

ATTACHMENT NO. X-F: Poplar Grove Boiler Repair

Potential motion: Motion to approve the replacement boiler for Poplar Grove Elementary for \$33,319

Recommended action: Approve the motion

The heat exchanger on one of the two boilers went out at PGE. Two options were explored. Quotes were given for replacing the heat exchanger and for the cost of a new boiler. To date, four contractors have provided quotes. It is recommended that we approve the quote from Ceroni Piping Company to install a new boiler for \$33,319. The cost to replace the while boiler is cheaper and provides a longer warranty than if only the heat exchanger were to be replaced. The new boiler meets the specs that are currently in place and can communicate with the second boiler that is currently running. This boiler is smaller and more efficient than the one that is being replaced. It also has a variable speed blower to maximize efficiency. The boiler has a ten year warranty.



POWER & PROCESS PIPING / PLUMBING / ENVIRONMENTAL

Poplar Grove Elementary School
208 N State St,
Poplar Grove, IL 61065

December 21, 2020

Reference: Replace exiting Aerco hot water boiler.
Attention: Mr. Dean Schultz

Ceroni Piping Company would like to thank you for the opportunity of submitting a proposal on the above referenced project. The following scope of work is our interpretation of responsibility to this project. Please contact the undersigned with any questions of further clarifications required.

Base Work:

- Demo existing boiler from building and recycle.
- Supply and install one new **LAARS OmniTherm 2000** BTUs to match existing boilers. (attached cut sheet)
- Install piping from new boiler to the existing boiler piping system will be re-piped as required.
- Tie new boilers into existing gas supply lines and re-use existing gas regulator.
- Supply and install new boiler flue pipes as needed, pipe will be tied into existing stacks.
- Re-use all existing valves, regulators, and pumps.
- Re-insulate water lines upon completion.
- Startup of equipment after electrical is complete.
- Customer orientation of new boiler and maintenance training
- Do complete start up on boiler.

Assumptions & Clarifications:

- All work to be completed on straight time (M-F 6:00-3:30).
- Boiler will set in old boiler locations, using the same housekeeping pad.
- We assume recirc pumps are still in good service and all existing valves provide positive shutoff.
- Pricing is good for 30 days.
- Outdoor reset low point will be set at 140 deg minimum
- We assume boiler will run off the incorporated boiler controls
- Ceroni piping assumes the existing expansion tank will be reused
- Boiler is in stock.

Items not included:

- Connections to any other equipment not identified.
- Overtime or premium time, bonds of any kind.
- PE stamped drawings.
- City permits if necessary.
- Boiler tied into the building automation system by others.
- New electrical service or wiring of control valves.
- Pump work or replacement
- Sales tax

Total Cost: \$ 33,319.00 (Thirty-three thousand three hundred nineteen dollars)

Alternate #1: Provide and install new heat exchanger on existing Aerco boiler.

Total Cost: \$ 34,965.00 (Thirty-four thousand nine hundred sixty-five dollars)

We appreciate the opportunity to work w/ you on the above referenced project. If you have any questions or concerns, please give me a call.

Sincerely,
CERONI PIPING COMPANY

Ben Henry



Helm Service
2279 E Yellow Creek Rd
PO Box 690
Freeport, IL 61032
815-235-1955
www.helmgroup.com

December 29, 2020

Jim Nolen | North Boone School District
Poplar Grove Elementary: 208 North State Street | Poplar Grove, IL 61065

RE: Boiler Replacement – Poplar Grove Elementary School

Good afternoon Jim,

Helm Service would like to thank you for the opportunity to provide this proposal for your consideration. Partnering with Helm Service for this work will ensure you are receiving the highest technical expertise in our industry.

Scope of Work:

- Provide material and labor for the following at Poplar Grove Elementary:
 - Demo existing boiler
 - Based on isolation valves holding.
 - Provide and install (1) new Aerco BMK2000 gas fired hot water boiler
 - Proposal includes freight for new equipment
 - Measure and fabricate new spool pieces
 - Install new piping
 - Install new metal fab flu
 - Proposal includes electrical as follows:
 - New 460V 2-Pole 15 amp breaker
 - New 460V to 120V 3kva transformer
 - 20 Amp toggle switch on boiler
 - Provide start-up and balancing
- Proposal based on straight time labor. Proposal does not include sales tax.
- Scope above based on reutilizing existing control valve.
- Proposal does not include any permits/inspection fees. If applicable, these are to be billed additional.
Investment for Boiler Replacement Above ----- \$ 64,845
- **Boiler Pump Adder:** Provide material & labor to install (1) new B&G vertical in-line pump with 2 hp, 3 phase motor and 4” triple duty valve
 - Includes new pump, electrical material/labor, and required piping. Based on straight time labor.
Boiler Pump Adder ---- \$ 9,998
- **Boiler Control Valve Adder:** Provide material and labor to install Aerco 4” motorized control valve.
Boiler Control Valve Adder ---- \$ 3,933

Thanks so much for the opportunity. We look forward to working with you.

Respectfully,
Brooke VenHuizen
Account Representative
Office # 800-747-1955 Ext. 6116
Email: bvenhuizen@mechinc.com

Approval to Proceed...

Name

Date



Mechanical Inc, along with other Helm Group companies, have been rebranded as a single entity. Our services and commitment to our customers remain unchanged.





Wayne Blocker / President
27 Airport Dr. Rockford, IL 61109
O:815-494-9090 C:815-494-5206
WBlocker@geostarinc.com
www.geostarinc.com

December 18th, 2020

NBCUSD- Poplar Grove Elementary
Jim Nolen
Director
208 N. State St.
Poplar Grove, IL. 61065

BID PROPOSAL: Aerco Boiler Repair/Replacement

Scope of Work: Comparison for the option to either replace heat exchanger in current Aerco boiler or replacement and install a new boiler. 1 of 2 boilers at site.

Aerco Heat Exchanger \$48,750.00 ea.

- Factory Heat Exchanger
- Factory gaskets
-
-
- No warranty

Aerco Boiler \$54,750.00 ea.

- New Aerco 2000 Boiler
- Rework piping
- Electrical and controls
- Factory Start-up
- 10-year warranty

Description of Work: 1st bid is for the replacement of the heat exchanger in the current Aerco boiler and make operational but all other components of the boiler will still be 15+ years old. 2nd bid is to install a new Aerco Benchmark 2000 boiler (like size to existing) with all new components to have a 10 year warranty.

Not Included: Any additional work or material required outside of the above scope or in addition to get the system to the proper operation.

Schedule: Work is to be performed during standard hours of operation Monday – Friday.

Warranty: Standard manufacturer’s warranty on parts / 1-year craftsmanship warranty on labor

Contact Name: _____ Phone: _____

Acceptance Signature: _____ Date: _____

Purchase Order: _____

Geostar Mechanical
HVAC – Boilers – Plumbing – Refrigeration – Backflow Preventers – Food Service Equipment

General Conditions- The following conditions shall be considered as part of this contract.

1. Seller guarantees the equipment and workmanship of the apparatus furnished under this contract and will replace or repair any defects, not due to ordinary wear and tear, or due to improper use or maintenance, which may develop within one year from the date of completion. Seller further agrees to replace any refrigerant lost during that period, caused by defects in the installation, and not due to improper use or maintenance.
2. In no event shall the seller be liable for consequential damages.
3. On the delivery of the equipment by seller, or any part thereof, to the premises of the buyer, buyer shall assume risk of loss or damage to such equipment and shall cause same to be insured in all aspects against loss or damage in an amount to protect the interest of the seller. Cost of insurance is to be paid by the buyer.
4. Unless otherwise agreed work shall be performed during regular business hours. If overtime is mutually agreed upon and performed, the additional price, at the seller's usual rates, shall be added to the contract.
5. Buyer shall provide the seller's workman a safe place in which to work, and the seller shall have the right to discontinue work when, in the seller's opinion, this clause is being violated. Seller shall not be liable for any delay, loss, or damage caused by such delay.
6. Buyer shall be responsible for structural ability of the premises to contain the equipment in the manner and location specified in the contract or shown on the drawings, and the seller shall not be liable for any failure of premises due to such structural deficiency.
7. In the event that material incorporated in this contract is for delivery and installation, and buyer is unable to receive same, Seller shall have the right to bill buyer for the amount of the material in accordance with the terms of the contract and also to provide suitable storage and insurance at the buyer's expense.
8. Seller shall not be held responsible or liable for any loss, damage detention, or delay caused by acts of God, strikes, lockouts, or by any other cause which is unavoidable or beyond the seller's control.
9. Title to the equipment remains in the seller until payment of the entire purchase price and all sums due the seller under this contract are fully made. All equipment, whether affixed to the realty or not, shall remain personal property and be deemed serviceable without injury to the free hold. In the event of default of payment or any installment or failure to perform any terms or conditions of their contract or in the event that a proceeding bankruptcy or insolvency be instituted by or against the buyer, or if equipment is misused, illegally used or imperiled, then at seller's option the entire unpaid balance shall become immediately due and payable without notice or demand and in such case seller may resell the equipment or any part thereof at either private or public sale.
10. Should the seller be delayed by reason of any default on the part of the buyer of the terms and conditions of this contract, the entire contract price, less payment theretofore made, shall become due, and shall bear interest at the full legal rate from the date of billing.
11. If buyer claims that the plan does not fulfill the terms and conditions of the contract. He shall notify seller in writing this effect, specifying in what particular it fails. A reasonable length of time shall then be allowed to remedy any defect or deficiencies that may exist, or to demonstrate to buyer the capacity of the plan to fulfill the terms and conditions.
12. Buyer shall keep the equipment free of taxes and encumbrances, shall not remove said equipment from the premises without written permission of seller, and shall not transfer an interest in said equipment or in this contract without written consent of seller until all payments due hereunder have been made.
13. Neither buyer nor seller shall not assign this contract or any rights thereunder without the other party's written consent.
14. Seller's scope of work shall not include the identification, detection, abatement, encapsulation, or removal of asbestos, or product or materials containing asbestos or similar hazardous substances. In the event that contractor encounters any such products or materials in the course of performing its work, seller shall discontinue its work and remove its employee's from the project until such products or materials and any hazards connected there within are abated, encapsulated or removed, or it is determined that no hazard exist (as the case may require), and the contractor shall receive an extension of time to complete its work hereunder and compensation for delays encountered as a result of such situation and correction of same.

Geostar Mechanical

HVAC – Boilers – Plumbing – Refrigeration – Backflow Preventers – Food Service Equipment



January 14, 2021

Poplar Grove Elementary
208 N State S.,
Poplar Grove, IL 61065

Re: Aerco BMK 2.0 Boiler Replacement

Hartwig Plumbing and Heating Inc. are pleased to quote you on the above-mentioned project.

Items included:

- Removal of old Benchmark 2.0
 - Electrical lockout / tag out / disconnect.
 - Proposal based on current isolation valves holding.
- Furnish and install (1) Laars OmniTherm 2000 NJA1XX 2000k
 - New interconnecting piping from existing shutoff valves.
 - Insulation of newly installed piping included.
 - Boiler will be furnished with stand alone controls.
 - Reconnect of existing electrical feed.
- Furnish and install interconnecting AL29C exhaust duct & intake vent to existing.
 - Existing intake/exhaust risers to remain.
- Furnish and install (1) Grundfos UPS50-160/2 Boiler Pump
 - Provide with new GF50 Cast Iron Flanges.
- Start up & Testing.

Exclusions:

- | | |
|--|---|
| • Boiler Integration into existing JCI control system | • MBE/WBE or workforce requirements |
| • Premium labor | • Temporary Heat, Ventilation, & Air Conditioning |
| • Replacement parts for existing Electrical or HVAC equipment. | • Loose motor starters / disconnects |
| • Concrete Pads | • Equipment warranty extension past mfr's std |
| • Permits, Bonds or allowances | • Painting of any kind |

TOTAL COST FOR THE ABOVE SCOPE OF WORK \$39,923.00

Thank you for giving Hartwig Plumbing & Heating, Inc. the opportunity to bid this upcoming project.

Sincerely,
Brian Raffaele
Director, Mechanical Division
Cell: (815) 560-1323
brian.raffaele@hartwigplumbing.com



LAARS[®] **OMNITHERM[®]**

*Near Condensing
Boiler and Volume Water Heater*

- Up to 7:1 Turndown Ratio
- Electronic Fuel-to-Air Ratio Control
- Up to 90% Thermal Efficiency
- Stainless Steel Heat Exchanger
- Indoor/Outdoor Rated
- LAARS LINC[®] Intuitive Touch Screen Controls
- Low Return Water Temperatures Allowed

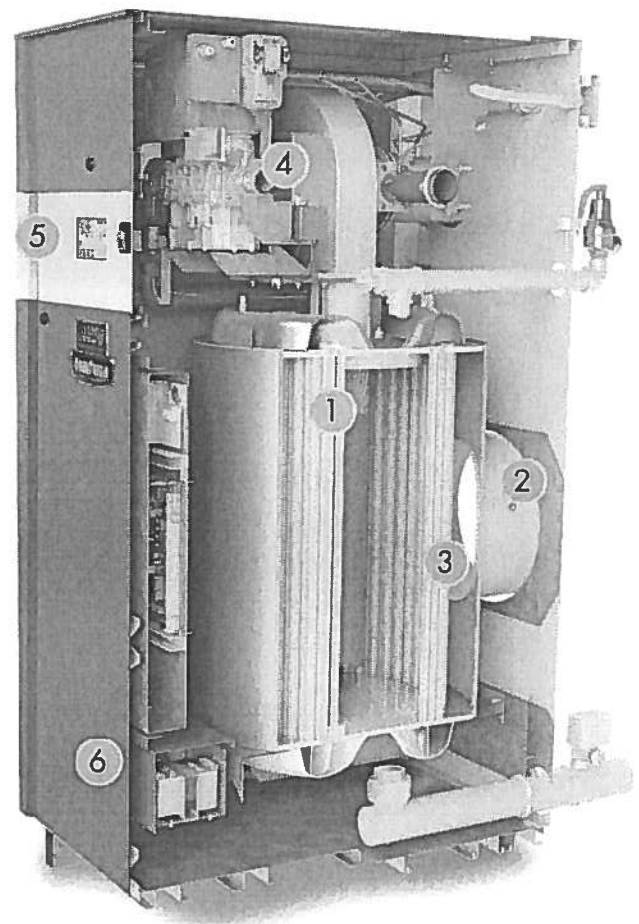
LAARS[®] 
Heating Systems Company

Laars OmniTherm Boilers and Volume Water Heaters include advanced features that bring tangible results to building owners. At the heart of the OmniTherm is a patent pending stainless steel corrosion resistant heat exchanger, industry leading Electronic Air-to-Fuel ratio combustion control and the advanced Laars Linc control platform. All of this has been combined for the first time in a near condensing heating platform intended for use in Category I, II, III or IV applications.

Designed with Performance and Practicality in Mind

OmniTherm, the new measure for installation flexibility, stands in a performance class of it's own. It can as easily be applied in replacement applications as it can be in new installations.

- 1) Long Life, Stainless Steel Heat Exchanger:
 - Protects against heat exchanger corrosion and fouling
 - High efficiency levels
 - Allows for low temperature return water
- 2) Available for use with Category I, II, III or IV Venting Applications
- 3) Category I or III Low Temperature Operation
 - Unique heat exchanger design and control logic allow for return water temperatures down to 85°F without the need for an external mixing system
- 4) Up to 7:1 Combustion Turndown (Category II/IV)
 - Increases overall efficiency by properly matching load requirements with firing rates
- 5) Laars Linc Intuitive to Use Control System
 - Icon driven, easy to navigate menu structure
 - Large color touchscreen



- 6) Vertical Configuration
 - Small footprint takes up less floor space
 - Easily fits through doors and into tight mechanical rooms.

THE LAARS OMNITHERM ADVANTAGE:

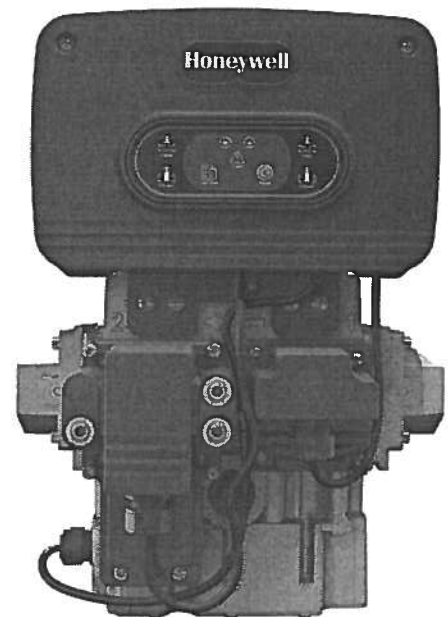
INDUSTRY
LEADING
TECHNOLOGY

Electronic Air-to-Fuel Ratio Control Brings Performance to a Whole New Level

The OmniTherm is outfitted with the latest in temperature compensated mass flow combustion control technology. This technology offers one of the highest levels of combustion accuracy and performance available.

Optimized performance, reduced emissions, and reliable operation lower operational costs and increase savings.

- **Peak Performance:** Optimal combustion and low emission levels are achieved by maintaining the ideal gas density levels within the air-fuel mixture regardless of operational demands.
- **Maximized Efficiency Levels:** Electronic management of premix process maintains proper oxygen levels for ideal combustion.
- **High Efficiencies at All Firing Rates:** Real-time air-to-fuel ratio compensation control results in highest possible efficiencies throughout the entire turndown range.
- **Stable Performance:** Electronic mass flow sensors adjust to supply pressure fluctuations to improve performance stability as compared to traditional pneumatic valve technology.
- **Reliable Operation:** Drifting from original set points over time is eliminated, keeping the OmniTherm operating at peak efficiencies.
- **Quick Response Rate:** Real time measurements of pressure, air flow, gas density, and temperature are monitored for fast acting adjustments to heating demands.



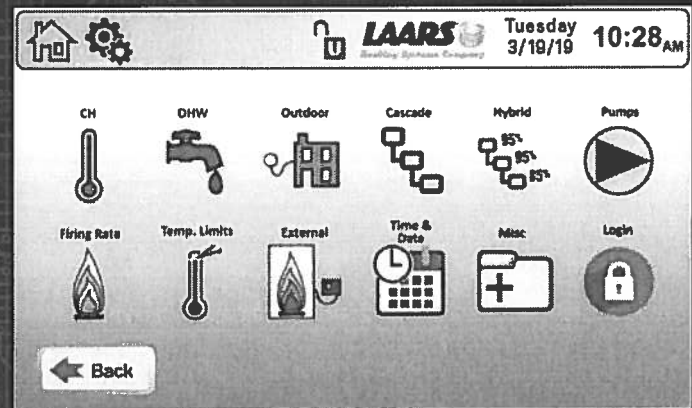
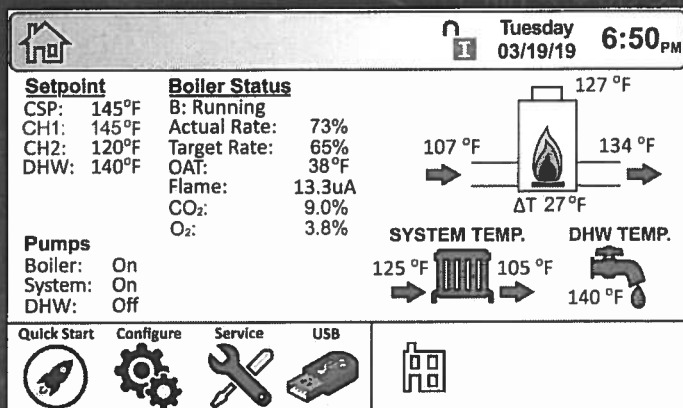
LAARS LINC®

LAARS LINC CONTROLS
ARE A STEP BEYOND
SMART, THEY'RE
INTUITIVE

LAARS LINC®

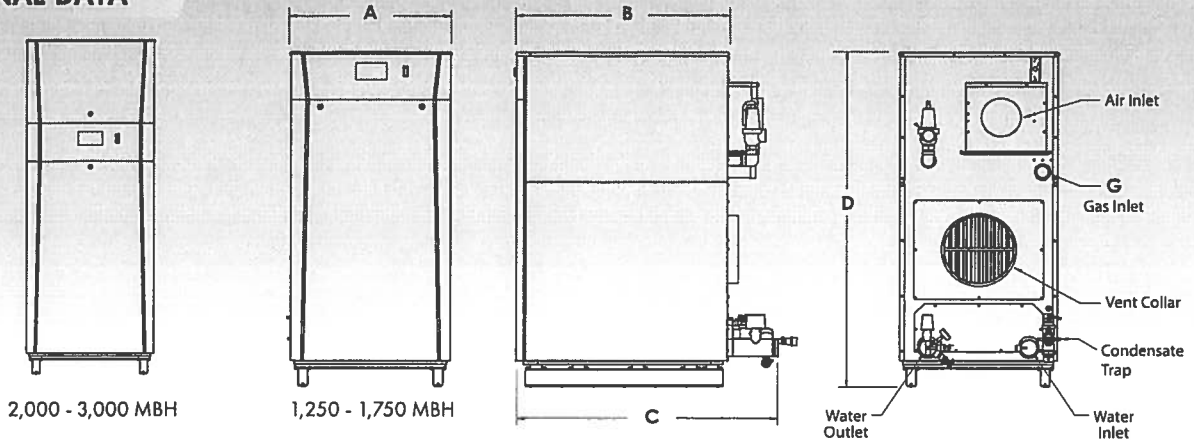
Powerful control logic is easily managed via icon driven, touch screen technology. The result is an intuitive to use control system with the intelligence to manage installations from the simple to the complex.

ADVANCED EASE OF USE FUNCTIONALITY:



- **HOME SCREEN BOILER STATUS:** The home screen shows the operational status of the boiler; all set points, status of each pump, and boiler run status.
- **QUICK START CONFIGURATOR:** Simply touch the "Quick Start" icon on the home screen to access the most commonly-used parameters for systems that don't require advanced set up.
- **USB DATA CONNECTION:** The USB connection allows for easy transfer of parameter sets from one boiler to another and for the boiler's history data to be transferred to a USB memory device.
- **VARI-PRIME® PUMP CONTROL:** This unique fixed delta T control functionality is included on OmniTherm Category II and IV boilers and works in conjunction with a variable speed boiler pump. As the boiler's firing rate changes, the Vari-Prime control modulates the signal to a variable speed boiler pump to ensure a user-programmable temperature rise is maintained across the boiler. Pump electrical savings as high as 70% can be realized via this configuration vs. constant speed pump installations.
- **LAARS LINC CONTROL TO DISPLAY HANDSHAKE:** If for any reason a display or control board needs to be replaced, the parameter set is automatically transferred from the remaining display or control board to the replaced component. Parameters are stored on both the display and control to auto populate either one!
- **INTELLIGENT REDUNDANCY:** Laars Linc cascade logic includes a built-in redundancy; via either a lag unit's internal setpoint, or a configurable redundant leader. A bank of boilers will continue to operate even if the master control goes down, keeping buildings warm and hot water flowing!
- **AUTO CONFIGURING CASCADE:** Up to 8 units can be automatically configured by simply connecting the controls and selecting the master boiler. The intelligence of Laars Linc takes over to auto configure the remaining follower boilers. No need to register each follower!
- **MULTIPLE PUMP CONTROL:** System pump, boiler pump and domestic water pump operation, each with time delay.
- **BacNET MSTP AND MODBUS RTU ON BOARD**

DIMENSIONAL DATA



NOTE: The unique design of this appliance requires connection to a condensate drain, including the Category I / III model.

Model	"A"		"B"		"C"		"D"		"G" Gas Conn.	Water Inlet & Outlet
	in.	(cm)	in.	(cm)	in.	(cm)	in.	(cm)	NPT	NPT
1250	24½	(62)	27	(69)	39	(99)	66	(168)	2"	2½"
1500	24½	(62)	27	(69)	39	(99)	66	(168)	2"	2½"
1750	32	(81)	43	(109)	53	(135)	69	(175)	2"	3"
2000	32	(81)	43	(109)	53	(135)	78	(198)	2"	3"
2500	32	(81)	43	(109)	53	(135)	78	(198)	2"	3"
3000	32	(81)	43	(109)	53	(135)	85	(216)	2"	3"

ELECTRICAL DATA

Voltage	1250 Current			1500 Current			1750 Current			2000 Current			2500 Current			3000 Current		
	FLA	MCA	MOP	FLA	MCA	MOP	FLA	MCA	MOP	FLA	MCA	MOP	FLA	MCA	MOP	FLA	MCA	MOP
120V, 1 phase	9.4	11.8	20	9.4	11.8	20	9.2	11.5	20	9.2	11.5	20	N/A	N/A	N/A	N/A	N/A	N/A
208V, 1 phase	N/A	N/A	N/A	4.8	6.0	15	5.0	6.3	15	5.0	6.3	15	5.0	6.3	15	N/A	N/A	N/A
220/240V, 1 ph	N/A	N/A	N/A	4.8	6.0	15	4.8	6.0	15	4.8	6.0	15	4.8	6.0	15	N/A	N/A	N/A
208V, 3 phase	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	5.2	6.5	15	6.2	7.8	15
480V, 3 phase	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	2.2	2.8	15	2.7	3.4	15
600V, 3 phase	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1.8	2.3	15	2.2	2.8	15

VENTING DATA

Model	General Air System Data				Category II and IV Vent Data								Category I and III Vent Data							
	Air Collar Size "E" and Ducted Air Pipe Size ¹		Maximum Ducted Air Pipe Length ¹		Vent Collar Size		Category IV Vent Pipe Size ⁴		Maximum Category IV Vent Pipe Length ⁴		Typical ^{3,4} Category II Vent Pipe Size		Vent Collar Size		Category III Vent Pipe Size ⁴		Maximum Category III Vent Pipe Length ⁴		Typical ³ Category I Vent Pipe Size	
	inches	cm	ft ²	m	inches	cm	inches	cm	ft ²	m	inches	cm	inches	cm	inches	cm	ft ²	m	inches	cm
1250	6	15	100	30.5	6	15	6	15	100	30.5	12	30	12	30	6	15	100	30.5	12	30
1500	6	15	100	30.5	6	15	6	15	100	30.5	12	30	12	30	6	15	100	30.5	12	30
1750	8	20	100	30.5	8	20	8	20	100	30.5	14	36	14	36	8	20	100	30.5	14	36
2000	8	20	100	30.5	8	20	8	20	100	30.5	14	36	14	36	8	20	100	30.5	14	36
2500	8	20	100	30.5	8	20	8	20	100	30.5	16	41	16	41	8	20	100	30.5	16	41
3000	10	25	100	30.5	10	25	10	25	100	30.5	16	41	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

- Intake air pipe may be single-wall galvanized steel pipe, 24 gauge minimum, and properly sealed.
- Equivalent Feet: To calculate, measure the linear feet of the pipe and add 5 ft (1.5m) for each elbow used.
- Category I and II vent pipe sizes shown are typical, but may not meet the requirements of every system.
- Category II, III, and IV vent pipe must be stainless steel complying with UL1738, and properly sealed.

OmniTherm Models OCH and OCV for Category II & IV Venting

BOILER SIZING DATA

OmniTherm Hydronic Model OCH (Category II & IV Vent)							
Model	Input Rate		Output Rate		Efficiency		Turndown Ratio
	MBH	kw	MBH	kw	% Thermal	% Combustion	
1250	1250	366	1098	322	87.8	87.7	5:1
1500	1500	440	1307	383	87.1	87.2	7:1
1750	1750	513	1523	446	87.0	86.7	7:1
2000	1999.9	586	1756	514	87.8	87.5	5:1
2500	2499.9	733	2193	643	87.7	87.0	7:1
3000	3000	879	2589	759	86.3	86.6	7:1

VOLUME WATER HEATER SIZING DATA

OmniTherm Volume Water Heater Model OCV (Category II & IV Vent)							
Model	Input Rate		Output Rate		Efficiency		Turndown Ratio
	MBH	kw	MBH	kw	% Thermal	% Combustion	
1250	1250	366	1125	330	90		5:1
1500	1500	440	1335	391	89		7:1
1750	1750	513	1540	451	88		7:1
2000	1999.9	586	1800	527	90		5:1
2500	2499.9	733	2250	659	90		7:1
3000	3000	879	2610	765	87		7:1

BOILER WATER FLOW REQUIREMENTS

Model	Temperature Rise																			
	20°F (11°C)				25°F (14°C)				30°F (17°C)				35°F (19°C)				40°F (22°C)			
	Flow		Headloss*		Flow		Headloss*		Flow		Headloss*		Flow		Headloss*		Flow		Headloss*	
	gpm	l/m	ft	m	gpm	l/m	ft	m	gpm	l/m	ft	m	gpm	l/m	ft	m	gpm	l/m	ft	m
1250	110	416	25.0	7.6	88	333	16.4	5.0	73	276	11.5	3.5	63	238	8.6	2.6	55	208	6.6	2.0
1500	131	495	34.8	10.6	105	397	22.9	7.0	87	329	16.0	4.9	75	284	12.1	3.7	65	246	9.1	2.8
1750	152	576	19.5	5.9	122	462	13.4	4.1	102	386	9.4	2.9	87	329	6.4	2.0	76	288	4.2	1.3
2000	176	666	24.9	7.6	140	530	16.6	5.1	117	443	11.8	3.6	100	379	8.5	2.6	88	333	6.2	1.9
2500	219	829	36.1	11.0	175	662	24.7	7.5	146	553	17.9	5.5	125	473	13.4	4.1	110	416	10.4	3.2
3000	259	980	65.2	19.9	207	784	40.7	12.4	173	655	28.1	8.6	148	560	20.4	6.2	129	488	15.6	4.8

*Headloss is for boiler only (no piping)

VOLUME WATER HEATER WATER FLOW REQUIREMENTS

Model	1-10 Grains Per Gallon Hardness						11-15 Grains Per Gallon Hardness					
	Flow Rate		Headloss*		Temp Rise		Flow Rate		Headloss*		Temp Rise	
	gpm	l/m	ft	m	°F	°C	gpm	l/m	ft	m	°F	°C
1250	85	322	16.1	4.9	26	14	104	394	23.6	7.2	21	12
1500	90	341	17.9	5.5	29	16	110	416	26.3	8.0	24	13
1750	120	454	12.9	3.9	25	14	150	568	19.6	6.0	20	11
2000	135	511	16.1	4.9	26	14	170	644	24.4	7.4	21	11
2500	140	530	17.2	5.2	31	17	170	644	24.4	7.4	26	14
3000	150	568	21	6.4	35	19	183	693	31.5	9.6	28	16

*Headloss is for the heater only (no piping)

Allowable pH is 6.5 to 9.5

VOLUME WATER HEATING RECOVERY DATA

Model	Temperature Rise													
	40°F (22°C)		50°F (25°C)		60°F (33°C)		70°F (39°C)		80°F (44°C)		90°F (50°C)		100°F (56°C)	
	gph	L/h	gph	L/h	gph	L/h	gph	L/h	gph	L/h	gph	L/h	gph	L/h
1250	3293	12463	2634	9971	2195	8309	1881	7122	1646	6232	1463	5539	1317	4985
1500	3920	14837	3136	11870	2613	9891	2240	8478	1960	7418	1742	6594	1568	5935
1750	4568	17290	3654	13832	3045	11527	2610	9980	2284	8645	2030	7684	1827	6916
2000	5268	19942	4214	15953	3512	13294	3010	11395	2634	9971	2341	8863	2107	7977
2500	6578	24899	5262	19919	4385	16599	3759	14228	3289	12449	2923	11066	2631	9959
3000	7767	29401	6214	23521	5178	19601	4438	16801	3884	14701	3452	13067	3107	11761

OmniTherm Models ONH and ONV for Category I & III Venting

BOILER SIZING DATA

OmniTherm Hydronic Model ONH (Category I & III Vent)*						
Model	Input Rate		Output Rate		Efficiency	
	MBH	kw	MBH	kw	% Thermal	% Combustion
1250	1250	366	1060	311	84.8	84.2
1500	1500	440	1259	369	83.9	83.3
1750	1750	513	1472	431	84.1	83.4
2000	1999.9	586	1668	489	83.4	84.0
2500	2499.9	733	2075	608	83.0	83.0

VOLUME WATER HEATER SIZING DATA

OmniTherm Volume Water Heating Model ONV (Category I & III Vent)*					
Model	Input Rate		Output Rate		Efficiency
	MBH	kw	MBH	kw	% Thermal
1250	1250	366	1063	311	85
1500	1500	440	1260	369	84
1750	1750	513	1488	436	85
2000	1999.9	586	1720	504	86
2500	2499.9	733	2150	630	86

* Category I & III venting achievable due to the on/off firing configuration of models ONH and ONV

BOILER WATER FLOW REQUIREMENTS

Model	Temperature Rise																			
	20°F (11°C)				25°F (14°C)				30°F (17°C)				35°F (19°C)				40°F (22°C)			
	Flow		Headloss*		Flow		Headloss*		Flow		Headloss*		Flow		Headloss*		Flow		Headloss*	
	gpm	l/m	ft	m	gpm	l/m	ft	m	gpm	l/m	ft	m	gpm	l/m	ft	m	gpm	l/m	ft	m
1250	106	401	23.6	7.2	85	321	15.4	4.7	71	268	11.1	3.4	61	229	8.2	2.5	53	201	6.2	1.9
1500	126	476	33.0	10.1	101	381	21.9	6.7	84	318	16.1	4.9	72	272	12.0	3.7	63	238	9.0	2.7
1750	147	557	18.4	5.6	118	446	12.9	3.9	98	371	8.2	2.5	84	318	5.9	1.8	74	279	3.8	1.2
2000	167	631	24.4	7.4	133	505	15.7	4.8	111	421	11.2	3.4	95	361	7.8	2.4	83	316	5.9	1.8
2500	207	786	33.7	10.3	166	628	23.9	7.3	138	524	17.2	5.2	119	449	12.9	3.9	104	393	9.8	3

*Headloss is for boiler only (no piping)

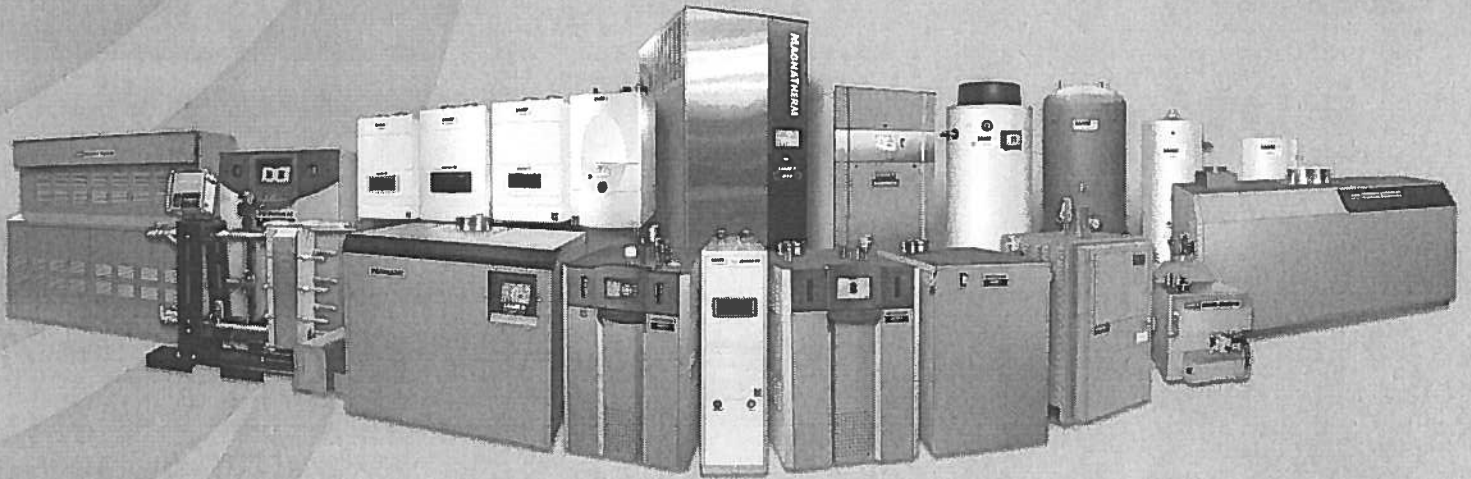
VOLUME WATER HEATER WATER FLOW REQUIREMENTS

Model	1-10 Grains Per Gallon Hardness						11-15 Grains Per Gallon Hardness					
	Flow Rate		Headloss*		Temp Rise		Flow Rate		Headloss*		Temp Rise	
	gpm	l/m	ft	m	°F	°C	gpm	l/m	ft	m	°F	°C
1250	85	322	16.1	4.9	25	14	104	394	23.6	7.2	20	11
1500	90	341	17.9	5.5	28	16	110	416	26.3	8.0	23	13
1750	120	454	12.9	3.9	25	14	150	568	19.6	6.0	20	11
2000	135	511	16.1	4.9	25	14	170	644	24.4	7.4	20	11
2500	140	530	17.2	5.2	31	17	170	644	24.4	7.4	25	14

*Headloss is for the heater only (no piping)
Allowable pH is 6.5 to 9.5

VOLUME WATER HEATING RECOVERY DATA

Model	Temperature Rise													
	40°F (22°C)		50°F (28°C)		60°F (33°C)		70°F (39°C)		80°F (44°C)		90°F (50°C)		100°F (56°C)	
	gph	L/h	gph	L/h	gph	L/h	gph	L/h	gph	L/h	gph	L/h	gph	L/h
1250	3188	12049	2550	9639	2125	8033	1821	6885	1594	6024	1417	5355	1275	4820
1500	3780	14288	3024	11431	2520	9526	2160	8165	1890	7144	1680	6350	1512	5715
1750	4463	16868	3570	13495	2975	11246	2550	9639	2231	8434	1983	7497	1785	6747
2000	5160	19504	4128	15603	3440	13003	2948	11145	2580	9752	2293	8668	2064	7802
2500	6450	24380	5160	19504	4300	16253	3686	13931	3225	12190	2867	10836	2580	9752



LAARS[®]
Heating Systems Company

Customer Service and Product Support: 800.900.9276 • Fax 800.559.1583

Headquarters: 20 Industrial Way, Rochester, NH 03867 • 603.335.6300 • Fax 603.335.3355
9 Brigden Gate, Halton Hills, Ontario, Canada, L7G 0A3 • 905.203.0600 • Fax 905.636.0666

www.LAARS.com

Benchmark 750-6000 Boilers

The AERCO Benchmark (BMK) Water Boiler is designed for condensing application in any closed loop hydronic system. It delivers unmatched burner modulation to match energy input directly to fluctuating system loads to yield the highest possible seasonal efficiencies. And no other product packs as much capacity into such a small footprint.

Energy Efficient

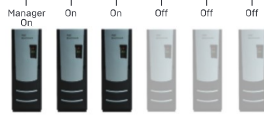
To minimize emissions, the BMK Series is fitted with a low NOx burner whose emissions will meet the most stringent NOx and CO requirements. The fully modulating burner also maintains AERCO standards for energy efficiency, longevity, reliability and construction quality.

The BMK Series comes standard with AERCO's Patent Pending, Oxygen Level (O₂) monitoring system. This monitoring system, designed to display the O₂ level directly on the unit in real time, can also be remotely monitored via Modbus giving the customer the ability to measure the emissions level and fuel economy of the boiler without traditional combustion calibration devices.



Application and Plant Design

The BMK boilers can be used as an individual unit or in modular arrangements and offers selectable modes of operation. 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 2-8 boilers, AERCO'S built-in Boiler Sequencing Technology (BST)* can be utilized. For heating plants greater than 8 boilers, AERCO's ACS (AERCO Control System) provides the right solution. Likewise, Benchmark systems can be easily integrated with a facility-wide Energy Management or Building Automation System.



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

Features

- Natural Gas, Propane, or Dual Fuel (model dependent)
- 20:1 Turndown Ratio (5%) depending on capacity
- Oxygen Level (O₂) Monitoring Standard
- 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
- Precise Temperature Control
- On-board Boiler Sequencing Technology (BST)
- Ducted Combustion Air Capable
- Easy Open Access for Service
- Acceptable vent materials AL29-4C, Polypropylene, PVC, cPVC (model dependent)
- Reliable Quiet Operation
- Controls Options: Constant Setpoint, Indoor/Outdoor Reset, Remote Setpoint, 4-20mA signal or ModBus
- Optional gas train with VPS (Value Proving System) for BMK 5000/6000

Specifications

	BMK Standard							
	750	1000	1500	2000	2500	3000	5000	6000
Boiler Category	ASME Sect.IV	ASME Sect.IV	ASME Sect.IV	ASME Sect.IV	ASME Sect.IV	ASME Sect.IV	ASME Sect.IV	ASME Sect.IV
Gas Connections (NPT)	1"	1"	2"	2"	2"	2"	2 / 3"	2 / 3"
Max. Gas Pressure	14"	14"	14"	14"	14"	14"	2psi/10**	2psi/10**
Min. Gas Pressure ¹	4"	4"	4"	4"	4"	4"	14 / 4**	14 / 4**
Max. Allowed Working Pressure	160 PSIG	160 PSIG	160 PSIG	160 PSIG	160 PSIG	160 PSIG	80PSIG/ 150 PSIG Optional	80 PSIG/ 150 PSIG Optional
Electrical Req. 120V/1PH/60Hz ²	13 FLA	13 FLA	16 FLA	16 FLA	N/A	N/A	N/A	N/A
Electrical Req. 208V/3PH/60Hz ²	N/A	N/A	N/A	N/A	10 FLA	10 FLA	19 FLA	19 FLA
Electrical Req. 460V/3PH/60Hz ²	N/A	N/A	N/A	N/A	5 FLA	5 FLA	9 FLA	9 FLA
Electrical Req. 575V/3PH/60Hz ²	N/A	N/A	N/A	N/A	N/A	N/A	7 FLA	7 FLA
Water Connect. (Flanged)	3"	3"	4"	4"	4"	4"	6"	6"
Min. Water Flow (GPM)	12	12	25	25	25	25	75	75
Max. Water Flow (GPM)	175	175	250	350	350	350	700	700
Water Volume Gallons	16.25	14.25	44	40	58	55	110	110
Water Pressure Drop	3.0 PSIG @100 GPM	3.0 PSIG @100 GPM	3.0 PSIG @170 GPM	3.0 PSIG @170 GPM	3.0 PSIG @218 GPM	3.0 PSIG @261 GPM	4.0 PSIG @500 GPM	4.0 PSIG @500 GPM
Turndown Ratio	15:1 (7%)	20:1 (5%)	20:1 (5%)	20:1 (5%)	15:1 (7%)	15:1 (7%)	12:1 (8%)	15:1 (7%)
Vent/Air Intake Connections	6 Inch	6 Inch	6 Inch	8 Inch	8 Inch	8 Inch	14 Inch Optional/ 12 Inch Flue Venting	14 Inch Optional/ 12 Inch Flue Venting
Vent Materials	AL29-4C Polypro, CPVC, PVC	AL29-4C Polypro, CPVC, PVC	AL29-4C Polypro	AL29-4C Polypro	AL29-4C Polypro	AL29-4C Polypro	AL29-4C Polypro	AL29-4C Polypro
Type of Gas	Natural Gas, Propane	Natural Gas, Propane	Natural Gas, Propane, Dual Fuel	Natural Gas, Propane, Dual Fuel	Natural Gas, Propane, Dual Fuel	Natural Gas, Propane, Dual Fuel	Natural Gas, Dual Fuel	Natural Gas, Dual Fuel
NOx Emissions <9ppm Capability	✓	✓	✓	✓	<13 ppm	<13 ppm	✓ ³	✓ ³
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, VPS (Value Proving System)	
Sound Rating dbA	65	65	70	70	72	72	79	79
Weight (dry) lbs.	669	700	1406	1500	2,000	2,170	3,000	3,000
Shipping Weight lbs.	862	900	1606	1700	2,200	2,370	3,800	3,800

*BMK5000/6000 low gas pressure option is available as a different style number. It operates between 4" and 10" of gas pressure.

BMK5000/6000 with natural gas can be ordered with VPS (Valve-Proving System) for additional operation safety.

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.

Ratings

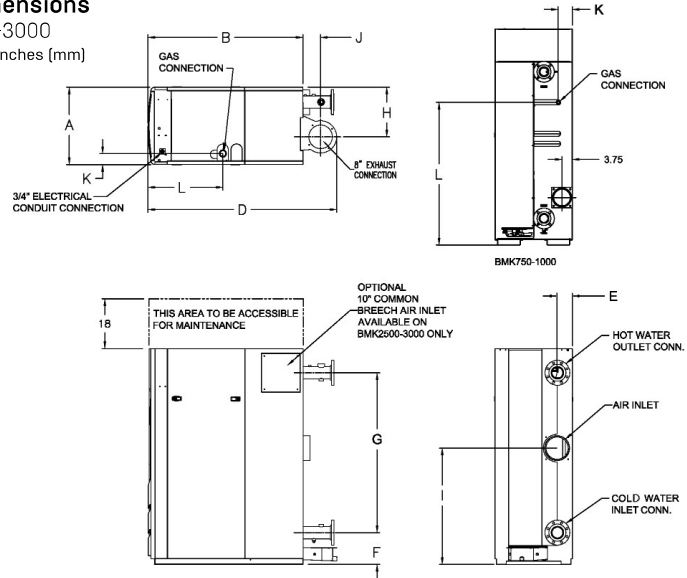
BMK Models	Min Input MBH	Max Input MBH	Max Output* MBH	Efficiency Range	Thermal Efficiency 80° to 180°F
750	50	750	653-720	87%-98%	95.6%
1000	50	1000	870-960	87%-98%	96.8%
1500	75	1500	1305-1425	87%-98%	94.6%
2000	100	2000	1740-1900	87%-98%	94.6%
2500	167	2500	2175-2360	87%-98%	93.5%
3000	200	3000	2610-2880	87%-98%	93.5%
5000	400	5000	4350-4800	87%-98%	93.9%
6000	400	6000	5220-5670	87%-98%	94.5%

*Max output dependent upon application – see efficiency curves

Dimensions

750-3000

Dim: Inches (mm)

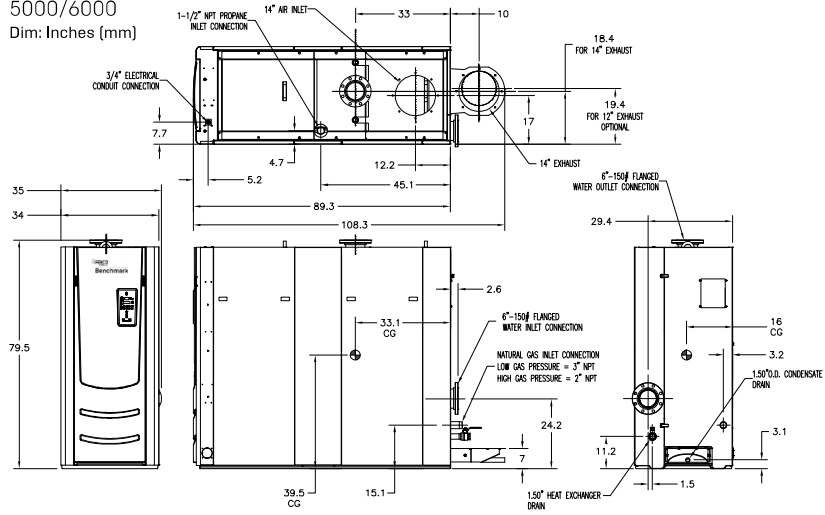


BMK Models	[Width] A	[Depth] B	[Height] C	D	E	F	G	H	I	J	K	L
BMK 750	28"	25"	78"	34"	10"	10"	53"	21"	17"	4"	5"	51.8"
BMK 1000	28"	25"	78"	34"	10"	10"	53"	21"	17"	4"	5"	51.8"
BMK 1500	28"	43.6"	78"	58.4"	7"	11.5"	57.8"	18"	42"	8.9"	4.7"	19.5"
BMK 2000	28"	43.6"	78"	58.4"	7"	11.5"	57.8"	18"	42"	8.9"	4.7"	19.5"
BMK 2500	28"	56"	78"	68.4"	5.4"	11.5"	57.8"	18"	42"	6.4"	3.6"	26"
BMK 3000	28"	56"	78"	68.4"	5.4"	11.5"	57.8"	18"	42"	6.4"	3.6"	26"

Dimensions

5000/6000

Dim: Inches (mm)



BMK Models	[Width] A	[Depth] B	[Height] C
5000	35"	89.3"	79.8"
6000	35"	89.3"	79.8"



Heating and Hot Water Solutions

AERCO International, Inc. • 100 Ortani Drive • Blauvelt, NY 10913
 USA: T: (845) 580-8000 • Toll Free: (800) 526-0288 • AERCO.com

© 2019 AERCO