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CSI SPECIFICATION: ***Electronic Steam Valve Control (ESV)***

SECTION: 230913 Instrumentation and Control Devices for HVAC

PART 1 GENERAL

1.1 Summary

A. Section Includes:

1. Electronic Dual Steam Valve Control.

B. Related Sections:

1. Conforms to applicable code requirements of all authorities having jurisdiction.

1.2 References

A. International Organization for Standardization (ISO):

1. Manufacturer shall be ISO 9001:2008 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 9001:2008 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 120VAC, with a maximum power of 48 VA. The control shall be pre-engineered and programmed for the operation of two steam or vacuum motorized valves. The control shall have the following features: adjustable valve start position, adjustable valve start delay, and an adjustable valve close position for each of the valves. In addition, the control must offer multiple modulating signals and a setback, boost, and outdoor cutoff settings.

B. Sequence of Operation: Enabling the control Tstat input shall activate the control operation. The control shall use the vacuum/pressure transducer reading and the current set point to determine the valve modulation requirement. The control shall modulate the first valve to the valve start position and maintain it for the valve start delay period. After the ending of the valve start delay period, the control shall continue to modulate the first valve to maintain the set point while keeping the second valve closed. When the first valve is fully open and additional output is needed, the control shall start to modulate the second valve. When less load is required, the control shall modulate the first valve to the valve close position setting. Afterwards, it shall gradually modulate the second valve until it fully closes. The first valve shall remain at the valve close position setting until the call for heat ends or the outdoor temperature rises above the outdoor cutoff setting.

C. Features:

1. **Multiple Modulating Actuators:** The control shall be capable of operating two actuators using multiple modulating signal outputs.
2. **Set Point:** The control shall offer the user a set point adjustment setting. The control shall display the set point at all times in the default screen.
3. **Remote Set Point:** The control shall offer a 4-20mA remote set point option to allow a BMS (Building Management System) to remotely change the set point.

4. **Setback:** On a call for setback, by shorting the setback input, the control shall reduce the set point by the adjustable setback setting. The setback setting shall be used during the night or low demand periods.
5. **Boost:** After ending the setback, the control shall have the option to increase the set point for an adjustable boost period to help bring the building back to normal operating temperature faster.
6. **Remote Shutdown:** The control shall offer shutdown input that can be activated remotely.
7. **Valve Start Position and Start Delay:** The control shall allow each valve to marginally open for a predetermined time period to allow the system to fill with steam slowly. This option shall reduce the stress on the piping and other system components.
8. **Valve Close Position:** The control shall allow each valve to remain marginally open instead of fully closed. This option shall reduce the stress on the piping and other system components.
9. **Outdoor Cutoff:** The control shall have an outdoor cutoff setting that can shutdown the control operation if the outdoor temperature exceeded it.
10. **Display:** The control shall have a two line by sixteen-character alphanumeric display. All control operation information shall be available for display.
11. **Memory and Backup:** The control shall store all configuration and settings on EE Prom. In case of power failure, the control shall be able to retrieve all of its latest settings when power is restored.

D. Inputs:

1. Transducer input (4-20mA)
2. Outdoor temperature
3. Shutdown input
4. Tstat input
5. Setback input

E. Outputs:

1. Two voltage modulation signal outputs each capable of providing: 0-5V, 1-5V, 0-10V, or 2-10V modulation signal.
2. 4-20mA current modulation signal output.

1.5 Optional Equipment

A. Outdoor Sensor.

1. The control shall have the option to connect to a temperature outdoor sensor to be used as an outdoor cutoff. The sensor shall be of the thermistor type and capable of reading values from –30°F to 250°F. The sensor shall have a weather shield.

1.6 Regulatory Approvals

B. Underwriters Laboratories, Inc. (UL).

1. The control shall be tested per standard 916, Temperature Indicating and Regulating Equipment.