

ExactLogic - Boiler Energy Lock System



Connections:

Input	Description	Output	Description
AI-0		BO-0	Boiler Stage 1
AI-1	3k Hot Water Supply Sensor	BO-1	Boiler Stage 2
AI-2	3k Outside Air Sensor	BO-2	Pump Enable
AI-3			
AI-5			

Application: This Boiler Energy Lock control panel will operate either two single stage boilers or one two stage boiler to maintain a hot water supply temperature as reset from a protected or “Locked” outside air temperature input with Sunguard to protect against less than ideal outside sensor locations. The reset schedule allows operator adjustment to curve fit the reset schedule by tracking comfort adjustments at the outside temperature when the adjustment is made.

Features:

- Resets boiler setpoint with Curvefit comfort adjustment
- Monitors Outside Air Temperature with Sunguard
- Monitors Hot Water Supply Temperature
- Supply Water setpoint is limited to no lower than 140°
- 2 stage control with dead band
- Inter-stage delay
- Minimum on time
- Minimum off time
- Outside air temperature enable
- Keypad for monitoring and adjusting system
- Digital display
- Energy Lock to protect energy savings
- Freeze protection
- Pump enable output.



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Operation

The display will show the current hot water temperature until a selection is made.
Items marked in **[BOLD]** are protected by Energy Lock, modification requires the password.

Outside Air []

- [OSA] Outside air temperature.
- **[MIN SP]** Minimum outside air reset setpoint.
- **[MAX SP]** Maximum outside air reset setpoint.
- **[ENBL SP]** Boiler enable setpoint.

Hot Water Supply []

- [HWS] Hot water supply temperature.
- **[MIN SP]** Minimum hot water supply reset setpoint.
- **[MAX SP]** Maximum hot water supply reset setpoint.
- **[CTRL SP]** Hot water supply temperature setpoint.

History []

- [HIST] Highest and lowest temperature for the last sensor viewed.

Reset Schedule Check []

- [40 SP] Boiler setpoint when the outside air is at 40°F.
- [10 SP] Boiler setpoint when the outside air is at 10°F.
- [-20 SP] Boiler setpoint when the outside air is at -20°F.

Curvefit Adjustment []

- [ADJ +] Raises the tenant comfort level (limited to ± 10) for the Curvefit zone.
- [ADJ -] Lowers the tenant comfort level (limited to ± 10) for the Curvefit zone.

Note: Pressing either button momentarily will display the current adjustment level.

Energy Lock Adjustments []

- [UP +1] Raises the selected setpoint by 1.
- [DN -1] Lowers the selected setpoint by 1.

Note: All adjustments require the Energy Lock password.



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Sequence of Operation

- On startup the unit will hold off both stages for 1 minute, and second stage for 15 minutes.
- The boiler control panel will be enabled when the outside air temperature is below the outside air enable setpoint [ENBL SP].
- Outside air temperature for reset is limited by the Sunguard program to eliminate large swings in outside air temperature due to solar heating.
- The hot water setpoint will be reset from the minimum hot water supply setpoint [MIN SP] to the maximum hot water supply setpoint [MAX SP] as the outside air temperature varies from the maximum outside air setpoint [MAX SP] to the minimum outside air setpoint [MIN SP].

Note: The minimum hot water supply setpoint is factory set to 140°, it is adjustable from 130°F to 160°F with the Energy Lock password.

- The hot water setpoint will be adjusted by the Curvefit program in five zones, each adjustable from $\pm 10^{\circ}\text{F}$. The minimum and maximum boiler setpoints will not change.
- The pump enable output will be active whenever the panel is enabled and for 15 minutes after the boilers have been disabled.
- Freeze protection will enable the boilers for any of the following conditions:
 - Bad outside air temperature sensor
 - Bad hot water supply temperature sensor
 - Hot water supply temperature below 50°F
- The first stage (or boiler) will stage on when the supply water is below the current hot water setpoint [CTRL SP], it will stage off when the hot water supply temperature is 8°F above the current hot water setpoint. The second stage (or boiler) will stage on when the hot water supply is below the current hot water setpoint by 5 degrees and the first stage boiler has been on for a minimum of 5 minutes, it will stage off when the hot water supply temperature is 3°F above the current hot water setpoint.
- Each stage will remain on, once started, for a minimum of 5 minutes and will remain off, once stopped, for a minimum of 5 minutes.

Note: Stage (or boiler) 2 will be disabled whenever stage one is off (minimum on time will be overridden).

Power	24Vac 40VA	Sensor Accuracy	$\pm .35^{\circ}\text{F}$
Outputs	24Vac – 1A max	Display Range	± 1999
Sensors	3k Thermistor	Display Accuracy	$\pm 1\% \pm 1$ count

Note: All connection points are low voltage.



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