



# Request for Quote

STATE OF RHODE ISLAND AND PROVIDENCE PLANTATIONS  
 ONE CAPITOL HILL  
 PROVIDENCE RI 02908

BUYER: Cadoret, David  
 PHONE #: N/A

CREATION DATE : 16-APR-15  
 BID NUMBER: 7549509  
 TITLE: REPLACEMENT CHILLER AT THE ACE BUILDING-FURNISH, DELIVER AND START UP ONLY  
 BID CLOSING DATE AND TIME: 14-MAY-2015 10:30:00

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 DOA CONTROLLER  
 ONE CAPITOL HILL, 4TH FLOOR  
 SMITH ST  
 PROVIDENCE, RI 02908  
 US

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 DCYF MANAGEMENT & BUDGET  
 101 FRIENDSHIP ST, 4TH FLOOR  
 PROVIDENCE, RI 02903  
 US

**Requisition Number:**

Note to Bidders: QUESTIONS CONCERNING THIS SOLICITATION MAY BE E-MAILED TO THE DIVISION OF PURCHASES AT DOA.PURBIDINFO@PURCHASING.RI.GOV NO LATER THAN APRIL 29, 2015 AT 5PM (EST). PLEASE REFERENCE THE RFQ NUMBER ON ALL CORRESPONDENCE. QUESTIONS SHOULD BE SUBMITTED IN A MICROSOFT WORD ATTACHMENT. ANSWERS TO QUESTIONS RECEIVED, IF ANY, WILL BE POSTED ON THE INTERNET AS AN ADDENDUM TO THIS SOLICITATION (WWW.PURCHASING.RI.GOV). IT IS THE RESPONSIBILITY OF ALL INTERESTED PARTIES TO DOWNLOAD THIS INFORMATION.

THIS IS ONLY TO FURNISH, DELIVER AND START UP (INSTALL BY OTHERS). INCLUDE ALL CHARGES IN BID PRICE. NO ADDITIONAL CHARGES WILL BE ACCEPTED.

Line	Description	Quantity	Unit	Unit Price	Total
1	REPLACEMENT CHILLER AT THE ACE BUILDING, 735 NEW LONDON AVE, CRANSTON AS PER ATTACHED SPECIFICATIONS. THIS IS ONLY TO FURNISH, DELIVER AND START UP (INSTALL BY OTHERS). INCLUDE ALL CHARGES IN BID PRICE. NO ADDITIONAL CHARGES WILL BE ACCEPTED.	1.00	Each		

Delivery: \_\_\_\_\_

Terms of Payment: \_\_\_\_\_

It is the Vendor's responsibility to check and download any and all addenda from the RIVIP. This offer may not be considered unless a signed RIVIP generated Bidder Certification Cover Form is attached and the Unit Price column is completed. The signed Certification Cover Form must be attached to the front of the offer



State of Rhode Island  
Department of Administration / Division of Purchases  
One Capitol Hill, Providence, Rhode Island 02908-5855  
Tel: (401) 574-8100 Fax: (401) 574-8387

**BID 7549509-REPLACEMENT CHILLER AT THE ACE BUILDING  
FURNISH, DELIVER AND START UP ONLY  
ADDITIONAL INFORMATION**

The State of Rhode Island through its, Department of Administration, Division of Purchases, is soliciting bid proposals for the equipment and services described in Attachment A and Attachment B attached. This bid is for a 52 Ton Air Cooled Chiller Package that at minimum meets the specifications of the Trane Air Cooled Scroll package included as Attachment A and the engineering specifications listed in Attachment B.

Vendor is responsible for delivery and startup of the equipment. The installation will be by others through a separate procurement.

The current chiller failed last season, so delivery is crucial to this procurement. Any proposal must indicate lead time from order to delivery.

# Attachment A

**Tag Data - Air-Cooled Scroll (Qty: 1)**

Item	Tag(s)	Qty	Description	Model Number
A1	CH-1	1	Air-Cooled Chiller, Scroll Compressors	CGAM052A2**2AXD2A1A1A1AXXA1D1A4XXAXX XB1A5A1D1X-L-X

**Product Data - Air-Cooled Scroll****Item: A1 Qty: 1 Tag(s): CH-1**

Air-Cooled Scroll Packaged Chiller  
 Startup Included - Trane Service must start equipment for warranty to be honored  
 52 nominal tons  
 60 hertz  
 208 volt 3 phases  
 High efficiency/performance  
 Full factory refrigerant charge (HFC-410A)  
 With freeze protection (External T-STAT control)  
 Refrigerant isolation valves (discharge valve)  
 UL listed to US and Canadian safety standard  
 ASHRAE 90.1 all versions compliant  
 AHRI certified  
 Factory installed flow switch - set point 60 cm/sec  
 Phase reversal protection  
 Std cooling (42 to 65F/5.5 to 18C)  
 Grooved pipe connection  
 Factory insulation - all cold parts  
 Performance based on water  
 Wide ambient (0 to 125F/-18 to 52C)  
 Lanced aluminum fins  
 Across the line starter/direct on line  
 Single point power connection  
 Circuit breaker-high fault rated control panel  
 Enclosure type UL 1995 rated for outdoor applications  
 BACnet interface  
 Programmable relays  
 High A short circuit rating  
 Elastomeric isolators  
 With water strainer factory installed  
 Comprehensive acoustic package  
 Architectural louvered panels  
 2nd-5th year compressor parts  
 1st year labor warranty

**Performance Data - Air-Cooled Scroll**

Tags	CH-1
Capacity (tons)	49.60
Unit power input (kW)	60.40
Full load efficiency (EER)	9.9
NPLV (EER)	15.3
IPLV (EER)	15.0
Sound power level (dBA)	87
Sound pressure level (dBA)	61
Refrigerant	R410A
Refrigerant charge circuit 1 (lb)	32.0
Refrigerant charge circuit 2 (lb)	32.0
Oil charge circuit 1 (gal)	1.74
Oil charge circuit 2 (gal)	1.74
Evap entering temp (F)	55.00
Evap leaving temp (F)	45.00
Evap flow rate (gpm)	118.70
Min evap flow rate (gpm)	73.50
Min flow PD evap+strainer (ft H2O)	6.80

Tags	CH-1
Max evap flow rate (gpm)	176.40
Max flow PD evap+strainer (ft H2O)	36.10
Evap fluid freeze point (F)	32.00
Evap press drop (ft H2O)	13.20
Total PD evap+strainer (ft H2O)	17.00
Evap fouling factor (hr-sq ft-deg F/Btu)	0.00010
Saturated evap temp circuit 1 (F)	38.20
Saturated evap temp circuit 2 (F)	38.20
Ambient air temperature (F)	95.00
Elevation (ft)	0.00
Saturated cond temp circuit 1 (F)	126.70
Saturated cond temp circuit 2 (F)	126.70
Compressor power input (kW)	55.50
RLA - compressor 1A (A)	50.60
LRA - compressor 1A (A)	315.00
RLA - compressor 1B (A)	50.60
LRA - compressor 1B (A)	315.00
RLA - compressor 2A (A)	50.60
LRA - compressor 2A (A)	315.00
RLA - compressor 2B (A)	50.60
LRA - compressor 2B (A)	315.00
Total airflow (cfm)	37227
Number of fans ( )	4
Fan motor power (kW)	4.60
Total fan FLA (A)	27.00
Single point power MCA (A)	246.20
Single point power MOP (A)	250.00
Short circuit current rating (A)	65000.00
Number of compressors ( )	4
Number of circuits ( )	2
Capacity steps ( )	4
Shipping weight (lb)	3760.6
Operating weight (lb)	3806.0
Length (in)	114.000
Width (in)	88.600
Height (in)	84.800

**Mechanical Specifications - Air-Cooled Scroll****Item: A1 Qty: 1 Tag(s): CH-1****General**

Units are constructed of a galvanized steel frame with galvanized steel panels and access doors. Component surfaces are finished with a powder-coated paint. All paint meets the requirement for outdoor equipment of the U.S. Navy and other Federal Government Agencies. This paint finish is durable enough to withstand a 1000-consecutive-hour salt spray application in accordance with standard ASTM B117.

Each unit ships with full operating charges of refrigerant and oil.

**Compressor and Motor**

The unit is equipped with four hermetic, direct-drive, 3600 rpm 60 Hz suction gas-cooled scroll compressors. The simple design has only three major moving parts and a completely enclosed compression chamber which leads to increased efficiency. Overload protection is internal to the compressors. The compressor includes: centrifugal oil pump, oil level sight glass and oil charging valve. Each compressor will have compressor heaters installed and properly sized to minimize the amount of liquid refrigerant present in the oil sump during off cycles.

**Unit-Mounted Starter**

The control panel is designed per UL 1995. The starter is in an across-the-line configuration, factory-mounted and fully pre-wired to the compressor motor and control panel. Typically, Trane scroll compressors are up to full speed in one second when started across-the-line.

A factory-installed, factory-wired 820 VA control power transformer provides all unit control power (120 Vac secondary) and Trane CH530 module power (24 Vac secondary).

A molded case high interrupting capacity circuit breaker, factory pre-wired with terminal block power connections and equipped with a lockable external operator handle, is available to disconnect the chiller from main power.

**Power Connection**

Power connections include main three-phase power and one separate 120V, 15 amp customer provided single phase power connection is required to power the heaters (if used for freeze protection).

Short circuit current rating of 65 kA is provided.

**Evaporator**

Braze plate evaporator is made of stainless steel with copper as the braze material. It is designed to withstand a refrigerant side working pressure of 430 psig (29.6 bars) and a waterside working pressure of 150 psig (10.5 bars). Evaporator is tested at 1.1 times maximum allowable refrigerant side working pressure and 1.5 times maximum allowable water side working pressure. It has one water pass. A water strainer and a flow switch are factory installed.

Immersion heaters protect the evaporator to an ambient of -20°F (-29°C).

**Condenser**

Air-cooled condenser coils have lanced aluminum fins mechanically bonded to internally-finned copper tubing.

The condenser coil has an integral subcooling circuit. The maximum allowable working pressure of the condenser is 650 psig (44.8 bars). Condensers are factory proof and leak tested at 715 psig (49.3 bars).

Direct-drive vertical discharge condenser fans are balanced and individually protected. Three-phase condenser fan motors with permanently lubricated ball bearings and external thermal overload protection are provided.

A variable speed drive on the first fan of each circuit allows the unit to start and operate with ambient temperatures between 0.0 F and 125.0 F.

**Refrigerant Circuits**

The unit has dual refrigerant circuits. Each refrigerant circuit has Trane scroll compressors piped in parallel with a passive oil management system. A passive oil management system maintains proper oil levels within compressors and has no moving parts. Each refrigerant circuit includes filter drier, electronic expansion valve, liquid line and discharge service valves. Capacity modulation is achieved by turning compressors on and off. The unit has four capacity stages.

**Unit Controls**

The microprocessor-based control panel is factory-installed and factory-tested. The control system is powered by a

pre-wired control power transformer, and will turn on and off compressors to meet the load. Microprocessor-based chilled water reset based on return water is standard. The unit comes with a factory installed flow switch.

The Trane CH530 microprocessor automatically acts to prevent unit shutdown due to abnormal operating conditions associated with low evaporator refrigerant temperature and high condensing temperature. If an abnormal operating condition continues and the protective limit is reached, the machine will shut down.

The panel includes machine protection for the following conditions: low evaporator refrigerant temperature and pressure, high condenser refrigerant pressure, critical sensor or detection circuit faults, lost communication between modules, phase loss, phase reversal, over temperature protection, external and local emergency stop, and loss of evaporator water flow.

When a fault is detected, the control system conducts more than 100 diagnostic checks and displays results. The display will identify the fault, indicate date, time, and operating mode at time of occurrence, and provide type of reset required and a help message.

Data contained in available reports includes: water and air temperatures, refrigerant pressures and temperatures, flow switch status, EXV position, and compressor starts and run-time. All necessary settings and setpoints are programmed into the microprocessor-based controller via the operator interface. The controller is capable of receiving signals simultaneously from a variety of control sources, in any combination, and priority order of control sources can be programmed.

#### **Communications**

BACNet Interface allows the user to easily interface using BACNet MS/TP via a single twisted-pair wiring to a factory-installed and tested communication board.

#### **Programmable Relays**

Predefined, factory-installed, programmable relays allow the operation to select four relay outputs. Available outputs are: Alarm-Latching, Alarm-Auto Reset, General Alarm, Warning, Chiller Limit Mode, Compressor Running, and Tracer Control.

#### **Comprehensive Acoustic Package**

Acoustical treatment for compressors is factory installed.

#### **Architectural Louvered Panels**

Louvered panels cover the complete condensing coil and service area beneath the condenser.

#### **Isolators**

Molded elastomeric isolators, sized to reduce vibration transmission to the supporting structure when the unit is installed, ship with the chiller.

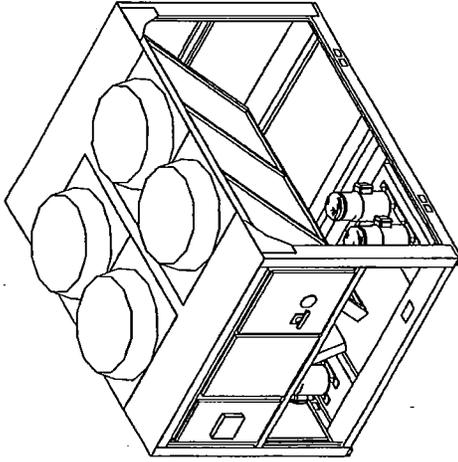
Unit Dimensions - Air-Cooled Scroll  
Item: A1 Qty: 1 Tag(s): CH-1

INLET/OUTLET WATER  
CONNECTION SIZE

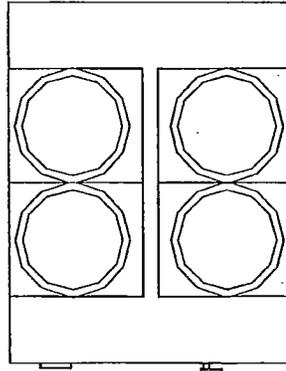
3" (80mm)

BRAZE PLATE  
WATER VOLUME/STORAGE

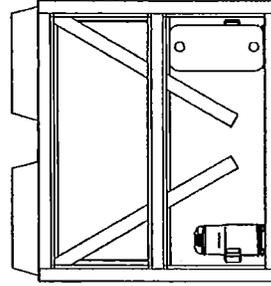
4.1 GAL (15.6 LITERS)



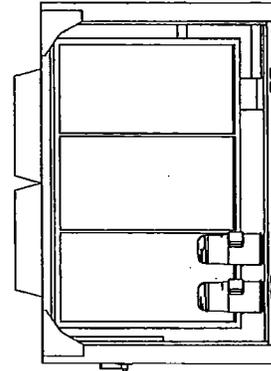
ISOMETRIC VIEW



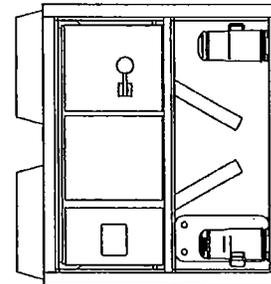
TOP VIEW



BACK VIEW

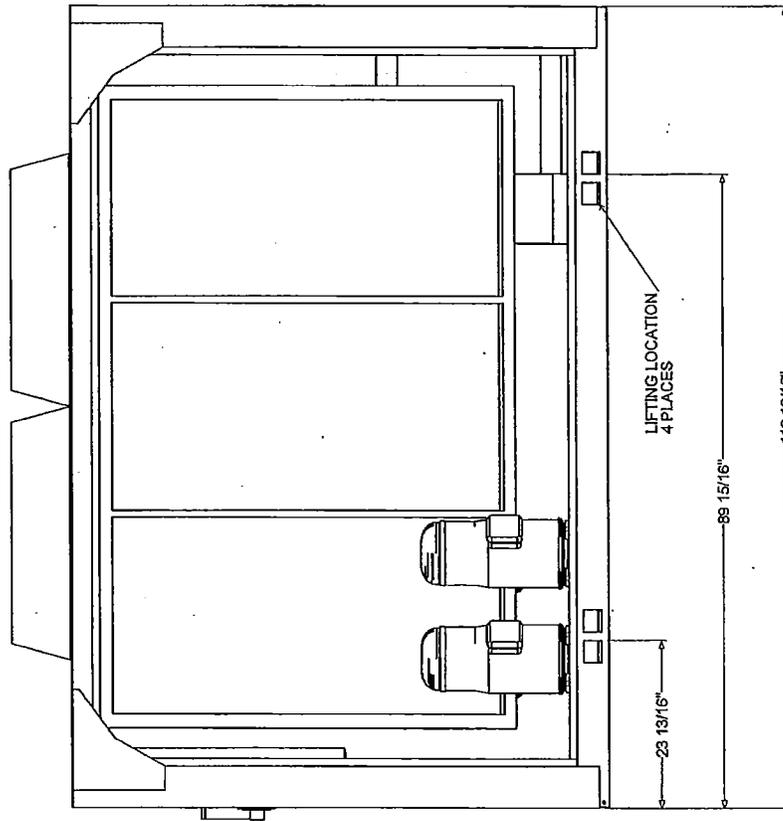


RIGHT SIDE VIEW



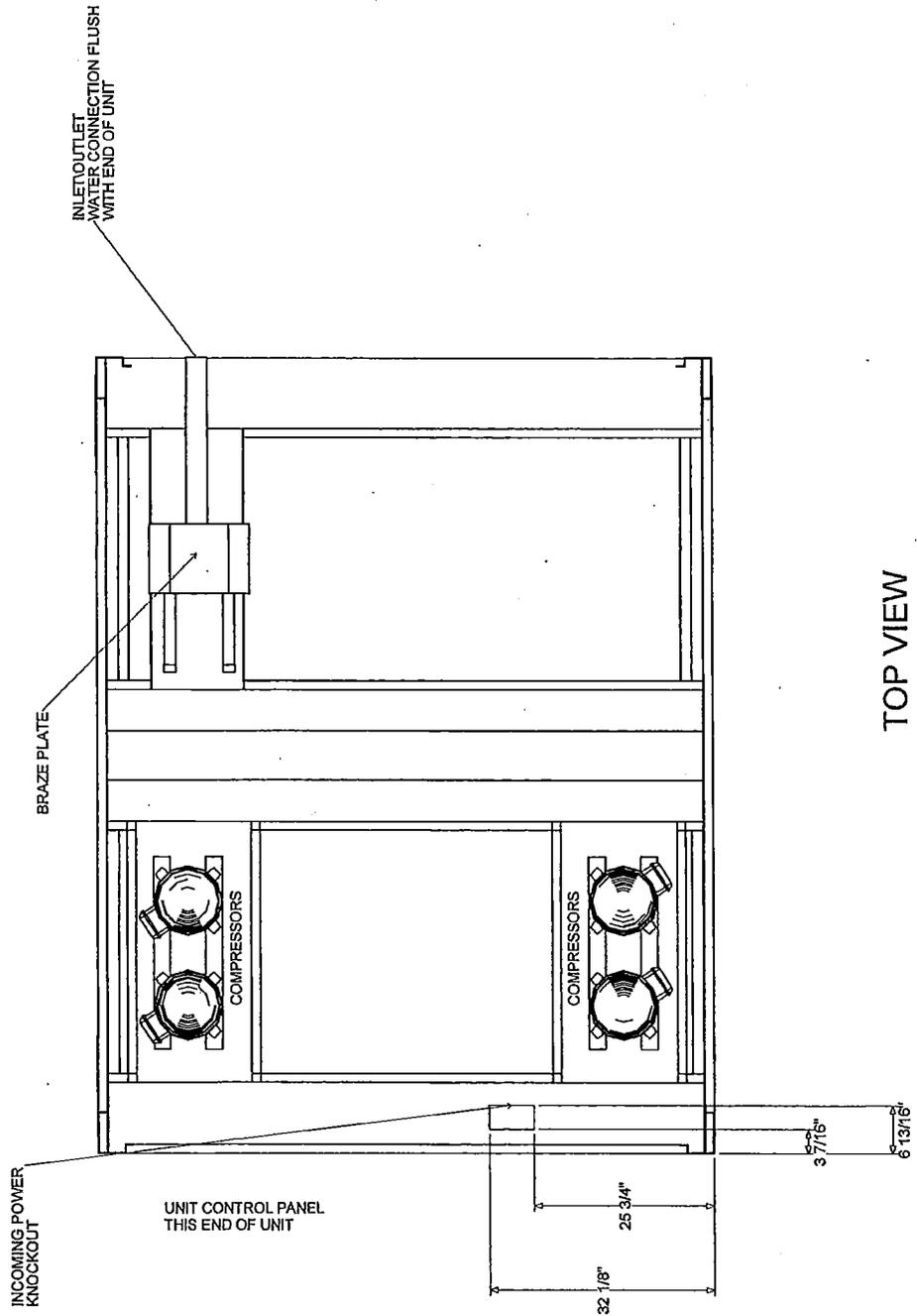
FRONT VIEW

**Unit Dimensions - Air-Cooled Scroll**  
Item: A1 Qty: 1 Tag(s): CH-1



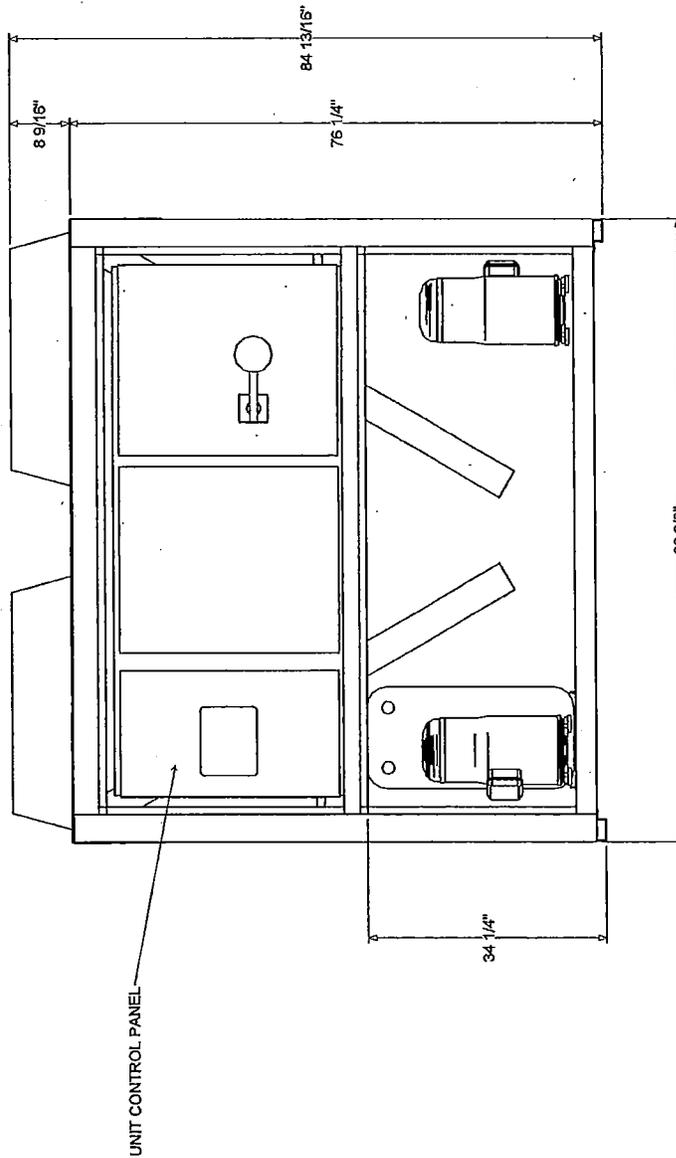
**RIGHT SIDE VIEW**

Unit Dimensions - Air-Cooled Scroll  
Item: A1 Qty: 1 Tag(s): CH-1



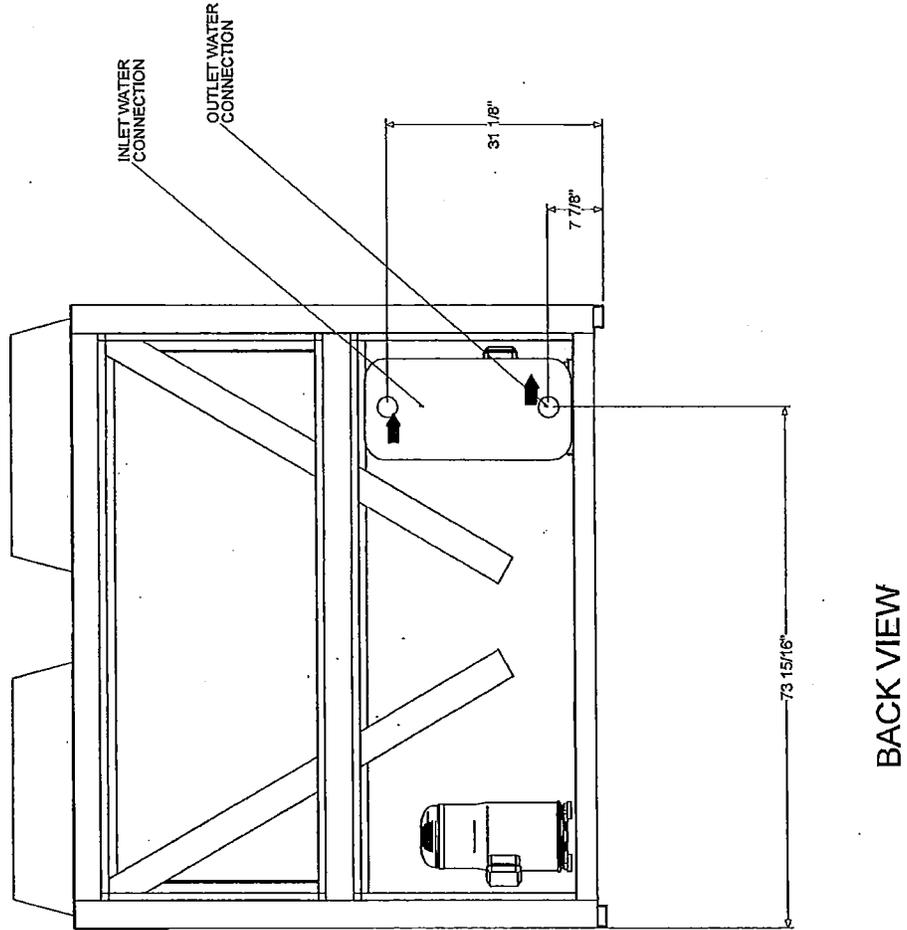
TOP VIEW  
CONDENSER, CONTROL PANEL AND  
VSD (WHEN ORDERED) REMOVED FOR CLARITY

**Unit Dimensions - Air-Cooled Scroll**  
Item: A1 Qty: 1 Tag(s): CH-1

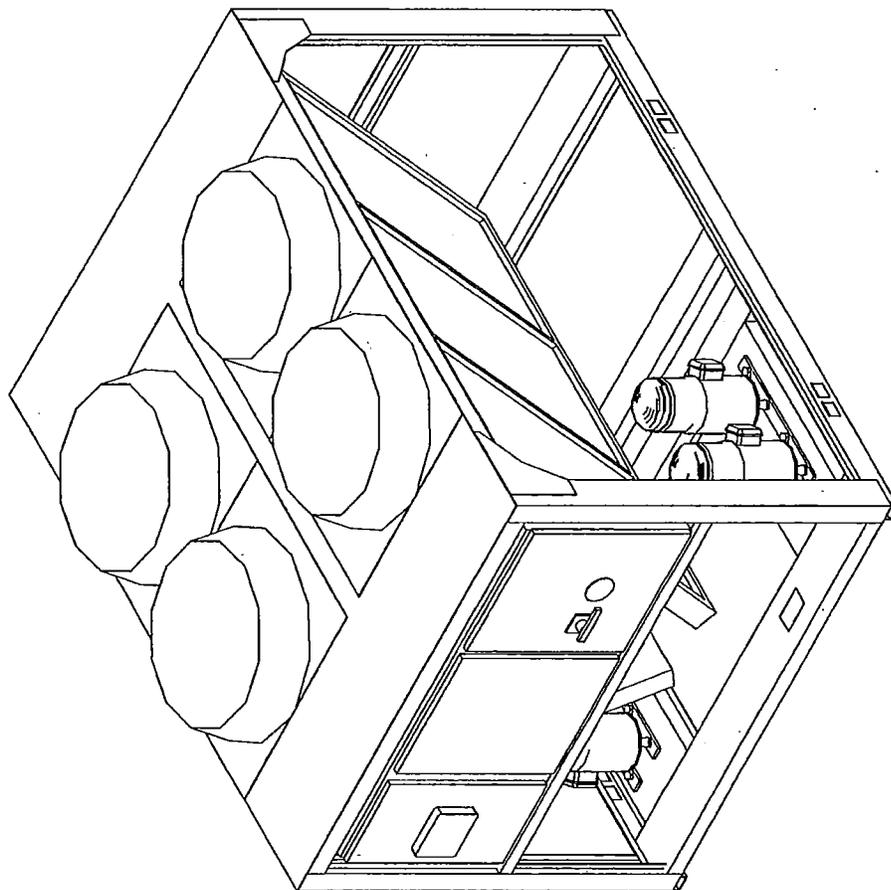


FRONT VIEW

Unit Dimensions - Air-Cooled Scroll  
Item: A1 Qty: 1 Tag(s): CH-1



Unit Dimensions - Air-Cooled Scroll  
Item: A1 Qty: 1 Tag(s): CH-1

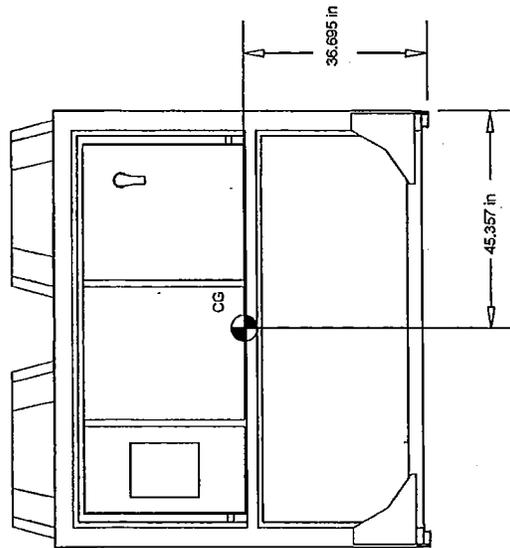


ISOMETRIC VIEW

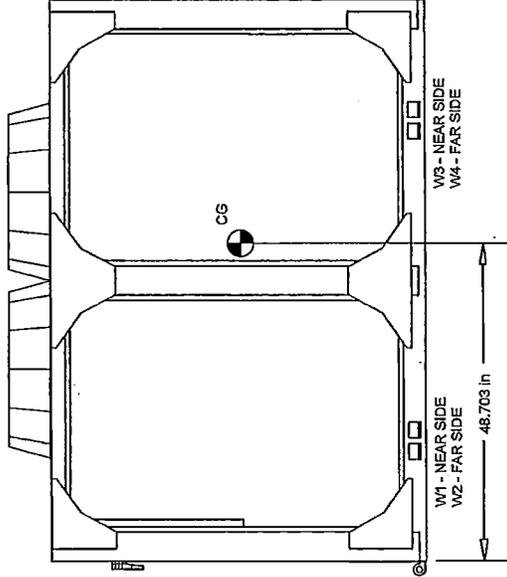
**Weight, Clearance & Rigging Diagram - Air-Cooled Scroll**  
 Item: A1 Qty: 1 Tag(s): CH-1

**UNIT CENTER OF GRAVITY**

LIFTING WEIGHTS				
W1	W2	W3	W4	SHIPPING WEIGHT
1127.0 lb	1166.1 lb	678.0 lb	701.5 lb	3760.6 lb



**FRONT VIEW  
CONTROL PANEL END**

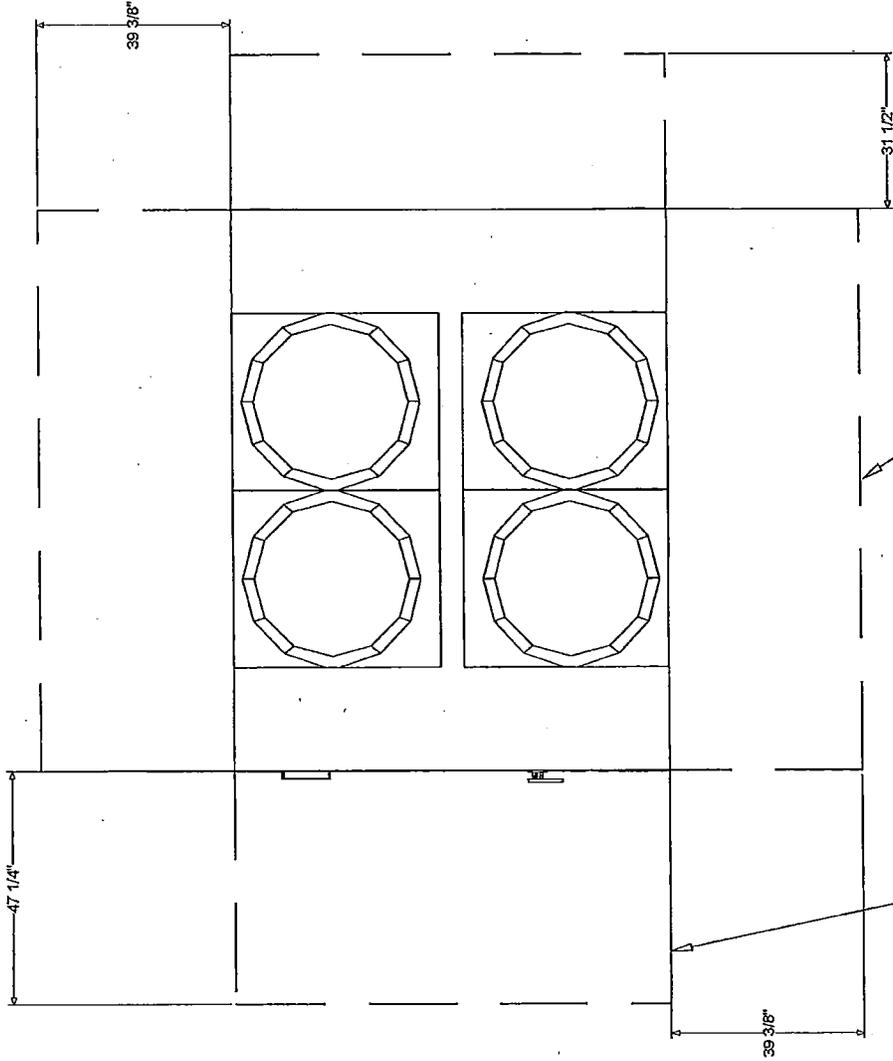


**SIDE VIEW**

**Weight, Clearance & Rigging Diagram - Air-Cooled Scroll**  
Item: A1 Qty: 1 Tag(s): CH-1

**UNIT CLEARANCE**

NO OBSTRUCTIONS ABOVE THE CONDENSER



**TOP VIEW**

FOR OBSTRUCTIONS OR MULTIPLE UNITS, REFER TO THE CLOSE SPACING BULLETIN.

**Weight, Clearance & Rigging Diagram - Air-Cooled Scroll**  
Item: A1 Qty: 1 Tag(s): CH-1

**UNIT RIGGING**

LIFTING A UNIT WITH EQUAL LENGTH STRAPS WILL NOT PRODUCE A LEVEL UNIT DURING THE LIFT BECAUSE THE CG WILL NOT BE AT THE MIDPOINT BETWEEN THE BASE LIFTING HOLES. THE FOLLOWING ADJUSTMENTS MUST BE MADE TO PRODUCE A LEVEL LIFT:

- SINGLE SPREADER BAR LIFTING METHOD  
IF THE UNIT CG IS CLOSER TO THE CONTROL PANEL, THE STRAPS ON THE CONTROL PANEL SIDE OF THE SPREADER BAR MUST BE ADJUSTED TO BE SHORTER THAN THOSE ON THE OPPOSITE SIDE OF THE SPREADER BAR, ALLOWING THE SPREADER BAR TO MOVE TOWARD THE CONTROL PANEL AND OVER THE UNIT CG. SEVERAL ADJUSTMENTS OF THE STRAP LENGTH MAY BE REQUIRED TO PRODUCE A LEVEL UNIT DURING LIFT.

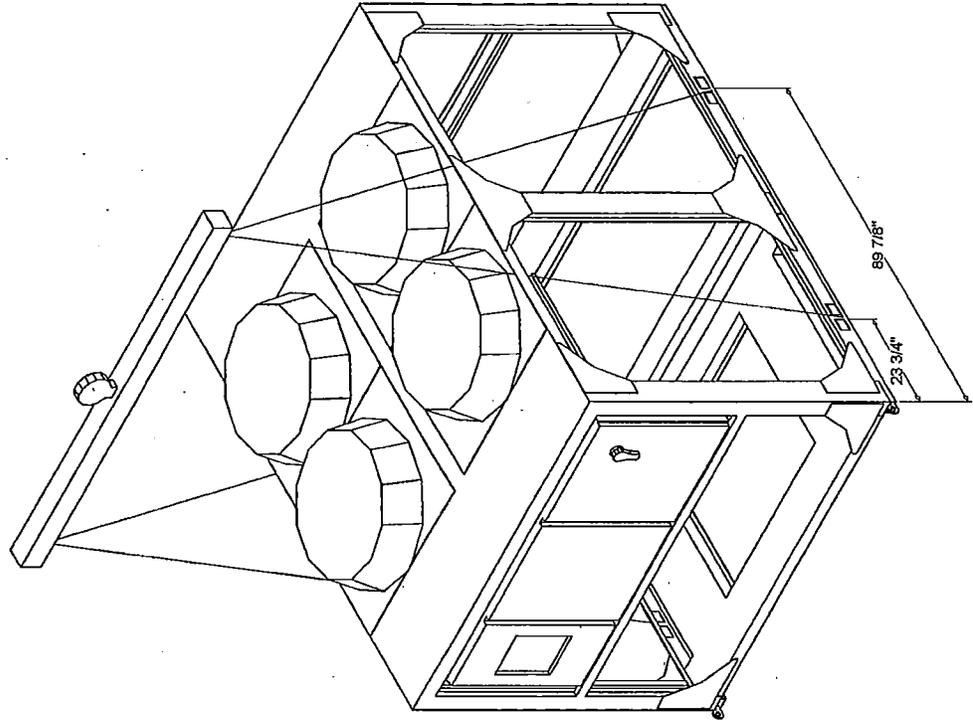
- H-TYPE SPREADER BAR LIFTING METHOD  
IF THE STRAPS FROM THE H BAR TO THE UNIT BASE ARE THE SAME LENGTH, THE CRANE LIFTING POINT ON THE CENTER WEB OF THE H BAR MUST BE ADJUSTED TO PRODUCE A LEVEL UNIT LIFT.



**WARNING**  
**IMPROPER LIFTING AND MOVING!**

USE SPREADER BAR AS SHOWN IN DIAGRAM. REFER TO INSTALLATION MANUAL OR NAMEPLATE FOR UNIT WEIGHT. REFER TO INSTALLATION INSTRUCTIONS LOCATED INSIDE CONTROL PANEL FOR FURTHER RIGGING INFORMATION.

OTHER LIFTING ARRANGEMENTS COULD RESULT IN DEATH, SERIOUS INJURY OR EQUIPMENT DAMAGE.

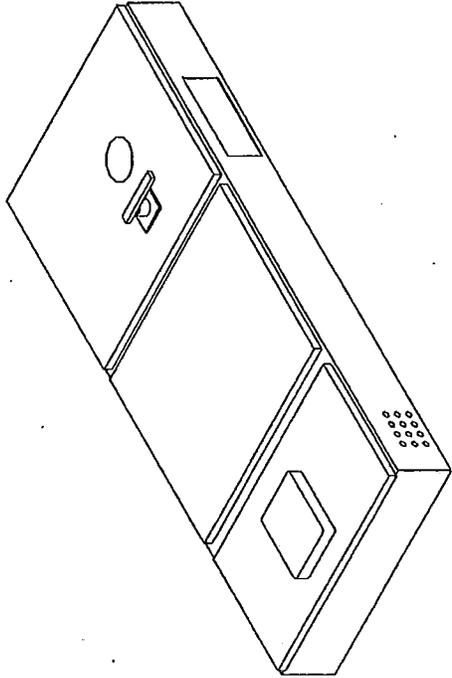


**ISOMETRIC VIEW**

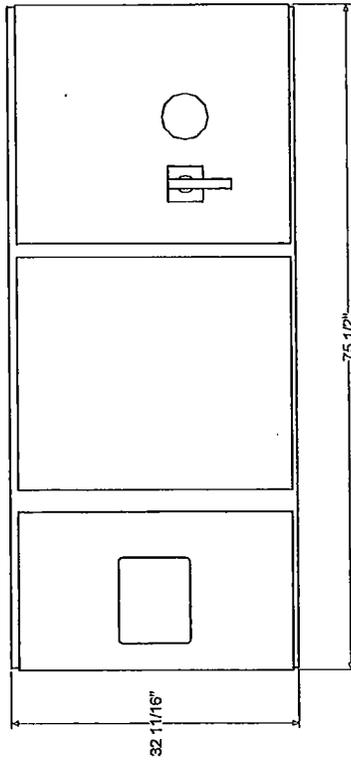
Accessory - Air-Cooled Scroll  
 Item: A1 Qty: 1 Tag(s): CH-1

SHORT CIRCUIT RATING 65KA

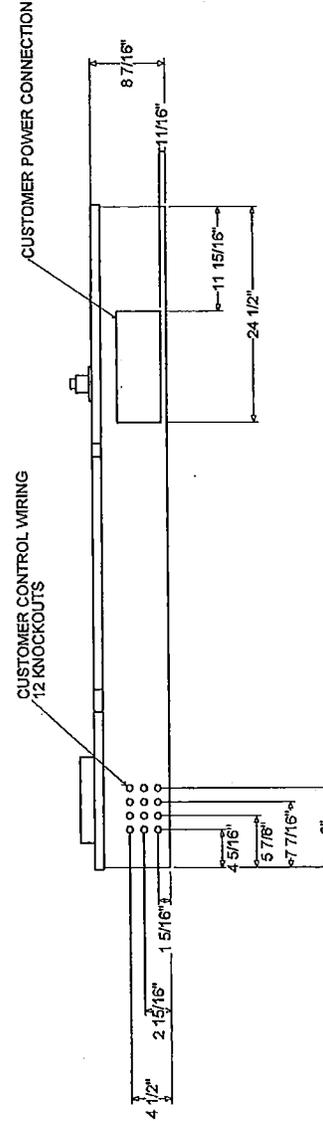
CUSTOMER WIRE SELECTION TABLE			
POWER WIRE CONNECTION TO CIRCUIT BREAKER (IQ1)			
UNIT SIZE	UNIT EFF	VOLTAGE	CIR 1 & 2 (SINGLE POINT POWER) LUG WIRE SIZE RANGE (PER PHASE)
052	HIGH	200	(1 MAX Conductor per phase) 3/0-350MCM



ISOMETRIC VIEW



FRONT VIEW



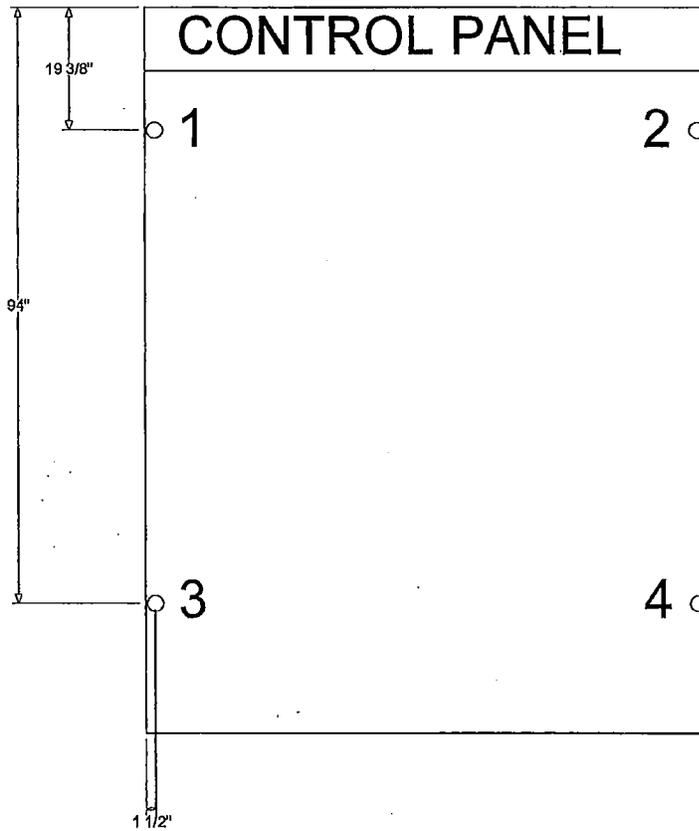
BOTTOM VIEW

**Accessory - Air-Cooled Scroll**  
**Item: A1 Qty: 1 Tag(s): CH-1**

UNIT SIZE	MOUNTING LOCATIONS & POINT LOAD WEIGHTS						TOTAL OPERATING WEIGHT
	1	2	3	4	5	6	
052	1080.5 lb	1155.4 lb	713.6 lb	768.5 lb	N/A	N/A	3806.0 lb

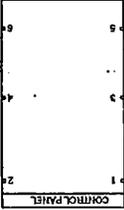
MOUNTING HOLE DIAMETER 19mm

DIMENSIONS ARE REFERENCED FROM THE END AND SIDE OF THE UNIT BASE



TOP VIEW

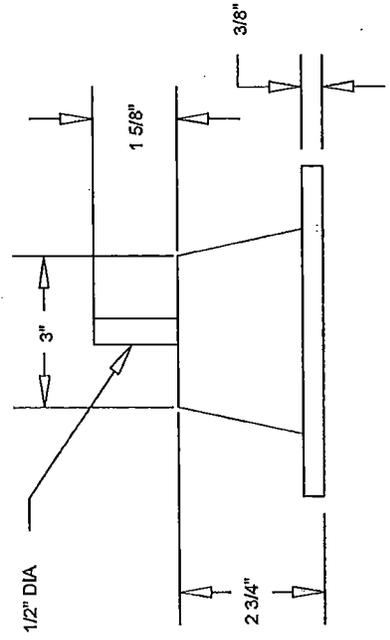
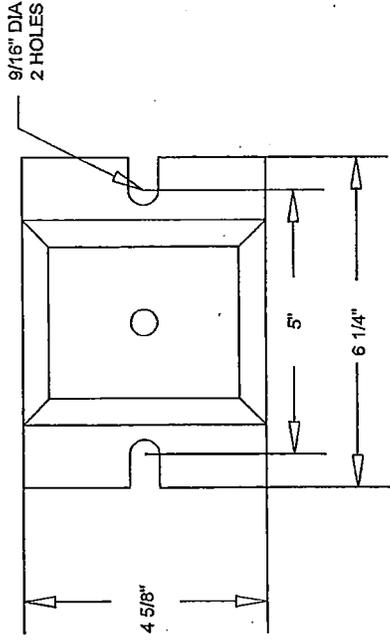
Accessory - Air-Cooled Scroll  
 Item: A1 Qty: 1 Tag(s): CH-1



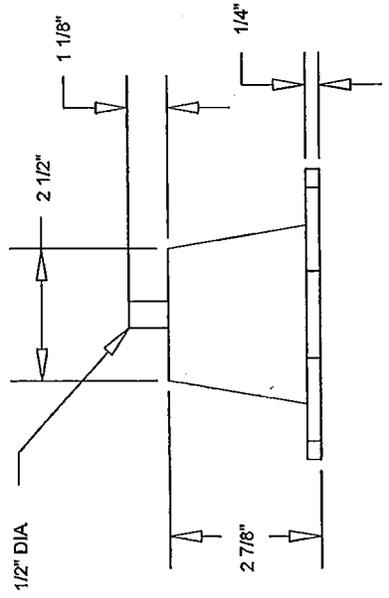
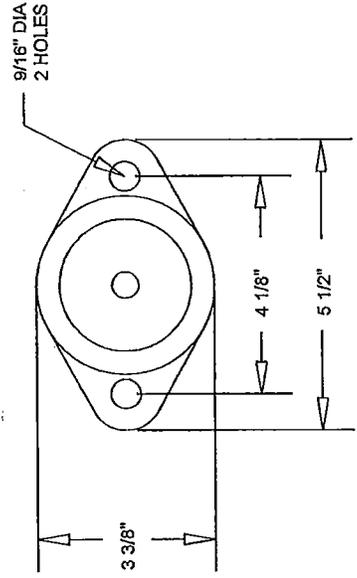
SEE ISOLATOR POINT LOADS  
 FOR DETAILED INFORMATION  
 ON ISOLATOR LOCATIONS.

UNIT SIZE	MOUNTING LOCATIONS AND ISOLATOR NUMBER					
	1	2	3	4	5	6
082	RDP-4 BRICK RED	RDP-4 BRICK RED	RDP-4 BRICK RED	RDP-4 BRICK RED	N/A	N/A

RDP-4 ISOLATORS

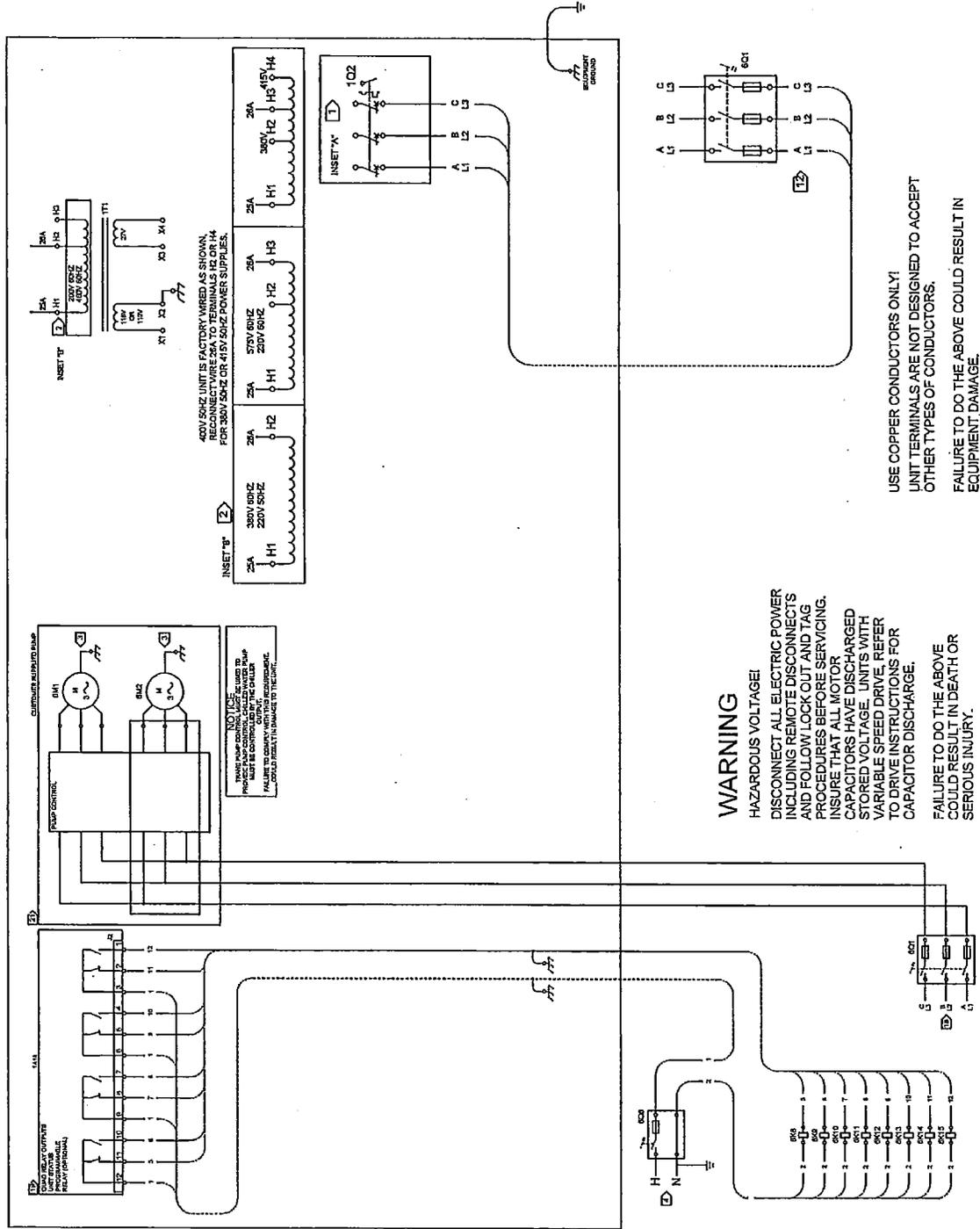


RDP-3 ISOLATORS



Field Wiring - Air-Cooled Scroll  
Item: A1 Qty: 1 Tag(s): CH-1

CONTROL PANEL  
PAGE 1 OF 2





# Attachment B

PRE-PURCHASED EQUIPMENT SPECIFICATIONS

AIR-COOLED WATER CHILLERS

PART 1 GENERAL

1.01 SCOPE

- A. The intent of this document is to provide information required for the contractor to pre-purchase this equipment in accordance to the Contract Documents. Equipment will be installed by the owner under a separate contract.
- B. Scope of work include but not be limited to:
  - 1. Purchase of equipment.
  - 2. Submittal generation.
  - 3. Receipt and storage of equipment until such a time as the owner is ready to accept delivery.
  - 4. Delivery to site as well as rigging and placement per direction of Owner.
  - 5. Processing and delivery of warranty information.
  - 6. Provide Owner Training and Factory Startup.
- C. Pre-purchased equipment shall be in compliance with this specification as well as the attached chiller equipment selection.
- D. This section includes design, performance criteria, controls and control connections, chilled water connections, electrical power connections and refrigerants of the chiller package.

1.02 REFERENCES

- A. Products shall be designed, rated and certified in accordance with applicable sections of the following Standards and Codes:
  - 1. To comply with the most recent versions of applicable Standards and

Codes of AHRI 550 / 590.

2. AHRI 370 - Standard for Sound Rating of Large outdoor Refrigerating and Air-conditioning Equipment.
3. To comply with the most recent versions of applicable Standards and Codes of ASHRAE 15.
4. Units shall meet the efficiency standards of the latest ASHRAE 90.1 Standard.
5. To comply with seismic application in accordance with the most recent versions of the International Building Code (IBC).

#### 1.03 QUALITY ASSURANCE

- A. UL 1995 -- Standard for Heating and Cooling Equipment.
- B. Manufactured facility to be ISO 9001.
- C. Factory Functional Test: The chiller shall be pressure tested, evacuated and fully charged with HFC-410A refrigerant and oil. In addition, a factory functional test to verify correct operation by cycling condenser fans, closing compressor contacts and reading data points from temperature and pressure sensors.
- D. Chiller manufacturer shall have a factory trained and supported service organization that is within a 75 mile radius of the site.
- E. Warranty: The manufacturer shall warrant all equipment and material of its manufacture against defects in workmanship and material for a period of one year from date of initial start-up or eighteen months from date of shipment; whichever occurs first.

#### 1.04 SUBMITTALS

- A. Submit shop drawings and product data in accordance with the specifications.
- B. Submittals shall include the following:
  1. Dimensioned plan and elevation view drawings, required clearances, and location of all field connections.

2. Product data indicating rated capacities, weights, specialties and accessories, electrical requirements and wiring diagrams.

1.05 OPERATION AND MAINTENANCE DATA

- A. Include manufacturer's descriptive literature, installation checklist, start-up instructions and maintenance procedure.

1.06 DELIVERY, STORAGE, AND HANDLING

- A. Units shall be delivered to job site fully assembled and charged with refrigerant (unless selected with nitrogen charge) and oil by the manufacturer.
- B. Unit shall be stored and handled per manufacturer's instructions.
- C. During shipment, provide protective covering over vulnerable components. Fit nozzles and open pipe ends with enclosures.

1.07 ENVIRONMENTAL REQUIREMENTS

1.08 WARRANTY

- A. Provide a full parts & labor warranty for one year from start-up or 18 months from shipment, whichever occurs first.
- B. A 5-year motor/transmission/compressor warranty shall be provided based upon the RPM of the compressors as follows:
- C. OEM provides several Extended Warranty options to include:
  1. Whole Units Parts Warranty (Year 2-5)
  2. Whole Labor Warranty (Year 2-5)

1.09 MAINTENANCE SERVICES

- A. All inspections and service of units shall be accomplished by factory trained and authorized servicing technicians.
- B. OEM shall provide and report quarterly, annual, and bi-annual maintenance in compliance with or better than ASHRAE Standard 180-2008.

- C. Include maintenance items as recommended in manufacturer's operating and maintenance data.
- D. Submit copy of service call work orders and summary report to the Owner, including description of work performed, operating performance status and noted exceptions.

**PART 2 PRODUCTS**

**2.01 ACCEPTABLE MANUFACTURERS**

- A. Trane Model CGAM 052 (see attached selection)
- B. Approved Equals: only equipment from approved equals (Carrier, McQuay) meeting the performance characteristics as outlined in the attached selection will be entertained.

**2.02 GENERAL UNIT DESCRIPTION**

- A. Factory assembled, single-piece chassis, air-cooled liquid chiller. Contained within the package shall be all factory wiring, piping, controls, and refrigerant charge (HFC-410A).

**2.03 CABINET**

- A. Frame shall be heavy-gage, with a powder coated paint finish for both aesthetic appeal and to offer more resistance to corrosion.
- B. Units shall be constructed of a galvanized steel frame with galvanized steel panels and access doors. Component surfaces shall be finished with a powder-coated paint. The coating or paint system shall withstand a 1000-consecutive-hour salt spray application in accordance with standard ASTM B117.

**2.04 COMPRESSORS**

- A. Fully hermetic scroll type compressors with R410A optimized and dedicated scroll profile.
- B. Direct drive motor cooled by suction gas with only three major moving parts and a completely enclosed compression chamber which leads to increased efficiency.

- C. Each compressor will have crankcase heaters installed and properly sized to minimize the amount of liquid refrigerant present in the oil sump during off cycles.

#### 2.05 EVAPORATOR

- A. The evaporator shall be a high efficiency, brazed plate-to-plate type heat exchanger consisting of parallel plates. Braze plates shall be stainless steel with copper braze material.
- B. The evaporator shall be protected with an etched foil heater and insulated with 3/4 inch insulation. This combination shall provide freeze protection down to -20F ambient temperatures while the heater is powered. Contractor shall provide separate power to energize heater and protect evaporator while chiller is disconnected.
- C. The water side working pressure shall be rated at 150 psig and tested at 1.5 times maximum allowable water side working pressure.
- D. The refrigerant side working pressure shall be rated at 460 psig (29.6 bars) and tested at 1.1 maximum allowable refrigerant side working pressure.

#### 2.06 CONDENSER

- A. The condenser coils shall consist of copper tubes mechanically bonded into plate-type aluminum fins. A subcooling coil shall be an integral part of the main condenser coil.
- B. The maximum allowable working pressure of the condenser shall be 650 psig (44.8 bars). The condensers shall be factory proof and leak tested at 715 psig (49.3 bars).
- C. Low Sound Fans shall be dynamically and statically balanced, direct drive, corrosion resistant glass fiber reinforced composite blades molded into a low noise fan blade.
- D. Low speed fan motors shall be three-phase with permanently lubricated ball bearings and individually protected by circuit breakers.
- E. Unit shall be capable of starting and running at outdoor ambient temperatures from 32F to 125F (0C - 52C) for all sizes.

- F. Provide coil protection for shipping. Entire condenser coil shall be covered with heavy plastic to prevent inadvertent damage to coil during shipment or rigging.

2.07 ENCLOSURES

- A. Mount starters in a UL1995 rated panel for outdoor use.
- B. The starter shall be across-the-line configuration, factory-mounted and fully pre-wired to the compressor motor(s) and control panel.
- C. Unit shall have a single point power connection.
- D. A control power transformer shall be factory-installed and factory-wired to provide unit control power.
- E. Control panel shall be dead front construction for enhanced service technician safety.
- F. Power line connection type shall be standard with a terminal block.

2.08 REFRIGERATION COMPONENTS

- A. Each refrigerant circuit shall include a filter drier, electronic expansion valve with site glass, liquid line service valves and a complete operating charge of both refrigerant HFC-410A and compressor oil.
- B. Each refrigerant circuit shall include a discharge line service valve to allow the refrigerant to be isolated in the condenser.

2.09 CONTROLS, SAFETIES AND DIAGNOSTICS

- A. The microprocessor-based unit controller shall be factory-installed and factory-tested.
- B. The unit display shall provide the following data:
  - 1. Water and air temperatures
  - 2. Refrigerant levels and temperatures
  - 3. Flow switch status

4. Compressor starts and run times
- C. The unit controller shall provide chilled water reset based on return water as an energy saving option.
  - D. Chilled water temperature control shall be microprocessor-based, proportional and integral controller to show water and refrigerant temperature, refrigerant pressure, and diagnostics. This microprocessor-based controller is to be supplied with each chiller by the chiller manufacturer. Controls shall include the following readouts and diagnostics:
    1. Low evaporator refrigerant temperature and/or pressure
    2. High condenser refrigerant pressure
    3. Motor current overload
    4. High compressor discharge temperature
    5. Electronic distribution faults: phase loss, phase imbalance, or phase reversal
  - E. Unit shall be shipped with factory control and power wiring installed.
  - F. On chiller, mount weatherproof control panel, containing starters, power and control wiring, factory wired with terminal block power connection. Provide primary and secondary fused control power transformer and a single 115 volt 60 Hz single phase
  - G. The unit controller shall utilize a microprocessor that will automatically take action to prevent unit shutdown due to abnormal operating conditions associated with: evaporator refrigerant temperature, high condensing pressure and motor current overload.
  - H. Provide the following safety controls with indicating lights or diagnostic readouts.
    1. Low chilled water temperature protection.
    2. High refrigerant pressure.
    3. Low oil flow protection.

4. Loss of chilled water flow.
  5. Contact for remote emergency shutdown.
  6. Motor current overload.
  7. Phase reversal/unbalance/single phasing.
  8. Over/under voltage.
  9. Failure of water temperature sensor used by controller.
  10. Compressor status (on or off).
- I. Provide the following operating controls:
1. Chilled water pump output relay that closes when the chiller is given a signal to start.
  2. High ambient pressure controller that shuts off a compressor to keep head pressure under control and help prevent high pressure nuisance trip outs on days when outside ambient is above design.
  3. Compressor current sensing limit that shuts off a compressor to help prevent current overload nuisance trips.
  4. Auto lead-lag functions that constantly even out run hours and compressor starts automatically. If contractor cannot provide this function then cycle counter and hour meter shall be provided for each compressor so owner can be instructed by the contractor on how to manually change lead-lag on compressors and even out compressor starts and running hours.
  5. Low ambient lockout control with adjustable setpoint.
- J. Provide user interface on the front of the panel. If display is on the inside of the panel, then a control display access door shall be provided to allow access to the display without removal of panels. Provide user interface with a minimum of the following features:
1. Leaving chilled water setpoint adjustment from LCD input

2. Entering and leaving chilled water temperature output
  3. Percent RLA output for each compressor
  4. Pressure output of condenser for circuits one and two
  5. Pressure output of evaporator for circuits one and two
  6. Ambient temperature output
  7. Voltage output
  8. Current limit setpoint adjustment from LCD input.
  9. Remote leaving water temperature setpoint.
  10. Alarm indicating light and relay
- K. Digital Communications to BAS system shall consist of a BacNET certified BacNET interface via a single twisted pair wiring supporting all standard points in the BacNET chiller profile.
- L. The chiller shall have Time of Day Scheduling capabilities for scheduling single chiller applications through the chiller control panel without the need for a building automation system. This feature allows the user to set up to 10 events in a 7 day time period.
- M. The chiller control panel shall provide leaving chilled water temperature reset based upon return water temperature.
- N. The chiller control panel shall provide an alarm relay output that shall energize whenever a fault requiring manual reset is detected by the panel.
- O. The chiller control panel shall provide input for leaving chilled water temperature setpoint based upon a 2-10VDC or 4-20mA signal from a building automation system.
- P. The chiller control panel shall provide input for chiller current limit setpoint based upon a 2-10VDC or 4-20mA signal from a building automation system.
- Q. The chiller control panel shall provide an output for chiller Percent Capacity via a 2-10VDC or 4-20mA signal to a building automation system

PART 3 EXECUTION

3.01 INSTALLATION

- A. Unit shall not be fully installed under this scope of work.

3.02 SCHEDULE

3.03 MANUFACTURER'S FIELD SERVICES

- A. OEM Startup is performed by factory trained and authorized servicing technicians confirming equipment has been correctly installed and passes specification checklist prior to equipment becoming operational and covered under OEM warranty.
  - 1. Included OEM Factory Startup:
    - a. Centrifugal, Rotary Screw, and Scroll Chillers
- B. Applied Chiller manufacturers shall maintain service capabilities no more than 50 miles from the jobsite.
- C. The manufacturer shall furnish an alternative price for:
  - 1. Extended compressor warranty for 10 years.
- D. The manufacturer shall furnish complete submittal wiring diagrams of the package unit as applicable for field maintenance and service.

END OF SECTION

**Contract Terms and Conditions**

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## Terms and Conditions

### BID STANDARD TERMS AND CONDITIONS

### TERMS AND CONDITIONS FOR THIS BID

#### INSURANCE REQUIREMENTS

AN INSURANCE CERTIFICATE IN COMPLIANCE WITH PROVISIONS OF ITEM 31 (INSURANCE) OF THE GENERAL CONDITIONS OF PURCHASE IS REQUIRED FOR COMPREHENSIVE GENERAL LIABILITY, AUTOMOBILE LIABILITY, AND WORKERS' COMPENSATION AND MUST BE SUBMITTED BY THE SUCCESSFUL BIDDER(S) TO THE DIVISION OF PURCHASES PRIOR TO AWARD. THE INSURANCE CERTIFICATE MUST NAME THE STATE OF RHODE ISLAND AS CERTIFICATE HOLDER AND AS AN ADDITIONAL INSURED. FAILURE TO COMPLY WITH THESE PROVISIONS MAY RESULT IN REJECTION OF THE OFFEROR'S BID. ANNUAL RENEWAL CERTIFICATES MUST BE SUBMITTED TO THE AGENCY IDENTIFIED ON THE PURCHASE ORDER. FAILURE TO DO SO MAY BE GROUNDS FOR CANCELLATION OF CONTRACT.

NOTE: IF THIS BID COVERS CONSTRUCTION, SCHOOL BUSING, HAZARDOUS WASTE, OR VESSEL OPERATION, APPLICABLE COVERAGES FROM THE FOLLOWING LIST MUST ALSO BE SUBMITTED TO THE DIVISION OF PURCHASES PRIOR TO AWARD: \* PROFESSIONAL LIABILITY INSURANCE (AKA ERRORS & OMISSIONS) - \$1 MILLION OR 5% OF ESTIMATED PROJECT COST, WHICHEVER IS GREATER. \* BUILDER'S RISK INSURANCE - COVERAGE EQUAL TO FACE AMOUNT OF CONTRACT FOR CONSTRUCTION. \* SCHOOL BUSING - AUTO LIABILITY COVERAGE IN THE AMOUNT OF \$5 MILLION. \* ENVIRONMENTAL IMPAIRMENT (AKA POLLUTION CONTROL) - \$1 MILLION OR 5% OF FACE AMOUNT OF CONTRACT, WHICHEVER IS GREATER. \* VESSEL OPERATION - (MARINE OR AIRCRAFT) - PROTECTION & INDEMNITY COVERAGE REQUIRED IN THE AMOUNT OF \$1 MILLION.

#### RIVIP INFO - BID SUBMISSION REQUIREMENTS

It is the Vendor's responsibility to check and download any and all addenda from the RIVIP. This offer may not be considered unless a signed RIVIP generated Bidder Certification Cover Form is attached and the Unit Price column is completed. The signed Certification Cover Form must be attached to the front of the offer. When delivering offers in person to One Capitol Hill, vendors are advised to allow at least one hour additional time for clearance through security checkpoints.

MAILING ADDRESS FOR BID PROPOSALS ISSUED BY THE STATE OF RHODE ISLAND, DIVISION OF PURCHASES

All Bid Proposals must be submitted by mail or hand delivered to:

- State of Rhode Island
- Department of Administration
- Division of Purchases, Second floor
- One Capitol Hill
- Providence, RI 02908-5855

#### DIVESTITURE OF INVESTMENTS IN IRAN REQUIREMENT:

**No vendor engaged in investment activities in Iran as described in R.I. Gen. Laws §37-2.5-2(b) may submit a bid proposal to, or renew a contract with, the Division of Purchases. Each vendor submitting a bid proposal or entering into a renewal of a contract is required to certify that the vendor does not appear on the list maintained by the General Treasurer pursuant to R.I. Gen. Laws §37-2.5-3.**

**VENDOR SPECIFICATIONS**

ALL VENDORS MUST INCLUDE SPECIFICATIONS WITH BID PROPOSAL (EVEN THOSE BIDDING BRAND SPECIFIED). FAILURE TO SUBMIT SPECIFICATIONS WITH BID PROPOSAL MAY RESULT IN DISQUALIFICATION OF BID. ITEMS IN CATALOGS MUST BE CLEARLY MARKED AND PAGES TABBED.

**AWARD**

THE STATE, AT ITS SOLE DISCRETION, SHALL RESERVE THE RIGHT TO MAKE ONE OR MULTIPLE AWARDS FOR THIS REQUIREMENT AND/OR TO REJECT ANY OR ALL BIDS.

**DELIVERY PER AGENCY**

DELIVERY OF GOODS OR SERVICES AS REQUESTED BY AGENCY.