

Specification of Energy Controller (EC)

INTRODUCTION

The EC is a simple yet sophisticated load control device.

The EC is specifically designed to meet the utilities needs for the dedicated off-peak control of electric water heaters, while offering customer flexibility needed for TOU operation.

Utilizing state-of-the-art microprocessor technology, the EC offers programming capabilities flexible enough to accommodate any off-peak or time-of-use schedule.

In addition, the EC has a green element "Power Pulse" which provides complete self-diagnostics of the EC as well as troubleshooting information on the water heater.

EC DESCRIPTION

Dimensions:

5.0" (h) X 4.0" (w) X 2.0" (d)

Voltage:

240v (Note: will operate at 208v as well)

Relay:

30 amp. Normally open.

Battery Backup:

10 year continuous use without power.

Approvals:

UL, CSA.

EC PROGRAM VARIABLES

Seasons:

Up to 10 per year. (More available upon request)

Control Periods (Weekdays):

Up to 8 per day. (More available upon request)

Control Periods (Weekends):

Up to 8 per day. (Or same as weekdays).

Randomization Of Control Periods:

Up to 99 minutes Plus or Minus.

Holidays:

Up to 30. Plus Good Friday.

Daylight Savings Time:

Automatic or custom.

Leap Year:

Automatic.

Max Time Before StartUp Override:

Adjustable from 1 hour to 99.

T. O. U. Override:

Toggle On/Off. Reset at next peak.

StartUp Override:

0 to 99 hours.

Customer Override:

0 to 99 hours.

Service Override:

0 to 99 hours.

EC OPERATION

The EC has a display which indicates the state of the Energy Controller and provides information on the condition of the water heater as well. The digital display describes the mode of the EC.

In addition, the EC has a unique **"Power Pulse"** which not only indicates when the relay of the EC is closed, but also indicates when the elements in the water heater are actually drawing current.

With the **"Power Pulse"**, it is easily determined if the homeowner ran out of hot water, or if there is a problem with the operation of the water heater itself.

The following is a list of the displays and an explanation of their meaning:



Off-Peak (This is **"O."** on units with a 7 segment display.)

Off-Peak is an uncontrolled state. The EC relay is closed, allowing full power to the water heater.

Note the green element "Power Pulse" will be ON when the relay is closed and BLINKING when the elements are heating.

Holiday Mode (This is **"H."** on units with a 7 segment display.)

Holidays are the same as an Off-Peak Mode and are active from midnight to midnight. **Note the green element "Power Pulse" will be ON when the relay is closed and BLINKING when the elements are heating.**



Peak (This is **"P"** on units with a 7 segment display.)

Peak is a controlled state. The EC relay is open, thereby preventing power from the controlled lower element in the water heater.

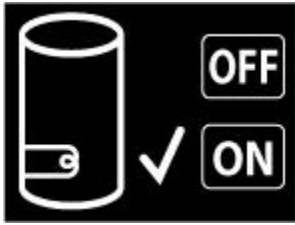
Cold Load Pickup. (This is **"L"** on units with a 7 segment display.)

Cold Load Pickup is the same as Peak mode, except that it automatically delays powering of the controlled lower element (from 7 to 15 minutes) any time the EC starts up in an energized state (Off-Peak, Override or Holiday). Once Cold Load Pickup is completed, the EC will return to whatever energized state it was in. A Cold Load Pickup can be eliminated by pushing the ON Button.



Vacation (This is **"U"** on units with a 7 segment display.)

Vacation Lockout occurs when the OFF Button is pressed. Once in Vacation Lockout, the EC will stay there until the ON Button is pressed. When Vacation Lockout is terminated, the EC will automatically go into a StartUp Override if the lockout period is longer than the Max Time Before StartUp Override.



Override Modes

Override modes occur when the ON button is pressed.

This will be displayed for StartUp, Customer, and Service Overrides.

Note the green element "Power Pulse" will be ON when the relay is closed and BLINKING when the elements are heating.

StartUp Override. (This is "S." on units with a 7 segment display.)

StartUp Override is activated on the first ON Button press after EC has been without power for more than the programmed length of time (Max Time Before StartUp Override). Also activated on the first ON Button press after reprogramming. Occurs automatically, when the Vacation Lockout has lasted longer than the Max. Time Before StartUp Override.

Note the green element "Power Pulse" will be ON when the relay is closed and BLINKING when the elements are heating.

Customer Override. (This is "C." on units with a 7 segment display.)

Customer Override is activated by ON Button press. Allowed only once per day. Customer Override is also available after a Service Override.

Note the green element "Power Pulse" will be ON when the relay is closed and BLINKING when the elements are heating.

Service Override. (This is "-." on units with a 7 segment display.)

Service Override occurs on an ON Button press with a Service Plug connected in the outdoor module socket. Service Override is used primarily by service technicians who need to override the EC in order to service the water heater. Once serviced, the heater can then be put back in control with all other overrides available to the customer if needed. (For example, tank can be drained, bottom element replaced, and tank reheated - all during the control period).

Note the green element "Power Pulse" will be ON when the relay is closed and BLINKING when the elements are heating.