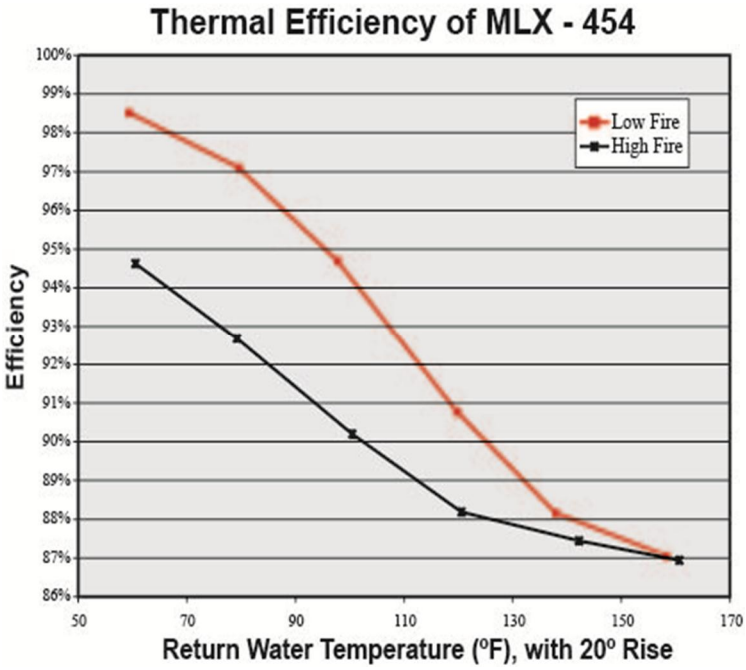
MODEL MLX
TECHNICAL DATA SHEET

AERCO MODULEX BOILERS

A breakthrough in high-efficiency design, AERCOôs condensing and fully modulating Modulex boilers support 300,000 to 1 million BTU/hr. hydronic heating systems while delivering a greater degree of operating reliability for customer peace of mind. To achieve the greatest possible fuel savings, each boiler combines independent, 151,500 BTU/hr. thermal modules (see back) that operate to deliver superior turndown and a range of non-cycling operation not readily achieved by competitive equipment or controls. In addition to minimizing redundant capacity needed for any project, these quiet and lightweight boilers can support low NOX and low gas pressure applications and a variety of venting materials. Each unit enclosure offers multiple supply/return piping and venting locations for installation flexibility and allows for multiple units to be easily co-located for greater than 1 million BTU/hr. applications. Combustion view ports and easy access to all operating components further simplify minimal maintenance requirements. In addition to controlling the boiler according to a constant set point, indoor/outdoor reset or 0-10V signal, one or more units can be integrated via Modbus communications protocol to a facility-wide Energy Management or Building Automation System.

THERMAL EFFICIENCY

AERCO is currently developing comprehensive efficiency curves for the complete line of Modulex boilers using a new, rigorous testing protocol which will be witnessed and reviewed by an independent organization. Until comprehensive, independently confirmed curves are available, the figure below provides boundary data for MLX-454 efficiency. Please note: Low Fire represents 45,500 BTU/hr. input ï the lowest firing rate of every Modulex unit. Full Fire represents 454,000 BTU/hr. or 100% capacity of the MLX-454.



FEATURES

- Condensing Boiler
- Natural Gas or Propane
- Unmatched Turndown
- 6:1 to 23:1 Depending Upon Unit
- Whisper Quiet Operation <50 dBa
- Low NOx Emission <14ppm
- Direct or Conventional Vent with PVC, CPVC or AL29-4C Materials
- Small, Doorway-Size Footprint
- Flexible Piping and Venting Connections
- Equipped with Sealed Combustion
- Superior Reliability
- Minimal Maintenance
- Easy Open Access for Service
- Supports Integration to BAS System

*Consult AERCO website or Engineering Manual for complete warranty details.

RATINGS

Model Number	Min Input	Max Input	Max Output*	Net IBR Rating
MLX-303	45,500	303,000	260,000-279,000	237,000
MLX-454	45,500	454,500	390,000-418,000	355,000
MLX-606	45,500	606,000	521,000-558,000	474,000
MLX-757	45,500	757,500	651,000-696,000	592,000
MLX-909	45,500	909,000	781,000-835,000	710,000
MLX-1060	45,500	1,060,500	912,000-975,000	829,000

*Depending on Return Water Temperature

DIMENSIONS

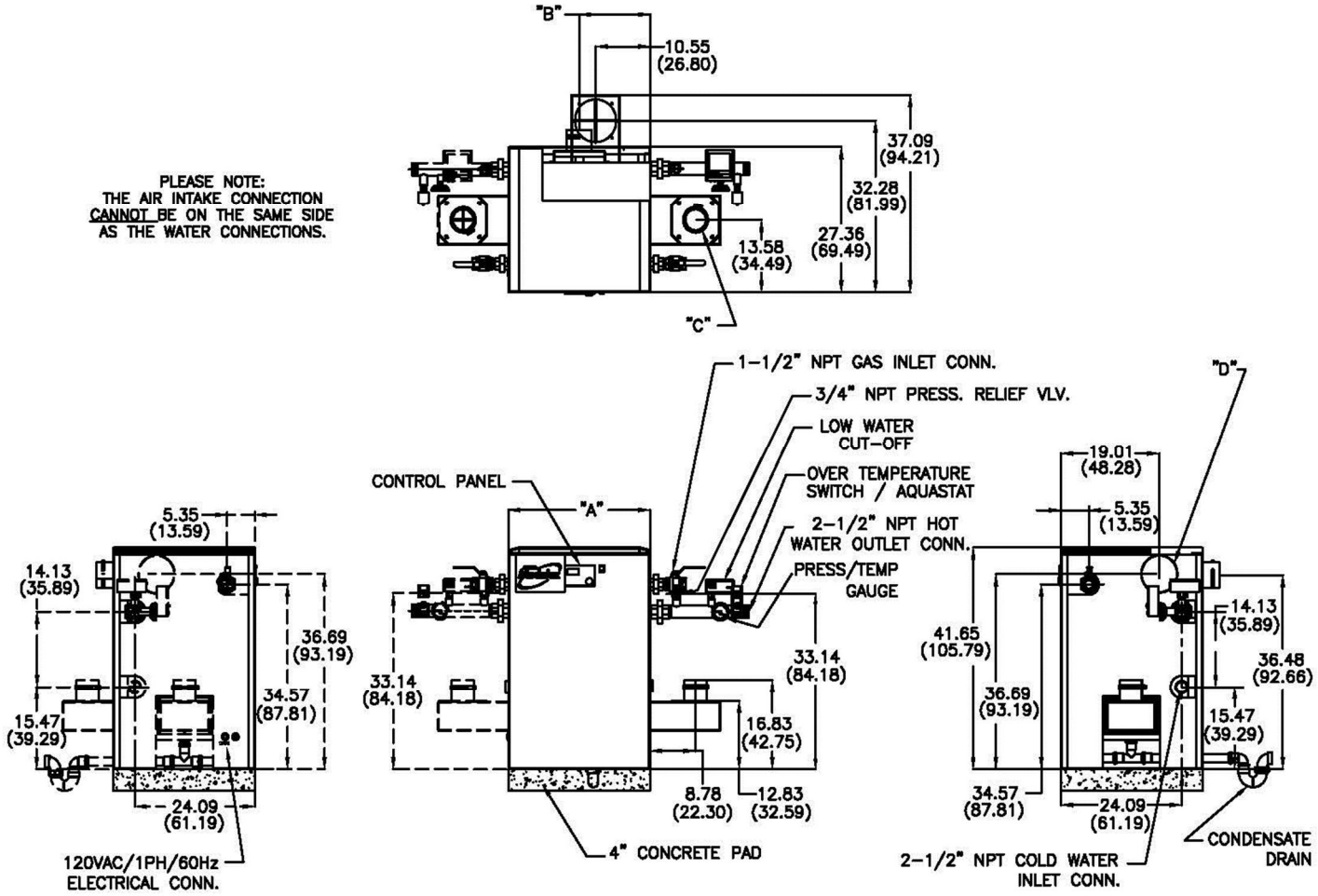
Model Number	Height	Width	Depth	Weight
MLX-303	42ò	28ò	27ò	405 lbs.
MLX-454	42ò	28ò	27ò	484 lbs.
MLX-606	42ò	33ò	27ò	575 lbs.
MLX-757	42ò	38ò	27ò	673 lbs.
MLX-909	42ò	44ò	27ò	764 lbs.
MLX-1060	42ò	49ò	27ò	869 lbs.

SPECIFICATIONS

	MLX-303	MLX-454	MLX-606	MLX-757	MLX-909	MLX-1060
Boiler Category	IV	IV	IV	IV	IV	IV
Gas Connections (NPT)	1.5ò	1.5ò	1.5ò	1.5ò	1.5ò	1.5ò
Max. Gas Pressure	14ò	14ò	14ò	14ò	14ò	14ò
Min. Gas Pressure	4ò	4ò	4ò	4ò	4ò	4ò
Max. Allowed Working Pressure	92 psi	92 psi	92 psi	92 psi	92 psi	92 psi
Electrical Req: 120V 15AMP max.	1.2 FLA	1.8 FLA	2.4 FLA	3.0 FLA	3.6 FLA	4.2 FLA
Water Connections (NPT)	2 1/2ò	2 1/2ò	2 1/2ò	2 1/2ò	2 1/2ò	2 1/2ò
Min. Water Flow (GPM)	11	17	22	28	34	39
Max. Water Flow (GPM)	28	42	55	70	84	98
Water Pressure Drop @ Max. Flow (Ft. of Hd)	7.8	9.3	9.4	10.0	10.1	10.2
Water Volume: Gallons	2.7	3.8	4.9	5.9	6.9	8.0
Water Volume: Liters	10.4	14.4	18.4	22.3	26.3	30.2
Thermal Modules	2	3	4	5	6	7
Turndown or Operating Range	6:1	10:1	13:1	16:1	20:1	23:1
Vent Size	4ò	4ò	4	6ò	6ò	6ò
Vent Materials (as per local code)	Can support PVC, CPVC or AL29-4C venting materials.					
Type of Gas	Natural Gas or Propane					
Temperature Control Range	Units deliver 50°-180°F supply; Min. 35°F inlet water required.					
Maximum Noise Level	All units deliver <50 dBa when operating at or below full fire.					
NOx Emissions Certification	Certified by SCAQMD and TCEQ; All units deliver <14 ppm NOx.					
Standard Listings and Approvals	CSA, ASME, CSD-1, MEA					
Water Quality	Ph operating range 6.5 to 8.0 and Glycol (if used) MUST be compatible Cast Aluminum heat exchangers.					

MLX DIMENSIONS

PLEASE NOTE:
THE AIR INTAKE CONNECTION
CANNOT BE ON THE SAME SIDE
AS THE WATER CONNECTIONS.



MATERIALS OF CONSTRUCTION
HEAT EXCHANGER: SAND CAST ALUMINUM ALLOY EN AC-AlSi10g(a), F Temper
HEAT EXCHANGER DESIGN STANDARDS
MAX. WORKING PRESS. (PSIG): 92 MAXIMUM TEMP. (°F): 200 TEST PRESS. (PSIG): 138
ASME B & PV CODE SECTION IV STAMP H

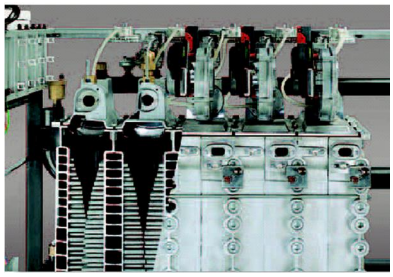
DIMENSION	MODULEX MODEL					
	MLX-303	MLX-454	MLX-606	MLX-757	MLX-909	MLX-1060
OVERALL WIDTH "A"	27.36 (69.49)	27.36 (69.49)	32.83 (83.39)	38.11 (96.80)	43.39 (110.21)	48.66 (123.60)
REAR AIR INTAKE LOCATION "B"	13.68 (34.75)	13.68 (34.75)	16.42 (41.71)	19.06 (48.41)	21.70 (55.12)	24.33 (61.80)
EXHAUST DIAMETER "C"	4 (10.16)	4 (10.16)	4 (10.16)	6 (15.24)	6 (15.24)	6 (15.24)
AIR INTAKE DIAMETER "D"	4 (10.16)	4 (10.16)	4 (10.16)	6 (15.24)	6 (15.24)	6 (15.24)

NOTES:
1) ALL DIMENSIONS SHOWN ARE IN INCHES (CENTIMETERS)
2) ALTERNATE LOCATIONS FOR COMPONENTS/CONNECTIONS ARE SHOWN IN DOTTED LINES.
3) WHEN USING ALTERNATE WATER CONNECTIONS, THE LEFT HAND AIR INTAKE CONNECTION CANNOT BE USED.
4) EXHAUST CONNECTION, AIR INTAKE CONNECTION, AND CONDENSATE TRAP ARE INCLUDED SEPARATELY IN SHIPMENT.
5) RELIEF VALVE, LOW WATER CUT-OFF, PRESS./TEMP GAUGE, AQUASTAT, AND THE 2-1/2" PIPE MANIFOLD FOR THESE COMPONENTS ARE INCLUDED SEPARATELY IN SHIPMENT.
6) THE pH, FOR BOILERS WITH ALUMINUM BODIES, MUST ALWAYS BE WITHIN 6.5 AND 8.0 pH.
7) GLYCOL SOLUTIONS: IF BOILER IS TO BE INSTALLED IN A SYSTEM WITH CONTAINS A GLYCOL SOLUTION, THE GLYCOL MUST BE COMPATIBLE WITH CAST ALUMINUM HEAT EXCHANGERS. USE OF INCOMPATIBLE GLYCOLS WILL VOID THE BOILER WARRANTY.
8) ALL PRECAUTIONS WILL BE TAKEN TO AVOID THE FORMATION AND LOCALIZATION OF OXYGEN IN THE WATER OF A HEATING SYSTEM.
9) AERCO REQUIRES THE INSTALLATION OF A 40 MESH OR FINER Y STRAINER TO KEEP DIRT OUT OF THE SYSTEM AND BOILER. THE STRAINER SHOULD BE INSTALLED IN THE RETURN PIPING WITH ISOLATION VALVES TO ALLOW FOR CLEANING AS NECESSARY.

INDEPENDENT THERMAL MODULE DESIGN

Depending on unit size, each AERCO Modulex boiler contains between two and seven, pre-assembled thermal modules housed within a common enclosure. Each standalone, 151,500 BTU/hr. thermal module features:

- a dedicated controller with built-in combustion safeguard;
- a variable speed fan;
- a modulating gas valve;
- an electronic iginition with flame detector;
- radiating, pre-mix, >3:1 modulating burner;
- flow temperature sensor;
- overtemperature limiting thermostat;
- cast aluminum heat exchanger.



Side view of 5- module unit shows cutaway of the first two thermal modules

As noted, the operation of each 151,500 BTU/hr thermal module is regulated by its own dedicated controller located internally along the front panel of the unit. Equipped with a combustion safeguard, each of these controllers drives the fan speed, gas delivery, burner turndown, etc. for its corresponding thermal module. All the individual thermal controllers are linked in a slave-to-master relationship with the boilerôs master controller. It is the master controller which drives or bypasses one or more thermal modules based on the total system load and in response to operating feedback received from each thermal module controller. For added reliability, the unitôs Boiler Communication Module also acts as a back-up master controller.

Model Number	Minimum Input	Maximum Input	Thermal Modules	Total Turndown
MLX-303	45,500	303,000	2	6:1
MLX-454	45,500	454,500	3	10:1
MLX-606	45,500	606,000	4	13:1
MLX-757	45,500	757,500	5	16:1
MLX-909	45,500	909,000	6	20:1
MLX-1060	45,500	1,060,500	7	23:1

Two or more AERCO Modulex boilers can be installed and controlled as a unified boiler plant in applications where greater than 1000 MBH is required.

ENHANCED RELIABILITY WITH GREATER SEASONAL EFFICIENCY

The independent operation of two or more thermal modules increases each boilerôs turndown range while also increasing its overall reliability. And since thermal efficiency increases as firing rates drop, the simultaneous low-fire operation of multiple modules also ensures that Modulex boilers continuously maximize operating efficiency.

For example, the MLX-1060 combines the power of seven thermal modules, each operating with greater than 3:1 turndown to deliver a 23:1 range of operations. From the low fire input of a single module (45,500 BTU/hr.) to the unitôs full fire capacity (1,060,000 BTU/hr.), the boiler precisely matches load without cycling or temperature overshoot. Importantly, it does so by always employing as many modules as possible, each firing at its lowest possible firing rate. Less energy is required for the group of thermal modules, each firing at part load, to heat a building than if only some modules, each operating at full fire, carried the entire load. Consequently, this approach to control results in greater fuel savings than if each thermal module reached its full 151,500 BTU/hr. capacity before the next module came on line.

In the event that one module is not working correctly, the remaining modules ï hence the boiler unit -- will continue to operate. Independently operating thermal modules deliver built-in redundancy to the boiler through the availability of multiple combustion safeguards, burners, gas valves, blowers, and the back-up master controller. Such a design approach is unique in the industry and can significantly reduce the need for redundant system capacity.

Represented by:

AERCO

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