

## Technical Data Sheet

# AERCO C-More™ Control System

### Advanced Technology for Easy and Reliable Control of AERCO Gas-Fired Boilers and Water Heaters.

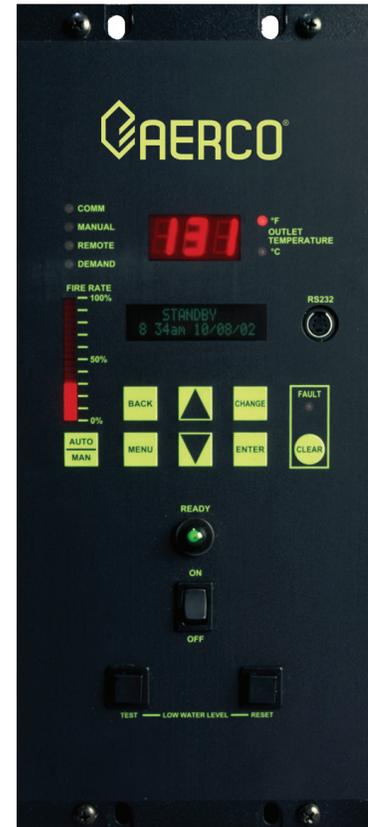
The AERCO C-More Control System offers customers more than just an easy-to-use, highly reliable control system for boiler and water heater management. The system incorporates the latest electronic technology to see and do more than was previously possible. It reports on individual system components such as unit status, firing rate and temperature control settings. It provides step-by-step diagnostic menus using clear and simple language and automatically captures performance history and operating trends.

Beyond these immediate benefits, the ruggedly built system has been designed using flash-upgrade able software components and open interoperability standards to support building automation and energy management software systems. Integrated Boiler and Water Heater Sequencing Technology is offered standard for optimal system efficiency and reliability.

It is included as a standard component on all AERCO Benchmark Boilers and Innovation Water Heaters. Older installations of the Benchmark boilers and discontinued KC1000 boilers and water heaters can be easily retrofitted with the AERCO C-More control system.

## Features

- Supports BAS and EMS Integration via ModBus Open Protocol
- Integrated Boiler Sequencing Technology (BST) on Benchmark units
- Water Heater Management (WHM) on Innovation units
- Optional Gateway for BACnet, Lonworks and N2 Communication also available
- Common platform on all Benchmark and Innovation units
- Log reports and fault history
- Rugged Hardware Design
- Simple and Clear Display Messages
- Step-by-Step Diagnostic Menus and System Status Reports
- Remote Monitoring Capability
- Precise Temperature Control
- UL Recognized



AERCO C-More Controller for  
Benchmark Boilers and  
Innovation Water Heaters

## Future-Proof Software in a Hardware Enclosure that is Built to Last

The most important feature of any product manufactured in today's "information age" is its ability to network with related equipment. And not just the equipment and systems that are available today – but those that are still on the horizon. This indisputable fact was a guiding principle in the design of the AERCO C-More Control System. It pairs software flexibility with hardware durability to ensure that your AERCO equipment will be as current tomorrow as it is today.

### Integrated Sequencing Technology

The C-More's integrated Boiler Sequencing Technology (BST) for Benchmark boilers & Water Heater Management (WHM) for Innovation Water Heaters is designed to maximize energy savings and uptime reliability in modular unit plants. The BST/WHM system can stage and coordinate operations for up to 8 units, utilizing AERCO's condensing equipment's unmatched modulation for utmost plant efficiency. The system offers sequential and parallel operation flexibility, and user programmable operation modes that can be easily adjusted. Furthermore, the system automatically rotates the lead unit to help equalize runtime or number of cycles. NOTE: When utilizing either BST or WHM, a gateway is required for BAS or EMS integration.



### Extensive Log Reports

The system continuously monitors and automatically captures data associated with operational events, faults and sensor readings which can be viewed in real-time via the Modbus RS485 RTU interface or downloaded for historical analysis through the RS-232 interface. Events such as power-up, ignition, and turn-off are time stamped and sensor value readings can be logged at flexible intervals established by the user. The system also maintains a log of the date, time and details of the last ten system faults to help end-users recognize boiler shutdown patterns.

### Open Platform Integrates with Energy Management Systems

The C-More controller is fully compatible with building-wide energy management systems and building automation software via ModBus open protocol. An optional AERCO Communications Gateway, to support integration with BACnet, Lonworks and N2 systems, is also available.

### Flash-Upgradeable Software

Once an AERCO C-More control module is in place, all new versions of the system's operating software can be uploaded electronically (or "flashed in"). The ability to upgrade the controller – without replacing hardware, circuit cards or boiler equipment – makes it faster, easier and less expensive to take advantage of new features and management controls that become available in the future.

### One Controller Fits All

AERCO C-More internal components are identical for Benchmark and Innovation equipment. Whole units or components can be swapped between any of AERCO's gas-fired boilers and water heaters as needed.

### Easy Retrofits

An affordable retrofit kit is available to equip any older existing AERCO gas-fired boiler or water heater installation with a state-of-the-art AERCO C-More control system. See document GF-2200 for Retrofit Kit / Part Number Guidelines to determine the kit needed for your AERCO equipment.

## Simple & Clear Display Messages are a Breeze for Maintenance

Forty-two distinct messages convey system status throughout the full start-up sequence and pinpoint the exact nature of any fault or operating problem. The easy-to-read display panel uses clear, simple language — rather than obscure programming codes — to ensure that day-to-day operations and annual maintenance goes smoothly for onsite maintenance staff and professional service contractors.

### Start Sequence Messages

DISABLED  
3:05PM 9/24/12

STANDBY  
3:06PM 9/24/12

DEMAND DELAY  
30 SEC

WAIT

PURGING  
30 SEC

IGNITION TRIAL  
4 SEC

WARMUP  
120 SEC

FLAME PROVEN  
3:08PM 9/24/12



### Fault Message Examples

LOW WATER  
LEVEL

AIRFLOW FAULT  
DURING PURGE

LOSS OF POWER  
3:09PM 9/24/12

DIRECT DRIVE  
SIGNAL FAULT

REMOTE SETPT  
SIGNAL FAULT

OUTDOOR TEMP  
SENSOR FAULT

LINE VOLTAGE OUT  
OUT OF PHASE

NETWORK COMM FAULT

### Step-by-Step Menu Check and Report Status of Each Component

The system has also been designed with step-by-step diagnostic menus to help personnel troubleshoot efficiently and quickly pinpoint problems. Users can test all system components as well as test keypad function, relay settings, switch positions, air/fuel valve calibration and sensor readings.

### Remote Upgrade, Monitoring and Troubleshooting Capabilities

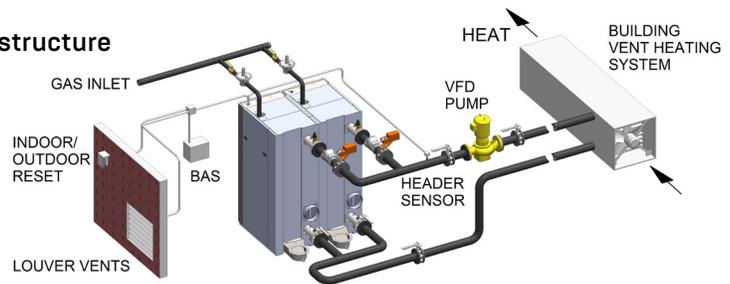
Opening the control module is unnecessary for initial system set-up, calibration, troubleshooting or during normal operations. The AERCO C-More controller links easily to a laptop via RS-232 connections so staff can monitor and troubleshoot issues remotely. AERCO also offers an optional service, On-AER Remote Monitoring, which monitors boiler plant operation, logs equipment heartbeat data and immediately notifies service representatives of any faults. The historical heartbeat data makes troubleshooting and resolving faults much easier, saving on repair time costs and offering peace of mind.

## Precise Temperature Control

The superior performance of AERCO equipment is due, in part, to tremendous condensing capabilities and unique firing technology. Put simply, AERCO extracts and transfers as much heat as possible from a highly efficient combustion process. Unparalleled, fully modulating, non-stepped burner turndown precisely matches heat input to load requirements. A state-of-the-art PID control system was employed to fully exploit the potential of such robust boiler mechanics. In short, it utilizes a Proportional + Integral + Derivative control algorithm to dynamically respond to changes throughout the heating plant operation. System temperatures, as well as a percentage of module input can be controlled with virtually no overshoot, droop or short cycling of equipment. A header temperature of  $\pm 4^{\circ}\text{F}$  is assured during continual plant operation.

## Integrated Approach to Overall Heating Plant Infrastructure

Such precise temperature control would not be possible without a highly integrated approach to the overall heating plant infrastructure. The AERCO C-More control supports equipment and information systems which extend beyond the limits of conventional boiler controls. These features will help you maximize the value of a sophisticated energy management system, or can assist with basic heating plant management in the absence of smart building systems.



## Interoperability with Energy Management Systems

(EMS) is achieved via the controller's RS485 port. Customers who are not equipped to take advantage of these network technologies can monitor trends in set point, outlet temperature or firing rates using conventional 4-20 mA signals.

A PID Temperature Control Override function prevents unnecessary shutdowns caused by external energy management controls. The feature gradually lowers the firing rate to safely operate the boiler until conditions return to normal. This prevents on/off cycling to save energy and reduce equipment wear and tear.

To help users start the heating plant as temperatures drop – or begin to promote client comfort and energy savings as temperatures warm – System Start Temp and Indoor/ Outdoor Reset controls can be used to enable or disable the boiler based on outside air temperature.

Similarly, Fail Safe Mode lets users choose to shut down the system or switch to constant set point operation if external signal input is ever lost. By choosing to revert to a constant set point, users can ensure that basic heat and hot water is available to avoid unnecessary building closures and prevent pipe freezes in the event of an EMS problem.

All AERCO equipment supports Variable Flow Designs and extremely low Flow Conditions without supplemental pumping requirements. While streamlining plant design is an effective way to reduce project and overall maintenance costs, AERCO C-More features are robust enough to support the most complex heating plant infrastructures. Remote and Delayed Interlocks, a Pump Delay Timer and/or Aux Start Delay can postpone the boiler's start-up sequence until a necessary external device is activated. Prior to operation, it can open a valve, boiler pump, gas booster, or louver as shown.



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