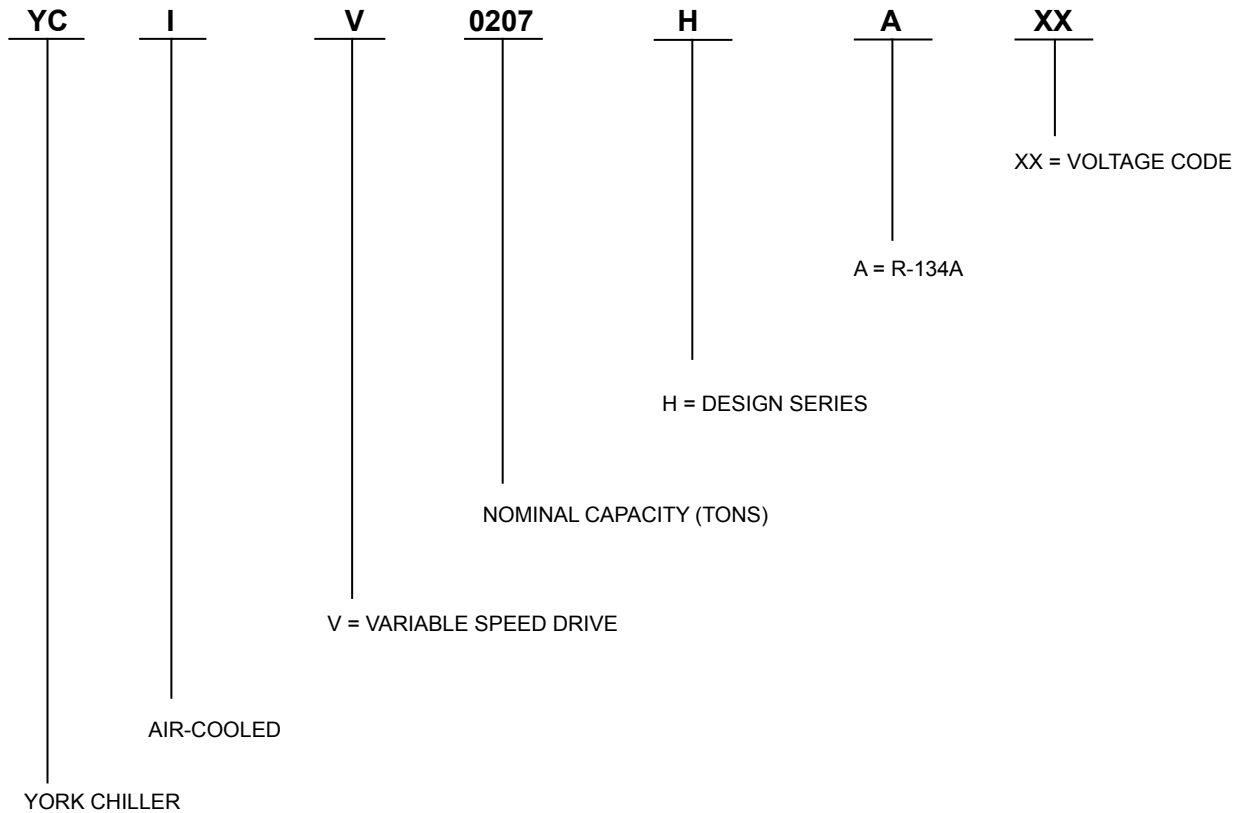


Model YCIV Air-Cooled Screw Liquid Chillers with Variable Speed Drive Style A

150 - 400 TONS
(527 - 1407 kW)
2, 3, and 4 Compressor
60 Hz
Design Series H



Nomenclature



Approvals

- ASME Boiler and Pressure Vessel Code – Section VIII Division 1.
- AHRI Standard 550/590.
- UL 1995 – Heating and Cooling Equipment
- ASHRAE 15 – Safety Code for Mechanical Refrigeration
- ASHRAE Guideline 3 – Reducing Emission of Halogenated Refrigerants in Refrigeration and Air-Conditioning Equipment and Systems
- N.E.C. – National Electrical Code
- OSHA – Occupational Safety and Health Act



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Performance data provided in this document was created in accordance with Johnson Controls software: **YORK-works version 14.03 and DXCHILL version 6.13.**

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Introduction

Johnson Controls has a proud history of innovation in both compressor design and variable-speed-drive (VSD) technology. The YCIV series of air-cooled chillers 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 YCIV model air-cooled chiller, system designers have the opportunity to design around the traditional benefits of air-cooled chillers and still offer building owners the most up-to-date 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, installing the Latitude allows for a combining the best of both worlds can provide a design that truly delivers the lowest total cost of ownership.



LD18333

Unit Overview

POWER AND ELECTRICAL

Johnson Controls 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.

All controls and motor starting equipment necessary for unit operation shall be factory wired and function tested.

VSD Power/Control Panel includes main power connection(s), VSD and fan motor contactors, current overloads, and factory wiring. Standard design includes NEMA 3R 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.

The chillers come standard with 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 standard power panel is equipped with terminal block electrical connections at the point of incoming power. An optional factory mounted circuit breaker is available, at the point of the incoming single point connection, providing the means to disconnect power and short circuit protection. The optional lockable operating handle extends through the power panel door so that power may be disconnected without opening any panel doors.

The unit has a Short Circuit Withstand Rating of the chiller electrical enclosure is 30,000 Amps for standard terminal block connection. These ratings are IAW (in accordance with) UL508. (See Accessories and Options section. They can be increased to 65,000 Amps for 380, 400 & 460V).

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.

Many utility companies charge an additional fee if power factor is below 0.95. These power factor adjustment penalties can affect both regular tariff rates, as well as demand charges. All YCIV models have a full load displacement 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.

Unit Overview (Cont'd)

SEMI-HERMETIC YORK TWIN SCREW COMPRESSORS

Johnson Controls Engineered Systems' Chiller Design Team has developed a world class compressor with unequaled performance. Continuous function, microprocessor controlled, VSDs provide valveless, smooth capacity control from 100% down to 10% of chiller capacity for two compressor chillers, 100% down to 7.5% for three compressor chillers, and 100% down to 5% for four compressor chillers. In addition, elimination of the slide valve and associated unloading components resulted in a 50% reduction in compressor moving parts.

Compressors are a direct drive, semi-hermetic, rotary twin-screw design, featuring an integrated muffler, a temperature actuated 'off-cycle' heater, a rain-tight terminal box, a discharge shut-off service valve, and a precision machined cast iron housing. The compressor is supported on elastomeric isolators.

A reliable suction-gas-cooled, high-efficiency, accessible hermetic compressor motor, is equipped with internal thermal overload protection and external current overload on all three phases. The motor is additionally protected by a full suction-gas flow-through 0.006" maximum mesh screen.

A suction-gas screen and serviceable, 0.5 micron full flow oil filter are located within the compressor housing.

Cast iron compressor housings are precisely machined for optimal clearances and superb efficiency. The entire compressor, from suction to discharge, has a design working pressure of 350 psig (24 barg) or higher.

REFRIGERANT CIRCUIT

The unit has one independent refrigerant circuits 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 a liquid line shut-off valve with charging port, a low side pressure relief device, a high adsorption removable core filter-drier, a sight glass with moisture-indicator, and an electronic expansion valve on each refrigerant circuit

Each discharge line is provided with a manual compressor shutoff service valve (See **Options and Accessories** for suction line valve information). Suction line equipped with closed-cell insulation.

Each circuit contains an insulated external oil separator with no moving parts. The design working pressure is 450 psig (31 barg), and each separator is UL listed.

Oil cooling is provided by a dedicated air-cooled finned-tube type heat exchanger located in the condenser section of the machine.

A flash tank is located in each refrigerant circuit to increase the system efficiency. The design working pressure is 450 psig (31 barg).

Suction lines, oil separators and flash tanks are covered with closed-cell insulation.

Unit Overview (Cont'd)

EVAPORATOR

The unit features a high efficiency, direct-expansion type evaporator with refrigerant in tubes and chilled liquid through the baffled shell. Independent circuits are provided for each compressor.

The design working pressure of the shell waterside is 150 psig (10.3 barg), and 235 psig (16 barg) for the refrigerant side. The evaporator is constructed and tested IAW applicable sections of ASME Pressure Vessel Code, Section VIII, Division (1). Water side exempt per paragraph U-1, ©, (6).

Removable heads allow access to the internally-enhanced, seamless, copper tubes. Water vent and drain connections are also included.

The evaporator is equipped with a thermostatically controlled heater for protection to -20°F (-29°C) ambient, and shell is covered with 3/4" (19mm), flexible, closed-cell insulation, thermal conductivity of 0.26k maximum. 1-1/2" (38mm) foam available as an option.

Water nozzles have grooves for mechanical (ANSI/AWWA C-606) couplings, and shall be insulated by Contractor after pipe installation. (See the Accessories and Options section for flange options.

CONDENSER SECTION

Condenser fans are dynamically and statically balanced, direct-drive, corrosion resistant glass fiber reinforced composite blades molded into a low noise, full airfoil cross section, providing vertical air discharge from extended orifices. Guards of heavy gauge, PVC (polyvinyl chloride) coated.

Standard and reduced sound level models have condensers fitted with single-speed fans. Low sound models have two-speed fans fitted.

The fan motors are high efficiency, direct drive, 6 pole on standard sound models and 8 pole on reduced and low sound models. The motor design is of the 3 phase, Class-"F", current overload protected, totally enclosed (TEAO) type with double sealed, permanently lubricated, ball bearings

Fin and tube condenser coils constructed 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 450 psig (31 barg).

MICROCOMPUTER CONTROL CENTER

The microcomputer control center 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 programmable set points are retained in lithium battery backed regulated time clock (RTC) memory for minimum 5 years.

Alarm contacts are provided to remote alert contacts for any unit or system safety fault.

Unit Overview (Cont'd)

Display and Keypad:

- The display contains an 80 character liquid crystal display that is both viewable in direct sunlight and has LED backlighting 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.
- The display provides descriptions in English (or available language options), numeric data in English (or Metric) units.
- Sealed keypad shall include unit On/Off switch.

The 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.

The display data shows 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. Also provided are messages for 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 are also displayed.

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 maintains 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). Safeties 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.

Unit Overview (Cont'd)

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 HFC-134a 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, 1000 hour, 5% salt spray test, yields minimum ASTM 1654 rating of "6".

Design is IAW applicable sections of ASME Pressure Vessel Code, NFPA 70 (National Electrical Code), U.L. and cU.L. standards and ASHRAE/ANSI-15 Safety Code for Mechanical Refrigeration.

Units are rated (all) and certified (140 - 200 tons) IAW AHRI Standard 550/590.

Design is IAW ASHRAE 90.1 Energy Standard for Building except Low-Rise Residential Buildings and AHRI 70 Sound Rating of Large Outdoor Refrigeration and Air Conditioning Equipment.

YCIV chillers are designed within EN ISO 9001 and built within an EN ISO 9002 accredited manufacturing organization.

All exposed power wiring routed through liquid-tight, UV-stabilized, non-metallic conduit.

When required, chillers (50 Hz only) have the option available to conform to the following European Directives:

- Machinery directive (2006/42/EC)
- Low Voltage Directive (2006/95/EC)
- EMC Directive (2004/108/EC)
- Pressure Equipment Directive (97/23/EC)
- Safety Code for Mechanical Refrigeration (EN378-2 (2008))

Accessories and Options

SOUND REDUCTION OPTIONS

The standard chiller has fans that operate at normal speed, no compressor enclosure, and is typically used in non-sensitive sound areas such as industrial areas or locations with traffic background noise. One or more of the following sound reduction options may be employed by the system designer as normally generated machine noise is considered in the overall project design.

Ultra Quiet Fans – 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 minimal effect on the chiller capacity or efficiency at standard AHRI conditions. Not recommended for high ambient (above 105°F (41°C) design conditions. **(Factory-mounted)**

Two-Speed Fans – With this option, the basic chiller is equipped with fans designed with two operating speeds. At high ambient conditions the fans operate at the normal speed with sound levels equivalent to Ultra Quiet Fans. As the ambient temperature falls the fans automatically reduce to slow speed reducing sound levels. If very low sound is required at all ambient conditions normal fan speed can be inhibited. **(Factory-mounted)**

Reduced Sound Option – With this option the chiller is equipped with an unlined compressor enclosure. This option is typically used for daytime operation where background noise is lower than normal city traffic etc. **(Factory-mounted)**

Low Sound Option – This option is only available with the selection of Ultra Quiet Fans or Two-Speed Fans. The chiller is equipped with an acoustically lined compressor enclosure. This option is typically for locations near residential areas, hotels, or hospitals etc where background noise is limited. When paired with the Two-Speed Fan option the unit can operate at normal speed during the day, when background noise levels are noticeable, and at low speed in the evening and at night when background levels are lower. **(Factory-mounted)**

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 are less than design and/or ambient temperatures are less than design. As a result, all YCIV 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 **Silent-Night™** 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.

High Static Fans – (380V/60Hz) Condenser fans with higher power motors suitable for high external static pressure, upto 100Pa (0.4 in. water), across condenser coils. Select this option if additional air-flow resistance may be present due to flow restrictions such as field installed ducts, filters, sound-enclosures etc. **(Factory-mounted)**

High Airflow Fans – (380V/60Hz) Condenser fans with airfoil type blades and high power motors providing extra airflow across coils. Recommended for high ambient (above 105°F (41°C) design conditions. Please contact your local JCI representative for more information. **(Factory-mounted)**

Accessories and Options (Cont'd)

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 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 alkalies, 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. Recommended for severe coastal applications only. (These are 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) – Louvered panels, painted the same color as the unit, 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) – Louvered panels, painted the same color as the unit, enclose the unit to protect condenser coils from incidental damage, visually screen internal components, and prevent unauthorized access to internal components. **(Factory-mounted)**

Louvered (Condensers)/Wire Panels (Mechanical) – Louvered panels, painted the same color as the unit, are mounted on external condenser coil faces. Heavy gauge, welded wire-mesh, coated to resist corrosion, around base of machine to restrict unauthorized access. **(Factory-mounted)**

Accessories and Options (Cont'd)

EVAPORATOR OPTIONS

1-1/2" Insulation – Double thickness insulation provided. (**Factory-mounted**)

Raised Face Flange Accessory for cooler nozzles:

- 150 psig (10.3 barg), welded flanges (field kit, matching pipe flange by contractor).
- 150 psig (10.3 barg) companion weld flanges. (field kit - Not available with 460V units).
- 150 psig (10.3 barg), **ANSI/AWWA C-606 COUPLINGS** (field kit, matching pipe flange by contractor).

Opposite Handed Evaporator Water – Connections for ease of installation. Standard water connections are on the left-hand side of the unit, when viewed from the control panel end.

GENERAL OPTIONS

Flow Switch Accessory – Vapor proof SPDT, NEMA 3R switch, 150 psig (10.3 barg) DWP, 20°F to 250°F (-7°C to 121°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**).

Differential Pressure Switch – Alternative to the paddle-type flow switch. 3-45 psig (0.2-3 barg) range with 1/4" NPTE pressure connections. (**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. (**Factory-mounted**)

Service Isolation Valve – Service suction isolation valve added to unit for each refrigerant circuit. (**Factory-mounted**)

Chicago Code Relief Valve – Special relief valves per Chicago code. (**Factory-mounted**)

Pressure Relief (CE/PED) Service Valve Kit – Each relief valve is mounted on a sealable ball valve to aid maintenance. (**Factory-mounted**)

Circuit Breaker – Power panel will come equipped with a factory mounted circuit breaker at the point of incoming single or multi-point connections that provides the following:

- A means to disconnect power mounted on chiller.
- Circuit breaker(s) 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.)
- A lockable operating handle that extends through power panel door. This allows power to be disconnected without opening any panel doors.
- A Short Circuit Withstand Rating of 65,000 amps when the chiller electrical enclosure when using circuit breaker option is 380, 400, & 460. Rated IAW UL508.

Accessories and Options (Cont'd)

VIBRATION ISOLATION

Elastomeric Isolation – This option is recommended for normal installations. It provides very good performance in most applications for the lowest cost. **(Field-mounted)**

1" Spring Isolators – Spring and cage type isolators for mounting under the unit base rails. They are level adjustable. 1" nominal deflection may vary slightly by application. **(Field-mounted)**

2" Spring Isolators – Restrained Spring-Flex Mounting isolators 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 up to 2" (51mm). The deflection may vary slightly by application. They are level adjustable. **(Field-mounted)**

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Temperatures and Flows

TEMPERATURE AND FLOWS

(ENGLISH UNITS)

MODEL NUMBER YCIV	LEAVING WATER TEMPERATURE (°F)		COOLER ³ FLOW (GPM)		AIR ON CONDENSER (°F)	
	MIN. ¹	MAX. ²	MIN.	MAX.	MIN.	MAX
60 HZ						
0157	40	60	140	675	0	125
0177	40	60	160	750	0	125
0187	40	60	160	750	0	125
0207	40	60	180	800	0	125
0227	40	60	180	800	0	125
0247	40	60	180	800	0	125
0267	40	60	180	800	0	125
0287	40	60	250	1200	0	125
0307	40	60	300	1200	0	125
0357	40	60	300	1200	0	125
0397	40	60	300	1200	0	125

NOTES:

1. For leaving brine temperature below 40°F (4.4°C), contact your nearest Johnson Controls office for application requirements.
2. For leaving water temperature higher than 60°F (15.6°C), contact the nearest Johnson Controls office for application guidelines.
3. The evaporator is protected against freezing to -20°F (-28.8°C) with an electric heater as standard.

Temperatures and Flows (Cont'd)

TEMPERATURE AND FLOWS

(SI UNITS)

MODEL NUMBER YCIV	LEAVING WATER TEMPERATURE (°C)		COOLER ³ FLOW (L/S)		AIR ON CONDENSER (°C)	
	MIN. ¹	MAX. ²	MIN.	MAX.	MIN.	MAX
60 HZ						
0157	4.4	15.6	8.8	42.6	-17.8	51.7
0177	4.4	15.6	10.1	47.3	-17.8	51.7
0187	4.4	15.6	10.1	47.3	-17.8	51.7
0207	4.4	15.6	11.4	50.5	-17.8	51.7
0227	4.4	15.6	11.4	50.5	-17.8	51.7
0247	4.4	15.6	11.4	50.5	-17.8	51.7
0267	4.4	15.6	11.4	50.5	-17.8	51.7
0287	4.4	15.6	15.8	75.7	-17.8	51.7
0307	4.4	15.6	18.9	75.7	-17.8	51.7
0357	4.4	15.6	18.9	75.7	-17.8	51.7
0397	4.4	15.6	18.9	75.7	-17.8	51.7

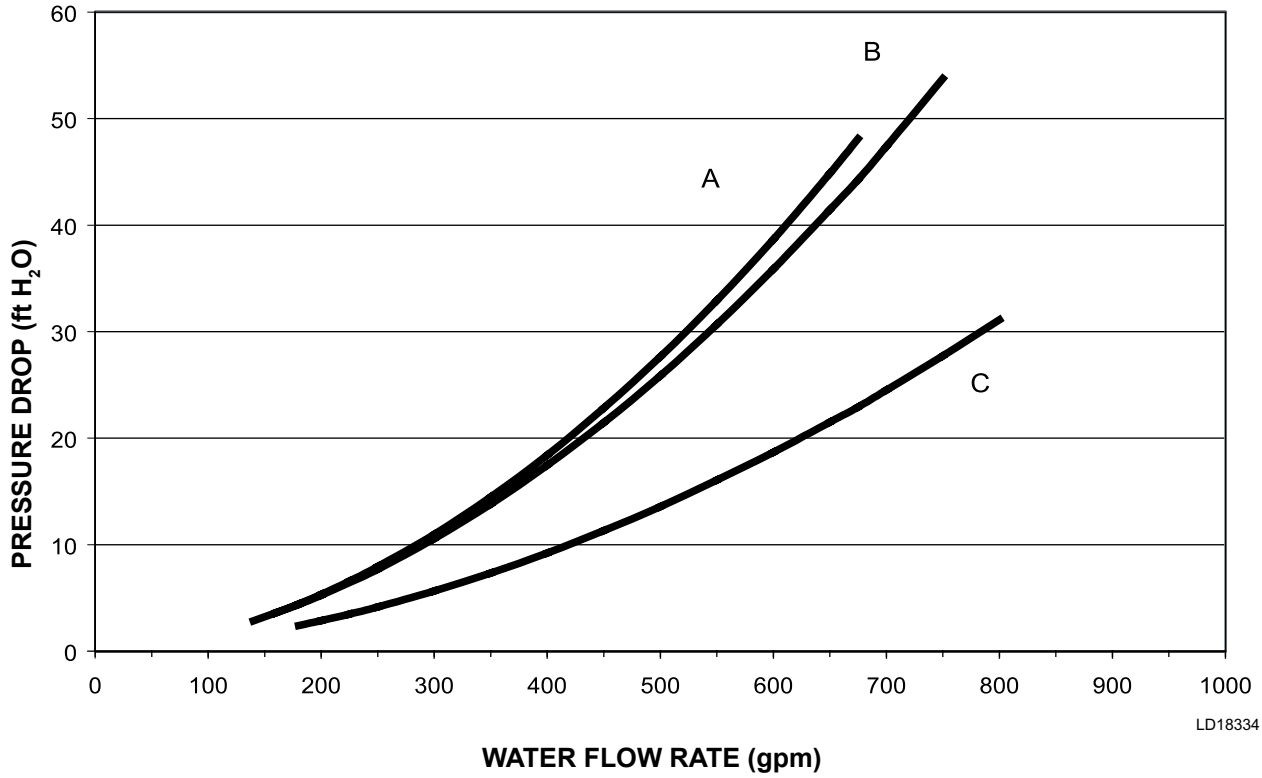
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3. The evaporator is protected against freezing to -20°F (-28.8°C) with an electric heater as standard.

Water Pressure Drop

ENGLISH UNITS

PRESSURE DROP THROUGH TWO CIRCUIT YCIV EVAPORATORS



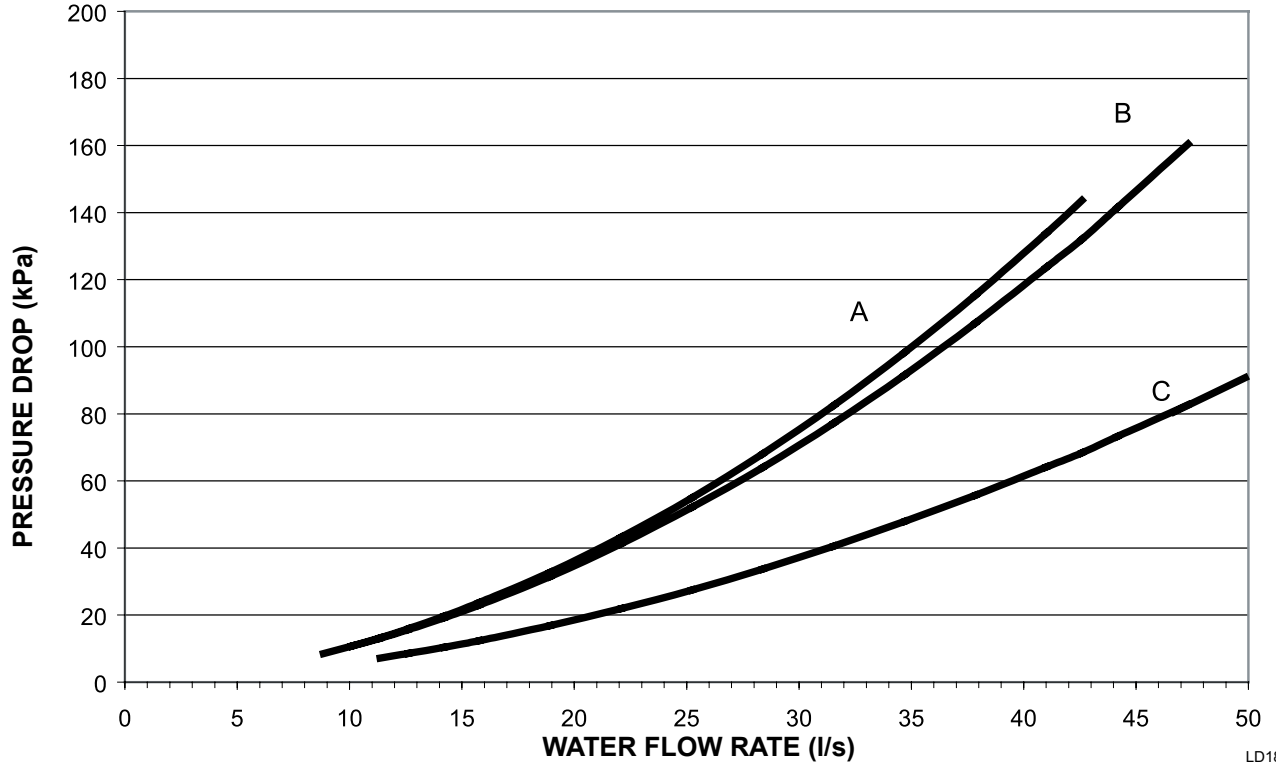
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COOLER	MODEL NUMBER YCIV
	60HZ
A	0157
	0177
B	0187
	0207
D	0227
	0247
	0267

Water Pressure Drop (Cont'd)

SI UNITS

PRESSURE DROP THROUGH TWO CIRCUIT YCIV EVAPORATORS



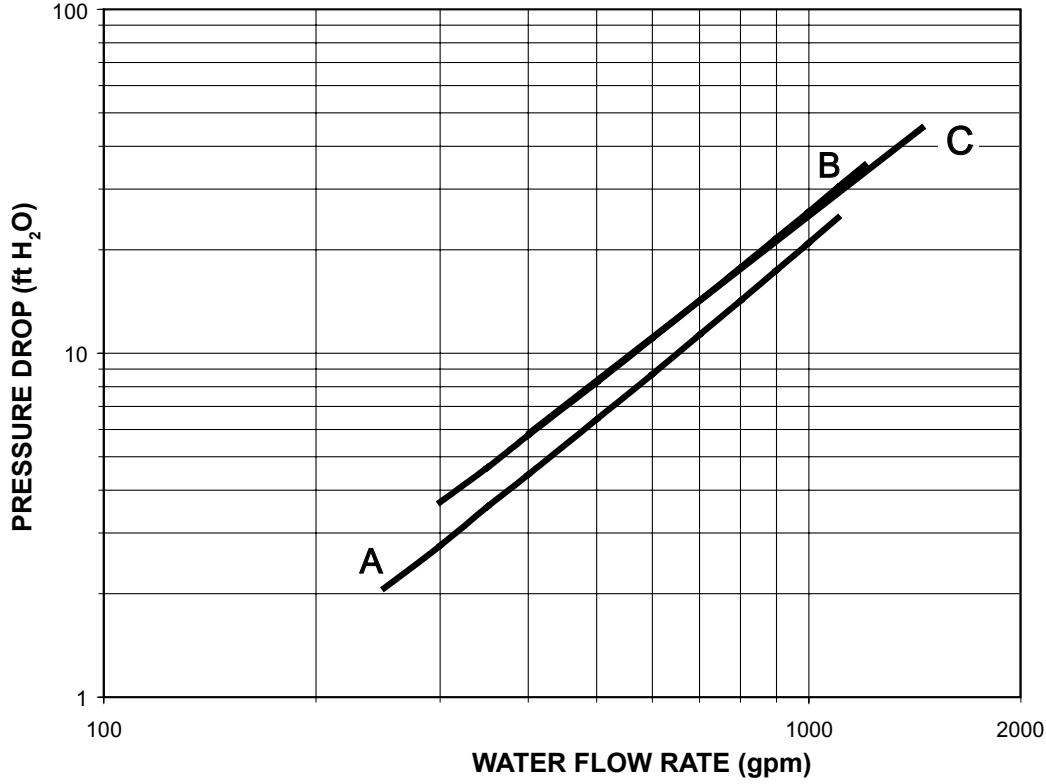
LD18335

COOLER	MODEL NUMBER YCIV
	60HZ
A	0157
	0177
B	0187
	0207
D	0227
	0247
	0267

Water Pressure Drop (Cont'd)

ENGLISH UNITS

PRESSURE DROP THROUGH THREE AND FOUR CIRCUIT YCIV EVAPORATORS



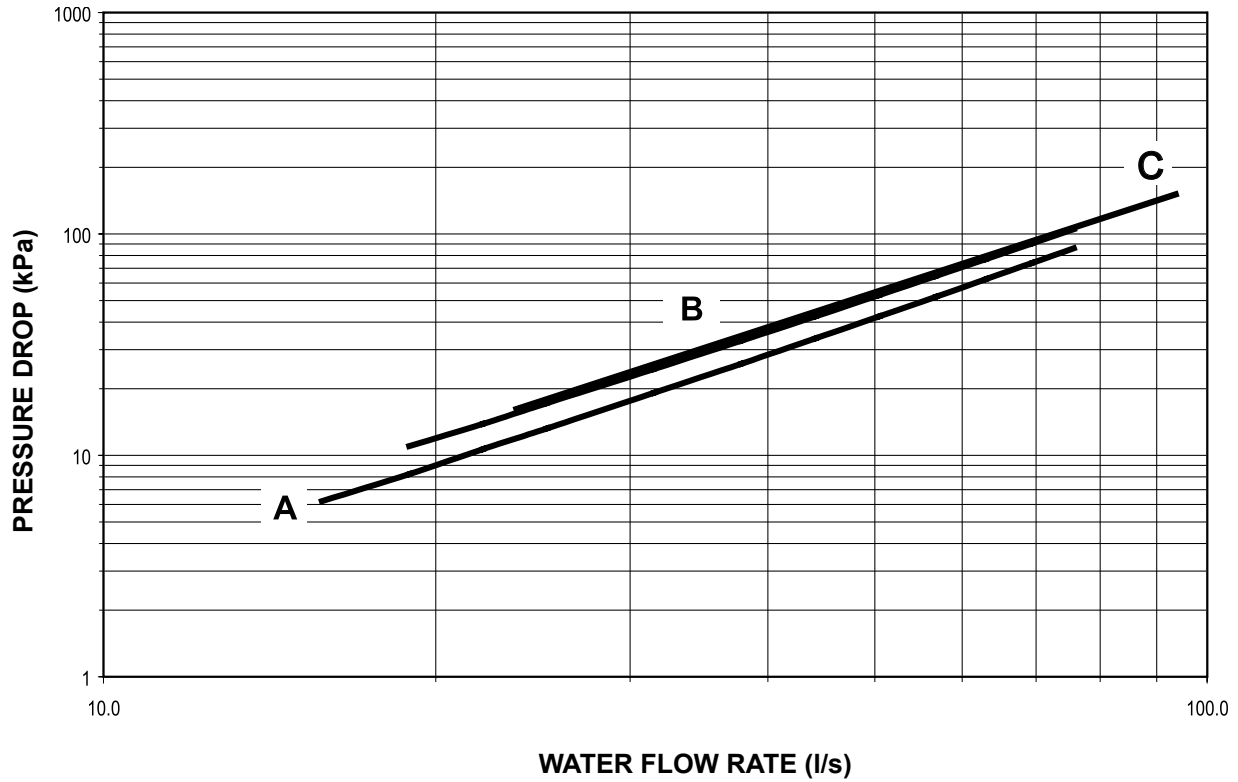
LD18336

EVAPORATOR	YCIV MODELS
	60HZ
A	0287
B	0307
	0357
	0397

Water Pressure Drop (Cont'd)

SI UNITS

PRESSURE DROP THROUGH THREE AND FOUR CIRCUIT YCIV EVAPORATORS



LD18337

EVAPORATOR	YCIV MODELS
	60HZ
A	0287
B	0307
	0357
	0397

Physical Data (English - Standard Efficiency)

REFRIGERANT R-134A	STANDARD EFFICIENCY							
GENERAL UNIT DATA	60HZ	0157	0177	0187	0207	0227	0247	0267
NOMINAL RATINGS								
TONS		153.0	169.3	184.6	197.7	216.0	237.6	257.9
KW		177.4	190.8	209.6	227.1	243.6	266.4	289.2
EER		9.6	9.9	9.9	9.8	10.0	10.0	10.0
IPLV		14.4	14.5	14.6	14.5	14.7	15.1	15.3
Number of Independent Refrigerant Circuits		2	2	2	2	2	2	2
Refrigerant Charge, R-134A, CKT.-1/CKT.-2, LBS		162/162	170/170	185/170	192/175	192/192	230/195	230/230
Oil Charge, CKT.-1/CKT.-2, GAL.		5/5	5/5	5/5	5/5	5/5	5/5	5/5
Compressors, Semi-Hermetic Screw Qty Per Chiller		2	2	2	2	2	2	2
CONDENSERS, HIGH EFFICIENCY FIN/TUBE WITH INTEGRAL SUBCOOLER								
Total Chiller Coil Face Area, FT ²		235	235	264	264	293	323	352
Number of Rows		3	3	3	3	3	3	3
Fins Per Inch		17	17	17	17	17	17	17
CONDENSER FANS								
Number, CKT.-1/CKT.-2		4/4	4/4	5/4	5/4	5/5	6/5	6/6
LOW NOISE FANS								
Fan Motor, HP		2	2	2	2	2	2	2
Total Chiller Airflow, CFM		104000	104000	117000	117000	130000	143000	156000
ULTRA QUIET FANS								
Fan Motor, HP		2	2	2	2	2	2	2
Total Chiller Airflow, CFM		104000	104000	117000	117000	130000	143000	156000
DUAL SPEED FANS - NORMAL SPEED								
Fan Motor, HP		2	2	2	2	2	2	2
Total Chiller, CFM		88000	88000	99000	99000	110000	121000	132000
DUAL SPEED FANS - LOWER SPEED								
Fan Motor, HP		2	2	2	2	2	2	2
Total Chiller, CFM		67200	67200	75600	75600	84000	92400	100800
HIGH STATIC FANS								
Fan Motor, HP		5	5	5	5	5	5	5
Total Chiller, CFM		104000	104000	117000	117000	130000	143000	156000
EVAPORATOR, DIRECT EXPANSION								
Water Volume, GALS.		67.0	95.0	95.0	140.0	140.0	140.0	140.0
Maximum Water Side Pressure, PSIG ¹		150	150	150	150	150	150	150
Maximum Refrigerant Side Pressure, PSIG		235	235	235	235	235	235	235
Minimum Chilled Water Flow Rate, GPM		140	160	160	180	180	180	180
Maximum Chilled Water Flow Rate, GPM		675	750	750	800	800	800	800
Water Connections, Inches		8	10	10	10	10	10	10

NOTES:

1. kW = Compressor Input Power.
2. EER = Chiller EER (includes power from compressors, fans, and the control panels 0.8 kW).
3. Rated in accordance with AHRI Standard 550/590 at an air on condenser temperature of 95°F and a leaving chilled water temperature of 44°F.
4. Additional rating information and weight data can be provided by your local Johnson Controls Sales Office.

Physical Data (English - Standard Efficiency) (Cont'd)

REFRIGERANT R-134A	STANDARD EFFICIENCY				
GENERAL UNIT DATA	60HZ	0287	0307	0357	0397
NOMINAL RATINGS					
TONS		272.9	301.5	339.8	382.7
KW		308.3	346.5	393.1	438.8
EER		9.9	9.8	9.7	9.8
IPLV		14.6	14.2	15.0	15.3
Number of Independent Refrigerant Circuits		3	3	3	3
Refrigerant Charge, R-134A, CKT.-1/CKT.-2, LBS		185/170/170	185/185/170	185/185/230	230/230/230
Oil Charge, CKT.-1/CKT.-2, GAL.		5/4/4	5/4/4	5/5/5	5/5/5
Glycol Charge (43% Concentration), GAL		5.4	5.5	6.0	6.3
Compressors, Semi-Hermetic Screw Qty Per Chiller		3	3	3	3
CONDENSERS, HIGH EFFICIENCY FIN/TUBE WITH INTEGRAL SUBCOOLER					
Total Chiller Coil Face Area, FT ²		381	411	469	528
Number of Rows		3	3	3	3
Fins Per Inch		17	17	17	17
CONDENSER FANS					
Number, CKT.-1/CKT.-2		5/4/4	5/4/4	5/5/6	6/6/6
LOW NOISE FANS					
Fan Motor, HP/KWI		2/1.8	2/1.8	2/1.8	2/1.8
Total Chiller Airflow, CFM		169000	182000	208000	234000
ULTRA QUIET FANS					
Fan Motor, HP/KWI		2/1.50	2/1.50	2/1.50	2/1.50
Total Chiller Airflow, CFM		169000	182000	208000	234000
DUAL SPEED FANS - NORMAL SPEED					
Fan Motor, HP		2	2	2	2
Total Chiller, CFM		143000	143000	165000	165000
DUAL SPEED FANS - LOWER SPEED					
Fan Motor, HP		2	2	2	2
Total Chiller, CFM		109200	109200	126000	126000
HIGH STATIC FANS					
Fan Motor, HP		5	5	5	5
Total Chiller, CFM		169000	182000	208000	234000
EVAPORATOR, DIRECT EXPANSION					
Water Volume, GALS.		202.0	236.0	236.0	236.0
Maximum Water Side Pressure, PSIG		150	150	150	150
Maximum Refrigerant Side Pressure, PSIG		235	235	235	235
Minimum Chilled Water Flow Rate, GPM		250	300	300	300
Maximum Chilled Water Flow Rate, GPM		1200	1200	1200	1200
Water Connections, Inches		10	10	10	10

NOTES:

1. kW = Compressor Input Power.
2. EER = Chiller EER (includes power from compressors, fans, and the control panels 0.8 kW).
3. Rated in accordance with AHRI Standard 550/590 at an air on condenser temperature of 95°F and a leaving chilled water temperature of 44°F.
4. Additional rating information and weight data can be provided by your local Johnson Controls Sales Office.

Physical Data (SI - Standard Efficiency)

REFRIGERANT R-134A	STANDARD EFFICIENCY							
	60HZ	0157	0177	0187	0207	0227	0247	0267
GENERAL UNIT DATA								
NOMINAL RATINGS								
TONS		538.0	595.4	649.2	695.2	759.6	835.6	906.9
KW		177.4	190.8	209.6	227.1	243.6	266.4	289.2
COP		2.81	2.90	2.90	2.87	2.93	2.93	2.93
IPLV		4.21	4.24	4.27	4.24	4.30	4.42	4.48
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 Qty Per Chiller		2	2	2	2	2	2	2
CONDENSERS, HIGH EFFICIENCY FIN/TUBE WITH INTEGRAL SUBCOOLER								
Total Chiller Coil Face Area, M ²		21.8	21.8	24.5	24.5	27.2	30.0	32.7
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 NOISE FANS								
Fan Motor, HP/KWI		2/1.50	2/1.50	2/1.50	2/1.50	2/1.50	2/1.50	2/1.50
Total Chiller Airflow, L/SEC.		49082	49082	55218	55218	61353	67488	73624
ULTRA QUIET FANS								
Fan Motor, HP/KWI		2/1.50	2/1.50	2/1.50	2/1.50	2/1.50	2/1.50	2/1.50
Total Chiller Airflow, L/SEC.		49082	49082	55218	55218	61353	67488	73624
DUAL SPEED FANS - NORMAL SPEED								
Fan, KWI		1.5	1.5	1.5	1.5	1.5	1.5	1.5
Total Chiller, M ³ /S		42	42	47	47	52	57	62
DUAL SPEED FANS - LOWER SPEED								
Fan, KWI		1.5	1.5	1.5	1.5	1.5	1.5	1.5
Total Chiller, M ³ /S		32	32	36	36	40	44	48
HIGH STATIC FANS								
Fan, KWI		3.7	3.7	3.7	3.7	3.7	3.7	3.7
Total Chiller, M ³ /S		49	49	55	55	61	67	74
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	10.1	10.1	11.4	11.4	11.4	11.4
Maximum Chilled Water Flow Rate, L/SEC.		42.6	47.3	47.3	50.5	50.5	50.5	50.5
Water Connections, Inches		8	10	10	10	10	10	10

NOTES:

- Standard Rating Conditions per AHRI Standard 550/590.
- COP = Chiller COP (includes power from compressors, fans, and the control panels).
- Rated in accordance with AHRI Standard 550/590 at an air on condenser temperature of 95°F and a leaving chilled water temperature of 44°F.
- Additional rating information can be provided by your local Johnson Controls Sales Office.

Physical Data (SI - Standard Efficiency) (Cont'd)

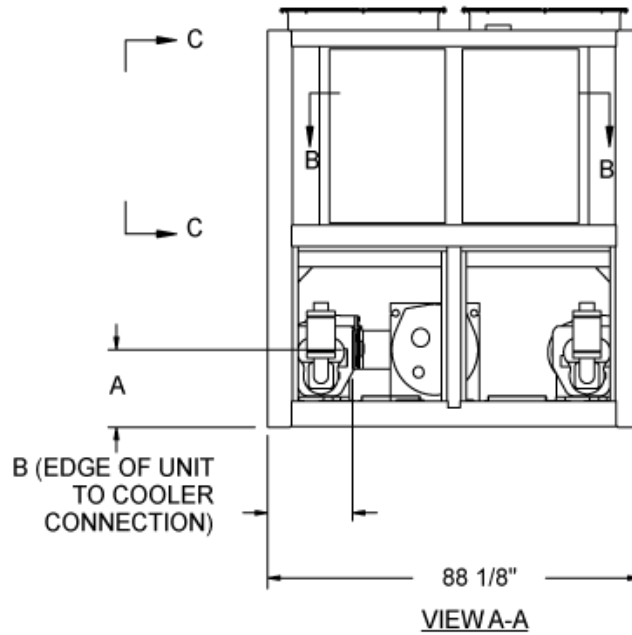
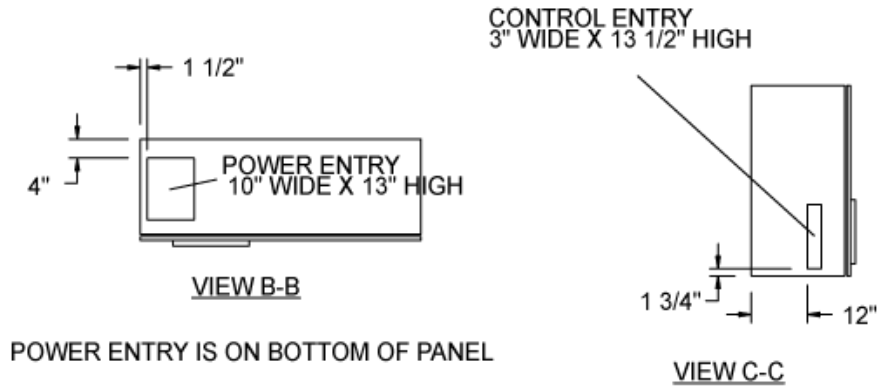
REFRIGERANT R-134A	STANDARD EFFICIENCY				
	60HZ	0287	0307	0357	0397
GENERAL UNIT DATA					
NOMINAL RATINGS					
TONS		959.7	1060.3	1195.0	1345.8
KW		308.3	346.5	393.1	438.8
COP		2.90	2.87	2.84	2.87
IPLV		4.27	4.16	4.39	4.48
Number Of Independent Refrigerant Circuits		3	3	3	3
Refrigerant Charge, R-134A, CKT.-1/CKT.-2, KG.		84 / 77 / 77	84 / 84 / 77	84 / 84 / 105	105 / 105 / 105
Oil Charge, CKT.-1/CKT.-2, Liters		19 / 15 / 15	19 / 19 / 15	19 / 19 / 19	19 / 19 / 19
Glycol Charge (43% Concentration), Liters		0	0	0	0
Compressors, Semihermetic Screw Qty Per Chiller		3	3	3	3
CONDENSERS, HIGH EFFICIENCY FIN/TUBE WITH INTEGRAL SUBCOOLER					
Total Chiller Coil Face Area, M ²		35	38	44	49
Number of Rows		3	3	3	3
Fins Per Meter		669	669	669	669
CONDENSER FANS					
Number, CKT.-1/CKT.-2		5/4/4	5/5/4	5/5/6	6/6/6
LOW NOISE FANS					
Fan Motor, HP/KWI		2/1.50	2/1.50	2/1.50	2/1.50
Total Chiller Airflow, L/SEC.		79768	85904	98176	110448
ULTRA QUIET FANS					
Fan Motor, HP/KWI		2/1.50	2/1.50	2/1.50	2/1.50
Total Chiller Airflow, L/SEC.		79768	85904	98176	110448
DUAL SPEED FANS - NORMAL SPEED					
Fan, KWI		1.5	1.5	1.5	1.5
Total Chiller, M ³ /S		67	67	78	78
DUAL SPEED FANS - LOWER SPEED					
Fan, KWI		1.5	1.5	1.5	1.5
Total Chiller, M ³ /S		52	52	59	59
HIGH STATIC FANS					
Fan, KWI		3.7	3.7	3.7	3.7
Total Chiller, M ³ /S		80	86	98	110
EVAPORATOR, DIRECT EXPANSION					
Water Volume, Liters		764.6	893.3	893.3	893.3
Maximum Water Side Pressure, Bar		10	10	10	10
Maximum Refrigerant Side Pressure, Bar		16	16	16	16
Minimum Chilled Water Flow Rate, L/SEC.		16	19	19	19
Maximum Chilled Water Flow Rate, L/SEC.		76	76	76	76
Water Connections, Inches		10	10	10	10

NOTES:

- Standard Rating Conditions per AHRI Standard 550/590.
- COP = Chiller COP (includes power from compressors, fans, and the control panels).
- Rated in accordance with AHRI Standard 550/590 at an air on condenser temperature of 95°F and a leaving chilled water temperature of 44°F.
- Additional rating information can be provided by your local Johnson Controls Sales Office.

Dimensions - English

MODELS YCIV0157



Ido18311

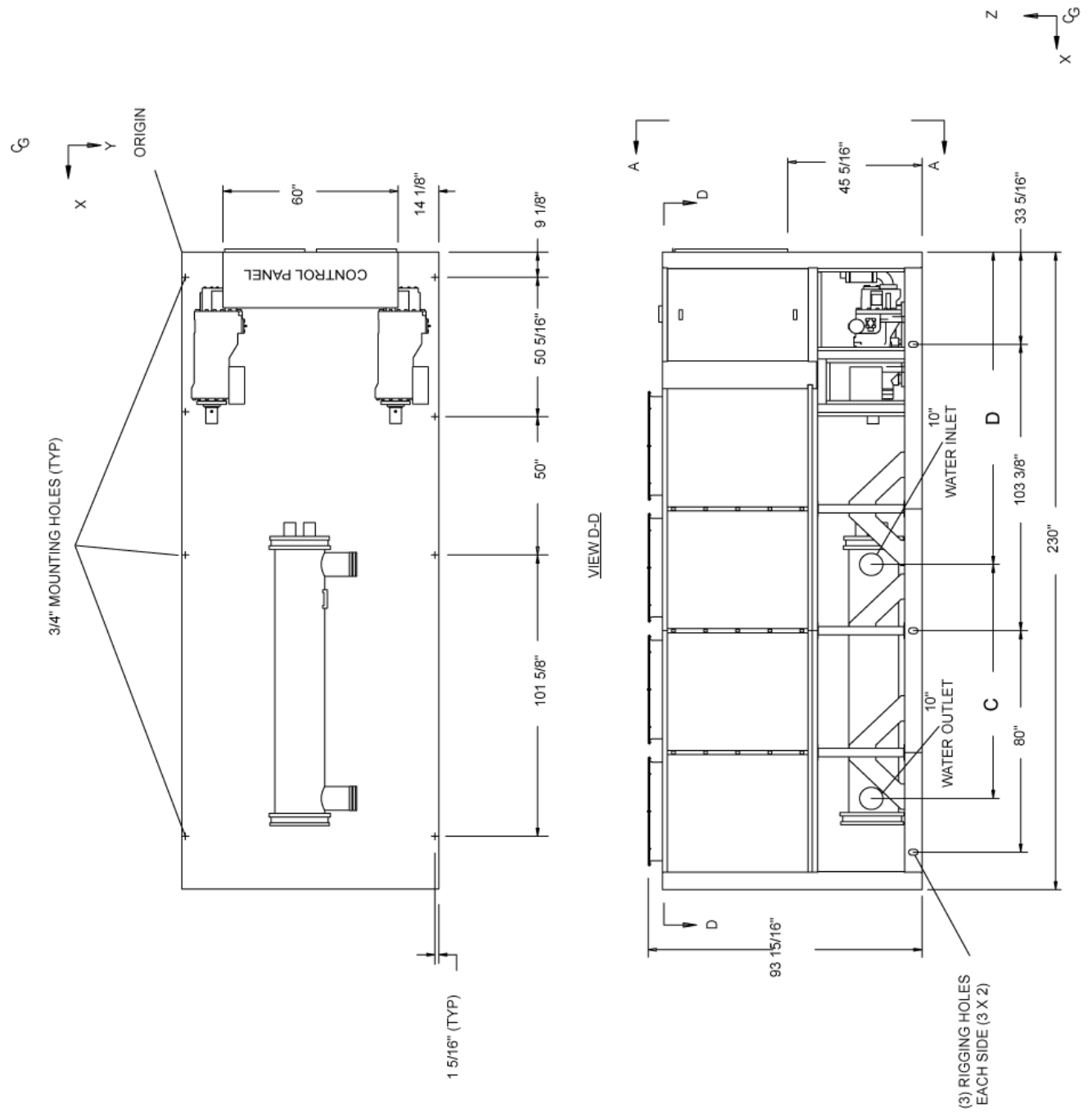
YCIV	A	B	C	D
0157	17.4"	29.1"	90.0"	110.1"

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 patterns and possible diminished performance. Johnson Controls' unit controls will optimize the operation without nuisance high pressure safety cutouts; however, the system designer **MUST** consider potential performance degradation.

Access to the unit control center stipulates the unit is no higher than on spring isolators. Recommended minimum clearances: side to wall - 6'; rear to wall - 6'; control panel end to wall - 4'; top - no obstructions whatsoever; distance between adjacent units - 10'. No more than one adjacent wall may be higher than the unit.

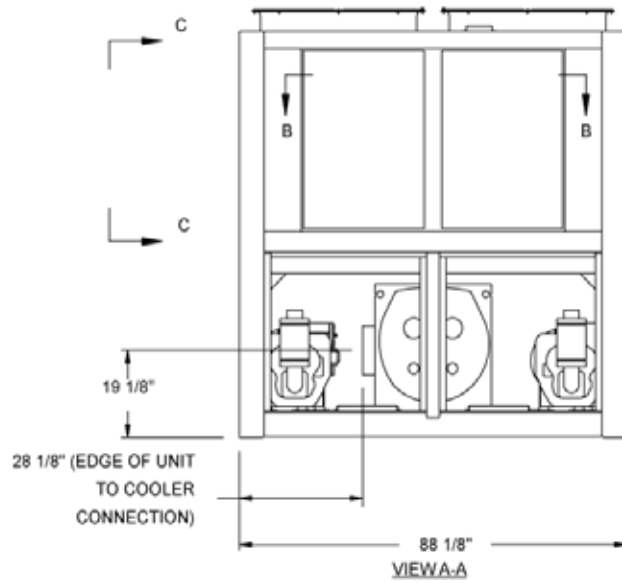
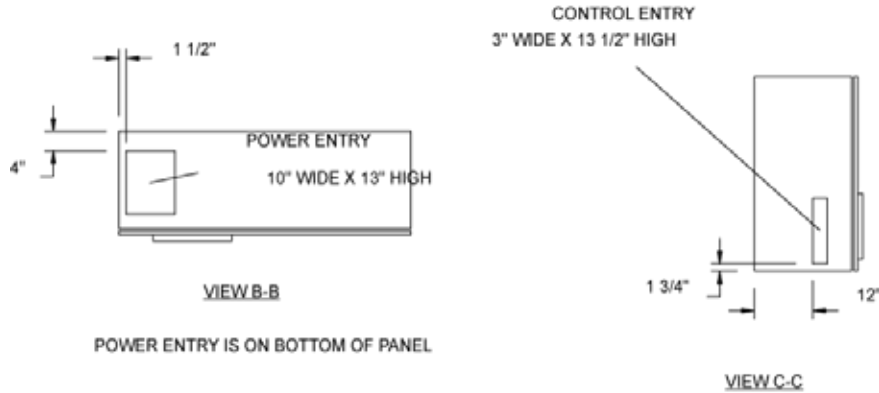
Dimensions - English (Cont'd)



Ido18312

Dimensions - English (Cont'd)

MODELS YCIV0177 AND YCIV0187



YCIV	A	B
0177	80.0"	230.0"
0187	88.1"	274.0"

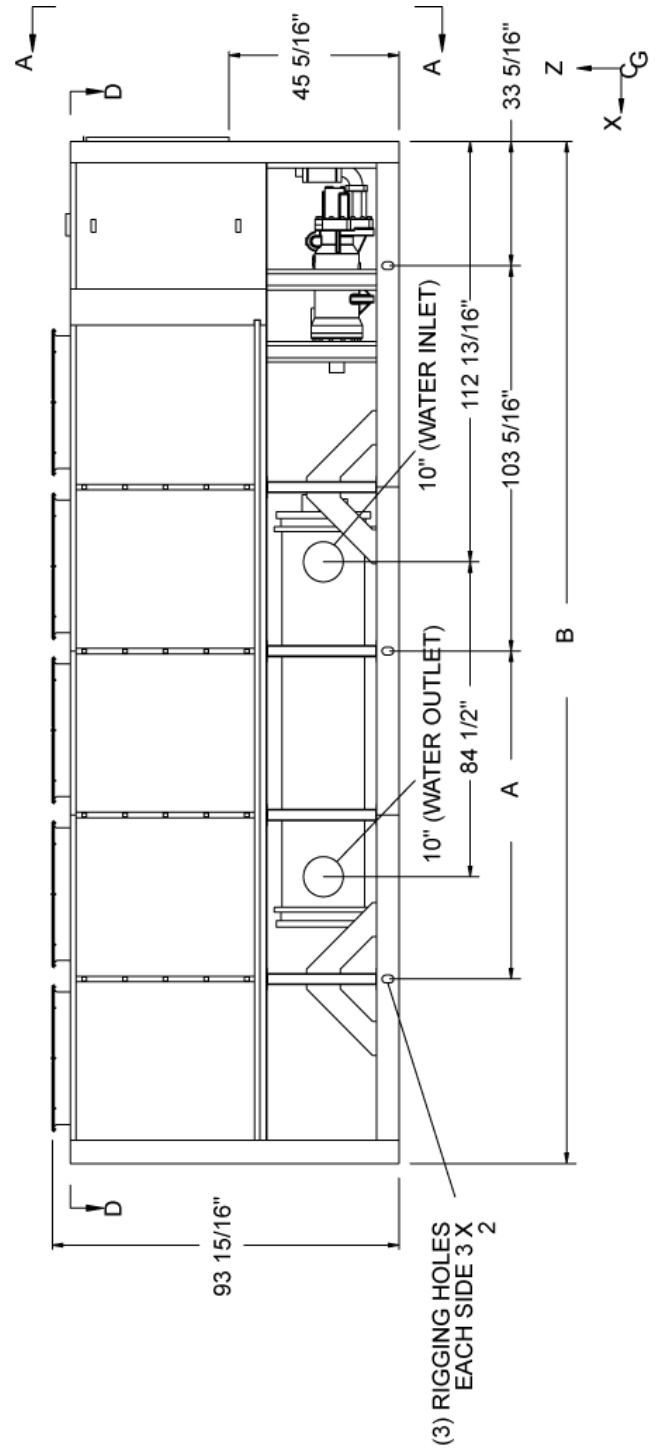
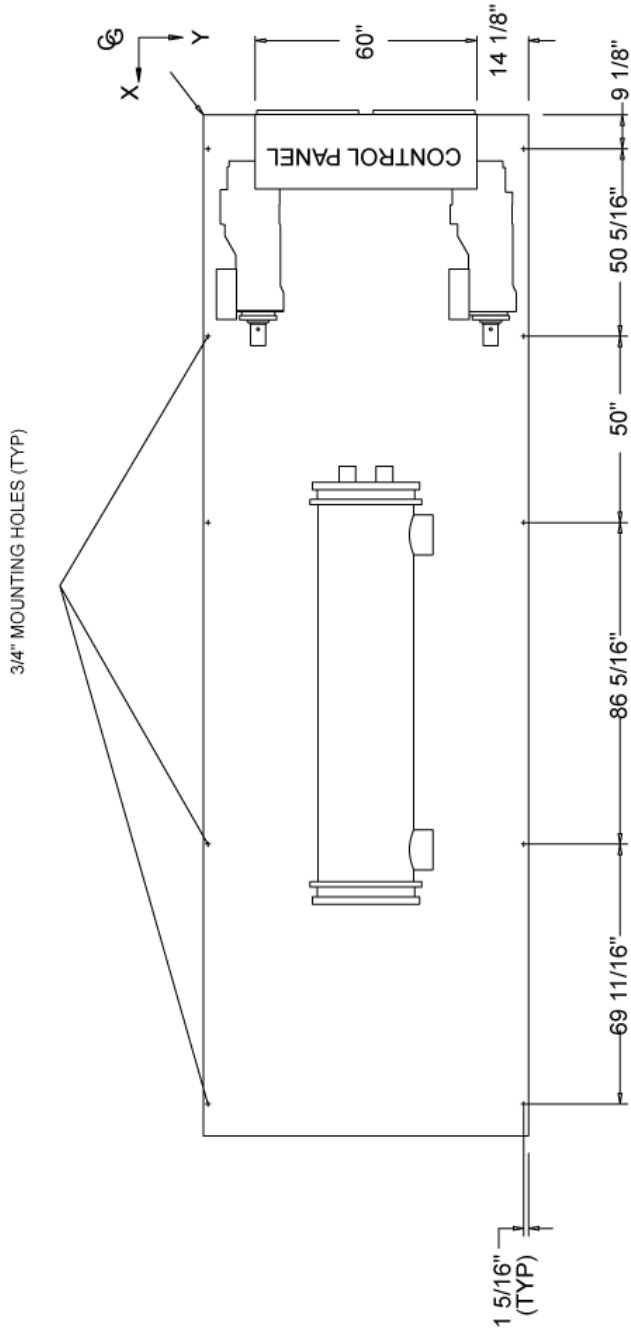
ldo18313

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 patterns and possible diminished performance. Johnson Controls' unit controls will optimize the operation without nuisance high pressure safety cutouts; however, the system designer **MUST** consider potential performance degradation.

Access to the unit control center stipulates the unit is no higher than on spring isolators. Recommended minimum clearances: side to wall - 6'; rear to wall - 6'; control panel end to wall - 4'; top - no obstructions whatsoever; distance between adjacent units - 10'. No more than one adjacent wall may be higher than the unit.

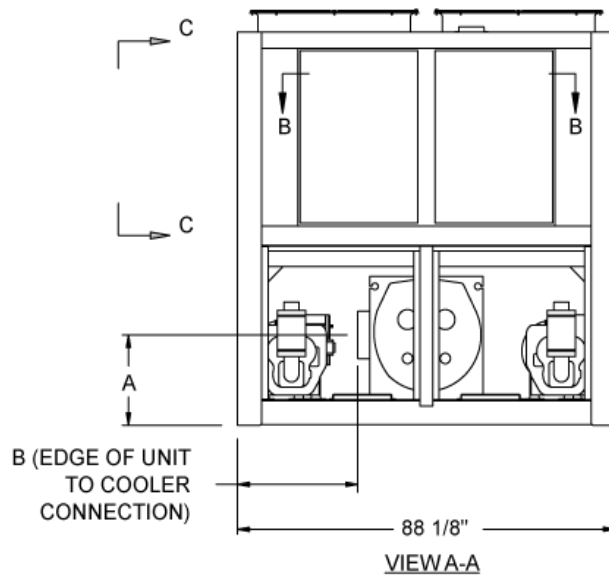
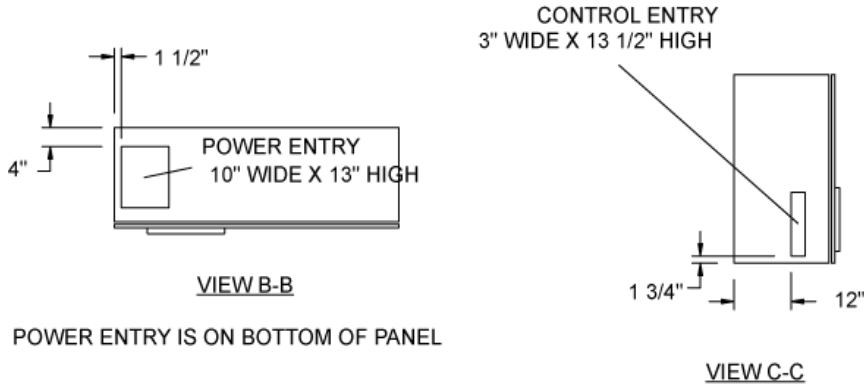
Dimensions - English (Cont'd)



Ido18314

Dimensions - English (Cont'd)

MODELS YCIV0207, AND YCIV0227



Ido18315

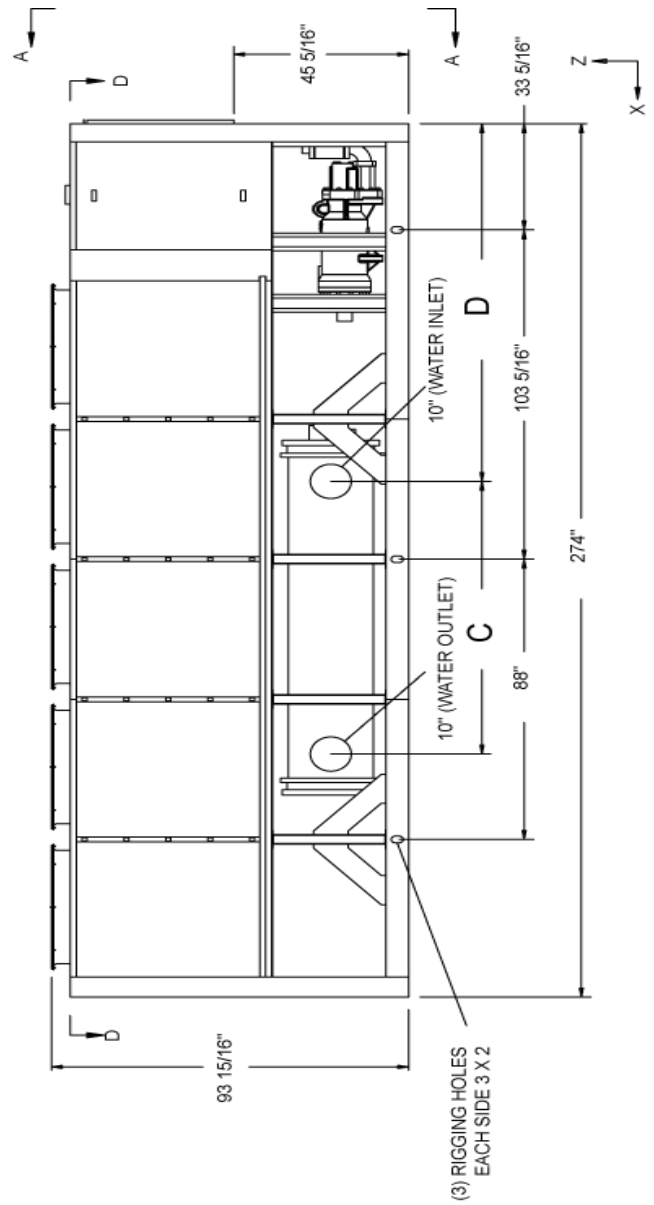
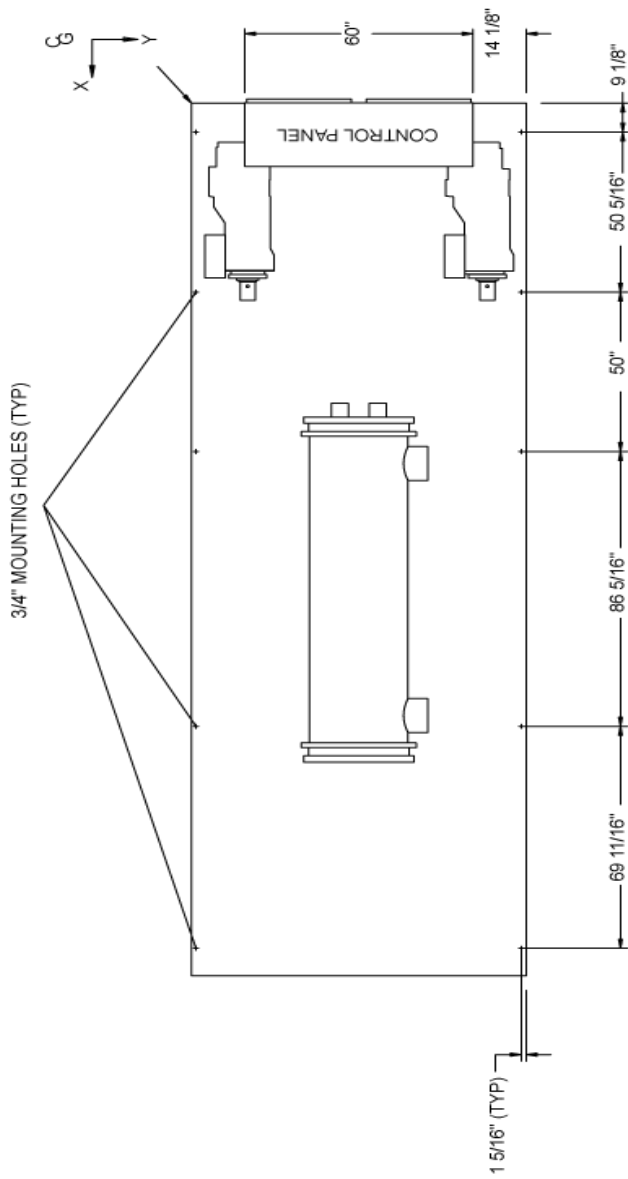
YCIV	A	B	C	D
0207	22.2"	26.0"	79.1"	113.3"
0227	22.2"	26.0"	79.1"	113.3"

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 patterns and possible diminished performance. Johnson Controls' unit controls will optimize the operation without nuisance high pressure safety cutouts; however, the system designer **MUST** consider potential performance degradation.

Access to the unit control center stipulates the unit is no higher than on spring isolators. Recommended minimum clearances: side to wall - 6'; rear to wall - 6'; control panel end to wall - 4'; top - no obstructions whatsoever; distance between adjacent units - 10'. No more than one adjacent wall may be higher than the unit.

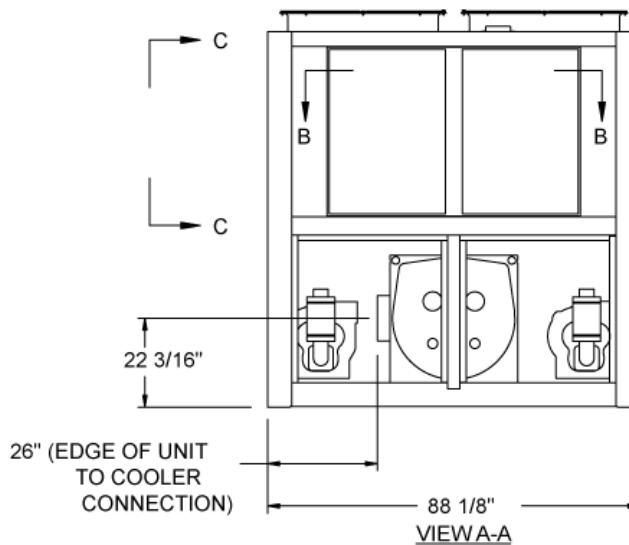
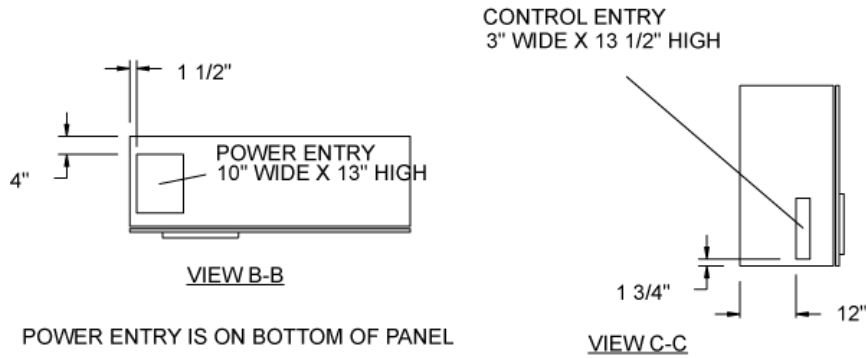
Dimensions - English (Cont'd)



Ido18316

Dimensions - English (Cont'd)

MODELS YCIV0247 AND YCIV0267



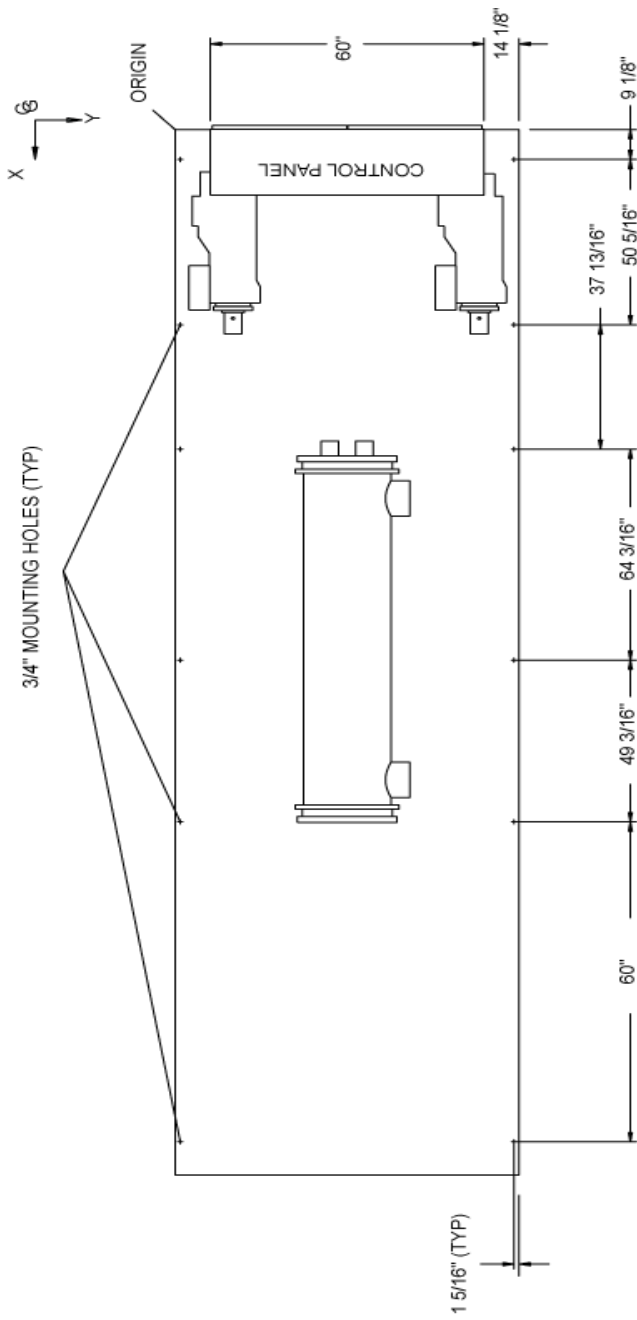
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Notes:

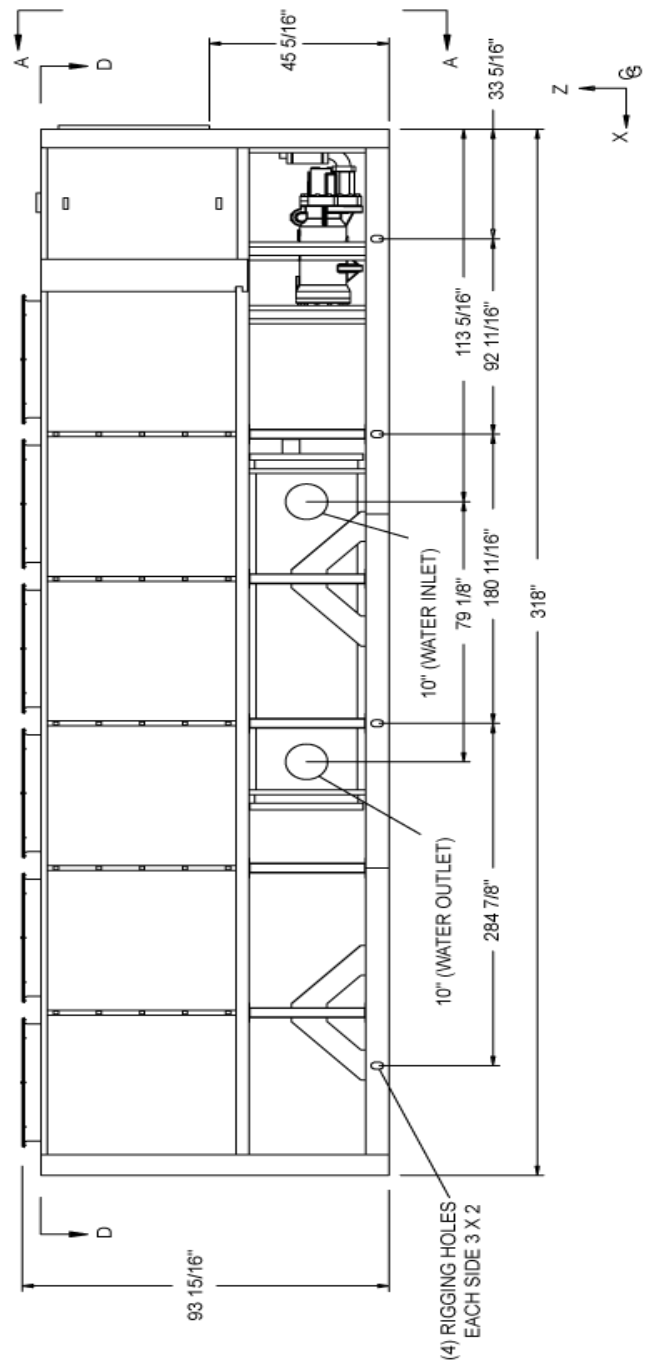
1. Placement on a level surface free of obstructions (including snow, for winter operation) or air recirculation ensures rated performance, reliable operation, and ease of maintenance. Site restrictions may compromise minimum clearances indicated below, resulting in unpredictable air patterns and possible diminished performance. Johnson Controls' unit controls will optimize the operation without nuisance high pressure safety cutouts; however, the system designer **MUST** consider potential performance degradation.

Access to the unit control center stipulates the unit is no higher than on spring isolators. Recommended minimum clearances: side to wall - 6'; rear to wall - 6'; control panel end to wall - 4'; top - no obstructions whatsoever; distance between adjacent units - 10'. No more than one adjacent wall may be higher than the unit.

Dimensions - English (Cont'd)



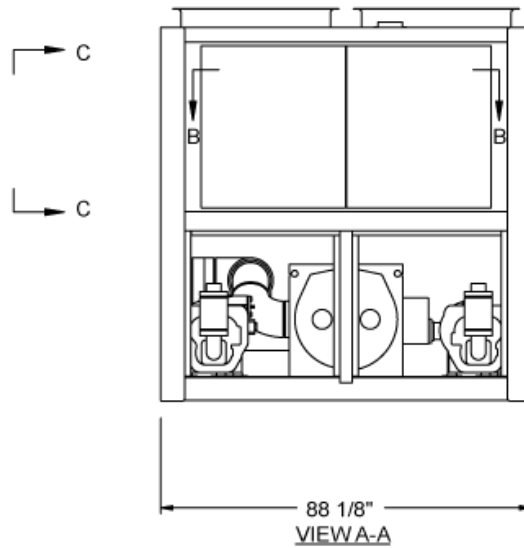
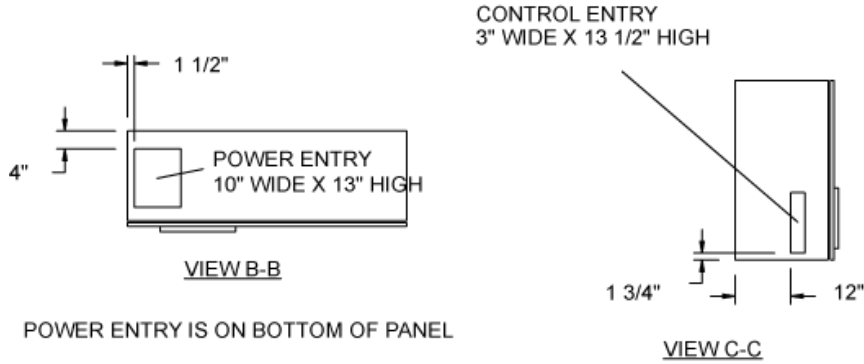
VIEW D-D



Ido18320

Dimensions (Cont'd)

MODEL YCIV0287



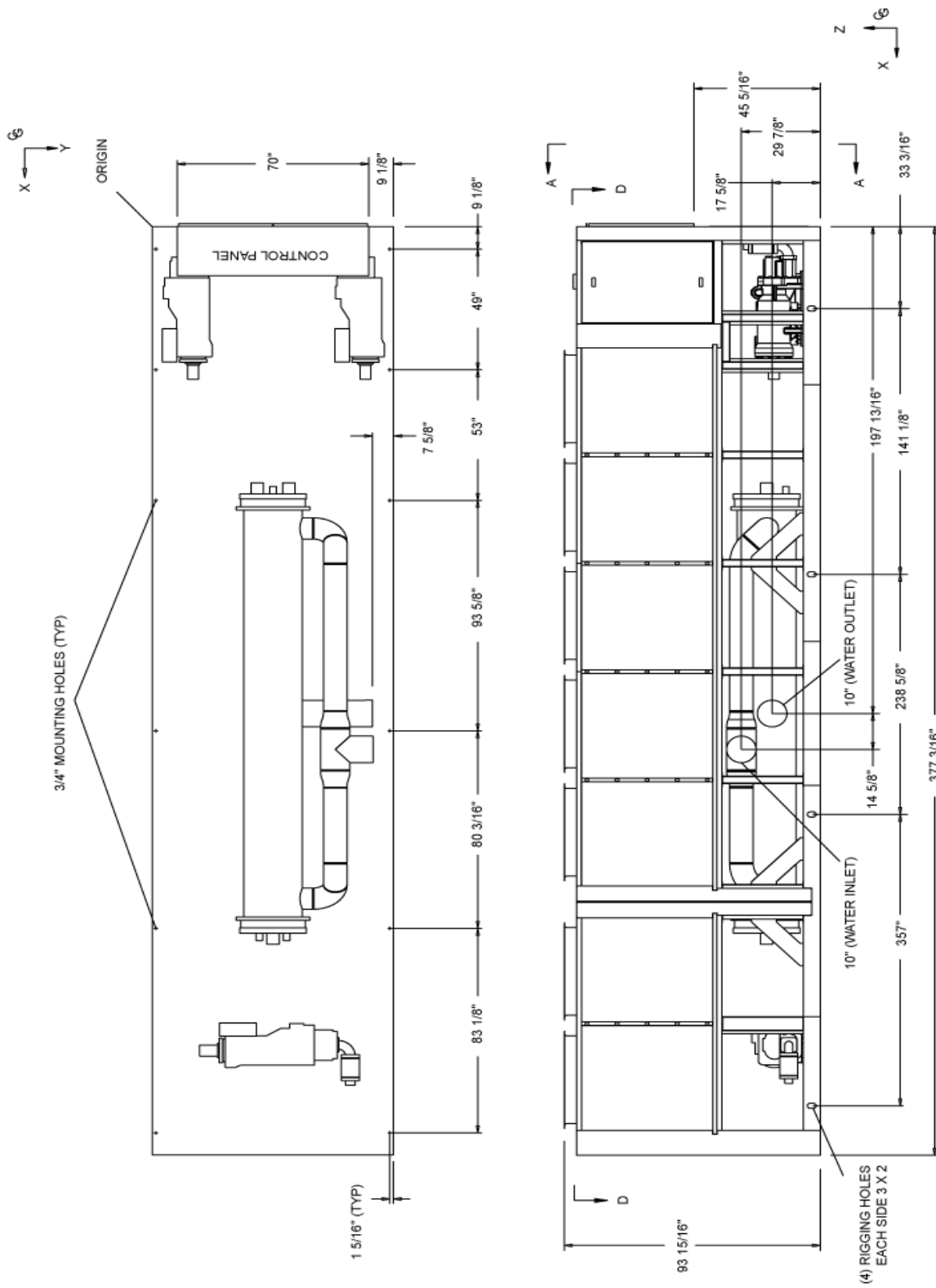
ldo18321

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 patterns and possible diminished performance. Johnson Controls' unit controls will optimize the operation without nuisance high pressure safety cutouts; however, the system designer **MUST** consider potential performance degradation.

Access to the unit control center stipulates the unit is no higher than on spring isolators. Recommended minimum clearances: side to wall - 6'; rear to wall - 6'; control panel end to wall - 4'; top - no obstructions whatsoever; distance between adjacent units - 10'. No more than one adjacent wall may be higher than the unit.

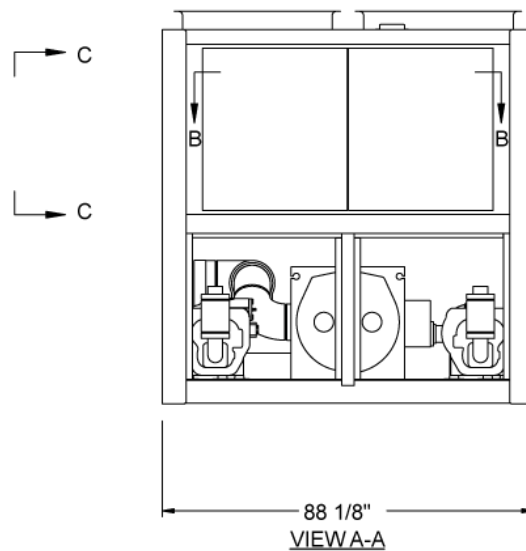
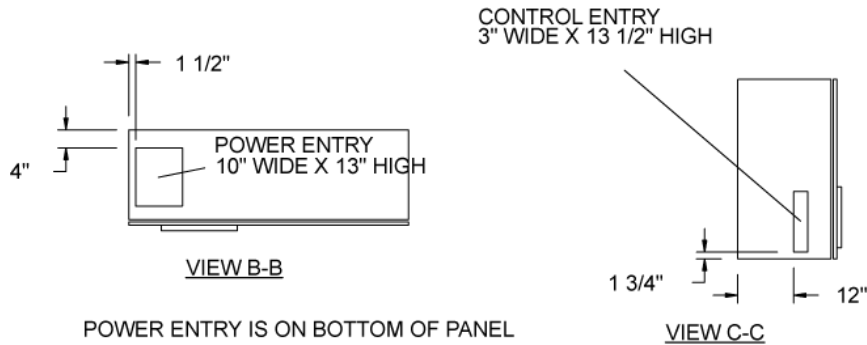
Dimensions - English (Cont'd)



Ido18322

Dimensions - English (Cont'd)

MODELS YCIV0307



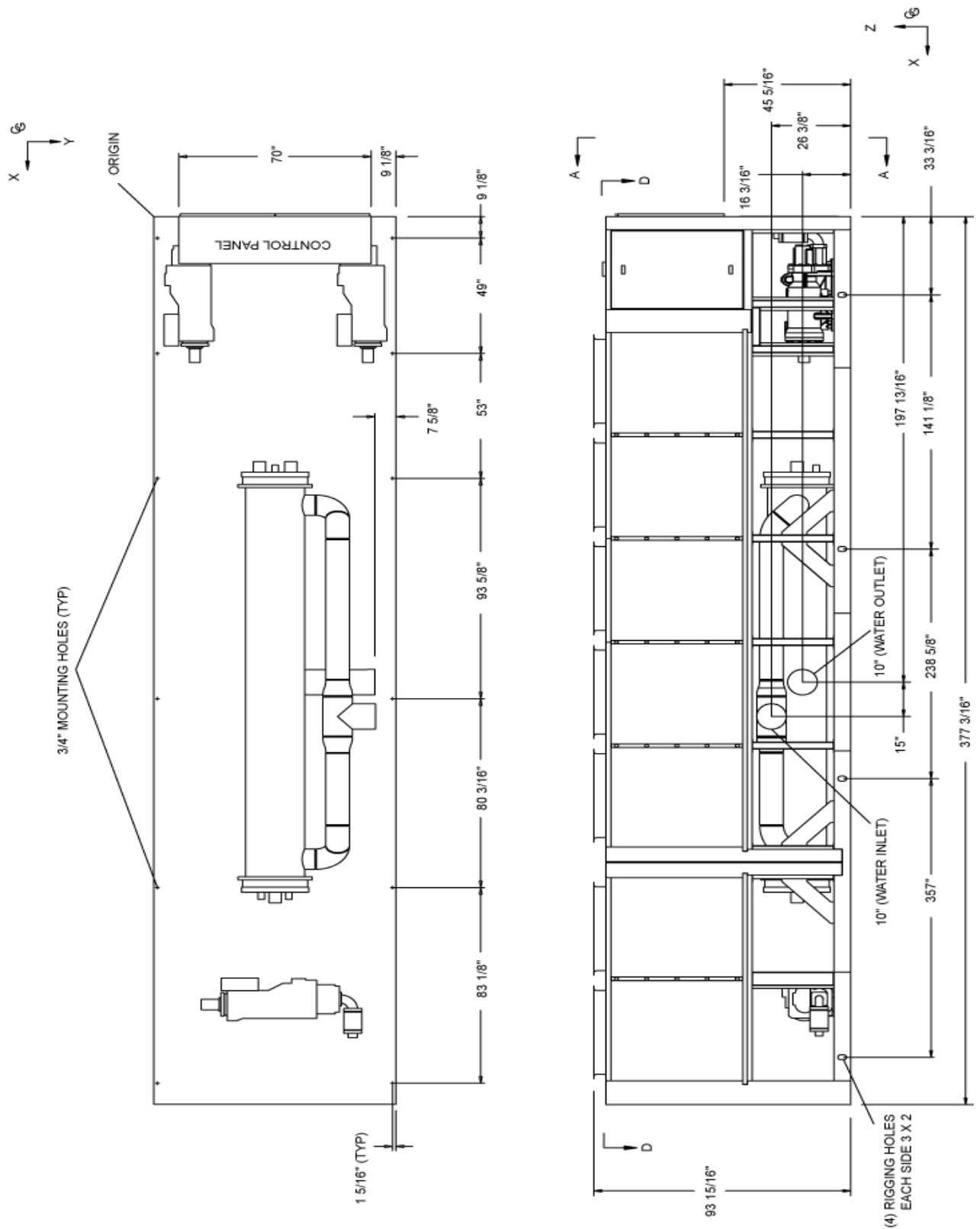
Ido18325

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 patterns and possible diminished performance. Johnson Controls' unit controls will optimize the operation without nuisance high pressure safety cutouts; however, the system designer **MUST** consider potential performance degradation.

Access to the unit control center stipulates the unit is no higher than on spring isolators. Recommended minimum clearances: side to wall - 6'; rear to wall - 6'; control panel end to wall - 4'; top - no obstructions whatsoever; distance between adjacent units - 10'. No more than one adjacent wall may be higher than the unit.

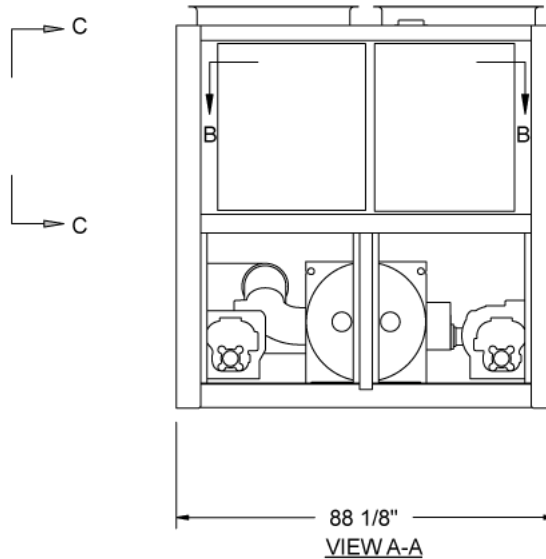
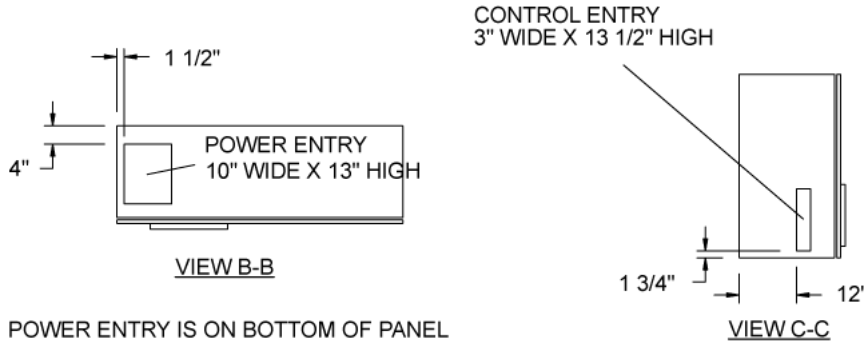
Dimensions - English (Cont'd)



Ido183226

Dimensions - English (Cont'd)

MODEL YCIV0357



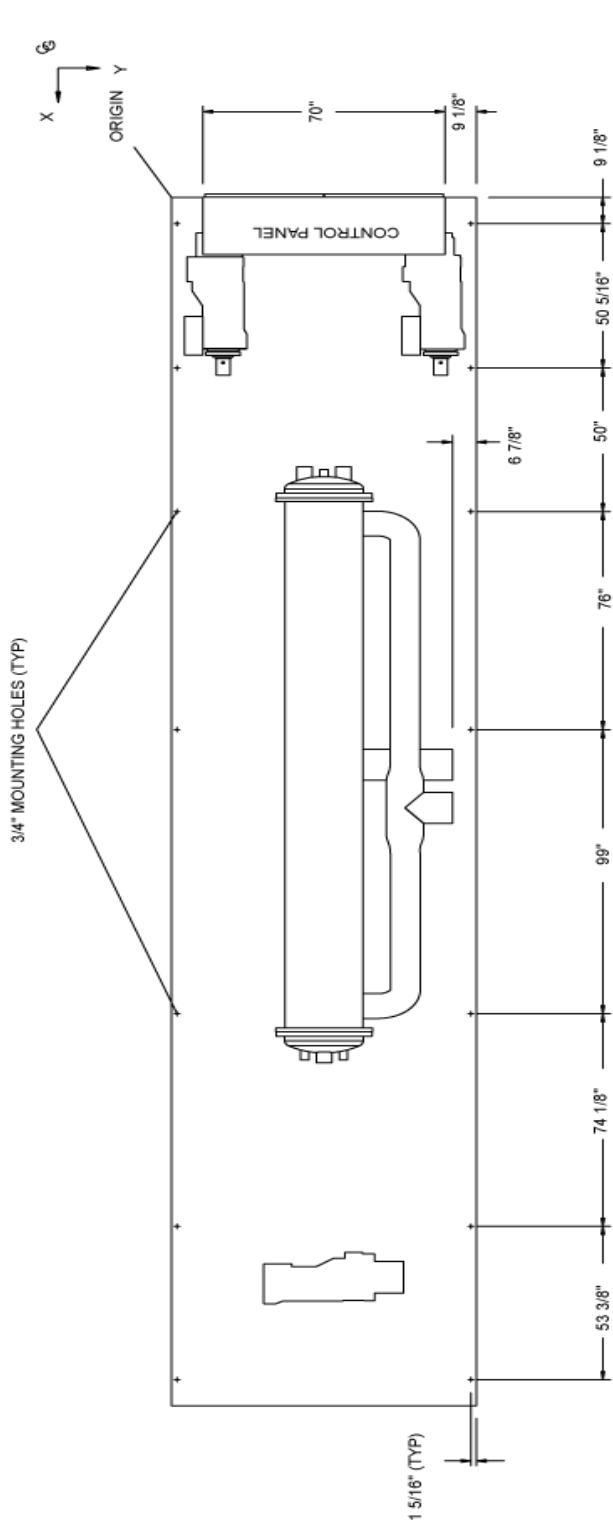
Ido18327

Notes:

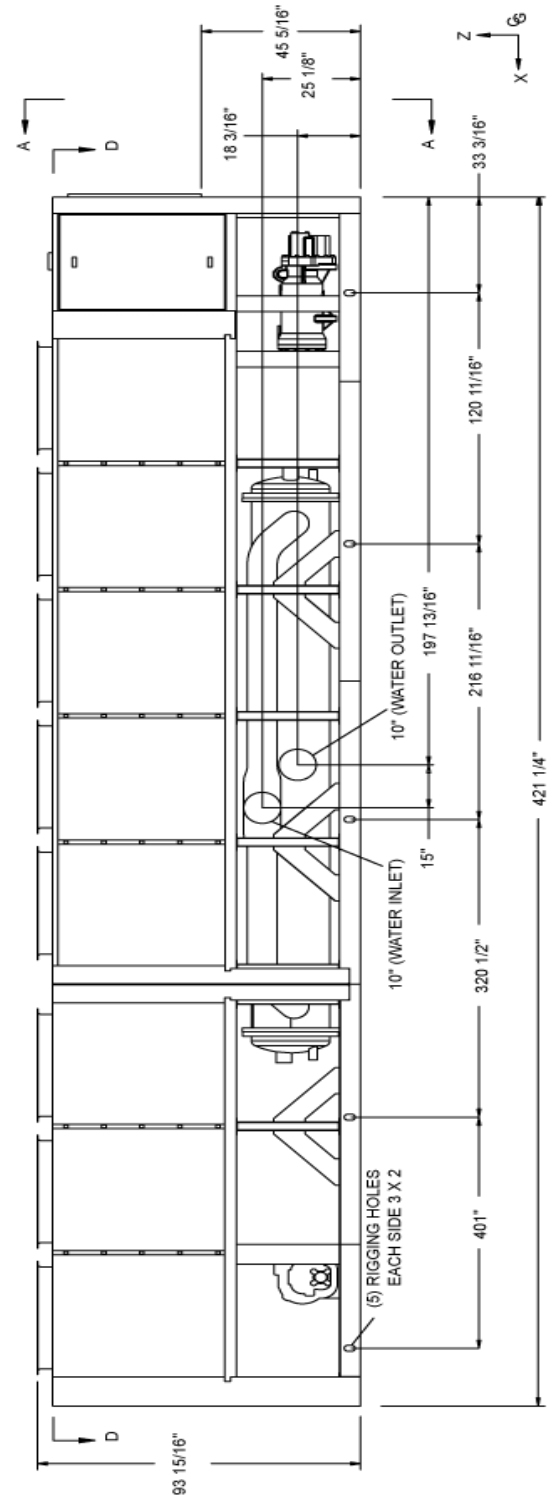
1. Placement on a level surface free of obstructions (including snow, for winter operation) or air recirculation ensures rated performance, reliable operation, and ease of maintenance. Site restrictions may compromise minimum clearances indicated below, resulting in unpredictable air patterns and possible diminished performance. Johnson Controls' unit controls will optimize the operation without nuisance high pressure safety cutouts; however, the system designer **MUST** consider potential performance degradation.

Access to the unit control center stipulates the unit is no higher than on spring isolators. Recommended minimum clearances: side to wall - 6'; rear to wall - 6'; control panel end to wall - 4'; top - no obstructions whatsoever; distance between adjacent units - 10'. No more than one adjacent wall may be higher than the unit.

Dimensions - English (Cont'd)



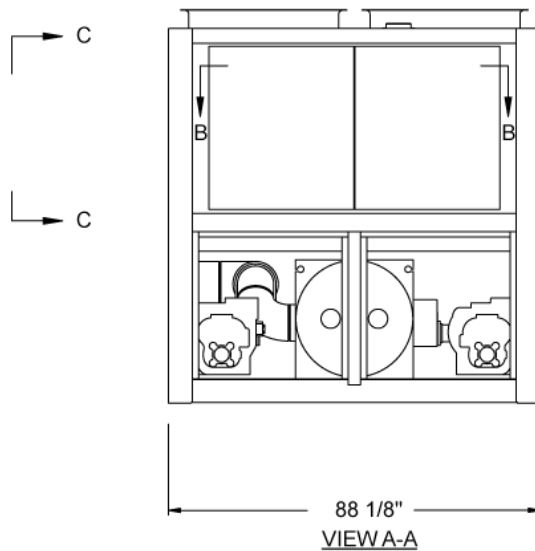
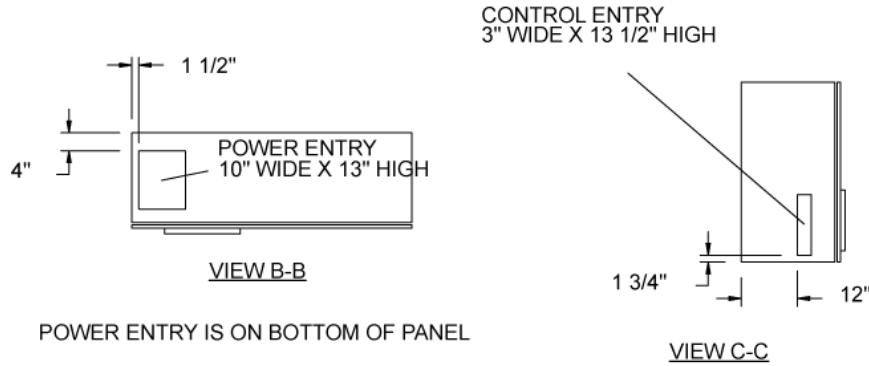
VIEW-D-D



Ido18328

Dimensions - English (Cont'd)

MODEL YCIV0397



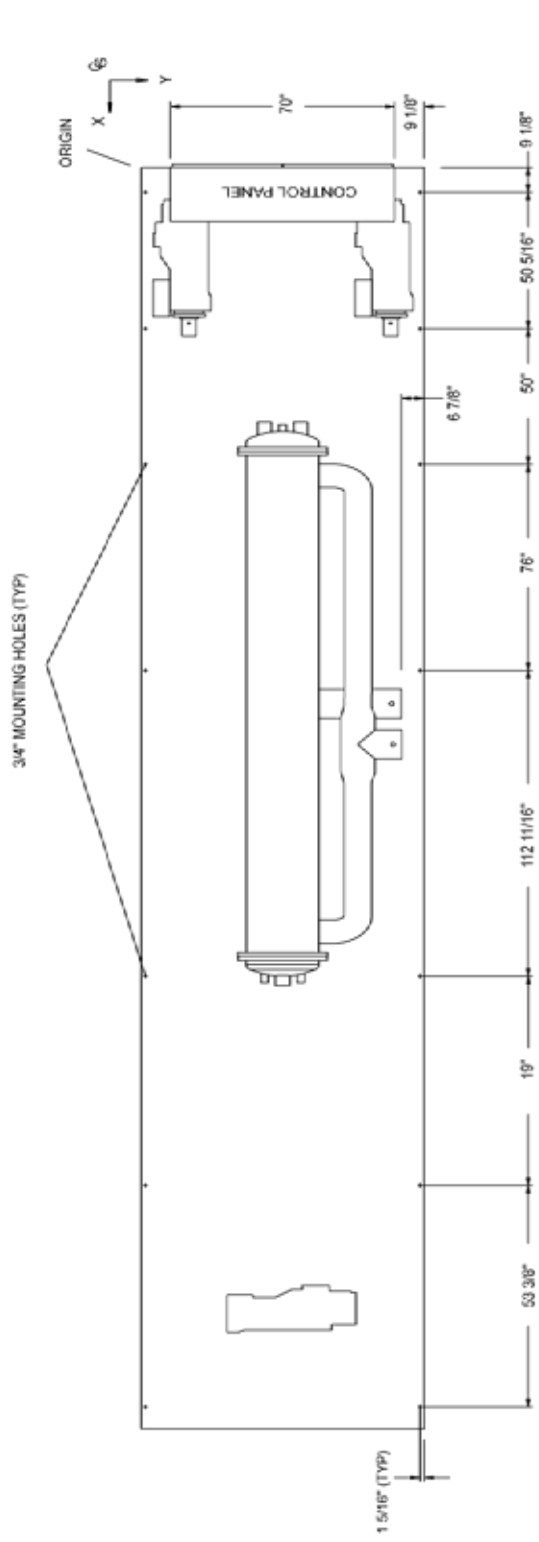
LDo18329

Notes:

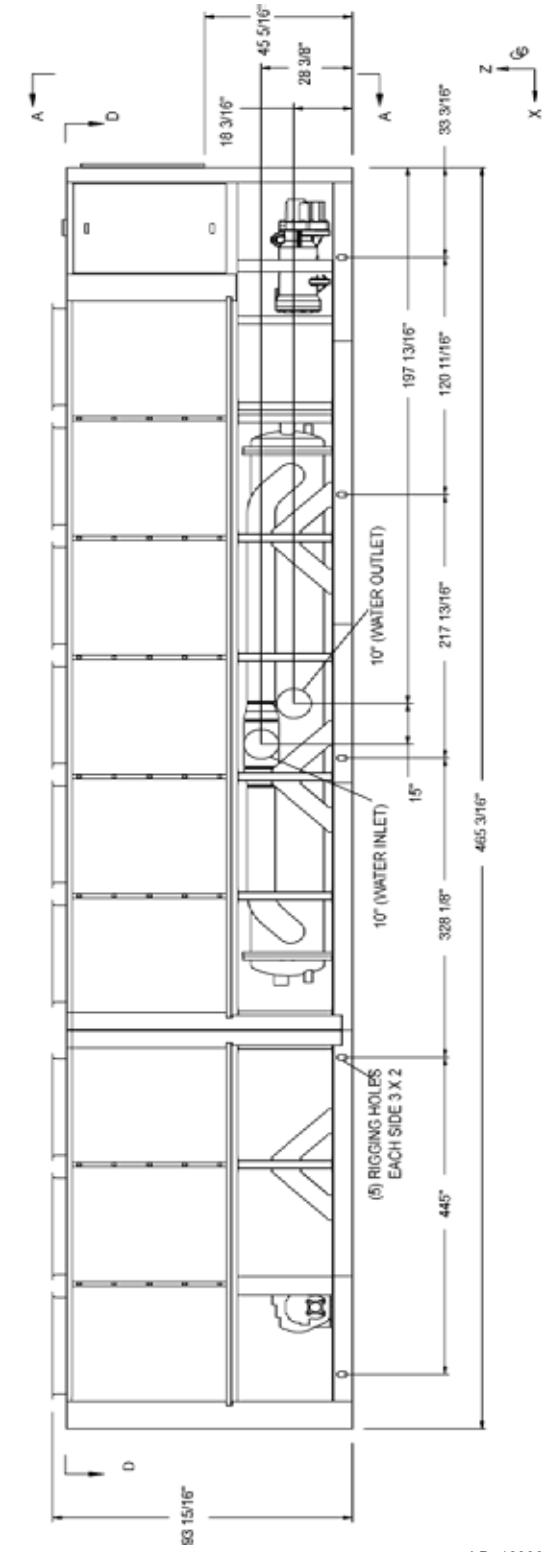
1. Placement on a level surface free of obstructions (including snow, for winter operation) or air recirculation ensures rated performance, reliable operation, and ease of maintenance. Site restrictions may compromise minimum clearances indicated below, resulting in unpredictable air patterns and possible diminished performance. Johnson Controls' unit controls will optimize the operation without nuisance high pressure safety cutouts; however, the system designer **MUST** consider potential performance degradation.

Access to the unit control center stipulates the unit is no higher than on spring isolators. Recommended minimum clearances: side to wall - 6'; rear to wall - 6'; control panel end to wall - 4'; top - no obstructions whatsoever; distance between adjacent units - 10'. No more than one adjacent wall may be higher than the unit.

Dimensions - English (Cont'd)

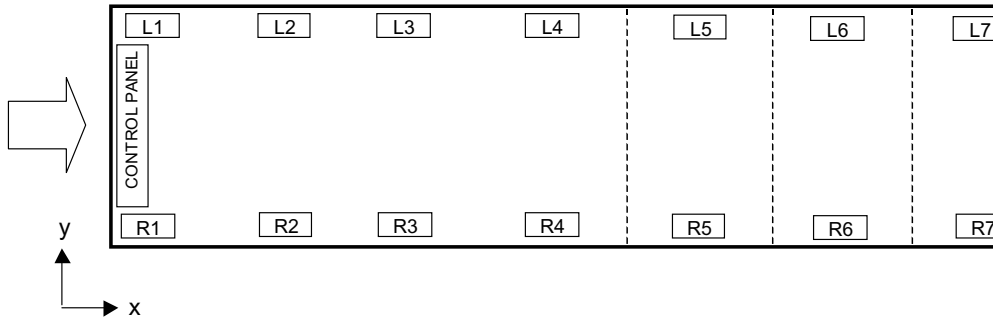


VIEW D-D



LD018330

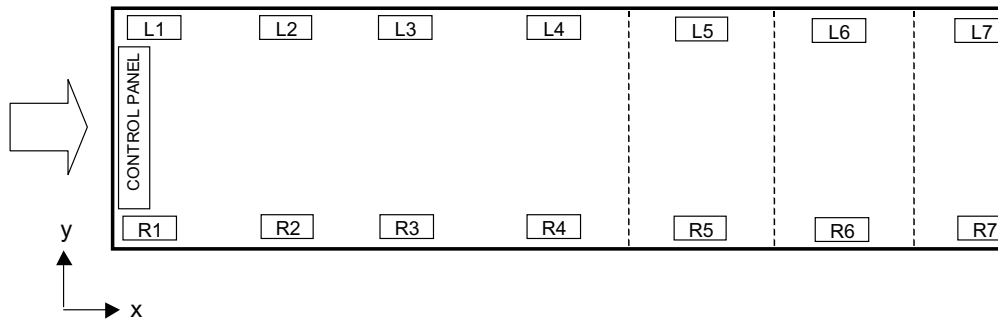
Isolator Locations - English



LD18338

STANDARD EFFICIENCY - ENGLISH					
YCIV	ISOLATOR LOCATIONS (X , Y) - IN. AND POINT LOADS - LBS				
60 HZ		1	2	3	4
0157	LEFT - L	(9.1 , 86.8)	(59.4 , 86.8)	(109.4 , 86.8)	(211 , 86.8)
	AL FIN COILS	1702	1592	1396	1340
	CU FIN COILS	1702	1704	1739	1682
	RS&LS1 / AL FIN COILS	1881	1770	1396	1340
	RS&LS1 / CU FIN COILS	1881	1883	1739	1682
	RIGHT - R	(9.1 , 1.3)	(59.4 , 1.3)	(109.4 , 1.3)	(211 , 1.3)
	AL FIN COILS	1702	1592	1396	1340
	CU FIN COILS	1702	1704	1739	1682
0177	LEFT - L	(9.1 , 86.8)	(59.4 , 86.8)	(109.4 , 86.8)	(211 , 86.8)
	AL FIN COILS	1720	1614	1667	1609
	CU FIN COILS	1720	1726	2011	1951
	RS&LS1 / AL FIN COILS	1898	1792	1667	1609
	RS&LS1 / CU FIN COILS	1898	1905	2011	1951
	RIGHT - R	(9.1 , 1.3)	(59.4 , 1.3)	(109.4 , 1.3)	(211 , 1.3)
	AL FIN COILS	1702	1594	1667	1609
	CU FIN COILS	1702	1706	2011	1951
0187	LEFT - L	(9.1 , 86.8)	(59.4 , 86.8)	(109.4 , 86.8)	(195.7 , 86.8)
	AL FIN COILS	1715	1579	1559	1274
	CU FIN COILS	1715	1700	1898	1653
	RS&LS1 / AL FIN COILS	1894	1757	1559	1274
	RS&LS1 / CU FIN COILS	1894	1878	1898	1653
	RIGHT - R	(9.1 , 1.3)	(59.4 , 1.3)	(109.4 , 1.3)	(195.7 , 1.3)
	AL FIN COILS	1698	1559	1559	1241
	CU FIN COILS	1698	1680	1898	1620
0207	LEFT - L	(9.1 , 86.8)	(59.4 , 86.8)	(109.4 , 86.8)	(195.7 , 86.8)
	AL FIN COILS	1728	1680	1768	1512
	CU FIN COILS	1728	1801	2108	1892
	RS&LS1 / AL FIN COILS	1907	1858	1768	1512
	RS&LS1 / CU FIN COILS	1907	1980	2108	1892
	RIGHT - R	(9.1 , 1.3)	(59.4 , 1.3)	(109.4 , 1.3)	(195.7 , 1.3)
	AL FIN COILS	1728	1676	1764	1475
	CU FIN COILS	1728	1797	2108	1854
0277	LEFT - L	(9.1 , 86.8)	(59.4 , 86.8)	(109.4 , 86.8)	(195.7 , 86.8)
	AL FIN COILS	1728	1680	1768	1523
	CU FIN COILS	1728	1801	2108	1903
	RS&LS1 / AL FIN COILS	1907	1858	1768	1523
	RS&LS1 / CU FIN COILS	1907	1980	2108	1903
	RIGHT - R	(9.1 , 1.3)	(59.4 , 1.3)	(109.4 , 1.3)	(195.7 , 1.3)
	AL FIN COILS	1728	1676	1764	1519
	CU FIN COILS	1728	1797	2103	1898

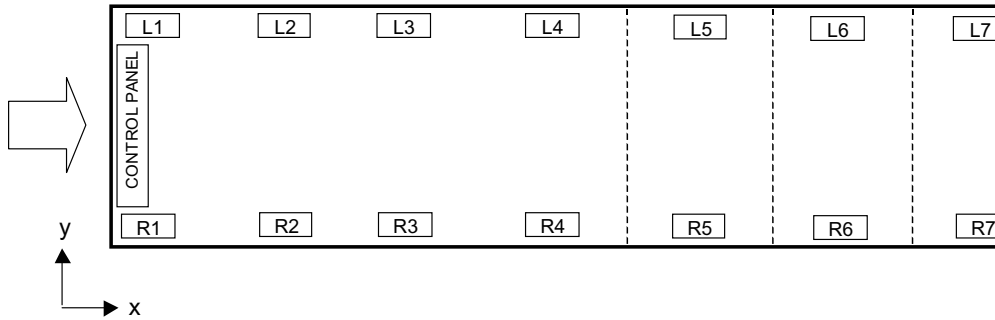
Isolator Locations - English (Cont'd)



LD18338

STANDARD EFFICIENCY - ENGLISH				
YCIV	ISOLATOR LOCATIONS (X , Y) - IN. AND POINT LOADS - LBS			
60 HZ		5	6	7
0157	LEFT - L			
	AL FIN COILS			
	CU FIN COILS			
	RS&LS1 / AL FIN COILS			
	RS&LS1 / CU FIN COILS			
	RIGHT - R			
	AL FIN COILS			
	CU FIN COILS			
0177	LEFT - L			
	AL FIN COILS			
	CU FIN COILS			
	RS&LS1 / AL FIN COILS			
	RS&LS1 / CU FIN COILS			
	RIGHT - R			
	AL FIN COILS			
	CU FIN COILS			
0187	LEFT - L	(265.4 , 86.8)		
	AL FIN COILS	774		
	CU FIN COILS	935		
	RS&LS1 / AL FIN COILS	774		
	RS&LS1 / CU FIN COILS	935		
	RIGHT - R	(265.4 , 1.3)		
	AL FIN COILS	664		
	CU FIN COILS	825		
0207	LEFT - L	(265.4 , 86.8)		
	AL FIN COILS	915		
	CU FIN COILS	1076		
	RS&LS1 / AL FIN COILS	915		
	RS&LS1 / CU FIN COILS	1076		
	RIGHT - R	(265.4 , 1.3)		
	AL FIN COILS	800		
	CU FIN COILS	961		
0277	LEFT - L	(265.4 , 86.8)		
	AL FIN COILS	959		
	CU FIN COILS	1120		
	RS&LS1 / AL FIN COILS	959		
	RS&LS1 / CU FIN COILS	1120		
	RIGHT - R	(265.4 , 1.3)		
	AL FIN COILS	955		
	CU FIN COILS	1116		
RS&LS1 / AL FIN COILS	955			
RS&LS1 / CU FIN COILS	1116			

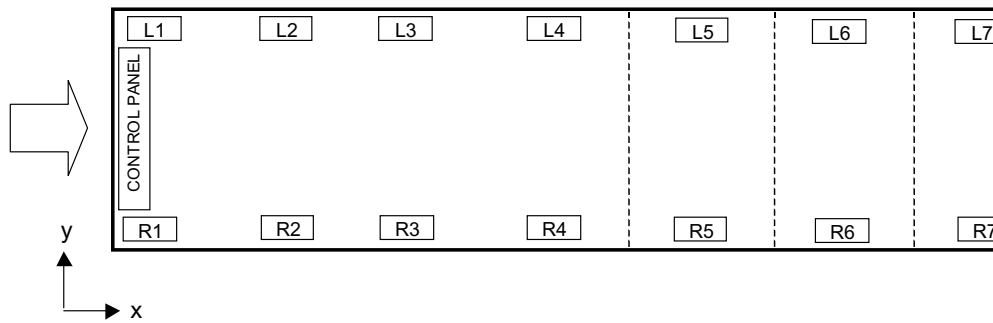
Isolator Locations - English (Cont'd)



LD18338

STANDARD EFFICIENCY - ENGLISH					
YCIV	ISOLATOR LOCATIONS (X , Y) - IN. AND POINT LOADS - LBS				
60 HZ		1	2	3	4
0247	LEFT - L	(9.1 , 86.8)	(59.4 , 86.8)	(97.2 , 86.8)	(161.4 , 86.8)
	AL FIN COILS	1728	1638	1248	1160
	CU FIN COILS	1728	1728	1488	1435
	RS&LS1 / AL FIN COILS	1907	1817	1248	1160
	RS&LS1 / CU FIN COILS	1907	1907	1488	1435
	RIGHT - R	(9.1 , 1.3)	(59.4 , 1.3)	(97.2 , 1.3)	(161.4 , 1.3)
	AL FIN COILS	1720	1625	1239	1153
	CU FIN COILS	1720	1715	1479	1429
0267	RS&LS1 / AL FIN COILS	1898	1803	1239	1153
	RS&LS1 / CU FIN COILS	1898	1894	1479	1429
	LEFT - L	(9.1 , 86.8)	(59.4 , 86.8)	(97.2 , 86.8)	(161.4 , 86.8)
	AL FIN COILS	1728	1638	1248	1160
	CU FIN COILS	1728	1728	1488	1435
	RS&LS1 / AL FIN COILS	1907	1817	1248	1160
	RS&LS1 / CU FIN COILS	1907	1907	1488	1435
	RIGHT - R	(9.1 , 1.3)	(59.4 , 1.3)	(97.2 , 1.3)	(161.4 , 1.3)
0287	AL FIN COILS	1728	1638	1248	1160
	CU FIN COILS	1728	1728	1488	1435
	RS&LS1 / AL FIN COILS	1907	1817	1248	1160
	RS&LS1 / CU FIN COILS	1907	1907	1488	1435
	LEFT - L	(9.1 , 86.8)	(58.1 , 86.8)	(111.1 , 86.8)	(204.7 , 86.8)
	AL FIN COILS	1753	1585	1821	1810
	CU FIN COILS	1775	1757	2165	2156
	RS&LS1 / AL FIN COILS	1929	1761	1821	1810
RS&LS1 / CU FIN COILS	1885	1933	2165	2156	
0307	RIGHT - R	(9.1 , 1.3)	(58.1 , 1.3)	(111.1 , 1.3)	(204.7 , 1.3)
	AL FIN COILS	1753	1596	2407	2414
	CU FIN COILS	1775	1768	2751	2760
	RS&LS1 / AL FIN COILS	1929	1773	2407	2414
	RS&LS1 / CU FIN COILS	1951	1944	2751	2760
	LEFT - L	(9.1 , 86.8)	(58.1 , 86.8)	(111.1 , 86.8)	(204.7 , 86.8)
	AL FIN COILS	1753	1585	1953	1978
	CU FIN COILS	1775	1757	2297	2324
RS&LS1 / AL FIN COILS	1929	1761	1953	1978	
RS&LS1 / CU FIN COILS	1951	1933	2297	2324	
0307	RIGHT - R	(9.1 , 1.3)	(58.1 , 1.3)	(111.1 , 1.3)	(204.7 , 1.3)
	AL FIN COILS	1753	1596	2540	2632
	CU FIN COILS	1775	1768	2884	2978
	RS&LS1 / AL FIN COILS	1929	1773	2540	2632
	RS&LS1 / CU FIN COILS	1951	1944	2884	2978

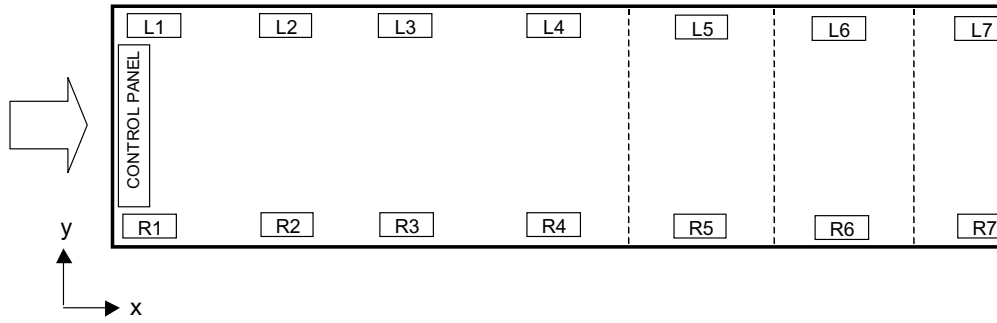
Isolator Locations - English (Cont'd)



LD18338

STANDARD EFFICIENCY - ENGLISH				
YCIV	ISOLATOR LOCATIONS (X , Y) - IN. AND POINT LOADS - LBS			
60 HZ		5	6	7
0247	LEFT - L	(210.6 , 86.8)	(307.9 , 86.8)	
	AL FIN COILS	1261	959	
	CU FIN COILS	1609	1199	
	RS&LS1 / AL FIN COILS	1261	959	
	RS&LS1 / CU FIN COILS	1609	1199	
	RIGHT - R	(210.6 , 1.3)	(307.9 , 1.3)	
	AL FIN COILS	1237	955	
	CU FIN COILS	1585	1195	
	RS&LS1 / AL FIN COILS	1237	955	
RS&LS1 / CU FIN COILS	1590	1195		
0267	LEFT - L	(210.6 , 86.8)	(307.9 , 86.8)	
	AL FIN COILS	1265	1005	
	CU FIN COILS	1614	1246	
	RS&LS1 / AL FIN COILS	1265	1005	
	RS&LS1 / CU FIN COILS	1614	1246	
	RIGHT - R	(210.6 , 1.3)	(307.9 , 1.3)	
	AL FIN COILS	1265	1005	
	CU FIN COILS	1614	1246	
	RS&LS1 / AL FIN COILS	1265	1005	
RS&LS1 / CU FIN COILS	1618	1246		
0287	LEFT - L	(284.9 , 86.8)	(368 , 86.8)	
	AL FIN COILS	2123	1175	
	CU FIN COILS	2467	1347	
	RS&LS1 / AL FIN COILS	2189	1462	
	RS&LS1 / CU FIN COILS	2533	1634	
	RIGHT - R	(284.9 , 1.3)	(368 , 1.3)	
	AL FIN COILS	2635	1179	
	CU FIN COILS	2978	1351	
	RS&LS1 / AL FIN COILS	2701	1466	
RS&LS1 / CU FIN COILS	3045	1638		
0307	LEFT - L	(284.9 , 86.8)	(368 , 86.8)	
	AL FIN COILS	2304	1184	
	CU FIN COILS	2648	1356	
	RS&LS1 / AL FIN COILS	2370	1470	
	RS&LS1 / CU FIN COILS	2714	1642	
	RIGHT - R	(284.9 , 1.3)	(368 , 1.3)	
	AL FIN COILS	2897	1188	
	CU FIN COILS	3241	1338	
	RS&LS1 / AL FIN COILS	2963	1475	
RS&LS1 / CU FIN COILS	3307	1647		

Isolator Locations - English (Cont'd)

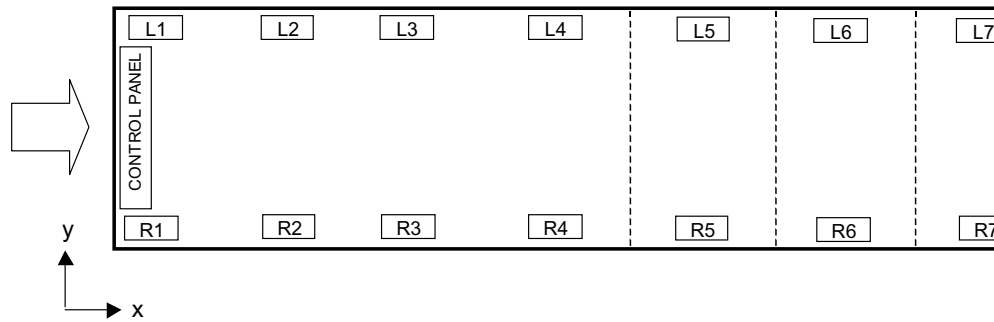


LD18338

STANDARD EFFICIENCY - ENGLISH					
YCIV	ISOLATOR LOCATIONS (X , Y) - IN. AND POINT LOADS - LBS				
60 HZ		1	2	3	4
0357	LEFT - L	(9.1 , 86.8)	(59.4 , 86.8)	(109.4 , 86.8)	(185.4 , 86.8)
	AL FIN COILS	1753	1585	1953	1978
	CU FIN COILS	1775	1733	2238	2363
	RS&LS1 / AL FIN COILS	1929	1761	1953	1978
	RS&LS1 / CU FIN COILS	1951	1909	2238	2363
	RIGHT - R	(9.1 , 1.3)	(59.4 , 1.3)	(109.4 , 1.3)	(185.4 , 1.3)
	AL FIN COILS	1753	1596	2540	2632
	CU FIN COILS	1775	1715	2824	3018
	RS&LS1 / AL FIN COILS	1929	1773	2540	2632
	RS&LS1 / CU FIN COILS	1951	1892	2824	3018
0397	LEFT - L	(9.1 , 86.8)	(59.4 , 86.8)	(109.4 , 86.8)	(185.4 , 86.8)
	AL FIN COILS	1766	1607	1953	1978
	CU FIN COILS	1788	1755	2238	2363
	RS&LS1 / AL FIN COILS	1942	1784	1953	1978
	RS&LS1 / CU FIN COILS	1964	1931	2238	2363
	RIGHT - R	(9.1 , 1.3)	(59.4 , 1.3)	(109.4 , 1.3)	(185.4 , 1.3)
	AL FIN COILS	1766	1618	2540	2632
	CU FIN COILS	1788	1737	2824	3018
	RS&LS1 / AL FIN COILS	1942	1795	2540	2632
	RS&LS1 / CU FIN COILS	1964	1914	2824	3018

NOTES: RS = Reduced Sound Option, LS = Low Sound Option

Isolator Locations - English (Cont'd)



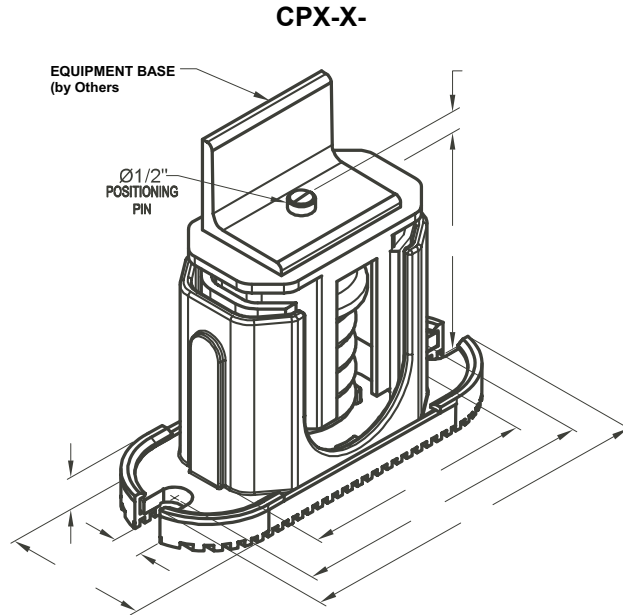
LD18338

STANDARD EFFICIENCY - ENGLISH				
YCIV	ISOLATOR LOCATIONS (X , Y) - IN. AND POINT LOADS - LBS			
60 HZ		5	6	7
0357	LEFT - L	(284.4 , 86.8)	(358.5 , 86.8)	(411.9 , 86.8)
	AL FIN COILS	1953	1140	946
	CU FIN COILS	2339	1424	1065
	RS&LS1 / AL FIN COILS	1953	1316	1122
	RS&LS1 / CU FIN COILS	2339	1601	1241
	RIGHT - R	(284.4 , 1.3)	(358.5 , 1.3)	(411.9 , 1.3)
	AL FIN COILS	2540	1151	946
	CU FIN COILS	2926	1435	1065
	RS&LS1 / AL FIN COILS	2540	1327	1122
	RS&LS1 / CU FIN COILS	2926	1612	1241
0397	LEFT - L	(298.1 , 86.8)	(375.2 , 86.8)	(456 , 86.8)
	AL FIN COILS	2041	1404	1056
	CU FIN COILS	2427	1689	1175
	RS&LS1 / AL FIN COILS	2041	1581	1232
	RS&LS1 / CU FIN COILS	2427	1865	1351
	RIGHT - R	(298.1 , 1.3)	(375.2 , 1.3)	(456 , 1.3)
	AL FIN COILS	2628	1415	1056
	CU FIN COILS	3014	1700	1175
	RS&LS1 / AL FIN COILS	2628	1592	1232
	RS&LS1 / CU FIN COILS	3014	1876	1351

NOTES:RS = Reduced Sound Option, LS = Low Sound Option

Isolator Details

ONE INCH DEFLECTION SPRING ISOLATOR CROSS-REFERENCE



LD18339

MOUNT TYPE	DIMENSION DATA (INCHES)						
	W	D	L	B	C	T	H
CP	3	5/8	7-3/4	6-1/2	4-3/4	1/2	5-5/8
C2P	3	5/8	10-1/2	9-1/4	7-3/4	9/16	6

MODEL NUMBER	COLOR CODE	RATED CAPACITY (FOR UNITS WITH ALL LOAD POINTS LESS THAN 1785 LBS (810 KG))	
		(LBS.)	(KG)
CP-1D-510	BLACK	Up thru 434	Up thru 197
CP-1D-900	DARK GREEN	435 thru 765	198 thru 347
CP-1D-1200	GRAY	766 thru 1020	348 thru 463
CP-1D-1360	WHITE	1021 thru 1156	464 thru 524
CP-1D-1785N	GRAY/RED	1157 thru 1785	525 thru 810

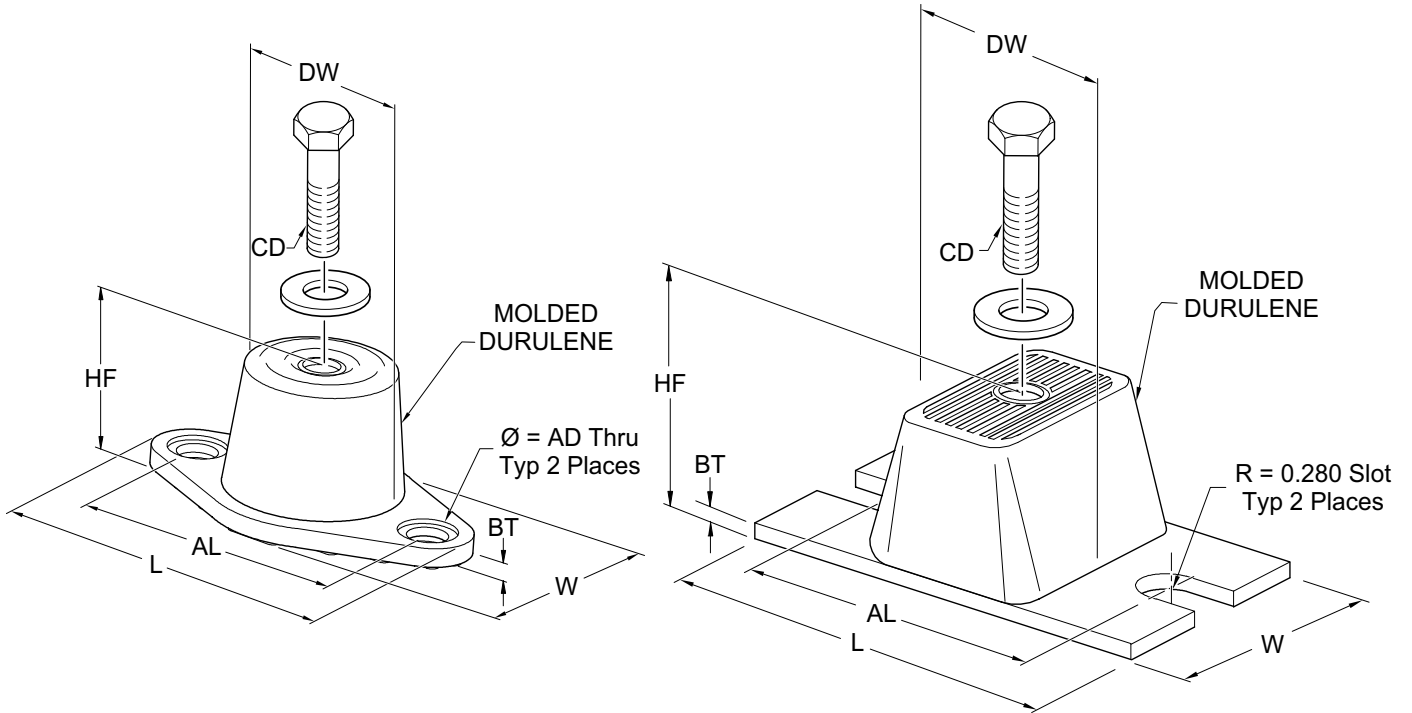
MODEL NUMBER	COLOR CODE	RATED CAPACITY (FOR UNITS WITH ANY LOAD POINT ABOVE 1518 LBS (689 KG))	
		(LBS.)	(KG)
C2P-1D-1350	DARK PURPLE	Up thru 1148	Up to 521
C2P-1D-1800	DARK GREEN	1149 thru 1530	522 - 694
C2P-1D-2400	GRAY	1531 thru 2040	695 - 925
C2P-1D-2400	GRAY	1531 thru 2040	695 - 925
C2P-1D-2720	WHITE	2041 thru 2312	926 - 1049
C2P-1D-3570N	GRAY/RED	2313 thru 3570	1050 - 1619

NOTE: Do not mix isolators types.

Isolator Details (Cont'd)

ELASTOMERIC ISOLATOR CROSS-REFERENCE

RD-STYLE ISOLATORS



LD17304

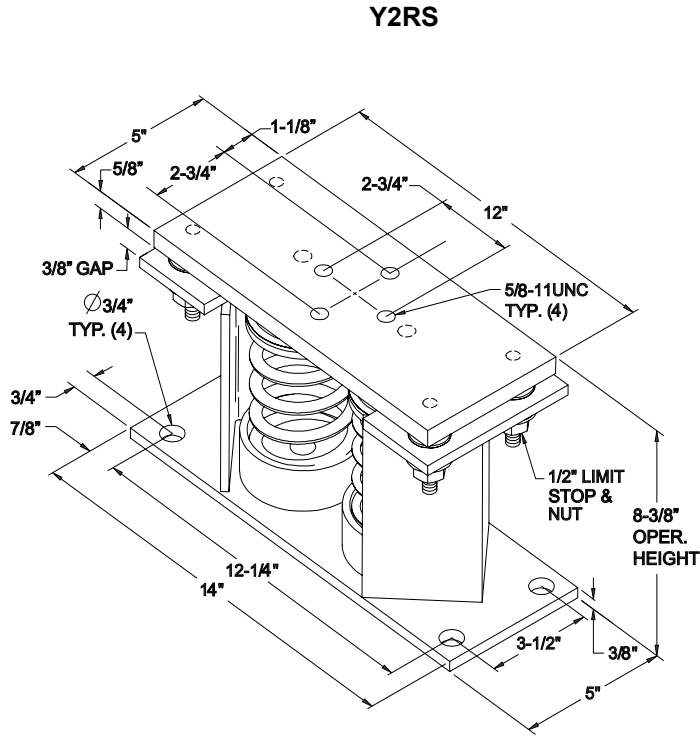
MOUNT TYPE	DIMENSION DATA (INCHES)							
	L	W	HF	AL	AD	BT	CD	DW
RD1-WR	3.13	1.75	1.25	2.38	0.34	0.19	5/16-18 UNC X 3/4	1.25
RD2-WR	3.88	2.38	1.75	3.00	0.34	0.22	3/8-16 UNC X 1	1.75
RD3-WR	5.50	3.38	2.88	4.13	0.56	0.25	1/2-13 UNC X 1	2.50
RD4-WR	6.25	4.63	2.75	5.00	0.56	0.38	1/2-13 UNC X 1	3.00

MODEL NUMBER	ISOLATOR COLOR	WEIGHT RANGE (LBS)	WEIGHT RANGE (KGS)
RD-3-CHARCOAL-WR	CHARCOAL	Up thru 825	UP TO 374
RD-4-BRICK RED-WR	BRICK RED	826 thru 1688	375 - 766
RD-4-CHARCOAL-WR	CHARCOAL	1689 thru 4000	767 - 1814

NOTE: Do not mix isolators types.

Isolator Details (Cont'd)

TWO INCH DEFLECTION, SPRING ISOLATOR CROSS-REFERENCE



LD18340

MODEL Y2RSI-2D RESTRAINED VIBRATION ISOLATOR FOR 2" DEFLECTION

MODEL NUMBER	ISOL. COLOR	WEIGHT RANGE (LBS)	WEIGHT RANGE (KGS)
Y2RSI-2D-460	GREEN	Up thru 391	UP TO 177
Y2RSI-2D-710	DARK BROWN	392 thru 604	178 - 274
Y2RSI-2D-870	RED	605 thru 740	275 - 336
Y2RSI-2D-1200N	RED/BLACK	741 thru 1020	337 - 463
Y2RSI-2D-1690	PINK	1021 thru 1437	464 - 652
Y2RSI-2D-2640N	PINK/GRAY	1438 thru 2244	653 - 1018
Y2RSI-2D-2870N	PINK/GRAY/ORANGE	2245 thru 2618	1019 - 1188
Y2RSI-2D-3280N	PINK/GRAY/DK.BROWN	2619 thru 3740	1189 - 1696

NOTE: Do not mix isolators types.

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Electrical Data - 2 Comp Standard Efficiency

STANDARD EFFICIENCY								
YCIV	INPUT VOLTS (9)	INPUT FREQ	SYSTEM 1					
			STD. & ULTRA QUIET COND. FANS			HIGH FLOW/STATIC COND. FANS		
			COMP. RLA (5)	CONDENSER FANS		COMP. RLA (5)	CONDENSER FANS	
				QTY.	FLA (EA)		QTY.	FLA (EA)
0157	460	60	120	4	2.8	152	4	9.3
	380	60	152	4	3.5			
0177	460	60	159	4	2.8	201	4	9.3
	380	60	201	4	3.5			
0187	460	60	162	5	2.8	205	5	9.3
	380	60	205	5	3.5			
0207	460	60	145	5	2.8	184	5	9.3
	380	60	184	5	3.5			
0227	460	60	162	5	2.8	205	5	9.3
	380	60	205	5	3.5			
0247	460	60	193	6	2.8	245	6	9.3
	380	60	245	6	3.5			
0267	460	60	191	6	2.8	242	6	9.3
	380	60	242	6	3.5			

YCIV	CONTROL KVA (7)	UNIT SHORT CIRCUIT WITHSTAND (KA)		FIELD WIRING & PROTECTION			
		TERMINAL BLOCK (STD)	CIRCUIT BREAKER (OPT)	STANDARD & ULTRA QUIET CONDENSER FANS			
				MINIMUM CIRCUIT AMPACITY (MCA) (3)	RECOMMENDED FUSE/CIRCUIT BREAKER RATING (4)	MAXIMUM INVERSE TIME CIRCUIT BREAKER RATING (2)	MAXIMUM DUAL ELEMENT FUSE SIZE (2)
0157	1.8	30KA	65KA	293	350	400	400
	1.8	30KA	65KA	370	450	500	500
0177	1.8	30KA	65KA	326	400	450	450
	1.8	30KA	65KA	413	500	600	600
0187	1.8	30KA	65KA	348	400	500	500
	1.8	30KA	65KA	440	500	600	600
0207	1.8	30KA	65KA	373	450	500	500
	1.8	30KA	65KA	472	600	600	600
0227	1.8	30KA	65KA	392	450	500	500
	1.8	30KA	65KA	496	600	700	700
0247	1.8	30KA	65KA	433	500	600	600
	1.8	30KA	65KA	547	700	700	700
0267	1.8	30KA	65KA	464	600	600	600
	1.8	30KA	65KA	587	700	800	800

See page 138 for Electrical Data footnotes.

STANDARD EFFICIENCY								
YCIV	INPUT VOLTS (9)	INPUT FREQ	SYSTEM 2					
			STANDARD & ULTRA QUIET CONDENSER FANS			HIGH FLOW/STATIC CONDENSER FANS		
			COMPRESSOR	CONDENSER FANS		COMPRESSOR	CONDENSER FANS	
			RLA (5)	QTY.	FLA (EA)	RLA (5)	QTY.	FLA (EA)
0157	460	60	120	4	2.8	152	4	9.3
	380	60	152	4	3.5			
0177	460	60	105	4	2.8	133	4	9.3
	380	60	133	4	3.5			
0187	460	60	120	4	2.8	152	4	9.3
	380	60	152	4	3.5			
0207	460	60	162	4	2.8	206	4	9.3
	380	60	206	4	3.5			
0227	460	60	162	5	2.8	205	5	9.3
	380	60	205	5	3.5			
0247	460	60	160	5	2.8	203	5	9.3
	380	60	203	5	3.5			
0267	460	60	191	6	2.8	242	6	9.3
	380	60	242	6	3.5			

YCIV	HIGH FLOW/HIGH STATIC FANS			
	MINIMUM CIRCUIT AMPACITY (MCA) (3)	RECOMMENDED FUSE/CIRCUIT BREAKER RATING (4)	MAXIMUM INVERSE TIME CIRCUIT BREAKER RATING (2)	MAXIMUM DUAL ELEMENT FUSE SIZE (2)
0157	417	500	500	500
0177	459	600	600	600
0187	492	600	700	700
0207	525	600	700	700
0227	554	700	700	700
0247	610	700	800	800
0267	657	800	800	800

Electrical Data - 3 & 4 Comp Standard Efficiency

YCIV	INPUT VOLTS (9)	INPUT FREQ	SYSTEM 1					
			STANDARD & ULTRA QUIET CONDENSER FANS			HIGH FLOW/STATIC CONDENSER FANS		
			COMPRESSOR	CONDENSER FANS		COMPRESSOR	CONDENSER FANS	
			RLA (5)	QUANTITY	FLA (EA)	RLA (5)	QUANTITY	FLA (EA)
0287	460	60	146	5	2.8	184	5	9.3
	380	60	184	5	3.5			
0307	460	60	147	5	2.8	186	5	9.3
	380	60	186	5	3.5			
0357	460	60	160	5	2.8	202	5	9.3
	380	60	202	5	3.5			
0397	460	60	191	6	2.8	241	6	9.3
	380	60	241	6	3.5			

YCIV	INPUT VOLTS (9)	INPUT FREQ	SYSTEM 3					
			STANDARD & ULTRA QUIET CONDENSER FANS			HIGH FLOW/STATIC CONDENSER FANS		
			COMPRESSOR	CONDENSER FANS		COMPRESSOR	CONDENSER FANS	
			RLA (5)	QTY.	FLA (EA)	RLA (5)	QTY.	FLA (EA)
0287	460	60	108	4	2.8	136	4	9.3
	380	60	136	4	3.5			
0307	460	60	165	4	2.8	208	4	9.3
	380	60	208	4	3.5			
0357	460	60	193	6	2.8	244	6	9.3
	380	60	244	6	3.5			
0397	460	60	191	6	2.8	241	6	9.3
	380	60	241	6	3.5			

Electrical Data - 3 & 4 Comp Standard Efficiency (Cont'd)

YCIV	INPUT VOLTS (9)	INPUT FREQ	SYSTEM 2					
			STANDARD & ULTRA QUIET CONDENSER FANS			HIGH FLOW/STATIC CONDENSER FANS		
			COMPRESSOR	CONDENSER FANS		COMPRESSOR	CONDENSER FANS	
			RLA (5)	QTY.	FLA (EA)	RLA (5)	QTY.	FLA (EA)
0287	460	60	164	4	2.8	207	4	9.3
	380	60	207	4	3.5			
0307	460	60	147	5	2.8	186	5	9.3
	380	60	186	5	3.5			
0357	460	60	160	5	2.8	202	5	9.3
	380	60	202	5	3.5			
0397	460	60	191	6	2.8	241	6	9.3
	380	60	241	6	3.5			

Electrical Data - 3 & 4 Comp Standard Efficiency (Cont'd)

YCIV	CONTROL KVA (7)	UNIT SHORT CIRCUIT WITHSTAND (KA)		FIELD WIRING & PROTECTION			
				STD. & ULTRA QUIET COND. FANS			
		TERMINAL BLOCK (STD)	CIRCUIT BREAKER (OPT)	MINIMUM CIRCUIT AMPACITY (MCA) (3)	RECOMMENDED FUSE/CIRCUIT BREAKER RATING (4)	MAXIMUM INVERSE TIME CIRCUIT BREAKER RATING (2)	MAXIMUM DUAL ELEMENT FUSE SIZE (2)
0287	2.4	30KA	65KA	494	600	600	600
				624	700	800	800
0307	2.4	30KA	65KA	540	600	700	700
				682	800	800	800
0357	2.4	30KA	65KA	607	700	800	800
				766	1000	1000	1000
0397	2.4	30KA	65KA	671	800	800	800
				847	1000	1000	1000

YCIV	CONTROL KVA (7)	UNIT SHORT CIRCUIT WITHSTAND (KA)	
		TERMINAL BLOCK (STANDARD)	CIRCUIT BREAKER (OPTIONAL)
0287	2.4	30KA	65KA
0307	2.4	30KA	65KA
0357	2.4	30KA	65KA
0397	2.4	30KA	65KA

Electrical Data - 3 & 4 Comp Standard Efficiency (Cont'd)

YCIV	CONTROL KVA (7)	FIELD WIRING & PROTECTION			
		HIGH FLOW/HIGH STATIC FANS		HIGH FLOW/HIGH STATIC FANS	
		MINIMUM CIRCUIT AMPACITY (MCA) (3)	RECOMMENDED FUSE/CIRCUIT BREAKER RATING (4)	MAXIMUM INVERSE TIME CIRCUIT BREAKER RATING (2)	MAXIMUM DUAL ELEMENT FUSE SIZE (2)
0287	2.4	676	800	800	800
0307	2.4	731	800	800	800
0357	2.4	827	1000	1000	1000
0397	2.4	911	1000	1000	1000

YCIV	FIELD WIRING & PROTECTION					
	STD. & ULTRA QUIET COND. FANS				HIGH FLOW/HIGH STATIC FANS	
	MINIMUM CIRCUIT AMPACITY (MCA) (3)	RECOMMENDED FUSE/CIRCUIT BREAKER RATING (4)	MAXIMUM INVERSE TIME CIRCUIT BREAKER RATING (2)	MAXIMUM DUAL ELEMENT FUSE SIZE (2)	MINIMUM CIRCUIT AMPACITY (MCA) (3)	RECOMMENDED FUSE/CKT. BREAKER RATING (4)
0287	494	600	600	600	676	800
	624	700	800	800		
0307	540	600	700	700	731	800
	682	800	800	800		
0357	607	700	800	800	827	1000
	766	1000	1000	1000		
0397	671	800	800	800	911	1000
	847	1000	1000	1000		

Electrical Data - 3 & 4 Comp Standard Efficiency (Cont'd)

YCIV	FIELD WIRING & PROTECTION					
	HIGH FLOW/HIGH STATIC FANS		TWO-SPEED CONDENSER FANS			
	MAXIMUM. INVERSE TIME CIRCUIT BREAKER. RATING (2)	MAXIMUM DUAL ELEMENT FUSE SIZE (2)	MINIMUM CIRCUIT AMPACITY (MCA) (3)	RECOMMENDED FUSE/CIRCUIT BREAKER RATING (4)	MAXIMUM. INVERSE TIME CIRCUIT BREAKER RATING (2)	MAXIMUM DUAL ELEMENT FUSE SIZE (2)
0287	800	800				
0307	800	800				
0357	1000	1000				
0397	1000	1000				

Electrical Data - 3 & 4 Comp Standard Efficiency (Cont'd)

FIELD WIRING LUGS							
STANDARD TERMINAL BLOCK				OPTIONAL CIRCUIT BREAKER			
SYSTEMS 1 & 3		SYSTEMS 2 & 4		SYSTEMS 1 & 3		SYSTEMS 2 & 4	
LUGS/ PHASE (1)	LUG WIRE RANGE	LUGS/ PHASE (1)	LUG WIRE RANGE	LUGS/ PHASE (1)	LUG WIRE RANGE	LUGS/ PHASE (1)	LUG WIRE RANGE
4	#2 - 600 KCM			4	#4/0 - 500 KCM		
4	#2 - 600 KCM			4	#4/0 - 500 KCM		
4	#2 - 600 KCM			4	#4/0 - 500 KCM		
4	#2 - 600 KCM			4	#4/0 - 500 KCM		
4	#2 - 600 KCM			4	#4/0 - 500 KCM		
4	#2 - 600 KCM			4	#4/0 - 500 KCM		
4	#2 - 600 KCM			4	#4/0 - 500 KCM		
4	#2 - 600 KCM			4	#4/0 - 500 KCM		
4	#2 - 600 KCM			4	#4/0 - 500 KCM		
3	#2 - 600KCM	3	#2 - 600KCM	4	#2 -400KCM	4	#2 -400KCM

Electrical Notes

1. As standard, all 2 and 3 compressor units have single point power connections. Contact factory for information regarding dual point power 2 and 3 compressor units.
2. Maximum Inverse Time Circuit Breaker or Dual Element Fuse - 225% of the largest compressor RLA plus the sum of all other loads per NEC 440.22 (A).
3. MCA - Minimum Circuit Ampacity - 125% of the largest compressor RLA plus 100% of the remaining compressor RLA's plus the sum of all condenser fan FLA's per NEC 440.33
4. Recommended time delay or dual element fuse size - 150% of the largest compressor RLA plus 100% of the remaining compressor RLA's plus the sum of all condenser fan FLA's.
5. RLA - Rated Load Amps - rated in accordance with UL standard 1995.
6. Local codes may take precedence.
7. Control KVA includes operational controls and evaporator heaters.
8. System inrush current is less than RLA due to the use of York Variable Speed Drive technology. Typical Compressor Starting Current (first four seconds of startup):

<u>Rated Voltage</u>	<u>Typical Starting Current per Compressor</u>
380-400/50/3	28A
380/60/3	29A
460/60/3	23A

9. Voltage Utilization Range:

<u>Rated Voltage</u>	<u>Utilization Range</u>
380-415/50/3	360 - 440
380/60/3	342 - 402
460/60/3	414 - 508

LEGEND

C.B.	CIRCUIT BREAKER
D.E.	DUAL ELEMENT FUSE
DISC SW	DISCONNECT SWITCH
FACT CB	FACTORY-MOUNTED CIRCUIT BREAKER
FLA	FULL LOAD AMPS
HZ	HERTZ
MAX	MAXIMUM
MCA	MINIMUM CIRCUIT AMPACITY
MIN	MINIMUM
MIN NF	MINIMUM NON-FUSED
RLA	RATED LOAD AMPS
S.P. WIRE	SINGLE-POINT WIRING

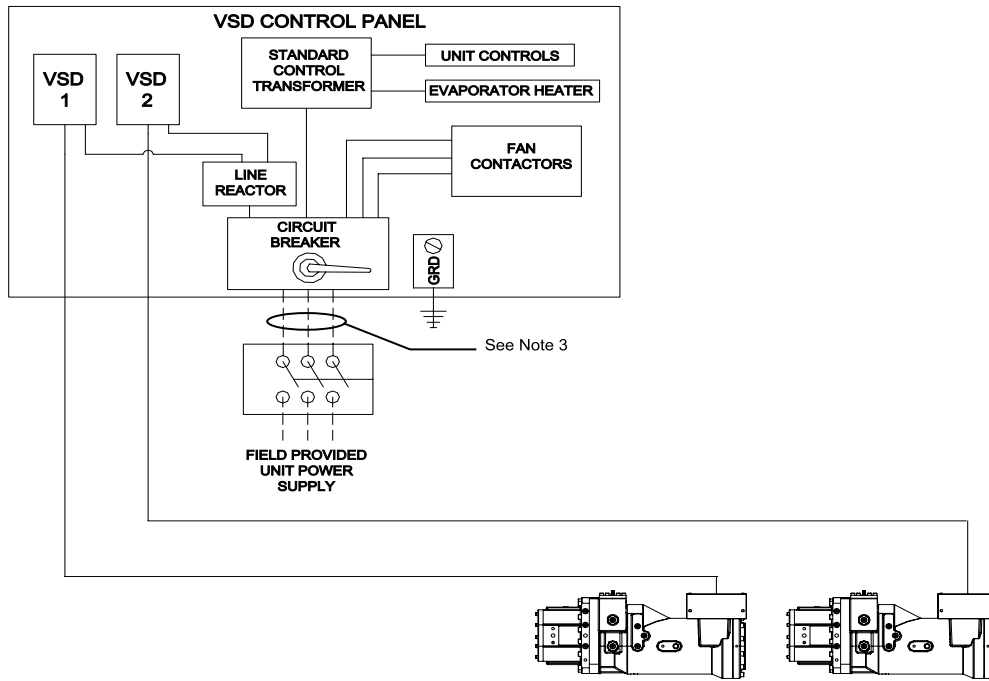
NOTES:

1. U.L. Label is provided on 50 and 60 Hz units for these electrical wiring configurations.
2. — — — — — Dashed Line = Field Provided Wiring.
3. The above recommendations are based on the National Electric Code and using copper conductors only. Field wiring must also comply with local codes. Group Rated breaker must be HACR type for cUL machines.

Power Wiring

2 COMPRESSOR POWER WIRING CONNECTIONS

2 COMPRESSOR POWER WIRING CONNECTIONS



LD18341

FIGURE 1 - TWO COMPRESSOR WIRING DIAGRAM WITH CIRCUIT BREAKER

2 COMPRESSOR POWER WIRING CONNECTIONS

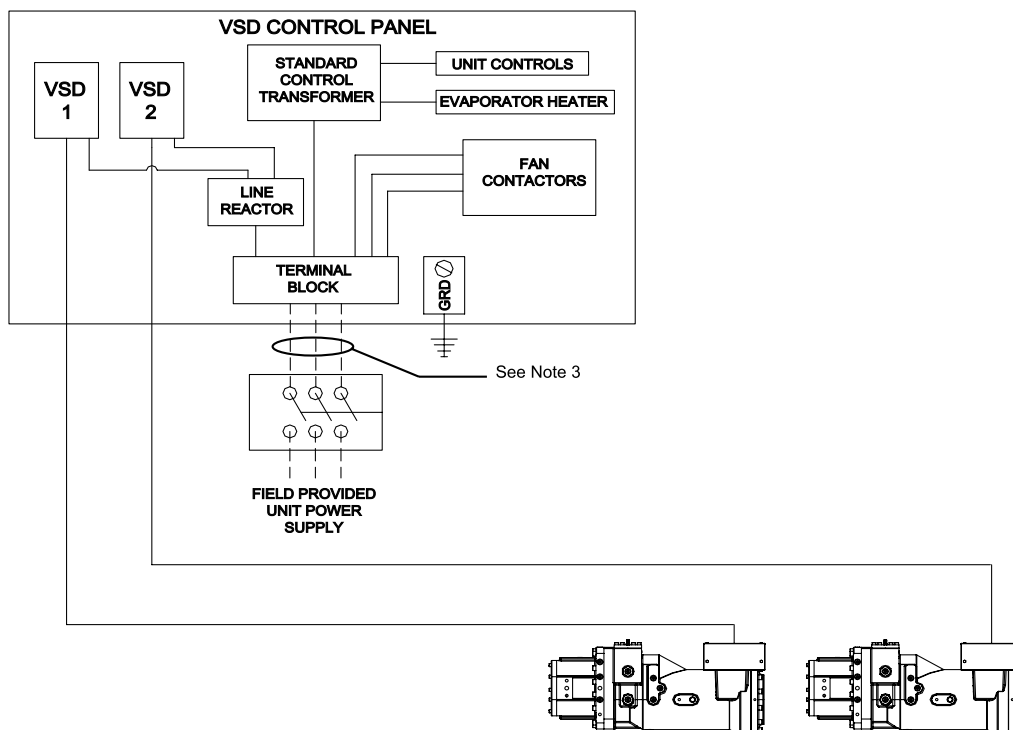
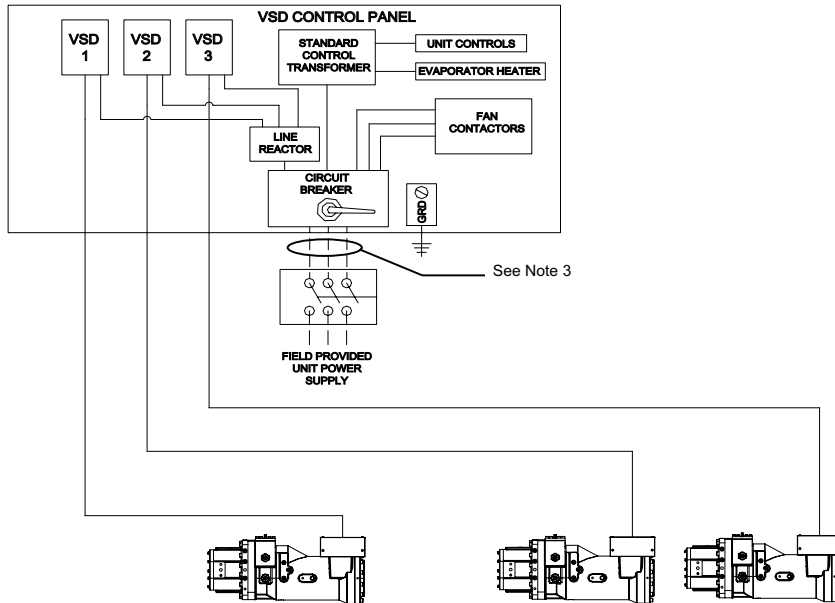


FIGURE 2 - TWO COMPRESSOR WIRING DIAGRAM WITH TERMINAL BLOCK

Power Wiring

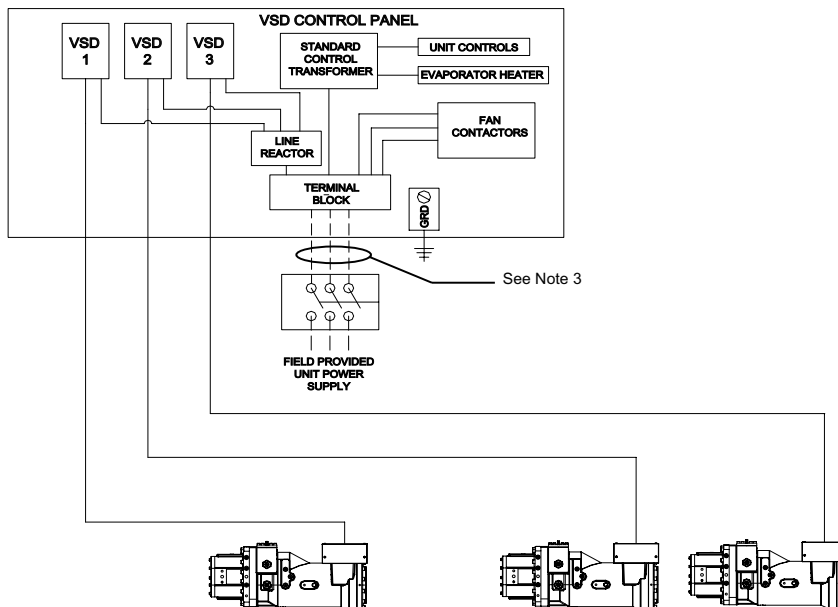
3 COMPRESSOR POWER WIRING CONNECTIONS



LD18343

FIGURE 3 - THREE COMPRESSOR WIRING DIAGRAM WITH CIRCUIT BREAKER – SINGLE POINT

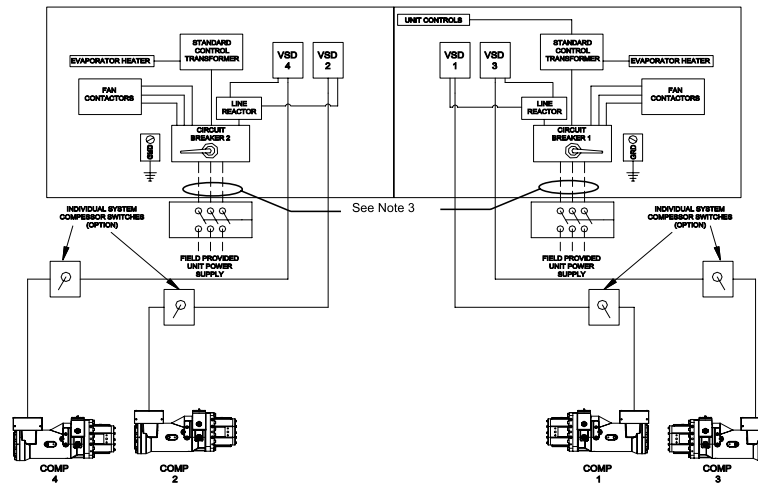
3 COMPRESSOR POWER WIRING CONNECTIONS



LD18344

FIGURE 4 - THREE COMPRESSOR WIRING DIAGRAM WITH TERMINAL BLOCK – SINGLE POINT

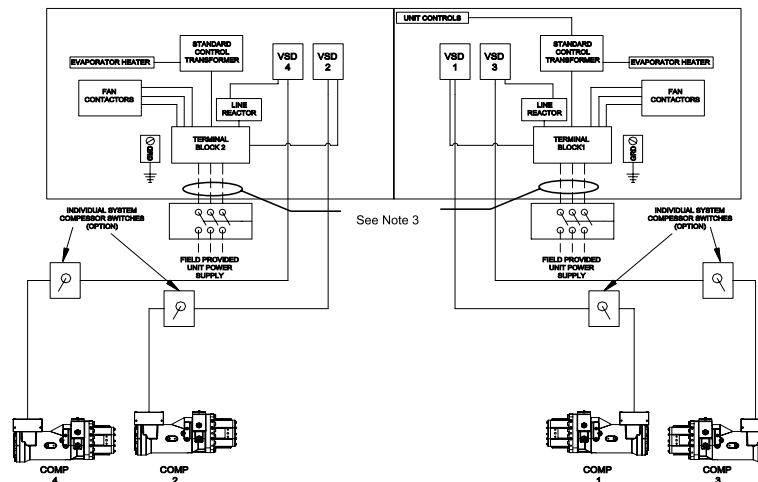
4 COMPRESSOR POWER WIRING CONNECTIONS



LD18345

FIGURE 5 - FOUR COMPRESSOR WIRING DIAGRAM WITH CIRCUIT BREAKER – MULTI POINT

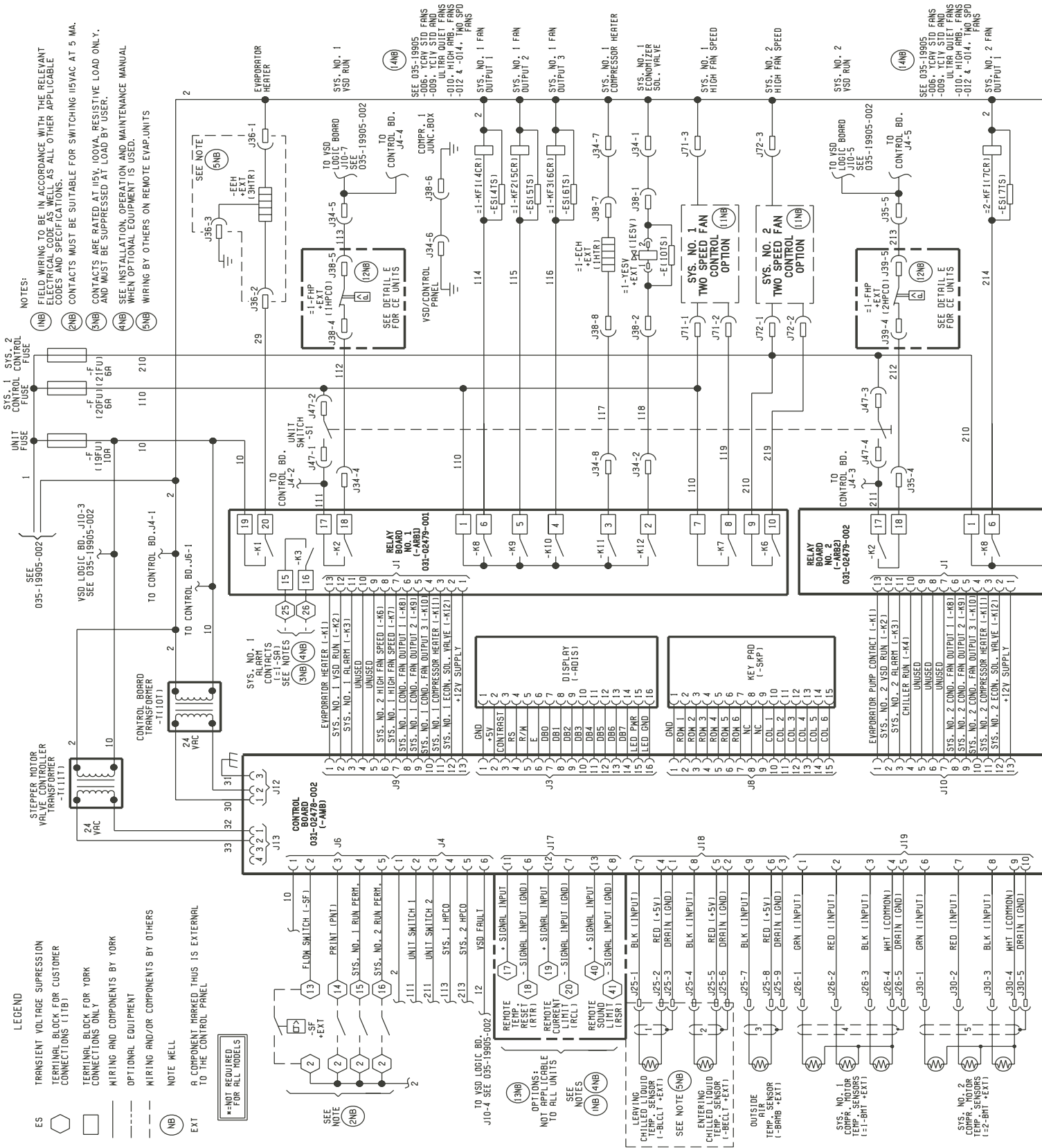
4 COMPRESSOR POWER WIRING CONNECTIONS

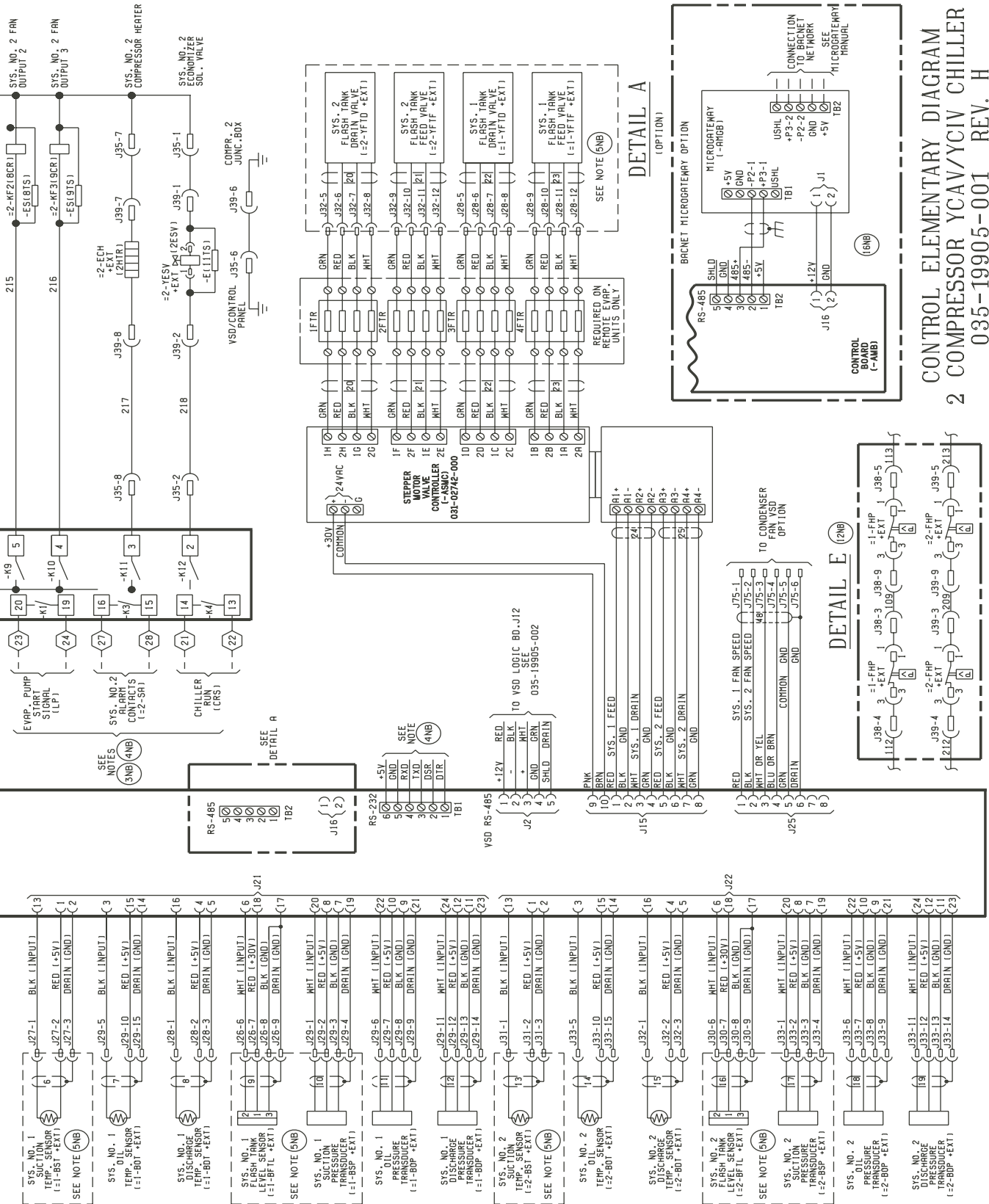


LD18346

FIGURE 6 - FOUR COMPRESSOR WIRING DIAGRAM WITH TERMINAL BLOCK – MULTI POINT

Typical Control Wiring - Two Compressor



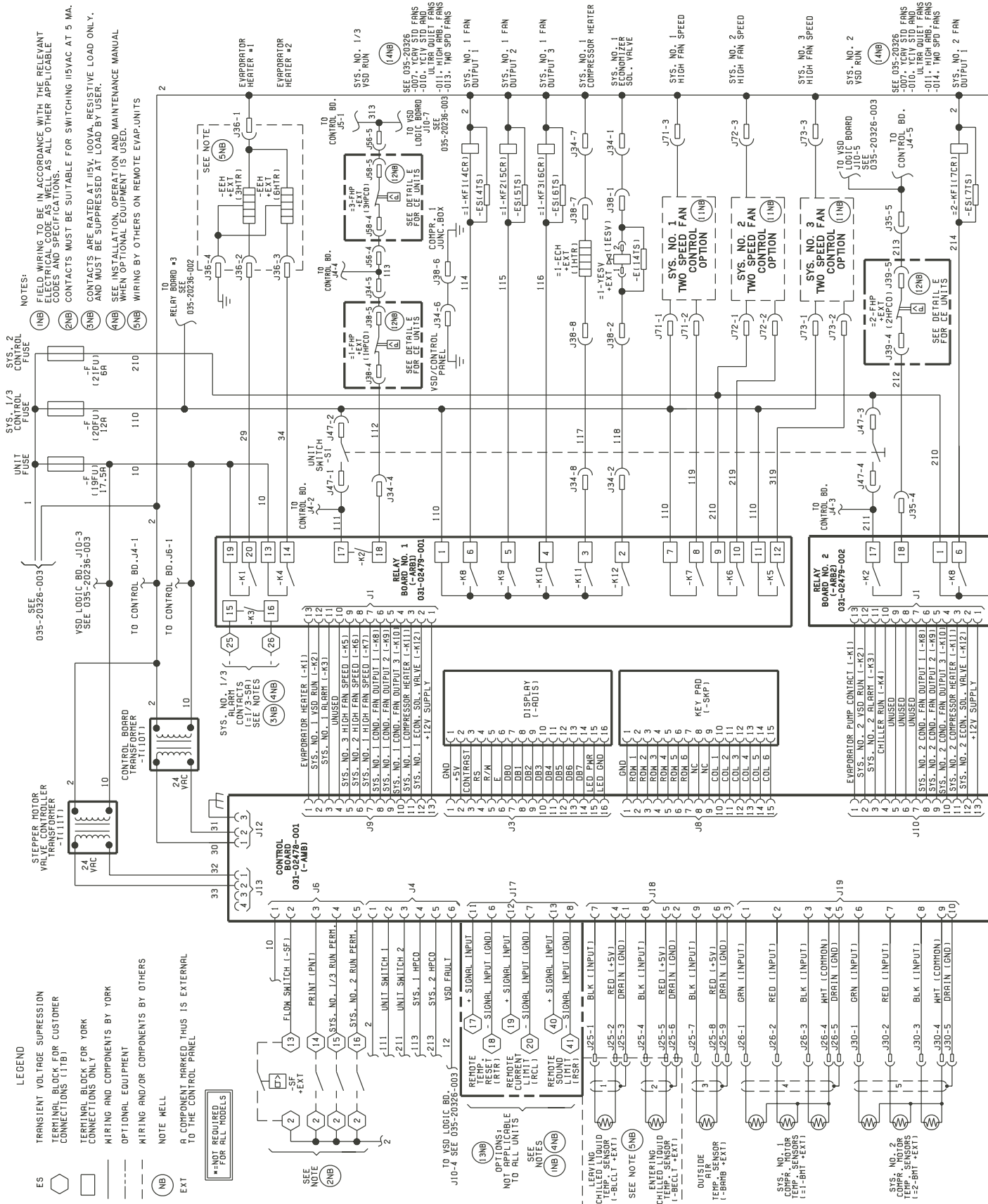


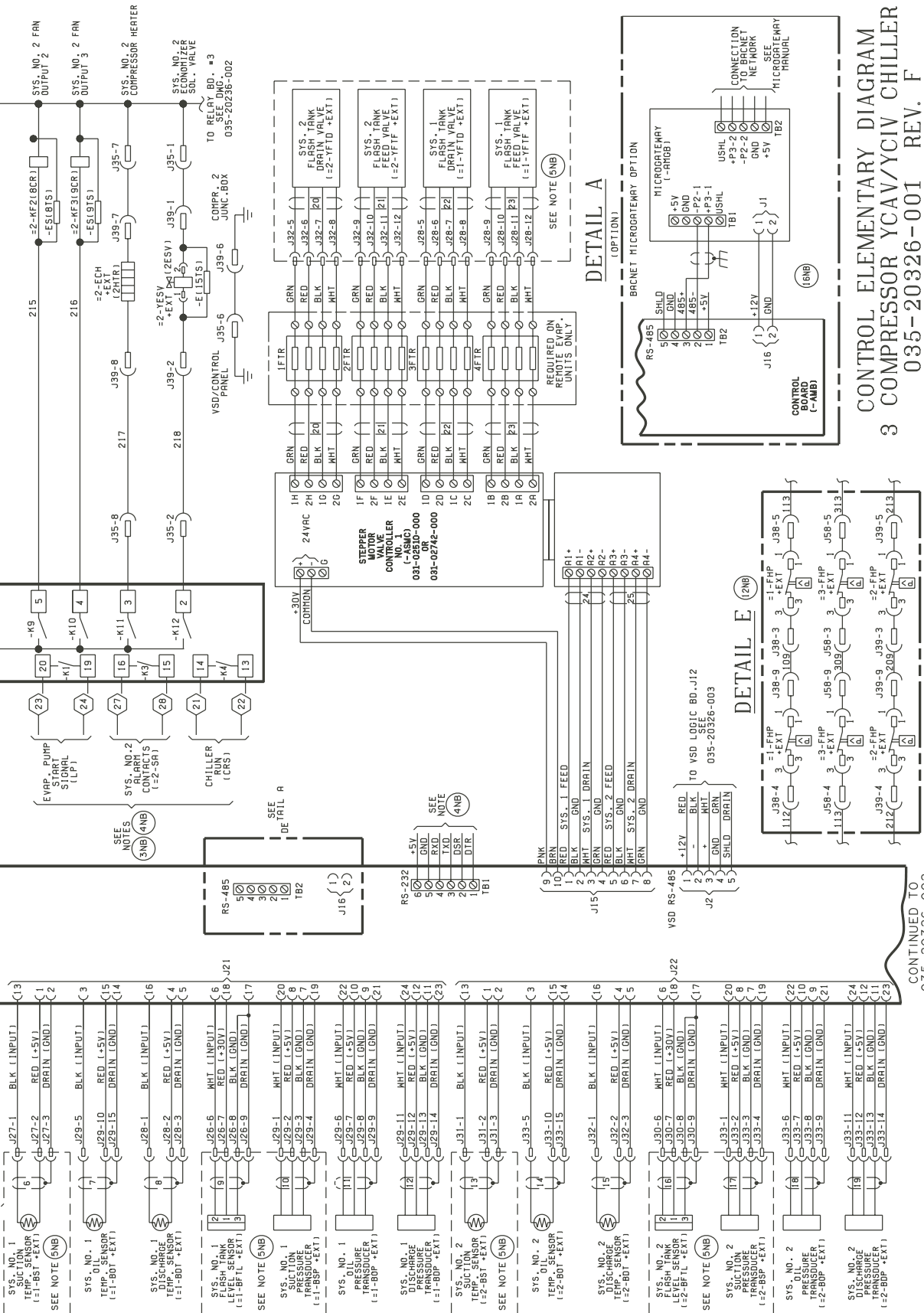
CONTROL ELEMENTARY DIAGRAM
2 COMPRESSOR YCAV/YCIV CHILLER
035-19905-001 REV. H

LD18349

For informational purposes only. Do not attempt to tie into wiring without a proper wiring diagram.

Typical Control Wiring - Three Compressor

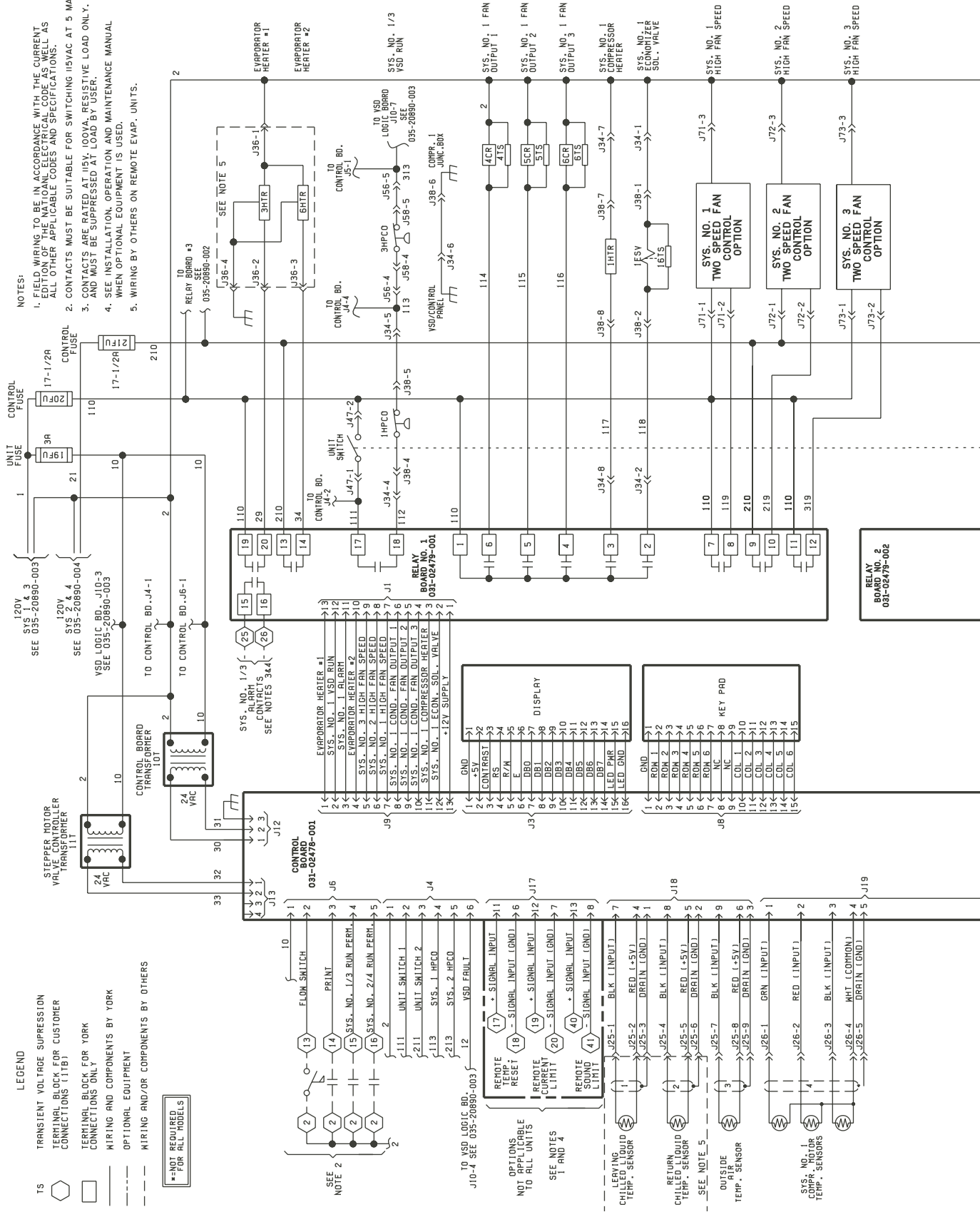




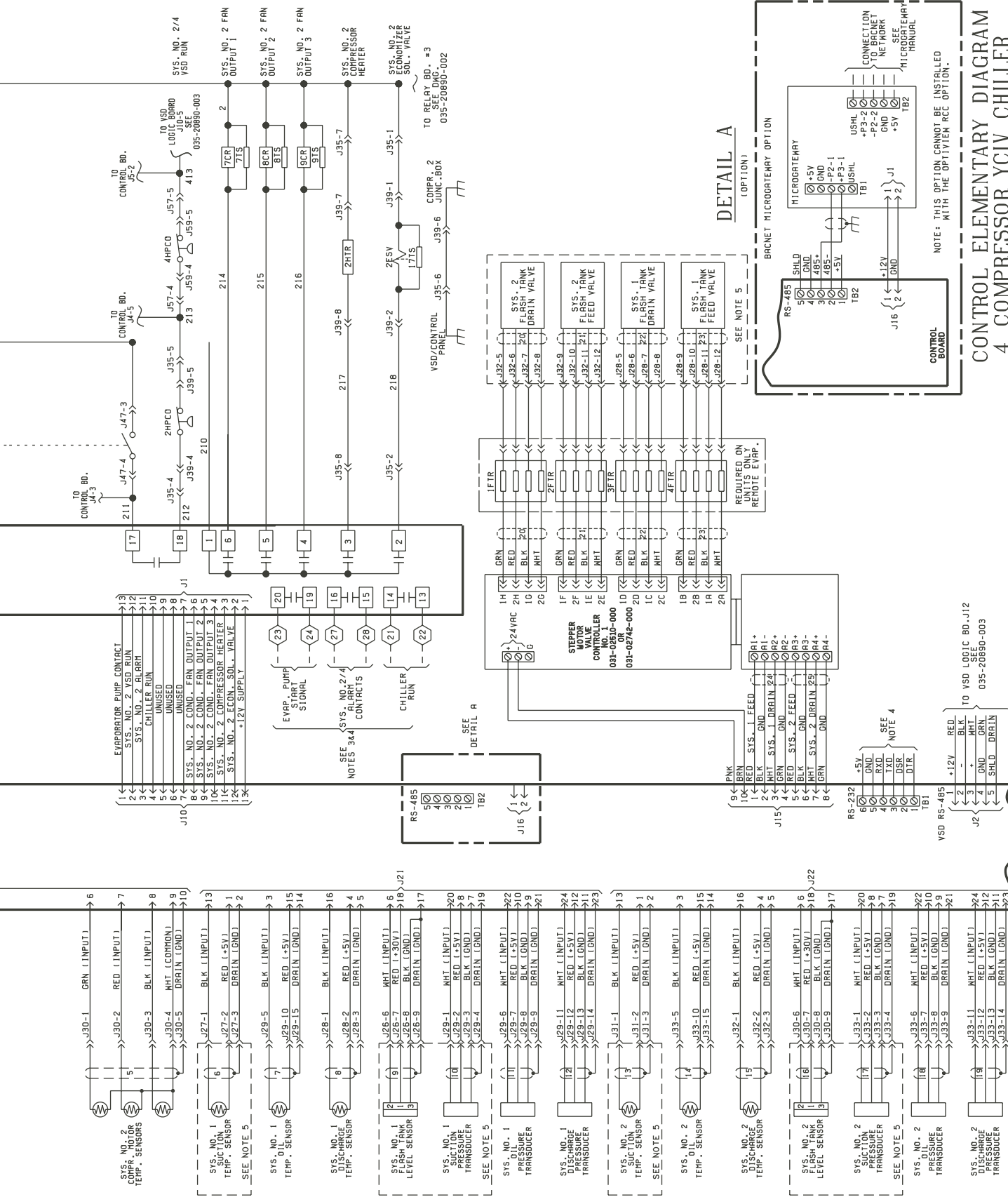
For informational purposes only. Do not attempt to tie into wiring without a proper wiring diagram.

Typical Control Wiring - Four Compressor

- NOTES:**
1. FIELD WIRING TO BE IN ACCORDANCE WITH THE CURRENT EDITION OF THE NATIONAL ELECTRICAL CODE AS WELL AS ALL OTHER APPLICABLE CODES AND SPECIFICATIONS.
 2. CONTACTS MUST BE SUITABLE FOR SWITCHING 115VAC AT 5 MA.
 3. CONTACTS ARE RATED AT 115V, 100VA, RESISTIVE LOAD ONLY, AND MUST BE SUPPRESSED AT LOAD BY USER.
 4. SEE INSTALLATION, OPERATION AND MAINTENANCE MANUAL WHEN OPTIONAL EQUIPMENT IS USED.
 5. WIRING BY OTHERS ON REMOTE EVAP. UNITS.



- LEGEND**
- TS TRANSIENT VOLTAGE SUPPRESSION TERMINAL BLOCK FOR CUSTOMER CONNECTIONS (1TB)
 - TERMINAL BLOCK FOR YORK CONNECTIONS ONLY
 - MIRING AND COMPONENTS BY YORK
 - OPTIONAL EQUIPMENT
 - MIRING AND/OR COMPONENTS BY OTHERS
- *NOT REQUIRED FOR ALL MODELS



**CONTROL ELEMENTARY DIAGRAM
4 COMPRESSOR YCIV CHILLER
035-20890-001 REV. E**

NOTE: THIS OPTION CANNOT BE INSTALLED WITH THE OPTIVIEW RCC OPTION.

CONTINUED TO 035-20890-002

Application Data

UNIT LOCATION

The YCIV 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 condenser fans are propeller-type and are not recommended for use with ductwork, filters or other impediments to airflow in the condenser air stream.
5. When it is desirable to surround the unit(s), in addition to whatever optional louver package is selected, 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 ordering 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. Please contact your nearest Johnson Controls Sales Office for shipping and operating weights.

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 operational noise 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.

The evaporator must be protected by a strainer, preferably of 40 mesh, fitted as close as possible to the liquid inlet connection, and provided with a means of local isolation.

The evaporator must not be exposed to flushing velocities or debris released during flushing. It is recommended that a suitably sized bypass and valve arrangement is installed to allow flushing of the piping system. The bypass can be used during maintenance to isolate the heat exchanger without disrupting flow to other units.

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, and Drawings apply to all work herein.
- B. Provide microcomputer 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 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 IAW, and installed in compliance with applicable sections of the following Standards and Codes:
 - 1. AHRI 550/590 – Water Chilling Packages Using the Vapor Compression Cycle
 - 2. AHRI 70 – 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. OSHA – Occupational Safety and Health Act
 - 10. Manufactured in facility registered to ISO 9001
 - 11. Conform to Underwriters Laboratories (U.L.) for construction of chillers and provide U.L./cU.L. listing label.

- B. Factory Test: Chiller shall be pressure-tested, evacuated and fully charged with refrigerant and oil, and shall be operationally run tested with water flowing through the vessel at the factory.
- C. Chiller manufacturer shall have a factory trained and supported service organization.
- 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 availability.

1.03 DELIVERY AND HANDLING

- A. Unit shall be delivered to job site fully assembled and charged with refrigerant and oil by the Manufacturer.
- B. During shipment, provide protective covering over vulnerable components. Fit nozzles and open ends with plastic enclosures.
- C. 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 a Johnson Controls design. Alternate equipment will be acceptable if the equipment meets the scheduled performance and complies with Johnson Controls' 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.
4. Chiller physical size on plant layout.
5. Site noise considerations.

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 multiple independent refrigerant circuits, semihermetic twin screw compressors, shell and tube type evaporator, air-cooled condenser, HFC-134a 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% for 2 compressor units, 7.5% for 3 compressor units, and 5% for 4 compressor units) 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, 1000 hour, 5% salt spray test, yields minimum ASTM 1654 rating of "6".

E. Unit shall ship in one piece and shall require installer to provide only a single evaporator inlet and outlet pipe connection. If a chiller model that ships in multiple pieces is provided, bid shall include all the material and field labor costs for factory authorized personnel to install a trim kit to connect the pieces as well as all interconnecting piping and wiring.

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 mounted on elastomeric isolators. Design working pressure of entire compressor, suction to discharge, shall be 350 psig (24 barg) or higher. 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 are provided on the chiller. 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. 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

- A. 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 (EEV).
- B. Chiller manufacturer shall provide independent circuit for each compressor to provide maximum redundancy during chiller operation. If equipment does not have independent circuits per compressor, manufacturer shall provide owner one spare compressor of each unique size.
- C. Discharge lines shall be provided with manual compressor shutoff service valves. Suction line shall be covered with closed cell foam insulation.

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 IAW applicable sections of ASME pressure vessel code for minimum 235 psig (16 barg) refrigerant side design working pressure and 150 psig (10 barg) 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 barg).
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.

2.05 POWER AND ELECTRICAL REQUIREMENTS

A. Power/Control Panel:

1. NEMA 3R, 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 (As standard for 2 and 3 compressor chillers)

1. Provide single point power connection to chiller, shall be 3 phase of scheduled voltage.
2. Terminal Block connections shall be provided at the point of incoming single point connection.

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 (380, 400, & 460V: 65,000 Amps). Rating shall be IAW 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 displacement power factor of 95% at all load conditions.
2. The installing contractor is responsible for additional cost to furnish and install power factor correction capacitors if they are not factory mounted and wired.

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 regulated 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 available language options), 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 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.

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 Johnson Controls 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.
2. Normal speed fans and unlined compressor enclosure. **(Factory Mounted)**
3. Two-speed fans and acoustically lined enclosure. **(Factory Mounted)**
4. Sound power octave band data, dB per AHRI standard 70 and IAW ISO3744 at 35°C ambient and 7°C leaving chilled water.
5. 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.

I. Power Supply/Connections:

1. Circuit breaker is optional 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.

J. Condenser Coil Environmental Protection:

1. **PRE-COATED FIN CONDENSER COILS** – The air-cooled condenser coils are constructed of 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.

K. 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.

L. Evaporator options:

1. Provide 1-1/2" (38mm) cooler insulation in lieu of standard 3/4" (19mm).
2. Provide Raised Face Flanges for cooler nozzles:
 - a. 150 psig (10.3 barg), welded flanges (field kit, matching pipe flange by contractor).
 - b. 150 psig (10.3 barg) companion flanges. (not available with 460V units)
 - c. 150 psig (10.3 barg), ANSI/AWWA C-606 couplings (field kit, matching pipe flange by contractor).

M. Flow Switch (**Field Mounted**): Vapor proof SPDT, NEMA 3R switch [___ 150 psig (10.3 barg) or ___ 300 psig (20.7 barg)], -20°F to 250°F (-28.9°C to 121.1°C).

N. Building Automation System Interface:

1. Chiller to accept 4 to 20mA or 0 to 10 VDC input to reset the leaving chilled liquid temperature. (**Factory Mounted**)

O. Vibration Isolation (**Field Mounted**):

1. Elastomeric Isolators.
2. 1 Inch Deflection Spring Isolators: Level adjustable, spring and cage type isolators for mounting under the unit base rails.
3. 2" Deflection 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).

P. Service Shut-Off Valve: Provide suction service shut-off valve for each compressor. (**Factory Mounted**)

PART 3 — EXECUTION**3.01 INSTALLATION**

- A. 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.

