

CSI SPECIFICATION: *HWE-MOV***SECTION: 230913 Instrumentation and Control devices for HVAC****PART 1 GENERAL****1.1 Summary**

- A. Section Includes:
 - 1. Motorized Valve Outdoor Reset Hydronic Heating Control.
- B. Related Sections:
 - 1. Conforms to applicable code requirements of all authorities having jurisdiction.

1.2 References

- A. International Organization for Standardization (ISO) Manufacturer shall be ISO 9001:2008 Quality Management Systems Certified.
- B. Underwriters Laboratories, Inc. (UL):
 - 1. The control shall be tested per standard 916 "Energy Management Equipment".

1.3 Quality Assurance

- A. Manufacturer's Quality System:
 - 1. Registered to ISO 9001:2008 Quality Standard, including in-house engineering for product design activities.
 - 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 120VAC, with a maximum power of 3 watts. The control shall be pre-engineered and programmed exclusively for the operation of a floating motorized valve in a Hydronic heating systems. It shall incorporate the following integrated functions: Hydronic outdoor reset, outdoor temperature cutoff; day/night heat level programming; and Boost (optimum start/stop).
- A. **Sequence of Operation:** When heat is required, the control shall check if the outdoor temperature is below the outdoor cutoff. This shall trigger the control PID to calculate the water temperature based on the outdoor temperature (outdoor reset). In addition, the control shall turn the system pump relay on. The control PID shall modulate the motorized valve to achieve the calculated water target. If the outdoor temperature increased above the outdoor cutoff, the control shall close the motorized valve. It shall turn off the system relay after an adjustable delay.
- B. **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. **Boost:** The control shall offer a boost period. This boost shall be used to help raise the building temperature from the setback/night period to the normal/day level sooner by increasing the system water target.

3. **Setback:** The control shall offer a setback option that will reduce the calculated target temperature when the setback input is activated.
4. **Minimum Boiler Return:** The control shall monitor the boiler return. If the return temperature dropped below a critical value, the control shall reduce the system target to allow the boiler return temperature to rise to a safe level. This shall protect the boiler from condensation and possible thermal shock.
5. **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.
6. **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.
7. **Buttons:** The control shall have three buttons to facilitate menu navigation and change settings.
8. **LED Lights:** The control shall have three LED lights representing each of the output relays status.

C. 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. **Setback Input:** The control shall have a setback setting where it will reduce the system temperature using an external setback signal.
5. **Boiler Return:** The control shall accept a temperature sensor input to monitor the boiler return.

D. Output Points/Relays:

1. System output relay.
2. 2 motorized valve output relays

E. Optional Add-Ons:

1. **Boiler Return Temperature Sensors:** The sensor shall be of the Thermistor type capable of measuring temperatures from -30°F to 250°F . It shall fit in a $3/8$ " well on the boiler return piping.

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 return line temperature Sensor shall be of the Thermistor type capable of measuring from -30°F to 250°F . It shall be of the strap-on type.