

ARMSTRONG



ECO*PAK MBS™ Ultra-Efficient Boiler Plant

FILE NO:	81.18
DATE:	Nov. 16, 2009
SUPERSEDES:	NEW
DATE:	NEW

Ultra-Efficient Boiler Plant



► The Challenge

In response to rising energy costs, new commercial boiler plants are moving towards high-efficiency condensing boilers. The majority of existing boiler systems, still in use today, operate with large, inefficient non-condensing, cast iron models.

The conventional retrofit practice involves maneuvering boilers through doorways and fabricating the complete boiler system on-site. Each installation becomes a unique project using different sizes of boilers, components and controls. This process creates logistical issues because of the need to coordinate

mechanical and electrical trades to coincide with equipment delivery. The assembly process involves pipe-fitting for gas and water, in addition to field wiring of the boilers, pumps and controls. When retrofitting older systems, the costs and risks become high and often result in delays, cost over-runs and call-backs.

In addition to the complexity of installing a boiler system, there is a real sense of urgency for owners to protect themselves against rising fuel prices by reducing energy use.

► The Solution

The Armstrong ECO*PAK MBS™ line of modular boiler systems can eliminate traditional delays and risks for the installation of a boiler system.

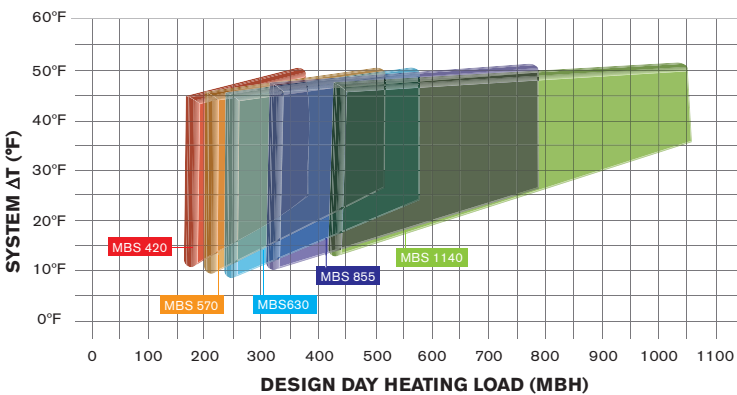
The ECO*PAK MBS is a factory-built, modular boiler system. Installation of the ECO*PAK MBS is fast and simple because of its compact size and modular design. The individual modules can be easily maneuvered through narrow spaces, including standard doorways. The modules can also be connected for operation within a few hours, by one person, accelerating delivery for building occupancy.

The ECO*PAK MBS is an all-variable-speed solution that greatly extends equipment life and improves efficiency. With a state-of-the-art integrated controller and user-friendly, color touch-screen, the ECO*PAK MBS uses proprietary

gas-saving control algorithms. This control system provides the benefits of a condensing boiler in systems that were not designed for condensing boilers, and still meet maximum load. Built-in diagnostics enable remote troubleshooting, reducing down time and maintenance costs.

Building owners and operators will benefit from the many built-in features, quick and easy installation, and trouble-free commissioning of the ECO*PAK MBS. It also provides environmental benefits through energy savings, employing boilers that are ENERGY STAR® compliant and 96% AFUE. In low-temperature radiant applications, efficiencies of more than 98% can be achieved, which exceeds the ENERGY STAR®, ASHRAE 90.1 and California Title 24 standards.

► The ECO*PAK MBS™ Design Envelope



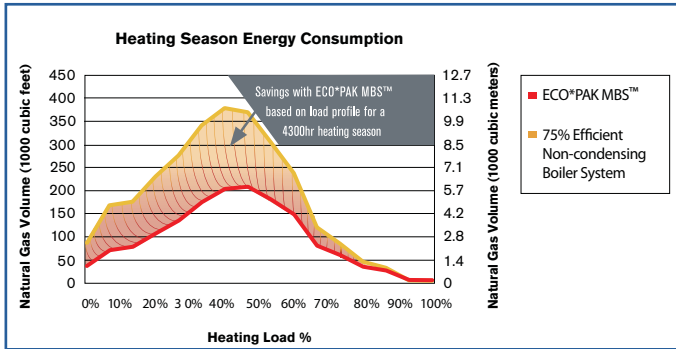
Low turndown capability accurately matches heat output with building requirements, at very low heating loads, while maintaining efficiencies of more than 90%.

ECO*PAK MBS™ TURNDOWN CAPACITIES						
MODEL	MIN			MAX		
	LOAD%	Btu/hr	Kilocalories/hr	LOAD%	Btu/hr	Kilocalories/hr
MODEL 420	10%	38,200	9626.4	100%	382,000	96264
MODEL 570	10%	51,800	13053.6	100%	518,000	130536
MODEL 630	7%	38,200	9626.4	100%	573,000	144396
MODEL 855	7%	51,800	13053.6	100%	777,000	195804
MODEL 1140	5%	51,800	13053.6	100%	1,036,000	261072

Armstrong Integrated Heating Solutions

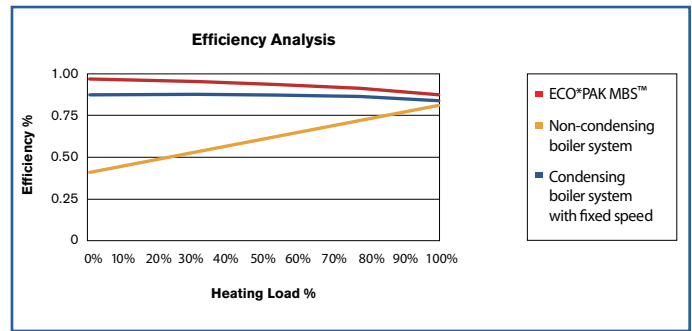
► Potential Savings with ECO*PAK MBS™ (Model 1140)

The graph below shows the annual natural gas savings of the ECO*PAK MBS compared to a 75% efficient traditional non-condensing boiler system.



► Efficiency Analysis

The efficiency analysis graph below illustrates that maximum efficiency is achieved when the ECO*PAK MBS is operating at part-load, between 20% to 50% of the actual design load. These high part-load efficiencies coupled with high part-load operating hours yield substantial energy savings.



► Most Efficient Boiler Plant, at No Extra Cost

The revolutionary, low carbon footprint, all-variable boiler system from Armstrong is aimed at reducing environmental impact and helping you save energy costs. The ECO*PAK MBS boiler is the option with the lowest cost and lowest risk available today for retrofitting an existing boiler plant, and once operating, it is more efficient than most other new construction systems.

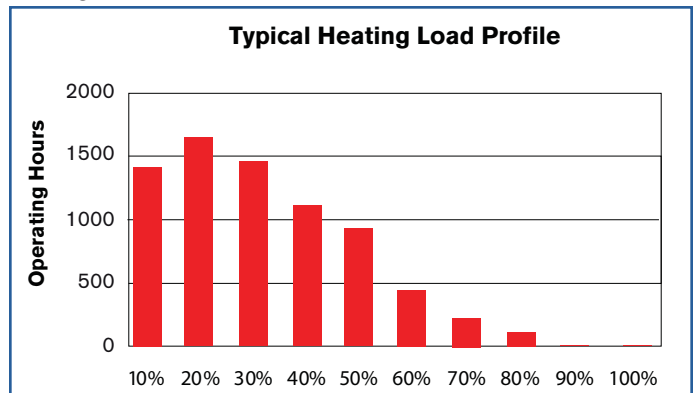
The ECO*PAK MBS integrates the best condensing boiler technology with the best flow control experience from Armstrong. Our patented controls and system construction ensure peak performance.

► Integrated Heating Solution from Armstrong Provides

- Easy installation
- Trouble-free startup
- Lower operating costs
- Longer equipment life
- Single scope of responsibility
- Ultra-efficient boiler solution
- Up to 45% energy savings vs. traditional boilers with industry standard efficiency
- Return on investment within 2-3 years based on energy savings

► Typical Heating Load Profile

The heating load profile graph below, for a 4300 hour heating season, shows that an average boiler system in North America operates at full load only 3% of the time and operates below 50% of design load 90% of the time. This holds true for all heating climate zones.



► Potential Annual Energy Savings

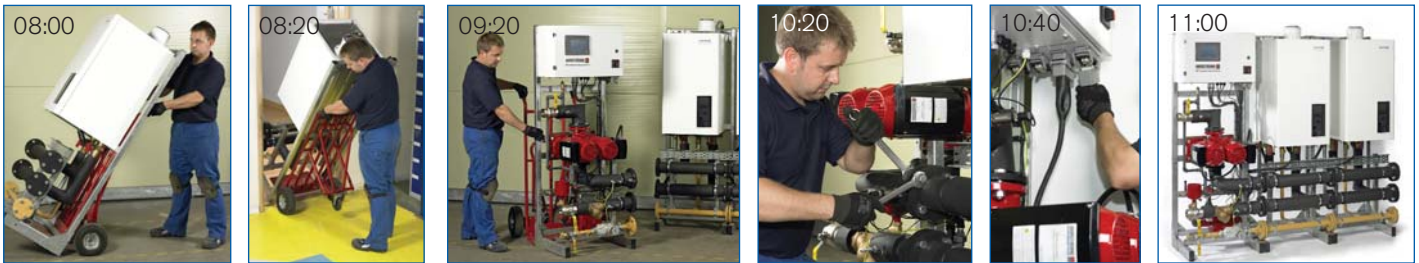
The Potential Annual Energy Savings table shows the annual energy savings of the ECO*PAK MBS in comparison to a less efficient system. For example, if the existing boiler system has an AFUE rating of 60% (top row), then the potential annual energy savings of the ECO*PAK MBS will be 63%, as seen in the bottom row of the same column.

ECO*PAK MBS™ Potential Annual Energy Savings								
Existing Boiler System AFUE (Peak)	50%	55%	60%	65%	70%	75%	80%	85%
Energy Savings with ECO*PAK MBS™ 1140	73%	68%	63%	57%	52%	47%	41%	36%

► Additional Features and Benefits

- High overall seasonal efficiencies ...Up to 94% overall seasonal efficiencies and low carbon emissions
- Variable speed pumpingReduces electricity consumption and matches duty to load
- Modulating load controlEnsures steady load matching and reduces wear on component parts
- Pressure controlled fill unitAutomatically fills and maintains the entire system to the pre-set cold fill pressure
- Touch-screen control panelAllows easy and secure access to mode and condition displays
- Weather compensationAutomatically adjusts system supply temperature in relation to varying outside temperatures
- Optimum startAutomatically calculates the best time to start the system each morning
- BMS/BAS compatiblePre-configured options for Trend, BACnet, Modbus, LonWorks, TCP/IP and GSM modem

► Fast and Simple Installation



A 3-module system can be assembled (mechanically and electrically) in as little as 3 hours.
Typical installed costs are 25% less than the traditional on-site approach.

► Applications

The ECO•PAK MBS is equally suited to new and retrofit installations in the following building types:

- Schools
- Military Establishments
- Correctional Facilities
- Hotels
- Sport Arenas
- Office Buildings
- Healthcare Facilities
- Student Dormitories
- Nursing Homes
- Apartment Buildings
- Government Buildings

For more details, please refer to data sheets, drawings and technical manuals.

EXPERIENCE BUILDING...

S. A. Armstrong Limited
23 Bertrand Avenue
Toronto, Ontario
Canada, M1L 2P3
T: 416-755-2291
F: 416-759-9101

Armstrong Pumps Inc.
93 East Avenue
North Tonawanda, New York
U.S.A., 14120-6594
T: 716-693-8813
F: 716-693-8970

Armstrong Holden Brooke Pullen
Wenlock Way
Manchester
United Kingdom, M12 5JL
T: +44 (0) 161 223 2223
F: +44 (0) 161 220 9660

ARMSTRONG 



© S.A. Armstrong Limited 2009

For Armstrong locations worldwide, please visit www.armstrongintegrated.com