

# Tempest<sup>®</sup>/PowderPro<sup>®</sup>

## Installation Instructions

Heidelberg QM46DI

**ACCEL**  <sup>®</sup>  
*Graphic Systems*



# POWDERPRO® GENERAL INFORMATION

**ATTENTION  
POWDERPRO®  
OWNER!**

Accel Graphic Systems provides parts and service through its authorized distributors and dealers. Therefore, all requests for parts and service should be directed to your local dealer.

The philosophy of Accel Graphic Systems is to continually improve all of its products. Written notices of changes and improvements are sent to Accel Graphic Systems' Dealers.

If the operating characteristics or the appearance of your product differs from those described in this manual, please contact your local Accel Graphic Systems Dealer for updated information and assistance.

Always update your equipment when improvements are made available, especially those related to safety.

**YOUR AUTHORIZED POWDERPRO® DEALER IS:**

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**THE SERIAL NUMBER OF YOUR  
POWDERPRO® IS:**

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**TECHNICAL  
ASSISTANCE**

For technical assistance, please contact:

**ACCEL GRAPHIC SYSTEMS**  
11103 Indian Trail  
Dallas, TX 75229  
(972) 484-6808  
FAX (800) 365-6510  
E-Mail [accel@dallas.net](mailto:accel@dallas.net)  
WEB SITE [www.accelgraphicsystems.com](http://www.accelgraphicsystems.com)

**PowderPro® is covered by U.S. Patents Pending**

# TEMPEST® GENERAL INFORMATION

**ATTENTION  
TEMPEST®  
DRYER  
OWNER!**

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**YOUR AUTHORIZED TEMPEST® DEALER IS:**

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**THE SERIAL NUMBER OF YOUR  
TEMPEST® HOT AIR DRYING SYSTEM IS:**

**TECHNICAL  
ASSISTANCE**

For technical assistance during the installation, please contact:

**ACCEL GRAPHIC SYSTEMS  
11103 INDIAN TRAIL  
Dallas, TX 75229  
PHONE (972) 484-6808  
FAX (800) 365-6510  
E-MAIL [accel@dallas.net](mailto:accel@dallas.net)  
WEB SITE [www.accelgraphicsystems.com](http://www.accelgraphicsystems.com)**

# TEMPEST® GENERAL INFORMATION

**ELECTRICAL REQUIREMENTS** 220 VAC 50/60HZ  
20 AMP DEDICATED LINE  
NEMA L620R RECEPTACLE

**IMPORTANT INFORMATION** The use of heat to accelerate drying may require more frequent lubrication and/or use of a high temperature lubricant in the delivery of the press. Please consult your press manufacturer for specific recommendations.

**SAFETY INFORMATION** The Tempest Dryer® contains high voltage and hot surfaces. Never attempt to service or work on the unit unless the power is shut off and the unit is cool.

Visually inspect the thermistors (triangle-shaped objects arranged in a honeycombed pattern on the underside of the unit) weekly. If a thermistor is damaged or cracked, do not operate the dryer. Contact Accel immediately for a replacement part.

The fans should be turned on and set at the lowest speed ("0" on the dial when running just spray powder and no heat. This prevents spray powder from accumulating in the thermistors and housings.

**TERMINOLOGY** OPS = Operator's Side  
NOPS = Non Operator's Side

## TEMPEST® GENERAL INFORMATION

### HOT AIR VS INFRARED WHAT MAKES TEMPEST® WORK

Although the technology behind the Tempest® dryer was significant enough to be awarded the GATF Intertech Award, it is by no means new. In fact, thermistors have been in use for many years. They were originally used in motors and other devices as a heat controller and later used in refrigeration to turn compressors on and off. It is only in the last 10 years or so that thermistors have been used as a heater.

Heat is generated by the thermistor because of the difficulty of electricity travelling through it when it is a conductor. The thermistor acts as a conductor until it reaches its set temperature and then it becomes a resistor. A thermistor is basically a coated semiconductor designed to switch from a conductor to a resistor at an established temperature.

When a current is applied to the thermistor it initially uses a large amount of electricity and heats up very quickly until it reaches its maximum set temperature. At this point it should not use any more electricity. However, air that is passed through the holes in the thermistor causes it to cool. This activates the thermistor to start using more power again so it can get back to its set temperature. The thermistor is constantly regenerating itself to stay at a constant temperature. This process is called autostabilization.

Thermistors are also the key element that makes the Tempest® dryer safe. Because the set temperature of the thermistor is lower than the flash point of paper, you can place even the most easily burned substrate, such as tissue paper, on top of the thermistor element without causing a fire. The tissue won't even char, let alone ignite. If you were to do the same with an IR element, a fire could be started in a matter of seconds. This is particularly important if a jam occurs in the delivery.

The objective of any drying system is to raise the pile temperature to accelerate the drying of the ink. However, heating the paper too much can aggravate problems such as blocking, setoff, mottle, loss of gloss, and loss of halftone definition. Too much heat can also cause the paper to shrink which can cause register problems in multiple pass work. The Tempest® dryer can keep the pile at a lower temperature than IR and still effectively set the ink film.

## TEMPEST® GENERAL INFORMATION

IR dryers use very high temperatures and a fixed amount of electricity. One of the drawbacks of using a very hot heat source is that heat wants to travel from a very high temperature to a very low temperature. In other words, the heat generated from an IR dryer will travel to the press wall and attempt to increase its temperature because it is cooler than the heat produced by the IR dryer. Because the thermistors used in the Tempest® dryer use lower temperatures, the heated air has had time to cool by the time it reaches the wall of the press, reducing the chance of premature wear to press parts.

### HOW DRYING IS ACCOMPLISHED WITH TEMPEST®

Tempest® "sets" the surface of the ink to prevent setoff from one sheet to another and to minimize the use of powder.

Tempest® accelerates the final drying of oil-based inks by raising the temperature of the delivery stack.

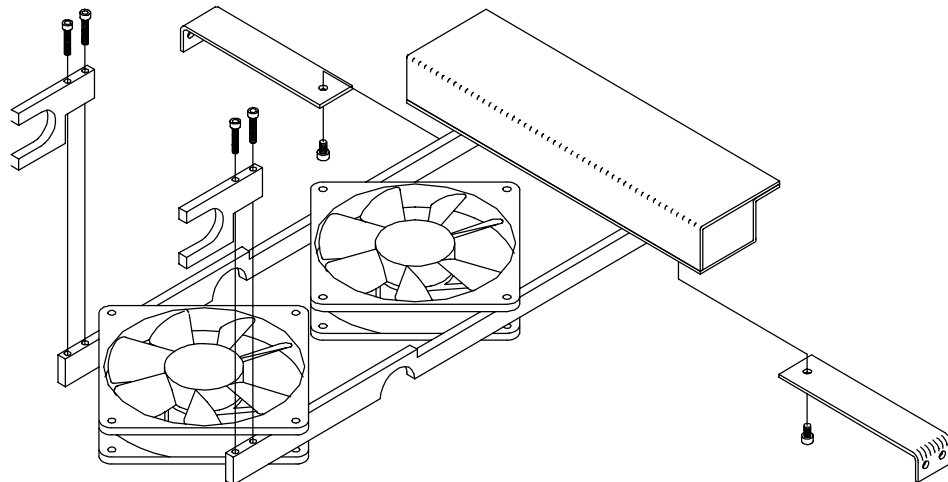
### KEY FACTORS TO REMEMBER ABOUT DRYERS FOR SMALL OFFSET PRESSES.

Do not expect a dryer to "instantly" dry the ink. Only UV inks and coatings dry instantly. The technology and hazards of such systems may make them cost prohibitive on small offset presses.

Some jobs may require spray powder. Because dryers for small offset presses do not dry ink instantly, powder will be required from time to time. However, you should expect to see a significant decrease in the amount of powder needed on a regular basis.

Drying time is dependent upon the press speed, paper stock, ink coverage, type of ink, etc.

Do not expect a dryer to accelerate the drying of rubber-based inks. These inks dry by absorption into the stock, and heat does not accelerate this process.



# INSTALLATION

1

Disconnect the electrical power to the press.

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2

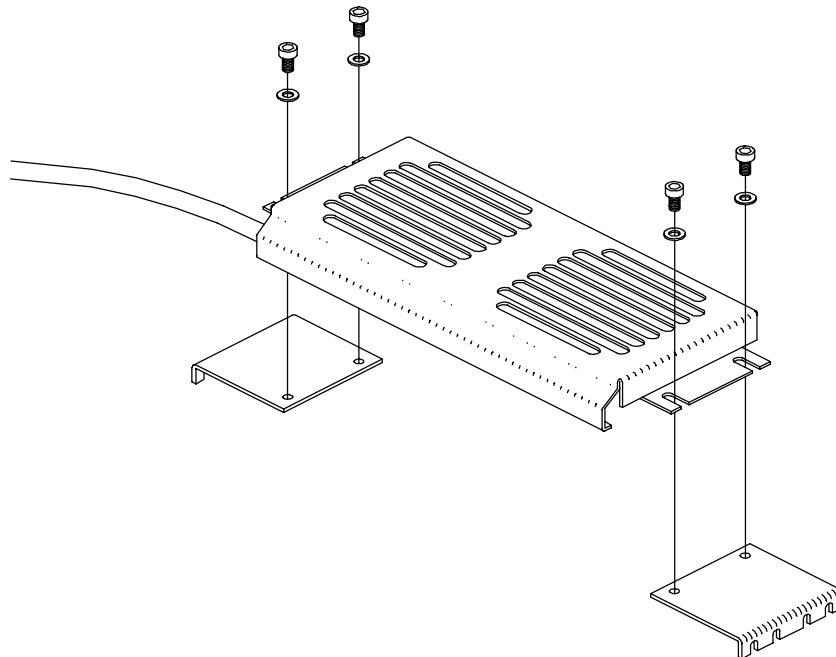
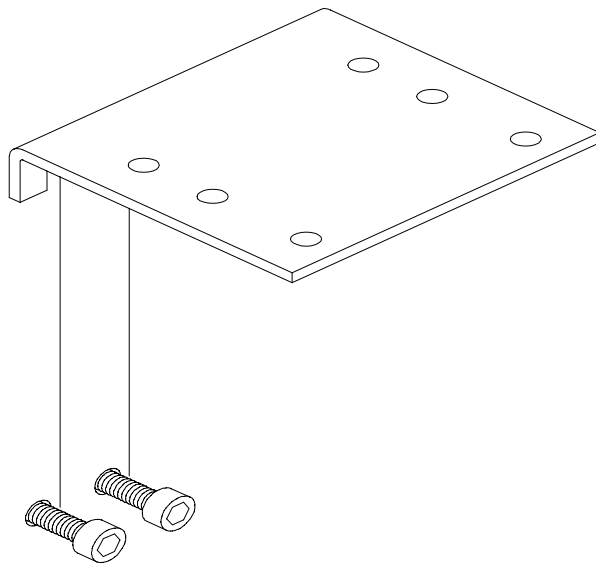
Remove the fixed guard over the delivery, the flip down guard above it, and the drip tray. The fixed guard is held in place by three bolts on each side. To access the OPS bolts you must move the electrical cabinet/control console away from the press. The NOPS bolts are easily accessed from behind the hinged side cover.

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3

Using the diagram as a guide, remove the bolts that secure the factory spray head assembly to its' side frame mounting brackets, and the bolts that attached the "C"shaped brackets to the ends of the blow down fan support bars. Pull the hoses out of the spray head. Cut all of the zip ties securing the blow down fan wires. Slide the fans off the end of the bars and remove the bars and spray head assembly from the press. Save the "C" brackets, their mounting bolts, and two of the spring clips used to secure the blow down fans.

9



## INSTALLATION

**4**

Unplug the electrical connection on the outside of the NOPS press frame where the original powder spray device is plugged in. This connection is a six-position connector on the underside of a bracket that is attached to the press frame. Cut any zip ties that secure this cable to other cables. Also disconnect the pump electrical connection, and air supply hose, from the back of the powder spray device. Remove the powder jar from the spray device. Remove the two bolts that secure the control box to the press frame and remove the device from the press by taking it out from underneath the walkway

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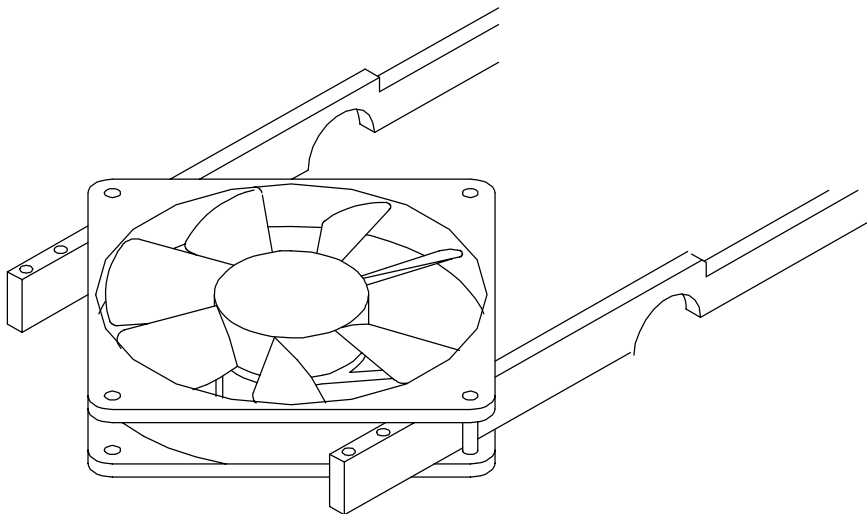
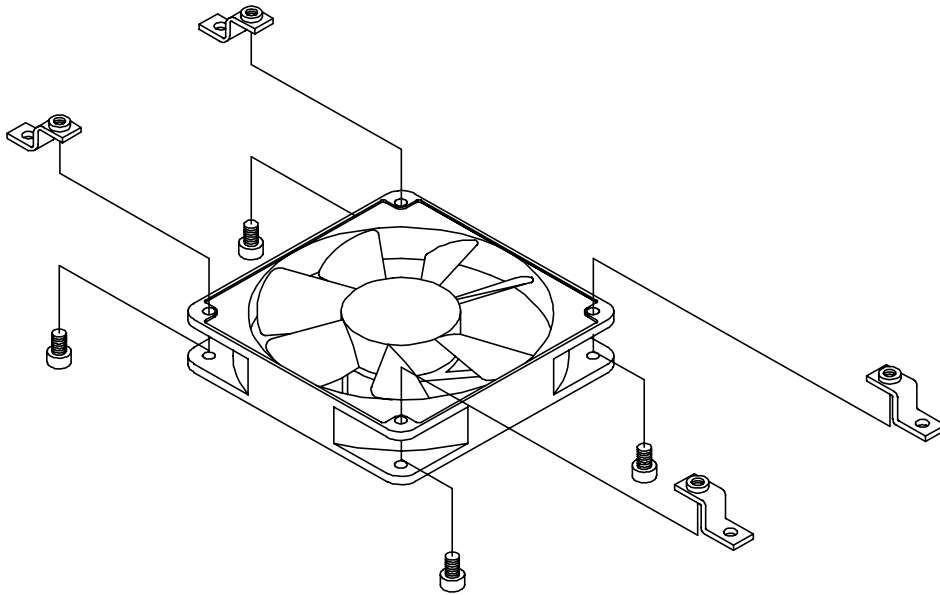
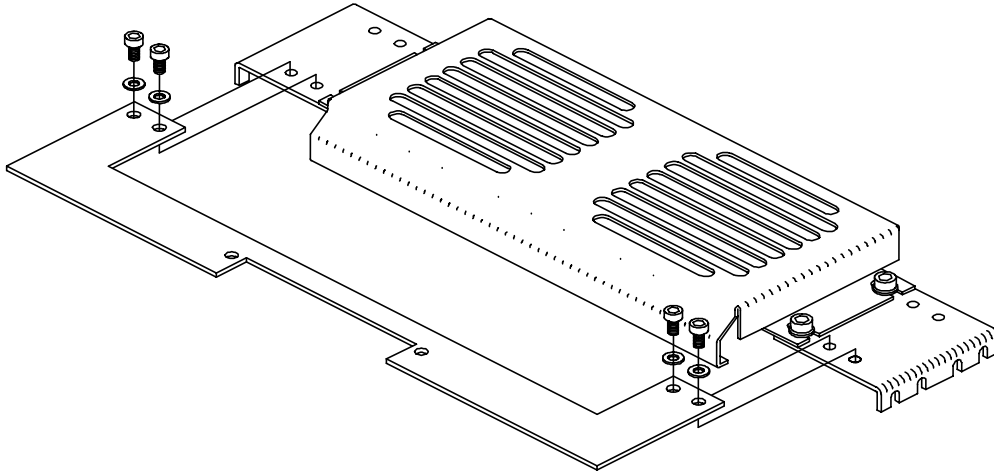
**5**

Using the provided hardware install the NOPS Tempest® mounting bracket to the press frame as shown in the diagram. Note that the correct pair of mounting slots on the bracket are the ones that place the bracket further towards the feeder end of the press. The bracket utilizes the same two M6 tapped holes in the press frame that were used by the original powder spray system. Repeat this procedure for the OPS Tempest® mounting bracket.

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**6**

Set the dryer in the delivery with the cable exiting the dryer on the NOPS. Start the cable through the round hole in the NOPS press frame where the original powder spray hoses were routed. As you pull the cable through the hole you can set the dryer on the mounting brackets. Secure the dryer to the mounting brackets using the provided hardware as shown in the diagram.



## INSTALLATION

**7**

Using the provided hardware attach the blow down fan support bracket to the Tempest® mounting brackets as shown in the diagram. Mount the bracket with the stiffening flange pointing down.

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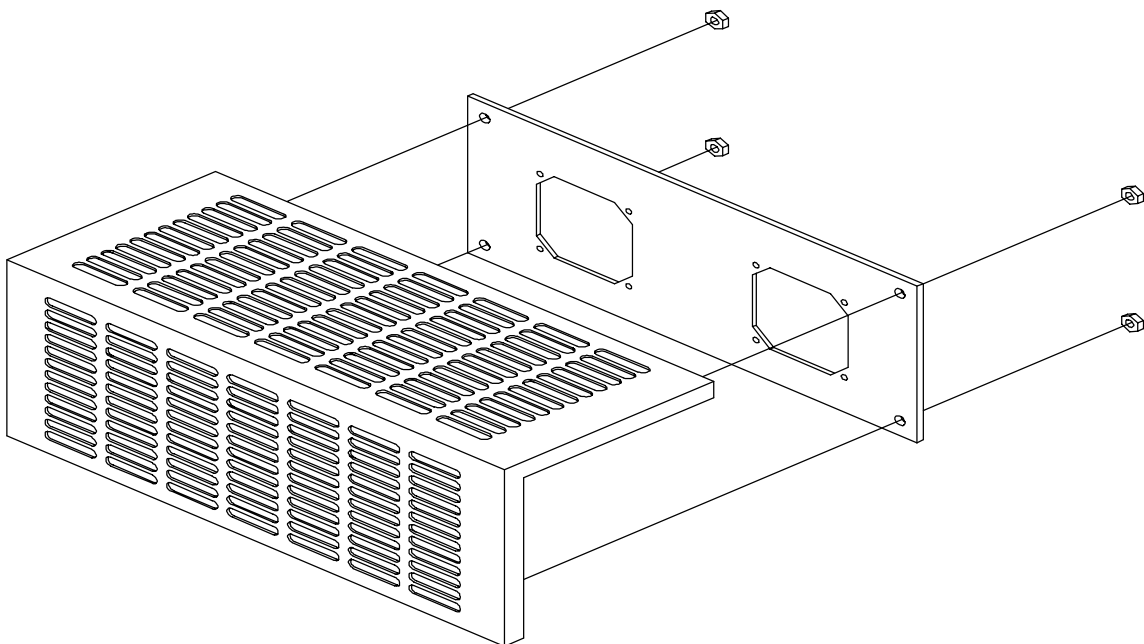
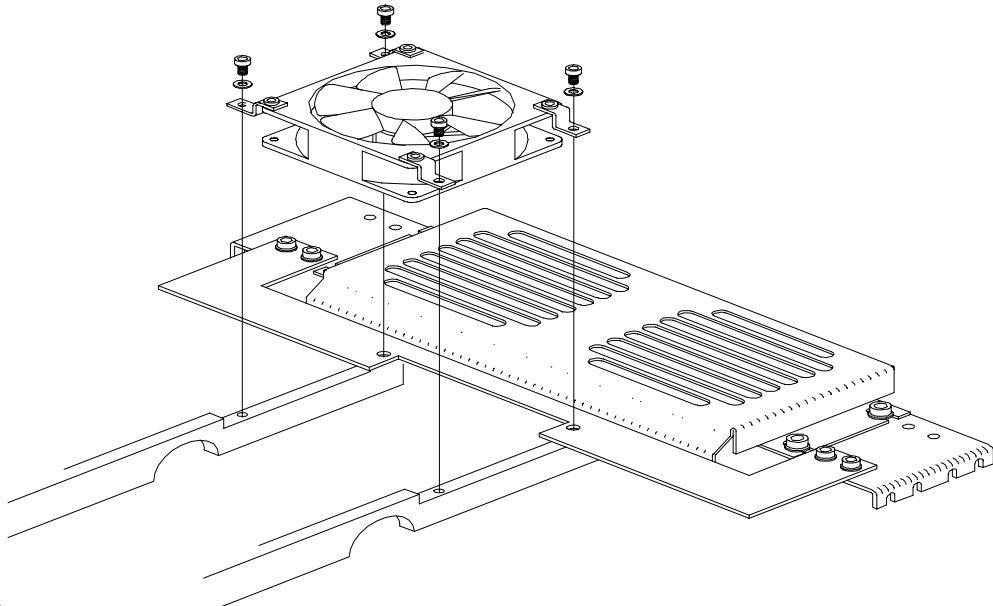
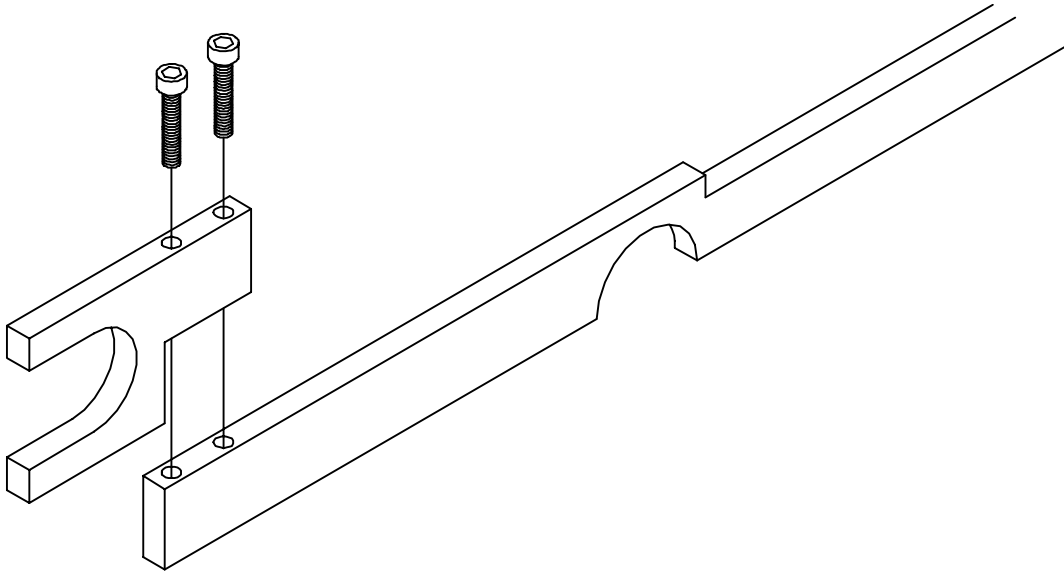
**8**

Remove the two roll pins from the blow down fan that was nearest to the feeder end of the press. Using the supplied hardware attach the provided mounting legs to this blow down fan as shown in the diagram. Make sure that the brackets are mounted to the side of the fan that is opposite the airflow direction (in the illustration the fan would be blowing down). The cable clamp on one corner of the fan will need to be reversed to access the mounting hole.

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**9**

Using two of the original spring clips attach the other blow down fan (nearest to the delivery end) to the supplied mounting bars as shown in the diagram.



## INSTALLATION

**10**

Using the original bolts attach the "C" brackets (removed in step 3) to the mounting bars as shown in the diagram.

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**11**

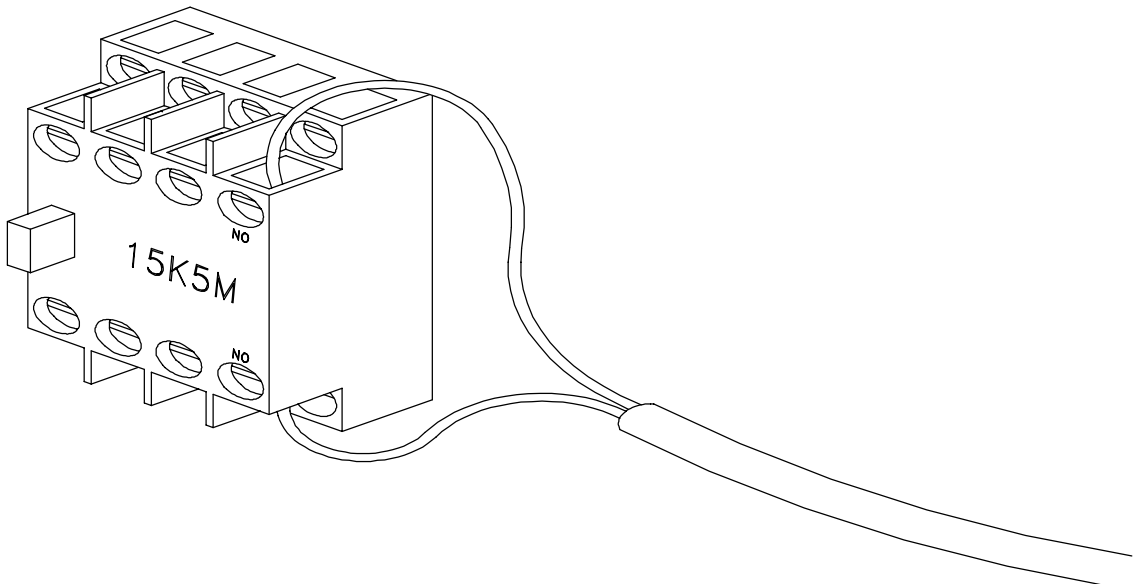
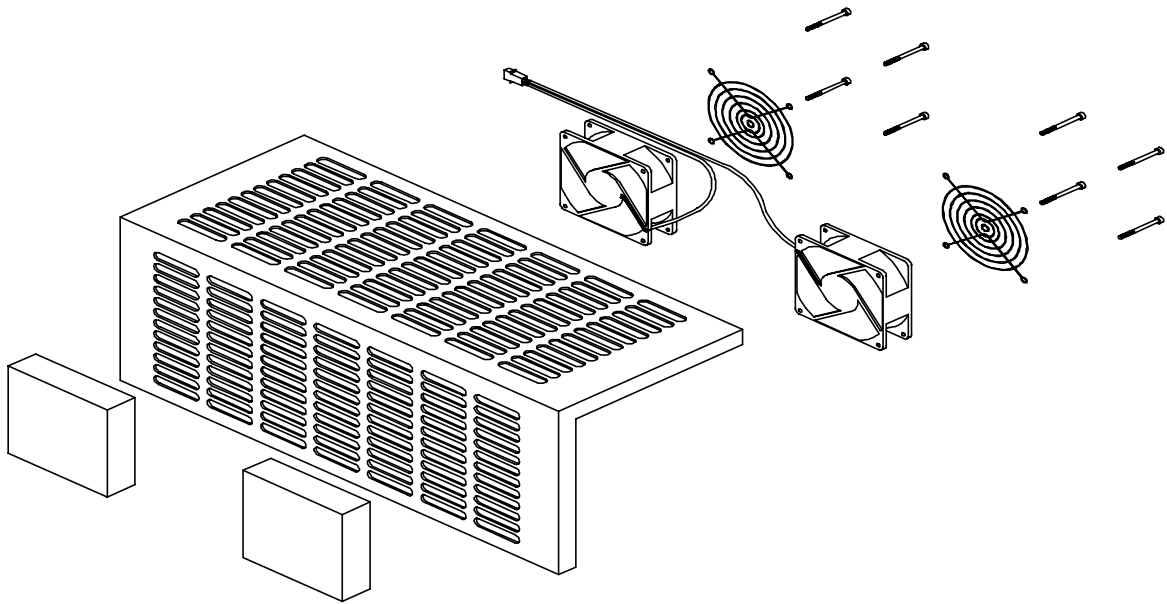
Using the provided hardware attach the blow down fan (with mounting legs) to the blow down fan mounting bars as shown in the diagram. Note how two of the bolts also go through the bracket installed in step 7.

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**12**

Remove the clear plastic insert from the vertical portion of the fixed delivery guard and replace it with the new one provided as shown in the diagram. Make sure that the side of the insert with the countersinks on the mounting holes goes up against the delivery guard.

**15**



## INSTALLATION

13

Attach the provided exhaust fan/deflector assembly to the new insert/guard assembly as shown in the diagram. Install the fans so that the connector will be in the upper corner of the guard on the NOPS when the guard is reinstalled. Also, make sure that the airflow directional arrows on the fans are pointing towards the guard (what will be out of the press when the guard is reinstalled). Use the provided zip-ties to secure the wires to the fans to prevent them from contacting the gripper bars.

14

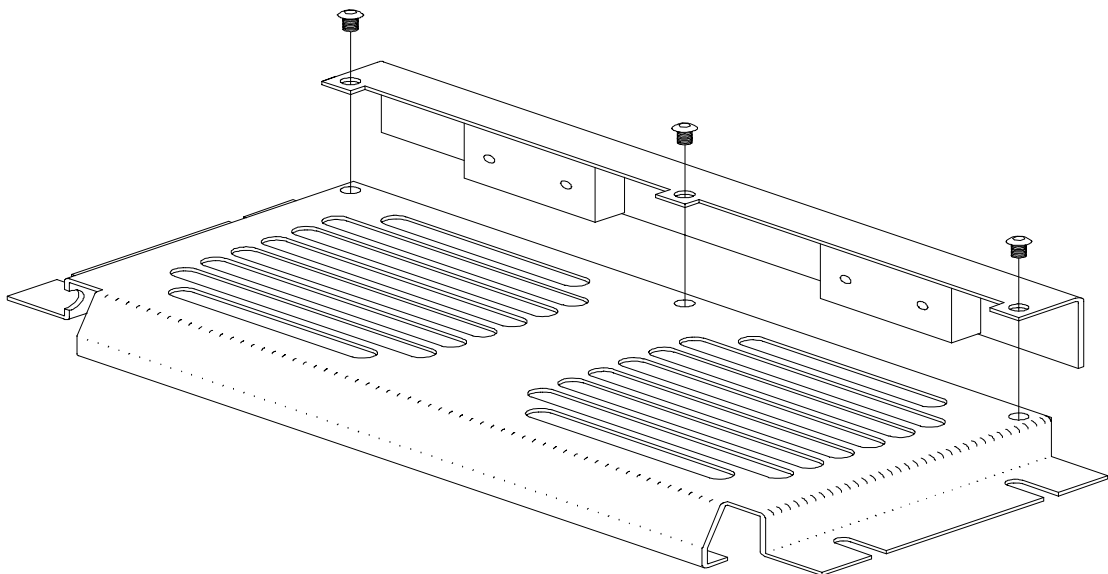
Set the main Tempest® electrical box under the walkway on the NOPS of the press. Route the exhaust fan cable into the delivery via the rectangular hole in the NOPS press frame. Use the provided stick-on-zip-tie mounts to secure the cable to the frame while routing it toward the end of the delivery where it will meet up with the connector for the exhaust fans installed in the previous step. The connector on the cable should come about flush with the end of the NOPS press frame.

15

Route the impression signal cable along the NOPS toward the feeder. Open the trap door in the floor and route the cable through the press to the OPS (using the existing cable tray) and into the electrical cabinet at the same point (nearest to the feeder end of the press) that the other cables also enter the cabinet. Locate the 15K5M relay on the upper right side of the press electrical cabinet. Connect the ends of the impression signal cable to a set of unused normally open contacts on this relay as shown in the diagram. Secure the cable in the wire duct directly underneath the relay. Secure the cable as necessary to the press to keep it away from any moving parts.

**NOTE: If the only unused pole of the relay has a black wire in the lower position, then remove the wire before connecting the Tempest® impression signal cable. Removing this wire will not affect the performance of the machine. Leaving the wire attached to the relay will damage the Tempest®.**

17



## INSTALLATION

**16**

Remove the cover from the main Tempest® electrical cabinet and insert the dryer cable through the strain relief on the bottom of the box. Insert the wires into the connector by matching the number on the wire to the number on the connector. Secure the ground wire to the stud on the inside of the box. Tighten the strain relief and replace the cover on the box.

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**17**

Route the remote control unit under and around the walkway, bringing it out where the original powder jar was previously located. The controller is secured to the NOPS side cover with the magnetic tape attached to its' backside.

**This completes the Tempest® installation, the remaining steps are for the installation of the PowderPro®.**

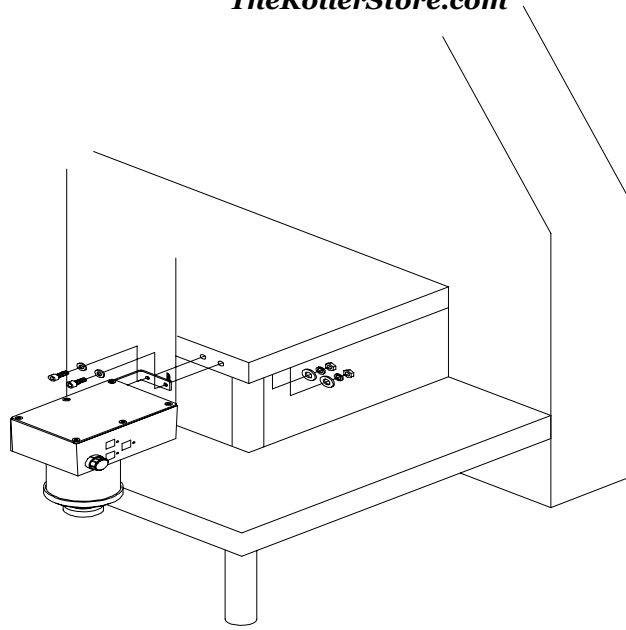
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**18**

Install the PowderPro® spray head assembly to the Tempest® unit, using the provided hardware, as shown in the diagram. Route the hoses through the same hole in the NOPS press frame that the original spray hoses used.

**NOTE: The hose coming from the OPS nozzle must be routed through the square notch in the center of the spray bar assembly. Otherwise the hose will get pinched between the nozzle assembly and the Tempest®.**

**19**



## INSTALLATION

**19**

Drill two 5/16" (8mm) holes, 1 3/8" (35mm) apart, in the NOPS walkway as shown in the diagram. Hold the control box up to the walkway in the desired position before marking and drilling the holes. Attach the PowderPro® control box assembly to the walkway with the provided hardware as shown in the diagram.

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**20**

Set the pump on the floor under the walkway directly beneath the control box installed in the previous step. Route the power cable for the pump through the opening in between the upper and lower steps in the walkway near the PowderPro® control box, and connect it to the proper mating connector coming out of the PowderPro® control box.

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**21**

Connect the provided impression signal cable to its' proper mating receptacle on the cable coming out of the PowderPro® control box. Connect the other end of this cable to the same connector on the outside of the NOPS press frame where the original powder spray device was disconnected in step 4. Use the supplied zip-ties to secure the cable as necessary.

**21**



## INSTALLATION

22

Route the hoses from the spray head to the PowderPro® control box. The hoses are provided longer than necessary so you will need to trim their length. Attach the two hoses to the stainless tubes coming out of the right side of the control box.

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23

Replace the delivery guard/exhaust fan assembly on the press. Make the electrical connection for the exhaust fans before replacing the guard.

**This connection is not accessible once the guard is replaced.**

---

24

Reinstall the flip down guard above the delivery guard and replace the drip tray in the press. It is very important that the drip tray remain in place at all times of dryer operation to prevent printing fluids from entering the dryer.

23



## INSTALLATION

**25**

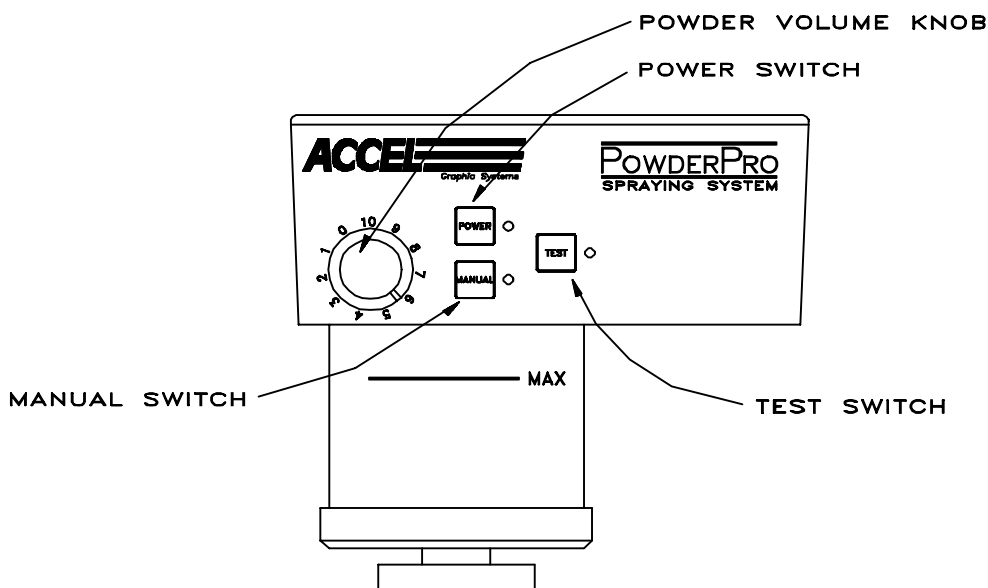
Use alcohol to clean the outside surface of the NOPS side cover around the rectangular hole in the OPS cover where the original powder spray device was located. Remove the liner from the two-sided tape on the provided cover plate and affix the plate over the hole in the cover.

This completes the Tempest® and PowderPro® installation. Proceed to the operation and maintenance sections for proper set-up and use of the Tempest® and PowderPro®.

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# POWDERPRO® OPERATION & MAINTENANCE



## POWDER PRO® CONTROLS

### VOLUME ADJUSTMENT KNOB

This feature controls the amount of powder being applied to the sheet. Turn the knob to a higher number for more powder, and a lower number for less powder.

### POWDER SWITCH

Press this button once to turn the unit on. The indicator light next to the button illuminates to indicate that the system is on and armed for impression. To turn the system off press the power button again.

### MANUAL SWITCH

Press this switch, with the power on, to manually activate the pump. This feature is necessary for setting the correct pump pressure (as detailed in the next section "PUMP ADJUSTMENT") since the pump would normally come on only when the press is on impression. When this switch is activated the indicator light next to the switch is illuminated.

### TEST SWITCH

Press this switch to manually activate the solenoid. When the MANUAL switch is activated and the TEST switch is pressed powder will be sprayed. This feature allows you to view the amount of powder coming out of the spray nozzles in the delivery without the press running. The light next to the test switch illuminates whenever the solenoid is activated.

### NOZZLE SELECTOR KNOB

This knob is only available on systems that have more than two spray nozzles. For maximum width sheets turn the knob so that the pointer indicates to the lower position. This setting sprays all of the nozzles. For narrower sheets, usually about 50% of maximum sheet size, rotate the knob to the upper position. This setting sprays only the two center nozzles.

# POWDERPRO® OPERATION & MAINTENANCE

## PUMP ADJUSTMENT

The outlet pressure from the pump indicates the range of spray powder available. Locate the regulator adjustment knob on the pump and loosen the locking knob. Turn the regulator knob clockwise to increase the pressure for more powder, and counter clockwise to decrease the pressure for less powder. To set the correct pump pressure:

1. Turn the POWER to the unit on.
2. Set the nozzle selector knob to the lower position (all spray nozzles)
3. Activate the MANUAL switch.
4. Set the powder volume adjustment knob to 10 (maximum powder).
5. Press the TEST switch while looking at the underside of the spray nozzles in the delivery.
6. Slowly adjust the pressure on the pump until powder is just visible as it exits the spray nozzles. A powder setting of 10 with visible powder is a good maximum setting. Consequently, a setting of 5 shows no visible powder, but sufficient powder is being sprayed for most jobs.
7. Tighten the locking knob on the regulator.

## INITIAL SETTINGS

This initial setting for the powder volume adjustment on an average job is 4 to 6. If more powder is required than is available at a setting of 10 you will need to readjust the pump. If less powder is required than is available at a setting of 0 you will need to readjust the pump.

# **POWDERPRO® OPERATION & MAINTENANCE**

## **MAINTENANCE**

1. Remove any powder that accumulates on the bottom of the spray nozzles daily.
2. Clean the filter on the pump once a week, blowing it clean with compressed air.
3. Purge the powder hoses once a month with compressed air.

## **OPERATION**

1. Fill the powder hopper with an intermediate grain (20-25) powder up to the MAX hopper.
2. Press the POWER switch.
3. Consider the sheet width and if necessary change the spray nozzle selector knob.
4. Adjust the powder volume as necessary.
5. The sprayer operates automatically when the press goes on impression and a sheet is present under the spray nozzles.

# TEMPEST® OPERATION & MAINTENANCE

## HOW DRYING IS ACCELERATED WITH TEMPEST®

Tempest® creates a two step drying process when used with oil base inks. These steps are:

1. Skinning the surface of the ink with the initial blast of hot air to prevent set off .
2. Accelerating the final drying process approximately 20°F over the cold stack temperature in the feeder. Heat accelerates the drying process, called oxidation and reduction, of oil based inks.

## HOW TEMPEST® WORKS

In general, dryers, including infrared, do not work well with rubber or acrylic based inks. These inks should be avoided when maximum results are desired.

1. When voltage is applied to the thermistors (triangular shaped objects arranged in a honeycomb pattern), the thermistors begin to heat. (Thermistors are coated semiconductors.)
2. Thermistors heat to a predetermined temperature, in this case about 400°F, and remain at that temperature. This is known as autostabilization.
3. The fans blow air down towards and through the thermistors, creating a flow of hot air to the sheet.
4. Drying of the ink occurs in the two step process as described above.

No dryer totally eliminates the need for spray powder. There may be some jobs, for example a heavy solid on a high gloss sheet, where powder is required. Overall, Tempest® should reduce your spray powder usage significantly, leaving you with a better printed product and cleaner working environment.

## TEMPEST® OPERATION

### NORMAL OPERATION

Pressing the HEAT switch will illuminate both the green and yellow LEDs on the remote control unit. The green LED indicates that the fans (both dryer and exhaust fans if so equipped) are running while the yellow LED indicates that the dryer is armed and the heat will come on automatically when the press goes on impression. When the press does go on impression, the red LED will illuminate indicating that the heat is on. Pressing the heat button again will disarm the heat mode but the fans will continue to run. To turn the unit OFF press the FAN switch at any time.

### FAN ONLY OPERATION

To operate only the fans, press the FAN switch. The green LED will illuminate and the fans will come on (both the dryer and exhaust fans if so equipped). The heat mode of the dryer is not armed and will not come on with impression. To turn the fans OFF press the FAN switch again.

### FAN SPEED CONTROL

To adjust the fan to a higher setting, press the up arrow on the remote control unit. To decrease the fan speed press the down arrow on the remote. The fans will automatically go to the minimum speed setting for a few seconds when the press goes on impression and then they return to the previous setting. This reduction in fan speed allows the dryer to heat up more quickly.

# TEMPEST® OPERATION & MAINTENANCE

## INITIAL SETTINGS

Try running Tempest® with the fan speed at "4" with the switch on "HEAT". After about 1" of paper stacked in the delivery, insert the thermometer into the center of the stack. Allow the thermometer to stabilize. It should be approximately 20°F above the initial pile temperature.

If the temperature is below that, **decrease the fan speed** slightly.

If the temperature is above that, **increase the fan speed** slightly.

## FACTORS THAT AFFECT DRYING

1. Speed of the press.
2. Amount of ink coverage and color.
3. Type of stock being printed.
4. Initial temperature of paper.

In time and with practice you will learn which settings are best for your particular shop.

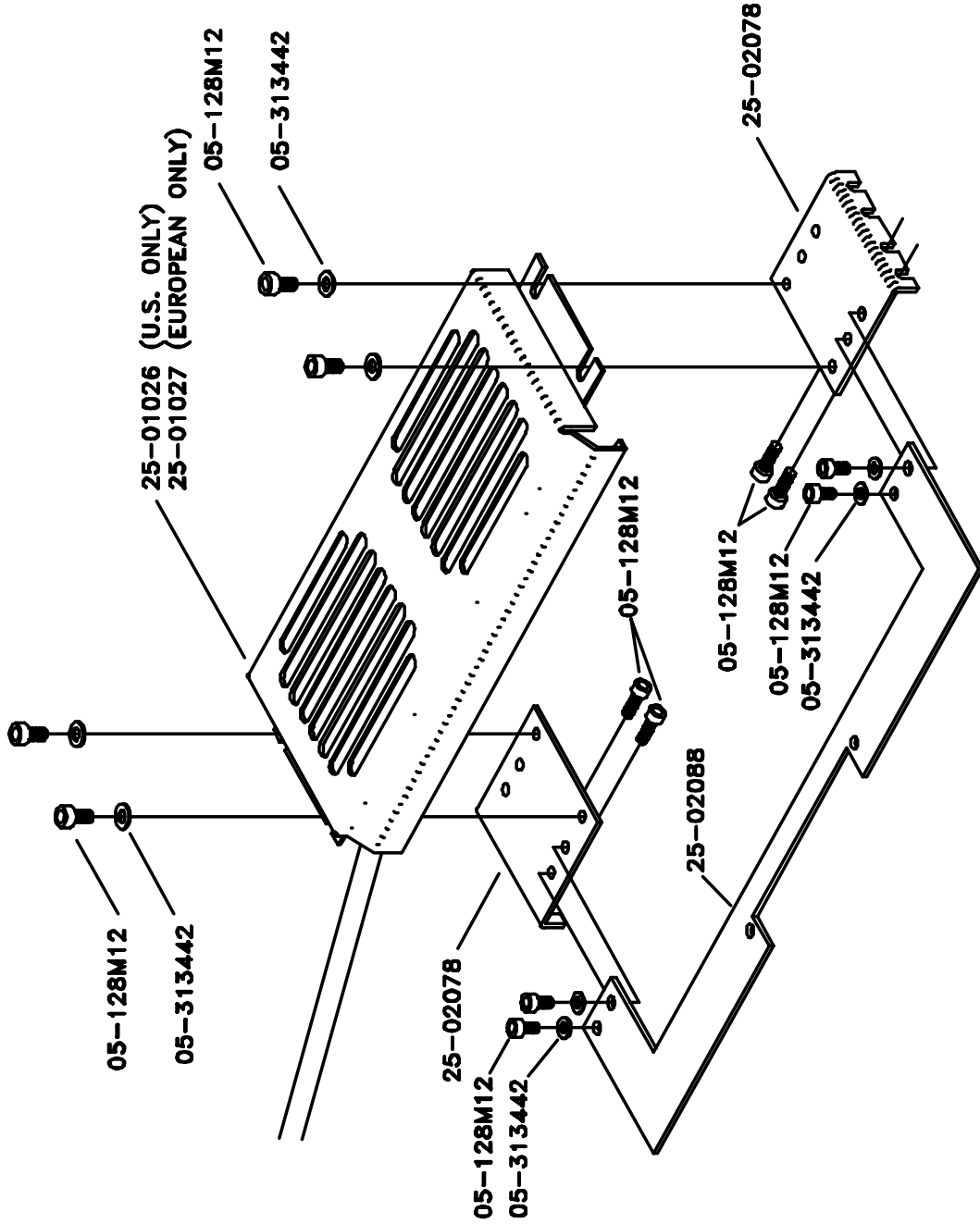
## KEYS TO REMEMBER

1. The Tempest® takes about 12 sheets to come up to full power. The dryer remains on as long as paper is being fed. It does not cycle like an infrared dryer.
2. The pile temperature should be approximately 20°F above the initial pile temperature for optimum drying.
3. Use spray powder only when absolutely necessary. A little spray powder goes a long way. Use it sparingly.
4. Inspect the Tempest® weekly.

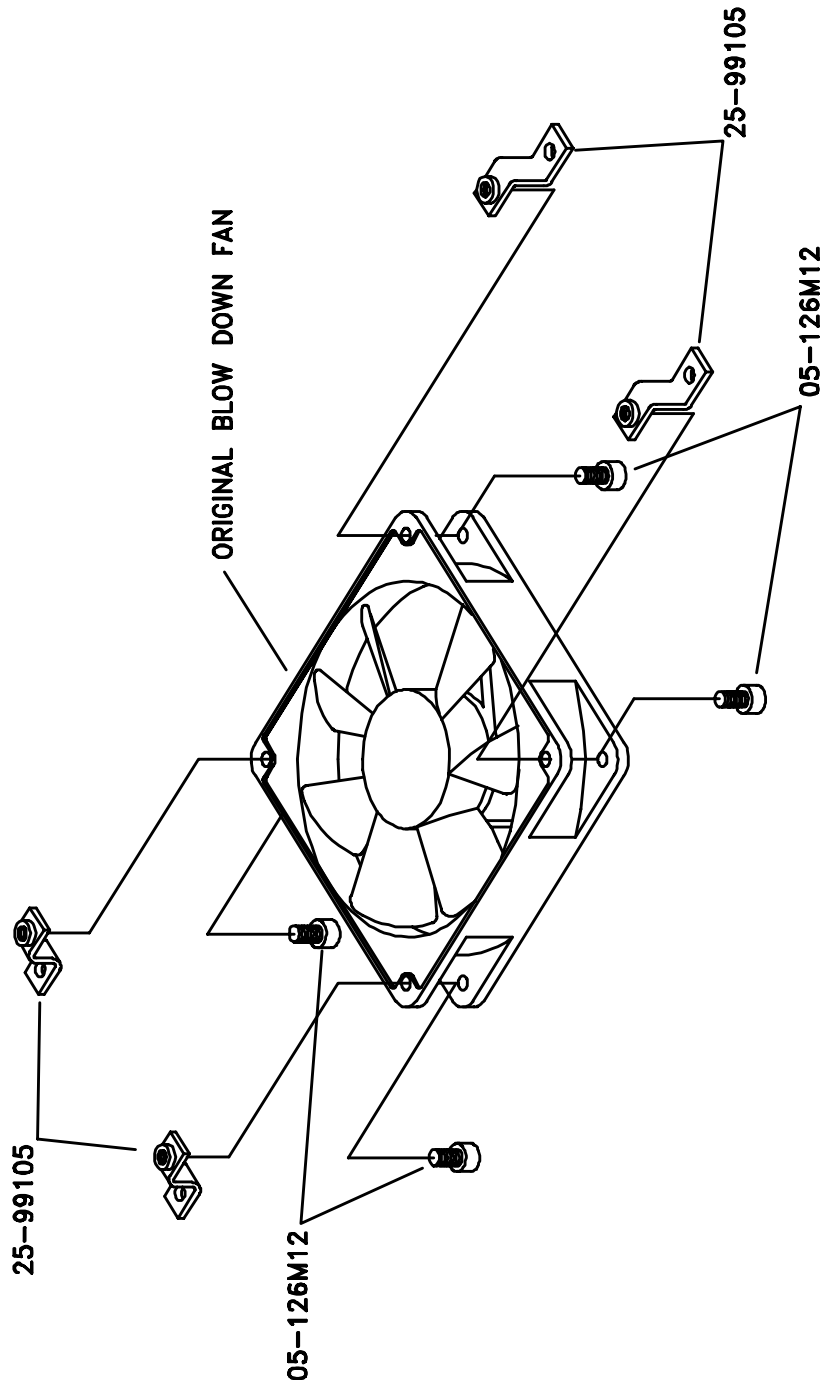
## MAINTENANCE

1. Inspect the dryer weekly. If the thermistors are cracked or have been damaged, do not operate the dryer. Call Accel immediately.
2. Never squirt cleaning solvents, water or any other liquids into the dryer. This may damage electrical components.
3. Any spray powder that accumulates in the dryer should be vacuumed out, not blown out.
4. Make sure all heat shields and guards are in place before operating the dryer or printing press.

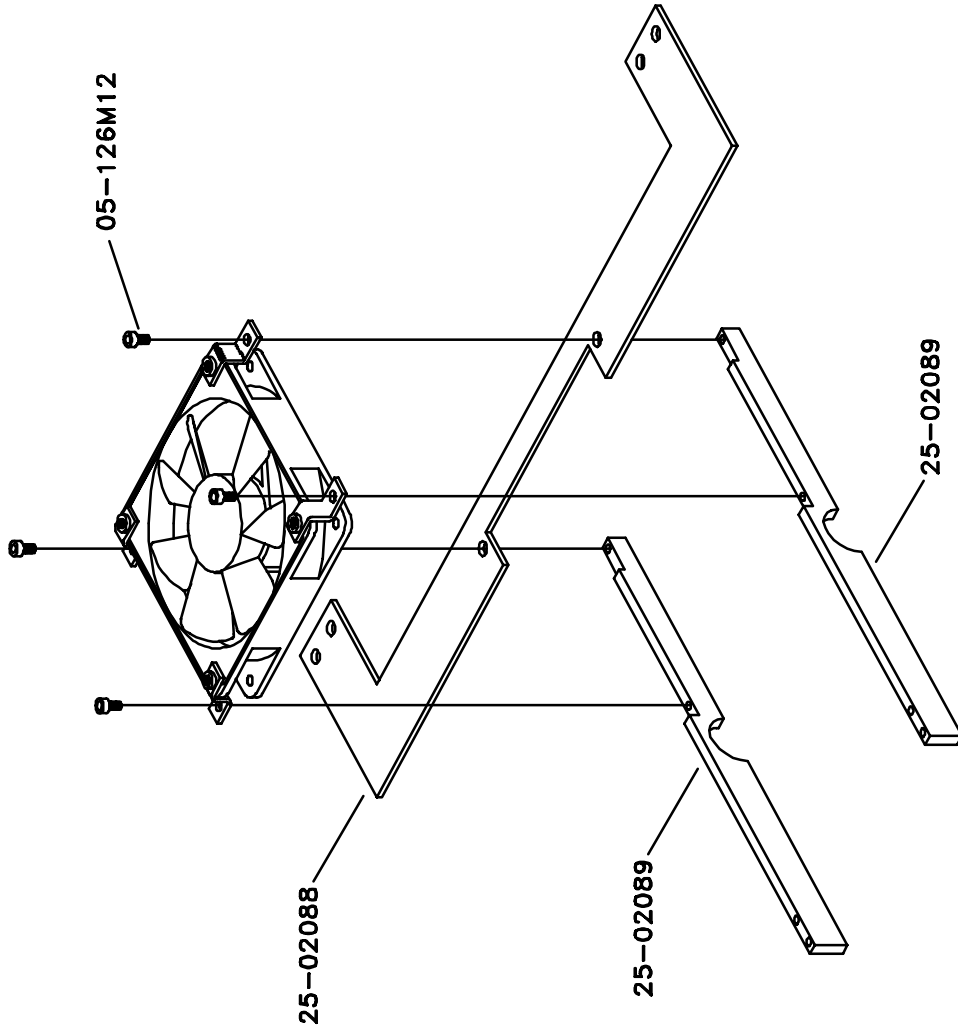
# **TEMPEST® REPLACEMENT PARTS DIAGRAMS**



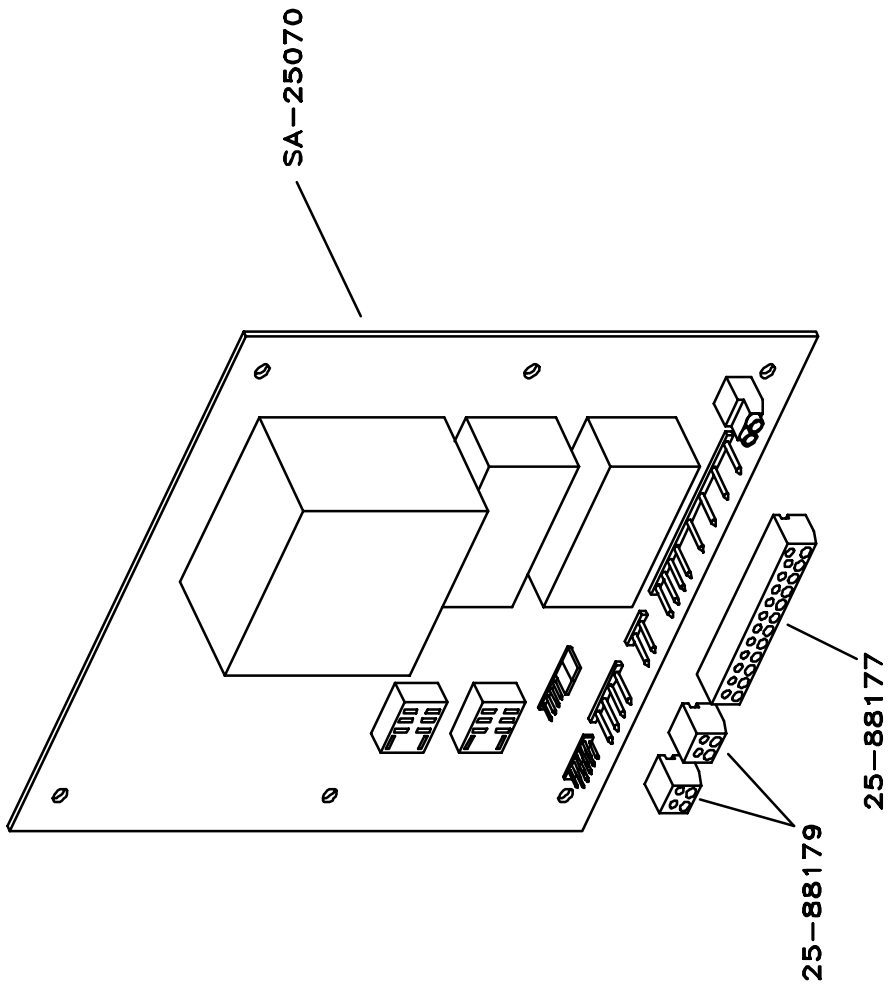
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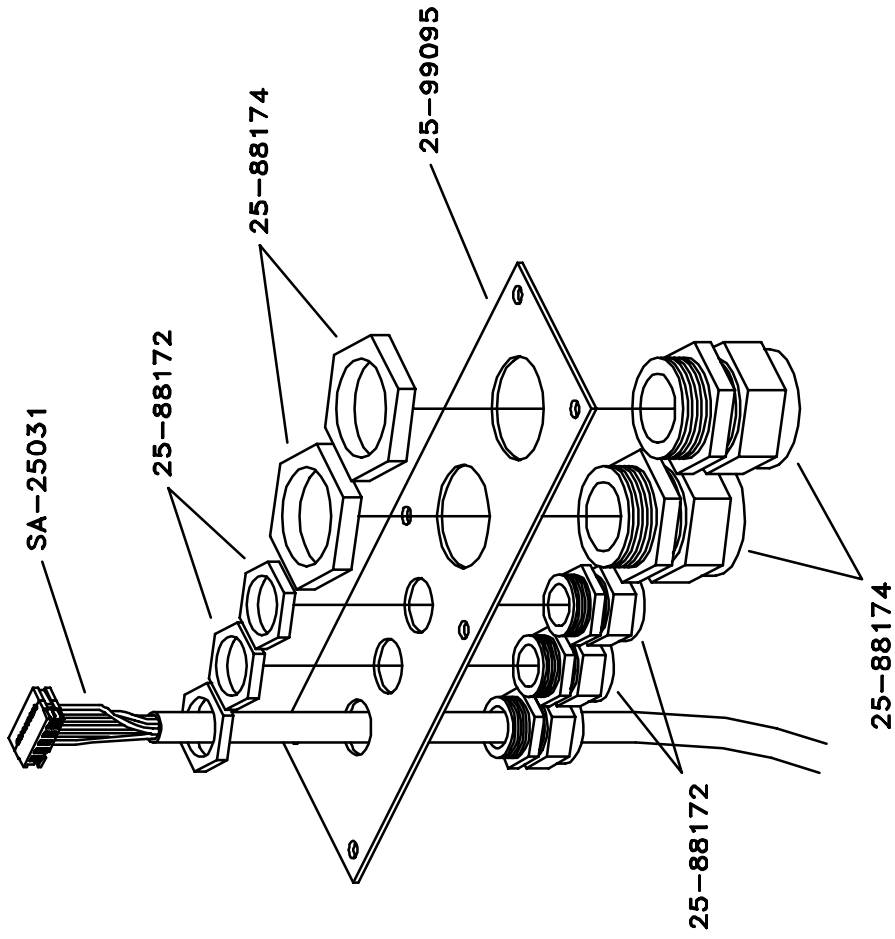
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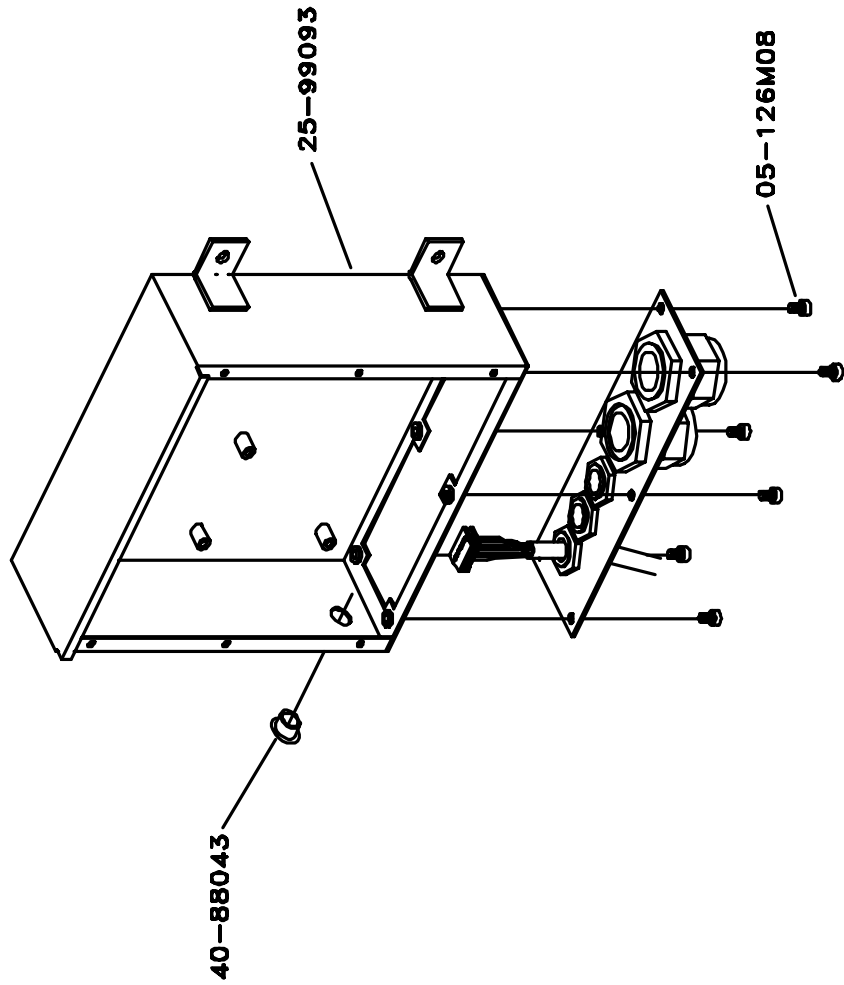
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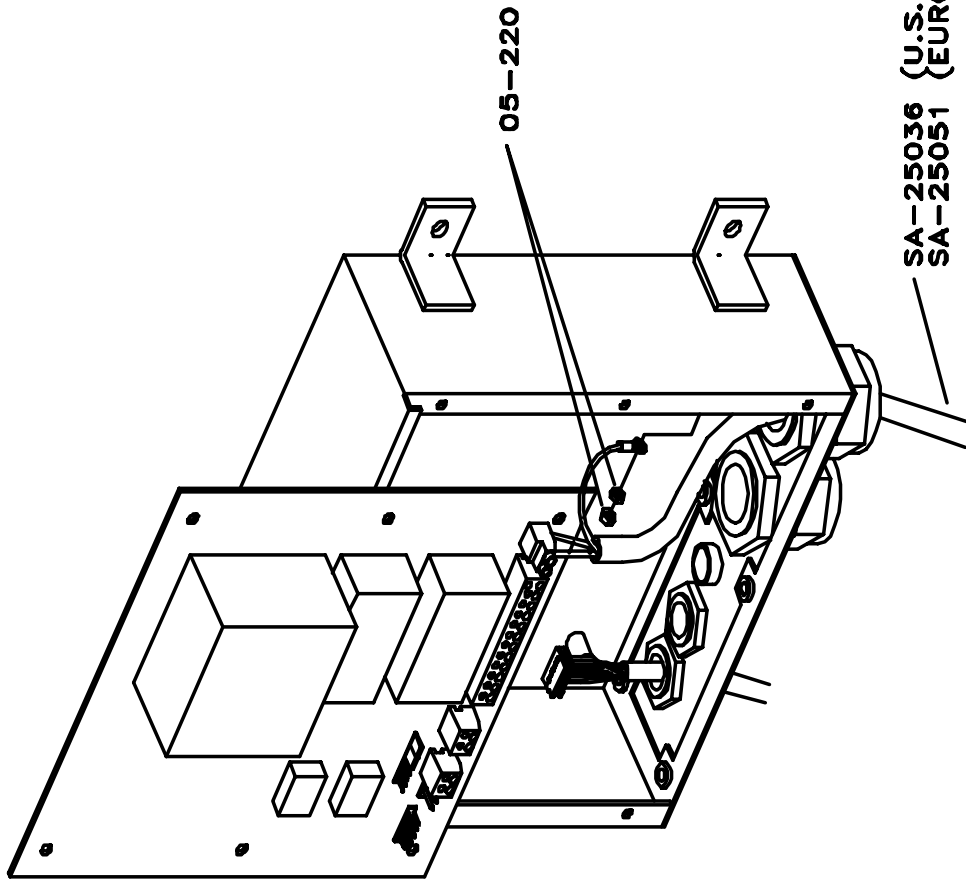
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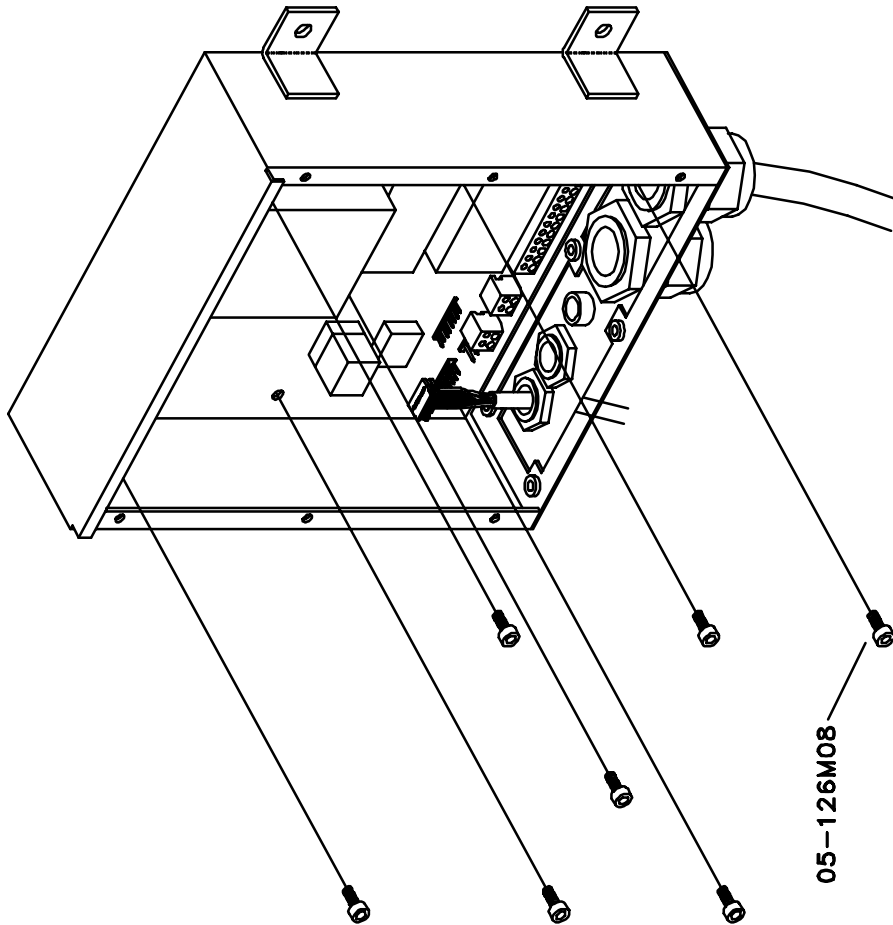


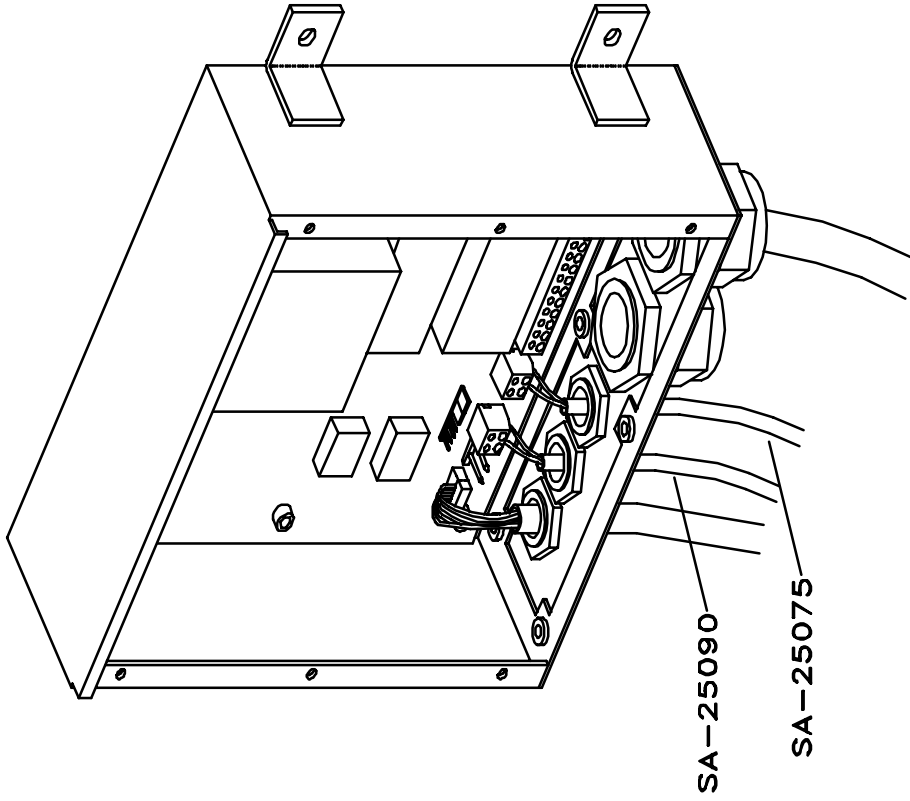
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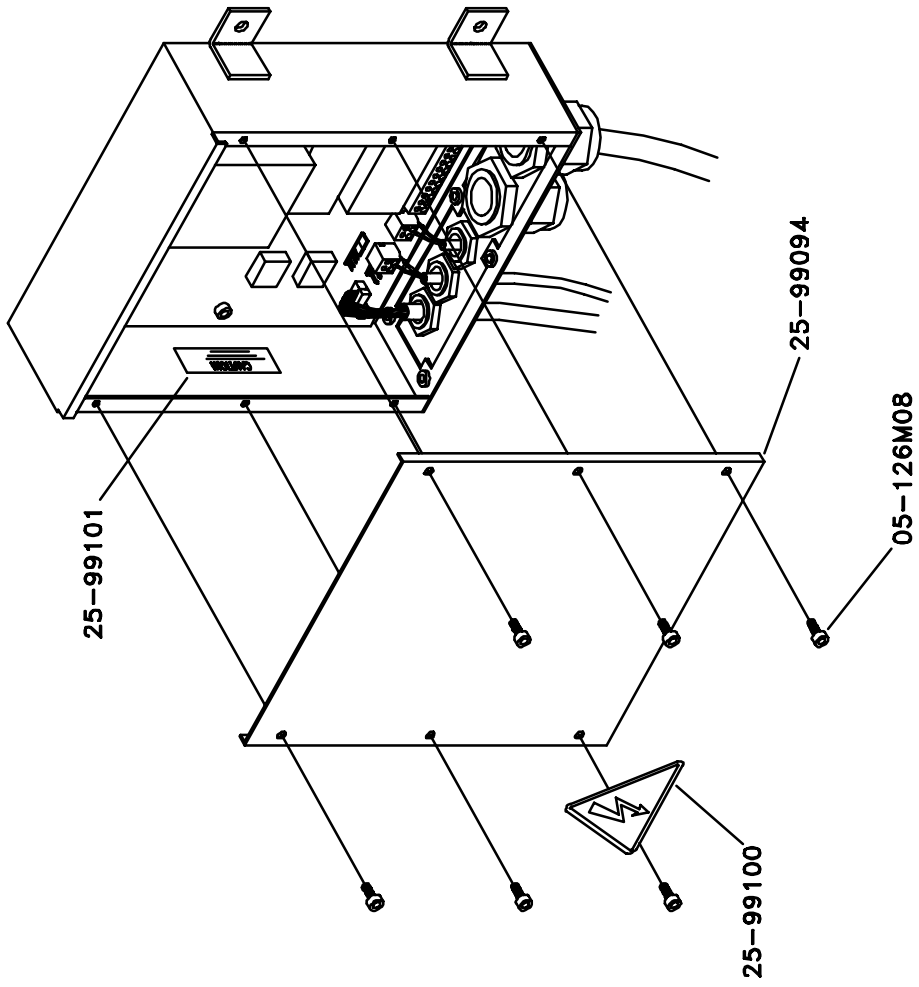
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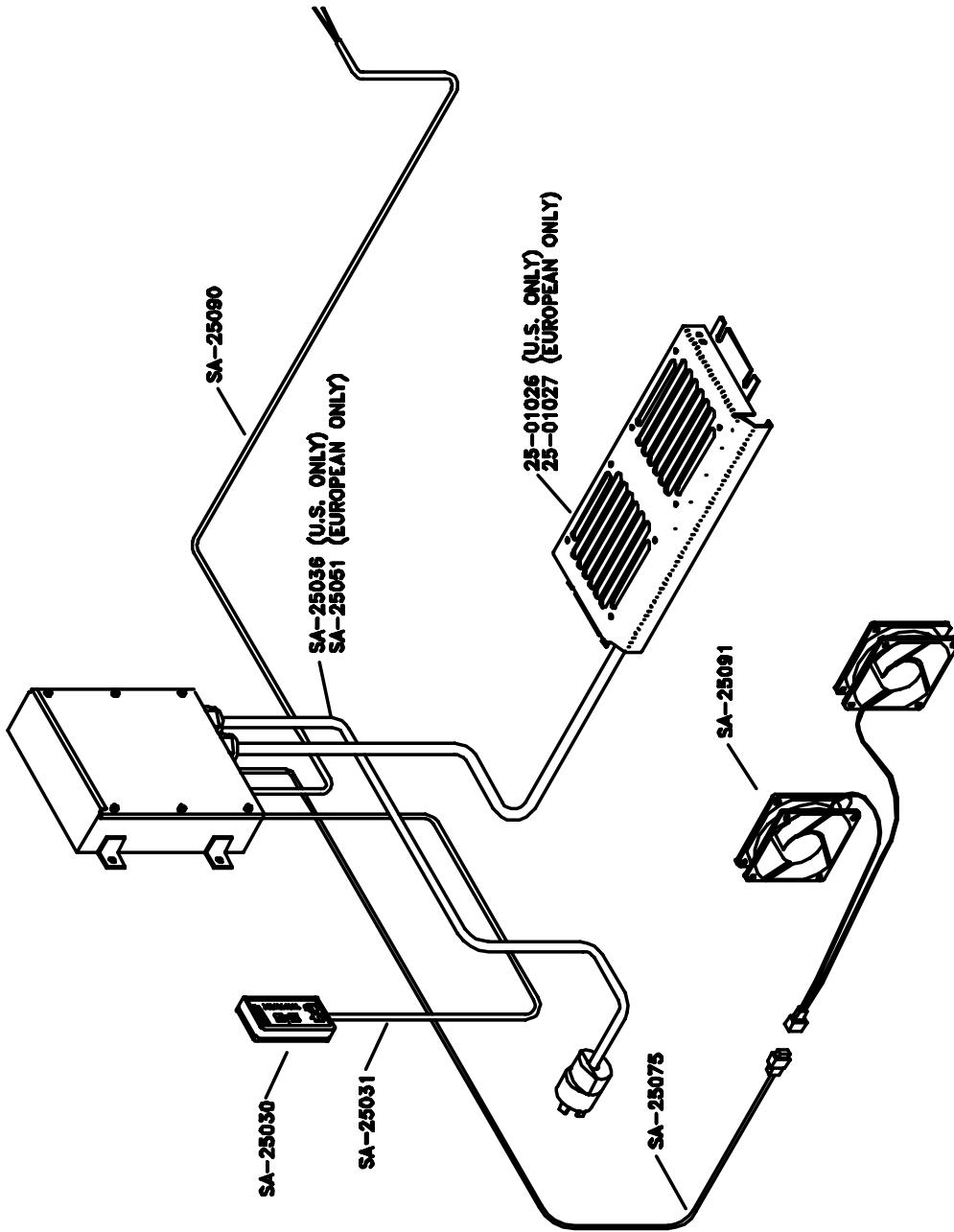
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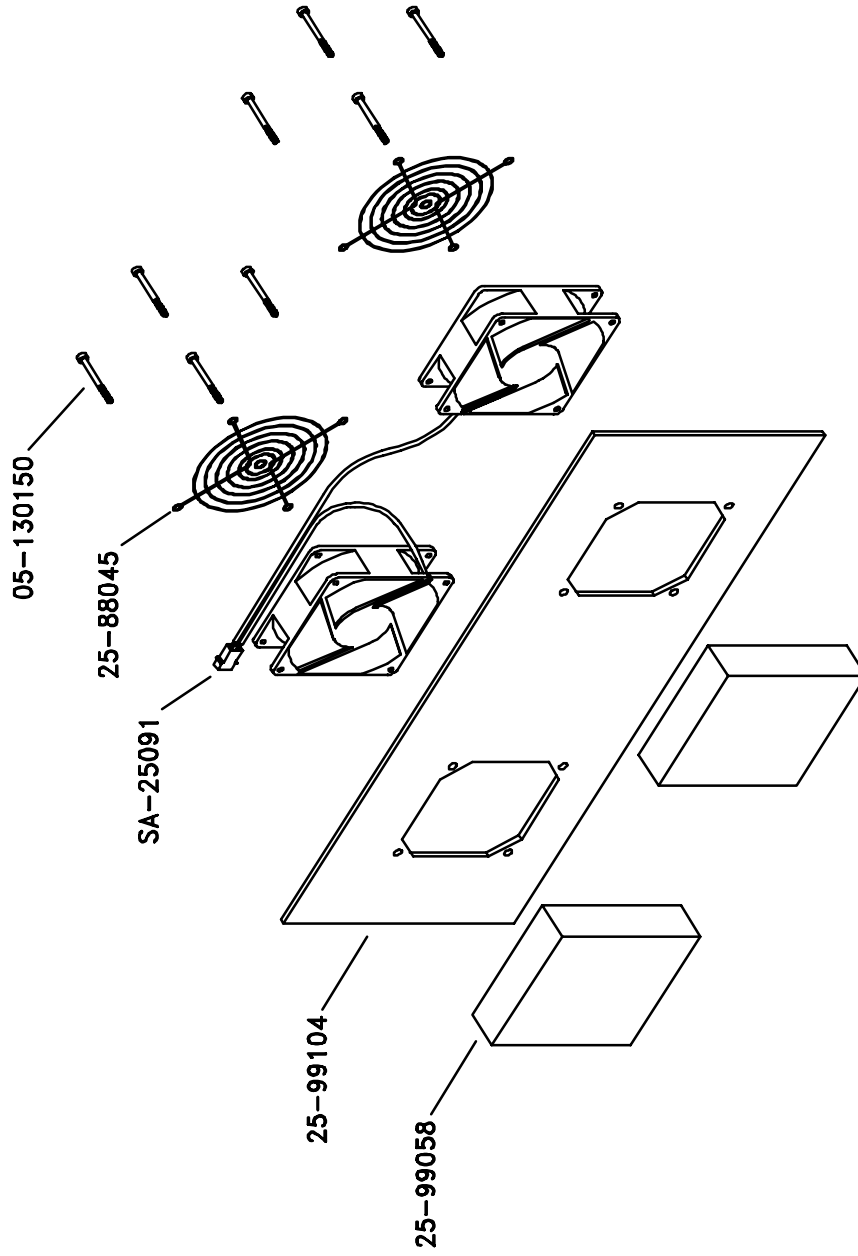


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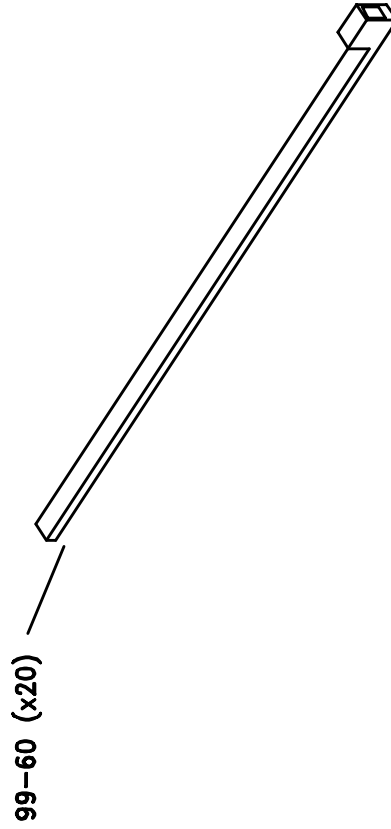
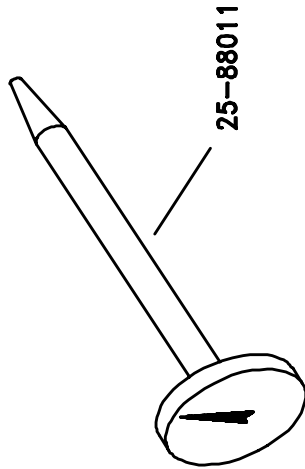
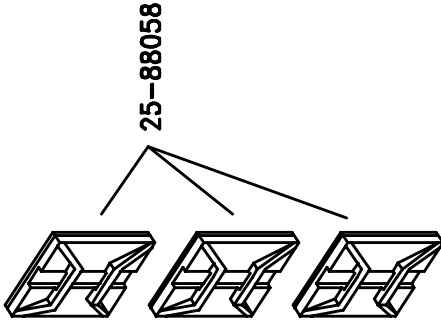




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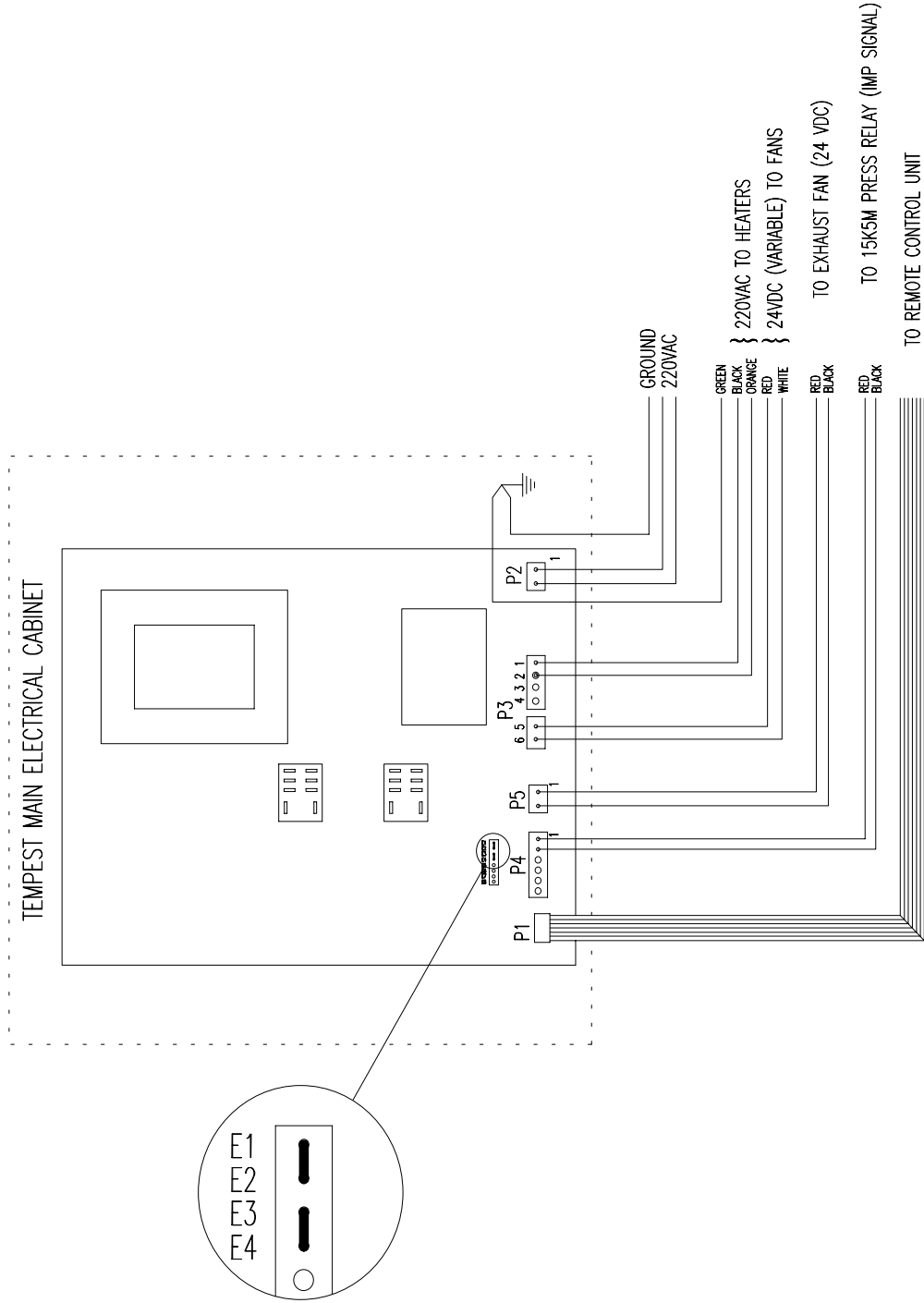


QM46DIT13, 3-9-98



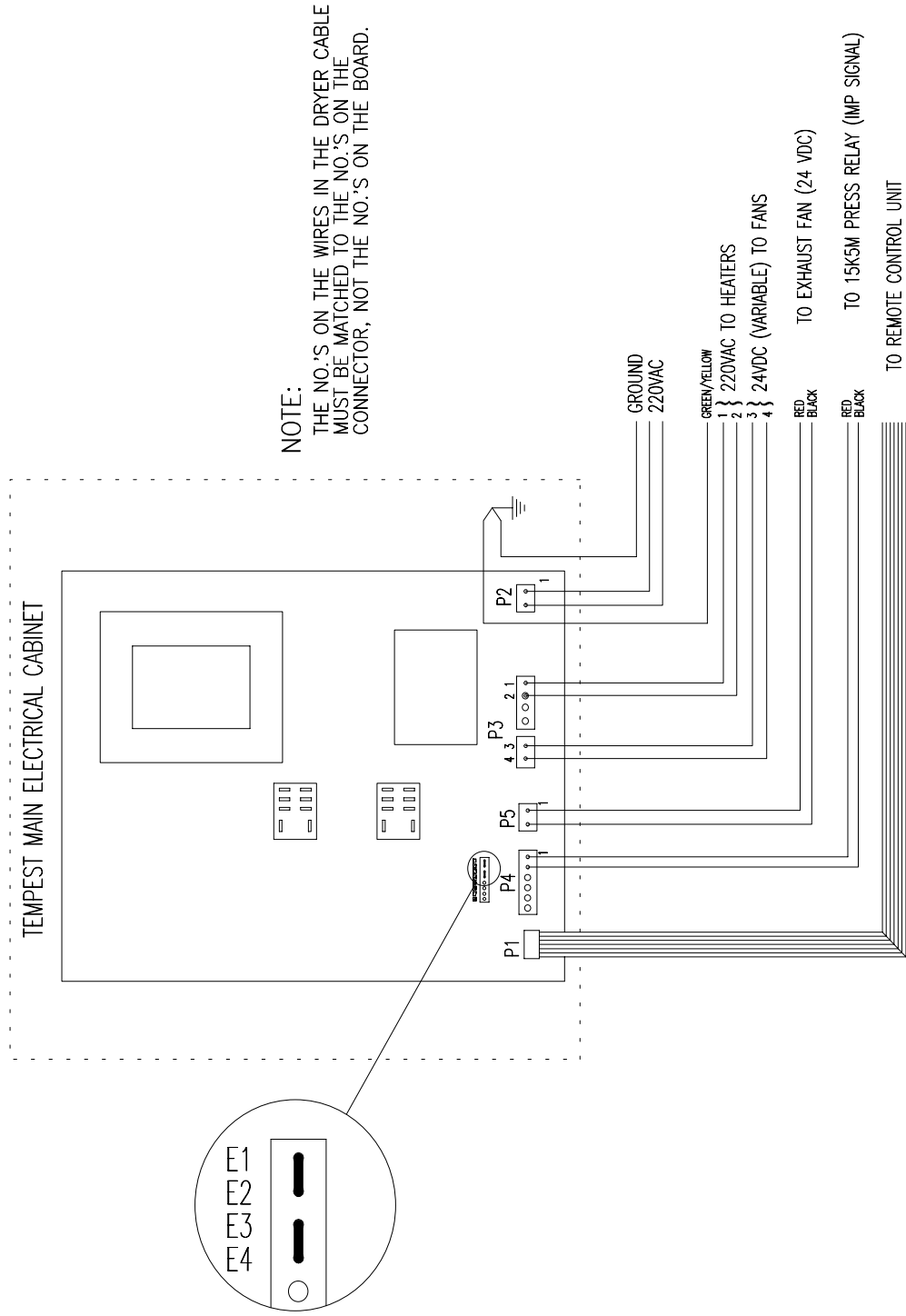
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HEIDELBERG QM46DI TEMPEST  
ELECTRICAL DIAGRAM (U.S. ONLY)



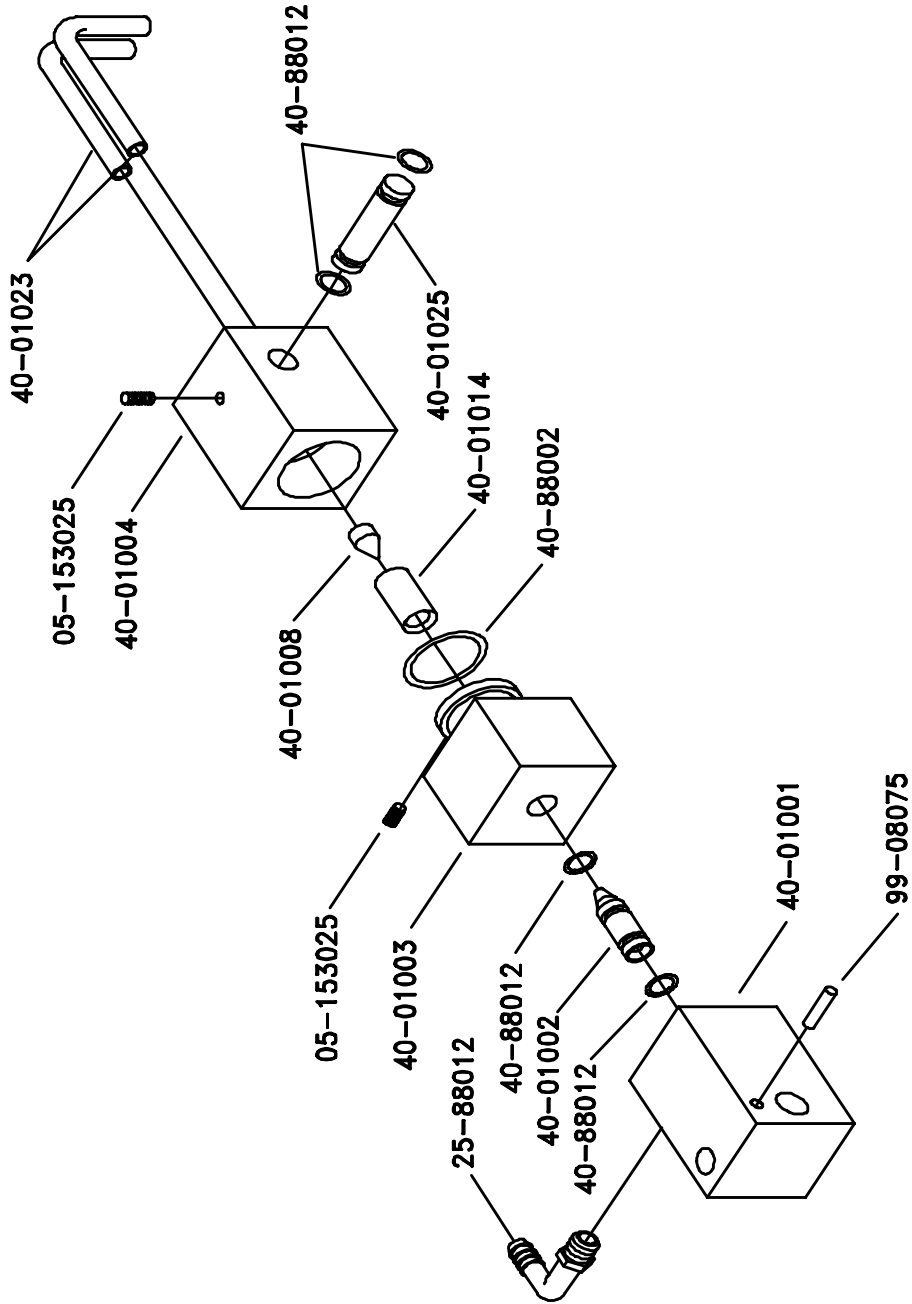
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HEIDELBERG QM46DI TEMPEST  
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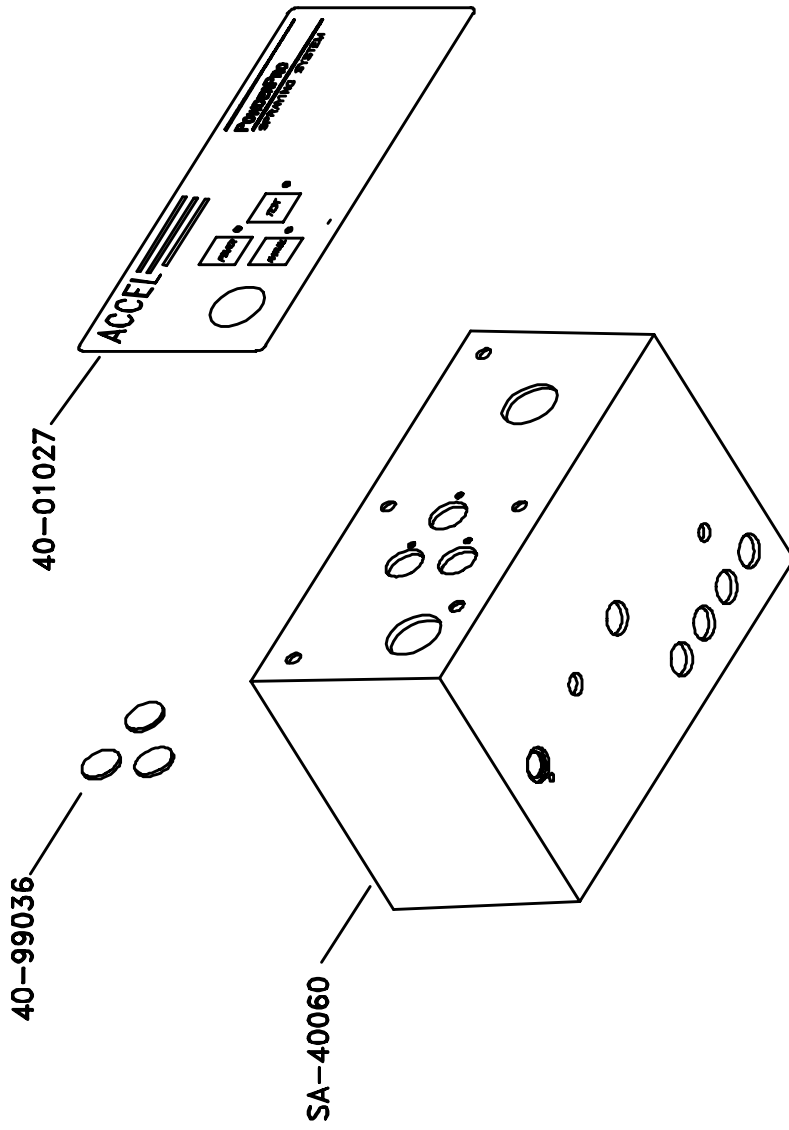


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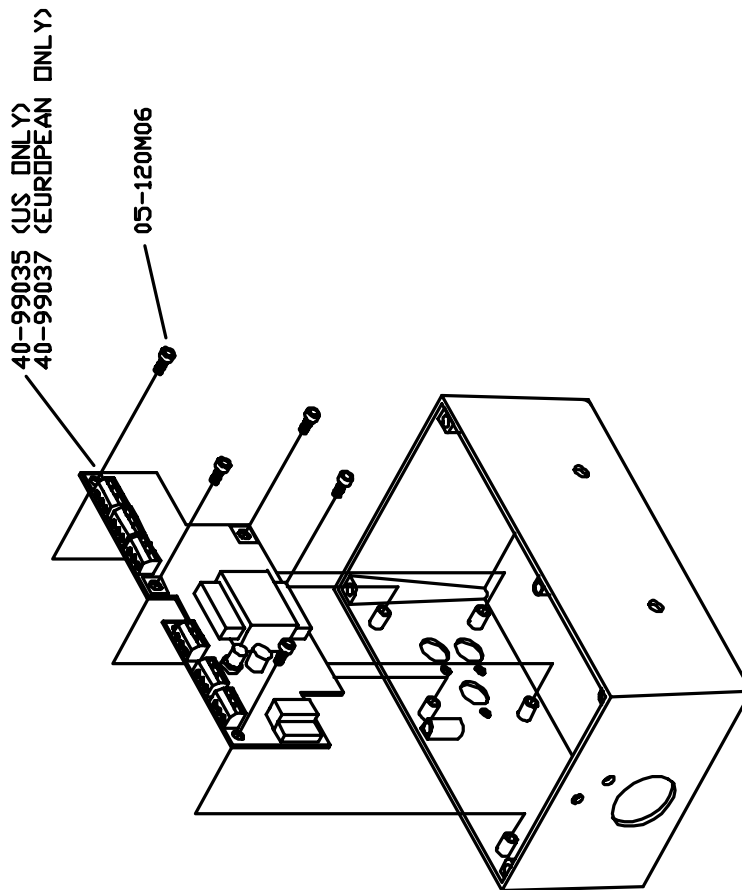
# **POWDERPRO® REPLACEMENT PARTS DIAGRAMS**



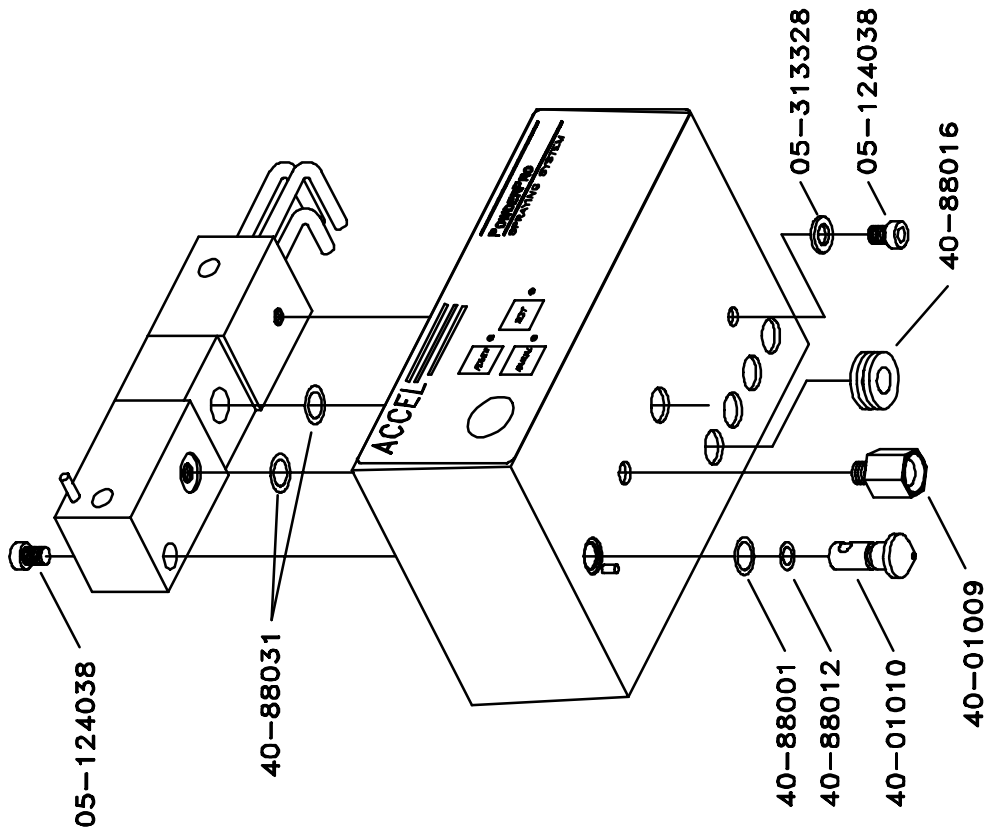
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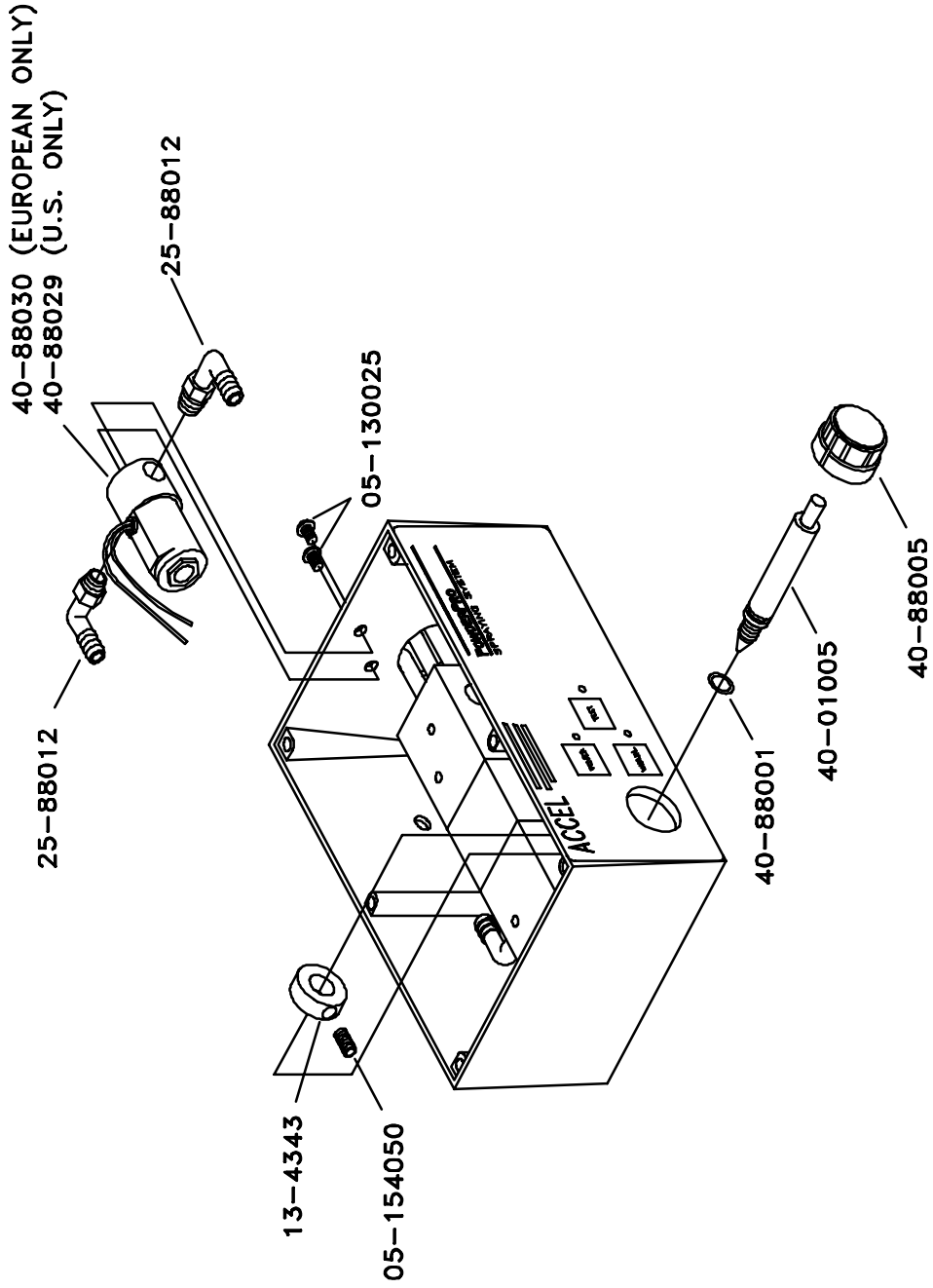
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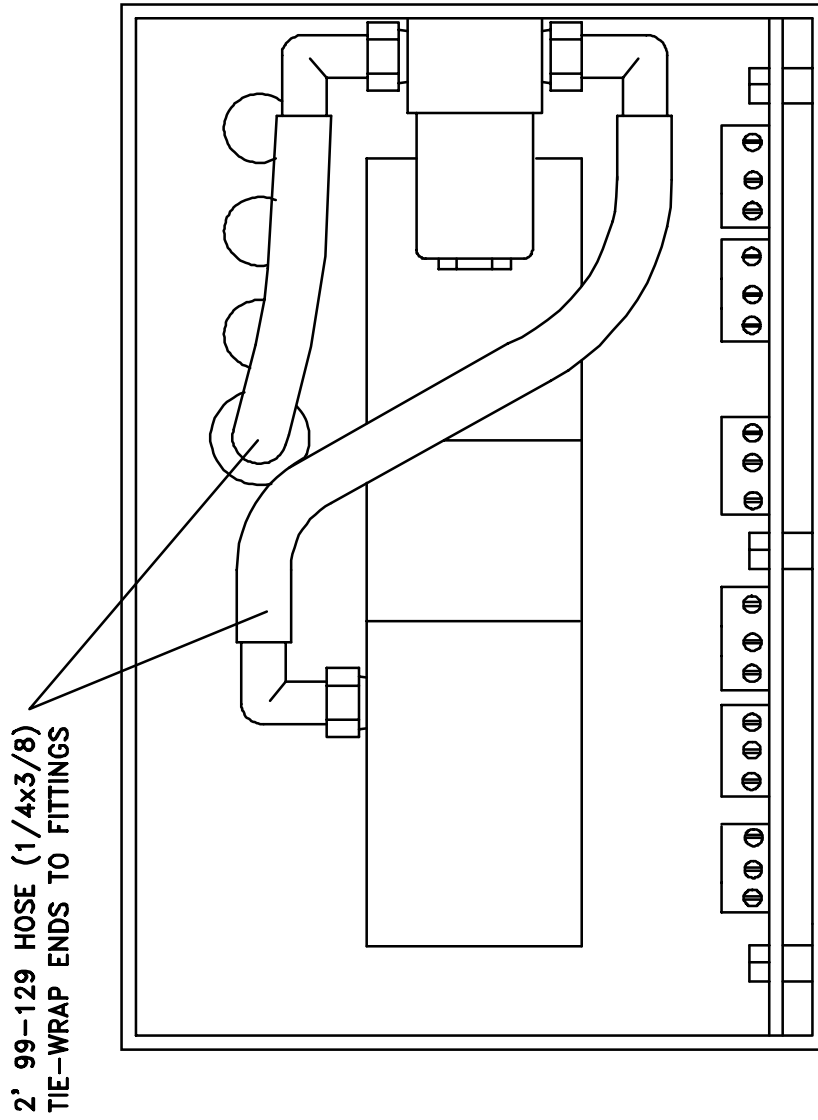
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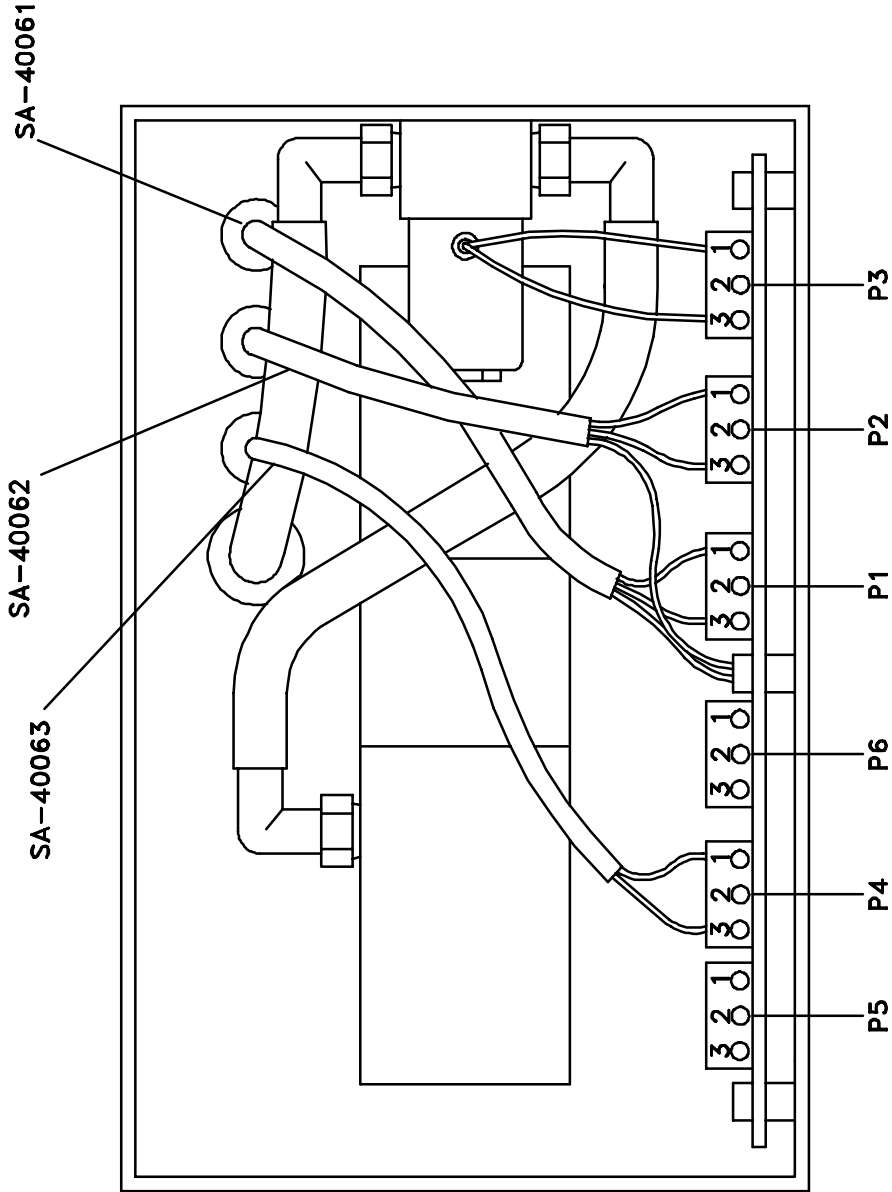
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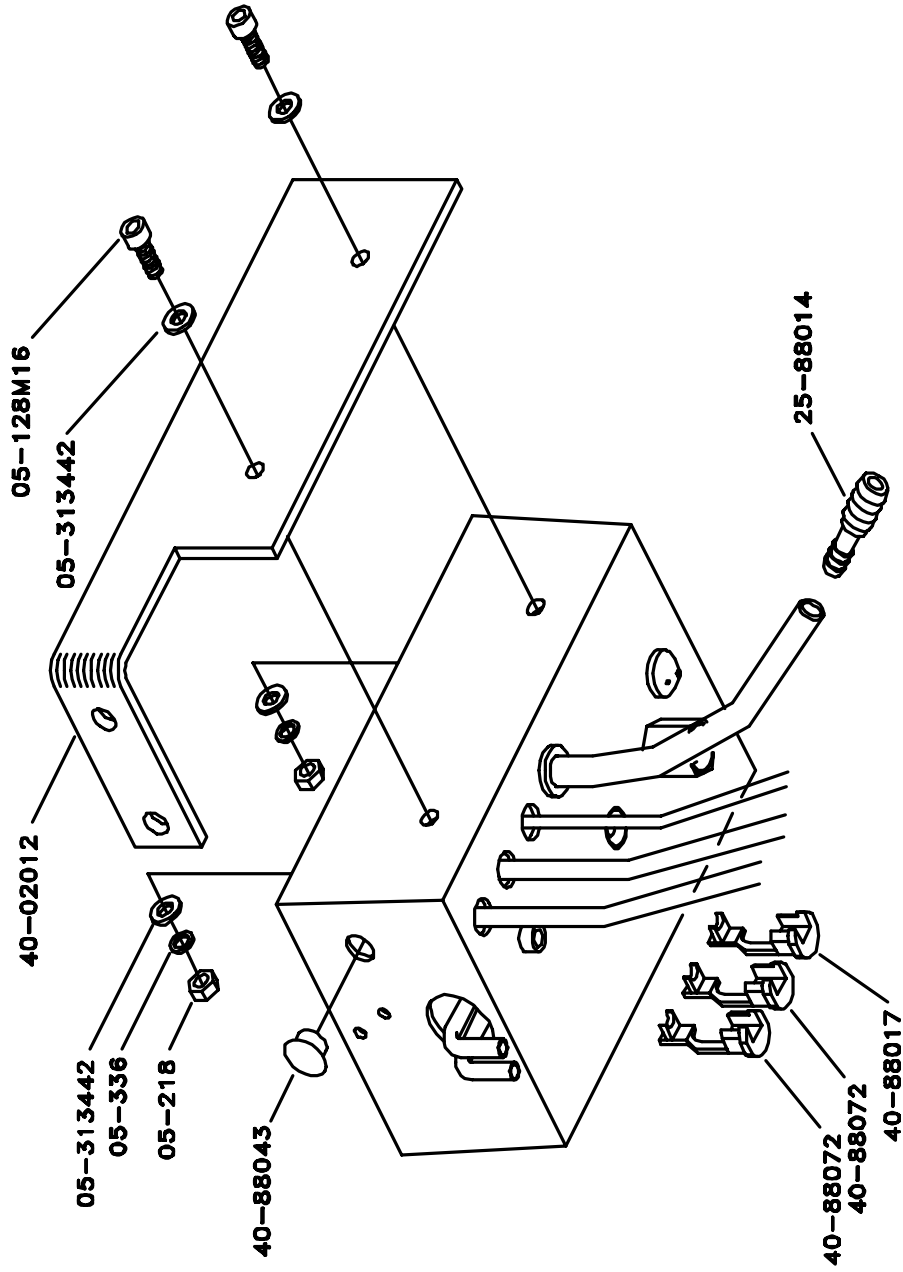
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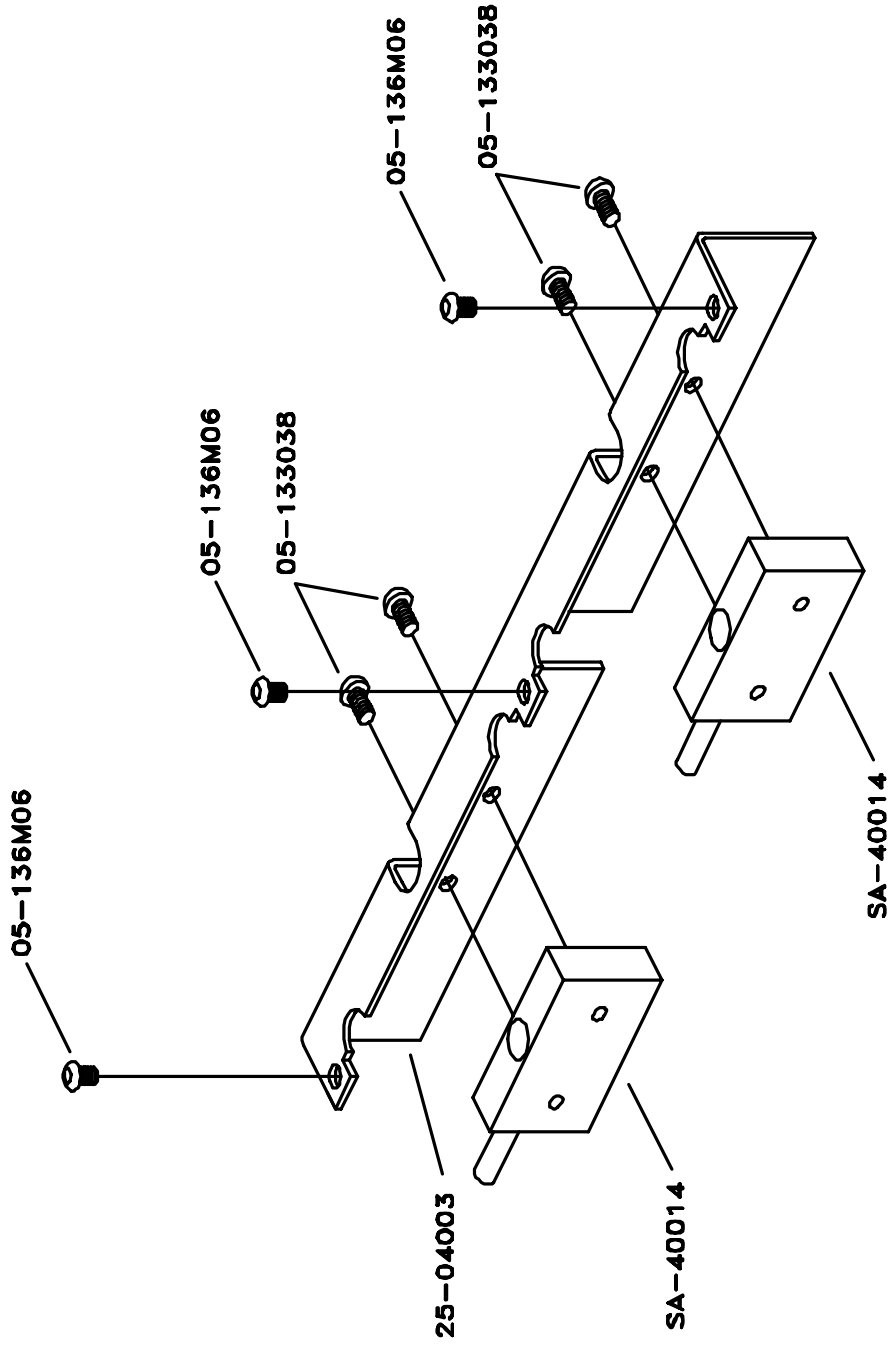
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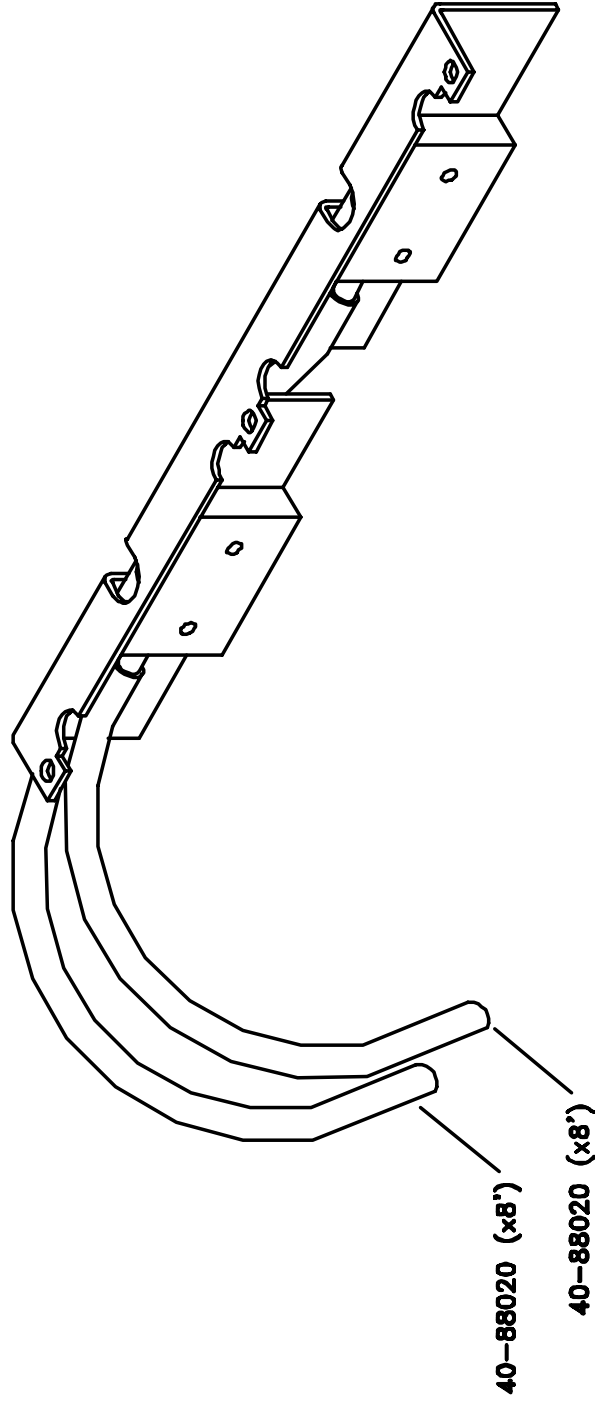
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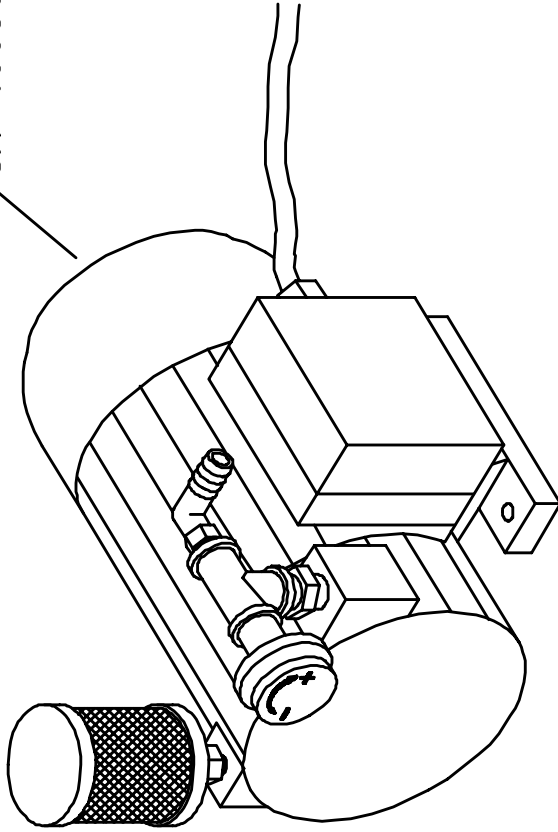


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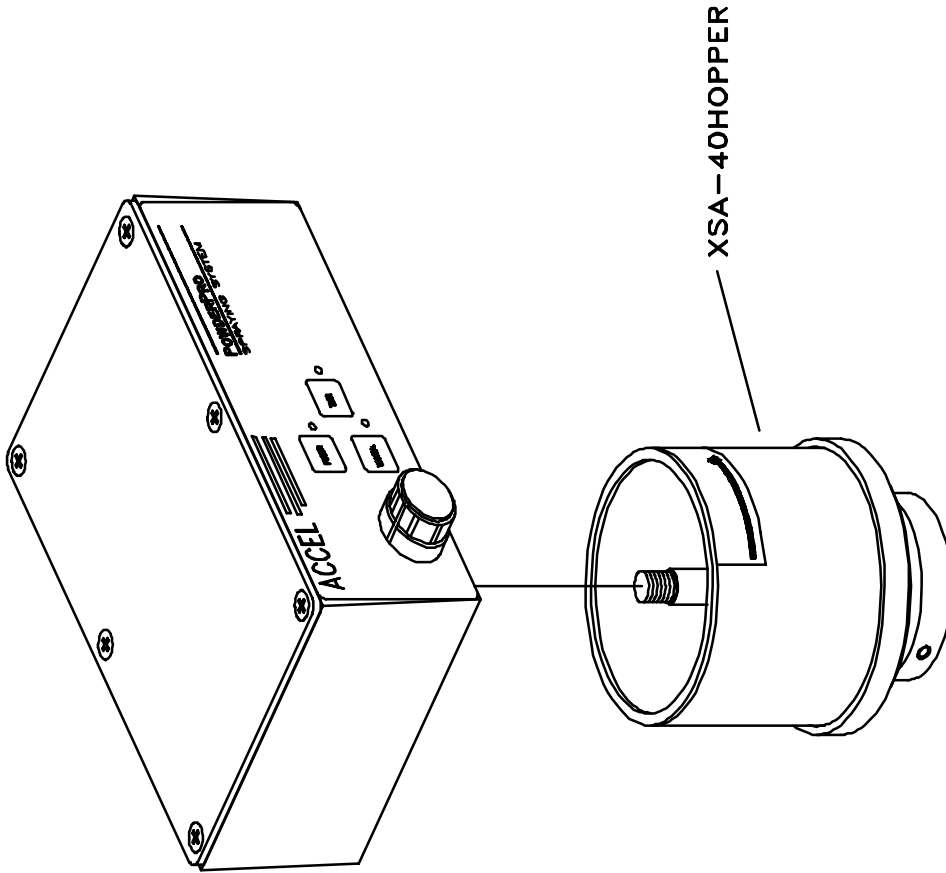


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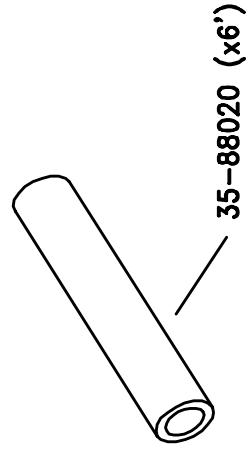
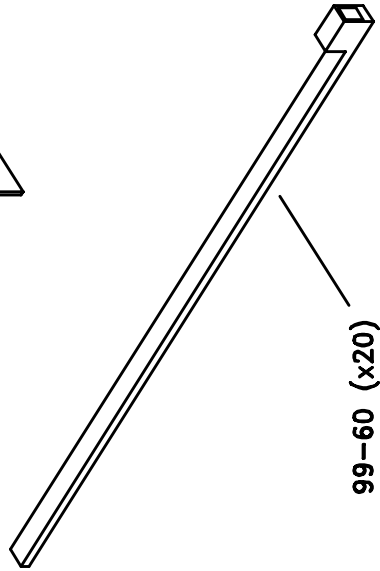
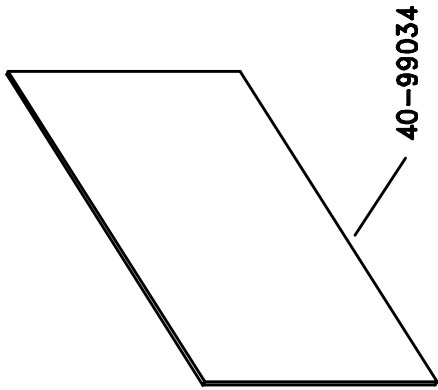
SA-40038 (EUROPEAN ONLY)  
SA-40030 (U.S. ONLY)

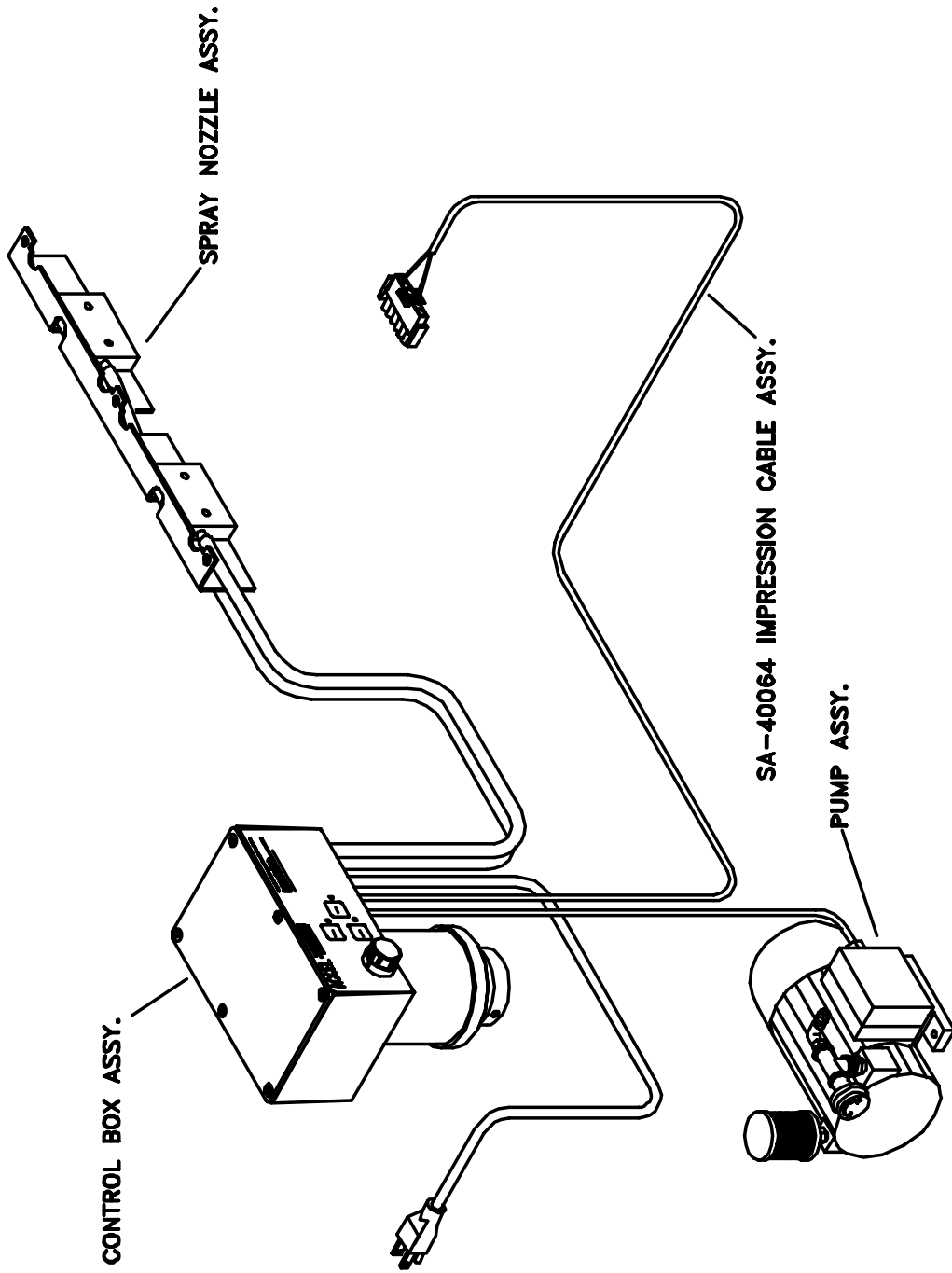


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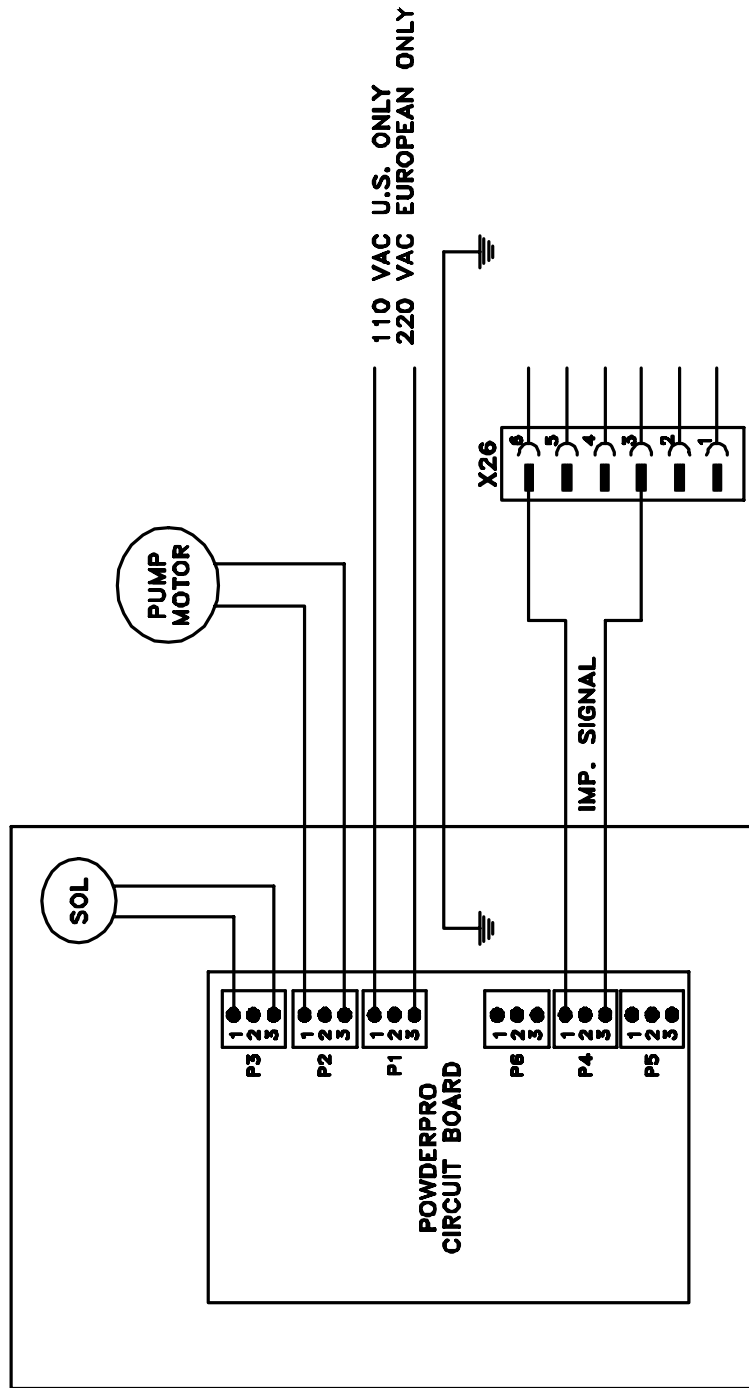
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QM46DIP14, 7-28-98

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QM46DI P15, 7-25-98



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