



# ARCTIC™

## Stainless Steel, Condensing, Gas-Fired Commercial Boiler

Because Reliability and Longevity Matter

- 95% AHRI-Certified Efficiency
- 1000, 1500, 2000, 2500, 3000 MBH
- Lifetime Shockproof Seal
- Knockdown or Fully Packaged
- Field-Repairable Heat Exchanger
- Variable Primary or Primary/  
Secondary Piping
- 100°F Delta-T with Low Minimum  
Flows
- Concert™ Touch Screen Display
- Designed and Made in the U.S.A.



**THERMAL**®  
**SOLUTIONS**  
Innovative Equipment for Hot Water Systems



## Longevity & Servicability Delivered to Condensing Space

Flexible watertubes have long been the workhorse of the boiler industry, naturally flexing and moving with expansion & contraction that occurs in heating. These tubes are unrivaled at absorbing and transferring the intense heat of today's burners into water and distributed as heat. Thermal Solutions uses no welds in mechanically sealing tubes to header and provides a lifetime warranty on this seal. With no welds, the Arctic permits field access for tube replacement making it the only field repairable heat exchanger in the condensing market. The Arctic is available fully packaged, or if required, knockdown for ease of onsite maneuvering and assembly, another industry first.



### Weld-Free from Tube to Header!

Tapered end-forms are mechanically fitted into the upper and lower headers allowing water to pass from tube to header. This proven assembly method has stood the test of time for nearly 100 years and is backed by a **Lifetime Shockproof Seal of Certainty** against leakage due to thermal shock. Capable of up to 100°F delta-T, no welded boiler can provide this assurance and longevity

### High Temperature Supply Header

We use flexible watertubes for what they do best;

- Flex and move with heat
- Absorb 2000°F burner heat into water
- Field-replaceable tubes



### Low Temperature Return Header

- Maximum heat transfer
- Minimal waterside pressure drop
- 0.33 ft. hd. at 57 gpm min. flow on ARC-3000

### Variable Primary or Primary/Secondary Piping

Low waterside pressure drop and minimal flow requirements make the Arctic ideal for variable primary and LEED conscious designs. Also well suited for primary/secondary piping, advocates isolating boiler from system flows can further benefit from optional **Eco Propel Cognitive Pump Technology**. Improve overall system efficiency by harmonizing firing rates and boiler pump speeds to maintain designed flow rates across all firing rates and reduce electrical consumption. Boiler-to-pump setup is done effortlessly on the Concert Boiler Control display eliminating complex programming at the pump.

### Advanced Control Platform – Concert™ Boiler Control

- 7" touch screen
- Icon navigation
- USB data sharing port
- BMS & peer-to-peer sequencing

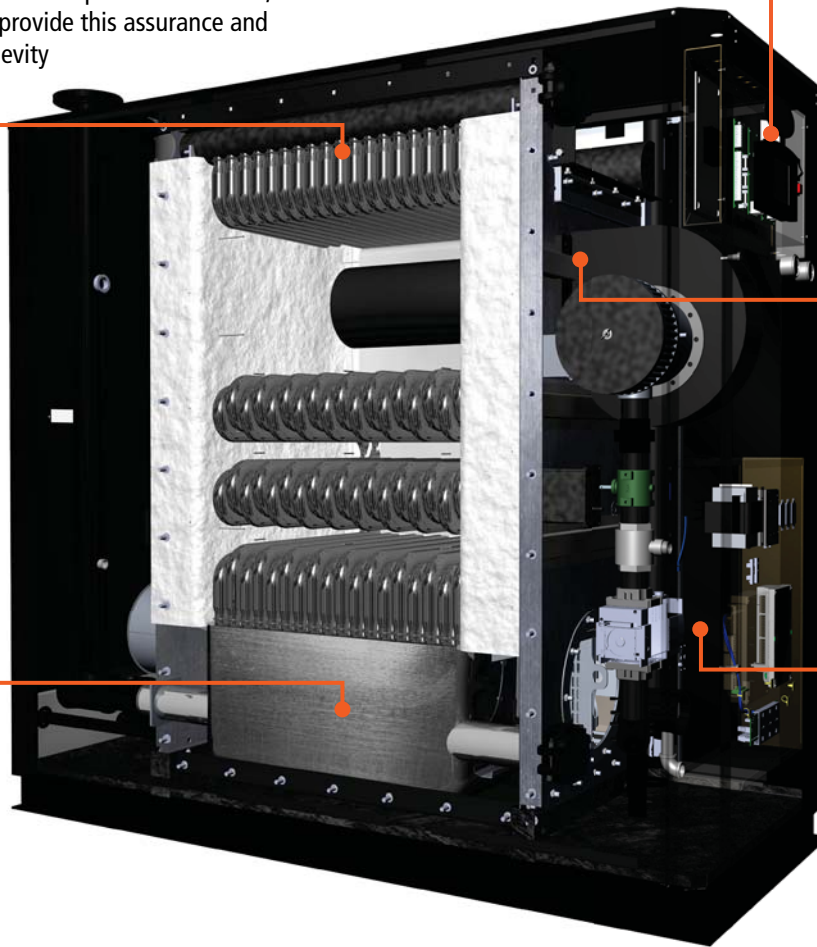
### Combustion Design

- Standard 5:1 turndown
- Optional up to 20:1 turndown
- Direct spark
- UV scanner
- Low NOx capable

### Service-Friendly by Design

Accessibility for service and maintenance is another vital feature to the overall design:

- Electrical panel available from front door
- Burner/blower assembly easily reached through front door and/or removable side flue collector doors
- Heat exchanger tubes accessible from removable side flue collector doors

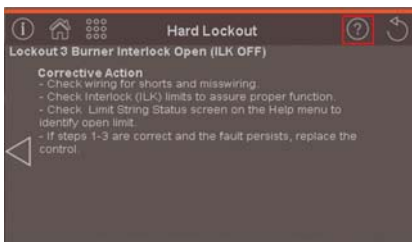


# Advanced Commercial Boiler Control...Putting your System in Tune

**The Concert™ Boiler Control** includes features and functions designed to save energy, optimize long-term efficiency, and integrate seamlessly with all Energy Management Systems (EMS). Built on a proven control platform, Concert is the most comprehensive commercial boiler control on the market - from Intuitive Icon Navigation, to Self Guiding Diagnostics, Unmatched Archives, USB Data Sharing, and other unique features & optional system enhancements that separate this control from all the others!



**Intuitive Icon Navigation** – “Touch” and move through our control menus effortlessly. Whether it be commissioning the boiler with the “Quick Setup” menu, pinpointing fault codes with corrective actions in seconds or seamlessly connecting to an EMS. Extensive data archives with graphical displays are available to evaluate boiler performance and make value-added adjustments to maximize boiler & system efficiency.



**Self-Guiding Diagnostics** – Troubleshooting boiler issues has never been this easy! The industry-leading fault identification and correction feature allows the service technician to quickly drill down on the issue, with cause and corrective measures.



**Unmatched Archives** – With the largest collection of stored operational data (4 months), no stone is left unturned when it comes to evaluating a boiler’s performance and pinpointing adjustment for improvement. The boiler’s onboard energy management system is a true step above all others!



**USB Data Sharing** – Make room on the tool belt for a flash drive as the USB data sharing port has become another important device to have in commissioning (upload/download settings from one boiler to the next), servicing (download data and email file to factory for assistance) and analyzing boiler operation (historical info can be downloaded & saved in .CRV formatted files).

## Unique Features:

- Complete EMS Interface - Read and write firing rate demand & setpoint.
- A.I.D. (Advanced Input Determination) - Firing rate and water temperature based algorithms for multiple boilers.
- Factory Default Settings - Restore control parameters back to factory settings.
- Real Time BTU/Hr Display
- Time/Date Stamp - On all logged events.
- Two (2) Boiler Start/Stop Trigger - Support large domestic hot water demands.
- USB Data Sharing Port - Easily Transfer parameters from boiler to boiler.

## Options:

- Eco Propel Cognitive Pump Technology – Provides variable speed pumping control for increased energy savings
- Motorized Isolation Valves - Maintain energy efficient flow requirements for variable flow systems.
- 0-10 vdc Input - Converts 0-10vdc signal from EMS to 4-20mAdc for our control.
- Wireless Outdoor Sensor - Saves installation time.
- BACnet, Metasys N2, LonWorks and Modbus -Communication gateway translates effectively to various EMS protocols.



## Arctic Standard Equipment

### PRESSURE VESSEL DESIGN

ASME certified stainless steel heat exchanger  
ASME Section IV-certified, "H" Stamp  
MAWP 160 PSIG & max temp 210°F  
Ten Year limited heat exchanger warranty  
Lifetime thermal shock warranty

### COMBUSTION DESIGN

Stainless steel mesh pre-mix burner  
Low NOx emissions  
Full modulation, 5:1 turndown  
Natural gas (consult factory on LP gas)  
4" wc to 14"wc inlet gas pressure

Direct spark ignition system/UV scanner  
Variable speed combustion blower  
Air proving switch  
High altitude available; please consult factory

### VENTING

Direct vent – horizontal or vertical (Cat. IV)  
Air intake – Ducted or room air (Cat. IV)

### BOILER EQUIPMENT

Concert Boiler Control™ (24 Vac)  
High limit w/auto reset temperature control  
High limit w/ manual reset safety temperature control  
Water flow switch (ARC-1000 only)  
Supply & return water temperature sensors  
Flue gas temperature sensor  
Air vent valve  
Boiler drain valve  
Condensate trap  
Pressure & temperature gauge  
ASME safety relief valve 50 psig (optional 30,60,75,100,125, or 150 psig)

### ELECTRICAL DESIGN

120 VAC / 60 Hertz / 1 phase power supply (ARC-1000)  
208-240 VAC / 60 Hertz / 1 phase power supply (ARC-1500 to 3000)  
208-240-460 VAC / 60 Hertz / 3 phase power supply (ARC-2000 to 3000)  
24 VAC low voltage control power supply

## Arctic Optional Equipment

Condensate neutralizer  
Header sensor, direct immersion  
Header sensor, well immersion (with well)  
Knockdown configuration  
Reverse construction



## Concert Boiler Control

### Dashboard - color touch screen display, 7"

- Intuitive icon navigation
- "Quick" setup menus
- "Real time" BTU/H display\*

### Two (2) temperature demand inputs

- Outdoor air reset curve for each input
- Time of day setback capability (EnviraCom thermostat must be installed)

### Three (3) pump control

- Boiler pump with on/off or variable speed cont.
- Domestic hot water (DHW) pump
- System pump
- Alternative control to isolation valve, combustion air damper, or standby loss damper
- Pump overrun for heat dissipation
- Pump exercise
- Pump rotor seizing protection

### Peer-to-peer boiler communications

- Multiple size boiler sequencing up to 8 units
- Two (2) boiler start/stop trigger\*
- Lead boiler automatic rotation

### Energy management system (EMS) interface

- Firing rate and water temperature based algorithms for multiple boilers; loss of EMS signal defaults to local boiler settings\*
- 4-20mAdc input/output (0-10Vdc optional converter)
- ModBus Input/Output (BACnet or LonWorks optional gateway)
- Simultaneous interface with peer-to-peer

### USB data port transfer\*

- Upload settings between boilers
- Download parameters for troubleshooting
- Import data into .CRV formatted files for performance analysis

### Energy efficiency enhancer

- Anti-cycling technology
- Multiple boiler base load common rate
- Outdoor air temperature reset curve
- Warm weather shutdown
- Boost temperature & time
- Ramp delay
- Over-temperature safeguarding

### Self-guiding diagnostics

- Identifies fault
- Describes possible problems
- Provides corrective actions

### Time/Date stamp on alarms and lockouts\*

### Unmatched archives

- Historical trends - collects up to 4 months of data
- Event History - up to 3,000 alarms, lockouts, and cycle & run times
- Alarm-limit string faults, holds, lockouts and others
- Cycle & run time - boilers & pumps
- Resettable (lockouts/alarms/cycles & run time)

### Domestic hot water priority

- DHW tank piped with priority in the boiler loop
- DHW tank piped as a zone in the system with the pumps controlled by the Concert control
- DHW modulation limiting

### Other features

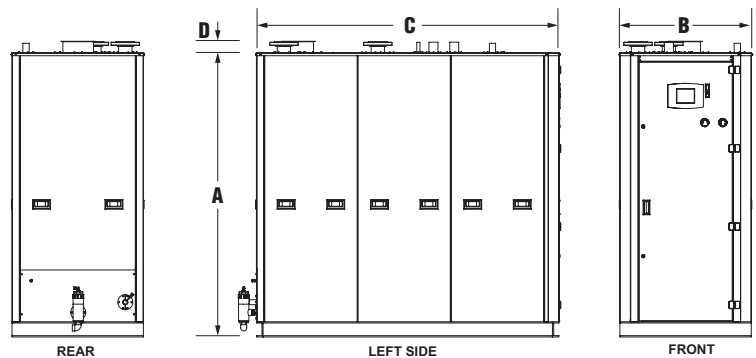
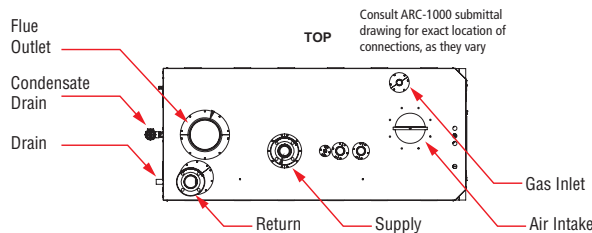
- Factory default settings\*
- Three level password security
- Frost protection
- Sensor monitoring and control
- Low water flow safety control & indication
- Proportion integral derivative (PID) parameters for central heat, DHW, sequencer and fan
- Built-in brown-out protection

\* Unique to Thermal Solutions

## Concert Boiler Control Options

- Communications gateway - BACnet, LonWorks or Modbus compatible
- Wireless outdoor air temperature kit
- 0-10v signal converter

## Specifications, Dimensions, & Ratings



MODEL	Ratings			THERM EFF. %	"A" HEIGHT (IN.)	"B" WIDTH (IN.)	"C" LENGTH (IN.)	"D" CONN. HEIGHT (IN.)	SUPPLY/ RETURN CONN. (IN.)	VENT DIA. (IN.)	AIR INTAKE DIA. (IN.)	CONDENSATE & BOILER DRAIN CONN. (IN.)	GAS CONN. (IN.)	APPROX. SHIPPING WEIGHT (LBS)
	MIN INPUT (MBH)	MAX INPUT (MBH)	GROSS OUTPUT (MBH)											
ARC-1000	200	1000	950	95.0	64	29	72	6	3 Victaulic	6	6	1	1	1185
ARC-1500	300	1500	1425	95.0	75	35	80	3	3 Flange	8	8	1	2	2020
ARC-2000	400	2000	1900	95.0	75	35	80	3	3 Flange	8	8	1	2	2020
ARC-2500	500	2500	2375	95.0	75	35	93	3	3 Flange	10	10	1	2	2500
ARC-3000	600	3000	2850	95.0	75	35	93	3	3 Flange	10	10	1	2	2500

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