

# TECHNICAL INSTRUCTIONS

**Hardware Procedure:**

## **AERCO Buffer Tank Installation and Maintenance**

**Applies to:**

Any applicable water heater/boiler piping system arrangement.

**Description of Document:**

This Technical Instruction Document provides the instructions necessary for the installation and maintenance of the AERCO buffer tanks in AERCO and non-AERCO systems.



**AERCO 4-Port Buffer Tank**

**Created: 08/27/2012**

# AERCO Buffer Tank Installation and Maintenance

Technical Instruction Document

TID-0006\_0B

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**Technical Support:**  
(Mon–Fri, 8am-5pm EST)  
**1-800-526-0288**

[www.aerco.com](http://www.aerco.com)

## **Disclaimer**

The information contained in this manual is subject to change without notice from AERCO International, Inc. AERCO makes no warranty of any kind with respect to this material, including, but not limited to, implied warranties of merchantability and fitness for a particular application. AERCO International is not liable for errors appearing in this manual. Nor for incidental or consequential damages occurring in connection with the furnishing, performance, or use of this material.

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## 1. INTRODUCTION

AERCO buffer tanks are ASME certified pressure vessels designed for use with high efficiency, low volume systems that incorporate low-mass condensing boilers. Hydronic heating systems featuring several low BTU heating loads (calling at different times) very often operate below the design load conditions, which causes short-cycling and so may reduce system efficiency and equipment life. A buffer tank may be added to such a system to add thermal mass, dampen fast transitions and minimize boiler cycling that occurs during zero or low domestic load conditions, thus reducing short cycling.

### **IMPORTANT NOTICE!**

Incorrect installation can cause rapid failure of water tanks due to electrolysis. It is vital that this risk is reduced by the use of dielectric connections, and isolation of the tank supports. Installers must be aware of correct procedures. For assistance please call: 1-800-526-0288.

## 2. BUFFER TANK TYPES

The AERCO buffer tanks come as either a 2-port or a 4-port primary-secondary tank and in the following three sizes:

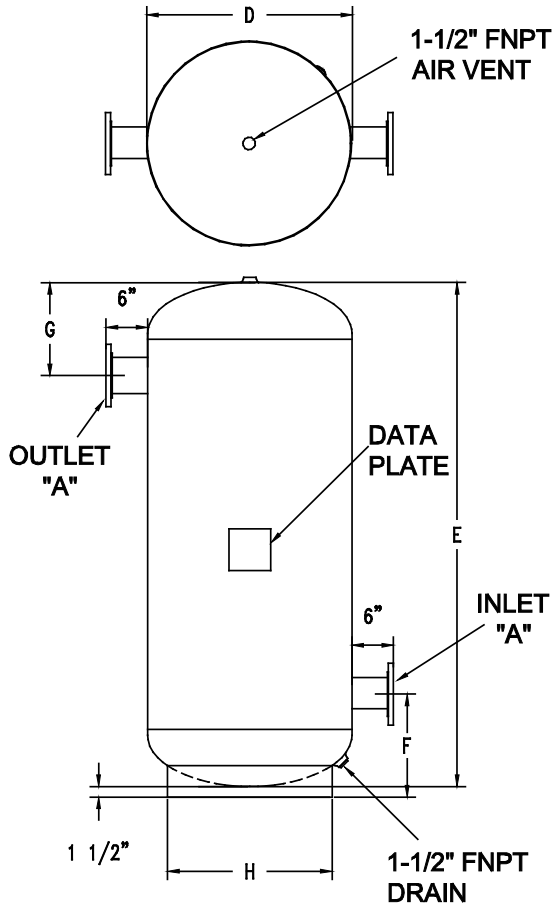
- 104 gallons
- 210 gallons
- 289 gallons

See Figure 1 for port designations and dimensions.

# AERCO Buffer Tank Installation and Maintenance

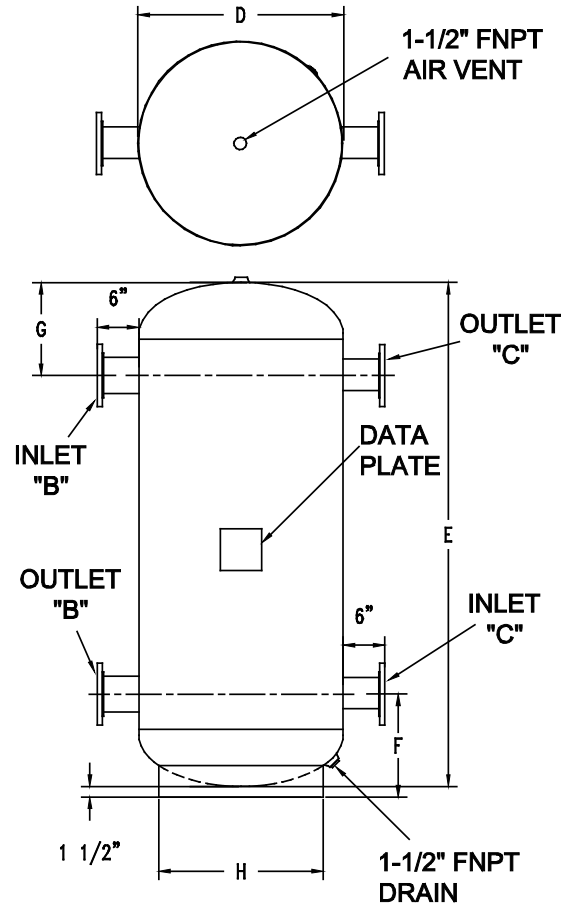
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## 2-PORT BUFFER TANK

DIMENSION "A"	DIMENSION "A"
2" FNPT	2" FNPT
3" FNPT	3" FNPT
4" 150-LB FLG	4" 150-LB FLG
6" 150-LB FLG	6" 150-LB FLG



## PRIMARY-SECONDARY BUFFER TANK

DIMENSION "B"	DIMENSION "C"
2" FNPT	2" FNPT
2" FNPT	3" FNPT
2" FNPT	4" 150-LB FLG
2" FNPT	6" 150-LB FLG
3" FNPT	3" FNPT
3" FNPT	4" 150-LB FLG
3" FNPT	6" 150-LB FLG
4" 150-LB FLG	4" 150-LB FLG
4" 150-LB FLG	6" 150-LB FLG

VOLUME	D	E	F	G	H	WEIGHT (LBS)	
						EMPTY	FLOODED
104 GAL.	24"	58-1/2"	13"	11-1/2"	20"	398	1398
210 GAL.	30"	73-1/2"	15"	13-1/2"	24"	563	2312
289 GAL.	36"	70-1/2"	16-1/2"	15"	30"	715	3214

Figure 1: AERCO Buffer Tanks – Port Designations

## 3. BUFFER TANK INSTALLATION

Consult your local building codes for water heater regulations and make sure that you acquire any necessary permits.

**NOTE FOR MASSACHUSETTS INSTALLATIONS:** Storage tank installations within the Commonwealth of Massachusetts must conform to 248 CMR 10.00.

Refer to the user manual for the water heater being used to ascertain any special requirements for your installation and proceed as follows:

### Installing the Buffer Tank

1. Clear the area around installation site of all flammable and combustible materials.
2. Switch off the boiler/water heater and allow the system to cool for four hours.
3. Isolate the electrical supply to the existing boiler/water heater by switching off the electricity at the mains supply point.
4. Turn off the cold water supply to the existing heating system and any other heating appliance.
5. Turn off the main gas supply valve downstream from the boiler/water heater.
6. If you are replacing an existing buffer tank, be sure to drain and disassemble it according to the manufacturer's instructions.
7. Install drain fittings at bottom connection before setting the tank permanently.
8. Place the new tank into position and line it up to be flush with existing plumbing connections. Connect the buffer tank to the plumbing using appropriate techniques.
9. Ensure ground wires to the boiler/water heater are connected.
10. Turn on mains electric power and mains gas upstream from the boiler/water heater.
11. Turn on the cold water supply to the tank, followed by the main water supply to the system. Allow the tank to fill with cold water. Open the bleeder valve on the top of the tank to vent air from the tank so it fills completely.
12. After installation, fill the system and run at operating temperature for at least one day in a closed loop mode, then drain system, and re-fill.

#### NOTE

The tank should be installed in such a manner that should the tank or any connections leak, the resulting flow of water will not cause damage.

## 4. BUFFER TANK FIELD PIPING

An AERCO boiler system should be piped in one of four arrangements, depending on your system design requirements and the boiler specified. Benchmark boilers can be installed with a 2-port buffer tank. Modulex boilers should be installed with a 4-port buffer tank. For illustration purposes, AERCO SmartPlate water heaters are depicted in the piping diagrams presented in these instructions.

Select the appropriate piping diagrams for your application from the following drawings:

### NOTE

Each AERCO boiler requires a minimum flow when used in DHW combination systems – see figures below for specific minimum flow requirements for each boiler model.

- Figure 2 shows the buffer tank and SmartPlate heaters piped as a zone with the Benchmark boilers and the heating system.
- Figure 3 shows the buffer tank and SmartPlate heaters, piped as a zone with the Benchmark boilers and the heating system, and a separate zone, or summer pump. In this arrangement the system pump supplies the buffer tank/SmartPlate zone during the heating season. When the heating season ends, the system pump can be shut down and the zone will be serviced by the separate summer pump to conserve energy.
- Figure 4 shows the buffer tank and SmartPlate heaters piped with Benchmark boilers dedicated solely to domestic water heating.
- Figure 5 shows the 4-port buffer tank and SmartPlate heaters piped with Modulex boilers. The location of connections on the 4-port buffer tank, and natural stratification will ensure that the hot outlet water for the boilers will pass through to the system and the colder return water will pass through back to the boilers and allow condensing.
- A non-AERCO low mass boiler system should be piped as shown in Figure 6. In this illustration, SmartPlate water heaters and a 4-port buffer tank are piped as a zone of the heating system.

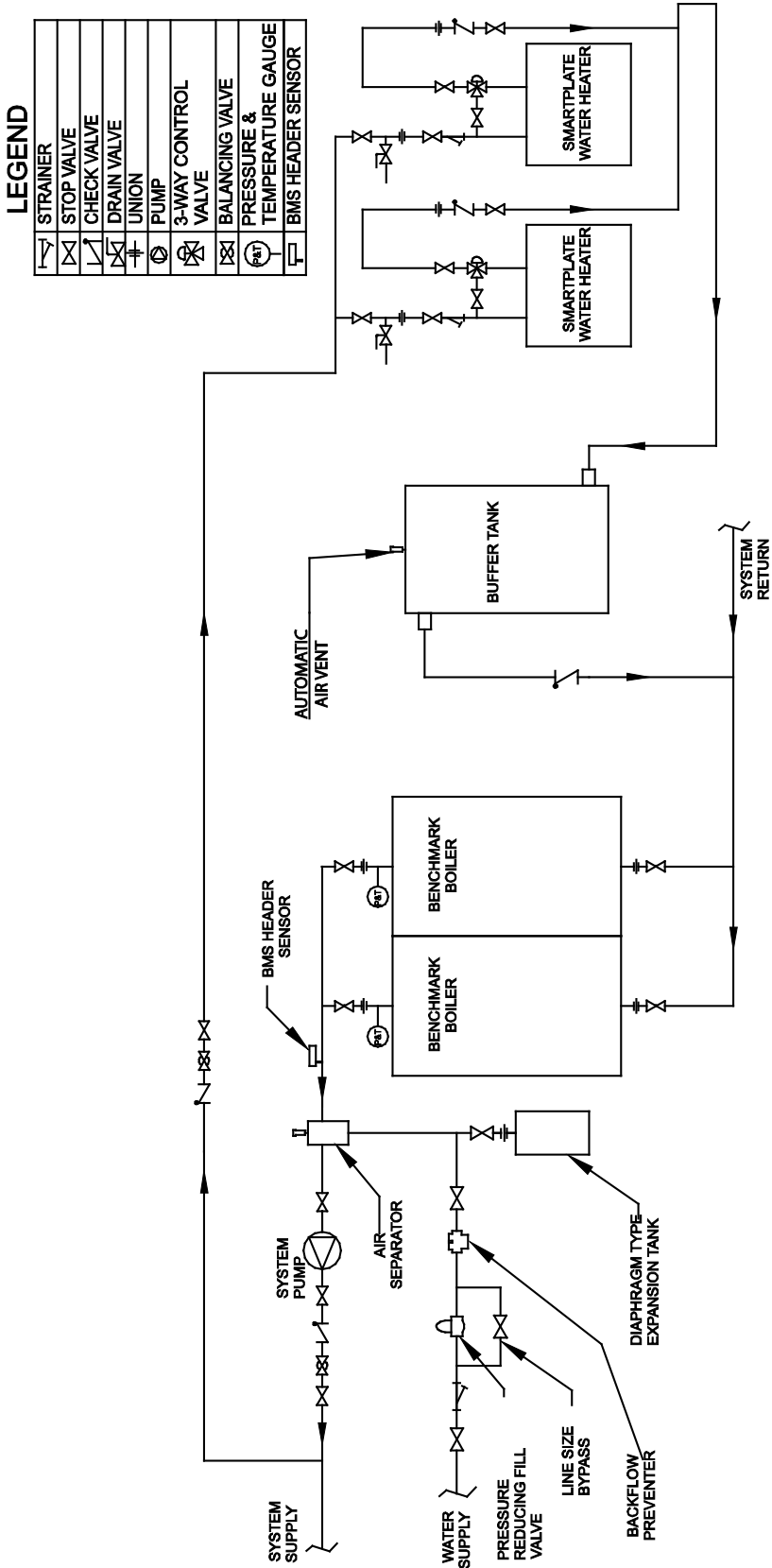
### IMPORTANT!

The piping schematics shown in these installation procedures illustrate only the piping between the water heater and the AERCO tank. SEE THE APPROPRIATE WATER HEATER OPERATIONS AND MAINTENANCE MANUAL FOR COMPLETE WATER HEATER INSTALLATION INSTRUCTIONS.

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## LEGEND

	STRAINER
	STOP VALVE
	CHECK VALVE
	DRAIN VALVE
	UNION
	PUMP
	3-WAY CONTROL VALVE
	BALANCING VALVE
	PRESSURE & TEMPERATURE GAUGE
	BMS HEADER SENSOR

- NOTES:**
1. REFER TO BOILER INSTALLATION DRAWINGS FOR RECOMMENDED FIELD INSTALLATION.
  2. REFER TO SMARTPLATE APPLICATIONS GUIDE, SP-1010, FOR BUFFER TANK SIZING.
  3. REFER TO SMARTPLATE INSTALLATION DRAWINGS FOR RECOMMENDED DOMESTIC PIPING INSTALLATION.  
SD-A-772  
SD-A-773  
SD-A-774  
SD-A-775  
SD-A-776  
SD-A-777

4. BOILER PUMP MUST BE SIZED TO PROVIDE THE APPROPRIATE FLOW AT THE DESIGN AT OF BOILER PLANT  
BOILER PUMP MUST MAINTAIN BENCHMARK BOILER(S) REQUIRED MINIMUM FLOW  
BMK 1.5 LN - 40 GPM MINIMUM FLOW  
BMK 2.0 STD - 40 GPM MINIMUM FLOW  
BMK 2.0 LN - 40 GPM MINIMUM FLOW  
BMK 3.0 LN - 40 GPM MINIMUM FLOW

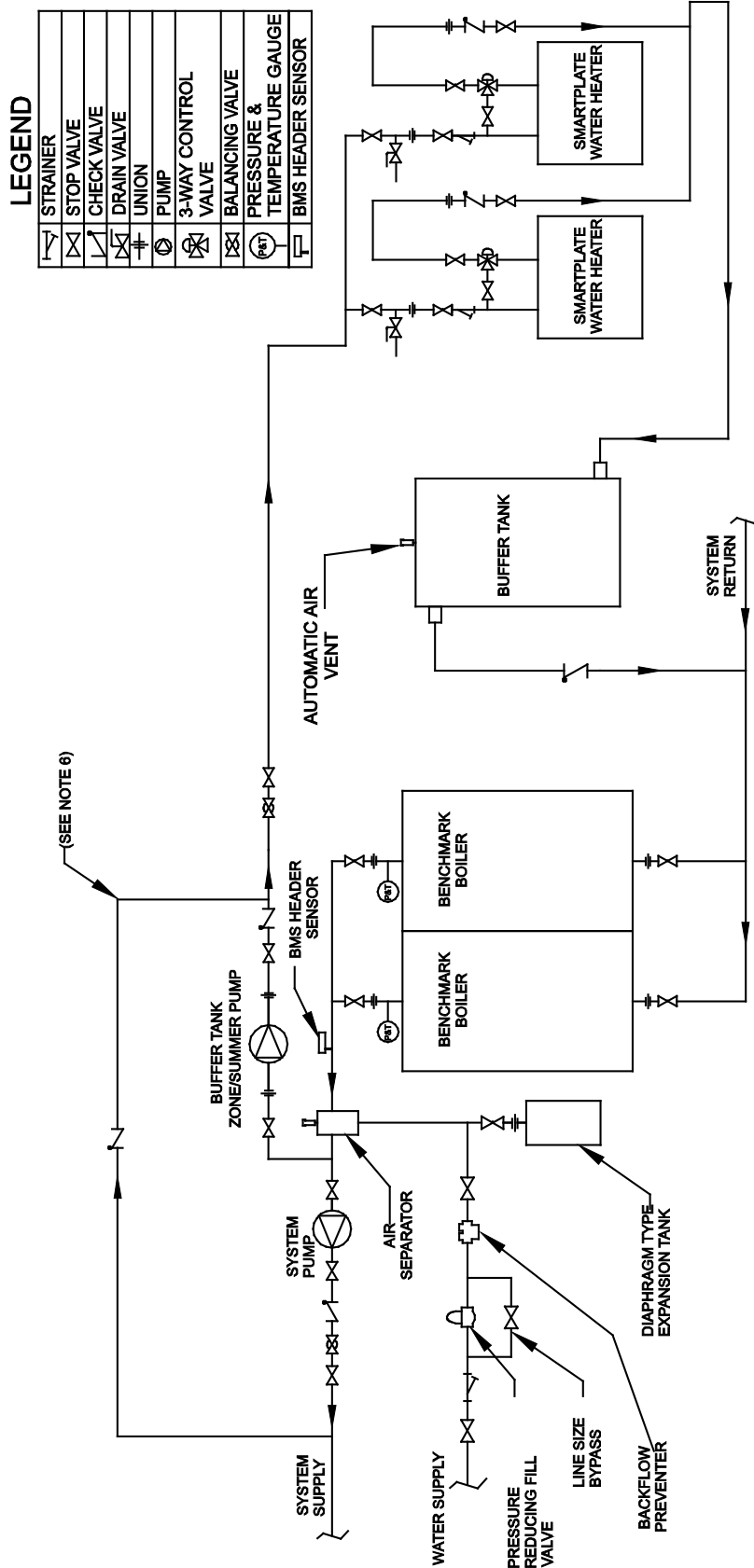
**Figure 2: 2-Port Buffer Tank and SmartPlate Heaters Piped as a Zone with Benchmark Boilers and Heating System**



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- NOTES:**
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  3. REFER TO SMARTPLATE INSTALLATION DRAWINGS FOR RECOMMENDED DOMESTIC PIPING INSTALLATION.
    - SD-A-772
    - SD-A-773
    - SD-A-774
    - SD-A-775
    - SD-A-776
    - SD-A-777

4. BOILER PUMP MUST BE SIZED TO PROVIDE THE APPROPRIATE FLOW AT THE DESIGN AT OF BOILER PLANT  
 BOILER PUMP MUST MAINTAIN BENCHMARK BOILER(S) REQUIRED MINIMUM FLOW
  - BMK 1.5 LN - 40 GPM MINIMUM FLOW
  - BMK 2.0 STD - 40 GPM MINIMUM FLOW
  - BMK 2.0 LN - 40 GPM MINIMUM FLOW
  - BMK 3.0 LN - 40 GPM MINIMUM FLOW
5. WHEN SYSTEM PUMP IS TURNED OFF, BUFFER TANK SUMMER PUMP SHOULD BE TURNED ON.
6. WHEN ZONE PUMP IS OPERATED YEAR ROUND, BYPASS LINE CAN BE DELETED

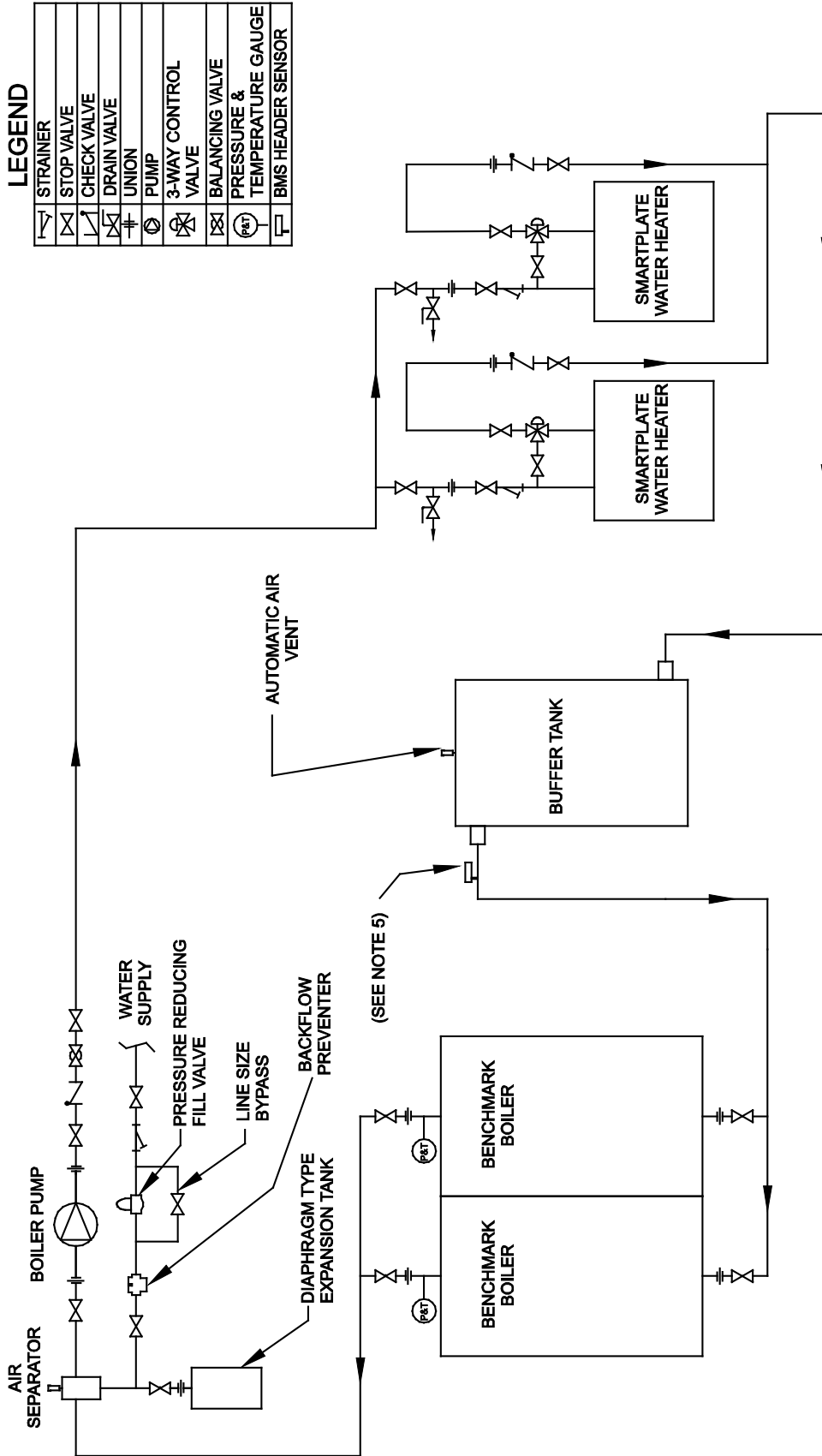
**Figure 3: 2-Port Buffer Tank and SmartPlate Heaters Piped as a Zone with Benchmark Boilers and Heating System with a Separate Zone/Summer Pump**

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LEGEND	
	STRAINER
	STOP VALVE
	CHECK VALVE
	DRAIN VALVE
	UNION
	PUMP
	3-WAY CONTROL VALVE
	BALANCING VALVE
	PRESSURE & TEMPERATURE GAUGE
	BMS HEADER SENSOR



**NOTES:**

1. REFER TO BOILER INSTALLATION DRAWINGS FOR RECOMMENDED FIELD INSTALLATION.
2. REFER TO SMARTPLATE APPLICATIONS GUIDE, SP-1010, FOR BUFFER TANK SIZING.
3. REFER TO SMARTPLATE INSTALLATION DRAWINGS FOR RECOMMENDED DOMESTIC PIPING

**INSTALLATION:**

- SD-A-772
- SD-A-773
- SD-A-774
- SD-A-775
- SD-A-776
- SD-A-777

4. BOILER PUMP MUST BE SIZED TO PROVIDE THE APPROPRIATE FLOW AT THE DESIGN AT OF THE BOILER PLANT. BOILER PUMP MUST MAINTAIN BENCHMARK BOILER(S) REQUIRED MINIMUM FLOW:  
 BMK 1.5 LN - 40 GPM MINIMUM FLOW  
 BMK 2.0 STD - 40 GPM MINIMUM FLOW  
 BMK 2.0 LN - 40 GPM MINIMUM FLOW  
 BMK 3.0 LN - 40 GPM MINIMUM FLOW

5. INSTALL THE BMS HEADER SENSOR IN THE BUFFER TANK SYSTEM SUPPLY PIPING.

**Figure 4: 2-Port Buffer Tank and SmartPlate Heaters with Benchmark Boilers Dedicated to Domestic Water Heating**

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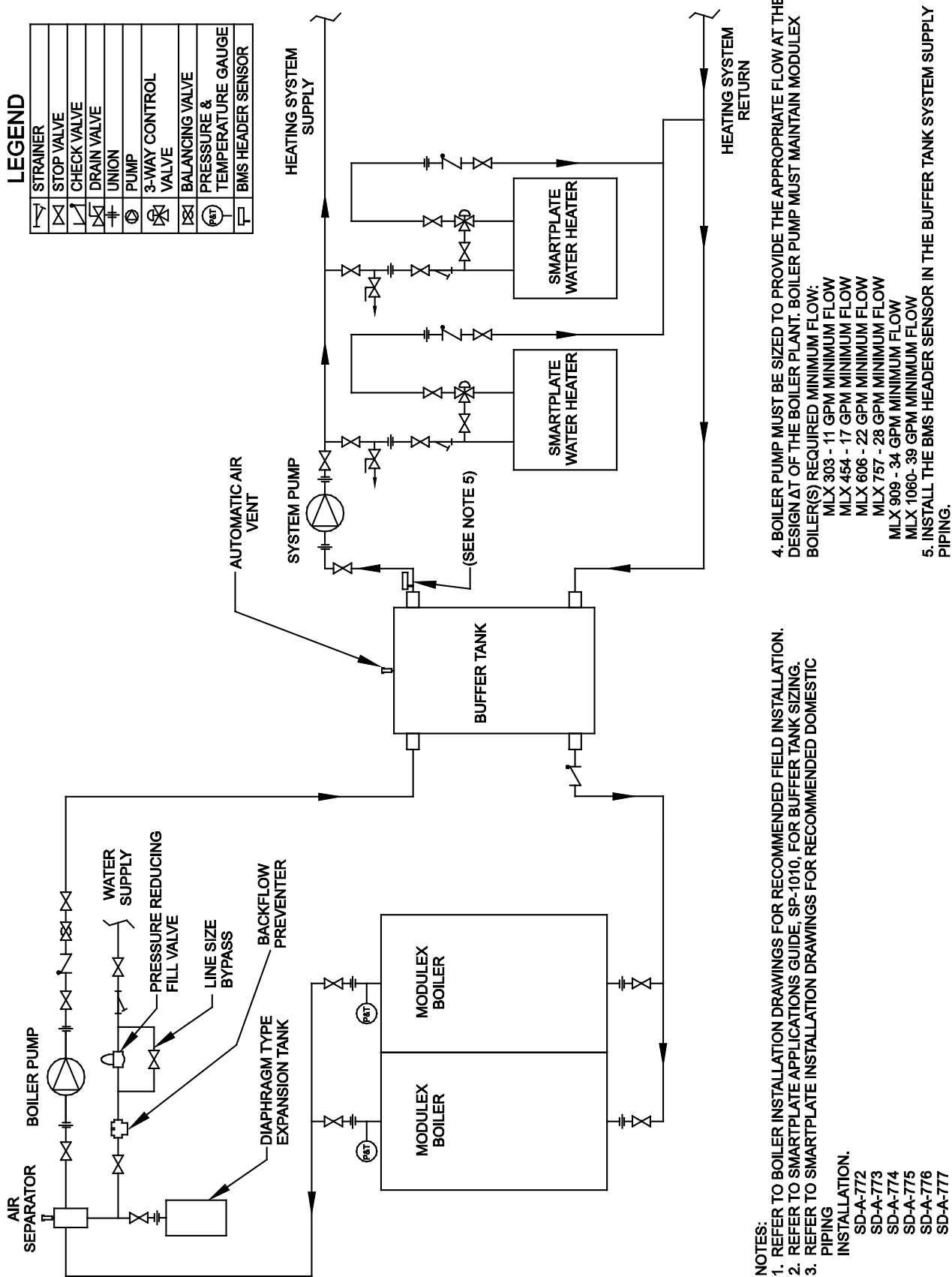
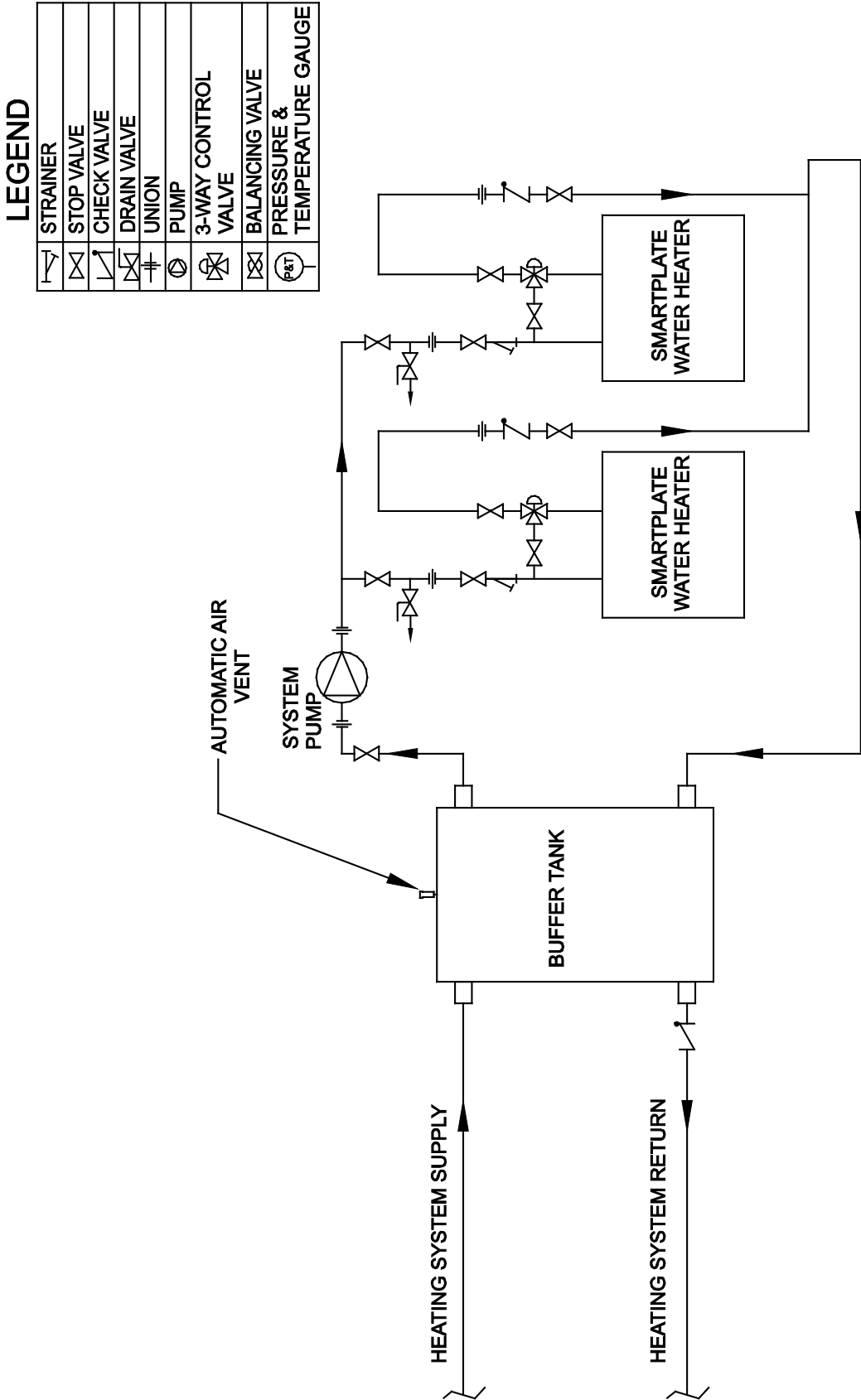


Figure 5: 4-Port Buffer Tank and SmartPlate Heaters with ModuLex Boilers

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- NOTES:**
1. REFER TO SMARTPLATE APPLICATIONS GUIDE, SP-1010, FOR BUFFER TANK SIZING.
  2. REFER TO SMARTPLATE INSTALLATION DRAWINGS FOR RECOMMENDED DOMESTIC PIPING INSTALLATION.

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- SD-A-775
- SD-A-776
- SD-A-777

Figure 6: SmartPlate Heaters with Boiler Side 4-Port Buffer Tank as a Zone

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## AERCO'S LIMITED BUFFER TANK WARRANTY

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AERCO International, Inc. warrants that its buffer tank is of the kind and quality quoted on and warrants it to be free of defective material and /or workmanship only. This warranty is not applicable to operational failures, gasket leaks or malfunctions caused by improper application, installation and/or maintenance. Warranty not applicable if electrolysis condition or abnormal water condition exists.

Any claim for adjustment under this Limited Warranty must be made within the Warranty period (see below). AERCO shall replace or repair at its option, all parts which upon examination by AERCO prove to be defective material and/or workmanship within the above Limited Warranty. If required by AERCO, parts which are claimed defective must be promptly delivered to AERCO facility, transportation charges prepaid. No material may be returned (unused or warranty), without prior approval. All returned goods must have a copy of original invoice. AERCO will not however, accept any claims for labor costs incurred by the user in removing or reinstalling a product and/or part thereof. This warranty does not apply if the defect is due to failure to use the product for its intended purpose, the result of an accident, abuse, misuse or unauthorized alteration, or because the product was not installed and maintained in accordance with standard plumbing practices. However, any and all costs required to ship, disassemble, remove, reassemble, reinstall a tank, shall not be borne by AERCO and **IS NOT COVERED** under this warranty. **IN NO EVENT SHALL AERCO BE LIABLE FOR INCIDENTAL OR CONSEQUENTIAL DAMAGES.** Some states do not allow the exclusion or limitation of incidental or consequential damages, so the above limitation or exclusion may not apply to you.

Any implied warranties which the user may have including merchantability and fitness for a particular purpose, shall not extend beyond the period (see below) from date of manufacture of any product. Some states do not allow limitations on how long an implied warranty lasts, so the above limitation may not apply to you.

### **PERIOD OF LIMITED WARRANTY**

The AERCO Buffer Tank is warranted for 1 YEAR FROM DATE OF SHIPMENT when used on applications for which it is intended.

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