



Division of Finance and Business Operations

Procurement & Strategic Sourcing  
5700 Cass Avenue, suite 4200  
Detroit, Michigan 48202  
(313) 577-3734  
FAX (313) 577-3747

February 27, 2014

Dear Vendors:

Wayne State University invites you to submit your Best Educational Pricing on the Pre-Purchase of the New Knapp Building Chillers for the University's **Facilities Planning & Management** per the specifications, drawings and requirements contained in this Request for Quotation, entitled: **Knapp Building Chiller Replacement**. Instructions to Bidders are as follows:

- Responses are to be on this request for quotation form only. Additional documents may be submitted: However, This form must be completed in full.
- Bidders that are unable to supply a specific item are encouraged to write "NO BID" on that line. Substitutions are not allowed!
- Bidders are to note expected time of delivery for each line if the order is to ship as a partial.
- All prices will be considered FOB Destination unless otherwise indicated. If prices are Shipping Point please indicate total transportation charges.
- This order will be awarded as a total package and not on a line item basis.
- Your reply must be received in the WSU Purchasing Office **by e-mail** no later than **4:00 PM** on **March 6, 2014. NO LATE BIDS WILL BE ACCEPTED**

Bidding documents may be obtained by vendors from the University Purchasing Web Site at [http://www.forms.purchasing.wayne.edu/Adv\\_bid/Adv\\_bid.html](http://www.forms.purchasing.wayne.edu/Adv_bid/Adv_bid.html) beginning **February 27, 2014**. When visiting the Web Site, click on the "MRO" link in green. If you are interested in participating in this process, you must submit your quotation to Procurement & Strategic Sourcing by e-mail no later than **March 6, 2014** as follows:

**E-mail: [Rfp@wayne.edu](mailto:Rfp@wayne.edu) and be sure your subject line reads "(company name) RFQ Knapp Building Chiller Replacement Pre-Purchase 2014 Response"**

**No Late Bids will be accepted**

Enclosed are our requirements and bid sheet for the purchase of **Pre-Purchase Knapp building Chillers**.

You must bid using the format shown in Schedule A. Vendors Quotation should include the following:

- Price Summary, signed by authorized agent of Vendors Company/Firm – please see **Schedule A**
- Vendor Profile (including at least 3 references)
- Exceptions/Restrictions (if any)

The electronic submission should be limited to no more than one of each of the following file types: 1 Word Document and/or 1 Excel Workbook and/or 1 PDF document, with a total file size less than **20 megabytes**.

We look forward to receiving your quotation on or before **March 6, 2014**. Should you have any questions or concerns about this invitation, please contact me by **e-mail at [Ac2843@wayne.edu](mailto:Ac2843@wayne.edu) (copy to Kimberly Tomaszewski, Email: [RFPteam1@wayne.edu](mailto:RFPteam1@wayne.edu))**. Thank you for your interest in doing business with Wayne State University.

Sincerely,

**Loretta McClary**  
**Senior Buyer**



## **Information for Vendors**

The Calendar of Events is as follows:

<u>Activity</u>	<u>Responsibility</u>	<u>Date</u>
Formal Release of RFQ	Purchasing (PD)	<b>February 27, 2014</b>
<u>Questions due to Procurement &amp; Strategic Sourcing</u>	<u>VENDORS</u>	<b><u>March 3, 2014, no later than 12:00 (noon)</u></b>
<u>Delivery of Quotations by e-mail to: Rfp@wayne.edu and be sure your subject line reads "(company name) RFQ Knapp Building Chiller Replacement Pre-Purchase 2014 Response"</u>	<u>VENDORS</u>	<b><u>March 6, 2014 by 4:00 p. m.</u></b>
<u>Announcement of Selected VENDOR</u>	<u>PD</u>	<u>Week of <b>March 19, 2014</b></u>
<u>Readiness for Service/Contract Commencement</u>	<u>VENDORS</u>	<u>Week of <b>March 21, 2014</b></u>
<u>Delivery and Acceptance</u>	<u>VENDORS/ET</u>	<b>May 1, 2014</b>

The University will make every effort to adhere to the above schedule. It is subject however, to time extensions. This would be in the event that further clarification of responses or terms of contract are in the best interest of the University and in the event the University requires more time to assure that the selection of the Vendor is in accordance with its policies, rules and regulations as well as actual timing needs.

Wayne State University (hereafter referred to as UNIVERSITY) is a national research university with an urban teaching and service mission. It is a constitutionally autonomous public university with 13 schools and colleges, has an enrollment of approximately 31,000 students, and has an alumni roster of over 235,000. It is rated among the top 4 percent of all colleges and universities nationwide as classified by the Carnegie Commission.

Expenses for developing and presenting quotes shall be the entire responsibility of the Vendor and shall not be chargeable to the University. All supporting documentation and manuals submitted with this quotation will become the property of the University unless otherwise requested by the Vendor, in writing, at the time of submission, and agreed to, in writing, by the University.

Upon request, **VENDOR must agree to provide** a minimum of **three (3) qualified references**. Requests for references will come from **Loretta McClary, Senior Buyer**, and will be treated as confidential and not added to the publicly permanent RFP file.

References are to be from organizations that have successfully utilized the products and services. The references supplied should include the name and address of the organization, and the contact name(s), titles, e-mail, and the telephone numbers.

### **Failure to agree to this will result in disqualification of your bid**

Vendor selected shall have an excellent track record for providing services for the size and scope of our project as outlined and shall provide WAYNE STATE UNIVERSITY with a top priority commitment. Quotations are to remain in effect a minimum of 120 days from the date of submission. A statement to this effect should be contained in the VENDOR'S cover letter.

## **Quotation Evaluation**



1. Quotations will be evaluated and award will be based on the VENDOR'S ability to offer the best value (technical quality, past performance and price), and on anticipated quality of service for the following principal elements:

- Ability to meet all mandatory requirements and specifications of this RFP;
- Cost of Services; Compensation and Fees; (Schedule A);
- Financial Strength of the VENDOR;
- Quotation Documentation / Presentation;
- VENDOR'S Experience (Exhibit 2);
- VENDOR Profiles/References; (Exhibit 2);
- VENDOR Service Plan; (Exhibit 3);

**NOTE: Evaluation Criteria are in alphabetical order and are not stated in order of preference.**

VENDOR quotations will be evaluated by an evaluation team consisting of members of the UNIVERSITY'S Purchasing and **the Facilities Planning & Management**. A preliminary screening will be used to identify competitive VENDORS who have met the mandatory requirements. Procurement & Strategic Sourcing may subsequently request selected VENDORS to make a presentation at a set time and date, to clarify information provided in the quotations. Final consideration, evaluation, and recommendation may be made at this point. However, the UNIVERSITY reserves the right to take additional time for reference review, site visits and/or quotation negotiations.

2. To qualify for evaluation, a VENDOR'S quotation must be responsive, must have been submitted on time and must materially satisfy all **mandatory requirements** identified throughout the RFP. To be considered responsive, a quotation must be reasonable and substantially conform in the judgment of the UNIVERSITY to all of the specified requirements in the RFP. **Any deviation from requirements indicated herein must be stated in the quotation specifically under the category "Restricted Services", and clearly identified as Exhibit 1.** Otherwise it will be considered that quotations are in strict compliance with all requirements, and any successful VENDOR will be held responsible therefor.
3. If there are portions of any quotation the UNIVERSITY finds unacceptable or otherwise in need of clarification or revision, the UNIVERSITY reserves the right to negotiate with any or all VENDORS. Should the outcome of evaluations result in a recommendation, any resultant contract shall be subject to the approval of the UNIVERSITY'S General Counsel and be approved and signed by the appropriate UNIVERSITY representative.

**The UNIVERSITY reserves the rights to accept, reject, modify, and/or negotiate any and all quotations received in conjunction with the Request for Quotation.** It reserves the right to waive any defect or informality in the Quotations on the basis of what it considers to be in its best interests. Any quotation which the UNIVERSITY determines to be incomplete, conditional, obscure, or has irregularities of any kind, may be rejected.

This Request for Quotation (RFQ) in no manner obligates the UNIVERSITY to the eventual purchase of any products or services described, implied, or which may be proposed, until confirmed by written agreement, and may be terminated by the UNIVERSITY without penalty or obligation at any time prior to the signing of an Agreement or Purchase Order.

Vendors must refrain from giving any reference to this program, whether in the form of press releases, brochures, photographic coverage, or verbal announcements, without specific written approval from the University.

Quotations are subject to public review after the contracts have been awarded. VENDORS responding to this RFQ are cautioned not to include any proprietary information as part of their Quotation unless such proprietary information is carefully identified as such in writing, and the UNIVERSITY accepts, in writing, the information as proprietary.



You must **email your responses to** our secure mailbox at **rfp@wayne.edu** and **be sure your subject line reads “(company name) RFQ Knapp Building Chiller Replacement Pre-Purchase 2014 Response”**. Remember, your bids must be in the format provided and be received in the Procurement & Strategic Sourcing by **March 6, 2014 by 4:00 p.m.** Please submit your bids in the format provided on the quote sheet. Include any supplemental information that will illustrate the features of the vehicles proposed.

If you have any questions regarding this bid, please contact **Loretta McClary** by email at **Ac2843@wayne.edu** (**copy to Kimberly Tomaszewski, Email: RFPteam1@wayne.edu**).

Sincerely,

**Loretta McClary, Senior Buyer**

Attachment:

- Cost Schedule A
- Insurance Requirements Schedule B
- WSU Standard Terms & Conditions of Purchase



## SCHEDULE A - PRICE SCHEDULE

Purchase of **Pre-Purchase Knapp building Chillers.**

Purchase of **Chiller:**

**Please Note:**

- Warranty must be assigned to the University.
- Chiller Supplier is to coordinate delivery with the Contractor.
- The University will issue 75% payment with the consent of the Contractor.
- WSU Standard Terms & Conditions applies to this pre-purchase and can be found on our website at [http://www.purchasing.wayne.edu/docs/po\\_terms.pdf](http://www.purchasing.wayne.edu/docs/po_terms.pdf)

Anticipated Quantity	Item	Unit Price	Manufacturer
<b>2</b>	Chiller per the specifications provided	\$ _____	
<b>Maintenance</b>	3 Years of routine service and maintenance	\$ _____	

Payment Schedule	Requirements / Qualifications	Total Cost	Payment Price
<b>75% Payment</b>	Upon damage free delivery of the Chiller and all accessories, and approval of the Contractor	\$ _____	\$ _____
<b>100% Payment</b>	Upon proof of successful operation, check, test and start-up	\$ _____	\$ _____

**Email your responses to Loretta McClary, at [Rfp@wayne.edu](mailto:Rfp@wayne.edu) and be sure your subject line reads "(company name) RFQ Knapp Building Chiller Replacement Pre-Purchase 2014 Response". Remember, your bids must be in the format provided and be received in the Procurement & Strategic Sourcing by **March 6, 2014 by 4:00 p.m****

**The Undersigned Bidder affirms that the Chiller is in full compliance with bid specifications of the Request for Quotation Documents and agrees to the above payment schedule.**

Company Name: \_\_\_\_\_

Address: \_\_\_\_\_

Telephone: ( \_\_\_\_\_ ) \_\_\_\_\_

Fax: ( \_\_\_\_\_ ) \_\_\_\_\_

Email address: \_\_\_\_\_

Submitted by: \_\_\_\_\_

Signature \_\_\_\_\_

(Title)

(Date)

## Schedule B - INSURANCE REQUIREMENTS (Rev 11-2012)

\_\_\_\_\_, at its sole expense, shall cause to be issued and maintained in full effect for the term of this agreement, insurance as set forth hereunder:

### General Requirements

<u>Type of Insurance</u>	<u>Minimum Requirement</u>
1. Commercial General Liability (CGL) CGL insurance should be written on ISO form CG 00 01 (or equivalent substitute)	\$1,000,000 combined single limit \$2,000,000 annual aggregate
2. Commercial Automobile Liability (including hired and non-owned vehicles)	\$1,000,000 combined single limit per accident for bodily injury and property damage, without annual aggregate.
3. Workers' Compensation (Employers' Liability)	Required by the State of Michigan and Employer's Liability in the amount of \$500,000 per accident for bodily injury or disease.

### Maximum Acceptable Deductibles

<u>Type of Insurance</u>	<u>Deductible</u>
Comprehensive General Liability	\$5,000
Comprehensive Automobile Liability	0
Workers' Compensation	0
Property - All Risk	\$1,000

### Coverage

1. All liability policies must be written on an occurrence form of coverage.
2. Commercial General Liability (CGL) includes, but is not limited to: consumption or use of products, existence of equipment or machines on location, and contractual obligations to customers.
3. The Board of Governors of Wayne State University shall be named as an additional insured, but only with respect to accidents arising out of said contract.
4. The additional insured provision shall contain a cross liability clause as follows: "The insurance afforded applies separately to each insured against whose claim is made or suit is brought, except with respects to the limits of the company's liability."

### Certificates of Insurance

1. Certificates of Insurance naming Wayne State University / Office of Risk Management as the certificate holder and stating the minimum required coverage must be forwarded to the Office of Risk Management to be verified and authenticated with the agent and/or insurance company.
2. Certificates shall contain a statement from the insurer that, for this contract, the care, custody or control exclusion is waived.
3. Certificates shall be issued on a ACORD form or one containing the equivalent wording, and require giving WSU a thirty (30) day written notice of cancellation or material change prior to the normal expiration of coverage.
4. Revised certificates must be forwarded to the Office of Risk Management thirty (30) days prior to the expiration of any insurance coverage listed on the original certificate, as follows:

Wayne State University  
Office of Risk Management  
5700 Cass Avenue, Suite 4622 AAB  
Detroit, MI 48202

**Specific Requirements-** Individual contracts may require coverage in addition to the minimum general requirement such as, business interruption, higher limits and or blanket fidelity insurance.

**Exception to the insurance requirements** is to be approved, in writing, by the Office of Risk Management. Exceptions are determined by the type and nature of the contract and the individual contractor.

**WAYNE STATE UNIVERSITY  
STANDARD TERMS AND CONDITIONS OF PURCHASE**

1. **ACCEPTANCE:** This order expressly limits acceptance to the terms and conditions stated herein. Any purported acceptance containing additional or different terms will not operate as an acceptance of this offer to purchase. Seller's shipment of goods or provision of services in response to this order shall constitute acceptance of the terms and conditions set out herein, notwithstanding any additional or different terms contained in any acknowledgement form submitted by Seller.
2. **TITLE AND RISK OF LOSS:** The title and risk of loss of the goods shall not pass to Buyer until Buyer receives and takes possession of the goods at the point or points of delivery.
3. **PLACE OF DELIVERY:** The place of delivery shall be that set forth in the block of the Purchase order entitled "Ship To". Any change thereto shall be effected by modification as provided for in Clause 5, Modification.
4. **PRICE:** This order shall not be filled at prices higher than specified herein Any change in price must be accepted and acknowledged, by a written Purchase Order Amendment, by Buyer.
5. **MODIFICATION:** Modification, rescission or amendment of this order or the contract of sale resulting from its acceptance shall be ineffective unless approved by written Purchase Order Amendment, by an authorized representative of the Wayne State University Purchasing Department.
6. **CHANGES:** Buyer reserves the right at any time to make changes in drawings, specifications, quantities, and delivery schedules as to any goods and/or work covered by this order. Such changes, to be binding on either Buyer or Seller, must be made by a written Purchase Order Amendment to this order. Any differences in price or time for performance resulting from such changes shall be equitably adjusted and shown on the Purchase Order Amendment.
7. **ASSIGNMENT:** Seller shall not, in any manner, delegate its duty of performance or assign its rights or obligations under this order without the prior written consent of the Buyer.
8. **PERFORMANCE:** Deliveries of goods or services ordered hereunder are to be made both in quantities and at the times specified by the Buyer. Buyer shall have the right (a) to cancel the order without liability this order if shipment is not made in accordance with such schedules for quantities or time periods; and (b) to refuse to accept delivery if shipments are made in advance of schedules herein or if quantities are in excess of this order.
9. **CANCELLATION:** Buyer reserves the right to cancel in whole or in part the contract resulting from the acceptance of this order if the Seller becomes insolvent; files a voluntary petition in bankruptcy, or an involuntary petition is filed to have Seller declared bankrupt and is not vacated within thirty (30) days from the date of filing; a Receiver or Trustee for Seller is appointed and such appointment is not vacated within thirty (30) days of the date thereof; Seller executes an assignment for benefit of creditors; or if Seller breaches any of the terms hereof including the warranties of Seller.
10. **INSPECTION:** Payment for the goods or services furnished hereunder shall not constitute acceptance thereof All goods are subject to Buyer's inspection, at the source if deemed necessary or required by government regulation. Inspection at the source may be made when deemed necessary by the Buyer If any of the goods are found at any time to be defective in material or workmanship, or otherwise not in conformity with the requirements of this order, Buyer, in addition to any other rights which it may have under warranties or otherwise, shall have the right to reject or re- turn such goods (plus inbound transportation charges if bought F.O.B. shipping point) at Seller's expense, and such goods are not to be replaced without written authorization by Buyer.
11. **WARRANTIES:** Seller represents and warrants that the articles supplied under this order are free from defects and conform to specifications herein and are fit for the purpose for which such goods are ordinarily employed, except if stated in a Special Condition, in which case the material must then fit that particular purpose Seller further warrants and represents that all goods and materials delivered herein are free and clear of all liens, claims or encumbrances of any kind.
12. **INFRINGEMENTS:** Seller agrees to protect, hold, and save harmless Buyer against all claims for patent, trademark, copyright, or franchising infringement arising from the purchase, installation, or use of material ordered on this order, and to assume all expense and damage arising from such claims.
13. **GOVERNING LAW:** This order, or any agreement of sale, or service resulting from its acceptance shall be governed by and construed according to the laws of the State of Michigan.
14. **NON-DISCRIMINATION:** By acceptance of this order the Seller certifies that it will comply with all applicable provisions of Executive Order 11246, as amended, Section 503 of the Rehabilitation Act of 1973, as amended, and the Vietnam Era Veterans' Readjustment Assistance Act of 1974, as amended, (38 U.S.C. 4212) and Implementing regulations at 41 CFR Chapter 60, and pertinent State/Federal statutes and regulations providing for equal opportunity in employment regardless of race, sex, color, national origin, age, or physical handicap, except as to physical handicap where there exists a bona-fide occupational qualification.
15. **GOVERNMENT REGULATION:** In furnishing goods or services covered by this order, Seller agrees to comply with the provisions of all applicable federal, state and local laws, rules, regulations, ordinances and orders.
16. **FAIR LABOR STANDARDS ACT:** Seller agrees, in connection with the production of the articles specified herein to comply with all applicable requirements of Section 6, 7 and 12 of the Fair Labor Standards Act, as amended, and of regulations and orders of the United States Department of Labor issued under Section 14 thereof.
17. **ADVERTISING:** Seller shall not, in any manner, advertise or publish the fact that Seller has contracted to furnish Buyer the goods/services herein ordered and for failure to observe this provision, Buyer shall have the right to terminate this order without any obligations to accept deliveries after the date of termination or make further payments except for completed articles delivered prior to termination. Buyer shall have the right to return any and all goods delivered for full refund in the event the Seller violates this clause.
18. **SELLER'S LIABILITY:** Seller assumes the entire responsibility and liability for losses, expenses, damages, demands and claims in connection with or arising out of any personal injury or alleged personal injury (including death) and/or damage or destruction or alleged damage or destruction to property sustained or alleged to have been sustained in connection with or to have arisen out of the performance of the work by Seller, its agents, employees, subcontractors and consultants, save and except for liability as may result from, or in connection with or to have arisen out of the negligent performance of the work by or willful misconduct of Buyer. Seller shall indemnify and hold harmless Buyer, its officers, agents, and employees from any and all liability for such losses, expenses, damages, demands, and claims and shall defend any suit or action brought against any or all of them based on an alleged personal injury or damage and shall pay any damages, costs and expenses including attorney fees in connection with or resulting from such suit or action.
19. **Sales Tax:**  
Wayne State University is a tax exempt Institution  
Tax Free Registry Number  
38-6028429
20. **PROHIBITION AGAINST PERSONAL INTEREST IN CONTRACTS:** Seller acknowledges that no officer or employee of the Buyer may have a financial interest, direct or indirect, in any contract with the Buyer, or shall be financially interested, directly or indirectly, in the sale to the Buyer of any land, materials, supplies, or service, except on behalf of the Buyer as an officer or employee.

**INSTRUCTIONS**

**SHIPPING AND MARKINGS:** All material shall be suitably packed, marked, and shipped in accordance with the requirements of common carriers in a manner to secure lowest transportation cost and no additional charge shall be made to the Buyer therefor unless otherwise stated on the face of the Purchase Order No charge shall be made by the Seller for drayage or storage, unless otherwise stated on the face of the Purchase Order Unless otherwise specified herein, Seller shall properly mark each package with Buyer's order number, and where multiple packages comprise a single shipment, each package shall also be consecutively numbered. Purchase order number, package number and receiving location shall be shown on packing slips, bills of lading and Invoices.

**PACKING SLIPS:** Enclose packing slip itemizing contents with each shipment.

**INVOICES:** Must show our Purchase Order number, and cash and transportation terms. Invoices improperly rendered may be returned for correction without loss of discount Cash Discount will be computed from date of Invoice.

**BILLS OF LADING:** Show our Purchase Order number, and number of containers. If shipping raw materials, also show number of containers in each lot If transportation is FOB origin and transportation charges are for our account, ship at value that will produce lowest transportation cost.





**MEP Engineers LLC**

Mechanical | Electrical | Plumbing  
Engineering & Construction Services

**ISSUED FOR BID**



**WATER COOLED MODULAR WATER CHILLER**

**Pre- Purchase Guide Specifications  
Scroll Compressor Liquid Chillers**

**Size Range: 40 to 46 Tons**

**Refer to attached sheet M-2 with Chillers Schedule**

**PART 1 – GENERAL**

Vendors to provide a complete package of water cooled modular chillers as specified below and including dual scroll compressors, single evaporator, single water cooled condenser for each chiller, control panel with through-the-door non-fused disconnect, three-phase fuses, motor starter, safety controls, water piping, refrigerant piping, wiring, mounted on steel base ready for connection to system chilled water piping and electrical power source to replace existing chillers.

**1.01 SYSTEM DESCRIPTION**

Microprocessor controlled liquid –cooled condenser liquid chiller utilizing scroll type compressor.

**1.02 QUALITY ASSURANCE**

- A. Chiller modules shall be completely factory assembled, wired and tested prior to shipment.
- B. All units shall be ASHRAE 90.1 compliant.
- C. Chillers shall shut down on condenser high pressure, condenser low pressure, low or no chilled water flow, low leaving chilled water temperature and compressor motor overload.
- D. Unit shall be ETL and ETL, Canada certified.
- E. Chiller shall comply with the requirements of ANSI/ASHRAE Standard 15 - Safety Code for Mechanical Refrigeration latest revision and NEC.
- F. 60-Hz unit performance shall be rated per ARHI Standard 550/590, latest edition (U.S.A.) at standard rating conditions. All other unit performance shall be based on ARHI Standard 550/590, latest edition.
- G. Unit shall be certified in accordance with ISO 9001:2000 manufacturing quality standard.





### **1.03 DELIVERY, STORAGE AND HANDLING**

- A. Unit shall be shipped factory-assembled with all piping and wiring, pre-charged with a complete operating charge of R410A and shall be stored and handled according to manufacturer's recommendations.
- B. Unit controls shall be capable of withstanding 150°F storage temperature in the control compartment.
- C. Chiller and starter should be stored indoors, protected from construction dirt and moisture. An inspection should be conducted under shipping tarps, bags, or crates to be sure water has not collected during transit. Protective shipping covers should be kept in place until machine is ready for installation. The inside of the protective cover should meet the following:
- D. Temperature is between 40°F and 120°F and Relative humidity between 10% and 80% (non-condensing).

### **1.04 SUBMITTALS:**

- A. Shop Drawings: No equipment shall be shipped from stock or fabricated until shop drawings have been reviewed by the Owner's Engineer. Review is only for general conformance with the design concept of the project and general compliance with the information given in this package.
- B. Operation and Maintenance Manuals: Shall be provided complete in electronics and hard copy as required by the owner including complete schematic drawings.

## **PART 2 – PRODUCTS**

### **2.01 MODULAR CHILLERS**

- A. Provide a complete packaged water chiller unit including: dual scroll compressors, single evaporator, single water cooled condenser, NEMA 4 control panel with through-the-door non-fused disconnect, three-phase fuses, motor starters, safety controls, water piping, refrigerant piping, wiring, mounted on steel base ready for connection to system chilled water piping and electrical power source.
- B. WARRANTY - Factory authorized start up first year parts and labor warranty, second year parts only with additional three (3) year parts warranty only on the compressor.



- C. MODULAR CHILLER BANK – Shall consist of two chiller modules with dual compressors in the Bank connected by common headers across the back. The Bank of chiller modules shall be capable of continuing to operate in the event of a failure of one of the chiller modules.
- D. REMOVABLE FOR SERVICE – Any chiller module in the Bank shall be designed to be physically removed for service (electrically and mechanically) without interrupting the operation of the Chiller Bank. Each chiller module shall have an integral non-fused disconnect in the control panel so that each chiller can be electrically isolated for service without interrupting the remaining chillers. Each chiller module shall have a system of manually-operated or motorized valves capable of isolating that module from the main Chiller Bank header, such that the module can be pulled from the Bank without draining the chiller system. Main Chiller Bank headers must be arranged outside of the module frames such that physical removal of one module does not required disassembly or draining of the header. Any system that does not allow for physical removal of one module while the Chiller Bank continues to operate is NOT acceptable.
- E. EASE OF INSTALLATION – Each chiller module shall be designed to fit through a 36” doorway and have cutouts in the base frame to fit for a fork lift or pallet truck. The chiller modules shall be shipped complete with headers and panels to facilitate a fast and easy installation. Chiller headers must be removable for moving through narrow halls and in fitting in small elevators.
- F. CHILLER MODULE CONTROLLER – Chiller module controller shall monitor all operating and fault conditions of the individual chiller module, display them in English on the door-mounted display, and communicate all of these points to the system Remote Master.
- G. EVAPORATOR – Each chiller module shall be equipped with high efficiency dual-circuit brazed plate evaporator with 316 stainless steel plates and copper brazing, insulated with not less than ¾” flexible elastomeric insulation. Evaporator shall be UL tested and certified.
- H. CONDENSER – Each chiller module shall be equipped with high efficiency dual-circuit evaporator with stainless steel plates and copper brazing. Condenser shall be UL tested and certified.
- I. REFRIGERATION SYSTEM – Each chiller module shall contain two independent refrigeration circuits each with liquid line sight glass moisture indicator and thermal expansion valve. Suction line insulated with flexible elastomeric insulation.



- J. EVAPORATOR WATER HEADERS - Branch headers shall be fabricated from Schedule 40 steel pipe roll-grooved and insulated with not less than  $\frac{3}{4}$ " flexible elastomeric insulation, and equipped with inlet and outlet lever operated butterfly valves, and inlet and outlet water temperature sensors with brass wells. EACH CHILLER MODULE shall be provided with its own flow switch and inlet and outlet temperature sensors to prevent freezing of the evaporator.
- K. CONDENSER WATER HEADERS - Branch headers shall be fabricated from Schedule 40 steel pipe roll-grooved, and equipped with inlet and outlet lever-operated butterfly valves, and inlet and outlet water temperature sensors with brass wells (on heat pump and heat reclaim chillers), Branch headers shall be connected to 6" or 8" Schedule 40 condenser water main headers.
- L. CHILLER CONTROL PANEL - NEMA (EEMAC) 4-12 control panel shall be complete REFRIGERANT 410A - Provide each chiller with a full charge of refrigerant and oil. Refrigerant pressures (high and low) are displayed on the chiller controller display.
- M. COMPRESSORS – Each chiller module shall be equipped with high efficiency scroll compressors with oil-level sight glass, and solid state internal thermal protection, rubber mounted to the chiller module frame. Each compressor must be provided with circuit breaker or in-line fuses.
- N. Control Panel shall come with door-mounted non-fused disconnect switch, chiller on-off switch, power on light, compressor fuses, compressor contactors, and chiller PLC controller module. Panel shall come pre-wired to compressors, safety controls, and sensors.
- O. FRAME: Chiller base formed shall be formed from 12 gauge galvanized steel with bolted assembly, with 20 gauge stainless steel front panel; 20 gauge galvanized steel side and top panels.

## 2.02 **CONTROLS:**

CHILLER MODULE CONTROLLER – Chiller module controller shall monitor all operating and fault conditions of the individual chiller module, display them in English on the door-mounted display, and communicate all of these points to the system Remote Master controller that shall communicate with THE EXISTING HONEYWELL CONTROL SYSTEM based on their current protocol.



A. Unit controls shall include the following minimum components:

1. ON/OFF control switch.
2. Thermistor to measure evaporator entering and leaving fluid temperatures.
3. Microprocessor.
4. Power and control circuit terminal blocks.
5. Terminal block for temporary and/or permanent interface to the existing building system control.

B. Microprocessor with non-volatile memory. (Battery backup system might not be accepted).

C. Pressure transducer to calculate saturated condensing temperature & saturated suction temperature.

D. Replaceable solid-state relay panels and controllers.

E. Control transformer to serve all controllers, contactors, relays, and control components.

F. Terminals shall be provided in the control box for wiring of accessory field-installed condenser temperature sensors.

G. Provision for field installation of accessory sensor to measure compressor return gas temperature (suction gas thermistor).

H. Unit controls shall be capable of performing the following functions:

1. Capacity control based on leaving chilled fluid temperature and compensated by rate of change of return-fluid temperature.
2. Leaving chilled fluid temperature reset from return fluid.
3. Dual chiller control for parallel chiller applications
4. Limiting of the chilled fluid temperature pull-down rate at start-up to 1° F/min to prevent excessive demand spikes at start-up.



## **2.03 DIAGNOSTICS:**

- A. The control panel shall include, as standard, a scrolling display capable of indicating the safety lockout condition by displaying a code for which an explanation may be scrolled at the display.
- B. Information included for display shall be:
  - 1. Evaporator freeze protection.
  - 2. Thermistor malfunctions.
  - 3. Compressor lockout.
  - 4. Loss of charge.
  - 5. Low fluid flow.
  - 6. Circuit suction and discharge pressure.
  - 7. Entering and leaving-fluid temperature.
- C. Display module, in conjunction with the microprocessor, must also be capable of displaying the output of a service test.
- D. Diagnostics shall include the ability to review a list of the 20 most recent alarms with clear language descriptions of the alarm event.
- E. An alarm history buffer shall allow the user to store no less than 20 alarm events with clear language descriptions, time and date stamp event entry.
- F. The control system shall allow software upgrade without the need for new hardware modules.
- G. The chiller controller shall include a connection port for communicating with the local equipment network.



## **2.04     UNIT SAFETY:**

A. Unit shall be equipped with sensors and all necessary components in conjunction with the control system to provide the unit with the following protections:

1.     Loss of refrigerant charge protection.
2.     Low fluid flow detection.
3.     Low chilled fluid temperature protection.
4.     Low control voltage (to unit) protection.
5.     High-pressure switch.
6.     Reverse rotation.
7.     Overcurrent protection.
8.     Loss of phase.

B. Compressors shall be equipped with the following protections:

1.     High discharge temperature protection.
2.     Electrical overload through the use of definite-purpose contactors and motor overload protection through internal compressor overload or external current overload.
3.     Circuit breakers shall open all 3 phases in the event of an overload in any one phase (single-phasing condition).
4.     Circuit breakers for short circuit protection.

## **2.05     STARTUP SERVICE**

A. Factory-authorized service representative has been engaged by the Owner to perform startup service. Assist with start-up as required.

## **2.06     DEMONSTRATION**

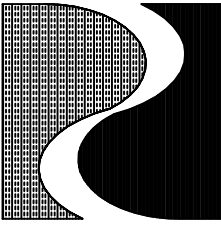
A factory-authorized service representative has been engaged to train Owner's maintenance personnel to adjust, operate, and maintain water chillers. Assist with training as required.

-----End of Pre-Purchased Specification-----

PRE-PURCHASED MODULAR CHILLER SCHEDULE																															
TAG #	MANUFACTURER	MODEL NO.	LOCATION	SERVICE	NOMAINAL CAP (TON)	NOMAINAL CAP (BTUH)	EVAPORATOR					CONDENSER				COMPRESSOR					ELECTRICAL (CHILLER)					ELECTRICAL (CONTROL CIRCUIT)			TOTAL SYSTEM CAPACITY TON	NOTES / ACCESSORIES	
							CHILLED WATER				FOULING FACTOR HR XSQ FT X F / BTU	WATER				TYPE	FULL LOAD KW/TON	TOTAL COMP. POWER KW	HPLV	EER	TYPE OF REFRIGERANT	VOLT	PHSE	HZ	MCA (AMPS)	MOCp (AMPS)	VOLT	PHSE			HZ
							ENT (F)	LVG (F)	GPM	PRESSURE DROP (FT)		ENT (F)	LVG (F)	GPM	PRESSURE DROP (FT)																
CH-1	XXXXX	XXXX	MECH. ROOM B-3	SF-1, 2, 3 & 4	40.0	480000	55	45	100	10.1	0.0001	85	95	125	11.0	SCROLL	0.727	30.5	21.1	16.3	R410A	208	3	60	142	200	120	1	60	80 (BASED ON 2 OPERATING MODULES)	A B C D E F G
CH-2	XXXXX	XXXX	MECH. ROOM B-3	SF-1, 2, 3 & 4	40.0	480000	55	45	100	10.1	0.0001	85	95	125	11.0	SCROLL	0.727	30.5	21.1	16.3	R410A	208	3	60	142	200	120	1	60		
CH-3	XXXXX	XXXX	MECH. ROOM B-3	SF-1, 2, 3 & 4	40.0	480000	55	45	100	10.1	0.0001	85	95	125	11.0	SCROLL	0.727	30.5	21.1	16.3	R410A	208	3	60	142	200	120	1	60	80 (BASED ON 2 OPERATING MODULES)	A B C D E F G
CH-4	XXXXX	XXXX	MECH. ROOM B-3	SF-1, 2, 3 & 4	40.0	480000	55	45	100	10.1	0.0001	85	95	125	11.0	SCROLL	0.727	30.5	21.1	16.3	R410A	208	3	60	142	200	120	1	60		
NOTES / ACCSSORIES																															
A FACTORY ASSEMBLED															APPROVED MANUFACTURER: TRANE CARRIER YORK																
B SINGLE POWER																															
C INDOOR INSTALLATION																															
D WATER COOLED CHILLER MODULES																															
E DUAL CIRCUITS PER MODULE (EACH CIRCUIT SIZED AT 20 TONS)																															
F HIGH EFFICIENCY WATER COOLED DUAL SCROLL COMPRESSOR 410 A CHILLERS.																															
G CHILLED WATER PIPING & FITTINGS SCH. 40 STEEL.																															

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sheet

M2.0

Project number  
MEP#207-3

date  
02-17-14

Issue  
description  
OWNER-REVIEW

design: K.M

drawn: S. A.

KNAPP CHILLER REPLACEMENT

WAYNE STATE UNIVERSITY

71 E FERRY, DETROIT, MICHIGAN

MECHANICAL SCHEDULES

seal