

Chapter 7

Troubleshooting

This chapter explains equipment trouble and how to remedy it. When trouble is detected by one of the self-check features, the trouble is displayed on the instrumentation panel display and a trouble buzzer is sounded. For trouble undetected in self-checks and misoperation which can be easily mistaken as trouble, see "7.2 Before you call for service".

7.1 Alarm and Action

⚠ WARNING

! ELECTRIC SHOCK! Before working on the power circuit on the primary side of the main power switch (breaker), shut OFF primary power supply and check the line is dead. Also, take measures to prevent accidental charging.

Working with primary power supply ON runs the risk of electric shock.

! Shut OFF power from the main power switch (leakage breaker) BEFORE detaching the electric parts compartment panels or the mechanical parts compartment panels.

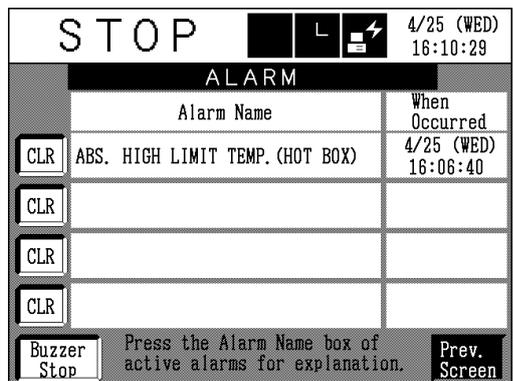
The TSE Series is equipped with a buzzer that sounds when trouble occurs as well as self-check features which display the trouble on the instrumentation panel display. Displayed alarm codes and their content are given in the alarm table on the following pages. Remedy trouble as described therein.

For trouble which is undetected in self-checks, see "7.2 Before you call for service". If the trouble cannot be remedied after taking the prescribed action, contact the place of purchase or ESPEC CORP.

When an Alarm Occurs

The chamber will be in one of the below states when an alarm occurs.

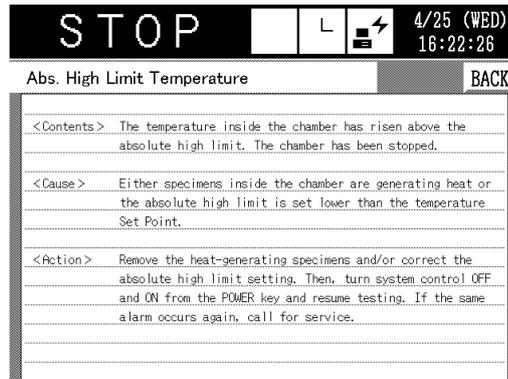
- Procedure**
1. When trouble occurs with the chamber or controller, the Alarm screen appears on the display.



* To silence the buzzer, press Buzzer Stop.

2. Press an entry under **Alarm Name**.

A screen will appear with information on the Contents, Cause and Action to be taken to remedy the trouble.



3. Try correcting the trouble as explained in the troubleshooting information. However, if instructed to “call for service” or if the action you take fails to remedy the problem, contact the place of purchase or ESPEC CORP.

Alarm Table

Table 7.1 Alarm table

Displayed alarm	Contents	Cause	Action
DOOR OPEN (HOT BOX) (WAR)	High temperature chamber door was detected in open position while testing was in progress. Testing has stopped.	Door was opened or not properly closed.	Close door securely and press CLR next to entry on ALARM screen. Then, press RESUME on Operation Mode Selection screen to resume testing.
DOOR OPEN (COLD BOX) (WAR)	Low temperature chamber door was detected in open position while testing was in progress. Testing has stopped.	Door was opened or not properly closed.	Close door securely and press CLR next to entry on ALARM screen. Then, press RESUME on Operation Mode Selection screen to resume testing.
DOOR OPEN (WAR)	High and/or low temperature chamber door was detected in open position at the start of testing. The chamber is holding the prepped stage.	Door(s) was not properly closed.	Close door securely and press CLR next to entry on ALARM screen. Then, press RESUME on Operation Mode Selection screen to resume testing.
PROGRAM SETTING TIME INVALID (WAR)	Programmed time of selected test pattern is invalid. Testing has stopped.	Test pattern contains invalid time setting.	Check and correct time setting. Then, press CLR next to entry on ALARM screen followed by RESUME on Operation Mode Selection screen to resume testing. If same alarm occurs again, call for service.
HI STAGE REFG. SURFACE TEMP. FAILURE (ALM)	Temperature switch (compressor thermostat) tripped because of high surface temperature on refrigerator high-temperature side. Testing has stopped.	Possible causes include high temperature in mechanical parts compartment, condenser fin clogging, refrigerator trouble, refrigerant leak, condenser fin trouble and phase misalignment.	Set POWER in OFF position and cool down refrigerator. Check condenser fins for clogging. Repair as necessary and resume testing. If same alarm occurs again, call for service.
HI STAGE HI-PRESSURE FAILURE (ALM)	Refrigerator high pressure switch tripped because of high pressure. Testing has stopped.	Refrigerator pressure rose above specified level.	Set POWER in OFF position and check condenser fins for clogging. Repair as necessary and resume testing. If same alarm occurs again, call for service.
HI STAGE REFG. OVERCURRENT (ALM)	Refrigerator thermal relay tripped because of high-temperature side overcurrent. Testing has stopped.	Possible causes include refrigerator trouble, condenser trouble, overheating and phase misalignment.	Set POWER in OFF position and check condenser fins for clogging. Repair as necessary and resume testing. If same alarm occurs again, call for service.

Cont.

Displayed alarm	Contents	Cause	Action
LOW STAGE REFG. SURFACE TEMP. FAILURE (ALM)	Temperature switch (compressor thermostat) tripped because of high surface temperature on refrigerator low-temperature side. Testing has stopped.	Possible causes include high temperature in mechanical parts compartment, refrigerator trouble, refrigerant leak, and phase misalignment.	Set POWER in OFF position and cool down refrigerator. Repair as necessary and resume testing. If same alarm occurs again, call for service.
LOW STAGE HI-PRESSURE FAILURE (ALM)	Refrigerator high pressure switch tripped because of high pressure on refrigerator low-temperature side. Testing has stopped.	Refrigerator pressure rose above specified level.	Set POWER in OFF position, then ON again and resume testing. If same alarm occurs again, call for service.
LOW STAGE REFG. OVERCURRENT (ALM)	Refrigerator thermal relay tripped because of low-temperature side overcurrent. Testing has stopped.	Possible causes include refrigerator trouble, overheating and phase misalignment.	Set POWER in OFF position and cool down refrigerator. Repair as necessary and resume testing. If same alarm occurs again, call for service.
REFRIG. CONDENSER FAN FAILURE (ALM)	Condenser fan temperature switch tripped because of fan overheating. Testing has stopped.	Condenser fan motor overload	Set POWER in OFF position and check for condenser clogging by dust. Repair as necessary and resume testing. If same alarm occurs again, call for service.
POWER PHASE FAILURE (ALM)	Reverse or misaligned phase was detected in primary (3-phase) power supply. Testing has stopped.	Improperly connected power supply to chamber	Set POWER in OFF position followed by main power switch (leakage breaker). Check power supply phase and connection. Repair as necessary and resume testing. If same alarm occurs again, call for service.
TEST AREA POSITION FAILURE (ALM)	Test area is not in position instructed by instrumentation. Testing has stopped.	Possible causes include link mechanism trouble.	Set POWER in OFF position, then ON again and resume testing. If same alarm occurs again, call for service.
HOT BOX CIRCULATOR FAILURE (ALM)	Air circulator temperature switch tripped because of high temperature in high temperature chamber air circulator motor. Testing has stopped.	Air circulator motor overload	Set POWER in OFF position and leave chamber OFF awhile to cool down air circulator. Resume testing. If same alarm occurs again, call for service.
HOT BOX ABS. HI LIMIT (ALM)	High temperature chamber temperature rose above high temperature limit. Testing has stopped.	Possible causes include heating circuit control instability.	Set POWER in OFF position, then ON again and resume testing. If same alarm occurs again, call for service.

Cont.

Displayed alarm	Contents	Cause	Action
COLD BOX CIRCULATOR FAILURE (ALM)	Low temperature chamber air circulator motor thermal relay tripped because of overcurrent. Testing has stopped.	Air circulator motor overload	Frost buildup may have caused overload. Set POWER in OFF position and leave chamber OFF awhile. Defrost chamber and resume testing. If same alarm occurs again, call for service.
COLD BOX ABS. HI LIMIT (ALM)	Low temperature chamber temperature rose above high temperature limit. Testing has stopped.	Possible causes include lost air flow due to frost buildup and heating circuit control instability.	Set POWER in OFF position and leave chamber OFF awhile. Defrost chamber and resume testing. If same alarm occurs again, call for service.
COLD BOX ABS. LOW LIMIT (ALM)	Low temperature chamber temperature dropped below low temperature limit. Testing has stopped.	Possible causes include abnormal temperature drop due to ineffective heater charging.	Set POWER in OFF position, then ON again and resume testing. If same alarm occurs again, call for service.
OVERHEATING (TEST AREA) (ALM)	Test area temperature rose above overheat protection alarm. Testing has stopped.	Possible causes include lost air flow due to excess of specimens and large overshoot due to high preheat target.	Check specimen quantity and preheating target. To prioritize recovery time over amount of overshoot, change overheat protection alarm setting in test pattern. Then, set POWER in OFF position, then ON again and resume testing. If same alarm occurs again, call for service.
OVERCOOLING (TEST AREA) (ALM)	Test area temperature dropped below overcool protection alarm. Testing has stopped.	Possible causes include lost air flow due to excess of specimens and large undershoot due to low precool target.	Check specimen quantity and precooling target. To prioritize recovery time over amount of undershoot, change overcool protection alarm setting in test pattern. Then, set POWER in OFF position, then ON again and resume testing. If same alarm occurs again, call for service.
OVERHEAT PROTECTOR TRIP (ALM)	The (operating panel) overheat protector tripped. Testing has stopped.	Test area temperature rose above overheat protector setting.	Check the overheat protector is set at least 10°C higher than the target high temperature. If overshoot is high, lower preheat temperature. Then, set POWER in OFF position, then ON again and resume testing. If same alarm occurs again, call for service.
OVERCOOL PROTECTOR TRIP (ALM)	The (operating panel) overcool protector tripped. Testing has stopped.	Test area temperature dropped below overcool protector setting.	Check the overcool protector is set at least 10°C lower than target low temperature. If undershoot is high, raise precool temperature. Then, set POWER in OFF position, then ON again and resume testing. If same alarm occurs again, call for service.

Cont.

Displayed alarm	Contents	Cause	Action
TEST AREA SHIFT FAILURE (ALM)	Test area drive end took longer than specified time. Testing has stopped.	Possible causes include too many specimens, foreign matter caught in mechanism and link mechanism trouble.	Set POWER in OFF position and check specimen status and foreign matter. Repair as necessary and resume testing. If same alarm occurs again, call for service.
TRANSFER FAILURE (ALM)	Test area drive safety device did not return to stop position within specified time. Testing has stopped.	Possible causes include link mechanism trouble.	Set POWER in OFF position, then ON again and resume testing. If same alarm occurs again, call for service.
SPECIMEN TRANSFER MOTOR FAILURE (ALM)	Safety device of specimen elevator motor tripped. Testing has stopped.	Possible causes include specimen elevator motor overload.	Set POWER in OFF position, then ON again and resume testing. If same alarm occurs again, call for service.
BURN-OUT (AI-0CH) (ALM)	Room temperature compensation input to controller disconnected. Testing has stopped. "----" appears on Top Monitor.	RTD terminal of controller (SCP-220 [analog]) is loose or there is short-circuit or open circuit in temperature measurement resistance (100Ω).	Set POWER in OFF position, then ON again and resume testing. If same alarm occurs again, call for service.
BURN-OUT (AI-1CH) (ALM)	Test area upstream input to controller disconnected. Testing has stopped.	TD terminal of controller (SCP-220 [analog]) is loose or there is open circuit in thermocouple.	Set POWER in OFF position, then ON again and resume testing. If same alarm occurs again, call for service.
BURN-OUT (AI-2CH) (ALM)	Test area downstream input to controller disconnected. Testing has stopped.	TW terminal of controller (SCP-220 [analog]) is loose or there is open circuit in thermocouple.	Set POWER in OFF position, then ON again and resume testing. If same alarm occurs again, call for service.
BURN-OUT (AI-3CH) (ALM)	Specimen temperature input to controller disconnected. Testing has stopped.	Ai-3 terminal of controller (SCP-220 [analog]) is loose or there is open circuit in thermocouple.	Set POWER in OFF position, then ON again and resume testing. If same alarm occurs again, call for service.
BURN-OUT (AI-5CH) (ALM)	High temperature chamber input to controller disconnected. Testing has stopped.	Ai-5 terminal of controller (SCP-220 [analog]) is loose or there is open circuit in thermocouple.	Set POWER in OFF position, then ON again and resume testing. If same alarm occurs again, call for service.
BURN-OUT (AI-6CH) (ALM)	Low temperature chamber input to controller disconnected. Testing has stopped.	Ai-6 terminal of controller (SCP-220 [analog]) is loose or there is open circuit in thermocouple.	Set POWER in OFF position, then ON again and resume testing. If same alarm occurs again, call for service.
BURN-OUT (AI-7CH) (ALM)	Refrigerator measurement channel (Ai-7ch) of controller disconnected. Testing has stopped.	Ai-7 terminal of controller (SCP-220 [analog]) is loose or there is open circuit in thermocouple.	Set POWER in OFF position, then ON again and resume testing. If same alarm occurs again, call for service.

Cont.

Displayed alarm	Contents	Cause	Action
BURN-OUT (AI-8CH) (ALM)	Refrigerator measurement channel (Ai-8ch) of controller disconnected. Testing has stopped.	Ai-8 terminal of controller (SCP-220 [analog]) is loose or there is open circuit in thermocouple.	Set POWER in OFF position, then ON again and resume testing. If same alarm occurs again, call for service.
BURN-OUT (AI-9CH) (ALM)	Refrigerator measurement channel (Ai-9ch) of controller disconnected. Testing has stopped.	Ai-9 terminal of controller (SCP-220 [analog]) is loose or there is open circuit in thermocouple.	Set POWER in OFF position, then ON again and resume testing. If same alarm occurs again, call for service.
COMMUNICATION ERROR-0 (ALM)	Communication error detected between instrumentation (display) and controller. Testing has stopped.	Communication trouble between display and controller	Reactivate chamber from main power switch (leakage breaker). If same alarm occurs again, call for service.
COMMUNICATION ERROR-1 (ALM)	Communication error detected between instrumentation (CPU board) and display board. Testing has stopped.	Communication trouble between CPU board and display board	Reactivate chamber from main power switch (leakage breaker). If same alarm occurs again, call for service.
COMMUNICATION ERROR-2 (ALM)	Communication error detected between instrumentation (display board) and CPU board. Testing has stopped.	Communication trouble between CPU board and display board	Reactivate chamber from main power switch (leakage breaker). If same alarm occurs again, call for service.
SYSTEM ERROR-1 (ALM)	System error detected by instrumentation (CPU board). Testing has stopped.	Memory or other error on CPU board	Reactivate chamber from main power switch (leakage breaker). If same alarm occurs again, call for service.
SYSTEM ERROR-2 (ALM)	System error detected by instrumentation (display board). Testing has stopped.	Memory or other error on display board	Reactivate chamber from main power switch (leakage breaker). If same alarm occurs again, call for service.
SYSTEM ERROR-4 (ALM)	System error detected by instrumentation (CPU board). Testing has stopped.	Sequence task error on CPU board	Reactivate chamber from main power switch (leakage breaker). If same alarm occurs again, call for service.
SYSTEM ERROR-5 (ALM)	System error detected by instrumentation (CPU board). Testing has stopped.	Refrigeration task error on CPU board	Reactivate chamber from main power switch (leakage breaker). If same alarm occurs again, call for service.
SYSTEM ERROR-6 (ALM)	System error detected by instrumentation (CPU board). Testing has stopped.	Control task error on CPU board	Reactivate chamber from main power switch (leakage breaker). If same alarm occurs again, call for service.