

CSI SPECIFICATION: *HWE-SS Elite*

SECTION: 230913 Instrumentation and Control devices for HVAC

PART 1 GENERAL

1.1 Summary

- A. Section Includes:
 - 1. Single On/Off Hydronic Boiler Outdoor Rest / Set Point Control.
- B. Related Sections:
 - 1. Conforms to applicable building code requirements of all authorities having jurisdiction.

1.2 References

- A. International Organization for Standardization (ISO) 1. Manufacturer shall be ISO 9001:2000 Quality Management Systems Certified.
- B. Underwriters Laboratories, Inc. (UL):
 - 1. Tested per standard 916, Temperature Indicating and Regulating Equipment.

1.3 Quality Assurance

- A. Manufacturer's Quality System:
 - 1. Registered to ISO 9001:2000 Quality Standard.
 - 2. The control must be UL tested and certified per standard 916, Temperature Indicating and regulating Equipment.

1.4 Control Operation

- A. **Description:** The control shall operate on either 120VAC or 24VAC, with a maximum power of 3 watts. The control shall be pre-engineered and programmed exclusively for the operation of a single On/Off Hydronic boiler heating systems using outdoor reset or set point with or without domestic hot water pump control.
- B. **Outputs:** The control shall have three normally open relay contacts that can be used to start/stop the boiler, the system pump, and a domestic hot water pump.
- C. **Sequence of Operation:** Enabling the control Tstat input shall activate the control heat demand. The control shall check the outdoor temperature sensor. If the outdoor temperature is at or below the configured outdoor cutoff, it shall energize the system pump. Then, it shall check the system sensor temperature. If the system temperature is below the desired set point and deferential, it shall start the boiler.
- D. **Features:**
 - 1. Outdoor Reset or Set Point: The control shall provide an integral sensor set point adjustment. The control shall have an option to vary the set point based on an outdoor reset curve. The outdoor reset curve parameters shall be field adjustable. A customizable reset ratio curve shall be available for specialized heating.
 - 2. Memory: The control shall store all configuration and settings on EE-Prom. In case of power failure the control should be able to retrieve all of its latest settings.
 - 3. Display: The control shall have a two line by sixteen-character alphanumeric. The display shall be visible with no ambient light. All control operation information shall be available for display. During times of inactivity, or 3 minutes after last user entry, the display shall revert to the default display. In this mode the control shall display current system target and temperature.

4. Domestic Hot Water: The control shall be capable of offering a domestic hot water priority option. It shall be capable of accepting a dry-contact DHW call. In addition, it shall be capable of controlling a DHW pump using one of its output relays.
5. Buttons: The control shall have three buttons to facilitate menu navigation and change settings.
6. LED Lights: The control shall have three LED lights representing each of the output relays status.

E. Input Points:

1. Outdoor Temperature: This shall be the value read from the outdoor sensor placed on the north side of the building at least 10 Ft. above the ground.
2. System Temperature: This shall be the value read from the system sensor placed on the hot water system pipe to measure the circulating water temperature.
3. External Tstat Signal: The control shall be capable of accepting a dry-contact closure Tstat input to start the control heat logic.
4. Domestic Hot Water Input: When the DHW call is activated using a dry-contact closure input, the control shall increase the set point to the maximum temperature allowed.
5. Setback Input: The control shall have a setback setting where it will reduce the system temperature using an external setback signal.

F. Output Relays:

1. Burner output relay
2. System pump output relay
3. Domestic hot water pump output relay

G. Setting Points:

1. Differential: This shall be the temperature at which the system must drop below the set point for the boiler to turn on.
2. Domestic Hot Water Priority period: This shall be the length of the DHW priority before the system pump is turned on for heating in addition to the domestic hot water pump.
3. Outdoor Cutoff: This shall be the outdoor temperature below which the control will turn on the system pump.
4. Reset Ratio: This shall be the adjustment for the following settings: Reset Curve, Offset, Minimum Water temp, Maximum Water temperature, and a customizable reset ratio.
5. Setback: This shall be the adjustment for the amount of degrees of reduction to the calculated set point.
6. System Run-On: This shall be the value at which the system relay shall remain energized for after the boiler has turned off.
7. System Set Point/Target. This shall be the adjustment of the desired system temperature.

1.5 Regulatory Approvals

A. Underwriters Laboratories, Inc. (UL):

1. The control shall be tested per standard 916 "Energy Management Equipment".

1.6 Included Items

- A. Outdoor Temperature Sensor shall be of the Thermistor type capable of measuring between -30°F to 250°F . It shall have a weather shield to protect it from moisture and direct sun.
- B. System temperature Sensor shall be of the thermistor type capable of measuring from -30°F to 250°F . It shall fit tight in a standard $\frac{3}{8}$ " x $\frac{1}{2}$ " well.