



Air Cooled Screw Liquid Chillers STYLE A



R134a

**492 - 879 kW
50 Hz**

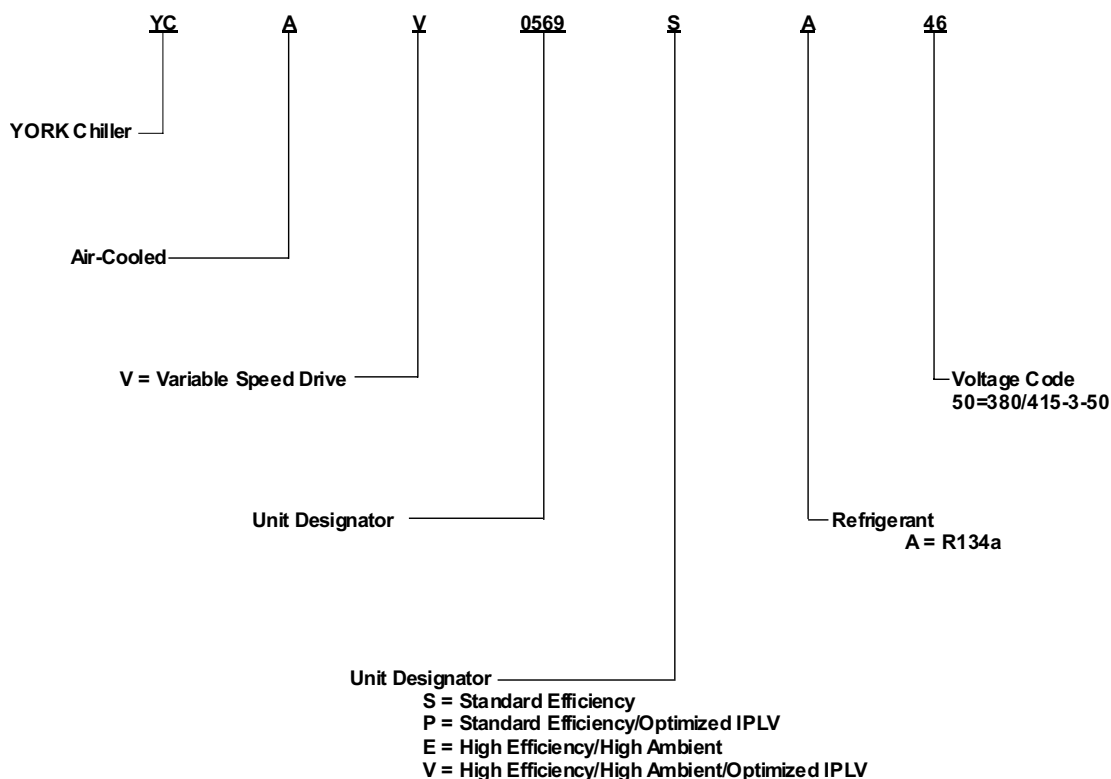


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NOMENCLATURE

The Model Number denotes the following characteristics of the unit:



Introduction

YORK YCAV Air Cooled Screw Liquid Chillers



YORK has a proud history of innovation in both compressor design and variable-speed drive (VSD) technology. The Latitude™ air cooled chiller uses the best of modern screw compressor design and manufacturing techniques and combines them with the latest in a long line of chiller variable-speed drives. The result is superior control and industry leading efficiency at real world conditions. In addition, by slowing the speed of the chiller to match system requirements at off-design conditions, the chiller sound output is reduced when it is the most sensitive to neighbors – evenings and weekends.

With the introduction of the YCAV model air cooled chiller, system designers are given the Latitude™ to design around the traditional benefits of air cooled chillers and still offer building owners energy efficient system design. In the past, the choice to use an air cooled chiller came with the expectation of compromise, where simplicity of design and maintenance were traded for performance and efficiency. Now combining the best of both worlds can provide a design that truly delivers the lowest total cost of ownership.

Specifications

POWER AND ELECTRICAL

YORK has over 25 years of experience designing variable-speed drives specifically for chiller applications. The result is an extremely reliable air-cooled chiller system that offers industry leading efficiency at real world operating conditions, valve-less compressor loading/unloading, excellent capacity control, high power factor and soft start.

- VSD Power/Control Panel includes main power connection(s), VSD and fan motor contactors, current overloads, and factory wiring. Standard design includes NEMA 3R (IP65) rating, powder painted steel cabinet with hinged, latched, and gasket sealed outer doors equipped with wind struts for safer servicing.
- VSD section of power panel includes a dedicated inverter for each compressor.
- The panel includes a control display access door so display and control features can be accessed without opening main cabinet doors.
- All models come standard with a single-point power connection. In addition, all models are supplied with a factory mounted and wired control transformer that will supply all unit control voltage from the main unit power supply. The transformer utilizes scheduled line voltage on the primary side and provides 115V/1Ø on secondary.
- The Short Circuit Withstand Rating of the chiller electrical enclosure is 30,000 Amps for the standard terminal block connection. Ratings are in accordance with UL508.
- Compressor motors are powered by a variable-speed drive. Therefore, motor current never exceeds the rated load amps (RLA), providing soft starts with no electrical inrush. This eliminates the motor heating and stress always found with conventional motor starters. In addition, by eliminating the heat buildup during starting, the required off-time between starts is reduced to a maximum of two minutes.
- The U.S. Department of Energy (D.O.E.) states that many utility companies charge an additional fee if power factor is below 0.95. These power factor adjustments/penalties can affect both regular tariff rates, as well as demand charges. All YCAV models have a full load power factor of 95% and maintain this level throughout the operating range. Specifications should always require the installing contractor to be responsible for additional cost to furnish and install power factor correction capacitors if they are not factory mounted and wired.

SEMI-HERMETIC YORK TWIN-SCREW COMPRESSORS

YORK's Refrigeration Compressor group have designed a compressor that results in unequalled performance:

- Continuous function, microprocessor controlled, VSD provides valveless, smooth capacity control from 100% down to 10% of chiller capacity. In addition, elimination of the slide valve and associated unloading components resulted in a 50% reduction in compressor moving parts.
- Compressors are direct drive, semihermetic, rotary twin-screw type, including: muffler, temperature actuated 'off-cycle' heater, rain-tight terminal box, discharge shut-off service valve, and precision machined cast iron housing.
- Reliable suction gas cooled, high efficiency, accessible hermetic compressor motor, full suction gas flow through 0.006" maximum mesh screen, with inherent internal thermal overload protection and external current overload on all three phases.
- Suction gas screen and serviceable, 0.5 micron full flow oil filter within the compressor housing.
- Cast iron compressor housing precisely machined for optimal clearances and superb efficiency. Entire compressor, from suction to discharge has a Design Working Pressure (DWP) of 31 bar.

REFRIGERANT CIRCUIT

- There is one independent refrigerant circuit per compressor, using copper refrigerant pipe formed on computer controlled bending machines. This eliminates over 60% of system piping brazed joints as compared to designs that use fittings, resulting in a highly reliable and leak resistant system.
- Liquid line components include: liquid line shut-off valve with charging port, low side pressure relief device, high adsorption removable core filter-drier, sight glass with moisture-indicator, and electronic expansion valve.
- Discharge line provided with manual compressor shutoff service valve (See Options and Accessories for suction line valve). Suction line covered with closed-cell insulation.
- External oil separators with no moving parts, 31 bar design working pressure, and UL listed. Refrigerant system differential pressure provides oil flow through service replaceable, 0.5 micron, full flow, cartridge type oil filter internal to compressor.
- Oil cooling provided by a dedicated air cooled finned tube type heat exchanger located in the condenser section of the machine.

EVAPORATOR

- High efficiency, direct-expansion type evaporator with refrigerant in tubes and chilled liquid flowing through the baffled shell. There is one circuit per compressor.
- Design working pressure of the shell waterside is 10.3 bar, and 16 bar for the refrigerant side. Constructed and tested in accordance with applicable sections of ASME Pressure Vessel Code, Section VIII, Division (1). Water side exempt per paragraph U-1, ©, (6).
- Removable heads allow access to internally-enhanced, seamless, copper tubes. Water vent and drain connections are included.
- The evaporator is equipped with thermostatically controlled heater for protection to -29°C ambient. The evaporator shell is covered with 19mm, flexible, closed-cell insulation, thermal conductivity of 0.26k ([BTU/HR-Ft²-°F]/in.) maximum.
- Water nozzles with grooves for mechanical couplings, and insulated by Contractor after pipe installation.

CONDENSER SECTION

- Low sound fans are provided standard on all models. Fans are dynamically and statically balanced, direct drive, corrosion resistant glass fiber reinforced composite blades molded into low noise, full airfoil cross section, providing vertical air discharge from extended orifices. Each fan is protected by a guard made of heavy gauge steel wire and covered with PVC (polyvinyl chloride) plastic.
- Condenser fan motors are high efficiency, direct drive, 3-phase, Class-“F”insulation, current overload protected, totally enclosed (TEAO) type with double sealed, permanently lubricated, ball bearings.
- Fin and tube condenser coils of seamless, internally enhanced, high condensing coefficient, corrosion resistant copper tubes arranged in staggered rows and mechanically bonded to corrosion resistant aluminum alloy fins with full height fin collars. Design working pressure is a full 31 bar.

MICROPROCESSOR CONTROLS

- The microprocessor control system provides automatic control of chiller operation including compressor start/stop and load/unload, anti-recycle timers, condenser fans, evaporator pump, evaporator heater, unit alarm contacts and run signal contacts.
- Chiller automatically resets to normal chiller operation after power failure.
- Unit operating software is stored in non-volatile

memory. Field programmed set points are retained in a lithium battery backed real time clock (RTC) memory for minimum five years.

- Alarm contacts are provided to remote alert contacts for any unit or system safety fault.
- Display and Keypad:
 - ◆ 80 character liquid crystal display that is both viewable in direct sunlight and has LED back-lighting for nighttime viewing. One keypad and display panel is provided with every chiller.
 - ◆ Display and keypad is accessible through display access door without opening main control/electrical cabinet doors.
 - ◆ Display provides unit setpoints, status, electrical data, temperature data, pressures, safety lockouts and diagnostics without the use of a coded display.
 - ◆ Descriptions in English (or Spanish or French), numeric data in SI units.
 - ◆ Sealed keypad shall include unit On/Off switch.
- Programmable Setpoints (within Manufacturer limits): display language; leaving chilled liquid temperature: setpoint, control range; local or remote control; units of measure; compressor lead/lag; and maximum chilled water setpoint reset temperature range.
- Display Data: Chiller liquid return and leaving temperatures, ambient, lead compressor identification, clock and schedule, (variable) out of range, remote input indication, chilled liquid reset setpoint, and history data for last ten shutdown faults. Compressor suction, discharge, and oil pressures and temperatures, suction and discharge superheats, percent of full-load, operating hours, starts, and anti-recycle timer status. Status Messages for manual override, unit switch off, compressor run, run permissive, remote controlled shut down, no cooling load, daily/holiday shut down, anti-recycle timer.
- During extreme or unusual conditions (i.e. blocked condenser coils, ambient above scheduled maximum, etc.) the chiller control system will avoid safety shutdown by varying the chiller controls and cooling load output to stay online and avoid safety limits being reached. This allows maximum possible cooling capacity until the unusual condition is cleared and avoids costly shutdowns. The system monitors the following parameters and maintain the maximum cooling output possible without shutdown of the equipment: motor current, suction pressure and discharge pressure.
- System Safeties are provided for individual compressor systems to perform auto-reset shut down (manual reset required after the third trip in 90 minutes). Safe-

Specifications (Continued)

ties include: high discharge pressure or temperature, low suction pressure, high / low motor current, high motor temperature, high pressure switch, high / low differential oil pressure, high oil temperature, low suction superheat, critical sensor malfunction, low or high current, phase loss/single phase power, overload of motor windings, and low voltage.

- Unit Safeties are provided for the chiller to perform auto-reset shut down for the following conditions: high or low ambient, low leaving chilled liquid temperature, under voltage, and flow switch operation.

COMPLETE FACTORY PACKAGE

These air cooled chillers are shipped as a complete factory package. Each unit is completely assembled with all interconnecting refrigerant piping and internal wiring, ready for field installation:

- Each compressor is installed on its own independent refrigerant circuit, which is factory pressure tested, evacuated, then fully charged with R134a refrigerant and oil.

- After assembly, an operational test is performed with water flowing through the cooler to ensure each circuit operates correctly.
- Unit panels, structural elements, control boxes and heavy gauge structural base shall be constructed of galvanized steel. Unit panels, control boxes and structural base are finished with a baked on powder paint. All painted surfaces shall be coated with baked on powder paint which, when subject to ASTM B117, 1,000 hour, 5% salt spray test, yields minimum ASTM 1654 rating of "6".
- Design is in accordance with applicable sections of ASME Pressure Vessel Code, NFPA 70 (National Electrical Code), and ASHRAE/ANSI-15 Safety Code for Mechanical Refrigeration.
- Units are Rated and Certified in accordance with ARI Standard 550/590-98.
- All exposed power wiring routed through liquid-tight, non-metallic conduit.

Accessories and Options

SOUND REDUCTION OPTIONS – One or all options may be employed by the system designer as normally generated machine noise is considered in the overall project design:

SilentNight™ – Standard variable-speed compressors result in a chiller system that has lower part load sound values than conventional air-cooled chillers. Over 99% of chiller operating hours occur when building loads and/or ambient temperatures are less than design. As a result, all YCAV model chillers will operate with less than full load sound output nearly all the time – this is especially important on evenings and weekends when neighbors are home the most. Due to time-of-day-based sound regulations, it may be desirable to force the chiller to a lower sound level on demand. The SilentNight™ control option provides a control input to limit sound output of the chiller based on time of day. This feature is programmable at the chiller panel or can be controlled remotely via signal (4-20mA or 0-10 VDC) from a BAS system.

Ultra Quiet Fans (Factory Mounted) – With this option, the basic chiller is equipped with specially designed fans and motors to provide lower sound levels and retain appropriate airflow. The result is reduced fan-generated noise with no adverse effect on the chiller capacity or efficiency performance.

Compressor Sound Blankets (Factory Mounted) – Black, high strength, rip-resistant, two-piece acoustic compressor sound blanket. Material is both UV and mildew protected, waterproof and fire resistant (meeting California fire marshal flame specification).

Acoustical perimeter enclosures (Field Mounted) – Perimeter enclosure panels that mount around the bottom section of the chiller to reduce sound output. Enclosure panels are painted to match unit panels and include sound insulating baffles spaced to allow for proper airflow. *NOTE: May ship separately from unit (Field Mounted).*

CIRCUIT BREAKER – Power panel will come equipped with a factory mounted circuit breaker at point of incoming single point connection that provides the following:

- Means to disconnect power mounted on chiller.
- Circuit breaker sized to provide the motor branch circuit protection, short circuit protection and ground fault protection for the motor branch-circuit conductors, the motor control apparatus and the motors. (Chiller mounted circuit breaker option sized for branch circuit protection eliminates the need to provide a separate 'line of sight' disconnect and separate branch circuit protection device.)
- Lockable operating handle that extends through power panel door so that power may be disconnected

without opening any panel doors.

- Short Circuit Withstand Rating of the chiller electrical enclosure when using circuit breaker option is 380V:65,000 Amps. Rating in accordance with UL508.

CONDENSER COIL PROTECTION – Standard condenser coil construction materials include aluminum fins, copper tubes, and galvanized tube supports for generally good corrosion resistance. However, these materials are not adequate for all environments. The system designer can take steps to inhibit coil corrosion in harsh applications and enhance equipment life by choosing from these options based on project design parameters and related environmental factors. (Factory Mounted)

- **PRE-COATED FIN CONDENSER COILS** – The air cooled condenser coils are constructed of black epoxy-coated aluminum fins. This can provide corrosion resistance comparable to copper-fin coils in typical seashore locations. Either these or the post coated coils (below), are recommended for units being installed at the seashore or where salt spray may hit the unit.
- **POST-COATED EPOXY DIPPED CONDENSER COILS** – The unit is built with dipped-cured epoxy condenser coils. This is another choice for seashore and other corrosive applications (with the exception of strong alkalis, oxidizers and wet bromine, chlorine and fluorine in concentrations greater than 100 ppm).
- **COPPER FIN CONDENSER COILS** – The unit constructed with copper tube condenser coils, which have copper fins. (This is not recommended for units in areas where they may be exposed to acid rain.)

PROTECTIVE CHILLER PANELS:

- **Wire Panels (full unit)** – UV stabilized black polyvinyl chloride coated, heavy gauge, welded wire mesh guards mounted on the exterior of the unit. Protects condenser coil faces and prevents unauthorized access to refrigerant components (compressors, pipes, cooler, etc.), yet provides free air flow. This can cut installation cost by eliminating the need for separate, expensive fencing. (Factory mounted)
- **Louvered Panels (condenser coils only)** – Painted steel to match unit panels, louvered panels are mounted over the exterior condenser coil faces on the sides of the unit to visually screen and protect coils. (Factory mounted.)
- **Louvered Panels (full unit)** – Painted steel to match unit panels, to protect condenser coils from incidental damage, visually screen internal components, and prevent unauthorized access to internal components. (Factory mounted)
- **Louvered (Condensers)/Wire Panels (Mechanicals)** – Louvered steel panels on external condenser coil faces,

Accessories and Options (Continued)

painted to match unit panels. Heavy gauge, welded wire-mesh, coated to resist corrosion, around base of machine to restrict unauthorized access. (Factory Mounted)

EVAPORATOR OPTIONS:

- 38mm Insulation – Double thickness insulation provided. (Factory Mounted)
- Raised Face Flange Accessory for cooler nozzles:
- 10.3 bar welded flanges (field kit, matching pipe flange by contractor).
- 20.7 bar welded flanges (factory installed, matching pipe flange by contractor).
- 10.3 bar Victaulic™ Flanges (field kit, matching pipe flange by contractor).

REMOTE COOLER:

- Manufacturer shall provide separately:
 1. Chiller (including filter-drier, sight glass with moisture indicator, and electronic expansion valve per refrigerant circuit) less evaporator and refrigerant (include a dry nitrogen holding charge).
 2. Insulated evaporator (include a dry nitrogen holding charge).
 3. Entering and leaving water temperature sensors for use in the interconnecting piping. (Field Mounted)

Contractor shall field erect system and provide interconnecting piping, refrigerant charge, and wiring in accordance with manufacturers recommendations, and project plans and schedules. Where not otherwise specified, Contractor-provided system piping shall be in accordance with applicable sections of the ASHRAE Handbook. *NOTE: Remote DX cooler applications are outside the scope of ARI Standard – 550/590.*

- FLOW SWITCH ACCESSORY : Vapor proof SPDT, NEMA 4X switch, 10.3 bar.
- DWP, -28.9°C to 121.1°C with 1" NPT (IPS) connection for upright mounting in horizontal pipe (This flow switch or equivalent must be furnished with each unit). (Field Mounted)

BUILDING AUTOMATION SYSTEM INTERFACE:

- Chiller to accept 4 to 20mA or 0 to 10 VDC input to reset the leaving chilled liquid temperature, or percent full load amps (current limit). (Factory Mounted)
- Provide chiller with microgateway for an interface to

YORK ISN ConneXsys controls. (Factory Mounted)

MULTI-UNIT SEQUENCE CONTROL:

Separate sequencing control center provided to permit control of up to eight chillers in parallel, based on mixed liquid temperature (interconnecting wiring by others). (Field Mounted)

VIBRATION ISOLATION:

- **Neoprene Isolation** – Recommended for normal installations. Provides very good performance in most applications for the least cost. (Field mounted)
- **1" Spring Isolators** – Level adjustable, spring and cage type isolators for mounting under the unit base rails. 1" nominal deflection may vary slightly by application. (Field mounted)
- **2" Seismic Spring Isolators** – Restrained Spring-Flex Mountings incorporate a rugged welded steel housing with vertical and horizontal limit stops. Housings designed to withstand a minimum 1.0g accelerated force in all directions to 51mm. Level adjustable, deflection may vary slightly by application. (Field mounted)

SERVICE ISOLATION VALVE – Service suction isolation added to unit for each refrigerant circuit. (Factory Mounted)

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Temperatures and Flows

TEMPERATURE AND FLOWS (Standard and High Efficiency)

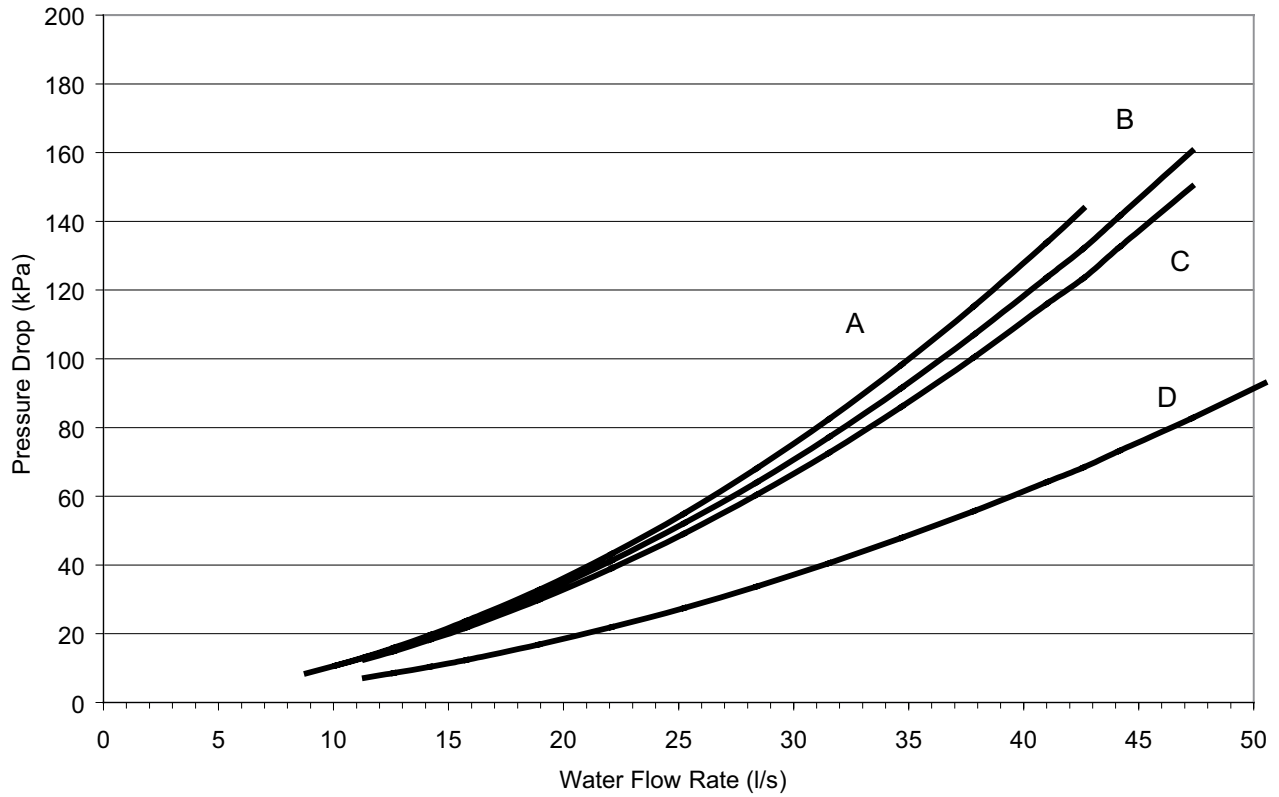
MODEL NUMBER YCAV	LEAVING WATER TEMPERATURE (°C)		EVAPORATOR ³ FLOW (l/s)		AIR ON CONDENSER (°C)	
	MIN. ¹	MAX. ²	MIN.	MAX.	MIN.	MAX
0569	4.4	15.6	8.8	42.6	-17.7	51.7
0639	4.4	15.6	9.5	47.3	-17.7	51.7
0679	4.4	15.6	9.5	47.3	-17.7	51.7
0719	4.4	15.6	11.4	47.3	-17.7	51.7
0739	4.4	15.6	11.4	47.3	-17.7	51.7
0819	4.4	15.6	11.4	47.3	-17.7	51.7
0889	4.4	15.6	11.4	50.5	-17.7	51.7
0969	4.4	15.6	11.4	50.5	-17.7	51.7

NOTES:

1. For leaving brine temperatures below 4.4°C, contact your nearest YORK office for application requirements.
2. For leaving water temperatures higher than 15.6°C, contact the nearest YORK office for application guidelines.
3. The evaporator is protected against freezing to -28.8°C with an electric heater as standard.

Water Pressure Drop

Pressure Drop Through YCAV Evaporators



MODEL NUMBER YCAV	COOLER
0569(S/P)	A
0569(E/V), 0639, 0679	B
0719, 0739, 0819	C
0889, 0969	D

Ratings - Standard Efficiency

MODEL: YCAV0569S/P

AIR TEMPERATURE ON - CONDENSER (°C)

LCWT (°C)	25.0			30.0			35.0			40.0			45.0			50.0		
	KWo	KWi	COP	KWo	KWi	COP	KWo	KWi	COP	KWo	KWi	COP	KWo	KWi	COP	KWo	KWi	COP
5.0	530.8	136.0	3.6	522.8	155.4	3.1	513.7	176.5	2.7	499.1	200.2	2.3	463.8	219.1	2.0	372.6	191.9	1.8
6.0	545.3	136.8	3.6	537.0	156.2	3.2	527.4	177.3	2.8	511.2	200.8	2.4	474.8	219.8	2.0	376.4	187.9	1.9
7.0	560.0	137.7	3.7	551.5	157.0	3.2	541.5	178.2	2.8	523.4	201.5	2.4	485.9	220.6	2.1	380.6	184.1	1.9
8.0	575.0	138.7	3.8	566.2	157.9	3.3	555.8	179.1	2.9	535.6	202.1	2.5	497.2	221.4	2.1	384.7	180.4	2.0
9.0	590.3	139.8	3.9	581.1	158.9	3.4	570.3	180.1	3.0	548.1	202.7	2.5	508.9	222.0	2.2	388.8	176.7	2.1
10.0	605.7	140.9	3.9	596.3	159.9	3.4	585.2	181.0	3.0	560.7	203.3	2.6	520.8	222.7	2.2	392.8	173.0	2.1
11.0	621.5	142.1	4.0	611.8	161.0	3.5	600.2	182.2	3.1	573.5	203.9	2.6	532.7	223.3	2.3	396.8	169.4	2.2
12.0	637.4	143.3	4.1	627.5	162.1	3.6	615.5	183.2	3.1	586.4	204.6	2.7	544.7	223.9	2.3	400.6	165.9	2.2
13.0	653.6	144.7	4.1	643.4	163.3	3.6	631.1	184.4	3.2	599.5	205.2	2.7	556.9	224.5	2.3	404.4	162.5	2.3

MODEL: YCAV0639S/P

AIR TEMPERATURE ON - CONDENSER (°C)

LCWT (°C)	25.0			30.0			35.0			40.0			45.0			50.0		
	KWo	KWi	COP	KWo	KWi	COP	KWo	KWi	COP	KWo	KWi	COP	KWo	KWi	COP	KWo	KWi	COP
5.0	589.6	149.7	3.6	578.8	171.5	3.1	565.6	195.0	2.7	538.2	213.3	2.4	447.0	191.6	2.2	275.0	117.0	2.1
6.0	606.1	150.7	3.7	595.1	172.5	3.2	581.5	196.0	2.8	552.4	213.9	2.4	450.7	187.2	2.3	278.7	115.0	2.2
7.0	622.9	151.8	3.8	611.6	173.5	3.3	597.7	197.2	2.8	566.1	214.3	2.5	455.1	183.2	2.3	282.7	113.1	2.2
8.0	639.9	152.9	3.9	628.5	174.5	3.3	613.5	197.9	2.9	579.9	214.7	2.5	459.4	179.3	2.4	286.4	111.1	2.3
9.0	657.2	154.0	3.9	645.6	175.6	3.4	629.2	198.4	3.0	594.0	215.1	2.6	463.4	175.3	2.5	288.6	108.6	2.4
10.0	674.6	155.3	4.0	663.0	176.8	3.5	645.1	198.8	3.0	608.1	215.4	2.7	467.2	171.3	2.5	294.1	108.2	2.4
11.0	692.1	156.8	4.1	680.4	178.1	3.6	661.1	199.4	3.1	622.6	215.7	2.7	470.5	167.1	2.6	297.3	105.4	2.5
12.0	709.9	158.3	4.1	698.1	179.4	3.6	677.3	199.9	3.2	637.2	216.0	2.8	474.3	163.3	2.7	300.6	103.5	2.6
13.0	727.9	159.9	4.2	716.1	180.9	3.7	693.6	200.5	3.2	651.9	216.4	2.8	478.8	159.9	2.8	303.6	101.5	2.6

MODEL: YCAV0679S/P

AIR TEMPERATURE ON - CONDENSER (°C)

LCWT (°C)	25.0			30.0			35.0			40.0			45.0			50.0		
	KWo	KWi	COP	KWo	KWi	COP	KWo	KWi	COP	KWo	KWi	COP	KWo	KWi	COP	KWo	KWi	COP
5.0	641.8	161.5	3.6	631.1	184.4	3.2	619.0	209.5	2.8	596.6	234.8	2.4	553.9	250.7	2.1	434.9	209.2	1.9
6.0	659.7	162.7	3.7	648.7	185.5	3.2	636.0	210.6	2.8	610.9	235.2	2.4	566.9	251.3	2.1	439.6	205.0	2.0
7.0	677.8	163.9	3.8	666.5	186.6	3.3	653.4	211.7	2.9	625.6	235.5	2.5	580.4	251.8	2.2	444.6	200.9	2.1
8.0	696.4	165.3	3.9	684.6	187.8	3.4	670.9	213.0	2.9	640.5	235.9	2.6	594.1	252.2	2.2	449.0	196.6	2.1
9.0	715.2	166.8	3.9	703.0	189.1	3.4	688.8	214.2	3.0	655.7	236.3	2.6	608.1	252.5	2.3	453.3	192.4	2.2
10.0	734.4	168.3	4.0	721.8	190.5	3.5	707.0	215.5	3.1	670.9	236.6	2.7	622.1	252.9	2.3	457.4	188.2	2.3
11.0	753.9	170.0	4.1	740.8	191.9	3.6	725.6	216.9	3.1	686.2	237.0	2.7	636.6	253.2	2.4	461.5	184.1	2.3
12.0	773.7	171.7	4.1	760.2	193.5	3.6	744.4	218.4	3.2	701.9	237.4	2.8	651.2	253.5	2.4	465.5	180.0	2.4
13.0	793.8	173.7	4.2	780.0	195.2	3.7	763.6	219.9	3.3	717.8	237.8	2.8	661.2	250.2	2.5	469.4	176.0	2.5

NOTES:

1. kWo = Unit kW Cooling Capacity Output
2. kW_i = Compressor kW Input
3. COP = Coefficient of Performance (includes condenser fan power)
4. LCWT = Leaving Chilled Water Temperature
5. Ratings based on 0.15 L/s cooler water per ton, and 0.018 (m² - °C)/kW

MODEL: YCAV0739S/P**AIR TEMPERATURE ON - CONDENSER (°C)**

LCWT (°C)	25.0			30.0			35.0			40.0			45.0			50.0		
	KWo	KWi	COP	KWo	KWi	COP	KWo	KWi	COP	KWo	KWi	COP	KWo	KWi	COP	KWo	KWi	COP
5.0	693.1	174.3	3.7	680.1	201.0	3.2	665.5	230.8	2.7	632.2	253.2	2.4	0.0	0.0	0.0	394.4	178.0	2.0
6.0	712.6	175.4	3.7	699.0	201.8	3.2	683.3	231.2	2.8	647.3	253.1	2.4	570.9	246.7	2.2	398.8	174.2	2.1
7.0	732.5	176.7	3.8	718.4	202.7	3.3	700.8	231.3	2.8	662.7	252.8	2.5	577.4	241.7	2.3	403.2	170.4	2.2
8.0	752.9	178.3	3.9	738.1	203.7	3.4	718.6	231.5	2.9	678.4	252.4	2.5	583.6	236.4	2.3	407.4	166.7	2.2
9.0	773.6	180.1	4.0	758.3	205.0	3.5	736.7	231.8	3.0	694.4	252.0	2.6	589.6	231.1	2.4	411.6	163.1	2.3
10.0	794.6	182.1	4.0	778.7	206.4	3.5	755.2	232.1	3.1	710.5	251.6	2.7	595.5	226.1	2.5	415.5	159.6	2.4
11.0	816.1	184.3	4.1	799.6	208.0	3.6	773.9	232.5	3.1	726.8	251.2	2.7	601.1	221.2	2.5	419.4	156.2	2.5
12.0	838.1	186.7	4.2	820.9	209.8	3.7	792.9	233.0	3.2	743.5	250.9	2.8	606.2	216.5	2.6	423.1	152.8	2.5
13.0	860.4	189.5	4.2	842.6	211.8	3.7	812.3	233.7	3.3	760.5	250.5	2.9	611.2	211.9	2.7	426.6	149.5	2.6

MODEL: YCAV0819S/P**AIR TEMPERATURE ON - CONDENSER (°C)**

LCWT (°C)	25.0			30.0			35.0			40.0			45.0			50.0		
	KWo	KWi	COP	KWo	KWi	COP	KWo	KWi	COP	KWo	KWi	COP	KWo	KWi	COP	KWo	KWi	COP
5.0	752.2	186.5	3.7	738.8	212.9	3.2	723.6	242.0	2.8	693.5	268.4	2.4	643.3	281.4	2.2	501.9	231.4	2.0
6.0	773.4	188.0	3.8	759.5	214.2	3.3	743.6	243.3	2.9	710.2	268.5	2.5	658.6	281.7	2.2	507.0	226.5	2.1
7.0	795.1	189.5	3.9	780.6	215.6	3.4	763.9	244.8	2.9	727.2	268.6	2.6	674.1	281.9	2.3	512.1	221.6	2.2
8.0	817.1	191.3	3.9	802.1	217.0	3.4	784.7	246.2	3.0	744.5	268.7	2.6	690.0	282.0	2.3	517.0	217.0	2.2
9.0	839.7	193.2	4.0	824.0	218.7	3.5	805.9	247.7	3.1	762.0	268.7	2.7	706.0	282.1	2.4	521.9	212.4	2.3
10.0	862.6	195.2	4.1	846.3	220.4	3.6	827.6	249.2	3.1	779.7	268.8	2.7	722.5	282.1	2.4	526.7	207.8	2.3
11.0	886.0	197.3	4.1	869.1	222.3	3.6	849.6	251.0	3.2	797.8	268.9	2.8	739.2	282.1	2.5	531.4	203.3	2.4
12.0	909.5	199.6	4.2	892.3	224.2	3.7	872.1	252.8	3.2	816.2	269.0	2.9	753.9	280.5	2.5	536.1	198.9	2.5
13.0	933.5	202.1	4.3	915.7	226.3	3.8	895.1	254.7	3.3	834.8	269.1	2.9	760.7	273.7	2.6	540.6	194.5	2.6

MODEL: YCAV0889S/P**AIR TEMPERATURE ON - CONDENSER (°C)**

LCWT (°C)	25.0			30.0			35.0			40.0			45.0			50.0		
	KWo	KWi	COP	KWo	KWi	COP	KWo	KWi	COP	KWo	KWi	COP	KWo	KWi	COP	KWo	KWi	COP
5.0	825.0	205.6	3.7	811.0	234.0	3.2	794.9	265.2	2.8	765.8	295.7	2.4	719.7	315.7	2.2	550.5	251.4	2.0
6.0	848.1	207.2	3.8	833.5	235.5	3.3	816.6	266.8	2.9	784.8	296.4	2.5	737.1	316.5	2.2	555.8	246.0	2.1
7.0	871.6	209.0	3.8	856.4	237.1	3.4	838.7	268.6	2.9	804.0	297.0	2.6	755.0	317.1	2.3	561.1	240.7	2.2
8.0	895.5	211.0	3.9	879.7	238.9	3.4	861.4	270.3	3.0	823.6	297.6	2.6	773.2	317.8	2.3	566.5	235.5	2.2
9.0	919.9	213.0	4.0	903.5	240.8	3.5	884.4	272.1	3.0	843.3	298.2	2.7	791.6	318.4	2.4	571.6	230.3	2.3
10.0	944.8	215.1	4.0	927.8	242.7	3.6	908.0	273.9	3.1	863.4	298.8	2.7	806.3	316.2	2.4	576.8	225.2	2.4
11.0	970.0	217.4	4.1	952.4	244.9	3.6	931.9	276.0	3.2	883.9	299.5	2.8	814.2	309.0	2.5	581.9	220.3	2.4
12.0	995.6	219.9	4.2	977.6	247.0	3.7	956.3	278.0	3.2	904.8	300.1	2.8	821.5	301.3	2.6	587.0	215.4	2.5
13.0	1021.7	221.9	4.3	1002.9	249.3	3.7	981.2	280.2	3.3	925.9	300.8	2.9	828.3	293.5	2.7	592.0	210.6	2.6

NOTES:

1. kW_o = Unit kW Cooling Capacity Output
2. kW_i = Compressor kW Input
3. COP = Coefficient of Performance (includes condenser fan power)
4. LCWT = Leaving Chilled Water Temperature
5. Ratings based on 0.15 L/s cooler water per ton, and 0.018 (m² - °C)/kW

Ratings - Standard Efficiency

MODEL: YCAV0969S/P

AIR TEMPERATURE ON - CONDENSER (°C)

LCWT (°C)	25.0			30.0			35.0			40.0			45.0			50.0		
	KWo	KWi	COP	KWo	KWi	COP	KWo	KWi	COP	KWo	KWi	COP	KWo	KWi	COP	KWo	KWi	COP
5.0	898.1	224.4	3.7	883.4	254.8	3.2	866.4	288.2	2.8	838.4	322.8	2.4	796.3	349.6	2.2	614.0	280.4	2.0
6.0	923.0	226.2	3.8	907.7	256.6	3.3	889.9	290.2	2.9	859.6	323.9	2.5	816.0	350.8	2.2	620.1	274.4	2.1
7.0	948.4	228.2	3.8	932.5	258.5	3.4	913.9	292.1	2.9	881.1	325.0	2.6	836.1	352.0	2.3	626.1	268.4	2.2
8.0	974.1	230.3	3.9	957.7	260.5	3.4	938.4	294.1	3.0	902.9	326.1	2.6	856.7	353.2	2.3	627.1	261.5	2.2
9.0	1000.4	232.5	4.0	983.4	262.6	3.5	963.2	296.3	3.0	924.9	327.3	2.7	877.6	354.4	2.3	637.9	256.7	2.3
10.0	1027.2	234.8	4.0	1009.5	264.8	3.5	988.6	298.4	3.1	947.5	328.5	2.7	894.1	352.2	2.4	643.6	251.1	2.4
11.0	1054.4	237.3	4.1	1036.0	267.2	3.6	1014.5	300.6	3.2	970.4	329.6	2.8	902.4	343.6	2.5	649.2	245.5	2.4
12.0	1081.9	240.0	4.2	1063.1	269.6	3.7	1040.8	302.9	3.2	993.6	330.9	2.8	910.6	335.1	2.6	654.7	240.0	2.5
13.0	1110.1	241.5	4.2	1090.4	272.1	3.7	1067.6	305.4	3.3	1017.3	332.1	2.9	918.5	326.8	2.7	660.0	234.7	2.6

NOTES:

1. kWo = Unit kW Cooling Capacity Output
2. kW_i = Compressor kW Input
3. COP = Coefficient of Performance (includes condenser fan power)
4. LCWT = Leaving Chilled Water Temperature
5. Ratings based on 0.15 L/s cooler water per ton, and 0.018 (m² – °C)/kW

Ratings - High Efficiency

MODEL: YCAV0569E/V

AIR TEMPERATURE ON - CONDENSER (°C)

LCWT (°C)	25.0			30.0			35.0			40.0			45.0			50.0		
	KWo	KWi	COP	KWo	KWi	COP	KWo	KWi	COP	KWo	KWi	COP	KWo	KWi	COP	KWo	KWi	COP
5.0	527.1	125.7	3.8	517.8	142.0	3.3	505.5	159.6	2.9	490.0	180.2	2.5	446.8	193.5	2.2	283.4	124.0	2.1
6.0	542.0	126.7	3.9	532.6	143.2	3.4	520.3	160.8	3.0	503.0	181.1	2.6	454.7	191.5	2.2	288.0	122.2	2.1
7.0	557.0	127.7	4.0	547.7	144.3	3.5	535.2	162.0	3.1	516.0	182.0	2.6	462.2	189.2	2.3	292.5	120.5	2.2
8.0	572.2	128.8	4.0	563.0	145.5	3.5	550.4	163.2	3.1	529.3	182.9	2.7	466.9	185.4	2.4	296.5	118.7	2.2
9.0	587.6	129.9	4.1	578.6	146.6	3.6	565.9	164.4	3.2	542.6	183.8	2.8	471.9	181.9	2.4	299.7	117.6	2.3
10.0	603.1	130.9	4.2	594.3	147.8	3.7	581.5	165.8	3.2	556.1	184.8	2.8	476.9	178.5	2.5	305.9	115.6	2.4
11.0	618.9	132.0	4.3	610.2	149.0	3.8	597.4	167.1	3.3	569.7	185.7	2.9	480.9	174.8	2.6	310.8	114.2	2.4
12.0	634.8	133.1	4.3	626.4	150.2	3.8	613.5	168.4	3.4	583.4	186.7	2.9	484.6	171.2	2.6	315.4	112.6	2.5
13.0	650.9	134.2	4.4	642.7	151.5	3.9	629.9	169.8	3.4	597.3	187.7	3.0	488.5	167.5	2.7	319.8	111.1	2.6

MODEL: YCAV0639E/V

AIR TEMPERATURE ON - CONDENSER (°C)

LCWT (°C)	25.0			30.0			35.0			40.0			45.0			50.0		
	KWo	KWi	COP	KWo	KWi	COP	KWo	KWi	COP	KWo	KWi	COP	KWo	KWi	COP	KWo	KWi	COP
5.0	561.0	131.9	3.8	552.5	150.2	3.3	542.5	170.5	2.9	527.1	193.7	2.5	494.1	213.9	2.2	387.1	182.8	2.0
6.0	576.9	132.9	3.9	568.1	151.1	3.4	557.6	171.3	3.0	540.8	194.4	2.6	505.9	214.6	2.2	391.4	179.2	2.0
7.0	593.0	133.9	4.0	583.9	152.0	3.5	573.0	172.2	3.1	554.8	195.0	2.6	518.3	215.1	2.3	395.6	175.6	2.1
8.0	609.4	135.1	4.1	600.0	152.9	3.6	588.7	173.1	3.1	569.0	195.7	2.7	530.8	215.7	2.3	399.8	172.0	2.1
9.0	626.1	136.3	4.1	616.5	154.0	3.7	604.7	174.1	3.2	583.5	196.4	2.8	543.5	216.2	2.4	403.9	168.5	2.2
10.0	643.1	137.6	4.2	633.2	155.1	3.7	621.1	175.1	3.3	598.3	197.2	2.8	556.5	216.8	2.4	407.8	165.1	2.3
11.0	660.4	139.0	4.3	650.2	156.3	3.8	637.7	176.2	3.3	613.3	198.0	2.9	569.7	217.3	2.5	411.7	161.7	2.3
12.0	678.1	140.5	4.4	667.6	157.6	3.9	654.7	177.3	3.4	628.6	198.8	2.9	583.1	217.9	2.5	415.5	158.3	2.4
13.0	696.0	142.1	4.4	685.2	159.0	3.9	672.0	178.5	3.5	644.1	199.6	3.0	596.6	218.4	2.6	419.0	155.1	2.5

MODEL: YCAV0679E/V

AIR TEMPERATURE ON - CONDENSER (°C)

LCWT (°C)	25.0			30.0			35.0			40.0			45.0			50.0		
	KWo	KWi	COP	KWo	KWi	COP	KWo	KWi	COP	KWo	KWi	COP	KWo	KWi	COP	KWo	KWi	COP
5.0	623.4	146.4	3.8	614.0	167.5	3.3	602.4	190.9	2.9	585.1	216.1	2.5	549.2	232.7	2.2	357.7	152.3	2.1
6.0	640.9	147.4	3.9	631.3	168.3	3.4	619.4	191.6	3.0	600.4	216.4	2.6	562.9	233.1	2.3	363.7	150.1	2.2
7.0	658.7	148.5	4.0	648.9	169.1	3.5	636.6	192.4	3.0	616.1	216.7	2.6	576.8	233.4	2.3	369.1	147.7	2.2
8.0	676.6	149.6	4.1	666.7	170.1	3.6	654.2	193.3	3.1	632.0	217.0	2.7	590.8	233.6	2.4	373.7	144.9	2.3
9.0	694.9	150.9	4.1	684.8	171.1	3.6	671.9	194.2	3.2	648.3	217.3	2.8	601.6	231.4	2.4	377.7	141.9	2.4
10.0	713.4	152.3	4.2	703.1	172.2	3.7	690.0	195.2	3.3	664.8	217.7	2.8	611.2	228.4	2.5	382.0	139.2	2.5
11.0	732.2	153.7	4.3	721.7	173.5	3.8	708.3	196.2	3.3	681.4	218.0	2.9	620.1	224.9	2.6	386.9	136.8	2.5
12.0	751.3	155.3	4.4	740.7	174.8	3.9	727.0	197.4	3.4	698.3	218.4	3.0	627.5	220.5	2.6	392.2	134.9	2.6
13.0	770.6	157.1	4.4	759.9	176.2	3.9	745.9	198.7	3.5	715.5	218.8	3.0	633.1	215.1	2.7	397.8	133.0	2.7

NOTES:

1. kWo = Unit kW Cooling Capacity Output
2. kWi = Compressor kW Input
3. COP = Coefficient of Performance (includes condenser fan power)
4. LCWT = Leaving Chilled Water Temperature
5. Ratings based on 0.15 L/s cooler water per ton, and 0.018 (m² - °C)/kW

Ratings – High Efficiency

MODEL: YCAV0719E/V

AIR TEMPERATURE ON - CONDENSER (°C)

LCWT (°C)	25.0			30.0			35.0			40.0			45.0			50.0		
	KWo	KWi	COP	KWo	KWi	COP	KWo	KWi	COP	KWo	KWi	COP	KWo	KWi	COP	KWo	KWi	COP
5.0	675.6	158.4	3.9	664.4	182.6	3.3	651.5	210.4	2.9	634.0	241.4	2.5	534.4	219.7	2.3	353.8	148.2	2.1
6.0	694.6	159.5	3.9	683.0	183.1	3.4	669.6	210.7	2.9	649.6	241.0	2.5	546.5	218.8	2.3	361.5	147.1	2.2
7.0	714.1	160.7	4.0	702.0	183.8	3.5	688.0	211.1	3.0	665.3	240.6	2.6	558.5	217.6	2.4	369.2	145.9	2.3
8.0	733.9	162.2	4.1	721.3	184.7	3.6	706.8	211.7	3.1	681.5	240.0	2.7	569.5	215.9	2.5	376.5	144.6	2.3
9.0	754.1	163.9	4.2	741.1	185.7	3.7	726.0	212.3	3.2	697.9	239.5	2.7	577.7	212.7	2.5	383.4	143.0	2.4
10.0	774.6	165.9	4.2	761.2	186.9	3.7	745.5	213.1	3.2	714.6	239.0	2.8	582.3	208.0	2.6	390.1	141.4	2.5
11.0	795.6	168.1	4.3	781.7	188.3	3.8	765.5	214.0	3.3	731.5	238.5	2.9	587.0	203.4	2.7	396.2	139.5	2.5
12.0	816.9	170.6	4.4	802.5	190.1	3.9	785.8	215.1	3.4	748.7	238.0	2.9	591.0	198.7	2.7	401.3	137.2	2.6
13.0	838.5	173.4	4.4	823.7	191.9	4.0	806.5	216.4	3.5	765.9	237.7	3.0	596.3	194.6	2.8	403.9	133.9	2.7

MODEL: YCAV0739E/V

AIR TEMPERATURE ON - CONDENSER (°C)

LCWT (°C)	25.0			30.0			35.0			40.0			45.0			50.0		
	KWo	KWi	COP	KWo	KWi	COP	KWo	KWi	COP	KWo	KWi	COP	KWo	KWi	COP	KWo	KWi	COP
5.0	718.2	166.7	3.9	706.8	191.3	3.4	693.9	219.3	2.9	675.0	250.0	2.5	593.2	242.9	2.3	455.9	197.9	2.1
6.0	738.5	167.9	4.0	726.6	192.0	3.5	713.1	219.9	3.0	692.4	250.2	2.6	702.9	301.2	2.2	463.5	195.3	2.2
7.0	759.2	169.2	4.0	746.8	192.9	3.5	732.7	220.5	3.1	710.1	250.3	2.6	721.1	302.8	2.2	470.4	192.3	2.2
8.0	780.3	170.8	4.1	767.4	193.9	3.6	752.7	221.3	3.1	728.2	250.4	2.7	739.6	304.2	2.3	476.8	189.0	2.3
9.0	801.8	172.6	4.2	788.5	195.0	3.7	773.1	222.1	3.2	746.7	250.5	2.8	0.0	0.0	0.0	484.4	186.3	2.4
10.0	823.7	174.5	4.3	809.9	196.4	3.8	793.9	223.0	3.3	765.5	250.6	2.8	694.4	255.0	2.5	492.3	183.8	2.4
11.0	846.0	176.7	4.3	831.6	198.0	3.8	815.1	224.1	3.4	784.3	250.7	2.9	717.3	258.3	2.6	500.4	181.4	2.5
12.0	868.2	179.1	4.4	853.7	199.7	3.9	836.7	225.4	3.4	802.6	250.5	3.0	739.5	261.1	2.7	508.6	179.2	2.6
13.0	890.8	181.8	4.5	875.8	201.6	4.0	858.4	226.9	3.5	821.2	250.2	3.1	760.7	263.2	2.7	516.9	177.0	2.6

MODEL: YCAV0819E/V

AIR TEMPERATURE ON - CONDENSER (°C)

LCWT (°C)	25.0			30.0			35.0			40.0			45.0			50.0		
	KWo	KWi	COP	KWo	KWi	COP	KWo	KWi	COP	KWo	KWi	COP	KWo	KWi	COP	KWo	KWi	COP
5.0	746.1	172.7	3.9	734.9	196.8	3.4	721.8	224.0	3.0	705.9	256.0	2.6	664.2	274.4	2.3	610.7	283.6	2.0
6.0	767.2	173.9	4.0	755.5	197.9	3.5	741.9	224.9	3.0	725.2	257.0	2.6	680.5	274.4	2.3	616.1	278.3	2.1
7.0	788.7	175.4	4.0	776.6	199.0	3.5	762.4	225.9	3.1	744.9	258.1	2.7	696.9	274.5	2.4	621.7	272.8	2.1
8.0	810.6	176.9	4.1	798.1	200.2	3.6	783.3	227.0	3.2	765.1	259.1	2.7	713.7	274.5	2.4	627.4	267.1	2.2
9.0	833.0	178.6	4.2	820.0	201.5	3.7	804.6	228.1	3.2	785.3	260.0	2.8	730.9	274.4	2.5	633.4	261.2	2.3
10.0	855.3	180.4	4.3	842.2	203.0	3.8	826.4	229.3	3.3	804.2	260.0	2.9	748.4	274.3	2.5	639.5	255.1	2.3
11.0	877.9	182.4	4.3	864.4	204.6	3.9	848.4	230.6	3.4	823.1	260.1	2.9	766.1	274.2	2.6	645.6	249.0	2.4
12.0	900.9	184.5	4.4	887.0	206.2	3.9	870.4	232.1	3.5	842.6	260.1	3.0	784.0	274.2	2.7	651.6	243.0	2.5
13.0	924.2	186.8	4.5	909.9	208.1	4.0	892.9	233.6	3.5	861.9	260.2	3.1	802.3	274.1	2.7	657.4	237.3	2.6

NOTES:

1. kWo = Unit kW Cooling Capacity Output
2. kW_i = Compressor kW Input
3. COP = Coefficient of Performance (includes condenser fan power)
4. LCWT = Leaving Chilled Water Temperature
5. Ratings based on 0.15 L/s cooler water per ton, and 0.018 (m² – °C)/kW

MODEL: YCAV0889E/V**AIR TEMPERATURE ON - CONDENSER (°C)**

LCWT (°C)	25.0			30.0			35.0			40.0			45.0			50.0		
	KWo	KWi	COP	KWo	KWi	COP	KWo	KWi	COP	KWo	KWi	COP	KWo	KWi	COP	KWo	KWi	COP
5.0	828.3	199.0	3.8	815.0	226.2	3.3	799.5	256.6	2.9	777.0	289.8	2.5	733.7	312.2	2.2	560.4	249.3	2.1
6.0	851.5	200.6	3.9	837.7	227.7	3.4	821.5	258.0	3.0	797.5	290.9	2.6	751.7	312.9	2.3	565.8	244.0	2.1
7.0	875.2	202.4	3.9	860.9	229.2	3.5	844.0	259.5	3.0	818.3	292.0	2.6	770.1	313.5	2.3	571.3	238.8	2.2
8.0	899.4	204.3	4.0	884.5	230.9	3.5	867.0	261.1	3.1	839.6	293.1	2.7	789.0	314.1	2.4	576.7	233.6	2.3
9.0	924.0	206.3	4.1	908.5	232.7	3.6	890.3	262.7	3.2	860.3	293.9	2.7	808.2	314.6	2.4	581.9	228.5	2.3
10.0	949.1	208.5	4.2	933.1	234.6	3.7	914.2	264.5	3.2	881.2	294.5	2.8	823.3	312.2	2.5	587.2	223.5	2.4
11.0	974.5	210.8	4.2	958.0	236.7	3.7	938.5	266.3	3.3	902.3	295.1	2.9	831.3	304.8	2.6	592.3	218.6	2.5
12.0	1000.3	213.3	4.3	983.4	238.8	3.8	963.3	268.3	3.3	923.9	295.7	2.9	838.8	297.0	2.6	597.4	213.7	2.6
13.0	1026.6	215.3	4.4	1009.0	241.1	3.9	988.4	270.3	3.4	945.7	296.4	3.0	845.6	289.2	2.7	602.4	209.0	2.6

NOTES:

1. kWo = Unit kW Cooling Capacity Output
2. kWi = Compressor kW Input
3. COP = Coefficient of Performance (includes condenser fan power)
4. LCWT = Leaving Chilled Water Temperature
5. Ratings based on 0.15 L/s cooler water per ton, and 0.018 (m² – °C)/kW

Physical Data (Standard Efficiency)

Refrigerant R-134a	STANDARD EFFICIENCY						
	MODEL NUMBER (YCAV ___ S/P)						
	YCAV0569	YCAV0639	YCAV0679	YCAV0739	YCAV0819	YCAV0889	YCAV0969
General Unit Data							
Number of Independent Refrigerant Circuits	2	2	2	2	2	2	2
Refrigerant Charge, R-134a, Ckt.-1/Ckt.-2, kg.	74 / 74	77 / 77	84 / 77	87 / 80	87 / 87	105 / 89	105 / 105
Oil Charge, Ckt.-1/Ckt.-2, liters	19 / 19	19 / 19	19 / 19	19 / 19	19 / 19	19 / 19	19 / 19
Compressors, Semihermetic Screw							
Quantity per Chiller	2	2	2	2	2	2	2
Condenser Coils, High Efficiency Fin/Tube with Integral Subcooler							
Total Chiller Coil Face Area, m ²	21.83	21.83	24.53	24.53	27.22	30.01	32.70
Number of Rows	3	3	3	3	3	3	3
Fins per meter	669	669	669	669	669	669	669
Condenser Fans							
Number, Ckt.-1/Ckt.-2	4/4	4/4	5/4	5/4	5/5	6/5	6/6
Low Sound Fans							
Fan Motor, kw	1.5	1.5	1.5	1.5	1.5	1.5	1.5
Fan & Motor Speed, revs./sec.	19.0	19.0	19.0	19.0	19.0	19.0	19.0
Fan Diameter, mm	899	899	899	899	899	899	899
Fan Tip Speed, m/sec.	53.7	53.7	53.7	53.7	53.7	53.7	53.7
Total Chiller Airflow, l/sec.	49088	49088	55224	55224	61360	67496	73632
Ultra Quiet Fans							
Fan Motor, kw	1.5	1.5	1.5	1.5	1.5	1.5	1.5
Fan & Motor Speed, revs./sec.	14.0	14.0	14.0	14.0	14.0	14.0	14.0
Fan Diameter, mm	899	899	899	899	899	899	899
Fan Tip Speed, m/sec.	39	39	39	39	39	39	39
Total Chiller Airflow, l/sec.	49082	49082	55218	55218	61353	67488	73624
Evaporator, Direct-Expansion							
Water Volume, liters	253.6	359.6	359.6	529.9	529.9	529.9	529.9
Maximum Water Side Pressure, Bar ¹	10	10	10	10	10	10	10
Maximum Refrigerant Side Pressure, Bar	16	16	16	16	16	16	16
Minimum Chilled Water Flow Rate, l/sec.	8.8	9.5	9.5	11.4	11.4	11.4	11.4
Maximum Chilled Water Flow Rate, l/sec.	42.6	47.3	47.3	47.3	47.3	50.5	50.5
Water Connections, inches	8	10	10	10	10	10	10

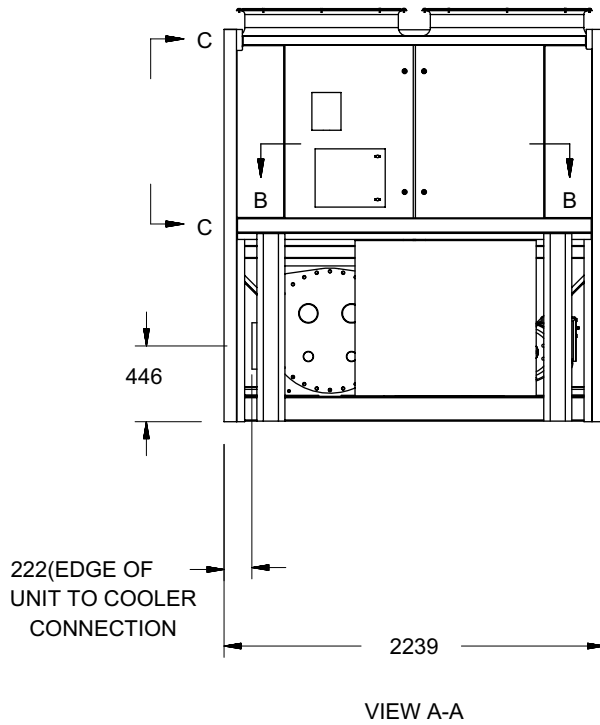
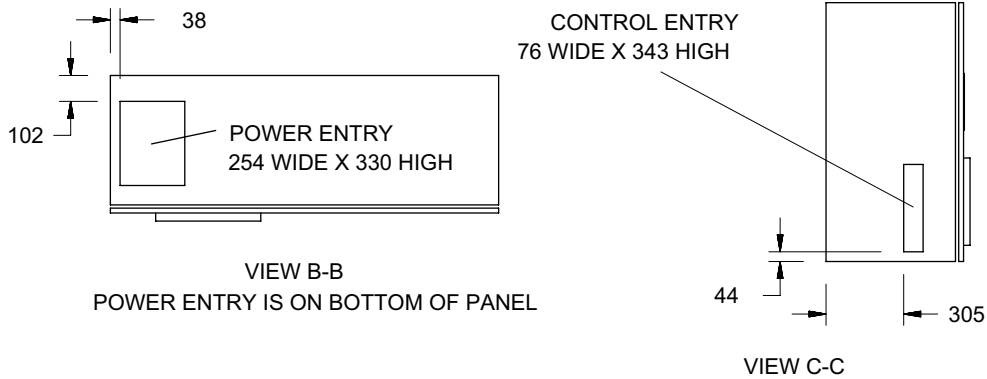
¹ Optional 21 Bar Waterside available

Physical Data (High Efficiency)

Refrigerant R-134a	HIGH EFFICIENCY						
	MODEL NUMBER (YCAV ___ E/V)						
	YCAV0569	YCAV0639	YCAV0679	YCAV0719	YCAV0739	YCAV0819	YCAV0889
General Unit Data							
Number of Independent Refrigerant Circuits	2	2	2	2	2	2	2
Refrigerant Charge, R-134a, Ckt.-1/Ckt.-2, kg.	77/77	84/77	84/84	87/87	102/87	102/102	105/105
Oil Charge, Ckt.-1/Ckt.-2, liters	19/19	19/19	19/19	19/19	19/19	19/19	19/19
Compressors, Semihermetic Screw							
Quantity per Chiller	2	2	2	2	2	2	2
Condenser Coils, High Efficiency Fin/Tube with Integral Subcooler							
Total Chiller Coil Face Area, m ²	21.83	24.53	27.22	27.22	30.01	32.70	32.70
Number of Rows	3	3	3	3	3	3	3
Fins per meter	669	669	669	669	669	669	669
Condenser Fans							
Number, Ckt.-1/Ckt.-2	4/4	5/4	5/5	5/5	6/5	6/6	6/6
Low Sound Fans							
Fan Motor, kw	1.5	1.5	1.5	1.5	1.5	1.5	1.5
Fan & Motor Speed, revs./sec.	19.0	19.0	19.0	19.0	19.0	19.0	19.0
Fan Diameter, mm	899	899	899	899	899	899	899
Fan Tip Speed, m/sec.	53.7	53.7	53.7	53.7	53.7	53.7	53.7
Total Chiller Airflow, l/sec.	49088	55224	61360	61360	67496	73632	73632
Ultra Quiet Fans							
Fan Motor, kw	1.5	1.5	1.5	1.5	1.5	1.5	1.5
Fan & Motor Speed, revs./sec.	14.0	14.0	14.0	14.0	14.0	14.0	14.0
Fan Diameter, mm	899	899	899	899	899	899	899
Fan Tip Speed, m/sec.	39	39	39	39	39	39	39
Total Chiller Airflow, l/sec.	49082	55218	61353	61353	67488	73624	73624
Evaporator, Direct-Expansion							
Water Volume, liters	359.6	359.6	359.6	416.4	416.4	416.4	529.9
Maximum Water Side Pressure, Bar ¹	10	10	10	10	10	10	10
Maximum Refrigerant Side Pressure, Bar	16	16	16	16	16	16	16
Minimum Chilled Water Flow Rate, l/sec.	9.5	9.5	9.5	11.4	11.4	11.4	11.4
Maximum Chilled Water Flow Rate, l/sec.	47.3	47.3	47.3	47.3	47.3	47.3	50.5
Water Connections, inches	10	10	10	10	10	10	10

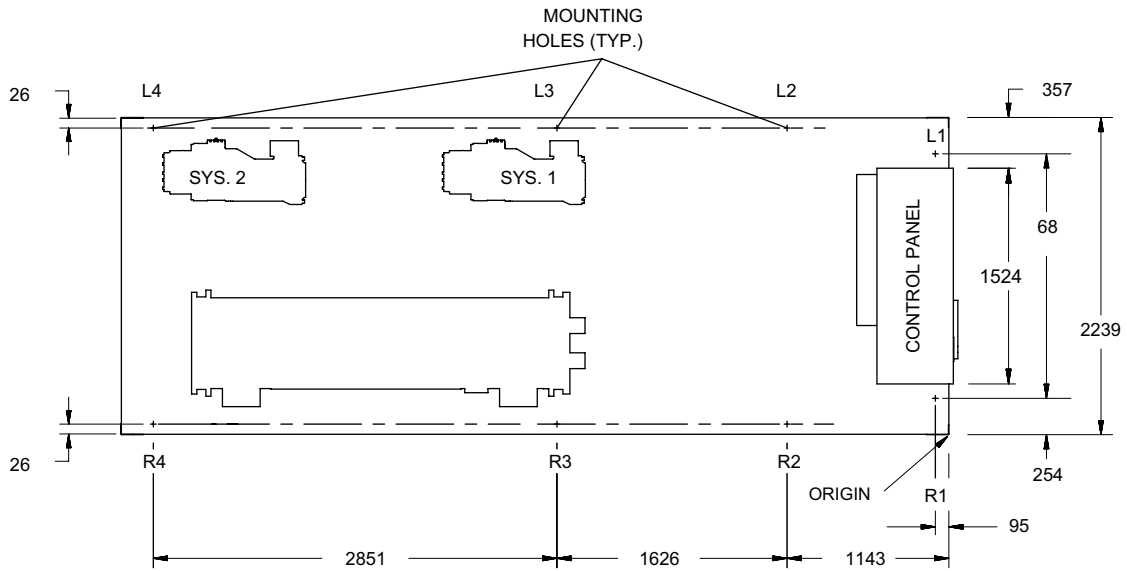
¹ Optional 21 Bar Waterside available

Dimensions – YCAV0569S/P - Standard Efficiency

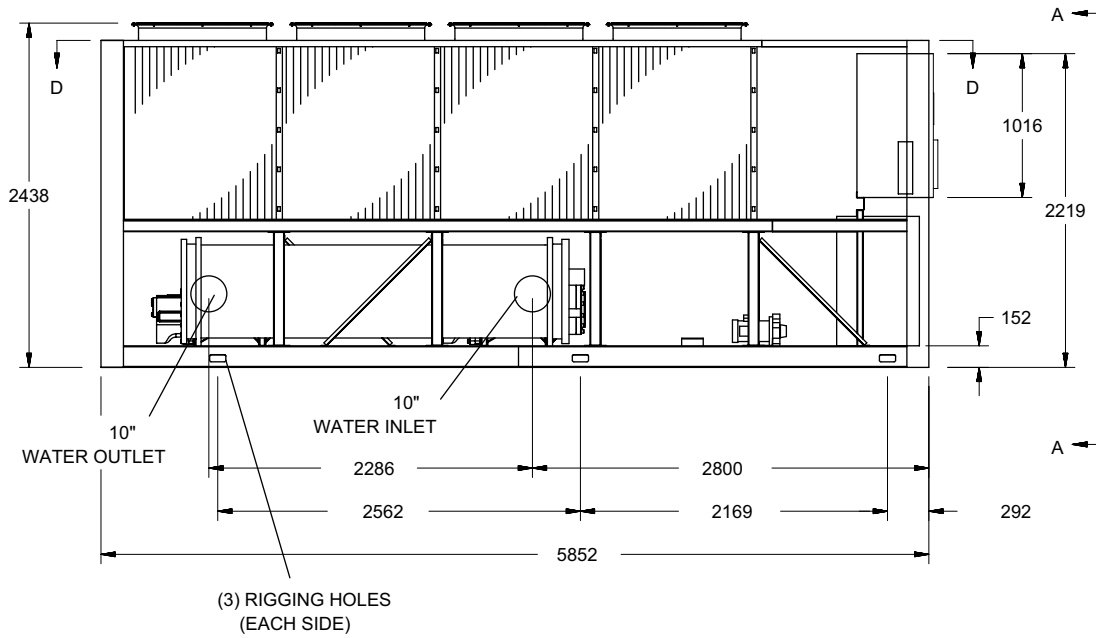


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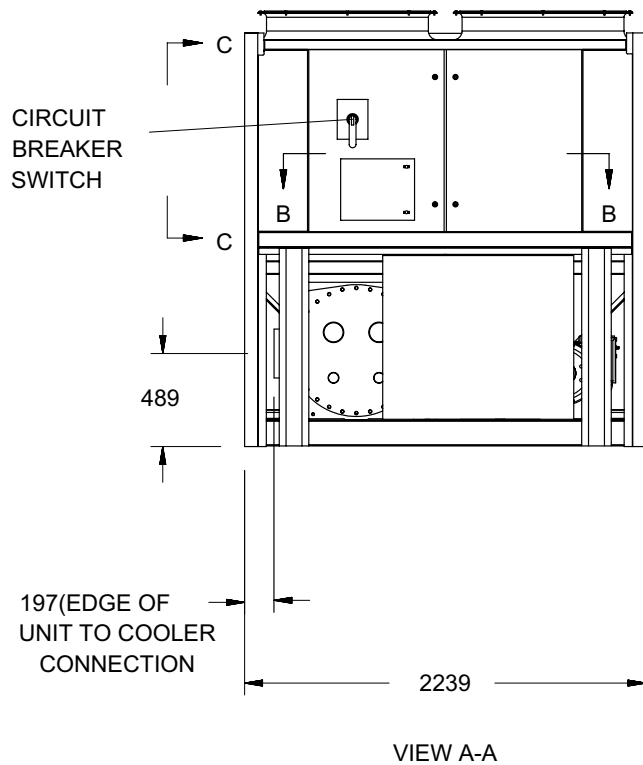
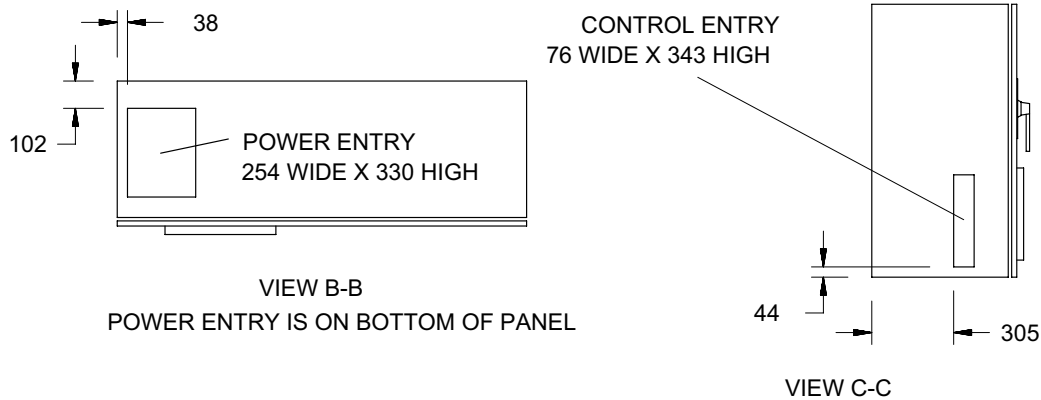
1. Placement on a level surface free of obstructions (including snow, for winter operation) or air recirculation ensures rated performance, reliable operation and ease of maintenance. Site restrictions may compromise minimum clearances indicated below, resulting in unpredictable air flow patterns and possible diminished performance. York's unit controls will optimize operation without nuisance high pressure safety cutout; however, the system designer must consider potential performance degradation. Access to the unit control center assumes the unit is no higher than on spring isolators. Recommended minimum clearances: side to wall - 2m; rear to wall - 2m; control panel end to wall - 1.2m; top – no obstructions allowed; distance between adjacent units - 3m. No more than one adjacent wall may be higher than the unit.



VIEW D-D

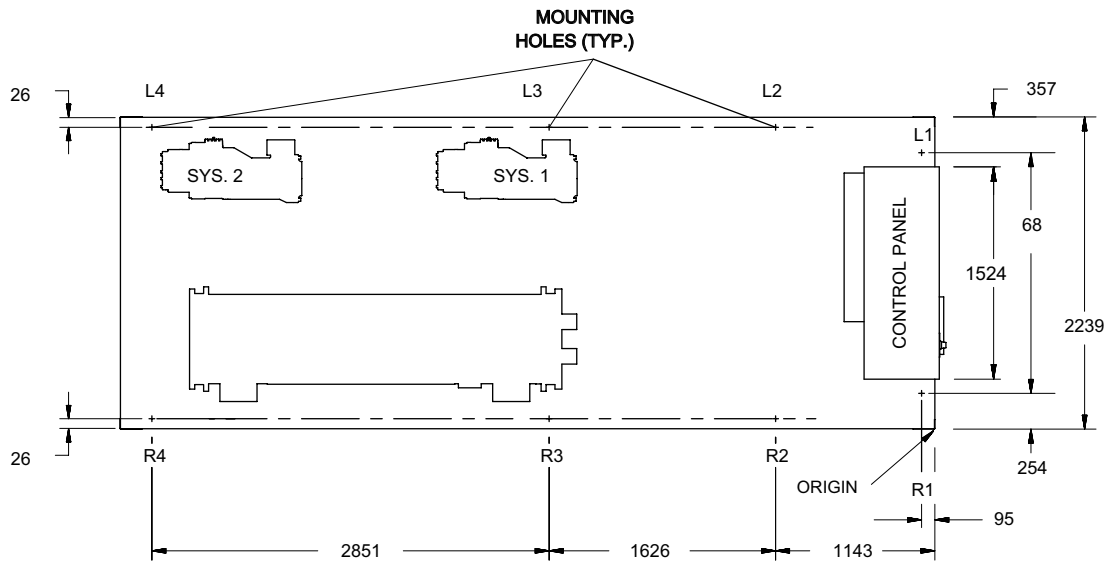


Dimensions – YCAV0569E/V - High Efficiency

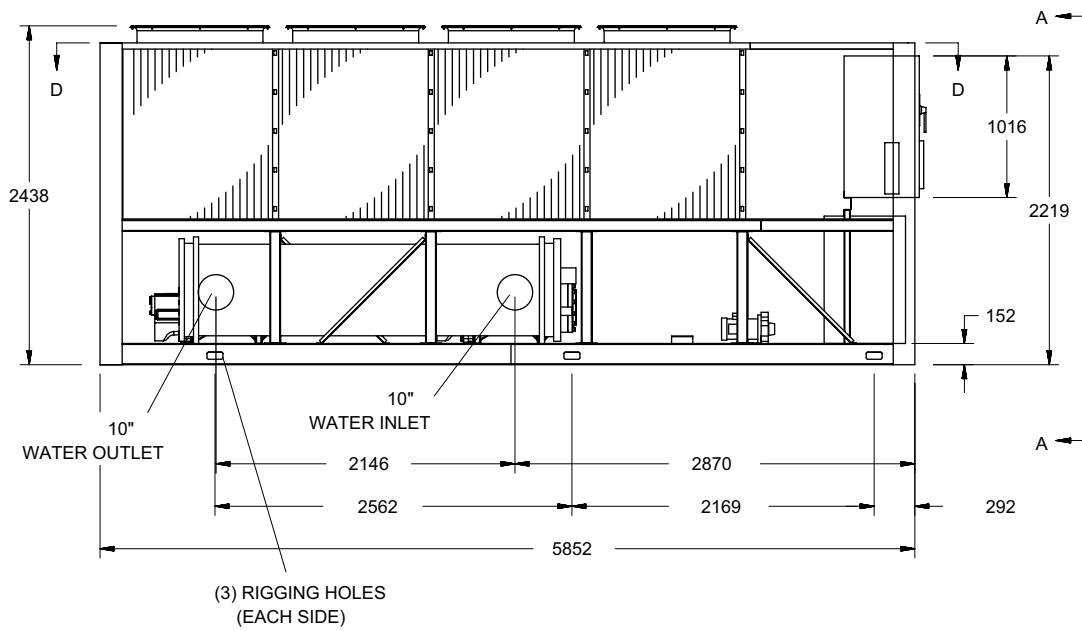


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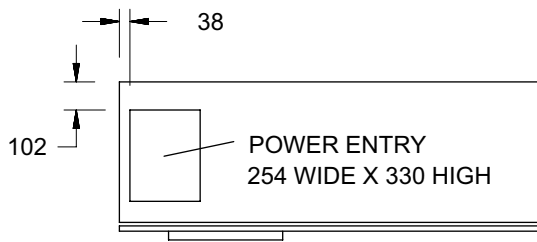
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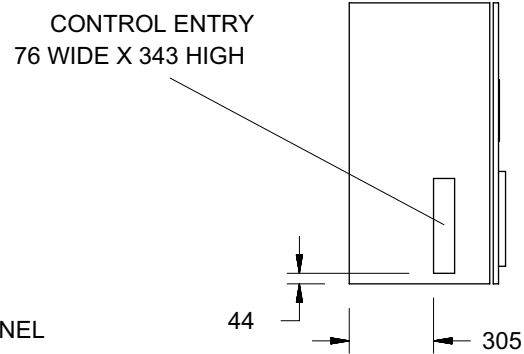
VIEW D-D



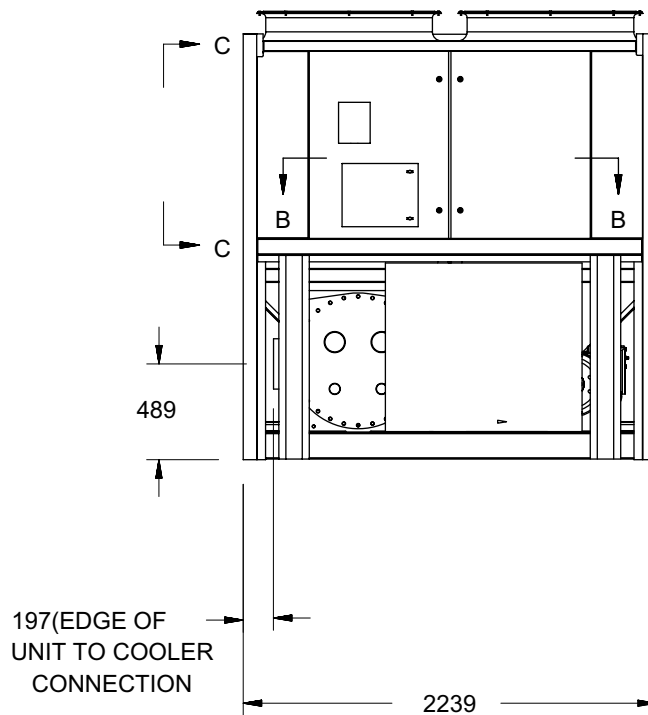
Dimensions – YCAV0639S/P - Standard Efficiency



VIEW B-B
POWER ENTRY IS ON BOTTOM OF PANEL



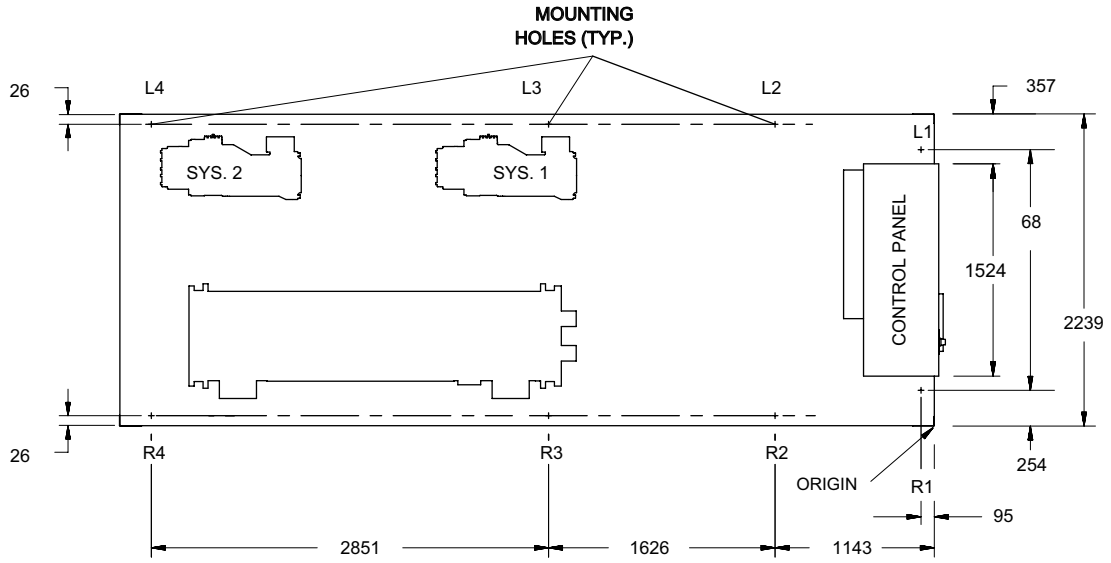
VIEW C-C



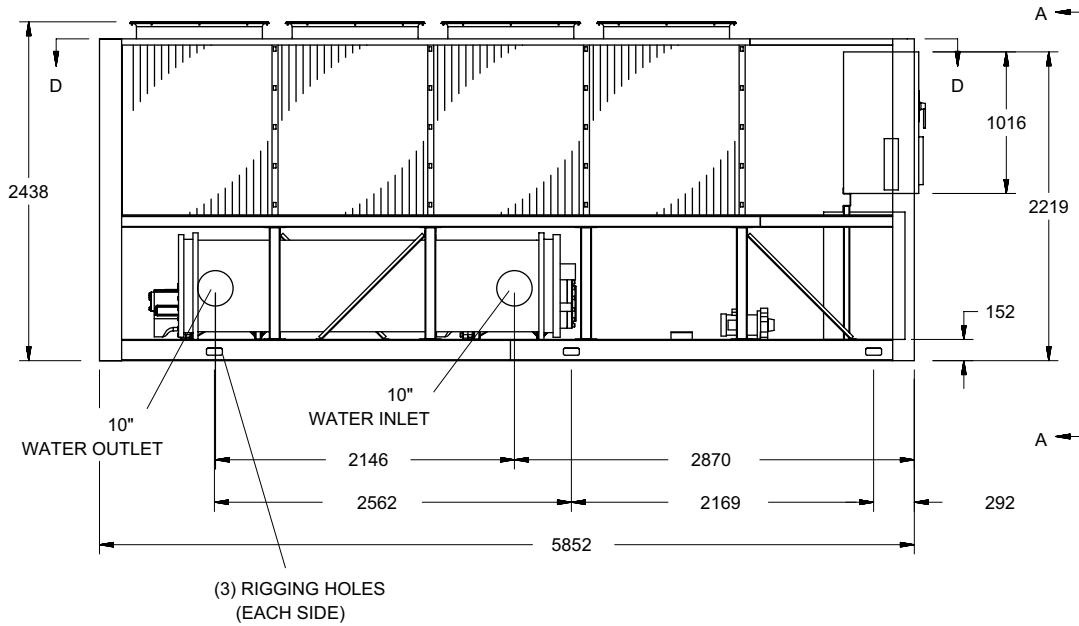
VIEW A-A

Notes:

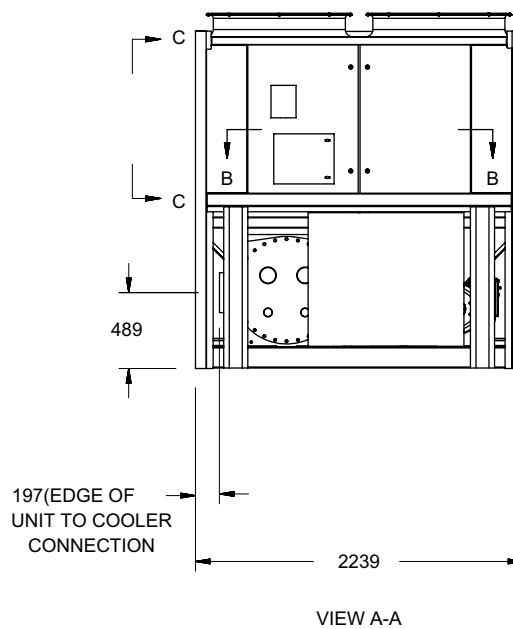
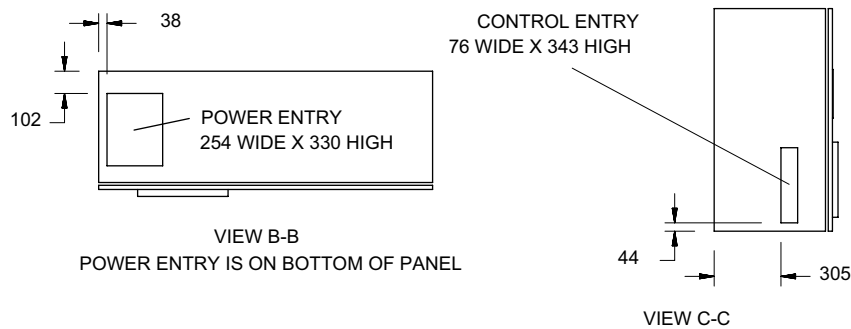
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VIEW D-D

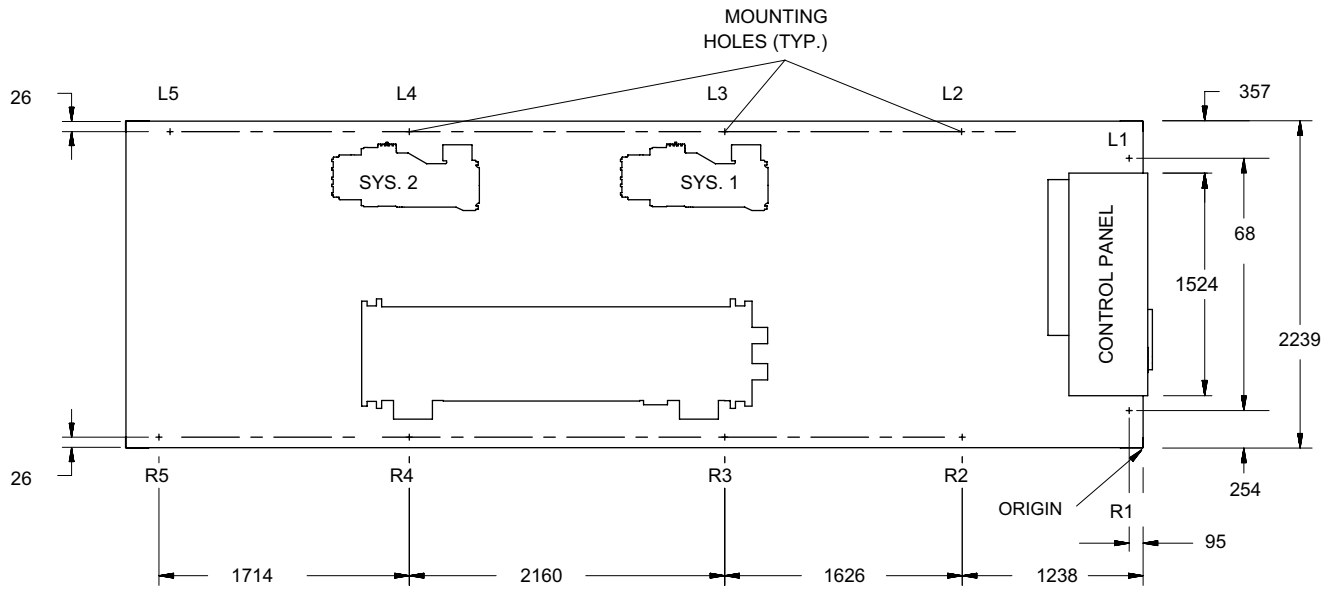


Dimensions – YCAV0639E/V - High Efficiency

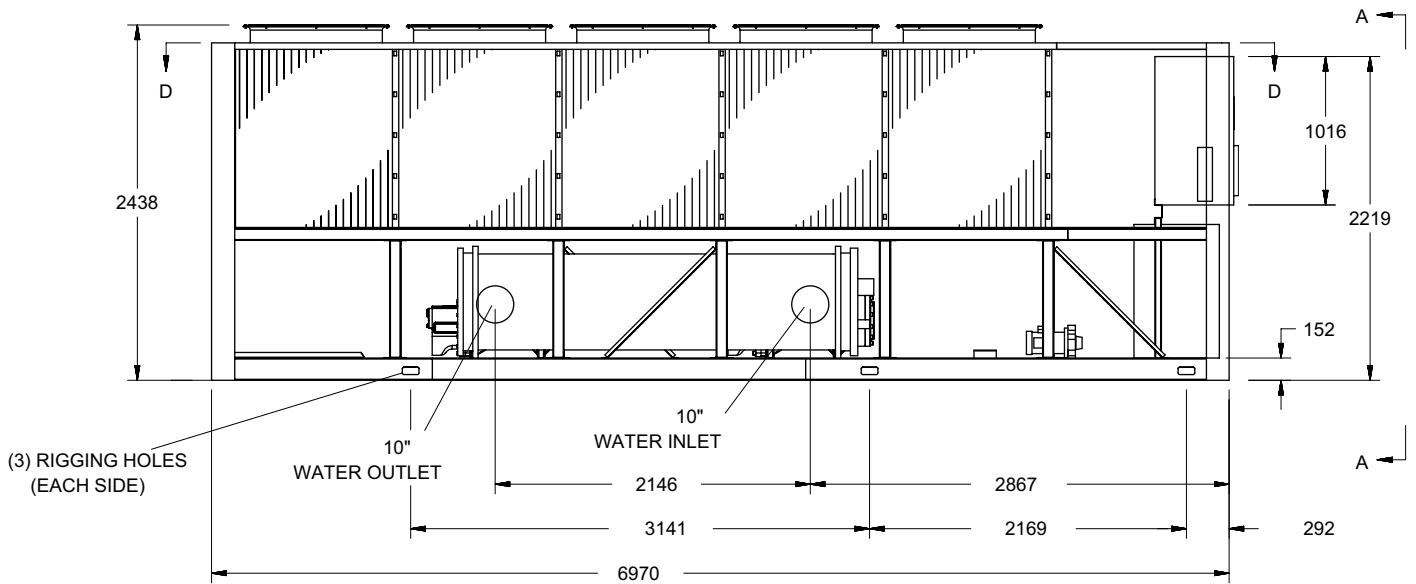


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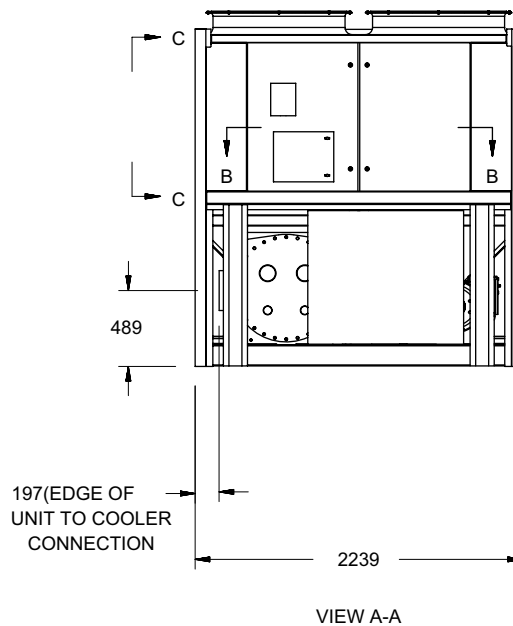
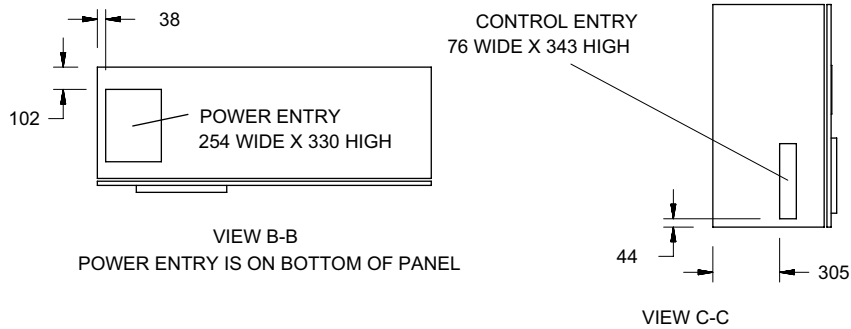
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VIEW D-D

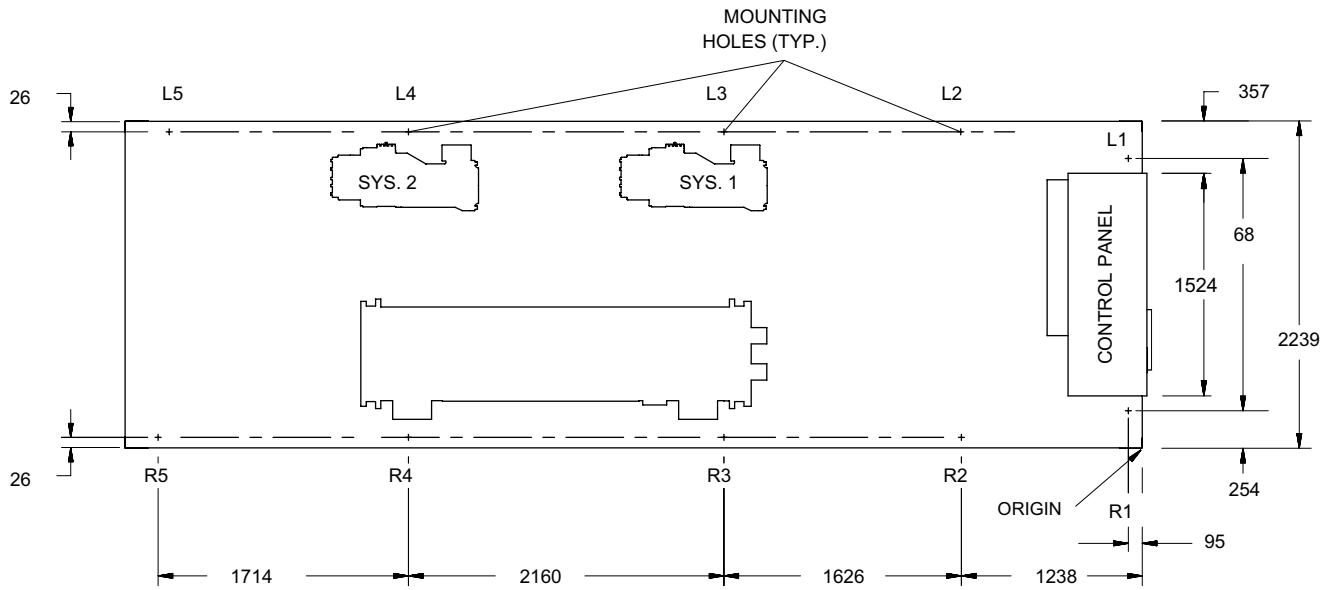


Dimensions – YCAV0679S/P - Standard Efficiency

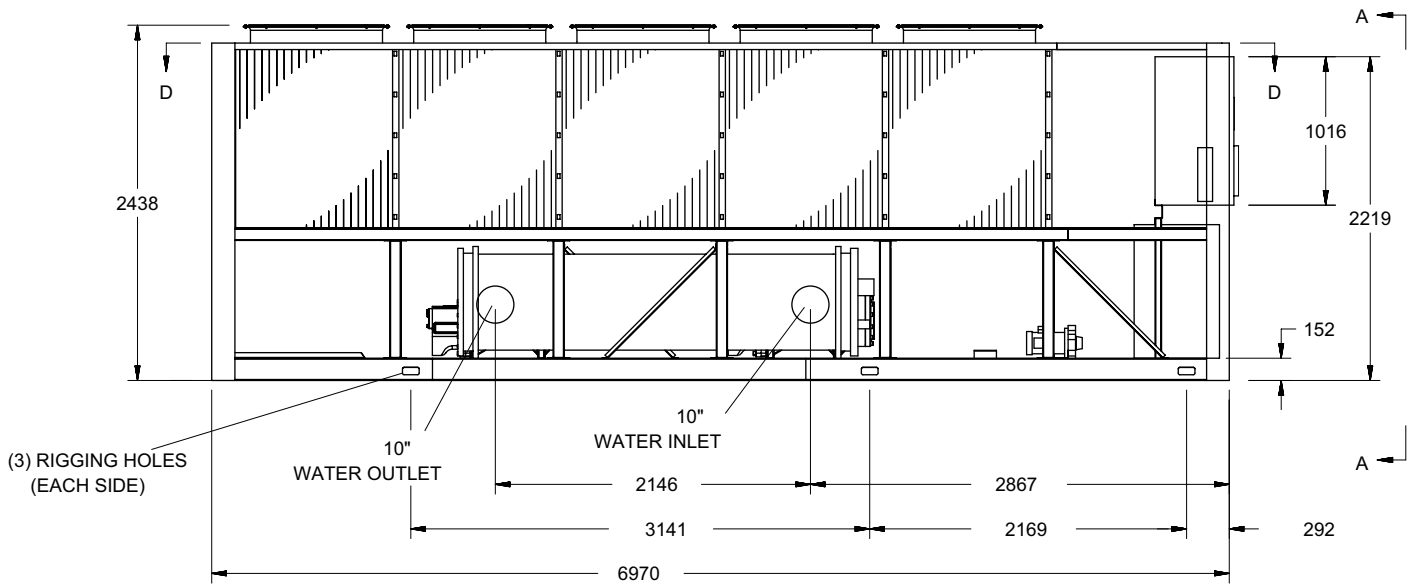


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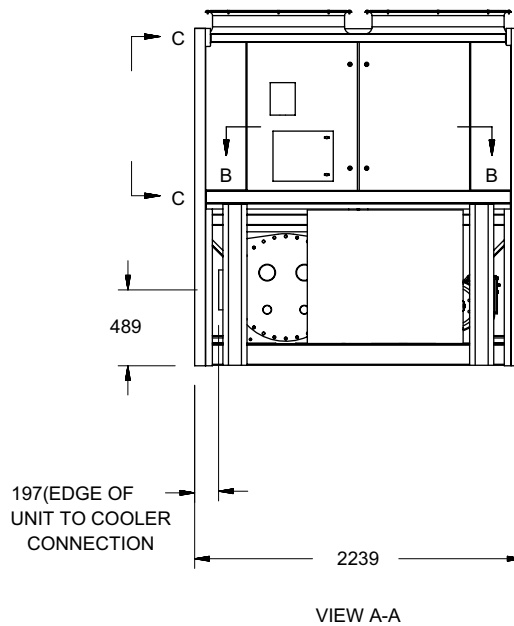
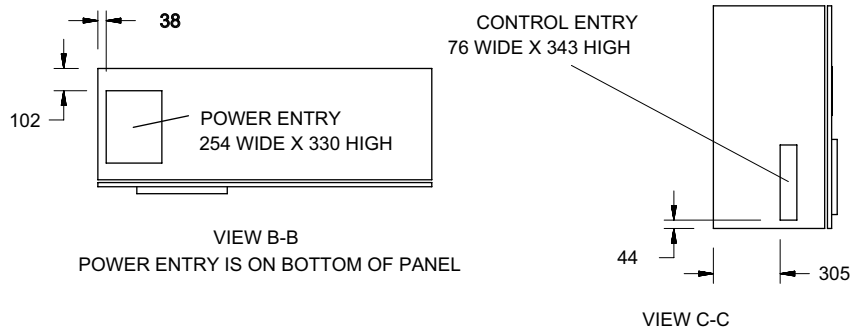
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VIEW D-D

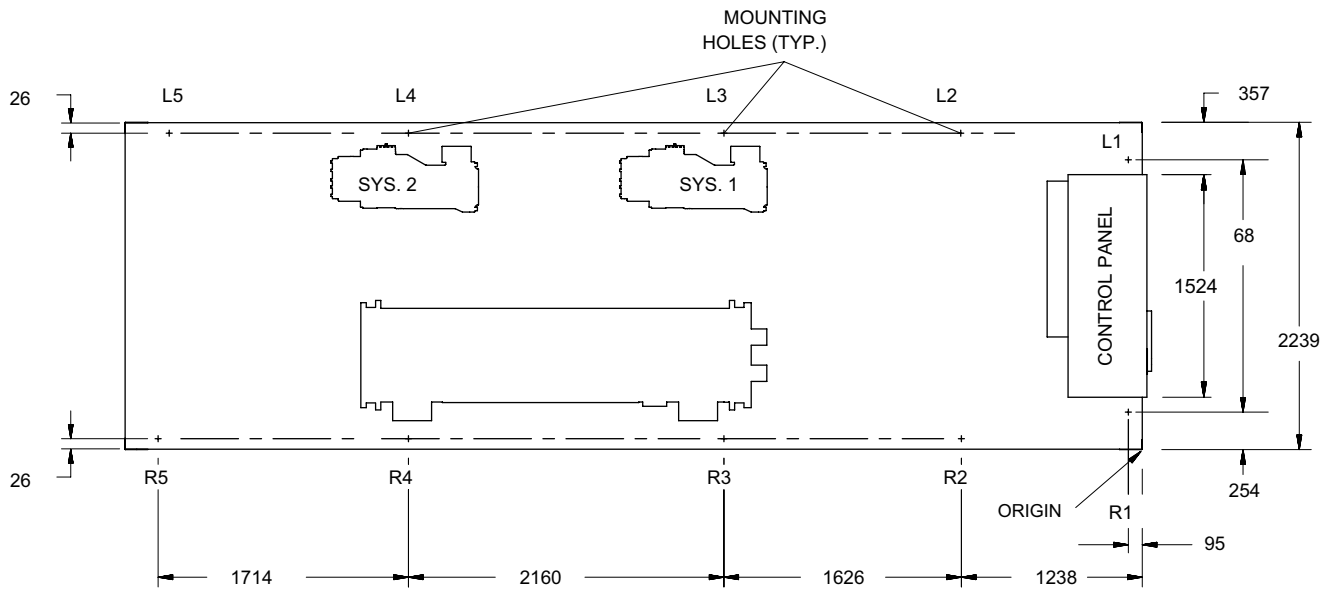


Dimensions – YCAV0679E/V - High Efficiency

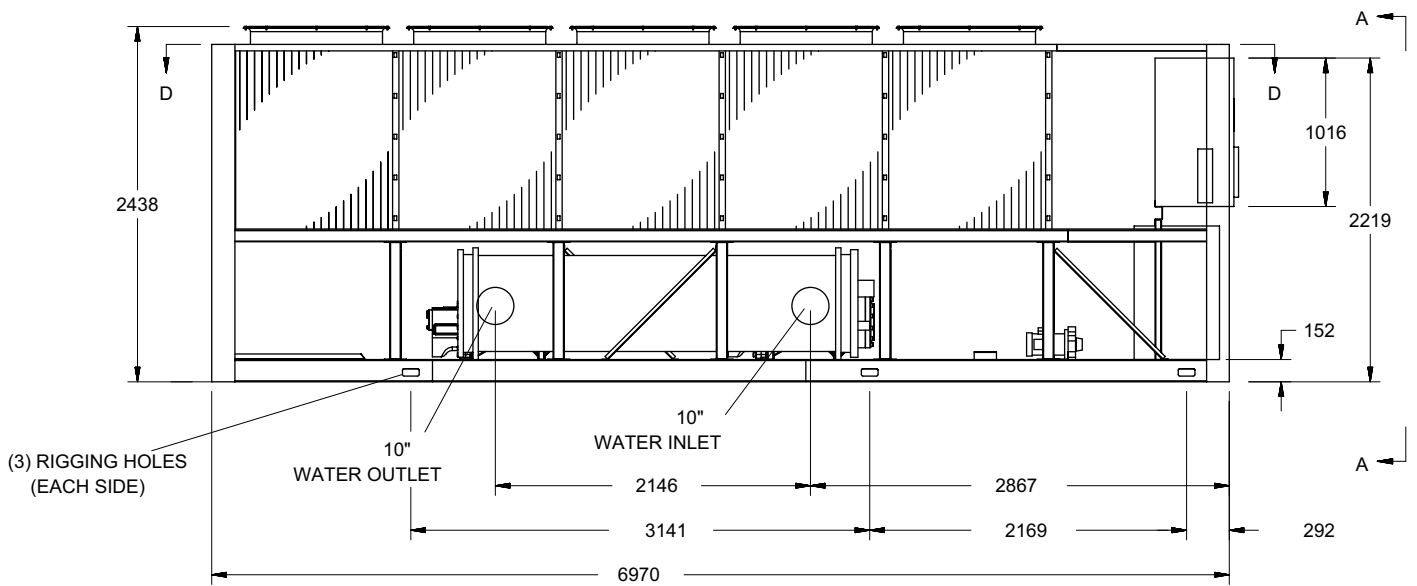


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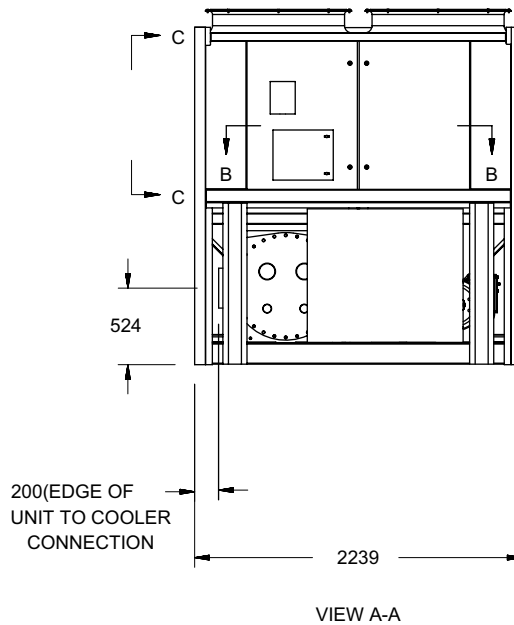
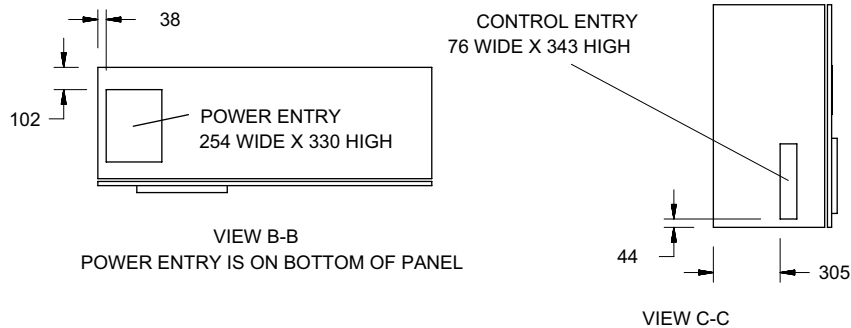
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VIEW D-D

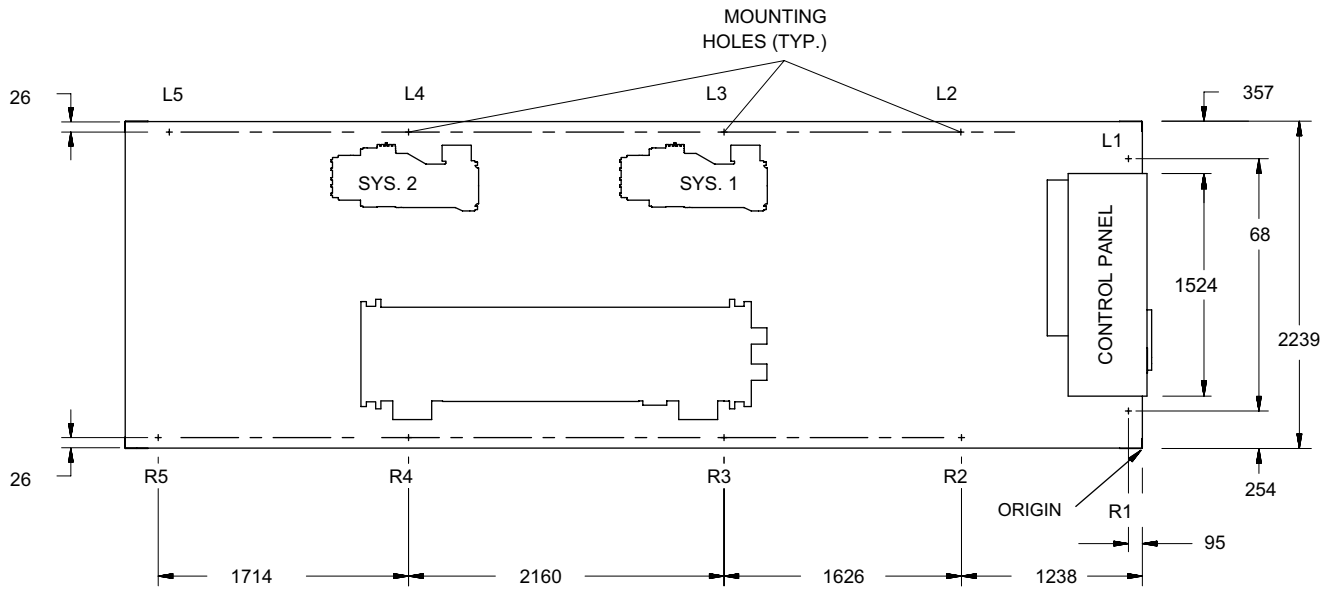


Dimensions – YCAV0719E/V - High Efficiency

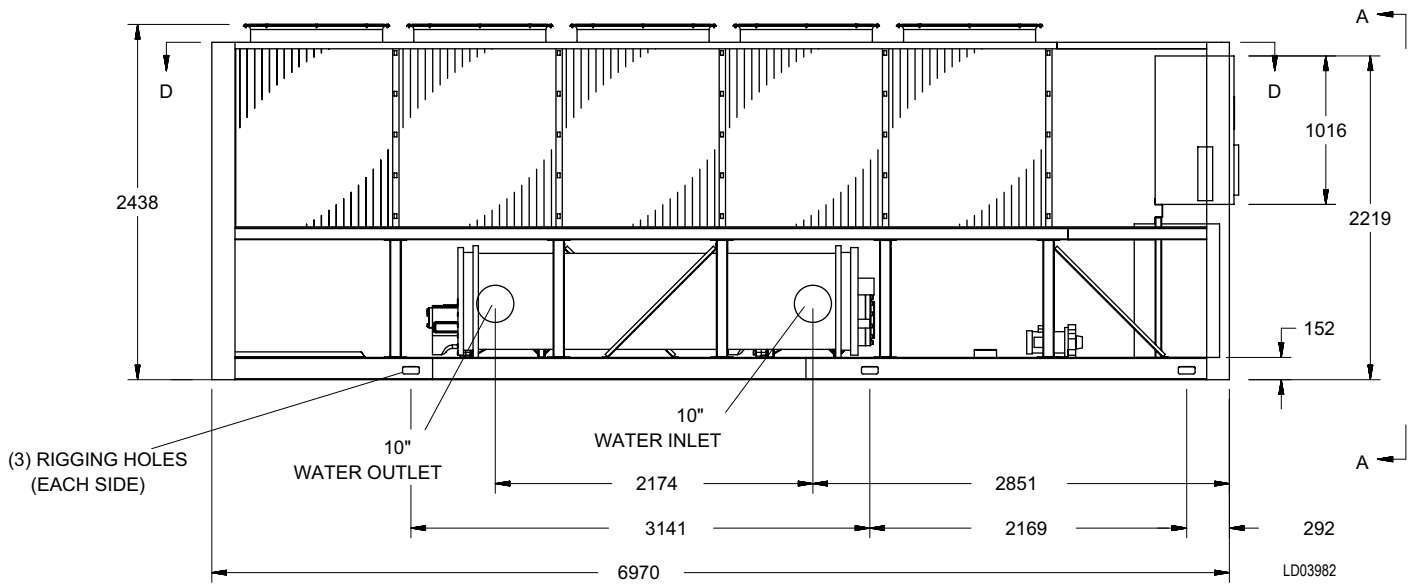


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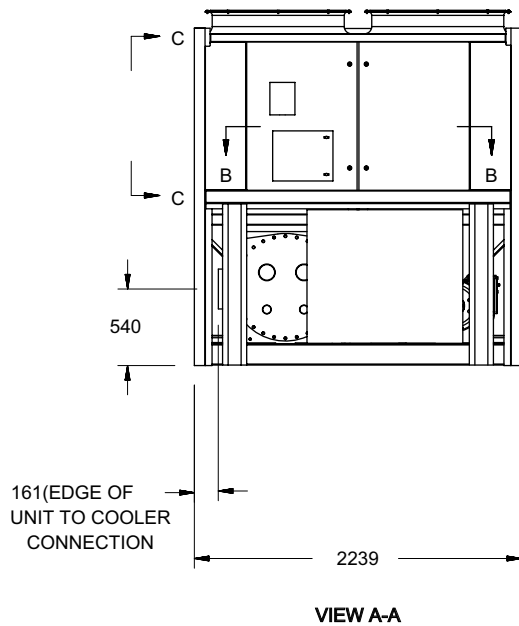
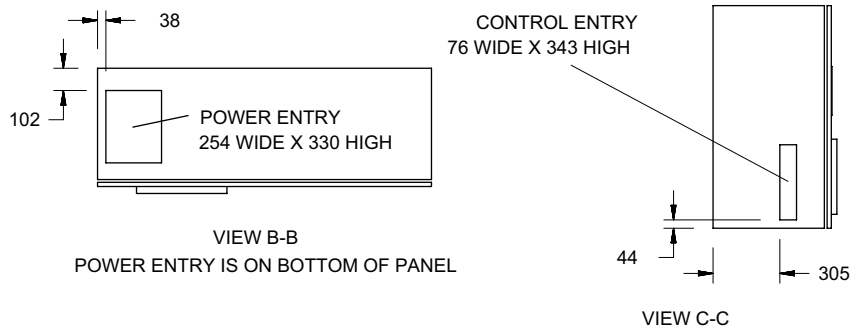
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VIEW D-D

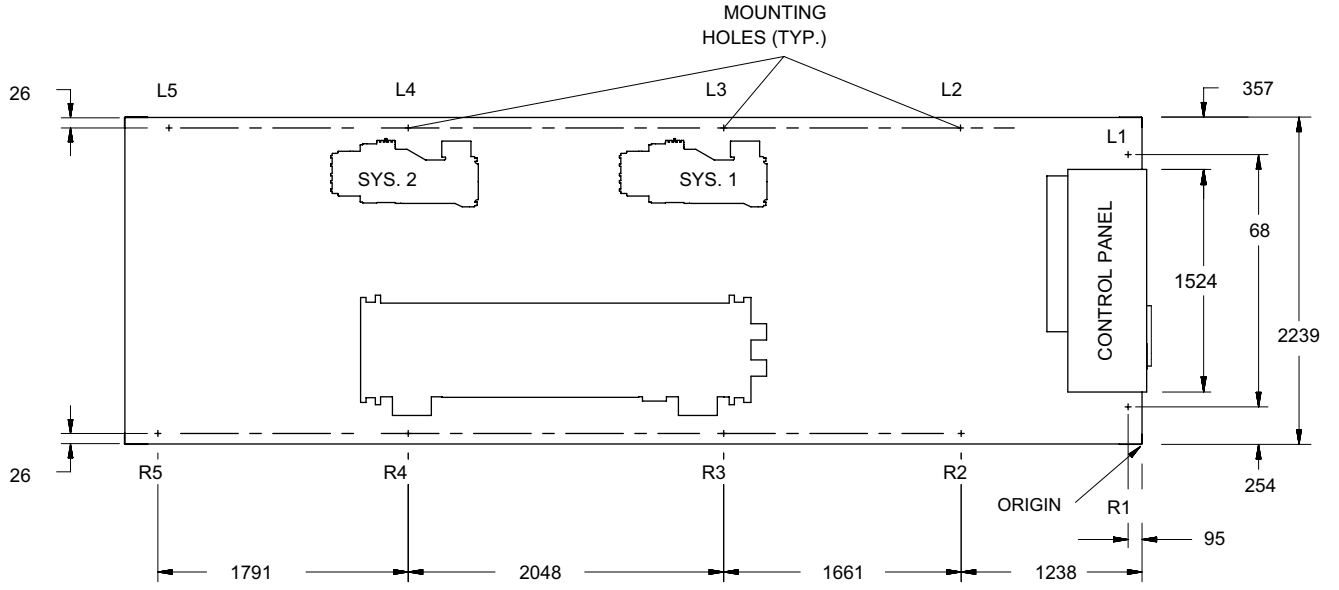


Dimensions – YCAV0739S/P - Standard Efficiency

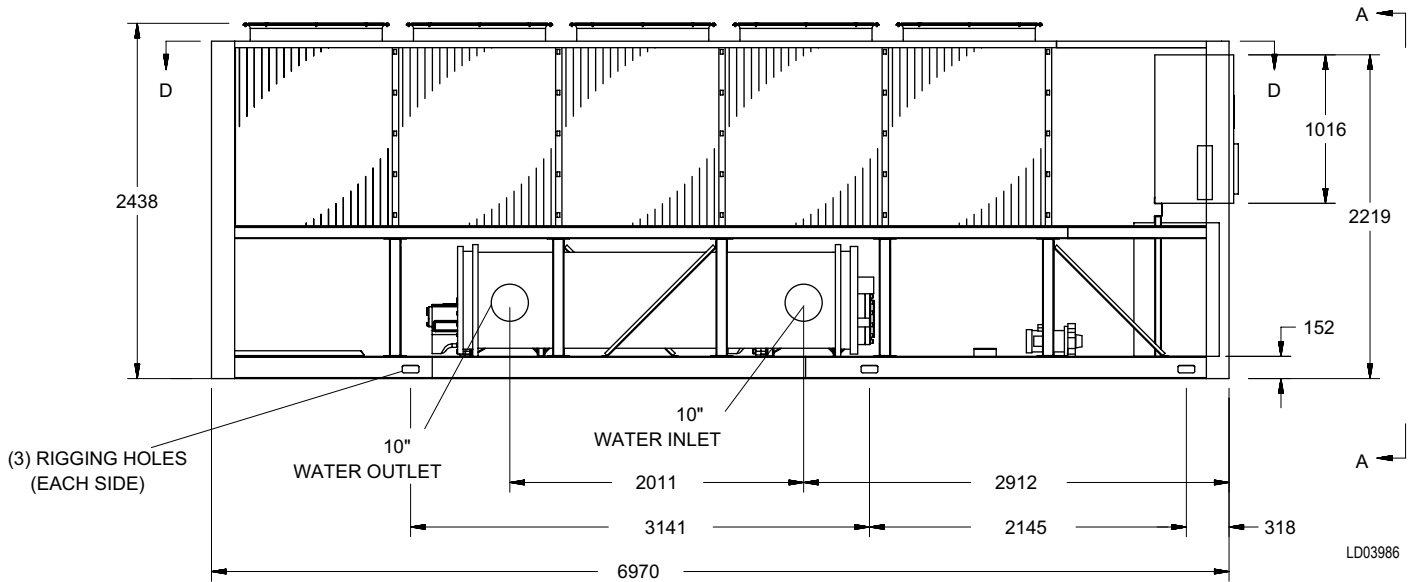


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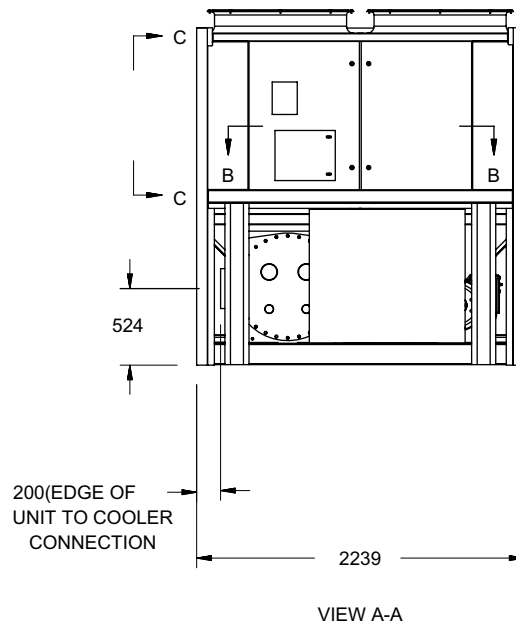
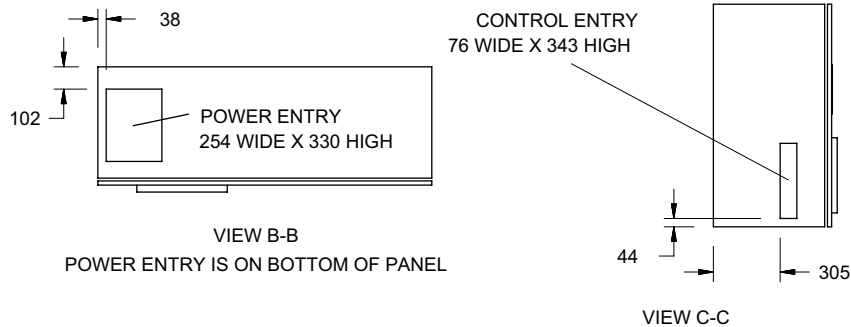
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VIEW D-D

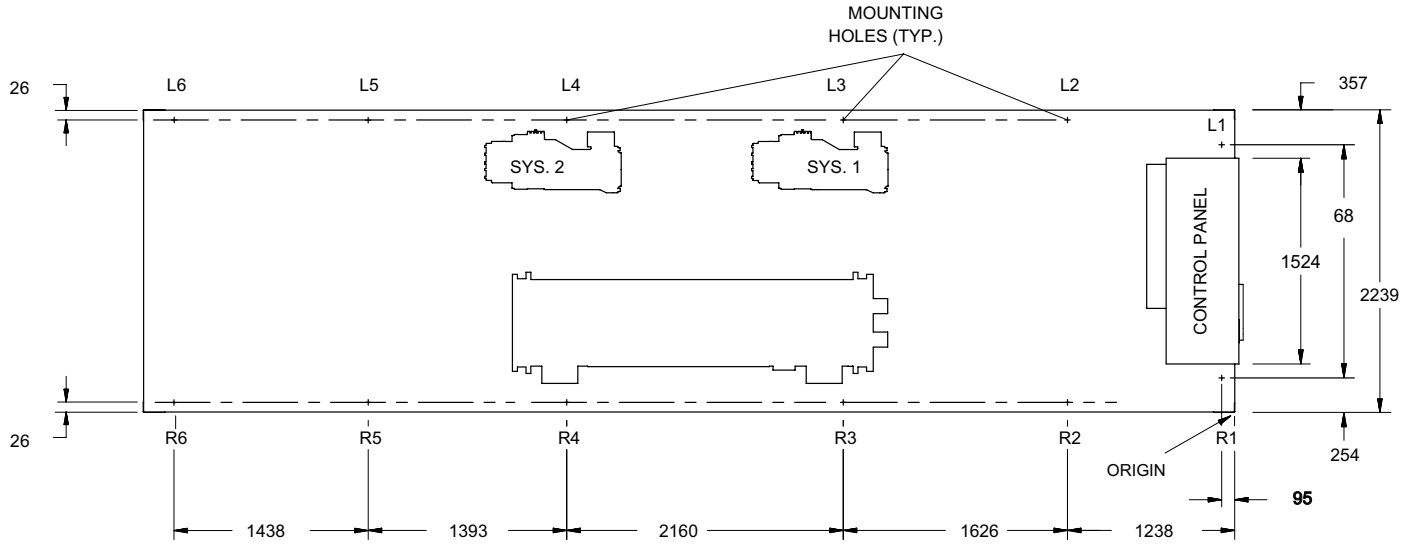


Dimensions – YCAV0739E/V - High Efficiency

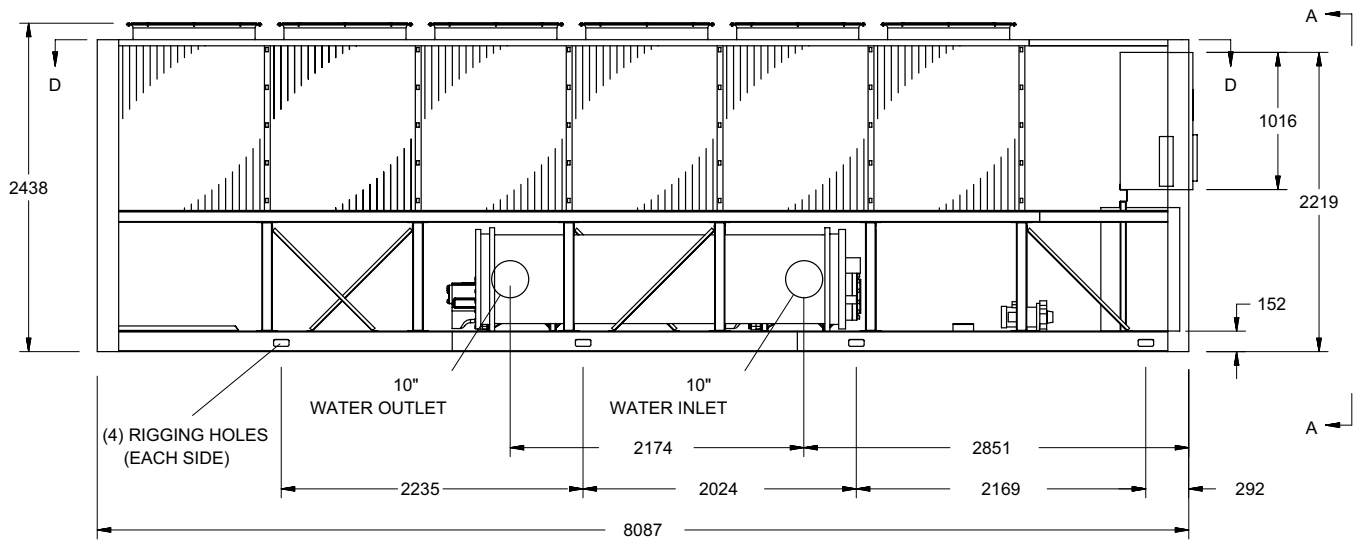


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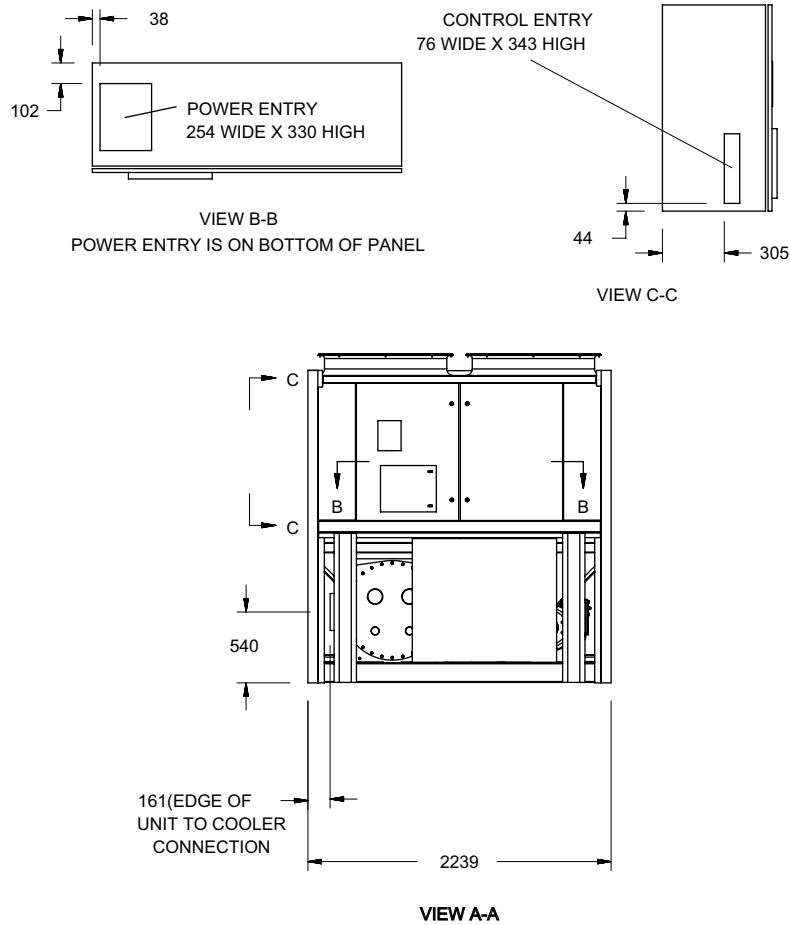
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VIEW D-D

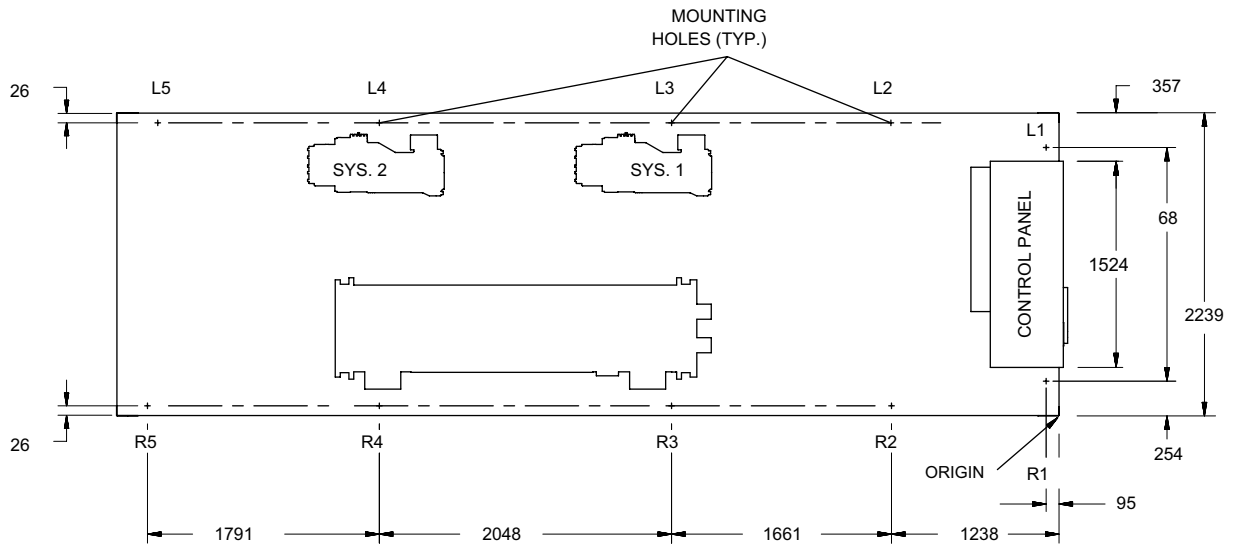


Dimensions – YCAV0819S/P - Standard Efficiency

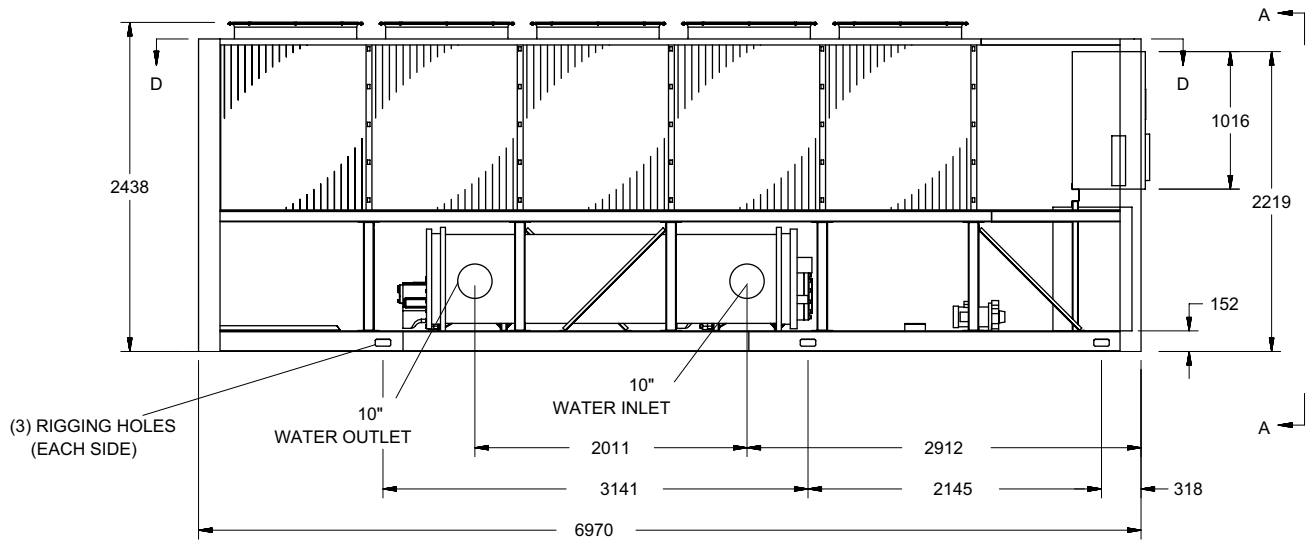


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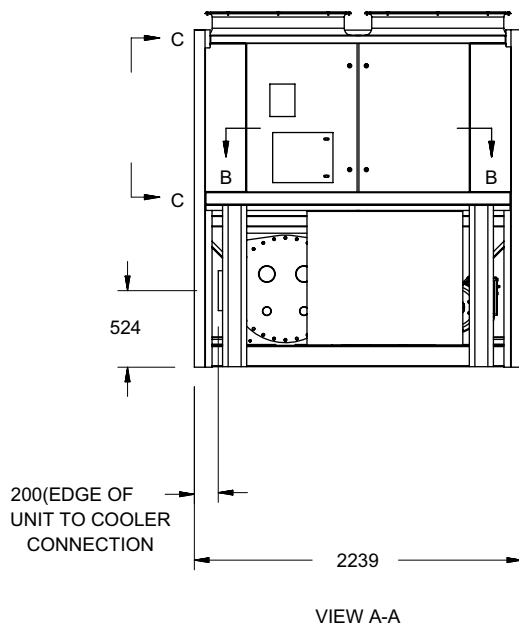
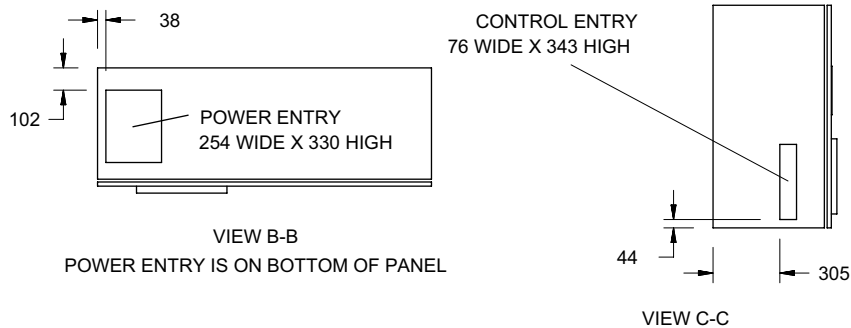
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VIEW D-D

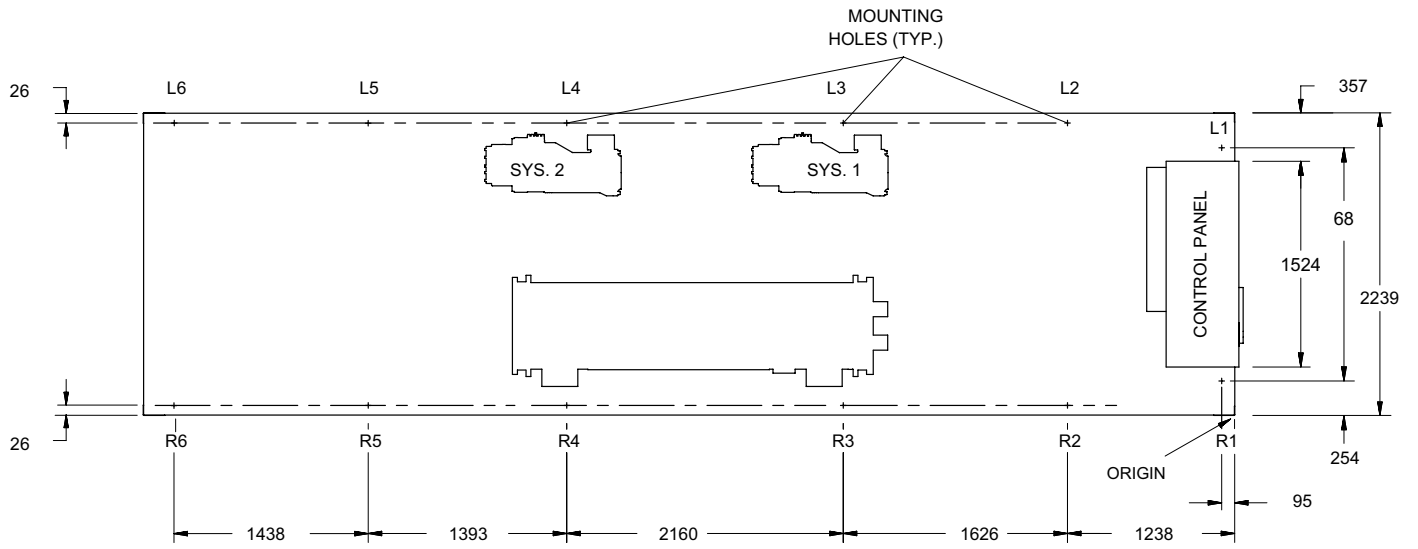


Dimensions – YCAV0819E/V - High Efficiency

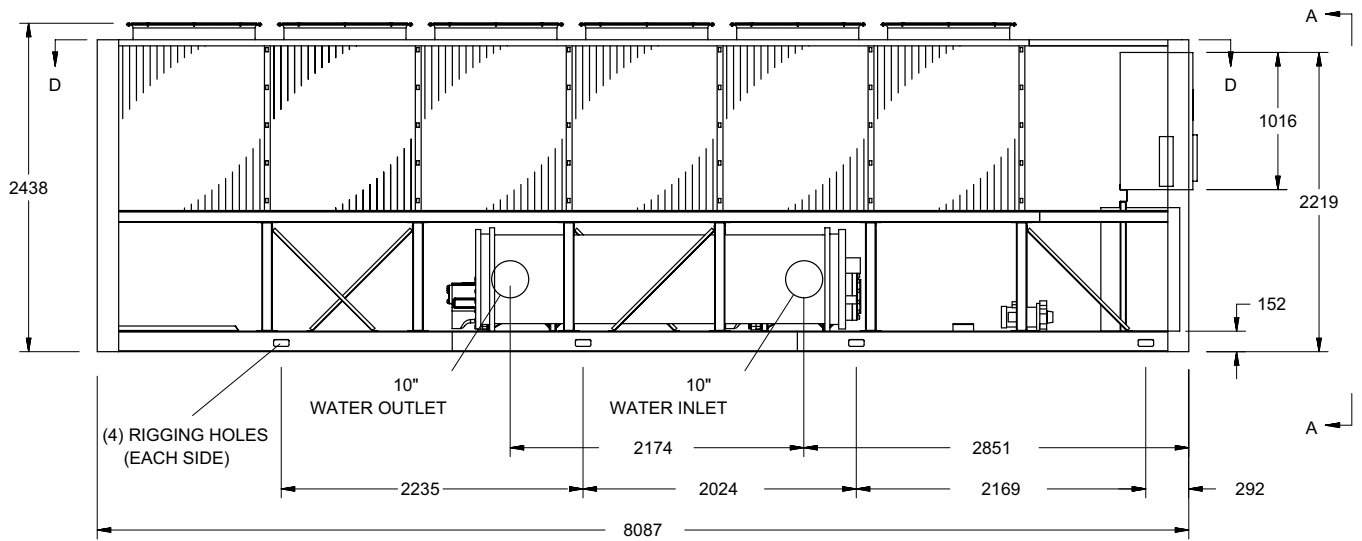


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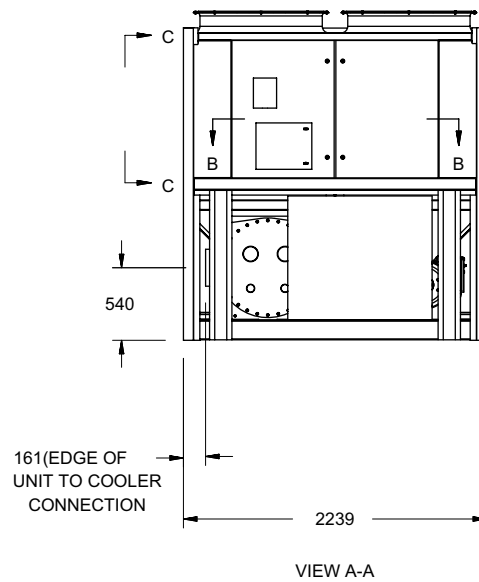
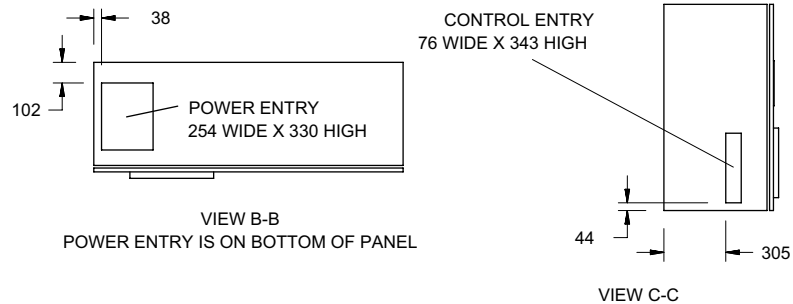
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VIEW D-D

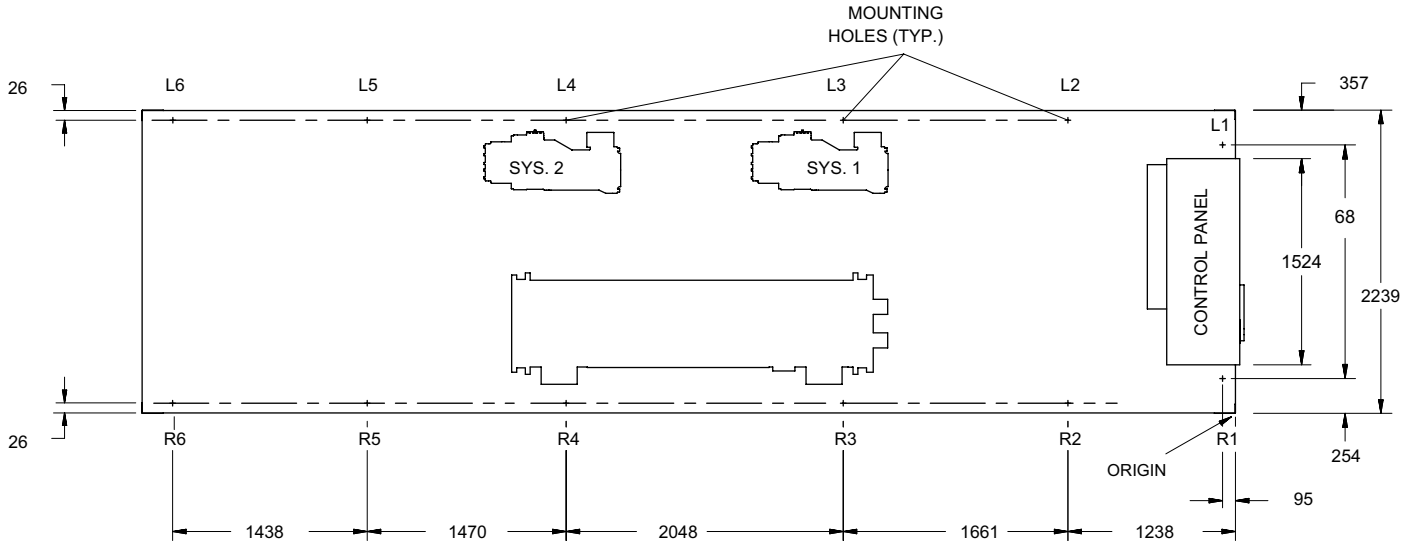


Dimensions – YCAV0889S/P - Standard Efficiency

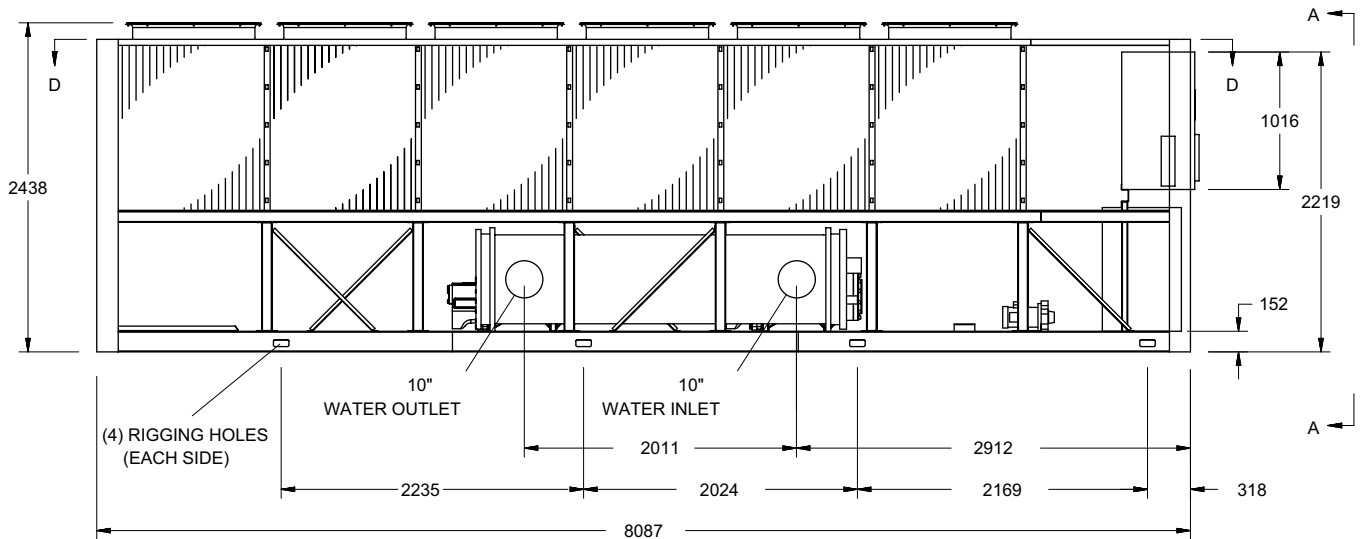


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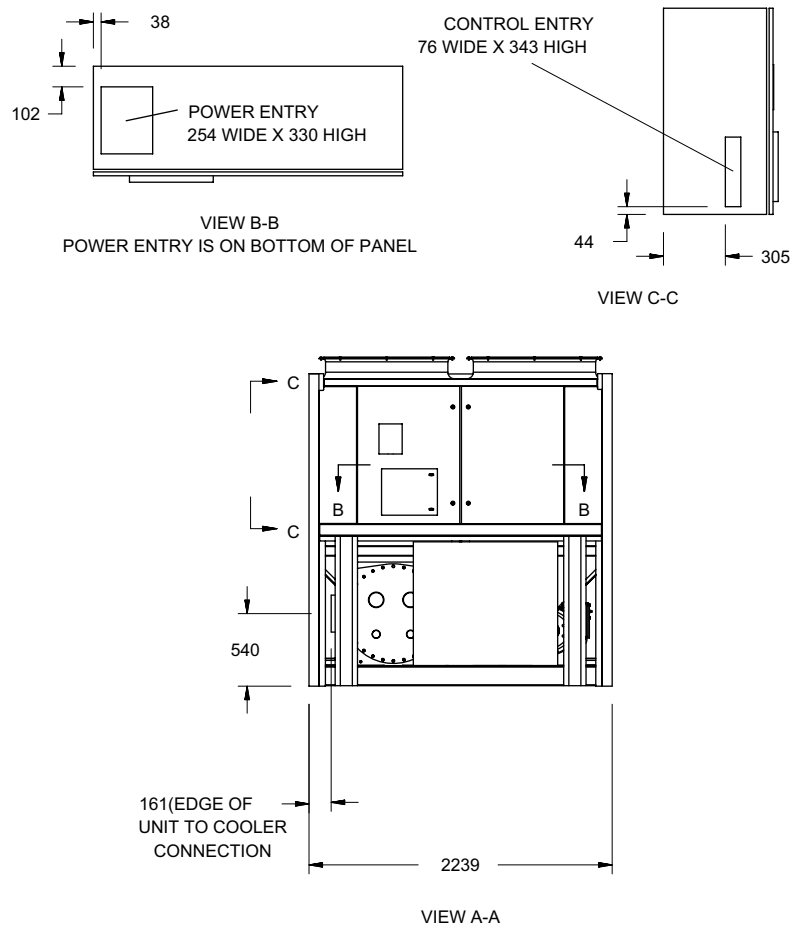
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VIEW D-D

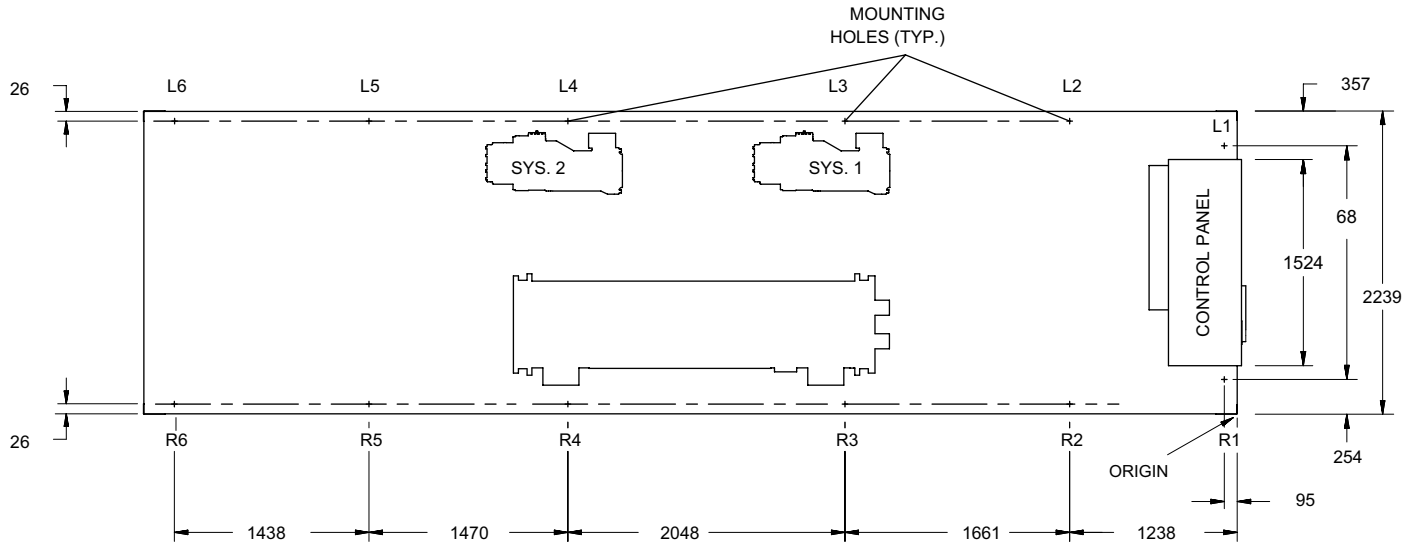


Dimensions – YCAV0889E/V - High Efficiency

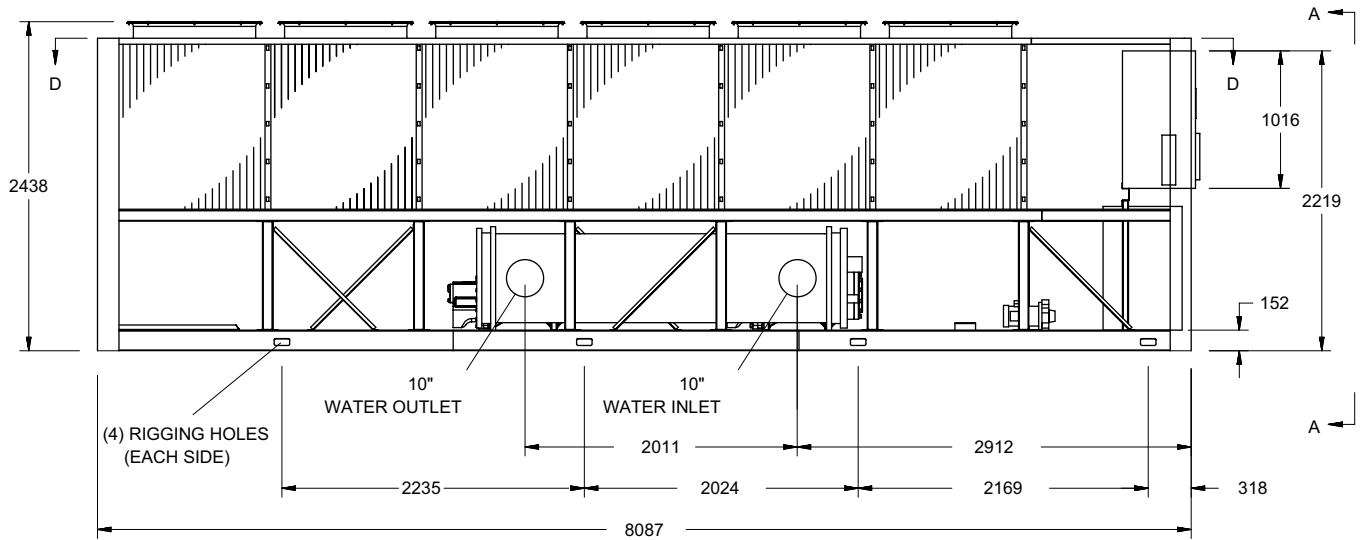


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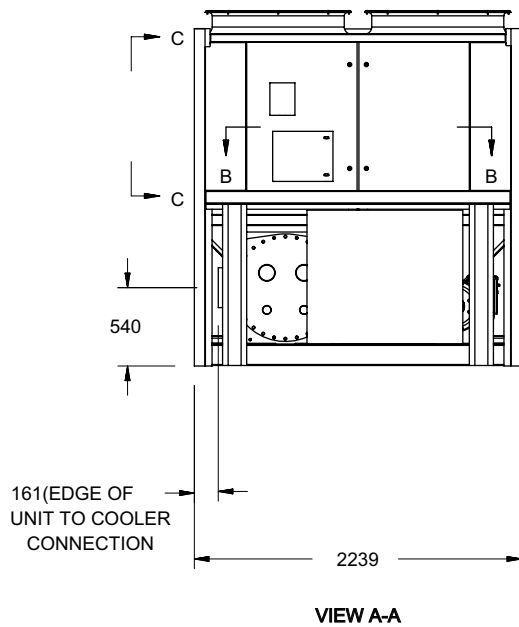
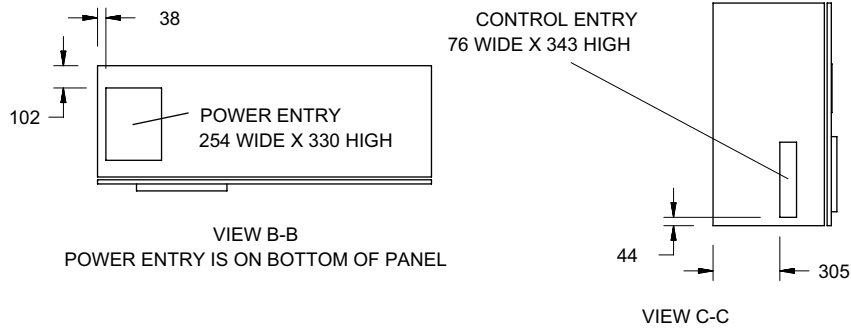
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VIEW D-D

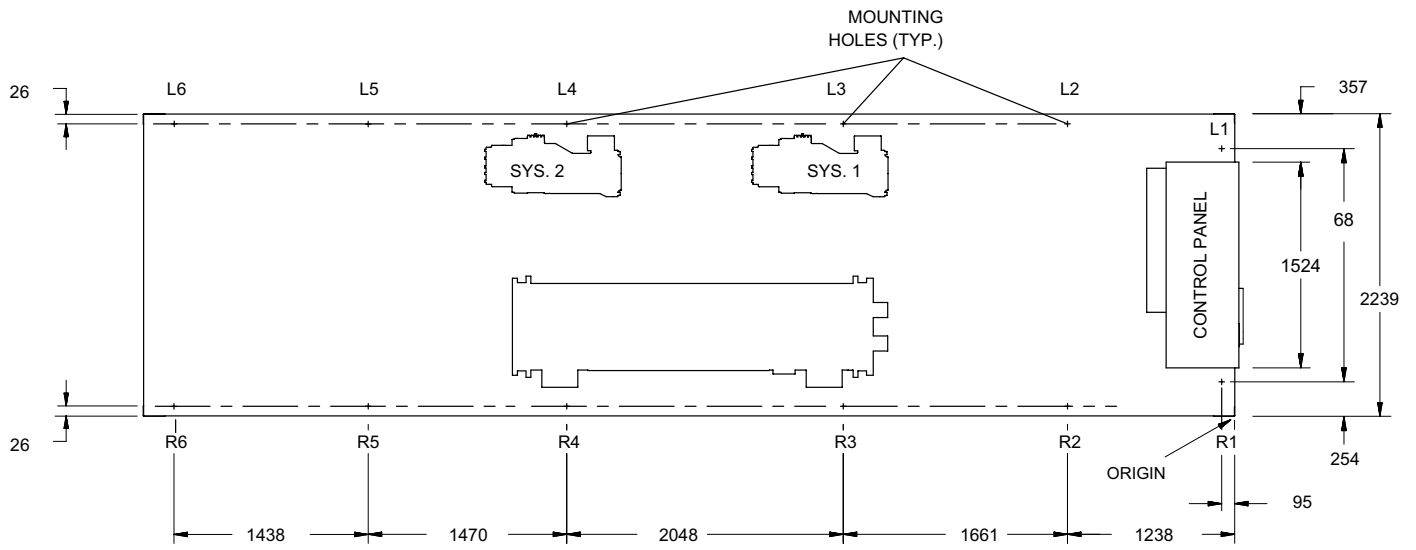


Dimensions – YCAV0969S/P - Standard Efficiency

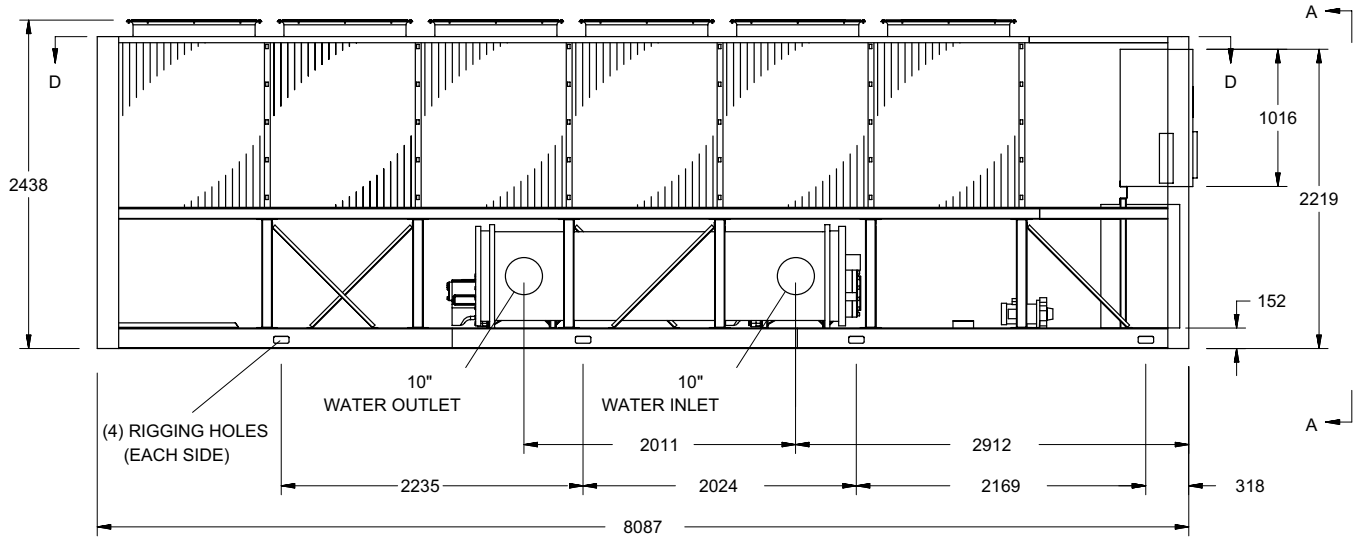


NOTES:

1. Placement on a level surface free of obstructions (including snow, for winter operation) or air recirculation ensures rated performance, reliable operation and ease of maintenance. Site restrictions may compromise minimum clearances indicated below, resulting in unpredictable air flow patterns and possible diminished performance. YORK's unit controls will optimize operation without nuisance high pressure safety cutout; however, the system designer must consider potential performance degradation. Access to the unit control center assumes the unit is no higher than on spring isolators. Recommended minimum clearances: Side to wall - 2m; rear to wall - 2m; control panel end to wall - 1.2m; top - no obstructions allowed; distance between adjacent units - 3m. No more than one adjacent wall may be higher than the unit.



VIEW D-D

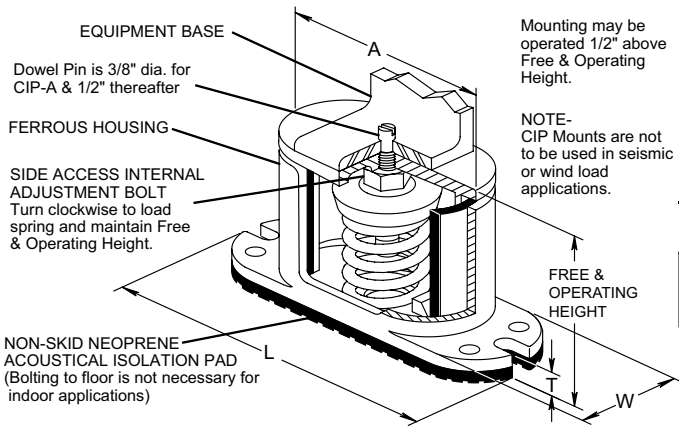


Isolator Cross-Reference

ONE INCH DEFLECTION SPRING ISOLATOR CROSS-REFERENCE

CIP-X-

Illustration shows single spring CIP-B or CIP-C mount.



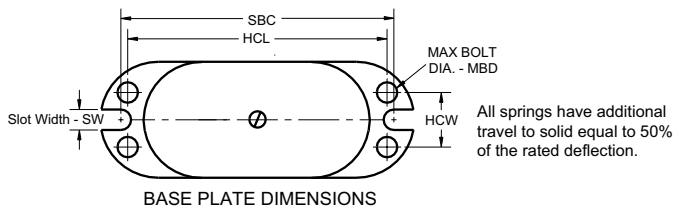
Mounting may be operated 1/2" above Free & Operating Height.

NOTE- CIP Mounts are not to be used in seismic or wind load applications.

TYPE CIP DIMENSIONS (inches)†

Size	A	L	T	W	SW	HCL	HCW	MBD	SBC	Free Ht.	Min Ht.
CIP-B	5 ³ / ₄	8 ¹ / ₄	1/2	2 ³ / ₄	7/16	6 ¹ / ₂	11/2	3/8	7 ¹ / ₄	6 ¹ / ₈	5 ¹ / ₄
CIP-C	6 ⁵ / ₈	8 ⁷ / ₈	9/16	3 ¹ / ₂	7/16	7 ¹ / ₄	13/4	3/8	7 ⁷ / ₈	6 ³ / ₄	6 ³ / ₄

†Casting dimensions may vary ±1/8"



BASE PLATE DIMENSIONS

FOR UNITS WITH ALL POINT LOADS LESS THAN 1404 LBS (637 KG)

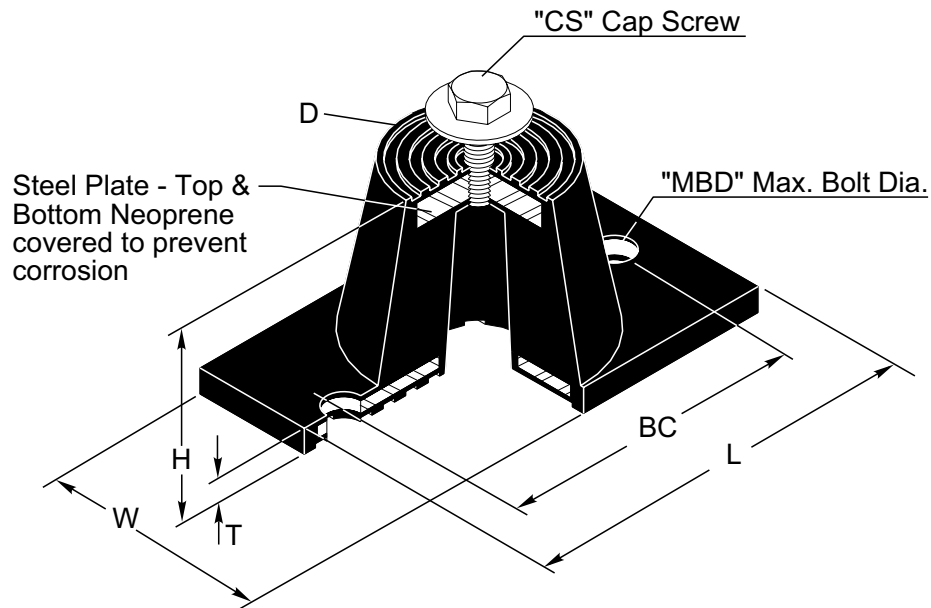
Weight Range (lbs)	Weight Range (kg)	Model Number	Color
239 to 384 lbs	108 to 174 kg	CIP-B-	Red
384 to 639 lbs	174 to 290 kg	CIP-B-	White
639 to 851 lbs	290 to 386 kg	CIP-B-	Blue
851 to 1064 lbs	386 to 483 kg	CIP-B-	Gray
1064 to 1404 lbs	483 to 637 kg	CIP-B-	Black

FOR UNITS WITH ANY POINT LOAD ABOVE 1404 LBS (637 KG)

Weight Range (lbs)	Weight Range (kg)	Model Number	Color
Up to 851 lbs	Up to 386 kg	CIP-C-	Black
851 to 1149 lbs	386 to 521 kg	CIP-C-	Yellow
1149 to 1489 lbs	521 to 675 kg	CIP-C-	Black
1489 to 1786 lbs	675 to 910 kg	CIP-C-	Yellow w/ Red
1786 to 2028 lbs	910 to 920 kg	CIP-C-	Yellow w/ Green
2028 to 2254 lbs	920 to 1022 kg	CIP-C-	Red w/ Red
2254 to 2936 lbs	1022 to 1332 kg	CIP-C-	Red w/ Green

NEOPRENE ISOLATOR CROSS-REFERENCE

ND-X



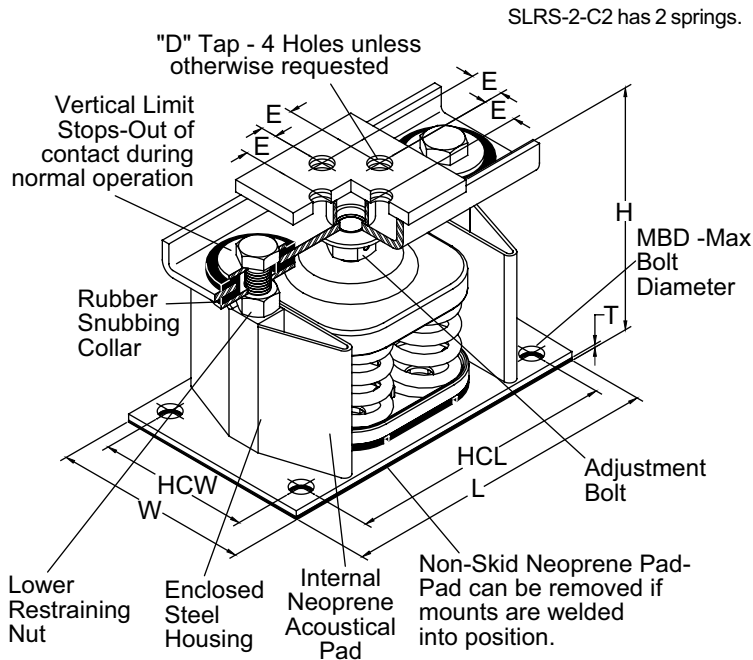
ENGLISH								
Size	D	H	L	T	W	BC	CS	MBD
ND-C	2 9/16	2 3/4	5 1/2	1/4	2 5/16	4 1/80	1/2- 13 x 1"	1/2"
ND-D	3 3/8	2 3/4	6 1/4	5/16	4	5	1/2- 13 x 1"	1/2"
ND-E	4 1/2	4 3/4	7 3/8	1/4	5 1/80	6 1/80	1/2- 13 x 1"	1/2"
SI								
ND-C	65.1	69.9	139.7	6.4	58.7	101.9	1/2- 13 x 1"	1/2"
ND-D	85.7	69.9	158.8	7.9	101.6	127.0	1/2- 13 x 1"	1/2"
ND-E	114.3	120.7	187.3	6.4	127.3	152.7	1/2- 13 x 1"	1/2"

Weight Range (lbs)	Weight Range (kg)	Model Number	Color
Up to 751 lbs	Up to 341 kg	ND-C	Yellow
751 to 1651 lbs	341 to 749 kg	ND-D	Yellow
1651 to 3226 lbs	749 to 1463 kg	ND-E	Yellow

Isolator Details

TWO INCH DEFLECTION, SEISMIC SPRING ISOLATOR CROSS-REFERENCE

SLRS



ENGLISH

SIZE	H	T	D	E	L	HCL	W	HCW	MBD
2-C2	8-1/2	3/8	5/8	1-3/8	14	12-1/4	5-1/4	3-1/2	5/8

SI

SIZE	H	T	D	E	L	HCL	W	HCW	MBD
2-C2	215.9	9.5	15.9	34.9	355.6	311.2	133.4	88.9	5/8

*Weight Range (lbs)	Weight Range (kg)	Model Number	Color
Up to 358 lbs	Up to 162 kg	SLRS-2-C2-	Red
358 to 443 lbs	162 to 201 kg	SLRS-2-C2-	White
443 to 582 lbs	201 to 264 kg	SLRS-2-C2-	Black
582 to 783 lbs	264 to 335 kg	SLRS-2-C2-	Blue
783 to 1038 lbs	335 to 471 kg	SLRS-2-C2-	Green
1038 to 1497 lbs	471 to 679 kg	SLRS-2-C2-	Gray
1497 to 2058 lbs	679 to 933 kg	SLRS-2-C2-	Silver
2058 to 2619 lbs	933 to 1188 kg	SLRS-2-C2-	Gray w/ red
2619 to 3180 lbs	1188 to 1442 kg	SLRS-2-C2-	Silver w/ red

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Electrical Data

STANDARD EFFICIENCY - 2 COMPRESSOR UNITS (SEE FIG. 1)

Model Number /Nameplate			System 1			System 2			Control KVA ⁸	Unit Short Circuit Withstand (KA)	
YCAV S/P	Input Volts	Input Freq	Compressor RLA ⁶	Cond. Fans		Compressor RLA ⁶	Cond. Fans			Terminal Block (STD)	Circuit Breaker (OPT)
				Qty.	FLA (EA)		Qty.	FLA (EA)			
0569	400	50	147	4	3.4	147	4	3.4	1.8	30KA	65KA
0639	400	50	195	4	3.4	128	4	3.4	1.8	30KA	65KA
0679	400	50	199	5	3.4	147	4	3.4	1.8	30KA	65KA
0739	400	50	178	5	3.4	201	4	3.4	1.8	30KA	65KA
0819	400	50	198	5	3.4	198	5	3.4	1.8	30KA	65KA
0889	400	50	236	6	3.4	196	5	3.4	1.8	30KA	65KA
0969	400	50	234	6	3.4	234	6	3.4	1.8	30KA	65KA

STANDARD EFFICIENCY - 2 COMPRESSOR UNITS (SEE FIG. 1)

YCAV S/P	Field Wiring & Protection				Field Wiring Lugs STD Terminal Block		Field Wiring Lugs OPT Circuit Breaker	
	Minimum Ckt. Ampacity (MCA) ⁴	Recommended Fuse/Ckt. Breaker Rating ⁵	Max. Inverse Time Ckt. Brkr. Rating ²	Max Dual Element Fuse Size ³	Lugs/ Phase ¹	Lug Wire Range	Lugs/ Phase ¹	Lug Wire Range
0569	357	400	800	600	3	2AWG - 600 kcmil	3	3/0AWG - 400 kcmil
0639	399	450	1000	700	3	2AWG - 600 kcmil	3	3/0AWG - 400 kcmil
0679	425	500	1000	700	3	2AWG - 600 kcmil	3	3/0AWG - 400 kcmil
0739	453	500	1200	800	3	2AWG - 600 kcmil	3	3/0AWG - 400 kcmil
0819	479	600	1200	800	3	2AWG - 600 kcmil	3	3/0AWG - 400 kcmil
0889	529	600	1200	1000	3	2AWG - 600 kcmil	3	3/0AWG - 400 kcmil
0969	568	700	1600	1000	3	2AWG - 600 kcmil	3	3/0AWG - 400 kcmil

Electrical Data

HIGH EFFICIENCY 2-Compressor Units

Model Number /Nameplate			System 1			System 2			Control KVA ⁸	Unit Short Circuit Withstand (KA)	
YCAV E/V	Input Volts	Input Freq	Compressor RLA ⁶	Cond. Fans		Compressor RLA ⁶	Cond. Fans			Terminal Block (STD)	Circuit Breaker (OPT)
				Qty.	FLA (EA)		Qty.	FLA (EA)			
0569	400	50	134	4	3.4	134	4	3.4	1.8	30KA	65KA
0639	400	50	135	5	3.4	149	4	3.4	1.8	30KA	42KA
0679	400	50	188	5	3.4	127	5	3.4	1.8	30KA	42KA
0739	400	50	172	5	3.4	172	5	3.4	1.8	30KA	42KA
0819	400	50	172	5	3.4	187	5	3.4	1.8	30KA	42KA
0889	400	50	183	6	3.4	183	6	3.4	1.8	30KA	42KA
0969	400	50	237	6	3.4	181	6	3.4	1.8	30KA	42KA

See page 56 for Electrical Data footnotes.

HIGH EFFICIENCY 2-Compressor Units

YCAV E/V	Field Wiring & Protection				Field Wiring Lugs STD Terminal Block		Field Wiring Lugs OPT Circuit Breaker	
	Minimum Ckt. Ampacity (MCA) ⁴	Recommended Fuse/Ckt. Breaker Rating ⁵	Max. Inverse Time Ckt. Brkr. Rating ²	Max Dual Element Fuse Size ³	Lugs/ Phase ¹	Lug Wire Range	Lugs/ Phase ¹	Lug Wire Range
0569	328	400	800	600	3	2AWG - 600 kcmil	3	3/0AWG - 400 kcmil
0639	348	400	800	600	3	2AWG - 600 kcmil	3	3/0AWG - 400 kcmil
0679	396	450	1000	700	3	2AWG - 600 kcmil	3	3/0AWG - 400 kcmil
0739	422	500	1000	700	3	2AWG - 600 kcmil	3	3/0AWG - 400 kcmil
0819	435	500	1000	700	3	2AWG - 600 kcmil	3	3/0AWG - 400 kcmil
0889	452	500	1200	800	3	2AWG - 600 kcmil	3	3/0AWG - 400 kcmil
0969	518	600	1200	1000	3	2AWG - 600 kcmil	3	3/0AWG - 400 kcmil

Power Connection Options

2 COMPRESSOR POWER WIRING CONNECTIONS

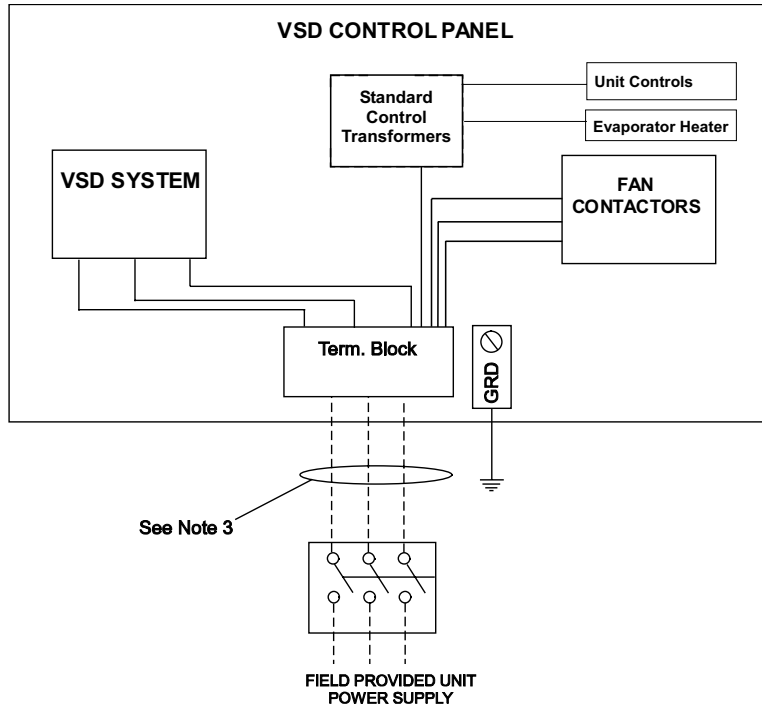


FIG. 1 – SINGLE-POINT POWER SUPPLY CONNECTION WITH FIELD SUPPLIED CIRCUIT PROTECTION

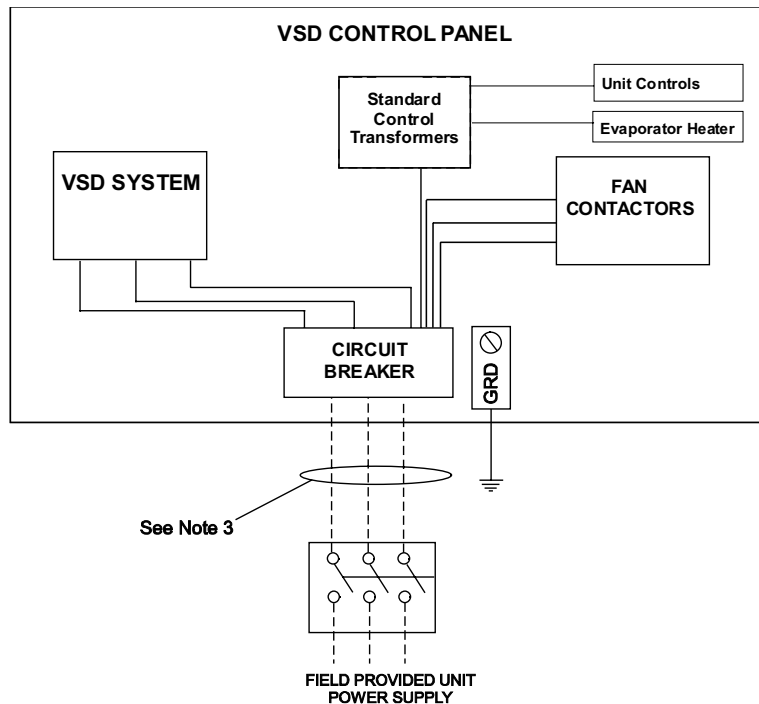


FIG. 2 – SINGLE-POINT POWER SUPPLY CONNECTION WITH OPTIONAL FACTORY CIRCUIT BREAKER

Application Data

UNIT LOCATION

The YCAV chillers are designed for outdoor installation. When selecting a site for installation, be guided by the following requirements:

1. Installation sites may be either on a roof or on ground level. (See FOUNDATION)
2. Select a place having an adequate supply of fresh air for the condensers. Recommended clearances for all units are shown on the DIMENSIONS pages.
3. Avoid locations near windows or structures where normal operating sounds may be objectionable.
4. The standard condenser fans are propeller-type and are not recommended for use with ductwork, filters or other nuisance in the condenser air stream.
5. When it is desirable to surround the unit(s), it is recommended that the screening be able to pass the required chiller CFM without exceeding 0.1" external static pressure.
6. Protection against corrosive environments is available by supplying the units with either copper fins, or cured epoxy-coating on the condenser coils. Epoxy-coated coils should be utilized with any units being installed at the seashore, or where salt spray may hit the units, or where acid rain is prevalent (copper condenser coils are not recommended where they may be exposed to acid rain).
7. On installations where winter operation is intended and snow accumulations are expected, additional elevation must be provided to insure normal condenser air flow.

FOUNDATION

The unit should be mounted on a flat and level foundation, ground or roof, capable of supporting the entire operating weight of the equipment. Operating weights are given in the PHYSICAL DATA tables.

Roof Locations – Adequate structural strength to safely support the entire weight of the unit and service personnel must be provided. Care must be taken not to damage the roof during installation. If the roof is “bonded”, consult building contractor or architect for special installation requirements. Roof installations should incorporate the use of spring-type isolators to minimize the transmission of vibration into building structure. Additional support should be provided to the roof at the spring-isolator locations.

Ground Locations – Units must be installed on a substantial base that will not settle and cause strain on the refrigerant lines, resulting in possible leaks. A one-piece concrete slab, with footers extending below the frost line, is recommended. The slab should not be tied to the main building foundation as noises will telegraph.

Mounting holes (5/8") are provided in the base rails for bolting the unit to its foundation. See DIMENSIONS for location of the mounting holes.

For ground installations, precautions should be taken to protect the unit from tampering by, or injury to, unauthorized persons. Fasteners on access panels will prevent casual tampering; however, further safety precautions, such as unit enclosure options, a fenced-in enclosure, or locking devices on the panels may be advisable. Check local authorities for safety regulations.

CHILLED LIQUID PIPING

The chilled liquid piping system should be laid out so that the circulating pump discharges into the cooler. The inlet and outlet cooler-liquid connections are given in DIMENSIONS. Hand stop valves are recommended for use in all lines to facilitate servicing. Drain connections should be provided at all low points to permit complete drainage of the cooler and system piping.

A strainer (40 mesh) is recommended for use on the INLET line to the cooler, and must be in place at initial operation of the water pumps.

Pressure-gauge connections are recommended for installation in the inlet and outlet water lines. Gauges are not provided with the unit and are to be furnished by others.

Chilled liquid lines exposed to the weather should be wrapped with a supplemental heater cable and insulated, or glycol should be added to the chilled liquid to protect against freezing if low-ambient periods are expected.

A flow switch is available as an accessory on all units. A flow switch must be installed in the leaving water piping of the cooler and must not be used to start and stop the unit.

Guide Specifications

PART 1 — GENERAL

1.01 SCOPE

- A. The requirements of the General Conditions, Supplementary Conditions, Division 1, and Drawings apply to all work herein.
- B. Provide Microprocessor controlled, twin-screw compressor, air-cooled, liquid chillers of the scheduled capacities as shown and indicated on the Drawings, including but not limited to:
 1. Chiller package
 2. Charge of refrigerant (Except remote evaporator applications) and oil.
 3. Electrical power and control connections
 4. Chilled water connections
 5. Factory start-up

1.02 QUALITY ASSURANCE

- A. Products shall be Designed, Tested, Rated and Certified in accordance with, and installed in compliance with applicable sections of the following Standards and Codes:
 1. ARI 550/590 – Water Chilling Packages Using the Vapor Compression Cycle
 2. ARI 370 – Sound Rating of Large Outdoor Refrigerating and Air Conditioning Equipment
 3. ANSI/ASHRAE Standard 15 – Safety Code for Mechanical Refrigeration
 4. ASHRAE 34 – Number Designation and Safety Classification of Refrigerants
 5. ASHRAE 90.1 – Energy Standard for Buildings Except Low-Rise Residential Buildings
 6. ANSI/NFPA Standard 70 – National Electrical Code (N.E.C).
 7. ASME Boiler and Pressure Vessel Code, Section VIII, Division 1.
 8. ASTM A48 – Gray iron Castings
 9. Manufactured in facility registered to ISO 9002
- B. Factory Test: Chiller shall be pressure-tested, evacuated and fully charged with refrigerant and oil, and shall be factory operational run tested with water flowing through the vessel.
- C. Chiller manufacturer shall have a factory trained and supported service organization that is within a 50 mile radius of the site.
- D. Warranty: Manufacturer shall Warrant all equipment

and material of its manufacture against defects in workmanship and material for a period of eighteen (18) months from date of initial start-up or date of shipment, whichever occurs first.

1.03 DELIVERY AND HANDLING

- A. Unit shall be delivered to job site fully assembled and charged with refrigerant (except remote evaporator applications) and oil by the Manufacturer.
- B. During shipment, provide protective covering over vulnerable components. Fit nozzles and open ends with plastic enclosures.
- C. Protect the chiller and its accessories from the weather and dirt exposure during shipment.
- D. Unit shall be stored and handled per Manufacturer's instructions.

PART 2 — PRODUCTS

2.01 GENERAL

- A. Manufacturers: The design shown on the drawings is based on York International. Alternate equipment will be acceptable if their equipment meets the scheduled performance and complies with these specifications. If equipment manufactured by a manufacturer other than that scheduled is utilized, then the Mechanical Contractor shall be responsible for coordinating with the General Contractor and all affected Subcontractors to insure proper provisions for installation of the furnished unit. This coordination shall include, but not be limited to, the following:
 1. Structural supports for units.
 2. Piping size and connection/header locations.
 3. Electrical power requirements and wire/conduit and overcurrent protection sizes.

The Mechanical Contractor shall be responsible for all costs incurred by the General Contractor, Subcontractors, and Consultants to modify the building provisions to accept the furnished units.

- B. Description: Install and commission, as shown on the schedules and plans, factory assembled, charged, and operational tested air cooled screw compressor chiller(s) as specified herein. Chiller shall include, but is not limited to: a complete system with not less than two independent refrigerant circuits, semihermetic twin

Guide Specifications (Continued)

screw compressors, shell and tube type evaporator, air-cooled condenser, R134a refrigerant, lubrication system, interconnecting wiring, safety and operating controls including capacity controller, control center, motor starting components, and special features as specified herein or required for safe, automatic operation.

C. Operating Characteristics:

1. Provide low ambient control and high ambient options as required to ensure unit is capable of operation from 0°F to 125°F (-18°C to 52°C) ambient.
2. Provide capacity control system capable of reducing unit capacity to 10% of full load. Compressor shall start in unloaded condition. Application of factory installed hot gas bypass shall be acceptable as required to meet specified minimum load.

D. Cabinet: Unit panels, structural elements, control boxes and heavy gauge structural base shall be constructed of galvanized steel. Unit panels, control boxes and structural base are finished with a baked on powder paint. All painted surfaces shall be coated with baked on powder paint which, when subject to ASTM B117, 1,000 hour, 5% salt spray test, yields minimum ASTM 1654 rating of "6".

2.02 COMPRESSORS AND MOTORS

- A. Compressors: Shall be direct drive, semihermetic, rotary twin-screw type, including: muffler, temperature actuated 'off-cycle' heater, rain-tight terminal box, discharge shut-off service valve, and precision machined cast iron housing. Design working pressure of entire compressor, suction to discharge, shall be 450 PSIG (31bar). Compressor shall be U.L. Recognized.
- B. Motors: Refrigerant suction gas cooled accessible hermetic compressor motor, full suction gas flow through 0.006" maximum mesh screen, with inherent internal thermal overload protection and external current overload on all three phases.
- C. Lubrication: External oil separators with no moving parts, 450 PSIG design working pressure, and UL listing. Refrigerant system differential pressure shall provide oil flow through service replaceable, 0.5 micron, full flow, cartridge type oil filter internal to compressor. Filter bypass, less restrictive media, or oil pump not acceptable.

D. Capacity Control: Compressors shall start at minimum load. Capacity control range from 100% to 10% of chiller full load. Provide Microprocessor control to command compressor capacity to balance compressor capacity with cooling load. When required to meet minimum load, hot gas bypass shall be factory installed and integrated into standard control system.

2.03 REFRIGERANT CIRCUIT COMPONENTS

Each independent refrigerant circuit shall include: liquid line shutoff valve with charging port, low side pressure relief device, removable core filter-drier, sight glass with moisture indicator, and electronic expansion valve.

2.04 HEAT EXCHANGERS

A. Evaporator:

1. Direct expansion type or flooded type shell and tube evaporator with high efficiency copper tubes. Independent refrigerant circuits shall be provided per compressor.
2. Constructed, tested, and stamped in accordance with applicable sections of ASME pressure vessel code for minimum 235 PSIG (16 bar) refrigerant side design working pressure and 150 PSIG (10 bar) water side design working pressure.
3. Shell covered with 3/4" (19mm), flexible, closed-cell insulation, thermal conductivity of 0.26k (BTU/HR-Ft²-°F/in.) maximum. Water nozzles with grooves for mechanical couplings, and insulated by Contractor after pipe installation.
4. Provide vent and drain fittings, and thermostatically controlled heaters to protect to -20°F (-29°C) ambient in off-cycle.

B. Air Cooled Condenser:

1. Coils: Internally enhanced, seamless copper tubes, mechanically expanded into aluminum alloy fins with full height collars. Subcooling coil an integral part of condenser. Design working pressure shall be 450 PSIG (31 bar).
2. Low Sound Fans: Shall be dynamically and statically balanced, direct drive, corrosion resistant glass fiber reinforced composite blades molded into low noise, full airfoil cross section, providing vertical air discharge from extended orifices. Guards of heavy gauge, PVC (polyvinyl chloride) coated or galvanized steel.
3. Fan Motors: High efficiency, direct drive, 3-phase, insulation class "F", current protected, Totally Enclosed Air Over (TEAO), with double sealed,

permanently lubricated ball bearings.

correction capacitors if they are not factory mounted and wired.

2.05 POWER AND ELECTRICAL REQUIREMENTS

A. Power/Control Panel:

1. NEMA 3R (IP65), powder painted steel cabinets with hinged, latched, and gasket sealed outer doors equipped with wind struts for safer servicing. Provide main power connection(s), compressor starters and fan motor contactors, current overloads, and factory wiring.
2. Panel shall include control display access door.

B. Single Point Power

1. Provide single point power connection to chiller, shall be 3 phase of scheduled voltage.
2. Circuit breaker shall be provided at point of incoming single point connection to provide disconnecting means AND be sized to provide the motor branch circuit protection, short circuit protection and ground fault protection for the motor branch-circuit conductors, the motor control apparatus and the motors. Circuit breaker shall be equipped with lockable operating handle that shall extend through power panel door so that power may be disconnected without opening any panel doors.

C. Control Transformer: Power panel shall be supplied with a factory mounted and wired control transformer that will supply all unit control voltage from the main unit power supply. Transformer shall utilize scheduled line voltage on the primary side and provide 115V/1Ø on secondary.

D. Short Circuit Withstand Rating of the chiller electrical enclosure shall be (200V & 230V: 100,000 Amps, 380, 400 & 460V: 65,000 Amps, 575V: 42,000 Amps) Rating shall be in accordance with UL508.

E. Motor Starters: Motors starters shall be reduced inrush type (Wye-Delta or Solid State) for minimum electrical inrush. Across the line type starters will not be acceptable.

F. Power Factor:

1. Provide equipment with power factor correction capacitors as required to maintain a power factor of 95% at all load conditions.
2. The installing contractor is responsible for additional cost to furnish and install power factor

G. Exposed compressor and fan motor power wiring shall be routed through liquid tight conduit.

2.06 CONTROLS

A. General:

1. Provide automatic control of chiller operation including compressor start/stop and load/unload, anti-recycle timers, condenser fans, evaporator pump, evaporator heater, unit alarm contacts and run signal contacts.
2. Chiller shall automatically reset to normal chiller operation after power failure.
3. Unit operating software shall be stored in non-volatile memory. Field programmed set points shall be retained in lithium battery backed real time clock (RTC) memory for minimum 5 years.
4. Alarm contacts shall be provided to remote alert for any unit or system safety fault.

B. Display and Keypad:

1. Provide minimum 80 character liquid crystal display that is both viewable in direct sunlight and has LED backlighting for nighttime viewing. Provide one keypad and display panel per chiller.
2. Display and keypad shall be accessible through display access door without opening main control/electrical cabinet doors.
3. Display shall provide a minimum of unit setpoints, status, electrical data, temperature data, pressures, safety lockouts and diagnostics without the use of a coded display.
4. Descriptions in English (or Spanish or French), numeric data in English (or Metric) units.
5. Sealed keypad shall include unit On/Off switch.

C. Programmable Setpoints (within Manufacturer limits): display language; leaving chilled liquid temperature: setpoint, control range; local or remote control; units of measure; compressor lead/lag; and maximum chilled water setpoint reset temperature range.

D. Display Data: Chiller liquid return and leaving temperatures, ambient, lead compressor identification, clock and schedule, (variable) out of range, remote input indication, chilled liquid reset setpoint, and his-

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tory data for last ten shutdown faults. Compressor suction, discharge, and oil pressures and temperatures, suction and discharge superheats, percent of full-load, operating hours, starts, and anti-recycle timer status. Status Messages for manual override, unit switch off, compressor run, run permissive, remote controlled shut down, no cooling load, daily/holiday shut down, anti-recycle timer.

- a. Ultra Quiet fans (Factory Mounted)
- b. Compressor Sound Blankets (Factory Mounted)
- c. Acoustical perimeter enclosures (Field Mounted)

E. Predictive Control Points: Unit controls shall avoid safety shutdown when operating outside design conditions by optimizing the chiller controls and cooling load output to stay online and avoid safety limits being reached. The system shall monitor the following parameters and maintain the maximum cooling output possible without shutdown of the equipment: motor current, suction pressure and discharge pressure.

F. System Safeties: Shall cause individual compressor systems to perform auto-reset shut down; manual reset required after the third trip in 90 minutes. Includes: high discharge pressure or temperature, low suction pressure, high / low motor current, high motor temperature, high pressure switch, high / low differential oil pressure, high oil temperature, low suction superheat, critical sensor malfunction, low or high current, phase loss/single phase power, overload of motor windings, and low voltage.

G. Unit Safeties: Shall be automatic reset and cause compressors to shut down if: high or low ambient, low leaving chilled liquid temperature, under voltage, and flow switch operation. Contractor shall provide flow switch and wiring per chiller manufacturer requirements.

H. Manufacturer shall provide any controls not listed above, necessary for automatic chiller operation. Mechanical Contractor shall provide field control wiring necessary to interface sensors to the chiller control system.

2.07 ACCESSORIES AND OPTIONS

Some accessories and options supersede standard product features. Your YORK representative will be pleased to provide assistance.

A. Sound Reduction

1. Provide the following options as required to meet scheduled sound performance data at all load points.

Sound Power Levels

Sound Power Levels									
Chiller Load	Octave Band Center Frequency, Hz								A-Weighted (dBA)
	63	125	250	500	1000	2000	4000	8000	
100%									
75%									
50%									
25%									

Sound power octave band data, dB per ARI standard 370.

2. Provide optional control input to limit sound output of the chiller based on time of day. Shall be programmable at the chiller panel or controlled remotely via signal (4-20mA or 0-10 VDC) from BAS system. Chillers without this feature shall be provided with the necessary sound attenuation to meet the scheduled sound performance data at all load points.

B. Power Supply/Connections:

1. Single-Point Terminal Block: Single point power connection shall be made to a Terminal Block with factory provided interconnecting wiring to chiller components.

C. Condenser Coil Environmental Protection:

1. **PRE-COATED FIN CONDENSER COILS** – The air-cooled condenser coils are constructed of black epoxy-coated aluminum fins.
2. **COPPER FIN** – Provide condenser coils with copper fins in lieu of aluminum fins.
3. **POST-COATED EPOXY DIPPED CONDENSER COILS** – The unit is built with dipped-cured condenser coils.

D. Protective Chiller Panels (Factory Mounted):

1. Louvered Panels (condenser coils only): Painted steel to match unit panels, over external condenser coil faces.
2. Wire Panels (full unit): Heavy gauge, welded wire mesh, coated to resist corrosion, to protect condenser coils from incidental damage and restrict

unauthorized access to internal components.

3. Louvered Panels (full unit): Painted steel to match unit panels, to protect condenser coils from incidental damage, visually screen internal components, and prevent unauthorized access to internal components.
4. Louvered/Wire Panels: Louvered steel panels on external condenser coil faces, painted to match unit panels. Heavy gauge, welded wire-mesh, coated to resist corrosion, around base of machine to restrict unauthorized access.

E. Evaporator options:

1. Provide 1-1/2" cooler insulation in lieu of standard 3/4".
2. Provide DX Cooler with 300 PSIG (20.7 bar) waterside design working pressure in lieu of standard 150 PSIG (10.3 bar).
3. Provide Raised Face Flanges for cooler nozzles:
 - a. 150 PSIG (10.3 bar), welded flanges (field kit, matching pipe flange by contractor).
 - b. 300 PSIG (20.7 bar), welded flanges (factory installed, matching pipe flange by contractor).
 - c. 150 PSIG (10.3 bar), Victaulic™ Flanges (field kit, matching pipe flange by contractor).

F. Remote Cooler: Manufacturer shall provide separately:

1. Chiller (including filter-drier, sight glass with moisture indicator, and electronic expansion valve per refrigerant circuit) less evaporator and refrigerant (include a dry nitrogen holding charge).
2. Insulated evaporator (include a dry nitrogen holding charge).
3. Entering and leaving water temperature sensors.

Contractor shall field erect system and provide interconnecting piping, refrigerant charge, and wiring in accordance with manufacturers recommendations, and project plans and schedules. Where not otherwise specified, Contractor provided system piping shall be in accordance with applicable sections of the ASHRAE Handbook.

- G. Flow Switch (Field Mounted): Vapor proof SPDT, NEMA 4X switch (___ 150 PSIG (10.3 bar) or ___ 300 PSIG (20.7 bar)), -20°F to 250°F (-

28.9°C to 121.1°C).

H. Building Automation System Interface:

1. Chiller to accept 4 to 20mA or 0 to 10 VDC input to reset the leaving chilled liquid temperature, or percent full load amps (current limit). (Factory Mounted)
2. Provide chiller with microgateway for an interface to other systems that can share data via BACNet™ the ASHRAE open systems protocol. (Factory Mounted)

I. Multi-Unit Sequence Control (Field Mounted): Separate Sequencing control center provided to permit control of up to eight chillers in parallel based on mixed liquid temperature.

J. Vibration Isolation (Field Mounted):

1. Neoprene Isolators.
2. 1 Inch Deflection Spring Isolators: Level adjustable, spring and cage type isolators for mounting under the unit base rails.
3. 2 Inch Deflection Seismic Isolators: Level adjustable, restrained mounts in rugged welded steel housing with vertical and horizontal limit stops. Housings shall be designed to withstand a minimum 1.0g accelerated force in all directions to 2" (50.8 mm).

K. Provide suction service shut-off valve for each compressor. (Factory Mounted)

PART 3 — EXECUTION

3.01 INSTALLATION

- A. General: Rig and Install in full accordance with Manufacturer's requirements, Project drawings, and Contract documents.
- B. Location: Locate chiller as indicated on drawings, including cleaning and service maintenance clearance per Manufacturer instructions. Adjust and level chiller on support structure.
- C. Components: Installing Contractor shall provide and install all auxiliary devices and accessories for fully operational chiller.
- D. Electrical: Coordinate electrical requirements and connections for all power feeds with Electrical Contractor (Division 16).





E. Controls: Coordinate all control requirements and connections with Controls Contractor.

F. Finish: Installing Contractor shall paint damaged and abraded factory finish with touch-up paint matching factory finish.

