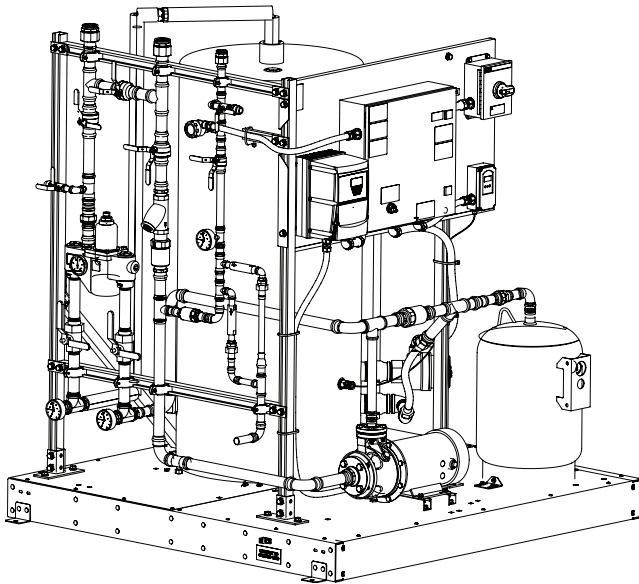


Installation and Maintenance Guide



Model NTS1 shown
(Includes recirculation line and VFD pump)



[Scan or click code to view
Installation Guide](#)

**NTS1 (One Station)
NTS2 (Two Station)**

Navigator® Tepid Water Skid System

Hot Water Tank with Navigator Emergency Fixture Thermostatic Mixing Valve (TMV) & Variable Frequency Drive Controlled Pump

General Area

Table of Contents

Safety Information	2
Components	3-4
Dimensions	5-8
Shipping and Handling Instructions	9
Skid System Preconstruction Guide	10
Storage & Preservation Guide	10
Prepare Skid System	11
Electrical Connections	11
Connect Water Supply	12
Tank Fill	13
Energizing the Unit	14
Adjust Temperature	14
Start-Up Checklist	15
Weekly Inspection Checklist	15
Performing Preventive Maintenance	16
Troubleshooting	16
Appendix: Pressure Transmitter Parameters	17-18



Read the instructions in this manual before beginning installation. Save these instructions and refer to them for inspection, maintenance and troubleshooting information.

For questions regarding the operation, installation or maintenance of this product, visit bradleycorp.com or call 800.BRADLEY (800.272.3539).

Product warranties and parts information may also be found under "Resources" on our website at bradleycorp.com/customerservice/warranty.

215-1953 Rev. A: ECO 23-05-037C

© 2024 Bradley

Page 1 of 18 5/10/2024

P.O. Box 309
Menomonee Falls, WI 53052 USA
800 BRADLEY (800 272 3539)
+1 262 251 6000
bradleycorp.com



A WATTS Brand

Safety Information

To reduce the risk of serious injury or death:

Installation

Failure to comply with proper installation and maintenance could contribute to a valve failure resulting in severe bodily injury including scalding, chilling, and/or death depending upon system water pressure changes and/or supply water temperature changes.

ANSI/ISEA Z358.1 requires this unit to be used with a clean, potable, uninterrupted supply of water. Constant power supply to safety equipment is necessary for it to function and to keep water tepid.

Before installation make sure that this equipment will meet the requirements of the potential hazardous contaminants in your location.

Installation and maintenance of this system must be completed by a qualified plumber and electrician in compliance with all national and local codes. Compliance and conformity to local codes and ordinances is the responsibility of the installer. Use this thermostatic mixing valve in accordance with ASSE standard 1071.

Weekly Inspections

Regular checking and cleaning of the valve's internal components and check stops is necessary for maximum life and proper product function. **Periodic inspection and yearly maintenance by a licensed contractor is required.** Corrosive water conditions and/or unauthorized adjustments or repairs could render the valve ineffective for its intended service. Frequency of cleaning and inspection depends upon local water conditions.

Operation of emergency thermostatic mixing valves (TMV) and fixtures must be tested weekly per ANSI/ISEA Z358.1.

Perform regular checks of the recirculation pump and flow switch (if equipped) along with strainers for clogged debris and clean if necessary.

Water Temperature

ANSI/ISEA Z358.1 requires tepid water. Suitable range is 60°F to 100°F (16°C to 38°C). Personal injury is possible outside this temperature range. Output temperature of the valve must be checked and adjusted at initial installation and on a quarterly basis.

This valve does not provide protection from pipe freezing.

Moving the Skid System

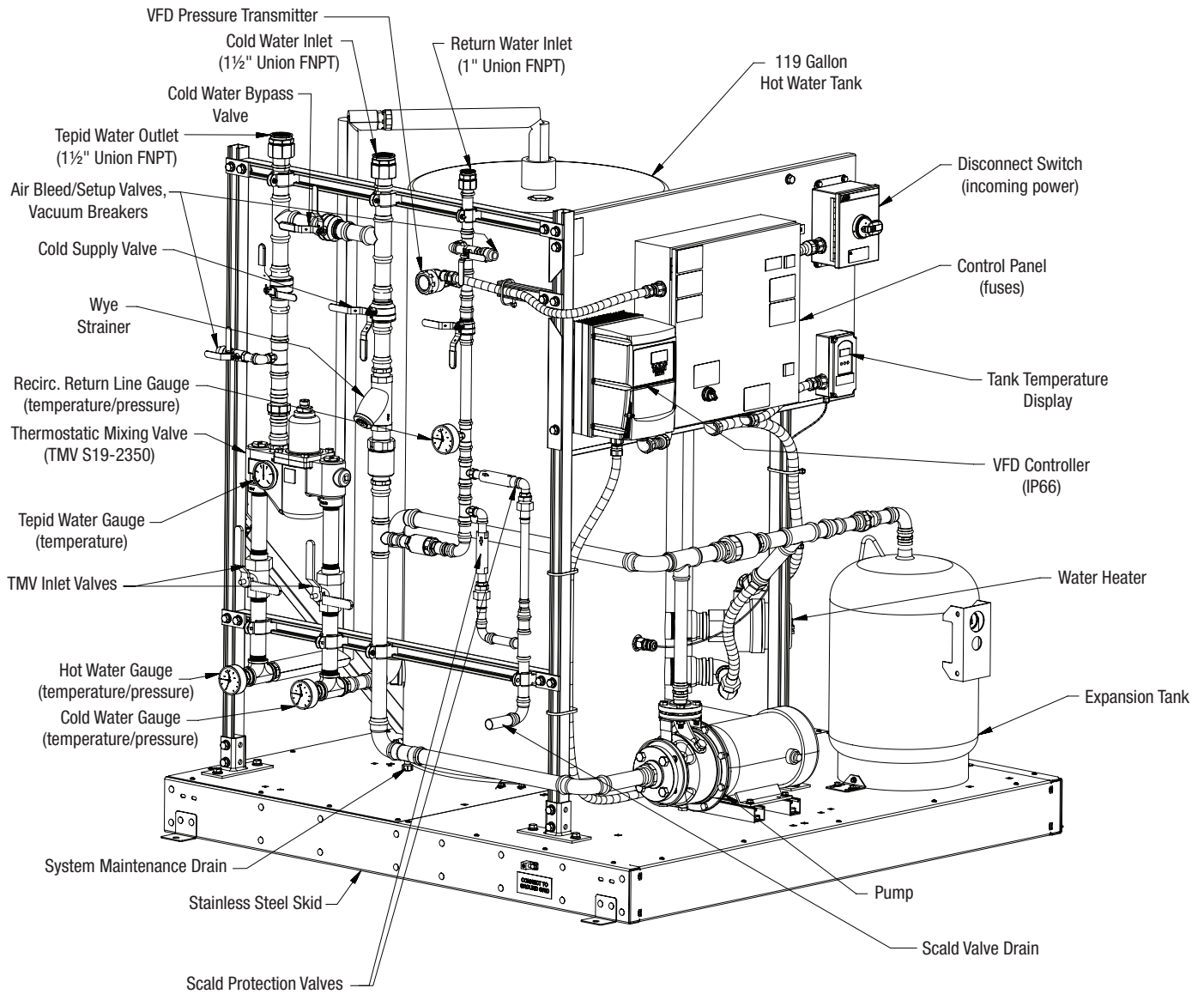
Drain the hot water tank completely before moving. Lifting or moving a tank with water may cause damage to the unit or a loss of stability when in motion.

Perform functional test upon relocation of equipment.

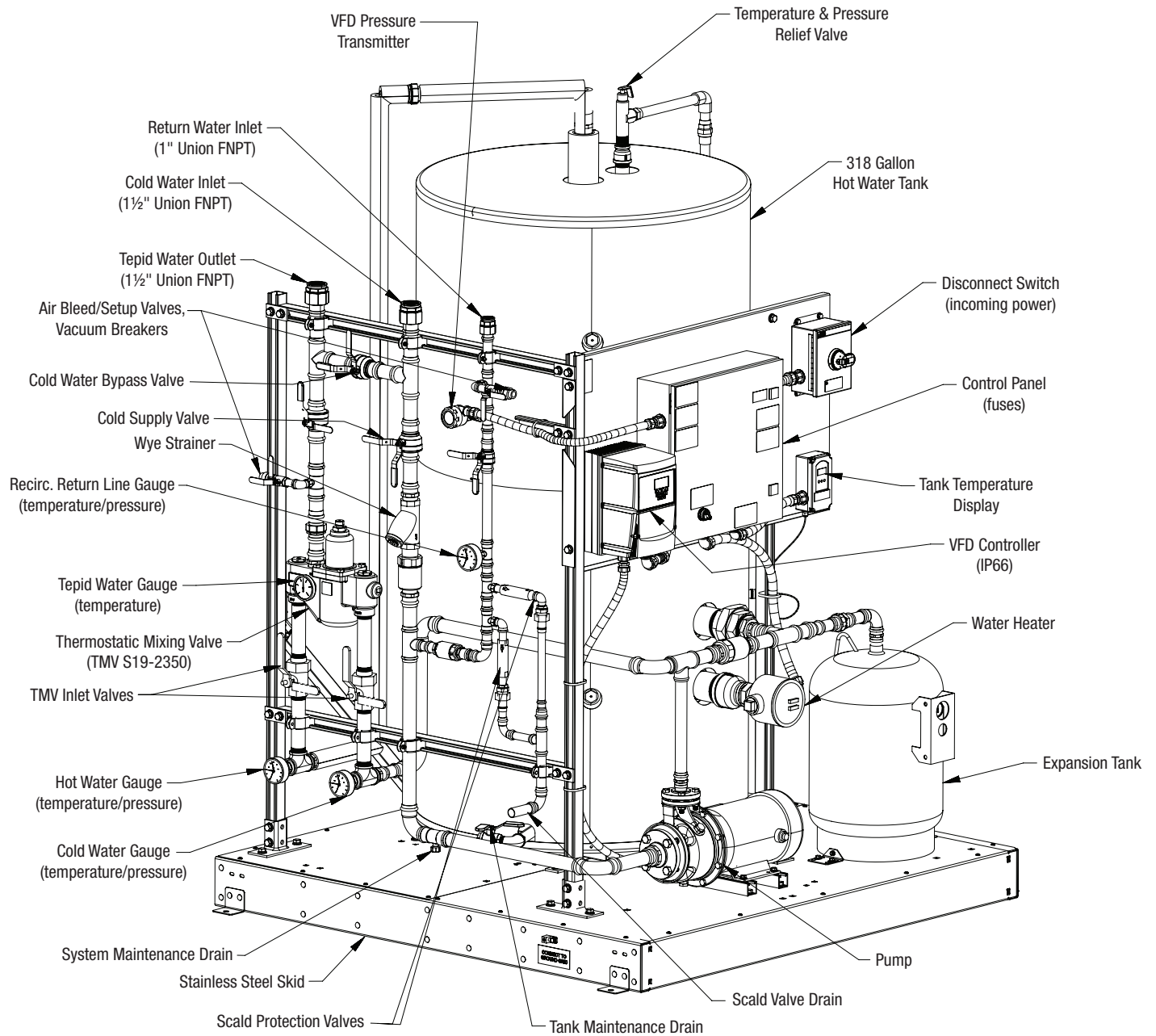
To avoid product or property damage:

- Make all water and electrical connections at temperatures above freezing (32°F (0°C)).

Components – Model NTS1 (Single Shower Station)



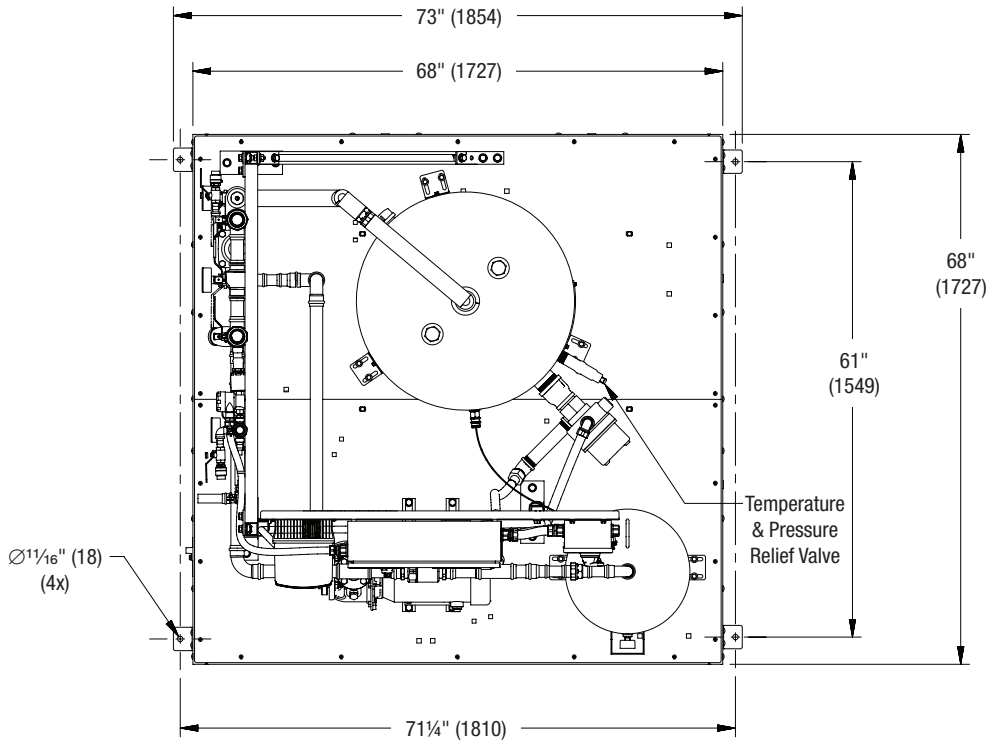
Components – Model NTS2 (Two Shower Station)



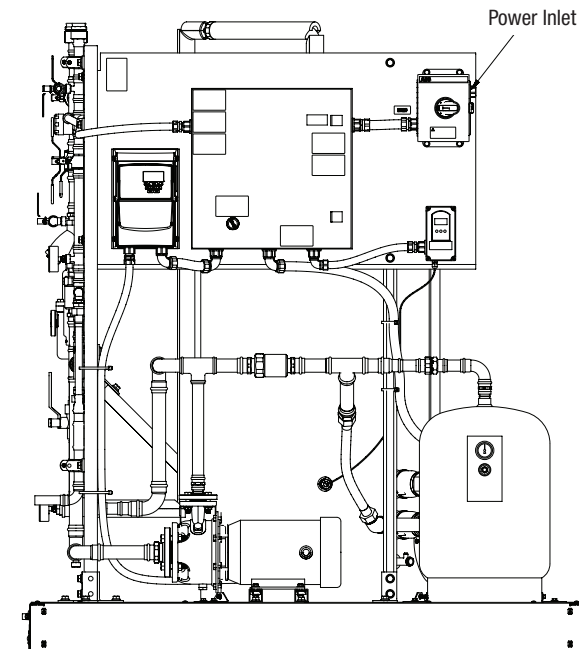
Dimensions – Model NTS1 (Single Shower Station) (mm)

(Includes Recirculation Line & VFD Pump)

Top View



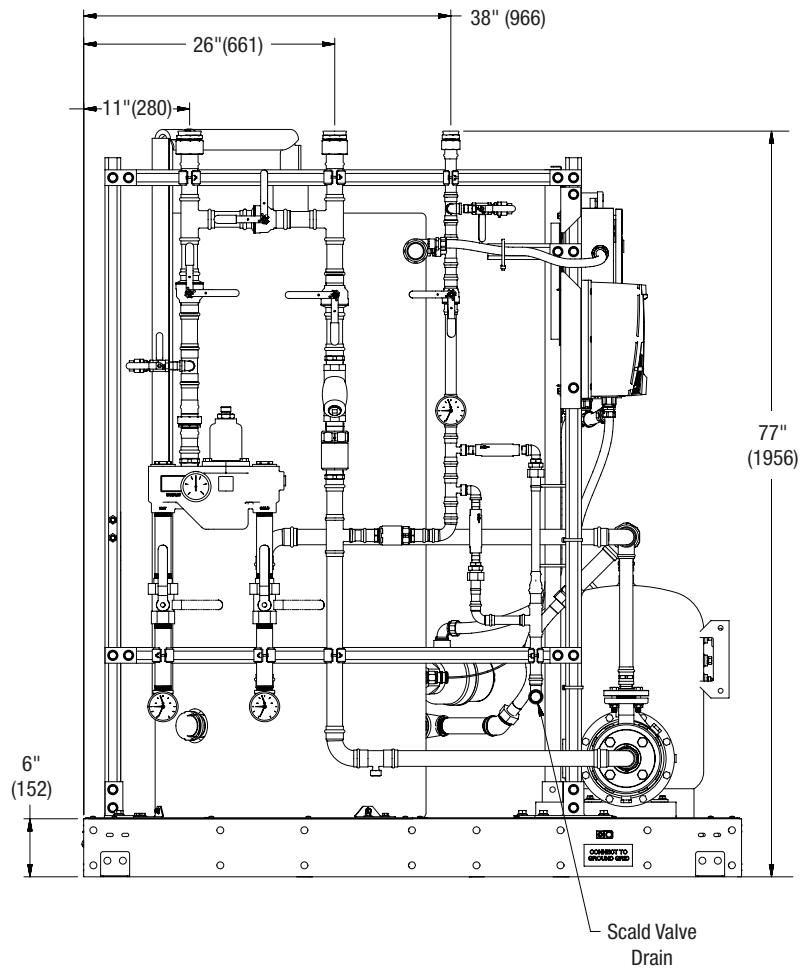
Back View



Dimensions – Model NTS1 (Single Shower Station)

(mm)

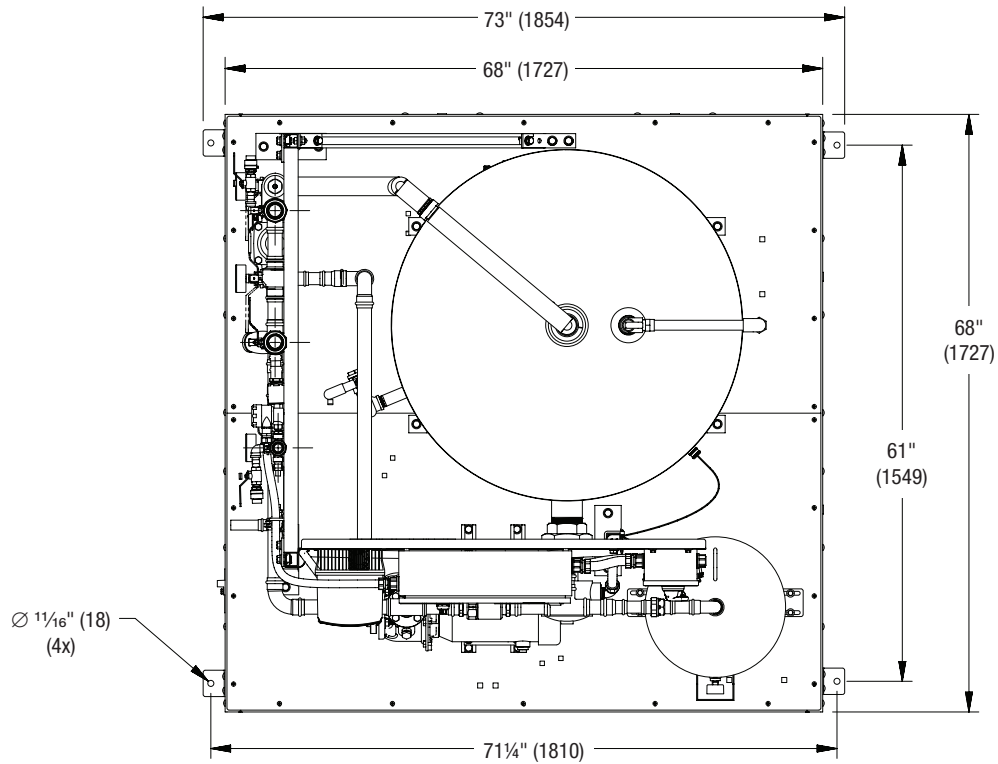
Side View



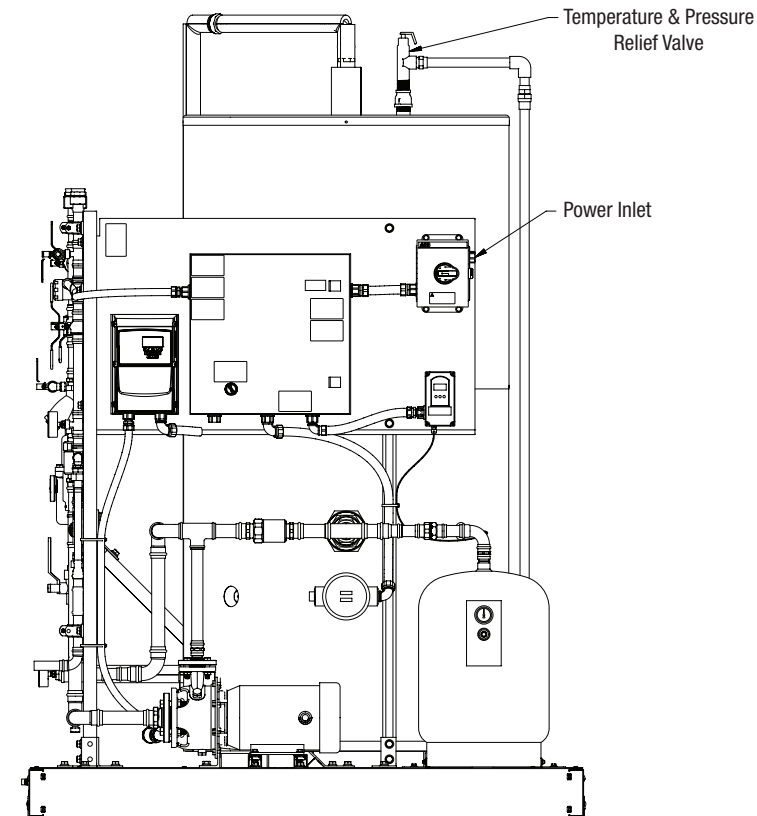
Dimensions – Model NTS2 (Two Shower Station) (Includes Recirculation Line & VFD Pump)

(mm)

Top View



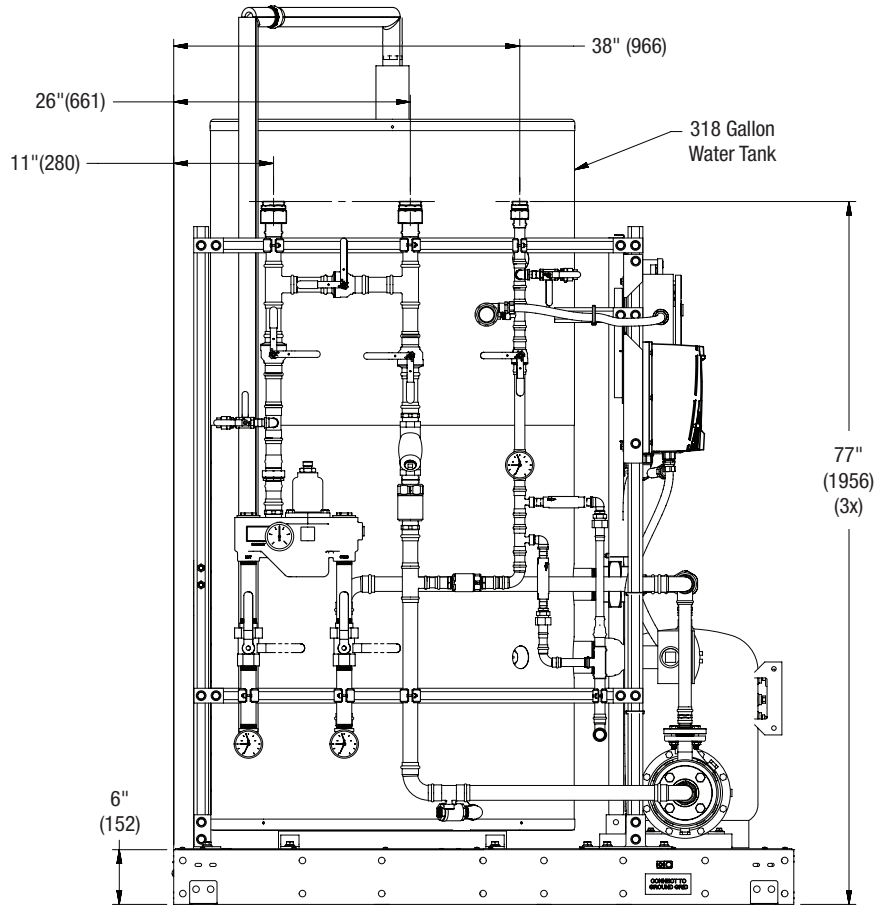
Back View



Dimensions – Model NTS2 (Two Shower Station)

(mm)

Side View



Shipping and Handling Instructions

Description	Approximate Weight (less shipping skid)
NTS1 (One Station Shower) Navigator Tepid Water Skid System	1800 lb*
NTS2 (Two Shower Station) Navigator Tepid Water Skid System	2000 lb*

* Weight will vary depending on options selected.

Transporting the Skid System



Bradley Skid Systems are transported within the continental United States and Canada via commercial truck.

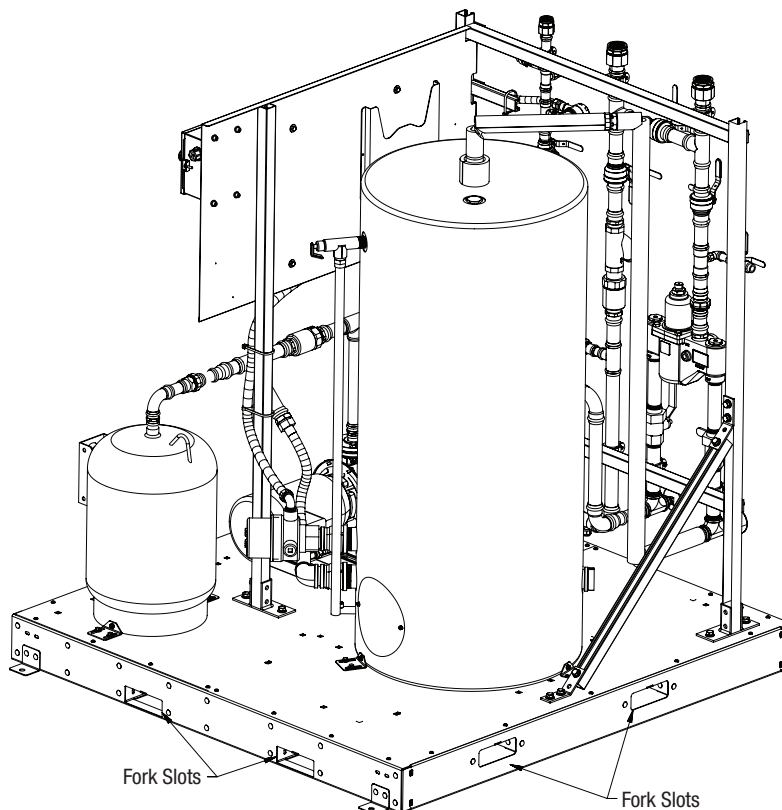
NOTICE! Use caution when transporting, and always use proper lifting techniques. Weight distribution is unbalanced and the product is susceptible to tipping which will result in damage to the product.

NOTICE! Check load ratings on equipment intended to be used to transport the enclosure. Standard safety procedures for forklift transport of larger than 2000 pounds should be followed at all times.

- **Bottom Lift:** Locate fork slots on one end of skid base. During transit, transport close to the ground. Use all standard safety measures and precautions prior to and during transit.
- If immediate destination of the unit is storage, refer to the Storage & Preservation Guide on page 10.



Each Skid System will be accompanied by a package of documents that includes the installation instructions and schematics. Store documents for reference.



Skid System Preconstruction Guide

Thank you for your business. The purpose of Bradley's Skid System preconstruction guide is to provide important pre-installation information to the customer that has determined their product specification needs are met by one of our skid systems. For system details refer to all documents included with the skid system. If additional information is still required contact the Bradley Technical Service Department.

Recommended Equipment, Materials & Supplies to be Provided by Installer

- Concrete slab rated to support a minimum 5000 lb load requirement
- Electrical supply materials
- Plumbing supply materials
- Properly rated lifting equipment which exceeds the total weight of the skid system unit

⚠ WARNING DO NOT energize skid system without first following all instructions in Steps 1 thru 6. Connections should be performed by a certified electrician and plumber only.

Pre-Installation Instructions



All practices are based on local codes and standards.

- Contact the authority having jurisdiction over local codes and ordinances regarding the disposal of waste water prior to installation.
- Contact the authority having jurisdiction over local codes and ordinances regarding the plumbing and electrical codes prior to installation.
- If concrete is not already present, pour a concrete pad with a minimum size of 6'-6" x 7'.
- Confirm that the installation area is a level plane.
- Make allowances to ensure the skid system is grounded prior to connecting power to the skid system.
- Survey the facility to ensure that the flushing system is installed per the ANSI/ISEA Z358.1 requirements. Identify a location that is capable of delivering a supply of water and power which will meet system plumbing and electrical requirements.
- Review minimum electrical requirements based on the unit and options selected. Refer to wiring schematic or system rating labels provided with unit.

Storage & Preservation Guide



Keep Bradley skid systems stored in original packaging until installation.

Recommended Storage Criteria

- Store Bradley skid system where temperatures are above 35°F (5°C) at all times.
- Indoor storage is recommended.
- Minimize excessive transportation around a job site to reduce risk of damage.

Alternate Storage

If the Bradley skid system is stored in an outdoor environment, care should be taken to protect the skid system from rain or other falling precipitation via tarp or other waterproof material or runoff and accumulation of ground water from any source that may exceed 3" depth.

1 Prepare Skid System

- ⚠ WARNING** To prevent personal injury or damage to the components, follow all manufacturer's warnings and instructions when performing any maintenance or installation of components used in this Skid System.
- ⚠ WARNING** To prevent personal injury and electrical system failure, **DO NOT** energize electrical power prior to priming the water in the system.
- ⚠ WARNING** To prevent personal injury, component damage or electrical system failure, **DO NOT** energize the pump until the water is primed.
- ⚠ WARNING** System is not freeze protected without an energized electrical connection. It is recommended that installation be completed when ambient temperature is above freezing.
- ⚠ WARNING** To prevent personal injury and damage to the unit, the installer may need to provide adequate support for the supply piping.

Place the unit in position and secure to the concrete using suitable concrete anchoring devices supplied by the installer (use corrosion-resistant anchoring devices (4 places), 1/2" diameter). Install anchors per the manufacturer's recommendation and local codes and ordinances.

2 Electrical Connections



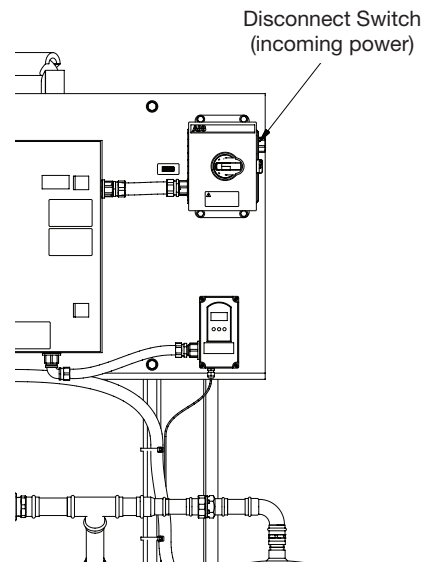
Some steps apply to optional components. Review and follow if applicable.

- ⚠ WARNING** To prevent personal injury and damage to the components, surge protection is recommended.
- ⚠ WARNING** To prevent personal injury and damage to the components, follow all manufacturer's warnings and instructions when performing any maintenance or installation of components used in this Skid System.
- ⚠ WARNING** To prevent personal injury or damage to the components, make sure electrical disconnect is in the OFF position.
- ⚠ WARNING** To prevent personal injury and electrical system failure, **DO NOT** energize the pump until the water is primed.

NOTICE! To prevent damage to the electronics or internal wiring, do not perform any brazing or sweat soldering inside the enclosure box.

NOTICE! System is not freeze protected without an energized electrical connection. It is recommended that installation be completed when ambient temperature is above freezing.

- ⚠ WARNING** Install in accordance with the National Electrical Code (NEC) or Canadian Electrical Code (CEC), and any applicable local codes, based on the installation location for USL/CNL panels. Follow all lockout/tagout procedures when performing any electrical maintenance to the system.



A Verify that disconnect switch is in the OFF position.

B Install the 3/4" conduit for the incoming power into the disconnect switch.

C Route the electrical supply wires to the wire leads leading from the disconnect switch, including the neutral wire if applicable. Refer to the system's electrical wiring schematic drawings included in the document package for proper conductor size and maximum electrical protection.

D Close the disconnect switch box, but **DO NOT** energize.

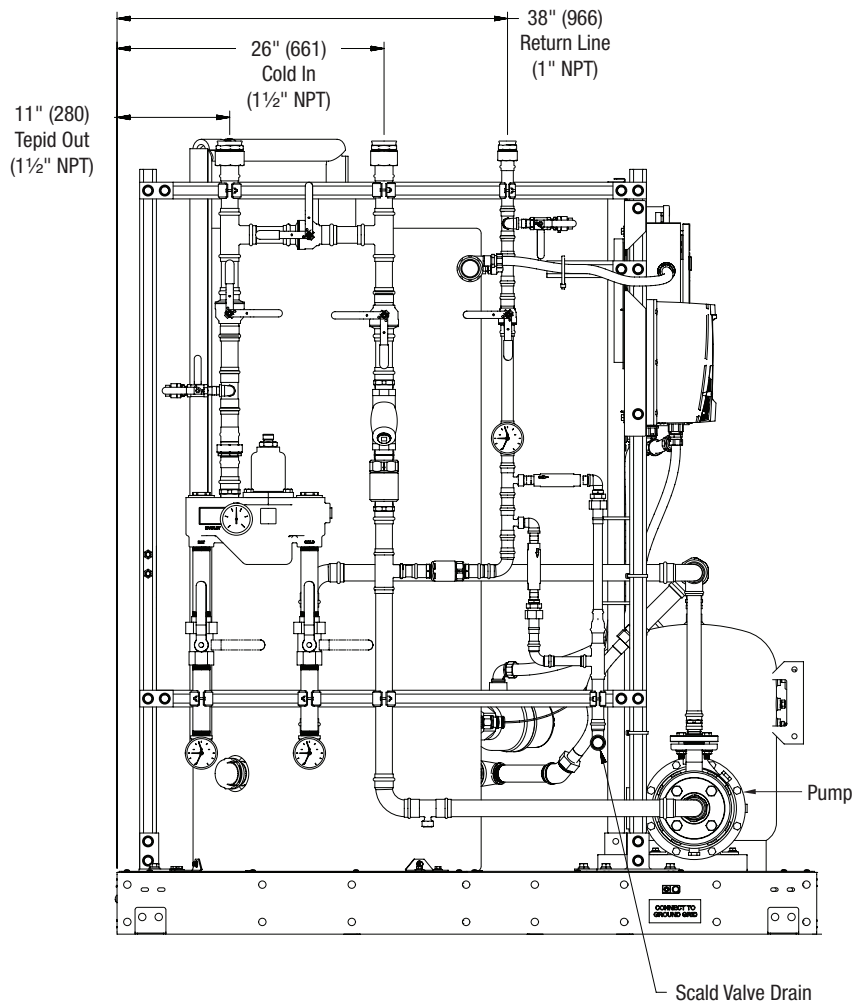
3 Connect Water Supply

A Apply pipe sealant or Teflon tape to all threaded pipe/fitting connections. Use care to avoid excess pipe sealant or Teflon tape which may enter the plumbing system. Ensure all fitting connections are properly secured.

B Connect water supply lines per pipe sizes shown below (piping by installer).

C Direct the possible water flow from the scald valve drain (1" Dia. copper tube) to an appropriate drain.

Right Side View - Rough-Ins (NTS1 shown)



Do not run pump dry. Operation without water circulation could result in pump or motor damage.



Recirculating the water in the system provides constant regulation of the water temperature. Flush the supply lines thoroughly after completing installation. Close off all fixtures and label them as not available for use during the installation process.

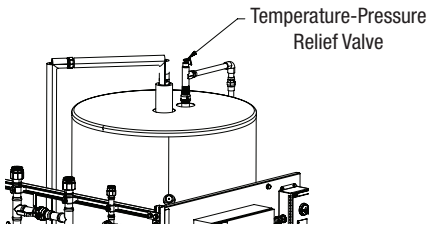
4 Tank Fill

Make sure all ball valves (BV1 – BV8) are closed before beginning. Refer to the illustration for BV locations.

Actual components, valves, and plumbing may be different than what is shown below.

A Open ball valve 6 (BV6) and then ball valve 8 (BV8). Purge the air from the loop. Close BV8.

B Open the temperature-pressure relief valve on top of the water tank to vent the air.



C Open the cold supply inlet valve (BV5). The tank will begin to fill. Open ball valve 4 (BV4).

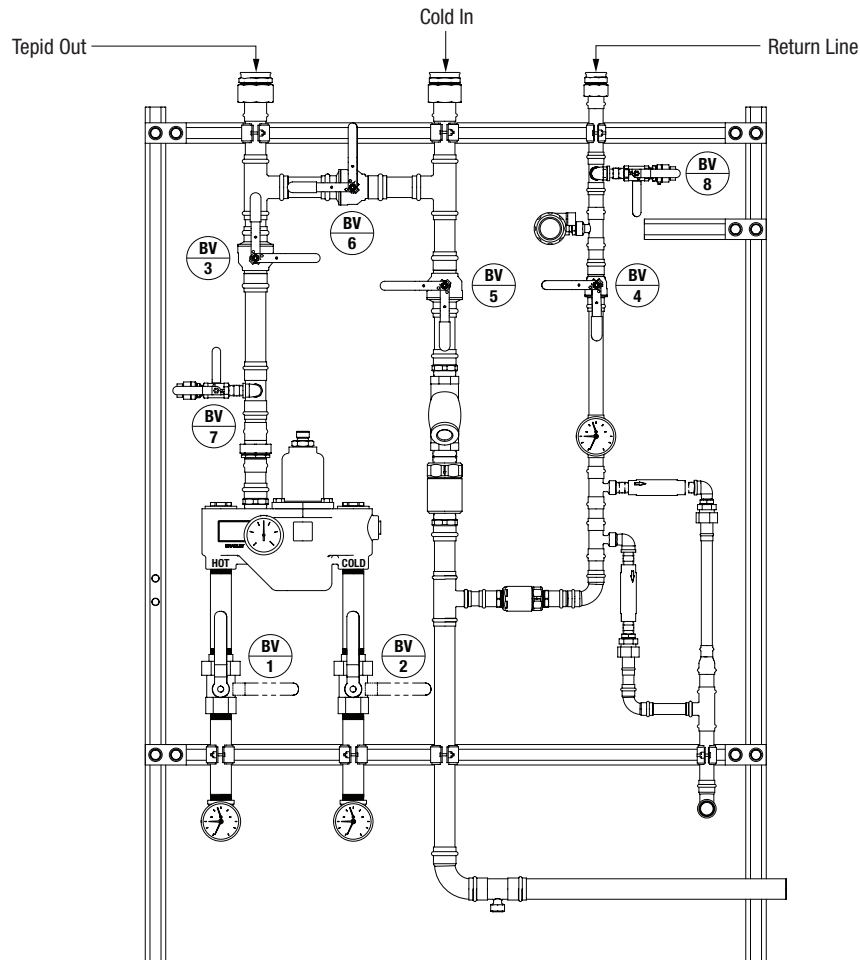
D Continue filling the tank until water comes out of the overflow pipe. Close the temperature-pressure relief valve.

E Open the thermostatic mixing valve (TMV) inlet valves (BV1 & BV2).

F Open the ball valve 7 (BV7) to bleed air from the system. Close BV7. Open ball valve 3 (BV3) and close ball valve 6 (BV6).

G Check all system fittings for water leaks.

All ball valves should be open, except BV6, BV7, and BV8 which are closed for final running position.



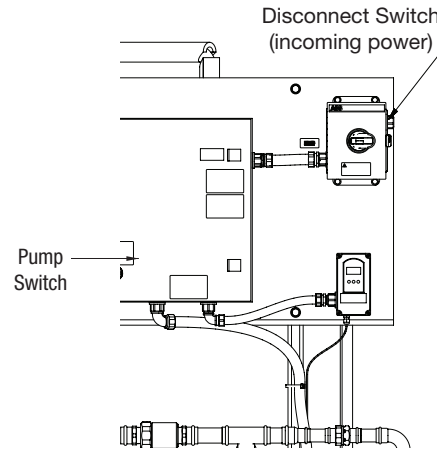
5 Energizing the Unit

A Make sure the system is NOT energized, and then perform a continuity test on all of the fuses, verifying that all fuses are good. Verify the pump switch is off.

B Turn on the power at the electrical disconnect switch.



This unit has a booster pump controlled by a VFD (Variable Frequency Drive) and pressure transmitter. The VFD and pressure transmitter are preprogrammed and ready for start up when powered up. See the VFD and pressure transmitter manual included with this unit for any pump adjustments.



6 Adjust Temperature



This device must be checked for final temperature and adjusted as necessary. The standard preset factory temperature setting is 85°F (29°C) with the range of the valve being 65–90°F (18–32°C). Consult proper medical and/or safety authorities for the optimum temperature recommended for your particular application.



Allow enough time for water in storage tank to get hot before making any temperature adjustments with the thermostatic mixing valve.



Refer to the [S19-2350 TMV installation guide](#) for information on adjusting the temperature and regular valve maintenance and trouble shooting.



Scan or click code to view
the [S19-2350 TMV Installation Guide](#)



The temperature indicator displays the temperature of the water in the heater. See the temperature indicators install manual provided with this unit for any needed adjustments and information on how to use this device for remote temperature monitoring.

Start-Up Checklist

Bradley Tepid Water Skid System Start-Up Checklist	Complete OK	Inspector Initials
Initial Inspection		
Verify that a minimum of 50 psi is supplied to the inlet of the skid system.		
Skid system is mounted to a surface that can withstand a 5000 pound load.		
Verify system water supply is connected and all water supply valves are open.		
All remote fixtures are deactivated		
Check all system fittings for water leaks.		
Bradley Tepid Water Skid System with Hot Water Tank System Start-Up and Test Checklist Completion & Approval		
System Serial Number:		
Inspection Date:		
Inspector Signature:		

Weekly Inspection Checklist

Survey the facility to ensure that the appropriate flushing system is installed per the ANSI/ISEA Z358.1 requirement.



Safety Data Sheets can help determine what flushing system is appropriate for your hazards.

Bradley Tepid Water Skid System Weekly Inspection Checklist	Complete OK	Inspector Initials
Verify unit is energized.		
Power disconnect switch is in the "ON" position.		
Activate and inspect all fixtures to ensure they are compliant and operational in case of an emergency.		
Replace any broken or missing parts immediately.		
Remove any obstructions or trip hazards.		
Test the remote fixtures to ensure proper water temperature is being achieved.		
Document inspection on the unit's inspection tag and in any centrally-controlled documentation log.		

⚠ WARNING: Monitor heater performance at each weekly fixture check.

Performing Preventive Maintenance

For your system to work properly and have protection from freezing, keep the electrical components and pump dry.

Regularly clean any debris out of the Wye strainer and the strainers in the TMV valve, and perform other regular maintenance recommended in the manuals of the TMV valve, VFD controller, booster pump, and water tank.

Drained System Restart

The system may require restarting if the heater tank was drained for maintenance or any other reason after initial installation. If the system has been drained and deactivated, follow Steps 4 and 5 on pages 13 and 14 prior to reactivate.

Troubleshooting

Problem	Cause	Solution
Water temperature is not tepid.	Thermostatic mixing valve may not be functioning properly.	See thermostatic mixing valve instruction sheet.
	Water heater may not be functioning properly.	Check the immersion heater and heater fuses.
	The power is off.	Check power to unit and check fuses.
	Hot water supply valve closed.	Open the hot water supply.

Appendix: Pressure Transmitter Parameters

Pressure Transmitter

The following is a list of programmed parameters for the pressure transmitter that were loaded prior to shipping. These are parameters that could be changed to meet site conditions once the units are installed and running. For more programming information, refer to the Ashcroft GC51 manual.

View/Change the Parameters

- Remove the blue cover.
- Hold the "M" button for 3+ seconds.
- Press the "M" button to switch between parameters.
- Press the "UP" or "DOWN" arrows to change parameters.

Filter (Damping)

Set the filter before setting the Pressure Display Mode or Linear (Scaling) Display Mode. The filter is based on the moving average of the pressure data to decrease display "bounce" and to smooth the analog output due to system pressure fluctuations at the user's discretion.

There are five selection options. See table below.

Selection Number	Duration (ms)
0	30 (filter is not active)
2	60
4	120
8	240
16	480

Pressure Transmitter Range

The pressure transmitter has a range of 0–150 psi. When adjusting the Zero Point and Span Point, it is a percentage of the total range. Refer to the table below for PSIs and their corresponding percentage.

FS = 150 psi	
% FS	PSI
0	0
6.7	10
10	15
20	30
30	45
40	60
50	75
60	90
70	105
80	120
90	135
100	150

Pressure Display Mode (Re-scaling in PSI Units)

This mode is used for the display and analog output of the actual pressure.

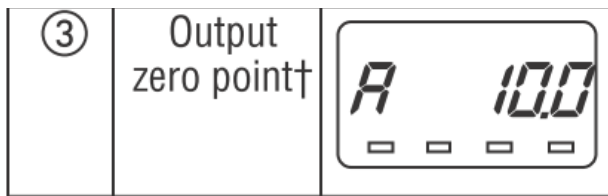
Analog Output

The analog output can be adjusted as follows:

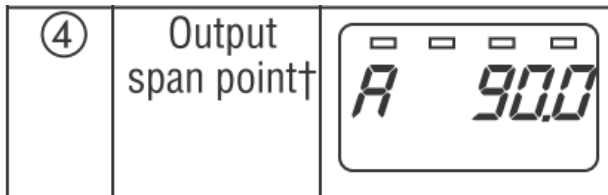
- The Zero Point (4 mA) and the Span Point (20 mA) can each be adjusted from -10 to 100% F.S. (URL).
- This means that, although the Zero Point is typically set at 0% F.S. and the Span Point is set at 100% F.S., the Zero Point can be adjusted to the point where zero (4mA) is 110% F.S., thus reversing the output. In addition, the zero and span can be adjusted accordingly for elevated tank levels.

Pressure Display

- The pressure display has a display span between the Zero Point and the Span Point as determined by the adjustment of zero and span (see previous paragraph) and can display the range of -5 to 105% F.S. (URL). In addition, the decimal point position of the pressure display is fixed for each pressure range.
- Pressure units: PSI



Factory set to 20



Factory set to 60