

Thermostatic Mixing Valves



NAVIGATOR Bradley

- High-Low
- Standard
- Point-of-Use
- Emergency



The Bradley Navigator® valve design launched a new direction in valve manufacturing. Bradley continues its innovation with a complete line of lead-free thermostatic valves for all applications.

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GET THE LEAD OUT



Navigator® Lead-Free Thermostatic Mixing Valves

Better for the environment and safer for drinking water, Navigator® Thermostatic Mixing Valves comply with all new lead-free requirements while maintaining the quality you have come to expect from Bradley. Bradley's Navigator Thermostatic Valves are American made and were the first lead-free mixing valve on the market.

What are the benefits of the Navigator valve's single valve design?

It is much less complex than a multi-valve system making it easier to set up and start up – especially in a recirculated system. An integral port allows the tempered water recirculation line to be attached directly to the valve body. As a result, the Navigator valve has fewer connections than a multi-valve manifold system. Fewer connections and universal mounting capability means reduced installation time. Navigator valves control the output temperature for variations in input temperature and pressure. This anti-scald protection is built in – another benefit of this compact uncomplicated line of valves.

CA AB 1953 defines lead-free as less than 0.25%

Types of Thermostatic Mixing Valves

Navigator High-low valves, High capacity systems, Recirculation systems

A high-low valve is best used when there is a fluctuation in usage, where there are both high and low flow requirements.



Navigator Standard valves

A standard valve is best used when there is a constant flow of water needed/required.



Navigator Emergency valves

An emergency valve is used exclusively on emergency eyewash and drench shower applications to provide tepid water. Safety features include anti-scald protection and fixed cold water bypass ports to ensure cold water will keep flowing at all times.



Point-of-Use Valves

A point-of-use valve is attached directly to the shower or lavatory to control the water temperature and provide anti-scald protection.



All Bradley valves have the following standard options:

Finishes

Bradley Thermostatic Valves can be specified as Rough Bronze or with a Chrome finish.



Cabinet styles

Stainless Steel or Baked White Enamel finish is available in Surface Mount or Recess style.



Pre-piped assemblies

Valves are available as pre-piped assemblies, including inlet and outlet shutoffs, in both Rough Bronze and Chrome finish.



Key Features

- ASSE 1017, cUPC certified valves
- Single valve design handles both high and low demand for tempered water
- Accurate temperature control to within +/- 3°F
- Factory assembled and tested
- Universal mounting capability
- Maximum operating pressure of 125 psi (860 kPA)
- Maximum inlet temperature of 200°F (93°C)
- Dial thermometer
- Standard options available
- 10-year warranty on liquid-filled thermostat

See *Technical Data Sheets* for available configurations.



Navigator High-Low Valves

Bradley's Navigator high-low valves use a single valve design to control water temperatures during both high demand and low demand. These valves can be used at the main water source or in remote locations such as a locker room. The valve maintains the temperature to within +/- 3 degrees no matter how much water is demanded.

Flow Capacities gpm (lpm)								
Model	Minimum Flow	Pressure Drop – psi (kPA)						
		5 (34.5)	10 (68.9)	15 (103.4)	20 (137.9)	30 (206.8)	45 (310.3)	60 (413.7)
HL45	1.5 (5.7)	12.5 (47.3)	19.0 (72)	24.0 (90.9)	28.5 (107.9)	37.0 (140.1)	47.0 (177.9)	56.5 (213.9)
HL80	2.0 (7.6)	26.0 (98.4)	36.0 (136.3)	44.0 (166.6)	51.0 (193.1)	63.0 (238.5)	77.0 (291.5)	88.0 (333.1)
HL130	4.0 (15.1)	40.0 (151.4)	58.0 (219.6)	71.0 (268.8)	83.0 (314.2)	102.0 (386.1)	126.0 (477)	147.0 (556.5)
HL200	5.0 (18.9)	60.0 (227.1)	91.0 (344.5)	109.0 (412.6)	127.0 (480.8)	157.0 (594.3)	192.0 (726.8)	220.0 (832.8)
HL2X1	8.0 (30.3)	80.0 (302.8)	116.0 (439.1)	142.0 (537.5)	166.0 (628.4)	204.0 (772.2)	252.0 (953.9)	294.0 (1112.9)
HL2X2	10.0 (37.9)	120.0 (454.2)	182.0 (688.9)	218.0 (825.2)	254.0 (961.5)	314.0 (1188.6)	384.0 (1453.6)	440.0 (1665.6)

All valves below are third party certified to meet lead-free requirements



HL45 Model S59-3045

- 3/4" (19mm) inlet, 1" (25.4mm) outlet
- 1.5 gpm (5.7 lpm) minimum flow capacity



HL80 Model S59-3080

- 1" (25.4mm) inlet, 1-1/4" (32.8mm) outlet
- 2 gpm (7.6 lpm) minimum flow capacity



HL130 Model S59-3130

- 1-1/4" (32.8mm) inlet, 1" (25.4mm) outlet
- 4 gpm (15.1 lpm) minimum flow capacity



HL200 Model S59-3200

- 2" (50.8mm) inlet, 2" (50.8mm) outlet
- 5 gpm (18.9 lpm) minimum flow capacity



High Capacity Systems

Large capacity for large projects

HL2x1 Model S59-3260

- 2" (50.8mm) inlet, 2" (50.8mm) outlet
- 8 gpm (30.3 lpm) minimum flow capacity



HL2x2 Model S59-3400

- 3" (76.2mm) inlet, 3" (76.2mm) outlet
- 10 gpm (37.9 lpm) minimum flow capacity



NovaCare Complex Philadelphia, PA

NFL Training Facility Reduces Maintenance with Navigator® Thermostatic Mixing Valve

NovaCare needed a valve that could deliver 5 to 200 gallons (757 liters) of water per minute and accurately maintain a preset temperature during periods when no water was being drawn from the system.

Ken Rinear, a Bradley Corp. representative with Keystone Sales, recommended that the existing two-valve system be replaced with a Bradley high-low Navigator TMV (model HL-200), which could accommodate a higher capacity. The Navigator is a compact valve capable of providing tempered water for fluctuating high and low demand without the need for a second low-capacity valve. "Sizing and specifying the Navigator valve couldn't have been easier," noted Ray Murphy, the plumbing foreman. "Installing the single unit was fast and the valve hasn't required any maintenance since being installed – we're extremely impressed."

Key Features

- ASSE 1017, cUPC certified valves
- Pre-assembled and tested recirculation station
- Navigator High-Low thermostatic valve
- Shutoff valves on inlets and outlets
- Outlet setup connection
- Return line with circulatory pump, balancing valve and check valves
- GFCI outlet
- Mounted to enamel-coated strut

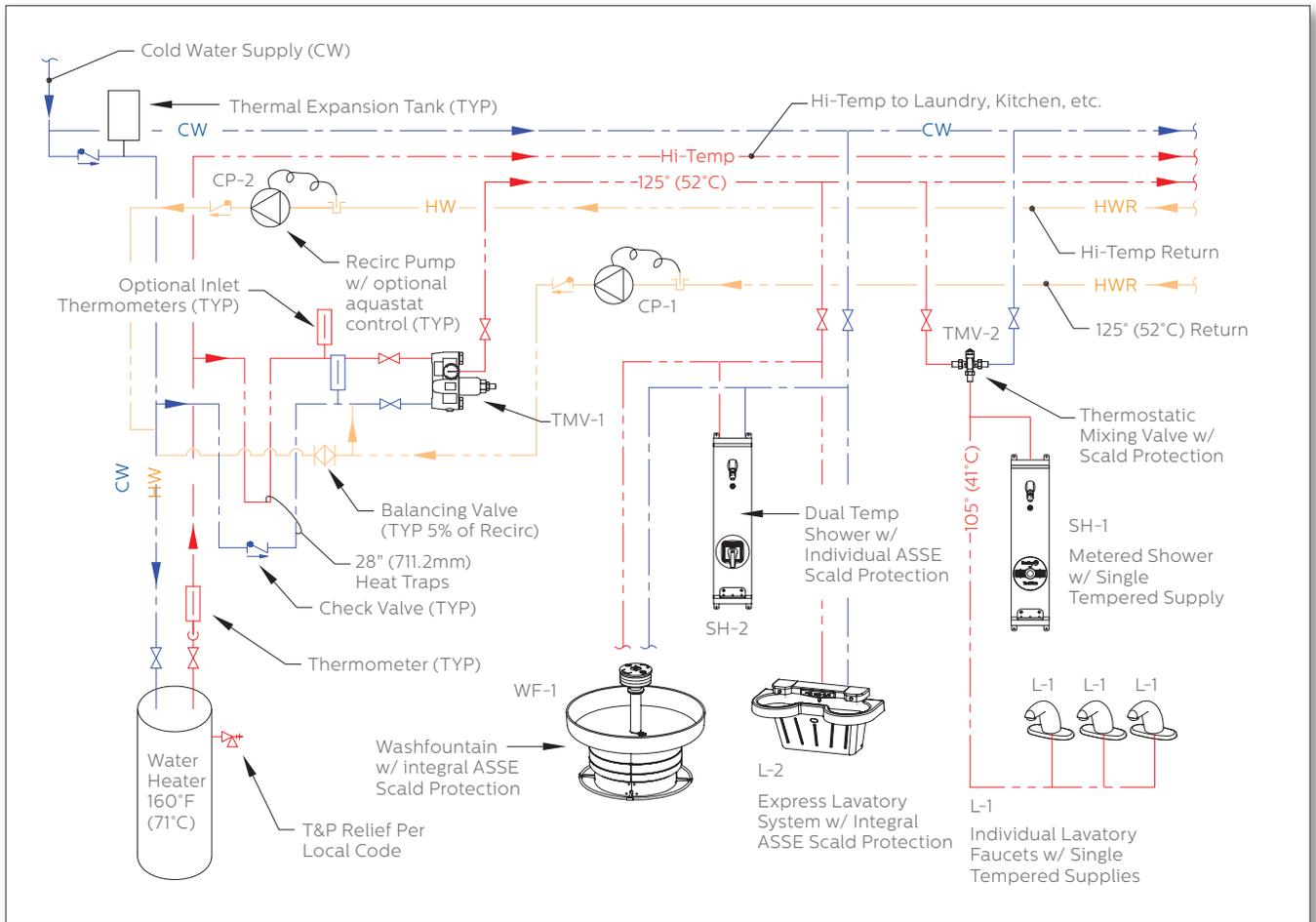
See Technical Data Sheets for available configurations.



Recirculation Stations – Save Time and Money

Bradley's Navigator Recirculation Station is designed to take the guesswork out of installing a thermostatic mixing valve in a recirculation system. This pre-assembled, pre-tested recirculation station consists of a Navigator High-Low Valve combined with the components typically used in this type of system: piping assembly, inlet/outlet shut-off valves, pressure/temperature gauges, circulation pump, balancing valve, and a GFCI outlet mounted to an enamel-coated strut. The Navigator NRS simplifies the specification and installation to such a degree that no factory technicians are required for installation. It's that easy.

Recirculation Diagram



Flow Capacities gpm (lpm)								
Model	Minimum Flow	Pressure Drop – psi (kPa)						
		5 (34.5)	10 (68.9)	15 (103.4)	20 (137.9)	30 (206.8)	45 (310.3)	60 (413.7)
NRS-4	1.5 (5.7)	12.5 (47.3)	19.0 (72)	24.0 (90.9)	28.5 (107.9)	37.0 (140.1)	47.0 (177.9)	56.5 (213.9)
NRS-8	2.0 (7.6)	26.0 (98.4)	36.0 (136.3)	44.0 (166.6)	51.0 (193.1)	63.0 (238.5)	77.0 (291.5)	88.0 (333.1)
NRS-13	4.0 (15.1)	40.0 (151.4)	58.0 (219.6)	71.0 (268.8)	83.0 (314.2)	102.0 (386.1)	126.0 (477)	147.0 (556.5)
NRS-20	5.0 (18.9)	60.0 (227.1)	91.0 (344.5)	109.0 (412.6)	127.0 (480.8)	157.0 (594.3)	192.0 (726.8)	220.0 (832.8)

NRS-4

3/4" (19mm) inlet,
1" (25.4mm) outlet

NRS-8

1" (25.4mm) inlet,
1-1/4" (32.8mm) outlet

NRS-13

1-1/4" (32.8mm) inlet,
1-1/2" (38.1mm) outlet

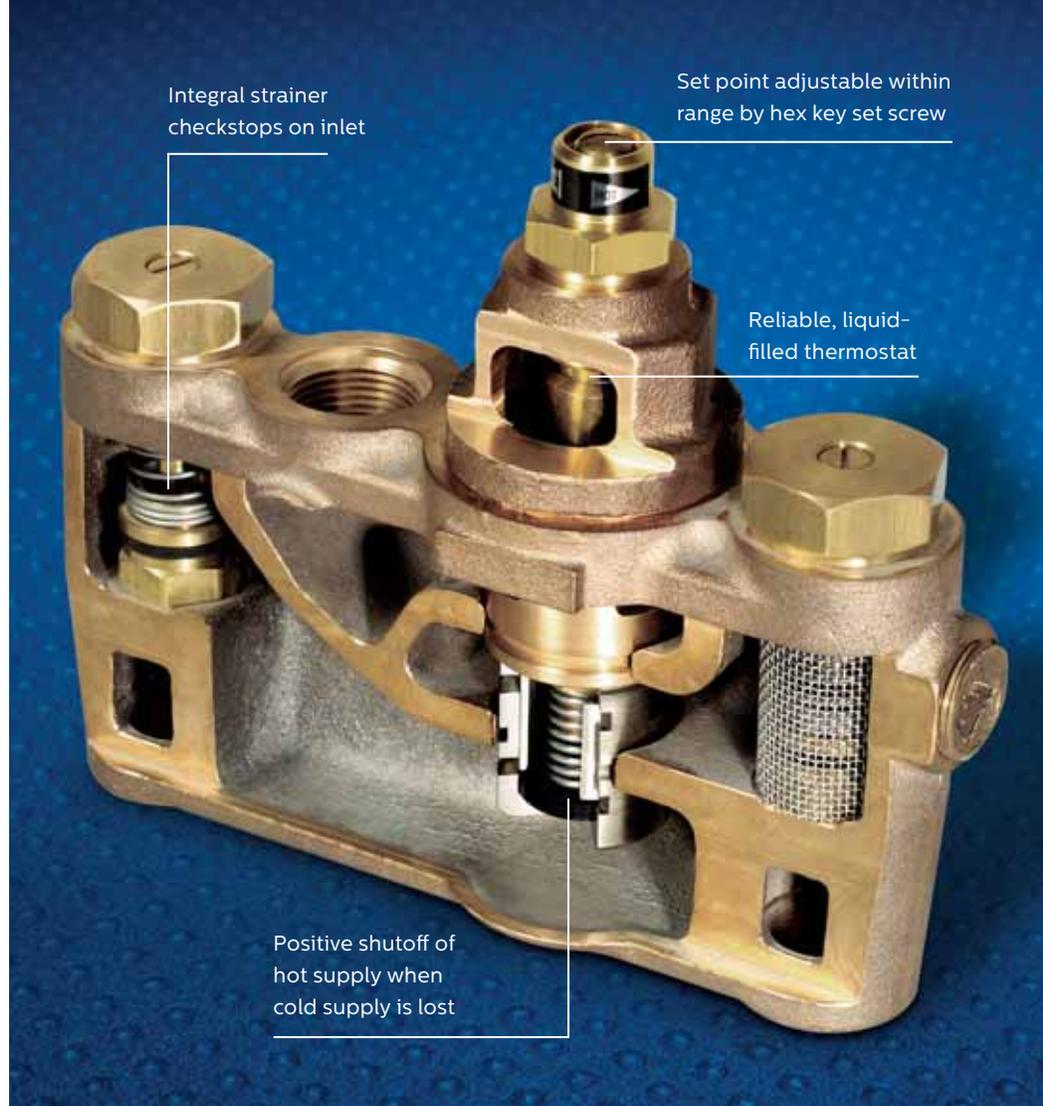
NRS-20

2" (50.8mm) inlet,
2" (50.8mm) outlet

KEY FEATURES

- ASSE 1017, cUPC certified
- Accurate temperature control to within +/- 3°F
- Factory assembled and tested
- Universal mounting capability
- Maximum operating pressure of 125 psi (860 kPA)
- Maximum inlet temperature of 200°F (93°C)
- Optional dial thermometer
- Standard options available
- 10-year warranty on liquid-filled thermostat

See *Technical Data Sheets* for available configurations.



Navigator Standard Valves

Bradley's Navigator standard valves provide reliable temperature control of water in a recirculation system or when the application does not call for a low demand of water. Bradley's Navigator standard valves are ASSE 1017 and cUPC certified, providing long-lasting reliable service. The single valve design ensures easy installation and maintenance – you can virtually "set it and forget it."

Flow Capacities gpm (lpm)								
Model	Minimum Flow	Pressure Drop – psi (kPA)						
		5 (34.5)	10 (68.9)	15 (103.4)	20 (137.9)	30 (206.8)	45 (310.3)	60 (413.7)
TMV25	2.0 (7.6)	5.5 (20.8)	9.0 (34.1)	13.0 (49.2)	16.0 (60.6)	20.0 (75.7)	25.0 (94.6)	29.0 (109.8)
TMV45	5.0 (18.9)	12.5 (47.3)	19.0 (72)	24.0 (90.9)	28.5 (107.9)	37.0 (140.1)	47.0 (177.9)	56.5 (213.9)
TMV80	8.0 (30.3)	24.0 (90.8)	34.0 (128.7)	44.0 (166.6)	48.0 (181.7)	60.0 (227.1)	74.0 (280.1)	85.0 (321.8)
TMV130	13.0 (49.2)	40.0 (151.4)	58.0 (219.6)	71.0 (268.8)	83.0 (314.2)	102.0 (386.1)	126.0 (477)	147.0 (556.5)
TMV200	20.0 (75.7)	60.0 (227.1)	91.0 (344.5)	109.0 (412.6)	127.0 (480.8)	157.0 (594.3)	192.0 (726.8)	220.0 (832.8)

All valves below are third party certified to meet lead-free requirements



TMV25 Model S59-2025

- 3/4" (19mm) inlet, 3/4" (19mm) outlet
- 2 gpm (7.6 lpm) minimum flow capacity



TMV45 Model S59-2045

- 3/4" (19mm) inlet, 1" (25.4mm) outlet
- 5 gpm (18.9 lpm) minimum flow capacity



TMV80 Model S59-2080

- 1" (25.4mm) inlet, 1-1/4" (32.8mm) outlet
- 8 gpm (30.3 lpm) minimum flow capacity



TMV130 Model S59-2130

- 1-1/4" (32.8mm) inlet, 1-1/2" (38.1mm) outlet
- 13 gpm (49.2 lpm) minimum flow capacity



HL200 Model S59-3200

- 2" (50.8mm) inlet, 2" (50.8mm) outlet
- 20 gpm (75.7 lpm) minimum flow capacity



University of Hartford West Hartford, Conn.

Campus Improves Safety, Reduces Maintenance with TMVs

Literally thousands of showers are taken each day in dorms and locker rooms on the University of Hartford campus. Since scald protection is a key issue, the school needed to replace single hot water tanks with tempering valves in its Village Apartment complex.

In total, about 12 Bradley Navigator TMVs have been installed at the University. For efficiency, these master TMVs are each installed near the hot water source. This eliminates the need for installing individual valves for each shower.

The Navigator line of valves uses single-valve technology to blend hot and cold water to preset temperatures with pinpoint accuracy, providing better user protection. Preset temperatures are maintained within three degrees, and in the event that cold water supply is lost, the valves will shutoff hot water to prevent scalding.

“The new Bradley TMVs are working marvelously,” Lou Perleoni, the University’s head of plumbing services said. “I’m amazed by the lack of maintenance on these valves.” Perleoni also mentioned that he appreciates the compact Navigator design and that cleaning the cartridge is not an issue.

KEY FEATURES

- Reliable wax-filled thermostat
- Adjustable set point within temperature limit
- Easy installation and serviceability
- Universal mounting capability
- Factory assembled and tested
- Maximum operating pressure of 125 psi (860 kPA)

See Technical Data Sheets for available configurations.



Point-of-Use Valves

The point-of-use valves work at the fixture for showers and sinks. They reliably control water temperature at flow as low as 0.35 gpm (1.32 lpm). Protect your users with these anti-scald valves.

Flow Capacities gpm (lpm)								
Model	Minimum Flow	Pressure Drop – psi (kPA)						
		5 (34.5)	10 (68.9)	15 (103.4)	20 (137.9)	30 (206.8)	45 (310.3)	60 (413.7)
S59-2007	0.5 (1.9)	2.0 (7.6)	3.5 (13.2)	4.5 (17.0)	5.0 (18.9)	6.5 (24.6)	8.0 (30.3)	9.5 (36.0)
S59-4000(A)	0.35 (1.3)	2.0 (7.6)	2.5 (9.5)	3.0 (11.4)	3.5 (13.2)	4.5 (17.0)	5.5 (20.8)	6.5 (24.6)
S59-4008	0.5 (1.9)	2.0 (7.6)	3.5 (13.2)	4.5 (17.0)	5.0 (18.9)	6.5 (24.6)	8.0 (30.3)	9.5 (36.0)
S59-4016	0.5 (1.9)	5.0 (18.9)	7.0 (26.5)	8.5 (412.6)	10.0 (37.9)	12.5 (47.3)	15.0 (56.8)	16.5 (62.5)



All valves below are third party certified
to meet lead-free requirements

Sink/Faucet Valve Model S59-2007

- 1/2" (12.7mm) inlet, 1/2" (12.7mm) outlet
- 0.5 gpm (1.9 lpm) minimum flow capacity
- ASSE, cUPC certified



Navigator Valve Models S59-4000, S59-4000A, S59-4000BY

- 3/8" (9.5mm) compression inlet, 3/8" (9.5mm) compression outlet
- 1/2" (12.7mm) inlet, 1/2" (12.7mm) outlet
- 0.35 gpm (1.3 lpm) minimum flow capacity
- ASSE, cUPC certified



Navigator Valve Models S59-4016D, S59-4016N, S59-4016S, S59-4016X, S59-4016Y

- 1/2" (12.7mm) inlet, 1/2" (12.7mm) outlet
- 3/4" (19mm) inlet, 3/4" (19mm) outlet
- 0.5 gpm (1.9 lpm) minimum flow capacity
- ASSE, cUPC certified



Vernatherm™ Valve Model S59-4008

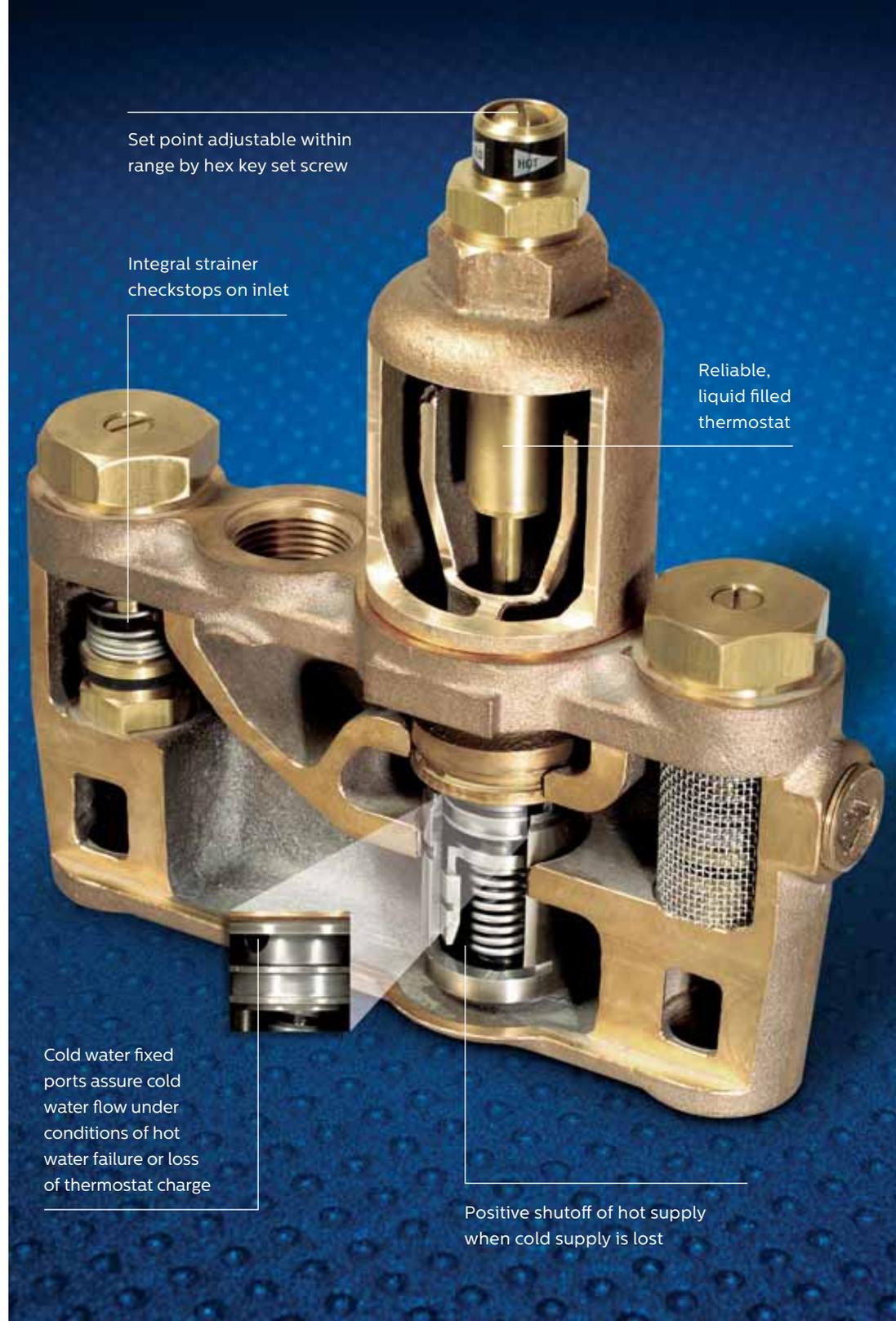
- 1/2" (12.7mm) inlet, 1/2" (12.7mm) outlet
- 0.5 gpm (1.9 lpm) minimum flow capacity
- ASSE, cUPC certified



KEY FEATURES

- ASSE 1071 certified
- Meet ANSI Z358.1 requirements
- Accurate temperature control to within +/- 3°F
- Adjustable set point temperature range 65°F to 95°F (18°C to 35°C). Factory set point is 85°F (29°C)
- Cold water fixed ports assure cold water flow
- Universal mounting capability
- Maximum operating pressure of 125 psi (860 kPa)
- Maximum inlet temperature of 180°F (82°C) with a recommended inlet temperature of 120°F to 140°F (49°C to 60°C)
- Standard options available
- 10-year warranty on liquid-filled thermostat

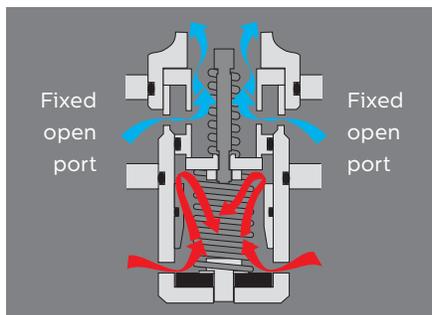
See *Technical Data Sheets* for available configurations.



Navigator Emergency Valves

The 15-minute rule: The current ANSI standard calls for emergency eyewash and drench showers to deliver tepid water for 15 minutes. This assures that a user won't be subjected to very cold water and possibly hypothermia or very hot scalding water and possibly skin burns. Therefore, a thermostatic mixing valve is needed to mix incoming hot and cold water to a tepid temperature. The Navigator EFX is designed for this very purpose.

Flow Capacities gpm (lpm)								
Model	Minimum Flow	Pressure Drop – psi (kPa)						
		5 (34.5)	10 (68.9)	15 (103.4)	20 (137.9)	30 (206.8)	45 (310.3)	60 (413.7)
EFX125	3.0 (11.4)	33.5 (126.8)	47.5 (179.8)	58.0 (219.6)	67.0 (253.6)	82.0 (310.4)	100.5 (380.4)	116.0 (439.1)
cold bypass only		25.5 (96.5)	36.5 (138.2)	44.5 (168.5)	51.5 (194.9)	63.0 (238.5)	77.0 (291.5)	89.0 (336.9)
EFX60	2.0 (7.6)	22.0 (83.3)	31.0 (117.3)	38.0 (143.8)	43.5 (164.7)	53.5 (202.5)	65.6 (247.9)	75.5 (285.8)
cold bypass only		16.5 (62.5)	23.5 (89.0)	29.0 (109.8)	33.5 (126.8)	41.0 (155.2)	50.0 (189.3)	58.0 (219.6)
EFX50	3.0 (11.4)	15.0 (56.8)	22.0 (83.3)	27.0 (x)	32.0 (x)	40.5 (x)	54.0 (x)	65.0 (x)
cold bypass only minimum of 8.0 gpm (30.3 lpm) at 30 psi (206.84kPa)								
EFX25	2.0 (7.6)	10.5 (39.7)	15.0 (56.8)	18.5 (70.0)	21.3 (80.6)	26.0 (98.4)	32.0 (121.1)	37.0 (140.1)
cold bypass only		8.0 (30.3)	11.5 (43.5)	14.0 (53.0)	16.5 (62.5)	20.0 (75.7)	24.5 (92.7)	28.0 (106.0)
EFX20	3.0 (11.4)	6.0 (22.7)	9.5 (36.0)	12.5 (47.3)	15.0 (56.8)	19.5 (73.8)	25.5 (96.5)	30.5 (115.5)
cold bypass only minimum of 28.5 gpm (107.88 lpm) at 30 psi (206.84kPa)								
EFX8	1.5 (5.7)	3.0 (11.4)	4.0 (15.1)	5.0 (18.9)	6.0 (22.7)	7.3 (27.6)	9.0 (34.1)	10.5 (39.7)
cold bypass only		2.3 (8.7)	3.2 (12.1)	4.0 (15.1)	4.6 (17.4)	5.6 (21.2)	6.8 (25.7)	7.7 (29.1)



Cold Water Bypass

Not only does the Navigator maintain an accurate temperature, it also has an added safety feature. If the cold water stops, the Navigator prevents scalding by shutting down the hot water. If the hot water stops or the thermostat loses its charge, the valve's fixed cold-water ports keep the cold water flowing.

For a complete listing of Bradley Safety Products, please see bradleysafety.com



EFX8 Model S19-2000

- 1/2" (12.7mm) inlet, 1/2" (12.7mm) outlet
- 1.5 gpm (5.7 lpm) minimum flow capacity



EFX20 Model S19-2150

- 3/4" (19mm) inlet, 1" (25.4mm) outlet
- 3 gpm (11.4 lpm) minimum flow capacity



EFX25 Model S19-2100

- 3/4" (19mm) inlet, 1" (25.4mm) outlet
- 2 gpm (7.6 lpm) minimum flow capacity



EFX50 Model S19-2250

- 1" (25.4mm) inlet, 1-1/4" (32.8mm) outlet
- 3 gpm (11.4 lpm) minimum flow capacity



EFX60 Model S19-2200

- 1" (25.4mm) inlet, 1-1/4" (32.8mm) outlet
- 2 gpm (7.6 lpm) minimum flow capacity



EFX125 Model S19-2300

- 1-1/4" (32.8mm) inlet, 1-1/2" (38.1mm) outlet
- 3 gpm (11.4 lpm) minimum flow capacity

How Much Water?

Specifying Valves

When you're specifying thermostatic mixing valves, "How much water is needed?" is a critical question. And, it inevitably leads to another critical question. "What size valve do I specify?"

Determining actual flow requirements is tricky. Only a small portion of faucets, showers and other fixtures in a large system are operating at any given time. Any valve selected to supply 100% of maximum demand would therefore be greatly oversized.

Standard thermostatic mixing valves provide accurate control at higher flow rates. High-Low valves are designed to control temperature at both high and low flow requirements. Matching the valve with the flow requirements will then provide the most accurate and economical valve for the job.

For several years thermostatic mixing valve manufacturers and system designers have successfully used a modified Hunter's Curve to determine the hot water requirements of various types of buildings. Originally used to size instantaneous heaters, this system provides accurate estimates of hot water usage. But, as with any system, the designer must account for any unusual or unique requirements.

Example

- 40-Room Nursing Home
- Each room has 1 private basin.
- Additionally there are 2 public lavatories, 2 showers, 1 bathtub and 1 service sink.
- Inlet water pressure is 35 psig (241 kPa).

Count fixture units using the values from Table 1:

Hot Water Demand

- 40 rooms at .75 per basin = 30
- 2 public lavs at 1.0 per basin = 2
- 2 showers at 1.5 = 3
- 1 bathtub at 1.5 = 1.5
- 1 service sink at 2.5 = 2.5

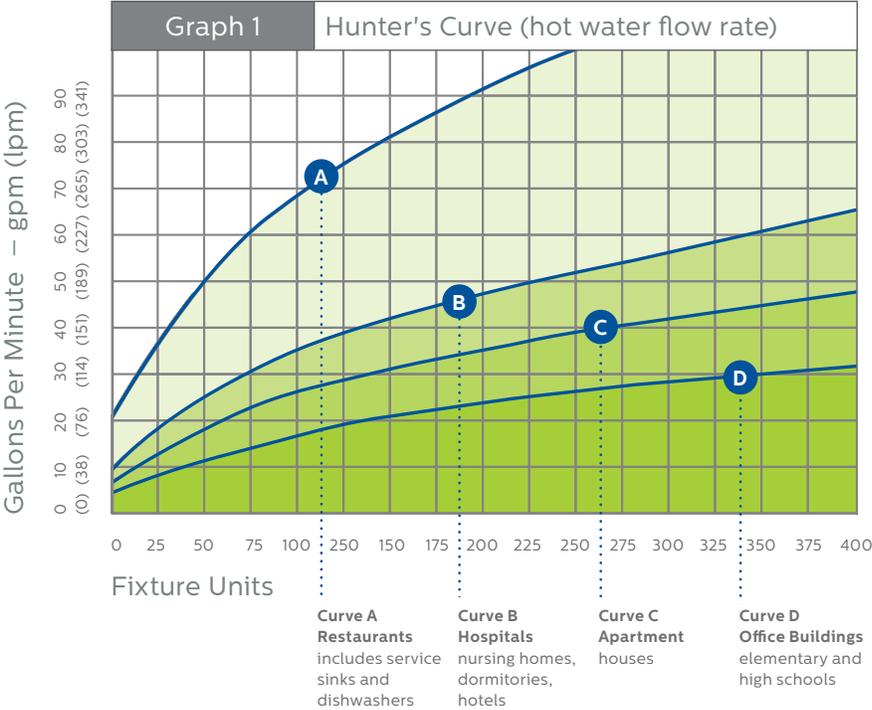
Total: 39 Fixture Units

1

Table 1 Hot Water Demand	
Fixture Units	
Basin, Private Lavatory	0.75
Basin, Private Lavatory	1.0
Bathtub	1.5
Therapeutic Bath	5.0
Service Sink	2.5
Showers	1.5
Circular Washfountain	2.5
Semi-Circular Washfountain	1.5

2

Referring to Graph 1, 39 Nursing Home Fixture Units corresponds to Hunter’s Curve “B” and a flow rate of 22 gpm (83.3 lpm). A High-Low valve is the best selection, in order to closely control temperatures at flows lower than 22 gpm (83.3 lpm).



The Hunter’s Curve Method

is simple and straightforward.

Total up the fixture units (values shown in Table 1)
 Determine the flow rate for the type of building from Graph 1.
 Select a valve which will give an appropriate pressure drop. (5 to 15 psi [34 to 103 kPA], avoid drops above 20 psi [138 kPA]).

3

With only 35 psig (241 kPA) inlet we must be careful not to take a large pressure drop across the valve. A maximum 5 to 15 psi (34 to 103 kPA) drop is recommended.

At 22 gpm (83.3 lpm) the High-Low 45 has a 13 psi (90 kPA) drop and the High-Low 80 has a 4 psi (28 kPA) drop. Subtract the expected pressure drop for the inlet water pressure to determine the pressure downstream of the mixing valve.

High-Low 45: $35 - 13 = 22 \text{ psi (152 kPA)}$ High-Low 80: $35 - 4 = 31 \text{ psi (214 kPA)}$

Flow restrictors in plumbing fixtures are designed to operate properly between 20 and 80 psi (138 to 552 kPA) differential. Generally, a fixture pressure of 30 psig is targeted. While both valves fall within that range, the High-Low 80 will be selected because it provides sufficient downstream pressure at the fixture.

Need Help? An interactive valve sizing guide can be found at bradleycorp.com This program will help size the right thermostatic valve for your application.

Application	Recommended Valve
<p>S19224 Halo Wall-Mounted Eyewash</p> 	<p>S19-2000 Emergency Thermostatic Mixing Valve</p> 
<p>S19214DCFW Halo Eye/Face Wash with Stainless Steel Bowl & Dust Cover</p> 	<p>S19-2000 Emergency Thermostatic Mixing Valve</p> 
<p>S19120 Drench Shower</p> 	<p>S19-2100 Emergency Thermostatic Mixing Valve</p> 
<p>S19314 Halo Drench Shower with Eye/Face Wash</p> 	<p>S19-2200 Emergency Thermostatic Mixing Valve</p> 
<p>WF2808 Washfountain</p> 	<p>S59-4008 Vernatherm Thermostatic Mixing Valve</p> 
<p>Aerada 1200 Faucet</p> 	<p>S59-4000A Point-of-Use Thermostatic Mixing Valve</p> 
<p>WS-3W-TT Group Shower</p> 	<p>S59-4016 Point-of-Use Thermostatic Mixing Valve</p> 
<p>COL-5C Column Shower</p> 	<p>S59-2025 Standard Thermostatic Mixing Valve</p> 
<p>WS-1WCA-HD Wall Showers</p> 	<p>S59-3045 High-Low Thermostatic Mixing Valve</p> 
<p>Building System</p> 	<p>NRS-20 Recirculation System</p> 