

## CL10, Hi, Lo, and Flashing Low/Med/High Lamps

### Applies to Models:

### Toyotomi Laser Heaters: L-30, L-56, L-73, L-60AT

If problems arise during ignition or operation of the L30, L56, and L73 Direct Vent Heaters, it will display a code on the Digital Indicator or Indicator Lamps. The Digital Indicator and Indicator Lamps also display codes during normal operation. This bulletin is organized by Normal Operation Codes and Abnormal Operation Codes.

#### Normal Operation Codes displayed on Indicator Lamps L56/73.

ON/OFF lamp	Flashing	Pre-heating, pre-purging, and post-purging mode.
	Lit	Heater in operation
AUTO lamp	Flashing	Power loss of more than 10 seconds
	Lit	Heater in operation at auto
LOW lamp	Lit	Heater in operation at low combustion
MED. lamp	Flashing	Pre-purging mode (Fuel Pump On, and flame not touching Flame Sensor)
	Lit	Heater in operation at medium combustion
HIGH lamp	Lit	Heater in operation at high combustion
NORMAL	Lit	Heater in operation at normal (manual) mode
SET-BACK lamp	Lit	Heater in operation at set-back mode

#### **WARNING**

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Normal Operation Codes displayed on Indicator Lamps L30

Power lamp	Flashing	1 Hz, pre-heating (90 sec. To 240 sec), igniter on
	Flashing	2 Hz, ignition, fuel pump on, flame not touching flame rod
	Lit	Heater is operating, flame touching flame sensor.
Temperature Lamp	Lit	Digital Indicator shows set and room temperature.
	Flashing	Set temperature can be changed.
Clock Lamp	Lit	Digital Indicator shows current time.
	Flashing	Current time can be changed.
Timer Lamp	Flashing	Timer setting can be changed.
Power Saver Lamp	Lit	Heater operating in Power Saver Mode
1 <sup>st</sup> Timer Lamp	Lit	Heater operating in 1 <sup>st</sup> Timer Mode
2 <sup>nd</sup> Timer Lamp	Lit	Heater operating in 2 <sup>nd</sup> Timer Mode

Normal Operation Codes displayed on Digital Indicator

Power OFF: Time

Power ON: Set temperature, and Room temperature as determined by the location of the room temperature sensor (thermistor).

CL10, CL9, is displayed on Digital Indicator.

IF THE CLOCK IS SET, the heater will automatically clean the igniter for ten minutes every day at 2:00AM. The Digital Indicator will display a CL 10, CL 9, during the clean cycle.

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Abnormal Operation Codes displayed on Digital Indicator.

Hi is displayed on Digital Indicator.

Causes:

- A. The room temperature is over 95°F.
- B. The room temperature sensor is located where the temperature is over 95°F.
- C. The room temperature sensor or main circuit board is malfunctioning.

Solution:

- A. Check room temperature with an independent thermometer.
- B. Check location of room temperature sensor.
- C. Procedure for testing room temperature sensor (thermistor) and main circuit board:
  - 1. Turn the stove off.
  - 2. Disconnect power cord.
  - 3. Disconnect room temperature sensor (connector 2) from main circuit board.
  - 4. Test resistance of room temperature sensor (10,000 ohms at 77°F). If resistance test is not within 5%, replace room temperature sensor. A Hi code usually is caused by a short circuit in the room temperature sensor (thermistor).
  - 5. With room temperature sensor disconnected, connect power cord, and turn on stove. If Digital Indicator displays Lo after one-minute, main circuit board is functioning correctly.
  - 6. If Digital Indicator displays Hi code with thermistor disconnected, the main circuit board may be malfunctioning.

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Lo is displayed on the Digital Indicator.

Causes:

- A. The room temperature is lower than 14°F.
- B. The room temperature sensor (thermistor) is disconnected from the main circuit board.
- C. The room temperature sensor is malfunctioning (the wire broken).
- D. Main circuit board is malfunctioning.

Solutions:

- A. Test room temperature with an independent thermometer.
- B. Turn the heater off and disconnect the power supply cord. Check the thermistor connection (2) at main circuit board.
- C. Test resistance of room temperature sensor (10,000 ohms at 77°F). If resistance test is not within 5%, replace room temperature sensor. A Lo code usually is caused by an open circuit in the room temperature sensor (thermistor).
- D. Carefully shorten the two pins on main circuit board thermistor connection (2). Connect power supply cord. If Digital Display reads Hi, the main circuit board is operating normally.

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### Abnormal Operation Codes displayed on Indicator Lamps

Low/Med/High lamps flash on L56/73. Temperature/Clock/Timer lamps flash on L30.

The main circuit board is sensing a flame in the burner assembly when there should be no flame (during preheat).

Causes:

- A. Fuel in burner assembly after post purge (Fuel pump OFF).
- B. Flame rod ceramic is cracked and shorted to burner assembly.
- C. Soot on burner assembly wall is grounding flame sensor to burner assembly.
- D. Cracked igniter. The igniter may turn orange, but crack is conducting current causing the board to flash L/M/H lamp. Circulation fan operates and igniter relay opens/closes.

Solutions:

- A. Remove front panel. Observe interior of burner assembly through window on heat chamber. If there is flame in the burner assembly, turn the power switch off and wait until the fire burns out. This problem can occur if there is a large accumulation of carbon (caused by age, #2 fuel and/or water) in the bottom of the burner assembly. The burner assembly must be cleaned, and a new burner mat installed.

B & C. Remove flame rod. Clean ceramic insulator and inspect for cracks. If cracked replace. Clean rod to bright surface. Blow through flame rod mounting hole to remove soot that might be contacting the flame rod. Clean inside wall of burner assembly. For a temporary solution, use an L-shaped wire to wipe inside wall of burner assembly.

D. A crack in the igniter can allow an electrical current to flow to the ground. This can cause the board to think there is a fire in the burner assembly during preheat.

If the soot is below the flame rod, you may need to disassemble the unit and clean burner assembly. Heavy soot is a sign that the combustion air and fuel ratios are incorrect. This can occur if snow, insects, or other foreign objects block the exhaust flue and/or air supply.

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6637 Arctic Spur Rd. Anchorage, AK 99518  
P. 907.278.7441 / 800.770.7330 (toll-free)  
F. 907.868.1766

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