LENNOX®
INSTALLATION INSTRUCTIONS

GAS UNITS
KITS AND ACCESSORIES

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IGNITION CONTROL TESTER KIT

INSTALLATION INSTRUCTIONS FOR IGNITION CONTROL TESTER KIT 22L0101 USED WHEN TESTING EGC OR SURELIGHT CONTROL BOARDS

ELECTROSTATIC DISCHARGE (ESD)
Precautions and Procedures

⚠ CAUTION

Electrostatic discharge can affect electronic components. Take precautions during furnace installation and service to protect the furnace's electronic controls. Precautions will help to avoid control exposure to electrostatic discharge by putting the furnace, the control and the technician at the same electrostatic potential. Neutralize electrostatic charge by touching hand and all tools on an unpainted unit surface, such as the gas valve or blower deck, before performing any service procedure.

SHIPPING AND PACKING LIST

Package 1 of 1 contains:

1 – Ignition control tester
1 – SureLight harness
1 – EGC harness
1 – EGC spark ignitor cable

SHIPPING DAMAGE

Check all components for shipping damage. Consult last carrier immediately if damage is found.

APPLICATION

This kit will test the function of two different control boards: the SureLight 50A62 board and the Heatcraft EGC board. The tester simulates normal thermostat demand and allows the user to introduce a variety of failure modes. The tester plugs into a 120V power supply and provides 24V to the control board.

GENERAL

The test procedure checks the following board functions:

1 – Cooling, fan on and heating modes.
2 – Heating operation during tester-induced failures.
3 – Standby operation during tester-induced failures:
Standby mode conditions:
  a – Main power on.
  b – Tester switches set for normal operation (as indicated in the set-up section below)
  c – No demand from thermostat.

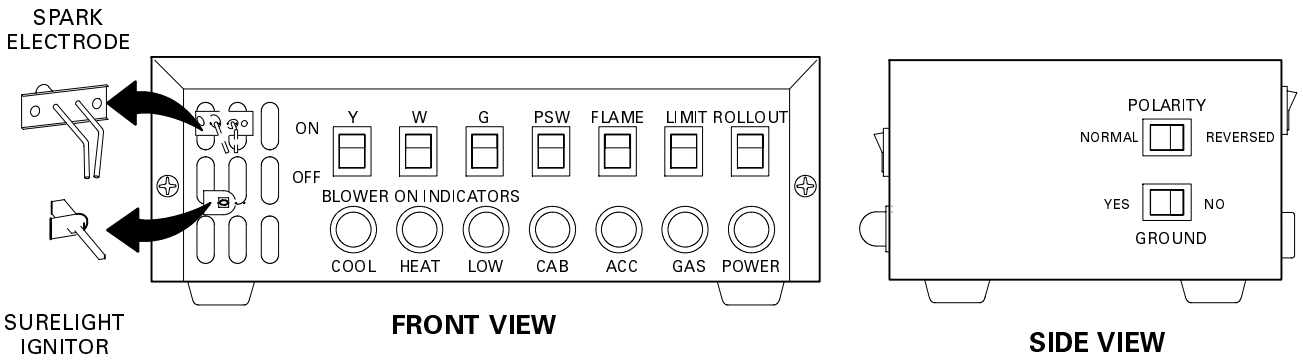
SET-UP

⚠ WARNING

Before installing or servicing unit, be sure ALL power to unit is OFF. More than one disconnect switch may be present. Electrical shock can cause personal injury or death!

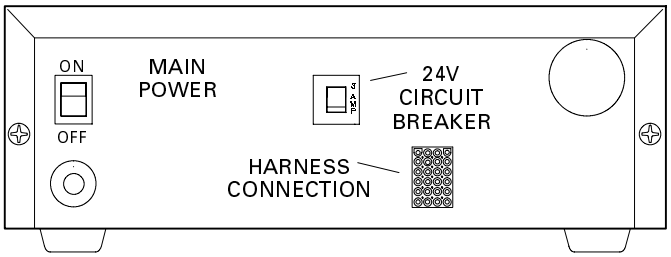
1 – Shut off electrical power to the unit. Locate control board in control box. Disconnect wiring from control board and remove board from the unit.
2 – Verify that the line voltage is between 98 and 132 VAC on a 60 hz. system.
3 – Select the appropriate test harness for the specific control board to be tested.
4 – Connect the harness to the control board as shown in figure 2 for SureLight or figure 4 for EGC control. Also, if desired, connect the designated harness to the combustion air blower.
5 – Set tester switches for standby mode (locations shown in figure 1) as follows:
  a -- Limit and rollout – **on**.
  b – Ground – **yes**.
  c – Polarity – **normal**.
  d – All other switches – **off**.
6 – Set control board heat off delay switches to **off**.
7 – Set fan off delay to shortest setting (60 seconds).

COMPONENT IDENTIFICATION



FRONT VIEW

SIDE VIEW



BACK VIEW

SWITCHES (Front)

Y – CALL FOR COOLING
W – CALL FOR HEATING
G – CALL FOR CONTINUOUS FAN
PSW – PRESSURE SWITCH – Open/Off; Closed/On
FLAME – FLAME RECTIFICATION – Yes/On; No/Off
LIMIT – HIGH LIMIT SWITCH – Open/Off; Closed/On
ROLLOUT – ROLLOUT SAFETY SWITCH – Open/Off; Closed/On

SWITCHES (Right Side)

GROUND – MAIN GROUND – Yes/No
POLARITY – MAIN POWER POLARITY – Normal/Reversed

SWITCHES (Rear)

POWER – MAIN POWER – On/Off

INDICATOR LIGHTS (Front)

COOL – INDOOR BLOWER ENERGIZED (Cooling Mode)
HEAT – INDOOR BLOWER ENERGIZED (Heating Mode)
LOW – INDOOR BLOWER ENERGIZED (Continuous Fan Mode)
CAB – COMBUSTION AIR BLOWER ENERGIZED
ACC – ACCESSORY ENERGIZED
GAS – GAS VALVE ENERGIZED (Gas Flow)
POWER – MAIN POWER TO TESTER ON

BULB REPLACEMENT INFORMATION

Replace bulbs when necessary using Sylvania pilot lamps.
120 PSB –- COOL, HEAT, LOW, CAB, and ACC indicators.
24 PSB –- GAS and POWER indicators.

FIGURE 1

TESTING – SureLight BOARD

Table 2 details control board diagnostic signals
Set tester switch positions for standby mode as follows before beginning test 1:
LIMIT AND ROLLOUT – ON; GROUND – YES; POLARITY – NORMAL; ALL OTHER – OFF.

TABLE 1

TEST NO.	TEST CONDITION	SWITCH ACTION	RESPONSE
1	NORMAL GROUND	POWER ON	**CAB** light turns on for 1 to 2 seconds. Indicates normal ground.
		POWER OFF	**CAB** de-energized
2	FAULTY GROUND	GROUND NO	No response
		POWER ON	**CAB** light turns on. Indicates faulty ground.
		GROUND YES	Control resets and **CAB** light turns on for 1 to 2 seconds. Indicates normal ground.
3	COOLING MODE	Y ON	**ACC** and **COOL** lights turn on. Indicates normal cooling mode.
4	FAN ON MODE	G ON	**ACC** and **LOW** lights turn on. Indicates normal fan on mode.
5	HEATING MODE	W ON	**CAB** light turns on. User has 150 seconds to turn **PSW** switch ON.
		PSW ON	Pressure switch closure verified and 15-second prepurge is initiated. After prepurge, 20-second ignitor warm-up period begins (observe ignitor). **GAS** flow light turns on. User has 4 seconds to turn **FLAME** switch ON.
		FLAME ON	Flame rectification is verified. After 45-second delay, **HEAT** and **ACC** lights turn on.
6	HEATING SHUTDOWN	W OFF	Call for heat is satisfied. **GAS** flow light is off.
		FLAME OFF	Flame sense circuit opens. **CAB** light shuts off after 5-second delay. User must turn **PSW** switch OFF.
		PSW OFF	Pressure switch circuit opens. After preset delay, **HEAT** and **ACC** lights turn off.
7	TRIPPED ROLLOUT (Occurring during heating cycle)	ROLLOUT OFF	**GAS** flow light is off. User must turn **FLAME** switch off.
		FLAME OFF	Flame rectification circuit opens. **CAB** light shuts off after 5-second delay. User must turn **PSW** switch OFF.
		PSW OFF	Pressure switch circuit opens. After preset delay, **HEAT** and **ACC** lights turn off. Control is in soft lockout until **ROLLOUT** switch is reset to closed (ON) position.
		ROLLOUT ON	**ROLLOUT** switch is reset to normally closed position. Control restarts ignition sequence.
8	TRIPPED LIMIT (Occurring during heating cycle)	LIMIT OFF	**GAS** flow light is off. User must turn **FLAME** switch off.
		FLAME OFF	Flame rectification circuit opens. **CAB light** shuts off after 5-second delay. User must turn **PSW** switch OFF.

TABLE 1 (CONTINUED)

TEST NO.	TEST CONDITION	SWITCH ACTION	RESPONSE
8	TRIPPED LIMIT (Continued) (Occurring during heating cycle)	PSW OFF	Pressure switch circuit opens. **HEAT** and **ACC** lights remain lit indefinitely. If **W** is turned off, **HEAT** and **ACC** lights turn off after preset delay.
		LIMIT ON	Limit switch resets to normally closed position. Control restarts ignition sequence to satisfy demand for heat. **GAS** flow light is on. If limit trips 5 times during one unsatisfied demand for heat, control begins 60-minute Watchguard mode.
9	OPEN PRESSURE SWITCH (Occurring during heating cycle)	PSW OFF	**GAS** flow light is off. User must turn **FLAME** switch OFF.
		FLAME OFF	Flame rectification circuit opens. **CAB** light shuts off after 150-second delay. **HEAT** and **ACC** lights turn off after preset delay. Control begins 5-minute pressure Watchguard mode. After 5 minutes, **CAB** light turns on and cycle repeats.
10	FLAME SENSE FAILURE (Occurring during heating cycle)	FLAME OFF	Flame rectification circuit opens. No flame is sensed. **GAS** flow light turns off. Control initiates relight sequence. After 5 ignition trials without proof of flame, control begins Watchguard Flame Failure mode.
11	VERIFY FLAME SENSE (Occurring during standby mode)	FLAME ON	Control senses flame. **HEAT**, **ACC** and **CAB** lights turn on and remain on until flame is no longer sensed.
12	PRESSURE SWITCH STUCK CLOSED (Occurring during standby mode)	PSW ON	No action. No error codes indicated.
		W ON	Call for heat, no action. Diagnostic LEDs indicate appropriate code.
13	ROLLOUT TRIPPED (Occurring during standby mode)	ROLLOUT OFF	No action. Diagnostic LEDs indicate appropriate code.
		W, Y or G ON	No action. Control will not respond to any demands.
14	LIMIT TRIPPED (Occurring during standby mode)	LIMIT OFF	No action. No error codes indicated.
		W ON	Call for heat. **HEAT** and **ACC** lights turn on. Diagnostic LEDs indicate appropriate code.
		Y or G ON	**COOL (or LOW)** and **ACC** lights are on and are not affected by tripped limit.
15	MAIN POWER POLARITY (Occurring during standby mode)	MAIN POWER OFF	Control is de-energized.
		POLARITY SWITCH TO REVERSED	Main power polarity is reversed.
		MAIN POWER ON	No action. Diagnostic LEDs indicate code for polarity problem.
Shaded area indicates tests performed during standby mode.			

SureLight CONTROL BOARD 50A62 (63K8901) HARNESS CONNECTIONS

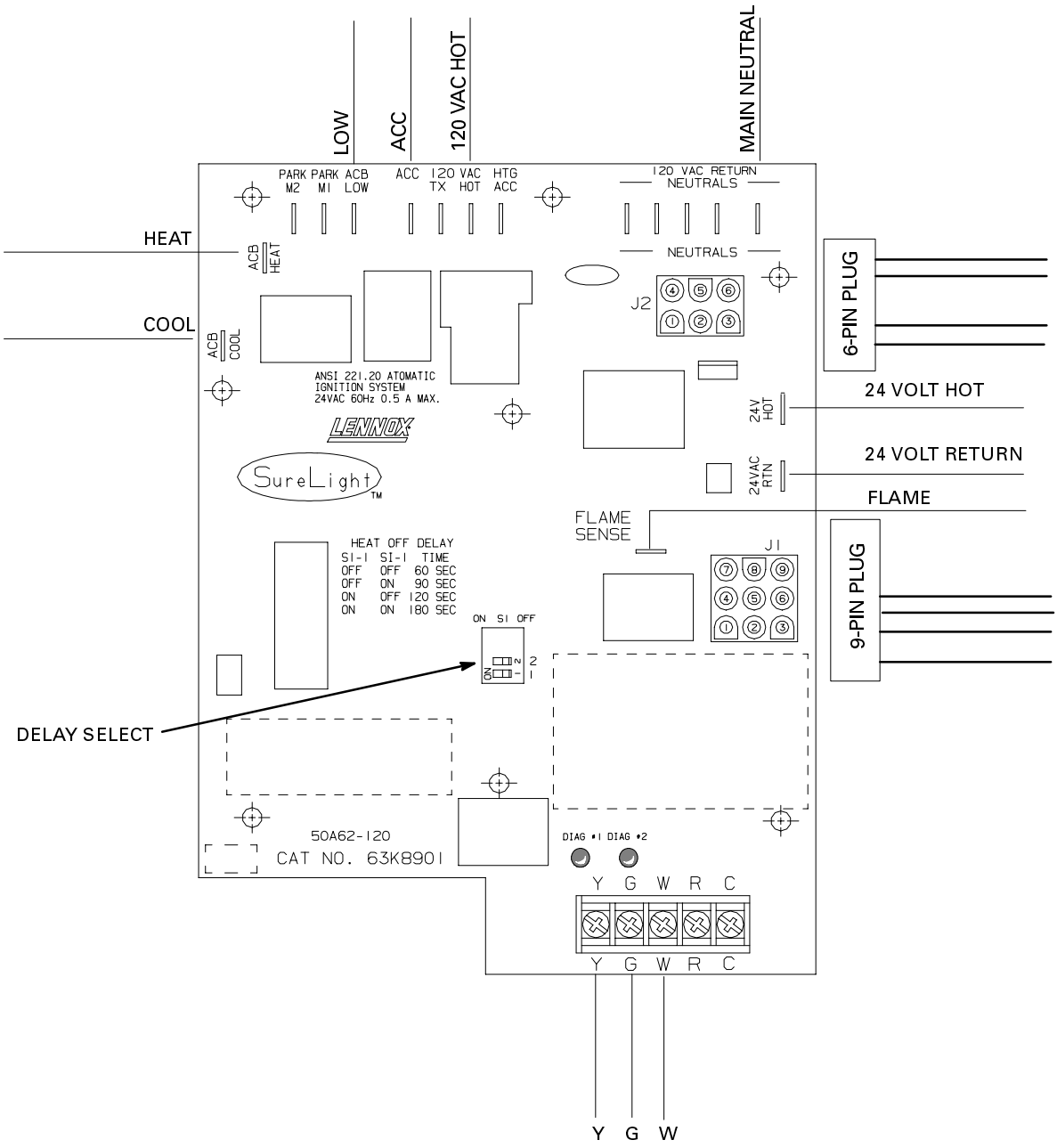


FIGURE 2

TABLE 2
DIAGNOSTIC CODES

LED #1	LED #2	DESCRIPTION
SIMULTANEOUS SLOW FLASH	SIMULTANEOUS SLOW FLASH	Power on –– Normal operation. Also signaled during cooling and continuous fan.
SIMULTANEOUS FAST FLASH	SIMULTANEOUS FAST FLASH	Normal operation – signaled when heating demand initiated at thermostat.
SLOW FLASH	ON	Primary or secondary limit switch open.
OFF	SLOW FLASH	Pressure switch open or has opened 5 times during a single call for heat; OR: Blocked inlet/exhaust vent; OR: Condensate line blocked; OR: Pressure switch closed prior to activation of combustion air blower.
ALTERNATING SLOW FLASH	ALTERNATING SLOW FLASH	Watchguard –– burners failed to ignite.
SLOW FLASH	OFF	Flame sensed without gas valve energized.
ON	SLOW FLASH	Rollout switch open. OR: 9-pin connector improperly attached.
ON ON OFF	ON OFF ON	Circuit board failure or control wired incorrectly.
FAST FLASH	SLOW FLASH	Main power polarity reversed. Switch line and neutral.
SLOW FLASH	FAST FLASH	Low flame signal. Measures below .7 microAmps. Replace flame sense rod.
ALTERNATING FAST FLASH	ALTERNATING FAST FLASH	Improper main ground or line voltage below 75 volts; OR: Broken ignitor; OR: Open ignitor circuit.

NOTE – Slow flash equals 1 Hz (one flash per second). Fast flash equals 3 Hz (three flashes per second). Minimum flame sense current = 0.15 microAmps.

OPERATIONAL INFORMATION

HEAT MODE
PREPURGE ..... 15 Seconds
INTER-PURGE ..... 15 Seconds
POST-PURGE ..... 5 Seconds
IGNITOR WARM-UP ..... 20 Seconds
IGNITION TRIAL ..... 4 Seconds
RETRY ..... 5 Times
RETRIALS ..... 3 Times

FAN OFF DELAY SELECT (SECONDS)
COOLING FAN OFF DELAY 0
HEAT FAN OFF DELAY
FACTORY SETTING 90
ADDITIONAL SETTINGS: 60, 120,180

FAN ON DELAY (SECONDS)
COOLING FAN ON DELAY 0
HEATING FAN ON DELAY 45

FIGURE 3

TESTING – EGC BOARD

Table 4 details control board diagnostic signals
Set tester switch positions for standby mode as follows before beginning test 1:
LIMIT AND ROLLOUT – ON; GROUND – YES; POLARITY – NORMAL; ALL OTHER – OFF.
*NOTE – The **EGC** control board is not polarity sensitive.*

TABLE 3

TEST NO.	TEST CONDITION	SWITCH ACTION	RESPONSE
1	NORMAL	POWER ON	No action. Diagnostic LEDs indicate appropriate code.
2	COOLING MODE	Y ON	**ACC** and **COOL** lights turn on.
3	FAN ON MODE	G ON	**ACC** and **LOW** lights turn on. *(EGC–2 –– **ACC** and **HEAT** lights turn on.)*
4	HEATING MODE	W ON	**CAB** light turns on. User has 150 seconds to turn **PSW** switch ON.
		PSW ON	Pressure switch closure verified and 15-second prepurge is initiated. After prepurge, **GAS** flow light turns on and spark ignitor is energized. User has 10 seconds to turn **FLAME** switch ON.
		FLAME ON	Flame rectification is verified. After 45-second delay, **HEAT** and **ACC** lights turn on. Diagnostic LEDs indicate appropriate code.
5	HEATING SHUTDOWN	W OFF	Call for heat is satisfied. **GAS** flow light is off. User must turn **FLAME** switch off.
		FLAME OFF	Flame sense circuit opens. **CAB** light shuts off after 5-second delay. User must turn **PSW** switch OFF.
		PSW OFF	Pressure switch circuit opens. After preset delay, **HEAT** and **ACC** lights turn off.
6	TRIPPED ROLLOUT (Occurring during heating cycle)	ROLLOUT OFF	**GAS** flow light is off. User must turn **FLAME** switch off.
		FLAME OFF	Flame rectification circuit opens. **CAB** light shuts off after 5-second delay. User must turn **PSW** switch OFF.
		PSW OFF	Pressure switch circuit opens. After preset delay, **HEAT** and **ACC** lights turn off. Ignition sequence restarts and **ROLLOUT** switch is reset to closed (ON) position.
		ROLLOUT ON	**ROLLOUT** switch is reset to normally closed position. Control restarts ignition sequence.
7	TRIPPED LIMIT (Occurring during heating cycle)	LIMIT OFF	**GAS** flow light is off. User must turn **FLAME** switch off.
		FLAME OFF	Flame rectification circuit opens. **CAB light** shuts off. User must turn **PSW** switch OFF.
		PSW OFF	Pressure switch circuit opens. **HEAT** and **ACC** lights remain lit indefinitely. If **W** is turned off, **HEAT** and **ACC** lights turn off after preset delay.

TABLE 3 (CONTINUED)

TEST NO.	TEST CONDITION	SWITCH ACTION	RESPONSE
7	TRIPPED LIMIT (Continued) (Occurring during heating cycle)	LIMIT ON	Limit switch resets to normally closed position. Control restarts ignition sequence to satisfy demand for heat. **GAS** flow light is on. If limit trips 5 times during one unsatisfied demand for heat, control begins 60-minute Watchguard mode.
8	OPEN PRESSURE SWITCH (Occurring during heating cycle)	PSW OFF	**GAS** flow light is off. User must turn **FLAME** switch OFF.
		FLAME OFF	Flame rectification circuit opens. **CAB** light shuts off after 150-second delay. **HEAT** and **ACC** lights turn off after preset delay. Control begins 5-minute pressure Watchguard mode. After 5 minutes, **CAB** lights. Cycle repeats and **CAB** light stays lit until pressure switch closes.
9	FLAME SENSE FAILURE (Occurring during heating cycle)	FLAME OFF	Flame rectification circuit opens. No flame is sensed. **GAS** flow light turns off. Control initiates relight sequence. After 5 ignition trials without proof of flame, control begins Watchguard Flame Failure mode.
10	VERIFY FLAME SENSE (Occurring during standby mode)	FLAME ON	Control senses flame. **HEAT**, **ACC** and **CAB** lights turn on and remain on until flame is no longer sensed.
11	PRESSURE SWITCH STUCK CLOSED (Occurring during standby mode)	PSW ON	No action. No error codes indicated.
		W ON	Call for heat, no action. Diagnostic LEDs indicate appropriate code.
12	ROLLOUT TRIPPED (Occurring during standby mode)	ROLLOUT OFF	No action. Diagnostic LEDs indicate appropriate code.
		W, Y or G ON	No action. Control will not respond to any demands.
13	LIMIT TRIPPED (Occurring during standby mode)	LIMIT OFF	No action. No error codes indicated.
		W ON	Call for heat. **HEAT** and **ACC** lights turn on. Diagnostic LEDs indicate appropriate code.
		Y or G ON	**COOL (or LOW)** and **ACC** lights are on and are not affected by tripped limit. *(EGC–2 –– **HEAT** and **ACC** lights are brought on by G demand.)*
Shaded area indicates tests performed during standby mode.			

HEATCRAFT CONTROL BOARD EGC (73K7901) HARNESS CONNECTIONS

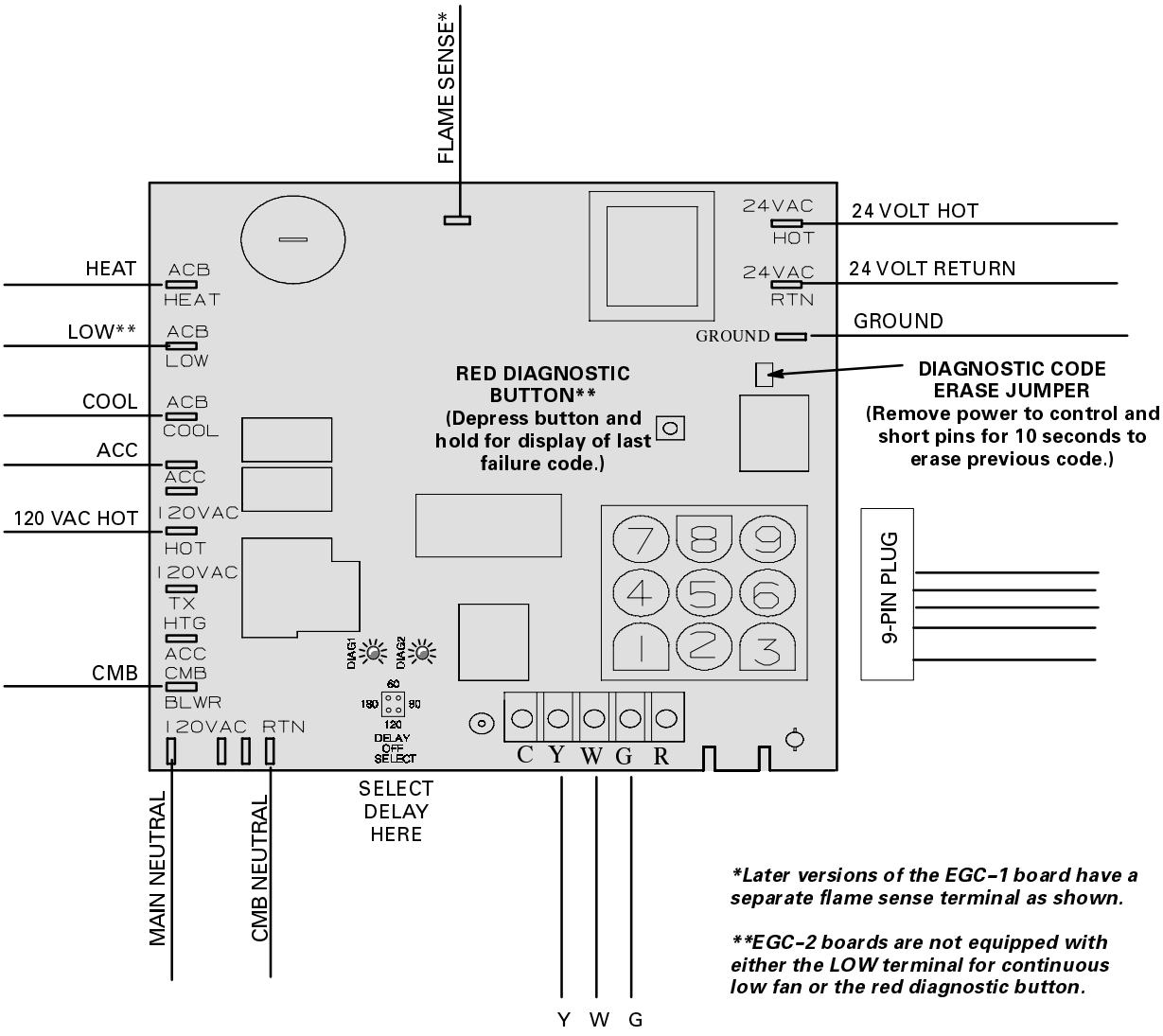


FIGURE 4

EGC–1 DIAGNOSTIC CODES AND OPERATIONAL INFORMATION

TABLE 4

EGC BOARD DIAGNOSTIC PATTERNS	MODE INDICATION	REMEDY
DIAG 1 ☼ Flashing Together DIAG 2 ☼ Flashing Together	Normal Operation	None. Slow flashing LED signifies normal operation. Fast flashing LED indicates a heating demand.
DIAG 1 ☼ Flashing DIAG 2 ● On	Limit Switch Open	This LED pattern indicates that either the primary or secondary limit switch has opened. Both switches are auto–reset.
DIAG 1 ○ Off DIAG 2 ☼ Flashing	Pressure Switch Open	This LED pattern indicates that the pressure switch opened during operation due to reduced flow of combustion products or a blocked condensate drain.
DIAG 1 ☼ Flashing Alternately DIAG 2 ☼ Flashing Alternately	Watchguard	The system is in Watchguard mode. Burners have failed to ignite.
DIAG 1 ☼ Flashing DIAG 2 ○ Off	Flame Failure	This LED pattern indicates that a flame was sensed without power to the gas valve.
DIAG 1 ● On DIAG 2 ☼ Flashing	Flame Roll–Out	This LED pattern indicates that the flame roll–out switch has opened. Check continuity of switch and for blockage in heat exchanger. Manually reset switch.
DIAG 1 ● Continuously On DIAG 2 ● Continuously On	EGC–1 Board Failure	Remove power to reset control. Run cycle. Check control wiring and replace the EGC–1 control board, if necessary.

OPERATIONAL INFORMATION

HEAT MODE

PREPURGE ..... 15 Seconds
INTER-PURGE ..... 15 Seconds
POST-PURGE ..... 5 Seconds
TRIAL TIME ..... 10 Seconds
RETRY ..... 5 Times
RECYCLE ..... 5 Minutes
LOCKOUT RESET ... 60 Minutes

FAN OFF DELAY SELECT (SECONDS)

COOLING FAN OFF DELAY 0
HEAT FAN OFF DELAY
FACTORY SETTING 60
ADDITIONAL SETTINGS: 90, 120,180
NO JUMPER 240

FAN ON DELAY (SECONDS)

COOLING FAN ON DELAY 0
HEATING FAN ON DELAY 45

FIGURE 5