INSTALLATION, OPERATING AND SERVICE INSTRUCTIONS FOR

ALPINE™

CONDENSING HIGH EFFICIENCY DIRECT VENT

GAS - FIRED HOT WATER BOILER

Size Range - 399 MBH through 800 MBH

Alpine "C" Models:

- **ALP399C**
- **ALP500C**
- **ALP600C**
- **ALP700C**
- **ALP800C**

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WARNING: Improper installation, adjustment, alteration, service or maintenance can cause property damage, injury, or loss of life. For assistance or additional information, consult a qualified installer, service agency or the gas supplier. This boiler requires a special venting system. Read these instructions carefully before installing.

106307-02 - 2/17

Price - $5.00

XII. Troubleshooting

WARNING

Electrical Shock Hazard. Turn off power to boiler before working on wiring.

A. Troubleshooting problems where no error code is displayed.

Condition	Possible Cause
Boiler not responding to call for heat, “Status” and “Priority” show “Standby”.	Boiler is not seeing call for heat. Check thermostat or zone wiring for loose connection, miswiring, or defective thermostat/zone control.
Boiler not responding to a call for heat, “Status” shows “Standby” and “Priority” shows Central Heat or Domestic Hot Water.	Boiler is not firing, temperature is greater than setpoint. Water flow through boiler primary loop non-existent or too low.
Boiler Running but System or Boiler Circulator is not running	• Check wiring for loose connection, miswiring. • When there is a Domestic Hot Water Heat Request the System or Boiler pumps will be forced “off” when there “Run Pump for” parameter is set to “Central heat, off DHW demand” or “Central Heat, Optional Priority”. This has been set to allow all of the heat to be provided for fast indirect water heater recovery. After one hour of “priority protection” or the end of the Domestic Hot Water Heat Request the system and boiler pumps will be free to run.
Home is cold during mild weather days	• Increase Low Boiler Water Temperature parameter 5°F (2.8°C) per day.
Home is cold during cold weather days	• Increase High Boiler Water Temperature parameter 5°F (2.8°C) per day

B. Display Faults:

Faults are investigated by selecting the “Help” button from the “Home” screen. When a fault is active the “Help” button flashes and the home screen turns a red color. Continue to select flashing buttons to be directed to the Fault cause.

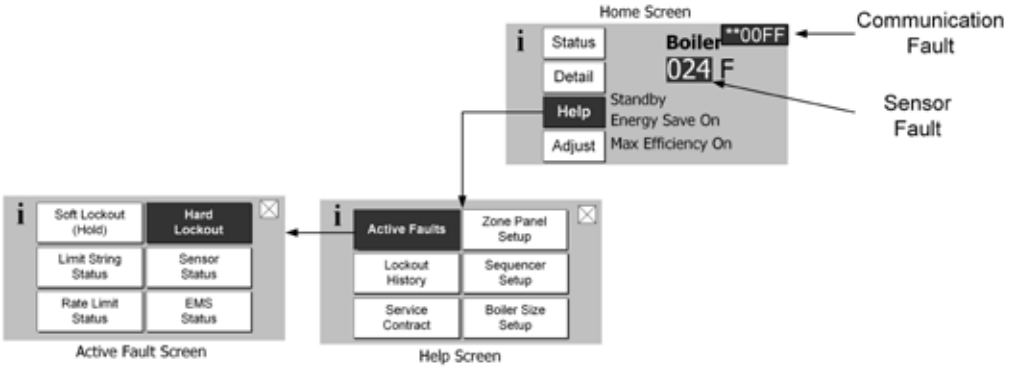
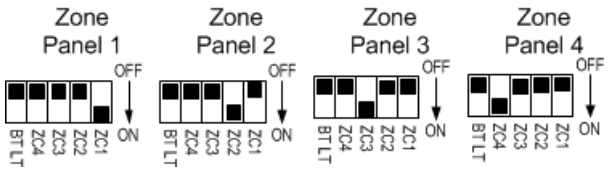


Figure 63: Help Menu

Indication	Condition	Possible Cause
Display Completely Dark Fan off, LWCO lights off, no green power light on Control	No 120Vac Power at Boiler	Check breaker and wiring between breaker panel and boiler.
Display Completely Dark, Fan running	No 24Vac Power to Control	- Loose 120Vac connection wiring between boiler J-Box and transformer - Loose 24 Vac connection wiring between transformer and Control.
Blinking Green power light on Control	Control Fault	- The green light is connected to internal power supply. The power supply is repeatedly starting and stopping (not normal) making the light flash. The microprocessors are not running. - Try disconnecting all terminals except 24VAC to power the Control. The green light should be steady. If it is not, then the control is defective. If steady, start plugging in all the connectors while watching the green light. When faulty wiring reconnected, green light will begin to flash.
Display Completely Dark but Boiler fires	No 5 Vdc Power to Display	- Loose 5 Vdc connection wiring between display and Control - Defective Display or Control.
****00FF or **ERFF**	display lost communication with control	- Loose or defective display harness - Defective Display - Defective Control
ER0011	Adjustment Mode Password Timeout	- The Control and Display are **NOT** defective. The password has timed out. Simply cycle power to the Display to restore operation.
ER0012	Control Failed	Defective Control. Replace Sage.

XII. Troubleshooting (continued)

C. Help Screen Faults

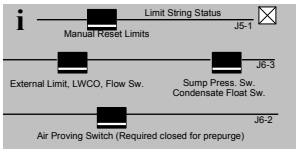
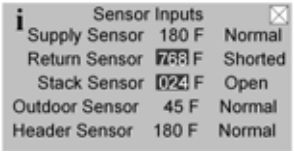
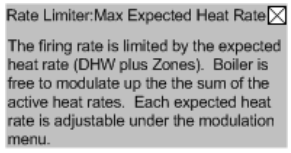
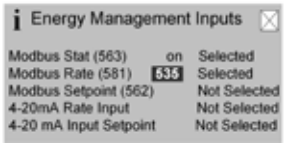
Indication	Condition	Possible Cause
Zone Panel Setup Flashing	**Zone Panel 1 Setup** Flashing	Zone Panel 1 communication lost, typical for Panel 1 through 4: The zone panel's communication was established and then lost. Check the following to correct the issue: • Wiring between panel and boiler. • Zone panel DIP switch settings have changed: - Set Master/Slave switch to "Master" - Set Zone Control switch ZC1 to "ON" - Cycle power
	Zone Panel Failure Flashing	Zone Panel Electronics Failure: A Zone Panel
	Duplicate Zone Flashing	Duplicate Zone: The Control has detected duplicate zone panel numbers. Check the following to correct: • Each Zone Control DIP Switch must be set to a Unique setting:  Note that when multiple ZC switches are set on ON the Zone Panel is reported as Zone Panel 1.
Sequencer Setup	Sequencer Setup Fault	This alarm is active if the slave boiler has lost communication with the Sequence Master. Check the following: - RJ 45 peer-to-peer network disconnected - Sequencer Master was Enabled and then Disabled - Master's Boiler has been powered down. - To clear fault restore communication or cycle power
Boiler Size Setup	Boiler Size Fault	**WARNING!** Boiler size setting may not match actual boiler size. The Boiler size setting determines min, max and light-off blower speeds. Incorrect boiler size can cause hazardous burner conditions and improper operation that may result in PROPERTY LOSS, PHYSICAL INJURY, OR DEATH. Refer to page 91 for boiler size setting instructions.

D. Help Screen Diagnostic Features

Indication	Possible Cause
	Lockout History is stored in a first-in, first-out basis. Each History file is stored with boiler run hour of when the lockout occurred. The "When happened" and "Current" provide: - "Current" is the run hour and status the boiler just finished. - "When happened" is the run hour and status when the lockout occurred.
For Service Contact: ☒ CONTRACTOR NAME CONTRACTOR ADDRESS 1 CONTRACTOR ADDRESS 2 PHONE NUMBER	The user is given the contact information of the responsible service provider. Refer to page 97 for data entry instructions.

XII. Troubleshooting (continued)

E. Active Fault Screen Faults

Indication	Condition	Possible Cause
Limit String Status 	Limit String Fault	The Limit String Status screen shows the faulty safety limit. A contact icon, either "open" or "closed", graphically represents each safety limit. The "closed" contact icon is steady; the "open" contact icon is blinking. For example, the screen shown to the left illustrates a "closed" Air Pressure Switch contact and an "open' Auto Reset High Limit contact. The Auto Reset High Limit is causing the boiler to stop firing. NOTE: Since the limit string items are wired in series, all limits downstream of the "open" limit will also appear on the screen as "open" (blinking) icons regardless of whether or not they are actually open.
Sensor Status 	Sensor Fault	The Sensor Status screen shows the status of all sensors. Possible states include: None: Feature requiring this sensor has not been selected. Normal: Sensor is working normally. Shorted: Sensor is shorted or is defective. Open: There is a break in the wiring between the Control and the sensor or the sensor is defective Out of Range: Sensor is defective or is being subjected to electrical noise. Unreliable: Sensor is defective or is being subjected to electrical noise. When a sensor fails "opened" or "shorted" the value is changed to reverse video (background black and value white) "024" or "768" respectively to indicate that there is a fault with the sensor.
Rate Limit 	Rate Limit	The following messages appear when the firing rate is limited or reduced to help avoid a lockout or save energy. Refer to Hard Lockout section for corrective actions - High Stack Temperature Limit - High Supply Temperature Limit - High Differential Temperature Limit The following messages appear as part of normal start and stop sequences: - Minimum Modulation (normal start/stop sequence) - Low Fire Hold Rate: Low fire hold rate is a normal start-up rate hold used to help ensure system temperature feedback prior to release to modulation. Low Fire Hold Time may be adjusted. Refer to the "Changing Adjustable Parameters", Paragraph F, for additional information. - Maximum Expected Heat Rate: Maximum Expected Heat Rate limit is a normal start-up rate hold used to save energy. This limit helps reduce extra cycles and save energy. Boiler is free to modulate up to the sum of the active zones and domestic hot water expected heat rates. Each zone heat rate is adjustable and may be modified under the modulation menu. Refer to the "Changing Adjustable Parameters", Paragraph F, for additional information.
EMS Status 	Energy Management System Fault	The Energy Management System (EMS) fault screen provides input fault status. When an input is shown as "Not Selected" it is not required for this application or has not yet been selected. These options are selected under the "Energy Management" Adjust mode menu. Modbus Input Failure: If a modus input is selected and out of range or not present a "535" value is shown reverse video (background black and value white). To fix the problem check the input source and check that the input is properly connected. 4-20mA Input Failure: Failure status for the 4-20mA input is the same as shown under Sensor Fault.

XII. Troubleshooting (continued)

F. Troubleshooting problems where a Soft Lockout Code is displayed. When a soft lockout occurs, the boiler will shut down, the display will turn red and the "Help" button will "blink". Select the "blinking" "Help" button to determine the cause of the soft lockout. The boiler will automatically restart once the condition that caused the lockout is corrected.

Soft Lockout Codes Displayed

Lockout Number	Condition	Possible Cause
1 Anti Short Cycle	Minimum time between starts has not been reached. Normal delay used to avoid excessive cycles.	
2 Boiler Recycling Limits Open (LCI OFF)	LCI safety limit input not energized.	Limit Control Input (LCI) is not ON. Refer to Limit String Status screen for list of limits. • Auto Reset Ext. Limit device open or jumper not installed • Low water condition (if using 24V LWCO) • Flow switch open. Check boiler pump and flow switch wiring. • Sump pressure switch open. Check for vent or combustion air pipe blockage. • Condensate float switch open. Check for condensate drain blockage. • Loose or defective limit string wiring
3 Burner Interlock Open (ILK OFF)	ILK safety limit input not energized.	Lockout input (ILK) is not ON. Refer to Limit String Status screen for list of limits. • Man Reset Ext. Limit device open or jumper not installed • High or low gas pressure switch open or jumper not installed • Thermal link open • Burner door thermostat open • Loose or defective limit string wiring
7 Return sensor fault	Shorted or open return temperature sensor.	• Shorted or mis-wired return sensor wiring. • Defective return sensor.
8 Supply sensor fault	Shorted or open supply temperature sensor.	• Shorted or mis-wired supply sensor wiring. • Defective supply sensor.
9 DHW sensor fault	Shorted or open Domestic Hot Water (DHW) temperature sensor.	• Shorted or mis-wired DHW sensor wiring. • Defective DHW sensor.
10 Stack sensor fault	Shorted or open flue gas (stack) temperature sensor.	• Shorted or mis-wired flue temperature sensor wiring. • Defective flue temperature sensor.
11 Ignition failure	Model ALP399C flame failure after 5 tries to restart.	• No gas pressure. • Gas pressure under minimum value shown on rating plate. • Gas line not completely purged of air. • Defective Electrode. • Loose burner ground connection. • Defective Ignition Cable. • Defective gas valve (check for 24 Vac at harness during trial for ignition before replacing valve). • Air-fuel mixture out of adjustment - consult factory.
13 Flame rod shorted to ground	Flame rod shorted to ground	• Shorted or mis-wired flame rode wiring. • Defective flame rod.
14 ΔT inlet/outlet high	Temperature rise between supply and return is too high.	• Inadequate boiler water flow. Verify that circulator is operating and that circulator and piping are sized per Section VI of this manual.
15 Return temp higher than supply	The Control is reading a return sensor temperature higher than the supply sensor temperature. Condition must be present for at least 75 seconds for this error code to appear.	• Flow through boiler reversed. Verify correct piping and circulator orientation. • No boiler water flow. Verify that system is purged of air and that appropriate valves are open. • Sensor wiring reversed. • Supply or return sensor defective.
16 Supply temp has risen too quickly	Supply water temperature has risen too quickly.	• See possible causes for "Hard Lockout 4". • Inadequate boiler water flow. • Verify that circulator is operating and that circulator and piping are sized per Section VI of this manual.
17 Blower speed not proved	Normal waiting for blower speed to match purge and light-off setpoint.	
27 Interrupted Airflow Switch (IAS) ON	Air proving switch failed to open.	Air proving switch closed before Prepurge. • Failed air proving switch. Check switch for proper operation. • Short in limit string wiring
27 Interrupted Airflow Switch (IAS) OFF	Air proving switch failed to close.	Air proving switch open during Prepurge or Drive Lightoff. • Check for vent or combustion air pipe blockage. • Confirm air proving switch hose connected to gas valve outlet tapping and outlet tapping internal screw is open. • Loose or defective limit string wiring

G. Troubleshooting problems where a Hard Lockout Code is displayed. When a hard lockout occurs, the boiler will shut down, the display will turn red and the "Help" button will "blink". Select the "blinking" "Help" button to determine the cause of the Hard Lockout. Once the condition that caused the lockout is corrected, the boiler will need to be manually reset using the Reset button on the "Active Fault" display or located on the Sage2.2 Control.

Alarm Output Contact

The Control includes an alarm output contact located on Control terminals J6 - 7 & 8. The alarm contact closes when the Control goes into a manual reset Hard Lockout. The list of Hard Lockouts is shown below.

Hard Lockout Codes Displayed

Lockout Number	Condition	Possible Cause
3 Burner Interlock Open (ILK OFF)	ILK safety limit input not energized	Lockout input (ILK) is not ON. Refer to Limit String Status screen for list of limits. • Man Reset Ext. Limit device open or jumper not installed • High or low gas pressure switch open or jumper not installed • Thermal link open • Burner door thermostat open • Loose or defective limit string wiring
4 Supply high limit	Sage2.2 supply sensor detected temperatures in excess of 210°F.	• Heating load at time of error was far below the minimum firing rate of the boiler. • Defective system circulator or no flow in primary loop. • Defective boiler circulator, no flow or insufficient flow in boiler loop. • Control system miswired so that the boiler operation is permitted when no zones are calling.
6 Stack High limit	Sage2.2 Flue gas (Stack) sensor detected temperatures in excess of 204°F (95.6°C).	• Heat exchanger needs to be cleaned. • Boiler over-fired. • Air-fuel mixture out of adjustment - consult factory.
12 Flame detected out of sequence	A flame signal was present when there should be no flame.	• Defective gas valve - make sure inlet pressure is below maximum on rating plate before replacing valve.
14 Delta T Inlet/Outlet High	Temperature rise between supply and return is too high.	Inadequate boiler water flow. • Boiler pump not operating • Boiler pump undersized • Valve closed
15 Return Temperature Higher Than Supply	Return temperature was greater than supply temperature for at least 75 seconds.	• Reversed flow through boiler. Verify correct piping and circulator orientation. • No boiler water flow. Verify system is purged of air and appropriate valves are open. • Defective supply or return sensor
16 Supply Temperature Risen Too Quickly	Supply water temperature has risen too quickly.	• Inadequate boiler water flow. See also causes for Hard Lockout 4. • Boiler pump not operating • Boiler pump undersized • Valve closed
18 Light off rate proving failed	Blower is not running at Light-off rate when it should or blower speed signal not being detected by Sage2.2.	• Loose connection in 120 VAC blower wiring. • Loose or miswired blower speed harness. • Defective blower
19 Purge rate proving failed	Blower is not running at Purge rate when it should or blower speed signal not being detected by Sage2.2.	• Loose connection in 120 VAC blower wiring. • Loose or miswired blower speed harness. • Defective blower
20 Invalid Safety Parameters	Unacceptable Sage2.2 control Safety related parameter detected.	Parameters change was invalid. Check parameter selection and reset Control. Contact factory if problem persists.
21 Invalid Modulation Parameter	Unacceptable Sage2.2 control Modulation related parameter detected.	Reset the control.
22 Safety data verification needed	Safety related parameter change has been detected and a verification has not been completed.	Safety related Sage2.2 control parameter has been changed and verification has not been performed.
23 24VAC voltage low/high	Sage2.2 control 24Vac control power is high or low.	• Loose connection in 24Vac VAC power wiring. • Loose or miswired 24Vac harness. • Miswired wiring harness causing power supply short to ground. • Defective transformer. • Transformer frequency, voltage and VA do not meet specifications.

XII. Troubleshooting (continued)

Hard Lockout Codes Displayed (continued)

Lockout Number	Condition	Possible Cause
24 Fuel Valve Error	Power detected at fuel valve output when fuel valve should be off.	• Loose or defective gas valve harness. Check electrical connections. • Defective gas valve (check for 24 Vac at harness during trial for ignition before replacing valve).
25 Hardware Fault	Internal control failure.	• Reset the control. If problem reoccurs, replace the Sage.
26 Internal Fault	Internal control failure.	• Reset the control. If problem reoccurs, replace the Sage.
27 Ignition failure	Models ALP500C, ALP600C, ALP700C and ALP800C: Flame failure after 1 try to restart.	• No gas pressure. • Gas pressure under minimum value shown on rating plate. • Gas line not completely purged of air. • Defective Electrode. • Loose burner ground connection. • Defective Ignition Cable. • Defective gas valve (check for 24 Vac at harness during trial for ignition before replacing valve). • Air-fuel mixture out of adjustment - consult factory.
27 Interrupted Airflow Switch (IAS) ON	Air proving switch failed to open.	Air proving switch closed before Prepurge. • Failed air proving switch. Check switch for proper operation. • Short in limit string wiring
27 Interrupted Airflow Switch (IAS) OFF	Air proving switch failed to close.	Air proving switch open during Prepurge or Drive Lightoff. • Check for vent or combustion air pipe blockage. • Confirm air proving switch hose connected to gas valve outlet tapping and outlet tapping internal screw is open. • Loose or defective limit string wiring
42 AC Phase Fault	AC inputs phase reversed	• Check control and display connections. • Verify line voltage frequency and voltage meet specifications. • Verify 24VAC transformer functioning properly.
47 Flame Lost	Flame lost at some stage. See display for details.	• Gas pressure too low. See minimum on boiler rating label. • Air-fuel mixture out of adjustment. See System Start-Up Section. • Disconnected or defective flame sensor wire. • Defective flame sensor. • Defective gas valve. Before replacing valve, check for 24 VAC at gas valve connector during trial for ignition.
284 Memory Reset To Default	OEM Memory Lost, Honeywell Default Memory Restored	• Control failure • Consult factory • Replace control