

<b>REQUEST FOR QUOTATIONS</b> <i>(THIS IS NOT AN ORDER)</i>		THIS RFQ <input checked="" type="checkbox"/> IS <input type="checkbox"/> IS NOT A SMALL BUSINESS SET-ASIDE			PAGE OF PAGES 1   45	
1. REQUEST NO. N69450-16-Q-3229	2. DATE ISSUED 25-Mar-2016	3. REQUISITION/PURCHASE REQUEST NO.	4. CERT. FOR NAT. DEF. UNDER BDSA REG. 2 AND/OR DMS REG. 1	RATING		
5a. ISSUED BY NAVFAC SOUTHEAST SOUTH TEXAS AREA PWD CORPUS CHRISTI/PWD INGLESIDE 8851 OCEAN DRIVE, BLDG 19 CORPUS CHRISTI TX 78419-5525			6. DELIVER BY (Date) <b>SEE SCHEDULE</b>			
5b. FOR INFORMATION CALL: (Name and Telephone no.)(No collect calls) JOEL OVERSON 361-961-3397			7. DELIVERY <input checked="" type="checkbox"/> FOB DESTINATION <input type="checkbox"/> OTHER (See Schedule)			
8. TO: NAME AND ADDRESS, INCLUDING ZIP CODE			9. DESTINATION (Consignee and address, including ZIP Code) PWD CORPUS CHRISTI INSPECTOR OF RECORD 8851 OCEAN DR, BLDG. 19 CORPUS CHRISTI TX 78419-5525 TEL: 361-961-3397 FAX:			
10. PLEASE FURNISH QUOTATIONS TO THE ISSUING OFFICE IN BLOCK 5a ON OR BEFORE CLOSE OF BUSINESS: (Date) 28-Apr-2016						
<b>IMPORTANT:</b> This is a request for information, and quotations furnished are not offers. If you are unable to quote, please so indicate on this form and return it to the address in Block 5a. This request does not commit the Government to pay any costs incurred in the preparation of the submission of this quotation or to contract for supplies or services. Supplies are of domestic origin unless otherwise indicated by quote. Any representations and/or certifications attached to this Request for Quotations must be completed by the quoter.						
11. SCHEDULE (Include applicable Federal, State, and local taxes)						
ITEM NO. (a)	SUPPLIES/ SERVICES (b)		QUANTITY (c)	UNIT (d)	UNIT PRICE (e)	AMOUNT (f)
<b>SEE SCHEDULE</b>						
12. DISCOUNT FOR PROMPT PAYMENT	a. 10 CALENDAR DAYS	b. 20 CALENDAR DAYS	c. 30 CALENDAR DAYS	d. CALENDAR DAYS		
	%	%	%	No.	%	
<b>NOTE: Additional provisions and representations <input type="checkbox"/> are <input type="checkbox"/> are not attached.</b>						
13. NAME AND ADDRESS OF QUOTER (Street, City, County, State, and ZIP Code)			14. SIGNATURE OF PERSON AUTHORIZED TO SIGN QUOTATION		15. DATE OF QUOTATION	
			16. NAME AND TITLE OF SIGNER (Type or print)		TELEPHONE NO. (Include area code)	

Section SF 30 - BLOCK 14 CONTINUATION PAGE

STATEMENT OF WORK

**GENERAL INFORMATION:**

**Document Type: Combined Synopsis/Solicitation Notice**

**Solicitation Number: N69450-16-Q-3229**

**Set Aside: 100% Total Small Business**

**NAICS Code: 238220, Size standard in Millions: \$15.0**

DESCRIPTION / SCOPE OF WORK: Contractor is to provide all Labor, Materials, equipment, Tools, Transportation and Management necessary to replace the runway remaining-distance markers at NAS Corpus Christi, TX.

This announcement constitutes the only solicitation; no separate written solicitation will be issued.

**BASIS FOR AWARD:** AWARD WILL BE BASED ON LOWEST PRICE.

**Target Price Range is less than \$30K**

Anticipated award date: 5 days after close of solicitation

**Quotes are to be received no later than 5:00 p.m. central standard time on 28 April 2016. Proposals should be emailed to [joel.overson@navy.mil](mailto:joel.overson@navy.mil)**

Any changes to the solicitation or RFI's will be posted on FEDBIZOPS ([www.fbo.gov](http://www.fbo.gov)) for the mutual benefit of all bidders.

**ADDITIONAL INFORMATION:**

Solicitation document shall be signed by bidders and all applicable Certifications and Representations shall be completed. Offer should be in sufficient detail to ensure that the technical team can determine the offer complies with the Statement of Work (SOW).

All payments are to be paid via the Internet through the Wide Area Work Flow (WAWF) system. WAWF may be accessed at <https://wawf.eb.mil>. WAWF training may be accessed online at <http://www.wawftraining.com>. Payment information may be accessed using the DFAS website at <https://www.dfas.mil>. Your purchase order/contract number or invoice will be required to inquire status of your payment.

Be advised that all interested parties must be registered in the System for Award Management (SAM) Database in order to receive payment for products/services

rendered to the Government as the result of an award. If you are not registered you may request an application at (334) 206-7828 or through the SAM website at <https://sam.gov>.

Rapid Gate Information: The Navy has implemented a new security access program for the Corpus Christi and Kingsville Naval Air Stations. This program, called Rapid gate, will reduce expenses, reduce risk, and insure quicker access for people coming to the installation. You must either call 1-877-727-4342 or go online to <http://rapidgate.com> Once the company is enrolled, your employees can register at the installation. If your company employees have been authorized the common access card (CAC), it is not necessary to enroll in the rapid gate program.

#### **SITE VISIT INFORMATION:**

1. One site visit will be held to ensure all potential offerors have uniform information in order to make an accurate proposal.
2. Site visit will be conducted on **04 APR 2016 at 1000 a.m. central time at NAS Corpus Christi, TX**. All potential offerors are encouraged to attend the site visit to perform an inspection of the size and current layout.
3. Offerors are expected to satisfy themselves as to the general and local conditions that may affect the cost of the performance of the work to the extent that such information is reasonably obtainable. It is considered impractical to determine, without inspection, the exact nature of the work and site conditions under which the work is to be performed.
4. To attend please contact the Site Visit POC.

**Site Visit POC:**  
**ENS Adam Vetere**  
[adam.vetere@navy.mil](mailto:adam.vetere@navy.mil)  
**361-961-2154**

**Deadline for receipt of this form is one week prior to the site visit.** It is the responsibility of the contractor to confirm this form is received. After submission of form should a person not be available to attend, send a cancellation email to the same POC.

5. Interested parties are advised to arrive by an hour early in order to receive security passes and clearance.
6. The contractor may require, and should have, their own ear plugs, safety glasses and safety shoes to have access to the work site.

## STATEMENT OF WORK

### REPAIR CHILLER BARREL AT 1281, NAS CORPUS CHRISTI, TX

1. **GENERAL DESCRIPTION:** The Contractor shall provide all supervision, transportation, labor, materials, equipment and incidental work necessary to repair the shell type heat exchanger for the water cooled cooling system at building 1281. See paragraph 13 for detailed statement work.
2. **LOCATION:** The work is located at Building 1281, N. A. S. Corpus Christi, Texas. See Attachment A for project location.
3. **PERIOD OF PERFORMANCE:** The period of performance is 180 calendar days. The period of performance starts when the contract/task order is awarded, and ends when the work is completed and accepted by the Government. The period of performance includes pre-construction submittals, material/equipment lead time, and all construction activities up to final acceptance. The period of performance is negotiable; hence, if the contractor believes a different/longer period of performance is needed, they should negotiate this with the Contract Specialist prior to task order/contract award.
4. **EXAMINATION OF SITE:** Bidders are expected to visit the site, take their own measurements, inspect carefully the work area and satisfy themselves as to the character and amount of work to be done. Site visit will be scheduled in advance. Arrangements to visit the site may be made by contacting the Contracting Officer's Representative. See site visit information above.
5. **SCHEDULE OF WORK:** The work shall be so scheduled as to cause a minimum of interference to the normal operations of the tenants. Work shall be accomplished between the hours of 7:30 A.M. and 4:30 P.M., Monday through Friday. If the Contractor desires to work on Saturday, Sunday, holidays, or outside of the Station's regular hours, an application may be submitted to the Contracting Officer for approval.
6. **PROTECTION OF EXISTING WORK:** Existing work to remain shall be protected from damage. Work damaged by the Contractor shall be repaired to original condition at no additional cost to the Government.
7. **NAS FIRE REGULATIONS:** "Hot work" permits are issued to the Contractor by the Fire Prevention Inspectors by calling 961-4151 or 961-4983. Permits are issued on a daily basis only and from start of work until finished. Permits are required for all "hot work" and before entering buildings. ("Hot work" includes all welding, cutting, soldering/brazing, blow torches, etc.)
8. **SAFETY REQUIREMENTS:** The Contractor shall comply with the safety rules and regulations pertaining to the activity, and shall govern employees according to, and in

compliance with applicable OSHA Regulations and U.S. Army Corps of Engineers Safety and Health Manual EM 385-1-1. The Contractor shall maintain an accurate record of exposure data on all accidents incidental to work performed under this contract resulting in death, traumatic injury, occupational disease, or damage to property, materials, supplies, or equipment. The Contractor shall report this data in the manner prescribed by the Contracting Officer. A written safety plan, outlining all Contractor Safety Procedures, will be required for all work under this contract, and is subject to acceptance by PWD Corpus Christi FEAD prior to commencement of work.

#### 8.1 Lock out/ Tag Out Policy:

- a. Combination locks shall not be used for lockout;
- b. No two (2) lockout devices (locks) shall be keyed alike;
- c. No more than two (2) keys shall exist for any lock. The worker shall maintain one key, and the supervisor shall maintain the other in a location readily accessible in the event of an emergency;
- d. Both lockout and tag-out devices shall indicate the identifier of the employee applying the device(s). Tag-out devices shall include the cognizant shop (or code), the telephone number where the employee can be reached during working hours, name of his/her supervisor, date the device was applied, and the machine, equipment, or system component that is de-energized.

9. ASBESTOS AND LEAD: There is no known asbestos containing material (ACM) and/or lead based paint on this project. If additional materials are encountered which may contain ACM and/or lead, DO NOT TOUCH THE MATERIAL. IMMEDIATELY NOTIFY THE CONTRACTING OFFICER IN WRITING. Within a reasonable time, the Government will perform tests to determine if asbestos or lead is present. If the materials are determined not to contain ACM or lead, the Contractor shall proceed without change. If it is determined that ACM and/lead are present and must be disturbed, the Contracting Officer may direct a change accordingly.

10. WEIGHT HANDLING EQUIPMENT (WHE): The provision of NAVFAC Publication P-307 apply to all civilian, military, and contractor personnel who operate weight handling equipment and use crane related rigging gear on board Naval Air Station Corpus Christi, Texas.

11. EXCAVATIONS AND OUTAGES: Any excavation greater than 6 inches below grade requires an excavation permit. Any utility or HVAC outage affecting inhabited work space, inhabited living space, or exit from an inhabited work space/living space requires an Outage Permit. For Excavation and Outage contact the government point of contact listed in paragraph 13.3.

12. ATTACHMENTS: The following sketches are a part of this specification and shall not be used for any purpose other than that contemplated by this contract:

Attachment	Title
A	Project Location
B	Solid Waste Report
C	PMI Equipment Inventory Card
D	Eddy Current Report
E	AQUAFORCE 30XW150-400 Water-Cooled Liquid chillers Installation Instructions

13. SCOPE OF WORK:

The carrier chiller (model #30XB3256H-M6H4B series # 2210Q18367) servicing building 1281 located in a small outbuilding behind 1281 has a damaged heat exchanger (model 00PSN800026906 A serial # 191OOU94-62) caused by a strainer basket failure. In attachment D the tubes that need repair have been identified using eddy current technology. The unit is currently disconnected from the chill water loop and the end flanges have been removed. The Contractor shall provide all supervision, transportation, labor, materials, equipment and incidental work necessary to repair the shell type heat exchanger for the water cooled cooling system at building 1281.

- I. The tubes identified as damaged (5) and the tube identified as completed blocked (1) need to be removed from service. These tubes are to be plugged using methods in the BPVC 8-Division 1.
- II. After repairs have been made contractor will need to hydrostatically test the unfired pressure vessel (heat exchanger) in accordance with manufacturer testing pressures and BPVC 8- Division 1 for non-destructive testing (NDT). This may require 24 hours of testing on the repaired tubes and non-repaired tubes. If other tubes are found to be damaged after the hydrostatic testing the contractor will need to plug those tubes as well. There are 19 other tubes noted with defect. If more defects are found notify the government representative.
- III. Clean the heat exchanger internally using manufacturer recommendations. This is to remove any debris left behind by the strainer basket failure. The end flanges will need to be cleaned before being returned to service.

- IV. All filters, driers, refrigerant oil, and refrigerant will need to be placed with new products with manufacturer required items. No reclaimed refrigerant shall be used and all filters, driers, refrigerant oil, and refrigerant will be new. A vacuum of at least 500 microns (0.5 mm Hg) shall be obtained. Use industry standard practices or refer to Carrier Standard Service Techniques Manual or the Controls, Start-up, Operation, Service and Troubleshooting guide as required. Charge the chiller from refrigerant cylinders
- V. Unit will be connected back to chilled water loop, tested and operated to ensure unit is back in full operation. More specifics about installation and the unit can be found in attachment E AQUAFORCE 30XW150-400 Water-Cooled Liquid chillers Installation Instructions.

13.1 The contractor shall conduct his own survey of the site to determine existing features, conditions, and measurements. The contractor shall report any discrepancy between the statement of work and existing conditions prior to the commencement of work.

13.2 The contractor shall coordinate with the FEAD Department approximately three working days in advance of start of work to let the occupant of the building know when the construction is to take place so that they may notify their personnel to remain clear of the jobsite and to not affect scheduled work hours.

13.3 All work under this Contract is to be accomplished with FEAD Department oversight. The contractor shall coordinate with the FEAD Point of Contact site visit access. The contractor shall give notice to the FEAD Point of Contact prior to accomplishment of any work. The Point of Contact will be assigned by the contracting officer at time of contract award.

13.4 Keep the jobsite clean at all times, and remove all debris from the station.

13.5. All work shall be performed in compliance with the latest edition ASME BPVC Section VIII Division 1 and UFC 3-340-07 Inspection and Certification of Boilers and Pressure Vessels. All products shall be installed according to manufacturer's recommendations.

13.6 Licensing Requirements: All work is to be accomplished with a licensed journeyman pipefitter and electrician that has met all current city & state certifications or license requirements to accomplish the specified work. This work requires a NBBI licensed Boiler and Pressure Vessel Inspector.

13.7 Submittals: Submittals shall be provided and approved prior to delivery to the job site. If submittals contain information for more than one product type, clearly indicate which product type is being submitted for approval. Provide submittals for the following materials to be furnished and delivered under this contract to the Contracting Officer for approval prior to installation:

1. Work Schedule / Safety Plan for all work.
2. QA / Inspection / Oversight Plan for all work.

3. Contractor Verified Pre-Job Measurements and Quantities Required in Specific Line Item Format
4. Installation, Operational and Hydrostatic Inspection and Testing Reports
5. Shop Drawing detailing all installations in AutoCAD 2010 Format or equivalent (Electronically)
6. Reports Detailing all QA Installation, Operational and Hydrostatic Inspection and Testing performed.

The approval or acceptance of submittals is not be construed as a complete check, and indicates only that the general method of construction, materials, detailing and other information are satisfactory. Approval or acceptance will not relieve the Contractor of the responsibility for any error which may exist, as the Contractor is responsible for dimensions, the design of adequate connections and details, and the satisfactory construction of all work.

13.8 WORK SCHEDULE: Submit schedule of work to include start date and end date of all major activities.

14. PRODUCTS: Products shall be new, manufacturer's standard products, and commonly available from manufacturer's stock.

15. TERMS OF PAYMENT: Refer to contract clauses and amendments for payment terms and conditions.

16. ORAL MODIFICATIONS: No oral statement of any person other than the Contracting Officer or his/her representative, as provided in the contract clause entitled "Changes" shall in any manner or degree modify or otherwise affect the terms of this contract.

17. CLEANUP: The premises shall be kept free at all times from the accumulation of waste material and/or rubbish resulting from the work. Combustibles shall be removed daily, and upon completion of the work, all debris, tools, and other surplus materials shall be removed and the premises left in approved condition.

18. ENVIRONMENTAL REQUIREMENTS: Take no action or inaction that exposes the Government to liability for non-compliance or other findings or damages, penalties or fines related thereto. In the event a regulatory agency assesses either a monetary or non-monetary fine or penalty for Contractor's noncompliance, the Contractor shall reimburse the Government for all associated cost. Remove all hazardous material and waste upon completion of the contract. Abandoned waste shall be managed as "unknown waste", and the contractor shall bear the cost of any analytical, disposal, or other costs incurred.

18. 1 Regulated Waste: Regulated waste is defined as (1) hazardous waste as defined in EPA Regulations 40 CFR 261, (2) universal waste as defined in EPA Regulations 40 CFR 273, and (3) Class 1 industrial waste as defined in Texas Commission on Environmental Quality Regulations 30 Texas Administrative Code Parts 335 and 503. Manage all regulated waste and used oil in accordance with applicable federal, state, and local regulations, Navy and NASCC

policies and instructions. All regulated waste shall be manifested through PWD Corpus Christi Environmental Division.

Before generating regulated waste obtain approval for storage from the Environmental Division. Application for approval shall include including location and type of storage (i.e. Satellite Accumulation Point or <90-day Storage Area). Contractor shall provide immediate access to PWD Corpus Christi Environmental Division to inspection any locked units. Contractor shall inspect their regulated waste storage areas and provide weekly inspection reports to the Government POC.

PWD Corpus Christi Hazardous Waste Commodity Branch (HWCB) provides comprehensive regulated waste disposal services. If the contractor chooses to dispose of regulated waste through the HWCB, contractor shall establish a line of credit with the HWCB and provide required waste stream information **before generating any waste**. If contractor chooses not to dispose of regulated waste through the HWCB, the contractor shall provide funding to the HWCB for manifesting services. For FY 16 the rate is \$68 per manifest. The contact phone number for the HWCB is 361-961-3760. Contractor shall contact the HWCB before make any arrangements to remove regulated waste from the installation.

18.2 Solid Waste Disposal: All waste not covered under paragraph 18.1 must be tracked by NASCC whether directly disposed in a landfill or recycled. Contractor shall recycle waste to the greatest extent feasible. The solid waste tracking form is included in Attachment B. Contractor shall provide the filled out form to the Government POC at the close of the project. For more information call John Phillips at 210-667-0687.

18.3 Environmental Assessment Compliance Training and Tracking System (ECATTS): The project quality control manager shall complete ECATTS training **prior** to starting work.

ECATTS is available 24/7 on the Internet. Contractors who perform work on more than one contract for the same installation or within the same state will not have to take the training each time they start a new project. Contractors will carry forward all applicable credits received for taking ECATTS to future contracts.

ECATTS is available at:

<https://environmentaltraining.ecatts.com/>

Registration Password = navfac (case sensitive)

Sample registration instructions that can be provided to users are available from ECATTS Customer Support.

19. PMI INVENTORY CARD: Contractor shall provide a completed PMI Equipment Inventory Card included as Attachment C for each piece of dynamic equipment containing a serial number. This requirement is in addition to any other operation and maintenance information required in the Submittals paragraph.

20. ACCEPTANCE: The work shall be accepted as a result of a final inspection conducted by a representative of the Facility Engineering and Acquisition Division, Public Works Department Corpus Christi.

21. WARRANTY: All workmanship and materials and/or equipment shall be warranted for a period of not less than one year under normal wear and tear or the normal standard warranty should it extend beyond one year.

\*\*\* END OF SPECIFICATIONS \*\*\*

Section B - Supplies or Services and Prices

ITEM NO	SUPPLIES/SERVICES	QUANTITY	UNIT	UNIT PRICE	AMOUNT
0001	B-1281 CHILLER REPAIR FFP REPAIR CHILLER AT BLDG 1281 AT NAS CORPUS CHRISTI, TX. PERIOD OF PERFORMANCE WILL BE A TOTAL OF 180 CALENDAR DAYS INCLUDING DESIGN, DESIGN APPROVAL, AND CONSTRUCTION. FOB: Destination	1	Job		

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NET AMT

Section E - Inspection and Acceptance

**INSPECTION AND ACCEPTANCE TERMS**

Supplies/services will be inspected/accepted at:

CLIN	INSPECT AT	INSPECT BY	ACCEPT AT	ACCEPT BY
0001	Destination	Government	Destination	Government

## Section F - Deliveries or Performance

## DELIVERY INFORMATION

CLIN	DELIVERY DATE	QUANTITY	SHIP TO ADDRESS	UIC
0001	02-DEC-2016	1	PWD CORPUS CHRISTI INSPECTOR OF RECORD 8851 OCEAN DR, BLDG. 19 CORPUS CHRISTI TX 78419-5525 361-961-3397 FOB: Destination	N44215

## Section G - Contract Administration Data

## CLAUSES INCORPORATED BY FULL TEXT

## 252.225-7048 EXPORT-CONTROLLED ITEMS (JUNE 2013)

(a) Definition. "Export-controlled items," as used in this clause, means items subject to the Export Administration Regulations (EAR) (15 CFR Parts 730-774) or the International Traffic in Arms Regulations (ITAR) (22 CFR Parts 120-130). The term includes--

(1) "Defense items," defined in the Arms Export Control Act, 22 U.S.C. 2778(j)(4)(A), as defense articles, defense services, and related technical data, and further defined in the ITAR, 22 CFR Part 120; and

(2) "Items," defined in the EAR as "commodities", "software", and "technology," terms that are also defined in the EAR, 15 CFR 772.1.

(b) The Contractor shall comply with all applicable laws and regulations regarding export-controlled items, including, but not limited to, the requirement for contractors to register with the Department of State in accordance with the ITAR. The Contractor shall consult with the Department of State regarding any questions relating to compliance with the ITAR and shall consult with the Department of Commerce regarding any questions relating to compliance with the EAR.

(c) The Contractor's responsibility to comply with all applicable laws and regulations regarding export-controlled items exists independent of, and is not established or limited by, the information provided by this clause.

(d) Nothing in the terms of this contract adds, changes, supersedes, or waives any of the requirements of applicable Federal laws, Executive orders, and regulations, including but not limited to—

(1) The Export Administration Act of 1979, as amended (50 U.S.C. App. 2401, et seq.);

(2) The Arms Export Control Act (22 U.S.C. 2751, et seq.);

(3) The International Emergency Economic Powers Act (50 U.S.C. 1701, et seq.);

(4) The Export Administration Regulations (15 CFR Parts 730-774);

(5) The International Traffic in Arms Regulations (22 CFR Parts 120-130); and

(6) Executive Order 13222, as extended.

(e) The Contractor shall include the substance of this clause, including this paragraph (e), in all subcontracts.

(End of clause)



01090 - Duplicating Machine Operator  
11.64  
01111 - General Clerk I  
11.40  
01112 - General Clerk II  
13.38  
01113 - General Clerk III  
15.06  
01120 - Housing Referral Assistant  
18.25  
01141 - Messenger Courier  
10.32  
01191 - Order Clerk I  
10.43  
01192 - Order Clerk II  
11.96  
01261 - Personnel Assistant (Employment) I  
15.03  
01262 - Personnel Assistant (Employment) II  
16.81  
01263 - Personnel Assistant (Employment) III  
18.75  
01270 - Production Control Clerk  
22.73  
01280 - Receptionist  
10.55  
01290 - Rental Clerk  
13.27  
01300 - Scheduler, Maintenance  
14.51  
01311 - Secretary I  
14.51  
01312 - Secretary II  
16.37  
01313 - Secretary III  
18.25  
01320 - Service Order Dispatcher  
15.58  
01410 - Supply Technician  
20.11  
01420 - Survey Worker  
15.95  
01531 - Travel Clerk I  
11.09  
01532 - Travel Clerk II  
12.21  
01533 - Travel Clerk III  
13.10  
01611 - Word Processor I  
12.31  
01612 - Word Processor II  
13.81  
01613 - Word Processor III  
15.45  
05000 - Automotive Service Occupations  
05005 - Automobile Body Repairer, Fiberglass  
18.21  
05010 - Automotive Electrician  
17.48

05040 - Automotive Glass Installer  
16.74  
05070 - Automotive Worker  
16.74  
05110 - Mobile Equipment Servicer  
15.29  
05130 - Motor Equipment Metal Mechanic  
18.21  
05160 - Motor Equipment Metal Worker  
16.74  
05190 - Motor Vehicle Mechanic  
18.21  
05220 - Motor Vehicle Mechanic Helper  
14.51  
05250 - Motor Vehicle Upholstery Worker  
16.01  
05280 - Motor Vehicle Wrecker  
16.74  
05310 - Painter, Automotive  
17.48  
05340 - Radiator Repair Specialist  
16.74  
05370 - Tire Repairer  
14.77  
05400 - Transmission Repair Specialist  
18.21  
07000 - Food Preparation And Service Occupations  
07010 - Baker  
9.21  
07041 - Cook I  
9.04  
07042 - Cook II  
10.08  
07070 - Dishwasher  
7.98  
07130 - Food Service Worker  
8.55  
07210 - Meat Cutter  
12.89  
07260 - Waiter/Waitress  
7.25  
09000 - Furniture Maintenance And Repair Occupations  
09010 - Electrostatic Spray Painter  
16.65  
09040 - Furniture Handler  
13.82  
09080 - Furniture Refinisher  
16.65  
09090 - Furniture Refinisher Helper  
13.82  
09110 - Furniture Repairer, Minor  
15.25  
09130 - Upholsterer  
17.70  
11000 - General Services And Support Occupations  
11030 - Cleaner, Vehicles  
10.49  
11060 - Elevator Operator  
8.92

11090 - Gardener  
12.98  
11122 - Housekeeping Aide  
8.92  
11150 - Janitor  
9.67  
11210 - Laborer, Grounds Maintenance  
10.24  
11240 - Maid or Houseman  
7.55  
11260 - Pruner  
9.86  
11270 - Tractor Operator  
12.15  
11330 - Trail Maintenance Worker  
10.24  
11360 - Window Cleaner  
10.67  
12000 - Health Occupations  
12010 - Ambulance Driver  
16.18  
12011 - Breath Alcohol Technician  
16.18  
12012 - Certified Occupational Therapist Assistant  
25.05  
12015 - Certified Physical Therapist Assistant  
25.45  
12020 - Dental Assistant  
13.95  
12025 - Dental Hygienist  
26.11  
12030 - EKG Technician  
23.84  
12035 - Electroneurodiagnostic Technologist  
23.84  
12040 - Emergency Medical Technician  
16.18  
12071 - Licensed Practical Nurse I  
15.14  
12072 - Licensed Practical Nurse II  
16.93  
12073 - Licensed Practical Nurse III  
18.88  
12100 - Medical Assistant  
10.96  
12130 - Medical Laboratory Technician  
13.70  
12160 - Medical Record Clerk  
13.21  
12190 - Medical Record Technician  
16.14  
12195 - Medical Transcriptionist  
13.92  
12210 - Nuclear Medicine Technologist  
25.78  
12221 - Nursing Assistant I  
9.86  
12222 - Nursing Assistant II  
11.12

12223 - Nursing Assistant III  
12.13  
12224 - Nursing Assistant IV  
13.62  
12235 - Optical Dispenser  
12.11  
12236 - Optical Technician  
11.26  
12250 - Pharmacy Technician  
12.34  
12280 - Phlebotomist  
13.62  
12305 - Radiologic Technologist  
22.62  
12311 - Registered Nurse I  
25.83  
12312 - Registered Nurse II  
31.60  
12313 - Registered Nurse II, Specialist  
31.60  
12314 - Registered Nurse III  
38.23  
12315 - Registered Nurse III, Anesthetist  
38.23  
12316 - Registered Nurse IV  
45.82  
12317 - Scheduler (Drug and Alcohol Testing)  
20.05  
13000 - Information And Arts Occupations  
13011 - Exhibits Specialist I  
16.99  
13012 - Exhibits Specialist II  
20.82  
13013 - Exhibits Specialist III  
25.46  
13041 - Illustrator I  
16.99  
13042 - Illustrator II  
20.82  
13043 - Illustrator III  
25.46  
13047 - Librarian  
23.18  
13050 - Library Aide/Clerk  
10.03  
13054 - Library Information Technology Systems  
20.94  
Administrator  
13058 - Library Technician  
12.51  
13061 - Media Specialist I  
15.10  
13062 - Media Specialist II  
16.90  
13063 - Media Specialist III  
18.84  
13071 - Photographer I  
13.47

13072 - Photographer II  
 16.43  
 13073 - Photographer III  
 19.23  
 13074 - Photographer IV  
 23.46  
 13075 - Photographer V  
 28.47  
 13110 - Video Teleconference Technician  
 14.29  
 14000 - Information Technology Occupations  
 14041 - Computer Operator I  
 14.77  
 14042 - Computer Operator II  
 16.52  
 14043 - Computer Operator III  
 18.43  
 14044 - Computer Operator IV  
 20.48  
 14045 - Computer Operator V  
 22.67  
 14071 - Computer Programmer I (see 1)  
 21.52  
 14072 - Computer Programmer II (see 1)  
 26.05  
 14073 - Computer Programmer III (see 1)  
 14074 - Computer Programmer IV (see 1)  
 14101 - Computer Systems Analyst I (see 1)  
 26.75  
 14102 - Computer Systems Analyst II (see 1)  
 14103 - Computer Systems Analyst III (see 1)  
 14150 - Peripheral Equipment Operator  
 14.77  
 14160 - Personal Computer Support Technician  
 20.48  
 15000 - Instructional Occupations  
 15010 - Aircrew Training Devices Instructor (Non-Rated)  
 27.65  
 15020 - Aircrew Training Devices Instructor (Rated)  
 33.46  
 15030 - Air Crew Training Devices Instructor (Pilot)  
 39.29  
 15050 - Computer Based Training Specialist / Instructor  
 27.65  
 15060 - Educational Technologist  
 26.91  
 15070 - Flight Instructor (Pilot)  
 39.29  
 15080 - Graphic Artist  
 20.98  
 15090 - Technical Instructor  
 18.85  
 15095 - Technical Instructor/Course Developer  
 23.06  
 15110 - Test Proctor  
 15.22  
 15120 - Tutor  
 15.22  
 16000 - Laundry, Dry-Cleaning, Pressing And Related Occupations

16010 - Assembler  
8.21  
16030 - Counter Attendant  
8.21  
16040 - Dry Cleaner  
9.65  
16070 - Finisher, Flatwork, Machine  
8.21  
16090 - Presser, Hand  
8.21  
16110 - Presser, Machine, Drycleaning  
8.21  
16130 - Presser, Machine, Shirts  
8.21  
16160 - Presser, Machine, Wearing Apparel, Laundry  
8.21  
16190 - Sewing Machine Operator  
10.14  
16220 - Tailor  
10.68  
16250 - Washer, Machine  
8.61  
19000 - Machine Tool Operation And Repair Occupations  
19010 - Machine-Tool Operator (Tool Room)  
18.54  
19040 - Tool And Die Maker  
21.95  
21000 - Materials Handling And Packing Occupations  
21020 - Forklift Operator  
11.29  
21030 - Material Coordinator  
23.55  
21040 - Material Expediter  
23.55  
21050 - Material Handling Laborer  
10.07  
21071 - Order Filler  
10.37  
21080 - Production Line Worker (Food Processing)  
11.29  
21110 - Shipping Packer  
13.35  
21130 - Shipping/Receiving Clerk  
13.35  
21140 - Store Worker I  
13.50  
21150 - Stock Clerk  
18.20  
21210 - Tools And Parts Attendant  
11.77  
21410 - Warehouse Specialist  
11.77  
23000 - Mechanics And Maintenance And Repair Occupations  
23010 - Aerospace Structural Welder  
25.10  
23021 - Aircraft Mechanic I  
24.06  
23022 - Aircraft Mechanic II  
25.10

23023 - Aircraft Mechanic III  
26.15  
23040 - Aircraft Mechanic Helper  
19.17  
23050 - Aircraft, Painter  
20.41  
23060 - Aircraft Servicer  
21.17  
23080 - Aircraft Worker  
22.11  
23110 - Appliance Mechanic  
19.18  
23120 - Bicycle Repairer  
13.35  
23125 - Cable Splicer  
20.98  
23130 - Carpenter, Maintenance  
17.36  
23140 - Carpet Layer  
17.64  
23160 - Electrician, Maintenance  
19.38  
23181 - Electronics Technician Maintenance I  
20.66  
23182 - Electronics Technician Maintenance II  
22.55  
23183 - Electronics Technician Maintenance III  
23.59  
23260 - Fabric Worker  
16.74  
23290 - Fire Alarm System Mechanic  
17.34  
23310 - Fire Extinguisher Repairer  
15.82  
23311 - Fuel Distribution System Mechanic  
24.91  
23312 - Fuel Distribution System Operator  
20.32  
23370 - General Maintenance Worker  
14.41  
23380 - Ground Support Equipment Mechanic  
24.06  
23381 - Ground Support Equipment Servicer  
21.17  
23382 - Ground Support Equipment Worker  
22.11  
23391 - Gunsmith I  
15.82  
23392 - Gunsmith II  
17.64  
23393 - Gunsmith III  
19.39  
23410 - Heating, Ventilation And Air-Conditioning  
19.18  
Mechanic  
23411 - Heating, Ventilation And Air Contditioning  
20.00  
Mechanic (Research Facility)

23430 - Heavy Equipment Mechanic  
17.79  
23440 - Heavy Equipment Operator  
17.34  
23460 - Instrument Mechanic  
20.98  
23465 - Laboratory/Shelter Mechanic  
18.54  
23470 - Laborer  
12.71  
23510 - Locksmith  
17.53  
23530 - Machinery Maintenance Mechanic  
21.16  
23550 - Machinist, Maintenance  
20.96  
23580 - Maintenance Trades Helper  
13.91  
23591 - Metrology Technician I  
20.98  
23592 - Metrology Technician II  
21.88  
23593 - Metrology Technician III  
22.78  
23640 - Millwright  
19.39  
23710 - Office Appliance Repairer  
16.65  
23760 - Painter, Maintenance  
18.10  
23790 - Pipefitter, Maintenance  
19.64  
23810 - Plumber, Maintenance  
18.87  
23820 - Pneudraulic Systems Mechanic  
19.39  
23850 - Rigger  
21.25  
23870 - Scale Mechanic  
17.64  
23890 - Sheet-Metal Worker, Maintenance  
23.54  
23910 - Small Engine Mechanic  
16.63  
23931 - Telecommunications Mechanic I  
20.85  
23932 - Telecommunications Mechanic II  
21.75  
23950 - Telephone Lineman  
23.11  
23960 - Welder, Combination, Maintenance  
18.30  
23965 - Well Driller  
19.15  
23970 - Woodcraft Worker  
19.39  
23980 - Woodworker  
15.94  
24000 - Personal Needs Occupations

24570 - Child Care Attendant  
8.99  
24580 - Child Care Center Clerk  
11.21  
24610 - Chore Aide  
8.36  
24620 - Family Readiness And Support Services  
11.85  
Coordinator  
24630 - Homemaker  
13.71  
25000 - Plant And System Operations Occupations  
25010 - Boiler Tender  
20.98  
25040 - Sewage Plant Operator  
18.32  
25070 - Stationary Engineer  
20.98  
25190 - Ventilation Equipment Tender  
15.93  
25210 - Water Treatment Plant Operator  
18.16  
27000 - Protective Service Occupations  
27004 - Alarm Monitor  
14.13  
27007 - Baggage Inspector  
10.84  
27008 - Corrections Officer  
19.97  
27010 - Court Security Officer  
19.97  
27030 - Detection Dog Handler  
13.78  
27040 - Detention Officer  
19.97  
27070 - Firefighter  
20.34  
27101 - Guard I  
10.84  
27102 - Guard II  
13.78  
27131 - Police Officer I  
23.49  
27132 - Police Officer II  
26.10  
28000 - Recreation Occupations  
28041 - Carnival Equipment Operator  
12.34  
28042 - Carnival Equipment Repairer  
12.85  
28043 - Carnival Equipment Worker  
10.10  
28210 - Gate Attendant/Gate Tender  
12.94  
28310 - Lifeguard  
11.34  
28350 - Park Attendant (Aide)  
14.48

28510 - Recreation Aide/Health Facility Attendant  
10.57  
28515 - Recreation Specialist  
17.94  
28630 - Sports Official  
11.54  
28690 - Swimming Pool Operator  
16.28  
29000 - Stevedoring/Longshoremen Occupational Services  
29010 - Blocker And Bracer  
17.93  
29020 - Hatch Tender  
17.93  
29030 - Line Handler  
17.93  
29041 - Stevedore I  
17.11  
29042 - Stevedore II  
18.79  
30000 - Technical Occupations  
30010 - Air Traffic Control Specialist, Center (HFO) (see 2)  
35.77  
30011 - Air Traffic Control Specialist, Station (HFO) (see 2)  
24.66  
30012 - Air Traffic Control Specialist, Terminal (HFO) (see 2)  
27.16  
30021 - Archeological Technician I  
18.17  
30022 - Archeological Technician II  
20.32  
30023 - Archeological Technician III  
25.17  
30030 - Cartographic Technician  
25.17  
30040 - Civil Engineering Technician  
22.71  
30061 - Drafter/CAD Operator I  
18.17  
30062 - Drafter/CAD Operator II  
20.32  
30063 - Drafter/CAD Operator III  
22.67  
30064 - Drafter/CAD Operator IV  
27.89  
30081 - Engineering Technician I  
15.64  
30082 - Engineering Technician II  
17.56  
30083 - Engineering Technician III  
19.64  
30084 - Engineering Technician IV  
24.33  
30085 - Engineering Technician V  
31.55  
30086 - Engineering Technician VI  
36.00  
30090 - Environmental Technician  
22.96

30210 - Laboratory Technician  
 19.91  
 30240 - Mathematical Technician  
 25.17  
 30361 - Paralegal/Legal Assistant I  
 17.64  
 30362 - Paralegal/Legal Assistant II  
 21.86  
 30363 - Paralegal/Legal Assistant III  
 26.74  
 30364 - Paralegal/Legal Assistant IV  
 32.35  
 30390 - Photo-Optics Technician  
 24.33  
 30461 - Technical Writer I  
 25.17  
 30462 - Technical Writer II  
 30.80  
 30463 - Technical Writer III  
 37.26  
 30491 - Unexploded Ordnance (UXO) Technician I  
 22.74  
 30492 - Unexploded Ordnance (UXO) Technician II  
 27.51  
 30493 - Unexploded Ordnance (UXO) Technician III  
 32.97  
 30494 - Unexploded (UXO) Safety Escort  
 22.74  
 30495 - Unexploded (UXO) Sweep Personnel  
 22.74  
 30620 - Weather Observer, Combined Upper Air Or (see 3)  
 21.55  
 Surface Programs  
 30621 - Weather Observer, Senior (see 3)  
 24.33  
 31000 - Transportation/Mobile Equipment Operation Occupations  
 31020 - Bus Aide  
 11.03  
 31030 - Bus Driver  
 14.79  
 31043 - Driver Courier  
 11.98  
 31260 - Parking and Lot Attendant  
 8.91  
 31290 - Shuttle Bus Driver  
 12.80  
 31310 - Taxi Driver  
 9.28  
 31361 - Truckdriver, Light  
 12.80  
 31362 - Truckdriver, Medium  
 15.17  
 31363 - Truckdriver, Heavy  
 15.38  
 31364 - Truckdriver, Tractor-Trailer  
 15.38  
 99000 - Miscellaneous Occupations  
 99030 - Cashier  
 8.97

99050 - Desk Clerk  
 8.99  
 99095 - Embalmer  
 21.11  
 99251 - Laboratory Animal Caretaker I  
 9.41  
 99252 - Laboratory Animal Caretaker II  
 9.88  
 99310 - Mortician  
 21.11  
 99410 - Pest Controller  
 15.36  
 99510 - Photofinishing Worker  
 11.95  
 99710 - Recycling Laborer  
 14.32  
 99711 - Recycling Specialist  
 17.01  
 99730 - Refuse Collector  
 12.97  
 99810 - Sales Clerk  
 10.96  
 99820 - School Crossing Guard  
 9.95  
 99830 - Survey Party Chief  
 18.65  
 99831 - Surveying Aide  
 12.54  
 99832 - Surveying Technician  
 15.43  
 99840 - Vending Machine Attendant  
 10.82  
 99841 - Vending Machine Repairer  
 12.50  
 99842 - Vending Machine Repairer Helper  
 10.82

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ALL OCCUPATIONS LISTED ABOVE RECEIVE THE FOLLOWING BENEFITS:

HEALTH & WELFARE: \$4.27 per hour or \$170.80 per week or \$740.13 per month

VACATION: 2 weeks paid vacation after 1 year of service with a contractor or successor; and 3 weeks after 8 years. Length of service includes the whole span of continuous service with the present contractor or successor, wherever employed, and with the predecessor contractors in the performance of similar work at the same Federal facility. (Reg. 29 CFR 4.173)

HOLIDAYS: A minimum of ten paid holidays per year, New Year's Day, Martin Luther King Jr's Birthday, Washington's Birthday, Memorial Day, Independence Day, Labor Day, Columbus Day, Veterans' Day, Thanksgiving Day, and Christmas Day. (A contractor may substitute for any of the named holidays another day off with pay in accordance with a plan communicated to the employees involved.) (See 29 CFR 4174)

THE OCCUPATIONS WHICH HAVE NUMBERED FOOTNOTES IN PARENTHESES RECEIVE THE FOLLOWING:

1) COMPUTER EMPLOYEES: Under the SCA at section 8(b), this wage determination does not apply to any employee who individually qualifies as a bona fide executive, administrative, or professional employee as defined in 29 C.F.R. Part 541. Because most Computer System Analysts and Computer Programmers who are compensated at a rate not less than \$27.63 (or on a salary or fee basis at a rate not less than \$455 per week) an hour would likely qualify as exempt computer professionals, (29 C.F.R. 541.400) wage rates may not be listed on this wage determination for all occupations within those job families. In addition, because this wage determination may not list a wage rate for some or all occupations within those job families if the survey data indicates that the prevailing wage rate for the occupation equals or exceeds \$27.63 per hour conformances may be necessary for certain nonexempt employees. For example, if an individual employee is nonexempt but nevertheless performs duties within the scope of one of the Computer Systems Analyst or Computer Programmer occupations for which this wage determination does not specify an SCA wage rate, then the wage rate for that employee must be conformed in accordance with the conformance procedures described in the conformance note included on this wage determination.

Additionally, because job titles vary widely and change quickly in the computer industry, job titles are not determinative of the application of the computer professional exemption. Therefore, the exemption applies only to computer employees who satisfy the compensation requirements and whose primary duty consists of:

- (1) The application of systems analysis techniques and procedures, including consulting with users, to determine hardware, software or system functional specifications;
- (2) The design, development, documentation, analysis, creation, testing or modification of computer systems or programs, including prototypes, based on and related to user or system design specifications;
- (3) The design, documentation, testing, creation or modification of computer programs related to machine operating systems; or
- (4) A combination of the aforementioned duties, the performance of which requires the same level of skills. (29 C.F.R. 541.400).

2) APPLICABLE TO AIR TRAFFIC CONTROLLERS ONLY - NIGHT DIFFERENTIAL: An employee is entitled to pay for all work performed between the hours of 6:00 P.M. and 6:00 A.M. at the rate of basic pay plus a night pay differential amounting to 10 percent of the rate of basic pay.

3) AIR TRAFFIC CONTROLLERS AND WEATHER OBSERVERS - NIGHT PAY & SUNDAY PAY: If you work at night as part of a regular tour of duty, you will earn a night differential and receive an additional 10% of basic pay for any hours worked between 6pm and 6am.

If you are a full-time employed (40 hours a week) and Sunday is part of your regularly scheduled workweek, you are paid at your rate of basic pay plus a Sunday premium of 25% of your basic rate for each hour of Sunday work which is not overtime (i.e. occasional work on Sunday outside the normal tour of duty is considered overtime work).

HAZARDOUS PAY DIFFERENTIAL: An 8 percent differential is applicable to employees employed in a position that represents a high degree of hazard when working with or in close proximity to ordnance, explosives, and incendiary materials. This includes work such as screening, blending, dying, mixing, and pressing of sensitive ordnance, explosives, and pyrotechnic compositions such as lead azide, black powder and photoflash powder. All dry-house activities involving propellants or explosives. Demilitarization, modification, renovation, demolition, and maintenance operations on sensitive ordnance, explosives and incendiary materials. All operations involving regrading and cleaning of artillery ranges.

A 4 percent differential is applicable to employees employed in a position that represents a low degree of hazard when working with, or in close proximity to ordnance, (or employees possibly adjacent to) explosives and incendiary materials which involves potential injury such as laceration of hands, face, or arms of the employee engaged in the operation, irritation of the skin, minor burns and the like; minimal damage to immediate or adjacent work area or equipment being used. All operations involving, unloading, storage, and hauling of ordnance, explosive, and incendiary ordnance material other than small arms ammunition. These differentials are only applicable to work that has been specifically designated by the agency for ordnance, explosives, and incendiary material differential pay.

\*\* UNIFORM ALLOWANCE \*\*

If employees are required to wear uniforms in the performance of this contract (either by the terms of the Government contract, by the employer, by the state or local law, etc.), the cost of furnishing such uniforms and maintaining (by laundering or dry cleaning) such uniforms is an expense that may not be borne by an employee where such cost reduces the hourly rate below that required by the wage determination. The Department of Labor will accept payment in accordance with the following standards as compliance:

The contractor or subcontractor is required to furnish all employees with an adequate number of uniforms without cost or to reimburse employees for the actual cost of the uniforms. In addition, where uniform cleaning and maintenance is made the responsibility of the employee, all contractors and subcontractors subject to this wage determination shall (in the absence of a bona fide collective bargaining agreement providing for a different amount, or the furnishing of contrary affirmative proof as to the actual cost), reimburse all employees for such cleaning and maintenance at a rate of \$3.35 per week (or \$.67 cents per day). However, in those instances where the uniforms furnished are made of "wash and wear" materials, may be routinely washed and dried with other personal garments, and do not require any special treatment such as dry cleaning, daily washing, or commercial laundering in order to meet the cleanliness or appearance standards set by the terms of the Government contract, by the contractor, by law, or by the nature of the work, there is no requirement that employees be reimbursed for uniform maintenance costs.

The duties of employees under job titles listed are those described in the "Service Contract Act Directory of Occupations", Fifth Edition, April 2006, unless otherwise indicated. Copies of the Directory are available on the Internet. A links to the Directory may be found on the WHD home page at <http://www.dol.gov/esa/whd/> or through the Wage Determinations On-Line (WDOL) Web site at <http://wdol.gov/>.

REQUEST FOR AUTHORIZATION OF ADDITIONAL CLASSIFICATION AND WAGE RATE {Standard Form 1444 (SF 1444)}

#### Conformance Process:

The contracting officer shall require that any class of service employee which is not listed herein and which is to be employed under the contract (i.e., the work to be performed is not performed by any classification listed in the wage determination), be classified by the contractor so as to provide a reasonable relationship (i.e., appropriate level of skill comparison) between such unlisted classifications and the classifications listed in the wage determination. Such conformed classes of employees shall be paid the monetary wages and furnished the fringe benefits as are determined. Such conforming process shall be initiated by the contractor prior to the performance of contract work by such unlisted class(es) of employees. The conformed classification, wage rate, and/or fringe benefits shall be retroactive to the commencement date of the contract. {See Section 4.6 (C)(vi)} When multiple wage determinations are included in a contract, a separate SF 1444 should be prepared for each wage determination to which a class(es) is to be conformed.

The process for preparing a conformance request is as follows:

- 1) When preparing the bid, the contractor identifies the need for a conformed occupation(s) and computes a proposed rate(s).
- 2) After contract award, the contractor prepares a written report listing in order proposed classification title(s), a Federal grade equivalency (FGE) for each proposed classification(s), job description(s), and rationale for proposed wage rate(s), including information regarding the agreement or disagreement of the authorized representative of the employees involved, or where there is no authorized representative, the employees themselves. This report should be submitted to the contracting officer no later than 30 days after such unlisted class(es) of employees performs any contract work.
- 3) The contracting officer reviews the proposed action and promptly submits a report of the action, together with the agency's recommendations and pertinent information including the position of the contractor and the employees, to the Wage and Hour Division, Employment Standards Administration, U.S. Department of Labor, for review. (See section 4.6(b)(2) of Regulations 29 CFR Part 4).
- 4) Within 30 days of receipt, the Wage and Hour Division approves, modifies, or disapproves the action via transmittal to the agency contracting officer, or notifies the contracting officer that additional time will be required to process the request.
- 5) The contracting officer transmits the Wage and Hour decision to the contractor.
- 6) The contractor informs the affected employees.

Information required by the Regulations must be submitted on SF 1444 or bond paper.

When preparing a conformance request, the "Service Contract Act Directory of Occupations" (the Directory) should be used to compare job definitions to insure that duties requested are not performed by a classification already listed in the wage determination. Remember, it is not the job title, but the required tasks that determine whether a class is included in an established wage determination. Conformances may not be used to artificially split, combine, or subdivide classifications listed in the wage determination.



## Section I - Contract Clauses

252.232-7006 WAWF

## 252.232-7006 WIDE AREA WORKFLOW PAYMENT INSTRUCTIONS (MAY 2013)

(a) Definitions. As used in this clause--

Department of Defense Activity Address Code (DoDAAC) is a six position code that uniquely identifies a unit, activity, or organization.

Document type means the type of payment request or receiving report available for creation in Wide Area WorkFlow (WAWF).

Local processing office (LPO) is the office responsible for payment certification when payment certification is done external to the entitlement system.

(b) Electronic invoicing. The WAWF system is the method to electronically process vendor payment requests and receiving reports, as authorized by DFARS 252.232-7003, Electronic Submission of Payment Requests and Receiving Reports.

(c) WAWF access. To access WAWF, the Contractor shall--

(1) Have a designated electronic business point of contact in the System for Award Management at <https://www.acquisition.gov>; and

(2) Be registered to use WAWF at <https://wawf.eb.mil/> following the step-by-step procedures for self-registration available at this Web site.

(d) WAWF training. The Contractor should follow the training instructions of the WAWF Web-Based Training Course and use the Practice Training Site before submitting payment requests through WAWF. Both can be accessed by selecting the "Web Based Training" link on the WAWF home page at <https://wawf.eb.mil/>.

(e) WAWF methods of document submission. Document submissions may be via Web entry, Electronic Data Interchange, or File Transfer Protocol.

(f) WAWF payment instructions. The Contractor must use the following information when submitting payment requests and receiving reports in WAWF for this contract/order:

**Contract number, typically in the form N69450-14-M-1234, for example.**

(1) Document type. The Contractor shall use the following document type(s).

**Naval Construction/Facilities Management Invoice**

(2) Inspection/acceptance location. The Contractor shall select the following inspection/acceptance location(s) in WAWF, as specified by the contracting officer.

**Inspection – N44215**

Acceptance – N44215

(3) Document routing. The Contractor shall use the information in the Routing Data Table below only to fill in applicable fields in WAWF when creating payment requests and receiving reports in the system.

Routing Data Table\*

Field Name in WAWF	Data to be entered in WAWF
Pay Official DoDAAC	N68732
Issue By DoDAAC	N69450
Admin DoDAAC	N44215
Inspect By DoDAAC	N44215
Ship To Code	N/A
Ship From Code	N/A
Mark For Code	N/A
Service Approver (DoDAAC)	N/A
Service Acceptor (DoDAAC)	N/A
Accept at Other DoDAAC	N/A
LPO DoDAAC	N44215
DCAA Auditor DoDAAC	N/A
Other DoDAAC(s)	N/A

(4) Payment request and supporting documentation. The Contractor shall ensure a payment request includes appropriate contract line item and subline item descriptions of the work performed or supplies delivered, unit price/cost per unit, fee (if applicable), and all relevant back-up documentation, as defined in DFARS Appendix F, (e.g. timesheets) in support of each payment request.

(5) WAWF email notifications. The Contractor shall enter the email address identified below in the “Send Additional Email Notifications” field of WAWF once a document is submitted in the system.  
[joel.overson@navy.mil](mailto:joel.overson@navy.mil)

(6) WAWF point of contact. (1) The Contractor may obtain clarification regarding invoicing in WAWF from the following contracting activity's WAWF point of contact.

WAWF Technician: Dana Villarreal (361)516-6210 [dana.villarreal@navy.mil](mailto:dana.villarreal@navy.mil)  
 Contracting Officer: Joel Overson (361)961-3397 [joel.overson@navy.mil](mailto:joel.overson@navy.mil)

(2) For technical WAWF help, contact the WAWF helpdesk at 866-618-5988.  
 (End of clause)

## CLAUSES INCORPORATED BY REFERENCE

52.222-50	Combating Trafficking in Persons	MAR 2015
52.223-2	Affirmative Procurement of Biobased Products Under Service and Construction Contracts	SEP 2013
52.223-3	Hazardous Material Identification And Material Safety Data	JAN 1997
52.223-5	Pollution Prevention and Right-to-Know Information	MAY 2011
52.223-10	Waste Reduction Program	MAY 2011
52.223-17	Affirmative Procurement of EPA-Designated Items in Service and Construction Contracts	MAY 2008
52.228-8	Liability and Insurance - Leased Motor Vehicles	MAY 1999
52.232-18	Availability Of Funds	APR 1984
52.245-1	Government Property	APR 2012
252.203-7002	Requirement to Inform Employees of Whistleblower Rights	SEP 2013
252.204-7003	Control Of Government Personnel Work Product	APR 1992
252.204-7012	Safeguarding Covered Defense Information and Cyber Incident Reporting.	DEC 2015
252.232-7010	Levies on Contract Payments	DEC 2006
252.246-7003	Notification of Potential Safety Issues	JUN 2013

## CLAUSES INCORPORATED BY FULL TEXT

## 52.212-4 CONTRACT TERMS AND CONDITIONS-- COMMERCIAL ITEMS (MAY 2015)

(a) Inspection/Acceptance. The Contractor shall only tender for acceptance those items that conform to the requirements of this contract. The Government reserves the right to inspect or test any supplies or services that have been tendered for acceptance. The Government may require repair or replacement of nonconforming supplies or reperformance of nonconforming services at no increase in contract price. If repair/replacement or reperformance will not correct the defects or is not possible, the Government may seek an equitable price reduction or adequate consideration for acceptance of nonconforming supplies or services. The Government must exercise its post-acceptance rights (1) within a reasonable time after the defect was discovered or should have been discovered; and (2) before any substantial change occurs in the condition of the item, unless the change is due to the defect in the item.

(b) Assignment. The Contractor or its assignee may assign its rights to receive payment due as a result of performance of this contract to a bank, trust company, or other financing institution, including any Federal lending agency in accordance with the Assignment of Claims Act (31 U.S.C. 3727). However, when a third party makes payment (e.g., use of the Governmentwide commercial purchase card), the Contractor may not assign its rights to receive payment under this contract.

(c) Changes. Changes in the terms and conditions of this contract may be made only by written agreement of the parties.

(d) Disputes. This contract is subject to 41 U.S.C. chapter 71, "Contract Disputes", as amended (41 U.S.C. 601-613). Failure of the parties to this contract to reach agreement on any request for equitable adjustment, claim, appeal or action arising under or relating to this contract shall be a dispute to be resolved in accordance with the clause at FAR 52.233-1, Disputes, which is incorporated herein by reference. The Contractor shall proceed diligently with performance of this contract, pending final resolution of any dispute arising under the contract.

(e) Definitions. The clause at FAR 52.202-1, Definitions, is incorporated herein by reference.

(f) Excusable delays. The Contractor shall be liable for default unless nonperformance is caused by an occurrence beyond the reasonable control of the Contractor and without its fault or negligence such as, acts of God or the public enemy, acts of the Government in either its sovereign or contractual capacity, fires, floods, epidemics, quarantine restrictions, strikes, unusually severe weather, and delays of common carriers. The Contractor shall notify the Contracting Officer in writing as soon as it is reasonably possible after the commencement or any excusable delay, setting forth the full particulars in connection therewith, shall remedy such occurrence with all reasonable dispatch and shall promptly give written notice to the Contracting Officer of the cessation of such occurrence.

(g) Invoice.

(1) The Contractor shall submit an original invoice and three copies (or electronic invoice, if authorized) to the address designated in the contract to receive invoices. An invoice must include--

(i) Name and address of the Contractor;

(ii) Invoice date and number;

(iii) Contract number, contract line item number and, if applicable, the order number;

(iv) Description, quantity, unit of measure, unit price and extended price of the items delivered;

(v) Shipping number and date of shipment, including the bill of lading number and weight of shipment if shipped on Government bill of lading;

(vi) Terms of any discount for prompt payment offered;

(vii) Name and address of official to whom payment is to be sent;

(viii) Name, title, and phone number of person to notify in event of defective invoice; and

(ix) Taxpayer Identification Number (TIN). The Contractor shall include its TIN on the invoice only if required elsewhere in this contract.

(x) Electronic funds transfer (EFT) banking information.

(A) The Contractor shall include EFT banking information on the invoice only if required elsewhere in this contract.

(B) If EFT banking information is not required to be on the invoice, in order for the invoice to be a proper invoice, the Contractor shall have submitted correct EFT banking information in accordance with the applicable solicitation provision, contract clause (e.g., 52.232-33, Payment by Electronic Funds Transfer—System for Award Management, or 52.232-34, Payment by Electronic Funds Transfer--Other Than System for Award Management), or applicable agency procedures.

(C) EFT banking information is not required if the Government waived the requirement to pay by EFT.

(2) Invoices will be handled in accordance with the Prompt Payment Act (31 U.S.C. 3903) and Office of Management and Budget (OMB) prompt payment regulations at 5 CFR part 1315.

(h) Patent indemnity. The Contractor shall indemnify the Government and its officers, employees and agents against liability, including costs, for actual or alleged direct or contributory infringement of, or inducement to infringe, any United States or foreign patent, trademark or copyright, arising out of the performance of this contract, provided the Contractor is reasonably notified of such claims and proceedings.

(i) Payment.--

(1) Items accepted. Payment shall be made for items accepted by the Government that have been delivered to the delivery destinations set forth in this contract.

(2) Prompt payment. The Government will make payment in accordance with the Prompt Payment Act (31 U.S.C. 3903) and prompt payment regulations at 5 CFR part 1315.

(3) Electronic Funds Transfer (EFT). If the Government makes payment by EFT, see 52.212-5(b) for the appropriate EFT clause.

(4) Discount. In connection with any discount offered for early payment, time shall be computed from the date of the invoice. For the purpose of computing the discount earned, payment shall be considered to have been made on the date which appears on the payment check or the specified payment date if an electronic funds transfer payment is made.

(5) Overpayments. If the Contractor becomes aware of a duplicate contract financing or invoice payment or that the Government has otherwise overpaid on a contract financing or invoice payment, the Contractor shall--

(i) Remit the overpayment amount to the payment office cited in the contract along with a description of the overpayment including the--

(A) Circumstances of the overpayment (e.g., duplicate payment, erroneous payment, liquidation errors, date(s) of overpayment);

(B) Affected contract number and delivery order number, if applicable;

(C) Affected contract line item or subline item, if applicable; and

(D) Contractor point of contact.

(ii) Provide a copy of the remittance and supporting documentation to the Contracting Officer.

(6) Interest.

(i) All amounts that become payable by the Contractor to the Government under this contract shall bear simple interest from the date due until paid unless paid within 30 days of becoming due. The interest rate shall be the interest rate established by the Secretary of the Treasury as provided in 41 U.S.C. 7109, which is applicable to the period in which the amount becomes due, as provided in (i)(6)(v) of this clause, and then at the rate applicable for each six-month period as fixed by the Secretary until the amount is paid.

(ii) The Government may issue a demand for payment to the Contractor upon finding a debt is due under the contract.

(iii) Final decisions. The Contracting Officer will issue a final decision as required by 33.211 if--

(A) The Contracting Officer and the Contractor are unable to reach agreement on the existence or amount of a debt within 30 days;

(B) The Contractor fails to liquidate a debt previously demanded by the Contracting Officer within the timeline specified in the demand for payment unless the amounts were not repaid because the Contractor has requested an installment payment agreement; or

(C) The Contractor requests a deferment of collection on a debt previously demanded by the Contracting Officer (see 32.607-2).

(iv) If a demand for payment was previously issued for the debt, the demand for payment included in the final decision shall identify the same due date as the original demand for payment.

(v) Amounts shall be due at the earliest of the following dates:

(A) The date fixed under this contract.

(B) The date of the first written demand for payment, including any demand for payment resulting from a default termination.

(vi) The interest charge shall be computed for the actual number of calendar days involved beginning on the due date and ending on--

(A) The date on which the designated office receives payment from the Contractor;

(B) The date of issuance of a Government check to the Contractor from which an amount otherwise payable has been withheld as a credit against the contract debt; or

(C) The date on which an amount withheld and applied to the contract debt would otherwise have become payable to the Contractor.

(vii) The interest charge made under this clause may be reduced under the procedures prescribed in 32.608-2 of the Federal Acquisition Regulation in effect on the date of this contract.

(j) Risk of loss. Unless the contract specifically provides otherwise, risk of loss or damage to the supplies provided under this contract shall remain with the Contractor until, and shall pass to the Government upon:

(1) Delivery of the supplies to a carrier, if transportation is f.o.b. origin; or

(2) Delivery of the supplies to the Government at the destination specified in the contract, if transportation is f.o.b. destination.

(k) Taxes. The contract price includes all applicable Federal, State, and local taxes and duties.

(l) Termination for the Government's convenience. The Government reserves the right to terminate this contract, or any part hereof, for its sole convenience. In the event of such termination, the Contractor shall immediately stop all work hereunder and shall immediately cause any and all of its suppliers and subcontractors to cease work. Subject to the terms of this contract, the Contractor shall be paid a percentage of the contract price reflecting the percentage of the work performed prior to the notice of termination, plus reasonable charges the Contractor can demonstrate to the satisfaction of the Government using its standard record keeping system, have resulted from the termination. The Contractor shall not be required to comply with the cost accounting standards or contract cost principles for this purpose. This paragraph does not give the Government any right to audit the Contractor's records. The Contractor shall not be paid for any work performed or costs incurred which reasonably could have been avoided.

(m) Termination for cause. The Government may terminate this contract, or any part hereof, for cause in the event of any default by the Contractor, or if the Contractor fails to comply with any contract terms and conditions, or fails to provide the Government, upon request, with adequate assurances of future performance. In the event of termination for cause, the Government shall not be liable to the Contractor for any amount for supplies or services not accepted, and the Contractor shall be liable to the Government for any and all rights and remedies provided by law. If it is determined that the Government improperly terminated this contract for default, such termination shall be deemed a termination for convenience.

(n) Title. Unless specified elsewhere in this contract, title to items furnished under this contract shall pass to the Government upon acceptance, regardless of when or where the Government takes physical possession.

(o) Warranty. The Contractor warrants and implies that the items delivered hereunder are merchantable and fit for use for the particular purpose described in this contract.

(p) Limitation of liability. Except as otherwise provided by an express warranty, the Contractor will not be liable to the Government for consequential damages resulting from any defect or deficiencies in accepted items.

(q) Other compliances. The Contractor shall comply with all applicable Federal, State and local laws, executive orders, rules and regulations applicable to its performance under this contract.

(r) Compliance with laws unique to Government contracts. The Contractor agrees to comply with 31 U.S.C. 1352 relating to limitations on the use of appropriated funds to influence certain Federal contracts; 18 U.S.C. 431 relating to officials not to benefit; 40 U.S.C. chapter 37, Contract Work Hours and Safety Standards; 41 U.S.C. chapter 87, Kickbacks; 41 U.S.C. 4712 and 10 U.S.C. 2409 relating to whistleblower protections; 49 U.S.C. 40118, Fly American; and 41 U.S.C. chapter 21 relating to procurement integrity.

(s) Order of precedence. Any inconsistencies in this solicitation or contract shall be resolved by giving precedence in the following order: (1) the schedule of supplies/services; (2) The Assignments, Disputes, Payments, Invoice, Other

Compliances, Compliance with Laws Unique to Government Contracts, and Unauthorized Obligations paragraphs of this clause; (3) the clause at 52.212-5; (4) addenda to this solicitation or contract, including any license agreements for computer software; (5) solicitation provisions if this is a solicitation; (6) other paragraphs of this clause; (7) the Standard Form 1449; (8) other documents, exhibits, and attachments; and (9) the specification.

(t) System for Award Management (SAM). (1) Unless exempted by an addendum to this contract, the Contractor is responsible during performance and through final payment of any contract for the accuracy and completeness of the data within the SAM database, and for any liability resulting from the Government's reliance on inaccurate or incomplete data. To remain registered in the SAM database after the initial registration, the Contractor is required to review and update on an annual basis from the date of initial registration or subsequent updates its information in the SAM database to ensure it is current, accurate and complete. Updating information in the SAM does not alter the terms and conditions of this contract and is not a substitute for a properly executed contractual document.

(2)(i) If a Contractor has legally changed its business name, "doing business as" name, or division name (whichever is shown on the contract), or has transferred the assets used in performing the contract, but has not completed the necessary requirements regarding novation and change-of-name agreements in FAR subpart 42.12, the Contractor shall provide the responsible Contracting Officer a minimum of one business day's written notification of its intention to (A) change the name in the SAM database; (B) comply with the requirements of subpart 42.12; and (C) agree in writing to the timeline and procedures specified by the responsible Contracting Officer. The Contractor must provide with the notification sufficient documentation to support the legally changed name.

(ii) If the Contractor fails to comply with the requirements of paragraph (t)(2)(i) of this clause, or fails to perform the agreement at paragraph (t)(2)(i)(C) of this clause, and, in the absence of a properly executed novation or change-of-name agreement, the SAM information that shows the Contractor to be other than the Contractor indicated in the contract will be considered to be incorrect information within the meaning of the "Suspension of Payment" paragraph of the electronic funds transfer (EFT) clause of this contract.

(3) The Contractor shall not change the name or address for EFT payments or manual payments, as appropriate, in the SAM record to reflect an assignee for the purpose of assignment of claims (see Subpart 32.8, Assignment of Claims). Assignees shall be separately registered in the SAM database. Information provided to the Contractor's SAM record that indicates payments, including those made by EFT, to an ultimate recipient other than that

Contractor will be considered to be incorrect information within the meaning of the "Suspension of payment" paragraph of the EFT clause of this contract.

(4) Offerors and Contractors may obtain information on registration and annual confirmation requirements via SAM accessed through <https://www.acquisition.gov>.

(u) Unauthorized Obligations.

(1) Except as stated in paragraph (u)(2) of this clause, when any supply or service acquired under this contract is subject to any End User License Agreement (EULA), Terms of Service (TOS), or similar legal instrument or agreement, that includes any clause requiring the Government to indemnify the Contractor or any person or entity for damages, costs, fees, or any other loss or liability that would create an Anti-Deficiency Act violation (31 U.S.C. 1341), the following shall govern:

(i) Any such clause is unenforceable against the Government.

(ii) Neither the Government nor any Government authorized end user shall be deemed to have agreed to such clause by virtue of it appearing in the EULA, TOS, or similar legal instrument or agreement. If the EULA, TOS, or similar legal instrument or agreement is invoked through an "I agree" click box or other comparable mechanism (e.g., "click-wrap" or "browse-wrap" agreements), execution does not bind the Government or any Government authorized end user to such clause.

(iii) Any such clause is deemed to be stricken from the EULA, TOS, or similar legal instrument or agreement.

(2) Paragraph (u)(1) of this clause does not apply to indemnification by the Government that is expressly authorized by statute and specifically authorized under applicable agency regulations and procedures.

(v) Incorporation by reference. The Contractor's representations and certifications, including those completed electronically via the System for Award Management (SAM), are incorporated by reference into the contract.

(End of Clause)

#### 52.212-5 CONTRACT TERMS AND CONDITIONS REQUIRED TO IMPLEMENT STATUTES OR EXECUTIVE ORDERS--COMMERCIAL ITEMS (JAN 2016)

(a) The Contractor shall comply with the following Federal Acquisition Regulation (FAR) clauses, which are incorporated in this contract by reference, to implement provisions of law or Executive orders applicable to acquisitions of commercial items:

(1) 52.209-10, Prohibition on Contracting with Inverted Domestic Corporations (Nov 2015).

(2) 52.233-3, Protest After Award (AUG 1996) (31 U.S.C. 3553).

(3) 52.233-4, Applicable Law for Breach of Contract Claim (OCT 2004) (Public Laws 108-77 and 108-78 (19 U.S.C. 3805 note)).

(b) The Contractor shall comply with the FAR clauses in this paragraph (b) that the Contracting Officer has indicated as being incorporated in this contract by reference to implement provisions of law or Executive orders applicable to acquisitions of commercial items: (Contracting Officer check as appropriate.)

- (1) 52.203-6, Restrictions on Subcontractor Sales to the Government (Sept 2006), with Alternate I (Oct 1995) (41 U.S.C. 4704 and 10 U.S.C. 2402).
- (2) 52.203-13, Contractor Code of Business Ethics and Conduct (Oct 2015) (41 U.S.C. 3509).
- (3) 52.203-15, Whistleblower Protections under the American Recovery and Reinvestment Act of 2009 (June 2010) (Section 1553 of Pub. L. 111-5). (Applies to contracts funded by the American Recovery and Reinvestment Act of 2009.)
- (4) 52.204-10, Reporting Executive Compensation and First-Tier Subcontract Awards (Oct 2015) (Pub. L. 109-282) (31 U.S.C. 6101 note).
- (5) [Reserved]
- (6) 52.204-14, Service Contract Reporting Requirements (JAN 2014) (Pub. L. 111-117, section 743 of Div. C).
- (7) 52.204-15, Service Contract Reporting Requirements for Indefinite-Delivery Contracts (JAN 2014) (Pub. L. 111-117, section 743 of Div. C).
- (8) 52.209-6, Protecting the Government's Interest When Subcontracting with Contractors Debarred, Suspended, or Proposed for Debarment. (Oct 2015) (31 U.S.C. 6101 note).
- (9) 52.209-9, Updates of Publicly Available Information Regarding Responsibility Matters (July 2013) (41 U.S.C. 2313).
- (10) [Reserved]
- (11)(i) 52.219-3, Notice of HUBZone Set-Aside or Sole-Source Award (NOV 2011) (15 U.S.C. 657a).
- (ii) Alternate I (NOV 2011) of 52.219-3.
- (12) (i) 52.219-4, Notice of Price Evaluation Preference for HUBZone Small Business Concerns (OCT 2014) (if the offeror elects to waive the preference, it shall so indicate in its offer) (15 U.S.C. 657a).
- (ii) Alternate I (JAN 2011) of 52.219-4.
- (13) [Reserved]
- (14)(i) 52.219-6, Notice of Total Small Business Set-Aside (NOV 2011) (15 U.S.C. 644).
- (ii) Alternate I (NOV 2011).
- (iii) Alternate II (NOV 2011).
- (15)(i) 52.219-7, Notice of Partial Small Business Set-Aside (June 2003) (15 U.S.C. 644).
- (ii) Alternate I (Oct 1995) of 52.219-7.
- (iii) Alternate II (Mar 2004) of 52.219-7.
- (16) 52.219-8, Utilization of Small Business Concerns (OCT 2014) (15 U.S.C. 637(d)(2) and (3)).

- \_\_\_ (17)(i) 52.219-9, Small Business Subcontracting Plan (Oct 2015) (15 U.S.C. 637(d)(4)).
- \_\_\_ (ii) Alternate I (Oct 2001) of 52.219-9.
- \_\_\_ (iii) Alternate II (Oct 2001) of 52.219-9.
- \_\_\_ (iv) Alternate III (Oct 2015) of 52.219-9.
- \_\_\_ (18) 52.219-13, Notice of Set-Aside of Orders (NOV 2011) (15 U.S.C. 644(r)).
- X (19) 52.219-14, Limitations on Subcontracting (NOV 2011) (15 U.S.C. 637(a)(14)).
- \_\_\_ (20) 52.219-16, Liquidated Damages—Subcontracting Plan (Jan 1999) (15 U.S.C. 637(d)(4)(F)(i)).
- \_\_\_ (21) 52.219-27, Notice of Service-Disabled Veteran-Owned Small Business Set-Aside (NOV 2011) (15 U.S.C. 657f).
- \_\_\_ (22) 52.219-28, Post Award Small Business Program Rerepresentation (July 2013) (15 U.S.C. 632(a)(2)).
- \_\_\_ (23) 52.219-29, Notice of Set-Aside for, or Sole Source Award to, Economically Disadvantaged Women-Owned Small Business Concerns (Dec 2015) (15 U.S.C. 637(m)).
- \_\_\_ (24) 52.219-30, Notice of Set-Aside for, or Sole Source Award to, Women-Owned Small Business Concerns Eligible Under the Women-Owned Small Business Program (Dec 2015) (15 U.S.C. 637(m)).
- X (25) 52.222-3, Convict Labor (June 2003) (E.O. 11755).
- X (26) 52.222-19, Child Labor--Cooperation with Authorities and Remedies (JAN 2016) (E.O. 13126).
- X (27) 52.222-21, Prohibition of Segregated Facilities (Apr 2015).
- X (28) 52.222-26, Equal Opportunity (Apr 2015) (E.O. 11246).
- X (29) 52.222-35, Equal Opportunity for Veterans (Oct 2015) (38 U.S.C. 4212).
- X (30) 52.222-36, Equal Opportunity for Workers with Disabilities (July 2014) (29 U.S.C. 793).
- X (31) 52.222-37, Employment Reports on Veterans (Oct 2015) (38 U.S.C. 4212).
- X (32) 52.222-40, Notification of Employee Rights Under the National Labor Relations Act (Dec 2010) (E.O. 13496).
- \_\_\_ (33)(i) 52.222-50, Combating Trafficking in Persons (March 2, 2015) (22 U.S.C. chapter 78 and E.O. 13627).
- X (ii) Alternate I (March 2, 2015) of 52.222-50 (22 U.S.C. chapter 78 and E.O. 13627).
- X (34) 52.222-54, Employment Eligibility Verification (Oct 2015). (E. O. 12989). (Not applicable to the acquisition of commercially available off-the-shelf items or certain other types of commercial items as prescribed in 22.1803.)
- X (35)(i) 52.223-9, Estimate of Percentage of Recovered Material Content for EPA-Designated Items (May 2008) (42 U.S.C. 6962(c)(3)(A)(ii)). (Not applicable to the acquisition of commercially available off-the-shelf items.)

\_\_\_\_ (ii) Alternate I (May 2008) of 52.223-9 (42 U.S.C. 6962(i)(2)(C)). (Not applicable to the acquisition of commercially available off-the-shelf items.)

\_\_\_\_ (36) (i) 52.223-13, Acquisition of EPEAT® Registered Imaging Equipment (Jun 2014) (E.O.s 13423 and 13514).

\_\_\_\_ (ii) Alternate I (OCT 2015) of 52.223-13.

\_\_\_\_ (37)(i) 52.223-14, Acquisition of EPEAT® Registered Televisions (Jun 2014) (E.O.s 13423 and 13514).

\_\_\_\_ (ii) Alternate I (Jun 2014) of 52.223-14.

\_\_\_\_ (38) 52.223-15, Energy Efficiency in Energy-Consuming Products (Dec 2007) (42 U.S.C. 8259b).

\_\_\_\_ (39)(i) 52.223-16, Acquisition of EPEAT[supreg]-Registered Personal Computer Products (OCT 2015) (E.O.s 13423 and 13514).

\_\_\_\_ (ii) Alternate I (Jun 2014) of 52.223-16.

X (40) 52.223-18, Encouraging Contractor Policies to Ban Text Messaging While Driving (Aug 2011) (E.O. 13513).

X (41) 52.225-1, Buy American--Supplies (May 2014) (41 U.S.C. chapter 83).

X (42) (i) 52.225-3, Buy American--Free Trade Agreements--Israeli Trade Act (May 2014) (41 U.S.C. chapter 83, 19 U.S.C. 3301 note, 19 U.S.C. 2112 note, 19 U.S.C. 3805 note, 19 U.S.C. 4001 note, Pub. L. 103-182, 108-77, 108-78, 108-286, 108-302, 109-53, 109-169, 109-283, 110-138, 112-41, 112-42, and 112-43).

\_\_\_\_ (ii) Alternate I (May 2014) of 52.225-3.

\_\_\_\_ (iii) Alternate II (May 2014) of 52.225-3.

\_\_\_\_ (iv) Alternate III (May 2014) of 52.225-3.

\_\_\_\_ (43) 52.225-5, Trade Agreements (Nov 2013) (19 U.S.C. 2501, et seq., 19 U.S.C. 3301 note).

\_\_\_\_ (44) 52.225-13, Restrictions on Certain Foreign Purchases (June 2008) (E.O.'s, proclamations, and statutes administered by the Office of Foreign Assets Control of the Department of the Treasury).

\_\_\_\_ (45) 52.225-26, Contractors Performing Private Security Functions Outside the United States (Jul 2013) (Section 862, as amended, of the National Defense Authorization Act for Fiscal Year 2008; 10 U.S.C. 2302 Note).

\_\_\_\_ (46) 52.226-4, Notice of Disaster or Emergency Area Set-Aside (Nov 2007) (42 U.S.C. 5150)

\_\_\_\_ (47) 52.226-5, Restrictions on Subcontracting Outside Disaster or Emergency Area (Nov 2007) (42 U.S.C. 5150).

\_\_\_\_ (48) 52.232-29, Terms for Financing of Purchases of Commercial Items (Feb 2002) (41 U.S.C. 4505, 10 U.S.C. 2307(f)).

\_\_\_\_ (49) 52.232-30, Installment Payments for Commercial Items (Oct 1995) (41 U.S.C. 4505, 10 U.S.C. 2307(f)).

X (50) 52.232-33, Payment by Electronic Funds Transfer—System for Award Management (July 2013) (31 U.S.C. 3332).

X (51) 52.232-34, Payment by Electronic Funds Transfer—Other than System for Award Management (July 2013) (31 U.S.C. 3332).

X (52) 52.232-36, Payment by Third Party (MAY 2014) (31 U.S.C. 3332).

\_\_\_\_\_ (53) 52.239-1, Privacy or Security Safeguards (Aug 1996) (5 U.S.C. 552a).

\_\_\_\_\_ (54)(i) 52.247-64, Preference for Privately Owned U.S.-Flag Commercial Vessels (Feb 2006) (46 U.S.C. Appx. 1241(b) and 10 U.S.C. 2631).

\_\_\_\_\_ (ii) Alternate I (Apr 2003) of 52.247-64.

(c) The Contractor shall comply with the FAR clauses in this paragraph (c), applicable to commercial services, that the Contracting Officer has indicated as being incorporated in this contract by reference to implement provisions of law or Executive orders applicable to acquisitions of commercial items: (Contracting Officer check as appropriate.)

X (1) 52.222-17, Nondisplacement of Qualified Workers (May 2014) (E.O. 13495).

X (2) 52.222-41, Service Contract Labor Standards (MAY 2014) (41 U.S.C. chapter 67).

X (3) 52.222-42, Statement of Equivalent Rates for Federal Hires (MAY 2014) (29 U.S.C. 206 and 41 U.S.C. chapter 67).

\_\_\_\_\_ (4) 52.222-43, Fair Labor Standards Act and Service Contract Labor Standards--Price Adjustment (Multiple Year and Option Contracts) (MAY 2014) (29 U.S.C. 206 and 41 U.S.C. chapter 67).

X (5) 52.222-44, Fair Labor Standards Act and Service Contract Labor Standards--Price Adjustment (MAY 2014) (29 U.S.C. 206 and 41 U.S.C. chapter 67).

\_\_\_\_\_ (6) 52.222-51, Exemption from Application of the Service Contract Labor Standards to Contracts for Maintenance, Calibration, or Repair of Certain Equipment--Requirements (MAY 2014) (41 U.S.C. chapter 67).

\_\_\_\_\_ (7) 52.222-53, Exemption from Application of the Service Contract Labor Standards to Contracts for Certain Services--Requirements (MAY 2014) (41 U.S.C. chapter 67).

\_\_\_\_\_ (8) 52.222-55, Minimum Wages Under Executive Order 13658 (DEC 2015) (E.O. 13658).

\_\_\_\_\_ (9) 52.226-6, Promoting Excess Food Donation to Nonprofit Organizations (MAY 2014) (42 U.S.C. 1792).

\_\_\_\_\_ (10) 52.237-11, Accepting and Dispensing of \$1 Coin (Sept 2008) (31 U.S.C. 5112(p)(1)).

(d) Comptroller General Examination of Record. The Contractor shall comply with the provisions of this paragraph (d) if this contract was awarded using other than sealed bid, is in excess of the simplified acquisition threshold, and does not contain the clause at 52.215-2, Audit and Records--Negotiation.

(1) The Comptroller General of the United States, or an authorized representative of the Comptroller General, shall have access to and right to examine any of the Contractor's directly pertinent records involving transactions related to this contract.

(2) The Contractor shall make available at its offices at all reasonable times the records, materials, and other evidence for examination, audit, or reproduction, until 3 years after final payment under this contract or for any shorter period specified in FAR Subpart 4.7, Contractor Records Retention, of the other clauses of this contract. If this contract is completely or partially terminated, the records relating to the work terminated shall be made available for 3 years after any resulting final termination settlement. Records relating to appeals under the disputes clause or to litigation or the settlement of claims arising under or relating to this contract shall be made available until such appeals, litigation, or claims are finally resolved.

(3) As used in this clause, records include books, documents, accounting procedures and practices, and other data, regardless of type and regardless of form. This does not require the Contractor to create or maintain any record that the Contractor does not maintain in the ordinary course of business or pursuant to a provision of law.

(e) (1) Notwithstanding the requirements of the clauses in paragraphs (a), (b), (c), and (d) of this clause, the Contractor is not required to flow down any FAR clause, other than those in this paragraph (e)(1) in a subcontract for commercial items. Unless otherwise indicated below, the extent of the flow down shall be as required by the clause—

(i) 52.203-13, Contractor Code of Business Ethics and Conduct (Oct 2015) (41 U.S.C. 3509).

(ii) 52.219-8, Utilization of Small Business Concerns (OCT 2014) (15 U.S.C. 637(d)(2) and (3)), in all subcontracts that offer further subcontracting opportunities. If the subcontract (except subcontracts to small business concerns) exceeds \$700,000 (\$1.5 million for construction of any public facility), the subcontractor must include 52.219-8 in lower tier subcontracts that offer subcontracting opportunities.

(iii) 52.222-17, Nondisplacement of Qualified Workers (MAY 2014) (E.O. 13495). Flow down required in accordance with paragraph (l) of FAR clause 52.222-17.

(iv) 52.222-21, Prohibition of Segregated Facilities (Apr 2015).

(v) 52.222-26, Equal Opportunity (APR 2015) (E.O. 11246).

(vi) 52.222-35, Equal Opportunity for Veterans (Oct 2015) (38 U.S.C. 4212).

(vii) 52.222-36, Equal Opportunity for Workers with Disabilities (Jul 2014) (29 U.S.C. 793).

(viii) 52.222-37, Employment Reports on Veterans (Oct 2015) (38 U.S.C. 4212).

(ix) 52.222-40, Notification of Employee Rights Under the National Labor Relations Act (Dec 2010) (E.O. 13496). Flow down required in accordance with paragraph (f) of FAR clause 52.222-40.

(x) 52.222-41, Service Contract Labor Standards (May 2014), (41 U.S.C. chapter 67).

(xi) \_\_\_\_\_ (A) 52.222-50, Combating Trafficking in Persons (March 2, 2015) (22 U.S.C. chapter 78 and E.O. 13627).

\_\_\_\_\_ (B) Alternate I (March 2, 2015) of 52.222-50 (22 U.S.C. chapter 78 and E.O. 13627).

(xii) 52.222-51, Exemption from Application of the Service Contract Labor Standards to Contracts for Maintenance, Calibration, or Repair of Certain Equipment--Requirements (May 2014) (41 U.S.C. chapter 67.)

(xiii) 52.222-53, Exemption from Application of the Service Contract Labor Standards to Contracts for Certain Services--Requirements (May 2014) (41 U.S.C. chapter 67)

(xiv) 52.222-54, Employment Eligibility Verification (Oct 2015) (E. O. 12989).

( xv ) 52.222-55, Minimum Wages Under Executive Order 13658 (DEC 2015) (E.O. 13658).

(xvi) 52.225-26, Contractors Performing Private Security Functions Outside the United States (Jul 2013) (Section 862, as amended, of the National Defense Authorization Act for Fiscal Year 2008; 10 U.S.C. 2302 Note).

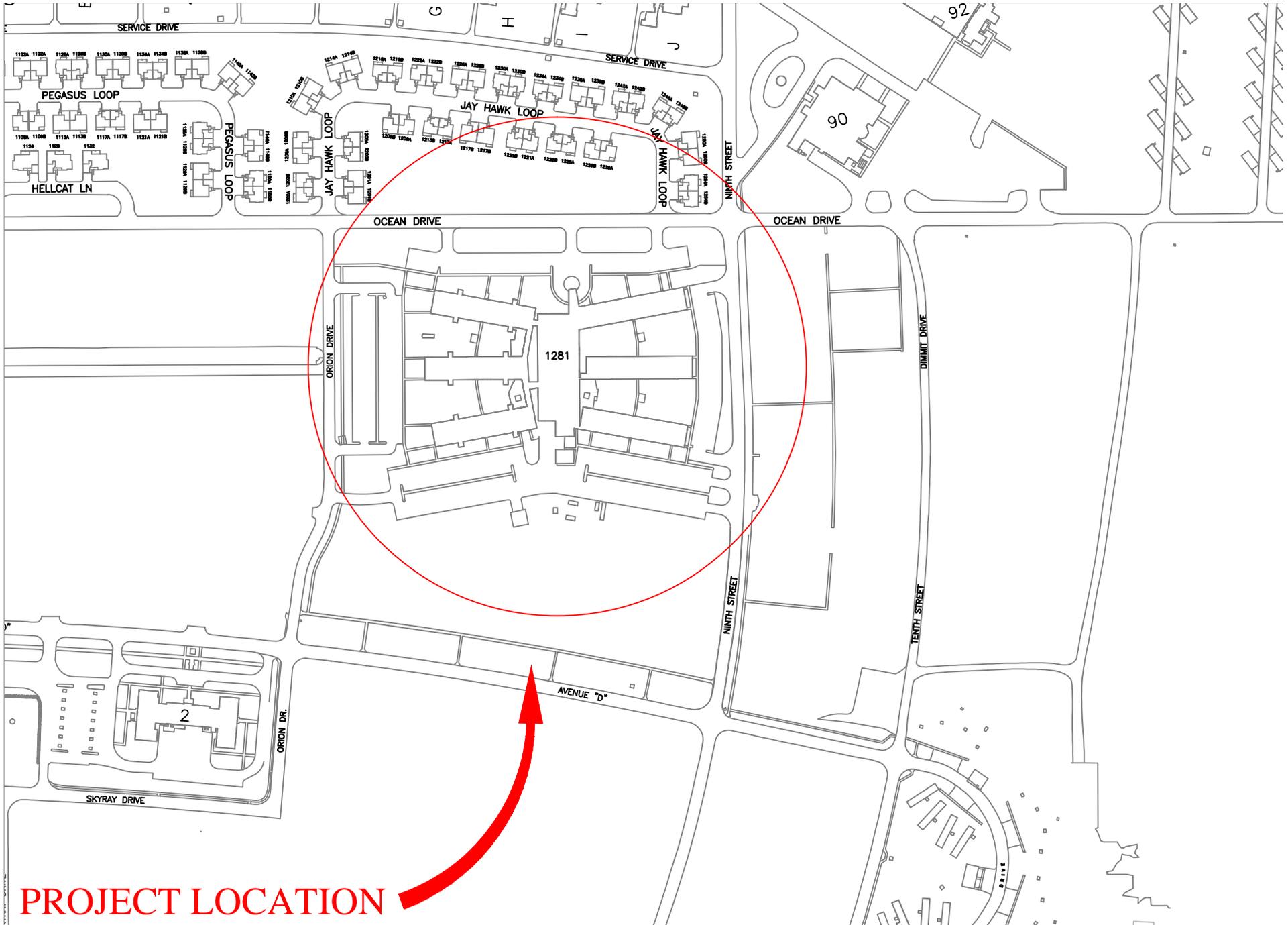
(xvii) 52.226-6, Promoting Excess Food Donation to Nonprofit Organizations. (May 2014) (42 U.S.C. 1792). Flow down required in accordance with paragraph (e) of FAR clause 52.226-6.

(xviii) 52.247-64, Preference for Privately-Owned U.S. Flag Commercial Vessels (Feb 2006) (46 U.S.C. Appx 1241(b) and 10 U.S.C. 2631). Flow down required in accordance with paragraph (d) of FAR clause 52.247-64.

(2) While not required, the Contractor may include in its subcontracts for commercial items a minimal number of additional clauses necessary to satisfy its contractual obligations.

(End of clause)

# ATTACHMENT A PROJECT LOCATION MAP



**PROJECT LOCATION**

**NAVAL AIR STATION CORPUS CHRISTI TEXAS - WASTE SUMMARY SHEET**

Name:  Project Title:  POC/Phone:   
 Number:  Delivery Order:  Project Location:   
 Activity\*:  Date of Project: Start:  End:

Types of Wastes	Landfill		Incinerated		**Recycled			***Composted		
	Tons	Cost	Tons	Cost	Tons	Cost	Revenue	Tons	Cost	Revenue
Metals	<input type="text"/>				<input type="text"/>					
Glass	<input type="text"/>				<input type="text"/>					
Paper & Paperboard Plastic	<input type="text"/>				<input type="text"/>					
Wood	<input type="text"/>				<input type="text"/>					
Asbestos	<input type="text"/>				<input type="text"/>					
Yard/Green Waste	<input type="text"/>				<input type="text"/>			<input type="text"/>		
Other <input type="text"/>	<input type="text"/>				<input type="text"/>					
Ethylene Glycol Antifreeze	<input type="text"/>				<input type="text"/>					
Lead-Acid Batteries Used	<input type="text"/>				<input type="text"/>					
Motor Oil	<input type="text"/>				<input type="text"/>					
Construction & Demolition	<input type="text"/>				<input type="text"/>					
General Refuse	<input type="text"/>				<input type="text"/>					

\*Recycling Facility used:   
 \*\*Composting Facility used:   
 \*\*\* Asbestos Disposal Facility:   
 \*\*\*\* Waste (Hazardous/Non-Hazardous) Disposal Facility:

PMI EQUIPMENT INVENTORY

Attachment C

EQUIPMENT NO.		EQUIPMENT NAME		FACILITY SUFFIX		PROPERTY NO.		
USER CODE		PRIORITY INSPECT		MAP GRID		ZONE		ROOM-WING
JOB NO.		PW CONTROL NO.		INVENTORY CODE		WARRANTY EXPIRATION DATE		
MODEL				MODEL YEAR		MAKE		
SERIAL NO.				USER FIELD ONE			USER FIELD TWO	
				CAP:				
REMARKS								
COST:								
		BTU		VOLT.		PHASE		
OR		TON.		H.P.		AMP		

NASCORPC 11014/25 (REV. 1-86)

# K & L SERVICES

16134 San Cayetano \* Helotes, TX 78023 \* 210 684-3558 \* FAX 210 688-0920 \* Email: dennis@klservice.net

## TEST REPORT

INSERVICE EDDY CURRENT EXAMINATION  
OF THE  
CONDENSER TUBES

INSTALLED IN  
CARRIER CHILLER

LOCATED AT

CORPUS CHRISTI NAVAL AIR STATION  
BUILDING 1800  
CORPUS CHRISTI, TX.

13 NOVEMBER 2015

TESTED FOR

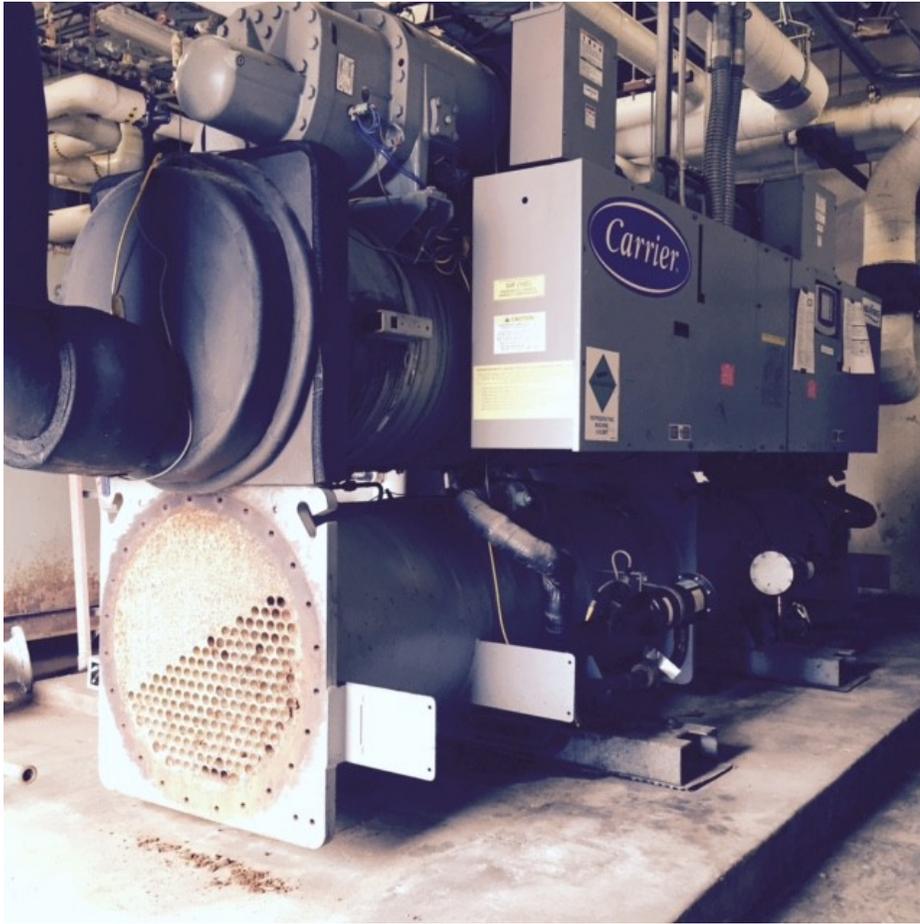
CARRIER COMMERCIAL SERVICES  
4410 Dillon Lane #46  
Corpus Christi, TX., 78415  
361-289-0944

TESTED AND REVIEWED BY:

---

DENNIS HENDRICKS  
Level III (SNT-TC-1A)

**UNIT TESTED**



***Carrier Chiller***

***Model Number: 30XWB3256H-M6H4B***

***Serial Number: 22100Q18367***

	<b><i>Condenser</i></b>
<b>Tube Type</b>	Skip-fin IE
<b>Tube Alloy</b>	Copper
<b>Tube Count</b>	173
<b>Nominal OD</b>	1.000"
<b>Nominal Wall</b>	0.028"
<b>Length</b>	146"
<b>Internal Supports</b>	3

## **PREFACE**

Prior to this Eddy Current Examination it was suspected by Maintenance Personnel that an internal tube leak may have occurred. A leak test positively identifying a suspect tube leak(s) had yet to have been achieved. The following examination was performed in an effort to identify a possible tube failure and to determine the general condition of the Condenser tube bundle.

## **SUMMARY**

The Condenser tubes installed in the Carrier Chiller were Eddy Current examined by K & L Services personnel on 13 November 2015. The testing was conducted using a Zetec MIZ-27 instrument and T-5 Hybrid test probes in a multifrequency technique in which two channels were calibrated in a differential and absolute modes to examine the tubing for defects in accordance with Section V, Article 8, Appendix 2 of the ASME Boiler and Pressure Vessel Code, 2013 Edition. Another channel was adjusted in an absolute mode to primarily detect and measure dimensional changes such as wall thinning, internal expansions, etc. Additionally, a fourth channel used special coils designed to primarily detect defects or irregularities occurring in the transition zones of the lands or tube ends.

**Pertinent test findings and comments are summarized as follows:**

<b>SECTION</b>	<b>TUBES WITH INDICATIONS</b>	<b>COMMENTS</b>
CONDENSER	8 with shallow ID defects and/or deposit induced indications.	Suitable for service.
	19 with moderate ID defects and/or deposit induced indications.	Suitable for service.
	5 with deep ID defects and/or deposit induced indications.	Remove from service.
	1 not tested due to internal obstructions.	Tube integrity unknown.

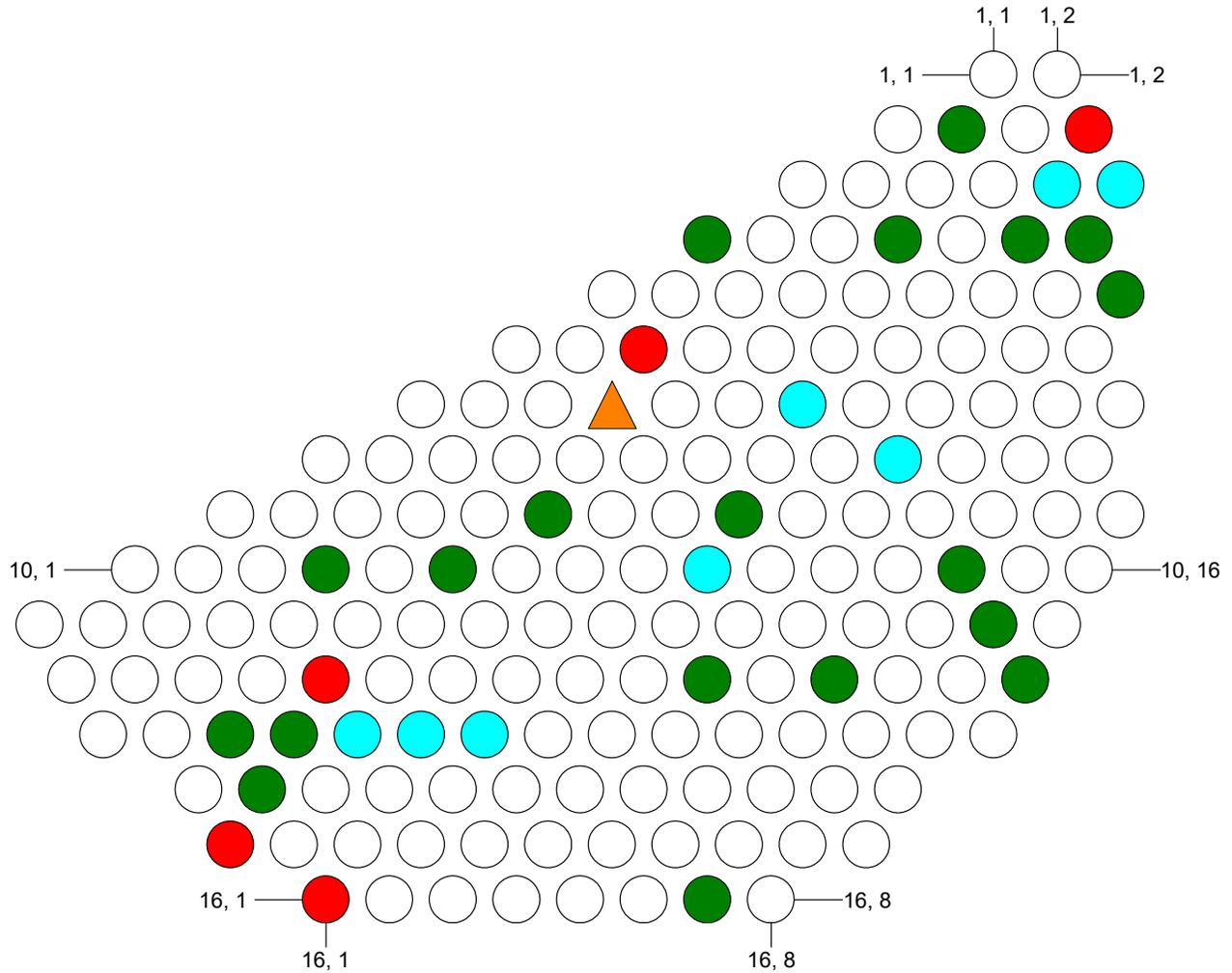
## **COMMENTS AND RECOMENDATIONS**

Varying depths of scattered ID defect indications were observed in approximately 19% of the Condenser tubing. Removing from service by plugging the five tubes with deep ID defects and the one tube not tested should be considered. Additionally, a proper leak test should be performed prior to re-commissioning the Chiller to help insure tube bundle reliability.

### **NOTE**

A slightly undersized test probe was used due to internal scale build up not allowing passage of an optimum sized test probe. Additionally, conductive deposits were encountered. Both conditions slightly compromised the integrity of this Eddy Current Inspection.

## CONDENSER TUBE MAP



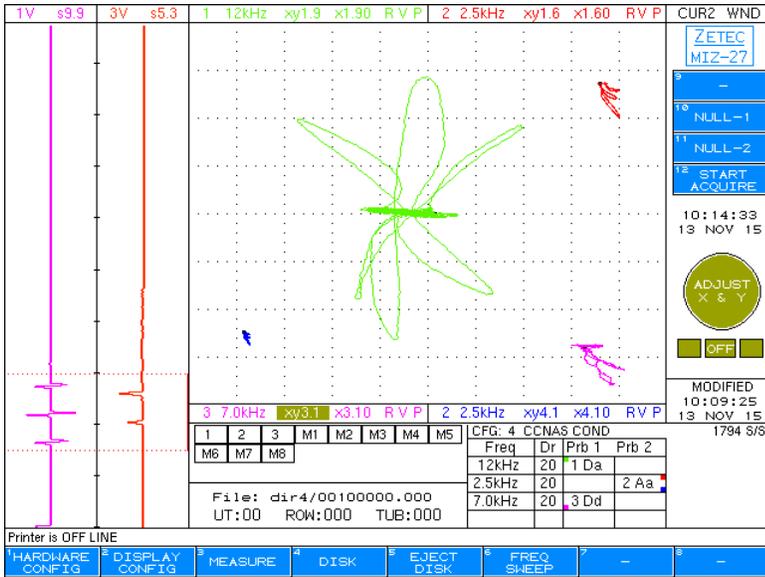
**CONDENSER WATER INLET END TUBESHEET**

### SUMMARY

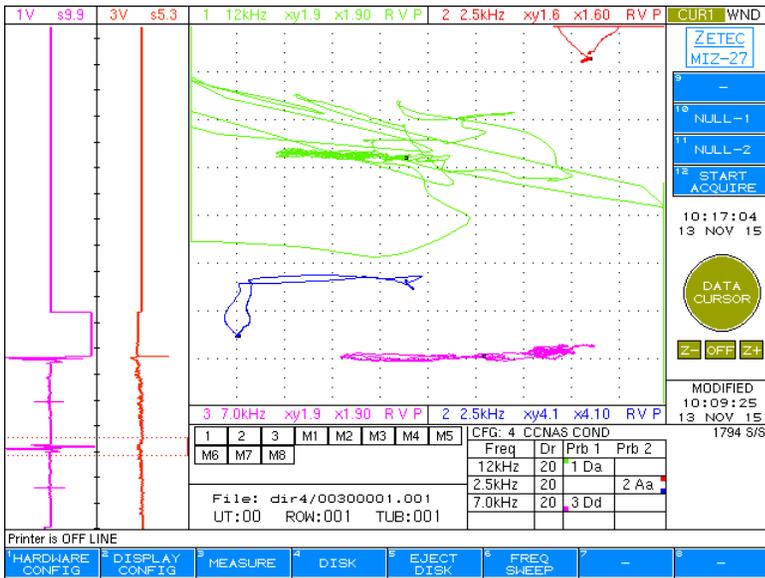
LEGEND KEY		
DESCRIPTION	SYMBOL	QTY
TUBE COUNT	○	173(100%)
5-19.9% ID	●	8(4.62%)
20-39.9% ID	●	19(10.98%)
40-100% ID	●	5(2.89%)
Obstructed	▲	1(0.58%)

### COMMENTS

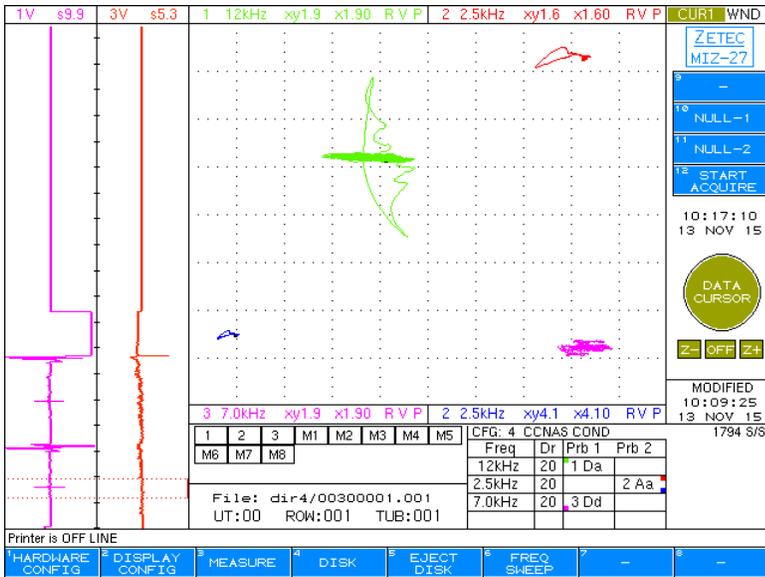
Representative test signals and MIZ-27 Eddy Current instrument settings are shown in Figures 1 through 9.



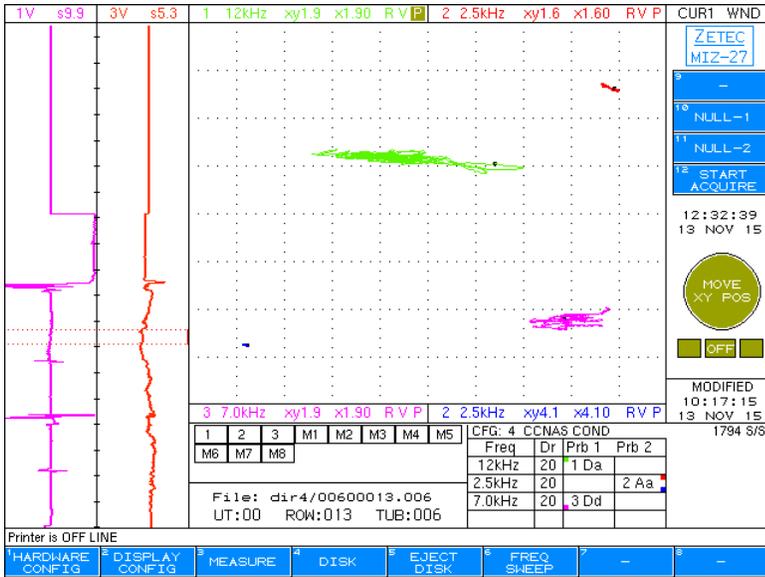
**FIGURE 1** – ASME Code calibration standard test signals.



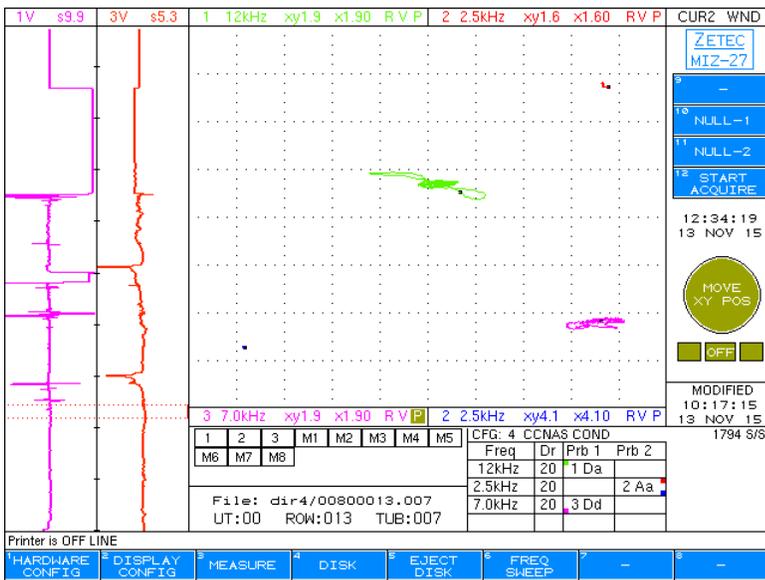
**FIGURE 2** – Typical land area test signals as observed in Condenser tube 1 – 1. Common to the center division sheet.



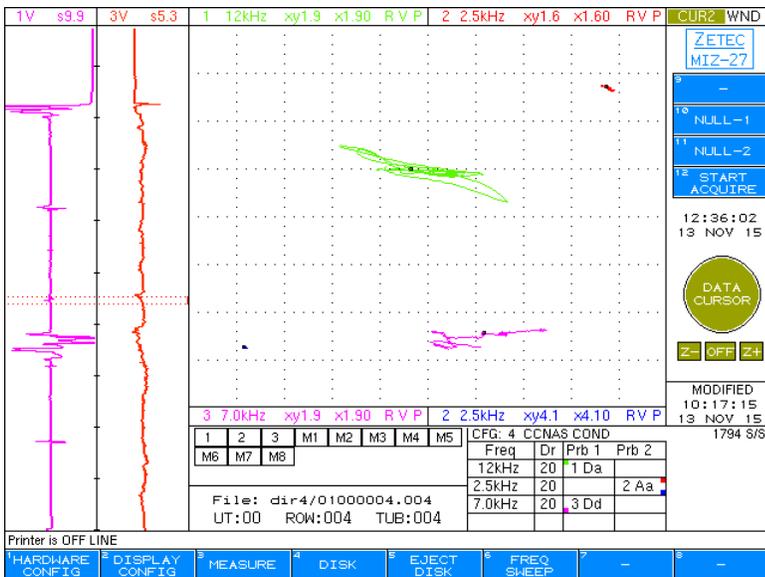
**FIGURE 3** – Typical support plate test signals as observed in Condenser tube 1 – 1.



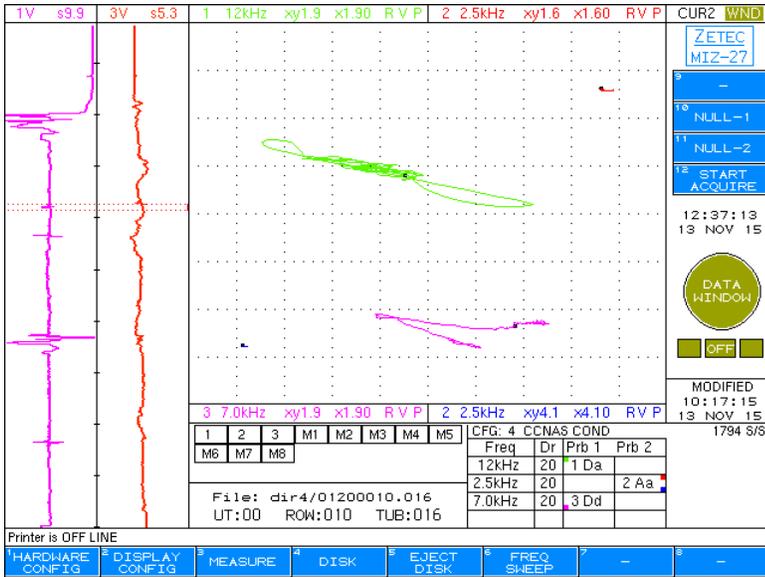
**FIGURE 4** – Typical shallow ID defect test signals as observed in Condenser tube 13 - 6.



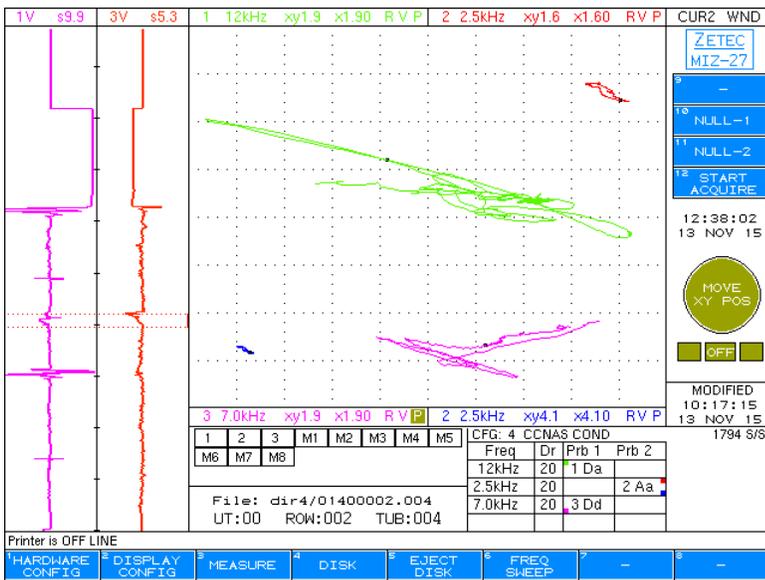
**FIGURE 5** – Typical shallow ID defect test signals as observed in Condenser tube 13 - 7.



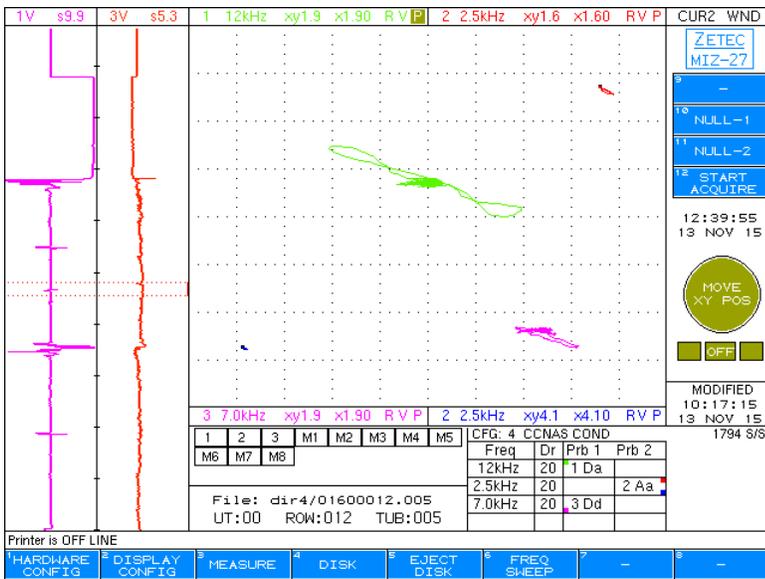
**FIGURE 6** – Typical moderate ID defect test signals as observed in Condenser tube 4 - 4.



**FIGURE 7** – Typical moderate ID defect test signals as observed in Condenser tube 10 - 16.



**FIGURE 8** – Typical deep ID defect test signals as observed in Condenser tube 2 - 4.



**FIGURE 9** – Typical deep ID defect test signals as observed in Condenser tube 12 - 5.

## TEST METHODS

The Eddy Current testing was conducted using a Zetec MIZ-27 four channel multifrequency instrument in which differential (channel 1) and absolute (channel 2) signals were adjusted in accordance with the ASME Boiler and Pressure Vessel Code, Section V, Article 8, Appendix 2, 2013 Edition. Channel 3 was adjusted in an absolute mode to primarily detect dimensional changes in the land areas. Channel 4 was used in conjunction with special coils designed to mainly detect defects occurring in the transition zones of the land areas and nipple ends. All channels were presented separately and simultaneously along with test instrument settings on a multi-color LED display. Pertinent signals were recorded digitally.

## LIMITATIONS

The inspection system is volumetric in nature and was designed primarily for Eddy Current testing of continuous finned or skip-fin Chiller tubing from the inside diameter (ID) to detect defects such as corrosion pitting, wall thinning, erosion, fretting, support wear, cracks, expansion variations, freeze bulges, etc. However, some test limitations are as follows:

1. Can not guarantee 100% tubing integrity but can **reliably detect 90% to 95%** of the defects that could propagate into tube failures.
2. Can not accurately measure defect depths - only **average** depths are indicated.
3. Can not detect flaws immediately adjacent to the tubesheets and expanded (rolled) tube ends in the tubesheets.
4. Can not detect leaks (should not be considered as a leak test which should be conducted separately).
5. Can not reliably detect very small volume defects such as very small cracks and beginning microbiological flaws similar in size to thru-wall pinholes (~0.020" diameter or less).
6. Can not reliably detect small volume defects in tubes that contain conductive deposits and/or debris.... *the cleaner the tubes, the more reliable the test results!*
7. Test sensitivity to small volume defects is decreased in tubes with excessive signal to noise ratios.

## CALIBRATION

The serial numbered calibration standards were pieces of finned non-ferrous tubing similar to the tubing in the Chiller. A thru-wall hole (0.052" diameter hole for tubes 0.075" or less in diameter or 0.067" diameter hole for tubes with diameters greater than 0.075") and partially drilled flat bottom holes ranging in depth from 20% to 80% of the tube wall penetration were machined in the finned section of the standard. Instrumentation sensitivity and phase relationships were adjusted in differential (channel 1) and absolute (channel 2) modes in accordance with the aforementioned ASME Code. The different phase angle test signals from the various depth machined penetrations along with signal amplitude provide the basis for defect analysis. Each standard also contained a machined 25% deep simulated saddle damage defect in the center of the land area and a 0.052" or 0.067" diameter thru-wall hole centered in the transition zone. Channels 3 and 4 were adjusted for maximum **detection** sensitivity of these two defects.

## TEST PERSONNEL QUALIFICATIONS

The most critical component of any test is the capability of the person conducting the test. K & L Services personnel are highly experienced professionals who specialize in the eddy current inspection of installed Chiller tubing. All field personnel have a minimum of 5 years documented Chiller tubing testing experience. They are **certified** as Level III **by** the American Society for Nondestructive Testing (ASNT) or employer (K&L) qualified as NDT Level II by an ASNT certified Level III Examiner in accordance with ASNT Recommended Practice No. SNTTC-1A. (Level III certification by the ASNT requires extensive testing experience and the passing of a national examination conducted by the ASNT after which an ASNT certificate number is issued for a 5 year period. Recertification is then required. Most other Level III certifications are "employer" designated and usually have been so designated in house without independent third party or ASNT Level III certification.)



# Installation Instructions

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## SAFETY CONSIDERATIONS

**IMPORTANT:** This equipment generates, uses, and can radiate radio frequency energy. If not installed and used in accordance with these instructions, this equipment may cause radio interference. The equipment has been tested and found to comply with the limits of a Class A computing device as defined by the FCC (Federal Communications Commission, U.S.A.) Regulations, Subpart J of Part 15, which are designed to provide reasonable protection against such interference when operated in a commercial environment.

Installing, starting up, and servicing this equipment can be hazardous due to system pressures, electrical components, and equipment location. Only trained, qualified installers and service mechanics should install, start up, and service this equipment.

When working on the equipment, observe precautions in the literature, and on tags, stickers, and labels attached to the equipment.

- Follow all safety codes.
- Wear safety glasses and work gloves.
- Use care in handling, rigging, and setting bulky equipment.

### WARNING

**DO NOT USE TORCH** to remove any component. System contains oil and refrigerant under pressure.

To remove a component, wear protective gloves and goggles and proceed as follows:

- Shut off electrical power to unit.
- Recover refrigerant to relieve all pressure from system using both high-pressure and low pressure ports.
- Traces of vapor should be displaced with nitrogen and the work area should be well ventilated. Refrigerant in contact with an open flame produces toxic gases.
- Cut component connection tubing with tubing cutter and remove component from unit. Use a pan to catch any oil that may come out of the lines and as a gage for how much oil to add to the system.
- Carefully unsweat remaining tubing stubs when necessary. Oil can ignite when exposed to torch flame.

Failure to follow these procedures may result in personal injury or death.

### CAUTION

**DO NOT** re-use compressor oil or any oil that has been exposed to the atmosphere. Dispose of oil per local codes and regulations. **DO NOT** leave refrigerant system open to air any longer than the actual time required to service the equipment. Seal circuits being serviced and charge with dry nitrogen to prevent oil contamination when timely repairs cannot be completed. Failure to follow these procedures may result in damage to equipment.

## INTRODUCTION

These instructions cover installation of 30XW liquid chillers with electronic controls and units with factory-installed options (FIOPs).

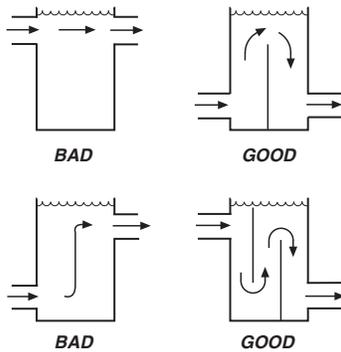
### System Design

**SYSTEM PIPING** — Proper system design and installation procedures should be followed closely. The system must be constructed with pressure tight components and thoroughly tested for installation leaks.

Installation of water systems should follow sound engineering practice as well as applicable local and industry standards.

Improperly designed or installed systems may cause unsatisfactory operation and/or system failure. Consult a water treatment specialist or appropriate literature for information regarding filtration, water treatment, and control devices.

**MINIMUM LOOP VOLUME** — The preferred minimum loop volume is dependent on the type of application. In order to obtain leaving water temperature stability for comfort cooling applications, a minimum of 3 gallons per ton (3.25 liters per kW) is required on all unit sizes. For process cooling applications or applications where high stability is critical, the loop volume should be increased to 6 to 10 gallons per ton (6.46 to 10.76 liters per kW) of cooling. In order to achieve this volume, it may be necessary to add a water storage tank to the water loop. If a storage tank is added to the system, it should be installed on the return/entering fluid side and properly vented so that the tank can be completely filled and all air eliminated. Failure to do so could cause lack of pump stability and poor system operation. Any storage tank that is placed in the water loop should have internal baffles to allow thorough mixing of the fluid. See Fig. 1.



**Fig. 1 — Tank Baffling**

## INSTALLATION

**Step 1 — Inspect Shipment** — Inspect unit for damage upon arrival. If damage is found, immediately file a claim with the shipping company. Verify proper unit delivery by checking unit nameplate data and the model number nomenclature shown in Fig. 2. Do not store units in an area exposed to weather because of sensitive control mechanisms and electronic devices. Chiller should be stored indoors, protected from construction dirt and moisture and with temperatures between 40 F (4.4 C) and 120 F (48.9 C) and relative humidity between 10% and 80% (non-condensing).

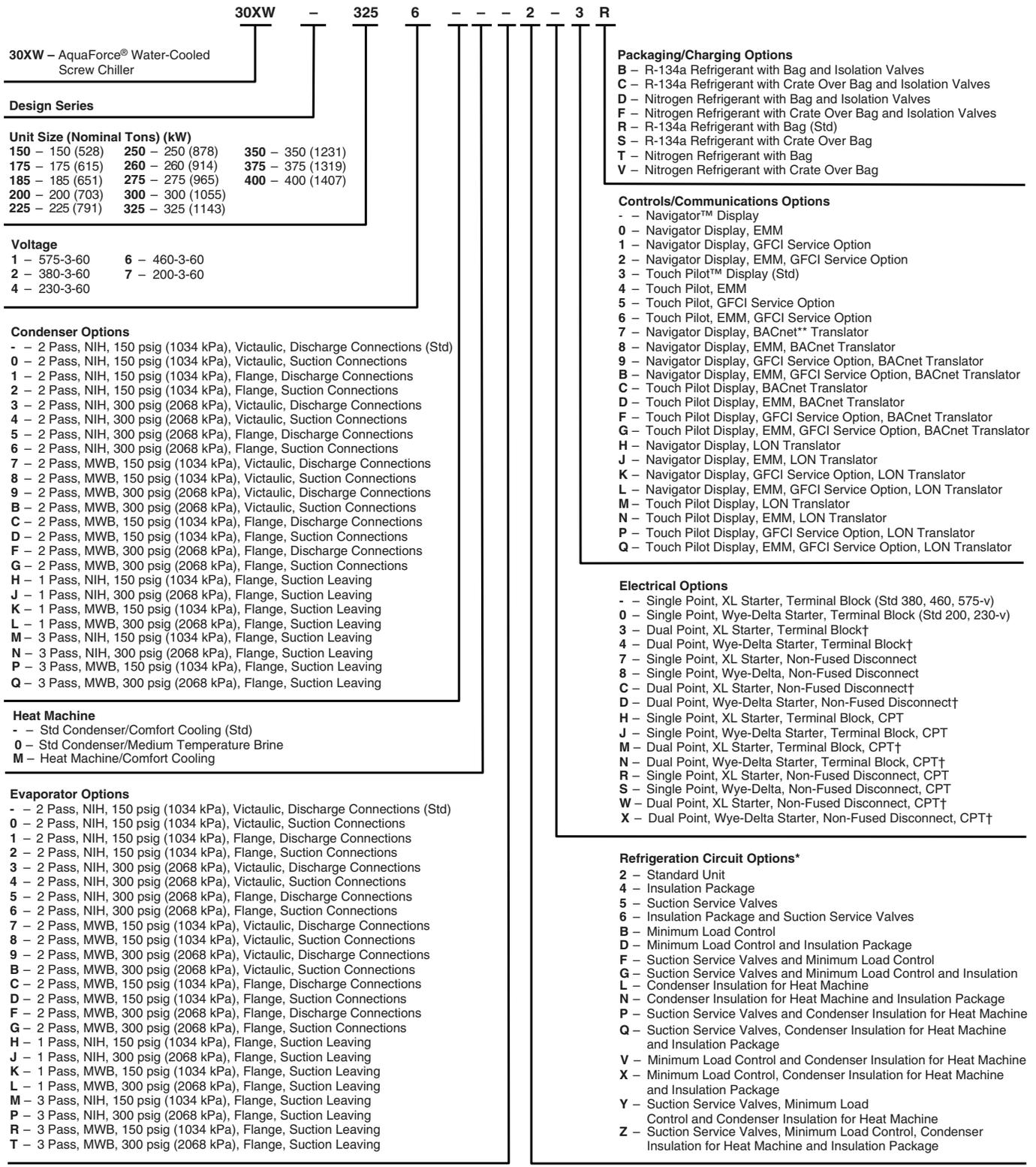
**Step 2 — Prepare Installation Site** — Locate unit indoors. When considering unit location, consult National Electrical Code (NEC, U.S.A.) and local code requirements. Allow sufficient space for wiring, piping, and service. Install unit in an area which will not be exposed to ambient temperatures below 50 F (10 C).

Be sure surface beneath unit is level and is capable of supporting the operating weight of the unit. See Tables 1 and 2 and Fig. 3-7 for unit mounting and operating weights.

If necessary, add supporting structure (steel beams or reinforced concrete slabs) to floor to transfer weight to nearest beams. See Fig. 3-5 for clearance details.

Allow the following clearances for service access:

Front .....	3 ft (914 mm)
Rear .....	3 ft (914 mm)
Top .....	2 ft (610 mm)
Ends .....	tube length at one (either) end; 3 ft (914 mm) at opposite end.



**LEGEND**

<b>CPT</b> — Control Power Transformer	<b>MWB</b> — Marine Waterbox
<b>EMM</b> — Energy Management Module	<b>NIH</b> — Nozzle-In-Head
<b>GFCI</b> — Ground Fault Circuit Interrupter	<b>XL</b> — Across-the-Line Start
<b>LON</b> — Local Operating Network	

\*Evaporator insulation is standard.  
†Available on unit sizes 325-400 only.  
\*\*Sponsored by ASHRAE (American Society of Heating, Refrigerating and Air Conditioning Engineers).

**Fig. 2 — Unit Model Number Nomenclature**

**Table 1 — 30XW150-400 Unit Physical Data — English**

30XW UNIT SIZE	150	175	185	200	225	250
<b>NOMINAL CAPACITY (tons)</b>	150	175	185	200	225	250
<b>UNIT WEIGHT (lb) (Operating/Shipping)</b>	7281/6826	7421/6966	7356/6901	7551/7096	9936/9217	10,010/9,291
<b>COMPRESSORS</b>	Semi-hermetic, twin screw					
Compressor Speed (rpm)	3500					
Compressor Model Number (qty)	06TU483 (1)	06TU483 (1)	06TU554 (1)	06TU554 (1)	06TV680 (1)	06TV680 (1)
Unloading Type	Slide Valve					
Minimum Step Capacity % (standard)	15%					
Minimum Step Capacity % (heat machine)	30%	30%	30%	30%	20%	20%
Minimum Step Capacity % (standard with optional minimum load control)	10%					
Minimum Step Capacity % (heat machine with optional minimum load control)	20%	20%	20%	20%	15%	15%
Economizer	No	Yes	No	Yes	No	Yes
Temperature Relief Valve Connection (in. SAE Flare) (2 per circuit)	—	3/8	—	3/8	—	3/8
<b>REFRIGERANT</b>	HFC, R-134a					
Charge (lb) Circuit A	290	300	290	300	420	430
Charge (lb) Circuit B	—	—	—	—	—	—
<b>OIL</b>	POE, SW-220					
Charge (gal.) Circuit A	6	6	6	6	8	8
Charge (gal.) Circuit B	—	—	—	—	—	—
<b>EVAPORATOR</b>	33.2   33.2   33.2   33.2   46.3   46.3					
Net Fluid Volume (gal.)	33.2   33.2   33.2   33.2   46.3   46.3					
Maximum Refrigerant Pressure (psig)	220					
Maximum Fluid Side Pressure (psig)	150					
Standard	150					
Optional	300					
Fluid Connections	6					
Inlet and Outlet (in.)	6					
1-Pass NIH or MWB Flange (optional)	6					
2-Pass NIH or MWB Flange (optional)	6					
2-Pass NIH Victaulic (standard)	6	6	6	6	8	8
2-Pass MWB Victaulic (optional)	6					
3-Pass NIH or MWB Flange (optional)	6					
Drain (in. NPT)	3/8					
Relief Valve Connection (in. NPTF)	3/4					
Quantity Per Circuit	1					
Relief Valve Setting (psig)	220					
Flow Rate (lb air/min)	31.7					
<b>CONDENSER</b>	33.5   33.5   33.5   33.5   52.0   52.0					
Net Fluid Volume (gal.)	33.5   33.5   33.5   33.5   52.0   52.0					
Maximum Refrigerant Pressure (psig)	220					
Standard Condenser	220					
Heat Machine	300					
Maximum Fluid Side Pressure (psig)	150					
Standard	150					
Optional	300					
Heat Machine	300					
Fluid Connections	6					
Inlet and Outlet (in.)	6					
1-Pass NIH or MWB Flange (optional)	6					
2-Pass NIH or MWB Flange (optional)	6					
2-Pass NIH Victaulic (standard)	6	6	6	6	8	8
2-Pass MWB Victaulic (optional)	6					
3-Pass NIH Flange (optional)	4	4	4	4	6	6
3-Pass MWB Flange (optional)	6					
Drain (in. NPT)	3/8					
Relief Valve Connection (in. NPTF) (Standard/Heat Machine)	3/4 / 3/4					
Quantity Per Circuit	2/2					
Relief Valve Setting (psig)	220/300					
Flow Rate (lb air/min)	31.7/46.6					
Temperature Relief Valve Connection (in. SAE Flare)	1/4					
Discharge Line (Qty per Circuit)	1					
Liquid Line (Qty per Circuit)	1					
<b>CHASSIS DIMENSIONS (ft-in.)</b>	10 - 7/8   10 - 10 <sup>11</sup> /16					
Length	10 - 7/8   10 - 10 <sup>11</sup> /16					
Width	3 - 7 <sup>3</sup> /8   4 - 0					
Height	5 - 10 <sup>7</sup> /8   6 - 6 <sup>13</sup> /16					

**LEGEND**

- HFC** — Hydrofluorocarbon
- MWB** — Marine Waterbox
- NIH** — Nozzle-In-Head
- NPTF** — National Pipe Thread Female
- POE** — Polyolester
- SAE** — Society of Automotive Engineers

NOTE: Weights are shown for standard chiller (2-pass, nozzle-in-head, Victaulic water boxes).

**Table 1 — 30XW150-400 Unit Physical Data — English (cont)**

30XW UNIT SIZE	260	275	300	325	350	375	400
<b>NOMINAL CAPACITY (tons)</b>	260	275	300	325	350	375	400
<b>UNIT WEIGHT (lb) (Operating/Shipping)</b>	9956/9237	10,029/9,311	10,043/9,324	14,319/ 13,173	14,515/ 13,369	14,468/ 13,323	14,759/ 13,614
<b>COMPRESSORS</b>	Semi-hermetic, twin screw						
Compressor Speed (rpm)	3500						
Compressor Model Number (qty)	06TV753 (1)	06TV753 (1)	06TV819 (1)	06TU483 (2)	06TU483 (2)	06TU554 (2)	06TU554 (2)
Unloading Type	Slide Valve						
Minimum Step Capacity % (standard)	15%	15%	15%	8%	8%	8%	8%
Minimum Step Capacity % (heat machine)	20%						
Minimum Step Capacity % (standard with optional minimum load control)	10%	10%	10%	5.5%	5.5%	5.5%	5.5%
Minimum Step Capacity % (heat machine with optional minimum load control)	15%						
Economizer	No	Yes	Yes	No	Yes	No	Yes
Temperature Relief Valve Connection (in. SAE Flare) (2 per circuit)	—	3/8	3/8	—	3/8	—	3/8
<b>REFRIGERANT</b>	HFC, R-134a						
Charge (lb) Circuit A	420	430	430	260	270	260	270
Charge (lb) Circuit B	—	—	—	260	270	260	270
<b>OIL</b>	POE, SW-220						
Charge (gal.) Circuit A	8	8	8	6	6	6	6
Charge (gal.) Circuit B	—	—	—	6	6	6	6
<b>EVAPORATOR</b>	46.3   46.3   46.3   76.0   76.0   76.0   76.0						
Net Fluid Volume (gal.)	46.3   46.3   46.3   76.0   76.0   76.0   76.0						
Maximum Refrigerant Pressure (psig)	220						
Maximum Fluid Side Pressure (psig)	150						
Standard	300						
Optional	300						
Fluid Connections	300						
Inlet and Outlet (in.)	300						
1-Pass NIH or MWB Flange (optional)	6						
2-Pass NIH or MWB Flange (optional)	6						
2-Pass NIH Victaulic (standard)	8						
2-Pass MWB Victaulic (optional)	6						
3-Pass NIH or MWB Flange (optional)	6						
Drain (in. NPT)	3/8						
Relief Valve Connection (in. NPTF)	3/4						
Quantity Per Circuit	1						
Relief Valve Setting (psig)	220						
Flow Rate (lb air/min)	31.7						
<b>CONDENSER</b>	52.0   52.0   52.0   82.6   82.6   82.6   82.6						
Net Fluid Volume (gal.)	52.0   52.0   52.0   82.6   82.6   82.6   82.6						
Maximum Refrigerant Pressure (psig)	220						
Standard Condenser	300						
Heat Machine	300						
Maximum Fluid Side Pressure (psig)	150						
Standard	300						
Optional	300						
Heat Machine	300						
Fluid Connections	300						
Inlet and Outlet (in.)	300						
1-Pass NIH or MWB Flange (optional)	6						
2-Pass NIH or MWB Flange (optional)	6						
2-Pass NIH Victaulic (standard)	8						
2-Pass MWB Victaulic (optional)	6						
3-Pass NIH Flange (optional)	6						
3-Pass MWB Flange (optional)	6						
Drain (in. NPT)	3/8						
Relief Valve Connection (in. NPTF)	3/4 / 3/4						
(Standard/Heat Machine)	3/4 / 3/4						
Quantity Per Circuit	2/2						
Relief Valve Setting (psig)	220/300						
Flow Rate (lb air/min)	31.7/46.6						
Temperature Relief Valve Connection (in. SAE Flare)	1/4						
Discharge Line (Qty per Circuit)	1						
Liquid Line (Qty per Circuit)	1						
<b>CHASSIS DIMENSIONS (ft-in.)</b>	10 - 10 <sup>11</sup> / <sub>16</sub>   4 - 0   13 - 3 <sup>3</sup> / <sub>4</sub>   4 - 0   6 - 6 <sup>11</sup> / <sub>16</sub>						
Length	10 - 10 <sup>11</sup> / <sub>16</sub>   4 - 0   13 - 3 <sup>3</sup> / <sub>4</sub>   4 - 0   6 - 6 <sup>11</sup> / <sub>16</sub>						
Width	10 - 10 <sup>11</sup> / <sub>16</sub>   4 - 0   13 - 3 <sup>3</sup> / <sub>4</sub>   4 - 0   6 - 6 <sup>11</sup> / <sub>16</sub>						
Height	10 - 10 <sup>11</sup> / <sub>16</sub>   4 - 0   13 - 3 <sup>3</sup> / <sub>4</sub>   4 - 0   6 - 6 <sup>11</sup> / <sub>16</sub>						

**LEGEND**

- HFC** — Hydrofluorocarbon
- MWB** — Marine Waterbox
- NIH** — Nozzle-In-Head
- NPTF** — National Pipe Thread Female
- POE** — Polyolester
- SAE** — Society of Automotive Engineers

NOTE: Weights are shown for standard chiller (2-pass, nozzle-in-head, Victaulic water boxes).

**Table 2 — 30XW150-400 Unit Physical Data — SI**

30XW UNIT SIZE	150	175	185	200	225	250
<b>NOMINAL CAPACITY (kW)</b>	528	615	651	703	791	878
<b>UNIT WEIGHT (kg) (Operating/Shipping)</b>	3303/3096	3366/3160	3337/3130	3425/3219	4507/4181	4540/4214
<b>COMPRESSORS</b>	Semi-hermetic, twin screw					
Compressor Speed (r/s)	58.3					
Compressor Model Number (qty)	06TU483 (1)	06TU483 (1)	06TU554 (1)	06TU554 (1)	06TV680 (1)	06TV680 (1)
Unloading Type	Slide Valve					
Minimum Step Capacity % (standard)	15%					
Minimum Step Capacity % (heat machine)	30%	30%	30%	30%	20%	20%
Minimum Step Capacity % (standard with optional minimum load control)	10%					
Minimum Step Capacity % (heat machine with optional minimum load control)	20%	20%	20%	20%	15%	15%
Economizer	No	Yes	No	Yes	No	Yes
Temperature Relief Valve Connection (in. SAE Flare) (2 per circuit)	—	3/8	—	3/8	—	3/8
<b>REFRIGERANT</b>	HFC, R-134a					
Charge (kg) Circuit A	131.5	136.1	131.5	136.1	190.5	195.0
Charge (kg) Circuit B	—	—	—	—	—	—
<b>OIL</b>	POE, SW-220					
Charge (L) Circuit A	22.7	22.7	22.7	22.7	30.3	30.3
Charge (L) Circuit B	—	—	—	—	—	—
<b>EVAPORATOR</b>	1517					
Net Fluid Volume (L)	125.7	125.7	125.7	125.7	175.3	175.3
Maximum Refrigerant Pressure (kPa)	1517					
Maximum Fluid Side Pressure (kPa)	1034					
Standard	1034					
Optional	2068					
Fluid Connections	6					
Inlet and Outlet (in.)	6					
1-Pass NIH or MWB Flange (optional)	6					
2-Pass NIH or MWB Flange (optional)	6	6	6	6	8	8
2-Pass NIH Victaulic (standard)	6					
2-Pass MWB Victaulic (optional)	6					
3-Pass NIH or MWB Flange (optional)	6					
Drain (in. NPT)	3/8					
Relief Valve Connection (in. NPTF)	3/4					
Quantity Per Circuit	1					
Relief Valve Setting (kPa)	1517					
Flow Rate (kg air/min)	14.38					
<b>CONDENSER</b>	1517					
Net Fluid Volume (L)	126.8	126.8	126.8	126.8	196.8	196.8
Maximum Refrigerant Pressure (kPa)	1517					
Standard Condenser	1517					
Heat Machine	2068					
Maximum Fluid Side Pressure (kPa)	1034					
Standard	1034					
Optional	2068					
Heat Machine	2068					
Fluid Connections	6					
Inlet and Outlet (in.)	6					
1-Pass NIH or MWB Flange (optional)	6					
2-Pass NIH or MWB Flange (optional)	6					
2-Pass NIH Victaulic (standard)	6	6	6	6	8	8
2-Pass MWB Victaulic (optional)	6					
3-Pass NIH Flange (optional)	4	4	4	4	6	6
3-Pass MWB Flange (optional)	6					
Drain (in. NPT)	3/8					
Relief Valve Connection (in. NPTF)	3/4 / 3/4					
(Standard/Heat Machine)	3/4 / 3/4					
Quantity Per Circuit	2/2					
Relief Valve Setting (kPa)	1517/2068					
Flow Rate (kg air/min)	14.38/21.1					
Temperature Relief Valve Connection (in. SAE Flare)	1/4					
Discharge Line (Qty per Circuit)	1					
Liquid Line (Qty per Circuit)	1					
<b>CHASSIS DIMENSIONS (mm)</b>	3319.5					
Length	3070.2				3319.5	
Width	1139.8				1219.2	
Height	1806.6				2001.8	

**LEGEND**

- HFC** — Hydrofluorocarbon
- MWB** — Marine Waterbox
- NIH** — Nozzle-In-Head
- NPTF** — National Pipe Thread Female
- POE** — Polyolester
- SAE** — Society of Automotive Engineers

NOTE: Weights are shown for standard chiller (2-pass, nozzle-in-head, Victaulic water boxes).

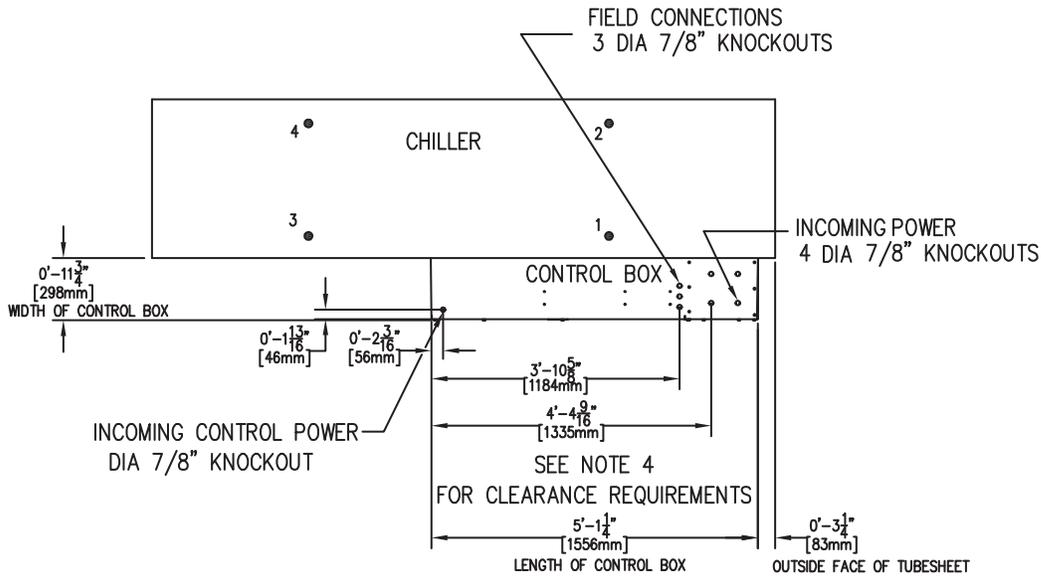
**Table 2 — 30XW150-400 Unit Physical Data — SI (cont)**

30XW UNIT SIZE	260	275	300	325	350	375	400
<b>NOMINAL CAPACITY (kW)</b>	914	965	1053	1143	1231	1319	1407
<b>UNIT WEIGHT (kg) (Operating/Shipping)</b>	4516/4190	4549/4223	4555/4229	6495/5975	6584/6064	6563/6043	6695/6175
<b>COMPRESSORS</b>	Semi-hermetic, twin screw						
Compressor Speed (r/s)	58.3						
Compressor Model Number (qty)	06TV753 (1)	06TV753 (1)	06TV819 (1)	06TU483 (2)	06TU483 (2)	06TU554 (2)	06TU554 (2)
Unloading Type	Slide Valve						
Minimum Step Capacity % (standard)	15%	15%	15%	8%	8%	8%	8%
Minimum Step Capacity % (heat machine)	20%						
Minimum Step Capacity % (standard with optional minimum load control)	10%	10%	10%	5.5%	5.5%	5.5%	5.5%
Minimum Step Capacity % (heat machine with optional minimum load control)	15%						
Economizer	No	Yes	Yes	No	Yes	No	Yes
Temperature Relief Valve Connection (in. SAE Flare) (2 per circuit)	—	3/8	3/8	—	3/8	—	3/8
<b>REFRIGERANT</b>	HFC, R-134a						
Charge (kg) Circuit A	190.5	195.0	195.0	117.9	122.5	117.9	122.5
Charge (kg) Circuit B	—	—	—	117.9	122.5	117.9	122.5
<b>OIL</b>	POE, SW-220						
Charge (L) Circuit A	30.3	30.3	30.3	22.7	22.7	22.7	22.7
Charge (L) Circuit B	—	—	—	22.7	22.7	22.7	22.7
<b>EVAPORATOR</b>	175.3   175.3   175.3   287.7   287.7   287.7   287.7						
Net Fluid Volume (L)	175.3   175.3   175.3   287.7   287.7   287.7   287.7						
Maximum Refrigerant Pressure (kPa)	1517						
Maximum Fluid Side Pressure (kPa)	1034						
Standard	1034						
Optional	2068						
Fluid Connections							
Inlet and Outlet (in.)							
1-Pass NIH or MWB Flange (optional)	6						
2-Pass NIH or MWB Flange (optional)	6						
2-Pass NIH Victaulic (standard)	8						
2-Pass MWB Victaulic (optional)	6						
3-Pass NIH or MWB Flange (optional)	6						
Drain (in. NPT)	3/8						
Relief Valve Connection (in. NPTF)	3/4						
Quantity Per Circuit	1						
Relief Valve Setting (kPa)	1517						
Flow Rate (kg air/min)	14.38						
<b>CONDENSER</b>	196.8   196.8   196.8   312.7   312.7   312.7   312.7						
Net Fluid Volume (L)	196.8   196.8   196.8   312.7   312.7   312.7   312.7						
Maximum Refrigerant Pressure (kPa)	1517						
Standard Condenser	1517						
Heat Machine	2068						
Maximum Fluid Side Pressure (kPa)	1034						
Standard	1034						
Optional	2068						
Heat Machine	2068						
Fluid Connections							
Inlet and Outlet (in.)							
1-Pass NIH or MWB Flange (optional)	6						
2-Pass NIH or MWB Flange (optional)	6						
2-Pass NIH Victaulic (standard)	8						
2-Pass MWB Victaulic (optional)	6						
3-Pass NIH Flange (optional)	6						
3-Pass MWB Flange (optional)	6						
Drain (in. NPT)	3/8						
Relief Valve Connection (in. NPTF) (Standard/Heat Machine)	3/4 / 3/4						
Quantity Per Circuit	2/2						
Relief Valve Setting (kPa)	1517/2068						
Flow Rate (kg air/min)	14.38/21.1						
Temperature Relief Valve Connection (in. SAE Flare)	1/4						
Discharge Line (Qty per Circuit)	1						
Liquid Line (Qty per Circuit)	1						
<b>CHASSIS DIMENSIONS (mm)</b>	3319.5   4057.7						
Length	3319.5			4057.7			
Width	1219.2			1215.0			
Height	2001.8			1998.7			

**LEGEND**

- HFC** — Hydrofluorocarbon
- MWB** — Marine Waterbox
- NIH** — Nozzle-In-Head
- NPTF** — National Pipe Thread Female
- POE** — Polyolester
- SAE** — Society of Automotive Engineers

NOTE: Weights are shown for standard chiller (2-pass, nozzle-in-head, Victaulic water boxes).



**STANDARD 30XW150-200 UNIT DIMENSIONS**

30XW UNIT SIZE	OPERATING WEIGHT		MOUNTING LOCATION WEIGHT							
			1		2		3		4	
	lb	kg	lb	kg	lb	kg	lb	kg	lb	kg
150	7281	3303	1312	595	1772	804	1785	810	2411	1094
175	7421	3366	1338	607	1806	819	1820	825	2457	1115
185	7356	3336	1326	601	1790	812	1804	818	2436	1105
200	7551	3425	1361	617	1838	834	1852	840	2500	1134

NOTE: Weights shown for standard chiller (2 pass with NIH, victaulic waterboxes).

**30XW150-200 UNIT AND WATERBOX SPECIFICATIONS**

<b>A</b>	<b>Evaporator Heat Exchanger Length — 9'-1 1/16" [2770 mm]</b>	<b>C</b>
<b>B</b>	<b>Condenser Heat Exchanger Length — 9'-1 1/16" [2770 mm]</b>	<b>D</b>

Overall Length = Larger of A or B + 9'-1 1/16" [2770 mm] + larger of C or D, where:  
 A = evaporator discharge end water box length      B = condenser discharge end water box length  
 C = evaporator suction end water box length      D = condenser suction end water box length

TYPE	WATER BOX ADDITIONAL LENGTH ADDERS				WATER BOX WEIGHT ADDERS			
	EVAP		COND		EVAP		COND	
	ft-in.	mm	ft-in.	mm	lb	kg	lb	kg
Return Cover	0-4 1/16	103	0-4 3/8	111	Std	Std	Std	Std
NIH 2 Pass Vic	0-7 1/8	181	0-7 7/16	189	Std	Std	Std	Std
NIH 2 Pass FL	0-4 5/8	117	1-1 7/8	352	137	62.1	146	66.2
NIH 1 Pass FL	1-0 5/8	321	1-1 7/8	352	188	85.3	244	110.7
NIH 3 Pass FL	1-0 5/8	321	1-1 7/8	352	198	89.8	185	83.9
MWB 2 Pass Vic	1-4 5/16	414	1-4 5/16	414	232	105.2	274	124.3
MWB 2 Pass FL	1-4 5/16	414	1-4 5/16	414	265	120.2	357	161.9
MWB 1 Pass FL	1-4 5/16	414	1-4 5/16	414	508	230.4	598	271.3
MWB 3 Pass FL	1-4 5/16	414	1-4 5/16	414	539	244.5	706	320.2

**LEGEND**

**MWB** — Marine Waterbox  
**NIH** — Nozzle-In-Head

**NOTES:**

1. Add the additional weight to the standard unit operating weight to find the total weight of the unit.
2. ● Denotes center of gravity.
3. Dimensions shown in ft-in. [mm] unless noted.
4. The recommended service clearance for the machine is 3 ft [914 mm] at the front and rear, 2 ft [610 mm] at the top, and the tube length at one end and 3 ft [914 mm] at the opposite end. Consult local electrical codes for minimum clearance requirements on control panel side.
5. Victaulic nozzles are standard on all units. A flow switch is factory-installed in evaporator inlet victaulic nozzle.
6. Maximum fluid side pressure of condenser or evaporator is 150 psig [1034 kPa] (standard) or 300 psig [2068 kPa] (optional).
7. Operating weight includes weight of water, refrigerant, and oil.

**Fig. 3 — 30XW150-200 Unit Dimensions**

FRONT VIEW — DISCHARGE END

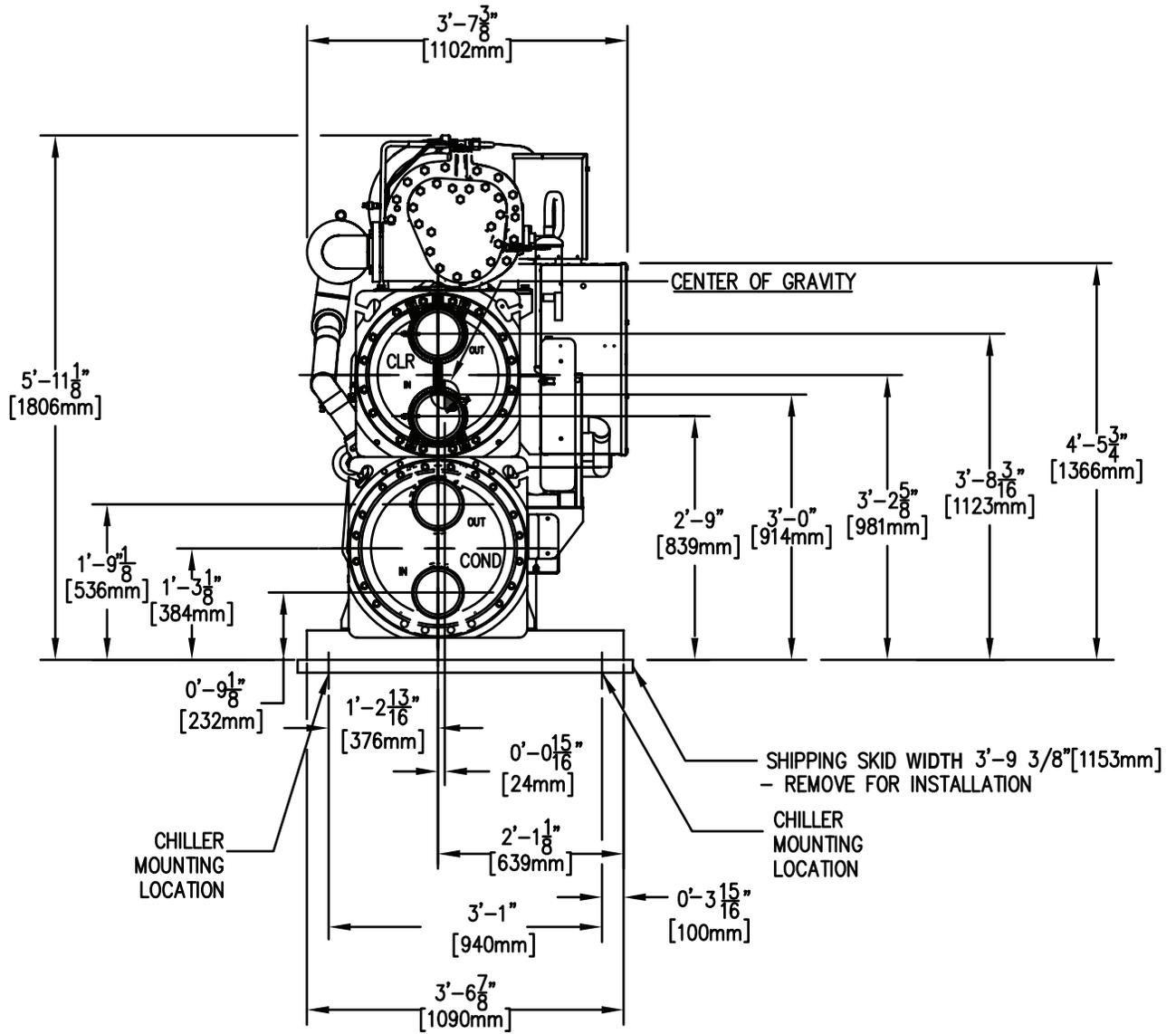
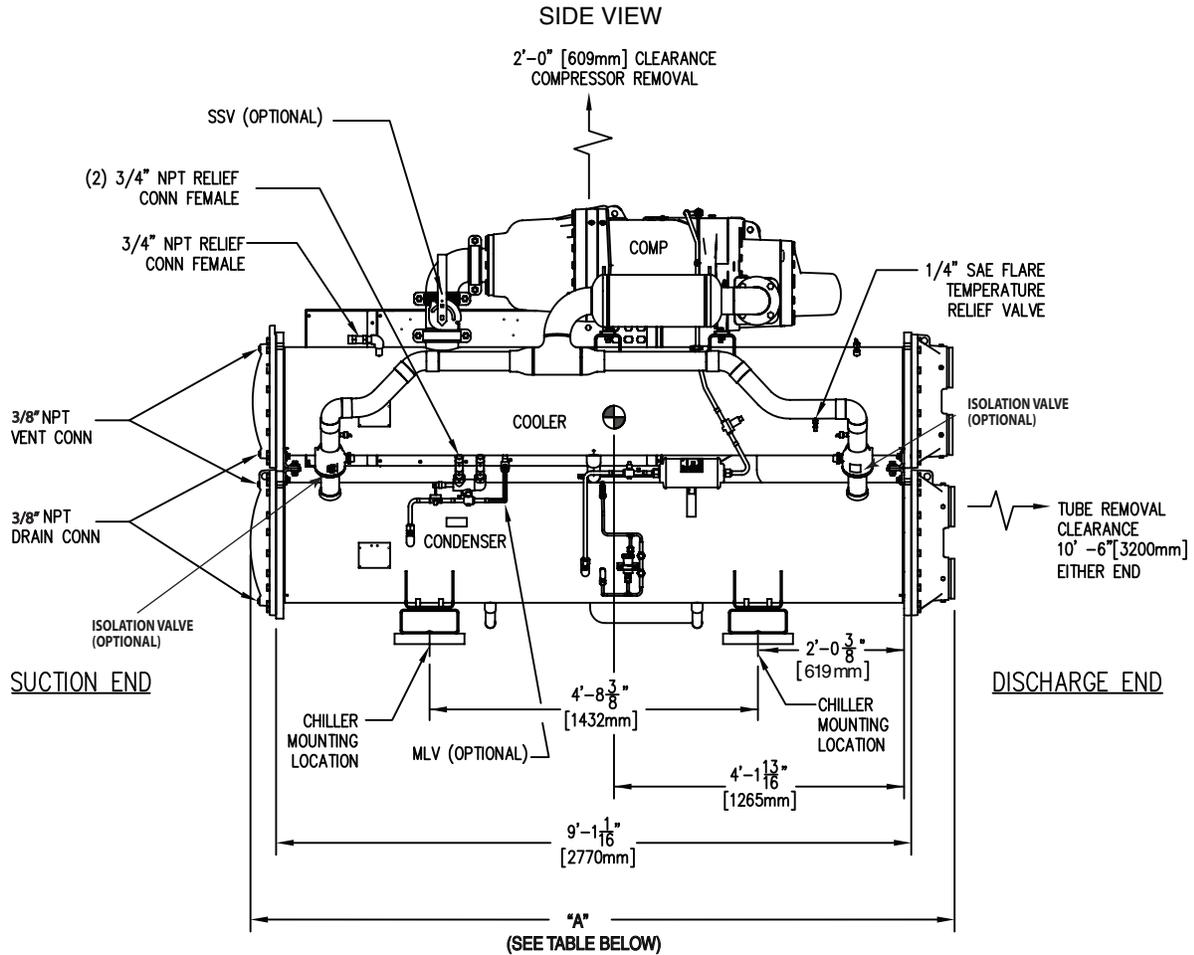


Fig. 3 — 30XW150-200 Unit Dimensions (cont)



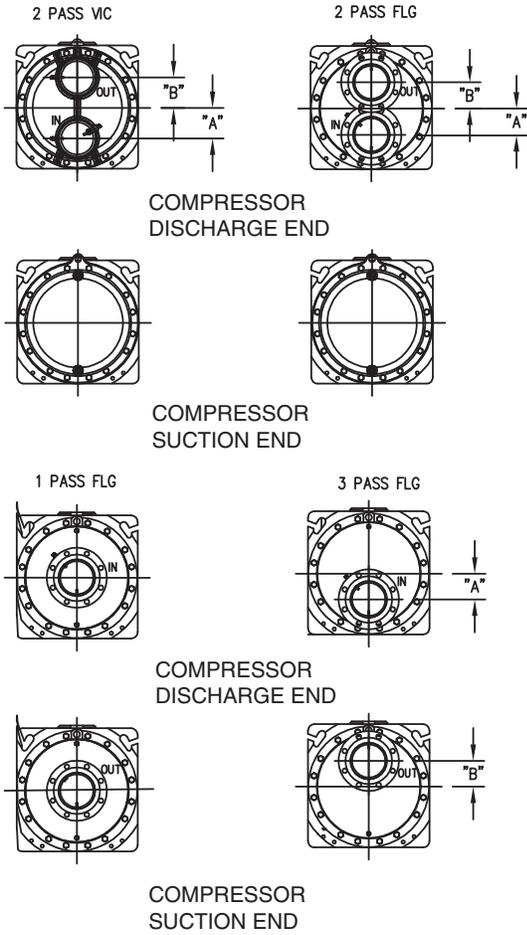
CHILLER DIMENSIONS						
CONNECTION	PASSES COOLER/ COND	WATER BOX COOLER/ COND	PRESSURE PSIG	NOZZLE TYPE	"A" ft-in. [mm]	ADDED WGT lb [kg]
STD ENDS	2P / 2P	NIH / NIH	150 or 300	VIC	10- 0 7/8 [3071]	0
STD ENDS	2P / 2P	NIH / NIH	150 or 300	FLG	10-10 1/16 [3304]	283 [128]
STD ENDS	2P / 2P	NIH / MWB	150 or 300	VIC	10- 9 13/16 [3297]	274 [124]
STD ENDS	2P / 2P	NIH / MWB	150 or 300	FLG	10- 9 13/16 [3297]	357 [162]
STD ENDS	2P / 2P	MWB / NIH	150 or 300	VIC	10- 9 13/16 [3297]	231 [105]
STD ENDS	2P / 2P	MWB / NIH	150 or 300	FLG	10- 9 13/16 [3297]	265 [120]
STD ENDS	2P / 2P	MWB / MWB	150 or 300	VIC	10- 9 13/16 [3297]	505 [229]
STD ENDS	2P / 2P	MWB / MWB	150 or 300	FLG	10- 9 13/16 [3297]	621 [282]
STD ENDS	2P / 3P	NIH / NIH	150 or 300	FLG	11- 4 5/8 [3469]	322 [146]
STD ENDS	2P / 3P	NIH / MWB	150 or 300	FLG	11- 9 3/4 [3600]	843 [382]
OPP ENDS	1P / 1P	NIH / NIH	150 or 300	FLG	11- 4 13/16 [3474]	432 [196]
OPP ENDS	1P / 1P	NIH / MWB	150 or 300	FLG	11- 9 3/4 [3600]	787 [357]
OPP ENDS	1P / 1P	MWB / NIH	150 or 300	FLG	11- 9 3/4 [3600]	751 [341]
OPP ENDS	1P / 1P	MWB / MWB	150 or 300	FLG	11- 9 3/4 [3600]	1106 [502]
OPP ENDS	2P / 2P	NIH / NIH	150 or 300	VIC	10- 0 7/8 [3071]	0
OPP ENDS	2P / 2P	NIH / NIH	150 or 300	FLG	10-10 1/16 [3304]	283 [128]
OPP ENDS	2P / 2P	NIH / MWB	150 or 300	VIC	10- 9 13/16 [3297]	274 [124]
OPP ENDS	2P / 2P	NIH / MWB	150 or 300	FLG	10- 9 13/16 [3297]	357 [162]
OPP ENDS	2P / 2P	MWB / NIH	150 or 300	VIC	10- 9 13/16 [3297]	231 [105]
OPP ENDS	2P / 2P	MWB / NIH	150 or 300	FLG	10- 9 13/16 [3297]	265 [120]
OPP ENDS	2P / 2P	MWB / MWB	150 or 300	VIC	10- 9 13/16 [3297]	505 [229]
OPP ENDS	2P / 2P	MWB / MWB	150 or 300	FLG	10- 9 13/16 [3297]	621 [282]
OPP ENDS	3P / 1P	NIH / NIH	150 or 300	FLG	11- 4 13/16 [3474]	442 [200]
OPP ENDS	3P / 1P	NIH / MWB	150 or 300	FLG	11- 9 3/4 [3600]	796 [361]
OPP ENDS	3P / 1P	MWB / NIH	150 or 300	FLG	11- 9 3/4 [3600]	783 [355]
OPP ENDS	3P / 1P	MWB / MWB	150 or 300	FLG	11- 9 3/4 [3600]	1138 [516]

**LEGEND**

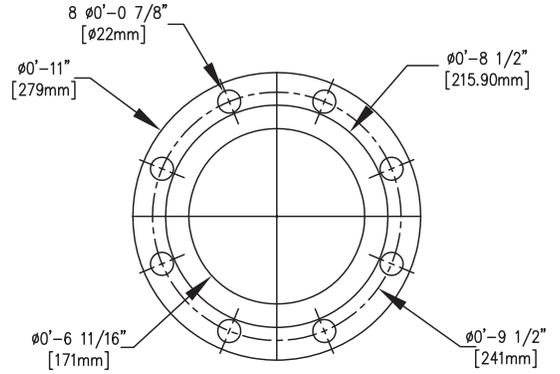
- 1P — 1 Pass
- 2P — 2 Pass
- 3P — 3 Pass
- FLG — Flange
- MLV — Minimum Load Valve
- MWB — Marine Water Box
- NIH — Nozzle-In-Head
- OPP ENDS — Opposite Ends
- SAE — Society of Automotive Engineers
- SSV — Suction Service Valve
- STD ENDS — Standard Ends
- VIC — Victaulic

**Fig. 3 — 30XW150-200 Unit Dimensions (cont)**

### NIH EVAPORATOR



### WATERBOX FLANGE DETAIL



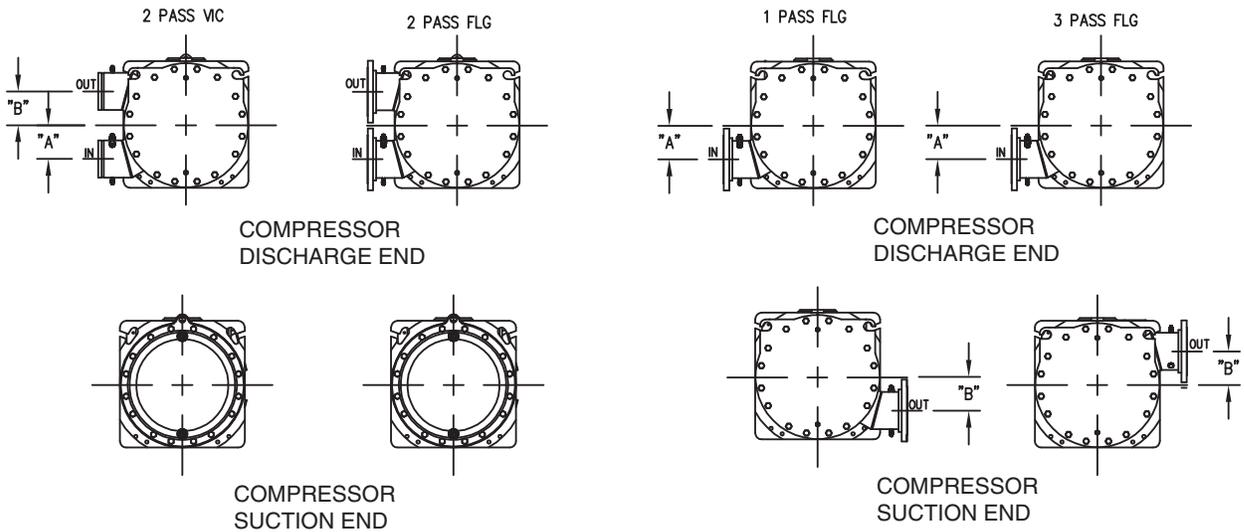
### NIH EVAPORATOR

30XW UNIT SIZE	NUMBER OF PASSES	VICTAULIC		
		A in. (mm)	B in. (mm)	CONNECTION SIZE, in. (mm)
150-200	2	5 <sup>9</sup> / <sub>16</sub> (142)	5 <sup>9</sup> / <sub>16</sub> (142)	6 (152)
	1	—	—	—
	3	—	—	—

30XW UNIT SIZE	NUMBER OF PASSES	FLANGE		
		A in. (mm)	B in. (mm)	CONNECTION SIZE, in. (mm)
150-200	2	4 <sup>13</sup> / <sub>16</sub> (122)	4 <sup>13</sup> / <sub>16</sub> (122)	6 (152)
	1	0 (0)	0 (0)	6 (152)
	3	4 <sup>11</sup> / <sub>16</sub> (119)	4 <sup>11</sup> / <sub>16</sub> (119)	6 (152)

### MARINE EVAPORATOR



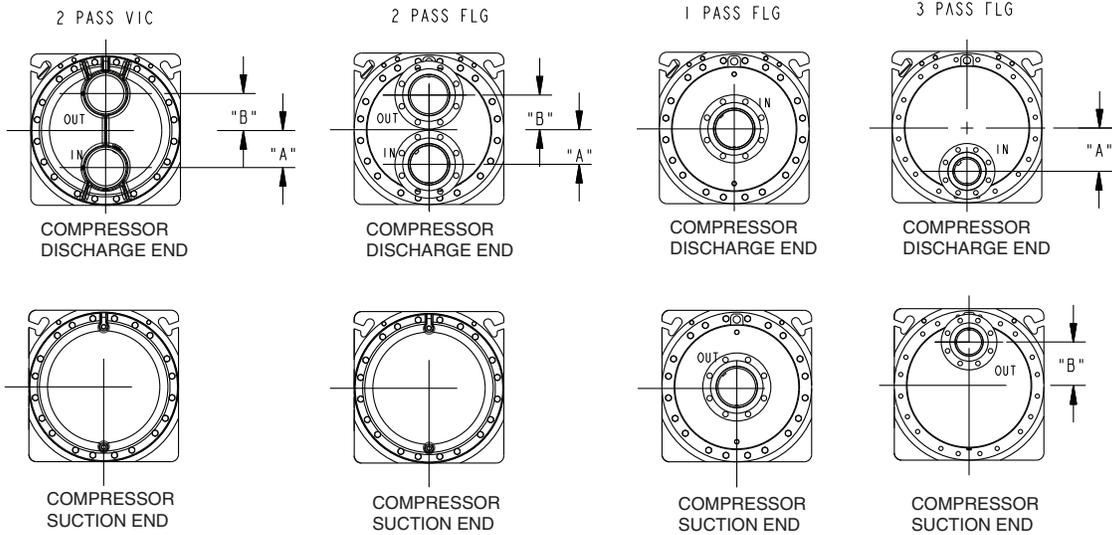
### MARINE EVAPORATOR

30XW UNIT SIZE	NUMBER OF PASSES	A in. (mm)	B in. (mm)	CONNECTION SIZE, in. (mm)
150-200	2	6 (152)	6 (152)	6 (152)
	1*	6 (152)	6 (152)	6 (152)
	3*	6 (152)	6 (152)	6 (152)

\* Flange only. Not available on Victaulic.

Fig. 3 — 30XW150-200 Unit Dimensions (cont)

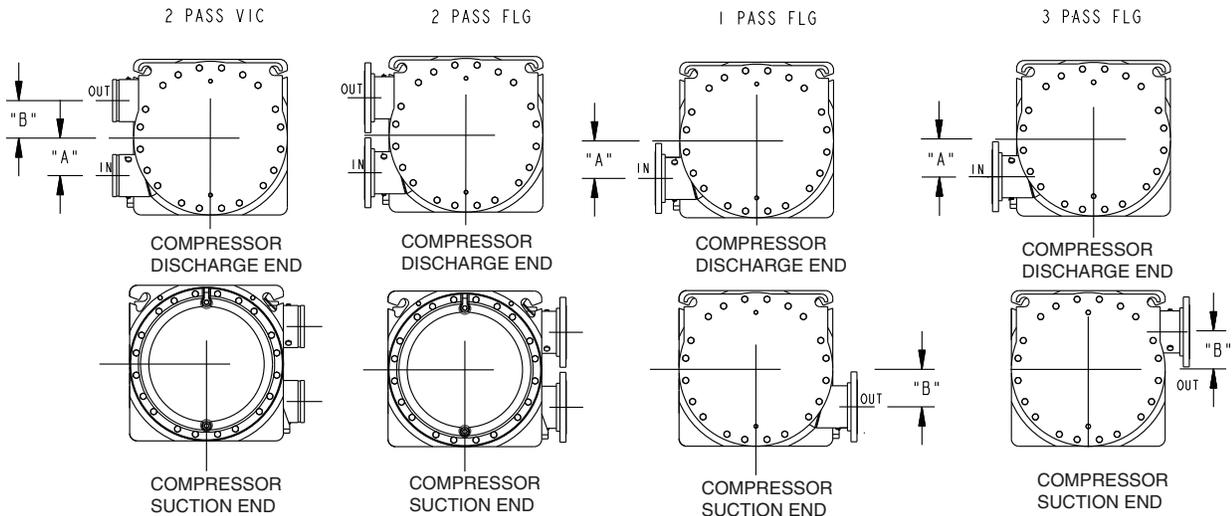
## NIH CONDENSER



30XW UNIT SIZE	NUMBER OF PASSES	A in. (mm)	B in. (mm)	CONNECTION SIZE, in. (mm)
150-200	2	6 (152)	5 <sup>5</sup> / <sub>8</sub> (142)	6 (152)
	1*	0 (0)	0 (0)	6 (152)
	3*	7 (178)	7 (178)	4 (102)

\* Flange only. Not available on Victaulic.

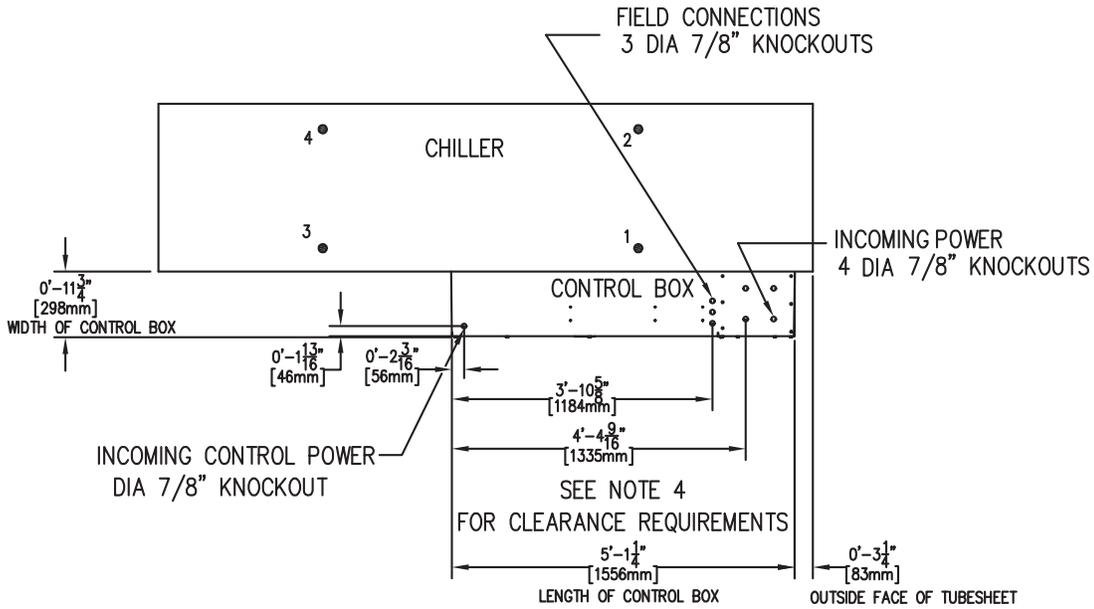
## MARINE CONDENSER



30XW UNIT SIZE	NUMBER OF PASSES	A in. (mm)	B in. (mm)	CONNECTION SIZE, in. (mm)
150-200	2	5 <sup>7</sup> / <sub>8</sub> (149)	5 <sup>7</sup> / <sub>8</sub> (149)	6 (152)
	1*	5 <sup>7</sup> / <sub>8</sub> (149)	5 <sup>7</sup> / <sub>8</sub> (149)	6 (152)
	3*	5 <sup>7</sup> / <sub>8</sub> (149)	5 <sup>7</sup> / <sub>8</sub> (149)	6 (152)

\* Flange only. Not available on Victaulic.

**Fig. 3 — 30XW150-200 Unit Dimensions (cont)**



**STANDARD 30XW225-300 UNIT DIMENSIONS**

30XW UNIT SIZE	OPERATING WEIGHT		MOUNTING LOCATION WEIGHT							
	lb	kg	1		2		3		4	
225	9,936	4506	1901	862	2390	1084	2501	1134	3144	1426
250	10,010	4541	1915	869	2408	1092	2520	1143	3168	1437
260	9,956	4516	1905	864	2395	1086	2506	1137	3151	1429
275	10,029	4549	1919	870	2412	1094	2524	1145	3174	1440
300	10,043	4557	1921	872	2416	1096	2528	1147	3178	1442

NOTE: Weights shown for standard chiller (2 pass with NIH, victaulic waterboxes).

**30XW225-300 UNIT AND WATERBOX SPECIFICATIONS**

<b>A</b>	<b>Evaporator Heat Exchanger Length — 9' - 8 15/16" [2970 mm]</b>	<b>C</b>
<b>B</b>	<b>Condenser Heat Exchanger Length — 9' - 8 15/16" [2970 mm]</b>	<b>D</b>

Overall Length = Larger of A or B + 9' - 8 15/16" [2970] + larger of C or D, where:  
 A = evaporator discharge end water box length      B = condenser discharge end water box length  
 C = evaporator suction end water box length      D = condenser suction end water box length

TYPE	WATER BOX ADDITIONAL LENGTH ADDERS				WATER BOX WEIGHT ADDERS			
	EVAP		COND		EVAP		COND	
	ft-in.	mm	ft-in.	mm	lb	kg	lb	kg
Return Cover	0-4 3/8	111	0-5 1/4	133	Std	Std	Std	Std
NIH 2 Pass Vic	0-7 7/16	189	0-8 1/2	216	Std	Std	Std	Std
NIH 2 Pass FL	1-1 7/8	352	1-1 7/8	352	151	68.5	170	77.1
NIH 1 Pass FL	1-1 7/8	352	1-1 7/8	352	224	101.6	268	121.6
NIH 3 Pass FL	1-1 7/8	352	1-1 7/8	352	237	107.6	319	144.7
MWB 2 Pass Vic	1-4 5/16	414	1-4 5/16	414	278	126.1	285	129.3
MWB 2 Pass FL	1-4 5/16	414	1-4 5/16	414	311	141.1	335	152.0
MWB 1 Pass FL	1-4 5/16	414	1-4 5/16	414	600	272.2	607	275.3
MWB 3 Pass FL	1-4 5/16	414	1-4 5/16	414	635	288.0	929	421.4

**LEGEND**

**MWB** — Marine Waterbox  
**NIH** — Nozzle-In-Head

**NOTES:**

1. Add the additional weight to the standard unit operating weight to find the total weight of the unit.
2. ● Denotes center of gravity.
3. Dimensions shown in ft-in. [mm] unless noted.
4. The recommended service clearance for the machine is 3 ft [914 mm] at the front and rear, 2 ft [610 mm] at the top, and the tube length at one end and 3 ft [914 mm] at the opposite end. Consult local electrical codes for minimum clearance requirements on control panel side.
5. Victaulic nozzles are standard on all units. A flow switch is factory-installed in evaporator inlet victaulic nozzle.
6. Maximum fluid side pressure of condenser or evaporator is 150 psig [1034 kPa] (standard) or 300 psig [2068 kPa] (optional).
7. Operating weight includes weight of water, refrigerant, and oil.

**Fig. 4 — 30XW225-300 Unit Dimensions**

FRONT VIEW — DISCHARGE END

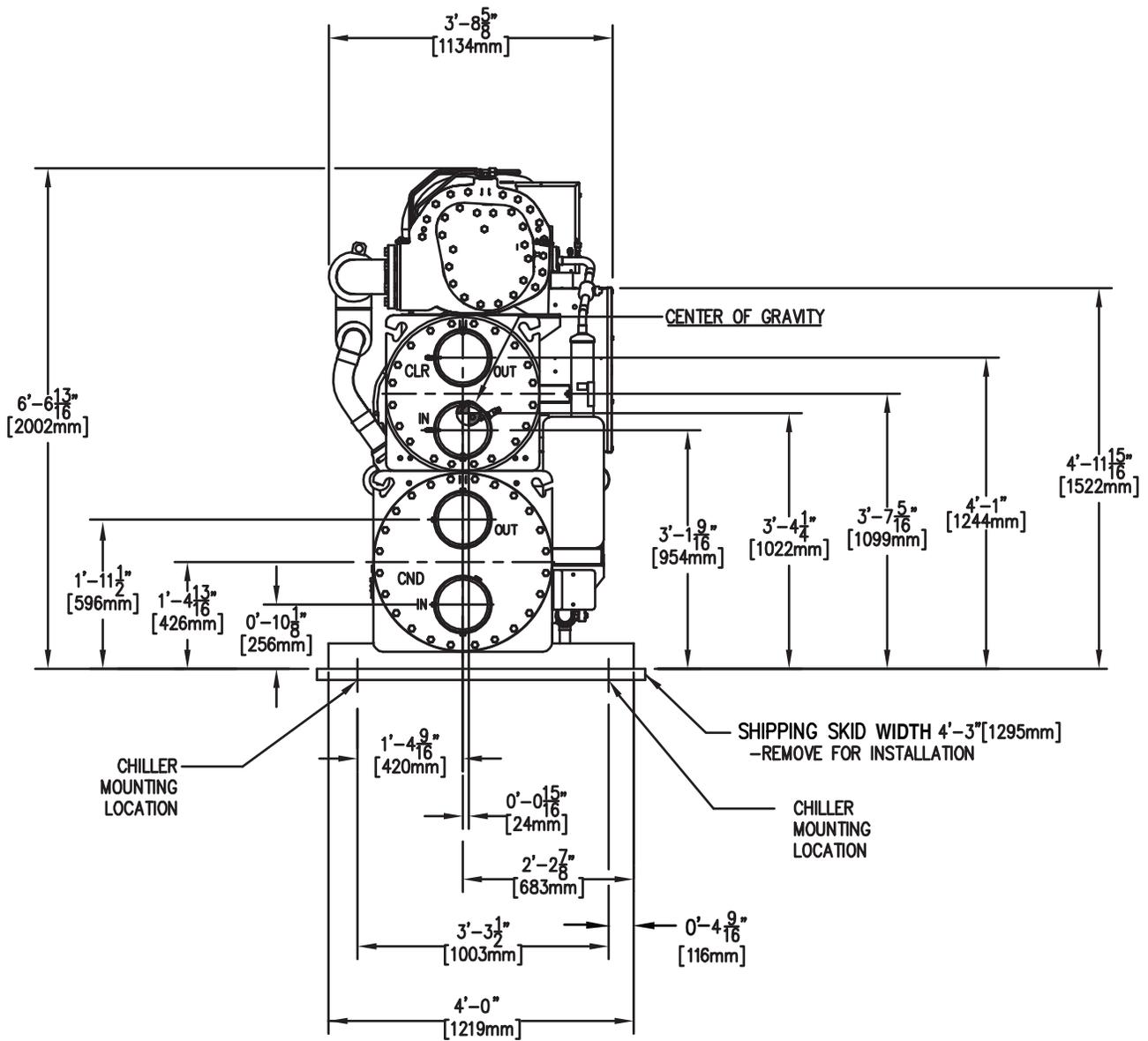
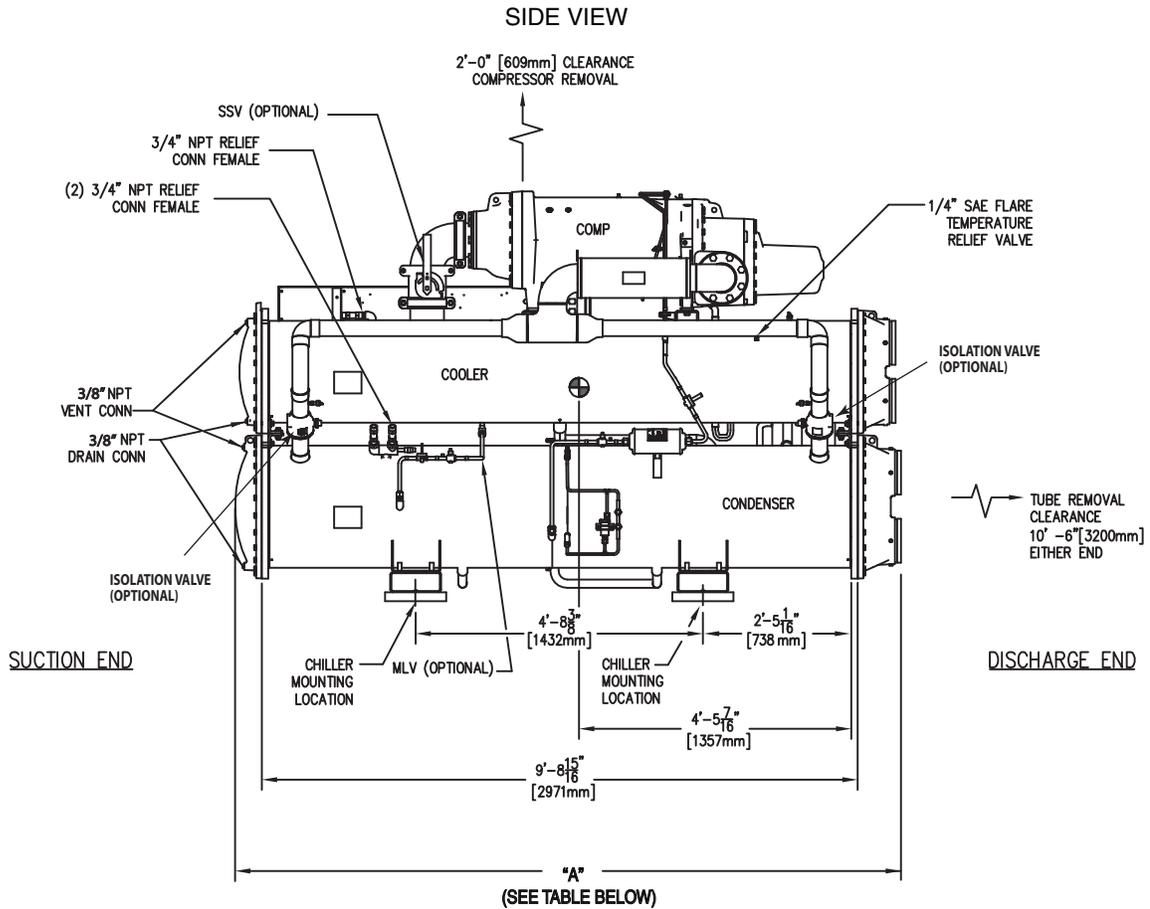


Fig. 4 — 30XW225-300 Unit Dimensions (cont)

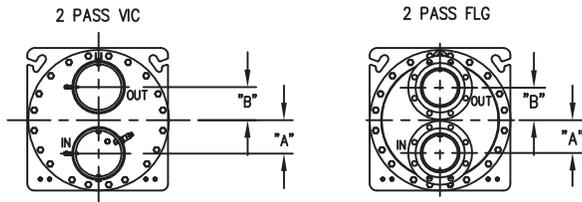


CHILLER DIMENSIONS						
CONNECTION	PASSES COOLER/ COND	WATER BOX COOLER/ COND	PRESSURE PSIG	NOZZLE TYPE	"A" ft-in. [mm]	ADDED WGT lb [kg]
STD ENDS	2P / 2P	NIH / NIH	150 or 300	VIC	10-10 11/16 [3320]	0
STD ENDS	2P / 2P	NIH / NIH	150 or 300	FLG	11- 4 5/16 [3463]	320 [145]
STD ENDS	2P / 2P	NIH / MWB	150 or 300	VIC	11- 6 9/16 [3519]	285 [129]
STD ENDS	2P / 2P	NIH / MWB	150 or 300	FLG	11- 6 9/16 [3519]	335 [152]
STD ENDS	2P / 2P	MWB / NIH	150 or 300	VIC	11- 6 9/16 [3519]	278 [126]
STD ENDS	2P / 2P	MWB / NIH	150 or 300	FLG	11- 6 9/16 [3519]	311 [141]
STD ENDS	2P / 2P	MWB / MWB	150 or 300	VIC	11- 6 9/16 [3519]	563 [255]
STD ENDS	2P / 2P	MWB / MWB	150 or 300	FLG	11- 6 9/16 [3519]	646 [293]
STD ENDS	2P / 3P	NIH / NIH	150 or 300	FLG	12- 0 1/2 [3670]	470 [213]
STD ENDS	2P / 3P	NIH / MWB	150 or 300	FLG	12- 5 5/8 [3800]	1080 [490]
OPP ENDS	1P / 1P	NIH / NIH	150 or 300	FLG	12- 0 11/16 [3676]	492 [223]
OPP ENDS	1P / 1P	NIH / MWB	150 or 300	FLG	12- 5 5/8 [3800]	831 [377]
OPP ENDS	1P / 1P	MWB / NIH	150 or 300	FLG	12- 5 5/8 [3800]	768 [394]
OPP ENDS	1P / 1P	MWB / MWB	150 or 300	FLG	12- 5 5/8 [3800]	1207 [547]
OPP ENDS	2P / 2P	NIH / NIH	150 or 300	VIC	10-10 11/16 [3320]	0
OPP ENDS	2P / 2P	NIH / NIH	150 or 300	FLG	11- 4 5/16 [3463]	320 [145]
OPP ENDS	2P / 2P	NIH / MWB	150 or 300	VIC	11- 6 9/16 [3519]	285 [129]
OPP ENDS	2P / 2P	NIH / MWB	150 or 300	FLG	11- 6 9/16 [3519]	335 [152]
OPP ENDS	2P / 2P	MWB / NIH	150 or 300	VIC	11- 6 9/16 [3519]	278 [126]
OPP ENDS	2P / 2P	MWB / NIH	150 or 300	FLG	11- 6 9/16 [3519]	311 [141]
OPP ENDS	2P / 2P	MWB / MWB	150 or 300	VIC	11- 6 9/16 [3519]	563 [255]
OPP ENDS	2P / 2P	MWB / MWB	150 or 300	FLG	11- 6 9/16 [3519]	646 [293]
OPP ENDS	3P / 1P	NIH / NIH	150 or 300	FLG	12- 0 11/16 [3676]	505 [229]
OPP ENDS	3P / 1P	NIH / MWB	150 or 300	FLG	12- 5 5/8 [3800]	844 [383]
OPP ENDS	3P / 1P	MWB / NIH	150 or 300	FLG	12- 5 5/8 [3800]	903 [410]
OPP ENDS	3P / 1P	MWB / MWB	150 or 300	FLG	12- 5 5/8 [3800]	1242 [470]

- LEGEND**
- 1P** — 1 Pass
  - 2P** — 2 Pass
  - 3P** — 3 Pass
  - MLV** — Minimum Load Valve
  - NIH** — Nozzle-In-Head
  - OPP ENDS** — Opposite Ends
  - SAE** — Society of Automotive Engineers
  - SSV** — Suction Service Valve
  - STD ENDS** — Standard Ends

**Fig. 4 — 30XW225-300 Unit Dimensions (cont)**

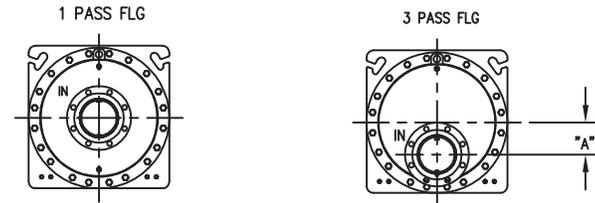
### NIH EVAPORATOR



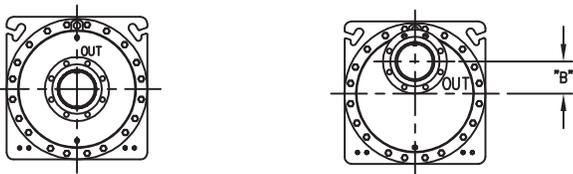
COMPRESSOR DISCHARGE END



COMPRESSOR SUCTION END

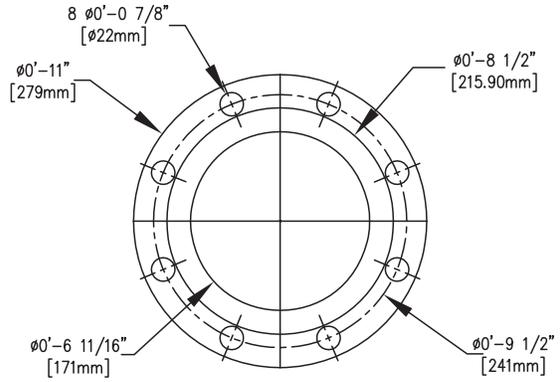


COMPRESSOR DISCHARGE END



COMPRESSOR SUCTION END

### WATERBOX FLANGE DETAIL



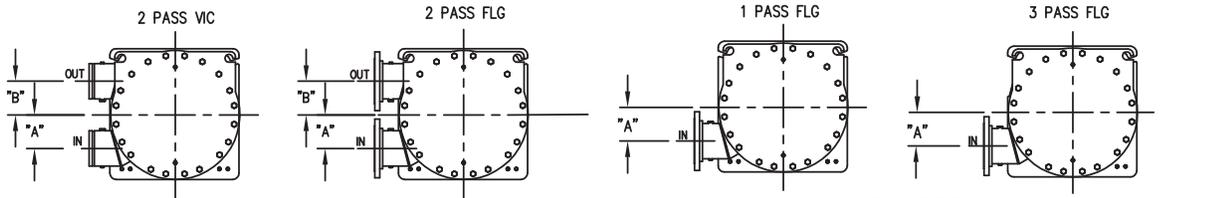
### NIH EVAPORATOR

30XW UNIT SIZE	NUMBER OF PASSES	VICTAULIC		
		A in. (mm)	B in. (mm)	CONNECTION SIZE, in. (mm)
225-300	2	5 <sup>11</sup> / <sub>16</sub> (145)	5 <sup>11</sup> / <sub>16</sub> (145)	8 (203)
	1	—	—	—
	3	—	—	—

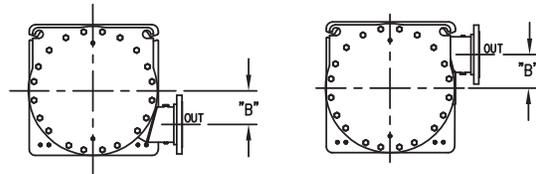
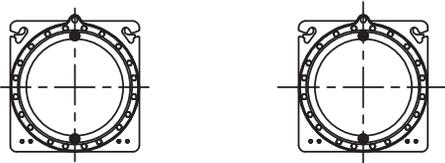
30XW UNIT SIZE	NUMBER OF PASSES	FLANGE		
		A in. (mm)	B in. (mm)	CONNECTION SIZE, in. (mm)
225-300	2	5 <sup>5</sup> / <sub>8</sub> (142)	5 <sup>5</sup> / <sub>8</sub> (142)	6 (152)
	1	0 (0)	0 (0)	6 (152)
	3	5 <sup>1</sup> / <sub>2</sub> (140)	5 <sup>1</sup> / <sub>2</sub> (140)	6 (152)

### MARINE EVAPORATOR



COMPRESSOR DISCHARGE END

COMPRESSOR DISCHARGE END



COMPRESSOR SUCTION END

COMPRESSOR SUCTION END

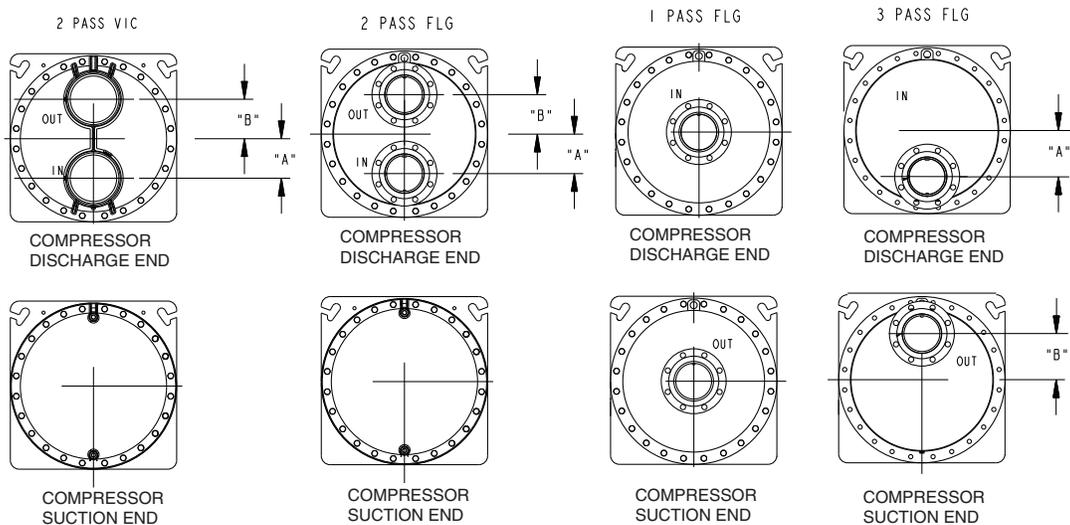
### MARINE EVAPORATOR

30XW UNIT SIZE	NUMBER OF PASSES	A in. (mm)	B in. (mm)	CONNECTION SIZE, in. (mm)
225-300	2	6 <sup>5</sup> / <sub>16</sub> (160)	6 <sup>5</sup> / <sub>16</sub> (160)	6 (152)
	1*	6 <sup>5</sup> / <sub>16</sub> (160)	6 <sup>5</sup> / <sub>16</sub> (160)	6 (152)
	3*	6 <sup>5</sup> / <sub>16</sub> (160)	6 <sup>5</sup> / <sub>16</sub> (160)	6 (152)

\* Flange only. Not available on Victaulic.

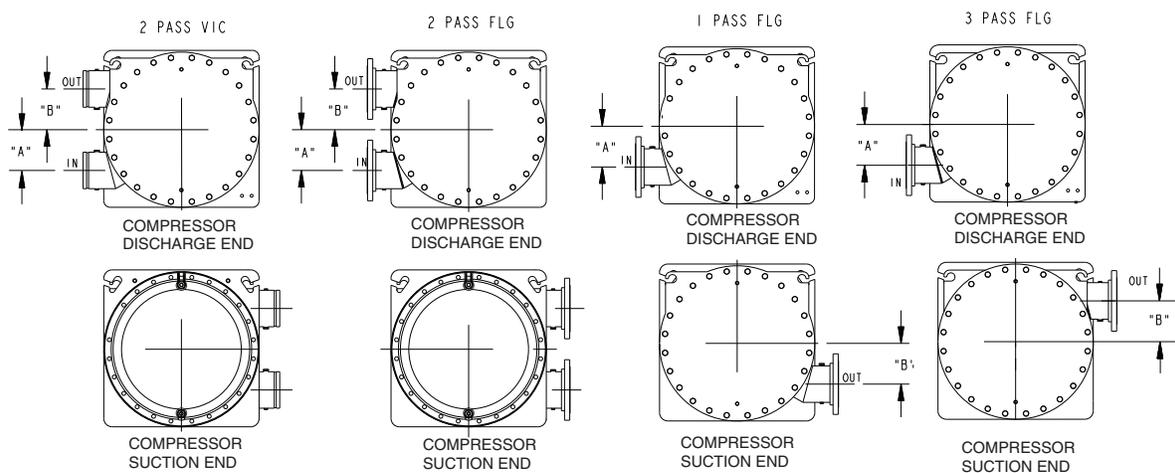
Fig. 4 — 30XW225-300 Unit Dimensions (cont)

## NIH CONDENSER



30XW UNIT SIZE	NUMBER OF PASSES	A in. (mm)	B in. (mm)	CONNECTION SIZE, in. (mm)	
				Flange	Victaulic
325-400	2	6 <sup>11</sup> / <sub>16</sub> (170)	6 <sup>11</sup> / <sub>16</sub> (170)	6 (152)	8 (203)
	1	0 (0)	0 (0)	6 (152)	—
	3	7 <sup>3</sup> / <sub>16</sub> (198)	7 <sup>3</sup> / <sub>16</sub> (198)	6 (152)	—

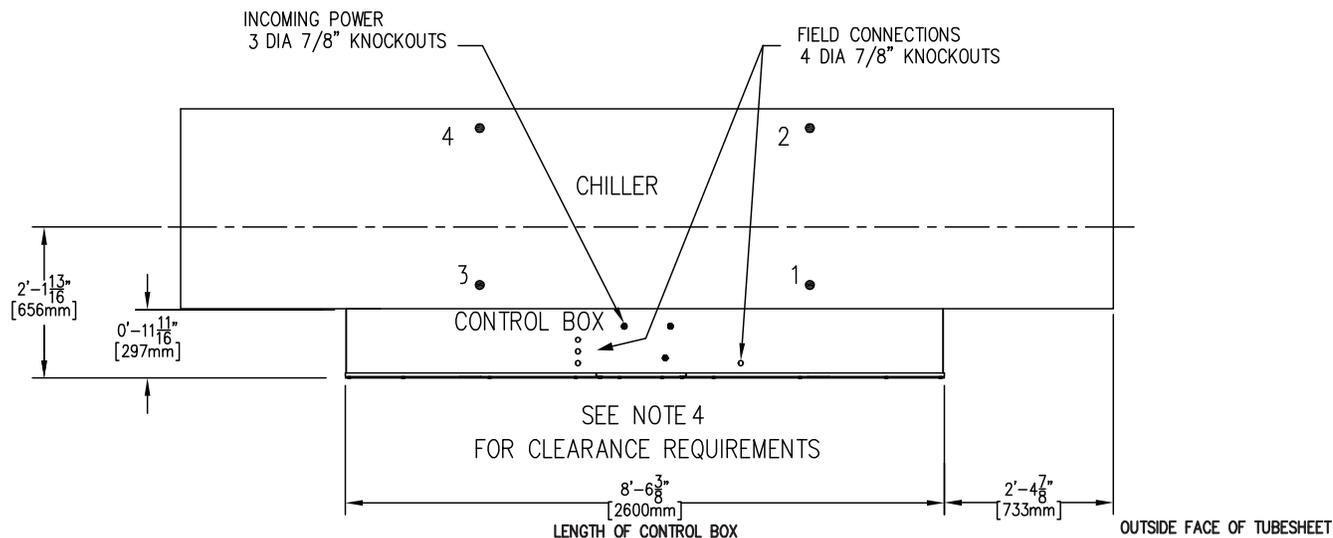
## MARINE CONDENSER



30XW UNIT SIZE	NUMBER OF PASSES	A in. (mm)	B in. (mm)	CONNECTION SIZE, in. (mm)
				6 (152)
225-300	2	7 <sup>3</sup> / <sub>8</sub> (188)	7 <sup>3</sup> / <sub>8</sub> (188)	6 (152)
	1*	7 <sup>3</sup> / <sub>8</sub> (188)	7 <sup>3</sup> / <sub>8</sub> (188)	6 (152)
	3*	7 <sup>3</sup> / <sub>8</sub> (188)	7 <sup>3</sup> / <sub>8</sub> (188)	6 (152)

\* Flange only. Not available on Victaulic.

**Fig. 4 — 30XW225-300 Unit Dimensions (cont)**



### STANDARD 30XW325-400 UNIT DIMENSIONS

30XW UNIT SIZE	OPERATING WEIGHT		MOUNTING LOCATION WEIGHT							
			1		2		3		4	
	lb	kg	lb	kg	lb	kg	lb	kg	lb	kg
325	14,319	6495	3770	1710	3891	1765	3277	1486	3381	1534
350	14,515	6584	3822	1734	3944	1789	3322	1507	3428	1555
375	14,468	6563	3810	1728	3931	1783	3311	1502	3417	1550
400	14,759	6695	3886	1763	4010	1819	3378	1532	3485	1581

NOTE: Weights shown for standard chiller (2 pass with NIH, victaulic waterboxes).

### 30XW325-400 UNIT AND WATERBOX SPECIFICATIONS

<b>A</b>	<b>Evaporator Heat Exchanger Length — 12' - 2" [3708 mm]</b>	<b>C</b>
<b>B</b>	<b>Condenser Heat Exchanger Length — 12' - 2" [3708 mm]</b>	<b>D</b>

Overall Length = Larger of A or B + 12' - 2" [3708] + larger of C or D, where:

A = evaporator discharge end water box length      B = condenser discharge end water box length  
 C = evaporator suction end water box length      D = condenser suction end water box length

TYPE	WATER BOX ADDITIONAL LENGTH ADDERS				WATER BOX WEIGHT ADDERS			
	EVAP		COND		EVAP		COND	
	ft-in.	mm	ft-in.	mm	lb	kg	lb	kg
Return Cover	0-4 7/8	124	0-5 1/4	133	Std	Std	Std	Std
NIH 2 Pass Vic	0-7 13/16	198	0-8 1/2	216	Std	Std	Std	Std
NIH 2 Pass FL	1-0 5/8	321	1-1 7/8	352	158	71.7	174	78.9
NIH 1 Pass FL	1-0 5/8	321	1-1 7/8	352	241	109.3	268	121.6
NIH 3 Pass FL	1-0 5/8	321	1-1 7/8	352	253	114.8	318	144.2
MWB 2 Pass Vic	1-4 5/16	414	1-4 5/16	414	276	125.2	278	126.1
MWB 2 Pass FL	1-4 5/16	414	1-4 5/16	414	355	161.0	362	164.2
MWB 1 Pass FL	1-4 5/16	414	1-4 5/16	414	611	277.1	651	295.3
MWB 3 Pass FL	1-4 5/16	414	1-4 5/16	414	657	298.0	928	420.9

#### LEGEND

**MWB** — Marine Waterbox  
**NIH** — Nozzle-In-Head

#### NOTES:

1. Add the additional weight to the standard unit operating weight to find the total weight of the unit.
2. ● Denotes center of gravity.
3. Dimensions shown in ft-in. [mm] unless noted.
4. The recommended service clearance for the machine is 3 ft [914 mm] at the front and rear, 2 ft [610 mm] at the top and the tube length at one end and 3 ft [914 mm] at the opposite end. Consult local electrical codes for minimum clearance requirements on control panel side.
5. Victaulic nozzles are standard on all units. A flow switch is factory-installed in evaporator inlet victaulic nozzle.
6. Maximum fluid side pressure of condenser or evaporator is 150 psig [1034 kPa] (standard) or 300 psig [2068 kPa] (optional).
7. Operating weight includes weight of water, refrigerant, and oil.

**Fig. 5 — 30XW325-400 Unit Dimensions**

FRONT VIEW — DISCHARGE END

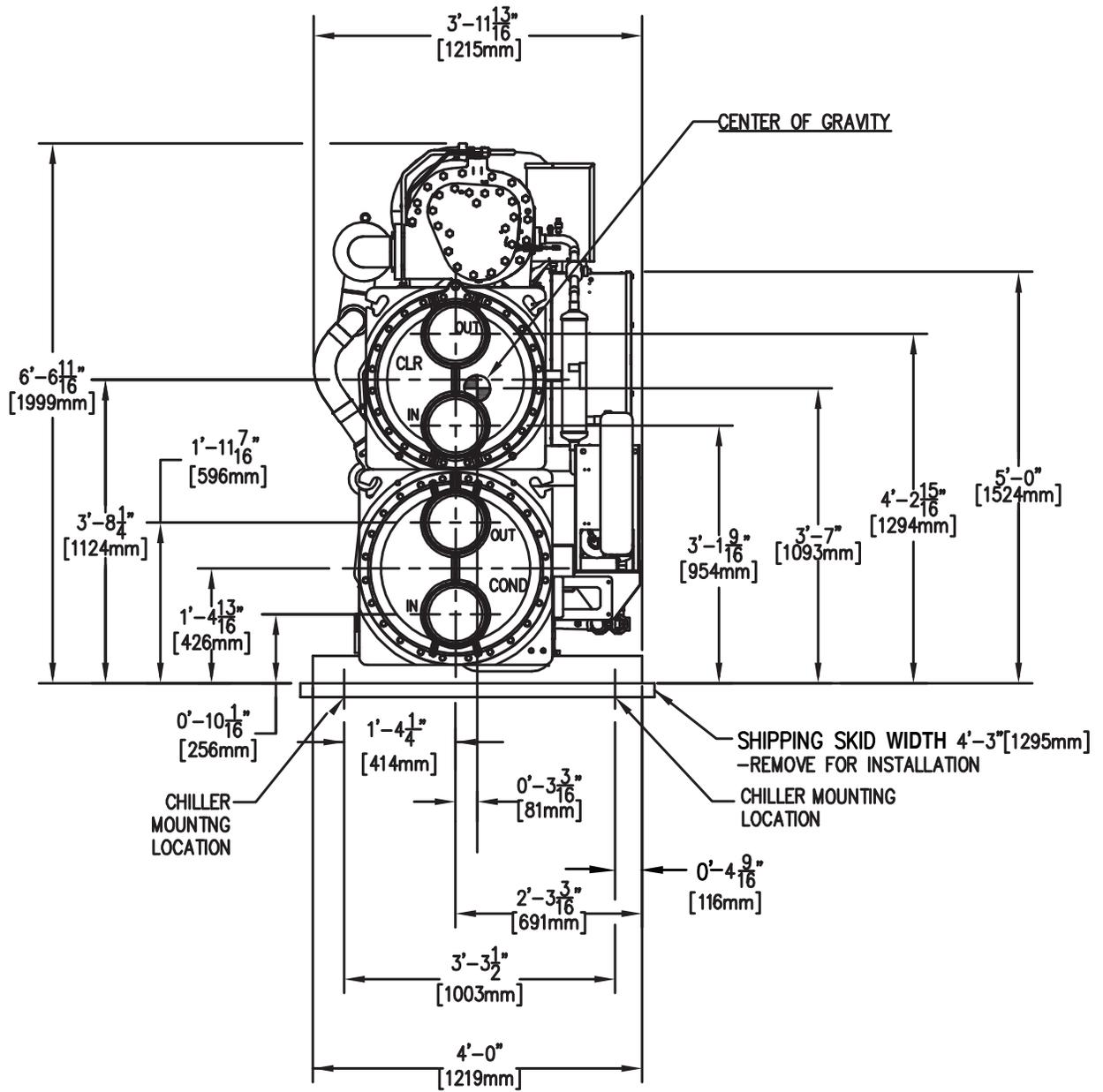
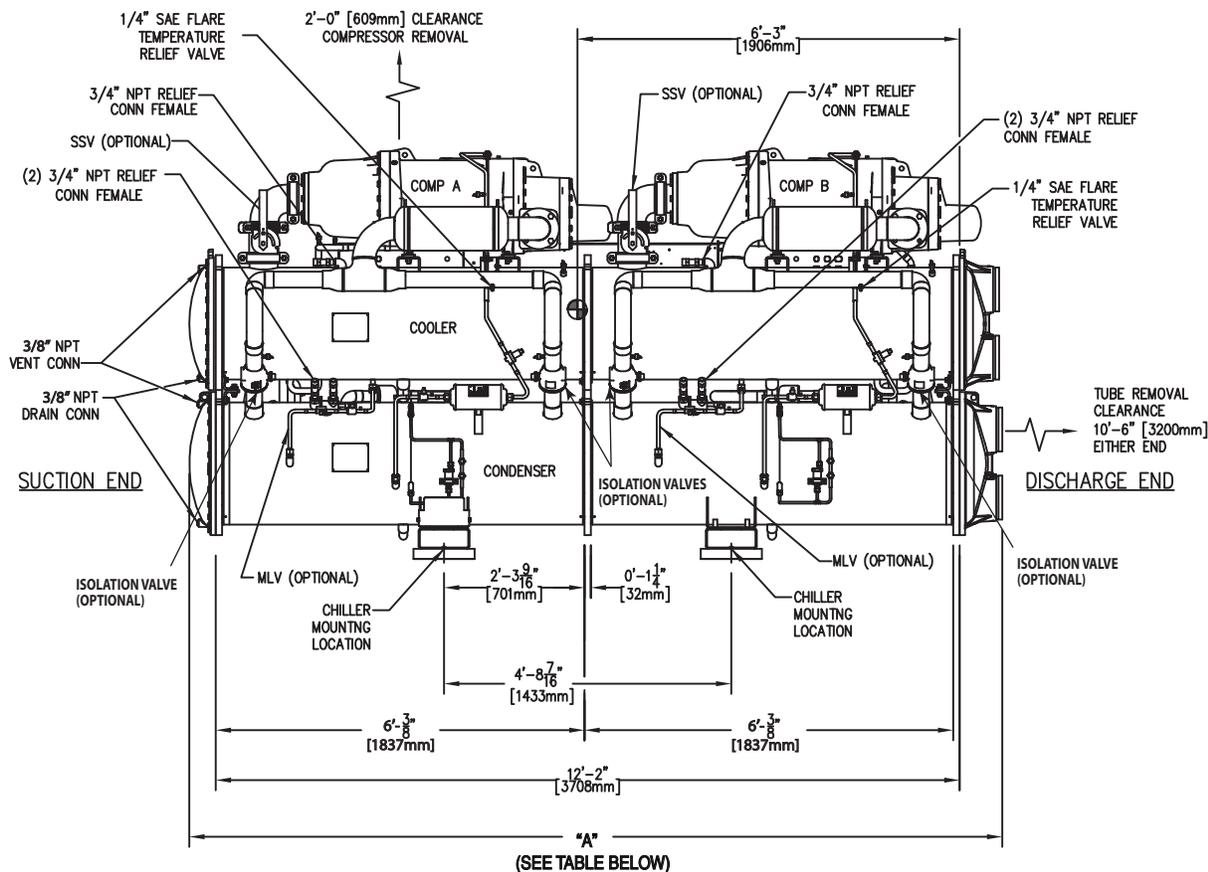


Fig. 5 — 30XW325-400 Unit Dimensions (cont)

SIDE VIEW



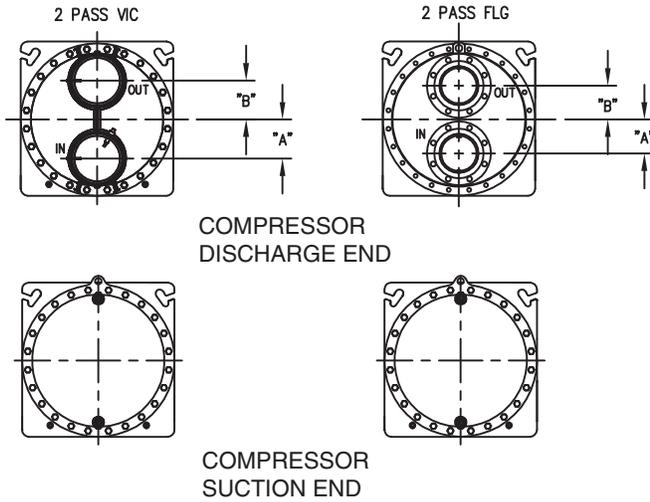
(SEE TABLE BELOW)

CHILLER DIMENSIONS						
CONNECTION	PASSES COOLER/ COND	WATER BOX COOLER/ COND	PRESSURE PSIG	NOZZLE TYPE	"A" ft-in. [mm]	ADDED WGT lb [kg]
STD ENDS	2P / 2P	NIH / NIH	150 or 300	VIC	13- 3 3/4 [4058]	0
STD ENDS	2P / 2P	NIH / NIH	150 or 300	FLG	13- 9 1/16 [4193]	331 [150]
STD ENDS	2P / 2P	NIH / MWB	150 or 300	VIC	13-11 9/16 [4256]	278 [126]
STD ENDS	2P / 2P	NIH / MWB	150 or 300	FLG	13-11 9/16 [4256]	362 [164]
STD ENDS	2P / 2P	MWB / NIH	150 or 300	VIC	13-11 9/16 [4256]	276 [125]
STD ENDS	2P / 2P	MWB / NIH	150 or 300	FLG	13-11 9/16 [4256]	355 [161]
STD ENDS	2P / 2P	MWB / MWB	150 or 300	VIC	13-11 9/16 [4256]	555 [252]
STD ENDS	2P / 2P	MWB / MWB	150 or 300	FLG	13-11 9/16 [4256]	717 [325]
STD ENDS	2P / 3P	NIH / NIH	150 or 300	FLG	14- 5 9/16 [4406]	476 [216]
STD ENDS	2P / 3P	NIH / MWB	150 or 300	FLG	14-10 9/16 [4535]	1086 [493]
OPP ENDS	1P / 1P	NIH / NIH	150 or 300	FLG	14- 5 5/8 [4410]	509 [231]
OPP ENDS	1P / 1P	NIH / MWB	150 or 300	FLG	14-10 9/16 [4535]	892 [405]
OPP ENDS	1P / 1P	MWB / NIH	150 or 300	FLG	14-10 9/16 [4535]	880 [399]
OPP ENDS	1P / 1P	MWB / MWB	150 or 300	FLG	14-10 9/16 [4535]	1262 [572]
OPP ENDS	2P / 2P	NIH / NIH	150 or 300	VIC	13- 3 3/4 [4058]	0
OPP ENDS	2P / 2P	NIH / NIH	150 or 300	FLG	13- 9 1/16 [4193]	331 [150]
OPP ENDS	2P / 2P	NIH / MWB	150 or 300	VIC	13-11 9/16 [4256]	278 [126]
OPP ENDS	2P / 2P	NIH / MWB	150 or 300	FLG	13-11 9/16 [4256]	362 [164]
OPP ENDS	2P / 2P	MWB / NIH	150 or 300	VIC	13-11 9/16 [4256]	276 [125]
OPP ENDS	2P / 2P	MWB / NIH	150 or 300	FLG	13-11 9/16 [4256]	355 [161]
OPP ENDS	2P / 2P	MWB / MWB	150 or 300	VIC	13-11 9/16 [4256]	555 [252]
OPP ENDS	2P / 2P	MWB / MWB	150 or 300	FLG	13-11 9/16 [4256]	717 [325]
OPP ENDS	3P / 1P	NIH / NIH	150 or 300	FLG	14- 5 5/8 [4410]	521 [236]
OPP ENDS	3P / 1P	NIH / MWB	150 or 300	FLG	14-10 9/16 [4535]	904 [410]
OPP ENDS	3P / 1P	MWB / NIH	150 or 300	FLG	14-10 9/16 [4535]	925 [420]
OPP ENDS	3P / 1P	MWB / MWB	150 or 300	FLG	14-10 9/16 [4535]	1308 [593]

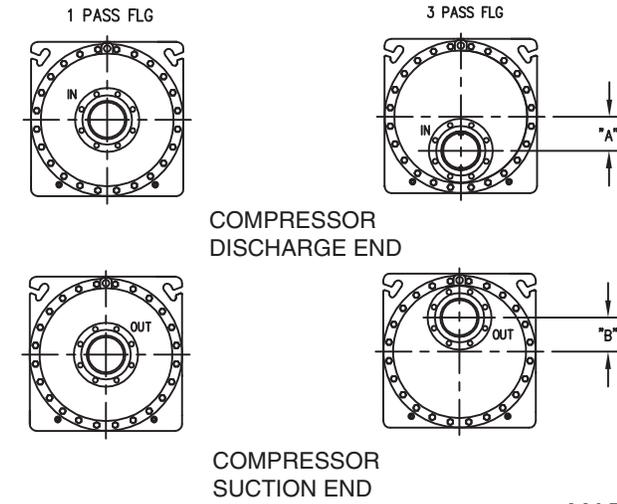
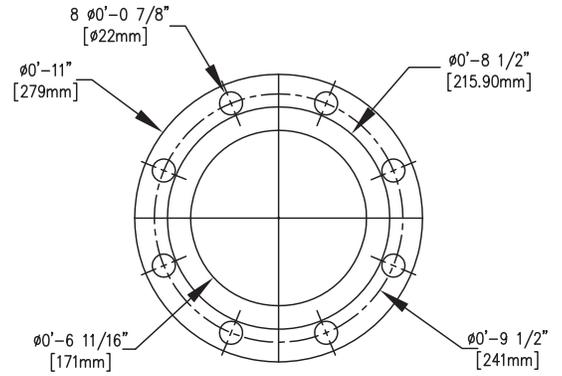
- LEGEND
- 1P — 1 Pass
  - 2P — 2 Pass
  - 3P — 3 Pass
  - FLG — Flange
  - MLV — Minimum Load Valve
  - MWB — Marine Water Box
  - NIH — Nozzle-In-Head
  - OPP ENDS — Opposite Ends
  - SAE — Society of Automotive Engineers
  - SSV — Suction Service Valve
  - STD ENDS — Standard Ends
  - VIC — Victaulic

Fig. 5 — 30XW325-400 Unit Dimensions (cont)

### NIH EVAPORATOR



### WATERBOX FLANGE DETAIL

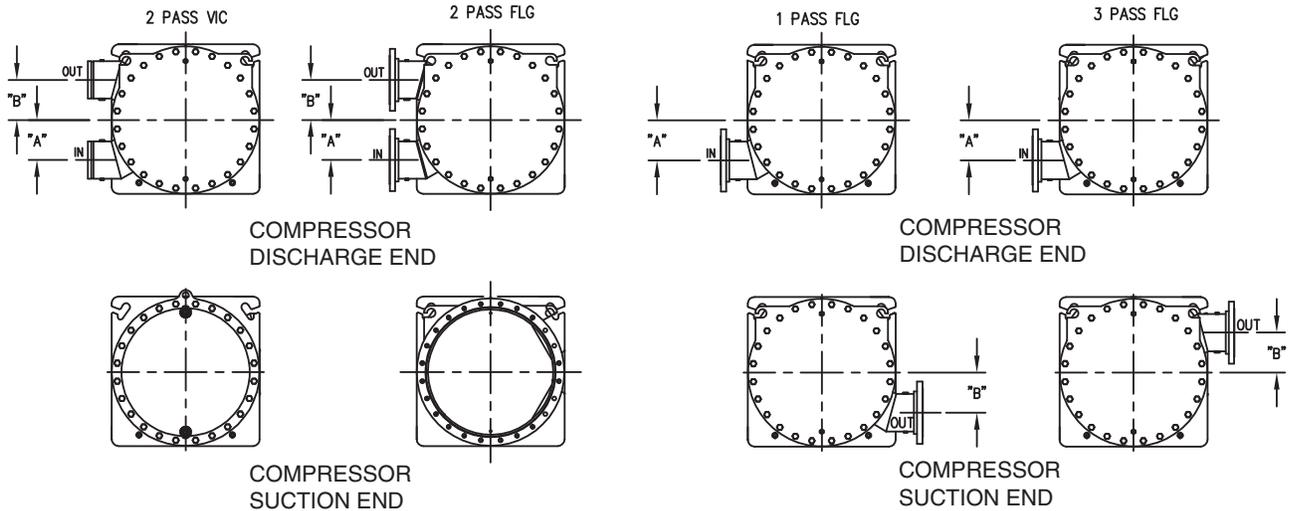


### NIH EVAPORATOR

30XW UNIT SIZE	NUMBER OF PASSES	VICTAULIC		
		A in. (mm)	B in. (mm)	CONNECTION SIZE, in. (mm)
325-400	2	6 <sup>11</sup> / <sub>16</sub> (170)	6 <sup>11</sup> / <sub>16</sub> (170)	8 (203)
	1	—	—	—
	3	—	—	—

30XW UNIT SIZE	NUMBER OF PASSES	FLANGE		
		A in. (mm)	B in. (mm)	CONNECTION SIZE, in. (mm)
325-400	2	5 <sup>13</sup> / <sub>16</sub> (148)	5 <sup>13</sup> / <sub>16</sub> (148)	6 (152)
	1	0 (0)	0 (0)	6 (152)
	3	5 <sup>13</sup> / <sub>16</sub> (148)	5 <sup>13</sup> / <sub>16</sub> (148)	6 (152)

### MARINE EVAPORATOR



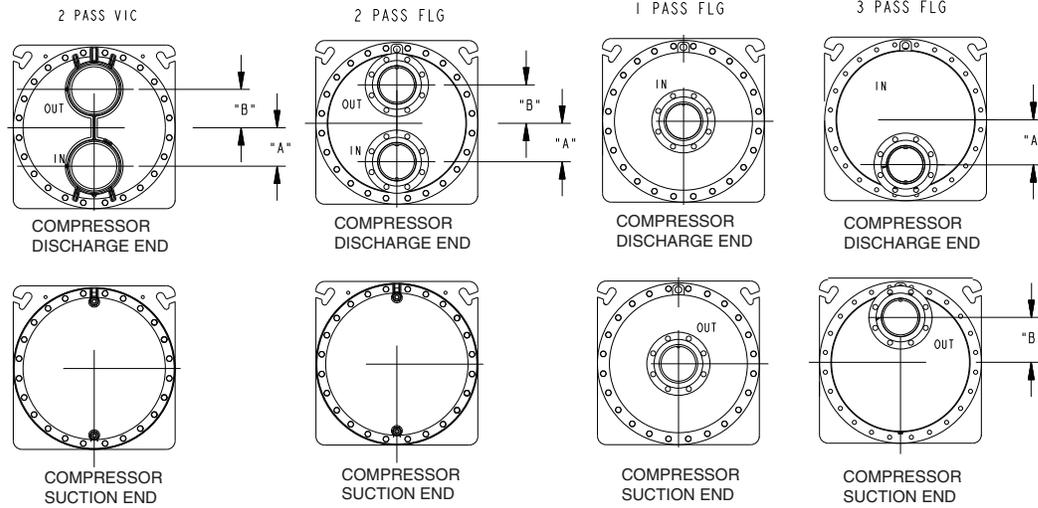
### MARINE EVAPORATOR

30XW UNIT SIZE	NUMBER OF PASSES	A in. (mm)	B in. (mm)	CONNECTION SIZE, in. (mm)
325-400	2	7 <sup>1</sup> / <sub>8</sub> (180)	7 <sup>1</sup> / <sub>8</sub> (180)	6 (152)
	1*	7 <sup>1</sup> / <sub>8</sub> (180)	7 <sup>1</sup> / <sub>8</sub> (180)	6 (152)
	3*	7 <sup>1</sup> / <sub>8</sub> (180)	7 <sup>1</sup> / <sub>8</sub> (180)	6 (152)

\* Flange only. Not available on Victaulic.

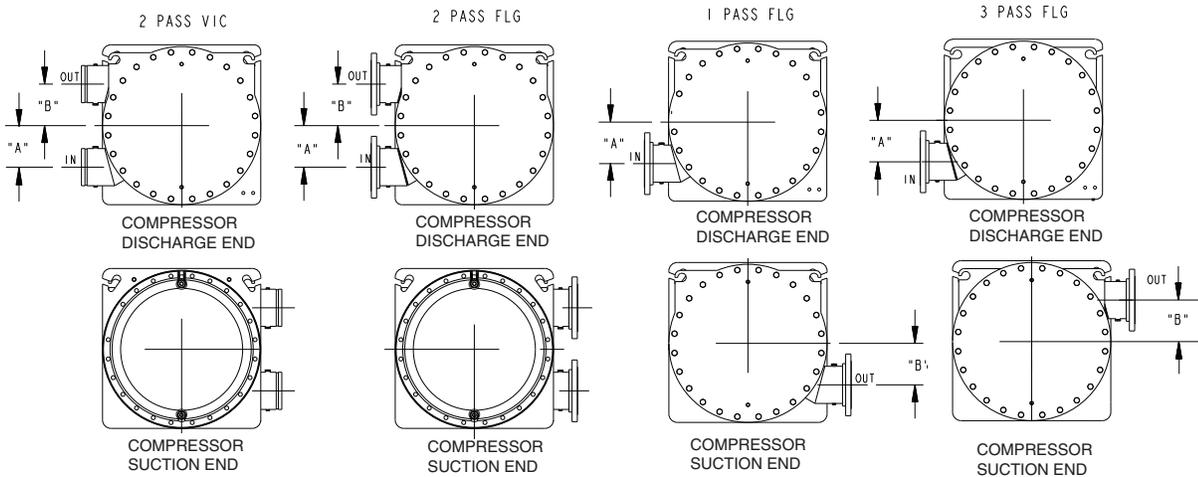
Fig. 5 — 30XW325-400 Unit Dimensions (cont)

## NIH CONDENSER



30XW UNIT SIZE	NUMBER OF PASSES	A in. (mm)	B in. (mm)	CONNECTION SIZE, in. (mm)	
				Flange	Victaulic
325-400	2	6 <sup>11</sup> / <sub>16</sub> (170)	6 <sup>11</sup> / <sub>16</sub> (170)	6 (152)	8 (203)
	1	0 (0)	0 (0)	6 (152)	—
	3	7 <sup>3</sup> / <sub>16</sub> (198)	7 <sup>3</sup> / <sub>16</sub> (198)	6 (152)	—

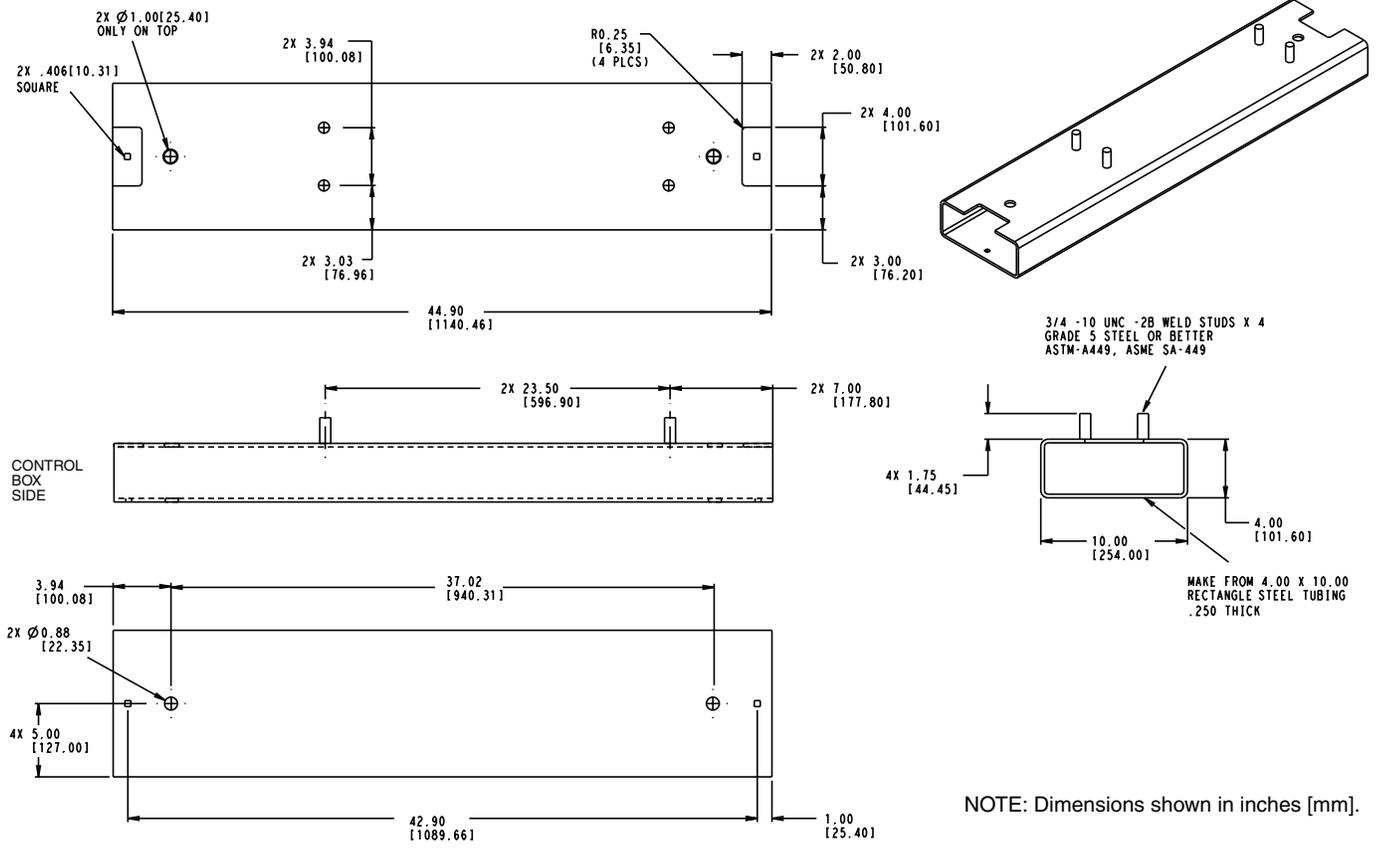
## MARINE CONDENSER



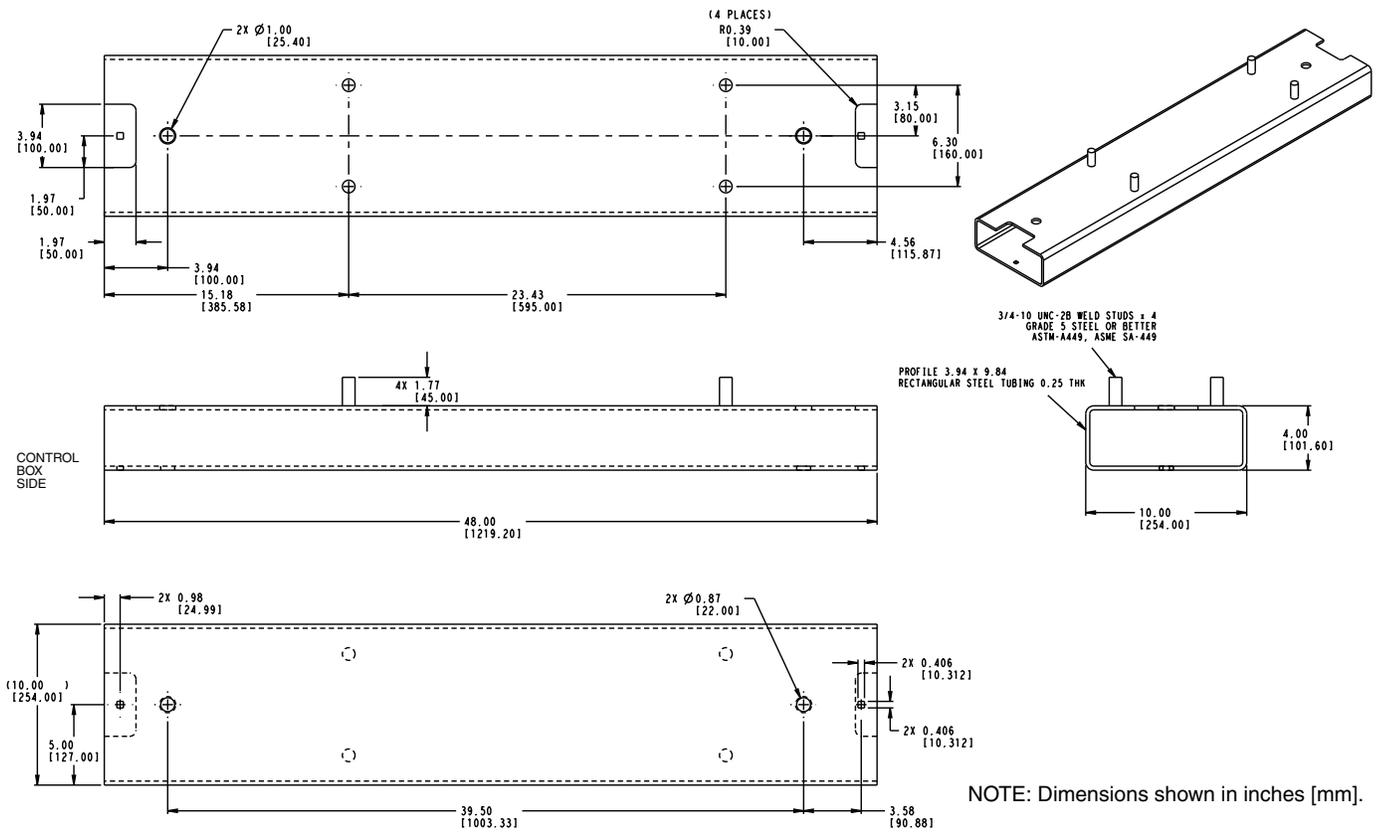
30XW UNIT SIZE	NUMBER OF PASSES	A in. (mm)	B in. (mm)	CONNECTION SIZE, in. (mm)
325-400	2	7 <sup>3</sup> / <sub>8</sub> (188)	7 <sup>3</sup> / <sub>8</sub> (188)	6 (152)
	1*	7 <sup>3</sup> / <sub>8</sub> (188)	7 <sup>3</sup> / <sub>8</sub> (188)	6 (152)
	3*	7 <sup>3</sup> / <sub>8</sub> (188)	7 <sup>3</sup> / <sub>8</sub> (188)	6 (152)

\* Flange only. Not available on Victaulic.

**Fig. 5 — 30XW325-400 Unit Dimensions (cont)**



**Fig. 6 — 30XW150-200 Unit Mounting Feet Dimensions**



**Fig. 7 — 30XW225-400 Unit Mounting Feet Dimensions**

### Step 3 — Rig and Place Unit

#### ⚠ CAUTION

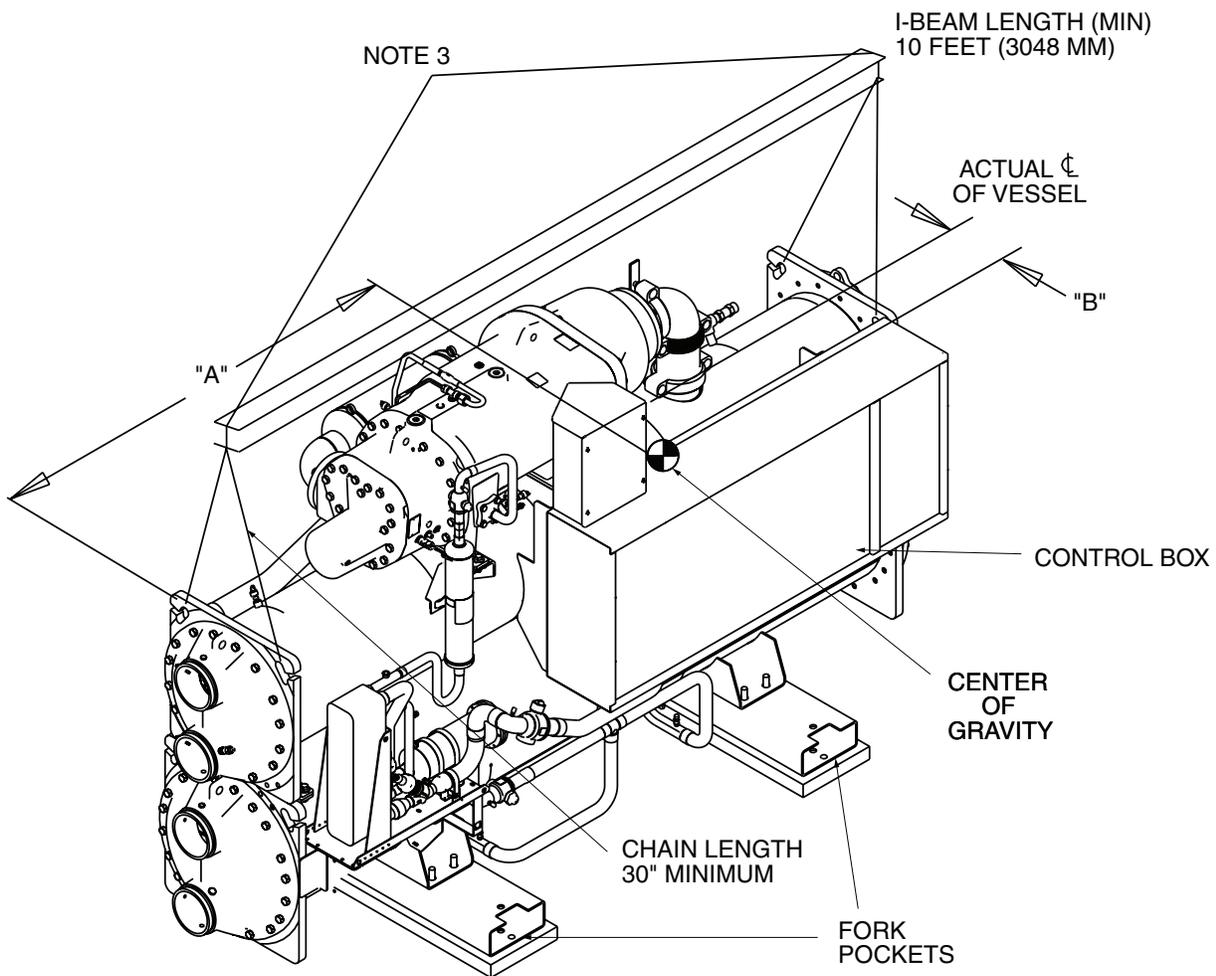
Rig unit from the top heat exchanger only. Rigging from the bottom heat exchanger will cause the unit to be lifted unsafely. Personal injury or damage to the unit may occur.

IMPORTANT: Install unit in area which will not be exposed to ambient temperatures below 50 F (10 C).

IMPORTANT: Carrier suggests that a structural engineer be consulted if transmission of vibrations from mechanical equipment is of concern.

Do not remove the shipping blocks or packaging until the unit is in its final position. Units can be moved with a fork lift truck, as long as the forks are positioned in the correct and direction using the fork pockets on either side of the unit. Rig from the rigging holes provided in the top heat exchanger. See Fig. 3-9 for rigging and center of gravity information. Lower the unit carefully onto the floor. Do not tilt the unit more than 15 degrees.

Areas where unit mounting points will be located must be level to within  $\frac{1}{16}$  in. per ft (5 mm per m) along the long axis of the unit. Once unit is in place and level, bolt unit to the floor or mounting pad. Use isolation pads under the unit to aid in vibration isolation as required.

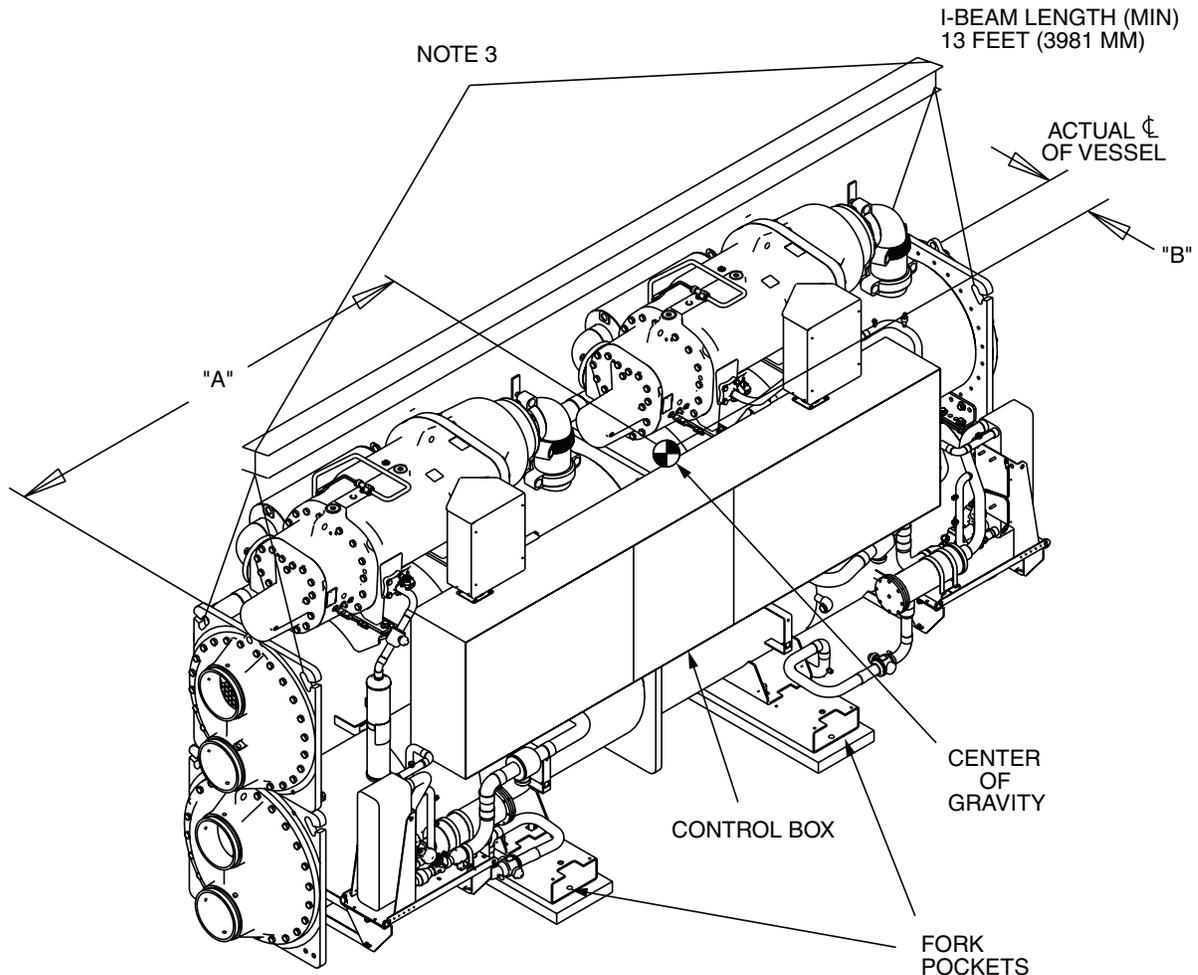


30XW UNIT SIZE	A in. (mm)	B in. (mm)
150-200	49.80 (1265)	0.94 (24)
225-300	53.44 (1357)	0.94 (24)

#### NOTES:

1.  $1\frac{1}{2}$  in. (38 mm) holes are provided for lifting unit.
2. Rig with cables as shown.
3. Run rigging cables to a central suspension point.
4. Check bill of lading for shipping weight of unit.
5. For vertical location of center of gravity, see Fig. 3 and 4.

Fig. 8 — 30XW150-300 Unit Rigging



30XW UNIT SIZE	A in. (mm)	B in. (mm)
325-400	75.03 (1906)	3.18 (81)

**NOTES:**

1. 1½ in. (38 mm) holes are provided for lifting unit.
2. Rig with cables as shown.
3. Run rigging cables to a central suspension point.
4. Check bill of lading for shipping weight of unit.
5. For vertical location of center of gravity, see Fig. 5.

**Fig. 9 — 30XW325-400 Unit Rigging**

**Step 4 — Connect Piping**

**⚠ CAUTION**

Protect insulation from weld heat damage and weld splattering. Cover with wet canvas cover during water piping insulation.

See Fig. 10-12 for typical piping diagram and applications. **EVAPORATOR FLUID, CONDENSER FLUID, VENT, AND DRAIN PIPING** — Plan the piping arrangement in accordance with good piping practices. Use flexible connections on evaporator and condenser piping to reduce vibration transmission. Offset the piping to permit removal of the evaporator head for maintenance. Install pipe hangers where needed. Make sure no weight or stress is placed on the water nozzle.

A screen strainer with a minimum of 20 mesh must be installed ahead of the evaporator and condenser inlet (within 10 ft [3.05 m]) to prevent debris from damaging internal tubes.

Field-supplied shutoff and balancing valves should also be installed to facilitate servicing and flow balancing. Locate valves in return and supply fluid lines as close to the chiller as possible.

Provide openings in fluid piping for pressure gages and thermometers (if used). These openings should be 5 to 10 pipe diameters from the unit water nozzles. For thorough mixing and temperature stabilization, wells in the leaving water piping should extend at least 2 in. (50 mm) into the pipe. Water flow direction must be as specified by inlet and outlet connections shown in Fig. 3-5.

**NOTE:** Outlet (supply) fluid connection is always the upper nozzle of the 2 evaporator connections. Inlet (return) fluid connection is always the lower nozzle.

The evaporator flow switch (CWFS) is factory installed in the inlet nozzle and wired.

Install air vents at all high points in piping to remove air and prevent water hammer. See Fig. 10 and 11. Provide drain connections at all low points to permit complete drainage of the system.

\*Control power supply is not required for chillers ordered with the control power transformer option.

NOTES:

1. Wiring and piping shown are for general point-of-connection only and are not intended to show details for a specific installation. Certified field wiring and dimensional diagrams are available upon request. The 30XW units should be installed using certified drawings.
2. All wiring must comply with applicable codes.
3. Refer to Carrier System Design Manual for details regarding piping techniques.
4. Piping, wiring, switches, valves, vent gages, strainers, drain, and vibration isolation are all field supplied.
5. Water connections are shown on left side of control box in this figure. Actual connections can be on either side according to chiller configuration ordered.

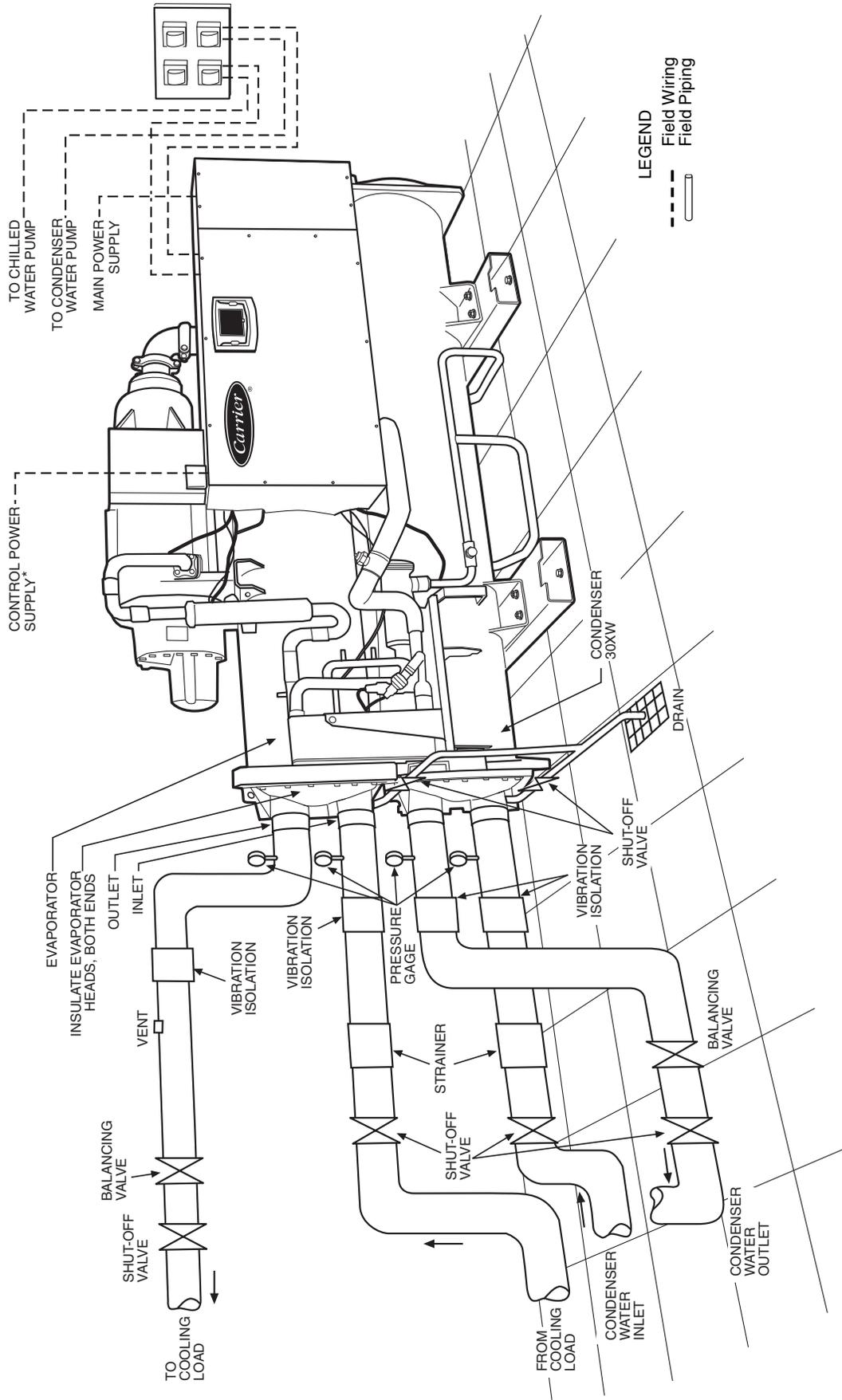


Fig. 10 — Typical Evaporator and Condenser Piping and Wiring — 30XW150-300

\*Control power supply is not required for chillers ordered with the control power transformer option.

NOTES:

1. Wiring and piping shown are for general point-of-connection only and are not intended to show details for a specific installation. Certified field wiring and dimensional diagrams are available upon request. The 30XW units should be installed using certified drawings.
2. All wiring must comply with applicable codes.
3. Refer to Carrier System Design Manual for details regarding piping techniques.
4. Piping, wiring, switches, valves, vent gages, strainers, drain, and vibration isolation are all field supplied.
5. Water connections are shown on left side of control box in this figure. Actual connections can be on either side according to chiller configuration ordered.

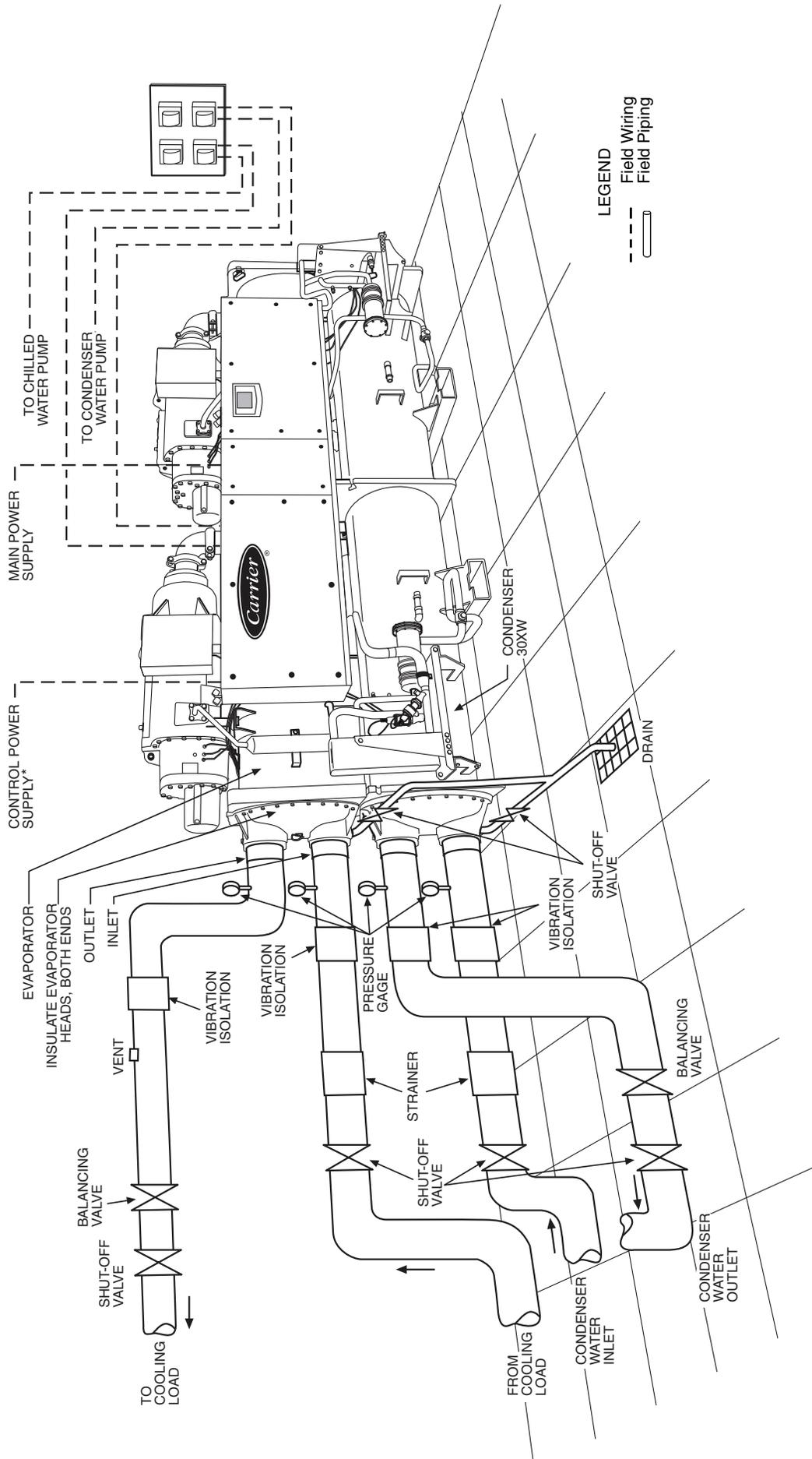
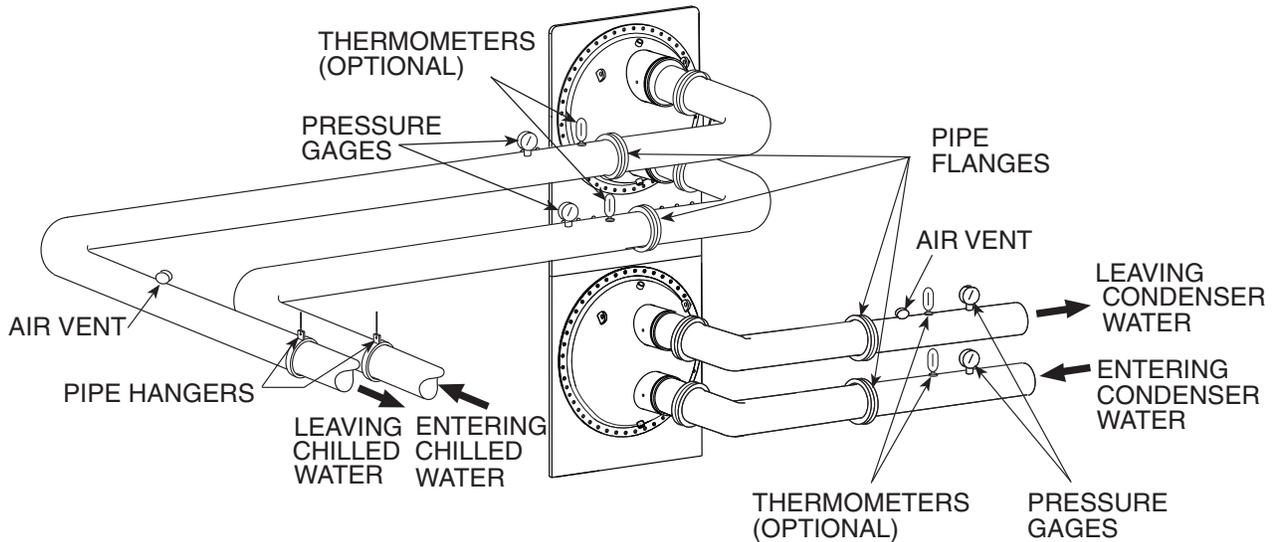


Fig. 11 — Typical Evaporator and Condenser Piping and Wiring — 30XW325-400



**NOTES:**

1. Chilled water flow switch is factory installed in the evaporator inlet nozzle.
2. Entering and leaving water thermistors are located in the evaporator inlet and outlet nozzles.
3. A 3/8 in. NPT vent plug is located in the top of the evaporator and condenser outlet nozzle.
4. A 3/8 in. NPT drain plug is located in the bottom of the evaporator and condenser inlet nozzle.
5. Condenser water flow switch is factory installed in the condenser inlet nozzle on units with heat machine option only.
6. Entering and leaving water thermistors are located in the condenser inlet and outlet nozzles on units with heat machine option only.

**Fig. 12 — Typical NIH Piping**

**CONDENSER FLUID CONTROL VALVE** — For installations where entering condensing fluid temperature could be below 65 F (18.3 C), a field-supplied control valve is required. Operation below 65 F (18.3 C) without this valve may cause the unit to shut down on low oil pressure alarms.

**NOTE:** A valve that can be controlled by a 0 to 10 vdc signal is supported by the *ComfortLink* control system. Figure 13 shows the installation details for the regulating valve.

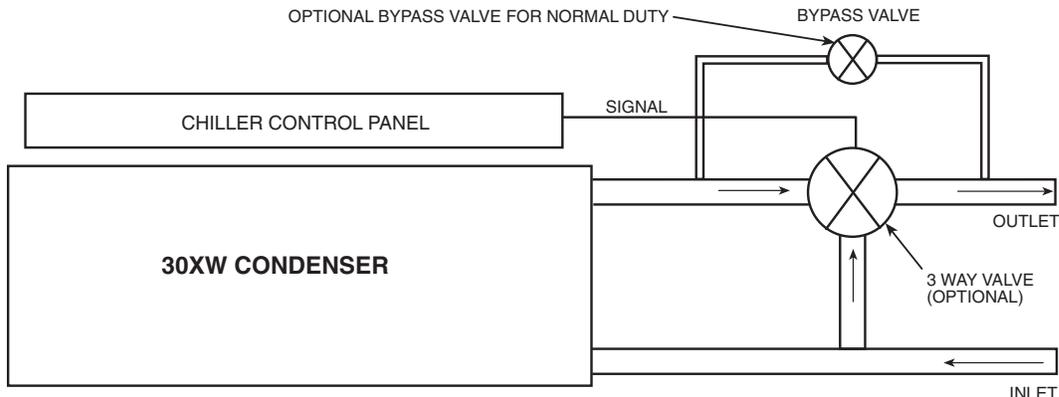
**IMPORTANT:** A separate, field-supplied power supply must be used with the condenser fluid control valve. Failure to use a separate power supply may result in damage to the electronic chiller components.

**INSTALL PRESSURE RELIEF REFRIGERANT VENT PIPING** — The 30XW chiller is factory equipped with relief valves on the evaporator and condenser shells. There is one relief valve per circuit on the evaporator and two relief valves per circuit on the condenser. Make the vent connection to the low side relief valve by installing a male NPT to copper OD braze adapter. Braze a 90-degree short-radius elbow to the adapter.

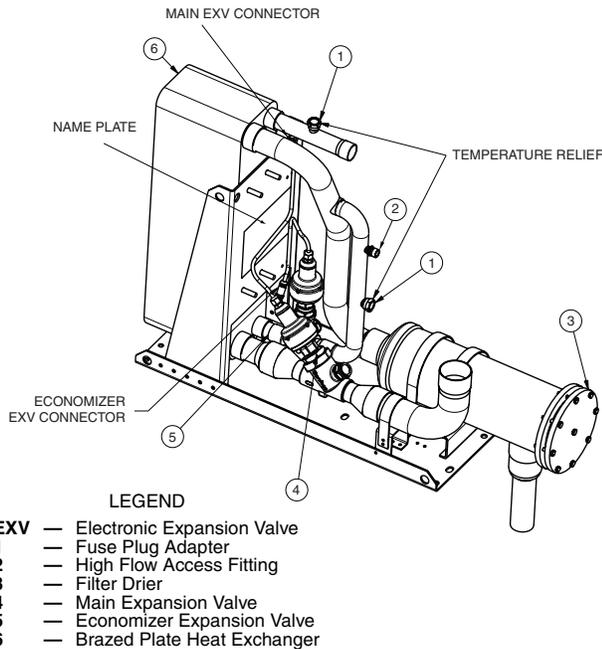
This will allow enough space to make vent connections to the elbow. An additional relief valve is located on the liquid line and the economizer assembly, if equipped, for each circuit. Refer to Tables 1 and 2 for connection size information. If the unit is equipped with an optional isolation service valve, an additional relief valve is located on the discharge line. See Fig. 3-5 for location and connection size information. See Fig. 14 for location of temperature relief valves on the economizer assembly. Vent relief devices to the outdoors in accordance with ANSI/ASHRAE (American National Standards Institute/American Society of Heating, Refrigerating and Air Conditioning Engineers) 15 Safety Code for Mechanical Refrigeration (latest edition) and all other applicable codes.

**⚠ DANGER**

Refrigerant discharged into confined spaces can displace oxygen and cause asphyxiation.



**Fig. 13 — Condenser Fluid Control Valve Installation**



**Fig. 14 — Typical Economizer Assembly**

Dual pressure relief valves mounted on three-way valves are located on the condenser to allow testing and repair without transferring the refrigerant charge. Three-way valve shafts should be turned either fully clockwise or fully counterclockwise so only one relief valve is exposed to refrigerant pressure at a time.

The flow area of discharge piping routed from more than one relief valve, or more than one heat exchanger, must be greater than the sum of the outlet areas of all relief valves that are expected to discharge simultaneously. All relief valves within a machinery room that are exposed to refrigerant may discharge simultaneously in the event of a fire. Discharge piping should lead to the point of final release as directly as possible with consideration of pressure drop in all sections downstream of the relief valves.

Provide a pipe plug in the vent piping near outlet side of each relief device for leak testing. Provide pipe fittings that allow vent piping to be disconnected periodically for inspection of valve mechanism. Piping to relief devices must not apply stress to the device. Adequately support piping. A length of flexible tubing or piping near the relief device is essential on spring-isolated machines.

Cover the outdoor vent with a rain cap and place a condensation drain at the low point in the vent piping to prevent water build-up on the atmospheric side of the relief device.

**FILL FLUID LOOP** — Fill the fluid loop with water (or suitable corrosion-resistant antifreeze solution) and a corrosion-resistant inhibitor suitable for the water of the area. Consult the local water authority for characteristics of area water and a recommended inhibitor for the evaporator fluid loop.

A drain connection is located at the bottom of the evaporator head. See Fig. 3-5 for connection location. Install shut-off valves to the drain line before filling the system with fluid.

**IMPORTANT:** Before starting the unit, be sure all of the air has been purged from the system.

**WATER TREATMENT** — Untreated or improperly treated water may result in corrosion, scaling, erosion, and algae. The services of a qualified water treatment specialist should be obtained to develop and monitor a treatment program.

**CAUTION**

Water must be within design flow limits, clean, and treated to ensure proper chiller performance and reduce the potential of tube damage due to corrosion, scaling, erosion, and algae. Carrier assumes no responsibility for chiller damage resulting from untreated or improperly treated water.

**NOTE:** Do not use automobile anti-freeze or any other fluid that is not approved for heat exchanger duty. Only use appropriately inhibited glycols, concentrated to provide adequate protection for the temperature considered.

**BRINE UNITS** — Special factory modifications to the units are required to allow them to operate at fluid temperatures less than 40 F (4.4 C). Be sure that the fluid has sufficient inhibited ethylene glycol or other suitable corrosion-resistant antifreeze solution to prevent cooler freeze-up. Condenser water flow must be maintained to prevent freeze-up on unit applications where condenser water does not contain antifreeze.

**IMPORTANT:** On brine applications where leaving cooler water is less than 40 F (4.4 C), a minimum water flow of 0.75 gpm/ton (0.14 L/s per kW) should be maintained through the condenser at all times. In addition to the factory-installed chilled water flow switch, a factory-supplied condenser water flow switch must be installed per the switch manufacturer's instructions. The chiller must control both the chilled water pump and the condenser pump and utilize cooler and condenser pump interlocks. The cooler pump must operate for a minimum of 10 minutes after the chiller has shut down and the condenser pump must operate for 30 minutes after the chiller has shut down. In the event of loss of condenser water flow, the flow of chilled fluid to the evaporator must be stopped or an isolation valve must be closed. Condenser head pressure control valve must be coordinated with condenser flow switch to ensure the minimum valve position does not prevent flow detection. This is necessary to reduce the possibility of condenser freeze-up.

**PREPARATION FOR YEAR-ROUND OPERATION** — In areas where the piping or unit is exposed to 32 F (0° C) or lower ambient temperatures, freeze-up protection is recommended using inhibited ethylene glycol or other suitable corrosion-resistant antifreeze solution and electric heater tapes (field supplied and installed). Heater tapes should have a rating for area ambient temperatures and be covered with a suitable thickness of closed-cell insulation. Route power for the heater tapes from a separately fused disconnect. Mount the disconnect within sight from the unit per local or NEC codes. Identify disconnect as heater tape power source with warning that power must not be turned off except when servicing unit.

**IMPORTANT:** Use of electric heat will not prevent freeze up in the event of a power failure.

**DUAL CHILLER CONTROL** — The *ComfortLink* controller allows 2 chillers (piped in parallel or series) to operate as a single chilled water plant with standard control functions coordinated through the master chiller controller. This standard *ComfortLink* feature requires a communication link between the 2 chillers.

There are several advantages to this type of control:

- redundancy (multiple circuits)
- better low load control, (lower tonnage capability)
- lower rigging lift weights (2 machines rather than one large machine)
- chiller lead-lag operation (evens the wear between the two machines)

**Parallel Dual Chiller Operation (See Fig. 15)** — Parallel chiller operation is the recommended option for dual chiller control. In this case, each chiller must control its own dedicated pump or isolation valve. Balancing valves are recommended to ensure proper flow in each chiller. Two field-supplied and installed dual chiller leaving water temperature sensors are required, one for each chiller for this function to operate properly.

Consider adding additional shutoff valves to isolate each chiller to allow for service on a machine, and still allow for partial capacity from the other chiller.

**Series Dual Chiller Operation (See Fig. 16)** — Series chiller operation is an alternate control method supported by the *ComfortLink* control system. Certain applications might require that the two chillers be connected in series. For nominal 10° F (5.6° C) evaporator ranges, use the 1-pass evaporator arrangements to reduce the fluid-side pressure drop. Use the 2-pass arrangement for low flow, high evaporator temperature rise applications. See Table 3.

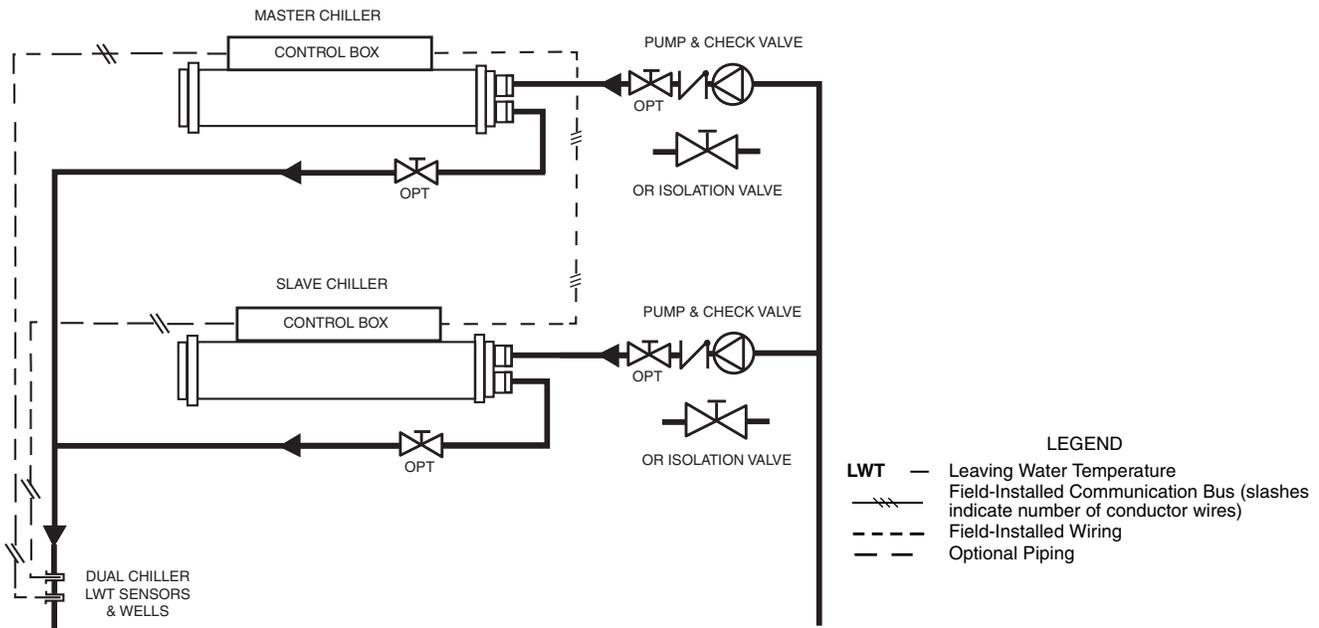
Consider adding additional piping and isolation valves to isolate each chiller to allow for service on a machine, and still allow for partial capacity from the other chiller.

**Dual Chiller Leaving Water Sensor** — If the dual chiller algorithm is used, and the machines are installed in parallel, a dual chilled water sensor must be installed for each module. Install the wells in the common leaving water header. See Fig. 15, 17 and 18. **DO NOT** relocate the chiller’s leaving water thermistors. They must remain in place for the unit to operate properly.

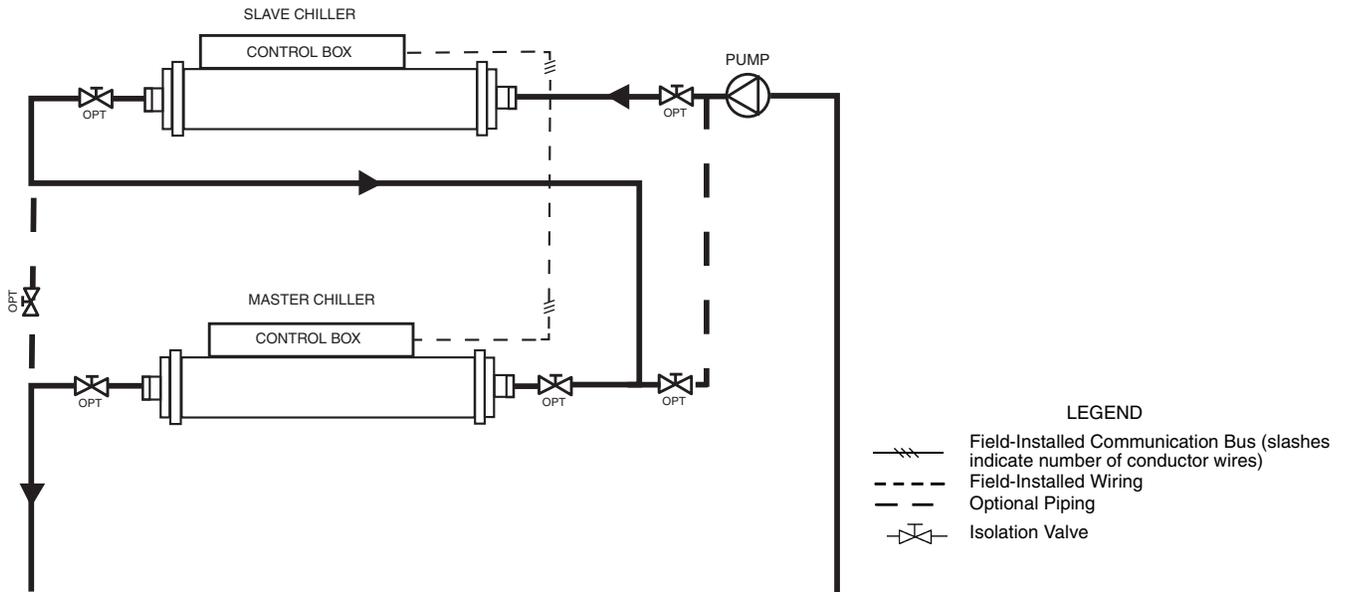
The thermistor well is a 1/4 in. NPT fitting for securing the well in the piping. The piping must be drilled and tapped for the well. Select a location that will allow for removal of the thermistor without any restrictions.

Once the well is inserted, install the thermistors. Insert the thermistor into the well until the O-ring reaches the well body. Use the nut on the thermistor to secure the thermistor in place. Once the thermistor is in place, it is recommended that a thermistor wire loop be made and secured with a wire tie to the chilled water pipe. See Fig. 18.

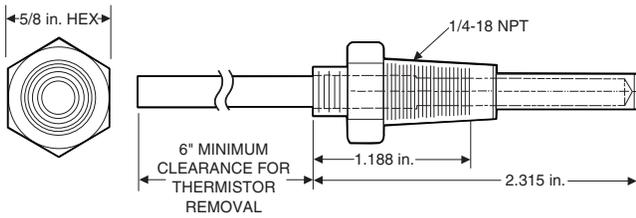
The series dual chiller application is shown in Fig. 16. Additional sensors are not required for series dual chiller applications. For dual chiller control a CCN bus must be connected between the two chillers. See the Carrier Comfort Network® Communication Bus Wiring section for additional information.



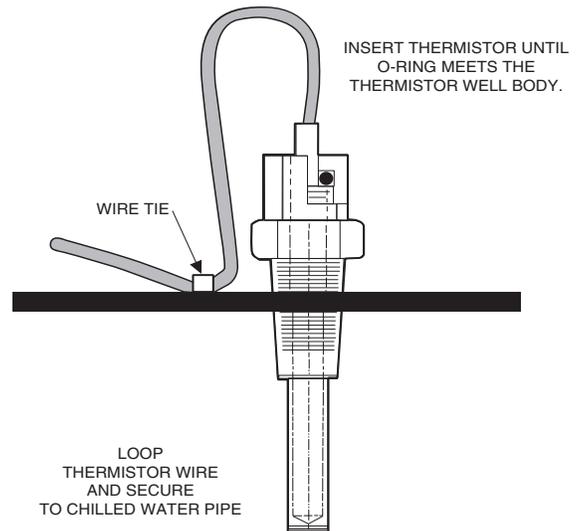
**Fig. 15 — Parallel Dual Chiller Operation**



**Fig. 16 — Series Dual Chiller Operation**



**Fig. 17 — Dual Chiller Leaving Water Thermistor Well (Part No. 00PPG00008000A)**



**Fig. 18 — Dual Chiller Leaving Water Thermistor (Part No. 30RB660036)**

**Table 3 — Evaporator and Condenser Flow Rates**

30XW UNIT		EVAPORATOR				CONDENSER				NOMINAL			
		Leaving Fluid/Entering Fluid				Leaving Fluid/Entering Fluid				Evaporator		Condenser	
		Minimum		Maximum		Minimum		Maximum*					
		40 F (4.4 C)/ 45 F (7.2 C)		60 F (15.6 C)/ 70 F (21.1 C)		70 F (21.1 C)/ 65 F (18.3 C)		118 F (47.8 C)/ 110 F (43.3 C)					
		Minimum Flow Rate		Maximum Flow Rate		Minimum Flow Rate		Maximum Flow Rate		Nominal Flow Rate		Nominal Flow Rate	
GPM	L/s	GPM	L/s	GPM	L/s	GPM	L/s	GPM	L/s	GPM	L/s		
150	Two pass	200	12.6	720	45.4	240	15.1	960	60.6	384	24.2	480	30.3
	One pass	384	24.2	1520	95.9	480	30.3	1600	100.9	384	24.2	480	30.3
	Three pass	120	7.6	480	30.3	160	10.1	528	33.3	384	24.2	480	30.3
175	Two pass	213	13.4	765	48.3	255	16.1	1021	64.4	408	25.8	510	32.2
	One pass	408	25.8	1616	102.0	510	32.2	1701	107.3	408	25.8	510	32.2
	Three pass	128	8.0	510	32.2	170	10.7	561	35.4	408	25.8	510	32.2
185	Two pass	223	14.1	802	50.6	267	16.9	1069	67.5	428	27.0	535	33.7
	One pass	428	27.0	1693	106.8	535	33.7	1782	112.4	428	27.0	535	33.7
	Three pass	134	8.4	535	33.7	178	11.2	588	37.1	428	27.0	535	33.7
200	Two pass	239	15.1	860	54.3	287	18.1	1147	72.3	459	28.9	573	36.2
	One pass	459	28.9	1815	114.5	573	36.2	1911	120.6	459	28.9	573	36.2
	Three pass	143	9.0	573	36.2	191	12.1	631	39.8	459	28.9	573	36.2
225	Two pass	278	17.5	1001	63.2	334	21.1	1335	84.2	534	33.7	668	42.1
	One pass	534	33.7	2114	133.4	668	42.1	2225	140.4	534	33.7	668	42.1
	Three pass	167	10.5	668	42.1	223	14.0	734	46.3	534	33.7	668	42.1
250	Two pass	301	19.0	1085	68.4	362	22.8	1447	91.3	579	36.5	723	45.6
	One pass	579	36.5	2290	144.5	723	45.6	2411	152.1	579	36.5	723	45.6
	Three pass	181	11.4	723	45.6	241	15.2	796	50.2	579	36.5	723	45.6
260	Two pass	306	19.3	1102	69.5	367	23.2	1469	92.7	588	37.1	734	46.3
	One pass	588	37.1	2326	146.7	734	46.3	2448	154.4	588	37.1	734	46.3
	Three pass	184	11.6	734	46.3	245	15.4	808	51.0	588	37.1	734	46.3
275	Two pass	329	20.7	1183	74.6	394	24.9	1577	99.5	631	39.8	788	49.7
	One pass	631	39.8	2497	157.5	788	49.7	2628	165.8	631	39.8	788	49.7
	Three pass	197	12.4	788	49.7	263	16.6	867	54.7	631	39.8	788	49.7
300	Two pass	357	22.5	1285	81.1	428	27.0	1713	108.1	685	43.2	857	54.0
	One pass	685	43.2	2712	171.1	857	54.0	2855	180.1	685	43.2	857	54.0
	Three pass	214	13.5	857	54.0	286	18.0	942	59.4	685	43.2	857	54.0
325	Two pass	403	25.4	1450	91.4	483	30.5	1933	122.0	773	48.8	967	61.0
	One pass	773	48.8	3061	193.0	967	61.0	3222	203.3	773	48.8	967	61.0
	Three pass	242	15.2	967	61.0	322	20.3	1063	67.1	773	48.8	967	61.0
350	Two pass	429	27.0	1544	97.4	515	32.5	2058	129.8	823	51.9	1029	64.9
	One pass	823	51.9	3259	205.6	1029	64.9	3430	216.4	823	51.9	1029	64.9
	Three pass	257	16.2	1029	64.9	343	21.6	1132	71.4	823	51.9	1029	64.9
375	Two pass	455	28.7	1639	103.4	546	34.5	2186	137.9	874	55.2	1093	69.0
	One pass	874	55.2	3461	218.3	1093	69.0	3643	229.8	874	55.2	1093	69.0
	Three pass	273	17.2	1093	69.0	364	23.0	1202	75.8	874	55.2	1093	69.0
400	Two pass	481	30.4	1733	109.3	578	36.4	2310	145.7	924	58.3	1155	72.9
	One pass	924	58.3	3658	230.8	1155	72.9	3850	242.9	924	58.3	1155	72.9
	Three pass	289	18.2	1155	72.9	385	24.3	1271	80.2	924	58.3	1155	72.9

\*Maximum condenser fluid temperature shown for standard condensing option. High condensing or heat machine option may have leaving fluid temperatures up to 140 F (60 C) and entering up to 128 F (53.3 C).

**Step 5 — Make Electrical Connections** — The electrical characteristics of the available power supply must agree with the unit nameplate rating. Supply voltage must be within the limits shown.

**FIELD POWER CONNECTIONS** — All units are supplied with  $\frac{7}{8}$  in. pilot holes for field power conduit connections.

All power wiring must comply with applicable local and national codes. Install field-supplied, branch circuit fused disconnect(s) of a type that can be locked off or open. Disconnect(s) must be located within sight and readily accessible from the unit in compliance with NEC Article 440-14. See Table 4 for compressor electrical data. See Tables 5 and 6 for unit electrical data. See Fig. 19 for field wiring diagram.

**IMPORTANT:** The 30XW units have a factory-installed option available for a non-fused disconnect for unit power supply. If the unit is equipped with this option, all field power wiring should be made to the terminal blocks or bus bars supplied.

All units have a single location for power entry to simplify the field power wiring. Maximum wire size that the unit terminal block or non-fused disconnect will accept is 500 kcmil.

**FIELD CONTROL POWER CONNECTIONS** (See Fig. 19) — All units require a separate 115-1-60 control circuit power supply. A factory-installed control power transformer option is available for all voltages. A separate power supply is NOT required for units ordered with this option. Field control power connections are made at terminals T1 and T2 of CB-13.

A field-installed dry contact wired into TB5-9 and TB5-10 can be used to start the chiller. See Fig. 19 for remote on-off and PMPI wiring. Contacts must be capable of handling a 24-vac to 50 mA.

**⚠ CAUTION**

Do not use interlocks or other safety device contacts connected between TB5 terminals 9 and 10 as remote on-off. Connection of safeties or other interlocks between these 2 terminals will result in an electrical bypass if the enable-off-remote contact switch is in the Enable position. If remote on-off unit control is required, a field-supplied relay must be installed in the unit control box and wired as shown in Fig. 19. Failure to wire the remote on-off as recommended will result in tube freeze damage.

Terminals 12 and 13 of TB5 have been provided for a field-supplied remote alarm (ALM). If an audible alarm is installed, an alarm shutoff is also recommended. Power for a

field-supplied relay coil is limited to 10-va sealed, 25-va inrush. See Fig. 19.

A field-supplied condenser pump relay must be connected to main base board channel 22, connector J2C. A connector is factory supplied. Power for the field-supplied relay coil is limited to 10-va sealed and 25-va inrush. See Fig. 19.

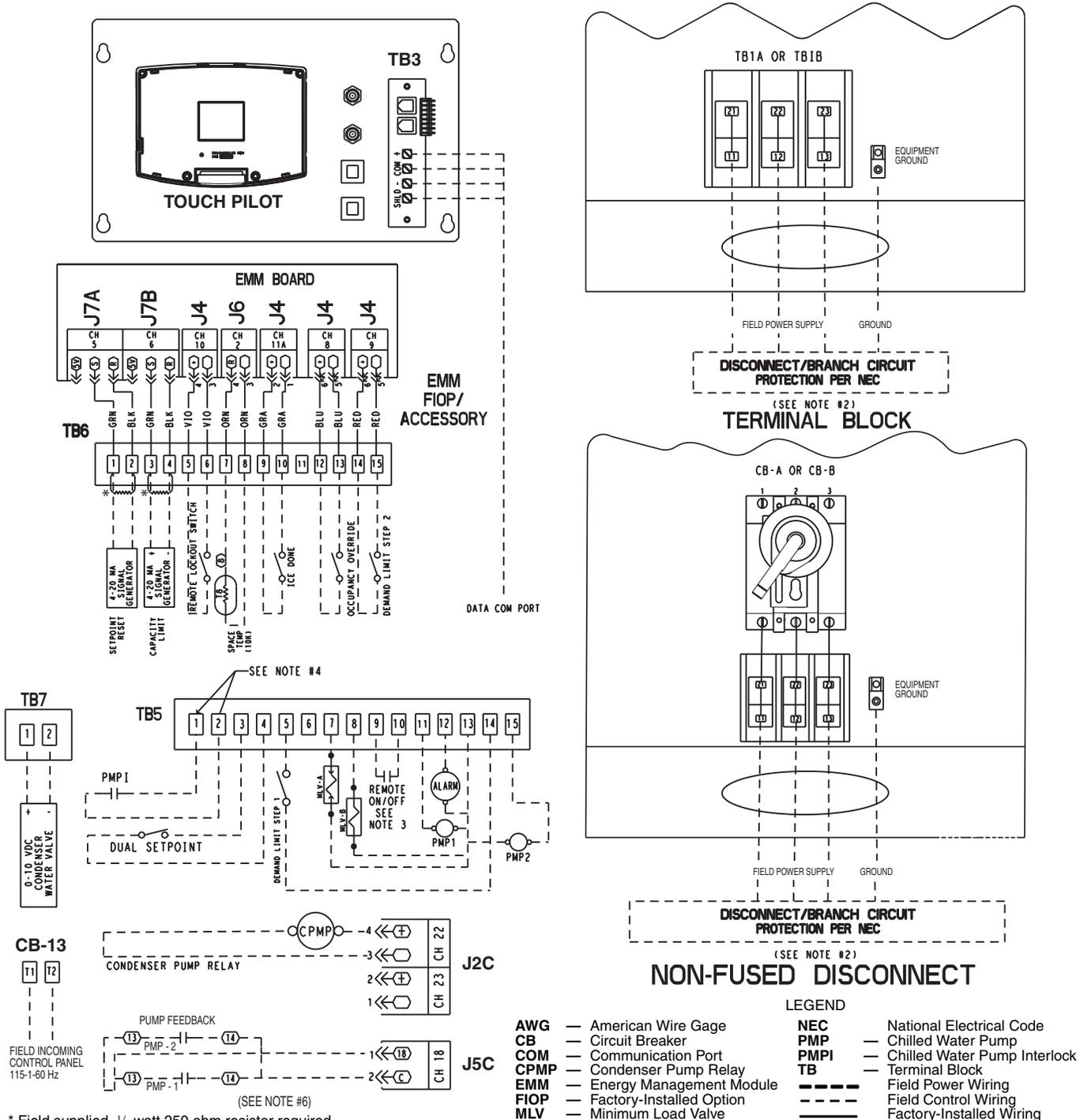
**EVAPORATOR PUMP CONTROL** — It is required that evaporator pump control be utilized on all chillers unless the chilled water pump runs continuously or the chilled water system contains a suitable antifreeze solution.

There are two interlocks required for pump control. It is required that the chiller be electrically interlocked with the chilled water pump starter to provide additional protection. Terminals TB5-1 and TB5-2 are provided for field installation of a chilled water (fluid) pump interlock (PMPI). Contacts must be capable of handling a 24-vac load up to 50 mA. Terminals 11 and 13 of TB5 have been provided for a field-supplied chilled water (fluid) pump relay (PMP1). Terminals 15 and 13 of TB5 have been provided for a field-supplied chilled water (fluid) pump relay (PMP2). Power for the field-supplied relay coil is limited to 10-va sealed and 25-va inrush. See Fig. 19.

It is also required that the evaporator pump output be used as an override to the chilled water pump control circuit to provide additional freeze protection, if required. This input works in conjunction with the flow switch for more protection. If the pump control outputs are used from the control system, an additional dry contact must be made to the MBB (main base board), channel 18, connector J5C. Normally open contacts from PMP1 and PMP2 must be connected to the violet and pink wires in the MBB J5C - channel 18. Contacts should not be wired to TB5 terminals 1 and 2.

Refer to Fig. 19 for proper connection of the evaporator pump output. The evaporator pump output will remain energized for 30 seconds after all compressors stop because of an OFF command. In the event a freeze protection alarm is generated, the evaporator pump output will be energized regardless of the evaporator pump control software configuration. The evaporator pump output is also energized anytime a compressor is started and when certain alarms are generated. A thermal flow sensor is factory installed in the entering fluid nozzle to prevent operation without flow through the evaporator. See Fig. 20. The flow sensor is factory wired.

Proper software configuration of the evaporator pump control parameters is required to prevent possible evaporator freeze-up. Refer to the Controls, Start-Up, Operation, Service and Troubleshooting guide for more information.



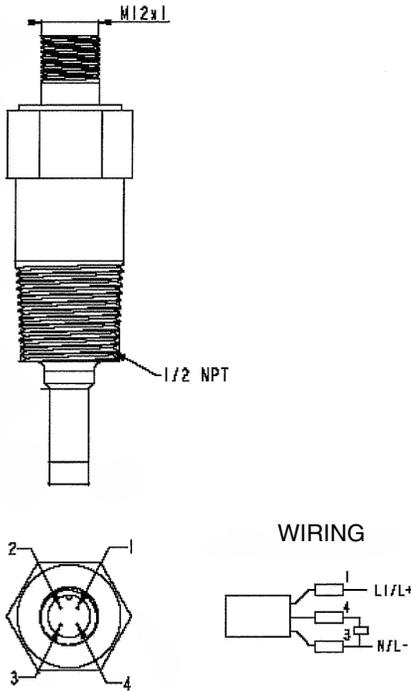
\* Field supplied. 1/2 watt 250 ohm resistor required.

**NOTES:**

- Factory wiring is in accordance with UL 1995 standards. Field modifications or additions must be in compliance with all applicable codes.
- Wiring for main field supply must be rated 75C minimum. Use copper for all units. Incoming wire size range for the terminal block is #4 AWG to 500 kcmil for single point power (two conductors per phase). Incoming wire size range for the terminal blocks for dual point power option is #4 AWG to 500 kcmil for single point power (one conductor per phase). Incoming wire size range for 200 and 230-v models is 3/0 to 500 kcmil for single point power (one conductor per phase). Unit sizes 150-300 are available only with single point power connections.
- Terminals 9 and 10 of TB5 are for field external connections for remote on-off. The contacts must be rated for dry circuit application capable of handling a 24-vac load up to 50 mA.
- Terminals 1 and 2 of TB5 are for external connections of chilled water pump interlock. The contacts must be rated for dry circuit application capable of handling a 24-vac load up to 50 mA.
- Terminals 11 and 13 of TB5 are for control of chilled water pump 1 (PMP 1) starter. Terminals 15 and 13 of TB5 are for control of chilled water pump 2 (PMP 2) starter. Remove factory-installed jumper when using pump interlock. The maximum load allowed for the chilled water pump relay is 10-va sealed, 25-va inrush at 24-v. Field power supply is not required.

- For control of chilled water pumps, a set of normally open contacts rated for dry circuit application must be supplied from field-supplied pump starter relay. Connect contacts directly to connector at main base board J5C channel 18.
- Terminals 12 and 13 of TB5 are for an alarm relay. The maximum load allowed for the alarm relay is 10-va sealed, 25-va inrush at 24-v. Field power supply is not required.
- Make appropriate connections to TB6 as shown for energy management board options. The contacts for occupancy override, demand limit, and ice done options must be rated for dry circuit application capable of handling a 24-vac load up to 50 mA.
- Terminal blocks TB5 and TB6 are located in the display panel for all units. Refer to certified dimensional drawing for each unit to get the exact locations.
- Refer to certified dimensional drawings for exact locations of the main power and control power entrance locations.
- For control of condenser pump, connect field-supplied relay (max 10-va sealed, 25-va inrush at 24-v) directly to terminals 3 and 4 (channel 22) of J2C on the main base board.
- Terminals 1 and 2 of TB7 provide 0 to 10-vdc signal for head pressure control. Refer to controls manual for configuration of field-supplied water regulating valve control parameters.

**Fig. 19 — 30XW Unit Field Wiring**



**Fig. 20 — Chilled Water and Condenser (Optional) Flow Switch**

CARRIER COMFORT NETWORK® COMMUNICATION BUS WIRING (See Fig. 21) — The communication bus wiring is a shielded, 3-conductor cable with drain wire and is field supplied and installed in the field.

The system elements are connected to the communication bus in a daisy chain arrangement. The positive pin of each system element communication connector must be wired to the positive pins of the system elements on either side of it. This is also required for the negative and signal ground pins of each system element. Wiring connections for CCN (Carrier Comfort Network) should be made at TB (terminal block) 3. Consult the CCN Contractor's Manual for further information. See Fig. 21.

NOTE: Conductors and drain wire must be 20 AWG (American Wire Gage) minimum stranded, tinned copper. Individual conductors must be insulated with PVC, PVC/nylon, vinyl, Teflon, or polyethylene. An aluminum/polyester 100% foil shield and an outer jacket of PVC, PVC/nylon,

chrome vinyl, or Teflon with a minimum operating temperature range of -4 F (-20 C) to 140 F (60 C) is required. See Table 7 for a list of manufacturers that produce CCN bus wiring that meet these requirements.

It is important when connecting to a CCN communication bus that a color coding scheme be used for the entire network to simplify the installation. It is recommended that red be used for the signal positive, black for the signal negative, and white for the signal ground. Use a similar scheme for cables containing different colored wires. At each system element, the shields of its communication bus cables must be tied together. If the communication bus is entirely within one building, the resulting continuous shield must be connected to a ground at one point only. If the communication bus cable exits from one building and enters another, the shields must be connected to grounds at the lightning suppressor in each building where the cable enters or exits the building (one point per building only).

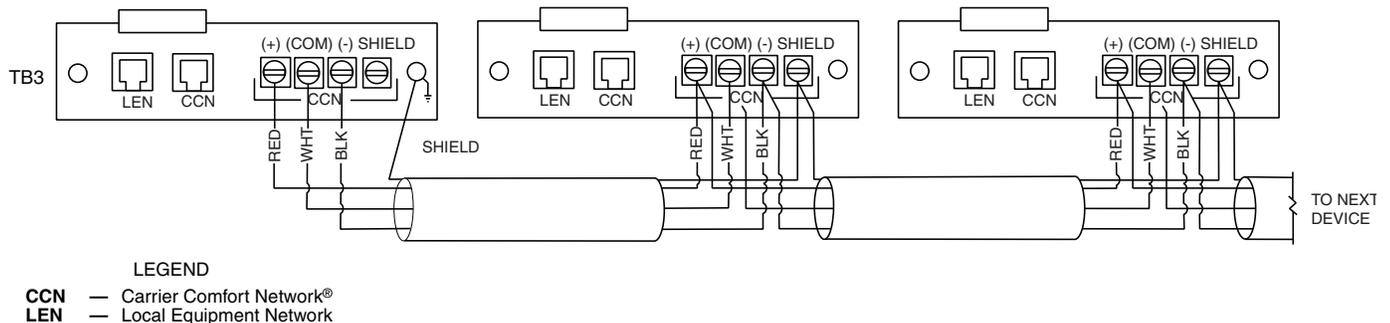
To connect the unit to the network:

1. Turn off power to the control box.
2. Cut the CCN wire and strip the ends of the red (+), white (ground), and black (-) conductors. Substitute appropriate colors for different colored cables.
3. Connect the red wire to (+) terminal on TB3 of the plug, the white wire to COM terminal, and the black wire to the (-) terminal.
4. The RJ14 CCN connector on TB3 can also be used, but is only intended for temporary connection (for example, a laptop computer running service tool).

**IMPORTANT:** A shorted CCN bus cable will prevent some routines from running and may prevent the unit from starting. If abnormal conditions occur, disconnect the machine from the CCN. If conditions return to normal, check the CCN connector and cable. Run new cable if necessary. A short in one section of the bus can cause problems with all system elements on the bus.

NON-CCN COMMUNICATION WIRING — The 30XW units offer several non-CCN translators. Refer to the separate installation instructions for additional wiring steps.

FIELD CONTROL OPTION WIRING — Install field control wiring options. Some options, such as 4 to 20 mA demand limit that requires the energy management module, may require that accessories be installed first (if not factory installed) for terminal connections.



**Fig. 21 — TB3 — CCN Wiring**

**Table 4 — Compressor Electrical Data**

30XW UNIT SIZE	VOLTAGE V-Ph-Hz	COMPRESSOR	COMPRESSOR A			COMPRESSOR B (SIZES 325-400 ONLY)		
			RLA	LRA (WD)	LRA (XL)	RLA	LRA (WD)	LRA (XL)
150, 325	200-3-60	06TU483	409.0	938	—	409.0	938	—
	230-3-60	06TU483	355.1	816	—	355.1	816	—
	380-3-60	06TU483	216.7	494	1537	216.7	494	1537
	460-3-60	06TU483	178.2	408	1270	178.2	408	1270
	575-3-60	06TU483	141.0	326	1016	141.0	326	1016
150, 325 HM	200-3-60	06TU483	519.2	1329	—	519.2	1329	—
	230-3-60	06TU483	452.6	1156	—	452.6	1156	—
	380-3-60	06TU483	273.1	700	2179	273.1	700	2179
	460-3-60	06TU483	227.0	578	1800	227.0	578	1800
	575-3-60	06TU483	180.8	462	1440	180.8	462	1440
175, 350	200-3-60	06TU483	409.0	938	—	409.0	938	—
	230-3-60	06TU483	355.1	816	—	355.1	816	—
	380-3-60	06TU483	216.7	494	1537	216.7	494	1537
	460-3-60	06TU483	178.2	408	1270	178.2	408	1270
	575-3-60	06TU483	141.0	326	1016	141.0	326	1016
175, 350 HM	200-3-60	06TU483	519.2	1329	—	519.2	1329	—
	230-3-60	06TU483	452.6	1156	—	452.6	1156	—
	380-3-60	06TU483	273.1	700	2179	273.1	700	2179
	460-3-60	06TU483	227.0	578	1800	227.0	578	1800
	575-3-60	06TU483	180.8	462	1440	180.8	462	1440
185, 200, 375, 400	200-3-60	06TU554	462.8	938	—	462.8	938	—
	230-3-60	06TU554	401.3	816	—	401.3	816	—
	380-3-60	06TU554	242.3	494	1537	242.3	494	1537
	460-3-60	06TU554	201.3	408	1270	201.3	408	1270
	575-3-60	06TU554	162.8	326	1016	162.8	326	1016
185, 200, 375, 400 HM	200-3-60	06TU554	591.0	1329	—	588.5	1329	—
	230-3-60	06TU554	514.1	1156	—	512.8	1156	—
	380-3-60	06TU554	311.5	700	2179	309.0	700	2179
	460-3-60	06TU554	257.7	578	1800	256.4	578	1800
	575-3-60	06TU554	206.4	462	1440	203.8	462	1440
225, 250	200-3-60	06TV680	550.0	1329	—	—	—	—
	230-3-60	06TV680	478.2	1156	—	—	—	—
	380-3-60	06TV680	288.5	700	2179	—	—	—
	460-3-60	06TV680	239.7	578	1800	—	—	—
	575-3-60	06TV680	191.0	462	1440	—	—	—
225, 250 HM	200-3-60	06TV680	—	—	—	—	—	—
	230-3-60	06TV680	—	—	—	—	—	—
	380-3-60	06TV680	378.2	758	—	—	—	—
	460-3-60	06TV680	311.5	625	1906	—	—	—
	575-3-60	06TV680	247.4	498	1521	—	—	—
260, 275	200-3-60	06TV753	609.0	1329	—	—	—	—
	230-3-60	06TV753	529.5	1156	—	—	—	—
	380-3-60	06TV753	319.2	700	2179	—	—	—
	460-3-60	06TV753	265.4	578	1800	—	—	—
	575-3-60	06TV753	211.5	462	1440	—	—	—
260, 275 HM	200-3-60	06TV753	—	—	—	—	—	—
	230-3-60	06TV753	—	—	—	—	—	—
	380-3-60	06TV753	419.2	758	—	—	—	—
	460-3-60	06TV753	344.9	625	1906	—	—	—
	575-3-60	06TV753	275.6	498	1521	—	—	—
300	200-3-60	06TV819	650.0	1329	—	—	—	—
	230-3-60	06TV819	565.4	1156	—	—	—	—
	380-3-60	06TV819	342.3	700	2179	—	—	—
	460-3-60	06TV819	283.3	578	1800	—	—	—
	575-3-60	06TV819	224.4	462	1440	—	—	—
300 HM	200-3-60	06TV819	—	—	—	—	—	—
	230-3-60	06TV819	—	—	—	—	—	—
	380-3-60	06TV819	444.9	758	—	—	—	—
	460-3-60	06TV819	367.9	625	1906	—	—	—
	575-3-60	06TV819	293.6	498	1521	—	—	—

LEGEND

- HM — Heat Machine Units
- LRA — Locked Rotor Amps
- RLA — Rated Load Amps
- WD — Wye-Delta
- XL — Across-the-Line

**Table 5 — Standard Single Input Power Configuration Electrical Data**

30XW UNIT SIZE	UNIT VOLTAGE			NO. POWER SUPPLY CONDUCTORS	MCA	MOCp	ICF		REC FUSE SIZE	CONTROL CIRCUIT	
	V-Ph-Hz	Supplied					WD	XL		VOLTAGE 1 PH, 60Hz	MCA and MOCp
		Min	Max								
150	200-3-60	187	220	6	511.3	800	938.0	—	700	115	20
	230-3-60	207	253	6	443.9	700	816.0	—	600	115	20
	380-3-60	342	418	3	270.9	450	494.0	1537	350	115	20
	460-3-60	414	506	3	222.8	400	408.0	1270	300	115	20
	575-3-60	518	633	3	176.3	300	326.0	1016	225	115	20
150 HM	200-3-60	187	220	6	649.0	1000	1329.0	—	800	115	20
	230-3-60	207	253	6	565.8	1000	1156.0	—	700	115	20
	380-3-60	342	418	3	341.4	600	700.0	2179	450	115	20
	460-3-60	414	506	3	283.8	500	578.0	1800	350	115	20
	575-3-60	518	633	3	226.0	400	462.0	1440	300	115	20
175	200-3-60	187	220	6	511.3	800	938.0	—	700	115	20
	230-3-60	207	253	6	443.9	700	816.0	—	600	115	20
	380-3-60	342	418	3	270.9	450	494.0	1537	350	115	20
	460-3-60	414	506	3	222.8	400	408.0	1270	300	115	20
	575-3-60	518	633	3	176.3	300	326.0	1016	225	115	20
175 HM	200-3-60	187	220	6	649.0	1000	1329.0	—	800	115	20
	230-3-60	207	253	6	565.8	1000	1156.0	—	700	115	20
	380-3-60	342	418	3	341.4	600	700.0	2179	450	115	20
	460-3-60	414	506	3	283.8	500	578.0	1800	350	115	20
	575-3-60	518	633	3	226.0	400	462.0	1440	300	115	20
185	200-3-60	187	220	6	578.5	1000	938.0	—	700	115	20
	230-3-60	207	253	6	501.6	800	816.0	—	700	115	20
	380-3-60	342	418	3	302.9	500	494.0	1537	400	115	20
	460-3-60	414	506	3	251.6	450	408.0	1270	350	115	20
	575-3-60	518	633	3	203.5	350	326.0	1016	250	115	20
185 HM	200-3-60	187	220	6	738.8	1200	1329.0	—	1000	115	20
	230-3-60	207	253	6	642.6	1000	1156.0	—	800	115	20
	380-3-60	342	418	6	389.4	700	700.0	2179	500	115	20
	460-3-60	414	506	3	322.1	500	578.0	1800	400	115	20
	575-3-60	518	633	3	258.0	450	462.0	1440	350	115	20
200	200-3-60	187	220	6	578.5	1000	938.0	—	700	115	20
	230-3-60	207	253	6	501.6	800	816.0	—	700	115	20
	380-3-60	342	418	3	302.9	500	494.0	1537	400	115	20
	460-3-60	414	506	3	251.6	450	408.0	1270	350	115	20
	575-3-60	518	633	3	203.5	350	326.0	1016	250	115	20
200 HM	200-3-60	187	220	6	738.8	1200	1329.0	—	1000	115	20
	230-3-60	207	253	6	642.6	1000	1156.0	—	800	115	20
	380-3-60	342	418	6	389.4	700	700.0	2179	500	115	20
	460-3-60	414	506	3	322.1	500	578.0	1800	400	115	20
	575-3-60	518	633	3	258.0	450	462.0	1440	350	115	20
225	200-3-60	187	220	6	687.5	1200	1329.0	—	1000	115	20
	230-3-60	207	253	6	597.8	1000	1156.0	—	800	115	20
	380-3-60	342	418	3	360.6	600	700.0	2179	450	115	20
	460-3-60	414	506	3	299.6	500	578.0	1800	400	115	20
	575-3-60	518	633	3	238.8	400	462.0	1440	300	115	20
225 HM	200-3-60	187	220	—	—	—	—	—	—	—	—
	230-3-60	207	253	—	—	—	—	—	—	—	—
	380-3-60	342	418	3	472.8	800	758.0	—	600	115	20
	460-3-60	414	506	3	389.4	700	625.0	1906	500	115	20
	575-3-60	518	633	3	309.3	500	498.0	1521	400	115	20
250	200-3-60	187	220	6	687.5	1200	1329.0	—	1000	115	20
	230-3-60	207	253	6	597.8	1000	1156.0	—	800	115	20
	380-3-60	342	418	3	360.6	600	700.0	2179	450	115	20
	460-3-60	414	506	3	299.6	500	578.0	1800	400	115	20
	575-3-60	518	633	3	238.8	400	462.0	1440	300	115	20
250 HM	200-3-60	187	220	—	—	—	—	—	—	—	—
	230-3-60	207	253	—	—	—	—	—	—	—	—
	380-3-60	342	418	3	472.8	800	758.0	—	600	115	20
	460-3-60	414	506	3	389.4	700	625.0	1906	500	115	20
	575-3-60	518	633	3	309.3	500	498.0	1521	400	115	20
260	200-3-60	187	220	9	761.3	1200	1329.0	—	1000	115	20
	230-3-60	207	253	6	661.9	1000	1156.0	—	800	115	20
	380-3-60	342	418	6	399.0	700	700.0	2179	500	115	20
	460-3-60	414	506	3	331.8	500	578.0	1800	400	115	20
	575-3-60	518	633	3	264.4	450	462.0	1440	350	115	20
260 HM	200-3-60	187	220	—	—	—	—	—	—	—	—
	230-3-60	207	253	—	—	—	—	—	—	—	—
	380-3-60	342	418	6	524.0	800	758.0	—	700	115	20
	460-3-60	414	506	3	431.1	700	625.0	1906	600	115	20
	575-3-60	518	633	3	344.5	600	498.0	1521	450	115	20

NOTE: See legend and notes on page 38.

**Table 5 — Standard Single Input Power Configuration Electrical Data (cont)**

30XW UNIT SIZE	UNIT VOLTAGE			NO. POWER SUPPLY CONDUCTORS	MCA	MOCP	ICF		REC FUSE SIZE	CONTROL CIRCUIT	
	V-Ph-Hz	Supplied					WD	XL		VOLTAGE 1 PH, 60Hz	MCA and MOCP
		Min	Max								
275	200-3-60	187	220	9	761.3	1200	1329.0	—	1000	115	20
	230-3-60	207	253	6	661.9	1000	1156.0	—	800	115	20
	380-3-60	342	418	6	399.0	700	700.0	2179	500	115	20
	460-3-60	414	506	3	331.8	500	578.0	1800	400	115	20
	575-3-60	518	633	3	264.4	450	462.0	1440	350	115	20
275 HM	200-3-60	187	220	—	—	—	—	—	—	—	—
	230-3-60	207	253	—	—	—	—	—	—	—	—
	380-3-60	342	418	6	524.0	800	758.0	—	700	115	20
	460-3-60	414	506	3	431.1	700	625.0	1906.0	600	115	20
	575-3-60	518	633	3	344.5	600	498.0	1521.0	450	115	20
300	200-3-60	187	220	9	812.5	1200	1329.0	—	1000	115	20
	230-3-60	207	253	6	706.8	1200	1156.0	—	1000	115	20
	380-3-60	342	418	6	427.9	700	700.0	2179.0	600	115	20
	460-3-60	414	506	3	354.1	600	578.0	1800.0	450	115	20
	575-3-60	518	633	3	280.5	500	462.0	1440.0	350	115	20
300 HM	200-3-60	187	220	—	—	—	—	—	—	—	—
	230-3-60	207	253	—	—	—	—	—	—	—	—
	380-3-60	342	418	6	556.1	1000	758.0	—	700	115	20
	460-3-60	414	506	3	459.9	800	625.0	1906.0	600	115	20
	575-3-60	518	633	3	367.0	600	498.0	1521.0	450	115	20
325	200-3-60	187	220	9	920.3	1200	1347.0	—	1200	115	20
	230-3-60	207	253	9	799.0	1000	1171.1	—	1000	115	20
	380-3-60	342	418	6	487.6	700	710.7	1753.7	600	115	20
	460-3-60	414	506	6	401.0	500	586.2	1448.2	450	115	20
	575-3-60	518	633	3	317.3	450	467.0	1157.0	400	115	20
325 HM	200-3-60	187	220	12	1168.2	1600	1848.2	—	1600	115	20
	230-3-60	207	253	9	1018.4	1200	1608.6	—	1200	115	20
	380-3-60	342	418	6	614.5	800	973.1	2452.1	700	115	20
	460-3-60	414	506	6	510.8	700	805.0	2027.0	600	115	20
	575-3-60	518	633	6	406.8	500	642.8	1620.8	500	115	20
350	200-3-60	187	220	9	920.3	1200	1347.0	—	1200	115	20
	230-3-60	207	253	9	799.0	1000	1171.1	—	1000	115	20
	380-3-60	342	418	6	487.6	700	710.7	1753.7	600	115	20
	460-3-60	414	506	6	401.0	500	586.2	1448.2	450	115	20
	575-3-60	518	633	3	317.3	450	467.0	1157.0	400	115	20
350 HM	200-3-60	187	220	12	1168.2	1600	1848.2	—	1600	115	20
	230-3-60	207	253	9	1018.4	1200	1608.6	—	1200	115	20
	380-3-60	342	418	6	614.5	800	973.1	2452.1	700	115	20
	460-3-60	414	506	6	510.8	700	805.0	2027.0	600	115	20
	575-3-60	518	633	6	406.8	500	642.8	1620.8	500	115	20
375	200-3-60	187	220	9	1041.3	1200	1400.8	—	1200	115	20
	230-3-60	207	253	9	902.9	1200	1217.3	—	1200	115	20
	380-3-60	342	418	6	545.2	700	736.3	1779.3	700	115	20
	460-3-60	414	506	6	452.9	600	609.3	1471.3	600	115	20
	575-3-60	518	633	3	366.3	500	488.8	1178.8	450	115	20
375 HM	200-3-60	187	220	12	1329.8	1600	1920.0	—	1600	115	20
	230-3-60	207	253	12	1156.7	1600	1670.1	—	1600	115	20
	380-3-60	342	418	6	700.9	1000	1011.5	2490.5	800	115	20
	460-3-60	414	506	6	579.8	800	835.7	2057.7	700	115	20
	575-3-60	518	633	6	464.4	600	668.4	1646.4	600	115	20
400	200-3-60	187	220	9	1041.3	1200	1400.8	—	1200	115	20
	230-3-60	207	253	9	902.9	1200	1217.3	—	1200	115	20
	380-3-60	342	418	6	545.2	700	736.3	1779.3	700	115	20
	460-3-60	414	506	6	452.9	600	609.3	1471.3	600	115	20
	575-3-60	518	633	3	366.3	500	488.8	1178.8	450	115	20
400 HM	200-3-60	187	220	12	1329.8	1600	1920.0	—	1600	115	20
	230-3-60	207	253	12	1156.7	1600	1670.1	—	1600	115	20
	380-3-60	342	418	6	700.9	1000	1011.5	2490.5	800	115	20
	460-3-60	414	506	6	579.8	800	835.7	2057.7	700	115	20
	575-3-60	518	633	6	464.4	600	668.4	1646.4	600	115	20

**LEGEND**

- HM — Heat Machine Units
- ICF — Maximum Instantaneous Current Flow
- LRA — Locked Rotor Amps
- MCA — Minimum Circuit Ampacity (for wire sizing)
- MOCP — Maximum Overcurrent Protection
- RLA — Rated Load Amps
- WD — Wye-Delta Start
- XL — Across-the-Line Start

- 5. Maximum allowable phase imbalance is: voltage, 2%; amps, 5%.
- 6. Use copper conductors only.
- 7. The MOCP is calculated as follows:  
MOCP = (2.25) (largest RLA) + the sum of the other RLAs. Size the fuse one size down from the result. The RLAs are listed on the nameplate. The recommended fuse size in amps (RFA) is calculated as follows: RFA = (1.50) (largest RLA) + the sum of the other RLAs. Size the fuse one size up from the result. The RLAs are listed on the nameplate.

**NOTES:**

1. Each main power source must be supplied from a field-supplied fused electrical service with a (factory-installed or field-installed) disconnect located in sight from the unit.
2. Control circuit power must be supplied from a separate source through a field-supplied disconnect. An optional control transformer may be used to provide control circuit power from the main unit power supply.
3. Maximum instantaneous current flow (ICF) during start-up is the point in the starting sequence where the sum of the LRA for the start-up compressor, plus the total RLA for all running compressors is at a maximum.
4. Maximum incoming wire size for each terminal block is 500 kcmil.



**Table 6 — Optional Dual Input Power Configuration Electrical Data**

30XW UNIT SIZE	UNIT VOLTAGE			NO. POWER SUPPLY CONDUCTORS	MCA	MOCP	ICF		REC FUSE SIZE	CONTROL CIRCUIT	
	V-Ph-Hz	Supplied					WD	XL		V-Ph-Hz	MCA and MOCP
		Min	Max								
325	200-3-60	187	220	6/6	511.3/511.3	800/800	938/938	—	700/700	115-1-60	20
	230-3-60	207	253	6/6	443.9/443.9	700/700	816/816	—	600/600	115-1-60	20
	380-3-60	342	418	3/3	270.9/270.9	450/450	494/494	1537/1537	350/350	115-1-60	20
	460-3-60	414	506	3/3	222.8/222.8	400/400	408/408	1270/1270	300/300	115-1-60	20
	575-3-60	518	633	3/3	176.3/176.3	300/300	326/326	1016/1016	225/225	115-1-60	20
325 HM	200-3-60	187	220	6/6	649.0/649.0	1000/1000	1329/1329	—	800/800	115-1-60	20
	230-3-60	207	253	6/6	565.8/565.8	1000/1000	1156/1156	—	700/700	115-1-60	20
	380-3-60	342	418	3/3	341.4/341.4	600/600	700/700	2179/2179	450/450	115-1-60	20
	460-3-60	414	506	3/3	283.8/283.8	500/500	578/578	1800/1800	350/350	115-1-60	20
	575-3-60	518	633	3/3	226.0/226.0	400/400	462/462	1440/1440	300/300	115-1-60	20
350	200-3-60	187	220	6/6	511.3/511.3	800/800	938/938	—	700/700	115-1-60	20
	230-3-60	207	253	6/6	443.9/443.9	700/700	816/816	—	600/600	115-1-60	20
	380-3-60	342	418	3/3	270.9/270.9	450/450	494/494	1537/1537	350/350	115-1-60	20
	460-3-60	414	506	3/3	222.8/222.8	400/400	408/408	1270/1270	300/300	115-1-60	20
	575-3-60	518	633	3/3	176.3/176.3	300/300	326/326	1016/1016	225/225	115-1-60	20
350 HM	200-3-60	187	220	6/6	649.0/649.0	1000/1000	1329/1329	—	800/800	115-1-60	20
	230-3-60	207	253	6/6	565.8/565.8	1000/1000	1156/1156	—	700/700	115-1-60	20
	380-3-60	342	418	3/3	341.4/341.4	600/600	700/700	2179/2179	450/450	115-1-60	20
	460-3-60	414	506	3/3	283.8/283.8	500/500	578/578	1800/1800	350/350	115-1-60	20
	575-3-60	518	633	3/3	226.0/226.0	400/400	462/462	1440/1440	300/300	115-1-60	20
375	200-3-60	187	220	6/6	578.5/578.5	1000/1000	938/938	—	700/700	115-1-60	20
	230-3-60	207	253	6/6	501.6/501.6	800/800	816/816	—	700/700	115-1-60	20
	380-3-60	342	418	3/3	302.9/302.9	500/500	494/494	1537/1537	400/400	115-1-60	20
	460-3-60	414	506	3/3	251.6/251.6	450/450	408/408	1270/1270	350/350	115-1-60	20
	575-3-60	518	633	3/3	203.5/203.5	350/350	326/326	1016/1016	250/250	115-1-60	20
375 HM	200-3-60	187	220	6/6	738.8/738.8	1200/1200	1329/1329	—	1000/1000	115-1-60	20
	230-3-60	207	253	6/6	642.6/642.6	1000/1000	1156/1156	—	800/800	115-1-60	20
	380-3-60	342	418	6/6	389.4/389.4	700/700	700/700	2179/2179	500/500	115-1-60	20
	460-3-60	414	506	3/3	322.1/322.1	500/500	578/578	1800/1800	400/400	115-1-60	20
	575-3-60	518	633	3/3	258.0/258.0	450/450	462/462	1440/1440	350/350	115-1-60	20
400	200-3-60	187	220	6/6	578.5/578.5	1000/1000	938/938	—	700/700	115-1-60	20
	230-3-60	207	253	6/6	501.6/501.6	800/800	816/816	—	700/700	115-1-60	20
	380-3-60	342	418	3/3	302.9/302.9	500/500	494/494	1537/1537	400/400	115-1-60	20
	460-3-60	414	506	3/3	251.6/251.6	450/450	408/408	1270/1270	350/350	115-1-60	20
	575-3-60	518	633	3/3	203.5/203.5	350/350	326/326	1016/1016	250/250	115-1-60	20
400 HM	200-3-60	187	220	6/6	738.8/738.8	1200/1200	1329/1329	—	1000/1000	115-1-60	20
	230-3-60	207	253	6/6	642.6/642.6	1000/1000	1156/1156	—	800/800	115-1-60	20
	380-3-60	342	418	6/6	389.4/389.4	600/600	700/700	2179/2179	500/500	115-1-60	20
	460-3-60	414	506	3/3	322.1/322.1	500/500	578/578	1800/1800	400/400	115-1-60	20
	575-3-60	518	633	3/3	258.0/258.0	450/450	462/462	1440/1440	350/350	115-1-60	20

**LEGEND**

- HM** — Heat Machine Units
- ICF** — Maximum Instantaneous Current Flow
- LRA** — Locked Rotor Amps
- MCA** — Minimum Circuit Ampacity (for wire sizing)
- MOCP** — Maximum Overcurrent Protection
- RLA** — Rated Load Amps
- WD** — Wye-Delta Start
- XL** — Across-the-Line Start

**NOTES:**

1. Unit sizes 150-300 are only available with single point power connections.
2. Each main power source must be supplied from a field-supplied fused electrical service with a (factory-installed or field-installed) disconnect located in sight from the unit.
3. Control circuit power must be supplied from a separate source through a field-supplied disconnect. An optional control transformer may be used to provide control circuit power from the main unit power supply.

4. Maximum instantaneous current flow (ICF) during start-up is the point in the starting sequence where the sum of the LRA for the start-up compressor, plus the total RLA for all running compressors is at a maximum. See Table 4 for LRA and RLA values.
5. Maximum incoming wire size for each terminal block is 500 kcmil.
6. Maximum allowable phase imbalance is: voltage, 2%; amps, 5%.
7. Use copper conductors only.
8. The MOCP is calculated as follows:  
 $MOCP = (2.25) (\text{largest RLA}) + \text{the sum of the other RLAs}$ . Size the fuse one size down from the result. The RLAs are listed on the nameplate. See Table 4 for RLA values.  
 The recommended fuse size in amps (RFA) is calculated as follows:  
 $RFA = (1.50) (\text{largest RLA}) + \text{the sum of the other RLAs}$ . Size the fuse one size up from the result. The RLAs are listed on the nameplate.



**Table 7 — CCN Communication Bus Wiring**

MANUFACTURER	PART NUMBER	
	Regular Wiring	Plenum Wiring
Alpha	1895	—
American	A21451	A48301
Belden	8205	884421
Columbia	D6451	—
Manhattan	M13402	M64430
Quabik	6130	—

**Step 6 — Install Accessories** — A number of accessories are available to provide the following optional features (for details, refer to the Controls, Start-Up, Operation, Service, and Troubleshooting guide shipped with the unit).

**ENERGY MANAGEMENT MODULE** — The energy management module is used for any of the following types of temperature reset, demand limit and ice features:

- 4 to 20 mA inputs for cooling set point reset and demand limit (requires field-supplied 4 to 20 mA generator)
- 0 to 10 v output for percentage total capacity running
- 24 v discrete outputs for shutdown and running relays
- 10 k space temperature input
- Discrete inputs for occupancy override, demand limit switch 2 (step 1 demand limit is wired to the base board, requires field-supplied dry contacts), remote lockout switch and ice done switch (requires field-supplied dry contacts).

**REMOTE ENHANCED DISPLAY (OR TOUCH PILOT™ DISPLAY)** — For applications where remote monitoring of the equipment is required; the remote enhanced display (or Touch Pilot display) provides an indoor display, capable of monitoring any equipment on the Carrier Comfort Network® (CCN) bus. A CCN bus is required.

**CONTROL ACCESSORIES** — Several optional control accessories are available to provide the following features:

- BACnet translator
- Local Operating Network (LON) translator
- Carrier Comfort Network (CCN) system
- Energy management module (EMM)

Refer to Controls, Start-Up, Operation, Service, and Troubleshooting guide and separate accessory installation instructions for additional information.

**MISCELLANEOUS ACCESSORIES** — For applications requiring special accessories, the following packages are available: sound blanket, external vibration isolation, and temperature reset sensor. Refer to individual accessory installation instructions for installation details.

**Step 7 — Leak Test Unit** — The 30XW units are shipped from the factory with a full charge of R-134a or a nitrogen holding charge (see Tables 1 and 2). Perform a leak test to ensure that leaks have not developed during unit shipment. Dehydration of the system is not required unless the entire refrigerant charge has been lost.

There are several O-ring face seal fittings used in the refrigerant and lubrication piping. If a leak is detected at any of these fittings, tighten the O-ring face seal nut to 85 to 118 in.-lb (9.5 to 12.4 Nm). Always use a back up wrench when tightening the O-ring face seal nut. If a leak is still detected, evacuate and open system to inspect O-ring surface for foreign matter or damage. Do not re-use O-rings. Repair any leak found using good refrigeration practice.

**Step 8 — Charge Unit** — The standard 30XW chiller is shipped with a full charge of R-134a in the vessels. However, the 30XW may be ordered with a nitrogen holding charge of 15 psig (103 kPa). In this case, evacuate the nitrogen from entire chiller. It is recommended that a vacuum of at least 500 microns (0.5 mm Hg) be obtained. Use industry standard practices or refer to Carrier Standard Service Techniques Manual or the Controls, Start-up, Operation, Service and Troubleshooting guide as required. Charge the chiller from refrigerant cylinders.

**IMPORTANT:** These units are designed for use with R-134a only. **DO NOT USE ANY OTHER REFRIGERANT** in these units without first consulting your Carrier representative.

**NOTE:** The liquid charging method is recommended if the system pressure is above 35 psig (241 kPa) for complete charging or when additional charge is required.

**⚠ CAUTION**

When adding or removing charge, circulate water through the condenser and evaporator at all times to prevent freeze-up. Never charge liquid R-134a into the chiller if the pressure is less than 35 psig (241 kPa). Charge as gas only until 35 psig (241 kPa) is reached. Flashing of liquid refrigerant at low pressures can cause tube freeze-up and considerable damage. Freeze damage is considered abuse and may negatively affect the Carrier warranty.

**⚠ CAUTION**

**DO NOT OVERCHARGE** system. Overcharging can result in higher discharge pressure at most operating conditions, possible compressor damage, and higher power consumption.

The refrigerant can then be added through the refrigerant charging valve located at the bottom of the evaporator and condenser. Charge the refrigerant as a gas until the system pressure exceeds 35 psig (241 kPa) for R-134a. After the chiller is beyond this pressure, charge the refrigerant as a liquid until all the refrigerant charge as listed on the unit nameplate has been added. Refer to Table 8 for evaporator refrigerant storage capacity.

**IMPORTANT:** Failure to properly evacuate the nitrogen holding charge from the unit before charging with refrigerant will result in poor operating performance because of non-condensables in the refrigeration system.

**Table 8 — Evaporator Refrigerant Storage Capacity**

UNIT SIZE 30XW	CKT	TOTAL VOLUME		REFRIGERANT STORAGE CAPACITY (R-134a)	
		cu ft	cu m	lb	kg
150-200	A	10.748	0.304	662	300.3
225-300	A	13.407	0.380	825	374.2
325-400	A	9.343	0.265	575	260.8
	B	9.343	0.265	575	260.8

**NOTE:** This table represents 80% volume allowance at 44 F (6.7 C) saturated liquid conditions.

**Step 9 — Install Field Insulation and Lagging** — Field insulation is required for several components. Refer to Table 9 for field insulation requirements.

When installing insulation at the job site, insulate the following components:

- compressor suction housing (if not equipped from factory)
- suction piping (if not equipped from factory)
- evaporator tubesheets
- evaporator water heads

Once the evaporator fluid lines, drain and vent lines have been installed and checked for leaks, insulate the evaporator heads with a suitable thickness of closed-cell insulation.

This will minimize the amount of condensation that forms on the evaporator heads. When insulating the evaporator heads, allow for service access and removal of heads. Additionally, it

is recommended that the first 12 in. of the drain line, if field installed, should be insulated to minimize any condensation that may form.

NOTE: Insulation of the waterbox return covers and water heads is applied only at the job site by the contractor. When insulating the covers, make sure there is access for removal of waterbox covers for servicing (Fig. 22).

For heat machines, additional insulation is required as follows:

- discharge pipe assembly
- oil lines and filter
- minimum load valve lines (if equipped)
- condenser tubesheets
- condenser water heads

Refer to Table 9 for field insulation requirements.

**Table 9 — Field Insulation Requirements**

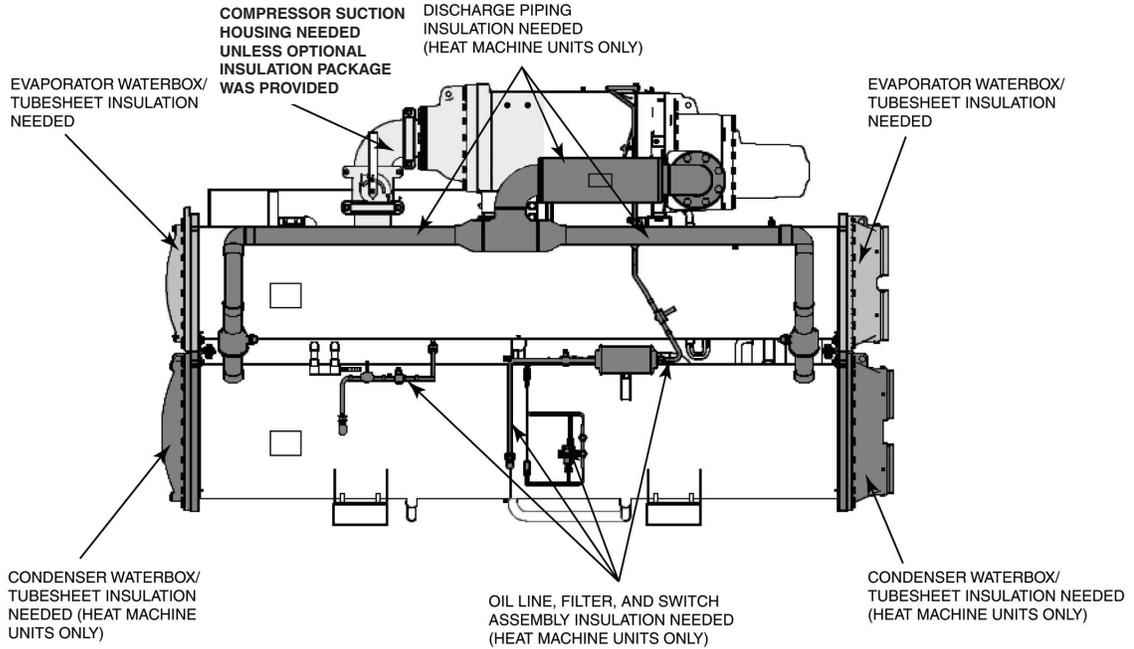
Field Insulation Requirements Tubesheet and Head												
Water Box Type	30XW150-200				30XW225-300				30XW325-400			
	Evaporator		Condenser*		Evaporator		Condenser*		Evaporator		Condenser*	
	sq ft	sq m	sq ft	sq m	sq ft	sq m	sq ft	sq m	sq ft	sq m	sq ft	sq m
Return Cover	6	0.6	7	0.7	7	0.7	9	0.8	8	0.8	9	0.8
Nozzle-In-Head	7	0.7	8	0.8	8	0.8	10	0.9	9	0.8	10	0.9
Marine Waterbox	12	1.1	13	1.2	13	1.2	16	1.5	14	1.3	16	1.5

Field Insulation Requirements Heat Machine						
Duty	Component	Type	30XW150-300		30XW325-400	
			sq ft	sq m	sq ft	sq m
Standard and Heat Machine	Compressor†		25	2.3	50	4.6
	Suction Line†		7	0.7	14	1.4
Heat Machine Only	Discharge Line	3 <sup>3</sup> / <sub>8</sub> in. Tubular	15	1.4	30	2.8
	Discharge Line		14	1.3	28	2.6
	Oil Lines	5 <sup>5</sup> / <sub>8</sub> in. Tubular	12	1.1	24	2.2
	Oil Lines	3 <sup>3</sup> / <sub>8</sub> in. Tubular	6	0.6	12	1.2
	MLV Lines	5 <sup>5</sup> / <sub>8</sub> in. Tubular	3	0.3	6	0.6
	Oil Filter		1.2	0.1	2.4	0.2

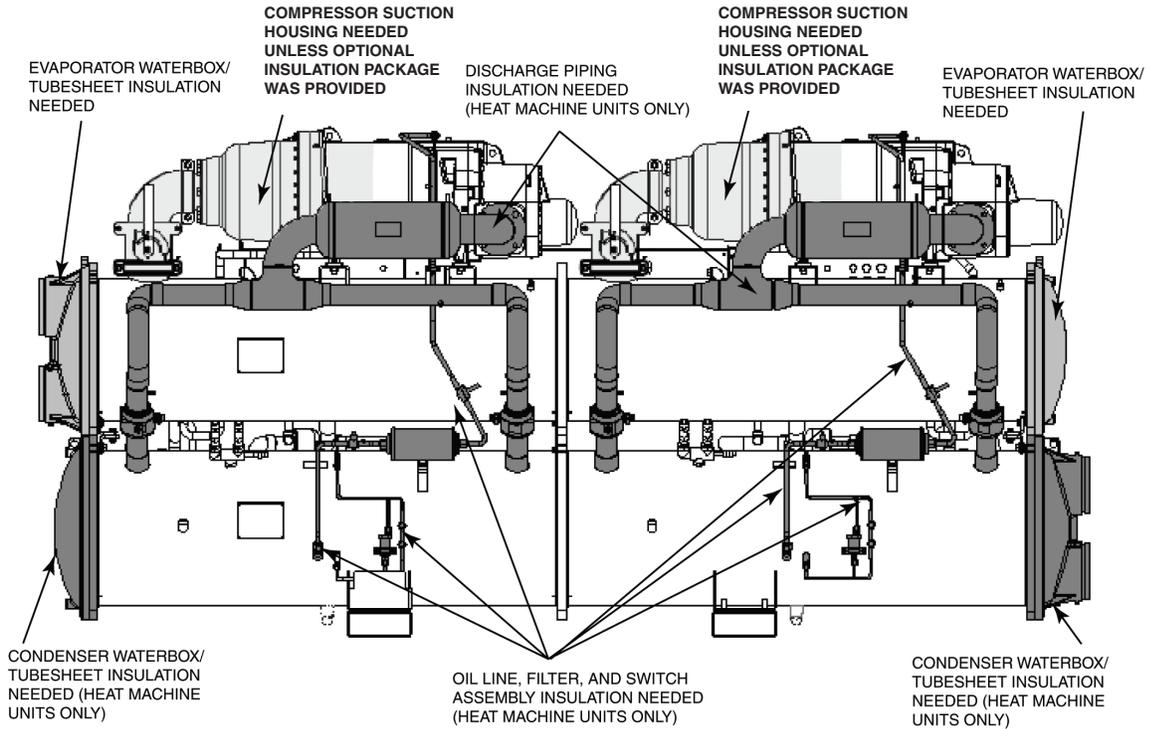
\* Condenser insulation required for Heat Machine only.

† Not required if insulation package option selected.

**30XW150-300 UNITS**



**30XW325-400 UNITS**



**NOTES:**

1. Field-installed insulation for standard units shown in medium gray.
2. Field-installed insulation for heat machine units shown in dark gray.
3. Factory-installed insulation for optional insulation kit shown in light gray.
4. Back of the unit shown.

**Fig. 22 — 30XW Field Insulation**



