

SANITECH MARK SERIES OPERATIONAL MANUAL

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SECTION 1 - A GENERAL INFORMATION:

The Sanitech Mark Series machines are designed to convert regular cold tap water into a pressurized wet-steam. The temperature can be adjusted to any output temperature up to 300°F +. This allows the operator to remove grease, oil, mold and other substances without chemical assistance and manual scrubbing. The high temperatures that are produced give you an exceptional bacteria kill and allows one employee with a Sanitech to clean faster and better than a crew using manual methods of cleaning.

SECTION 1 - B ITEMS TO HAVE ON HAND:

1. A good quality water hose to bring cold/warm water from the hose bib to the machine. The best length is 25' or 50'. Use of a long hose (100'+) can cause an airlock in the pump if not purged.
2. A good quality electrical cord (12 or 14 gauge is best). The best length is 25' or 50'. Use of a long extension cord (100'+) can lead to some loss of electrical voltage.
3. Two LP gas bottles per machine. The best size is 40 lb (9.6 gallons). On Mark I & II you can also use the smaller 30 lb tank. They should be "vaporous" tanks. The same type as used on a bar-b-q grill. These tanks sit upright on the rear ledge of the machine between the wheels. There is another type of tank that sits sideways and are used on lift trucks. This type can't be used.
4. Gloves for the operator who is using the Sanitech.

SECTION 1 - C UNPACKING THE SANITECH:

If you are having a Sanitech rep set up the machine and training your employees you should leave the large cardboard box that the machine is shipped in unopened. Inspect the box for obvious damage prior to the trucking company leaving your facility. If damage is apparent note it on the Bill of Lading and call Sanitech. Leaving the box unopened will prevent small parts packed inside from being lost.

1. Cut banding, open the top of the box, remove the interior packing boxes and the steam wand.
2. Turn box on its side and roll the Sanitech out through the open top.
3. Open the parts box you will find: the 50' steel braided steam hose and a smaller parts box.
4. The small parts box will include: the LP gas regulator, a number of nozzles, a bungie strap for the LP gas tank, a yellow top dip-stick and a caster wheel with four bolts.
5. Attach the caster wheel to the bottom front of the machine using the four bolts.
6. Put the nozzles in the nozzle holder on the machine and attach the gas regulator to your tank.
7. The hose and steam wand should be attached using the twist connect fittings provided.
8. The yellow dip-stick should be installed per the directions under "Setting Up the Machine"

SECTION 1 - D WARNINGS – READ BEFORE OPERATING

1. Never leave the unit unattended with the pump "on".
2. Never operate the unit directly under a heat sensor.
3. Do not touch or look down the coil stack when the unit is plugged in.
4. Unit should only be operated on a grounded power source.
5. Gloves should be worn at all times. When cleaning overhead goggles should be worn.
6. Make sure that water supply is open and flowing thru unit before starting pump.
7. Make sure all air is purged from the heat coils prior to starting ignition.
8. Never use hot water on the intake. The unit will not accept water above 140°F.
9. Never hook unit up to a high pressure water line. Pump damage will occur.
10. Use only LP tanks that are "vaporous" and stand upright like a bar-b-q tank. Not a lift truck tank.
11. LP and Natural gas have a distinctive odor. If you smell gas check for a leak before operating.
12. Never operate at a fuel pressure above 8psi on the fuel gauge. Incomplete combustion can occur.
13. Never operate the Sanitech in a temperature controlled environment like a meat locker or a cold room where air is only recirculated and not exchanged.

SECTION 1 – E THINGS TO KNOW & REGULAR MAINTENANCE

1. Never store the Sanitech in an area that is not heated. If the machine freezes the water inside will expand and crack the coils. More than one hole in the coils is a sure sign of freezing.
2. Check the oil level in the pump at least once a month using the yellow dip-stick. The oil should be within the cutout portion of the dip-stick. If low add 30 wt non-detergent automotive oil.
3. Change the oil in the pump once a year by removing the brass hexnut on the bottom of the pump
4. Keep the small inlet water filter and the nozzles free of dirt and debris. When dirt particles lodge in the nozzle the flat fan spray pattern will be disrupted. You should remove the nozzle and tap it to remove dirt. If a large blockage occurs the ignition will terminate automatically.
5. Never remove the locking nuts from under the black plastic knob on the gas regulator. These nuts prevent fuel usage above 8psi. Removal can lead to poor combustion and high CO levels.
6. As previously stated; unit should not be operated in a “cold room”. If you wish to clean these areas leave the unit outside in the normal plant environment where you have natural or forced ventilation. You can run the steam hose into the cold storage areas. Extension hoses are available
7. Freezing of the LP gas tank. When the tank starts to empty a moist film will start at the bottom of the tank. The film will become a frost. When it reaches midtank the fuel pressure will drop. You should switch to a new tank. The old tank can be used again when it heats back up to room temp.
8. You can decrease tank switching by using a larger tank. You can decrease fuel usage by using warm water on the intake (under 140°f).
9. Scale buildup. The #1 cause of pump damage is scale from hard water building up in the heat coils. Scale restricts the coil opening thru which the pump pushes the water. Eventually you will notice a lower pressure at the nozzle due to a restricted water flow. If you have hard water you should use a water filter (available from Sanitech) or descale on a regular basis. See below.

SECTION 1 – F DESCALING PROCEDURES:

Items needed: 5 gallon bucket & old garden hose.

Do a “Dump Test” to see if scale has built up. This will tell if less water is getting thru the coils then when the unit was new. Mark I & II 1.5 gpm, Mark III, IV, V, VI & VII are 2.0 gpm.

1. Connect unit and run water thru it so all air is purged. Put green/white fan nozzle on wand.
2. Place wand in empty 5 gallon bucket and turn pump on. You have scale if it takes longer than 4 min on a Mark I & II to fill the bucket within 2” of the lip. Mark III thru Mark VII more than 3 minutes.
3. To descale get a bottle of liquid descalent (for removal of lime deposits) from the hardware store.
4. Mix the descalent into 2.5 gallons of water in your bucket.
5. Take an old garden hose and cut off a 3’ or 4’ segment from the inlet of the machine. Put the end of this hose in the bucket. Remove the nozzle and place the end of the wand in the bucket.
6. Make sure all air has been purged from the coils. Turn on the pump switch.
7. The pump will draw the descalent in. Let it recirculate for 10 minutes. Save the descalent.
8. Reattach a good water hose and flush with clean water for 5 minutes.
9. Do a “dump test” again and see if all scale has been removed. If not, descale again.

SECTION 1 – G ANTI-FREEZE PROCEDURES:

Items needed: 5 gallon bucket & old garden hose.

1. You can use 1 gallon of anti-freeze and mix it with 2 gallons of water or you can use 3 gallons of windshield fluid, not diluted.
2. Connect the unit and run water through it so that all the air is purged from the coils.
3. Mix your anti-freeze in the bucket or put your straight windshield fluid in the 5 gallon bucket.
4. Follow steps #5 and #6 under Descaling Procedures.
5. When the water coming out of the steam wand changes color the unit is anti-frozen.
6. Next time you use the unit you can save the anti-freeze by pumping it back into the bucket.

OPERATING INSTRUCTIONS FOR SANITECH MARK UNITS

SECTION 2 – A SETTING UP THE MACHINE:

1. **IMPORTANT** - Remove the front panel (below the switch panel) by unscrewing six screws.
2. Inside, on the lower right, you will see a black water pump with a red plug on the top. **THIS RED PLUG MUST BE REMOVED AND REPLACED WITH THE YELLOW DIPSTICK FOUND IN THE PARTS BOX.** The yellow plug/dipstick has a vent in it that allows the pump to breathe. **FAILURE TO CHANGE PLUGS WILL VOID THE PUMP WARRANTY.**
3. Connect the garden hose to the faucet and the machine.
4. Connect the extension cord to the electrical outlet and the machine. The extension cord should be 50 feet or less and the gauge should be 14 or 12.
5. Connect the steam hose to the machine. Connect the steam wand to the steam hose.
6. Connect the LP gas regulator to the LP tank (30lb or 40 lb tank). Connect the LP gas hose to the machine using the quick connect fitting. Open the silver valve on the tank all the way “open”.

SECTION 2 – B TURNING THE MACHINE ON:

1. Turn the water on at the faucet. Open the trigger gun by pulling the handle.
 2. You must let the water run with the trigger gun open for at least two minutes to get all the air out of the heat coils. Put the green or white nozzle (found in the parts box) on the end of the wand.
 3. Turn the pump switch “on”. Pressure will be generated. Wait for 30 seconds before the next step to be sure all the air is out of the coils.
 4. With the trigger gun open, turn the ignition switch “on”. You should hear a slight “click” sound. This sound shows the machine is trying to ignite. Reduce the fuel setting on the fuel pressure gauge to 2psi.
 5. The unit will not ignite the first time you turn the ignition switch “on”. Air is in the gas lines and it needs to be purged. Leave the ignition switch on for 10 seconds and turn it back “off”. Then turn it back “on”. Wait another 10 seconds and turn off. Repeat this process until the machine ignites.
- NOTE: The trigger gun has to be open and the water flowing any time you are trying to ignite the unit.

SECTION 2 – C SETTING THE TEMPERATURE:

1. A good temperature for degreasing and cleaning without using any chemicals is 230°-240°f.
2. The machine should have been ignited at 2psi. You should now turn the black knob on the gas regulator clockwise until it is at 4psi. The temperature will slowly increase.
3. When the increase has stopped, if you are still below 230°f, increase the fuel pressure by ½ psi. Do this until the temperature is in the desired region.
4. The fan nozzles (green, white & optional yellow) will maintain a sharp cutting edge up to 250°f. After this temperature the flat spray will start to “vaporize” or become more rounded. If you wish to sanitize at temperatures above 250°f we recommend that you use the zero degree red nozzle.

SECTION 2 – D CLEANING WITH THE SANITECH:

1. The Sanitech cleans primarily with temperature. It does not try to blast the surface clean with large water volumes and extremely high pressure. Get the nozzle as close to the surface as is necessary to remove the grease or other substances that you are cleaning.
2. Once you have established the correct distance, clean as quickly as possible using a “back and forth” motion. Areas that are being cleaned for the first time might require a slow initial cleaning. Follow-up cleanings can be done much more rapidly.
3. Try to use the trigger gun as infrequently as possible. Each time you close it the heat goes off. When you reopen the gun the ignition will come on in 1-3 seconds. During this time cold water is being pumped thru the coils. **Constant “on & off” will make it difficult to maintain a good temperature.**

SECTION 2 – E TURNING THE MACHINE OFF:

1. Close the trigger gun and walk back to the machine. Turn the ignition switch “off”.
2. Reopen the trigger gun and allow the cold water to pump through the machine until the temperature is down around 100°F.
3. When the steam hose is cool enough to touch, you can turn the pump switch “off”. At this point turn the silver knob on the LP gas tank all the way clockwise to the closed position.
4. You can now turn the inlet water off and disconnect everything.

SECTION 3 – A SAFETY FEATURES:

Sanitech safety devices and controls have been designed to protect the personnel using the unit by automatically monitoring the water flow, water pressure, water temperature, the electrical supply and the ignition system. They make the systems easy to use and highly reliable.

1. **ELECTRONIC PILOT CONTROLLED IGNITION**- This system ensures instant termination of the ignition process in case of malfunction during operation. The thermal coupler function, with dual solenoid operation, permits the main burner to come on only when the pilot is lit.
2. **FLOW SWITCH TO MONITER WATER FLOW**- The flow switch prevents coil rupture in the event of inadequate water supply. It instantly cuts off the electrical current to the ignition.
3. **PRESSURE SWITCH TO MONITER LOW PRESSURE**- If the internal pressure falls below 350 psi the pressure switch automatically terminates power to the ignition.
4. **PRESSURE RELIEF VALVE MONITERS HIGH PRESSURE**- When the internal pressure goes beyond specified limits the relief valve opens automatically to prevent pump damage.
5. **THERMAL RELIEF MONITERS INTAKE WATER TEMP.**- If the water temperature in the pump goes beyond 140°F. This valve opens up to prevent pump seal damage.
6. **THERMAL CUTOFF ON MOTOR**- Prevents motor damage due to overheating.
7. **CIRCUIT BREAKER**- Prevents electrical component damage due to inadequate power supply.
8. **TRIGGER GUN**- If the steam wand is dropped it instantly shuts off to prevent injury to user.

SECTION 3 – B OPTIONAL EQUIPMENT:

Every Sanitech comes with : a 50 ft primary steam hose, a 3 ft long steam wand, an adjustable gas regulator for the LP gas tank & three nozzles: Red (0°), Green (25°) fan, & White (40°) fan.

1. HS-02 Extension Steam Hose 50’ w/quick connect fittings to extend your hose to 100’.
2. IG- 13 Extra Gas Regulator. If you use multiple tanks this makes for a quicker change.
3. WA-03 12” Short Wand. Very good for cleaning equipment and getting into tight spaces.
4. WA-04 3” Pistol Wand. Even smaller for getting into tight spaces.
5. AC-01 Water Filter to prevent scale buildup in hard water areas.
6. AC-03 Thermal Hat for top of coil stack. This deflects heat from going straight up.
7. AC-04 30” Coil Stack Extension. Put on top of coils to prevent access to “flare up” area.
8. AC-05 Spray Bar with three nozzles. Used for wide area cleaning (floors, conveyors).

SECTION 3 – C WARRANTY EXCLUSIONS:

1. Allowing the Sanitech to freeze. This causes coil damage.
2. Running the pump without water going thru the machine. This causes pump damage.
3. Tampering with safety components of the machine.
4. Tampering with electronic ignition and control unit.
5. Using an incorrect type of LP gas tank. Lift truck tanks can not be used.
6. Failure to check oil level in pump or change oil as instructed in this manual.
7. Failure to purge all air from heat coils prior to starting the ignition.
8. Failure to follow written instructions in this manual or abuse of the equipment.

TROUBLE SHOOTING GUIDE

SECTION 4 – A HELP: CONTACT INFORMATION

In the U.S. & Canada call our toll free number 1-800-486-4321 Fax: 703-339-6848

International calls: 703-339-7001 Fax: 703-339-6848

Let us know what model you have, its serial number and voltage (115, 230, etc)

SECTION 4 – B UNIT WILL NOT START (PUMP WILL NOT START) When

you turn the pump switch “on” and nothing happens, this is your section. If the pump does come on but the ignition doesn’t you should bypass this section. The primary voltage (115, 230, etc) runs only the following components: Circuit Breaker, Pump Switch & Motor. The motor is connected to the pump and unloader. The rest of the components are involved in ignition and are 24 volt.

1. Check that a sufficient power supply is available by plugging into an outlet you know is good.
2. Check that your extension cord is good by using another extension cord.
3. Check to see if the center of the circuit breaker has popped up. If it has push it back down.
4. Make sure the wires from the power cord to the circuit breaker to the pump switch to the (TS) terminal strip are tight and that the green ground wires at the top/bottom of the TS are tight.
5. Use a voltage tester to see if the pump switch and circuit breaker are conducting power.
6. If you have good power to the TS the problem will be with the motor.
7. If the motor hums but does not come on you will need to change the motor or the capacitor on the motor.
8. If the motor is silent the motor reset might have tripped. The reset pops if the motor becomes too hot. Take off the front panel. The motor is on your lower left. On the rear left side of the motor (facing the hull) you will feel the reset button. Push it in to reset it. The reset normally trips if the strain on the motor is too great. This strain is caused by the pump being hard to turn. Check to be sure that the oil level in your pump is sufficient, that the unloader is correctly set and that scale buildup in the coils has not occurred.

SECTION 4 – C CIRCUIT BREAKER IS TRIPPING ON A REGULAR BASIS

The circuit breaker on Mark I & II is 15 amp. Mark III & IV 20 amp. Mark V, VI & VII varies by voltage. The settings: Mark I- 5amp, Mark II- 12amp, Mark III- 13.5amp, Mark IV- 14.5amp, Mark V, VI & VII- varies

1. The circuit breaker will trip primarily due to insufficient voltage. Plug the unit into another outlet. If it runs in one or more outlet but not in others then the bad outlets have too great a load on them. You should use a voltage tester. Clip it over the white or black wire from the motor to the terminal strip. You can identify which outlets are overloaded.
2. The oil level in your pump could be bad. Fill it to the proper level and retest the amp draw. When the oil is low the pump will put a high amp load on the motor. Sometimes correcting the oil level will solve the problem. Other times that pump is damaged and must be replaced.
3. If scale has developed in your coils this will put a high amp load on the motor as the pump tries to push water through a restricted opening. See “dump test” in Descaling Procedures.
4. Your extension cord might be bad. Use a cord no longer than 50’ and 14 gauge.
5. The unloader might have been moved which will change the amperage draw. The unloader is attached to the pump. It is located at the right rear of the pump. If you turn the knob counter clockwise you decrease the amp load. Clockwise increases it. Reset amp load to proper level.

SECTION 4 – D UNIT WILL NOT IGNITE:

This is a catch-all complaint. It should be taken a step at a time. Here are the three main categories:

1. **IMPROPER USAGE –MENTAL OPERATING MISTAKES**
2. **“CLICK” SOUND PRESENT BUT IGNITION DOESN’T TAKE PLACE**
3. **NO “CLICK” SOUND- ELECTRONIC TROUBLE SHOOTING NECESSARY**

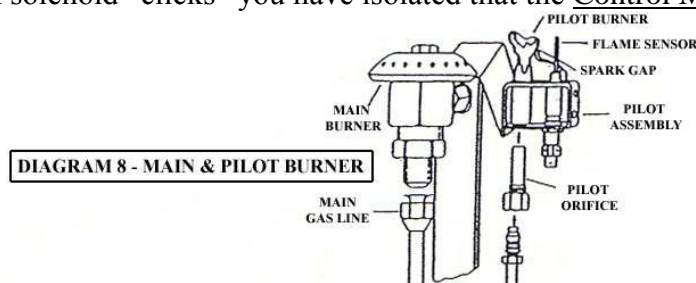
SECTION 4 – E IMPROPER USAGE (MENTAL MISTAKES)

1. Make sure the LP bottle is not empty and that the valve on top is open.
2. Make sure that the fuel gauge is showing at least 2 psi. Adjust the gas regulator knob.
3. Make sure that the trigger gun is open and water is flowing out. The unit will not ignite without the trigger open and both the pump and ignition switches turned to “on”.
4. Make sure there is a nozzle on the end of the wand. Ignition won’t start without a nozzle.
5. Make sure the nozzles are clean. A partial nozzle blockage will stop the ignition process.
6. Make sure that sufficient water is being supplied to the machine.
7. If you are using a new tank it is possible that the air wasn’t properly purged from the new tank. This air will sit on top of the gas and air doesn’t burn.
8. Turn the ignition switch on. Wait 15 seconds. Turn it off and back on. Wait another 15 sec. Do this at least five times. Air might be trapped in the gas lines and it takes a while to purge it.

SECTION 4 – F CLICK SOUND PRESENT BUT IGNITION DOESN’T TAKE PLACE

The “click” sound is generated by the pilot solenoid valve opening up 1-4 seconds after turning the ignition switch “on”. If you hear the “click” sound it means that the unit is trying to light. If this “click” sound is not present go onto the next section.

1. The problem will be in the pilot burner. A diagram is provided on this page.
2. The system works this way: When the pilot solenoid opens (click sound) gas goes down the smaller copper pilot gas line. It passes thru the pilot gas orifice. This has two holes the size of a human hair. A small amount of gas gets thru these holes and is lit by an electronic spark. The heat of the pilot flame is sensed by the flame sensor. This creates a small electrical charge which goes back on the white flame sensor wire to the control module and main ignition starts.
3. First you want to see if you are getting a pilot flame. Put a brick/concrete block under the front of the machine. You will be able to see the coils and burner. Have someone start the machine so that the pump is on and water is flowing. Turn the ignition “on”.
4. **If you see a strong pilot flame** then the problem will be in the flame sensor, the flame sensor wire or the blue Control Module in the machine.
 - Check that the flame wire is not burned and is connected well to the flame sensor and position #8 on the CM (Control Module).
 - If the wire is fine remove the flame sensor and replace it with a new one.
 - If this doesn’t work remove the main solenoid wire from position #1 on the CM and touch the metal end of this wire to live 24 volts on the 24 Volt Terminal Strip row #2 right screw. You should hear a “click” sound. This shows that the main solenoid is working.
 - If the main solenoid “clicks” you have isolated that the Control Module is bad. Replace.



Click sound present but ignition not taking place (continued)

5. **If you don't see a pilot flame** then the problem will either be that your pilot burner is not generating a sufficient spark or not enough gas is getting thru the pilot gas orifice.
6. To check the spark please make sure that the orange electrode wire is secured tightly to the control module at position #10. Pull it off the CM and put it back on. Check that the wire is not burned.
7. Check that the pilot burner itself is not bent so that it is touching or is very near the coil. This will cause the spark to arc onto the coil instead of just above the pilot gas orifice.
8. If you don't have a spark replace the pilot burner.
9. If you do see a spark and it is in the right place then not enough gas is getting thru the pilot gas orifice. This is the #1 reason why the machine won't light if you are getting a "click". The pilot gas orifice has two very small holes on the top of it. The holes can be blocked by dirt particles in your gas, or by moisture that has fallen on the pilot orifice. Replace the pilot gas orifice.
 - Use a ½" wrench to remove the small copper gas line attached to the pilot gas orifice.
 - Use the same wrench to remove the pilot gas orifice from the pilot burner.
 - Remove the other end of the pilot gas line and pull the gas line out of the machine. Blow thru the gas line. This will remove any dirt particles from the gas line.
 - Put the new orifice in and reattach both ends of the gas line. Make sure they don't leak.
 - It is a good idea to keep a spare pilot gas orifice and a spare flame sensor.

SECTION 4 – G NO CLICK SOUND / NO IGNITION

When you turn the ignition switch "on" and don't get a "click" sound first go thru Section 4 - E Improper Usage. If you have done this then one of the electronic components of the ignition system is stopping the ignition (as it should) or one of these components is bad and needs to be replaced. Refer to the diagram below for this section. The 24 Volt Terminal Strip (TS) is where most of the testing will take place.

- The 24 V Terminal Strip has two bolts securing it at the top and two securing it at the bottom.
- In between you have 4 rows with a connection screw on the right and the left.
- These rows are referred to as Rows 2, 3, 4 & 5 in the troubleshooting guide.

There are three reasons that the click sound would be absent and the components are all perfect:

- 1) You have scale building up in the coils that is restricting the water flow and causing the flow switch to terminate the electrical supply. If you have noticed a low water or pressure output and scaling is a problem in your area, you should do a “dump test”. See: Descaling Procedures.
- 2) The pump may be damaged and putting out low pressure. This is especially true if you are getting a lot of vibration. If the internal pressure falls below 350 psi the pressure switch will terminate the electrical supply to the ignition.
- 3) You have a wire that is loose or off. Refer to the wiring diagram and make sure they are tight.

If you do not have any of the above problems you will need to do electronic trouble shooting. The best way is with a low voltage tester that measures 5-50 volts. These are available at Home Depot for under \$5. They are in the electrical section on a cardboard backing marked “Electrical Tester”. One model is made by A.W. Sperry, model ET-200A. It is about 6” long with a yellow body and two wires w/clips.

- Always make sure that you use it only on the 24 V terminal strip . If you touch it to the 115 V terminal strip you will blow the light bulb of the tester.
- Put one of the alligator clips on a ground position. If you refer to the diagram you can use any of the 4 positions on the top of the Control Module.
- The other alligator clip will be used on the terminal strip at different positions. If the light on the tester stays lit you know that power is good. When the light goes out you will know which component is bad.

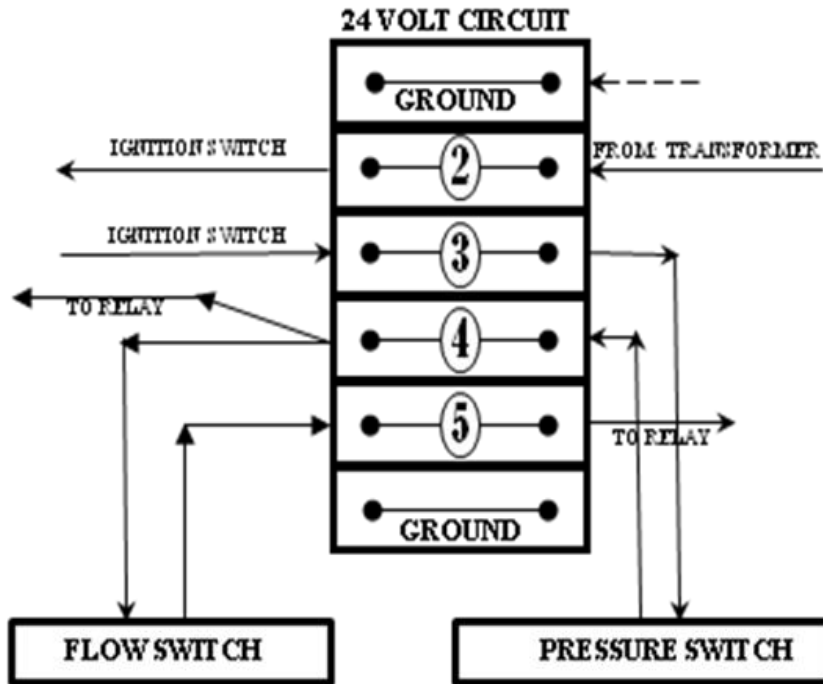
SECTION 4 – H ELECTRONIC TESTING OF TERMINAL STRIP

There are two Terminal Strips on the Mark Series systems, a 110 Volts Terminal Strip and a separate 24 Volt Strip. The Ignition system on the Mark Series models operates on 24 Volts. All electronic testing for any Ignition related issues is done on the 24 Volt Terminal Strip. Please refer to the diagram below. To trouble shoot ignition problems, the machine should be fully connected with water flowing thru the unit, the trigger gun in the open position, nozzle on the wand, the Pump and Ignition switches in the “On” position. Do not connect the LP gas tank.

1. The 115 V that drives the motor is reduced by a transformer to 24 V for the ignition system. The top and bottom most rows on the Terminal Strip [TS] are ground positions.
2. The low voltage enters the TS on **Row 2 Right** screw. Take the alligator clip that is not attached to ground and touch it to this screw. If you don’t get a light or read power replace the Transformer.
3. The power then goes from **Row 2 Left** to the Ignition switch. It returns from the Ignition switch on **Row 3 Left**. Make sure the Ignition switch is “On”. If no power at **3-L** replace Ignition switch
4. Next power goes from **Row 3 Right** to the Pressure switch and returns on **Row 4 Right**. If no power at **4-R** replace Pressure switch.
5. Next power goes from **Row 4 Left** to the Flow switch and returns on **Row 5 Left**. If no power at **5-L** replace Flow switch. This is the most common component to go bad.
6. The power next goes from **Row 5 Right** to the Relay. Check that the relay wires are tight and the terminals are not damaged.
7. Remove the wire from **Position #6 on the Control Module** put the alligator clip on the end of this wire. If no light replace the Relay.
8. You now need to check if the Pilot Solenoid is good. Take the black wire out of **Position #3 on the Control Module**. This wire has a plastic shield. Put a small screw into the end of the wire so that metal to metal contact can be made. Then take this wire and touch it to **Row 3 Right** on the Terminal Strip. You should hear a “click” sound when the solenoid opens. Take the screw out of the wire and put the wire back in **Position #1 on the Control Module**.
9. If the solenoid was good and you had power on the wire going to **Position #2 CM**, then you should replace the Control Module.

SECTION 4 – I (EYE) ELECTRONIC TESTING WITH A JUMPER WIRE

It is better to use a low voltage tester. However, you can test with a short “jumper” wire. You can remove from the terminal strip the two wires going to each component. In the case of the flow switch this would be the wires on **Row 4 & 5 Left**. You can then put a jumper wire between these two screws to complete the circuit. If you then get the “click” you will know which component to replace. **Do not use the LP tank if you have jumper wires in the machine.** They are for testing purposes only.



SECTION 4 – J FLAME GOES OUT OR IS IRREGULAR:

1. If unit is being operated outdoors, windy conditions can cause the pilot flame to be blown out. This will shut the main burner down. It will automatically try to relight.
2. Too much gas pressure can cause the ignition to go off and on. Reduce the fuel pressure to 6 psi or lower.
3. Particles of dirt in the pilot gas line can cause the pilot gas orifice to be temporarily blocked. This knocks the pilot flame out and the main ignition terminates. See Section 4-F-9.
4. There might be a pinpoint leak in your heat coils or a loose water fitting. The water can hit the pilot and knock it out. Check for leaks and tighten.
5. Condensation forms on the outside of the coils when the machine is in use. A few drops of water are always coming off the coils. If these drops fall directly on the pilot it can put the pilot flame out or temporarily block the pilot gas orifice. You can bend the straight burner bracket a few degrees to remove it from being hit directly by the drops of condensation.

SECTION 4 – K UNIT DOES NOT RUN HOT ENOUGH:

1. It is possible that your temperature gauge is not giving a good reading. You can test this by using the green or white fan nozzle. Turn the ignition on and let the temperature stabilize. Increase the fuel pressure by ½ psi until the flat spray pattern starts to “round out”. This starts to occur at 250°F. If the temperature gauge reads lower than this when the “round out” starts then it is bad.
2. Check to make sure you have enough gas in the tank. A tank that is almost empty will not have a high enough gas pressure to get you to top temperatures. Put a fresh tank on the unit and test it.
3. Make sure your gas regulator is not set too low. Turn the knob clockwise to increase the fuel.
4. You might have the wrong size steam nozzle on the wand. If you are using a nozzle that was not supplied by Sanitech please call us and we will tell you the correct specifications.
5. The flame should be primarily blue in color with a little yellow. If the flame is very yellow you might have a partially blocked main burner or a gas leak.
6. The main burner should have 360° of flame. If there is an interruption in this pattern some of the holes in the burner might be blocked.
7. A gas leak will happen at the point that the main and pilot gas lines attach to the burners. If these fittings aren't tight you will see soot stains at these connection points. Tighten these connections.
8. If you have an old machine, and you see a lot of soot on the coils, it is very possible that the coils have slowly fallen down and are now too close to the burner. This creates a smaller combustion area and you can not get the same BTU output. Replace or repair coil.

SECTION 4 – L LOW WATER FLOW/LOW WATER PRESSURE:

1. Check to see that you have sufficient water coming into the machine.
2. Check to see that the inlet filter screen (where you hook the garden hose) is not blocked up.
3. Make sure your nozzle is clean and not fully or partially blocked.
4. You might have an air-lock in the machine. Take the nozzle off and turn the pump on. Wait about two minutes and all the air should be removed.
5. Your pump might be damaged and not producing sufficient pressure.
6. Someone might have moved the unloader setting counter clockwise which will reduce the water flow. You can check this by using an amp meter. The amp meter can be clipped over the white or black motor wire. The proper amperage readings are found in Section 4-C. If the readings are too low increase the unloader by turning clockwise until the proper readings are achieved.
7. The most common reason for low water flow/pressure is that scale is starting to buildup in the heat coils and thermal well (where the temperature gauge probe is at the outlet of unit). You can check for scale by following the instructions in Section 1-F.

SECTION 4 – M WATER IS LEAKING FROM THE UNIT

A small amount of water will always be found under an operating machine. Condensations forms on the outside of the heat coils and drips off the coils onto the ground.

1. If you had been using hot water (above 140°) on the intake the thermal relief (dump) valve could have been activated. This valve is located on the pump at the lower port that faces the motor. It will reseal when cold water is used in the machine again. Hook cold water up & see if leak stops.
2. If you have left the pump running for a long time with the trigger gun closed the water inside the pump will get very hot as it re-circulates. It will activate the thermal relief valve. See #1 above.
3. If your machine has **stainless steel coils** it will have a “rupture disk”. This is located directly below the last portion of coil before the steam exits the machine. The rupture disk is located inside the rupture disk holder made of stainless steel with a six sided hex nut. If water is coming out of this point there has to be a reason for it. The rupture disk must be replaced before testing.
 - If the machine was allowed to freeze the water inside will expand when it becomes ice. The rupture disk will pop to protect the coils from being damaged.
 - If the flow switch has failed in the “open” position the rupture disk will go. When the trigger gun is closed with the ignition running, the flow switch should instantly shut the ignition off. If it fails to turn the ignition off then the water in the coils directly above the burner gets superheated. When this water goes from a liquid to a gaseous state a rapid expansion occurs. The rupture disk will pop to save the coils from being damaged. When you install a new rupture disk check at least 10 times that the flow switch is terminating the ignition instantly when the trigger gun is closed. If it does not reopen the gun instantly & order a flow switch.
4. Water may be leaking from the small inlet water hose that goes from the hose swivel fitting to the pump. This is not a high pressure hose. It will blow out if you attach the machine to a high pressure water line to save the pump from being damaged. It will also soften and can blow out if you have hooked the unit up to hot water. This hose will need to be replaced.
5. Water can leak from the three “O” rings in the Sanitech. There is an “O” ring in the ¼” quick connect socket that holds the nozzle. There is an “O” ring in the 3/8” quick connect socket at the outlet of the machine into which the steam hose connects. The last “O” ring is in the quick connect socket that attaches the steam wand to the outlet of the steam hose.
6. Water can leak from the coils. There is a diagram in this manual of the coils. You want to make sure that the leak is not occurring where the coils connect. If it is you should tighten these connections. Otherwise, use the diagram to determine which coil is leaking and order it.

DIAGRAM 1 - CONTROL PANEL LAYOUT

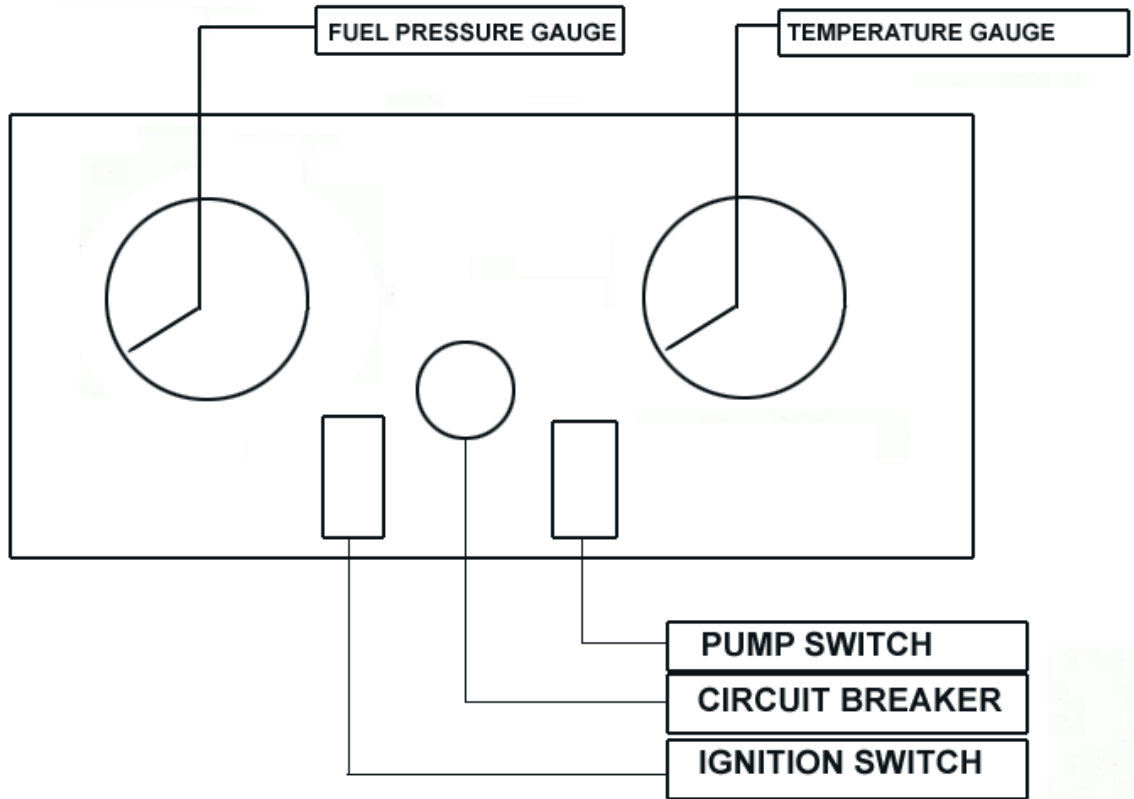


DIAGRAM - 2 SIDE & FRONT PANELS

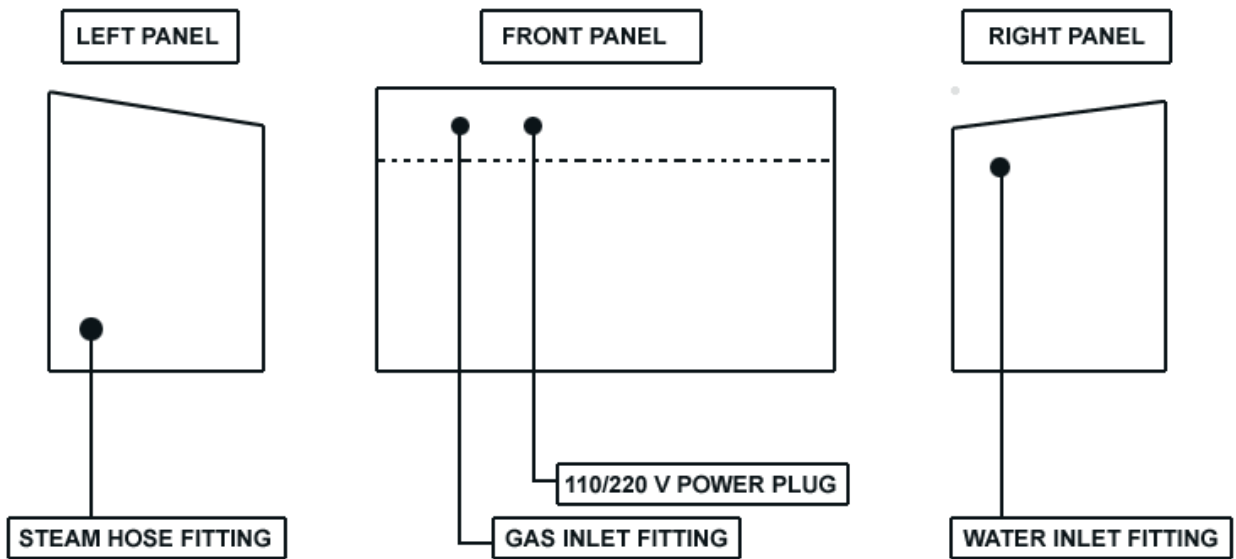


DIAGRAM 3 - WATER FLOW SCHEMATIC

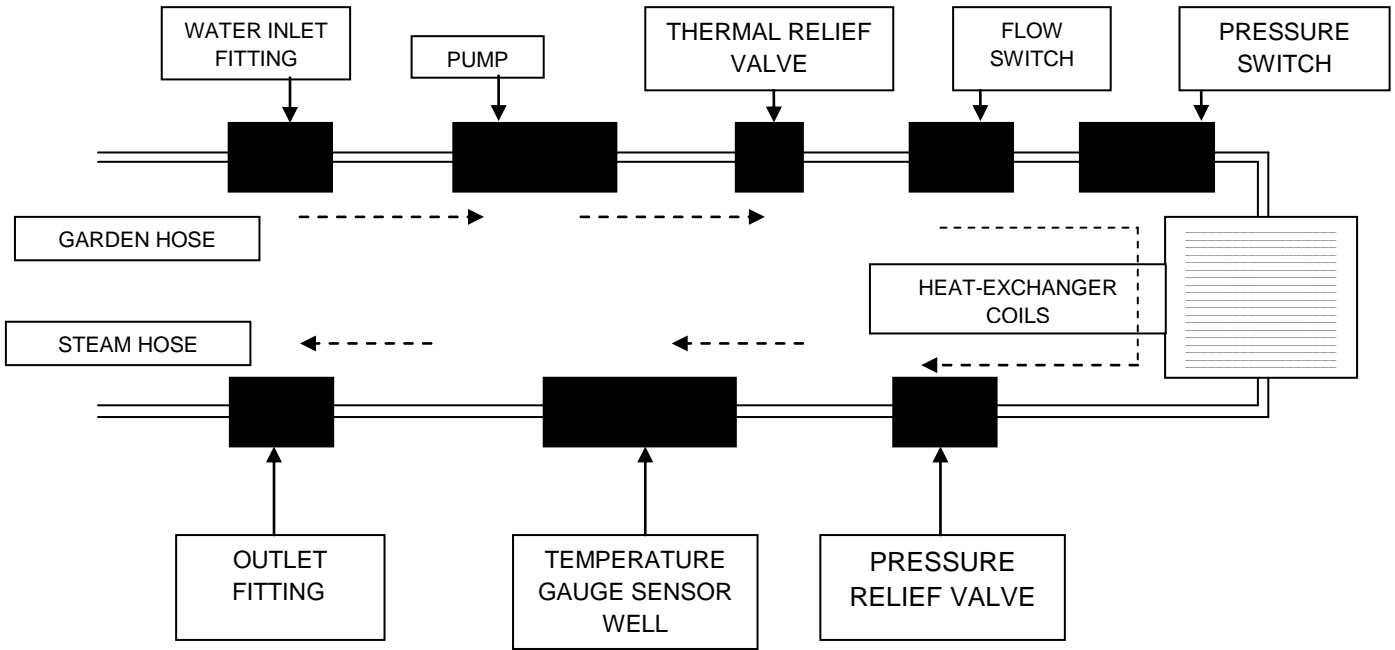
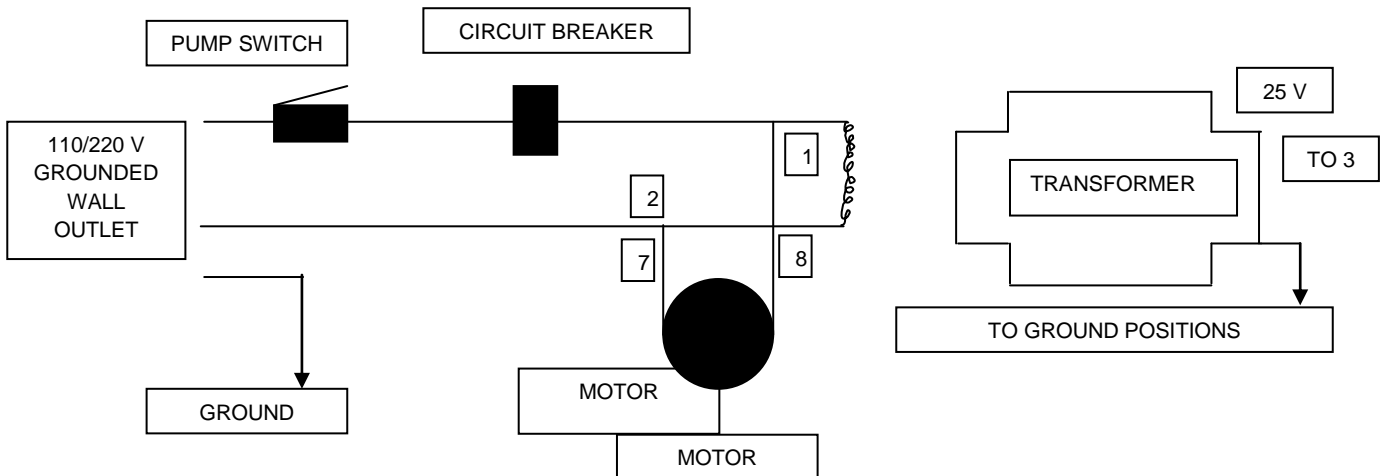
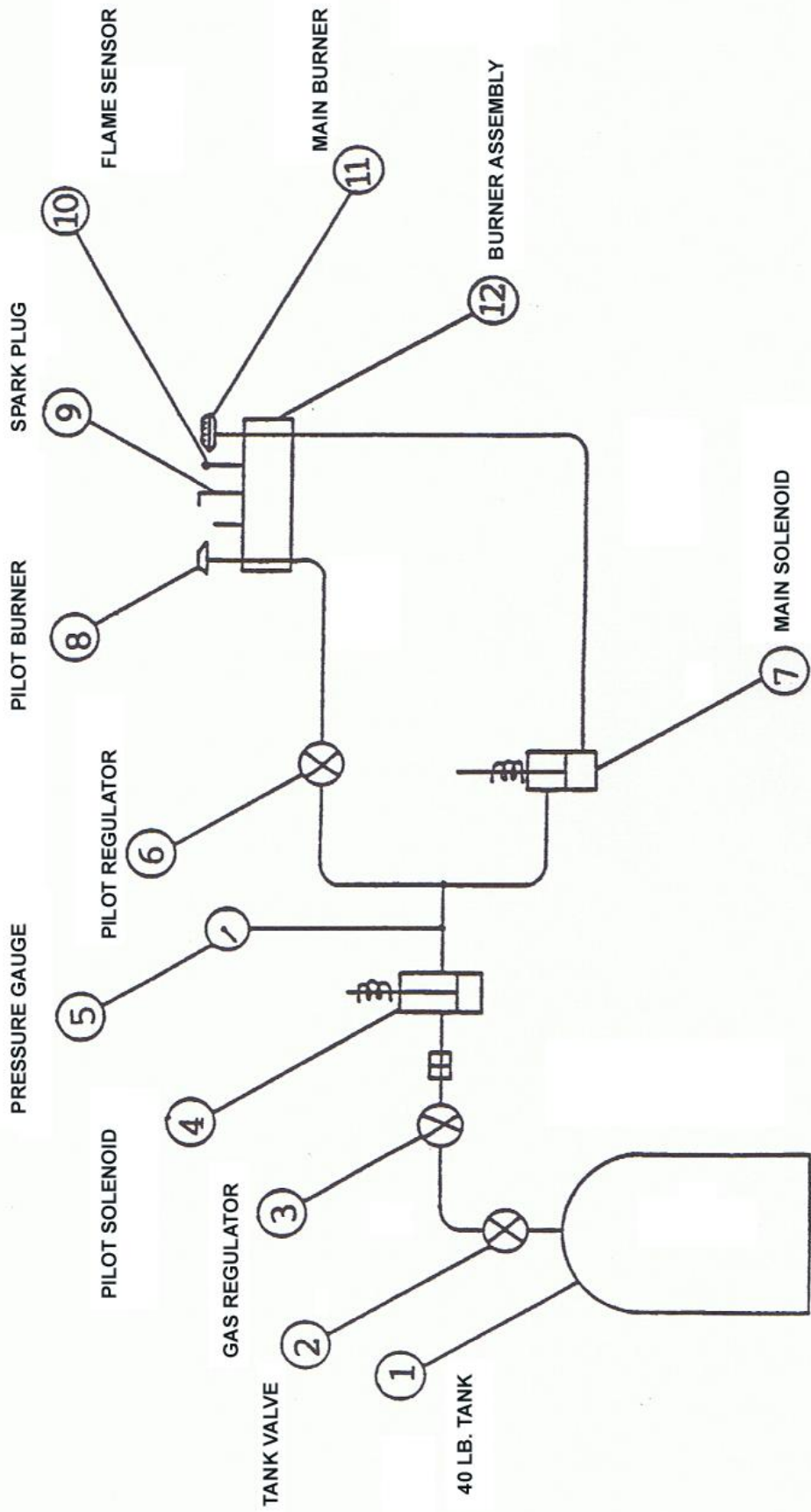


DIAGRAM 4 - ELECTRICAL SCHEMATIC



DRAWING 4. GAS FLOW SCHEMATIC



HEAT EXCHANGE COILS

THERE ARE THREE COILS IN AN ALUMINUM COIL SET. TWO COILS IN A S.S. COIL SET

- **OUTER COIL:** The water first enters this coil and is heated slightly
- **VERTICAL COIL:** Only in aluminum coil set. This coil receives water from the outer coil and further heats it. The water then goes to the inner coil.
- **INNER COIL:** The final coil. This is where most of the heating takes place. When the water leaves this coil it goes directly to the steam hose.

HOW COILS MAY BE DAMAGED:

1. The most common coil damage occurs when the machine is allowed to freeze. The water in the coils becomes ice, expands, and causes the coil to split.
2. The next most common way occurs when the air is not purged from the coils prior to ignition. Air can be purged by running water through the system for at least one (1) minute before starting the unit. The burner will superheat an empty section of coil to the point that a split will develop. This split will occur on either the vertical or inner coil. The outer coil is not prone to "air lock" damage.
3. Lastly, a rupture can occur on the vertical or inner coil if the flow switch malfunctions. The flow switch is supposed to turn the ignition off when the trigger gun is closed. If it malfunctions and doesn't turn the ignition off then the water in the coils expands and the coil ruptures.

HOW TO CHANGE A COIL — Tools Needed: two adjustable wrenches and Teflon plumbing tape

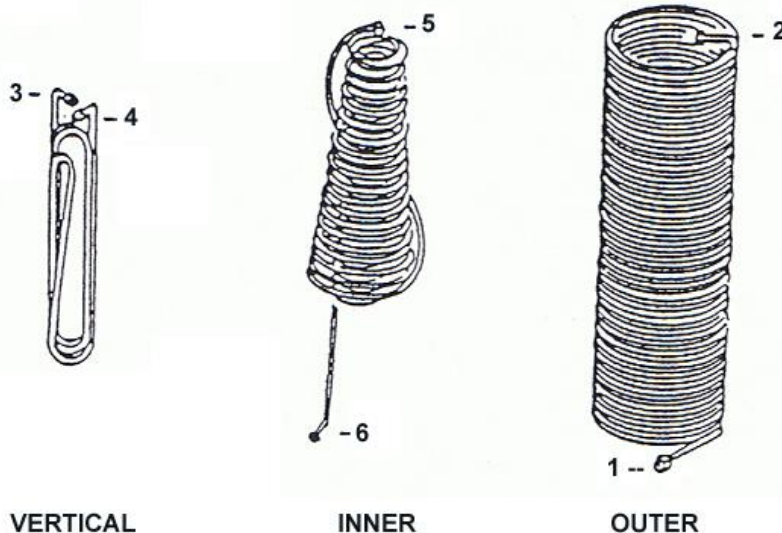
OUTER COIL: To remove the outer coil you need to remove all coils from the machine. Do this by removing fitting #1 on the outer coil and fitting #6 on the inner coil. You will now be able to slide the full set of coils out the top of the coil stack. Remove the old outer coil by loosening fitting #2. Put Teflon tape on all fittings you have removed and replace the coils in the machine.

VERTICAL COIL: (Only on aluminum coil units). To remove this coil you don't have to disturb the other coils. Loosen fitting #3 & #4 and slide the coil out the top. Use Teflon tape & put new coil in.

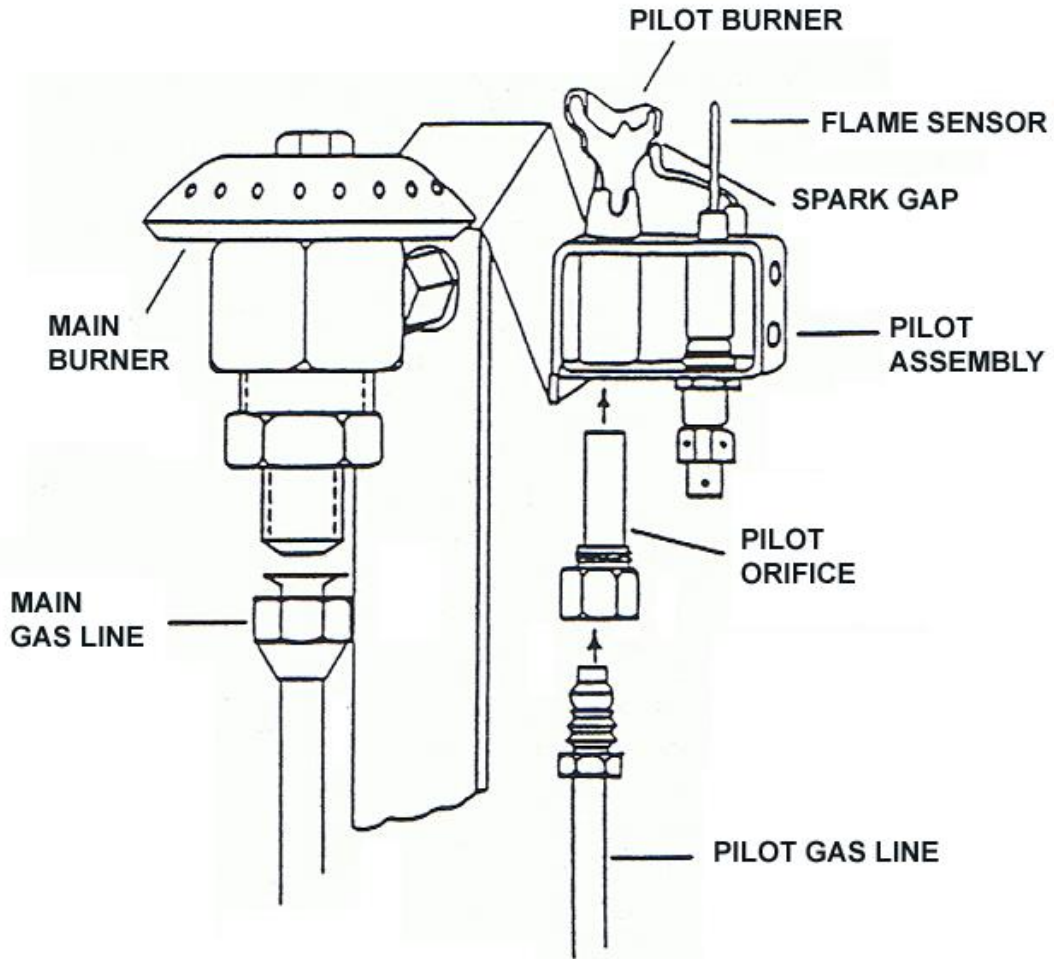
INNER COIL: To remove this coil you need to take out the vertical coil also. Disconnect fitting #3 & #6 and remove both coils thru the top. Next, disconnect fitting #5 and remove the vertical coil. Use Teflon tape on new fittings and reconnect #5 and slip the coils back in. Finally, reconnect #3 & #6.

NOTE: Be sure to test the coils to check for tightness at the fittings. Turn the unit on after purging the air. When the ignition comes on, close the trigger gun and make sure the ignition goes off instantly. If it does not, open up the trigger gun to avoid new damage and replace the flow switch.

DIAGRAM 7 - HEAT EXCHANGE COILS

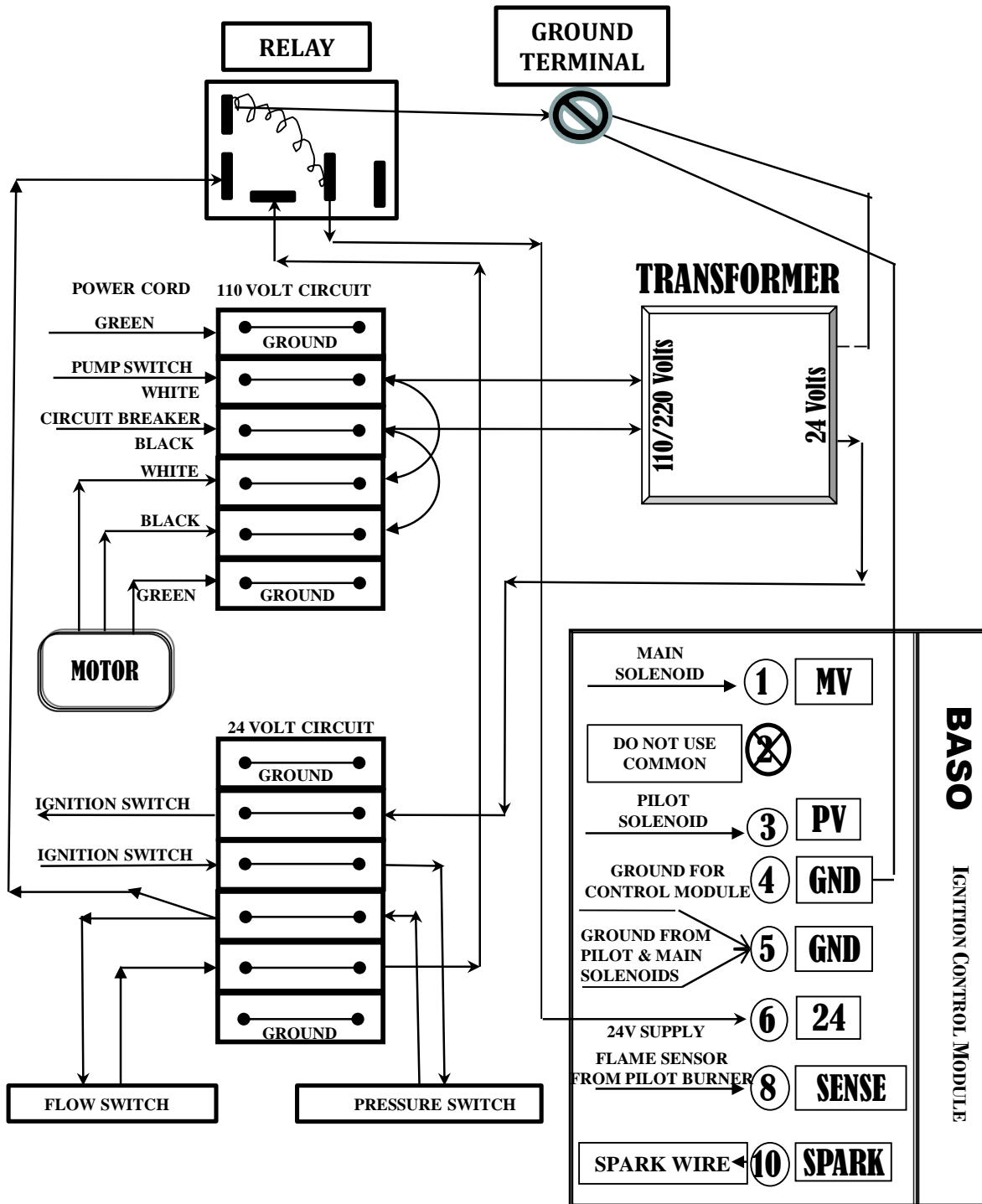


**EXPLODED VIEW FIGURE B
BURNER WITH PILOT ASSEMBLY**



PARTS LIST

<u>REF. NO.</u>	<u>DISCRIPTION</u>
1.	PILOT ASSEMBLY COMPLETE
2.	FLAME SENSOR
3.	FLAME SENSOR WIRE
4.	PILOT ORIFICE
5.	MAIN BURNER
6.	BURNER ASSEMBLY COMPLETE



110/220 VOLT WIRING SCHEMATICS