

CSI SPECIFICATION: *Electronic Tempering Valves (ETV Platinum PLUS) with High-Temp Safeguard*

SECTION: 223313.13

Flow-Control, Instantaneous Electric Domestic Water Heaters

PART 1 GENERAL

1.1 Summary

A. Section Includes:

1. Domestic Hot Water Electronic Tempering Valve Control with Optional High-Temp Safeguard.

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.

C. CSA International

1. Tested and certified per standard NSF/ANSI 61.

D. California Domestic Water Lead-Free Law AB1953

1. Tested and certified per standard NSF/ANSI 61.

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.
3. The control and valve shall be certified to comply with ASSE 1017.
4. The control and valve shall be certified to comply with NSF/ANSI 61.
5. The control and valves shall be certified to comply with California Lead-Free AB1953 code.
6. The control and valves shall be certified to be installed in Massachusetts.

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 direct valve actuator operation in a domestic hot water heating system or the regulation of system water temperature in heating or cooling applications. It shall incorporate the following components:

1. **Control:** A microprocessor Electronic Tempering Valve control with PID-type logic, built-in transformer, digital display of temperature and set point, and LED indicator. It shall be capable of controlling a set point range from 40°F to 200°F (4.5°C to 93.3°C). It shall display the valve opening percentage to match actuator percent. The control shall maintain set point temperature within $\pm 2^\circ$ during a domestic draw of 0.5 gpm to full flow capacity in accordance with ASSE 1017.
2. **Actuator:** An actuator/Motor and linkage capable of traveling the complete valve stroke from fully OPEN to fully CLOSE in less than 20 seconds. It shall calibrate to the actual valve stroke. The actuator is also capable of operating in the reverse direction, allowing the interchangeability of the HOT and COLD connections to the valve body.

3. **Stainless Steel Valve:** An NPT threaded 3-way mixing valve with 304 stainless steel body and trim (*Meets California AB1953 and Massachusetts domestic water codes*). The maximum operating temperature of the valve shall be 300°F (149°C) with a maximum working pressure of 225 psi.
4. **Sensor:** Temperature sensor of the thermistor type that can measure from -30°F to 250°F (-34.5°C to 121°C).

B. Sequence of Operation: The control shall modulate the mixing valve to match the set point.

C. Features:

1. **Setpoint:** The control shall offer the user the ability to adjust the setpoint using a menu option and it shall display the setpoint at all times on the default screen.
2. **Modes of Operation:** The control shall operate in one of three modes: as an electronic tempering valve, as a high temp alarm / safeguard, or as an electronic tempering valve with high temp alarm / safeguard.
3. **Remote Setpoint:** The control shall offer a 4-20mA remote setpoint option to allow a BMS (Building Management System) to remotely change the setpoint.
4. **Schedules:** The control shall offer the user the ability to set a schedule where the control overrides the setpoint and sets an absolute water temperature. The control shall offer schedules for each day, every day, weekdays only, and weekends only. Up to four periods can be configured per day.
5. **Flow Switch:** The control shall offer an input that can accept a dry-contact flow switch to detect when no water flow is detected.
6. **Auto Calibration:** After initial startup calibration, the actuator/motor shall automatically calibrate itself to the valve attached.
7. **Multiple Actuator Connection:** The control shall be capable of operating multiple valves piped in parallel with a single 0–10Vdc output signal.
8. **Display:** The control shall have an alphanumeric display. All control operation information shall be available for display.
9. **Memory and Backup:** The control shall store all configuration and settings on EEPROM. In case of power failure, the control shall be able to retrieve all of its latest settings when power is restored.
10. **Sensor Inputs:** The control shall be capable of supporting three standard sensor inputs. One sensor input shall be of the thermistor type. Thermistor operating temperature range shall be -30°F to 250°F (-34.5°C to 121°C). Should the sensor show a fault condition, the control shall automatically close the hot port of the valve until the situation is rectified. Two sensor inputs shall be auxiliary inputs capable of being configured as temperature sensors or switch sensors. When configured as a switch sensor, the sensors detect open or close. When configured as a temperature sensor, the sensor monitors water or other system temperatures.
11. **Alarm / Safeguard Option:** The control shall have a manual reset button that will exit the control from its alarm status. The reset function shall only work when the temperature has dropped below the alarm setpoint. When connected to a safety valve (motorized ball valve), the control will power the valve close, turn on an alarm indicator, and energize both alarm relays for optional external alarms. When the alarm is corrected and the control is reset, the control will power the valve open for normal operation.
12. **Power Failure:** The control shall automatically shutoff the flow of hot water in the event of a power failure.
13. **Remote Communication Option:** The control shall be capable of communicating remotely, allowing the user the ability to view and change control settings. The control shall be capable of supporting the following communication options:
 - RINET / Internet
 - BACnet IP
 - BACnet MSTP
 - MODBUS (RTU)

The control communication option can be installed directly from the factory or as a field upgrade option installed by a qualified Field Technician.

14. **IP65 "Rainproof" Rated Option:** The actuator enclosure should be rated as per IP 65 for outdoor installation.

1.5 Regulatory Approvals

A. Underwriters Laboratories, Inc. (UL)

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

B. American Society of Sanitary Engineers (A.S.S.E.) (www.asse.org)

1. The control, valve, and actuator/motor shall be certified to comply with ASSE code 1017.

C. CSA International

1. The control and valve shall be certified to comply with NSF/ANSI 61.

D. California Domestic Water Lead-Free Law AB1953

1. The valve shall be certified to comply with California Lead-Free Fixture AB1953 (*applies to stainless steel valves only*).

E. The State of Massachusetts (license.reg.state.ma.us)

1. The ETV shall be certified to be installed in the state of Massachusetts (*applies to stainless steel valves only*).