

May 6, 2019

ADDENDUM NO. 1

- RE: HVAC Equipment Replacement For Greenbrier Hall New River Community and Technical College Lewisburg, West Virginia Architect's Job No. 18045
- TO: Prospective Bidders
- FROM: ZMM, Inc. Architects and Engineers

This Addendum forms a part of the Contract Documents and modifies the original Bidding Documents.

ATTACH THIS ADDENDUM TO THE FRONT COVER OF THE PROJECT MANUAL AND ACKNOWLEDGE RECEIPT OF THIS ADDENDUM IN THE SPACE PROVIDED ON THE BID FORM.

PART 1 - INFORMATION FOR BIDDERS

- A. Pre-Bid Meeting Sign-In Sheet is attached to this Addendum.
- B. Refer to Owner-Furnished Chiller Submittal as attached to this Addendum.

PART 2 - CHANGES TO SPECIFICATIONS

A. Section 250923 "Direct Digital Control (DDC) System for HVAC"; Paragraph 1.4 Item E. **ADD** 4. Johnson Controls, Johnson Controls, (304) 550-5871.

PART 3 - CHANGES TO DRAWINGS

A. Drawing M112; Keyed Note #4; **ADD** Contractor shall field verify locations of existing duct mounted smoke detectors. Remove, store and reinstall in new ductwork as required for new work.

END OF ADDENDUM

Attachments:	Pre-Bid Meeting Sign-In Sheet	2 pages
	Owner-Furnished Chiller Submittal	27 page

PRE-BID MEETING SIGN-IN SHEET

HVAC Equipment Replacement for Greenbrier Hall New River Community & Technical College - #18045

PLEASE PRINT
NAME: Jerry Priddy
FIRM: Nitro LS
ADDRESS: 4300 First Auc
NITO
PHONE: 304-741-7878FAX:
EMAIL: jpriddy @ nitro cs. com
BIDDING CONTRACT FOR:
NAME: Mike Loughlin
FIRM: DSo Mechanical
ADDRESS: 515 Third Ave
So Charleston we 25303
PHONE: <u>304-744-8474</u> FAX: <u>304-744-845</u>
EMAIL: Mlaushlin & dsomech, com
BIDDING CONTRACT FOR:
NAME: David Bostic
FIRM: Approved Builders ===
ADDRESS: 467 Main St. W
W.S.S., WV ZY98L
PHONE: 304-646-3373: 304-536-5103
EMAIL: the approved builders egma. I. com
BIDDING CONTRACT FOR: Pro / HVAC
NAME: Andy Skiba
FIRM: Air Systems
ADDRESS: 3331 Tezys Vulley Roz 1
Hourricane, W
PHONE: 304 539-3353 FAX: 304 562 5281
EMAIL: acs Cairsystems wy, com
BIDDING CONTRACT FOR: HVAC

PLEASE PRINT

NAME: DEAN STONE
FIRM: CASTO TECHNICAL
ADDRESS: 540 LEON GULLIVAN WAY
CHARLESTON WY 25301
PHONE: 304 545 3844 FAX: 304 346 8920
EMAIL: distone @ castotech.com
BIDDING CONTRACT FOR: CHILLED
NAME: Lee Gill
FIRM: Dougherty Co
ADDRESS: P.G. BOX 1828
Chas NOU 25327
PHONE: 304. 925-6664 FAX: 304-925- 428
EMAIL: briansmithe douglerty com
BIDDING CONTRACT FOR:
NAME:
FIRM:
ADDRESS:
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EMAIL: briansmithe douglertyso.com
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SUBMITTAL COVER SHEET

(Attach to each copy of each submittal.)

PROJECT:	New Rive	r Community &	Technical College	
ARCHITECT/ENGINEER:	ZMM, Inc. 222 Lee Street We Charleston, WV 2:	A/E COMMISS st (found on cover 5302	ION #: of Project Manual)	
PRIME CONTRACTOR: _	Engineere	& Building Sys	stem 5	
SUBCON./SUPPLIER:	NIA	<u> </u>		
MANUFACTURER:	JCI / York	-		
ITEM SUBMITTED:	Air Cooled, Scio	11 Water ChillesuBM	TTAL #:	
SPEC. SECTION #:	236423.21	PARAC	GRAPH #:	
DRAWING REFERENCE:	SKOOL	_ DF	ETAIL #:	
CERTIFICATION: (Circle of	one.)			
Deviation Sheet.	oplier Date	Signature: Prime Cor	<u>14-18-19</u> htractor Date	
Provide chiller with BA	ACnet point	NO EXCEPTION TAKEN	EXCEPTION NOTED	
addressing for coordin	nation with	SUBMIT SPECIFIED	□ REVISE AND RESUBMIT	
Installing contractor.		SEE COVER LETTER	REJECTED	
COMMENTS MADE ON THE SHOP DRAWINGS DURING THIS REVIEW DO NOT RELIEVE THE CONTRACTOR FROM COMPLIANCE WITH REQUIREMENTS OF THE DRAWINGS AND SPECIFICATIONS. THIS CHECK IS ONLY FOR REVIEW OF GENERAL CONFORMANCE WITH THE DESIGN CONCEPT OF THE PROJECT AND GENERAL COMPLIANCE WITH THE INFORMATION GIVEN IN THE CONTRACT DOCUMENTS. THE CONTRACTOR IS RESPONSIBLE FOR: CONFIRMING AND CORRELATING QUANTITIES AND DIMENSIONS, SELECTING FABRICATION PROCESSES AND TECHNIQUES OF CONSTRUCTION, COORDINATING THIS WORK WITH THAT OF ALL OTHER TRADES, AND PERFORMING WORK IN A SAFE AND SATISFACTORY MANNER. NOTE ANY DEVIATIONS IN ATTACHED SUBMITTAL DEVIATION SHEET.				
(PRIME CONTRACTOR APP)	ROVAL STAMP)	(ARCHITECT/ENGIN)	ZMM, Inc.	

SUBMITTAL PROCEDURES

013300 - 1



ENGINEERED BUILDING SYSTEMS

375 Southpointe Blvd. Suite 340, Canonsburg, PA 15317 Phone: 724-514-6093

SUBMITTAL DATA

PROJECT

New River Community and Technical College Greenbrier Hall Lewisburg, WV

> EQUIPMENT Air Cooled Scroll Chiller YLAA0136SE

SUBMITTED TO

Community & Technical College System of WV 1018 Kanawha Boulevard East, Suite 700 Charleston, WV 25301

SUBMITTED FOR

Approval

SUBMITTED

April 18, 2019

SUBMITTED BY

Engineered Building Systems

FOR INFORMATION CONTACT

Quinn French 561-715-0819



BILL OF MATERIAL

- Quantity 1 YLAA0136SE
- R410A Refrigerant
- 460V/3 Phase Single Point Power
- Circuit Breaker Disconnect w/ Lockable Handle
- Control Transformer
- Scroll Compressors
- Acoustic Sound Blankets for Compressors
- High Ambient Kit with Sunshield
- Service Isolation Valves
- Electronic Expansion Valves
- Hot Gas Bypass (1 Circuit)
- Evaporator Insulation 1 ¹/₂" Thick Insulation
- Thermal Dispersion Flow Switch
- Microchannel Condenser Coil
- Condenser Fans Ultra Quiet Fans
- Louvered Enclosure Panels Full Unit
- Communication Interface BACNet, Modbus, N2
- Neoprene Isolators (Field Installed by Others)
- Start-Up JCI Service (1 Day)
- Training Owner Training (1 Day)
- Standard Warranty -1st Year Entire Unit Parts and Labor
- Extended Warranty 2nd 5th Year Compressor Parts Only

NOTES

- 1. The current estimated lead time for this chiller is 10 weeks from the time of release of the order to the factory. Transit time for shipment is 5 business days.
- 2. To release the order to the factory, an approved submittal and purchase order required.
- 3. PO should be made payable to: Johnson Controls, Inc. c/o Engineered Building Systems, 117 New Fredrick Street, Wilkes-Barre, PA 18702.
- 4. Johnson Controls/EBS Payment Terms are Net 30 Days
- 5. Freight Terms are FOB Destination as Specified

MODEL YLAA AIR-COOLED SCROLL CHILLERS WITH BRAZED PLATE HEAT EXCHANGERS STYLE B

55 – 230 TON 195 – 700 kW 60 Hz R-410A







Introduction

Johnson Controls, the building efficiency leader, is proud to present the YORK Model YLAA Air-Cooled Scroll Chiller.

FEATURES AND BENEFITS

Installation

The YLAA chiller arrives as a factory-assembled package ready to be installed outdoors, either on the roof or at ground level. The air-cooled condensers eliminate the capital, installation and maintenance costs of a cooling-tower circuit.

The YLAA weighs less and has s smaller footprint than other chillers in its class. In fact, it is 20-35% lighter weight than the market average chiller. When the chiller is roof-mounted in new construction, the cost of the support structure can be reduced. In building retrofits, the YLAA can provide the largest capacity in a given space and existing structure.

Power hook-up could not be any easier with the standard single-point connection. A terminal block, disconnect switch or circuit breaker is provided to meet the unique needs of every project and minimize installation time and labor. The factory-installed control transformer steps down the power voltage to the control voltage.

Chilled-water piping is also simple. The water connections are factory-piped to the outside of the unit, for ease of access. Factory-cut grooves, or optional flanges, make piping connections simple. Optional factory-installed pump kits eliminate the time, cost, and mechanical-equipment room space necessary to install chilled-water pumps.

Press the start button with confidence – your YLAA has been run-tested at the factory to ensure that you will have a successful start-up.

Reliability

The YLAA chiller is proven and reliable, designed to reduce service calls. The scroll compressors have logged hundreds of thousands of operating hours in numerous different applications. The corrosive-resistant condenser heat exchangers have been specifically designed for stationary HVAC applications and have undergone extensive laboratory and field testing to extend chiller life and improve performance. They are also more rigid than standard condenser coils, making them less susceptible to damage during rigging, lifting, and installation of the chiller.

Components are designed to keep the chiller up-and-running. A factory-installed water strainer prevents debris from affecting unit flow and/or heat transfer. The rugged thermaldispersion flow switch is factory-installed at the optimum location in the piping for superior flow sensing, reducing the potential for nuisance trips. Intelligent controls protect the chiller while keeping it online, for maximum uptime. Exterior panels of the chiller are powder-coated with highly durable corrosion-resistant paint.

Introduction (Cont'd)

Efficiency

YLAA high-efficiency chillers, with their innovative control algorithms, offer industry-leading energy efficiency. Real-world energy efficiency is measured by IPLV (off-design) performance, and YLAA chillers provide some of the best IPLVs in their class.

YLAA also offers an efficiency choice. In addition to the high-efficiency units, YLAA chillers are available in standard efficiency models with smaller footprints and lower capital costs.

Only pay for the chiller you need – the multi-efficiency levels of the YLAA allow you to decide the best investment for the job.

Flexibility

The YLAA chiller offers a number of options designed to operate reliably across a wide range of customer needs. It can cool glycol down to 10° F (- 12° C). It can provide heat recovery up to 140° F (60° C), with up to 85% of total heat rejection captured.

When factory-mounted pump kits are considered, there are now more pump sizes to choose from. The optional kits come standard with valves, pressure ports, flow switch, and strainer for quick hook-up, and frost protection to prevent freeze-up. There are also more pump options available: variable-speed drives, dual pumps, service shut-off valves, expansion tanks, and additional test ports for temperature and pressure sensing.

Standard low sound and multiple sound attenuation options allow flexibility in locating the chiller, and reduce the cost for field-constructed barriers.

Sustainability

The YLAA makes you a leader in sustainability through innovation, not added cost. With the combination of R-410A refrigerant, which has no ozone-depletion potential, and stateof-the-art heat exchanger technology that allows refrigerant charge to be reduced by as much as 30%, the YLAA chiller provides the most ecologically friendly equipment. Partnered with its low-sound properties for noise pollution prevention, this chiller is a true earth-friendly offering.

Introduction (Cont'd)

Communications

The YLAA chiller comes standard with native communication capability for BACnet (MS/ TP), Modbus, and N2, with optional capabilities available for LON. The standard unit capabilities include built-in-scheduling, remote start-stop, remote water temperature reset and up to two steps of demand (load) limiting depending on model. The standard control panel can be directly connected to a Johnson Controls Building Automated System via the standard factory-installed RS232 communication port.

Serviceability

Minimal maintenance is required to keep the unit operating at maximum performance. If service should ever be required, the YLAA chiller has been designed to simplify the work, keeping costs down. The layout of the chiller locates all the major components that can be serviced near the outside edge. The condenser heat exchangers are light enough that no crane is required for replacement and when it's time to clean them, city tap water, with water pressure typical of a spray from a common garden hose, is all that's needed.

AHRI CERTIFICATION PROGRAM

YORK YLAA chillers have been tested and certified by Air-Conditioning, Heating and Refrigeration Institute (AHRI) in accordance with the latest edition of AHRI Standard 550/590 (I-P). Under this Certification Program, chillers are regularly tested in strict compliance with this Standard. This provides an independent, third-party verification of chiller performance. Refer to the AHRI site at www.ahrinet.org/ for complete Program Scope, Inclusions, and Exclusions as some options listed herein fall outside the scope of the AHRI certification program. For verification of certification, go to the AHRI Directory at www. ahridirectory.org.



Air-Cooled Water Chilling Packages AHRI Standards 550/590 and 551/591

Rated in accordance with the latest issuance of AHRI Standard 550/590 and 551/591.

Equipment Overview

The 55 - 230 Ton (195 - 800 kW) YLAA models are shipped complete from the factory ready for installation and use. The unit is pressure-tested, evacuated, and fully charged with a zero Ozone Depletion Potential Refrigerant R-410A and includes an initial oil charge. After assembly, a complete operational test is performed with water flowing through the evaporator to assure that the refrigeration circuit operates correctly.

The unit structure is heavy-gauge, galvanized steel. This galvanized steel is coated with baked-on powder paint, which, when subjected to ASTM B117 1000 hour, salt spray testing, yields a minimum ASTM 1654 rating of "6". Units are designed in accordance with NFPA 70 (National Electric Code), ASHRAE/ANSI 15 Safety code for mechanical refrigeration, ASME and rated in accordance with AHRI Standard 550/590 and 551/591.

COMPRESSORS

The chiller has suction-gas cooled, hermetic scroll compressors. The YLAA compressors incorporate a compliant scroll design in both the axial and radial direction. All rotating parts are statically and dynamically balanced. A large internal volume and oil reservoir provides greater liquid tolerance. Compressor-crankcase heaters are also included for extra protection against liquid migration.



LD18425a

BRAZED PLATE EVAPORATOR

The compact, high efficiency Brazed Plate Heat Exchanger (BPHE) is constructed with 316L stainless steel corrugated channel plates with a filler material between each plate. It offers excellent heat transfer performance with a compact size and low weight, reducing structural steel requirements on the job site.



LD18426

The heat exchanger is manufactured in a precisely controlled vacuum-brazing process that allows the filler material to form a brazed joint at every contact point between the plates, creating complex channels. The arrangement is similar to older plate and frame technology, but without gaskets and frame parts.

Water inlet and outlet connections are grooved for compatibility with field supplied ANSI/ AWWA C-606 couplings.

A 20 mesh wye-strainer is provided as standard to provide protection at the evaporator inlet, particularly at system start-up when construction debris may be present in the piping system.

The evaporator is equipped with a thermostat-controlled heater. The heater provides freeze protection for the evaporator down to -20° F (-29° C) ambient. The evaporator is covered with 3/4" flexible, closed-cell, foam insulation (K=0.25).

A factory-wired flow switch is standard, installed in a pipe section at the outlet of the evaporator.

CANADIAN REGISTRATION NUMBER (CRN) APPLICATION & PROOF OF CONFORMANCE

Reference Table 1 for YLAA brazed plate evaporator Canadian Registration Numbers (CRN) for all Canadian Provinces. All YLAA brazed plate evaporators are categorized as pressure "H" fittings per CSA-B51.

CANADIAN PROVINCE	CRN#
BC	OH13953.51
AB	OH13953.52
ON	OH13953.5
PQ/MB/SK	OH13953.56
NB	OH13953.57
NS	OH13953.58
PEI	OH13953.59
NF	OH13953.50
NU	OH13953.5N
NWT	OH13953.5T
YU	OH13953.5Y

TABLE 1 - CANADIAN REGISTRATION NUMBERS

CONDENSER

Coils - Condenser coils are made of a single material to avoid galvanic corrosion due to dissimilar metals. Coils and headers are brazed as one piece. Integral sub cooling is included. The design working pressure of the coil is 650 PSIG (45 BarG). Condenser coil is easily washable with clear water up to 100 PSI (7 bar).



LD18427

Fans – The condenser fans are composed of corrosion resistant aluminum hub and glassfiber-reinforced polypropylene composite blades molded into a low-noise airfoil section. They are designed for maximum efficiency and are statically and dynamically balanced for vibration-free operation. They are directly driven by independent motors, and positioned for vertical air discharge. The fan guards are constructed of heavy-gauge, rust-resistant, coated steel. All blades are statically and dynamically balanced for vibration-free operation.



LD18428

Motors – The fans are driven by Totally Enclosed Air-Over, squirrel-cage type, current protected motors. They feature ball bearings that are double-sealed and permanently lubricated.

UNIT CONTROL SYSTEM

The YLAA chiller is designed with an intelligent control system that operates the chiller automatically with maximum reliability, safety and ease of use. The controls are factory tested and with as little user input as a chilled liquid setpoint the chiller will operate to meet the load demand.

The control system includes native BACnet MS/TP, Modbus and N2 communications, with LON protocol served through an optional eLink communications card.

The operating program is stored in non-volatile memory (EPROM), so power failures and battery discharge will not require reprogramming the chiller. Programmed setpoints are retained in lithium battery-backed RTC memory for five years minimum.

Unit alarm contacts are standard. Contacts for remote chilled liquid temperature reset and two steps of demand load limiting are also standard, for projects without BAS or for redundancy.



Maximum reliability is achieved through intelligent control. Run hours and starts are averaged across all compressors automatically, and between both pumps of the optional dual pump hydro-kit. When compressors are cycled off, an anti-recycle timer ensures the motors have time to cool before starting again, for the maximum service life. At unit shutdown, the unit pumps down automatically to prevent liquid refrigerant from entering the compressors at restart, which can cause premature bearing wear and other compressor damage.

Liquid temperature sensors provide feedback to the controller, and logic predicts when additional capacity will be required based on how quickly the unit has loaded or unloaded in the past. This prevents unnecessary compressor cycling and helps maintain setpoint accurately.

If there is a problem that prevents the unit operating properly, the controls are designed to allow the unit to operate safely while making as much capacity as possible. For example, if airflow to the condenser coil is diminished due to a dirty coil, the chiller will unload slightly to provide maximum capacity possible while remaining within the unit operating envelope.

If a fault prevents the unit from starting or causes it to shutdown, the chiller will attempt to restart three times. If it cannot start, a manual reset is required to alert the operator about the fault condition. The fault history is stored in the unit controller RTC memory for the last six fault shutdown conditions. An RS-232 port provides capability to print hard copy reports (printer available separately).

All controls are contained in a NEMA 3R cabinet with a hinged outer door and includes a liquid crystal display (LCD) with light emitting diode (LED) backlighting for outdoor viewing. There are two display lines, each with 20 text characters per line, and a color coded 12-button non-tactile keypad with sections for display, entry and printing.

DISPLAY/PRINT provides quick access to frequently needed information:

- · Chilled liquid temperatures
- Ambient temperature
- System pressures (each circuit)
- · Operating hours and starts (each compressor)
- Operating data for the systems

ENTRY section allows entering setpoints or modifying system values.

SETPOINTS updating can be performed to:

- · Chilled liquid temperature setpoint and range
- Remote reset temperature range
- · Set daily schedule/holiday for start/stop
- · Manual override for servicing
- Low and high ambient cut-outs
- Number of compressors
- Low liquid temperature cut-out
- · Low suction pressure cut-out

- · High discharge pressure cut-out
- · Anti-recycle timer (compressor start cycle time)
- Anti-coincident timer (delay compressor starts)

UNIT section to:

- Set time
- · Set unit options

In addition, the microprocessor control center is capable of displaying the following data points:

- · Return and leaving liquid temperature
- · Low leaving liquid temperature cut-out setting
- · Low ambient temperature cut-out setting
- Outdoor air temperature
- · English or Metric data
- · Suction pressure cut-out setting
- · Each system suction pressure
- Discharge pressure (optional)
- · Anti-recycle timer status for each system
- · Anti-coincident system start timer condition
- Compressor run status
- No cooling load condition
- · Day, date and time
- · Daily start/stop times
- Holiday status
- Automatic or manual system lead/lag control
- Lead system definition
- · Compressor starts & operating hours (each compressor)
- Status of hot gas valves, evaporator heater and fan operation
- Run permissive status
- Number of compressors running
- · Liquid solenoid valve status
- · Load & unload timer status
- Water pump status

COMMUNICATIONS

- Native communication capability for BACnet (MS/TP), Modbus and N2
- · Optional communication available for LON via eLink option

BUILDING AUTOMATION SYSTEM INTERFACE

In addition to native BACnet, Modbus and N2, the YLAA chiller accepts a 4-20 milliamp or 0-10VDC input to reset of the leaving chilled liquid temperature. The standard unit capabilities include remote start-stop, remote water temperature reset via up to two steps of demand (load) limiting depending on model. The standard control panel can be directly connected to a Johnson Controls Building Automated System via the standard on-board RS232 communication port. (Factory- installed)

For connection with Johnson Controls Connected Services, an optional interface card (SC-EQUIP) is required and may be factory installed for easier field commissioning. Additional hardware (SC-AP access point), field provided, must be installed remotely from the chiller to interface with the Connected Services remote operations center. Contact your local Johnson Controls office to learn more about Connected Service and to schedule installation during chiller commissioning.

POWER PANEL

Each panel contains:

- · Compressor power terminals
- · Compressor motor starting contactors per I.E.C.
- · Control power terminals to accept incoming for 115-1-60 control power
- · Fan contactors & overload current protection

The power wiring is routed through liquid-tight conduit to the compressors and fans.



Unit Components



FIGURE 1 - GENERAL UNIT COMPONENTS

Accessories and Options

All options are factory installed unless otherwise noted.

POWER OPTIONS:

Unit Power Connections – Single-point terminal block connection(s) are provided as standard. The following power connections are available as options. (See electrical data for specific voltage and options availability.)

Single-Point Supply Terminal Block – Includes enclosure, terminal-block and interconnecting wiring to the compressors. Separate external protection must be supplied, by others, in the incoming compressor-power wiring. (Do not include this option if either the Single-Point Non-Fused Disconnect Switch or Single-Point Circuit Breaker options have been included.)

Single-Point Non-Fused Disconnect Switch – Unit-mounted disconnect switch(es) with external, lockable handle (in compliance with Article 440-14 of N.E.C.)can be supplied to isolate the unit power voltage for servicing. Separate external fusing must be supplied, by others in the power wiring, which must comply with the National Electrical Code and/or local codes.

Single-Point Circuit Breaker – A unit mounted circuit breaker with external, lockable handle (in compliance with NEC Article 440-14), can be supplied to isolate the power voltage for servicing. (This option includes the Single-Point Power connection.)

Multiple Point Supply With Individual System Circuit Breakers – Two unit-mounted circuit breakers, with external lockable handles (in compliance with NEC Article 440-14), can be supplied to isolate the power voltage for servicing. **(SQ only)**

Control Transformer – Converts unit power voltage to 115-1-60 (0.5 or 1.0 kVA capacity). Factory mounting includes primary and secondary wiring between the transformer and the control panel.

Power Factor Correction Capacitors – Will correct unit compressor power factors to a 0.90-0.95.

CONTROL OPTIONS:

High Ambient Kit – Allows units to operate when the ambient temperature is above 115°F (46°C). Includes sun shield panels and discharge pressure transducers.

Low Ambient Kit – Standard units will operate to $30^{\circ}F$ (-1°C). This accessory includes all necessary components to permit chiller operation to $0^{\circ}F$ (-18°C). (This option includes the discharge pressure transducer /readout capability option.) For proper head pressure control in applications below $30^{\circ}F$ (-1°C) where wind gusts may exceed 5 mph, it is recommended that optional condenser louvered enclosure panels also be included.

Language LCD and Keypad Display – Spanish, French, German, and Italian unit LCD controls and keypad display available. Standard language is English.

Accessories and Options (Cont'd)

COMPRESSOR, PIPING, EVAPORATOR OPTIONS:

Low Temperature Glycol – Replaces standard Thermostatic Expansion Valves with Electronic Expansion Valves to achieve leaving glycol temperatures as low as 10°F (-12°C). Required for any leaving liquid temperature below 30°F (-1°C). Electronic Expansion Valves permit operation at both low temperatures and comfort cooling applications without a capacity loss or derate at either condition.

Chicago Code Relief Valves – Unit will be provided with relief valves to meet Chicago code requirements.

Service Suction Isolation Valve – Service suction discharge (ball-type) isolation valves are added to unit per system (discharge service ball-type isolation valve is standard on each circuit).

Hot Gas By-Pass – Permits continuous, stable operation at capacities below the minimum step of compressor unloading to as low as 5% capacity (depending on both the unit and operating conditions) by introducing an artificial load on the evaporator. Hot gas by-pass is installed on only refrigerant system #1.

Thermal Dispersion Flow Switch – A thermal dispersion type flow switch provides accurate, low maintenance flow proving and is included standard. It is factory wired and installed in the extension pipe between evaporator outlet and edge of chiller. The extension pipe is secured to the chiller frame for shipping to avoid risk of damage to evaporator and is easily attached to the evaporator at startup using the supplied ANSI/AWWA C-606 connector. The flow switch can be deleted if alternate or existing flow switch is field supplied.

Evaporator Nozzle Extension Kit – Pipe and ANSI/AWWA C-606 fittings to extend the evaporator connections to the outside of the chiller. Includes the Thermal Dispersion Flow Switch. Provided as standard on all chillers but can be deleted if alternate or existing piping and flow switch is field supplied. The extension pipe is secured to the chiller frame for shipping to avoid risk of damage to evaporator and is easily attached to the evaporator at startup using the supplied ANSI/AWWA C-606 connector. A support bracket for the extension kit or field piping is standard on all chillers. Extension kit insulation and heat trace to be field provided if required.

Heat Recovery Condenser – A partially condensing refrigerant to liquid condenser recovers heat off both refrigerant circuits and rejects into a single liquid circuit. Factory installed between the compressor discharge and the condenser (air) coils to capture the maximum amount of heat. Capable of recovering up to 85% total heat of rejection (cooling load plus work input); temperatures as high as 140°F (60°C) are possible.

Hydro-Kit – Factory installed Hydro-Kit suitable for water glycol systems with up to 35% glycol at leaving temperatures down to 20°F (-6.7°C). The hydro-kit option is available in a single or dual configuration (dual as standby duty only), with totally enclosed permanently lubricated pump motors.

The hydro-kit comes standard with a variable speed drive, a balancing valve, discharge check valve, discharge shutoff valve, thermal dispersion flow switch, pressure ports, inlet wye-strainer, bleed and drain valves and frost protection.

Service shut off valves, additional pressure ports and taps for the expansion tank are optional within the hydro-kit option. Expansion tanks are available by request.

Accessories and Options (Cont'd)

CONDENSER AND CABINET OPTIONS:

Condenser coil protection against corrosive environments is available by choosing any of the following options. For additional application recommendations, refer to FORM 150.12-ES1.

Environment Guard Premium – Microchannel condenser coils coated with an electro-deposited and baked flexible epoxy coating that is finished with a polyurethane UV resistant top-coat.

Environment Guard Basic – Microchannel condenser coils treated with immersion bath-applied chemical treatment.

Microchannel condenser shall be provided with a 5-year warranty against corrosion damage.

Enclosure Panels (Unit) – Tamperproof enclosure panels prevent unauthorized access to units. Enclosure panels can provide an aesthetically pleasing alternative to expensive fencing. Additionally, for proper head pressure control, Johnson Controls recommends the use of Condenser Louvered Panels for winter applications where wind gusts may exceed five miles per hour (8 kph). The following types of enclosure panels are available:

Wire Panels (Full Unit) – Consists of welded wire-mesh guards mounted on the exterior of the unit. Prevents unauthorized access, yet provides free air flow.

Wire/Louvered Panels – Consists of welded wire-mesh panels on the bottom part of unit and louvered panels on the condenser section of the unit.

Louvered Panels (Condenser Coil Only) – Louvered panels are mounted on the sides and ends of the condenser coils for protection.

Louvered Panels (Full Unit) – Louvered panels surround the front, back, and sides of the unit. They prevent unauthorized access and visually screen unit components. Unrestricted

Accessories and Options (Cont'd)

air flow is permitted through generously sized louvered openings. This option is applicable for any outdoor design ambient temperature up to 115°F (46°).

Coil End Hail Guard – Louvered panel attached to exposed coil end.

SOUND ATTENUATION:

One or both of the following sound attenuation options are recommended for residential or other similar sound sensitive locations.

Compressor Acoustic Sound Blanket – Each compressor is individually enclosed by an acoustic sound blanket. The sound blankets are made with one layer of acoustical absorbent textile fiber of 5/8" (15mm) thickness; one layer of heavy duty anti-vibration material thickness of 1/8" (3mm). Both are closed by two sheets of welded PVC, reinforced for temperature and UV resistance.

Ultra Quiet Fans – Lower RPM, 8-pole fan motors are used with steeper-pitch fans.

Variable Speed Fans - Controls all the fans on the circuit. There is a drive installed for each circuit. Available on both low sound and ultra quiet fans.

VIBRATION ISOLATION

Vibration Isolators – Level adjusting, spring type 1 inch (25.4mm), 2 inch (50.8 mm) deflection, or neoprene isolators for mounting under unit base rails. (**Field installed**)



Design Conditions Datasheet

Unit Tag	Qty	Model No	Net Cooling Capacity (ton.R)	Nominal Voltage	Refrigerant Type
CH-1	1	YLAA0136SE46XFBBXTX	124.2	460-3-60.0	R410A

PIN:							
YLAA0136SE	46XFBBXTXH	SXBLXCXX44	SE1XXKHXDX	YAXGXXX7BX	XLXNXXXXX		
				550		 	

Evaporator Data			Evaporator Da	ta (Cont.)	Performance Data	
EWT (°F)	54.00		Fluid Volume (USGAL)	10.04	EER (Btu/W⋅h)	9.492
LWT (°F)	44.	00	Min. Flow Rate (USGPM)	115.1	NPLV.IP (Btu/W⋅h)	15.57
Design Flow Rate (USGPM)	296.5		Max. Flow Rate (USGPM)	530.0		
Evap. Press. Drop (ft H2O)	12	.2				
Fluid	Water		Condense	Condenser Data		а
Strainer Press. Drop (ft H2O)	2.2	7	Ambient Temp. Design (°F)	95.0	Rigging Wt. (lb)	6920
Ext. Kit Press. Drop (ft H2O)	5.25		Altitude (ft)	2100	Operating Wt. (lb)	7004
Total Press. Drop (ft H2O)	19.8		Compressor Type	Scroll - Hermetic	Refrigerant Charge (lb)	146
Fouling Factor (h.ft ² .F/Btu)	0.000	100				

Electrical Data							
Circuit	1	2	3	4			
Compressor RLA	53 / 53 / 53	27 / 27 / 27					
Fan QTY/FLA (each)	4 / 4	4 / 4					
High LRA Current	290 / 290 / 290	180 / 180 / 180					

Single Point						
Min. Circuit Ampacity	290					
Recommended Fuse/CB Rating	300					
Max. Inverse Time CB Rating	300					
Max. Dual Element Fuse Size (A)	300	Operating Cond	Operating Condition Electrical Data			
Unit Short Circuit Withstand (STD)	5 [kA]	Compressor kW	143.6			
Wires Per Phase	1 + 2	Total Fan kW	13.44			
Wire Range (Lug Size)	250 - 500 kcmil + #3/0 AWG - 250 kcmil	Total kW	157.0			
Starter Type	Across The Line					

Notes:

This unit does not have a coil coating selected.

Certified in accordance with the AHRI Air-Cooled Water-Chilling Packages Using Vapor Compression Cycle Certification Program, which is based on AHRI Standard 550/590 (I-P) and AHRI Standard 551/591 (SI). Certified units may be found in the AHRI Directory at www.ahridirectory.org. Auxiliary components included in total KW - Oil heaters, Chiller controls. Auxiliary power is already included in the compressor and fan power



Compliant with the requirements of the LEED Energy and Atmosphere Enhanced Refrigerant Management Credit (EAc4).



Design Conditions Datasheet

Part Load Rating Data						
Stage	Ambient (°F)	Capacity (ton.R)	Total kW	Unit Efficiency		
1	95.0	124.2	157.0	9.492		
2	86.7	107.1	106.4	12.07		
3	80.9	94.97	86.61	13.16		
4	67.5	67.22	48.97	16.47		
5	60.3	52.29	35.21	17.82		
6	55.0	35.27	22.41	18.88		

Sound Power Levels (In Accordance with AHRI 370)										
Stage	Ambient (°F)	63 Hz (dB)	125 Hz (dB)	250 Hz (dB)	500 Hz (dB)	1 kHz (dB)	2 kHz (dB)	4 kHz (dB)	8 kHz (dB)	LWA
1	95.0	95	94	90	90	87	83	80	83	92
2	86.7	95	94	90	90	86	83	79	83	92
3	80.9	95	93	90	90	86	82	79	82	91
4	67.5	92	91	87	87	83	80	76	80	89
5	60.3	92	91	87	87	83	80	76	80	89
6	55.0	89	88	84	84	81	77	74	77	86

Note: Unit is equipped with Acoustic Sound Blanket and Ultra Quiet Fans.

Performance at AHRI Conditions							
Evaporator Data		Condense	Condenser Data		Performance Data		
EWT (°F)	54.00	Ambient Temp. (°F)	95.0	EER (Btu/W·h)	9.701		
LWT (°F)	44.00	Altitude (ft)	0.000	IPLV.IP (Btu/W·h)	15.80		
Flow Rate (USGPM)	298.9			Net Cooling Capacity (ton.R)	125.2		
Pressure Drop (ft H2O)	12.4						
Fluid	Water						
Fouling Factor (h.ft ² .F/Btu)	0.000100						
Fluid Volume (USGAL)	10.04						

Note: Unit rated at design condition capacity.



YLAA 0136 S	E YLAA 0155 SE				-
YLAA OL39 H	F YLAA 0456 HE				- - J
YLAA OI42 H	E YLAA 0516 HE				
16	5	4	3	2	

9 8 7 6	5 4 3 2 1	
		K
	CONTROL PANEL BOTTOM DETAIL	
HEAT		Η
	A" VICTAULIC OUTLET	G
		E
Ø 15.9 [0.63] MOUNTING HOLES TYP 1473.2 [58.00]	36.4 1.43] 36.4 1.43] MOUNTING HOLES TYP 136.8 136.8	D
<u> </u>	DRAWING TOLERANCES	С
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Air Cooled Scroll Liquid Chiller -YORK YLAA R410A 50Hz & 60Hz

1. GENERAL

1.01. GENERAL REQUIREMENTS

The requirements of this Section shall conform to the general provisions of the Contract, including General and Supplementary Conditions, Conditions of the Contract, and Contract Drawings.

1.02. SCOPE

Provide Microprocessor controlled, multiple scroll 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 liquid connections
- 5. Manufacturer start-up

1.03. QUALITY ASSURANCE

A. Products shall be Designed, Tested, Rated and Certified in accordance with, and Installed in compliance with applicable sections of the following Standards and Codes:

- 1. AHRI 550/590 Water Chilling Packages Using the Vapor Compression Cycle
- 2. AHRI 370 Sound Rating of Large Outdoor Refrigerating and Air-Conditioning Equipment
- 3. ANSI/ASHRAE 15 Safety Code for Mechanical Refrigeration
- 4. ANSI/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 70 National Electrical Code (N.E.C.)
- 7. ASME Boiler and Pressure Vessel Code, Section VIII, Division 1
- 8. OSHA Occupational Safety and Health Act
- 9. Manufactured in facility registered to ISO 9001
- 10. Conform to Intertek Testing Services for construction of chillers and provide ETL/cETL Listed Mark

B. Factory Run Test: Chiller shall be pressure-tested, evacuated and fully charged with refrigerant and oil, and shall be factory operational run tested with water flowing through the vessel.

C. Chiller manufacturer shall have a factory trained and supported service organization.

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 shipment or twelve (12) months from date of start-up, whichever occurs first.

1.04. DELIVERY AND HANDLING

A. Unit shall be delivered to job site fully assembled with all interconnecting refrigerant piping and internal wiring ready for field installation and charged with refrigerant and oil by the Manufacturer.

B. Provide protective covering over vulnerable components for unit protection during shipment. Fit nozzles and open ends with plastic enclosures.

C. Unit shall be stored and handled per Manufacturer's instructions.



2. PRODUCTS

2.01. CHILLER MATERIALS AND COMPONENTS

A. General: Install and commission, as shown on the schedules and plans, factory assembled, charged, and tested air cooled scroll compressor chiller(s) as specified herin. Chiller shall be designed, selected, and constructed using a refrigerant with Flammability rating of "1", as defined by ANSI/ASHRAE STANDARD 34 Number Designation and Safety Classification of Refrigerants. Chiller shall include not less than two refrigerant circuits above 50 tons (200kW), scroll compressors, direct-expansion type evaporator, air-cooled condenser, refrigerant, lubrication system, interconnecting wiring, safety and operating controls including capacity controller, control center, motor starting components and special features as specified herin or required for safe, automatic operation.

B. Cabinet: External structural members shall be constructed of heavy guage, galvanized steel 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".

C. Operating Characteristics: Provide low and high ambient temperature control options as required to ensure unit is capable of operation from 30°F to 115°F (-1°C to 46°C) ambient temperature. [Optional: -10°F to 125°F (-23°C to 52°C) ambient.]

D. Service Isolation valves: Discharge (ball type) isolation valves factory installed per refrigerant circuit. Includes a system high-pressure relief valve in compliance with ASHRAE15.

E. Pressure Transducers and Readeout Capability

- 1. Discharge Pressure Transducers: Permits unit to sense and display discharge pressure.
- 2. Suction Pressure Transducers: Permits unit to sense and display suction pressure.

3. High Ambient Control: Allows units to operate when the ambient temperature is above 115°F (46°C). Includes discharge pressure transducers

2.02. COMPRESSORS

A. Compressors: Shall be hermetic, scroll-type, including:

- 1. Compliant design for axial and radial sealing.
- 2. Refrigerant flow through the compressor with 100% suction cooled motor.
- 3. Large suction side free volume and oil sump to provide liquid handling capability.
- 4. Compressor crankcase heaters to provide extra liquid migration protection.

5. Annular discharge check valve and reverse vent assembly to provide low-pressure drop, silent shutdown and reverse rotation protection.

- 6. Initial oil charge.
- 7. Oil level sight glass.
- 8. Vibration isolator mouonts for compressors.
- 9. Brazed-type connections for fully hermetic refrigerant circuits.

10. Compressor Motor overloads capable of monitoring compressor motor current. Provides extra protection against compressor reverse rotation, phase-loss and phase-imbalance.

2.03. REFRIGERANT CIRCUIT COMPONENTS

Each refrigerant circuit shall include: a discharge service ball type isolation valve, high side pressure relief, liquid line shutoff valve with charging port, low side pressure relief device, filter-drier, solenoid valve, sight glass with moisture indicator, thermostatic expansion valves, and flexible, closed-cell foam insulated suction line and suction pressure transducer.



A. Evaporator:

1. Evaporator shall be brazed-plate stainless steel construction capable of refrigerant working pressure of 650 psig (3103 kPa) and liquid side pressure of 150 psig (1034 kPa) [Option for 300 psig (2068 kPa) available].

2. Brazed plate heat exchangers shall be UL listed.

3. Exterior surfaces shall be covered with 3.4" (19mm), flexible, closed cell insulation, thermal conductivity of 0.26k ([BTU/HR-Ft² - °F]/in.) maximum.

4. Water nozzles shall be provided with grooves for field provided ANSI/AWWA C-606 mechanical couplings.

5. Evaporator shall include vent and drain fittings and thermostatically controlled heaters to protect to -20°F (-29°C) ambient in off-cycle.

6. A 20-mesh, serviceable wye-strainer and mechanical couplings shall be provided for field installation on evaporator inlet prior to startup.

7. Evaporator shall be provided with piping extension kit and mechanical couplings to extend liquid connection from evaporator to edge of unit. Thermal dispersion type flow switch shall be factory installed in the evaporator outlet pipe extension and wired to the unit control panel. Insulation and heat trace on piping shall be responsibility of installing contractor. Extension kit nozzle connections shall be ANSI/AWWA C-606 (grooved).

B. Air-cooled Condenser:

1. Coils: Condenser coils shall be constructed of a single material to avoid galvanic corrosion due to dissimilar metals. Coils and headers are brazed as one piece. Integral sub cooling is included. Coils shall be designed for a design working pressure of 650 PSIG (45 bar). Condenser coil shall be washable with potable water under 100 psi (7 bar) pressure.

2. Low Sound Fans: Shall be 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 and low sound. Each fan shall be provided in an individual compartment to prevent crossflow during fan cycling. Guards of heavy gauge, PVC (poly- vinylchloride) coated or galvanized steel shall be factory installed.

3. Fan Motors: High efficiency, direct drive, 6 pole, 3 phase, insulation class "F", current protected, Totally Enclosed Air-Over (TEAO), rigid mounted, with double sealed, permanently lubricated, ball bearings.

2.05. CONTROLS

A. General: Automatic start, stop, operating, and protection sequences across the range of scheduled conditions and transients.

B. Power/Control Enclosure: Rain and dust tight NEMA 3R powder painted steel cabinet with hinged, latched, and gasket sealed door.

C. Microprocessor Control Center:

1. Automatic control of compressor start/stop, anti-coincidence and anti-recycle timers, automatic pumpdown at system shutdown, condenser fans, evaporator pump, evaporator heater, unit alarm contacts, and chiller operation from -10°F to 125°F (-23°C to 52°C) ambient. Automatic reset to normal chiller operation after power failure.

2. Software stored in non-volatile memory, with programmed setpoints retained in lithium battery backed realtime-clock (RTC) memory for minimum 5 years.

3. Forty character liquid crystal display, descriptions in English (or Spanish, French, Italian, or German), numeric data in English (or Metric) units. Sealed keypad with sections for Setpoints, Display/Print, Entry, Unit Options & clock, and On/Off Switch.

4. Programmable Setpoints (within Manufacturer limits): display language; chilled liquid temperature setpoint and range, remote reset temperature range, daily schedule/holiday for start/stop, manual override for servicing, low and high ambient cutouts, low liquid temperature cutout, low suction pressure cutout, high discharge pressure cutout, anti-recycle timer (compressor start cycle time), and anti-coincident timer (delay compressor starts).

5. Display Data: Return and leaving liquid temperatures, low leaving liquid temperature cutout setting, low ambient temperature cutout setting, outdoor air temperature, English or metric data, suction pressure cutout



setting, each system suction pressure, liquid temperature reset via a 4-20milliamp or 0-10 VDC input, anti-recycle timer status for each compressor, anti-coincident system start timer condition, compressor run status, no cooling load condition, day, date and time, daily start/stop times, holiday status, automatic or manual system lead/lag control, lead system definition, compressor starts/operating hours (each), status of hot gas valves, evaporator heater and fan operation, run permissive status, number of compressors running, liquid solenoid valve status, load & unload timer status, water pump status.

6. System Safeties: Shall cause individual compressor systems to perform auto shut down; manual reset required after the third trip in 90 minutes. System Safeties include: high discharge pressure, low suction pressure, high pressure switch, and motor protector. Compressor motor protector shall protect against damage due to high input current or thermal overload of windings.

7. Unit Safeties: Shall be automatic reset and cause compressors to shut down if low ambient, low leaving chilled liquid temperature, under voltage, and flow switch operation.

8. Alarm Contacts: Low ambient, low leaving chilled liquid temperature, low voltage, low battery, and (per compressor circuit): high discharge pressure, and low suction pressure.

9. BAS Communications: YORKTalk 2, BACnet MS/TP, Modbus and N2 communication capabilities are standard.

D. 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.

2.06. POWER CONNECTION AND DISTRIBUTION

A. Power Panels:

1. NEMA 3R/12 rain/dust tight, powder painted steel cabinets with hinged, latched, and gasket sealed outer doors. Provide main power connection(s), control power connections, compressor and fan motor start contactors, current overloads, and factory wiring.

2. Power supply shall enter unit at a single location, be 3 phase of scheduled voltage, and connect to individual terminal blocks per compressor. Separate disconnecting means and/or external branch circuit protection (by Contractor) required per applicable local or national codes.

B. Compressor, control and fan motor power wiring shall be located in an enclosed panel or routed through liquid tight conduit.

2.07. ACCESSORIES AND OPTIONS

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

A. Microprocessor controlled, Factory installed Across-the-Line type compressor motor starters as standard.

- B. Low Ambient Control: Permits unit operation to -10°F ambient. Standard unit controls to 30°F ambient.
- C. Power Supply Connections:

1. Single Point Circuit Breaker: Single point Terminal Block with Circuit Breaker and lockable external handle (in compliance with Article 440-14 of N.E.C.) can be supplied to isolate power voltage for servicing. Incoming power wiring must comply with the National Electric Code and/or local codes.

D. Control Power Transformer: Converts unit power voltage to 120-1-60 (500 VA capacity). Factory-mounting includes primary and secondary wiring between the transformer and the control panel.

E. Protective Chiller Panels (Factory or Field Mounted)

1. Louvered Panels (full unit): Painted steel as per re- mainder of unit cabinet, to protect condenser coils from incidental damage, visually screen internal components, and prevent unauthorized access to internal components.

F. Thermal Dispersion Flow Switch (Factory installed and wired in piping extension kit): Normally open, 30bar pressure rating, stainless steel 316L construction, IP67, -4°F to 158°F ambient rating.



G. Evaporator options:

1. Provide 1-1/2"" evaporator insulation in lieu of standard 3/4".

H. Hot Gas By-Pass: Permits continuous, stable operation at capacities below the minimum step of unloading to as low as 5% capacity (depending on both the unit & operating conditions) by introducing an artificial load on the evaporator. Hot gas by-pass is installed on only one refrigerant circuit.

I. Sound Reduction (Factory installed):

- 1. Ultra Quiet Low speed, reduced noise fans
- 2. Compressor Acoustic Sound Blankets
- J. Vibration Isolation (Field installed):

3. EXECUTION

3.01. INSTALLATION

A. General: Rig and Install in full accordance with Manufacturer's requirements, Project drawings, and Contract documents.

B. Location: Locate chiller as indicated on drawings, including cleaning and service maintenance clearance per Manufacturer instructions. Adjust and level chiller on support structure.

C. Components: Installing Contractor shall provide and install all auxiliary devices and accessories for fully operational chiller.

D. Electrical: Coordinate electrical requirements and connections for all power feeds with Electrical Contractor (Division 16).

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

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