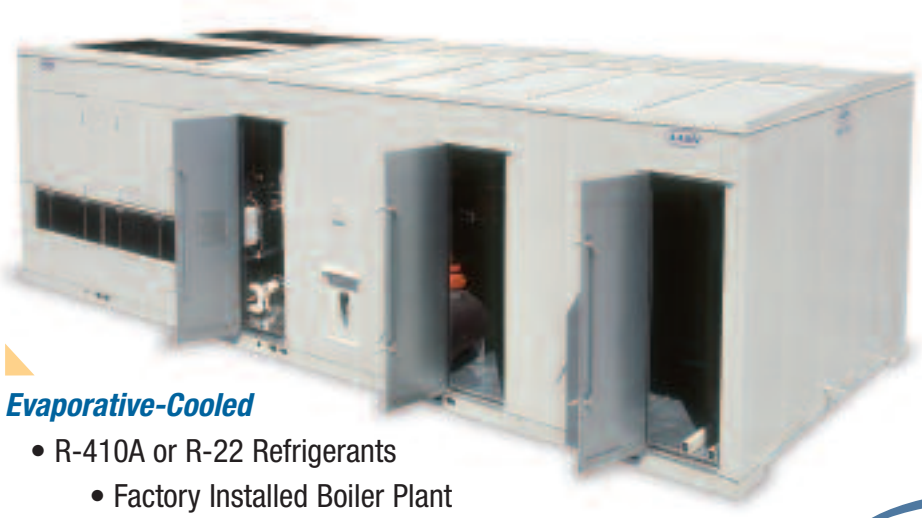
LL SERIES

CHILLERS

Air-Cooled or Evaporative-Cooled

35–365 Ton



Evaporative-Cooled

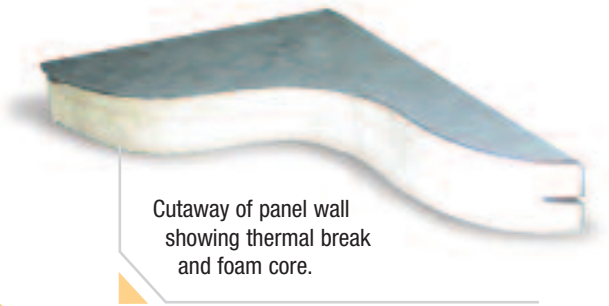
- R-410A or R-22 Refrigerants
- Factory Installed Boiler Plant
- Pre-engineered Pumping Packages
- Foam Insulated Double Wall Construction

AAON®

Quality + Performance = Engineered Value

AAON continues to expand its line of quality products with the introduction of the package LL Series Chillers. The LL Series is designed for critical chiller solutions from AAON, the premier supplier of rooftop equipment. Available in a variety of configurations to meet the specific job requirements, the LL Series continues the tradition of excellence of the RL Series and incorporates the quality AAON customers demand.

All cabinet walls, roof and floor are a high performance composite panel construction to ensure low sound levels in adjacent areas.



Cutaway of panel wall showing thermal break and foam core.

At AAON, quality products are our primary priority. State-of-the-art manufacturing and assembly facilities assure finished products to meet customer requirements.

Air-Cooled Condensers

Coils are constructed of copper tubing mechanically bonded to aluminum fins. Coil mounts are sloped to protect fins from damage. In addition, coils facing outward are protected by perforated sheet metal screens. Coils are designed for a minimum 10°F refrigerant sub-cooling. When conditions warrant, condenser fans are cycled off, or VFD controlled, to maximize energy conservation.

Evaporative Condensers

The AAON design provides energy savings of 20 to 40% over an air-cooled model. All wetted surfaces are constructed of 304 stainless steel, copper or other non-corrosive material. The system utilizes a Patented desuperheater above the wetted evaporative condenser section that reduces the water usage and chemical treatment requirement for the condenser water by 20 to 100% depending on the ambient temperature.

Customer Benefits

- All condensers are vertical discharge
- All Condenser fans are forged aluminum axial flow
- Maximum energy efficiency and sound attenuation, minimal operation temperature achieved by VFD controlled fans.
- All wetted surfaces on Evaporative-Cooled condensers are 304 Stainless Steel, Copper, or other non-corrosive materials.
- All water circuits are factory piped and wired to include all controls
- All water dispensing components on Evaporative-Cooled condensers are non-corrosive high strength material
- Water treatment systems for Evaporative-Cooled condensers are completely factory assembled, and include chemical dispensers. All processes are controlled through a factory supplied microprocessor

Heat Exchangers

- All chilled water piping takes place inside the LL Series cabinet. Heated compartment is available.
- All chillers come with a factory installed, completely insulated shell and tube heat exchanger.

LL SERIES

Design Data

Unit Size	Model	No. of Compressors	Design GPM-Flow Rate	LL Series Overall Dimensions - Inches All models are 102" in height. Air-Cooled Curb L x W	Air-Cooled OAL**	Evaporative-Cooled Curb L x W	Evaporative-Cooled OAL**
A	35 - 50 - 55	4	81 - 110 - 126	140 x 100	212.4	185 x 100	185
B	60 - 75	4	141 - 180	190 x 100	234.5	210 x 100	210
C *	67 - 92 - 104	8	162 - 220 - 252	244 x 100	387.0	334 x 100	335
D *	118	8	283	344 x 100	431.0	384 x 100	384
E	85 - 90 - 105 - 115	6	196 - 212 - 251 - 274	216 x 100	274.9	256 x 100	256
F	125 - 140	6	290 - 329	218 x 142	272.9	239 x 142	239
G	150 - 170 - 185	8	361 - 400 - 438	235 x 142	256.0	267 x 142	267
H *	210 - 230 - 245 - 275	12	502 - 552 - 580 - 658	400 x 142	507.8	442 x 142	440
I *	300 - 335 - 365	16	721 - 798 - 876	434 x 142	474.0	498 x 142	496

* Dual end condensers

** OAL = Overall length.

Standard Features and Specifications

- Completely factory assembled and piped
- Cabinets designed for outdoor applications:
  - All cabinet walls, roof and floor shall be a high performance composite panel constructed with G90 galvanized steel on both sides and a closed cell polyurethane foam interior core providing a rigid, impact resistant surface. All panels have a thermal break with no metal contact from inside to outside
    - the walls and access doors of the control compartment shall be 2 inches thick with a minimum R value of 13
    - the roof shall be sloped at a minimum of 1/4 inch per foot and shall be an average of 2.5 inches thick with a minimum R value of 16
    - the floor of the control compartment shall be 3 inches thick with a minimum R value of 19. The floor shall also have an aluminum tread plate covering the appropriate equipment access areas
  - Walk-In Doors: Control and Maintenance Areas – Bulb Perimeter Gasket
  - Full Height Stainless Steel Hinges
  - Cast Aluminum Lockable Dual Operation Handles
  - Rain Gutters on All Access Doors
  - Polyurethane Grey paint finish
  - Walk-In Compressor – Control Vestibule
  - Compressors Deck Mounted for Vibration Isolation
  - Single Point Electrical Connection
  - Sections are Spliced and Sealed
- Condenser fans are direct drive axial flow, forged aluminum blades
- Capacities from 35 to 365 tons standard
- Shell and Tube Evaporators
- Refrigerant circuits:
  - Automatic low pressure and manual reset high pressure control
  - Schrader valves high and low side of circuit
  - Replaceable core filter driers on each circuit with Isolation Valves
  - Thermal Expansion Valves – each circuit
  - Tandem compressors – internal overload protection - vibration isolation
  - Full factory refrigerant charge
- Water Circuits–Evaporative-Cooled:
  - All wetted surfaces are 304 Stainless Steel, Copper, or Non-Corrosive Material
  - Circulation Pump – Sump water – ODP Motor
  - Sump water level control
  - Water Distribution – Non-corrosive materials
  - Spray Nozzles – Non-corrosive materials – quick change
  - Water Fill – Shut-off, Positive Solenoid Controlled
  - Bleed Valve – Microprocessor Controlled
  - Drain Valve – Accessible Manual Gate Valve
  - Water Treatment – Three-Chemical, Microprocessor Controlled

Options

- Cabinet:
  - Custom Paint Colors
  - Door Windows
  - Low Ambient Operation
- Air-Cooled Condenser:
  - Low Ambient Operation Package
  - Polymer Coated
- Evaporative Condenser:
  - Low Ambient Operation Package
- Interior metal panels are available as stainless steel
- Unit available with R-410A refrigerant
- Factory installed system pumps for primary or primary secondary chilled water systems

Chiller Controller

All the chiller models have a microprocessor based control system mounted in the compressor/control compartment. The controller cycles the compressors in response to leaving water temperature to maintain the setpoint over a wide range of operating conditions. Standard features are:

- Two lines of 16 character alphanumeric liquid crystal display
- Inputs are made through 16 large single function keys with menu driven prompts
- The display data is updated once per second
- A non-volatile memory is used for all control functions
- Schedules are available with a seven-day built-in time clock
- Terminals are provided for remote stop-start
- Terminals are available for remote reset of the leaving water temperature setpoint by a 0 to 10 volt DC signal

Options are available:

- Diagnostic sensors for the pressure and temperature on each refrigerant circuit and current sensors for each compressor
- An RS-485 port allows communication with other manufacture's control systems

LL SERIES

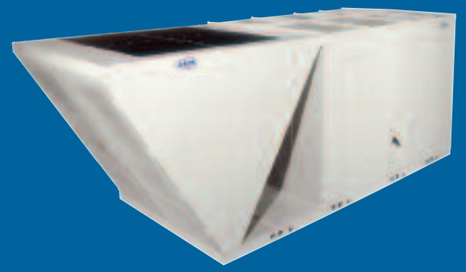
A Truly New and Breakthrough Design

Good Looks Do Count

Compare the appearance of the AAON® LL Series chiller to that of any of the traditional chiller designs. A clean, exterior with entrance to a lighted interior penthouse through lockable doors – not the welded angle iron look with exposed compressors and heat exchangers.

An installation on a roof can have all the water connections through the bottom and into the building with no worry of exposure to freezing weather.

Typical slab mounting at ground level can make unit replacements or new installations easy and attractive. It eliminates the need for a remote location or a protected area with screening.



Quiet and Energy Efficient Too

The AAON chiller is unmatched with its lower sound level. Copeland Compliant Scroll© compressors not only provide high efficiency full and part load operation, they also are quieter under all load conditions. Now place the compressors inside a compartment with 2 inch thick polyurethane insulated walls and the sound of the compressor is essentially eliminated. The condenser fans are axial flow, adjustable pitch blades designed to provide maximum airflow with minimum sound levels. To ensure the sound level is held to a minimum under all load conditions, VFDs are standard on all evaporative cooled models and are an option on all the air cooled models. This provides major sound and energy reduction at all but maximum load conditions.

AAON Innovation

Available in a variety of configurations to meet specific job requirements, the LL Series continues the tradition of excellence and incorporates the quality that AAON customers have learned to expect.

The AAON Model LL air and evaporative cooled chillers contain features never before offered in a packaged chiller. Model sizes from 35 to 365 tons in either an air-cooled condensing or an enhanced energy conserving evaporative cooled configuration. All models feature a lighted, full height, walk-in compartment that contains all vital operational components to allow maximum accessibility for maintenance or service. This includes high efficiency multiple scroll compressors, evaporator heat exchangers, all electrical components, and a DDC controller, available with diagnostics, and a network connection for remote monitoring and control.

The LL Chiller may be installed on a roof, on a platform, or at ground level to meet building requirements. The chilled water pump package and expansion tank may be factory or field installed in the insulated compartment. Additional compartments may be ordered for factory or field addition of a boiler or other necessary equipment. Field water piping may be specified through either side.

Equipment Selection and Installation Made Easy With Factory Installed Pumping Package

You can eliminate the cost of a mechanical equipment room space within the building. The AAON chiller can be delivered to the job completely ready for installation. The factory installed piping package can include primary and secondary pumps and expansion tanks with piping access to the building through the sides or bottom. The insulated compartment can also be provided with heating and cooling.

- Primary pumping package includes an Armstrong® pump(s), butterfly valves, strainers, ball valves, pressure relief valves, water makeup pressure reduction valve and backflow prevention.
- Primary/Secondary pumping package for variable flow systems include all the primary pumping package components listed above plus a secondary pump and associated additional components.
- Individual redundant or ***dualArm***™ pumps are available.
- An air separator and expansion/compression tanks are also available factory mounted.
- Victaulic piping and fittings are furnished as standard throughout.
- AAONECat32 selection program for the PC will determine proper pumping package component selection at the time of the equipment selection. *We calculate the system components for you.*

Primary Pump Example

After a primary pump selection is made in the AAONECat32 program, the rating sheet, the pump performance curves and the piping diagram are automatically generated as part of the output.

Typical Primary Pump and Inlet Strainer of a Primary/Secondary Pump Package

Typical Secondary Pump, Inlet Strainer and Expansion Tank of a Primary/Secondary Pump Package

Optional Factory Installed Boilers

AAON also offers factory installed boilers for the LL Chiller models. The boilers configurations are available in capacities from 500,000 to 6,000,000 Btuh input.

The design takes the very best of existing copper-finned boiler technology to the next level by incorporating a list of features not found in competitors products. Real-life serviceability, innovative heat exchanger design, clean and efficient advanced combustion, and unique timesaving controls are all combined in a compact quick-connect package with efficiencies of up to 88%. Full modulation is achieved using a VFD and an air-fuel ratio modulating control valve.

Heat Exchanger

Ceramic Radiant Burner

Innovative Heat Exchanger Design

Central to the boiler's highly efficient operation is the design of its copper-tube heat exchanger. Not only does it efficiently maintain heat transfer, but the innovative gasketless carbon steel header provides for easy inspection, cleaning and individual tube replacement. The combustion chamber is also completely enclosed in a stainless steel compartment and features collection/evaporation components to effectively handle cold-start condensate.

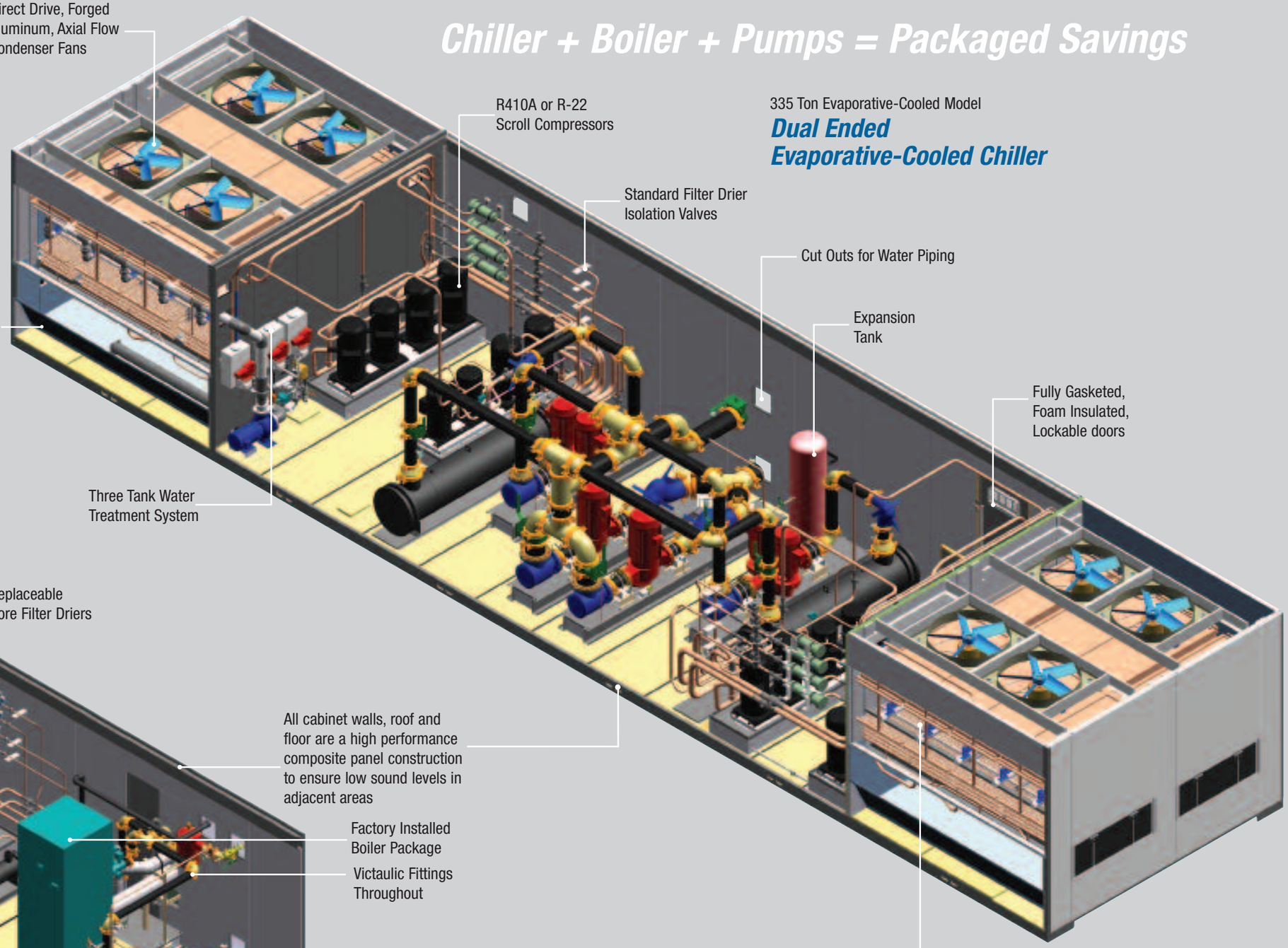
Designed to operate at 88% thermal efficiency with NOx ratings less than 9.9 ppm, the noiseless ceramic radiant burner runs at minimal excess air levels creating highly efficient, trouble-free operation. The rugged industrial cast aluminum blower and fan wheel are equipped with a replaceable combustion air filter (99% efficient to one micron) to create excellent combustion characteristics and even air distribution. The boiler can even be operated with its jacket panels removed for easy inspection or maintenance.

LL SERIES

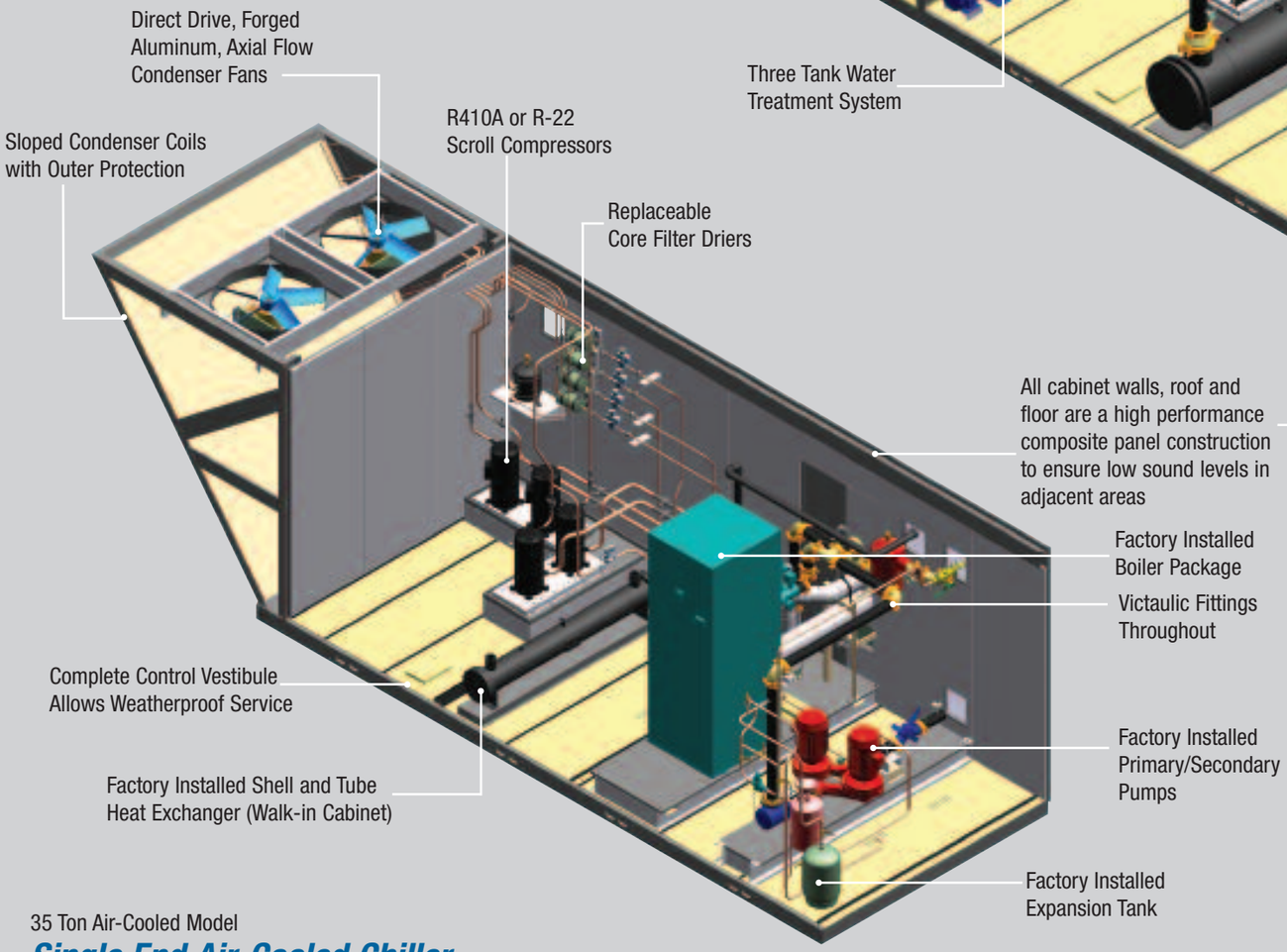
Chiller + Boiler + Pumps = Packaged Savings

335 Ton Evaporative-Cooled Model

Dual Ended Evaporative-Cooled Chiller



Patented Desuperheat System Inhibits Scale Accumulation. The System utilizes an exclusive desuperheater above the wetted evaporative condenser section that can reduce the water consumption and chemical treatment requirements by 20 to 100% dependent on ambient temperature.



35 Ton Air-Cooled Model

Single End Air-Cooled Chiller

AAON®

The Name To Remember.

2425 South Yukon Avenue
Tulsa, OK 74107

918-583-2266
Fax 918-583-6094

www.aaon.com

Rev. 2 08/06 • R42980