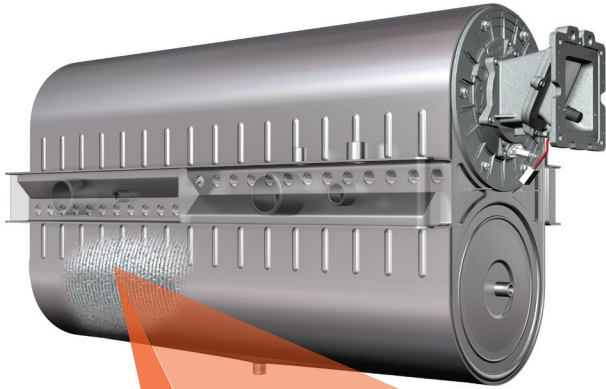# APEX™

Stainless Steel, Condensing, Gas-Fired Commercial Boiler
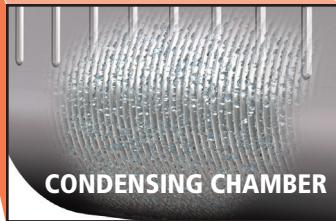
97% EFFICIENT

- **Next Generation Watertube Technology**
  - Improved Efficiency, up to 97%
  - Up to 50% Smaller Pumps
  - Reduced Electrical Consumption
  - Increased Venting Lengths
  - Unique to Thermal Solutions

- **Concert Boiler Control, Advanced Touch Screen Display**

- **5-to-1 Modulation Turndown**

- **Stackable; Eliminates Costly Stands**

- **Eco Propel Variable Speed Pumping**

ECO PROPEL
Cognitive Pump Technology

THERMAL SOLUTIONS®
Innovative Equipment for Hot Water Systems

ETL LISTED Intertek C US

A S M E H

AHRI CERTIFIED®
www.ahridirectory.org

Founded & grounded in the boiler business, Thermal Solutions believes product longevity is paramount. In the drive for increased efficiency, some have placed a premium on smaller pump requirements consuming less electricity and piping arrangements over time-proven designs worthy of being designated a boiler. We believe you deserve **both**. Thermal Solutions all new Apex Commercial Condensing Boiler ensures the highest boiler appliance efficiency, economical electrical usage, and long lasting design for reliable performance year after year. It starts with our unique heat exchanger with characteristics you won't find anywhere else.
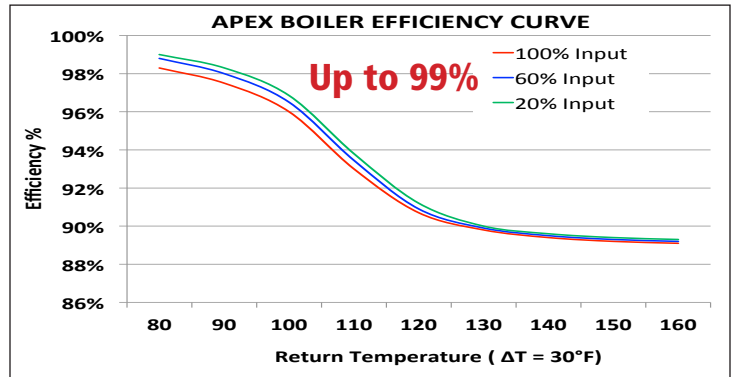
Apex™

Unparalleled Efficiency & Longevity

Next generation watertube technology with internal condensing chamber induces more latent heat to be captured in tubes. Additional heat is transferred into the water to be used in the system instead of going up the vent as wasted heat. Flue gas temperatures decrease by 54°F at high fire, and harmful emissions are reduced maximizing our GREEN footprint.

☑ **BOILER EFFICIENCY**

CONDENSING CHAMBER

APEX BOILER EFFICIENCY CURVE

Up to 99%

— 100% Input
— 60% Input
— 20% Input

Efficiency %
Return Temperature (ΔT = 30°F)

Flex & Move or Fight "Mother Nature"

Objects expand and contract as they heat up and cool. Our spiral flex tubes mimic and move with this natual occuring motion ensuring long lasting reliability and performance. Other designs directly expose flat tube sheets and require welds to hold back against this phenomenon, causing stress on material and welds.

☑ **BOILER LONGEVITY**

Electrical Savings & Eco Propel

NORTHEAST, UNITED STATES / System Design at 30°F Δ T				
Boiler Model	Pump HP	Amp Draw	Watts	Yearly Operation (US-$)
Apex 625	1/6	1.9	218.5	$89.26
Brand "A"	1/2	4.9	563.5	$230.19
ANNUAL SAVINGS OF $140.93 OVER COMPETING BRAND*				

*Based on AHRI runtime of 2,500 hours and 16.34¢ per KW/hr.

Unique to Thermal Solutions, refined waterways reduce circulator pump sizes by 30–50%. The diminutive pump uses half the electricity, keeping 50% of operating cost in your pocket *every year…*

OR take your system to the next level with optional Eco Propel Variable Speed Cognitive Pump Technology. Varying boiler flow rates to match system load changes improves overall energy savings, reducing fuel consumption by up to 3%. The bottom line is that Eco Propel's advanced technology can pay for itself in less than one year!
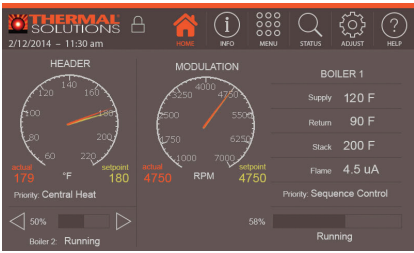
ECO PROPEL
Cognitive Pump Technology

Harmonizing Condensing Control

CONCERT

Specifically designed for condensing boilers, innovative logic reduces water temperature and minimizes firing rates. Benefit…the Concert Control actually prolongs condensing periods and reduces cycling, maximizing performance and boosting overall system efficiency. We didn't stop with enriching condensing performance; seamless EMS integration, touch screen navigation with intuitive icons, and USB data sharing port make the control the most flexible and feature-packed boiler control available anywhere.
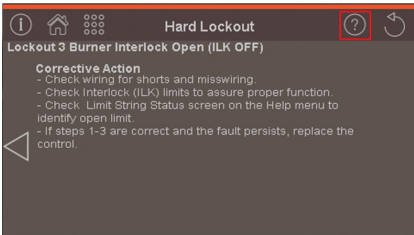
☑ **OPTIMIZED SYSTEM EFFICIENCY**

Advanced Control Platform – Concert™ Boiler Control

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 evaluting a boiler's performance and pinpointing adjustment for impovement. 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).
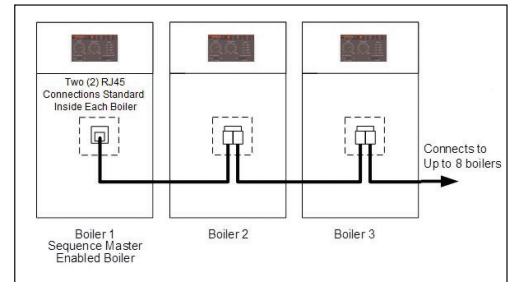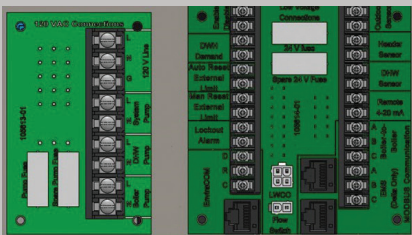
Peer-To-Peer Boiler Sequencing – Unique control logic uses both temperature and firing rate of the connected boilers to sequence up to eight units in unison to optimize system efficiency. Included dual RJ45 connections make peer-to-peer and/or simultaneous EMS communications (ModBus Standard / Other Protocols Optional) a snap without the need of a separate splitter.
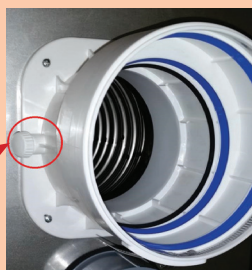

Simplified Wiring and Serviceability

Low and high voltage fused printed circuit boards (PCB) simplifies wiring, enhances serviceability & troubleshooting with easy to read labeling, and provides electrical protection (spare fuses located on PCB for quick replacement). Other connections include: 120/1/60 voltage and pumps (boiler, system & domestic hot water); alarm; auto & manual reset external limits; enable/disable; DHW demand; 4-20mA remote; sensors (outdoor, remote and DHW); EnviraCOM thermostat; low water cutoff; and flow switch.
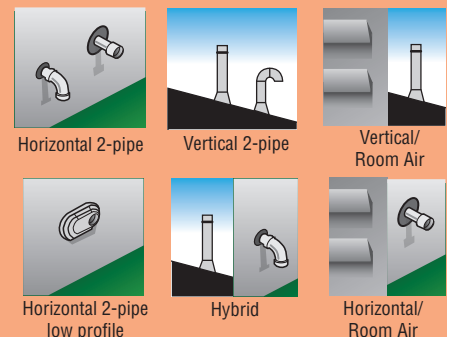
3-in-1 Vent Connection

- Accepts CPVC, Polypropelyne or Stainless Steel without the need of an external adapter.
- Built-in combustion analyzer test port with cap for convenience and avoids holes in vent pipe, causing leakage if not sealed properly.

Flexible Venting Configurations

- Venting up to 100 equivalent feet (Models 425C & 525C)
- Venting up to 200 equivalent feet (Models 625C thru 825C)
- Direct air intake venting up to 100 equivalent feet; Optional room air capability
- Optional Ipex Low Profile Sidewall Termination Kit with reduced vent/air intake connections for up to 50 equivalent feet max.

Horizontal 2-pipe

Vertical 2-pipe

Vertical/Room Air

Horizontal 2-pipe low profile

Hybrid

Horizontal/Room Air

Apex 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

COMBUSTION DESIGN
Stainless steel mesh pre-mix burner
Low NOx emissions (<20 ppm); SCAQMD Compliant
Full modulation, 5:1 turndown
Natural or LP gas
4" wc to 14" wc inlet gas pressure
Direct spark ignition system
Zero governor gas valve
Variable speed combustion blower
Air proving switch
High altitude availalbe; please consult factory

VENTING
3-in-1 vent connector*
– CPVC, polypropylene or stainless steel
– Combustion analyzer test port
PVC vent kit:
– 30" CPVC pipe, schedule 40
– 90° elbow, schedule 80
– (2 qty.) vent terminals w/ rodent screens
Direct vent – horizontal or vertical (Cat. IV)
Air intake – room air capable (Cat. IV)

BOILER EQUIPMENT
Concert Boiler Control™
High limit w/auto reset temperature control
High limit w/ manual reset safety temperature control
Water flow switch

Supply & return water temperature sensors
Flue gas temperature sensor
Outdoor air temperature sensor
Air vent valve
Boiler drain valve
Condensate trap
Stacking boiler brackets
Pressure & temperature gauge
ASME safety relief valve
– 50 psig. APX425C & 525C
– 60 psig. APX625C to 825C

ELECTRICAL DESIGN
High voltage printed circuit board (PCB)
120 VAC / 60 Hertz / 1-phase power supply
Three sets of pump contacts
PCB fused connections
Low Voltage Printed Circuit Board (PCB)
24 VAC enable/disable sensor contacts
24 VAC DHW demand contacts
24 VAC Low water cutoff contacts
24 VAC proving switch or auto reset external limit contacts
24 VAC manual reset external limit contacts
24 VAC lockout alarm contacts
24 VAC EnviraCom thermostat contacts
24 VAC flow switch contacts
5 VDC remote header sensor contacts
5 VDC DHW tank sensor contacts
5 VDC outdoor air sensor contacts
5 VDC peer-to-peer communication contacts
5 VDC EMS interface contacts
5 VDC remote 4-20mA contacts
RJ45 dual ports for peer-to-peer or ModBus communications

Apex Optional Equipment

Hydronic kit - boiler pump, CSD-1 kit, low water cutoff, and condensate neutralizer
Eco Propel™ variable speed pump

ECO PROPEL

Condensate neutralizer
80 &100 psi ASME safety relief valve
CSD-1 Kit - high & low gas pressure switches, manual reset
Low water cutoff, manual reset
Remote header sensor - direct or well immersion type
Ipex low profile sidewall termination kit (3" vent/air intake on 425C & 525C / 4" vent/air intake on 625C to 825C)

Concert Boiler Control

Dashboard - color touch screen display, 4.3"
– 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
– 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
– ModBus Input/Output
– 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
– Cycle & run time - boilers & pumps
– Resettable
Domestic hot water priority
– DHW tank piped with priority in the boiler loop
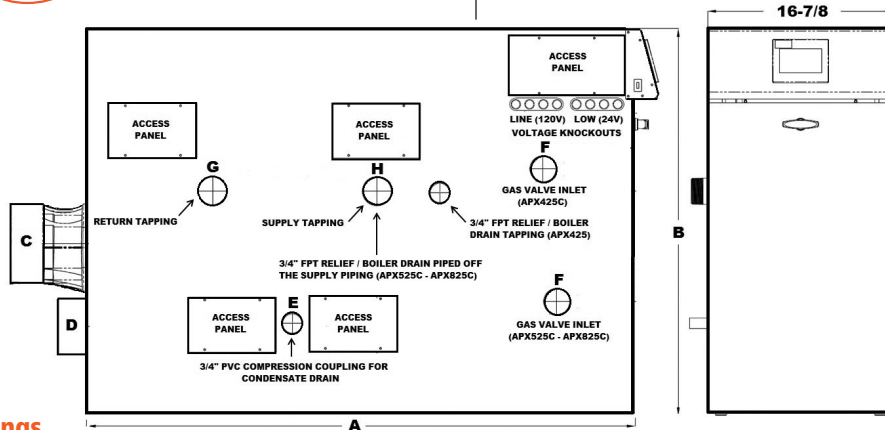– DHW tank piped as a zone in the system with the pumps controlled by the Concert control
Other features
– Factory default settings*
– Three level password security
– Frost protection
– Sensor monitoring and control
– Low water flow safety control & indication
– Proportion integral derivative (PID) parameters for central heat, DWH, sequencer and fan
– Built-in brown-out protection

* Unique to Thermal Solutions

Concert Boiler Control Options

– Communications gateway - BACnet, LonWorks, Metasys N2 or ModBus TCP/IP compatible
– Wireless outdoor air temperature kit
– 0-10v signal converter

Specifications, Dimensions, & Ratings

MODEL	INPUT		GROSS OUTPUT (MBH)	THERMAL EFFICIENCY %	"A" LENGTH (INCHES)	"B" HEIGHT (INCHES)	"F" GAS CONN. (INCHES)	"G-H" SUPPLY/ RETURN (INCHES)	"C" VENT		"D" AIR INTAKE		APPROX. SHIPPING WEIGHT (LBS)
	MIN. (MBH)	MAX. (MBH)							SIZE (IN)	EQUIV. LENGTH (FT.)	SIZE (IN)	EQUIV LENGTH (FT.)	
APX425C	80	399	375	94.1	31-3/16	43-1/2	3/4 FPT	1-1/2 FPT	4	up to 100	4	up to 100	316
APX525C	100	500	485	97.0	46-1/2	35-1/16	3/4 FPT	2 MPT	4	up to 100	4	up to 100	368
APX625C	125	625	594	95.0	49-1/2	35-1/16	1 FPT	2 MPT	6	up to 200	4	up to 100	458
APX725C	145	725	689	95.0	49-1/2	35-1/16	1 FPT	2 MPT	6	up to 200	4	up to 100	458
APX825C	160	800	760	95.0	53-5/16	35-1/16	1 FPT	2 MPT	6	up to 200	4	up to 100	500

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