

The logo for HORIZON Solutions features the word "HORIZON" in a bold, black, sans-serif font, with a stylized green and yellow sunburst graphic behind the letter "O". Below "HORIZON" is the word "Solutions" in a smaller, black, sans-serif font. The entire logo is set against a green and yellow oval background.

HORIZON
Solutions

Energy Services

Knowledge in Supply



**Boston Green Tourism
Energy Efficiency Opportunities
Thursday July 16, 2015
by: Tony Parente**



Who is Horizon Solutions

- Energy efficiency service provider for all New England states including New York.
- Eversource Preferred vendor for all programs.
- National Grid Preferred vendor for all programs.
- Top vertical markets are:
 - Hotels, Hospitals, Education, Municipal, Waste Water & Industrial
- Distributor
- We conduct all audits, engineering and installs for lighting and mechanical measures in house.



Energy Efficiency Opportunities

- Heat Timer Boiler Control Panel
- Generator Block Heater Heat Pump



Why Install a Heat Timer?

- Many boilers operate with little or no control.
 - No scheduling
 - No night set-back
- Hydronic (hot water) boilers often run at full temperature regardless of outdoor temperature from October to May
- Steam boilers often run at high pressure for the entire heating season as well.
- Most Boilers that were installed over 5 years ago are a good candidate.



What Do They Do

- Heat Timer Panels function as a “mini-EMS”, with the following control strategies that are common to all systems
 - Time of day scheduling
 - Outside air re-set (note that steam re-set is slightly different than hydronic reset)
 - Night Set Back
 - Boiler Staging (Q systems only)
 - Optimal Start/Stop
 - Extend Life of Boiler

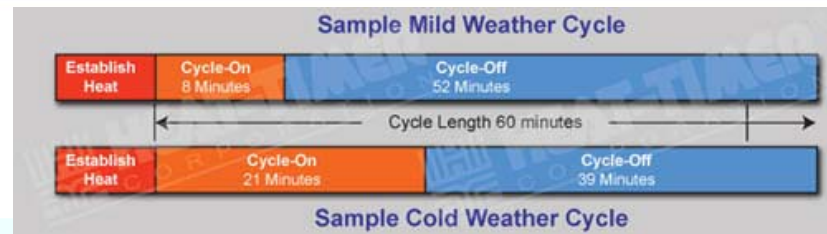


Types of Systems

- Heat Timer MPC
 - For steam systems with single boilers
- Heat Timer MPC-Q
 - For steam systems with multiple boilers
- Heat Timer HWR
 - For hydronic systems with single boilers
- Heat Timer HWR-Q
 - For hydronic systems with multiple boilers



Energy Savings Strategies for MPC/MPC-Q installations

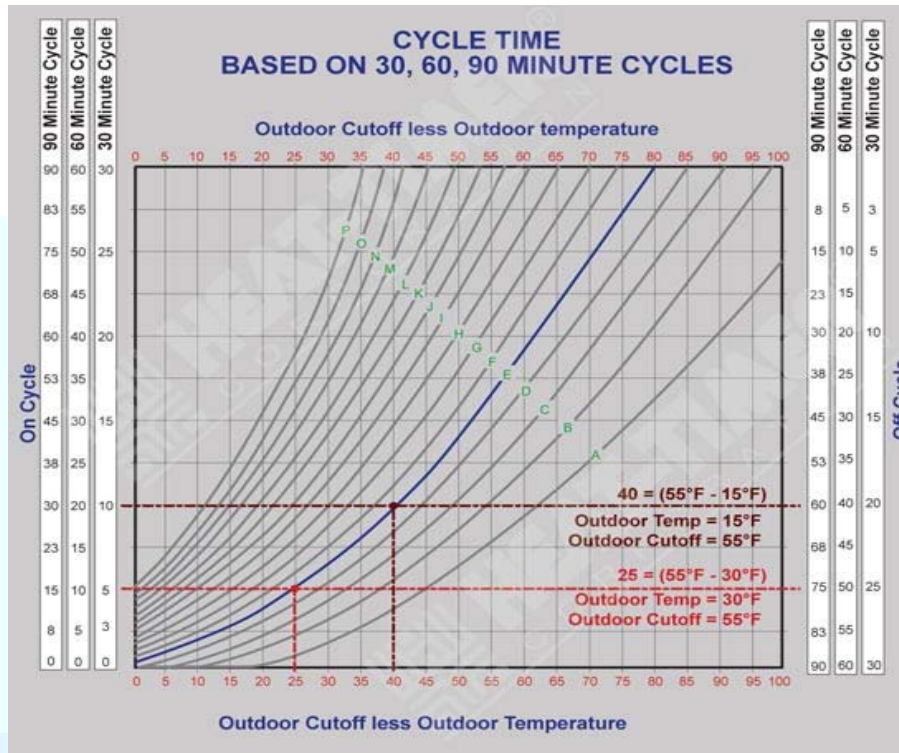


- Using an outdoor air sensor, the system monitors temperature and adjusts cycle time based on outdoor air conditions.
- Warmer outside = longer cycle-off time
- At the same time, the control monitors the building heating system temperature using a heating system sensor. The heating system sensor is located at the furthest location in the building (or the hardest to heat area). Based on the combined sensor data, the control sends instructions to the heating plant to control the heat level in the building. Before starting a heating cycle, the control checks the heating system sensor temperature. If the temperature is above the required set point, the control will not start another heating cycle. That is because there is enough heat in the system. However, if the temperature is below the set point, the control will start the heat until the system sensor temperature reaches the set point, then initiate the heating cycle starting with the Cycle-ON period.



MPC/MPC-Q Typical Building Curves

Curves are adjusted on site depending on building

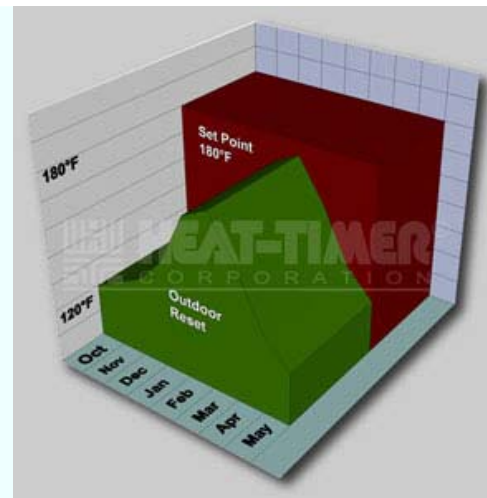


Customize based on building thermal characteristics



How Does Hot Water Reset Work

Outdoor Reset controls respond to changes in weather by changing the boiler water temperature circulating throughout the building. It sends out cooler water to the system during the warmer outdoor temperatures. And sends warmer water to the building in cooler outdoor temperatures. What the outdoor reset does, is regulate the amount of energy entering the building based on the outdoor temperature by changing the boiler water temperature





Heat Timer Results

- Horizon has installed over 175 units.
- Average Return on Investment is under 2 years with Utility incentives.
- We have seen Thermal savings ranging from 3,000 – 80,000 therms per year per installed unit.
- Average Thermal savings per unit is closer to 8,000 therms per year.



Heat Pump Block Heater

- Existing Set Up
 - Currently emergency generators heat the coolant within block of the engine to 100 -120 F.
 - To allow for instantaneous start of the engine at all times.
 - Typically applications use multiple 3000 or 6000 watt electric resistance heaters.



Typical Generator



Electric Resistance
Block Heater



Heat Pump Block Heater – Solution

- Instead of electric heat, incorporate a heat pump to keep temperature
- Increased COP (coefficient of performance) from 1.0 to 4.0.
 - **Example: A typical 6000 watt electric heater will be replaced by a 1200 watt heat pump.**
- Typically 30,000-50,000 kWh saved/generator per year.
- At an average \$0.18/kWh the savings are \$5400 to \$9000 per year.
- Normally used for generators in enclosed spaces with space temperatures at or above 50 F
- Utility incentives available for 3000 watt resistive block heaters and above.





Examples of Existing Installations

- Multiple MWRA pump stations
- Town of Natick
- Harvard University





Heat Pump Block Heater Results

- Horizon has installed over 25 units
- Average Return on Investment is under 3 years with Utility incentives.
- We have seen Electrical savings ranging from 10,000 – 80,000 kwh per year per installed unit.
- Average Electrical savings per unit is closer to 40,000 kwh per year.



Contact Information

Tony Parente

401-265-1284

tparente@hs-e.com