Technical Data Sheet

AERCO Edge™ Controller

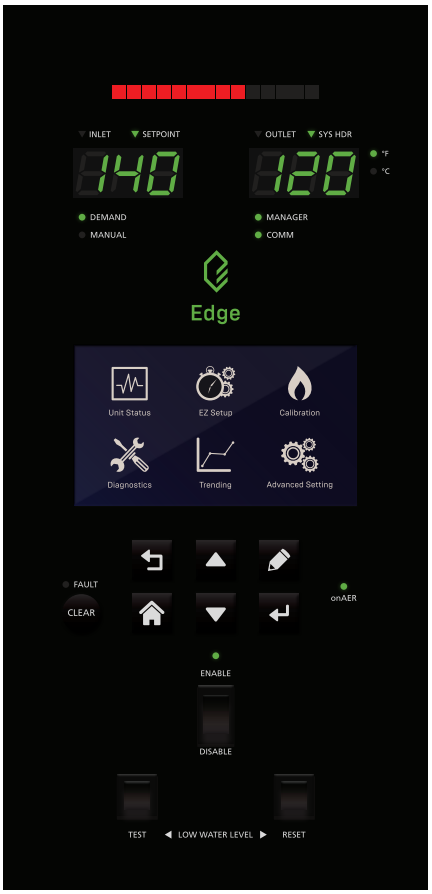
The Edge is a revolutionary controller designed to provide continuous benefit throughout the life cycle of a heating system: from project/operating cost savings, to simplified system design and startup, and optimized system performance and health monitoring.

The Edge Controller makes boiler startups effortless with EZ Setup – guiding users step by step through automated configuration, while Combustion Calibration Assist saves time and ensures precise combustion settings. Intuitive touchscreen and menu structure virtually eliminate programming errors. Graphical unit and plant status details are accessible onscreen; Bluetooth communication to tablet/mobile app allows mobility to user while maintaining complete control of unit.

Heating applications are optimized with the Edge Controller through control of valves and control/sequencing of pumps, as well as interfacing with AERCO SmartPlate indirect water heaters in combination plants. The flow balancing feature eliminates the need for individual boiler circuit setters, saving on installation and commissioning costs.

Built into the Edge Controller are AERCO's Boiler Sequencing Technology (BST), AERtrim System, and connectivity to onAER Predictive Maintenance – ensuring peak performance, system efficiency and reliability, while reducing cost of ownership.

The Edge comes with integrated BACnet & Modbus protocols for full compatibility with building automation and energy management systems. Firmware upgrade, settings transfer/backup and data logging are conveniently accomplished via a USB port.



Features

- EZ Setup with guided application configuration
- Boiler Sequencing Technology on Benchmark Platinum
- Precise Temperature Control
- SmartPlate control in combination plant applications
- System pump control and sequencing
- Valve Control
- Flow Balancing
- Combustion Calibration Assist
- Self-adjusting air-fuel ratio with AERtrim
- Intuitive Touchscreen, Graphical interface
- Integrated BACnet & Modbus Communication protocols
- Bluetooth communication to mobile app
- Transfer settings and upgrade firmware through USB port
- onAER Predictive Maintenance ready
- UL Listed

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 Edge Controller. It pairs software flexibility with hardware durability to ensure that your AERCO equipment will be as current tomorrow as it is today.

Startup and Setup made easy

EZ Setup simplifies start-ups, enabling even the most complex systems to be setup in minutes through intuitive, guided instructions. Settings can be uploaded without having to redo the same steps for each unit in the plant. Important unit and plant performance details are viewable without sifting through multiple screens. Units are precisely calibrated with Assisted or Manual Calibration options.

Edge strengthens performance by optimizing the overall system and increasing efficiency

Step by step guided setup ensures applications are configured correctly. Combination plant setup is made easy with two boiler groups for independent heating and domestic hot water control — unique swing boilers with swing valves control for heating and DHW with SmartPlate integration. This allows AERCO boilers and water heaters to work together for smoother, more efficient operation. Trend multiple parameters simultaneously for a more holistic insight on the health of the system. Troubleshooting is made easy with enhanced diagnostics and visual ignition sequence.

Flow Balancing and system pump sequencing saves installation and start-up costs

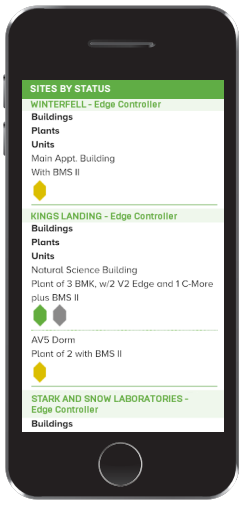
The Edge Controller features a single point flow balancing which can eliminate balancing valve installation if the project allows. Built-in system pump sequencing eliminates the need for separate pump sequencer for alternating pump operation, reducing complexity and equipment cost. Redundant pump is sequenced based on run-time, ensuring equal wear and tear.

Patented AERtrim ensures optimal O_2 levels, lowering operating and maintenance costs

AERtrim saves energy and lowers operating and maintenance cost by delivering the exact fuel needed for combustion. Precise air-fuel ratio increases condensing zone in the heat exchanger to maximize efficiency, deliver additional seasonal efficiency gains, and decreases emissions.

onAER Predictive Maintenance allows access to real-time system performance

With onAER, user does not merely address faults, but predict when to take action/ perform maintenance to prevent them. onAER allows users to see exactly how efficient their units and plants are, how many cycles per hour, O2 levels and more. Customer will be able to pro-actively review data and trends to ensure units are operating optimally. Instant alerts are received if a unit is down and see which ones need attention - view possible causes and suggested actions.



Integrated BACnet & Modbus protocols for full Compatibility with BAS

For facilities that have taken a building-wide approach to energy efficiency, the Edge has integrated BACnet IP, BACnet MSTP, Modbus RTU and Modbus TCP for easy integration with Building Automation Software (BAS). In addition, it offers an optional LonWorks compatibility using Modbus protocol and RS-485 interface.

Enhanced graphics with Mobile App

For greater flexibility, our mobile app functions as a high definition, large screen controller with enhanced graphics giving you full control functionality and freedom to move around the unit when configuring, diagnosing and troubleshooting.
Users can conveniently submit service forms to AERCO directly from the app.

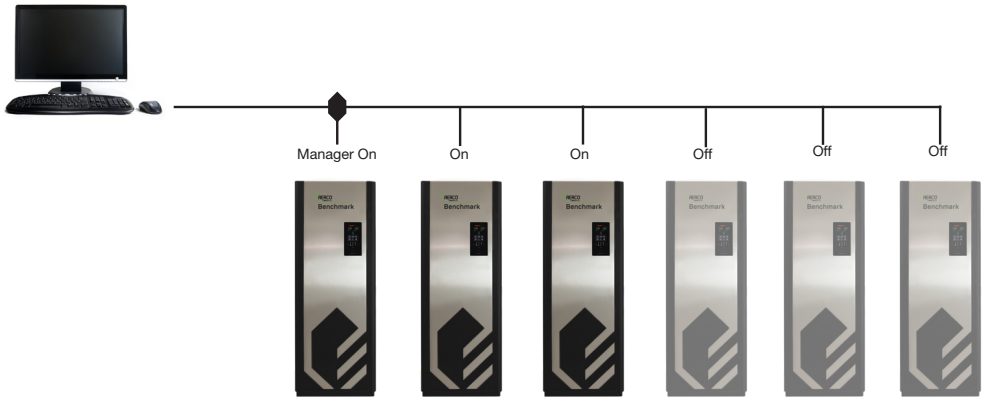
Simplified Software Upgrade

Once an AERCO Edge Controller is in place, all new versions of the system's operating software can be uploaded via a USB port. 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.

Boiler Sequencing Technology (BST) - Load Sharing Strategy Maximizes Energy Efficiency

The Edge's integrated BST for Benchmark boilers is designed to maximize energy savings and uptime reliability in modular unit plants. It requires less energy for a group of modulating boilers, each firing at "part load," to heat a building, than for a single boiler operating at "full fire" to carry the entire workload. The BST system can stage and coordinate operations for up to 16 units, utilizing AERCO's condensing equipment's unmatched modulation for utmost plant efficiency. To meet building demand, the BST will employ as many boilers as available, each operating at its most efficient firing rate. And as individual boilers are added or deleted, the energy delivered is automatically adjusted to prevent fluctuations in the header temperature of the plant.
For boiler plants greater than 16 boilers, the AERCO Control System (ACS) panel is required. Able to regulate overall plant output with precise accuracy, a boiler plant with ±4°F header temperature variation is assured under normal load conditions. It offers sequential or parallel operation flexibility, and user programmable modes of operation that can be easily adjusted.

BST Breakthrough Features Sustain Efficient Boiler Plant Operation



Precise Temperature Control

The BST uses PID (Proportional & Integral + Derivative) and Dynamic Up/Dynamic Down Modulation control algorithm to provide a dynamic response to all changes in plant operation. Header temperatures, as well as percentage boiler input, are precisely controlled with virtually no overshoot or short cycling of equipment. A header temperature of ±4°F is assured during continual plant operation.

Lead/Lag Boiler Designation and Rotation

The BST will select the Lead and Lag boilers by either Unit Size or Run Hours depending on user setting. The Lead and Lag boilers can also be manually selected by the user. Lead boilers are rotated at specified time and helps equalize runtime.

Anti-Cycling Features

These features prolong the system's stay at specific state (firing/off) - reducing the number of cycles while maintaining accurate temperature control: Shutoff Delay Temp, Demand offset, Deadband high and Deadband low.

Low Flow Mode

An INNOVATIVE and EXCLUSIVE feature in the AERCO BST control that detects a "low-flow" condition in a multi-boiler system. When the AERCO BST determines that a low-flow condition exists, it will slowly shut down one boiler at a time in an attempt to raise the Fire Rate of the remaining boilers. If the low-flow condition persists and only a single boiler remains ignited, the AERCO BST will use the "Outlet Temperature Sensor" of the remaining ignited boiler to control the temperature. The Outlet Temperature Sensor is mounted in the individual boiler and drastically increases the response time to precisely control temperature. The distant header sensor is ignored in this mode of operation.

Setback Setpoint Gradual Decrease

Whenever boilers are running at a high rate and the Setback-Setpoint feature is activated, the sudden decrease in setpoint will cause the PID to drastically cut back on fire rate. This sudden decrease in fire rate will often cause the boilers to drop below their Stop Levels causing them to turn off, thereby causing excessive cycling and loss of heating capacity while the boilers can re-ignite. The Setback-Setpoint gradual decrease feature will decrease the setpoint, lowered by the activation of the Setback-Setpoint feature, at a slow rate thereby allowing the PID to recover and prevent any boilers from shutting down if not required to do so.

Warm-Up and Low-Fire-Delay Fire Rate Hold

When an extra boiler is ignited to meet demand, the fire rate of all ignited boilers will be held at their present level until the newly ignited boiler has completed Warm-up and Low Fire Delay. When the newly ignited boiler has completed Warm-up and Low Fire Delay, all boiler fire rates will decrease to approx. 30% Fire Rate. All boiler fire rates will then rise together to the required fire rate to meet demand.

Next Turn On Valve Position

When all ignited boilers reach or exceed the BST Next on VP value, another boiler will be ignited to share the load (if one is available). The default value is 50%. This feature is also useful if a user wishes to always have as few boilers on at any one time. Setting the BST Next on VP value to a high number (Example 100%) will only ignite a new boiler if all currently ignited boilers reach their total BTU capacity (100%).

Warm-Up and Low-Fire-Delay PID Hold

Whenever any boiler is in either Warm-up or Low Fire Delay, the Integral portion of the BST PID will be frozen in order to prevent the PID from winding up too high causing the temperature to overshoot causing an over-temp condition.

Setpoint Approach Rate control – To avoid header temperature overshoots, whenever the header temperature nears the setpoint temperature at a rate too quickly to prevent a temperature overshoot, the BST fire rate will temporarily decrease in order to lower the temperature rise momentum. This feature will help avoid temperature overshoots due to variable flow as well as other conditions.

Automatic Transfer of Manager Function

In the event the manager unit experiences a panel failure or communication loss, the BST system will automatically transfer the manager function to the next available unit in the system plant. This ensures maximum efficiency and intended plant operation in face of the events mentioned above. This capability requires a Modbus Transmitter box and dual element sensors.

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