

Apex™ Series

STAINLESS STEEL, CONDENSING,
GAS-FIRED COMMERCIAL BOILER

95% THERMAL EFFICIENCY

500, 625, 725,
800 MBH

MULTIPLE
VENTING OPTIONS
UP TO 200
EQUIVALENT FEET

NEGATIVE
PRESSURE
CABINET

5:1 MODULATION

RELIEF VALVE
UP TO 100PSI

SUB 20PPM NO_x

STACKABLE



EQUIPPED WITH ABC 2.1 CONTROL SYSTEM

- MULTIPLE BOILER LEAD/LAG
UP TO 8 BOILERS
- LCD TOUCHSCREEN DISPLAY
- INTUITIVE TEXT-BASED MENUS
- OUTDOOR RESET



BURNHAM®

Commercial Boilers

Apex Boiler FEATURES

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• **FLEXIBILITY OF VENTING OPTIONS**

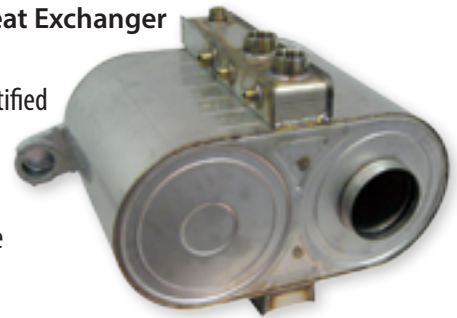
The ability to vent by using PVC material provides multiple venting options and enables a greater level of choice concerning the layout of a boiler room. Apex boilers can be vented horizontally with a sidewall penetration, or vertically. In addition to PVC, the Apex can be vented with concentric polypropylene (500 model only), AL29-4C stainless steel piping or with single wall rigid and/or flexible polypropylene vent piping.

High Performance Commercial Hydronic and Radiant Heating

Introducing the Apex from Burnham Commercial, a condensing boiler with thermal efficiency ratings of 95%. The Apex utilizes a stainless steel heat exchanger, designed to extract maximum heat from the combustion process, along with the Apex Boiler Control System which is designed to enhance boiler and system efficiency and provide easy installation and servicing. These intelligent features are wrapped in a sleek, modern appliance-like jacket, which makes the Apex both attractive and smart.

Stainless Steel Heat Exchanger

The heart of the Apex boiler is the ASME-certified stainless steel heat exchanger. Each heat exchanger is factory hydro-tested to ensure quality and reliability.



The Apex Boiler Control System

The Apex Boiler Control System (ABC System) has many features which maximize the efficiency and comfort of a heating system, while providing unmatched ease of use (for a full description of these features, please see pages 4–5).

- LCD touchscreen display
- Intuitive menus which provide data in simple text, not in cryptic codes
- Capable of linking up to eight boilers and three pumps simultaneously
- Control data logging
- Outdoor reset and warm weather shutdown
- Domestic hot water priority
- Full modulation with 5-to-1 turndown and adaptable firing rate output
- Built in provision for off-season pump exercising
- Plug and play connections
- Multiple and adjustable pump outputs
- Night setback and unoccupied modes
- 4–20mA and modbus inputs
- EMS Gateway to BacNet, LonWorks®, Modbus (optional)

Apex Boiler FEATURES

Single Point Power

Boiler pump and DHW pump are powered directly from the Apex

Sealed Combustion with Negative Cabinet Pressure

Lower portion of the boiler cabinet operates under a negative pressure, creating an additional layer of safety

Simple Connections

All gas, water and electrical connections are made from the left side of the boiler

Condensate Protection

Unique polypropylene condensate trap (patented) stands up to acidic condensate and features an integral float switch which protects the heat exchanger from condensate back-up

Sealed Top Panel

The sealed top panel protects boiler controls from spills or leaks; the components are also isolated from the lower jacket to protect them from cold or moist combustion air

Smart Controls

ABC 2.1 control system offers multiple boiler lead/lag for up to eight (8) boilers, LCD touchscreen display, intuitive text-based menus and outdoor reset

Efficient Combustion

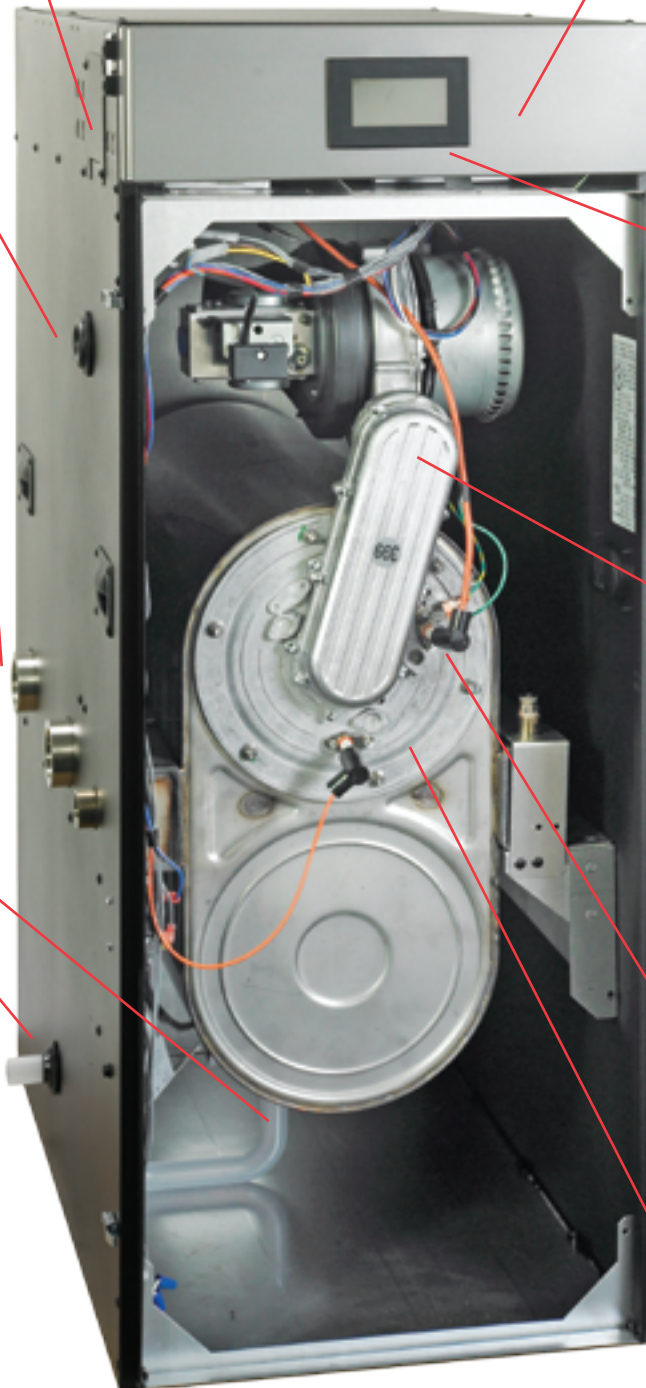
Air and fuel are pre-mixed in the blower assembly for clean, balanced combustion, longer component life and protection of mechanical fan components

Design Simplicity

Separate spark rod and flame sensor are used for longevity and reliability

Durable, Efficient Stainless Steel Heat Exchanger

Maximizes heat transfer



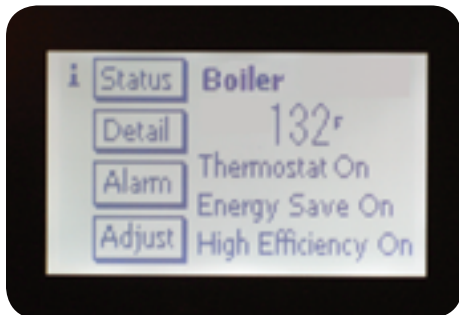
Apex Boiler Control FEATURES BEYOND COMPARE

PAGE 4

The Apex Boiler Control System is the next generation of advanced electronic controls designed specifically for condensing boilers. The ABC System was designed with many features that make the control simple to understand and use, as well as features that optimize boiler performance, flexibility and overall system efficiency and reliability. The ABC System is simply the most powerful, versatile and user-friendly boiler control available.

Touch Screen LCD Display

- Simple setup! Requires only four inputs (boiler minimum and maximum water temperatures and outdoor air minimum and maximum temperatures).
- Boiler status, settings and diagnostic information are all accessible from the display in simple English text.
- Settings are password protected.
- Built-in diagnostics.
- Display turns red in the event of lockout.



Control Data Logging

- Can display and recall information from numerous control parameters.
- Previous five (5) lock-out events can be recalled on the display.
- Logs runtime hours for the boiler as well as the number of cycles for the boiler, the boiler pump, the DHW pump and the system pump.

Outdoor Reset

- Adjusts boiler temperature based on the outdoor temperature.
- Helps to keep the boiler in condensing mode longer, resulting in higher efficiency.
- Improves comfort by reducing overheating of the zones.

Domestic Priority with Priority Protection

- Directs boiler output to the indirect water heater.
- Priority Protection is provided to allow the boiler to continue heating in the event of excessive domestic hot water demand.

Control Flexibility

- Responds to multiple heating demands, and features adjustable pump outputs.
- Pump outputs for system, boiler and domestic hot water pumps.

Warm Weather Shutdown

- Ideal for commercial installations that maintain heating loop temperatures year round.
- Fully adjustable.

Freeze Protection

- If possible freezing water temperatures are detected, the ABC System will operate all pumps connected to the boiler. If water temperatures continue to drop, the boiler will fire and warm the system slightly in order to prevent freezing and damage to the system.

Pump Exercise

- Circulators connected to the ABC System control that don't operate for seven (7) days, are activated to run for ten (10) seconds.
- Reduces the possibility for pumps to seize and fail.

Apex Boiler Control FEATURES BEYOND COMPARE



Staging and Modulation

- The ABC can be connected to external staging controls via a 4–20mA and heat demand contact.
- External controls can modulate the boiler's firing rate in order to satisfy overall system demand.
- No external relays or adapters are required.

Energy Management System (EMS) Compatible

- Can be connected to a building's Energy Management System (EMS) using simple menu selections and wiring a 4–20mA input.
- Connects to EMS using modbus protocol.
- Optional EMS Gateway to BacNet or LonWorks.
- Allows EMS controls to adjust either the ABC central heating setpoint or the firing rate.

"Night Setback" and "Unoccupied" Control Modes

- EnviraCom™ enabled, allows the boiler to communicate directly with Honeywell EnviraCom™ thermostats.
- Allows the boiler to further enhance system efficiency by reducing the water temperature during "sleep" and "away" modes.

Reliability

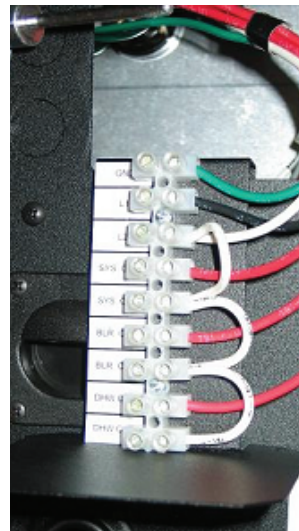
- Built-in brown out protection, with no additional devices such as "brown out relays" required.
- Internal fuse protection for pump outputs is NOT REQUIRED. The control is capable of handling up to 15 amps, and does not require additional relays to switch power to the circulators in most installations.

Ease of Connectivity...



Cat 5 Connections

- Enables easy connections between boilers or between boiler and building management system
- Utilizes ordinary RJ-45 (Cat 5 Ethernet) cord



Line Voltage Terminal Strip

- 120V AC power, pump outputs
- Strip slides out and hooks to boiler for easy access



Low Voltage Terminal Strip

- Adds additional inputs for header and DHW sensors

Lower Cost HIGHER EFFICIENCY ALTERNATIVE

The Lower Cost, Higher Efficiency Alternative to Single Commercial Boilers

Modular/Multiple Boiler Concept

Modular/multiple boiler systems, such as the Apex put the efficiency, cost and service advantages of compact gas boilers to work in heating applications where a single commercial boiler would not be sufficient. The systems connect any number of compact, self-contained gas boilers together and step-fire them to efficiently meet heating loads on demand.

Firing to Load Demand Minimizes Standby Losses

Maximum fuel utilization is achieved during long periods of full firing at the design temperature for each boiler. In comparison, a single large boiler would cycle on and off, more frequently during partial loads, not reaching its rated efficiency. During 90% of the average heating season, less than 65% of the total heating capacity is required. Step-firing activates only those boilers needed to meet the load demand which reduces cycling and increases annual fuel efficiency.

Features and Benefits of Apex Boilers in Modular/Multiple Boiler Installations

Choosing a modular or multiple boiler system can have many benefits over a single boiler installation.

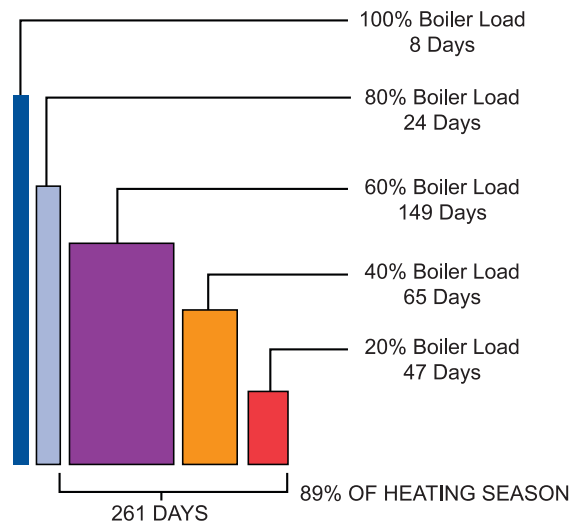
• COST SAVINGS

The basic cost of a modular/multiple system is typically less than that of a single large boiler of equal capacity in most applications.

• BASE LOADING

The practice of replacing larger boilers with multiple, smaller modular units can offer numerous benefits such as greatly increased efficiencies with reduced standby losses, cycling and emissions.

**HOT WATER BOILER SIZING
SEASONAL BOILER LOAD DEMAND**



Program Outdoor Air Reset Curve with only four points:

- Minimum boiler water temperature
- Maximum boiler water temperature
- Minimum outdoor air temperature
- Maximum outdoor air temperature

• COMPACT DESIGN

Lighter weight boilers like the Apex are suitable for installation on any floor, from basement to penthouse.

- Apex boilers are readily portable, and can be brought through standard doorways using a common hand truck.
- Apex boilers can be installed during any phase of construction.
- Stackable—boilers mount on top of each other without the use of a frame. Simply secure with bracket hardware kit.
- Apex boilers can be interconnected via a common RJ45 ethernet cable (or by alternate three wire connection).

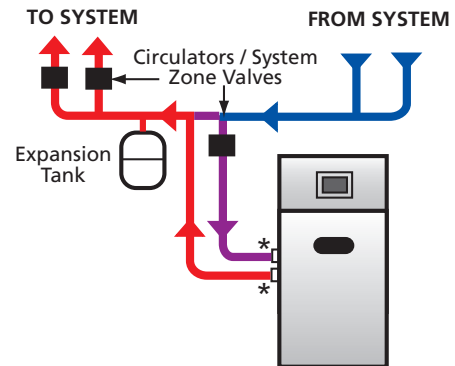
Lower Cost HIGHER EFFICIENCY ALTERNATIVE

System Piping

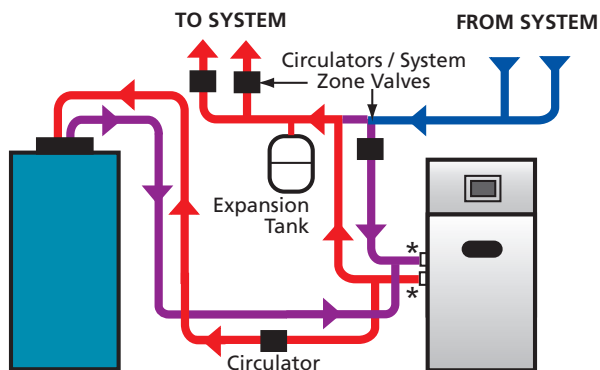
The Apex is designed to be installed in a variety of configurations. Shown here are four illustrated examples of how the Apex boiler can be piped into new or existing heating systems. Examples shown here include heat-only applications, building heat plus domestic hot water, alternate piping of heat plus domestic hot water and a multiple boiler installation incorporating domestic hot water. The Apex provides outstanding flexibility by providing the capability of controlling up to three system pumps. In addition, an indirect water heater can be placed in either the primary or secondary loop, further enhancing the boiler's ability to accommodate a variety of systems.

These illustrations are intended for informational purposes only, and are not intended for use as near boiler piping diagrams.

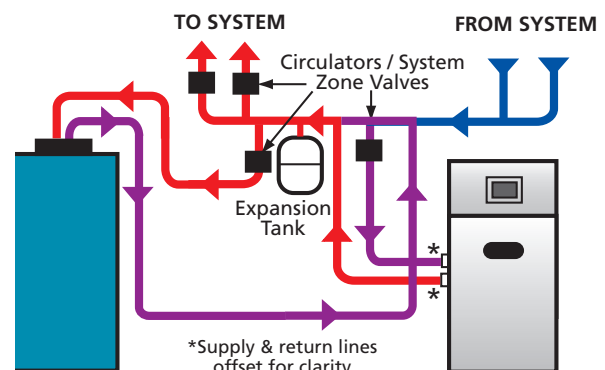
For further information on piping requirements, please see the Apex Installation & Operations Manual.



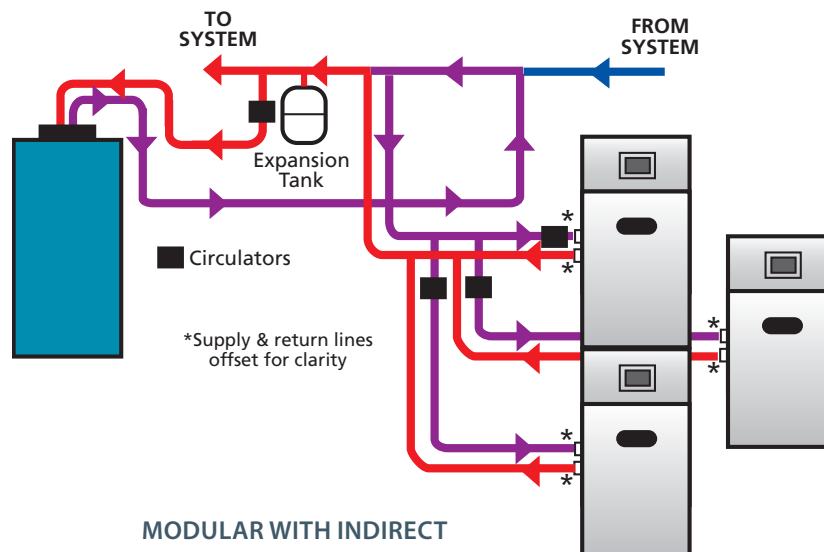
*Supply & return lines offset for clarity
HEAT-ONLY APPLICATION



*Supply & return lines offset for clarity
HEAT PLUS INDIRECT



*Supply & return lines offset for clarity
HEAT PLUS INDIRECT (ALTERNATE)



MODULAR WITH INDIRECT

Apex SPECIFICATIONS & DIMENSIONS

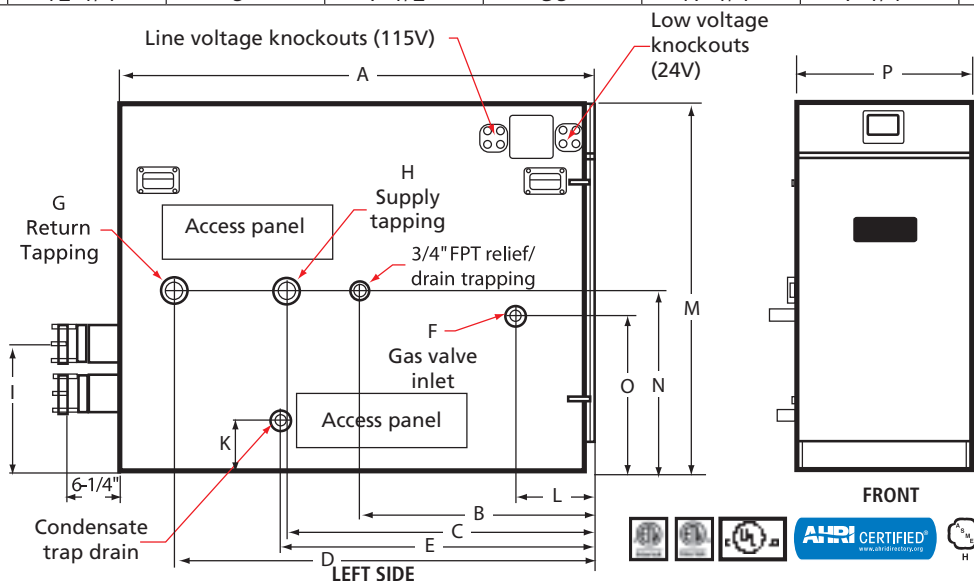
Apex Specifications & Ratings

MODEL	RATINGS			NET RATING (MBH)	THERMAL EFFICIENCY	GAS CONNECTION	WATER CONTENT (Gal.)	APPROX. SHIPPING WEIGHT (Lbs.)	HEAT TRFR. AREA (SQ. FT.)	INTAKE & VENT DIA.	SUPPLY & RETURN CONNECTIONS
	MIN. INPUT (MBH)	MAX. INPUT (MBH)	GROSS OUTPUT (MBH)								
APX500	100	500	475	413	95%	3/4" NPT	4.2	375	50.8	4"	1-1/2" NPT
APX625	125	625	593	516	95%	1" NPT	5.5	430	76.2	6"	2" NPT
APX725	145	725	688	598	95%	1" NPT	5.5	430	76.2	6"	2" NPT
APX800	160	800	760	661	95%	1" NPT	5.0	430	65.3	6"	2" NPT

Apex Dimensions

Model	A	B	C	D	E	F	G	H
APX500	44-7/8"	22-1/8"	29"	39-11/16"	29-3/8"	3/4"	1-1/2"	1-1/2"
APX625	50-1/4"	—	24"	38-7/8"	31-5/8"	1"	2"	2"
APX725	50-1/4"	—	24"	38-7/8"	31-5/8"	1"	2"	2"
APX800	54-9/10"	28-3/8"	34-1/4"	48-1/16"	33-3/16"	1"	2"	2"

Model	I	K	L	M	N	O	P
APX500	12-1/4"	5"	7-7/16"	35"	17-5/16"	14-29/32"	16-11/16"
APX625	12-1/4"	5"	7-1/2"	35"	17-1/4"	7-1/4"	16-11/16"
APX725	12-1/4"	5"	7-1/2"	35"	17-1/4"	7-1/4"	16-11/16"
APX800	12-1/4"	5"	7-1/2"	35"	17-1/4"	7-1/4"	16-11/16"



Standard Equipment

ASME stainless steel heat exchanger
Stainless steel mesh burner
Full modulation, 5:1 turndown
Variable speed combustion blower
Negative reduction gas valve
Supply & Return temperature sensors
Flue gas temperature sensor
Sealed control compartment
Negative pressure lower cabinet
Outdoor air temperature sensor

Front-mounted terminal switch
Low voltage terminal strip
Line voltage junction box
Polypropylene condensate trap
Pressure relief valve, 50 psi for 500
Pressure relief valve, 60 psi for 625, 725, 800
Rear flue outlet
Stacking boiler brackets
Built-in lifting handles

PVC Vent Kit:
30" CPVC
90° Elbow
(2) Vent-terminals with rodent screens

ABC2.1™ (Apex Boiler Control):
Touch screen display
Built-in diagnostics
Slide out drawer
Multiple boiler lead-lag control
Domestic water priority
Warm weather shut down
4-20 mA inputs for external modulation

Optional Equipment

Condensate Neutralizer
Header Sensor—1/2NPT required for multiple burner systems
Header sensor, alternate immersion (103104-01)
RJ45 Cable Splitter (103192-01)
80 psi relief valve (all models)

100 psi relief valve (all models)
Tekmar 265-3 boiler modulating control
CSD-1 Kit—Includes high and low gas pressure switches, manual reset high limit, manual reset low water cutoff and gas valve leak test equipment.
Burnham Commercial Universal Gateway—LonWorks or BacNet/Modbus/Modbus Compatible