City of Ansonia Public Schools

Prendergast Boiler Replacement

Bid RFI's & Responses

RFI Period Closes End of Business April 21, 2020

1. Will you consider offering a virtual walk through or making the walk through optional? I attended a walkthrough for this project when it was publicly bid last summer and am familiar with the site conditions. This request is made not for convenience, but for public health and safety during a pandemic… attempts at risk mitigation listed in the specs notwithstanding.
   Walk thru was accomplished while maintaining social distancing.

2. Please provide copy of sales order/bill of materials for boilers being pre-purchased by Owner.
   Sales orders are attached as separate documents.
   Provided will be:

   - two Aerco BMK3000 boilers each with P/T gauge, pressure relief valve, condensate drain trap, and gas supply shutoff valve.
   - header temp sensor (p/n 61058)
   - outside air sensor (p/n 61060)
   - two JM-30 condensate neutralizers.

3. Are gas pressure regulators being furnished with boilers, or furnished by installing contractor?
   A 2" regulator is supplied with each boiler. Contractor shall supply and install *all specified regulators beyond those supplied by the owner to provide a complete and operational system*

4. Are condensate neutralizers being furnished with boilers, or furnished by installing contractor?

   Boiler condensate neutralizers are provide as part of the Owner supplied boilers. One exhaust stack neutralizer is to be provided and installed by the Contractor as part of the Work.

5. What is the gas supply pressure to the boiler room?
   Current gas pressure is a 7" water column.

6. How tall is the brick chimney to be lined with a metal stack?
   The existing chimney is 45' tall from top of stack to the boiler room floor.

7. Drawing M-100 Boiler Flue & Stack Section: steel support frame at base of stack on a concrete pad is shown. Existing brick chimney only has a small clean-out door at base. Is the intent to cut an opening at base of chimney large enough to install steel frame and then patch the brick opening after installation of support frame and pad?
   Cut opening in the base of chimney neat and square. Support each masonry wythe with a separate steel angle lintel. Clean stack of accumulated soot. Install steel support frame. Finish opening and leave open.

8. Please confirm whether performance and payment bonds will be required in addition to the bid bond for the Prendergast School boiler replacement project as indicated in spec section 004313.

   Bid, Performance and Payment Bonds are required as stated in 004313.

9. Page 5 indicates 5% bid bond, page 9 indicates 10% bid bond please confirm which value is correct.

   The Bid Bond is to be 10%

10. Please confirm flow testing of existing pumps is required prior to demo.
    No flow testing is required on the existing system.

11. Please confirm total system volume for determining Sentinel product dosing or provide an allowance value that bidders should carry.
    Contractor shall carry an allowance for 8,000 gallons of system volume. Drained water shall be metered as indicated in specification 232500 and document to owner and design team. Any additional water volume not used must be credited back to owner.

12. Please confirm whether we must follow both the existing and new system flushing procedures on M000 or which one as they appear to be redundant unless the intent is to perform two separate flushes of the old and new piping
    For flushing procedures see Specification 23 2500 - HVAC Water Treatment in Addendum 1.

13. The boiler is being supplied to us by the owner, what would be the process if a warranty issue occurs and we did not purchase the boiler?
    The warranty for the Owner supplied boiler and parts is covered under 235234 1.10 B & C; this is a warranty from the Manufacturer to the Owner. Contractor is responsible for inspecting boiler and accessories for damage upon receipt at the

site. Contractor responsible for warranty of all materials and labor for the installation of the boiler to provide a complete and operational system.

Technical Data Sheet

Benchmark Platinum 750-6000 with Edge Controller

High Efficiency Boilers

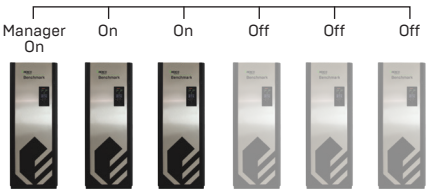
The AERCO Benchmark® (BMK) Platinum water boiler is designed for condensing application in any closed loop hydronic system. It delivers burner modulation to match energy input directly to fluctuating system. No other product packs as much capacity into such a small footprint that fits through a standard door and can be transported in a freight elevator.

Platinum exclusives:

- AERtrim patented O_2 Trim technology combined with air temperature compensation provides precise combustion
- Edge® Controller and Mobile App – advanced features including seven industry-first's
- Dual Return water connections enable maximum efficiency and application flexibility (standard)
- onAER Predictive Maintenance pro-active performance analytics tool
- Industry-best warranty

Energy Efficient

To minimize emissions, the BMK Series is fitted with a low NOx burner whose emissions will meet the most stringent NOx and CO requirements. The fully modulating burner also maintains AERCO standards for energy efficiency, longevity, reliability and construction quality. The BMK Platinum Series comes standard with AERCO's patented AERtrim™ system, an innovative O_2 trim system for condensing boilers, that self-adjusts and maintains air-fuel ratios at optimum levels for peak efficiency, low emissions and maximum uptime reliability in event of any site condition changes (air density, gas pressure, BTU content, etc.) which can be detrimental to efficiency, stability and reliability. Oxygen levels can be directly displayed on the unit in real time or be remotely monitored via onAER®, BACnet or Modbus, giving our customers the ability to measure the emissions level and fuel economy of the boiler without traditional combustion calibration devices.



*See BST System technical data sheet for additional system details and capabilities

Application and Plant Design

Benchmark boilers can be used as individual units or in modular arrangements. In addition to controlling the boiler according to a constant set point, indoor/outdoor reset schedule or 4-20mA signal, one or more units can be integrated via Modbus communications protocol. For boiler plants ranging from 2-16 boilers, AERCO'S built-in Boiler Sequencing Technology (BST) can be utilized. The built-in Edge [ii] control is capable of controlling up to two groups of boilers. It manages a group of heating boilers with lead rotation as well as a group of domestic hot water boilers with their own lead rotation.

It also manages a group of swing boilers and their swing valves directing the swing boilers output to heating or domestic loops based on the priority settings. In addition, the Benchmark with Edge [ii] control has integrated solutions for multiple Building Management system protocols. BMK Platinum models also come standard with dual return connections for optimal application flexibility and seasonal efficiency gains of up to 8%.

onAER Predictive Maintenance

BMK Platinum boilers come onAER-ready and with a 5-year subscription of onAER standard. AERCO's onAER service is a premiere online service which grants the user remote access to view boiler plant operation and status, track performance and efficiency, and set and view alerts such as faults or maintenance. The onAER service can be set to provide alerts to local trained technicians, offering additional peace of mind and ensuring the utmost uptime reliability.

Features

- Natural gas, propane, or dual fuel (model dependent)
- 20:1 turndown ratio (5%) depending on capacity
- 439 stainless steel fire tube heat exchanger
- Capable of variable primary flow Installations
- NOx emissions capable of 9PPM or less @ all firing rates depending on capacity
- Compact footprint, light weight, freight elevator friendly
- Standard dual return water connections
- Ducted combustion air capable
- Easy open access for service
- Acceptable vent materials AL29-4C, Polypropylene, PVC, cPVC (model dependent)
- Reliable quiet operation
- 15 year heat exchanger warranty
- Optional gas train with VPS (Value Proving System) for BMK Platinum 4000/5000/6000
- Integrated O_2 Alert for critical conditions

Edge [ii]

- AERtrim system standard
- Precise temperature control
- On-board boiler sequencing technology (BST)
- BST minimum number of open valves
- Equipped with EZ setup
- Integrated BACnet IP, BACnet MS/TP, Modbus IP and Modbus RTU communication
- System pump lead-lag rotation
- Variable speed pump control
- Communicates to and controls multiple SmartPlates®
- Built-in Bluetooth® for smart devices' app communication
- Simple combination plant setup and control
- Balancing valve control simplifies commissioning
- Controls options:
  - Constant setpoint
  - Indoor/outdoor reset
  - Remote setpoint
  - 4-20mA signal or ModBus

Ratings

BMK Platinum	Min Input MBH	Max Input MBH	Max Output[1] MBH	Efficiency Range	Thermal Efficiency 80° to 180°F
750	50	750	653-720	87%-98%	95.6%
1000	50	1000	870-960	87%-98%	96.8%
1500	75	1500	1305-1425	87%-98%	94.6%
2000	100	2000	1740-1900	87%-98%	94.6%
2500	167	2500	2175-2360	87%-98%	93.5%
3000	200	3000	2610-2880	87%-98%	93.5%
4000	267	4000	3480-3920	87%-98%	94.1%
5000N[2]	267	5000	3480-3920	87%-98%	94.%
5000	400	5000	4350-4800	87%-98%	93.9%
6000	400	6000	5220-5670	87%-98%	94.5%

[1]Max output dependent upon application – see efficiency curves [2]Data listed is preliminary and is subject to change without notice.

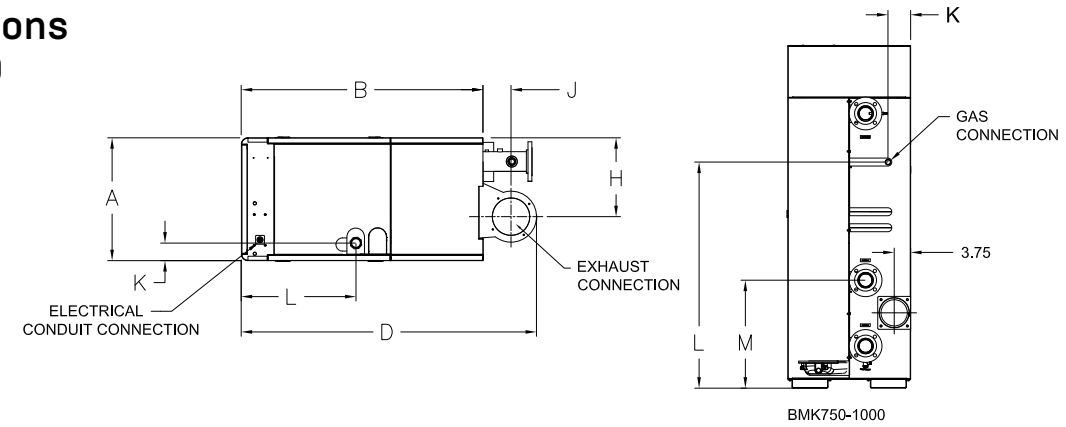
Specifications

	BMK Platinum									
	750	1000	1500	2000	2500	3000	4000	5000N	5000[4]	6000[4]
Boiler Category	ASME Sect.IV									
Gas Connections (NPT)	1"		2"				3"		2 / 3"	
Max. Gas Pressure	14"								2psi/10"[4]	
Min. Gas Pressure [1]	4"								14 / 4"[4]	
Max. Allowed Working Pressure	160 PSIG								80PSIG/150 PSIG Optional	
Electrical Req. 120V/1PH/60Hz [2]	13 FLA		16 FLA		N/A					
Electrical Req. 208V/3PH/60Hz [2]	N/A				10 FLA		N/A		19 FLA	
Electrical Req. 460V/3PH/60Hz [2]	N/A				5 FLA		12 FLA		9 FLA	
Electrical Req. 575V/3PH/60Hz [2]	N/A								7 FLA	
Water Connect. (Flanged)	3"		4"				6"			
Min. Water Flow (GPM)	12		25				35		75	
Max. Water Flow (GPM)	175		250	350			500		600	
Water Volume Gallons	16.25	14.25	44	40	58	55	75		110	
Water Pressure Drop	3.0 PSIG @100 GPM		3.0 PSIG @170 GPM		3.0 PSIG @218 GPM	3.0 PSIG @261 GPM	5.0 PSIG @475 GPM		4.0 PSIG @500 GPM	
Turndown Ratio	15:1 (7%)	20:1 (5%)			15:1 (7%)	15:1 (7%)	15:1 (7%)	20:1 (5%)	12:1 (8%)	15:1 (7%)
Vent/Air Intake Connections	6 Inch			8 Inch			12 Inch		14 Inch Optional/ 12 Inch Flue Venting	
Vent Materials	AL29-4C Polypro, CPVC, PVC	AL29-4C Polypro								
Type of Gas	Natural Gas, Propane	Natural Gas, Propane, Dual Fuel, Natural Gas					Natural Gas		Natural Gas, Dual Fuel	
NOx Emissions <9ppm Capability[4]	✓				<13 ppm		✓			
Temp. Control Range	50°F to 190°F									
Ambient Temp. Range	0°F to 130°F									
Standard Listings & Approvals	UL, CUL, CSD-1, ASME									
Gas Train Operations	FM Compliant or Factory Installed DBB (IRI)						FM Compliant or Factory Installed DBB (IRI), VPS (Value Proving System)		FM Compliant, VPS (Value Proving System)	
Sound Rating dbA	65		70		72		75		79	
Weight (dry) lbs.	669	700	1406	1500	2000	2170	2200		3000	
Shipping Weight lbs.	862	900	1606	1700	2200	2300	2350		3800	

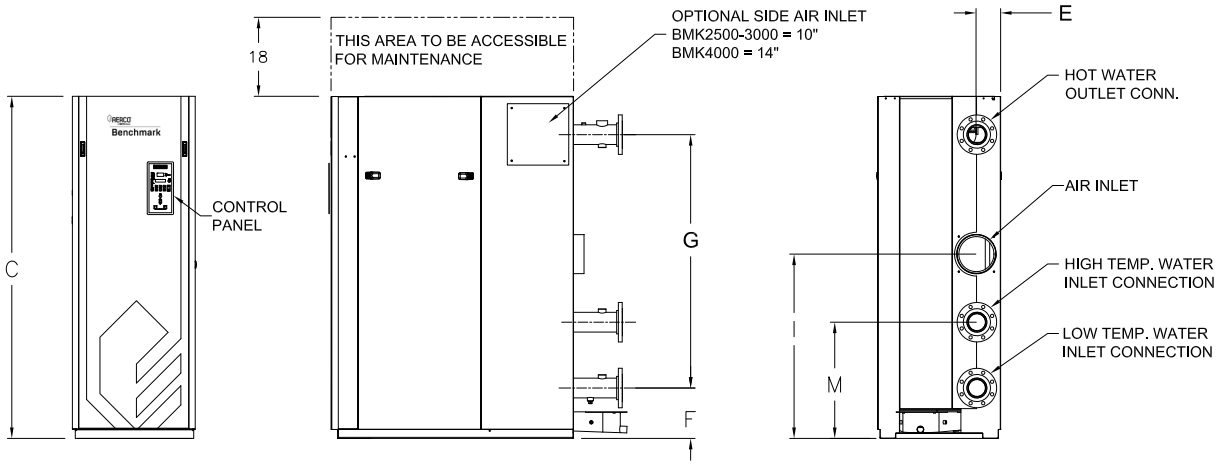
1. Values are for natural gas FM compliant gas trains only. See Benchmark Gas Components & Supply Design Guide GF-2030 for propane, DBB & dual fuel gas train minimum gas pressure requirements.
2. See Benchmark Electrical Power Guide GF-2060 for Service Disconnect Switch amperage requirements.
3. BMK5000/6000 operating at standard gas pressure (>14" W.C.) can achieve 9 ppm NOx.
4. BMK5000/6000 low gas pressure option is available as a different style number. It operates between 4" and 10" of gas pressure.

Dimensions

750-4000



BMK750-1000



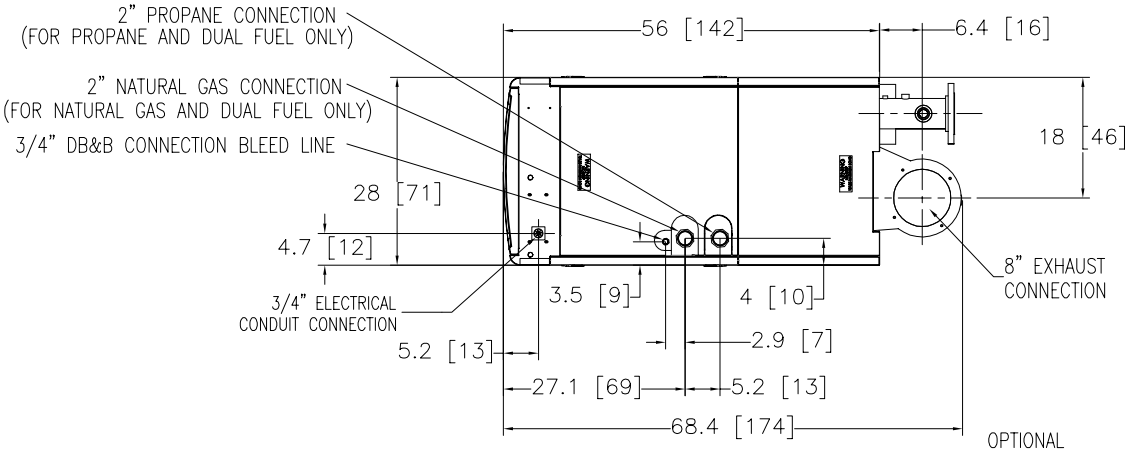
BMK Models	(Width) A	(Depth) B	(Height) C	D	E	F	G	H	I	J	K	L	M
750	28″	24.5″	78″	34″	10.2″	9.6″	53″	21″	17.1″	4.5′	5.1″	51.5″	24.6″
1000	28″	25″	78″	34″	10.2″	9.6″	53″	21″	17.1″	4.5″	5.1″	51.5″	24.6″
1500	28″	43.6″	78″	58.4″	6.6″	11.5″	57.8″	18″	42″	8.9″	4.4″	19.1″	26.5″
2000	28″	43.6″	78″	58.4″	7″	11.5″	57.8″	18″	42″	8.9″	4.4″	19.1″	26.5″
2500	28″	56″	78″	68.4″	5.6″	11.5″	57.8″	18″	42″	6.4″	4.4‴	27.1″	26.5″
3000	28″	56″	78″	68.4″	5.6″	11.5″	57.8″	18″	42″	6.4″	4.4‴	27.1‴	26.5″
4000	34″	63.5″	78.2″	80.6″	6″	12.4″	56″	21.4″	44.4″	9″	5.5″	28.7″	27.4″
5000N	34″	63.5″	78.2″	80.6″	6″	12.4″	56″	21.4″	44.4″	9″	5.5″	28.7″	27.4″

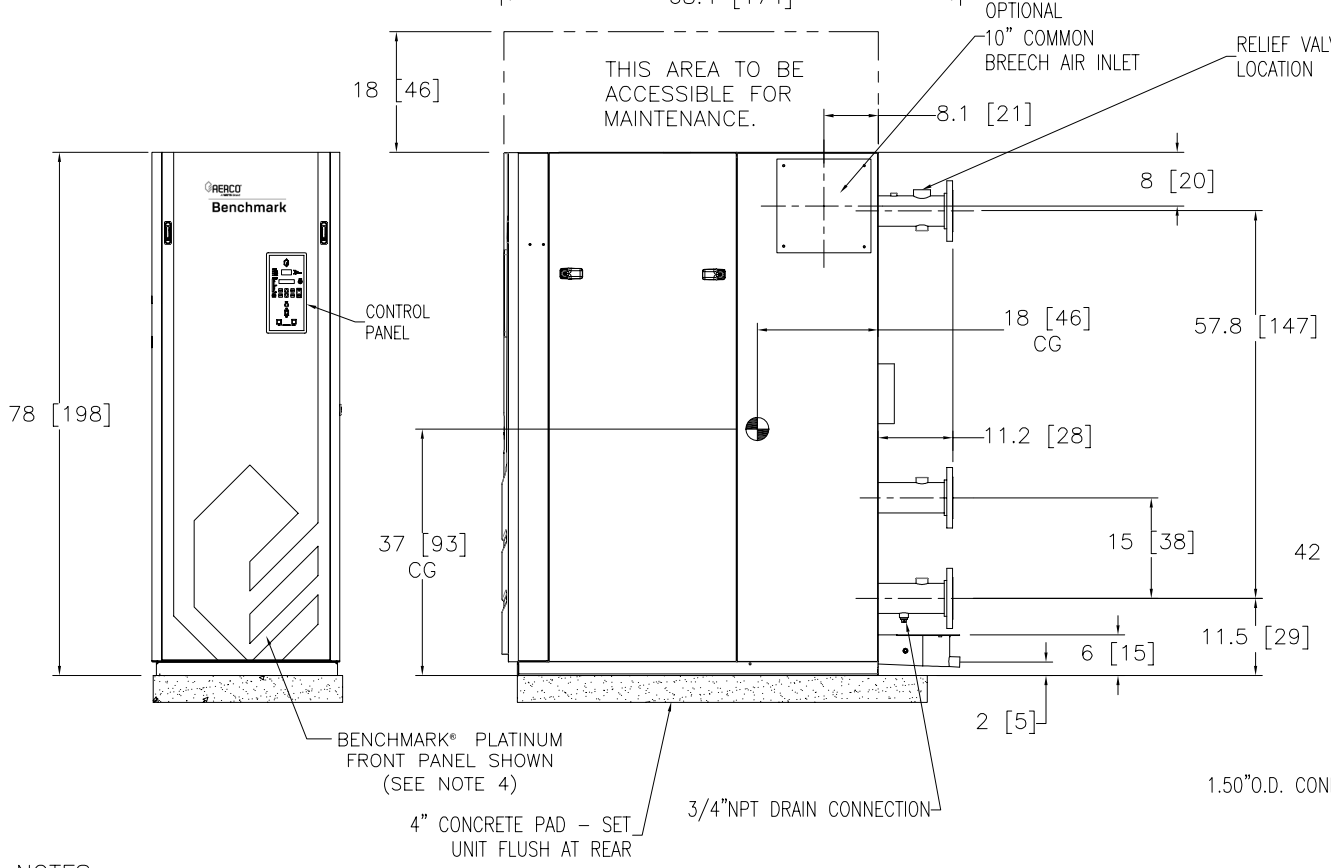
MATERIALS OF CONSTRUCTION	
COMBUSTION CHAMBER	SHELL OUTER–1/4" CARBON STEEL,SA–53 GR.B SHELL INNER–1/4"STAINLESS STEEL,SA–240, 439SS HEAD–1/2" CARBON STEEL,SA–516 GR.70 EXPANSION JOINT–1/4" STAINLESS STEEL,SA–240,439SS
HEAT EXCHANGER	UPPER TUBESHEET– 1/4" STAINLESS STEEL,SA–240,439SS LOWER TUBESHEET– 1/4" STAINLESS STEEL,SA–240,439SS TUBES–STAINLESS STEEL,9/16"O.D. X .049 WALL SA–249,439SS SHELL–1/4" CARBON STEEL,SA–53,GR.A OR B

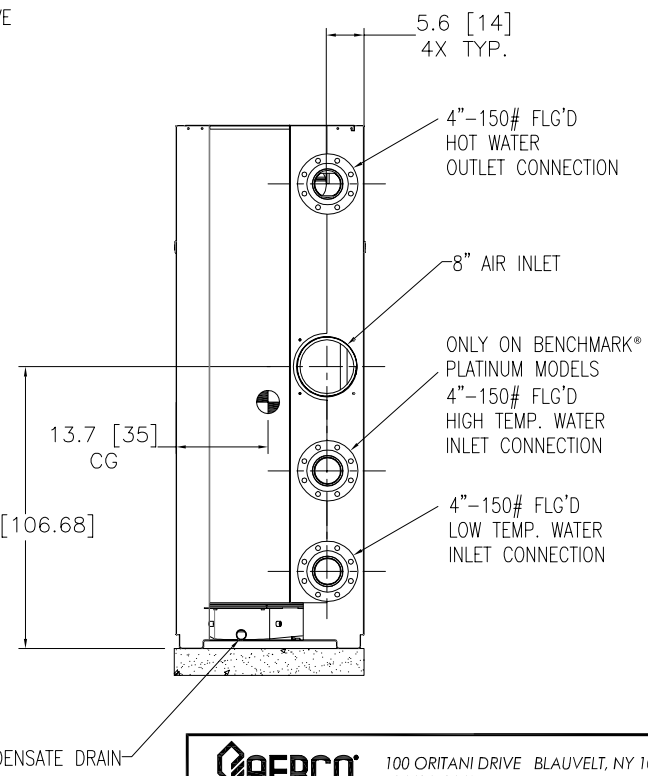
HEAT EXCHANGERS & COMBUSTION CHAMBER DESIGN STANDARDS

MAX. WORKING PRESS. (PSIG)	MAXIMUM TEMP. (°F)	TEST PRESS. (PSIG)	HT'G SURFACE SQ.FT.	MIN. RELIEF VA. CAPACITY MBH
160	210	240	143	2500
160	210	240	203	3000

ASME B & PV CODE: SECTION IV STAMP H







NOTES:
1) ALL DIMENSIONS SHOWN ARE IN INCHES (CENTIMETERS).
2) RELIEF VALVE, TRIDICATOR & CONDENSATE TRAP ARE INCLUDED SEPARATELY IN SHIPMENT.
3) AERCO RESERVES THE RIGHT TO MODIFY BOILER DIMENSIONS WITHOUT PRIOR NOTICE
4) BENCHMARK® PLATINUM SHOWN. SAME DIMENSIONS APPLY TO STANDARD BENCHMARK MODELS.

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aerco.com

BENCHMARK 2500 & 3000 MBH
NATURAL GAS, PROPANE, DUAL FUEL &
DF–DB&B BOILER DUAL INLET
DIMENSIONAL DRAWING

DWN.BY PR DATE 110712 SCALE ____ SIZE A CHKD. ____ APPD. ____ REV.DATE K.S. 110518	AP–A–915	REV. G

Technical Data Sheet

Dual-Bead Temperature Sensors and Backup Manager

In the event the Manager unit experiences a panel failure or communication loss, the Edge's new Dual-Bead temperature sensors will automatically transfer the Manager function to the Backup Manager. This automatic transfer feature only needs one dual-bead sensor to function instead of using a Modbus transmitter and two separate sensors. This not only saves money on installations, but also reduces downtime and maintenance.

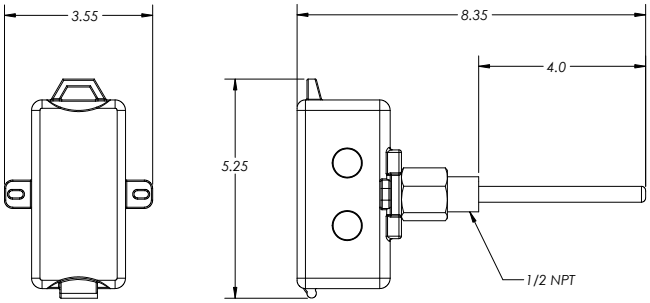
Dual Bead Sensors

AERCO's Dual-Bead sensors give your boiler plant the ability to take advantage of the EDGE Controller's Backup Manager feature. These sensors have dual internal temperature sensors in a single well or enclosure, simplifying installation. Each dual-bead temperature sensor is wired to both the Manager and Backup Manager boilers.

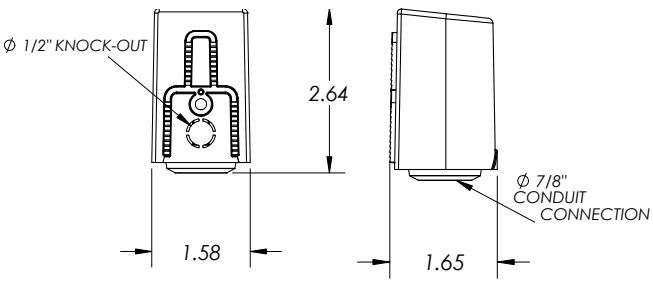
Backup Manger

The EDGE BST Backup Manager feature monitors the assigned Manager Boiler operation of the plant until that boiler is turned Off for service or loses communication to the remaining boilers. The Backup Manager Boiler will then automatically take over and become the new manager without any external intervention. This helps keep your boiler plant running at peak efficiency at all times.

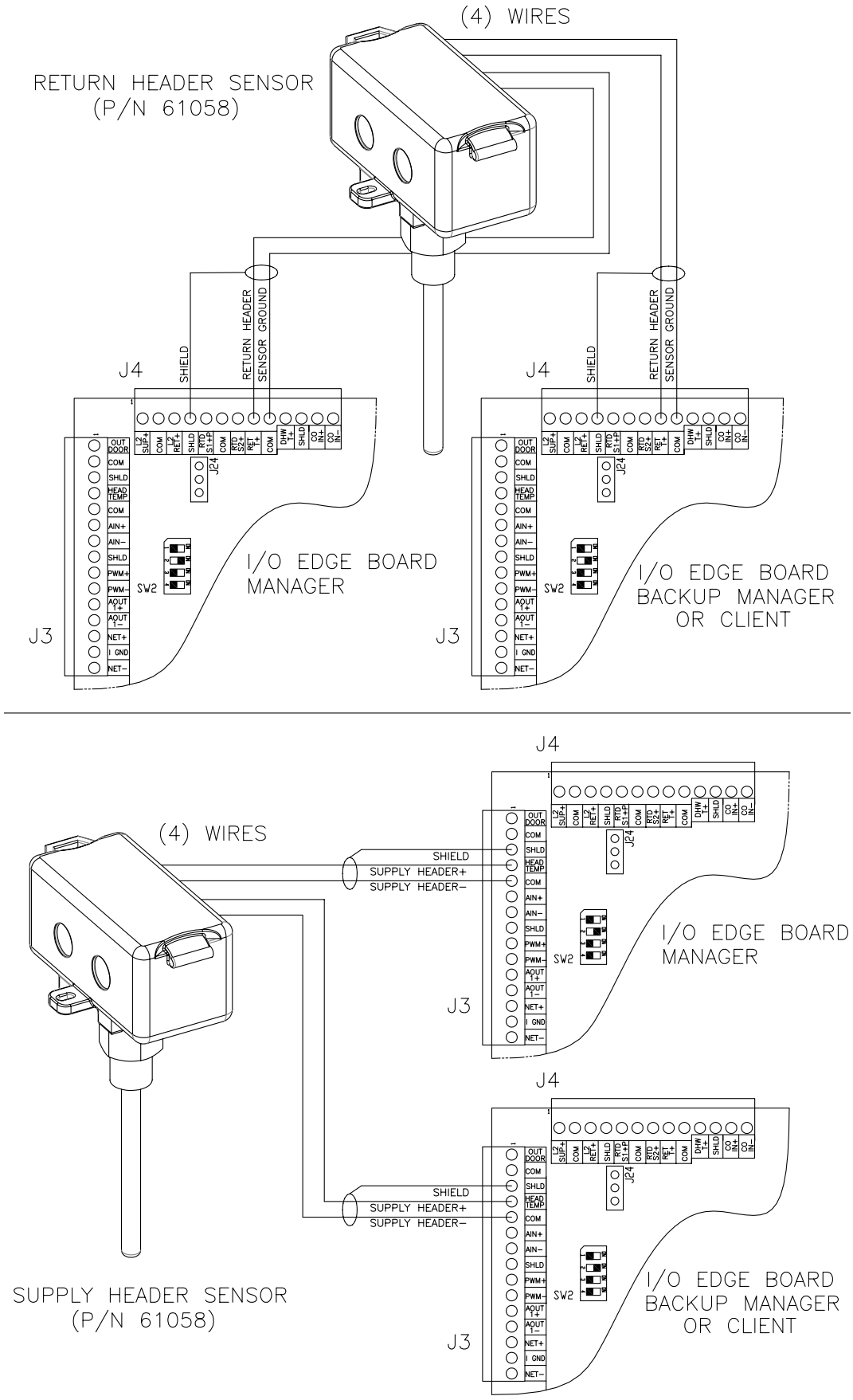
Dual-Bead Header Temperature Sensor (#61058)

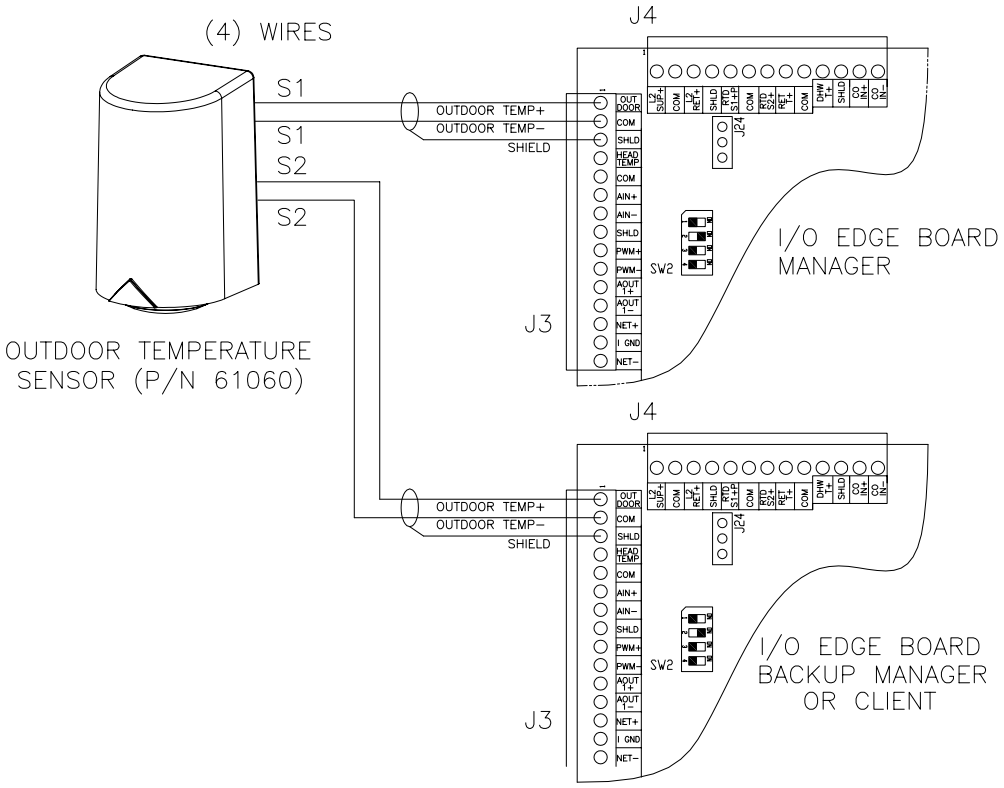


Dual-Bead Outdoor Temperature Sensor (#61060)



Each sensor connects to both the Manager and Backup Manager boilers.





Header Sensor Specifications

Header Temperature Sensor Type	Platinum RTD PT1000	**Outdoor Temperature Sensor Type**	Platinum RTD PT1000
Operating Temp. Range	-40°F to 240°F	**Operating Temp. Range**	-40°F to 140°F
Accuracy	± 0.1%	**Accuracy**	± 0.1%
Probe Dimensions	Dia = 0.25" Length = 4"		
Elements per Probe	2 RTD elements. Each element has two wires	**Elements per Sensor**	2 RTD built-in elements. Each element has two terminals
Well Material	304 SS		
Well Thread	Male ½" NPT	**Conduit Connection**	Bottom 7/8"
Enclosure	Plastic UL94-HB	**Enclosure**	White PVC plastic, NEMA type 2

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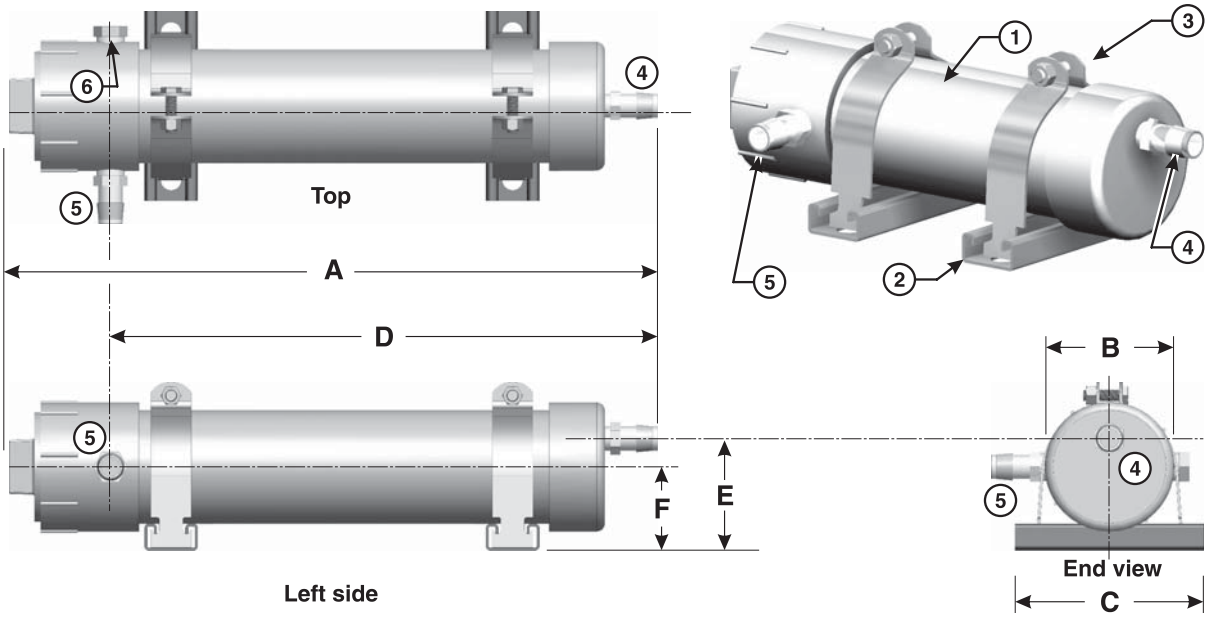
Installation

Figure 1 JM-series condensate neutralizing tubes — features and dimensions



RATINGS & DIMENSIONS *(in inches)*								
Model	**MBH**	**GPH**	**A**	**B**	**C**	**D**	**E**	**F**
JM-6	600	6	14 ¼	4	6	10 ¾	3 ½	2 ½
JM-10	1,000	10	19	4	6	16 ⅛	3 ½	2 ½
JM-20	2,000	20	19 ½	5	6	16 ⅛	4 ½	3 ⅛
JM-30	3,000	30	24 ½	5	6	21	4 ½	3 ⅛
JM-40	4,000	40	22 ½	7 3⁄16	8	19	7 ½	4 ½
JM-50	5,000	50	28 ½	7 3⁄16	8	24	7 ½	4 ½

Item	Description	
1	PVC tubing filled with ½" and ¾" aggregate calcium carbonate	
2	Channel strut mounts	
3	Galvanized strut clamps, bolts and nuts	
4	Condensate outlet hose barb fitting	JM-6 to -10: ¾" hose barb x ½" NPT JM-20 to -30: ¾" hose barb x ¾" NPT JM-40 to -50: 1" hose barb x ¾" NPT
5	Condensate inlet hose barb fitting	
6	Plugged — alternate location for condensate inlet hose barb fitting	

Figure 2 JM-series tube with floor drain, typical

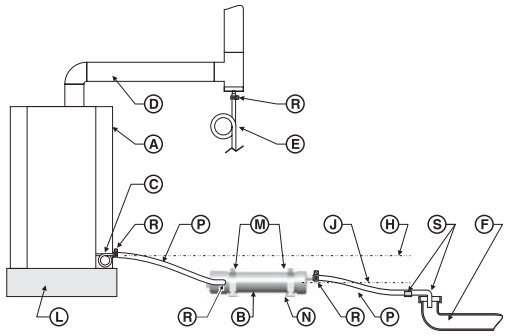
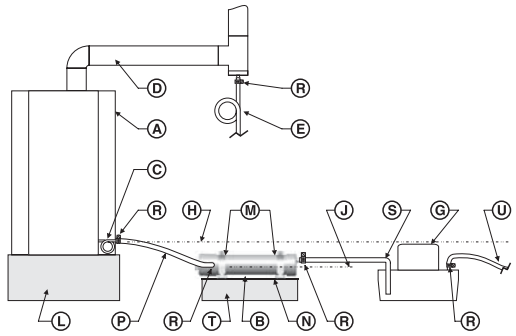


Figure 3 JM-series tube with condensate pump, typical



A Condensing boiler or furnace

B JM condensate neutralizing tube (or multiple tubes piped in parallel)

C Boiler/furnace condensate trap connection

D Boiler/furnace vent

E Vent condensate trap, when used — Install a trap as shown. Connect the tubing to a separate JM tube if appliances are common vented. For individually-vented appliances, the vent condensate drain can be connected to the appliance condensate drain line.

F Floor drain or sump

G Condensate pump

H Bottom of boiler/furnace condensate outlet — MUST be ABOVE condensate pump inlet connection

J Bottom of JM tube condensate outlet

L Mounting pad or structural platform, when required to elevate boiler condensate drain as needed

M Mounting clamps

N Mounting clamps must be secured to the mounting surface

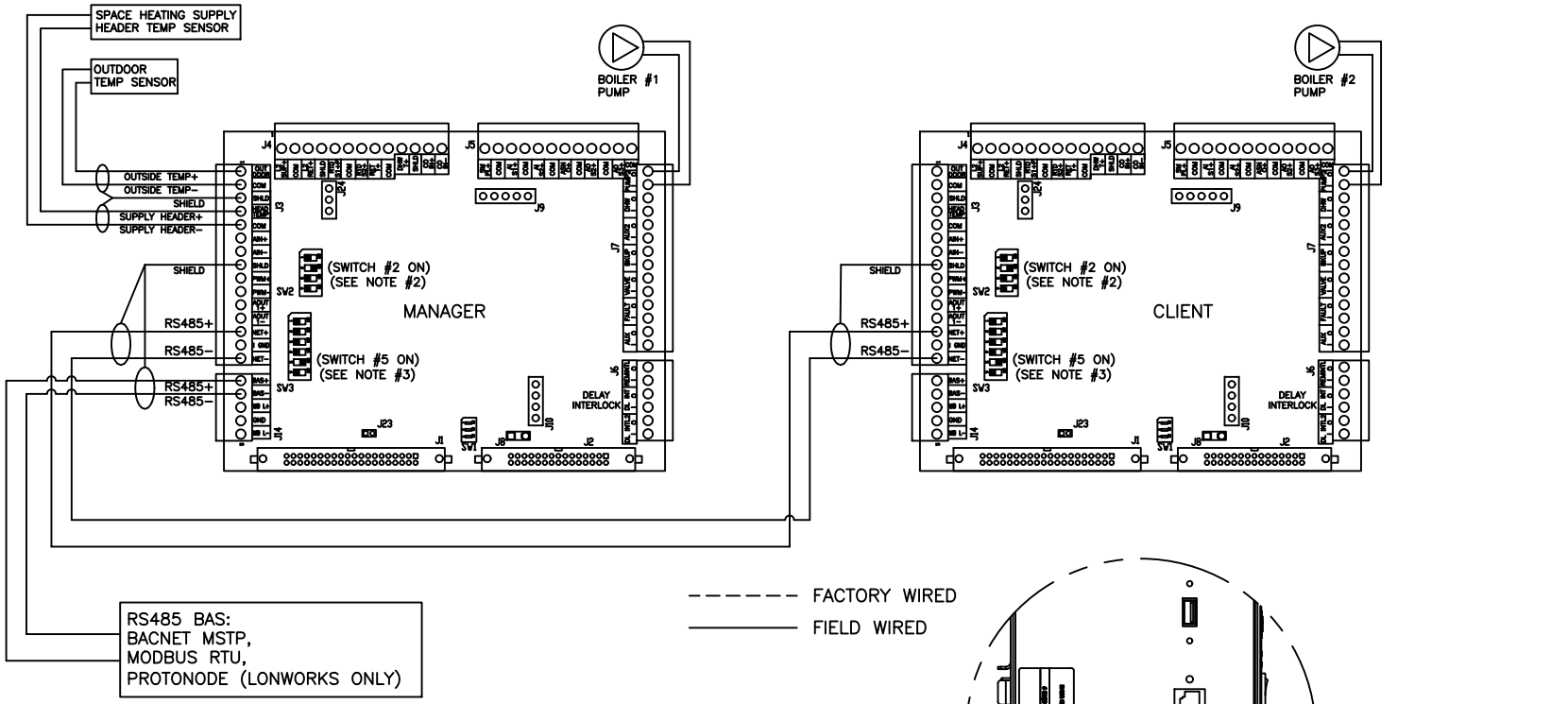
P Plastic tubing or PVC pipe — When using PVC pipe, remove the JM inlet and outlet hose barb fittings and replace with threaded PVC fittings. Include unions in the piping to allow removal of the JM tube for inspection and service. — Secure pipe or tubing in place. — Protect with a shield if necessary if routed through traffic areas.

R Use hose clamps at all connections when using plastic tubing.

S Condensate drain termination at floor drain (or condensate pump reservoir inlet) — secure in place with clamps. — Follow instructions for condensate pump.

T Elevate the JM tube on a structural base if necessary for the outlet to be raised.

U Route condensate discharge line from to appropriate drain location.



NOTES:

1) RS485 WIRING TO USE SHIELDED TWISTED PAIR CABLE (BELDEN 9841 OR EQUIVALENT).
2) BST BUS MUST BE TERMINATED ON BOTH ENDS. THE BENCHMARK BOILERS HAVE IN–BUILT TERMINATION RESISTOR AS PER SW2–2. SW2–2 = "ON" ON END OF LINE UNITS ONLY. WHEN WIRING SMART PLATE AS AN END OF LINE UNIT, 120 OHM TERMINATION RESISTOR MUST BE PLACED ACROSS THE SMART PLATE MODBUS TERMINALS.
3) RS485 BAS: TERMINATION OF END UNITS REQUIRED. USE SW3–5 = "ON" ON END OF LINE UNITS ONLY.

Consulting Engineering Services, Inc.

Addendum

Addendum Number: 01

Addendum Date: April 20, 2020

Written To: Bob Grzywacz

Project Name: John G. Prendergast School Boilers Replacement

CES Project Number: 2018168.00

Written By: Eric Romeo

The work shall be carried out in accordance with the following supplemental instructions and in accordance with the Contract Documents.

Description:

ADD: Specification 23 2500 - HVAC Water Treatment

Attachments:

- 23 2500 - HVAC Water Treatment

811 Middle Street, Middletown, CT 06457 T 860.632.1682 F. 860.632.1768 ceseng.com

SECTION 232500 - HVAC WATER TREATMENT

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:
1. System cleaner.
2. Closed system treatment (water).

B. Related Sections:
1. Section 23 04 00 – General Conditions for Mechanical Trades

1.2 REFERENCES

A. National Electrical Manufacturers Association:
1. NEMA 250 - Enclosures for Electrical Equipment (1000 Volts Maximum).

1.3 SUBMITTALS

A. Section 01 33 05 - Submittal Procedures: Submittal procedures.

B. Shop Drawings: Indicate system schematic, equipment locations, and controls schematics, electrical characteristics and connection requirements.

C. Product Data: Submit chemical treatment materials, chemicals, and equipment including electrical characteristics and connection requirements.

D. Manufacturer's Installation Instructions: Submit placement of equipment in systems, piping configuration, and connection requirements.

E. Manufacturer's Certificate: Certify products meet or exceed specified requirements.

F. Manufacturers Field Reports: Indicate start-up of treatment systems when completed and operating properly. Indicate analysis of system water after cleaning and after treatment.

1.4 CLOSEOUT SUBMITTALS

A. Section 01 73 00 - Execution and Section 017700 - Closeout Procedures. Section 017423 - Final cleaning: Closeout products.

B. Project Record Documents: Record actual locations of equipment and piping, including sampling points and location of chemical injectors.

C. Operation and Maintenance Data: Submit data on chemical feed pumps, agitators, and other equipment including spare parts lists, procedures, and treatment programs. Include step by step instructions on test procedures including target concentrations.

1.5 QUALITY ASSURANCE

A. Perform Work in accordance with State of Connecticut standard for addition of non-potable chemicals to building systems and for discharge to public sewers.

B. Maintain one copy of each document on site.

1.6 QUALIFICATIONS

A. Manufacturer: Company specializing in manufacturing products specified in this section with minimum three years experience.

B. Installer: Company specializing in performing Work of this section with minimum three years documented experience approved by manufacturer.

1.7 PRE-INSTALLATION MEETINGS

A. Section 01 30 00 - Administrative Requirements: Pre-installation meeting.

B. Convene minimum one week prior to commencing work of this section.

1.8 FIELD MEASUREMENTS

A. Verify field measurements prior to fabrication.

1.9 WARRANTY

A. Section 01 73 00 - Execution and Section 017700 - Closeout Procedures: Product warranties and product bonds.

B. Furnish two year manufacturer warranty for pumps, valves and water meters.

C. Warranty starts at date of Commissioning acceptance of a complete system and Owner approval

1.10 MAINTENANCE SERVICE

A. Section 01 73 00 - Execution and Section 017700 - Closeout Procedures: Maintenance service.

1.11 MAINTENANCE MATERIALS

A. Section 01 73 00 - Execution and Section 017700 - Closeout Procedures: Spare parts and maintenance products.

B. Furnish chemicals for treatment and testing during warranty period.

PART 2 PRODUCTS

2.1 SYSTEM CLEANER

A. Manufacturers:
1. Biomin
2. Culligan
3. Aptech
4. Substitutions: Division 01, Section 012300 Alternates, Section 012500 – Substitution Procedures – Substitution Request Form and Section 016000 - Product Requirements.

B. Product Description: Liquid alkaline compound with emulsifying agents and detergents to remove grease and petroleum products; sodium tri-Poly phosphate and sodium molybdate.

2.2 CLOSED SYSTEM TREATMENT (WATER)

A. Manufacturers:
1. Biomin
2. Culligan
3. Aptech
4. Substitutions: Division 01, Section 012300 Alternates, Section 012500 – Substitution Procedures – Substitution Request Form and Section 016000 - Product Requirements

B. Sequestering agent to reduce deposits and adjust pH.

C. Corrosion inhibitors boron-nitrite, sodium nitrite and borax, sodium totyltriazole, low molecular weight polymers, phosphonates, sodium molybdate, or sulfites.

D. Conductivity enhancers; phosphates or phosphonates.

2.3 TESTING EQUIPMENT

A. Furnish basic water test equipment, including carrying case and spare reagents for maintaining control of the program standards. Provide reagents and apparatus for determination of corrosion inhibitor and oxidizing biocide levels in the re-circulating water systems.

B. Provide reagents and apparatus for determination of TDS (umhos) in the system. The TDS meter should be a hand held with 4 selectable ranges (0-10, 0-100, 0-1000, and 0-10,000 umhos).

C. Provide bacteria slides for measuring total bacteria counts in the system.

PART 3 EXECUTION

3.1 PREPARATION

A. Drain existing building hot water heating system.

B. Operate, fill, start and vent systems prior to cleaning. Use water meter to record capacity in each system. Place terminal control valves in open position during cleaning.

C. Flush and clean existing building hot water heating system before operating new boilers.

3.2 CLEANING

A. Concentration:
1. As recommended by manufacturer.
2. One pound per 100 gallons of water contained in the system.
3. One pound per 100 gallons of water for hot systems and one pound per 50 gallons of water for cold systems.
4. Fill steam boilers only with cleaner and water.

B. Hot Water Heating Systems:
1. Apply heat while circulating, slowly raising temperature to 160 degrees F and maintain for 12 hours minimum.
2. Remove heat and circulate to 100 degrees F or less; drain systems as quickly as possible and refill with clean water.
3. Circulate for 6 hours at design temperatures, then drain.
4. Refill with clean water and repeat until system cleaner is removed.

C. Use neutralizer agents on recommendation of system cleaner supplier and acceptance of Architect/Engineer.

D. Flush glycol filled closed systems with clean water for one hour minimum. Drain completely and refill.

E. Remove, clean, and replace strainer screens.

F. Inspect, remove sludge, and flush low points with clean water after cleaning process is completed. Include disassembly of components as required.

3.3 INSTALLATION

A. Install Work in accordance with State of Connecticut standards.

3.4 CLOSED SYSTEM TREATMENT

A. Install isolating and drain valves and interconnecting piping. Install around balancing valve downstream of circulating pumps.

B. Introduce closed system treatment through bypass feeder.

3.5 DEMONSTRATION

A. Section 01 73 00 - Execution and Section 017700 - Closeout Procedures: Requirements for demonstration and training.

B. Furnish two hour training course for operating personnel, instruction to include installation, care, maintenance, testing, and operation of water treatment systems. Arrange course at start up of systems.

END OF SECTION 232500