

# Trouble Shooting

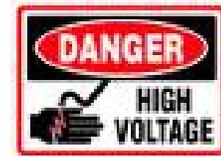
## DT Series Pasteurizers

**\*This guide is intended for use as a troubleshooting directive. All electrical tests and diagnostics should be performed only by those skilled in the electrical profession\***

**\*All electrical testing and repairs should be performed by an experienced professional or technician trained in the electrical trade\***

**\*Serious injury or death may result from improperly testing or handling this equipment\***

**\*This unit contains HIGH VOLTAGE electricity that can cause serious harm or death\***



1. No power to the control panel
  - a. Check to be certain unit is plugged into 120vac outlet and that there is power at the outlet.
  - b. Be certain that breakers in panel box or ground fault receptacle are not tripped
    - i. If the breakers are being tripped, the system is likely being shorted to ground. Look for any blown fuses to indicate trouble areas and consult the fuse layout for more detail. Have the system checked by a certified electrician before operating.
  - c. Check the 15amp fuse (F1). Make sure there is 115vac to and through the fuse. If not, replace with appropriate fuse. **DO NOT REPLACE WITH OVERSIZED FUSES. (Part # AE-Fuse)**
  - d. Check the rocker switch to see if it is lit when switched on. This should indicate that power is getting to the switch. If there is not 115vac leaving the switch through the black/yellow wire when switched on, the switch may need replaced **(Part# E-Switch)**
  - e. Check the transformer (TX1) for proper voltages. The purple and grey wires should carry a 24-32VAC signal to the control. The black/white and white/black wires carry the 115VAC supply to the transformer. **(Part# AE-TXFR)**
  - f. On the back of the control, make certain that the orange 15pt plug is securely plugged into the receptacle on the back of the controller.
  - g. The control is fused (F2) between the transformer and the control. Check the appropriate fuse to make sure power is getting to the control.
  - h. The control **(Part # E-Control)** itself could be malfunctioning or internally damaged. This is only rarely seen. Call for assistance.

2. Milk does not heat and the heater is not hot.
  - a. Is there power getting to the pasteurizer heater? Check the incoming voltage to the contactor through L1 and L3. There should be 120vac on each line coming in. If not, check the breaker. The breaker should be 40 amp but in some instances with 240vac and long runs to the unit, a 50 amp service may be required or an upgrade to heavier gauge wire. Contact an electrician.
  - b. Is there power getting to the heater? Initiate a cycle and the contactor should make a loud “click” as it activates. Check to see if the 220-240vac is getting through the contactor and out of L1 and L3 on the bottom. If not, the contactor may need replaced.
    - i. If the contactor does not click, check the 115vac leads (brown/white and white/orange wires) on the back top of the contactor to see if it is being signaled by the SS relay. If there is 115vac signal, replace the contactor (Part# E-Contact)
    - ii. If no 115vac signal to the contactor, check the solid state relay SSR2. There should be a D/C signal through the yellow and orange colored wires to the relay and the LED should be lit when activated. 115vac is supplied to the relay through the black/yellow wire. Once signaled, there should be 115vac out of the black/white wire to the contactor. If not, replace the SSR2 (Part # AE-RelaySS)
    - iii. No D/C signal to the SSR2. Check the fuses for the control (F5 and F8). Check the orange plug on the back of the control. Call for service as the control output may be damaged and need replaced. (Part# E-Control)
  - c. 240vac is getting to the heating element but still no heat .... Remove the red or orange cap from the bottom of the heater and check for continuity across the elements. If you have an element with redundant sets of elements, rewire a new element or order a replacement heating element (Part # E-HeatX).
3. Milk does not get hot but Heater is hot.
  - a. Some old units have a solenoid valve on the top row of brass with a blue body. This hot water solenoid valve must open to allow hot water to flow. Check it for power or call for instructions to remove this valve and instructions to reroute the plumbing on the heater.
  - b. Pump must be working to circulate the hot water.
    - i. Check for power inside the control box at the terminal strips. If there is power to the pump but it is not flowing, the pump may be air-locked (carefully open the pop-off valve on the heater to allow any air out of the system) or the pump may be bound by debris (relieve water pressure and open the body of the pump to check the blades for free movement). If the pump turbine does not spin when powered, replace. (Part# P-Pump.)
    - ii. No power getting to the pump during a heating cycle: check the fuse in the control panel box marked pump (F4) and replace if necessary. (Part#-AE-Fuse)

- iii. No power to the fuse holder during a heating cycle: Check the cube relay CR1. There should be 115vac coming into the top of the CR1 through the black/orange wire at all times. The brown wire brings the 115vac signal from the control to activate the relay to allow 115vac out the bottom of CR1 through the black/red wire to the valve fuse (F6), and through the black/brown wire to the pump fuse (F4). If no power to the brown wire, check the control fuse marked hot (F3). The output of the control may be damaged and need replacement (Part# E-Control). If there is a proper 115vac signal, the relay or relay base may need replaced. (Part# E-relay8 or E-relaybase)
  - c. Milk level is not high enough. The thermocouple needs to be immersed into the milk otherwise it will read foam temperatures which are cooler and not allow the control to know that the milk is heating.
  - d. Heating coil is caked with milk. This prevents the heat from dispersing out of the coil and caused further baking of the milk onto the coil. Remove from the milk, shut the machine off and clean thoroughly. Some non-stick cooking sprays can be used after cleaning to prevent sticking if it is a problem.
  - e. Cold water is coming into the system. If there is a leak in the system, a leaking pop-off valve or a leaking cold water solenoid valve, the heater cannot keep up and the milk will not heat properly. Repair the leak or replace the valve (Part # P-ValRel) or the solenoid valve (Part# P-Val2psi).
  - f. Red or yellow hose is kinked inside the hood preventing hot water circulation.
- 4. Milk will not cool
  - a. At the end of the heating and time-out cycle, the cooling solenoid valve should automatically open and allow water to drain from the machine.
    - i. Make certain the discharge drain is not blocked, kinked or obstructed with back pressure of any kind
    - ii. Make certain the cold water supply to the unit is always on ... it is common to find that someone has shut the valve not knowing its importance.
    - iii. Make certain that the user did not initiate a “Heat Only” cycle after which the unit does not cool the milk automatically. Use the “Start” button to initiate full cycles.
  - b. Check the cold (black bodied) solenoid valve. The thermocouple temperature must be above 100F or above your coolT setting in the control for the cycle to initiate.
    - i. Is there power to the valve? If so, and it is not opening, replace the valve. (Part# P-Val2psi)
    - ii. No power to the valve: Check the fuse marked Cold valve (F7). Replace if necessary and check for power to the fuse from the cube relay CR2 via the blue/white wire. There should be 115vac power supply to the top of the CR2 through the black/orange wire. The

115vac signal from the control comes through the blue wire to open the relay. If the relay is powered, replace the relay or the base of the relay. (Part# E-relay8 or E-relaybase)

- iii. If there is no 115vac signal to the relay from the blue wire, check the cold control fuse (F8) or the output from the control may be malfunctioning (Part# E-control)

- 5. Error message appears: The display is on but is flashing an Error message.
  - a. Check to make certain that the thermocouple retractable cord is plugged into the female outlets on the pasteurizer lid and the control box. There may also be corrosion at a terminal, or a break in continuity of the thermocouple system that is causing the error.
  - b. If it shows only “ERROR” without a number, the unit has exceeded the set amount of time it thinks is required to complete the cycle and is indicating that the process should be monitored for problems. This setting is labeled “terr” in the E-type submenu of the controller and will likely be set for 3-5 hours depending on the unit size and whether refrigerated or not.
  - c. Error codes
    - i. Error 1, Error 2 or Error 3: controller malfunction. Cycle the power off and then back on. IF the error persists, return the controller for replacement. The system may be too cold to operate.
    - ii. Error 4: calibration error in the controller. Return the controller for recalibration or replacement.
    - iii. Error 5 and Error 7: temperature sensor input 1 (milk) is incompatible with the controller, has lead wires improperly terminated (leads switched at the terminal) or is measuring a condition below the normal temperature range. Check the lead wires for t/c 1 and check the controller for proper t/c selection and parameters. Check all t/c connections to make certain they are making a good connection. See thermocouple diagnostics below for more information and troubleshooting procedures. Error 6 and Error 8: temperature sensor input 1 (milk) is incompatible with the controller, has lead wires improperly terminated (leads switched at the terminal) or is measuring a condition above the normal temperature range. Check the lead wires for t/c 1 and check the controller for proper t/c selection and parameters. Check all t/c connections to make certain they are making a good connection. See thermocouple diagnostics below for more information and troubleshooting procedures.
    - iv. Error 9 and Error 11: temperature sensor input 2 (heater) is incompatible with the controller, has lead wires improperly terminated (leads switched at the terminal) or is measuring a condition below the normal temperature range. Check the lead wires for t/c 2 and check the controller for proper t/c selection and

parameters. Check all t/c connections to make certain they are making a good connection. The system may be too cold to operate.

- v. Error 10 and Error 12: temperature sensor input 2 (heater) is incompatible with the controller, has lead wires improperly terminated (leads switched at the terminal) or is measuring a condition above the normal temperature range. Check the lead wires for t/c 2 and check the controller for proper t/c selection and parameters. Check all t/c connections to make certain they are making a good connection.
  - vi. Error 13: ambient temperature around the equipment is too high or too low.
  - vii. Error 14: Real time clock error. Not a fatal error but may need replaced if the clock is not able to be used properly for delayed start function.
6. Temperature Display is erratic or incorrect.
- a. Troubleshooting the thermocouple system
  - b. The thermocouples are polar sensitive and will yield erratic numbers or even move down in temp when the process is heating. The unit may also flash an unusually high number and then immediately indicate END or begin to countdown because the unit thinks it has reached temperature. Make certain that purple or white leads are positive (+) and red leads are negative (-) at all junctions.
  - c. The thermocouple rod itself could be damaged or kinked. To test this, unplug the retractable cord from the back of the black hood. Hold the two prongs of the cord end against a copper pipe to jumper them together. If this makes the error go away, the problem is with the thermocouple itself. (Part # E-therm24)
  - d. The retractable thermocouple cord could be damaged. To test this, unplug the cord as it enters into the bottom or side of the control box on the wall. Make a u-shaped jumper with a paperclip and insert it into the plug. If the error goes away, the problem is either in the retractable cord (Part # E-tcRSC-E-3-4-4) or in the thermocouple probe (see above).
  - e. The controller may be programmed to read the wrong type of thermocouple. (This condition may allow the unit to operate but at temperatures that are different than what is displayed ... cross reference with a second thermometer if concerned about this rare occurrence and contact your dealer immediately to reprogram the control).
7. Milk is separated or congealed
- a. The most common cause for milk or colostrum to separate or congeal is acidification of the milk caused by two processes:
    - i. Fermentation of the milk by bacteria will cause the release of lactic acid and other acidic by-products resulting in a lower pH of the milk. This in turn allows it to separate. The heat of pasteurization will exacerbate this problem. To control this, cool the milk during holding stages or pasteurize the milk sooner after collection to prevent the start of fermentation.

- ii. Acidic cleaners are not being rinsed from the system. Rinse properly before each use. Do not use acids to clean the aluminum parts as this can cause severe damage to the tanks and pose a safety risk for the employees.
  - b. Thickened milk or colostrum that is stuck to the tank or heating coil may be due to:
    - i. Improper stirring (make certain the propeller is moving during heating, time out and cooling cycles)
    - ii. Temperatures that are too high (rarely a problem since our units cannot superheat water).
- 8. Stir motor is not turning
  - a. Check the fuse for the motor F5 (Part# E-fuse10)
  - b. If the fuse is good, make certain that the wire to the motor has not been damaged or pulled out of the unit.
  - c. If there is power to the motor and it will not turn, replace the motor (Part# E-motor)
  - d. If there is no power to the motor, check the solid state relay SSR1. During heating, timing or cooling cycles, the red LED should be on at this relay indicating power from the controller. If this light is not on, check for a DC signal from the controller and check fuses to the control. The output from the control may be malfunctioning, replace the control (Part# E-control).
  - e. If 115VAC power comes into the SSR1 through the black/grey wire but does not go out through the black/green wire when the LED is on, replace the relay (Part # e-relaySS)
- 9. Delay start does not come on automatically
  - a. Check the clock settings to make certain that the time of day is set correctly
  - b. Make certain that the steps for using the delay start are being followed exactly. The start button should be pushed 3 times to set the delay start mode.
  - c. The control output could be damaged. (Part# E-control)
- 10. Cycle starts automatically when toggle is switched on
  - a. Your pasteurizer is equipped with a security feature that reminds it to come back on to its last unfinished cycle once power is restored after a power failure. This will also occur if someone shuts the unit off prior to completion of its assigned cycles, and the unit will automatically restart when the toggle switch or power is restored. To reset to IDLE, hold the START, HEAT ONLY, or COOL ONLY (whichever button is lit) button in for 3 seconds ... let it go to pause and continue to hold in until back to IDLE.
- 11. Pressure relief valve is dripping
  - a. Occasionally, these valves may start to leak, especially if they have popped off under pressure a few times. They should be replaced with an industrial pressure relief valve rated for the same temperature, pressure and BTU rating (Part # P-valRel).
- 12. Cooling solenoid valve will not stop running

- a. Shut off cold water supply and remove the 4 bolts into the body of the solenoid valve. Check for debris that may be preventing the diaphragm of the valve from reseating properly.
- b. The valve may need to be replaced if it is powering properly but not closing when the solenoid closes (**Part # P-val2PSI**)

13. Fuse and electrical schematic

a.	F1	Main power supply 115vac	15A	<b>Part# E-fuse15</b>
b.	F2	Transformer	1A	<b>Part# E-fuse1</b>
c.	F3	Hot control	1A	<b>Part# E-fuse1</b>
d.	F4	Pump circulator	2A	<b>Part# E-fuse2</b>
e.	F5	Motor for stirring	10A	<b>Part# E-fuse1</b>
f.	F6	Hot valve	1A	<b>Part# E-fuse1</b>
g.	F7	Cold Valve	1A	<b>Part# E-fuse1</b>
h.	F8	Cold Control	1A	<b>Part# E-fuse1</b>

14. Replacement part list and ordering form ... [www.dairytechinc.com](http://www.dairytechinc.com)