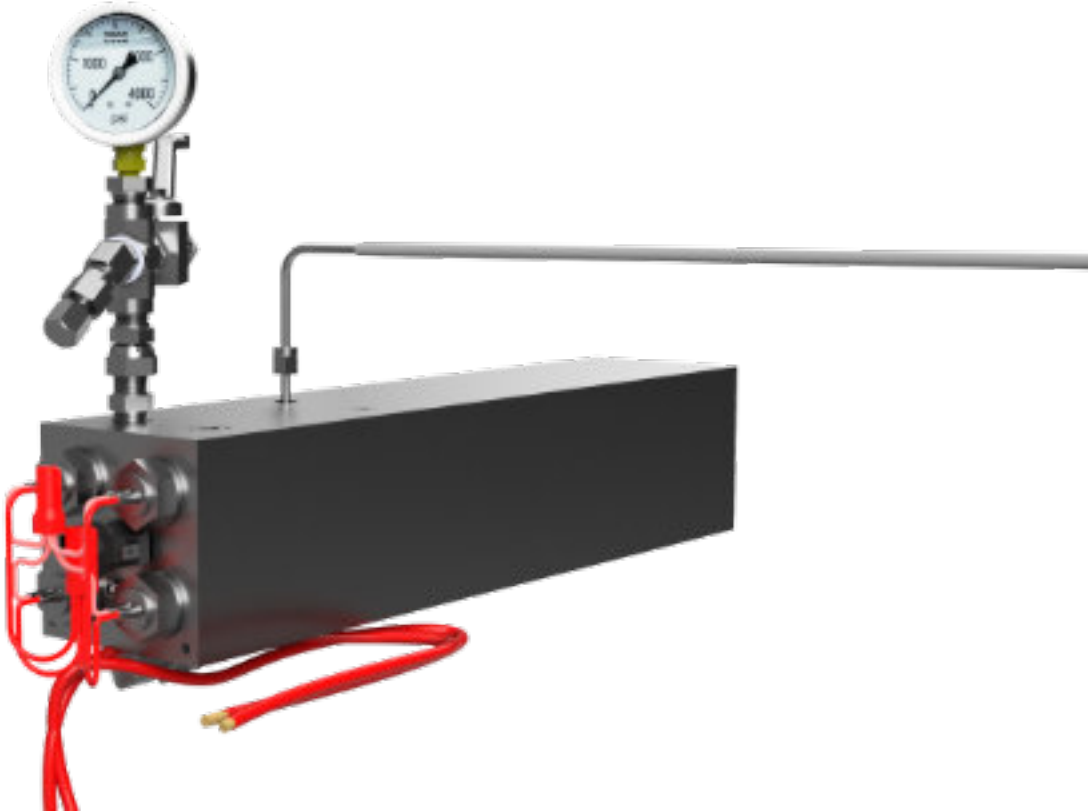
## WYE STRAINER ASSEMBLY



# COMPONENT IDENTIFICATION

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## PREHEAT ASSEMBLY



# PART DESCRIPTIONS

SFE PART#	DESCRIPTION	SFE PART#	DESCRIPTION
300403	Electrical Butt Splice Connector	400200	5" Cylinder Cap for 5" Air Motor
400015	Replacement Screens for Black Iron Wye Strainer	400203	6" Cylinder Cap for 6" Air Motor
400101-D	400 PSI Fluid Gauge	400204	6" Cylinder Base for 6" Air Motor
400102	50 Amp Breaker (On/Off Switch for Hose Heat or Preheat)	400205	6" Cylinder Housing for 6" Air Motor
400103	60 Amp Fuse for Hose Heat	400206	6" Cylinder Piston for 6" Air Motor
400104-NV	Novus N1020 Controller for Hose Heat or Preheat	400207-3	Air Piston Shaft (Version 3) for Air Motor on Boss Air Machine
400105	1/4" High Pressure Ball Valve	400210	Plunger Link for Boss Air Machine
400107	Magnetic Proximity Switch	400221	5" Cylinder Base for 5" Air Motor
400108	3000 PSI Pressure Limit Switch	400222	5" Cylinder Piston for 5" Air Motor
400109-N80	Novus Solid State Relay - 80 amp for Preheat	400223	5" Cylinder Housing for 5" Air Motor
400109-N100	Novus Solid State Relay - 100 amp for Hose Heat	400224	O-Ring Kit for 5" Air Motor
400110-P12K	1/2" Parker Air Directional Valve Assembly	400305A	ISO Solvent Cup for 1.25" (Felt Wiper) Fluid Pump on Boss Air Machine
400111 / HVLP510	Stroke Counter	400305B	RESIN Solvent Cup for 1.25" (Felt Wiper) Fluid Pump on Boss Air Machine
400113	Black Iron Wye Strainer	400306	Foot Valve Housing for 1.25" Fluid Pump on Boss Air Machine
400113-KA	ISO Wye Strainer Assembly	400307	Washer for Foot Valve Housing of 1.25" Fluid Pump on Boss Air Machine
400113-KB	RESIN Wye Strainer Assembly	400309	Cylinder Housing for 1.25" Fluid Pump on Boss Air Machine
400114	(Mini) Step-Down Transformer for Reversing System Power	400310A	ISO Head for 1.25" (Felt Wiper) Fluid Pump on Boss Air Machine
400115	10 Amp Contact Relay	400310A	RESIN Head for 1.25" (Felt Wiper) Fluid Pump on Boss Air Machine
400116	8 Pin Blade Socket for Contact Relay	400311	Large Check Ball for Foot Valve Housing in 1.25" Fluid Pump on Boss Air Machine
400118	Step-Down Hose Heat Transformer For Up To 400' Hose	400312	Large Spring for Foot Valve Housing in 1.25" Fluid Pump on Boss Air Machine
400110-P12	1/2" Parker Directional Valve	400313	Shaft for 1.25" (Felt Wiper) Fluid Pump on Boss Air Machine
400122-P12	1/2" Parker Air Regulator	400314	1.25" High Pressure Seal for Shaft and Solvent Cup on Boss Air Machine
400122-P12K	1/2" Parker Regulator Assembly	400315	Support Washer for Solvent Cup on Boss Air Machine
400124	Connector Kit for 1/2" Air Directional Valve	400316	Seat for Transfer Housing of 1.25" Fluid Pump on Boss Air Machine
400126	1/2" Muffler for 1/2" Air Directional Valve	400317A	ISO Base for 1.25" Fluid Pump on Boss Air Machine
400127	Fuse Holder for Hose Heat Fuse	400317B	RESIN Base for 1.25" Fluid Pump on Boss Air Machine
400128	Toggle Switch for Reversing System on Boss Machine	400318	Small Check Ball for Transfer Housing of 1.25" Fluid Pump on Boss Air Machine
400130-P	Locking Nut for Parker Regulator	400319	Small Spring for Transfer Housing of 1.25" Fluid Pump on Boss Air Machine
400141	Ground Lug for Boss Machine	400320A	1.25" ISO (Felt Wiper) Fluid Pump for Boss Pneumatic Machine
400131	200 PSI Face Mount Gauge	400320B	1.25" RESIN (Felt Wiper) Fluid Pump for Boss Pneumatic Machine
400134	Green Indicator Light	400321	Back Up Ring for 1.25" High Pressure Seal of Fluid Pump on Boss Air Machine
400135	Red Indicator Light	400322	Back Up Ring for Solvent Cup Assembly on Boss Air Machine
400136	Blue Indicator Light	400323	Felt Wiper for Solvent Cup Assembly
400139	Mounting Base for CH Style 60 Amp Breaker	400324	Snap Ring for Solvent Cup
400140	Single-Phase 60 Amp Main Breaker for Boss Air Machine	400325	O-Ring for Solvent Cup and 1.25" Pump Cylinder Body
400160	2-Pole Terminal Strip for Reversing System on Boss Machine	400326	O-Ring for Foot Valve Seat in 1.25" Fluid Pump
400161	8-Pole Terminal Strip for Reversing System on Boss Machine	400327	Bolt for Securing Fluid Pump to Tower on Boss Air Machine
400201	O-Ring Kit for 6" Air Motor	400330	8 oz. Bottle of Pump Lube
		400344	Snap Ring for Shaft of 1.25" Fluid Pump
		400400	Upper Mounting Plate for Tower Assembly on Boss Air Machine

# PART DESCRIPTIONS


<b>SFE PART#</b>	<b>DESCRIPTION</b>
<b>400401</b>	Base Mounting Plate for Tower Assembly on Boss Air Machine
<b>400402</b>	Center Mounting Plate for Tower Assembly on Boss Air Machine
<b>400420</b>	Reversing Switch Bracket
<b>400403</b>	10.25" Rod for Tower Assembly on Boss Air Machine
<b>400404</b>	21" Rod for Tower Assembly on Boss Air Machine
<b>400405</b>	Heater Cover on Boss Air Machine
<b>400406</b>	End Cap for Heater Cover on Boss Air Machine
<b>400409-K</b>	Complete Double Preheater Assembly (with 1/2" ports)
<b>400410</b>	Chassis/Frame for Boss Air Machine
<b>400419</b>	Mounting Foot for Preheater
<b>400425</b>	Electrical Control Box Subfloor for Boss Air Machine
<b>400430</b>	A-Side HP Valve Assembly for Double Preheat Air Machine
<b>400432</b>	B-Side HP Valve Assembly for Double Preheat Air Machine
<b>400530</b>	3-Phase Distribution Block for Boss Air Machine
<b>400531</b>	3-Phase 60 Amp Main Breaker for Boss Air Machine
<b>PF0033</b>	Quick Connect Air Fitting
<b>PH0044</b>	11" Bolt for 1.25" Fluid Pump on Boss Air Machine
<b>PH0043</b>	10" Bolt for 1/2" Ported Air Motor on Boss Air Machine
<b>PH0052</b>	Nut for Securing Fluid Pump Shaft to Plunger Link

# SETUP

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Before installing and starting the BOSS PNEUMATIC PROPORTIONER, carefully read all technical and safety documentation included in this manual. All information is included for user safety and avoiding possible breakdowns from the incorrect use of the proportioner.

- 1. Inspect proportioner for any damage that may have occurred during shipping. If damage is noted, contact your supplier.**
- 2. Station machine in a dry, level area away from moisture.**

	<b>Electric Shock Warning!</b>
	Installation of this equipment requires accessing parts which could result in electric shock or serious injury. A qualified electrician should make all electrical connections. Install according to all national, state and local codes.

**Electrical requirements for proportioner:**

- Input Voltage: 1 phase, 240V AC, 50/60hz
- Amperage Requirements: 57 Amp max load

*\*\*See Technical Data sheet for more details.*

- 3. For single-phase incoming power, connect a 6 AWG (2 wire + ground) electrical cord to the proportioner's main breaker, which is located in the upper control box.**



Figure 3

# SETUP


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## 4. Connect barrel (transfer) pumps.

- a. Install barrel pumps in component A (ISO) and B (RESIN) supply drums.
- b. Install air mixer in component B (RESIN) drum. Only mix RESIN if required; some RESIN drums should NOT be mixed. Review technical data sheets for material or contact material manufacturer prior to mixing.
- c. Connect 3/4 in. supply hoses between barrel pumps and fluid inlet on proportioner.




**Figure 4**

	<b>Warning!</b>
	Use high pressure hose rated to withstand the maximum working pressure of this equipment.

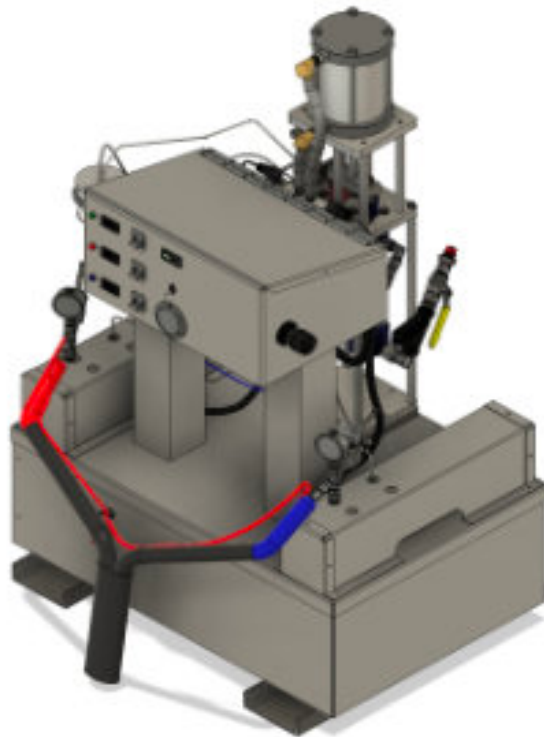
# SETUP

## 5. Connect recirculating/pressure relief lines.

- a. Use a ¼" high-pressure return line to connect the high pressure (return) valves to the barrel pumps.
- b. An optional connection would be a relief line from the high pressure (return) valve to a grounded and sealed waste container.

	<b>Risk of electric shock!</b>
	<b>Make sure all electricity is disconnected. A qualified electrician should make all electrical connections.</b>

## 6. Connecting the initial section of spray hose



**Figure 5**

- a. Connect the fluid lines of the spray hose to the front outlet fittings on the valve assemblies above each preheater on the machine (ISO to the "A" preheater on the left, and RESIN to the "B" preheater on the right).

## SETUP

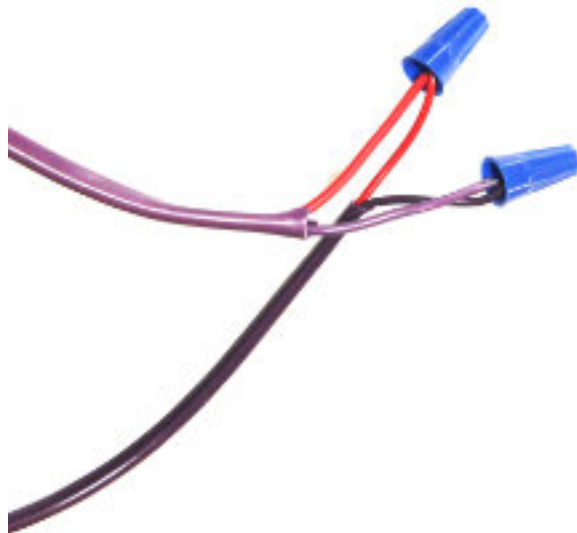
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b. Locate the electrical connectors on the (red) 6-gauge wires coming from the lower compartment of the machine. Attach these connectors to the power cables on the spray hose, and thoroughly wrap/insulate the connectors with electrical tape (if non-insulated).

c. Connect the purple temperature sensing wire from the proportioner to the temperature sensing wire in the hose by splicing each strand to its corresponding strand in separate wire nut connections (red strand to red strand, and purple strand to purple strand). On standard Boss spray hose, the temperature sensing wire runs the entire length of the hose section and the end of the wire is already inserted underneath the insulation to read hose temperature.

If connecting additional sections of hose, proceed to step e (skip step d).

d. If only one section of spray hose is being used with the proportioner, the power cables at the gun end of the hose should be connected to each other to complete the circuit. Use an electrical connector and thoroughly wrap the connector with electrical tape to insulate it from the hose itself. Leave the temperature sensing wire inserted underneath the insulation at the gun end of the final section so that it reads hose temperature just prior to the spray gun.



**Figure 7**

### **Connecting additional sections of spray hose**

When connecting more than one section of standard Boss spray hose, the temperature sensing wire and the power cables from the first section will need to be connected to the next section(s). There is excess temperature sensing wire on one end of the spray hose to allow for this. If connecting more than one section of standard Boss spray hose:

e. Locate the gun end of the first section of spray hose and pull back the scuff jacket approximately four to six feet. The purple sensing wire is affixed to the hose in an S-loop just prior to insertion under the insulation on the ISO side. Follow the temperature sensing wire approximately 4 inches away from the S-loop and cut the wire. Strip both strands of the temperature sensing wire and splice them to the excess wire from the next section of spray hose in the same manner as the machine to hose connection above.

## SETUP

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**Figure 8**

f. Use electrical connectors to connect the power cables from the first sections of spray hose to the next section of spray hose (ISO to ISO and RESIN to RESIN). Thoroughly wrap/insulate the electrical connectors with electrical tape.

Repeat this process for each additional spray hose.

g. Once the final section of spray hose is connected to its preceding section, the power cables at the gun end of the final section should be connected to each other to complete the circuit. Use an electrical connector and thoroughly wrap the connector with electrical tape to insulate it from the hose itself. Leave the temperature sensing wire inserted underneath the insulation at the gun end of the final section so that it reads hose temperature just prior to the spray gun.

### **7. Connect gun to spray hose.**




**Figure 9**

a. Close fluid shut off valves on manifold of spray gun

b. Connect the (red) ISO hose to A-side of the spray gun and (blue) RESIN hose to B-side of the spray gun.

c. Pressure check hose. Check for leaks. If there are no leaks, wrap hose and electrical connections to prevent damage.

# SETUP

	<b>Risk of Electric Shock!</b>
	<b>Disconnect all power before servicing.</b>

## 8. Determine appropriate transformer lead.

a. Remove the access cover that reads “BOSS” from the bottom compartment of the proportioner and identify the lead wire that is connected from the step-down transformer to the fuse holder. Use the chart below to determine which lead is appropriate for the corresponding length of Boss spray hose. If necessary, remove the existing lead wire and connect the appropriate lead wire to the end of the fuse holder closest to the access cover. (Leave access cover off until completion of step b.)

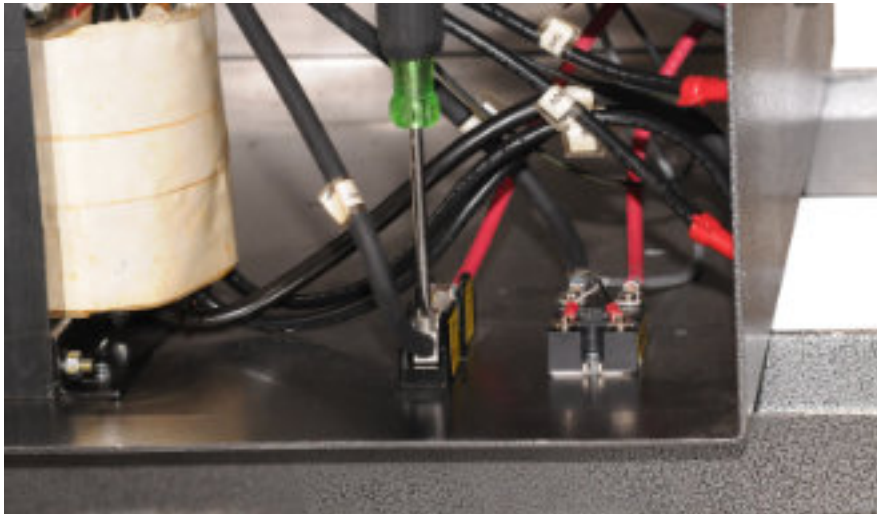


Figure 10

**Recommended voltage guidelines for standard Boss spray hoses ONLY:**

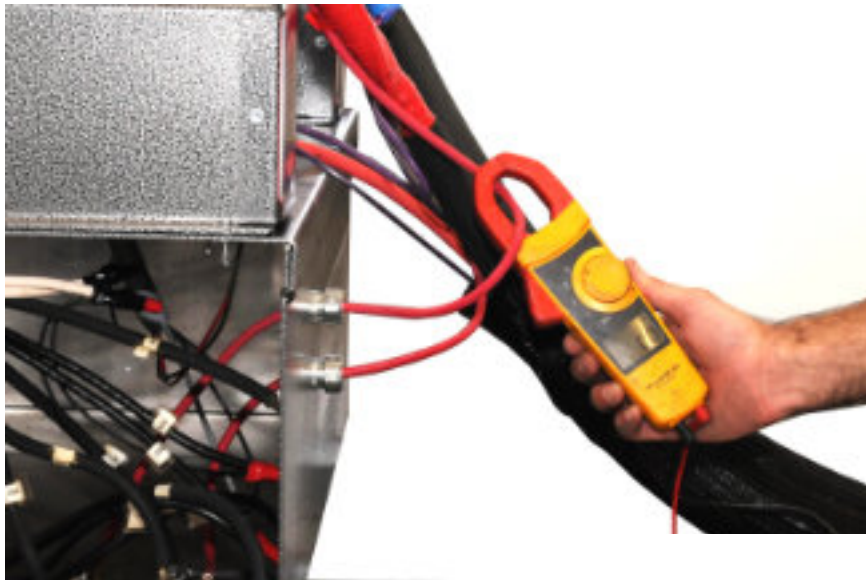
Hose length	Lead Voltage
50'	20v
100'	35v
150'	50v
200'	64v
250'	76v
300'	90v

## SETUP

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b. To confirm the correct voltage output is going to the spray hose, test the amperage on the step-down circuit from the hose heat transformer by placing a clamp meter on one of the red power cables connected to the hose. Turn on the hose heat switch and set the temperature setpoint higher than the ambient temperature so that the controller calls for heat. The AC amps should read between 35 and 42. (This amperage reading is on the step-down voltage coming from the transformer, and does not reflect amperage drawn on the main power supply.)

If the amperage is higher than 42 amps, connect the next lowest voltage lead wire from the transformer to the fuse holder. If the amperage reading is below 38, connect the next highest voltage lead. If the amperage reading is still unsatisfactory, contact Boss Manufacturing, Inc. for further instructions. Once the required amperage is achieved, reinstall the lower access cover.



**Figure 11**

# START UP PROCEDURE

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## STARTUP

1. Verify that all air, fluid, and electrical connections are secure and that the shut off valves are closed on the manifold of the spray gun.
2. Check the wye screens on the proportioner for blockages.
3. Open the  $\frac{3}{4}$ " supply valves on the wye strainers (yellow handles should be inline with the supply hoses).
4. Verify that the ISO & RESIN solvent cups are free of debris and fill both with pump lube (DOP or TSL).  
\*\*Failure to lubricate will result in damage to fluid pump seals.\*\*
5. Turn on air supply to the proportioner and ensure incoming air pressure is 115–120 psi.
6. Turn on the main breaker inside the control box of the proportioner.
7. Remove the full length of spray hose from the hose rack. Do not kink the hose.  
\*\*Failure to remove the entire hose prior to use may cause damage and void warranty.\*\*
8. Turn on the hose heat switch. To adjust the hose temperature, press the (P) button on the hose heat controller twice. 'SP' will appear on the display. Press the up or down button on the controller until desired setpoint is reached. Press the (P) button again to begin heating the spray hose. The controller will display "Out" until the hose reaches temperature.
9. If required, mix the RESIN drum while the hose is heating.
10. Use the air regulator on the side of the proportioner to set the air pressure gauge on the front of the control box to 40 psi. The air regulator will be adjusted further in Step 15.
11. Close the high pressure (return) valves to put the proportioner in spray mode (handles should be perpendicular to the  $\frac{1}{4}$ " return lines behind fluid pressure gauges).
12. Turn on the barrel pumps once the spray hose has reached desired temperature.
13. Hold the fluid manifold of the spray gun over two waste containers. Open the fluid shut off valves one at a time to confirm that clean, air-free fluid comes from valves.
14. Reclose the shut off valves and attach the manifold to the bottom of the spray gun.
15. Turn on the ISO and RESIN preheaters. Adjust the preheat temperatures using the same controller procedure from Step 8 above.
16. Pressurize the ISO and RESIN fluid by moving the toggle switch to On (up position).

## Figure 12

## START UP PROCEDURE

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17. Adjust the air regulator on the side of the proportioner to increase or decrease the ISO and RESIN fluid pressures; set fluid pressures 200 psi above desired spray pressure.

\*\*A pressure imbalance may create an off ratio mix and result in a material "crossover" at the spray gun. Do not allow the pressure gauges to have a variance of more than 200 psi. If necessary, carefully bleed off ISO or RESIN pressure by briefly opening the corresponding return valve so that the pressures on each gauge are the same.\*\*

18. Turn on the air supply at the spray gun.



19. Disengage the safety and pull the trigger to remove the grease from the gun. Once completed, re-engage the safety.

20. Open the shut off valves on the manifold.

21. Disengage the safety and begin spraying.

\*\*Always reengage the safety when not in use.\*\*

# SPRAYING PROCEDURE

 	<p style="text-align: center;">Skin Injection Hazard</p> <p><b>High pressure fluid from spray gun, ruptured components, or leaks will pierce skin. This may look minor but is a serious condition. Get immediate emergency treatment!</b></p> <ul style="list-style-type: none"><li>• Do not point spray gun at anyone or any part of body</li><li>• Do not place hand or fingers over gun tip</li><li>• Use lowest possible pressure when troubleshooting or flushing equipment</li><li>• Check hoses, connections and fittings daily. Tighten or replace loose or worn or damaged parts immediately</li><li>• Relieve all pressure from proportioner and all components when you stop spraying and before cleaning or servicing equipment</li></ul>
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1. Engage gun safety lock.
2. Attach gun fluid manifold and attach air line. Open the air valve at gun.
3. Open gun fluid manifold valves A and B (turn counterclockwise).
4. Disengage gun safety lock.
5. Adjust fluid pressure if needed on gauges at pre-heaters.
6. Test spray for several seconds. Adjust temperature and pressure for desired results.
7. You are now ready to spray.

# SHUTDOWN PROCEDURE

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1. Close the shut off valves on the manifold of the spray gun.
2. Engage the gun trigger to release the remaining material from the mixing chamber.
3. Pump grease into the gun until a fine mist sprays from the nozzle.
4. Turn off the air supply at the spray gun.
5. Pump more grease into the gun until grease exits the nozzle. **\*\*Do not exceed five pumps of grease.\*\***  
**\*\***
6. Turn off the ISO & RESIN preheaters on the proportioner.
7. Turn off the hose heat switch.
8. Turn off the barrel pumps.
9. Move the toggle switch on the proportioner to the off (down) position and use the air regulator on the side of the proportioner to decrease the front air pressure gauge to 40 psi.  
**\*\*Do not move to step 9 without doing without first completing steps 6, 7, & 8.\*\***
10. Slowly bleed off the fluid pressure by opening the high pressure (return) valves.  
**\*\*Open both valves simultaneously to avoid a pressure imbalance/pressure spike on one side of the system.\*\***
11. Ensure the ISO & RESIN fluid pumps are now parked in the down position.  
**\*\*If the pumps finished in the upstroke after relieving the fluid pressure, quickly turn the toggle switch on and back off to cycle the pumps back down (parking the machine in the down position).\*\***
12. Relieve the remaining air pressure by decreasing the air regulator until the gauge on the control box is at 0 psi.
13. Once fluid and air pressures have been relieved and the machine is parked in the down position, allow time for the ISO and RESIN preheaters to cool to ambient temperature prior to reclosing the high pressure (return) valves.  
**\*\*Closing the high pressure valves before the preheaters reach ambient temperature could result in negative fluid pressures. Negative fluid pressures could damage the pressure gauges and increase ISO crystallization in the spray hose by drawing in moisture.\*\***
14. Turn off the main breaker inside the control box.
15. Turn off the air supply to the proportioner.
16. Verify that the ISO & RESIN solvent cups are free of debris and fill both with pump lube (DOP or TSL).
17. Roll the spray hose back onto the hose rack, being careful not to kink the hose.
18. Close the ¾" (yellow) supply valves on the wye strainers.

The proportioner is now properly shut down.

**It is very important to maintain a clean spray gun. Refer to the spray gun literature for proper cleaning of the gun after each use.**

## BOSS PNEUMATIC PROPORTIONER MAINTENANCE

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If there is ISO component within the system, it is absolutely vital that the material is circulated every two weeks while not in use! Failure to properly circulate material may cause permanent damage to hoses, supply lines, recirculating lines, and the machine!

Follow these steps to properly circulate material through the system:

1. Ensure the high pressure (return) valves are closed in spray mode, so that the flow of material is into the spray hose.
2. Turn on both the hose heat and the ISO preheater on the proportioner.
3. Turn on the air supply to the ISO transfer pump.  
Do NOT turn on the proportioner toggle switch to pressure up the air motor!  
Use ONLY the transfer pump to circulate ISO material through the system.
4. Remove spray gun from the manifold and open the ISO shut off valve.
5. Circulate ISO fluid through the machine, spray hose, and manifold back into the ISO drum.  
Allow to circulate for five minutes.
6. Close ISO shut off valve on the manifold.
7. Replace spray gun on the manifold.
8. Open high pressure (return) valves on preheaters to allow fluid to flow through the recirculating line back to supply drums. Allow to recirculate for two minutes.
9. Close the high pressure (return) valves.
10. Disconnect air supply to transfer pump.
11. Turn off hose heat and ISO preheater on the proportioner.

## BOSS PNEUMATIC PROPORTIONER MAINTENANCE

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- Inspect and lubricate the ISO and RESIN fluid pumps before, during, and after use.
- Inspect daily the machine, supply lines, spray hose, and spray gun to ensure everything is in proper working order and that there are no leaks.
- Remove wye screen from the wye strainer and clean as needed.
- Clean check valves on the spray gun regularly.
- Clean mixing chamber ports and inspect side seals regularly.
- Grease gun after use to prevent accidental material crossover.
- Keep ISO drum from exposure to moisture by ensuring the transfer pump remains secure.
- Inspect hose and electrical connections daily and make any necessary repairs to ensure proper performance.
- Test amperage on spray hose periodically and ensure amperage is between 35-42 amps..
- Drain moisture from air supply daily to prevent any damage to system components. If air dryer is in use, periodically lubricate with pneumatic tool oil
- Circulate material throughout the entire system every two weeks if the machine is not in use.
- Flush entire system with compatible solvent and purge solvent with proper lubricant prior to storing the machine for an extended period of time.

# BOSS PNEUMATIC PROPORTIONER CIRCULATING FLUID THROUGH THE SYSTEM

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## CIRCULATING FLUID THROUGH THE SYSTEM

If there is ISO component within the system, it is absolutely vital that the material is circulated every two weeks while not in use! Failure to properly circulate material may cause permanent damage to hoses, supply lines, recirculating lines, and the machine!

Follow these steps to properly circulate material through the system:

- Ensure the high pressure (return) valves are closed in spray mode, so that the flow of material is into the spray hose.
- Turn on both the hose heat and the ISO preheater on the proportioner.
- Turn on the air supply to the ISO transfer pump.
  - Do NOT turn on the proportioner toggle switch to pressure up the air motor!
  - Use ONLY the transfer pump to circulate ISO material through the system.
- Remove spray gun from the manifold and open the ISO shut off valve.
- Circulate ISO fluid through the machine, spray hose, and manifold back into the ISO drum. Allow to circulate for five minutes.
- Close ISO shut off valve on the manifold.
- Replace spray gun on the manifold.
- Open high pressure (return) valves on preheaters to allow fluid to flow through the recirculating line back to supply drums. Allow to recirculate for two minutes.
- Close the high pressure (return) valves.
- Disconnect air supply to transfer pump.
- Turn off hose heat and ISO preheater on the proportioner.

## BOSS PNEUMATIC PROPORTIONER

### Changing Supply Drums

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If the material is changed over prior to initial pressurization, follow normal startup procedures after switching drums. If drums must be switched over during processing, use the following procedure to change to a new set of material:

- a. While the system is not under pressure, close the shut off valves and remove the manifold from the spray gun.
- b. Close high pressure (return) valves.
- c. Turn on air supply to both the ISO & RESIN transfer pumps. Open the A-side and B-side shut off valves one-at-a-time, over separate empty buckets.
- d. Observe the material flow until there is continuous flow with no air bubbles in the system.
- e. Proceed with normal startup procedure to repressurize the spray system.

#### Switching between Open & Closed Cell RESIN

- a. While the system is not under pressure, close the shut off valves and remove the manifold from the spray gun.
- b. Close high pressure (return) valves
- c. Remove the B-side transfer pump from the RESIN drum and insert the B-side transfer pump into a 5-gallon bucket of water.
- c. Open the B-side shut off valve of the manifold over an empty bucket and turn on air supply to the B-side transfer pump.
- d. Observe the flow of material out of the manifold. Once the existing RESIN material becomes mostly water, turn off the air supply to the B-side transfer pump and close the B-side shut off valve of the manifold.
- e. Remove B-side transfer pump from 5-gallon bucket of water and insert into new RESIN drum.
- f. Open the B-side shut off valve of the manifold over an empty bucket and turn on air supply to the B-side transfer pump.
- g. Observe the flow of material out of the manifold. Once the water becomes mostly RESIN again, turn off the air supply to the B-side transfer pump and close the B-side shut off valve of the manifold.

The RESIN materials have now been properly changed over.

## APPLICATION TROUBLESHOOTING

Problem	Cause	Solution
Hose heat temperature not rising on controller	<ol style="list-style-type: none"> <li>1. Temperature sensing wire untucked from insulation or insulation is missing</li> <li>2. Temperature sensing wire connected improperly between joints</li> </ol>	<ol style="list-style-type: none"> <li>1. Reinsert temperature sensing wire underneath insulation or replace insulation on hose</li> <li>2. Ensure red &amp; purple strands of temperature sensing wire are not in contact prematurely</li> </ol>
Hose heat temperature rising higher than setpoint	<ol style="list-style-type: none"> <li>1. Defective solid state relay</li> <li>2. Temperature sensing wire has direct contact with copper heating element</li> <li>3. Faulty connection or hot spot in spray hose</li> <li>4. Multiple brands of spray hose being used</li> </ol>	<ol style="list-style-type: none"> <li>5. Replace solid state relay</li> <li>6. Ensure copper is not exposed and is covered by tape</li> <li>7. Locate and repair loose connection or damage in hose</li> <li>8. Ensure all sections of spray hose are the same</li> </ol>
Hose not heating (no amp draw)	<p>Broken circuit in hose</p> <p>Blown fuse</p> <p>Defective solid state relay</p>	<p>Locate and repair broken connection in hose</p> <p>Replace fuse</p> <p>Replace solid state relay</p>
Hose heating slowly (low amp draw)	<p>Low incoming power from main power supply</p> <p>Defective solid state relay</p> <p>Incorrect tap setting connected from transformer</p> <p>Damaged circuit in spray hose</p>	<p>Ensure adequate incoming power (240v)</p> <p>Replace solid state relay</p> <p>Connect correct voltage lead from transformer for hose length (ensure 35-40 amps)</p> <p>Repair connection in hose</p>

## APPLICATION TROUBLESHOOTING

<b>Problem</b>	<b>Cause</b>	<b>Solution</b>
Preheater not heating	<p>Thermostat snap disc tripped</p> <p>Wire(s) unplugged from snap disc</p> <p>Loose wire nut connection</p> <p>Defective snap disc</p> <p>Defective solid state relay</p>	<p>Reset snap disc</p> <p>Ensure wire(s) are plugged into snap disc</p> <p>Ensure wires are secure in wire nuts</p> <p>Replace snap disc</p> <p>Replace solid state relay</p>
Pressure loss/unable to maintain spray pressure	<p>Air directional valve and/or mufflers icing</p> <p>Air directional valve is worn</p> <p>ISO fluid pump is in a bind</p> <p>Piston shaft o-ring is damaged</p> <p>Air piston o-rings are worn</p> <p>Piston shaft is unthreading from air piston</p> <p>Inadequate air supply / air pressure is dropping</p>	<p>Remove mufflers and lubricate air directional valve with pneumatic oil</p> <p>Replace air directional valve</p> <p>Rebuild ISO fluid pump</p> <p>Replace piston shaft o-ring</p> <p>Replace air piston o-rings</p> <p>Inspect air motor and retighten piston shaft if necessary (use loc-tite when retightening)</p> <p>Ensure incoming air supply maintains air pressure, replace air regulator(s) if necessary</p>
Machine not cycling manually	<p>Air directional valve not reversing air</p> <p>ISO or RESIN fluid pump is in a bind</p> <p>Air piston shaft is completely unthreaded from air piston</p> <p>Piston o-rings are worn (if constant air flow from mufflers on directional valve)</p>	<p>Remove mufflers and lubricate with pneumatic oil; replace air directional valve if necessary</p> <p>Replace or rebuild ISO or RESIN fluid pump(s)</p> <p>Inspect air motor and reattach piston shaft to air piston (use loc-tite with reattaching)</p> <p>Replace o-rings on air piston</p>

## APPLICATION TROUBLESHOOTING

Problem	Cause	Solution
Machine not cycling up or down (with toggle switch)	<p>Low voltage from (mini) step-down transformer in reversing harness due to low incoming power from main power supply</p> <p>Defective (mini) step-down transformer</p> <p>Dirty or defective 3,000 psi pressure limit switch</p> <p>Defective toggle switch</p> <p>Incorrect wiring</p>	<p>Ensure adequate incoming power and adequate voltage from (mini) step-down transformer</p> <p>Replace (mini) step-down transformer</p> <p>Clean or replace 3,000 psi pressure limit switch</p> <p>Replace toggle switch</p> <p>Ensure wiring is correct in right-side (reversing) harness</p>
Machine only strokes up or only strokes down (with toggle switch)	<p>Loose or defective contact relay or relay socket</p> <p>Loose wire in right-side (reversing) harness</p> <p>Defective magnetic proximity switch (sensor stuck on or sensor not working)</p> <p>Magnetic proximity switch not in alignment with plunger link due to placement of reversing bracket, or air piston shaft unthreading from plunger link or air motor piston</p> <p>Loose coil or din connector on air directional valve</p> <p>Defective coil or din connector on air directional valve</p>	<p>Wiggle, remove and reinsert contact relays in sockets; swap relays to confirm if problem reverses; replace relays or sockets if necessary</p> <p>Ensure wires and screws are tight in right-side (reversing) harness</p> <p>Replace magnetic proximity switch</p> <p>Adjust placement of reversing bracket and ensure air piston shaft is not unthreading from plunger link or air motor piston</p> <p>Ensure coils are tightened on ends of air directional valve</p> <p>Replace coil or connector kit</p>

## TECHNICAL DATA

Line Voltage Requirement	SFE-5-12k (195-264 Vac, 50/60 Hz) SFE-6-12k (195-264 Vac, 50/60 Hz)
Amperage Requirement	SFE 12k series (57 Amps max load)
Heater Wattage	SFE 12k series (12000 watts)
Maximum Fluid Working Pressure	SFE-5 series (2000 psi) SFE-6 series (3000 psi)
Maximum Fluid Temperature	195° F
Maximum Output	SFE-5 series (32 lb./min) SFE-6 series (32 lb./min)
Output Each Cycle (A and B pumps)	SFE-5 series (0.0500 gal/cycle) SFE-6 series (0.0500 gal/cycle)
Fluid Inlets	¾ npt with ¾ npsm union
Fluid Outlets	Component A (ISO) #8 (1/2") JIC with #5(5/16) JIC adapter Component B (RES) #10 (5/8") JIC with #6(3/8) JIC adapter
Fluid Circulation	¼" with thermoplastic tubing (3000 psi)
Parts Contacting Fluid	Stainless Steel, Zinc Plated, Carbon Steel, Aluminum, Chrome, Brass, PTFE, Viton O- rings
Weight	SFE 12k series (301 lbs)
Dimensions	D: 32in x W:36in x H:51in

## BOSS Manufacturing Inc. Standard Warranty

BOSS Manufacturing Inc warrants all equipment referenced in this document which is manufactured by BOSS Manufacturing Inc. and bearing its name to be free from defects in material and workmanship on the date of sale to the original purchaser for use. With the exception of any special, extended, or limited warranty published by BOSS Manufacturing Inc, BOSS Manufacturing Inc will, for a period of twelve months from the date of sale, repair or replace any part of the equipment determined by BOSS Manufacturing Inc to be defective. This warranty applies only when the equipment is installed, operated and maintained in accordance with BOSS Manufacturing Inc's written recommendations.

This warranty does not cover, and BOSS Manufacturing Inc shall not be liable for general wear and tear, or any malfunction, damage or wear caused by faulty installation, misapplication, abrasion, corrosion, inadequate or improper maintenance, negligence, accident, tampering, or substitution of non-BOSS Manufacturing Inc component parts. Nor shall BOSS Manufacturing Inc be liable for malfunction, damage or wear caused by the incompatibility of BOSS Manufacturing Inc. with structures, accessories, equipment or materials not supplied by BOSS Manufacturing Inc, or the improper design, manufacture, installation, operation or maintenance of structures, accessories, equipment or materials not supplied by BOSS Manufacturing Inc.

This warranty is conditioned upon the prepaid return of the equipment claimed to be defective to BOSS Manufacturing Inc for verification of the claimed defect. If the claimed defect is verified, BOSS Manufacturing Inc will repair or replace free of charge any defective parts. The equipment will be returned to the original purchaser transportation prepaid. If the inspection of the equipment does not disclose any defect in material or workmanship, repairs will be made at a reasonable charge, which charges may include the costs of parts, labor, and transportation.

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## BOSS Manufacturing Inc Information

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[Bossmfg.net](http://Bossmfg.net)

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