TECHNICAL MANUAL

FLOWTRON®

MOSQUITO POWERTRAP™

MODELS:
MT-125
MT-275

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www.flowtron.com

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Appendix:

1. ABNORMAL OPERATION - WARNING SIGNALS

MT-125:

Symptom: Flashing red LED light

Cause:

1. Lack of propane gas
   a). Refill propane tank
   b). Check for leaks
   c). Reset the microprocessor by interrupting the unit's electrical power
   d). Re-apply power to restart the unit
2. Initial start-up was unsuccessful
   a). Follow "Troubleshooting and Repair Analysis" on next page to determine cause and recommended corrective action
3. PowerTrap shut down for no apparent reason
   a) Follow "Troubleshooting and Repair Analysis" on next page to determine cause and recommended corrective action

Symptom: Flashing blue LED light

Cause:

1. Unit experienced an overheat condition
   a). Reset the microprocessor by interrupting the unit's electrical power
   b). Allow unit to cool
   c). Re-apply power to restart the unit
   d). If condition reoccurs, follow"Troubleshooting and Repair Analysis" on next page to determine cause and recommended corrective action

Symptom: Not catching mosquitoes

Cause:

1. Funnel clogged or not centered over catch tray opening
   a). Remove catch tray and funnel
   b). Clean funnel and reinstall
   c). Reinstall catch tray. Ensure that the funnel end is lined-up with the catch tray opening
2. Trap is not located in a productive location
   a). Move trap to a new site
   b). Follow placement guidelines provided with the PowerTrap
3. Current mosquito species not attracted to Octenol lure
   a). Operate the trap with the Octenol cartridge removed

2. MT-125 TROUBLESHOOTING AND REPAIR ANALYSIS

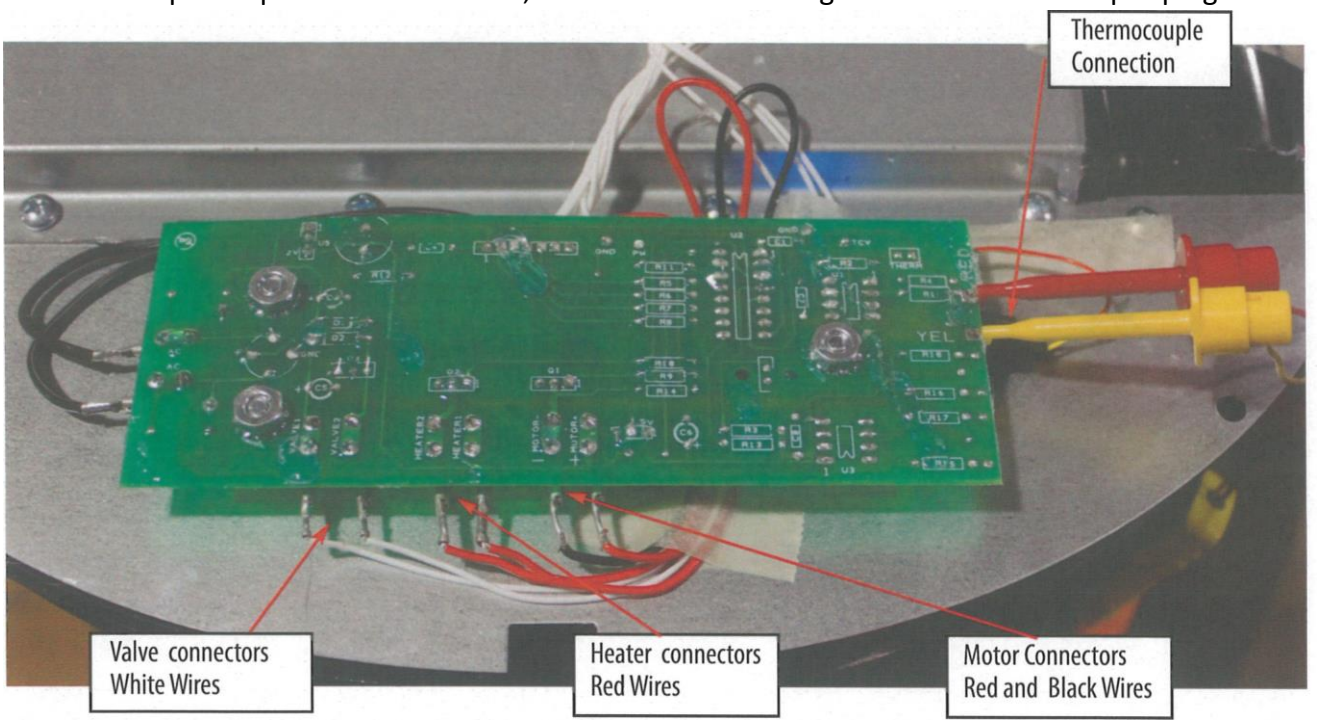
The following instruments are required for proper troubleshooting:

1. Multimeter
2. Thermocouple reader with hook-type test leads.

Remove top cover. Connect thermocouple test leads to pins on front end of printed circuit board. (See appendix A for instructions on removing the top cover.)

The thermocouple reader should show ambient (room) temperature. If it shows a minus, or negative, reading, switch the thermocouple test leads. If it shows no reading, the thermocouple is defective (open).

Connect the power pack to an AC outlet; connect the low voltage wire to the unit's input plug.



Turn the propane valve on the propane tank to the "on" position.

The thermocouple reader should show a gradual increase in temperature. When the temperature reaches approximately 195^0 F (90^0 C), the propane valve should begin to operate as verified by an audible clicking sound.

In the event the temperature does not increase, check the heater circuit using the multimeter. A 12 volt AC reading should be present at the red heater terminals. If there is no voltage at the heater terminals, replace the printed circuit board.

If there is a voltage, disconnect one of the heater wires at its terminal and check for continuity. If the heater circuit shows an open condition, replace the burner assembly.

The valve operates on a pulsing voltage which is difficult to detect with a multimeter. If the valve does not produce an audible clicking sound, replace the valve. If the valve still does not produce a clicking sound at approximately 195 ^{0} F (90^0 C), replace the printed circuit board.

Once the valve begins to operate, the burner temperature will increase slowly (approximately 20 per second) to 250-270 F, (1 20 -133 C) and then will start to increase more rapidly (approximately 5^0 per second).

At approximately 350^0 F, (1 77^0 C) the fan should begin to operate and cycle "on" for a few seconds, then "off" for 20 - 30 seconds. At 750^0 (400^0 C), the fan should remain on continuously. If the fan does not come on, check for DC voltage on the printed circuit board at the motor terminals. Be sure to observe the correct polarity. Continue checking for motor voltage over a period of time sufficient to allow for several motor "on/off" cycles to have occurred. If the DC voltage is present, replace the motor. If not present, replace the printed circuit board.

In the unlikely event that the burner temperature reaches 1360 F, (738^0 C), the unit will automatically shut down and the blue LED lights will flash signaling an overheat condition. Allow the unit to cool and then restart. If the overheat condition reoccurs, replace the propane valve.

During start-up, if the red LED light flashes, this indicates that the burner temperature will not increase above 760 degrees. If this should occur, disconnect electrical power and allow the unit to cool. Then restart by applying electrical power. If the condition reoccurs, replace the burner chamber.

3. ABNORMAL OPERATION -WARNING SIGNALS

MT-275

Symptom: Three flashing mode lights on the control panel

Cause:

1 . Lack of propane gas
   a). Refill propane tank
   b). Check for leaks
   c). Press "off/reset" button on the control panel
   d). Select mode and restart the unit

2. Initial start-up was unsuccessful
   a). Follow "Troubleshooting and Repair Analysis" on next page to determine cause and recommended corrective action

3. PowerTrap shut down for no apparent reason
   a) Follow "Troubleshooting and Repair Analysis" on next page to determine cause and recommended corrective action

Symptom: Two flashing mode lights on the control panel

Cause:

1 . Unit experienced an overheat condition
   a). Push "off/reset" button on the control panel
   b). Allow unit to cool
   c). Select mode and restart the unit
   d). If condition reoccurs, follow"Troubleshooting and Repair Analysis" on next page to determine cause and recommended corrective action.

Symptom: Not catching mosquitoes

Cause:

1. Funnel clogged or not centered over catch tray opening
   a). Remove catch tray and funnel
   b). Clean funnel and reinstall
   c). Reinstall catch tray. Ensure that the funnel end is lined-up with the catch tray opening.

2. Trap is not located in a productive location
   a). Move trap to a new site.
   b). Follow placement guidelines provided with the PowerTrap

3. Current mosquito species not attracted to Octenol lure
   a). Operate the trap with the Octenol cartridge removed

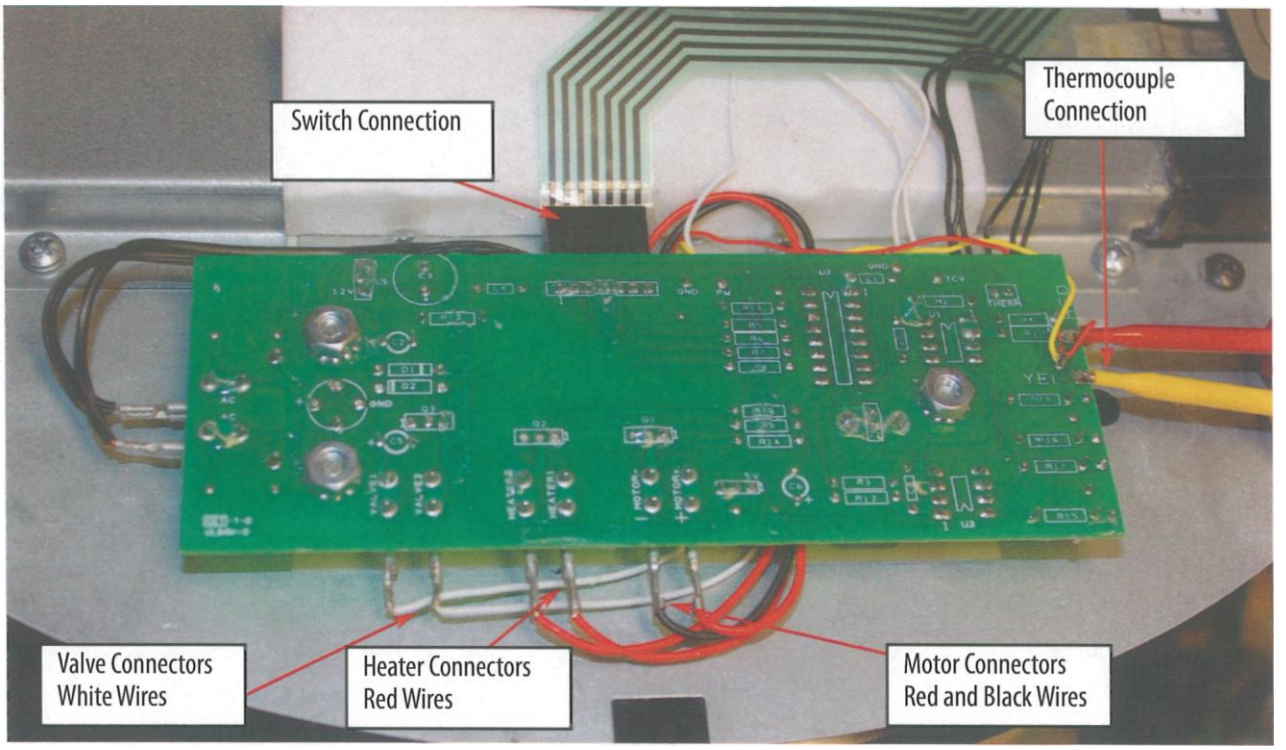
4. MT-275 TROUBLESHOOTING AND REPAIR ANALYSIS

The following instruments are required for proper troubleshooting:

1. Multimeter
2. Thermocouple reader with hook-type test leads.

Remove top cover. Connect thermocouple test leads to pins on front end of printed circuit board. (See appendix A for instructions on removing the top cover.)

The thermocouple reader should show ambient (room) temperature. If it shows a minus, or negative, reading, switch the thermocouple test leads. If it shows no reading, the thermocouple is defective (open). Connect the power pack to an AC outlet; connect the low voltage wire to the unit's input plug. Turn



the propane valve on.

Plug the ribbon wire extending from the underside of the top cover into the PCB and select the 24/7 mode on the control panel.

The thermocouple reader should show a gradual, steady increase in temperature. When the temperature reaches approximately 1950F (900C), the propane valve should begin to operate as verified by an audible clicking sound.

In the event the temperature does not increase, check the heater circuit using the multimeter. A 12 volt AC reading should be present at the red heater terminals. If there is no voltage at the heater terminals, replace the printed circuit board.

If there is a voltage, disconnect one of the heater wires at its terminal and check for continuity. If the heater circuit shows an open condition, replace the burner assembly.

The valve operates on a pulsing voltage which is difficult to detect with a multimeter. If the valve does not produce an audible clicking sound, replace the valve. If the valve still does not produce a clicking sound at approximately 1950F (900C), replace the printed circuit board.

Once the valve begins to operate, the burner temperature will increase slowly (approximately 10 - 20 per second) to 250 0-270 0 F, (1 20 0-133 0 C) and then will start to increase more rapidly (approximately 3 0-40 per second).

At approximately 3500 F, (1770C) the fan should begin to operate and cycle "on" for a few seconds, then "off" for 20 — 30 seconds. At 7600 (4050C), the fan should remain on continuously.

If the fan does not come on, check for DC voltage on the printed circuit board at the motor terminals. Be sure to observe the correct polarity. Continue checking for motor voltage over a period of time sufficient to allow for several motor "on/off" cycles to have occurred. If the DC voltage is present, replace the motor. If not present, replace the printed circuit board.

The burner temperature should stabilize at 10500 F, (5660 C) +/- 5%, 10 to 12 minutes after start.

In the unlikely event that the burner temperature reaches 1360 F (7380 C), the unit will automatically shut down and two of the LED mode lights on the control panel will flash signaling an overheat condition. Allow the unit to cool and then restart. If the overheat condition reoccurs, replace the propane valve.

During start-up, if three of the LED mode lights on the control panel flash, this indicates that the burner temperature will not increase above 760 degrees. If this should occur, switch the unit off and allow it to cool. Then restart in the 24/7 mode. If the condition reoccurs, replace the burner chamber.

5. PRINTED CIRCUIT BOARD- REPLACEMENT

1. Unplug the PowerTrap's electrical connector and disconnect the gas regulator from the propane tank.

2. Remove the top cover. (See appendix A instructions on removing the top cover).

3. Disconnect the six wires from their connectors located along the outside edge of the PCB. Disconnect the thermocouple connector located at the front edge of the PCB. Disconnect the two black wires from the connectors on the back edge of the PC board. Remove the three nuts at the top of the board and remove the PCB from the PowerTrap..

4. Install a new PCB and secure in place with the three nuts. Connect all wires as follows:

    a). Red motor wire to motor terminal marked plus. Black motor wire to motor terminal marked minus.

    b). Red heater wires (2) to terminals marked heater.

    c). White valve wires (2) to terminals marked valve.

    d). Black AC power wires (2) to the AC terminals at the rear edge of the PCB.

    e). Plug the thermocouple connector into the socket at the front edge of the PCB.

5. Model MT-275 only: Connect the ribbon wire from the underside of the top cover to the PCB taking care to engage all slots in the plug with the corresponding pins in the socket.

6. Install the top cover by spreading the louvers at the rear of the unit to engage the boss at the rear of the cover and secure with screw. Install the two screws in the front of the unit to secure the top cover to the metal plate.

7. Re-attach the PowerTrap's electrical connector and attach the gas regulator to the propane tank.

6. MOTOR AND FAN-REPLACEMENT

1. Unplug the PowerTrap and disconnect the gas regulator from the propane tank. Remove the collection tray and the funnel.

2. Remove the top cover. (See appendix A for instructions on removing the top cover.)

3. Disconnect the two motor wires from the PCB. Remove the three nuts at the top of the board and lift the PCB off its mounting. Feed the two motor wires down through the hole in the metal plate (top plate) below the PCB.

4. Remove the eight screws that secure the metal channel running along the center of the top plate. Remove the channel and, on Model MT-275 only, remove the metal strip holding the insulation material along the side of the channel. This will expose the black impeller and impeller housing. Remove the impeller from its housing by prying the impeller off of the motor shaft. .

5. Remove the two screws holding the impeller housing to the top plate. These screws also hold the motor in place and removing these screws will allow the motor to be removed from beneath the top plate.

6. Remove the fan from the motor shaft and place it on the new motor. Make certain the fan is located in the same place on the motor shaft as it was on the shaft of the old motor.

7. Position the new motor in place, run the motor wires through the hole in the top plate, then fasten the motor and impeller housing to the top plate with two screws. Press the impeller onto the motor shaft and make certain the top of the impeller is just below the top of the impeller housing. Be certain that the impeller turns freely and does not rub on the bottom of the housing.

8. . Install the metal channel and secure using the eight screws. Be sure the metal strip retaining the insulation material is in place before the screws are secured. (Note: Insulation material is not used on Model MT-1 25).

9. Connect the ribbon wire from the underside of the top cover to the PCB taking care to engage all slots in the plug with corresponding pins in the socket. (Not applicable for Model MT-125).

10. Install the top cover by spreading the louvers at the rear of the unit to engage the boss at the rear of the cover and secure with screw. Install the two screws in the front of the unit to secure the top cover to the top plate.

1 1. Complete the installation by installing the funnel and the collection tray and attaching the electrical connector and the gas regulator.

7. BURNER ASSEMBLY - REPLACEMENT

Applicable for Units Manufactured prior to 2011

1. Unplug the PowerTrap and disconnect the regulator from the propane tank.

2. Remove the top cover. (See appendix A for instructions on removing the top cover.) Unplug the ribbon wire from the edge of the PCB and remove the top cover completely from the unit.

3. Disconnect remaining wires from the outside edge of the PCB. Twist off the red and yellow thermocouple wires from the posts located at the front edge of the PCB and disconnect the two black wires from the back edge of the board. Remove the three nuts at the top of the board.

4. Remove the eight screws that secure the metal channel running along the center of the top metal plate and remove the channel (and metal strip holding the insulation material along the side). Remove the screw in the center of the top plate which secures the top plate to the vertical rod extending through the center of the housing. Bend the tabs (two) at the top of the burner assembly so that they are in line with the slots in the top plate.

5. Disconnect the copper tube from the valve located at the bottom of the burner assembly using a 3/8" wrench.

6. Lift the top plate off the trap housing. Remove the burner assembly by moving it to the rear until tabs line up with the slots in the top plate and then pull it down while passing the burner wires through the hole in the top plate.

7. Position the replacement burner assembly in place with its tabs penetrating the metal top plate. Make certain that the white thermal shield at the top of the burner lies under the burner opening in the metal top plate. Bend the tabs at the top of the burner assembly outward to hold it in place.

8. Run all wires through the hole in the top plate below the PCB while lowering the top plate onto the trap housing. Install the screw in the center of the top plate which secures the top plate to the vertical rod. Install the metal channel and secure using the eight screws. Be sure the metal strip retaining the insulation material is in place before the screws are secured. (Note: Insulation material not present on model MT-125).

9. Fasten the PCB in place with three nuts and connect the wires to the PCB as follows:

    a). Red motor wire to motor terminal marked plus. Black motor wire to motor terminal marked minus.

    b). Red heater wires (2) to terminals marked heater.

    c). White valve wires (2) to terminals marked valve.

    d). Black AC power wires to the AC terminals at the rear edge of the PCB

    e). Wrap thin red and yellow thermocouple wires securely around posts on PCB with the red wire on post marked plus and the yellow wire on post marked minus. Make certain these wires are wrapped tightly around their respective posts. DO NOT SOLDER WIRES TO POST.

10. Connect the copper tube to the valve at the bottom of the burner.

11. Connect the ribbon wire from the underside of the top cover to the PCB taking care to engage all slots in the plug with corresponding pins in the socket. (Not applicable for MT-1 25).

12. Install the top cover by spreading the louvers at the rear of the unit to engage the boss at the rear of the cover and secure with screw. Install the two screws in the front of the unit to secure the top cover to the metal plate.

13. Attach electrical plug and gas regulator. Open propane valve on tank, press off/reset button on switch panel and set mode to 24/7. Unit should start and run in 7-10 minutes as evidenced by the fan running continuously and the LED lights inside the unit remaining on.

8. BURNER ASSEMBLY - REPLACEMENT

Applicable for units manufactured from 2011 to present

1. Unplug the PowerTrap and disconnect the regulator from the propane tank.
2. Remove the top cover. (See Appendix A for instructions on removing the top cover.)
3. Remove the catch tray and funnel from the unit.
4. Note that the power cord is secured to the PowerTrap housing through a strain relief molded into the housing. Detach the power cord from the strain relief by gently pulling the power cord out through the tabs on the strain relief.
5. Remove the Phillips screw at the rear of the unit which secures the louvers to the housing. Remove the Phillips screw at the front of the unit which secures the plenum to the housing and remove the plenum.
6. Remove the Phillips screw located inside the recess for the mounting post located at the bottom of the housing, then separate the housing from the louver assembly.
7. Disconnect the connector for the valve wires and the connector for the heater wires, both located at the bottom of the burner assembly.
8. Hold the valve in place with pliers or vise grips and using a 13mm open end wrench, disconnect the regulator hose from the valve. Make certain that the valve does not turn and stays in position during the removal of the regulator hose.
9. Unscrew the two plastic wing nuts that secure the burner assembly to the top metal plate and remove the burner assembly from the unit.
10. Install the replacement burner assembly and reassemble the unit by reversing the steps taken to remove the original burner assembly.

APPENDEX

A.

REMOVAL OF TOP COVER

TO REMOVE THE TOP COVER FROM THE POWERTRAP, PROCEED AS FOLLOWS:

1 . Unplug the PowerTrap and disconnect the gas regulator from the propane tank.

2. Remove the two screws which secure the top cover to the metal plate located under the top cover at the front edge of the unit, to the left and right of center.

3. Remove the screw used to secure the louver halves together and which captures the top cover between the louver halves. This screw is located at the rear, center, of the unit directly below the top cover.

4. Using a screw driver, spread the louvers and lift the back of the top cover to disengage it from the louvers.

5. Model MT-275 only: Unplug the ribbon wire, attached to the underside of the top cover, from the printed circuit board.

6. Remove the top cover completely from the unit.

B.
MICROPROCESSOR - REPLACEMENT

1 . Unplug the PowerTrap and disconnect the regulator from the propane tank.

2. Remove the top cover. (See Appendix A for instructions on removing the top cover.) as follows:

3. Remove the three nuts located at the top of the PCB and raise the board to gain access to the microprocessor.

4. Locate the microprocessors (Chip) on the PCB near the inside edge of the board and carefully remove it from its socket.

5. Orient the replacement Chip, marked MT-125-P03 or MT-275-P04, depending upon the applicable PowerTrap model, by matching the dimple centered at the top, left hand edge of the Chip with the slot centered along the side of the socket and insert the Chip into the socket.

6. Lower the PCB back into position and secure with the three nuts.
7. MT-275 only, connect the ribbon wire from the underside of the top cover to the PCB taking care to engage all slots in the plug with corresponding pins in the socket. (Not applicable for MT-125).

8. Install the top cover by spreading the louvers at the rear of the unit to engage the boss at the rear of the cover and secure with screw. Install the two screws in the front of the unit to secure the top cover to the metal plate.

9. Attach electrical plug and gas regulator.

MT-125 & MT-275

C.

Function	Elapsed Time	Temperature	Comments
Srart	0:00	25 C Ambient	
Valve Pulses	1:50 – 2:10	88 - 93 c	Valve makes clicking sound;Gas flow starts
Fan Starts	2:30 - 3:00 min.	170- 180 c	"On" 1 second every 20 - 30 seconds
Fan Intermittent		230 - 235 c	"On" 2 second every 20 - 30 seconds
Fan Intermittent		285 - 290 c	"On" 3 second every 20 - 30 seconds
Fan Intermittent		340 - 345 c	"On" 4 second every 20 - 30 seconds

D.

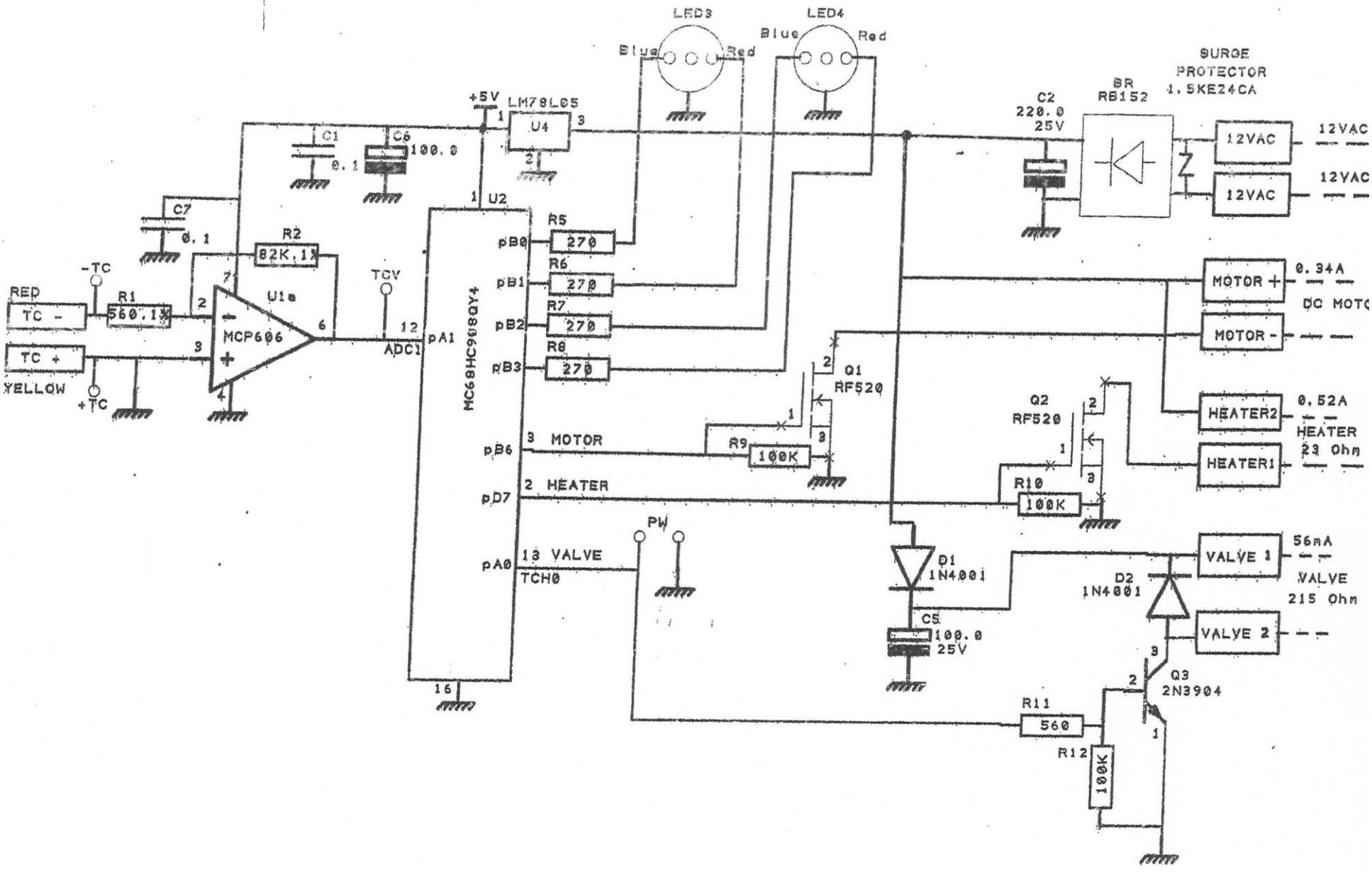
Fan Continuous	5:00 — 8:00 min.	398 — 405 C	Auto control begins
Start-up Complete	10:00 — 12:00 min	560 - 593 c	Stabilizes at normal operating temperature

PowerTrap Start-Up Characteristics (Temperature — Fahrenheit)

Function	Elapsed Time	Temperature	Comments
Srart	0:00	78 F Ambient	
Valve Pulses	1 -2:10	190 - F	Valve makes clicking sound;Gas flow starts
Fan Starts	2:30 - 3:00 min.	345 - 355 F	"On" 1 second every 20 - 30 seconds
Fan Intermittent		445 —455 F	"On" 2 second every 20 - 30 seconds
Fan Intermittent		545 - 555 F	"On" 3 second every 20 - 30 seconds
Fan Intermittent		645 - 655 F	"On" 4 second every 20 - 30 seconds
Fan Continuous	5:00 — 8:00 min.	755 - 765 F	Auto control begins
Start-up Complete	10:00 — 12:00 min	1040 - 1100 F	Stablizes at normal operating temperature

PowerTrap Start-Up Characteristics
(Temperature — Celsius)

D. MT125


LED3
Blue
Red
LED4
Blue
Red
+5V
LM78L05
U4
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0.1
C6
100.0
C7
0.1
R2
82K,1%
U2
MC68HC908QY4
R5
270
R6
270
R7
270
R8
270
pB0
pB1
pB2
pB3
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RED
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R1
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TC +
YELLOW
+TC
U1a
MCP606
TCV
ADC1
pA1
3 MOTOR
pB6
2 HEATER
pD7
13 VALVE
pA0
TCH0
PW
16
R9
100K
Q1
RF520
Q2
RF520
R10
100K
D1
1N4001
C5
100.0
25V
D2
1N4001
Q3
2N3904
R11
560
R12
100K
C2
220.0
25V
BR
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SURGE
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12VAC
12VAC
12VAC
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MOTOR -
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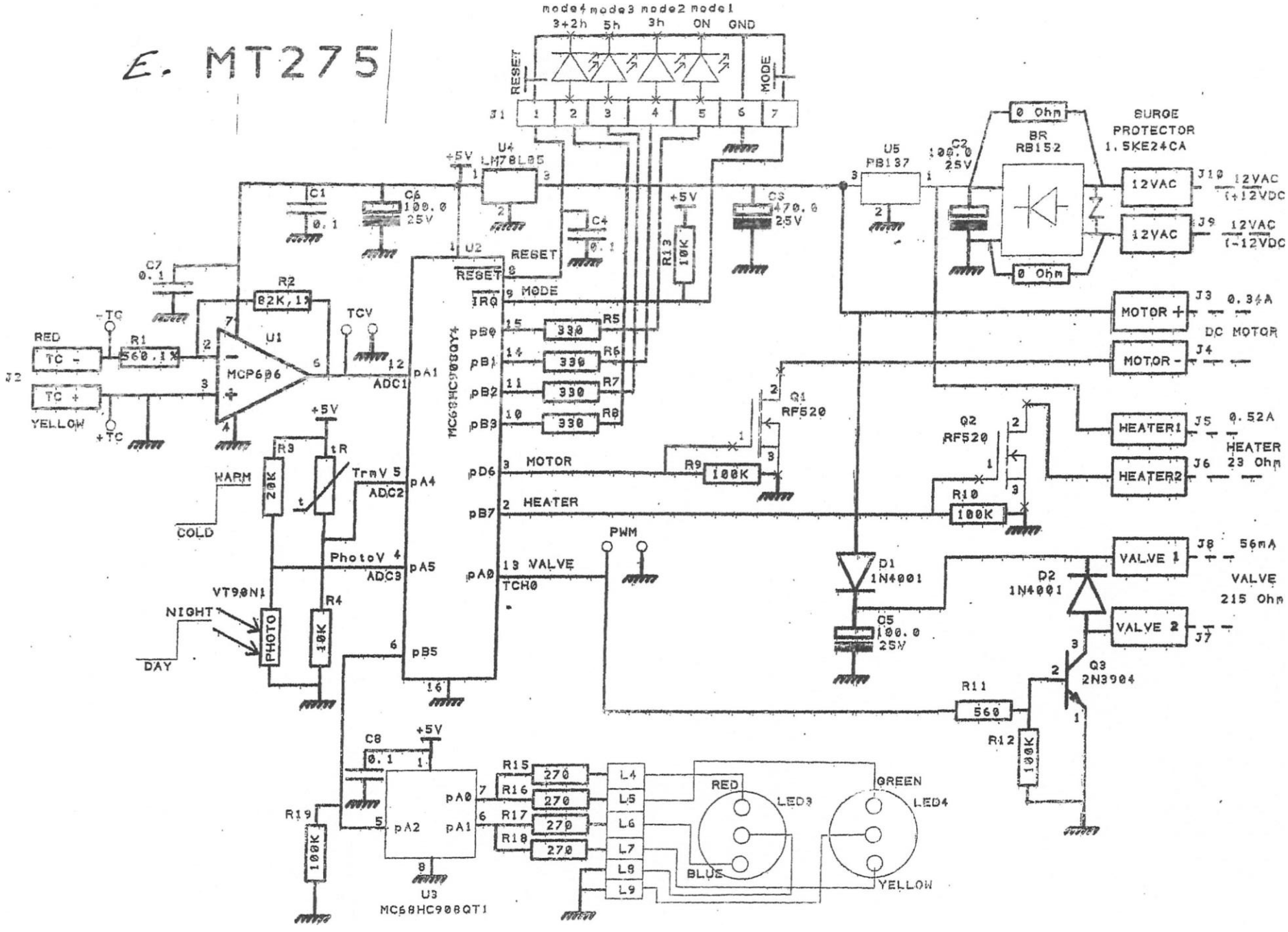
VALVE 1
VALVE 2
56mA
VALVE
215 Ohm

E. MT275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3+2h 5h 3h ON GND
RESET
MODE
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U4
LM78L05
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C1
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C6
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25V
C4
0.1
C3
470.0
25V
R13
10K
U5
PB137
C2
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25V
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BR
RB152
SURGE
PROTECTOR
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J9
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C7
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MCP606
-TC
+TC
RED
TC -
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YELLOW
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J2
TCV
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U2
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RESET
IRQ
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pB2
pB3
R5
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R6
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R7
330
R8
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MOTOR +
J3
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DC MOTOR
MOTOR -
J4
Q1
RF520
R9
100K
MOTOR
HEATER
pD6
pB7
Q2
RF520
R10
100K
HEATER1
J5
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HEATER
23 Ohm
HEATER2
J6
+5V
R3
20K
tR
TrmV 5
ADC2
pA4
WARM
COLD
PhotoV 4
ADC3
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PWM
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VALVE
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J7
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VT90N1
NIGHT
DAY
PHOTO
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pB5
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Q3
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R11
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R12
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R19
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pA2
pA1
U3
MC68HC908QT1
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R16
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R17
270
R18
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L4
L5
L6
L7
L8
L9
RED
LED3
GREEN
LED4
BLUE
YELLOW