



ECO*PAK MBS™
THE MODULAR INTEGRATED
HEATING SOLUTION THAT
SAVES TIME & ENERGY – AND
KEEPS COSTS DOWN





The Armstrong ECO*PAK MBS™

THE NEW OPPORTUNITY

EVERYTHING OLD CAN BE MADE NEW!

New efficiency standards are having a significant impact on both new construction and retrofit projects. Builders, owners, managers and engineers are increasingly looking to condensing boilers to achieve mandated seasonal efficiencies – and to provide cost savings through improved energy efficiency.

However, when condensing boilers are retrofitted to most existing systems, problems with outdated design, mismatched components, and primitive on/off boiler sequencing prevent the boilers from operating at peak efficiency.

But whether the installation is in a new build or a retrofit, putting different pieces together on-site to make up a complete system poses its own challenges. Most systems are not integrated or specifically designed for easy installation, so putting together a cohesive system can be difficult, time-consuming and can result in operational inefficiencies that waste money and energy in the long term.

In the past, installing condensing boilers on existing systems has restricted the overall efficiency when operating at design temperatures, (typically 180°F [82°C] supply and 160°F [71°C] return). To work best, condensing boilers need water return temperatures below 135°F [57°C].

The Armstrong ECO*PAK MBS™ employs a weather compensation curve which resets the supply temperature based on the outdoor air temperature. Adjusted supply (140°F [60°C]) means cooler return (below 120°F [49°C]) which allows the system to operate in condensing mode.

THE NEW SOLUTION: ECO*PAK MBS™

AN EFFICIENT, INTEGRATED, EASY-TO-INSTALL SYSTEM

Instead of boosting efficiency by upgrading individual components such as pipes and terminal units, building owners can upgrade the boiler system by installing a packaged integrated solution. The Armstrong ECO*PAK MBS™ is an integrated modular boiler package that uses intelligent automation to maximize operating efficiencies.

The ECO*PAK MBS™ is an easy-to-install system that's ideal for both retrofits and new construction, and is especially effective for small mechanical rooms with little available floor space. It is suited for use in:

- schools
- healthcare facilities
- military establishments
- residential buildings
- student residences
- government buildings
- nursing homes
- office buildings
- sports arenas
- hotels
- prisons
- churches

THE ECO*PAK MBS™ COMBINES EXCELLENT OPERATING EFFICIENCIES WITH FAST INSTALLATION.

All these building types can benefit from the many built-in features, as well as easy installation and trouble-free commissioning. The Armstrong ECO*PAK MBS™ uses a proprietary gas-saving control algorithm* that leverages variable speed technology to match the system flow to varying heat loads and ensures that the boilers operate in condensing mode.

**patent pending*



The ECO*PAK MBS™ Integrated controller

ARMSTRONG
EXPERIENCE IN FLUID CONTROL

01-15-91



STOP CLEAR RESET TEST

ARMSTRONG MBS MBS MBS

ECO*PAK™

ARMSTRONG

FAST, EASY INSTALLATION OF MODULES

AN EFFICIENT AND FLEXIBLE MODULAR DESIGN

The modular configuration makes the Armstrong ECO*PAK MBS™ maneuverable and easy to install. Each module fits easily through a standard doorway, and has a small physical footprint. It's a flexible system that's ideal for both retrofit and new construction, especially where a traditional mechanical room assembly would not be viable.

Only four connections are required to complete the ECO*PAK MBS™ installation:

- gas piping connection
- supply and return water connections
- electrical power connection (single point)
- BAS communication connection

A three-module system can be installed in as little as three hours, and a five-module system can be installed in five hours.

8:00



8:20



9:20



10:20



10:40



11:00



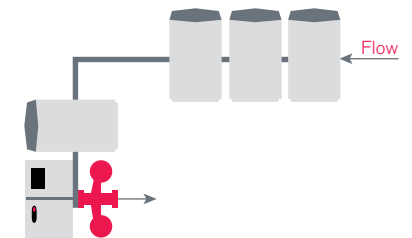
One installer – no special tools required
UK version shown.

Multiple Installation Configurations

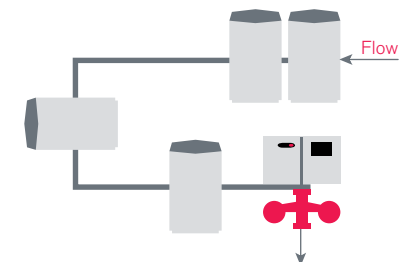
In-line



L-shape



U-shape



Armstrong Series 4392 Variable Speed Startwin 2x2x6 pump

ECO*PAK MBS™ FEATURES AND BENEFITS

Pre-engineered, factory built and pre-tested: Ensures a smooth commissioning process and reliable operation.

High overall seasonal efficiencies: With seasonal efficiencies of up to 96%, the system ensures lower operating costs and reduced Nitrogen Oxide (NOx) emissions.

Modulating load control: Proprietary technology+ ensures steady load matching and reduces wear and tear on component parts.

Modular layout: Easy and quick installation in multiple configurations.

Sustainable design: Easy to relocate or recycle.

Slim profile: Easily maneuvered by one person through a single doorway.

Variable speed pumping: Reduces electricity consumption and matches duty to load.

Auto water make-up assembly: Automatically fills and maintains the entire system to the preset cold fill pressure.

Color touch-screen display: Includes easy-to-use graphic controls and multi-level password-protected setup screens.

Weather compensation (HW supply temperature reset): Lower return water temperatures ensure higher operating efficiency and greater savings.

Optimum start: Automatically determines the best time to start the system each morning.

BAS/BMS compatible: Includes pre-configured options for BACnet, Modbus, LonWorks, TCP/IP and GSM modem.

Plug and play configuration: Pre-wired with quick-connects for easy connection of modules. The only field wiring required is a connection to a main power supply.

Pre-insulated pipe-work: Saves energy and reduces site labor costs.

Integrated gas meter: Assists in commissioning and helps monitor energy usage.

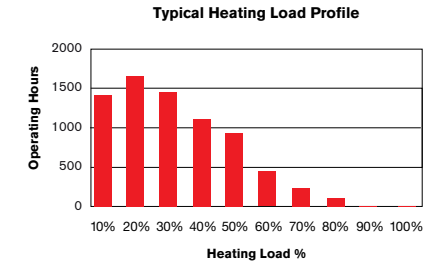
Integrated dosing pot: Enables safe dosing of essential water treatment chemicals.

Condensed Boiler Pumping+: ECO*PAK MBS is designed as a variable primary flow system with a single twin head pump for both primary and distribution system in a headered pumping configuration. The primary-only configuration eliminates the water mixing that wastes energy in primary / secondary configurations and reduces initial cost associated with the additional set of secondary pumps.

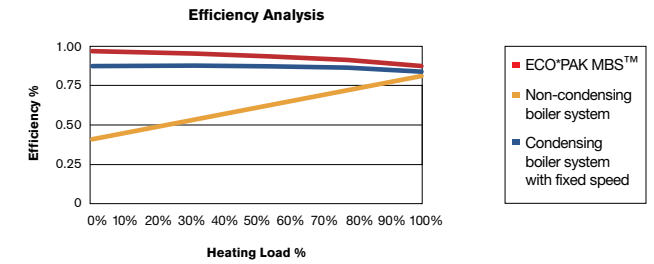
Modu-flow Boiler Pumping+: The modulating load control and floating outdoor ambient reset continuously adjusts the ECO*PAK MBS to match the actual building load, optimizing energy efficiency and occupant comfort. Modulating both variable water flow and flame control keeps the system operating in condensing mode under all load conditions. Traditional boiler systems use fixed speed pumps and control the burner flame using proportional integral derivative (PID) feedback control based on a fixed targeted leaving hot water temperature setpoint. The ECO*PAK MBS continuously adjusts the leaving hot water temperature setpoint, the flow and the burner flame to accurately match the actual building heating load.

Dynamic Boiler Curve Control+: Boilers are sequenced to ensure smooth and precise load matching. With the dynamic boiler control and variable-speed operation, on/off cycling of the boiler and pump is reduced, extending equipment life, improving comfort, and at the same time reducing energy use and maintenance costs. Traditional boiler controls use maximum design capacity-based sequencing to cycle parallel boilers. Typically both the boilers and the pumps would operate at full capacity until the temperature reaches a setpoint.

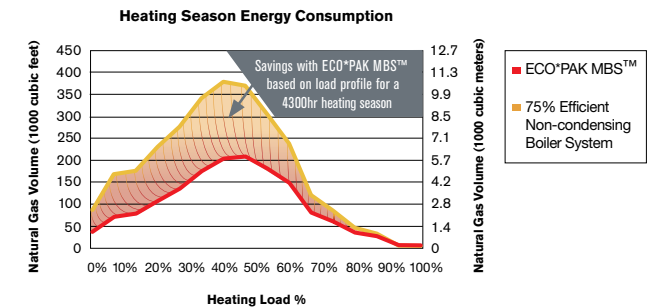
Traditional boiler systems are most efficient when operating at full load, so they are typically sized to match peak capacity with peak load requirements. However, most installations operate at peak heating load (90-100%) for only a few hours of the entire heating season. For all of the remaining operating hours in the heating season the boiler system operates at part load.



The ECO*PAK MBS™ is designed to serve the part load requirements of boiler system installations. The system operates at its maximum efficiency in part load situations (between 20% and 50% of the actual design load). As well, the ECO*PAK MBS™ delivers high-efficiency operation throughout the range of load conditions.



Annually, and throughout the lifespan of the system, the ECO*PAK MBS™ provides substantial energy savings compared to a 75% efficient traditional non-condensing boiler system. In this example, the non-condensing boiler system consumes a total of 375,000 cubic feet [10618 cubic meters] of natural gas when operating at 50% heating load during the heating season, while the ECO*PAK MBS consumes only 200,000 cubic feet [5660 cubic meters]. That's a 45% savings in energy costs at that heating load.



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™ 11 40	73%	68%	63%	57%	52%	47%	41%	36%

Annual energy savings of the ECO*PAK MBS™ compared to a less efficient system. For example, if the existing boiler system has an AFUE rating of 80% (top row), the potential annual energy savings of the ECO*PAK MBS™ will be 41%, as seen in the bottom of the same column.

+patent pending

The background is a vibrant green with diagonal stripes in shades of green and yellow. There are silhouettes of trees and foliage in the top left and bottom left corners. The overall aesthetic is clean, modern, and eco-friendly.

ECO*PAK MBS™

AN ENERGY-EFFICIENT, ENVIRONMENTALLY-FRIENDLY HEATING SOLUTION

When properly controlled, condensing boilers reclaim and convert wasted flue gas heat, resulting in lower carbon emissions, reduced NOx emissions, and a smaller carbon footprint. The ECO*PAK MBS™ integrates patented control technology to save more than 60% on fuel costs by optimizing operating efficiencies at all heating loads.

The system also provides installation cost savings of as much as 25%, compared to traditional on-site fabricated boiler systems.

