

BRADLEY THERMOSTATIC MIXING VALVES

Bradley Corporation, a leader in the manufacture of fixtures and plumbing products, produces four lines of thermostatic mixing valves (TMVs). **Bradley Navigator® High-Low** thermostatic mixing valves are ideal for applications where off-peak demand is very low. Valve design handles both high and low demand with a single device. **Navigator Standard** thermostatic mixing valves are recommended for applications where demand is fairly constant even during off peak times. **Navigator Emergency** thermostatic mixing valves are for use with emergency eyewash, drench showers, and combination emergency wash units. Emergency thermostatic mixing valves provide tepid water as required by ANSI Z358.1. Bradley is the only manufacturer of both emergency fixtures and valves. **Navigator Point-of-Use** thermostatic mixing valves are intended for use with a single shower or sink faucet.

Responding to recent legislation, Bradley Navigator line of thermostatic mixing valves are manufactured from lead-free brass castings and bar stock to comply with the most stringent rules that require less than one-quarter of one-percent lead content.

Architects, engineers, and specifiers look to Bradley Corporation for innovation in design and leadership in the development of environmentally conscious products. Bradley Corporation, a member of the U.S. Green Building Council, the Wisconsin Green Building Alliance, has several products earning certification by Greenguard Environmental Institute, and Greenguard Children and Schools program.

Bradley makes it easy to specify products with helpful information tools on an advanced website, and a seasoned customer service staff. Easy-to-use sizing software, available on Bradley's website, allows engineers to quickly determine the correct size Thermostatic Mixing Valves. Bradley is the industry leader in the manufacture of premium quality commercial plumbing fixtures, valves, TMVs and washroom accessories that appear in the following CSI MasterFormat 2004™ Sections:

Section 10 21 13 – Toilet Compartments (Mills Metal, Plastic-laminate, Phenolic, and Plastic units)

Section 10 28 13.13 – Commercial Toilet Accessories

Section 10 28 13.15 – Hand and Hair Dryers

Section 10 28 13.63 – Detention Toilet Accessories

Section 10 51 26.00 – Plastic Lockers (Lenox Plastic Lockers)

Section 10 51 26.13 – Plastic Lockers (Lenox Recycled Plastic lockers)

Section 22 11 19 – Domestic Water Piping Specialties (Thermostatic mixing valves)

Section 22 42 16.01 – Commercial Lavatories and Faucets (Single and multi-station lavatory systems)

Section 22 42 16.02 – Commercial Lavatories and Faucets (Bradley Advocate Lavatory System)

Section 22 42 16.03 – Commercial Lavatories and Faucets (Bradley Verge Lavatory System)

Section 22 42 16.11 – Commercial Sinks and Faucets

Section 22 42 23 – Commercial Showers and Shower Valves

Section 22 42 33 – Wash Fountains

Section 22 43 00 – Healthcare Plumbing Fixtures (Patient care lavatory units)

Section 22 45 00 – Emergency Plumbing Fixtures ([Emergency Eyewash Fixtures and Drench Showers](#))

Section 22 46 00 – Security Plumbing Fixtures

Contact Bradley Corporation, Menomonee Falls, WI 53051; Phone: 800-BRADLEY ((800)272-3539) Fax: (262)251-5817, or visit the Bradley web site www.bradleycorp.com.

Bradley Corporation is an AIA/CES registered provider currently offering five programs earning one (1) HS&W Learning Unit each; several qualify for sustainable design (SD) credit. All active AIA members must successfully complete 18 learning unit (LU) hours each year.

SECTION 22 11 19

DOMESTIC WATER PIPING SPECIALTIES

PART 1 - GENERAL

1.1 SECTION INCLUDES

Specifier: Edit list below to correspond to Project requirements.

1. High-Low thermostatic mixing valves.
2. Standard thermostatic mixing valves.
3. Point-of-use thermostatic mixing valve.
4. Emergency fixture thermostatic mixing valves.
5. Valve cabinets.

1.2 RELATED SECTIONS

1. Division 22 Section "Healthcare Plumbing Fixtures" for thermostatic mixing valves for sitz baths, hydrotherapy equipment, and dialysis equipment.

1.3 REFERENCES:

- A. American Society of Sanitary Engineering (ASSE):
 1. ASSE 1016 - Individual Thermostatic, Pressure Balancing and Combination Pressure Balancing and Thermostatic Control Valves for Individual Fixtures.
 2. ASSE 1017 - Temperature Actuated Mixing Valves for Hot Water Distribution Systems.
 3. ASSE 1070 - Water Temperature Limiting Devices.
- B. American National Standards Institute (ANSI):
 1. ANSI Z358.1 - Emergency Eyewash and Shower Equipment Requirements.
- C. International Association of Plumbing and Mechanical Officials (IAPMO):
 1. IAPMO-listed and certified to meet lead free requirements.
- D. NSF International (NSF):
 1. NSF 61, Drinking Water System Components - Health Effects; Sections 1 through 9.

1.4 PERFORMANCE REQUIREMENTS

- A. Maximum Working Pressure: 125 psig (860 kPa), unless otherwise indicated.

1.5 ACTION SUBMITTALS

- A. Product Data: For each product indicated.

1.6 INFORMATION SUBMITTALS

- A. Operation and Maintenance data.

1.7 QUALITY ASSURANCE

- A. Conform to requirements of ASSE – (US) and CSA – (Canada).
 1. ASSE 1070 Water Temperature Limiting Devices.

- B. Comply with NSF 61, "Drinking Water System Components."
- C. Comply with California Health & Safety Code 116875 for lead free content.

1.8 WARRANTY

- A. Special Manufacturer's Warranty: Provide manufacturer's standard form in which manufacturer agrees to repair or replace products that fail in materials or workmanship.
 - 1. Thermostats: 10 years.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Basis-of-Design Product: Subject to compliance with requirements, provide temperature-actuated water mixing valves manufactured by Bradley Corporation, Menomonee Falls, WI 53051, (800)272-3539, fax (262)251-5817, www.bradleycorp.com.

Specifier: Retain one of three paragraphs below based upon Project requirements.

- 1. Submit comparable products of one of the following for approval by Architect:
 - a. [Insert name of manufacturer of comparable product].
- 2. Submit requests for substitution in accordance with Instructions to Bidders and Division 01 General Requirements.
- 3. Provide specified product; Owner will not consider substitution requests.

2.2 TEMPERATURE ACTUATED WATER MIXING VALVES

- A. High Low Temperature Thermostatic Mixing Valves: ASSE 1017, liquid-filled thermal motor and piston control mechanism with positive shutoff of hot water when cold water supply is lost, and allowing restricted cold flow in event of loss or interruption of hot water supply. Flow is shut off in the event of thermostat failure. Equipped with integral check stops, thermometer, and removable strainers. Valve controls temperature within $\pm 3^\circ$ F from a low flow to a maximum flow rate for a given pressure differential.
 - 1. Inlet Water temperature: Maximum 200 deg F (93 deg C).
 - 2. Material: Bronze body, stainless steel piston and liner, and corrosion-resistant interior components.
 - 3. Valve Body Finish: [Rough bronze] [Chrome-plated bronze].
 - 4. Tempered-Water Settings:
 - a. Low: 80 deg F (27 deg C).
 - b. Standard: 110 deg F (43 deg C).
 - c. High: 130 deg F (54 deg C).
 - 5. Temperature Range:
 - a. Low: 70 to 100 deg F (21 to 38 deg C).
 - b. Standard: 90 to 120 deg F (32 to 49 deg C).
 - c. High: 110 to 140 deg F (43 to 60 deg C).

Specifier: Edit following list by deleting valve models not required for Project.

- 6. Tempered-Water Design Flow Rate:
 - a. Valve Flow Rate at 45-psig (310-kPa) Pressure Drop: 47 gpm (3.0 L/s) [HLTV#__].
 - 1) Basis of Design: **Bradley Model No. S59-3045.**
 - 2) Inlets: 3/4-Inch NPT.
 - 3) Outlet: 1-inch NPT.

- b. Valve Flow Rate at 45-psig (310-kPa) Pressure Drop: 77 gpm (4.9 L/s)
[HLTV#___].
 - 1) Basis of Design: **Bradley Model No. S59-3080.**
 - 2) Inlets: 1-inch NPT.
 - 3) Outlet: 1-1/4-inch NPT.
- c. Valve Flow Rate at 45-psig (310-kPa) Pressure Drop: 126 gpm (8 L/s)
[HLTV#___].
 - 1) Basis of Design: **Bradley Model S59-3130.**
 - 2) Inlets: 1-1/4-inch NPT.
 - 3) Outlet: 2-inch NPT.
- d. Valve Flow Rate at 45-psig (310-kPa) Pressure Drop: 192 gpm (12 L/s)
[HLTV#___].
 - 1) Basis of Design: **Bradley Model S59-3200.**
 - 2) Inlets: 2-inch NPT.
 - 3) Outlet: 2-inch NPT.
- e. Valve Flow Rate at 45-psig (310-kPa) Pressure Drop: 252 gpm (16 L/s)
[HLTV#___].
 - 1) Basis of Design: **Bradley Model S59-3260 HL2X1 High Capacity Manifold.**
 - 2) Mixing Valves: Two S59-3130 factory assembled into a manifold system.
 - 3) Inlets: 2-inch NPT.
 - 4) Outlet: 2-inch NPT.
- f. Valve Flow Rate at 45-psig (310-kPa) Pressure Drop: 384 gpm (24 L/s)
[HLTV#___].
 - 1) Basis of Design: **Bradley Model S59-3400 HL2X2 High Capacity Manifold** with S59-3200 mixing valves.
 - 2) Mixing Valves: Two, factory assembled into a manifold system.
 - 3) Inlets: 3-inch NCT.
 - 4) Outlet: 3-inch NCT.
- g. Valve Flow Rate at 45-psig (310-kPa) Pressure Drop: 37 gpm (2.3 L/s)
[HLTV#___].
 - 1) Basis of Design: **Bradley Model NRS-4 with Navigator Module No. S59-3045.**
 - 2) Preamsembled Hi-Lo recirculating water station with thermostatic mixing valve, inlet/outlet pressure and temperature gauges, and circuit setter balancing valve mounted to steel strut frame.
 - 3) Inlets: 3/4-inch NCT.
 - 4) Outlet: 1-inch NCT.
 - 5) Return: 3/4-inch NCT.
- h. Valve Flow Rate at 45-psig (310-kPa) Pressure Drop: 77 gpm (4.9 L/s)
[HLTV#___].
 - 1) Basis of Design: **Bradley Model NRS-8 with Navigator Model No. S59-3080.**
 - 2) Preamsembled Hi-Lo recirculating water station thermostatic mixing valve, inlet/outlet pressure and temperature gauges, and circuit setter balancing valve mounted to steel strut frame.
 - 3) Inlets: 1-inch NCT.
 - 4) Outlet: 1-1/4-inch NCT.
 - 5) Return: 3/4-inch NCT.
- i. Valve Flow Rate at 45-psig (310-kPa) Pressure Drop: 126 gpm (8 L/s)
[HLTV#___].
 - 1) Basis of Design: **Bradley Model NRS-13 with Navigator Model No. S59-3130.**

- 2) Preassembled Hi-Lo recirculating water station, thermostatic mixing valve, inlet/outlet pressure and temperature gauges, and circuit setter balancing valve mounted to steel strut frame.
 - 3) Inlets: 1-1/4-inch NCT.
 - 4) Outlet: 1-1/2-inch NCT.
 - 5) Return: 3/4-inch NCT.
- j. Valve Flow Rate at 45-psig (310-kPa) Pressure Drop: 192 gpm (12 L/s) **[HLTV#___]**.
- 1) Basis of Design: **Bradley Model NRS-20 with Navigator Model No. S59-3200.**
 - 2) Preassembled Hi-Lo recirculating water station, thermostatic mixing valve, inlet/outlet pressure and temperature gauges, and circuit setter balancing valve mounted to steel strut frame.
 - 3) Inlets: 2-inch NCT.
 - 4) Outlet: 2-inch NCT.
 - 5) Return: 3/4-inch NCT.

Specifier: Select mounting option; retain cabinet and options if applicable.

7. Mounting Type: **[Surface-mounted, exposed]** **[Surface-mounted cabinet]** **[Recessed cabinet]**.
 - a. Cabinet: Factory-fabricated, **[recessed,]** **[surface mounted,]** **[stainless steel]** **[powder coated steel]**, with hinged door **[and plexiglas window]**.
- B. Standard Thermostatic, Water Mixing Valves: ASSE 1017, liquid-filled motor and piston control mechanism with positive shutoff of hot water when cold water supply is lost. Water flow is shut off in event of thermostat failure. Bronze valve body and cap with replaceable corrosion-resistant components, including stainless steel piston and liner. Equipped with integral check stops and removable strainers.
1. Inlet Temperature: Maximum 200 deg F (93 deg C).
 2. Material: Bronze body and corrosion-resistant interior components.
 3. Valve Body Finish: **[Rough bronze]** **[Chrome-plated bronze]**.
 4. Tempered-Water Setting:
 - a. Low: 80 deg F (27 deg C).
 - b. Standard: 110 deg F (43 deg C).
 - c. High: 130 deg F (54 deg C).
 5. Temperature Range:
 - a. Low: 50 to 100 deg F (10 to 38 deg C).
 - b. Standard: 85 to 135 deg F (29 to 57 deg C).
 - c. High: 100 to 150 deg F (38 to 66 deg C).

Specifier: Edit following list by deleting valve models not required for Project.

6. Tempered-Water Design Flow Rate
 - a. Valve Flow Rate at 45-psig (310-kPa) Pressure Drop: 25 gpm (L/s) **[STV#___]**.
 - 1) Basis of Design: **Bradley Model No. S59-2025.**
 - 2) Inlets: 3/4-Inch NPT.
 - 3) Outlet: 3/4-Inch NPT.
 - b. Valve Flow Rate at 45-psig (310-kPa) Pressure Drop: 47 gpm (3.0 L/s) **[STV#___]**.
 - 1) Basis of Design: **Bradley Model No. S59-2045.**
 - 2) Inlets: 3/4-inch NPT.
 - 3) Outlet: 1-inch NPT.
 - c. Valve Flow Rate at 45-psig (310-kPa) Pressure Drop: 74 gpm (4.7 L/s) **[STV#___]**.

- 1) Basis of Design: **Bradley S59-2080**.
- 2) Inlets: 1-inch NPT.
- 3) Outlet: 1-1/4-inch NPT.
- d. Valve Flow Rate at 45-psig (310-kPa) Pressure Drop: 126 gpm (8 L/s) [STV#___].
 - 1) Basis of Design: **Bradley Model S59-2130**.
 - 2) Inlets: 1-1/4-inch NPT.
 - 3) Outlet: 1-1/2-inch NPT.
- e. Valve Flow Rate at 45-psig (310-kPa) Pressure Drop: 192 gpm (12 L/s) [STV#___].
 - 1) Basis of Design: **Bradley Model S59-2200**.
 - 2) Inlets: 2-inch NPT.
 - 3) Outlet: 2-inch NPT.

Specifier: Select mounting option; retain cabinet and options if applicable.

1. Mounting Type: [Surface-mounted, exposed] [Surface-mounted cabinet] [Recessed cabinet].
 - a. Cabinet: Factory-fabricated, [recessed,] [surface mounted,] [stainless steel] [powder coated steel], with hinged door [and plexiglas window].
- C. Point-of-Use Water Tempering Valves: ASSE 1016, or 1070, with piston-control mechanism, positive shutoff of hot water when cold water supply is lost, bronze body and cap with replaceable corrosion-resistant components, including stainless steel piston and liner.
 1. Valve Body Finish: [Rough bronze] [Chrome-plated bronze].
 2. Set Point: Adjustable.
 3. Tempered-Water Setting: Factory preset, 105 deg F (41 deg C).
 4. Temperature Range: 95 deg F to 115 deg F (35 to 46 deg C).

Specifier: Edit following list by deleting valve models not required for Project.

5. Individual Shower Thermostatic Mixing Valve: For in-wall shower only [PUV#___].
 - a. Basis of Design: **Bradley Model S59-2005**.
 - b. Valve Flow Rate at 45-psig (310-kPa) Pressure Drop: 4 gpm (0.25 L/s).
 - c. Inlets: 1/2-inch NPT with check stop.
 - d. Outlet: 1/2-inch NPT.
 - e. Temperature Range: 90 to 110 deg F (32 to 43 deg C).
 - f. Tempered-Water Design Flow Rate:
6. Individual Shower Thermostatic Mixing Valve: For in-wall shower only [PUV#___].
 - a. Basis of Design: **Bradley Model S59-2006**.
 - b. Valve Flow Rate at 45-psig (310-kPa) Pressure Drop: 8 gpm (0.5 L/s).
 - c. Inlets: 1/2-inch NPT [with check stop].
 - d. Outlet: 1/2-inch NPT.
 - e. Temperature Range: 90 to 110 deg F (32 to 43 deg C).
 - f. Tempered-Water Design Flow Rate:
7. Individual Sink/Faucet Thermostatic Mixing Valve [PUV#___].
 - a. Basis of Design: **Bradley Model S59-2007**.
 - b. Valve Flow Rate at 45-psig (310-kPa) Pressure Drop: 8 gpm (0.5 L/s).
 - c. Inlets: 1/2-inch NPT with elbow check stop.
 - d. Outlet: 1/2-inch NPT with elbow check stop.
 - e. Temperature Range: 95 to 115 deg F (35 to 46 deg C).
8. Point of Use Thermostatic Mixing Valve **complying with CA AB 1953 Lead Free Content** [PUV#___].
 - a. Basis of Design: **Bradley Navigator Model S59-4000**.
 - b. Valve Flow Rate at 45-psig (310-kPa) Pressure Drop: 5.5 gpm (0.5 L/s).
 - c. Inlets: [1/2-inch NPT] [3/8-inch compression].

- d. Outlet: [1/2-inch NPT] [3/8-inch compression].
- e. Temperature Range: 95 to 115 deg F (35 to 46 deg C).
- f. Mounting Bracket: [Required] [Not required].
- 9. Thermostatic Mixing Valve [PUV#___].
 - a. Basis of Design: **Bradley Vernatherm Model S59-4004.**
 - b. Valve Flow Rate at 45-psig (310-kPa) Pressure Drop: 5.5 gpm (0.5 L/s).
 - c. Inlets: 1/2-inch NPT.
 - d. Outlet: 1-inch NPT.
 - e. Temperature Range: 95 to 115 deg F (35 to 46 deg C).
- 10. Thermostatic Mixing Valve [PUV#___].
 - a. Basis of Design: **Bradley Vernatherm Model S59-4004XS.**
 - b. Valve Flow Rate at 45-psig (310-kPa) Pressure Drop: 5.5 gpm (0.347 L/s).
 - c. Inlets: 1/2-inch NPT with Check Stops.
 - d. Outlet: 1-inch NPT.
 - e. Temperature Range: 95 to 115 deg F (35 to 46 deg C).
- 11. Thermostatic Mixing Valve [PUV#___].
 - a. Basis of Design: **Bradley Vernatherm Model S59-4008.**
 - b. Valve Flow Rate at 45-psig (310-kPa) Pressure Drop: 7.5 gpm (0.47 L/s).
 - c. Inlets: [1/2-inch NPT] [1/2-inch Copper].
 - d. Outlet: [1/2-inch NPT] [1/2-inch copper].
 - e. Temperature Range: 95 to 115 deg F (35 to 46 deg C).
- 12. Thermostatic Mixing Valve [PUV#___].
 - a. Basis of Design: **Bradley Vernatherm Model S59-4015.**
 - b. Valve Flow Rate at 45-psig (310-kPa) Pressure Drop: 12.5 gpm (0.8 L/s).
 - c. Inlets: [1/2-inch NPT] [1/2-inch Copper].
 - d. Outlet: [1/2-inch NPT] [1/2-inch copper].
 - e. Temperature Range: 95 to 115 deg F (35 to 46 deg C).

- D. Emergency Fixture Thermostatic Mixing Valves, General: Liquid-filled thermal motor and piston control mechanism with positive shutoff of hot water when cold water supply is lost. Valve allows cold flow in event of loss or interruption of hot water supply or thermostat failure. Valve controls outlet temperature over wide flow range and is suitable for drench shower and eyewash applications. Valve includes vandal-resistant temperature adjustment, dial thermometer, integral strainer, and check stops.
- 1. Inlet Water temperature: Maximum 180 deg F (82 deg C).
 - 2. Tempered-Water Setting: Factory preset, 85 deg F (29 deg C).
 - 3. Temperature Range: 65 to 95 deg F (18 to 35 deg C).

Specifier: Edit following list by deleting valve models not required for Project.

Specifier: Bradley Navigator EFX8 is recommended for up to 3-eyewashes or 1 eye/face wash.

- 4. Emergency Fixture Thermostatic Mixing Valve **EFV#___**.
 - a. Basis of Design: **Bradley Navigator EFX8 S19-2000.**
 - b. Valve Flow rate at 45-psig (310-kPa) Pressure Drop: 9.4 gpm (0.6 L/s).
 - c. Inlets: 1/2-Inch NPT.
 - d. Outlet: 1/2-Inch NPT.

Specifier: Bradley Navigator EFX25 is recommended for one combination drench shower/eye wash or multiple eye wash.

- 1. Emergency Fixture Thermostatic Mixing Valve **EFV#___**.
 - a. Basis of Design: **Bradley Navigator EFX25 S19-2100.**
 - b. Valve Flow rate at 45-psig (310-kPa) Pressure Drop: 44 gpm (2.8 L/s).
 - c. Inlets: 3/4-inch NPT.
 - d. Outlet: 1-inch NPT.

Specifier: Bradley Navigator EFX60 is recommended for two combination drench shower/eye wash or multiple eye wash.

1. Emergency Fixture Thermostatic Mixing Valve **EFV#** ___.
 - a. Basis of Design: **Bradley Navigator EFX60 S19-2200**.
 - b. Valve Flow rate at 45-psig (310-kPa) Pressure Drop: 83 gpm (5.2 L/s)
 - c. Inlets: 1-inch NPT.
 - d. Outlet: 1-1/4-inch NPT.

Specifier: Bradley Navigator EFX125 is recommended for two combination drench shower/eye wash or multiple eye wash.

1. Emergency Fixture Thermostatic Mixing Valve **EFV#** ___.
 - a. Basis of Design: **Bradley Navigator EFX125 S19-2300**.
 - b. Valve Flow rate at 45-psig (310-kPa) Pressure Drop: 127 gpm (8 L/s).
 - c. Inlets: 1-1/4-inch NPT.
 - d. Outlet: 1-1/2-inch NPT.

Specifier: Select mounting option; retain cabinet and options if applicable.

2. Mounting Type: [Surface-mounted, exposed] [Surface-mounted cabinet] [Recessed cabinet].
 - a. Cabinet: Factory-fabricated, [recessed,] [surface mounted,] [stainless steel] [powder coated steel], with hinged door [and plexiglas window].

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Basic installation requirements: Refer to Division 22 Section "Common Work Results for Plumbing."
- B. Install temperature-actuated water mixing valves with check stops or shutoff valves on inlets and with shutoff valve on outlet.

Specifier: Retain one or both subparagraphs below if required for Project.

1. Install thermometers and water regulators where indicated.
2. Install recessed or surface mounted cabinet units as indicated.

3.2 LABELING AND IDENTIFYING

- A. Equipment Nameplates and Signs: Install equipment nameplate or sign on or near each of the following:

Specifier: Coordinate list below with products retained in Part 2.

1. Primary, thermostatic water mixing valves.
 2. Manifold, thermostatic water-mixing-valve assemblies.
- B. Provide explanatory text on signs. Identify units. Distinguish among units, inform operator of operating requirements, indicate safety and emergency precautions, and warn of hazards and improper operations.
 - C. Nameplates and Signs: Specified in Division 22 Section "Identification for Plumbing Piping and Equipment."

3.3 TESTING AND ADJUSTING

- A. Set field-adjustable temperature set points of temperature-actuated water mixing valves. Adjust set point within allowable temperature range.
- B. Test and adjust installation.
- C. Remove and replace malfunctioning thermostatic mixing valves and retest.

END OF SECTION 22 11 19