Carrier®

19XRV
Hermetic Centrifugal Liquid Chillers With PIC III Controls and HFC-134a 50/60 Hz

Installation Instructions

SAFETY CONSIDERATIONS

Centrifugal liquid chillers are designed to provide safe and reliable service when operated within design specifications. When operating this equipment, use good judgment and safety precautions to avoid damage to equipment and property or injury to personnel.

Be sure you understand and follow the procedures and safety precautions contained in the machine instructions, as well as those listed in this guide.

⚠ DANGER

DO NOT VENT refrigerant relief devices within a building. Outlet from rupture disc or relief valve must be vented outdoors in accordance with the latest edition of ANSI/ASHRAE 15 (American National Standards Institute/American Society of Heating, Refrigeration and Air-Conditioning Engineers) Safety Code for Mechanical Refrigeration. The accumulation of refrigerant in an enclosed space can displace oxygen and cause asphyxiation.

PROVIDE adequate ventilation in accordance with ANSI/ASHRAE 15, especially for enclosed and low overhead spaces. Inhalation of high concentrations of vapor is harmful and may cause heart irregularities, unconsciousness, or death. Intentional misuse can be fatal. Vapor is heavier than air and reduces the amount of oxygen available for breathing. Product causes eye and skin irritation. Decomposition products are hazardous.

DO NOT USE OXYGEN to purge lines or to pressurize a machine for any purpose. Oxygen gas reacts violently with oil, grease, and other common substances.

DO NOT USE air to leak test. Use only refrigerant or dry nitrogen.

NEVER EXCEED specified test pressures. VERIFY the allowable test pressure by checking the instruction literature and the design pressures on the equipment nameplate.

DO NOT VALVE OFF any safety device.

BE SURE that all pressure relief devices are properly installed and functioning before operating any machine.

RISK OF INJURY OR DEATH by electrocution. High voltage is present on motor leads even though the motor is not running when a VFD is used. Open the power supply disconnect before touching motor leads or terminals.

⚠ WARNING

DO NOT WELD OR FLAMECUT any refrigerant line or vessel until all refrigerant (liquid and vapor) has been removed from chiller. Traces of vapor should be displaced with dry air or nitrogen and the work area should be well ventilated. *Refrigerant in contact with an open flame produces toxic gases.*

DO NOT USE eyebolts or eyebolt holes to rig machine sections or the entire assembly.

DO NOT work on high-voltage equipment unless you are a qualified electrician.

DO NOT WORK ON electrical components, including control panels, switches, VFD, or oil heater until you are sure ALL POWER IS OFF and no residual voltage can leak from capacitors or solid-state components.

LOCK OPEN AND TAG electrical circuits during servicing. IF WORK IS INTERRUPTED, confirm that all circuits are deenergized before resuming work.

AVOID SPILLING liquid refrigerant on skin or getting it into the eyes. USE SAFETY GOGGLES. Wash any spills from the skin with soap and water. If liquid refrigerant enters the eyes, IMMEDIATELY FLUSH EYES with water and consult a physician.

NEVER APPLY an open flame or live steam to a refrigerant cylinder. Dangerous over pressure can result. When it is necessary to heat refrigerant, use only warm (110 F [43 C]) water.

DO NOT REUSE disposable (nonreturnable) cylinders or attempt to refill them. It is DANGEROUS AND ILLEGAL. When cylinder is emptied, evacuate remaining gas pressure, loosen the collar, and unscrew and discard the valve stem. DO NOT INCINERATE.

CHECK THE REFRIGERANT TYPE before adding refrigerant to the machine. The introduction of the wrong refrigerant can cause machine damage or malfunction.

Operation of this equipment with refrigerants other than those cited herein should comply with ANSI/ASHRAE 15 (latest edition). Contact Carrier for further information on use of this machine with other refrigerants.

DO NOT ATTEMPT TO REMOVE fittings, covers, etc., while machine is under pressure or while machine is running. Be sure pressure is at 0 psig (0 kPa) before breaking any refrigerant connection.

CAREFULLY INSPECT all relief valves, rupture discs, and other relief devices AT LEAST ONCE A YEAR. If machine operates in a corrosive atmosphere, inspect the devices at more frequent intervals.

DO NOT ATTEMPT TO REPAIR OR RECONDITION any relief valve when corrosion or build-up of foreign material (rust, dirt, scale, etc.) is found within the valve body or mechanism. Replace the valve.

DO NOT install relief devices in series or backwards.

USE CARE when working near or in line with a compressed spring. Sudden release of the spring can cause it and objects in its path to act as projectiles.

⚠ CAUTION

DO NOT STEP on refrigerant lines. Broken lines can whip about and release refrigerant, causing personal injury.

DO NOT climb over a machine. Use platform, catwalk, or staging. Follow safe practices when using ladders.

USE MECHANICAL EQUIPMENT (crane, hoist, etc.) to lift or move inspection covers or other heavy components. Even if components are light, use mechanical equipment when there is a risk of slipping or losing your balance.

BE AWARE that certain automatic start arrangements CAN ENGAGE THE VFD, TOWER FAN, OR PUMPS. Open the disconnect *ahead of* the VFD, tower fan, and pumps. Shut off the machine or pump before servicing equipment.

USE only repaired or replacement parts that meet the code requirements of the original equipment.

DO NOT VENT OR DRAIN waterboxes containing industrial brines, liquid, gases, or semisolids without the permission of your process control group.

DO NOT LOOSEN waterbox cover bolts until the waterbox has been completely drained.

DOUBLE-CHECK that coupling nut wrenches, dial indicators, or other items have been removed before rotating any shafts.

DO NOT LOOSEN a packing gland nut before checking that the nut has a positive thread engagement.

PERIODICALLY INSPECT all valves, fittings, and piping for corrosion, rust, leaks, or damage.

PROVIDE A DRAIN connection in the vent line near each pressure relief device to prevent a build-up of condensate or rain water.

CONTENTS

INTRODUCTION

General — The 19XRV machine is factory assembled, wired, and leak tested. Installation (not by Carrier) consists primarily of establishing water and electrical services to the machine. The rigging, installation, field wiring, field piping, and insulation of waterbox covers are the responsibility of the contractor and/or customer. Carrier has no installation responsibilities for the equipment.

Job Data

Necessary information consists of:
- job contract or specifications
- machine location prints
- rigging information
- piping prints and details
- field wiring drawings
- VFD manufacturer's installation details
- Carrier certified print

INSTALLATION

Receiving the Machine

INSPECT SHIPMENT

⚠ CAUTION

Do not open any valves or loosen any connections. The 19XRV machine may be shipped with a full refrigerant charge. Some machines may be shipped with a nitrogen holding charge as an option.

1. Inspect for shipping damage while machine is still on shipping conveyance. If machine appears to be damaged or has been torn loose from its anchorage, have it examined by transportation inspectors before removal. Forward claim papers directly to transportation company. *Manufacturer is not responsible for any damage incurred in transit.*
2. Check all items against shipping list. Immediately notify the nearest Carrier representative if any item is missing.
3. To prevent loss or damage, leave all parts in original packages until beginning installation. All openings are closed with covers or plugs to prevent dirt and debris from entering machine components during shipping. A full operating oil charge is placed in the oil sump before shipment.

IDENTIFY MACHINE — The machine model number, serial number, and heat exchanger sizes are stamped on the refrigeration machine nameplate located on the right side of the control panel (Fig. 1-3). Check this information against shipping papers and job data.

INSTALLATION REQUIREMENTS — Certain requirements should be checked before continuing with the chiller's electrical installation. Input power wire sizes, branch circuit protection, and control wiring are all areas that need to be evaluated.

Determining Wire Size Requirements — Wire size should be determined based on the size of the conduit openings, and applicable local, national, and international codes (e.g., NEC [National Electric Code]/CEC [California Energy Commission] regulations). General recommendations are included in the Carrier field wiring drawings.

Conduit Entry Size — It is important to determine the size of the conduit openings in the enclosure power entry plate so that the wire planned for a specific entry point will fit through the opening. Do NOT punch holes or drill into the top surface of the VFD (variable frequency drive) enclosure for field wiring. Knockouts are provided on the side of the VFD enclosure for field control wiring connections.

Recommended Control and Signal Wire Sizes — The recommended minimum size wire to connect I/O signals to the control terminal blocks is 18 AWG (American Wire Gage). Recommended terminal tightening torque is 7 to 9 in.-lb (0.79 to 1.02 N-m).

Recommended Airflow Clearances — Be sure there is adequate clearance for air circulation around the enclosure. A 6-in. (152.4 mm) minimum clearance is required wherever vents are located in the VFD enclosure.

Match Power Module Input and Supply Power Ratings — It is important to verify that building power will meet the input power requirements of the Machine Electrical Data nameplate input power rating. Be sure the input power to the chiller corresponds to the chiller's nameplate voltage, current, and frequency. The machine electrical data nameplate is located on the right side of the VFD enclosure.

PROVIDE MACHINE PROTECTION — Protect machine and VFD from construction dirt and moisture. Keep protective shipping covers in place until machine is ready for installation.

If machine has possibly been exposed to freezing temperatures after water circuits have been installed, open waterbox drains and remove all water from cooler and condenser. Leave drains open until system is filled.

It is important to properly plan before installing a 19XRV unit to ensure that the environment and operating conditions are satisfactory and the machine is protected. The installation must comply with all requirements in the certified prints.

Rigging the Machine — The 19XRV machine can be rigged as an entire assembly. It also has flanged connections that allow the compressor, cooler, and condenser sections to be separated and rigged individually.

RIG MACHINE ASSEMBLY — See rigging instructions on label attached to machine. Also refer to rigging guides (Fig. 4 and 5), physical data in Fig. 6, and Tables 1-9B. *Lift machine only from the points indicated in rigging guide.* Each lifting cable or chain must be capable of supporting the entire weight of the machine.

⚠ WARNING

Lifting machine from points other than those specified may result in serious damage to the unit and personal injury. Rigging equipment and procedures must be adequate for machine weight. See Fig. 4 and 5 for machine weights.

NOTE: These weights are broken down into component sections for use when installing the unit in sections. For the complete machine weight, add all component sections and refrigerant charge together. See Tables 4-9B for machine component weights.

IMPORTANT: Ensure that rigging cable is over the cable hook on the motor end cover before lifting, if heat exchanger size is 20 through 67.

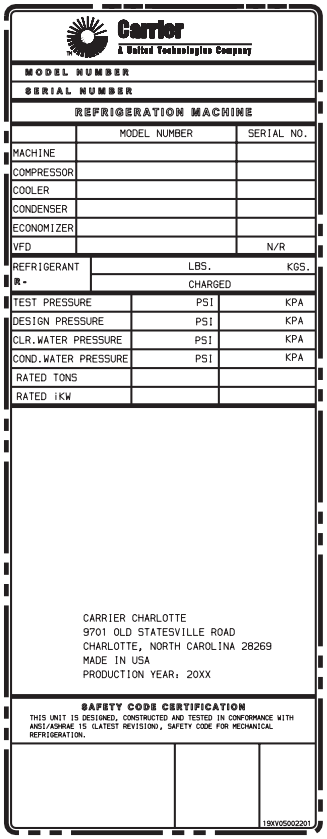


Fig. 1 — 19XRV Refrigeration Machine Nameplate

19XRV 52 51 473 DG H 64 –

19XRV — High Efficiency Hermetic Centrifugal Liquid Chiller with Variable Frequency Drive Unit-Mounted

Special Order Indicator
– — Standard
S — Special Order

Motor Voltage Code

Code	Volts-Phase-Hertz
62	380-3-60
63	416-3-60
64	460-3-60
52	400-3-50

Motor Efficiency Code
H — High Efficiency
S — Standard Efficiency

Cooler Size

20-22 (Frame 2 XRV)	5F (Frame 5 XRV)
30-32 (Frame 3 XRV)	5G (Frame 5 XRV)
35-37 (Frame 3 XRV)	5H (Frame 5 XRV)
40-42 (Frame 4 XRV)	60-62 (Frame 6 XRV)
45-47 (Frame 4 XRV)	65-67 (Frame 6 XRV)
50-52 (Frame 5 XRV)	70-72 (Frame 7 XRV)
5A (Frame 5 XRV)	75-77 (Frame 7 XRV)
5B (Frame 5 XRV)	80-82 (Frame 8 XRV)
5C (Frame 5 XRV)	85-87 (Frame 8 XRV)
55-57 (Frame 5 XRV)	

Condenser Size

20-22 (Frame 2 XRV)	60-62 (Frame 6 XRV)
30-32 (Frame 3 XRV)	65-67 (Frame 6 XRV)
35-37 (Frame 3 XRV)	70-72 (Frame 7 XRV)
40-42 (Frame 4 XRV)	75-77 (Frame 7 XRV)
45-47 (Frame 4 XRV)	80-82 (Frame 8 XRV)
50-52 (Frame 5 XRV)	85-87 (Frame 8 XRV)
55-57 (Frame 5 XRV)	

Compressor Code
(First Digit Indicates Compressor Frame Size)*

Motor Code

Compressor Frame 2	3	3	4	4	5
BD	CD	KB	DB	LB	EH
BE	CE	KC	DC	LC	EJ
BF	CL	KD	DD	LD	EK
BG	CM	KE	DE	LE	EL
BH	CN	KF	DF	LF	EM
BJ	CP	KG	DG	LG	EN
	CQ	KH	DH	LH	EP
	CR		DJ		EQ
			DK		

*Second digit will be a letter (example 4G3) on units equipped with split ring diffuser.

MODEL NUMBER NOMENCLATURE

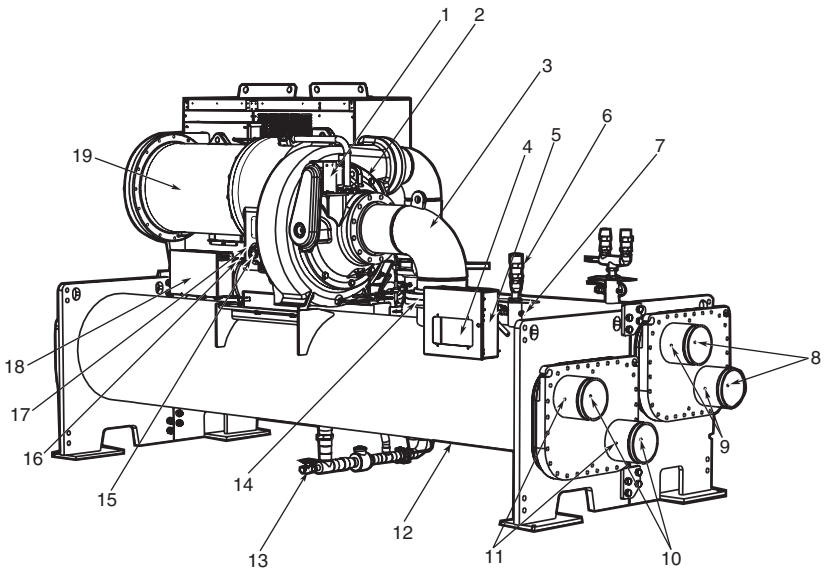
27 05 Q 71843

Week of Year
Year of Manufacture
Unique Number
Place of Manufacture

SERIAL NUMBER BREAKDOWN

Fig. 2 — Model Number Identification

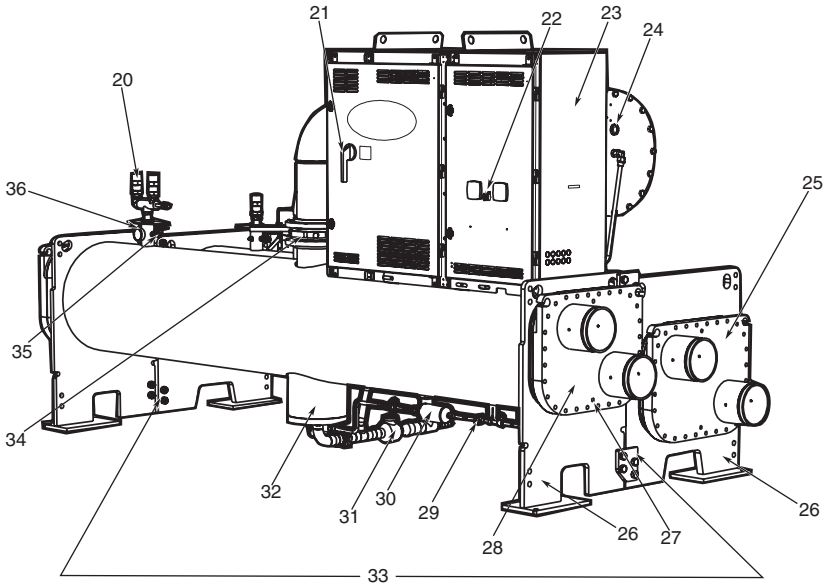
FRONT VIEW



LEGEND

1 — Guide Vane Actuator
2 — Split Ring Diffuser Actuator (Optional)
3 — Suction Elbow
4 — International Chiller Visual Control (ICVC)
5 — Chiller Identification Nameplate
6 — Cooler, Auto Reset Relief Valves
7 — Cooler Pressure Transducer
8 — Condenser In/Out Temperature Thermistors
9 — Condenser Waterflow Device (Optional ICVC Inputs available)
10 — Cooler Waterflow Device (Optional ICVC Inputs available)
11 — Cooler In/Out Temperature Thermistors
12 — Evaporator Saturation Temperature Sensor (Hidden)
13 — Liquid Line Service Valve
14 — Typical Flange Connection
15 — Oil Level Sight Glasses
16 — Refrigerant Oil Cooler (Hidden)
17 — Oil Drain/Charging Valve (Hidden)
18 — Power Panel
19 — Compressor Motor Housing

REAR VIEW



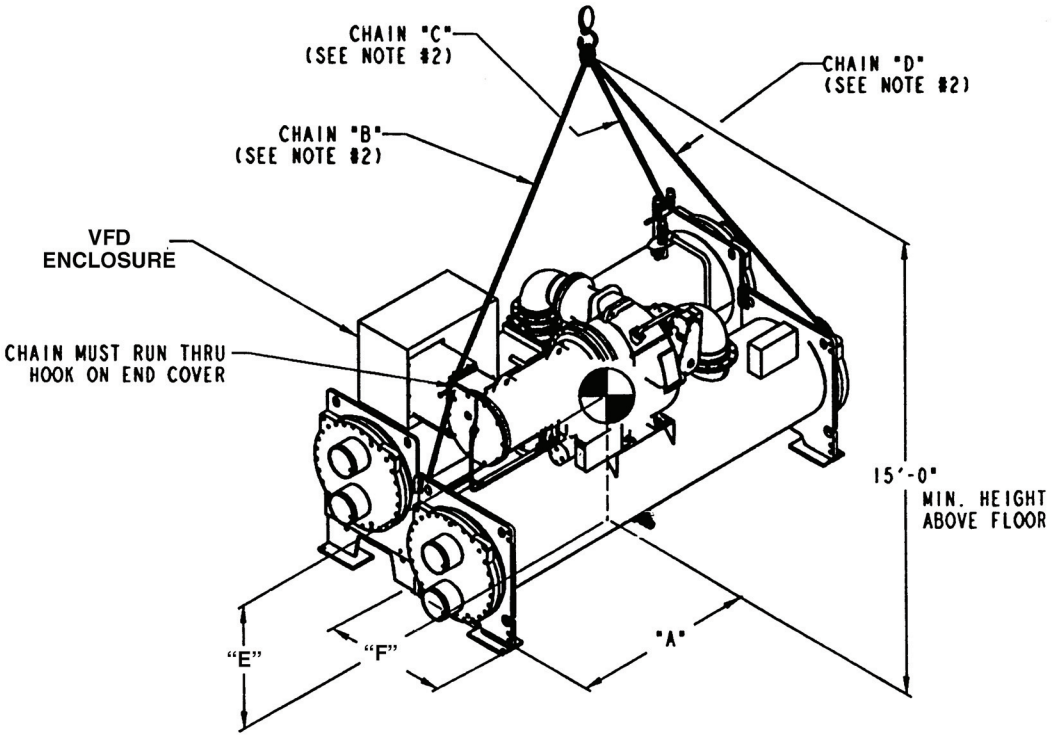
LEGEND

20 — Condenser Auto. Reset Relief Valves
21 — VFD Circuit Breaker
22 — VFD Meter Package (Optional)
23 — Unit-Mounted VFD
24 — Motor Sight Glass
25 — Cooler Waterbox Cover
26 — ASME Nameplate (One Hidden)
27 — Typical Waterbox Drain Port
28 — Condenser Waterbox Cover
29 — Refrigerant Moisture/Flow Indicator
30 — Refrigerant Filter/Drier
31 — Liquid Line Isolation Valve (Optional)
32 — Linear Float Valve Chamber
33 — Tubesheet Mounting Brackets
34 — Discharge Isolation Valve (Optional)
35 — Refrigerant Charging Valve
36 — Condenser Pressure Transducer (Hidden)

Fig. 3 — Typical 19XRV Components

COMPRESSOR FRAME SIZE*	HEAT EXCHANGER SIZE	MAXIMUM WEIGHT		VESSEL LENGTH		DIM. "A"		CHAIN LENGTH						DIM. "E"		DIM. "F"	
								"B"		"C"		"D"					
		lb	kg	ft	mm	ft-in.	mm	ft-in.	mm	ft-in.	mm	ft-in.	mm	ft-in.	mm	ft-in.	mm
2	20-22	22,800	10 342	10	3048	4- 7	1397	12-7	3836	13-0	3962	13-0	3962	3-1	939	2-4	712
2 or 3	30-32	24,300	11 022	12	3658	5- 9	1753	13-6	4114	13-2	4013	13-3	4038	3-6	1066	2-6	762
	35-37	25,800	11 702	14	4267	7- 4	2236	14-2	4318	13-4	4064	13-4	4064	3-6	1066	2-6	762
3	40-42	33,000	14 969	12	3658	5- 9	1753	12-8	3861	12-8	3861	13-4	4064	3-2	965	2-7	788
	45-47	35,100	15 921	14	4267	6-10	2083	13-1	3987	13-2	4013	13-8	4165	3-2	965	2-7	788
	50-52, 5A-5C	34,500	15 649	12	3658	5- 9	1753	12-7	3836	12-9	3887	13-5	4089	3-2	965	2-7	788
	55-57, 5F-5H	36,500	16 556	14	4267	6-10	2083	13-1	3987	13-3	4038	13-9	4191	3-2	965	2-7	788
4	50-52, 5A-5C	35,830	16 252	12	3658	5- 9	1753	13-1	3987	12-9	3887	13-4	4064	3-4	1016	2-8	813
	55-57, 5F-5H	37,530	17 023	14	4267	6- 2	1880	13-7	4140	13-1	3987	14-4	4369	3-4	1016	2-8	813
	60-62	38,250	17 350	12	3658	5- 9	1753	13-1	3987	12-9	3887	13-4	4064	3-4	1016	2-8	813
	65-67	40,250	18 257	14	4267	6- 2	1880	13-7	4140	13-1	3987	14-4	4369	3-4	1016	2-8	813

*The first digit of the 3-digit compressor code indicates the frame size of the compressor.



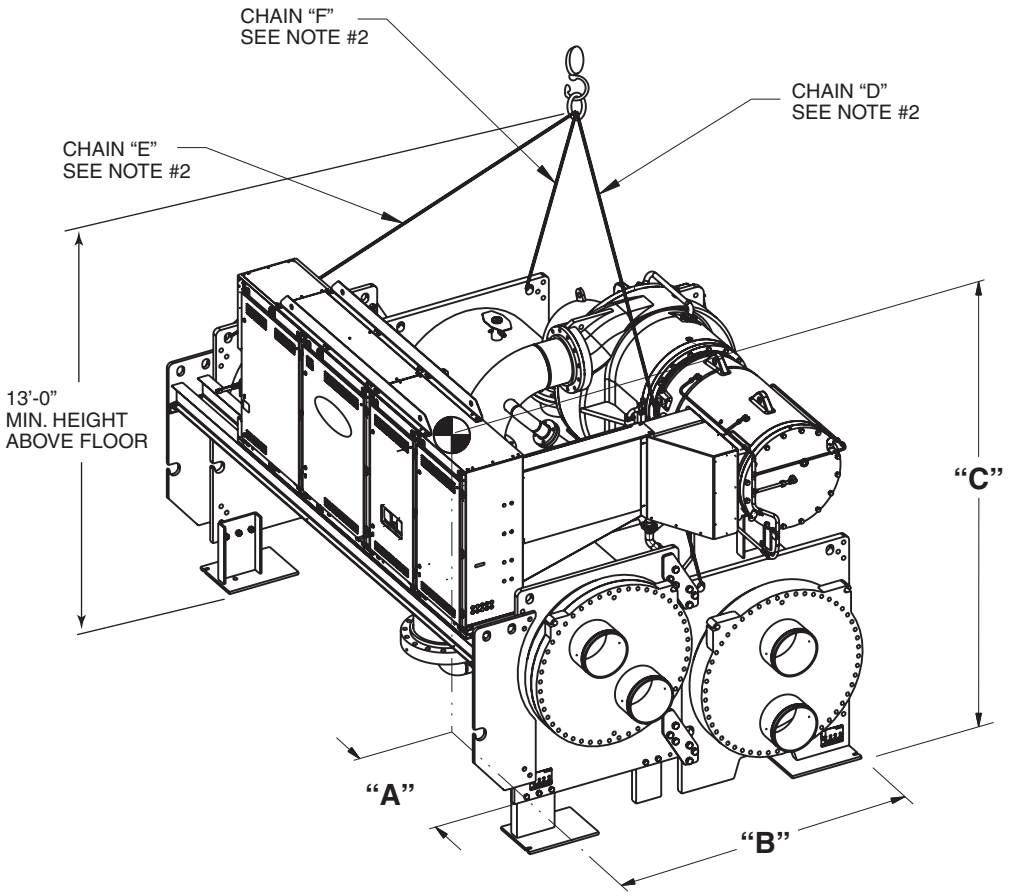
MACHINE RIGGING GUIDE

NOTES:
1. Each chain must be capable of supporting the entire weight of the machine. See chart for maximum weights.
2. Chain lengths shown are typical for 15′ lifting height. Some minor adjustments may be required.

Fig. 4 — Machine Rigging Guide (Heat Exchanger Sizes 20 Through 67)

COMPRESSOR FRAME SIZE*	HEAT EXCHANGER SIZE	MAXIMUM WEIGHT		VESSEL LENGTH		DIM. "A"		DIM. "B"		DIM. "C"		CHAIN LENGTH					
												DIM. "D"		DIM. "E"		DIM. "F"	
		lb	kg	ft	mm	ft-in.	mm	ft-in.	mm	ft-in.	mm	ft-in.	mm	ft-in.	mm	ft-in.	mm
4	70-72	49,430	22 421	14	4267	6- 5	1956	3-8 1/2	1130	4-9	1448	9- 8	2946	11-6	3505	11- 8	3556
5	70-72	54,620	24 775	14	4267	6- 1 1/2	1867	3-9	1143	4-9	1448	9-10	2997	11-4	3455	11- 6	3505
	75-77	58,780	26 662	16	4877	6-10	2083	3-9	1143	4-9	1448	10- 6	3200	12-8	3861	12-10	3912
	80-82	63,785	28 932	14	4267	6- 1 1/2	1867	3-9	1143	4-9	1448	9-10	2997	11-4	3455	11- 6	3505
	85-87	67,575	30 652	16	4877	6-10	2083	3-9	1143	4-9	1448	10- 6	3200	12-8	3861	12-10	3912

*The first digit of the 3-digit compressor code indicates the frame size of the compressor.



MACHINE RIGGING GUIDE

NOTES:
1. Each chain must be capable of supporting the entire weight of the machine. See chart for maximum weights.
2. Chain lengths shown are typical for 13′ lifting height. Some minor adjustments may be required.
3. Dimensions "A" and "B" define distance from machine center of gravity to tubesheet outermost surfaces. Dimension "C" defines distance from machine center of gravity to floor.

Fig. 5 — Machine Rigging Guide (Heat Exchanger Sizes 70 Through 87)

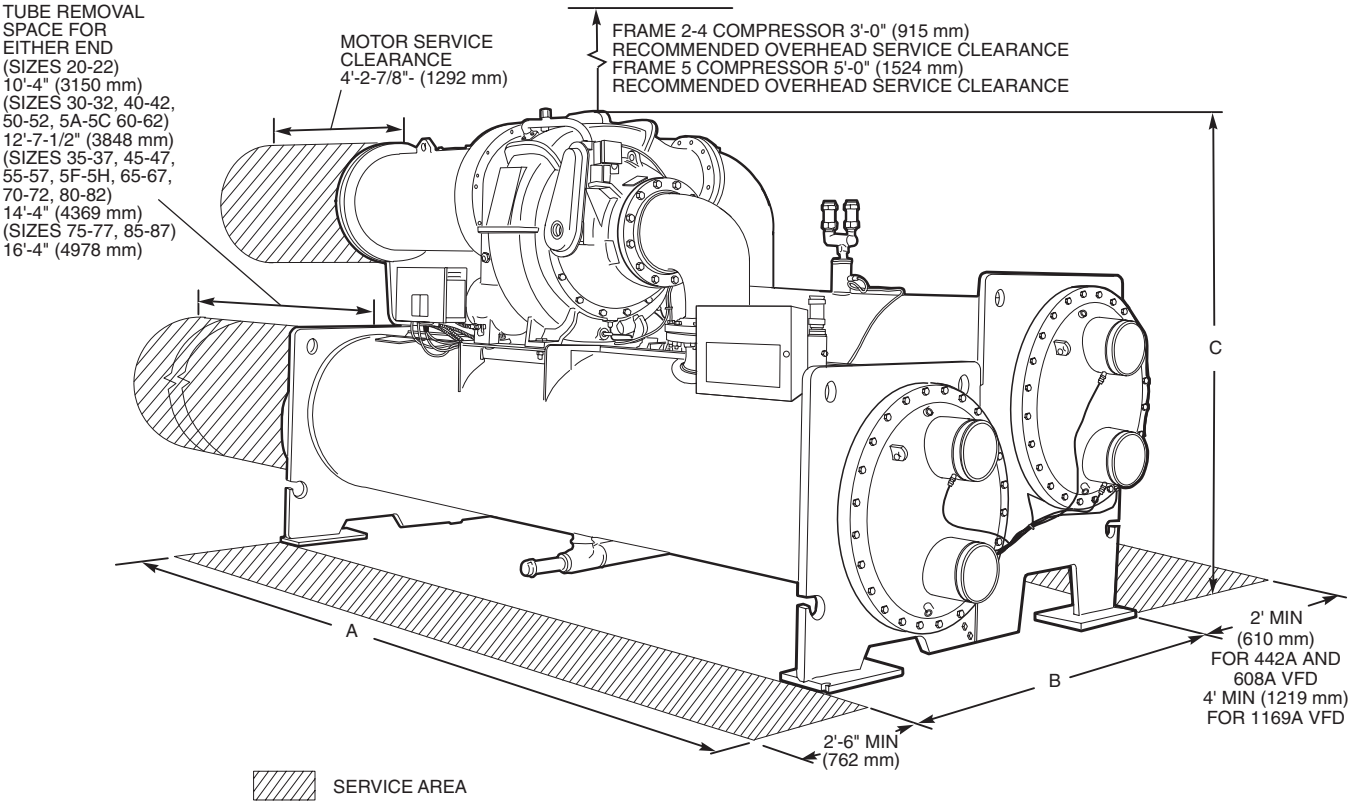


Fig. 6 — 19XRV Dimensions (Refer to Tables 1 Through 3)

Table 1 — 19XRV Dimensions (Nozzle-In-Head Waterbox)

HEAT EXCHANGER SIZE	A (Length, with Nozzle-in-Head Waterbox)						B (Width)		19XRV C (Height)	
	1 Pass		2-Pass*		3 Pass†					
	ft-in.	mm	ft-in.	mm	ft-in.	mm	ft-in.	mm	ft-in.	mm
20 to 22	12- 0 1/2	3670	11- 5 1/8	3483	12- 0 1/2	3670	5- 6 1/2	1689	7-10 1/4	2394
30 to 32	14- 4	4369	13- 8 5/8	4182	14- 4	4369	5- 6 1/2	1689	7- 6 3/4	2305
35 to 37	16- 0 1/2	4890	15- 5 1/8	4702	16- 0 1/2	4890	5- 6 1/2	1689	7- 6 3/4	2305
40 to 42	14-10	4521	14- 3 5/8	4359	14- 6 3/4	4439	6- 2	1880	7-11	2413
45 to 47	16- 6 1/2	5042	16- 0 1/8	4880	16- 3 1/4	4960	6- 2	1880	7-11	2413
50 to 52	14-11	4547	14- 5	4394	14- 7 1/4	4452	6- 7 7/8	2029	8- 6 3/4	2610
5A to 5C	14-11	4547	14- 5	4394	14- 7 1/4	4452	6- 7 7/8	2029	8- 6 3/4	2610
55 to 57	16- 7 1/2	5067	16- 1 1/2	4915	16- 3 3/4	4972	6- 7 7/8	2029	8- 6 3/4	2610
5F to 5H	16- 7 1/2	5067	16- 1 1/2	4915	16- 3 3/4	4972	6- 7 7/8	2029	8- 6 3/4	2610
60 to 62	15- 0	4572	14- 5 3/4	4413	14- 7 3/4	4464	6-10 5/8	2099	8- 9 7/8	2690
65 to 67	16- 8 1/2	5093	16- 2 1/4	4934	16- 4 1/4	4985	6-10 5/8	2099	8- 9 7/8	2690
70 to 72	17- 1 1/2	5220	16- 11 1/2	5169	16-10	5131	9- 3 5/8	2835	10- 4 3/4	3169
75 to 77	19- 1 1/2	5829	18- 11 1/2	5778	18-10	5740	9- 3 5/8	2835	10- 4 3/4	3169
80 to 82	17- 4 1/2	5296	17- 1	5207	16-10 1/2	5144	10- 0 5/8	3062	10- 4 3/4	3169
85 to 87	19- 4 1/2	5906	19- 1	5817	18-10 1/2	5753	10- 0 5/8	3062	10- 4 3/4	3169

*Assumes both cooler and condenser nozzles on same end of chiller.
†1 or 3 pass length applies if either (or both) cooler or condenser is a 1 or 3 pass design.

NOTES:
1. Service access should be provided per American Society of Heating, Refrigeration, and Air Conditioning Engineers 15 (ASHRAE), latest edition, National Fire Protection Association (NFPA) 70, and local safety codes.
2. Allow at least 3 ft (915 mm) overhead clearance for service rigging for frame 2-4 compressor. Overhead clearance for service rigging frame 5 compressor should be 5 ft (1524 mm).
3. Certified drawings available upon request.
4. Marine waterboxes may add 6 in., to the width of the machine. See certified drawings for details.
5. 'A' length dimensions shown are for standard 150 psi design and victaulic connections. The 300 psi design and/or flanges will add length. See certified drawings.
6. Dished head waterbox covers not available for 3 pass design.
7. 'B' width dimensions include the largest compressor available for a given heat exchanger size. See certified drawings.

Table 2 — 19XRV Dimensions (Marine Waterbox)

HEAT EXCHANGER SIZE	A (Length, Marine Waterbox — not shown)				B WIDTH	
	2-Pass*		1 or 3 Pass†			
	ft-in.	mm	ft-in.	mm	ft-in.	mm
20 to 22	12- 5 1/2	3797	14- 1 1/4	4299	6- 6 1/8	1985
30 to 32	14- 9	4496	16- 4 3/4	4997	6- 6 1/8	1985
35 to 37	16- 5 1/2	5017	18- 1 1/4	5518	6- 6 1/8	1985
40 to 42	15- 2 3/4	4642	16- 8 1/4	5086	6- 3 1/4	1911
45 to 47	16-11 1/4	5163	18- 4 3/4	5607	6- 3 1/4	1911
50 to 52	15- 3 1/2	4661	16- 8 1/2	5093	6- 7 7/8	2029
5A to 5C	15- 3 1/2	4661	16- 8 1/2	5093	6- 7 7/8	2029
55 to 57	17- 0	5182	18- 5	5613	6- 7 7/8	2029
5F to 5H	17- 0	5182	18- 5	5613	6- 7 7/8	2029
60 to 62	15- 4 1/8	4677	16- 8 3/4	5099	6-11 3/4	2127
65 to 67	17- 0 5/8	5197	18- 5 1/4	5620	6-11 3/4	2127
70 to 72	18- 3 5/8	5579	19- 9 3/4	6039	9- 6 3/8	2905
75 to 77	20- 3 5/8	6188	21- 9 3/4	6649	9- 6 3/8	2905
80 to 82	18- 4	5588	19-10 1/2	6058	10- 5	3175
85 to 87	20- 4	6198	21-10 1/2	6668	10- 5	3175

*Assumes both cooler and condenser nozzles on same end of chiller.
†1 or 3 pass length applies if cooler is a 1 or 3 pass design.

NOTES:
1. Service access should be provided per American Society of Heating, Refrigeration, and Air Conditioning Engineers 15 (ASHRAE), latest edition, National Fire Protection Association (NFPA) 70, and local safety codes.
2. Allow at least 3 ft (915 mm) overhead clearance for service rigging for frame 2-4 compressor. Overhead clearance for service rigging frame 5 compressor should be 5 ft (1524 mm).
3. Certified drawings available upon request.
4. Marine waterboxes may add 6 in., to the width of the machine. See certified drawings for details.
5. 'A' length and 'B' width dimensions shown are for standard 150 psi design and victaulic connections. The 300 psi design and/or flanges will add length. See certified drawings.
6. 'B' width is the widest combination of 150 PSI design cooler and condenser marine waterboxes.

Table 3 — 19XRV Nozzle Size

FRAME SIZE	NOZZLE SIZE (in.) (Nominal Pipe Size)					
	Cooler			Condenser		
	1-Pass	2-Pass	3-Pass	1-Pass	2-Pass	3-Pass
2	10	8	6	10	8	6
3	10	8	6	10	8	6
4	10	8	6	10	8	6
5	10	8	6	10	10	8
6	10	10	8	10	10	8
7	14	12	10	14	12	12
8	14	14	12	14	14	12

RIG MACHINE COMPONENTS — Refer to instructions on pages 9 and 10 to disassemble a chiller with a 442A or 608A VFD. Special instructions for chillers with a 1169A VFD are on pages 20-25.

Disassemble a Chiller with a 442A or 608A VFD

IMPORTANT: Only a qualified service technician should perform this operation.

⚠ WARNING

Do not attempt to disconnect flanges while the machine is under pressure. Failure to relieve pressure can result in personal injury or damage to the unit.

⚠ CAUTION

Before rigging the compressor, disconnect all wires entering the power panel.

Remove the 442A or 608A VFD Enclosure — Confirm that the power supply disconnect is open and all safety procedures are observed before removing the VFD. This procedure minimizes the number of sensors and cables that need to be disconnected.

⚠ WARNING

Do not attempt to remove the VFD without first closing the refrigerant isolation valves. Failure to do so during VFD removal will result in an uncontrolled refrigerant leak. A refrigerant leak can damage the unit as well as displace oxygen, causing asphyxiation.

1. Close the 2 filter drier isolation valves and the VFD refrigerant drain isolation valve. Evacuate the VFD coldplate through the Schrader valve next to the filter/drier.
2. Remove any field wiring conduits that bring power to the VFD.
3. Remove the terminal box transition piece.
4. Label and disconnect the motor leads from the motor terminals. Note the position of the motor terminal cable lugs so they can be reinstalled with sufficient clearance away from the surrounding structure.
5. Remove the motor ground lead. Note the position of the ground lead so it can be reinstalled with sufficient clearance away from the surrounding structure.
6. Label and disconnect the power cables, interlock cable, and communication cable between the VFD enclosure and the power panel.
7. Remove the access panels on the back of the VFD enclosure and disconnect the VFD cooling lines. Cover all openings.

Lifting the VFD — Care should be used to prevent damage due to dropping or jolting when moving the VFD. A fork truck or similar means of lifting and transporting may be used. Sling the VFD in a manner that will equalize the load at the pickup joints. Use a spreader bar if the angle of the sling is less than 45 degrees relative to horizontal. Do not jolt while lifting.

Use the following procedure to lift the VFD:

1. Attach a sling to the four lifting holes in the lifting brackets (lifting brackets are factory-installed on top of the VFD enclosure). Make certain that the angle of the sling is not less than 45 degrees relative to horizontal.
2. Using an overhead or portable hoist (minimum 2 ton rated capacity), attach a free-fall chain to the sling secured to the drive. Take up any slack in the chain.
3. Rig the control center and remove the bolts that secure it to the VFD mounting brackets on the condenser. See Fig. 7.

NOTE: To reassemble, follow steps in reverse order. Connect sensors and cables after major components have been secured to reduce the risk of damaging them.

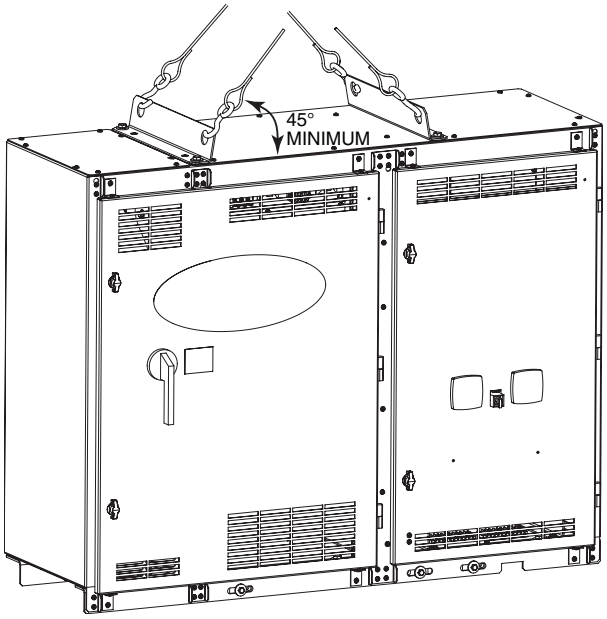


Fig. 7 — 442A and 608A VFD Enclosure Lifting Points

To Separate Cooler and Condenser

NOTE: If the cooler and condenser vessels must be separated, the heat exchangers should be kept level by placing a support plate under the tube sheets. The support plate will also help to keep the vessels level and aligned when the vessels are bolted back together.

Remove all transducer and sensor wires at the sensor. Clip all wire ties necessary to pull heat exchangers apart.

⚠ CAUTION

Do not separate the cooler and condenser until the 1169A VFD is removed. The 1169A VFD/condenser assembly has a high center of gravity and may tip over when the cooler and condenser are separated, which could result in equipment damage and/or serious personal injury. See pages 20-25 for special instructions on 1169A VFD removal.

1. Place a support plate under each tube sheet to keep each vessel level (Fig. 8, Item 4).
2. Cut the refrigerant motor cooling line at the location shown (Fig. 8, Item 2).
3. Disconnect the compressor discharge elbow at the compressor (Fig. 9, Item 6).
4. Unbolt the cooler liquid feed line at the location shown (Fig. 8, Item 8).
5. Cover all openings.
6. Disconnect all wires and cables that cross from the cooler side of the machine to the condenser side, including:
   a. temperature sensor cable at the waterbox (Fig. 10, Item 5)
   b. waterside transducer cables at the transducer (Fig. 10, Item 4)
   c. condenser transducer cable at the transducer (Fig. 9, Item 7)
   d. motor power wires at the motor terminal box (Fig. 8, Item 3)
   e. wires and cable housings at the power panel that cross from the VFD to the power panel (Fig. 9, Item 2).
7. Disconnect the tube sheet mounting brackets on the tube sheets (Fig. 8, Item 5).
8. Rig the vessels apart.

To Separate the Compressor from the Cooler:

1. Unbolt the compressor suction and discharge elbows (Fig. 8, Items 1 and 10).
2. Cut the refrigerant motor cooling line at the location shown (Fig. 8, Item 2).
3. Disconnect the motor refrigerant return line (Fig. 8, Item 6).
4. Disconnect the following:
   a. compressor oil sump temperature sensor cable (Fig. 11, Item 4)
   b. bearing temperature sensor cable (Fig. 11, Item 2)
   c. motor temperature sensor cable (Fig. 11, Item 1)
   d. wires and cable housings that cross from the power panel to the VFD and control panel (Fig. 9, Item 2)
   e. discharge temperature sensor cable (Fig. 11, Item 6)
   f. compressor oil sump pressure cable (Fig. 11, Item 3)
   g. compressor oil discharge pressure cable (Fig. 11, Item 5)
   h. guide vane actuator cable (Fig. 9, Item 1)
   i. diffuser actuator cable (Frame 5 compressor and Frame 4 units with split ring diffuser — Fig. 10, Item 2)
   j. diffuser pressure cable (Frame 5 compressor and Frame 4 units with split ring diffuser — Fig. 11, Item 8).
5. Disconnect the flared fitting for the oil reclaim line (Fig. 8, Item 9).
6. Unbolt the compressor discharge elbow (Fig. 9, Item 6).
7. Cover all openings.
8. Disconnect motor power cables at the VFD lugs (Fig. 8, Item 3).
9. Unbolt the compressor mounting from the cooler (Fig. 8, Item 7).
10. Rig the compressor.

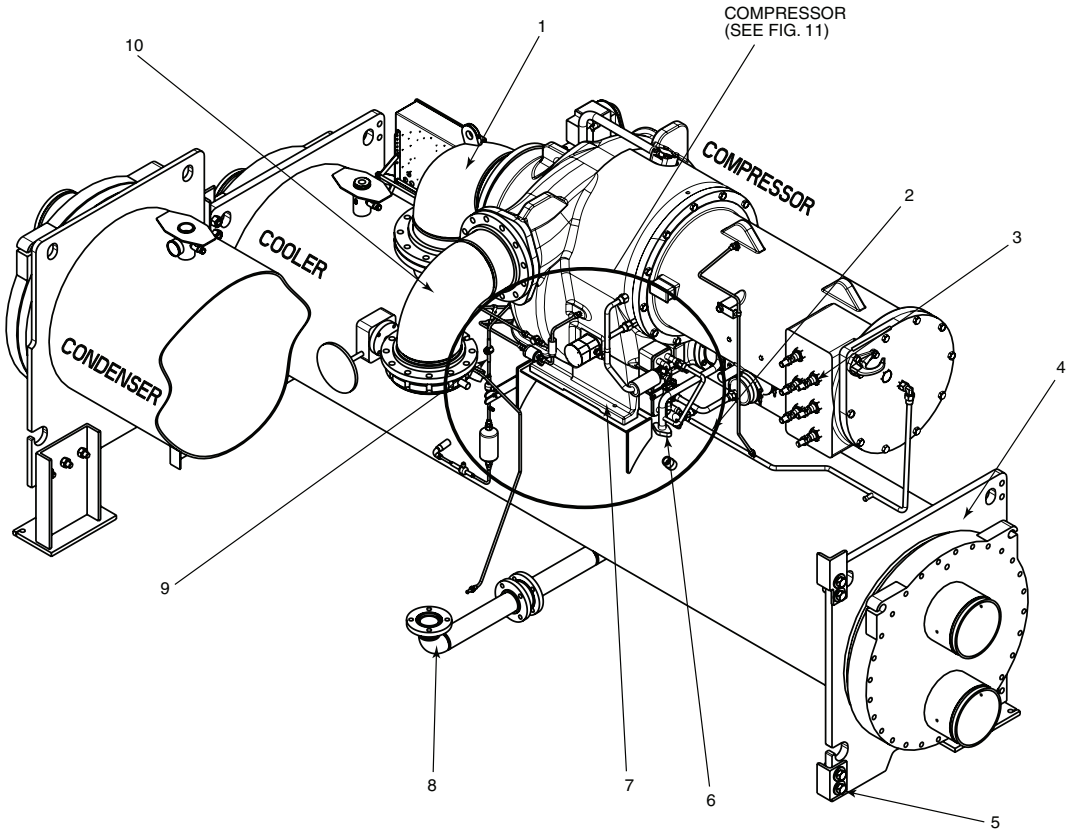
To Rig Compressor

NOTE: The motor end of the 19XRV compressor is heavy and will tip backwards unless these directions are followed:

1. Cut two 4 in. x 6 in. wooden beams to the same length as the compressor.
2. Drill holes into the beams and bolt them to the base of the compressor using the compressor base mounting holes.

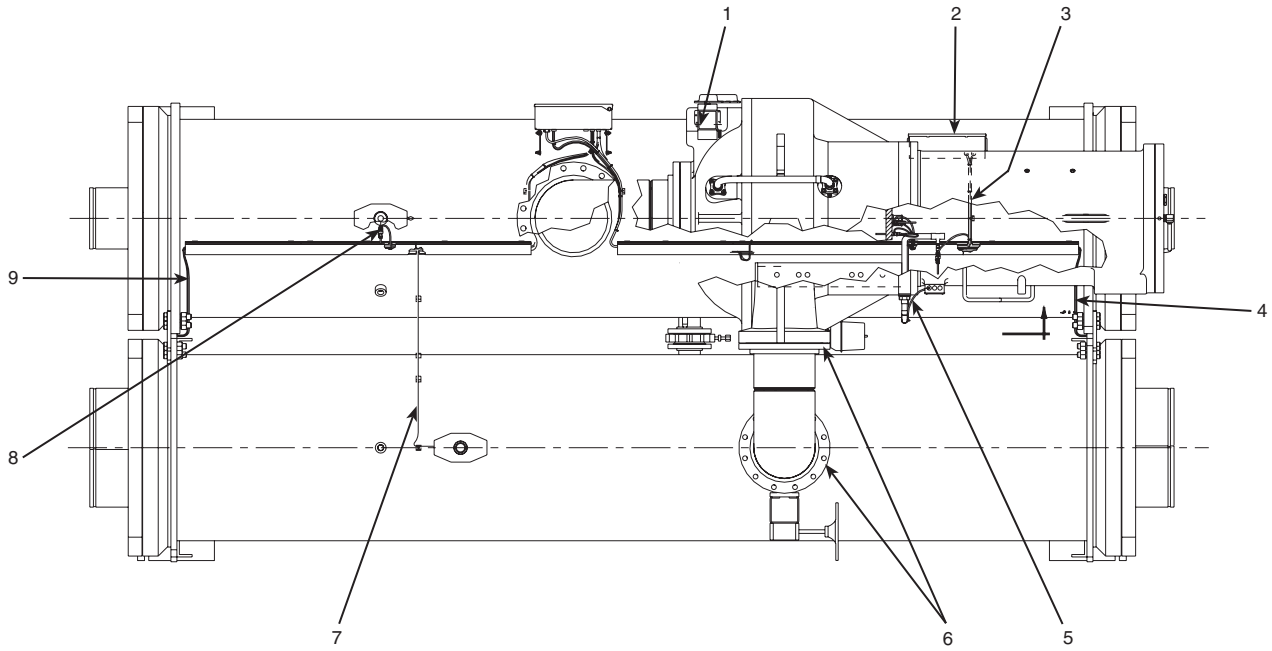
Additional Notes

1. Use O-ring lubricant on new O-rings when refitting.
2. Use gasket sealant on new gaskets when refitting.
3. Cooler and condenser vessels may be rigged vertically. Rigging should be fixed to all 4 corners of the tube sheet.



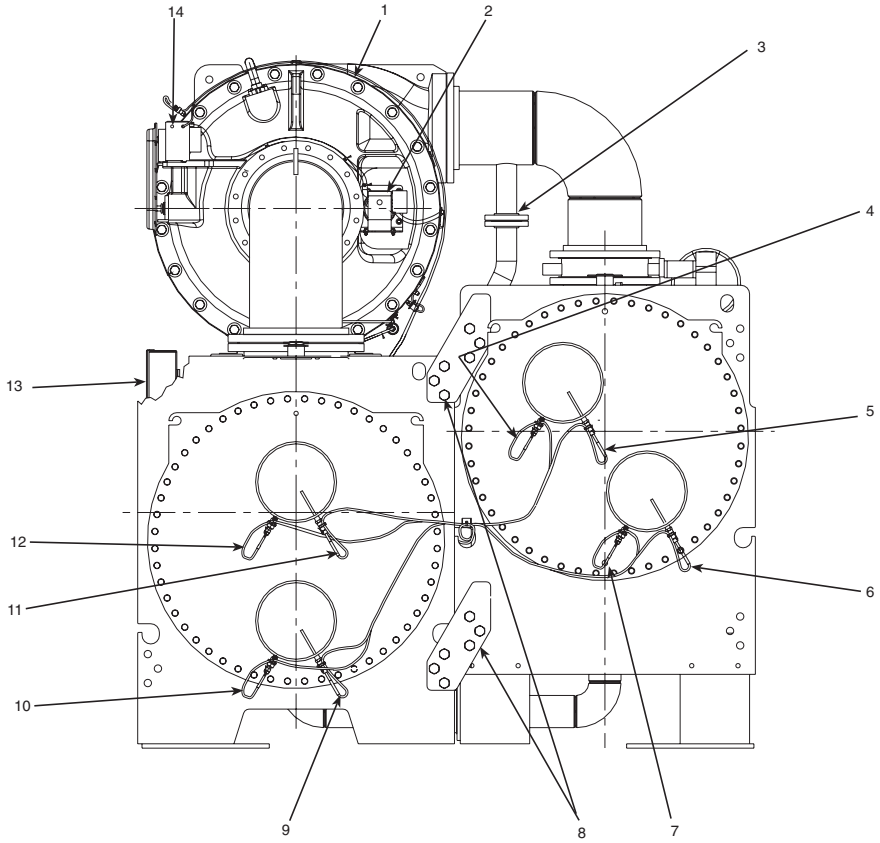
1 — Compressor Suction Elbow (Unbolt)
2 — Motor Cooling Line (Cut)
3 — Motor Terminal Box (Unbolt)
4 — Tube Sheet
5 — Tube Sheet Mounting Brackets (Unbolt — 4 Places)
6 — Motor Cooling Drain Line (Unbolt)
7 — Compressor Mounting Bolt (Unbolt — 4 Places)
8 — Cooler Liquid Feed Line (Unbolt)
9 — Oil Reclaim Line (Unbolt)
10 — Compressor Discharge Elbow (Unbolt)

Fig. 8 — Cooler, Side View



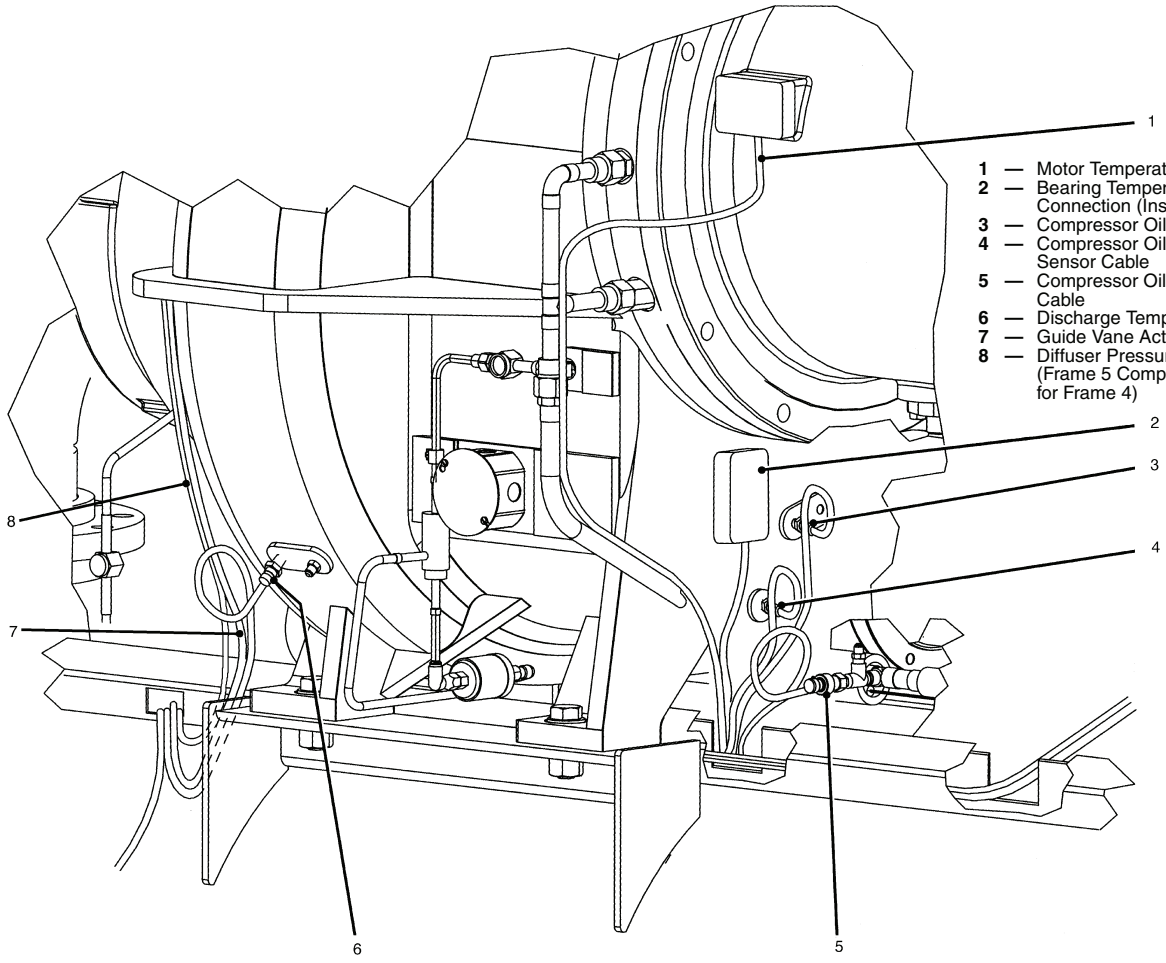
1 — Guide Vane Actuator Cable
2 — Power Panel
3 — Communication Cable
4 — Water Sensor Cables
5 — Motor Winding Temperature Cable
6 — Compressor Discharge Elbow Joints
7 — Condenser Pressure Cable
8 — Cooler Pressure Connection
9 — Water Sensor Cables

Fig. 9 — 19XRV Chiller Top View



1 — Guide Vane Actuator Cables
2 — Diffuser Actuator (Frame 5 Compressor, Frame 4 Optional)
3 — Hot Gas Bypass Line (Optional)
4 — Condenser Leaving Water Pressure Cable (Optional)
5 — Condenser Leaving Water Temperature Cable
6 — Condenser Entering Water Temperature Cable
7 — Condenser Entering Water Pressure Cable (Optional)
8 — Vessel Take-Apart Connectors
9 — Cooler Entering Water Temperature Cable
10 — Cooler Entering Water Pressure Cable (Optional)
11 — Cooler Leaving Water Temperature Cable
12 — Cooler Leaving Water Pressure Cable (Optional)
13 — International Chiller Visual Controller (ICVC)
14 — Guide Vane Actuator

Fig. 10 — Chiller End View



1 — Motor Temperature Sensor Cable
2 — Bearing Temperature Sensor Cable Connection (Inside Box)
3 — Compressor Oil Sump Pressure Cable
4 — Compressor Oil Sump Temperature Sensor Cable
5 — Compressor Oil Discharge Pressure Cable
6 — Discharge Temperature Sensor Cable
7 — Guide Vane Actuator Cable
8 — Diffuser Pressure and Actuator Cable (Frame 5 Compressor Only, Optional for Frame 4)

Fig. 11 — Compressor Detail

Table 4 — 19XRV Compressor Weights

COMPRESSOR FRAME	MOTOR CODE	ENGLISH		SI	
		Total Compressor Weight (lb)*		Total Compressor Weight (kg)*	
		60 Hz	50 Hz	60 Hz	50 Hz
2	BD	3,736	3,751	1695	1701
	BE	3,787	3,808	1718	1727
	BF	3,844	3,878	1744	1759
	BG	3,931	3,953	1783	1793
	BH	3,931	4,008	1783	1818
	BJ	4,008	—	1818	—
3	CD	4,566	4,641	2071	2105
	CE	4,611	4,705	2092	2134
	CL	4,637	4,764	2103	2161
	CM	4,724	4,833	2143	2192
	CN	4,789	4,892	2172	2219
	CP	4,847	4,921	2199	2232
	CQ	4,864	4,948	2206	2244
	CR	4,958	—	2249	—
	KB	4,276	4,314	1940	1957
	KC	4,314	4,341	1957	1969
	KD	4,341	4,379	1969	1986
	KE	4,379	4,406	1986	1999
	KF	4,406	4,439	1999	2013
	KG	4,439	4,467	2013	2026
	KH	4,467	—	2026	—
4	DB	6,885	6,885	3123	3123
	DC	6,885	6,983	3123	3167
	DD	7,215	7,325	3273	3323
	DE	7,229	7,329	3279	3324
	DF	7,354	7,476	3336	3391
	DG	7,378	7,508	3347	3406
	DH	7,336	7,513	3328	3408
	DJ	7,371	7,523	3343	3412
	DK	7,448	—	3378	—
	LB	6,766	6,857	3069	3110
	LC	6,857	6,958	3110	3156
	LD	6,958	6,989	3156	3170
	LE	6,989	7,059	3170	3202
	LF	7,059	7,106	3202	3223
	LG	7,106	7,186	3223	3260
	LH	7,186	—	3260	—
5	EH	11,509	11,686	5220	5301
	EJ	11,659	11,811	5288	5357
	EK	11,659	11,821	5288	5362
	EL	11,766	11,911	5337	5403
	EM	11,766	11,953	5337	5422
	EN	11,766	12,088	5337	5483
	EP	11,766	12,088	5337	5483
	EQ	11,816	—	5360	—

*Compressor weight is comprised of compressor, stator, rotor, and end bell.

Table 5 — 19XRV Component Weights

COMPONENT	FRAME 2 COMPRESSOR*		FRAME 3 COMPRESSOR*		FRAME 4 COMPRESSOR*		FRAME 5 COMPRESSOR*	
	lb	kg	lb	kg	lb	kg	lb	kg
Suction Elbow	116	53	185	84	239	108	407	185
Discharge Elbow	100	45	125	57	157	71	325	147
Control Panel†	34	15	34	15	34	15	34	15
Optional Cooler Liquid Line Isolation Valve	8	4	13	6	20	9	24	11
Optional Discharge Isolation Valve	26	12	46	21	74	34	108	49
442A / 608A VFD**	1600	726	1600	726	1600	726	—	—
1169A VFD**	—	—	—	—	2800	1270	2800	1270
VFD Shelf (1169A VFD only)	—	—	—	—	1049	476	1049	476

*To determine compressor frame size, refer to 19XRV Computer Selection Program.
†Included in total cooler weight.
**Weight of factory-mounted VFD (variable frequency drive) is not included and must be added to the heat exchanger weight.

Table 6 — 19XRV Heat Exchanger Data

CODE	ENGLISH						SI					
	Dry Rigging Weight (lb)*		Machine Charge				Dry Rigging Weight (kg)*		Machine Charge			
	Cooler Only	Condenser Only	Refrigerant Weight (lb)		Water Volume (gal)		Cooler Only	Condenser Only	Refrigerant Weight (kg)		Water Volume (L)	
			Cooler	Condenser	Cooler	Condenser			Cooler	Condenser	Cooler	Condenser
20	3,407	3,373	345	225	48	48	1545	1530	156	102	182	182
21	3,555	3,540	385	225	55	55	1613	1606	175	102	208	208
22	3,711	3,704	435	225	62	63	1683	1680	197	102	235	238
30	4,071	3,694	350	260	56	56	1847	1676	159	118	212	212
31	4,253	3,899	420	260	64	65	1929	1769	191	118	242	246
32	4,445	4,100	490	260	72	74	2016	1860	222	118	273	280
35	4,343	4,606	400	310	61	62	1970	2089	181	141	231	235
36	4,551	4,840	480	310	70	72	2064	2195	218	141	265	273
37	4,769	5,069	550	310	80	83	2163	2299	249	141	303	314
40	4,908	5,039	560	280	104	110	2226	2286	254	127	394	416
41	5,078	5,232	630	280	112	119	2303	2373	286	127	424	450
42	5,226	5,424	690	280	119	129	2370	2460	313	127	450	488
45	5,363	5,602	640	330	112	120	2433	2541	290	150	424	454
46	5,559	5,824	720	330	122	130	2522	2642	327	150	462	492
47	5,730	6,044	790	330	130	141	2599	2742	358	150	492	534
50	5,713	6,090	750	400	132	147	2591	2762	340	181	500	556
51	5,940	6,283	840	400	143	156	2694	2850	381	181	541	591
52	6,083	6,464	900	400	150	165	2759	2932	408	181	568	625
5A	5,124	—	500	—	123	—	2324	—	227	—	466	—
5B	5,177	—	520	—	126	—	2348	—	236	—	477	—
5C	5,243	—	550	—	129	—	2378	—	249	—	488	—
55	6,257	6,785	870	490	144	161	2838	3078	395	222	545	609
56	6,517	7,007	940	490	156	171	2956	3178	426	222	591	647
57	6,682	7,215	980	490	164	182	3031	3273	445	222	621	689
5F	5,577	—	550	—	133	—	2530	—	249	—	503	—
5G	5,640	—	570	—	137	—	2558	—	259	—	519	—
5H	5,716	—	600	—	141	—	2593	—	272	—	534	—
60	6,719	6,764	940	420	168	182	3048	3068	426	191	636	689
61	6,895	6,949	980	420	176	191	3128	3152	445	191	666	723
62	7,038	7,130	1020	420	183	200	3192	3234	463	191	693	757
65	7,392	7,682	1020	510	183	200	3353	3485	463	231	693	757
66	7,594	7,894	1060	510	193	210	3445	3581	481	231	731	795
67	7,759	8,102	1090	510	201	220	3519	3675	494	231	761	833
70	9,942	10,782	1220	780	241	267	4510	4891	553	354	912	1011
71	10,330	11,211	1340	780	259	286	4686	5085	608	354	980	1083
72	10,632	11,612	1440	780	274	305	4823	5267	653	354	1037	1155
75	10,840	11,854	1365	925	262	291	4917	5377	619	420	992	1102
76	11,289	12,345	1505	925	283	314	5121	5600	683	420	1071	1189
77	11,638	12,803	1625	925	300	335	5279	5807	737	420	1136	1268
80	12,664	12,753	1500	720	327	357	5744	5785	680	327	1238	1351
81	12,998	13,149	1620	720	343	377	5896	5964	735	327	1298	1427
82	13,347	13,545	1730	720	360	397	6054	6144	785	327	1363	1503
85	13,804	14,008	1690	860	354	388	6261	6354	767	390	1340	1469
86	14,191	14,465	1820	860	373	411	6437	6561	826	390	1412	1556
87	14,597	14,923	1940	860	392	434	6621	6769	880	390	1484	1643

*Rigging weights are for standard tubes of standard wall thickness (Turbo-B3 and Spikefin 2, 0.025-in. [0.635 mm] wall).

NOTES:
1. Cooler includes the control panel (ICVC), suction elbow, and 1/2 the distribution piping weight.
2. Condenser includes float valve and sump, discharge elbow, and 1/2 the distribution piping weight.
3. For special tubes, refer to the 19XRV Computer Selection Program.
4. All weights for standard 2-pass NIH (nozzle-in-head) design.

Table 7 — 19XRV Additional Data for Marine Waterboxes*

HEAT EXCHANGER FRAME, PASS	ENGLISH					SI				
	psig	Rigging Weight (lb)		Water Volume (gal)		kPa	Rigging Weight (kg)		Water Volume (L)	
		Cooler	Condenser	Cooler	Condenser		Cooler	Condenser	Cooler	Condenser
FRAME 2, 1 AND 3 PASS	150	730	N/A	84	N/A	1034	331	N/A	318	N/A
FRAME 2, 2 PASS		365	365	42	42		166	166	159	159
FRAME 3, 1 AND 3 PASS		730	N/A	84	N/A		331	N/A	318	N/A
FRAME 3, 2 PASS		365	365	42	42		166	166	159	159
FRAME 4, 1 AND 3 PASS		1888	N/A	109	N/A		856	N/A	412	N/A
FRAME 4, 2 PASS		944	989	54	54		428	449	205	205
FRAME 5, 1 AND 3 PASS		2445	N/A	122	N/A		1109	N/A	462	N/A
FRAME 5, 2 PASS		1223	1195	61	60		555	542	231	226
FRAME 6, 1 AND 3 PASS		2860	N/A	139	N/A		1297	N/A	524	N/A
FRAME 6, 2 PASS		1430	1443	69	69		649	655	262	262
FRAME 7, 1 AND 3 PASS		3970	N/A	309	N/A		1801	N/A	1170	N/A
FRAME 7, 2 PASS		1720	1561	155	123		780	708	585	465
FRAME 8, 1 AND 3 PASS		5048	N/A	364	N/A		2290	N/A	1376	N/A
FRAME 8, 2 PASS		2182	1751	182	141		990	794	688	532
FRAME 2, 1 AND 3 PASS	300	860	N/A	84	N/A	2068	390	N/A	318	N/A
FRAME 2, 2 PASS		430	430	42	42		195	195	159	159
FRAME 3, 1 AND 3 PASS		860	N/A	84	N/A		390	N/A	318	N/A
FRAME 3, 2 PASS		430	430	42	42		195	195	159	159
FRAME 4, 1 AND 3 PASS		2162	N/A	109	N/A		981	N/A	412	N/A
FRAME 4, 2 PASS		1552	1641	47	47		704	744	178	178
FRAME 5, 1 AND 3 PASS		2655	N/A	122	N/A		1204	N/A	462	N/A
FRAME 5, 2 PASS		1965	1909	53	50		891	866	199	190
FRAME 6, 1 AND 3 PASS		3330	N/A	139	N/A		1510	N/A	524	N/A
FRAME 6, 2 PASS		2425	2451	58	58		1100	1112	218	218
FRAME 7, 1 AND 3 PASS		5294	N/A	309	N/A		2401	N/A	1170	N/A
FRAME 7, 2 PASS		4140	4652	146	94		1878	2110	553	356
FRAME 8, 1 AND 3 PASS		6222	N/A	364	N/A		2822	N/A	1376	N/A
FRAME 8, 2 PASS		4952	4559	161	94		2246	2068	609	355

*Add to heat exchanger data for total weights or volumes.

NOTE: For the total weight of a vessel with a marine waterbox, add these values to the heat exchanger weights (or volumes).

Table 8A — 19XRV Cooler Waterbox Cover Weights — English (lb)

HEAT EXCHANGER	WATERBOX DESCRIPTION	FRAME 2		FRAME 3	
		Standard Nozzles	Flanged	Standard Nozzles	Flanged
COOLER	NIH, 1 Pass Cover, 150 psig	282	318	282	318
	NIH, 2 Pass Cover, 150 psig	287	340	287	340
	NIH, 3 Pass Cover, 150 psig	294	310	294	310
	NIH Plain End Cover, 150 psig	243	243	243	243
	MWB End Cover, 150 psig	315	315	315	315
	MWB Return Cover, 150 psig	243	243	243	243
	NIH, 1 Pass Cover, 300 psig	411	486	411	486
	NIH, 2 Pass Cover, 300 psig	411	518	411	518
	NIH, 3 Pass Cover, 300 psig	433	468	433	468
	NIH Plain End Cover, 300 psig	291	291	291	291
	MWB End Cover, 300 psig	619	619	619	619
	MWB Return Cover, 300 psig	445	445	445	445

HEAT EXCHANGER	WATERBOX DESCRIPTION	FRAME 4		FRAME 5		FRAME 6	
		Standard Nozzles	Flanged	Standard Nozzles	Flanged	Standard Nozzles	Flanged
COOLER	NIH, 1 Pass Cover, 150 psig	148	185	168	229	187	223
	NIH, 2 Pass Cover, 150 psig	202	256	222	276	258	331
	NIH, 3 Pass Cover, 150 psig	472	488	617	634	765	791
	NIH Plain End Cover, 150 psig	138	138	154	154	172	172
	MWB End Cover, 150 psig	314	314	390	390	487	487
	MWB Return Cover, 150 psig	138	138	154	154	172	172
	NIH, 1 Pass Cover, 300 psig	633	709	764	840	978	1053
	NIH, 2 Pass Cover, 300 psig	626	733	760	867	927	1078
	NIH, 3 Pass Cover, 300 psig	660	694	795	830	997	1050
	NIH/MWB End Cover, 300 psig	522	522	658	658	834	834

HEAT EXCHANGER	WATERBOX DESCRIPTION	FRAME 7		FRAME 8	
		Standard Nozzles	Flanged	Standard Nozzles	Flanged
COOLER	NIH, 1 Pass Cover, 150 psig	329	441	417	494
	NIH, 2 Pass Cover, 150 psig	426	541	531	685
	NIH, 3 Pass Cover, 150 psig	1250	1291	1629	1687
	NIH Plain End Cover, 150 psig	315	315	404	404
	MWB End Cover, 150 psig	844	844	1339	1339
	MWB Return Cover, 150 psig	315	315	404	404
	NIH, 1 Pass Cover, 300 psig	1712	1883	2359	2523
	NIH, 2 Pass Cover, 300 psig	1662	1908	2369	2599
	NIH, 3 Pass Cover, 300 psig	1724	1807	2353	2516
	NIH/MWB End Cover, 300 psig	1378	1378	1951	1951

LEGEND

MWB — Marine Waterbox
NIH — Nozzle-in-Head

NOTE: Weight for NIH 2-Pass Cover, 150 psig is included in the heat exchanger weights shown in Table 6.

Table 8B — 19XRV Cooler Waterbox Cover Weights — SI (kg)

HEAT EXCHANGER	WATERBOX DESCRIPTION	FRAME 2		FRAME 3	
		Standard Nozzles	Flanged	Standard Nozzles	Flanged
COOLER	NIH, 1 Pass Cover, 150 psig	128	144	128	144
	NIH, 2 Pass Cover, 150 psig	130	154	130	154
	NIH, 3 Pass Cover, 150 psig	133	141	133	141
	NIH Plain End Cover, 150 psig	110	110	110	110
	MWB End Cover, 150 psig	143	143	143	143
	MWB Return Cover, 150 psig	110	110	110	110
	NIH, 1 Pass Cover, 300 psig	186	220	186	220
	NIH, 2 Pass Cover, 300 psig	186	235	186	235
	NIH, 3 Pass Cover, 300 psig	196	212	196	212
	NIH Plain End Cover, 300 psig	132	132	132	132
	MWB End Cover, 300 psig	281	281	281	281
	MWB Return Cover, 300 psig	202	202	202	202

HEAT EXCHANGER	WATERBOX DESCRIPTION	FRAME 4		FRAME 5		FRAME 6	
		Standard Nozzles	Flanged	Standard Nozzles	Flanged	Standard Nozzles	Flanged
COOLER	NIH, 1 Pass Cover, 150 psig	67	84	76	104	85	101
	NIH, 2 Pass Cover, 150 psig	92	116	101	125	117	150
	NIH, 3 Pass Cover, 150 psig	214	221	280	288	347	359
	NIH Plain End Cover, 150 psig	63	63	70	70	78	78
	MWB End Cover, 150 psig	142	142	177	177	221	221
	MWB Return Cover, 150 psig	63	63	70	70	78	78
	NIH, 1 Pass Cover, 300 psig	287	322	347	381	444	478
	NIH, 2 Pass Cover, 300 psig	284	332	345	393	420	489
	NIH, 3 Pass Cover, 300 psig	299	315	361	376	452	476
	NIH/MWB End Cover, 300 psig	237	237	299	298	378	378

HEAT EXCHANGER	WATERBOX DESCRIPTION	FRAME 7		FRAME 8	
		Standard Nozzles	Flanged	Standard Nozzles	Flanged
COOLER	NIH, 1 Pass Cover, 150 psig	149	200	189	224
	NIH, 2 Pass Cover, 150 psig	193	245	241	311
	NIH, 3 Pass Cover, 150 psig	567	586	739	765
	NIH Plain End Cover, 150 psig	143	143	183	183
	MWB End Cover, 150 psig	383	383	607	607
	MWB Return Cover, 150 psig	143	143	183	183
	NIH, 1 Pass Cover, 300 psig	777	854	1070	1144
	NIH, 2 Pass Cover, 300 psig	754	865	1075	1179
	NIH, 3 Pass Cover, 300 psig	782	820	1067	1141
	NIH/MWB End Cover, 300 psig	625	625	885	885

LEGEND

MWB — Marine Waterbox
NIH — Nozzle-in-Head

NOTE: Weight for NIH 2-Pass Cover, 150 psig is included in the heat exchanger weights shown in Table 6.

Table 9A — 19XRV Condenser Waterbox Cover Weights — English (lb)

HEAT EXCHANGER	WATERBOX DESCRIPTION	FRAME 2		FRAME 3	
		Standard Nozzles	Flanged	Standard Nozzles	Flanged
CONDENSER	NIH, 1 Pass Cover, 150 psig	282	318	282	318
	NIH, 2 Pass Cover, 150 psig	287	340	287	340
	NIH, 3 Pass Cover, 150 psig	294	310	294	310
	NIH Plain End Cover, 150 psig	225	225	225	225
	MWB End Cover, 150 psig	234	234	234	234
	MWB Return Cover, 150 psig	225	225	225	225
	NIH, 1 Pass Cover, 300 psig	411	486	411	486
	NIH, 2 Pass Cover, 300 psig	411	518	411	518
	NIH, 3 Pass Cover, 300 psig	433	468	433	468
	NIH Plain End Cover, 300 psig	270	270	270	270
	MWB End Cover, 300 psig	474	474	474	474
	MWB Return Cover, 300 psig	359	359	359	359

HEAT EXCHANGER	WATERBOX DESCRIPTION	FRAME 4		FRAME 5		FRAME 6	
		Standard Nozzles	Flanged	Standard Nozzles	Flanged	Standard Nozzles	Flanged
CONDENSER	NIH, 1 Pass Cover, 150 psig	148	185	168	229	187	223
	NIH, 2 Pass Cover, 150 psig	191	245	224	298	245	318
	NIH, 3 Pass Cover, 150 psig	503	519	628	655	772	799
	NIH Plain End Cover, 150 psig	138	138	154	154	172	172
	MWB End Cover, 150 psig	314	314	390	390	487	487
	MWB Return Cover, 150 psig	138	138	154	154	172	172
	NIH, 1 Pass Cover, 300 psig	633	709	764	840	978	1053
	NIH, 2 Pass Cover, 300 psig	622	729	727	878	926	1077
	NIH, 3 Pass Cover, 300 psig	655	689	785	838	995	1049
	NIH/MWB End Cover, 300 psig	522	522	658	658	834	834

HEAT EXCHANGER	WATERBOX DESCRIPTION	FRAME 7		FRAME 8	
		Standard Nozzles	Flanged	Standard Nozzles	Flanged
CONDENSER	NIH, 1 Pass Cover, 150 psig	329	441	417	494
	NIH, 2 Pass Cover, 150 psig	404	520	508	662
	NIH, 3 Pass Cover, 150 psig	1222	1218	1469	1527
	NIH Plain End Cover, 150 psig	315	315	404	404
	MWB End Cover, 150 psig	781	781	1007	1007
	Bolt On MWB End Cover, 150 PSI	700	700	1307	1307
	MWB Return Cover, 150 psig	315	315	404	404
	NIH, 1 Pass Cover, 300 psig	1690	1851	1986	2151
	NIH, 2 Pass Cover, 300 psig	1628	1862	1893	2222
	NIH, 3 Pass Cover, 300 psig	1714	1831	1993	2112
	NIH/MWB End Cover, 300 psig	1276	1276	1675	1675

LEGEND

MWB — Marine Waterbox
NIH — Nozzle-in-Head

NOTE: Weight for NIH 2-Pass Cover, 150 psig is included in the heat exchanger weights shown in Table 6.

Table 9B — 19XRV Condenser Waterbox Cover Weights — SI (kg)

HEAT EXCHANGER	WATERBOX DESCRIPTION	FRAME 2		FRAME 3	
		Standard Nozzles	Flanged	Standard Nozzles	Flanged
CONDENSER	NIH, 1 Pass Cover, 150 psig	128	144	128	144
	NIH, 2 Pass Cover, 150 psig	130	154	130	154
	NIH, 3 Pass Cover, 150 psig	133	141	133	141
	NIH Plain End Cover, 150 psig	102	102	102	102
	MWB End Cover, 150 psig	106	106	106	106
	MWB Return Cover, 150 psig	102	102	102	102
	NIH, 1 Pass Cover, 300 psig	186	220	186	220
	NIH, 2 Pass Cover, 300 psig	186	235	186	235
	NIH, 3 Pass Cover, 300 psig	196	212	196	212
	NIH Plain End Cover, 300 psig	122	122	122	122
	MWB End Cover, 300 psig	215	215	215	215
	MWB Return Cover, 300 psig	163	163	163	163

HEAT EXCHANGER	WATERBOX DESCRIPTION	FRAME 4		FRAME 5		FRAME 6	
		Standard Nozzles	Flanged	Standard Nozzles	Flanged	Standard Nozzles	Flanged
CONDENSER	NIH, 1 Pass Cover, 150 psig	67	84	76	104	85	101
	NIH, 2 Pass Cover, 150 psig	87	111	102	135	111	144
	NIH, 3 Pass Cover, 150 psig	228	235	285	297	350	362
	NIH Plain End Cover, 150 psig	63	63	70	70	78	78
	MWB End Cover, 150 psig	142	142	177	177	221	221
	MWB Return Cover, 150 psig	63	63	70	70	78	78
	NIH, 1 Pass Cover, 300 psig	287	322	347	381	444	478
	NIH, 2 Pass Cover, 300 psig	282	331	330	398	420	489
	NIH, 3 Pass Cover, 300 psig	297	313	356	380	451	476
	NIH/MWB End Cover, 300 psig	237	237	298	298	378	378

HEAT EXCHANGER	WATERBOX DESCRIPTION	FRAME 7		FRAME 8	
		Standard Nozzles	Flanged	Standard Nozzles	Flanged
CONDENSER	NIH, 1 Pass Cover, 150 psig	149	200	189	224
	NIH, 2 Pass Cover, 150 psig	183	236	230	300
	NIH, 3 Pass Cover, 150 psig	554	552	666	693
	NIH Plain End Cover, 150 psig	143	143	183	183
	MWB End Cover, 150 psig	354	354	457	457
	Bolt On MWB End Cover, 150 PSI	318	318	593	593
	MWB Return Cover, 150 psig	143	143	183	183
	NIH, 1 Pass Cover, 300 psig	767	840	901	976
	NIH, 2 Pass Cover, 300 psig	738	845	859	1008
	NIH, 3 Pass Cover, 300 psig	777	831	904	958
	NIH/MWB End Cover, 300 psig	579	579	760	760

LEGEND

MWB — Marine Waterbox
NIH — Nozzle-in-Head

NOTE: Weight for NIH 2-Pass Cover, 150 psig is included in the heat exchanger weights shown in Table 6.

Special Instructions to Disassemble a Chiller with an 1169A VFD

⚠ WARNING

Do not attempt to disconnect flanges while the machine is under pressure. Failure to relieve pressure can result in personal injury or damage to the unit.

NOTE: Label each wire before removal when wiring must be disconnected. Clip all wire ties necessary when removing pressure and temperature sensors. Disconnect all pressure transducer wires at the sensor. Temperature sensors cannot be disconnected from their cables; remove temperature sensors from their thermowells and label as required.

⚠ WARNING

Do not separate the cooler and condenser until the 1169A VFD enclosure is removed. The 1169A VFD/cooler assembly has a high center of gravity and may tip over when the cooler and condenser are separated which could result in equipment damage and/or serious personal injury. See Fig. 12.

Remove the VFD Enclosure From the Condenser — Confirm that the power supply disconnect is open and all safety procedures are observed before removing the VFD. This procedure minimizes the number of sensors and cables that need to be disconnected.

⚠ WARNING

Do not attempt to remove the VFD without first closing the VFD refrigerant isolation valves. Failure to do so during VFD removal will result in an uncontrolled refrigerant leak. A refrigerant leak can damage the unit as well as displace oxygen, causing asphyxiation.

1. Close the 2 filter drier isolation valves (Fig. 13) and the VFD refrigerant drain isolation valve. Evacuate the VFD coldplate through the Schrader valve (Fig. 13) next to the filter/drier.
2. Remove any conduits that bring power to the VFD. See Fig. 14.
3. Remove the terminal box transition piece. See Fig. 15.
4. Label and disconnect the motor leads from the motor or VFD terminals (Fig. 16 and 17). Note the position of the motor terminal cable lugs so they can be reinstalled with sufficient clearance away from the surrounding structure. When reinstalling the VFD, assemble the back panel, floor, and tray of the motor terminal box transition piece prior to installing the motor leads.

⚠ CAUTION

Use a backing wrench when removing nuts and bolts that secure the motor leads to the VFD bus bars to prevent damage to the bus bar insulators.

5. Remove the motor ground lead. Note the position of the ground lead so it can be reinstalled with sufficient clearance away from the surrounding structure.
6. Disconnect the power cables, interlock cable, and communication cable between the VFD enclosure and the power panel. See Fig. 14.
7. Remove the access panels on the back of the VFD enclosure and disconnect the VFD cooling lines (Fig. 18). Cover all openings.

Lifting the VFD — Care should be used to prevent damage due to dropping or jolting when moving the VFD enclosure. A fork truck or similar means of lifting and transporting may be used. Sling the VFD in a manner that will equalize the load at the pickup joints. Use a spreader bar if the angle of the sling is less than 45 degrees relative to the horizontal. Do not jolt while lifting.

NOTE: The two lifting brackets for the 1169A VFD are not installed when they are shipped. They are bolted upside down to the bottom of the VFD support shelf. They must be unbolted and installed on the top of the VFD enclosure with ten $^1/_2$-13 x 1.25 in. long grade 5 bolts.

Use the following procedure to lift the control center:

1. Attach a sling to the four lifting holes in the installed lifting brackets. Make certain that the angle of the sling is not less than 45 degrees relative to horizontal.
2. Using an overhead or portable hoist (minimum 2 ton rated capacity), attach a free-fall chain to the sling secured drive. Take up any slack in the chain. See Fig. 19.
3. The VFD support assembly can be removed from the condenser if it is necessary to reduce the width of the condenser assembly. The eight $1^1/_8$-7 bolts that secure the VFD support assembly to the tubesheets should be torqued to 750 ft-lb when the support assembly is reinstalled. See Fig. 20.

NOTE: To reassemble, follow steps in reverse order. Connect sensors and cables after major components have been secured to reduce the risk of damaging them.

NOTE: If overhead space is limited following reinstallation of the VFD enclosure, the VFD enclosure lifting brackets (Fig. 19) may be removed from the top of the VFD and fastened to the bottom of the VFD support shelf (Fig. 21). Reinstall the $^1/_2$-13 x 1.25 in. long grade 5 bolts into the top of the VFD enclosure to prevent debris from falling into the VFD.

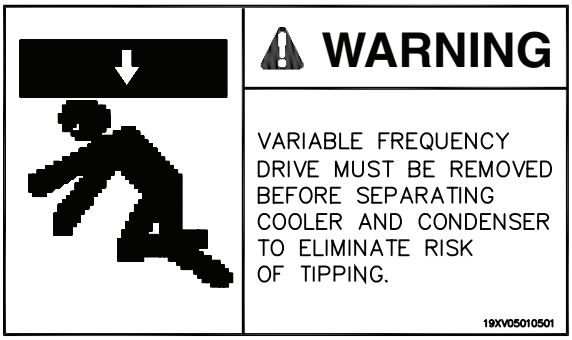


Fig. 12 — 1169A VFD Removal Warning Label

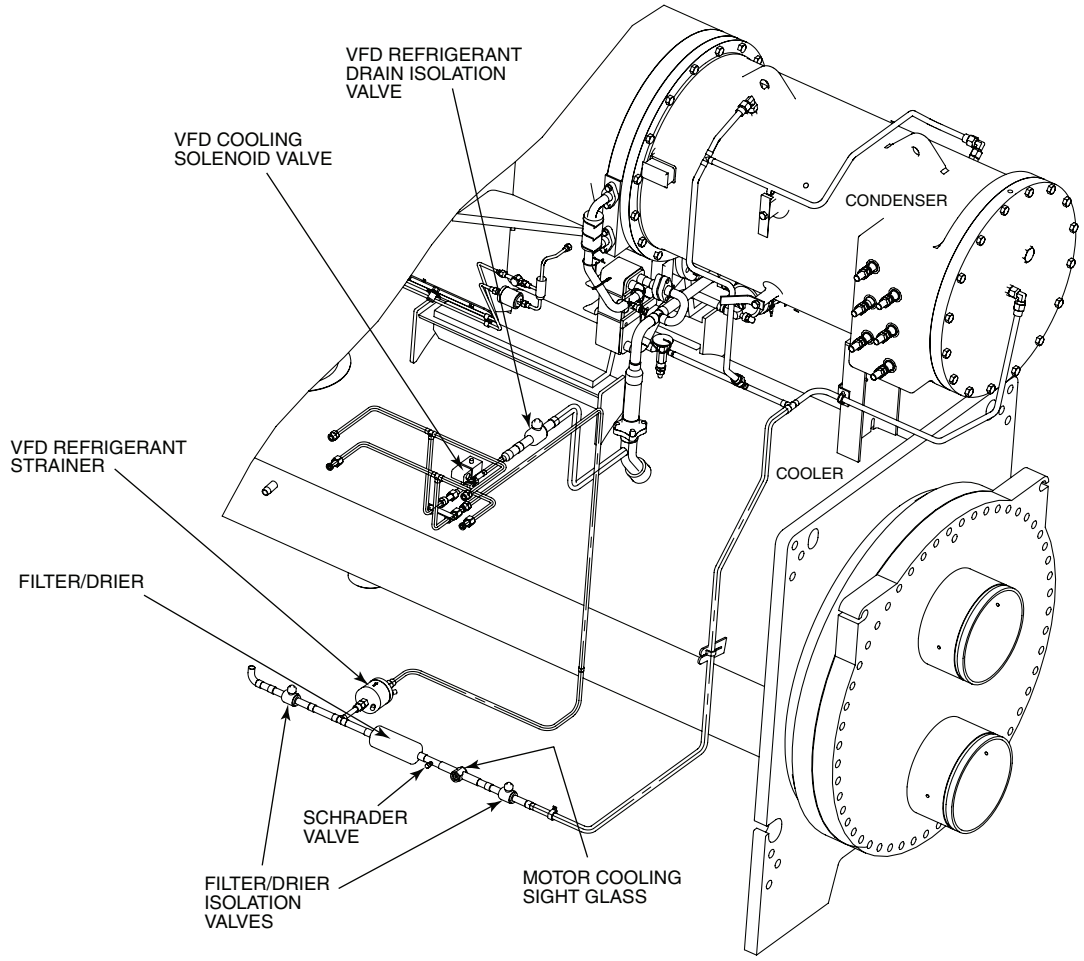


Fig. 13 — 1169A VFD Isolation Valves

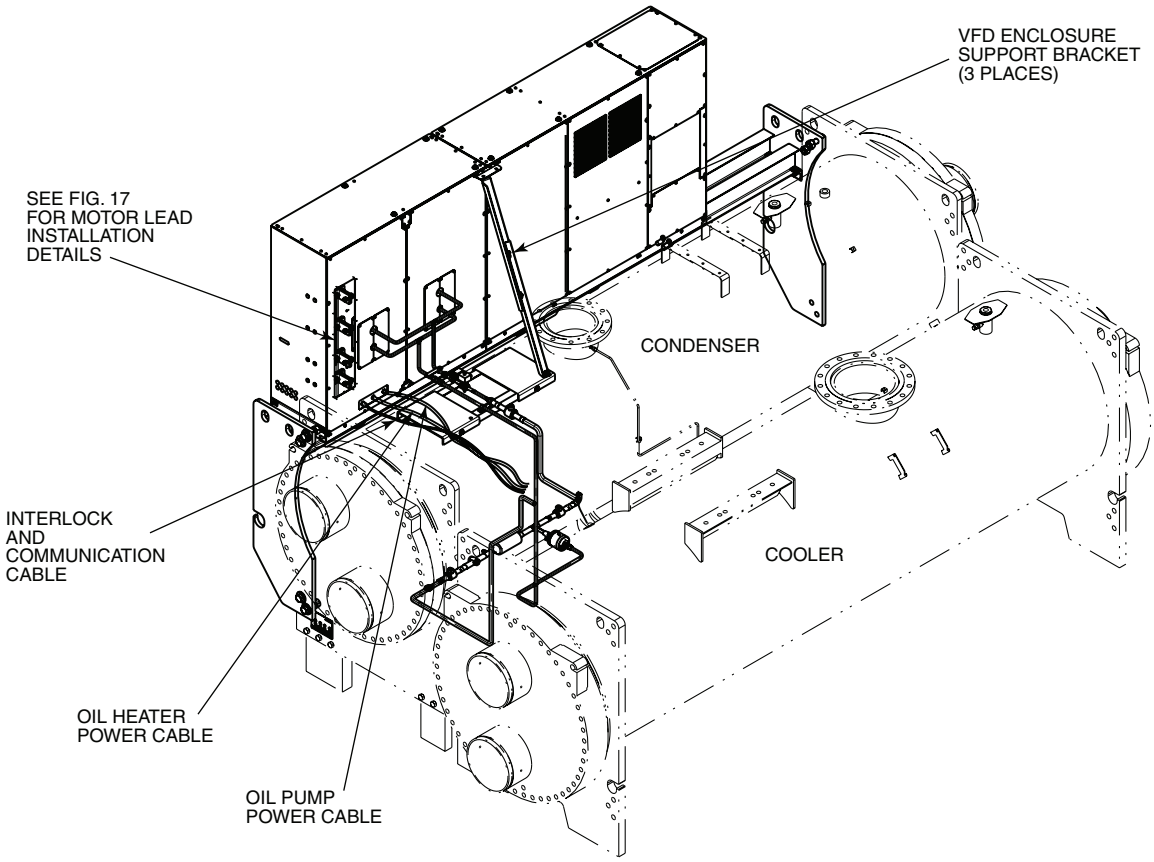


Fig. 14 — 1169A VFD Installation

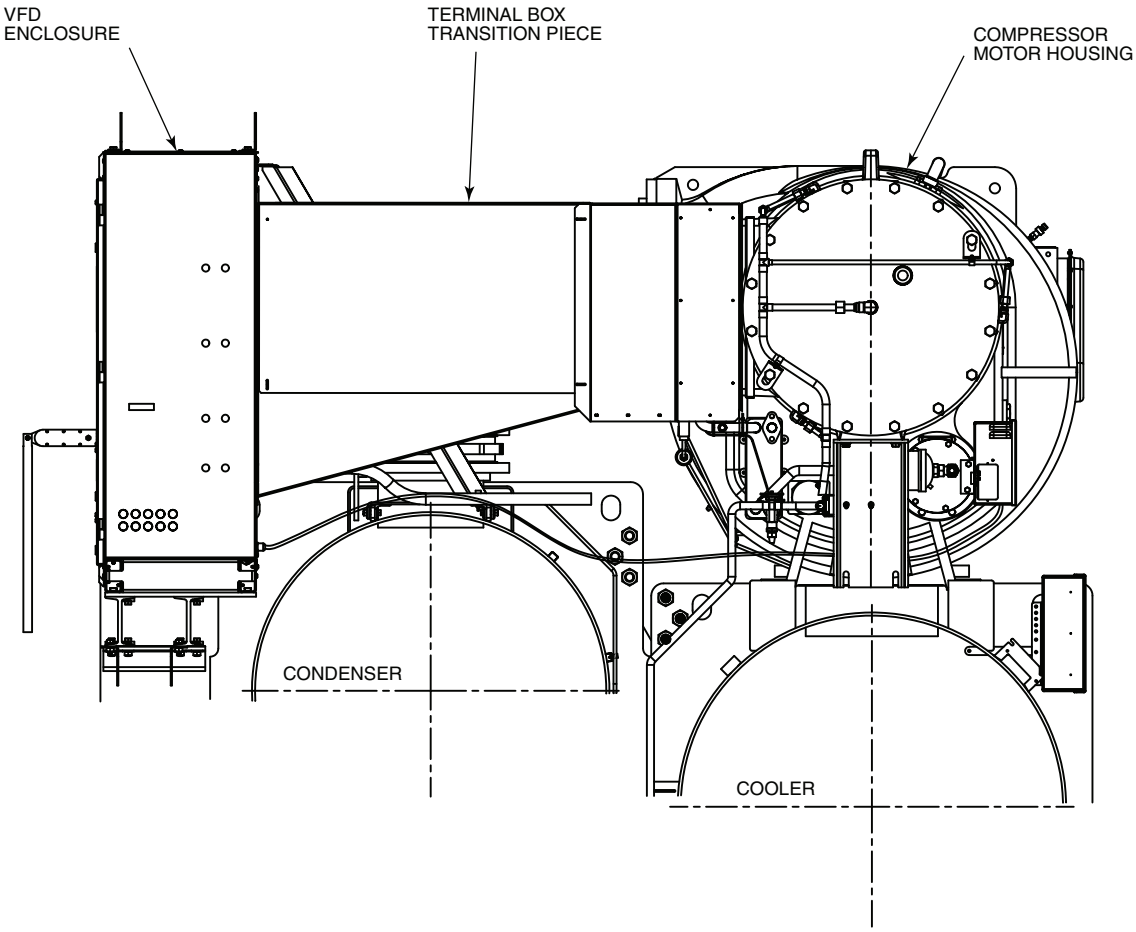
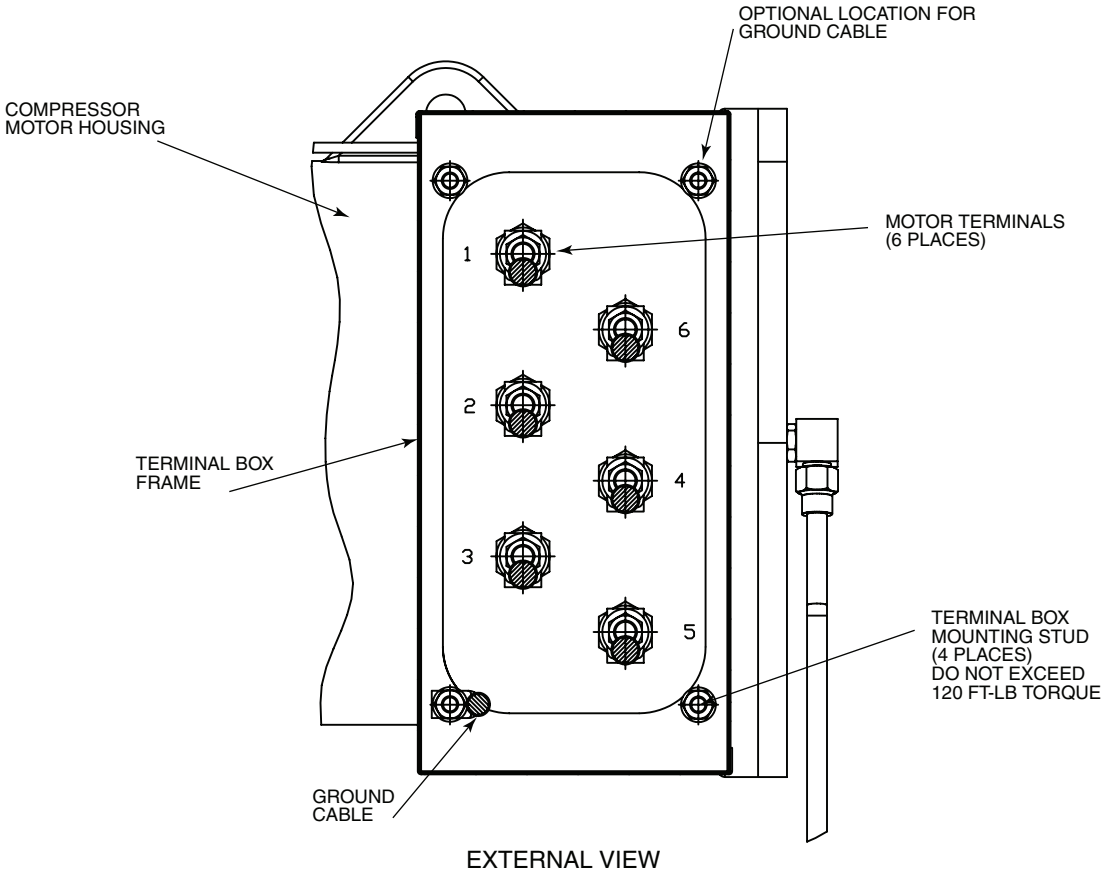
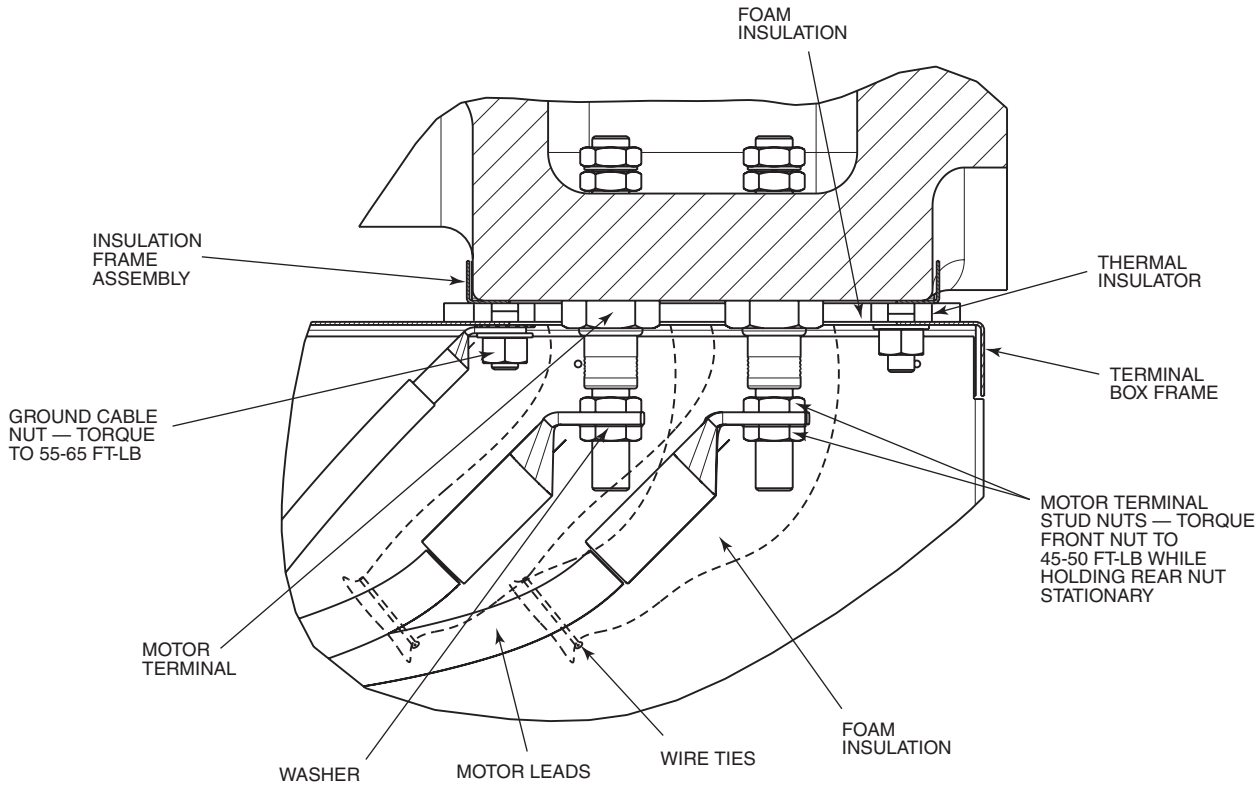


Fig. 15 — 1169A VFD Motor Terminal Box Transition Piece



EXTERNAL VIEW



CROSS-SECTION VIEW

Fig. 16 — Compressor Motor Terminals (Typical)

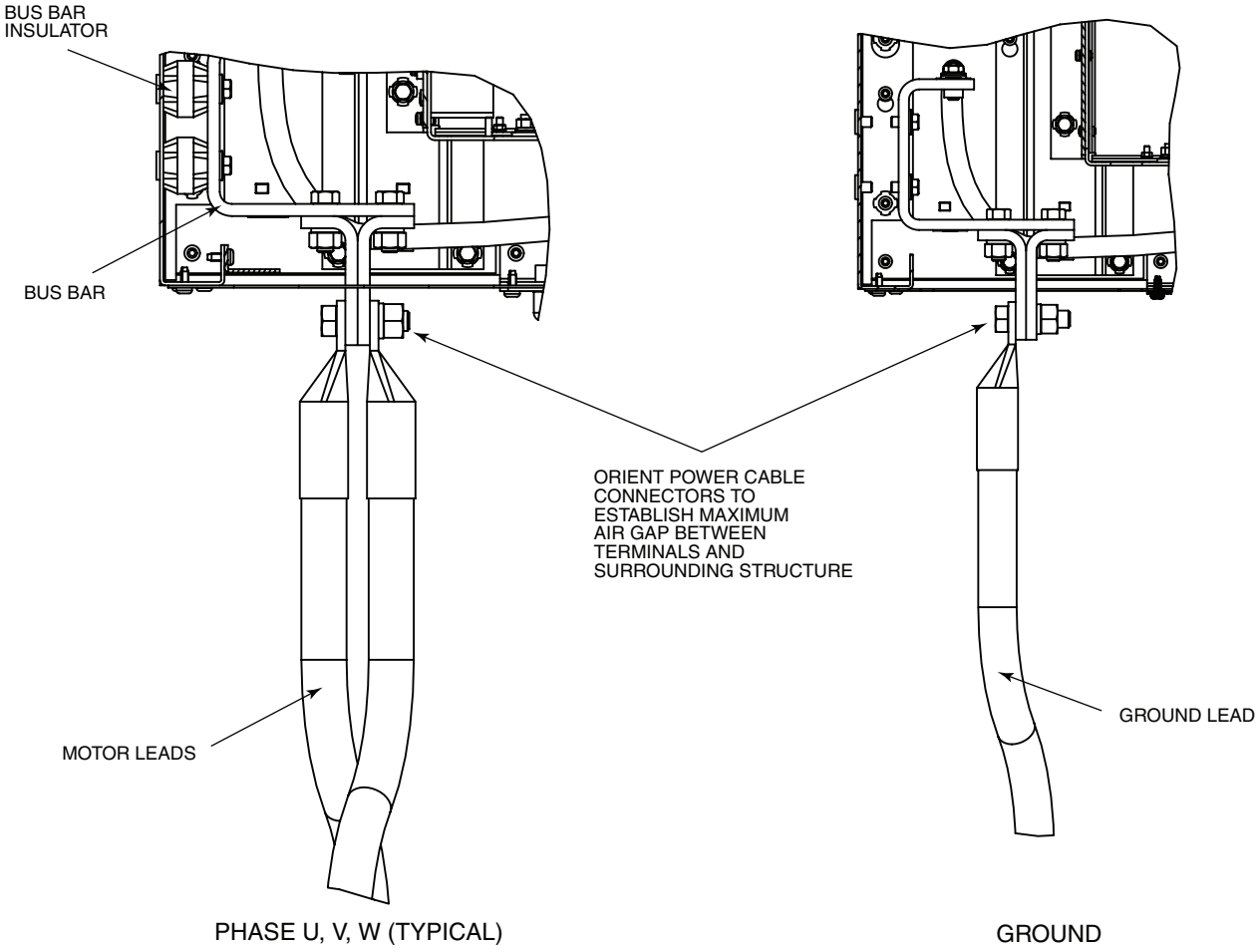


Fig. 17 — VFD Motor Lead Installation (View Looking Down)

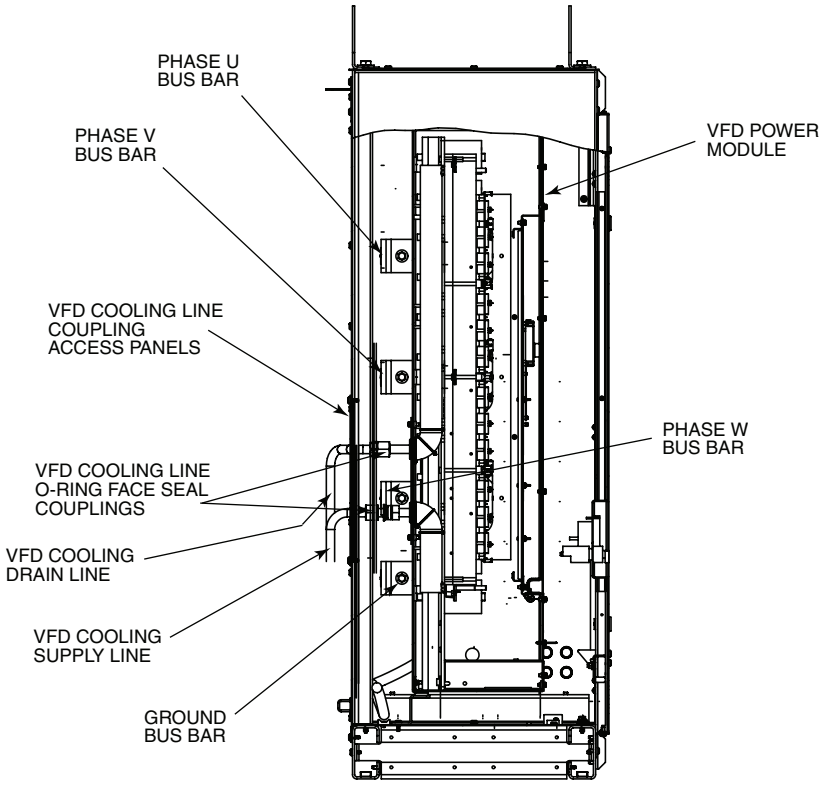


Fig. 18 — 1169A VFD Refrigerant Cooling Lines

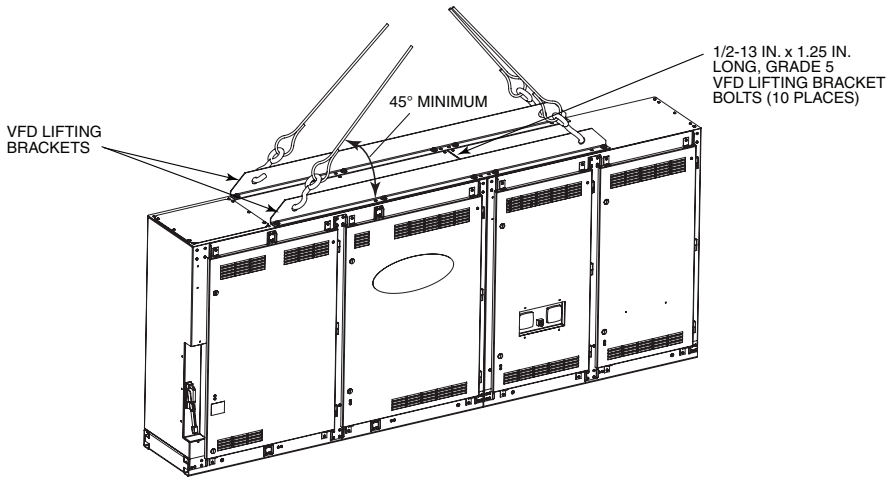


Fig. 19 — 1169A VFD Enclosure Lifting Points

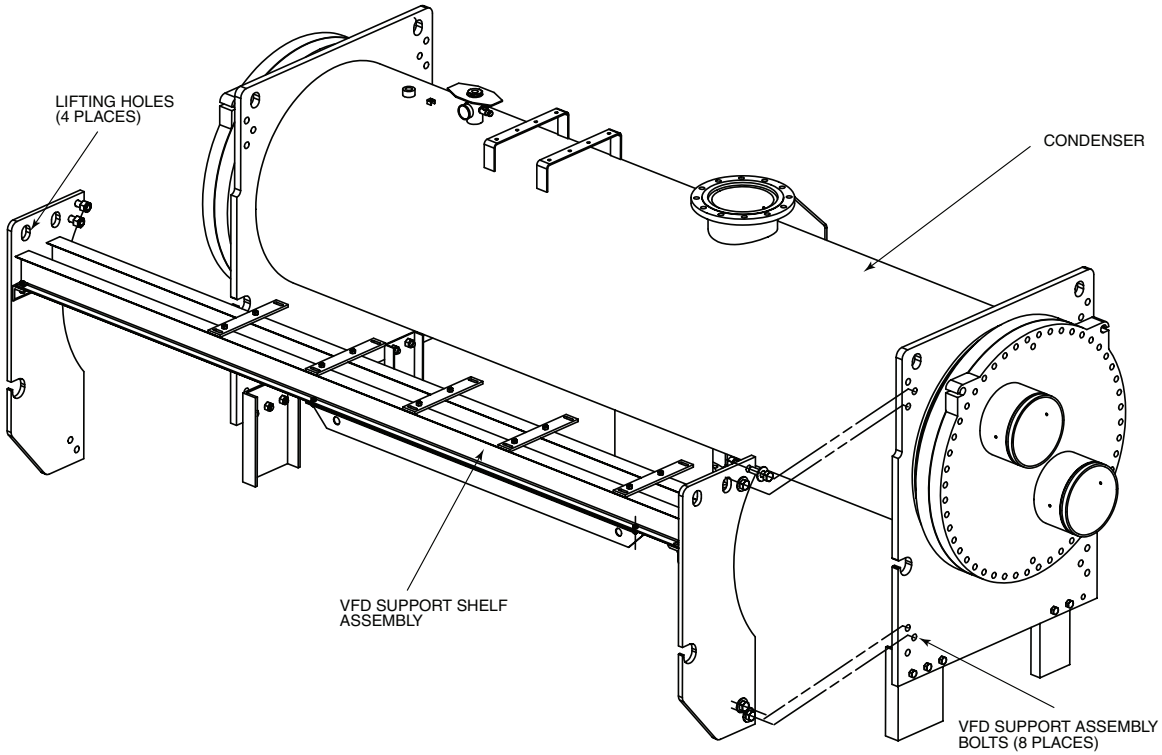


Fig. 20 — 1169A Support Assembly Installation

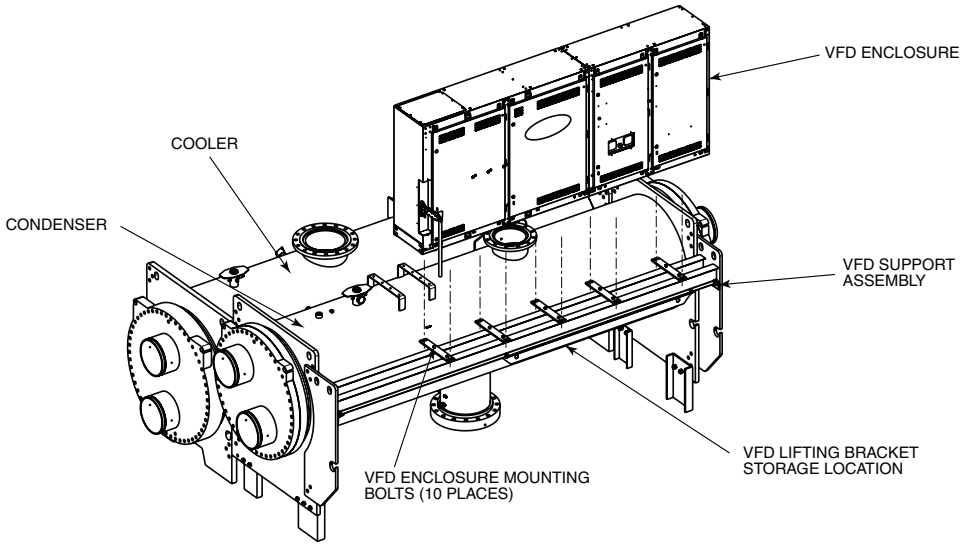


Fig. 21 — 1169A VFD Enclosure Installation

VFD Installation

1. Install terminal box frame mounting studs into tapped holes using short threaded end. Do not exceed 120 ft-lb (163 N-m). See Fig. 16.
2. Install thermal insulators, insulation frame assembly, and terminal box frame prior to attaching motor power cables. Assemble the back panel, floor, and tray of the motor terminal box transition piece before installing the motor leads.
3. Tighten Frame 2 and Frame 3 motor terminals into the motor housing, with 25 to 40 ft-lb of torque. Tighten Frame 4 and Frame 5 motor terminals into the motor housing with 50 to 75 ft-lb of torque.
4. There may be 1 or 2 motor power cables per terminal identified as T1, T2, and T3. Position motor end lugs on terminal studs with Belleville washer located against the front terminal lug with the convex side facing toward the front terminal nut. Clinch the two cables together with wire ties before tightening terminal nuts. Install front terminal nut finger tight. Hold rear terminal nut stationary while tightening front terminal nut to 45 to 50 ft-lb (61 to 68 N-m). See Fig. 16.
5. Check all terminal connections for proper installation.

IMPORTANT: Do not insulate terminals until wiring arrangement has been checked and approved by Carrier start-up personnel. Motor terminals must be insulated in acceptance with national and local electrical codes.

Insulate Motor Terminals and Lead Wire Ends — Locate heat shrink tubing (RCD P/N LF33MM114) over power connections so that they are completely covered and tubing is against motor housing. Shrink into position. Slide foam tubing (3 in. inner diameter closed cell vinyl, neoprene, or nitrile foam) part way over the heat shrink tubing. Apply adhesive for closed cell foam insulation to motor side end of the foam tubing and push tubing the rest of the way over the terminal and against the sheet insulation on the motor side. Secure the opposite end of the foam tubing with a wire tie as shown in Fig. 16.

Alternate Insulation for Motor Terminals and Lead Wire Ends — Insulate compressor motor terminals, lead wire ends, and electrical wires to prevent moisture condensation and electrical arcing. Obtain Carrier approved insulation material from RCD (Replacement Components Division) consisting of 3 rolls of insulation putty and one roll of vinyl tape.

a. Insulate each terminal by wrapping with one layer of insulation putty (RCD P/N 19EA411-1102).
b. Overwrap putty with 4 layers of vinyl tape.

6. Orient PE/ground lug as shown in Fig. 16. Assemble internal/external tooth lock washer between the terminal box frame and the PE/ground cable. Torque PE/ground lug nut to 55 to 65 ft-lb (75 to 89 N-m).
7. Complete assembly of the motor terminal box transition piece after all power and ground leads are installed. The motor terminal box transition piece must be adjusted to completely cover the opening on the back of the VFD enclosure. See Fig. 15.
8. Install O-rings on VFD refrigerant connections using silicone grease. Tighten connector using two wrenches to 27 to 33 ft-lb (37 to 45 N-m). See Fig. 18.
9. Evacuate all piping between the VFD and the VFD isolation valves after assembly and tightening of VFD fittings. When dehydration/evacuation is complete, equalize VFD piping pressure with machine pressure if machine is charged with refrigerant. See Fig. 13.

Install Machine Supports

INSTALL STANDARD ISOLATION — Figures 22 and 23 show the position of support plates and shear flex pads, which together form the standard machine support system.

INSTALL ACCESSORY ISOLATION (if required) — Uneven floors or other considerations may dictate the use of accessory soleplates (supplied by Carrier for field installation) and leveling pads. See Fig. 22 and 24.

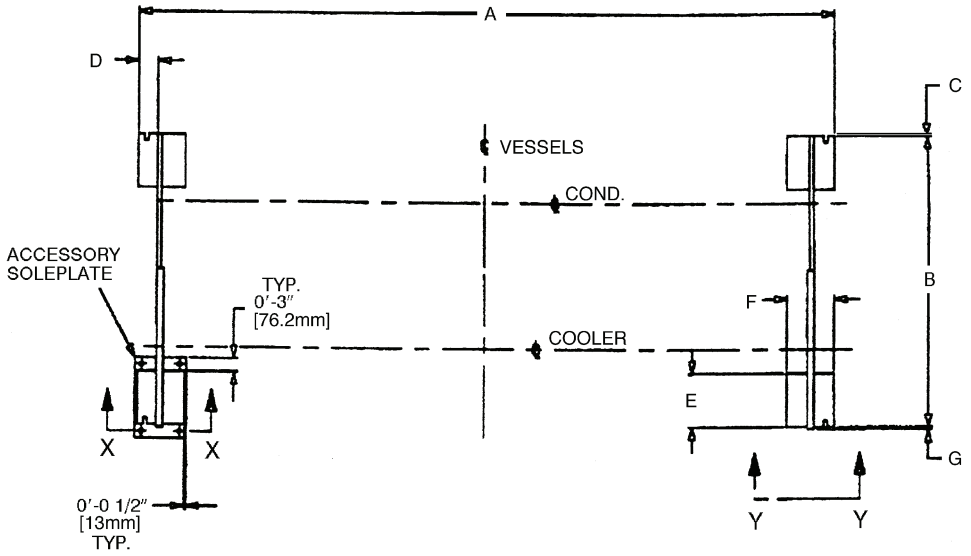
Level machine by using jacking screws in isolation soleplates. Use a level at least 24-in. (600 mm) long.

For adequate and long lasting machine support, proper grout selection and placement is essential. Carrier recommends that only pre-mixed, epoxy type, non-shrinking grout be used for machine installation. Follow manufacturer's instructions in applying grout.

1. Check machine location prints for required grout thickness.
2. Carefully wax jacking screws for easy removal from grout.
3. Grout must extend above the base of the soleplate and there must be no voids in grout beneath the plates.
4. Allow grout to set and harden, per manufacturer's instructions, before starting machine.
5. Remove jacking screws from leveling pads after grout has hardened.

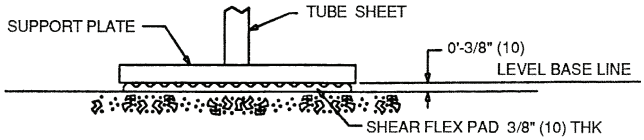
INSTALL SPRING ISOLATION — Spring isolation may be purchased as an accessory from Carrier for field installation. It may also be field supplied and installed. Spring isolators may be placed directly under machine support plates or located under machine soleplates. See Fig. 25. Consult job data for specific arrangement. Low profile spring isolation assemblies can be field supplied to keep the machine at a convenient working height.

Obtain specific details on spring mounting and machine weight distribution from job data. Also, check job data for methods to support and isolate pipes that are attached to spring isolated machines.



19XRV HEAT EXCHANGER SIZE	DIMENSIONS													
	A		B		C		D		E		F		G	
	ft-in.	mm	ft-in.	mm	ft-in.	mm	ft-in.	mm	ft-in.	mm	ft-in.	mm	ft-in.	mm
20-22	10- 7 1/4	3232	5- 4 1/4	1632	0-1	25	0-3 5/8	92	1- 3 1/4	387	0-9	229	0-1/2	13
30-32	12-10 3/4	3931	5- 5 1/4	1657	0	0	0-3 5/8	92	1- 3 1/4	387	0-9	229	0-1/2	13
35-37	14- 7 1/4	4451	5- 5 1/4	1657	0	0	0-3 5/8	92	1- 3 1/4	387	0-9	229	0-1/2	13
40-42	12-10 3/4	3931	6- 0	1829	0-1 1/2	38	0-3 5/8	92	1- 3 1/4	387	0-9	229	0-1/2	13
45-47	14- 7 1/4	4451	6- 0	1829	0-1 1/2	38	0-3 5/8	92	1- 3 1/4	387	0-9	229	0-1/2	13
50-52, 5A-5C	12-10 3/4	3931	6- 5 1/2	1969	0-1/2	13	0-3 5/8	92	1- 3 1/4	387	0-9	229	0-1/2	13
55-57, 5F-5H	14- 7 1/4	4451	6- 5 1/2	1969	0-1/2	13	0-3 5/8	92	1- 3 1/4	387	0-9	229	0-1/2	13
60-62	12-10 3/4	3931	6- 9 1/2	2070	0-1/2	13	0-3 5/8	92	1- 3 1/4	387	0-9	229	0-1/2	13
65-67	14- 7 1/4	4451	6- 9 1/2	2070	0-1/2	13	0-3 5/8	92	1- 3 1/4	387	0-9	229	0-1/2	13
70-72	15- 1 7/8	4620	7-10 1/2	2401	0-1/4	6	0-6 15/16	176	1-10	559	1-4	406	0-3/4	19
75-77	17- 1 7/8	5230	7-10 1/2	2401	0-1/4	6	0-6 15/16	176	1-10	559	1-4	406	0-3/4	19
80-82	15- 1 7/8	4620	8- 9 3/4	2686	0-15/16	24	0-6 15/16	176	1-10	559	1-4	406	0-1/16	2
85-87	17- 1 7/8	5230	8- 9 3/4	2686	0-15/16	24	0-6 15/16	176	1-10	559	1-4	406	0-1/16	2

Fig. 22 — 19XRV Machine Footprint

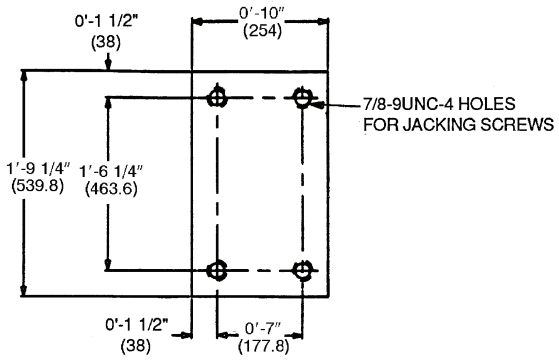


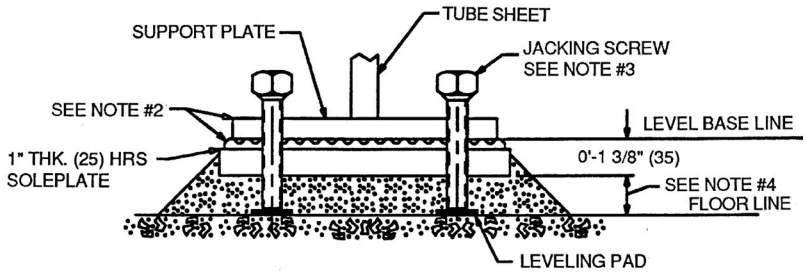
VIEW Y-Y

NOTES:
1. Dimensions in ( ) are in millimeters.
2. Isolation package includes 4 shear flex pads.

Fig. 23 — Standard Isolation

ACCESSORY SOLEPLATE DETAIL





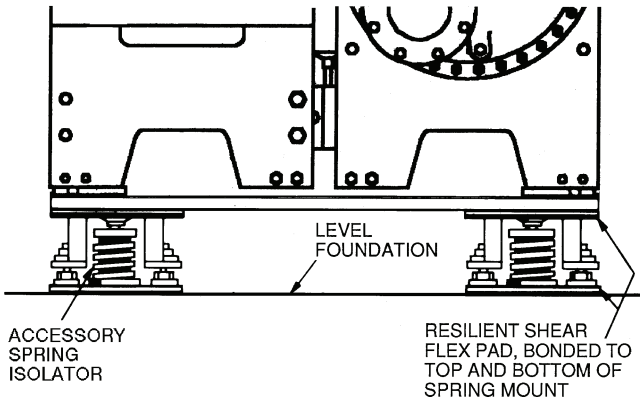
VIEW X-X

LEGEND

HRS — Hot Rolled Steel

NOTES:
1. Dimensions in ( ) are in millimeters.
2. Accessory (Carrier supplied, field installed) soleplate package includes 4 soleplates, 16 jacking screws and leveling pads.
3. Jacking screws to be removed after grout has set.
4. Thickness of grout will vary, depending on the amount necessary to level chiller. Use only pre-mixed non-shrinking grout, Ceilcote 748 or Chemrex Embeco 636 Plus Grout 0′-1 1/2″ (38.1) to 0′-2 1/4″ (57) thick.

Fig. 24 — Accessory Isolation



NOTE: The accessory spring isolators are supplied by Carrier for installation in the field.

Fig. 25 — 19XRV Accessory Spring Isolation (Shown with Accessory Soleplates)

Connect Piping

INSTALL WATER PIPING TO HEAT EXCHANGERS — Refer to Table 10 for nozzle sizes. Install piping using job data, piping drawings, and procedures outlined below. A typical piping installation is shown in Fig. 26.

⚠ CAUTION

Factory-supplied insulation is not flammable but can be damaged by welding sparks and open flame. Protect insulation with a wet canvas cover.

⚠ CAUTION

Remove chilled water, condenser water, and water pressure sensors before welding connecting piping to water nozzles. Refer to Fig. 10. Replace sensors after welding is complete.

1. Offset pipe flanges to permit removal of waterbox cover for maintenance and to provide clearance for pipe cleaning. No flanges are necessary with marine waterbox option; however, water piping should not cross in front of the waterbox or access will be blocked.
2. Provide openings in water piping for required pressure gages and thermometers. For thorough mixing and temperature stabilization, wells in the leaving water pipe should extend inside pipe at least 2 in. (50 mm).
3. Install air vents at all high points in piping to remove air and prevent water hammer.
4. Install pipe hangers where needed. Make sure no weight or stress is placed on waterbox nozzles or flanges.
5. Water flow direction must be as specified in Fig. 27-30.

   NOTE: Entering water is always the lower of the 2 nozzles. Leaving water is always the upper nozzle for cooler or condenser.
6. Install waterbox vent and drain piping in accordance with individual job data. All connections are $^3/_4$-in. FPT.
7. Install waterbox drain plugs in the unused waterbox drains and vent openings.
8. Install optional pumpout system or pumpout system and storage tank as shown in Fig. 31-34.

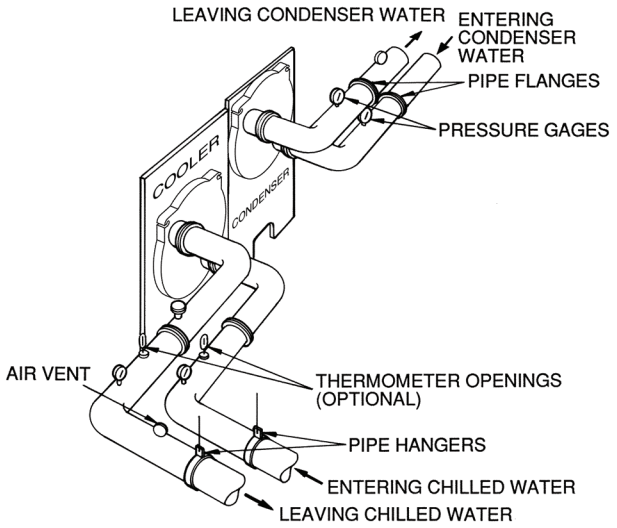
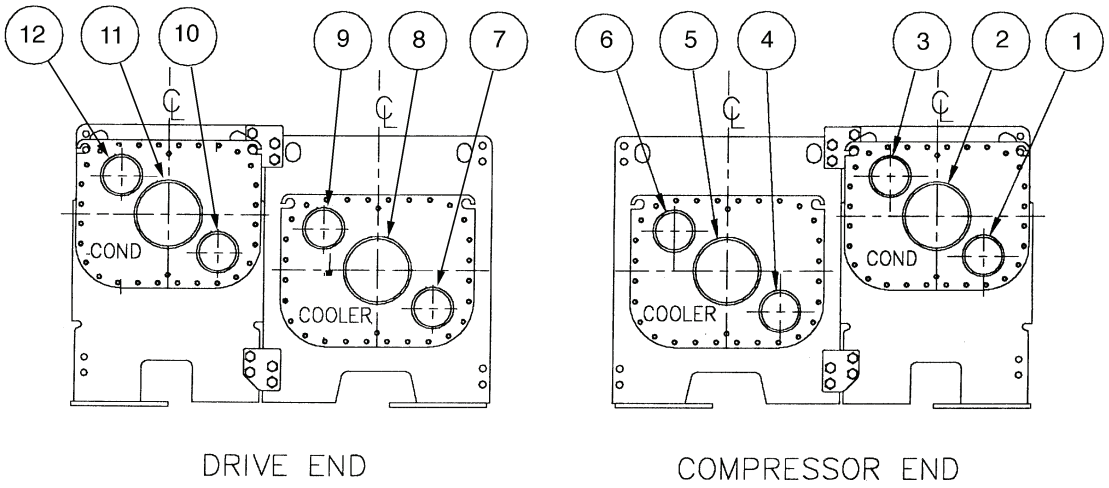


Fig. 26 — Typical Nozzle Piping

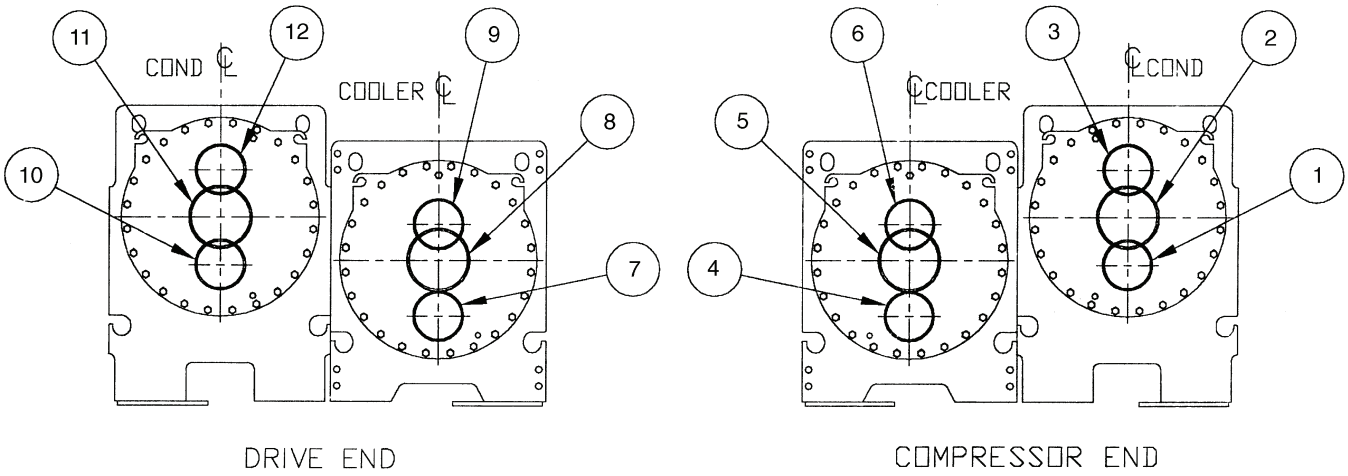
Table 10 — 19XRV Waterbox Nozzle Sizes

FRAME SIZE	PRESSURE psig (kPa)	PASS	NOMINAL PIPE SIZE (in.)		ACTUAL PIPE ID (in.)	
			Cooler	Condenser	Cooler	Condenser
2	150/300 (1034/2068)	1	10	10	10.020	10.020
		2	8	8	7.981	7.981
		3	6	6	6.065	6.065
3	150/300 (1034/2068)	1	10	10	10.020	10.020
		2	8	8	7.981	7.981
		3	6	6	6.065	6.065
4	150/300 (1034/2068)	1	10	10	10.020	10.020
		2	8	8	7.981	7.981
		3	6	6	6.065	6.065
5	150/300 (1034/2068)	1	10	10	10.020	10.020
		2	8	10	7.981	10.020
		3	6	8	6.065	7.981
6	150/300 (1034/2068)	1	10	10	10.020	10.020
		2	10	10	10.020	10.020
		3	8	8	7.981	7.981
7	150 (1034)	1	14	14	13.250	13.250
		2	12	12	12.000	12.000
		3	10	12	10.020	12.000
	300 (2068)	1	14	14	12.500	12.500
		2	12	12	11.376	11.376
		3	10	12	9.750	11.750
8	150 (1034)	1	14	14	13.250	13.250
		2	14	14	13.250	13.250
		3	12	12	12.000	12.000
	300 (2068)	1	14	14	12.500	12.500
		2	14	14	12.500	12.500
		3	12	12	11.376	11.376

NOZZLE-IN HEAD (NIH) WATERBOXES



FRAMES 2 AND 3



FRAMES 4, 5, AND 6

NOZZLE ARRANGEMENT CODES FOR ALL 19XRV NOZZLE-IN-HEAD WATERBOXES

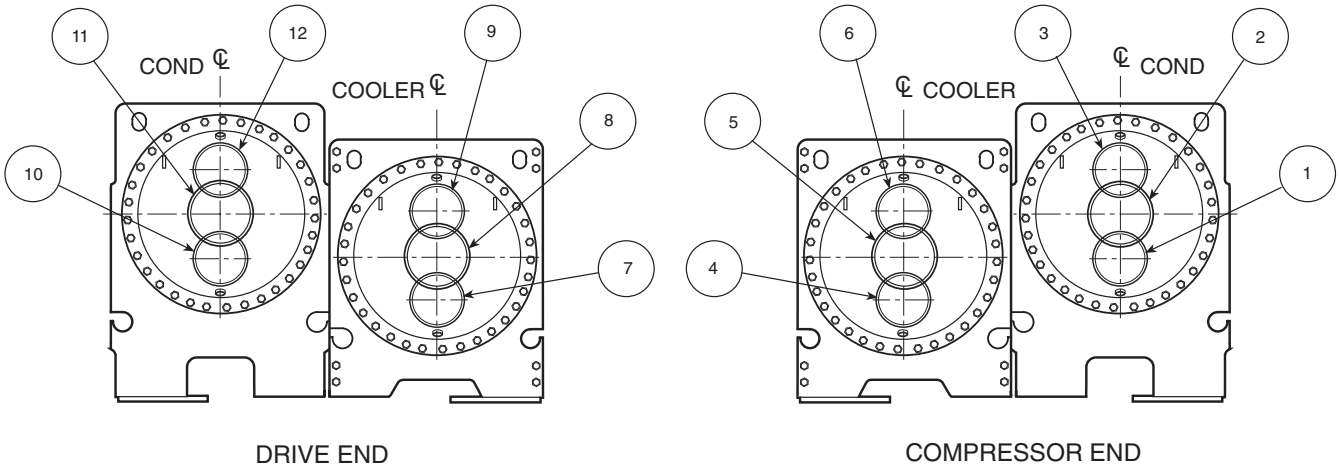
PASS	COOLER WATERBOXES		
	In	Out	Arrangement Code*
1	8	5	A
	5	8	B
2	7	9	C
	4	6	D
3	7	6	E
	4	9	F

PASS	CONDENSER WATERBOXES		
	In	Out	Arrangement Code*
1	11	2	P
	2	11	Q
2	10	12	R
	1	3	S
3	10	3	T
	1	12	U

*Refer to certified drawings.

Fig. 27 — Piping Flow Data (NIH, Frames 2 Through 6)

NOZZLE-IN HEAD (NIH) WATERBOXES



FRAMES 7 AND 8

NOZZLE ARRANGEMENT CODES FOR ALL 19XRV NOZZLE-IN-HEAD WATERBOXES

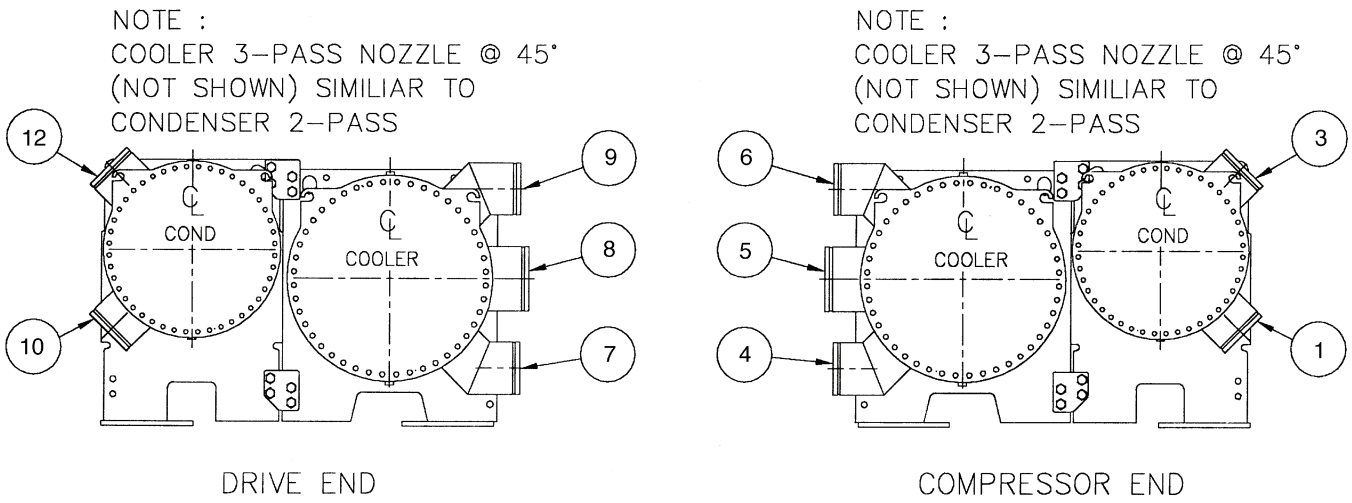
PASS	COOLER WATERBOXES		
	In	Out	Arrangement Code*
1	8	5	A
	5	8	B
2	7	9	C
	4	6	D
3	7	6	E
	4	9	F

PASS	CONDENSER WATERBOXES		
	In	Out	Arrangement Code*
1	11	2	P
	2	11	Q
2	10	12	R
	1	3	S
3	10	3	T
	1	12	U

*Refer to certified drawings.

Fig. 28 — Piping Flow Data (NIH, Frames 7 and 8)

MARINE WATERBOXES (MWB)



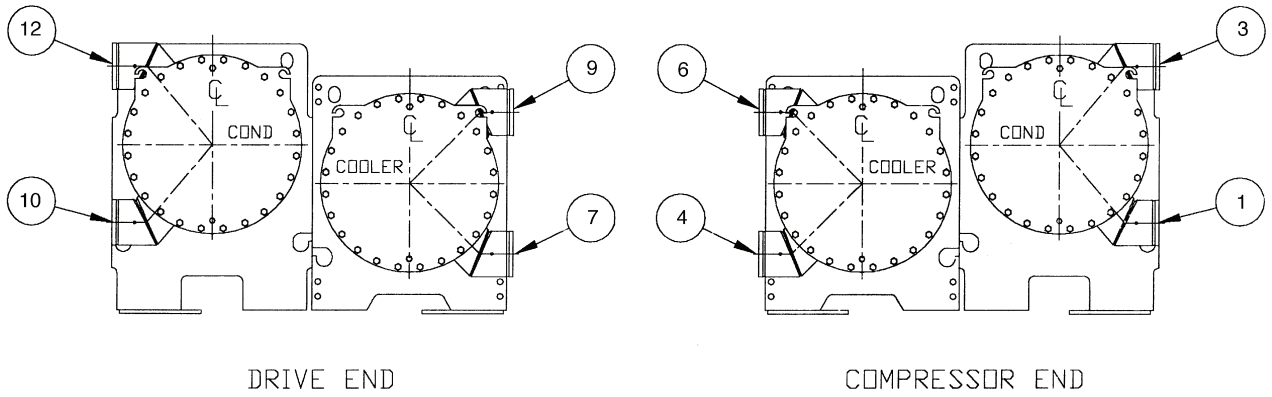
FRAMES 2 AND 3

NOZZLE ARRANGEMENT CODES

PASS	COOLER WATERBOXES			CONDENSER WATERBOXES		
	In	Out	Arrangement Code	In	Out	Arrangement Code
1	8	5	A	—	—	—
	5	8	B	—	—	—
2	7	9	C	10	12	R
	4	6	D	1	3	S
3	7	6	E	—	—	—
	4	9	F	—	—	—

Fig. 29 — Piping Flow Data (MWB, Frames 2 and 3)

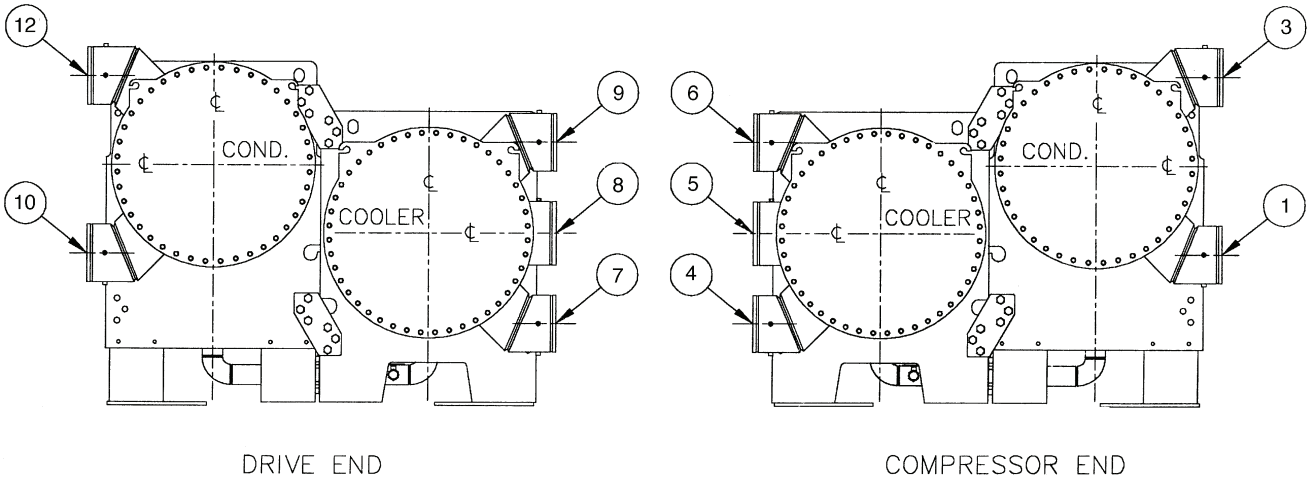
MARINE WATERBOXES (MWB)



FRAMES 4, 5, AND 6

NOZZLE ARRANGEMENT CODES

PASS	COOLER WATERBOXES			CONDENSER WATERBOXES		
	In	Out	Arrangement Code	In	Out	Arrangement Code
1	9	6	A	—	—	—
	6	9	B	—	—	—
2	7	9	C	10	12	R
	4	6	D	1	3	S
3	7	6	E	—	—	—
	4	9	F	—	—	—

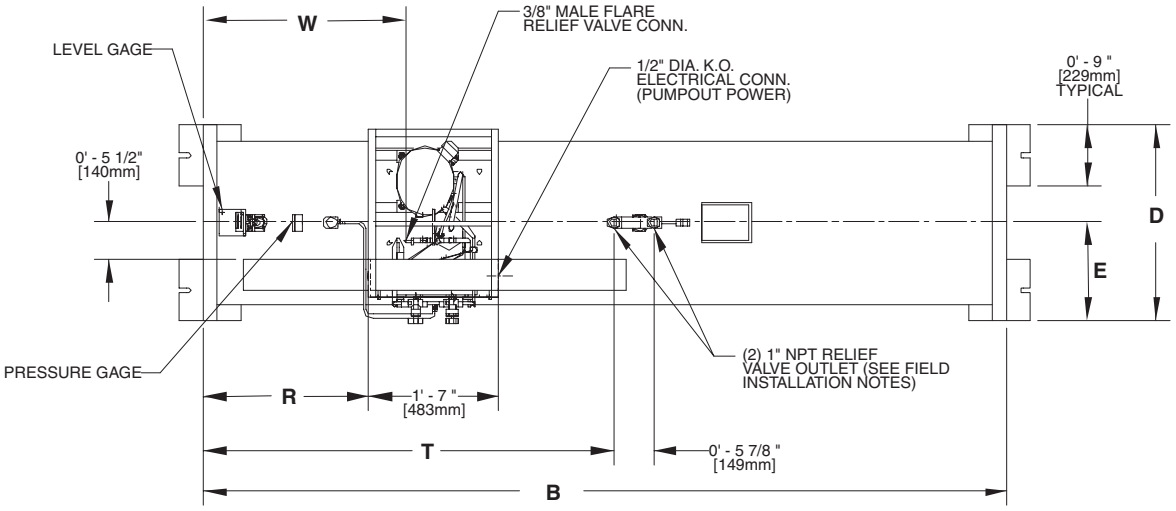


FRAMES 7 AND 8

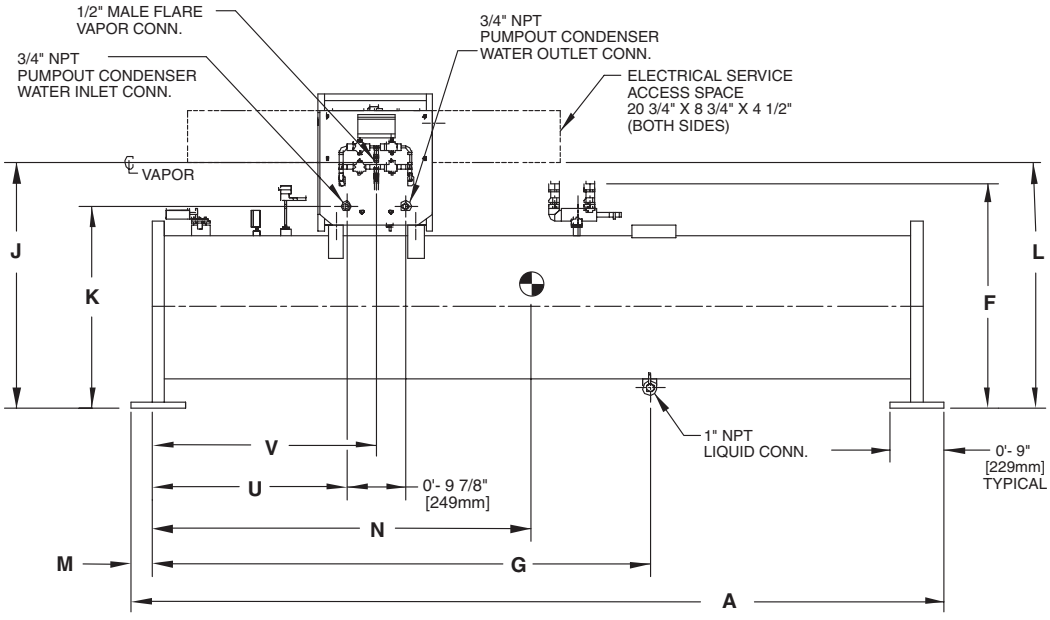
NOZZLE ARRANGEMENT CODES

PASS	COOLER WATERBOXES			CONDENSER WATERBOXES		
	In	Out	Arrangement Code	In	Out	Arrangement Code
1	8	5	A	—	—	—
	5	8	B	—	—	—
2	7	9	C	10	12	R
	4	6	D	1	3	S
3	7	6	E	—	—	—
	4	9	F	—	—	—

Fig. 30 — Piping Flow Data (MWB, Frames 4 Through 8)



TOP VIEW



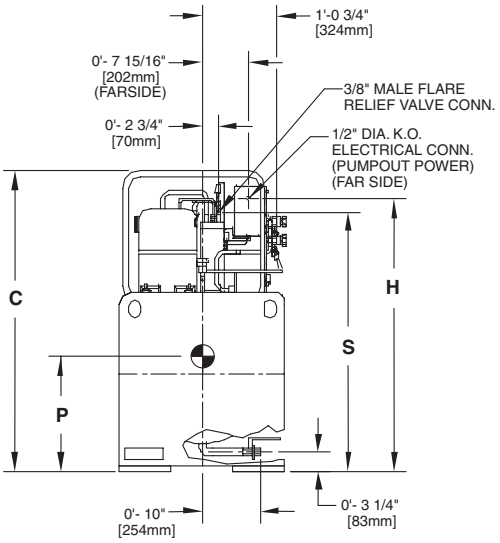
FRONT VIEW

NOTES:

1. ◓ Denotes center of gravity.
2. Dimensions in [ ] are in millimeters.
3. The weights and center of gravity values given are for an empty storage tank.
4. For additional information on the pumpout unit, see certified drawings.
5. Conduit knockout is located on the side of the control box.
6. 28 cubic ft storage tank weight: 2334 lb (1059 kg).
7. 52 cu ft storage tank weight: 3414 lb (1549 kg).

AVAILABLE CONDUIT KNOCKOUT SIZES

TRADE SIZE	QTY	LOCATION
1/2″	1	TOP
3/4″	1	BOTTOM
1″	1	MIDDLE
1 1/4″	1	MIDDLE



LEFT SIDE VIEW

DIMENSIONS

ENGLISH (ft-in.)

TANK SIZE	A	B	C	D	E	F	G	H	J	K
0428	10- 5	9-10	4-4 1/4	2-4 3/4	1-2 3/8	3-1 1/4	6-4 3/16	3-11 3/8	3-4 7/8	2-9 9/16
0452	14-11 1/4	14- 4 1/2	4-8 1/4	2-8 1/2	1-4 1/4	3-4 1/2	7-2 1/4	4- 3 1/4	3-8 3/4	3-17/16

TANK SIZE	L	M	N	P	R	S	T	U	V	W
0428	3-4 5/8	0-3 1/2	4- 9 1/2	1-7 7/8	2-0 3/8	3-9	5-0 1/4	2-5	2-9 7/8	2-5 3/4
0452	3-8 1/2	0-3 3/8	6-11 5/8	1-8 3/4	2-0 5/8	4-1	5-0 1/2	2-5 1/4	2-10 1/8	2-6

SI (mm)

TANK SIZE	A	B	C	D	E	F	G	H	J	K
0428	3175	2997	1327	730	365	946	1935	1203	1038	852
0452	4553	4381	1429	826	413	1029	2191	1302	1137	951

TANK SIZE	L	M	N	P	R	S	T	U	V	W
0428	1032	89	1451	505	619	1143	1530	737	860	756
0452	1130	86	2124	527	625	1225	1537	742	867	762

Fig. 31 — Optional Pumpout Unit and Storage Tank

RATED DRY WEIGHT AND REFRIGERANT CAPACITY

ENGLISH (lb)

TANK SIZE	TANK OD (in.)	DRY WEIGHT* (lb)	MAXIMUM REFRIGERANT CAPACITY (lb)	
			ANSI/ASHRAE 15	UL 1963
0428	24.00	2334	1860	1716
0452	27.25	3414	3563	3286

SI (kg)

TANK SIZE	TANK OD (mm)	DRY WEIGHT* (kg)	MAXIMUM REFRIGERANT CAPACITY (kg)	
			ANSI/ASHRAE 15	UL 1963
0428	610	1059	844	778
0452	692	1549	1616	1491

LEGEND

ANSI — American National Standard Institute
ASHRAE — American Society of Heating, Refrigeration, and Air Conditioning Engineers
OD — Outside Diameter
UL — Underwriters Laboratories

*The above dry weight includes the pumpout condensing unit weight of 164 lb (75 kg).

Fig. 31 — Optional Pumpout Unit and Storage Tank (cont)

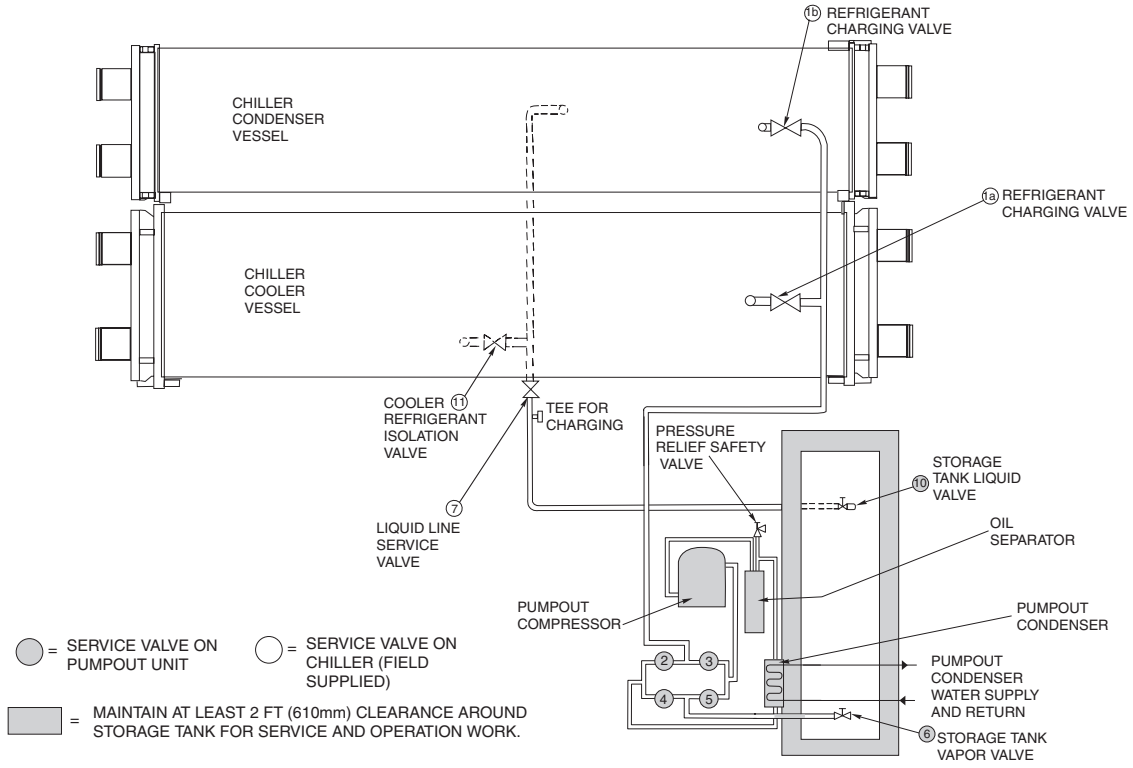


Fig. 32 — Optional Pumpout System Piping Schematic with Storage Tank

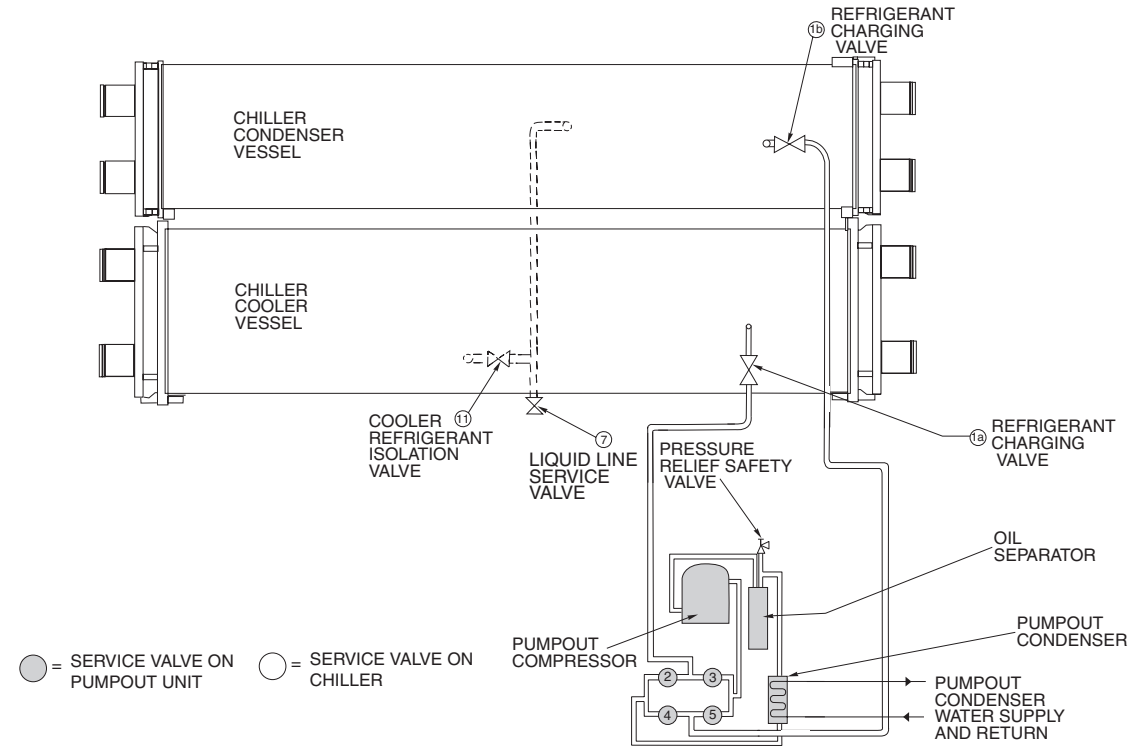


Fig. 33 — Optional Pumpout System Piping Schematic without Storage Tank

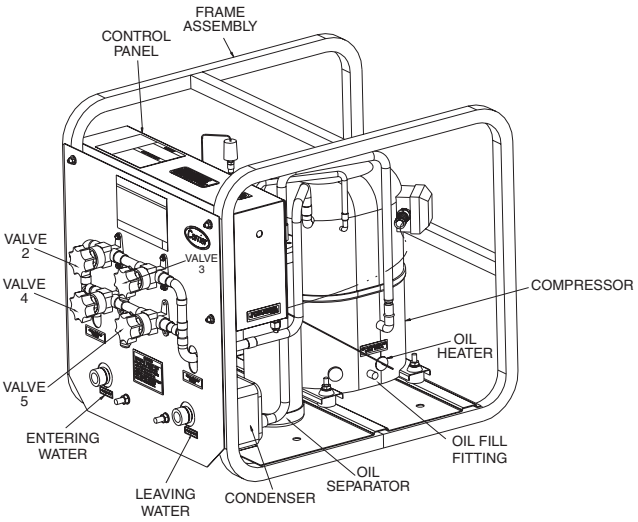


Fig. 34 — Pumpout Unit

INSTALL VENT PIPING TO RELIEF VALVES — The 19XRV chiller is factory equipped with relief valves on the cooler and condenser shells. Refer to Fig. 35 and Tables 11 and 12 for size and location of relief devices. Vent relief devices to the outdoors in accordance with ANSI/ASHRAE 15 (latest edition) Safety Code for Mechanical Refrigeration and all other applicable codes.

⚠ DANGER

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

1. If relief devices are manifolded, the cross-sectional area of the relief pipe must at least equal the sum of the areas required for individual relief pipes.
2. Provide a pipe plug 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.
3. Piping to relief devices must not apply stress to the device. Adequately support piping. A length of flexible tubing or piping near the device is essential on spring-isolated machines.
4. 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.

Make Electrical Connections — Field wiring must be installed in accordance with job wiring diagrams and all applicable electrical codes.

⚠ CAUTION

Do not run 120-v wiring into the control cabinet. The control cabinet should only be used for additional extra-low voltage wiring (50-v maximum).

Wiring diagrams in this publication (Fig. 36-38) are for reference only and are not intended for use during actual installation; follow job specific wiring diagrams.

⚠ CAUTION

Do not attempt to start compressor or oil pump (even for a rotation check) or apply test voltage of any kind while machine is under dehydration vacuum. Motor insulation breakdown and serious damage may result.

CONNECT CONTROL INPUTS — Wiring may be specified for a spare safety switch, and a remote start/stop contact can be wired to the VFD terminal strip. Additional spare sensors and Carrier Comfort Network® modules may be specified as well.

CONNECT CONTROL OUTPUTS — Connect auxiliary equipment, chilled and condenser water pumps, and spare alarms as required and indicated on job wiring drawings.

Table 11 — Relief Valve Locations

LOCATION	FRAME SIZE	RELIEF VALVE OUTLET SIZE	QUANTITY OF RELIEF VALVES	
			With Discharge and Cooler Inlet Isolation	Without Discharge and Cooler Inlet Isolation
Cooler	2	1″ NPT FEMALE CONNECTOR	1	2
	3-6	1¼″ NPT FEMALE CONNECTOR	1	2
	7,8	1¼″ NPT FEMALE CONNECTOR	2	4
Condenser	2	1″ NPT FEMALE CONNECTOR	2	2
	3-6	1¼″ NPT FEMALE CONNECTOR	2	2
	7,8	1¼″ NPT FEMALE CONNECTOR	4	4
Optional Storage Tank	—	1" NPT FEMALE CONNECTOR	2	2

NOTE: All valves relieve at 185 psi (1275 kPa).

Table 12 — Cooler/Relief Valve Arrangement

HEAT EXCHANGER FRAME SIZE	COMPRESSOR FRAME SIZE	ISOLATION VALVES	COOLER ARRANGEMENT SEE FIGURE NO.	CONDENSER ARRANGEMENT SEE FIGURE NO.
2	2	Yes	35A	35E
		No	35C	35E
3	2	Yes	35A	35E
		No	35C	35E
3, 4, 5	3	Yes	35A	35E
		No	35C	35E
5, 6	4	Yes	35A	35E
		No	35C	35E
7	4	Yes	35B	35F
		No	35D	35F
7, 8	5	Yes	35B	35F
		No	35D	35F

COOLER RELIEF VALVE ARRANGEMENT WITH OPTIONAL ISOLATION OF DISCHARGE AND COOLER (Fig. A, B)

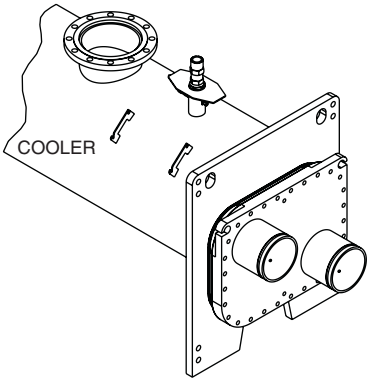


FIG. A

FRAME 2-6

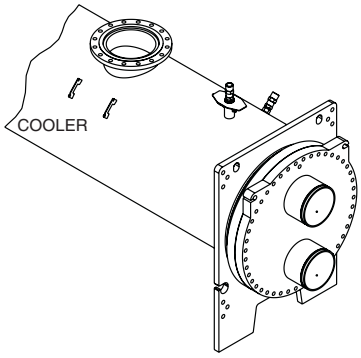


FIG. B

FRAMES 7, 8

COOLER RELIEF VALVE ARRANGEMENT WITHOUT ISOLATION OPTION OF DISCHARGE AND COOLER (Fig. C, D)

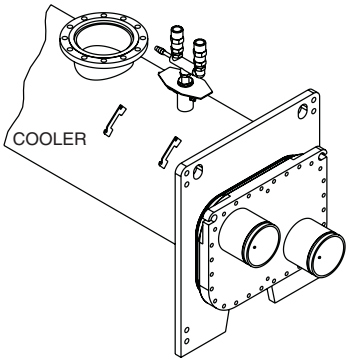


FIG. C

FRAME 2-6

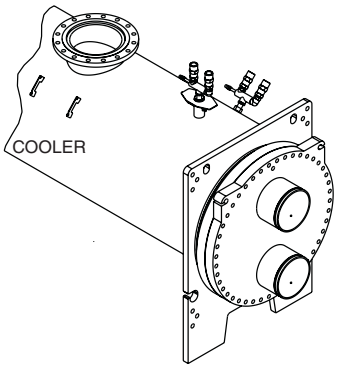


FIG. D

FRAME 7, 8

CONDENSER RELIEF VALVE ARRANGEMENT — WITH OR WITHOUT OPTIONAL ISOLATION (Fig. E, F)

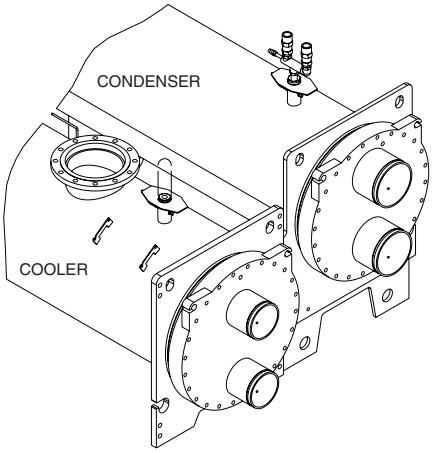


FIG. E

FRAME 2-6

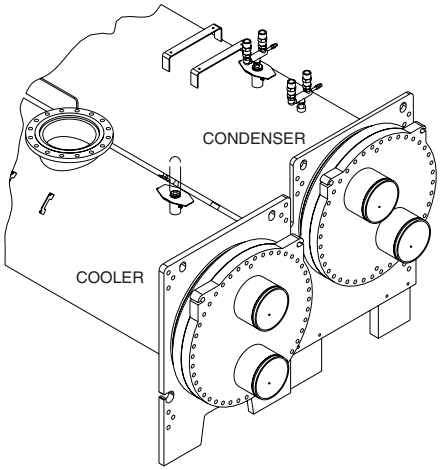


FIG. F

FRAME 7, 8

Fig. 35 — Relief Valve Arrangements

LEGEND

ITEM		DESCRIPTION
1		Unit-Mounted VFD Model 0442
		Unit-Mounted VFD Model 0608
		Unit-Mounted VFD Model 1169
		VFD with 65 KAIC Circuit Breaker (Std)
		VFD with 100 KAIC Circuit Breaker (Optional)
		Includes: (1) N.O. Chilled Water Pump Contact Output (1) N.O. Condenser Water Pump Contact Output (1) N.O. Tower Fan Low/#1 Contact Output (1) N.O. Tower Fan High/#2 Contact Output (1) N.O. Alarm Contact Output (1) 4-20mA Head Pressure Reference Output (1) N.C. Spare Safety (Dry) Contact Input (1) N.O. Remote Start (Dry) Contact Input (1) N.O. Ice Build (Dry) Contact Input
	PROTECTION	3 Phase Under/Over Voltage Protection (Line Side)
		Phase Loss/Imbalance/Reversal Protection (Line Side)
		Frequency Shift Protection (Line Side)
		Over Current Protection (Line and Load Side)
		Phase to Ground Fault Protection (Line and Load Side)
	METERING	3 Phase Amps (Chiller Display Line and Load Side)
		3 Phase Volts (Chiller Display Line Side)
		4-20mA kW Transducer Output (Line Side) From Chiller Control Module (CCM)
		kW Hours/Demand kW (Chiller Display Line Side)
		kW Metering (Chiller Display Line and Load Side)
	ANCIL-LARY	Control Power Transformer (3 KVA)
		Controls and Oil Heater Disconnect
		3 Phase Analog Volts/Amps Meter Package (Option)
2		System Feeder (Short Circuit, Ground Fault and Protection)
A		Evaporator Liquid Pump Starter Disconnect
B		Evaporator Liquid Pump Motor Starter
C		Condenser Liquid Pump Starter Disconnect
D		Condenser Liquid Pump Motor Starter
E		Cooling Tower Fan Starter Disconnect (Low Fan/#1)
F		Cooling Tower Fan Starter (Low Fan/#1)
G		Cooling Tower Fan Starter Disconnect (High Fan/#2)
H		Cooling Tower Fan Starter (High Fan/#2)
J		Spare Safety Devices [N.C.] See Note 3.1
K		Remote Start/Stop Device [N.O.] See Note 3.1
L		Remote Alarm See Note 3.3
M		Remote Annunciator See Note 3.3
N		Line Side Lug Adapters See Note 2.3
P		Ice Build Start/Terminate Device See Note 3.1

Fig. 36 — 19XRV Field Wiring

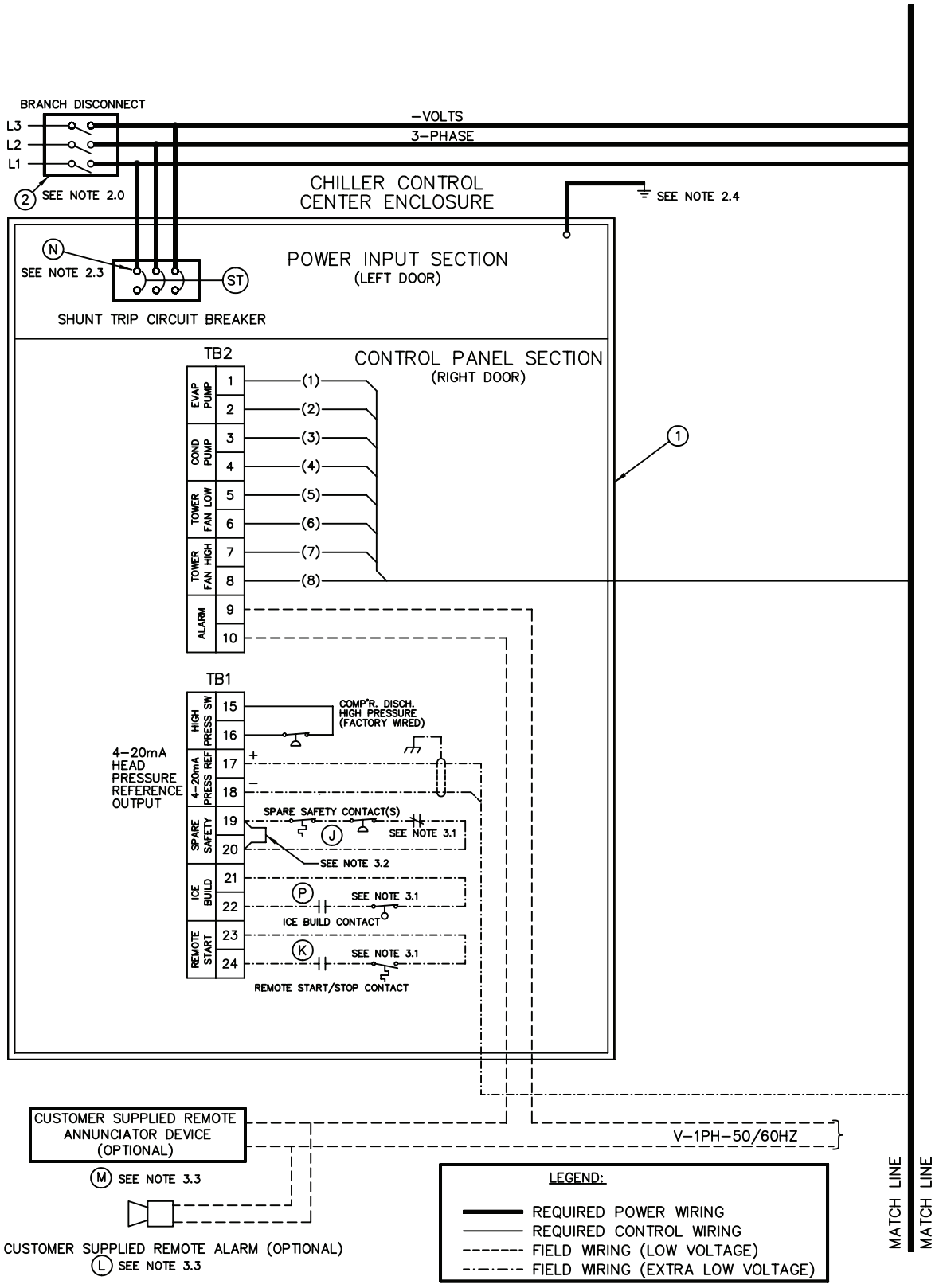


Fig. 36 — 19XRV Field Wiring (cont)

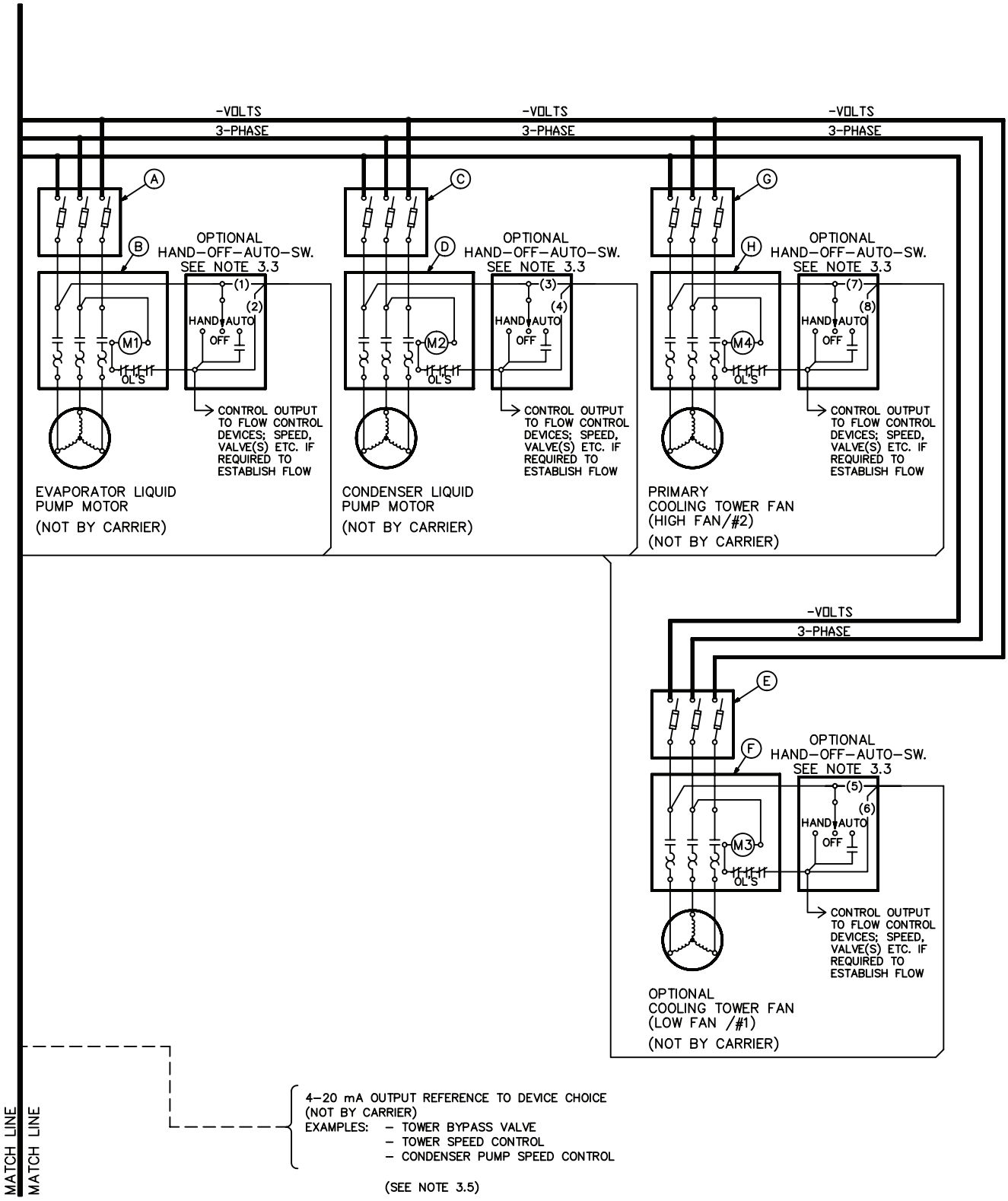


Fig. 36 — 19XRV Field Wiring (cont)

NOTES

I General

1.0 Variable Frequency Drive (VFD) shall be designed and manufactured in accordance with Carrier engineering requirement Z-420.
1.1 All field-supplied conductors and devices must be compliant, and be installed in compliance with all applicable codes and job specifications.
1.2 The routing of field-installed conduit and conductors and the location of field-installed devices must not interfere with equipment access or the reading, adjusting or servicing of any component.
1.3 Equipment installation and all starting and control devices must comply with details in equipment submittal drawings and literature.
1.4 Contacts and switches are shown in the position they would assume with the circuit deenergized and the chiller shutdown.
1.5 Warning — Do not use aluminum conductors.
1.6 Warning — Remove panel above VFD main circuit breaker before drilling. Do not drill into any other VFD cabinet panels.

II Power Wiring To VFD

2.0 Provide a means of disconnecting branch feeder power to VFD. Provide short circuit protection and interrupt capacity for branch feeder in compliance with all applicable codes.
2.1 Metal conduit must be used for the power wires, from VFD to branch feeder.
2.2 Line side power conductor rating must meet VFD nameplate voltage and chiller full load amps (minimum circuit ampacity).
2.3 Lug adapters may be required if installation conditions dictate that conductors be sized beyond the minimum ampacity required. Circuit breaker lugs will accommodate the quantity (#) and size cables (per phase) as follows.

VFD MAX INPUT AMPS	STANDARD 65KAIC LUG CAPACITY (PER PHASE)		OPTIONAL 100KAIC LUG CAPACITY (PER PHASE)	
	No. of Conductors	Conductor Range	No. of Conductors	Conductor Range
442A	3	3/0 — 500MCM	2	400 — 500MCM
608A	3	3/0 — 500MCM	3	3/0 — 400MCM
1169A	4	500 — 1000MCM	4	500 — 1000MCM

If larger lugs are required, they can be purchased from the manufacturer of the circuit breaker (Cutler-Hammer or Square D).
2.4 Compressor motor and controls must be grounded by using equipment grounding lug provided inside unit-mounted VFD enclosure.

III Control Wiring

3.0 Field-supplied control conductors to be at least 18 AWG (American Wire Gage) or larger.
3.1 Ice build start/terminate device contacts, remote start/stop device contacts and spare safety device contacts (devices not supplied by Carrier) must have 24 vac rating. Max current is 60 mA, nominal current is 10 mA. Switches with gold-plated bifurcated contacts are recommended.
3.2 Remove jumper wire between TB1-19 and TB1-20 before connecting auxiliary safeties between these terminals.
3.3 Each integrated contact output can control loads (VA) for evaporator pump, condenser pump, tower fan low, tower fan high and alarm annunciator devices rated 5 amps at 115 vac and up to 3 amps at 250 vac.

⚠ WARNING

Control wiring required for Carrier to start pumps and tower fan motors, and established flows must be provided to assure machine protection. If primary pump, tower fan and flow control is by other means, also provide a parallel means for control by Carrier. Failure to do so could result in machine freeze-up or overpressure.

Do not use control transformers in the VFD enclosure or power panel as the power source for external or field-supplied contactor coils, actuator motors or any other loads.
3.4 Do not route control wiring carrying 30 v or less within a conduit which has wires carrying 50 v or higher or along side wires carrying 50 v or higher.
3.5 Spare 4 to 20 mA output signal is designed for controllers with a non-grounded 4 to 20 mA input signal and a maximum input impedance of 500 ohms.

Fig. 36 — 19XRV Field Wiring (cont)

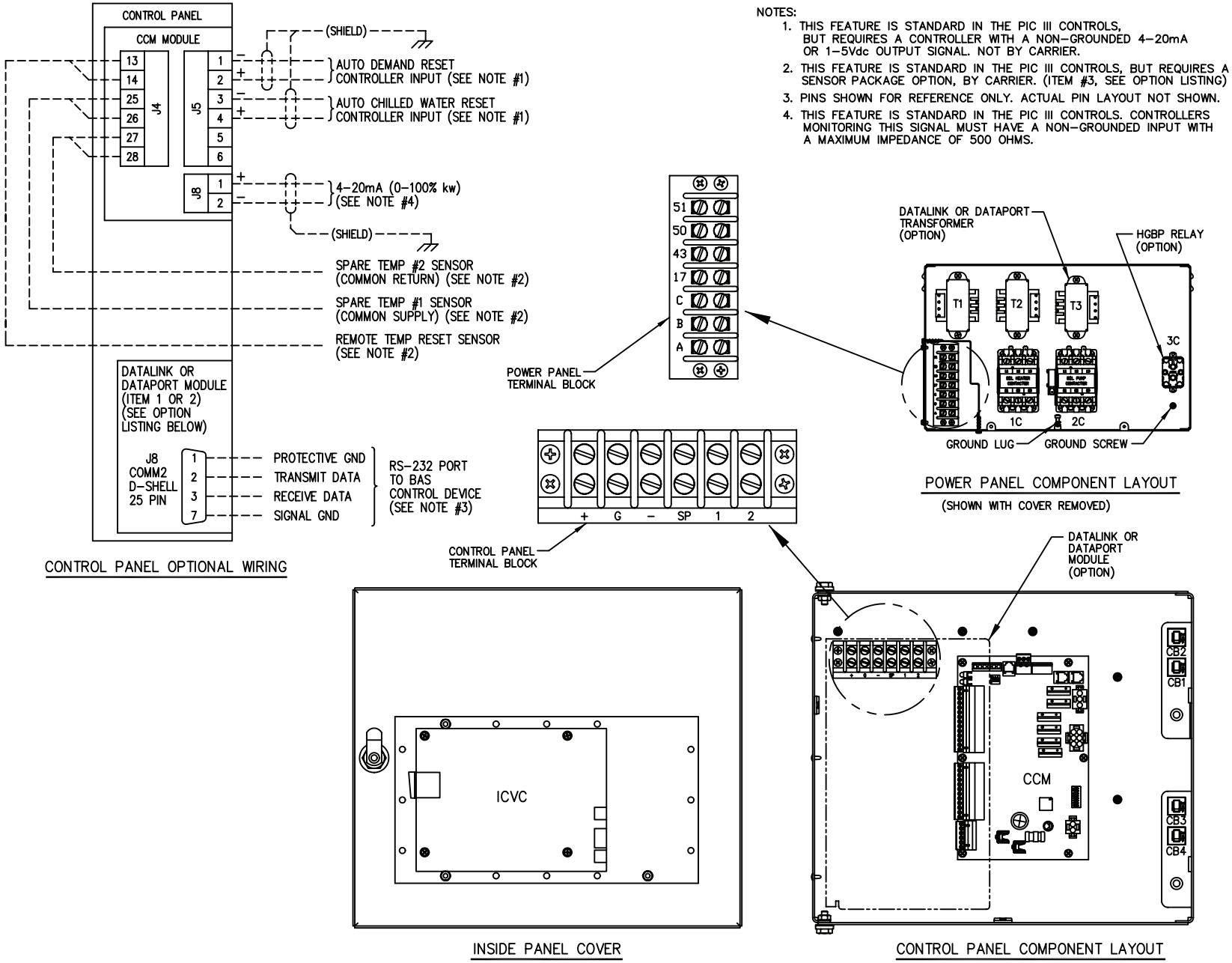


Fig. 37 — PIC III Control Panel Optional Wiring and Power Panel Component Layout

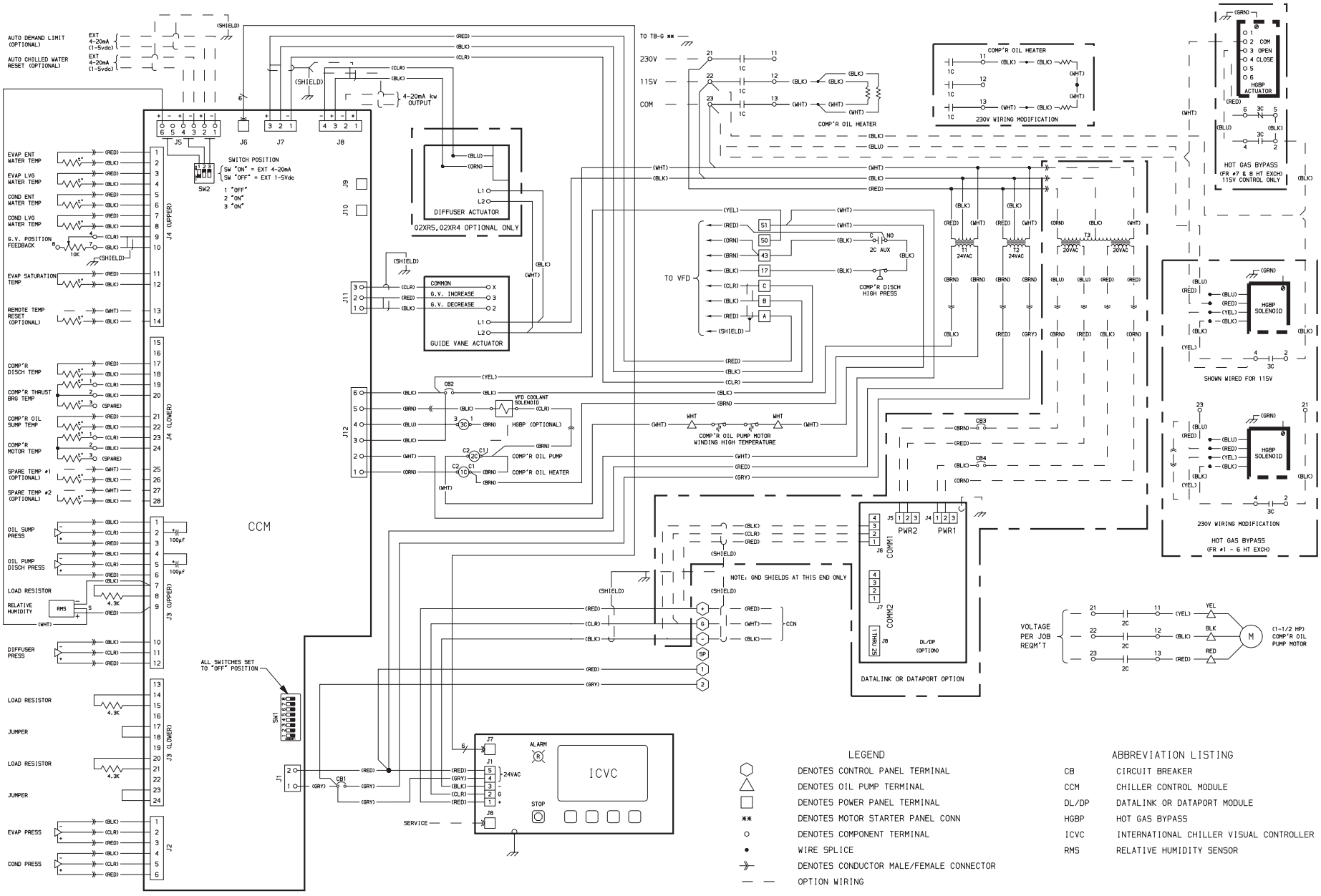


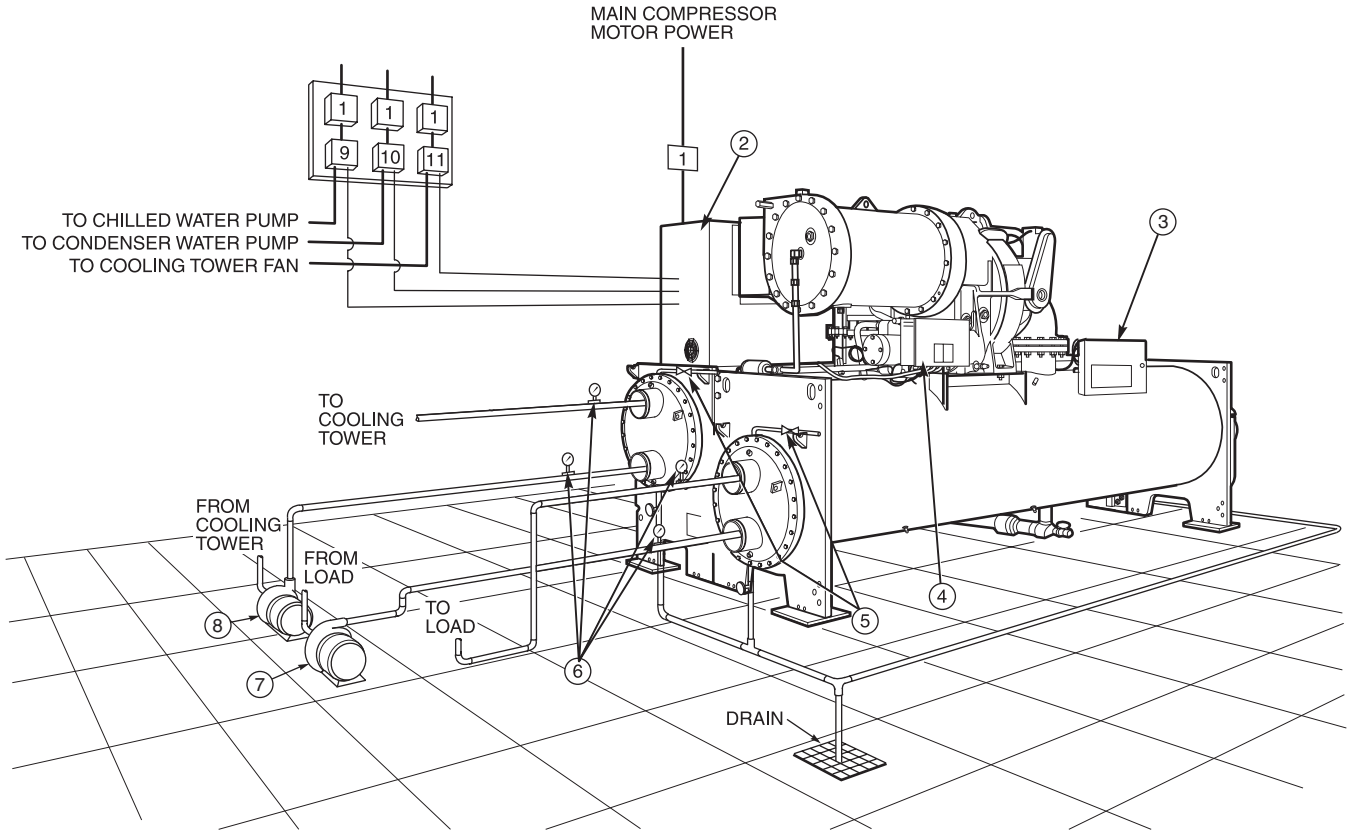
Fig. 38 — Electronic PIC III Controls Wiring Schematic

CONNECT VFD — The 19XRV has a unit-mounted, factory-installed VFD starter. Attach power leads by connecting them from inside the VFD cabinet to the line side circuit breaker terminals. See Fig. 36 and 39.

IMPORTANT: Be sure to ground the power circuit in accordance with the National Electrical Code (NEC), applicable local codes, and job wiring diagrams. Also, make sure correct phasing is observed for proper rotation.

⚠ CAUTION

Do not punch holes or drill into the top surface of the power panel. Knockouts are provided in the bottom of the power panel for wiring connections.



Piping
Control Wiring
Power Wiring

LEGEND

1 — Disconnect NOT by Carrier
2 — Unit Mounted Starter
3 — Control Panel
4 — Power Panel
5 — Vents
6 — Pressure Gages
7 — Chilled Water Pump
8 — Condenser Water Pump
9 — Chilled Water Pump Starter
10 — Condensing Water Pump Starter
11 — Cooling Tower Fan Starter

IMPORTANT: 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 on request.

NOTES:
1. All wiring must comply with applicable codes.
2. Refer to Carrier System Design Manual for details regarding piping techniques.
3. Wiring not shown for optional devices such as:
   - remote start-stop
   - remote alarm
   - optional safety device
   - 4 to 20 mA (1 to 5 VDC) resets
   - optional remote sensors
   - kW output
   - head pressure reference

Fig. 39 — 19XRV with Unit-Mounted Starter

Connect Power Wires to Oil Pump Contacts — See Fig. 40. Connect power wires to oil pump contacts mounted in machine power panel. Use separate fused disconnect or circuit breaker as shown on job wiring diagrams and Fig. 40. Check that power supply voltage agrees with oil pump voltage. Follow correct phasing for proper motor rotation.

Connect Power Wires to Oil Heater Contactor — Connect control power wiring between the oil heater contactor terminals and terminals LL1 and LL2 on the field wiring strip in the compressor motor starter. See Fig. 41 and wiring label on the machine power panel.

⚠ WARNING

Voltage to terminals LL1 and LL2 comes from a control transformer in a VFD built to Carrier specifications. Do not connect an outside source of control power to the compressor motor starter (terminals LL1 and LL2). An outside power source will produce dangerous voltage at the line side of the starter, because supplying voltage at the transformer secondary terminals produces input level voltage at the transformer primary terminals.

Connect Wiring to VFD — Connect control wiring to the VFD. All control wiring must use shielded cable. Also, connect the communications cable. Refer to the job wiring diagrams for cable type and cable number. Make sure the control circuit is grounded in accordance with applicable electrical codes and instructions on machine control wiring label.

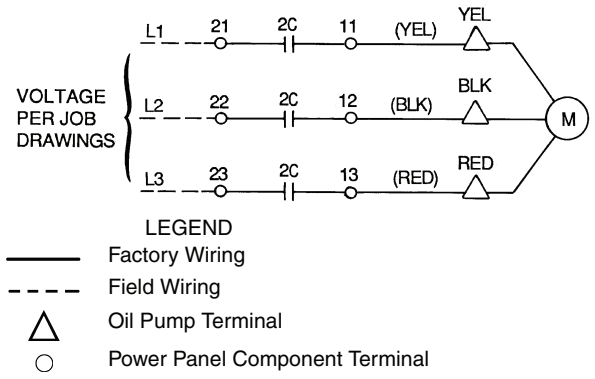


Fig. 40 — Oil Pump Wiring

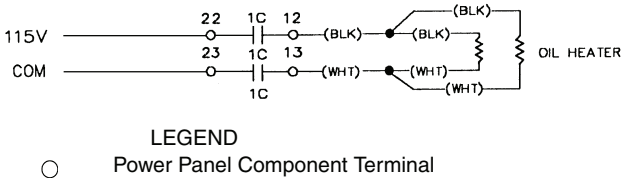


Fig. 41 — Oil Heater and Control Power Wiring

CARRIER COMFORT NETWORK® INTERFACE — The Carrier Comfort Network (CCN) communication bus wiring is supplied and installed by the electrical contractor. It consists of shielded, 3-conductor cable with drain wire.

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 element on either side of it. The negative pins must be wired to the negative pins. The signal ground pins must be wired to the signal ground pins. See Fig. 42 for location of the CCN network connections on the terminal strip labelled CCN.

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 to 140 F (–20 C to 60 C) is required. See table below for cables that meet the requirements.

MANUFACTURER	CABLE NO.
Alpha	2413 or 5463
American	A22503
Belden	8772
Columbia	02525

When connecting the CCN communication bus to a system element, a color code system for the entire network is recommended to simplify installation and checkout. The following color code is recommended:

SIGNAL TYPE	CCN BUS CONDUCTOR INSULATION COLOR	CCN NETWORK INTERFACE (Control Panel)
+	Red	+
Ground	White	G
–	Black	–

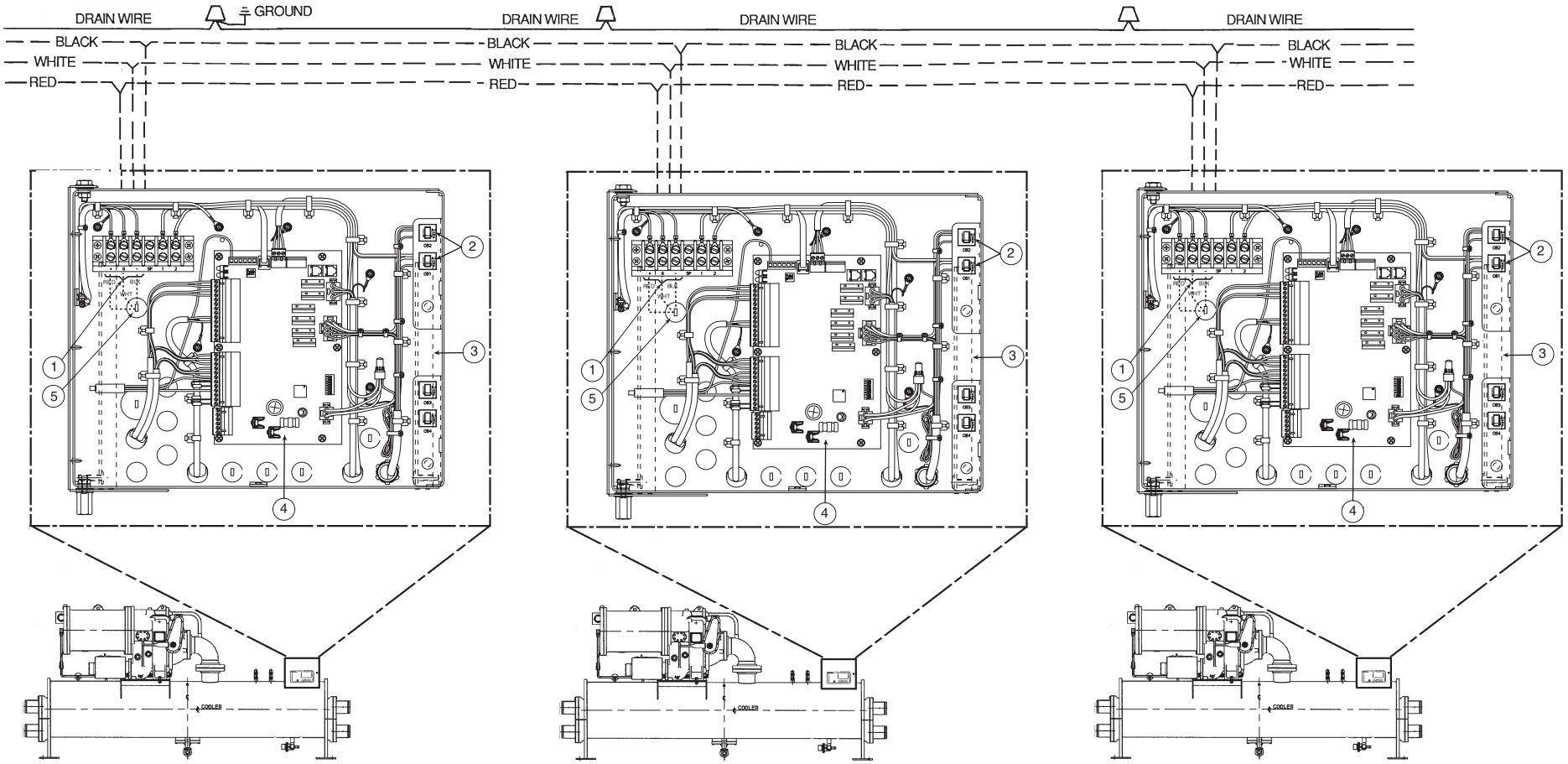
If a cable with a different color scheme is selected, a similar color code should be adopted for the entire network.

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 ground at only one single point. See Fig. 42. If the communication bus cable exits from one building and enters another, the shields must be connected to ground at the lightening suppressor in each building where the cable enters or exits the building (one point only).

To connect the 19XRV chiller to the network, proceed as follows (see Fig. 42):

1. Route wire through knockout in back of control panel.
2. Strip back leads.
3. Crimp one no. 8 size spring spade terminal on each conductor.
4. Attach red to "+" terminal and white to "G" terminal and black to "–" terminal of CCN interface located in the control panel.

Lead-Lag Control Wiring — The 19XRV can be wired for lead-lag operation in either series or parallel. See Fig. 43A and 43B for applicable wiring schematics.



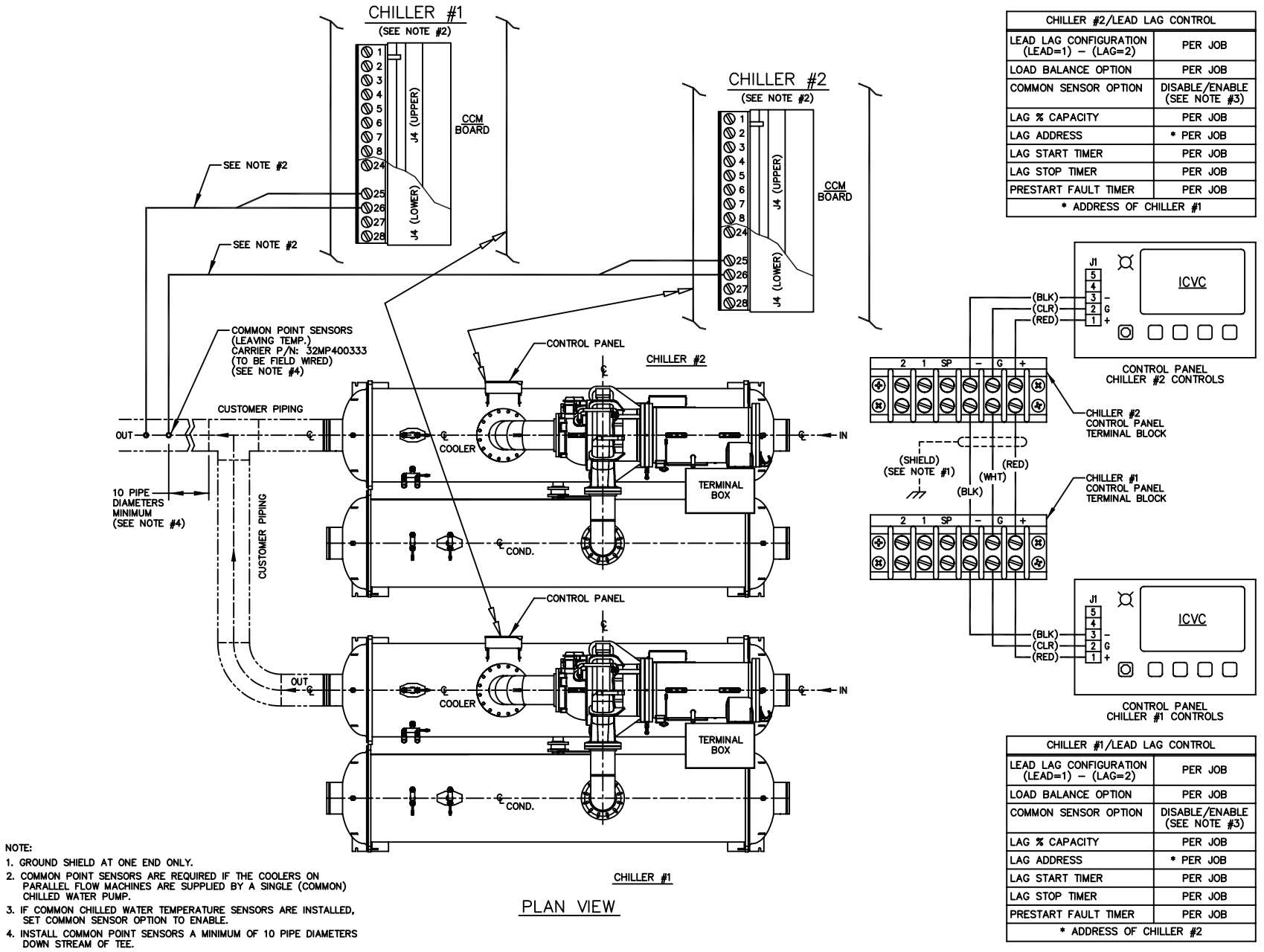
19XRV CHILLERS

LEGEND

1 — Carrier Comfort Network® (CCN) Interface
2 — Circuit Breakers
3 — Control Panel Internal View
4 — Chiller Control Module (CCM)
5 — CCN Conduit Knockout
——— Factory Wiring
- - - - Field Wiring

NOTE: Field supplied terminal strip must be located in control panel.

Fig. 42 — CCN Communication Wiring For Multiple Chillers (Typical)



CHILLER #2/LEAD LAG CONTROL	
LEAD LAG CONFIGURATION (LEAD=1) – (LAG=2)	PER JOB
LOAD BALANCE OPTION	PER JOB
COMMON SENSOR OPTION	DISABLE/ENABLE (SEE NOTE #3)
LAG % CAPACITY	PER JOB
LAG ADDRESS	* PER JOB
LAG START TIMER	PER JOB
LAG STOP TIMER	PER JOB
PRESTART FAULT TIMER	PER JOB
* ADDRESS OF CHILLER #1	

CHILLER #1/LEAD LAG CONTROL	
LEAD LAG CONFIGURATION (LEAD=1) – (LAG=2)	PER JOB
LOAD BALANCE OPTION	PER JOB
COMMON SENSOR OPTION	DISABLE/ENABLE (SEE NOTE #3)
LAG % CAPACITY	PER JOB
LAG ADDRESS	* PER JOB
LAG START TIMER	PER JOB
LAG STOP TIMER	PER JOB
PRESTART FAULT TIMER	PER JOB
* ADDRESS OF CHILLER #2	

NOTE:
1. GROUND SHIELD AT ONE END ONLY.
2. COMMON POINT SENSORS ARE REQUIRED IF THE COOLERS ON PARALLEL FLOW MACHINES ARE SUPPLIED BY A SINGLE (COMMON) CHILLED WATER PUMP.
3. IF COMMON CHILLED WATER TEMPERATURE SENSORS ARE INSTALLED, SET COMMON SENSOR OPTION TO ENABLE.
4. INSTALL COMMON POINT SENSORS A MINIMUM OF 10 PIPE DIAMETERS DOWN STREAM OF TEE.

Fig. 43A — 19XRV Lead Lag Schematic Parallel Cooler Flow

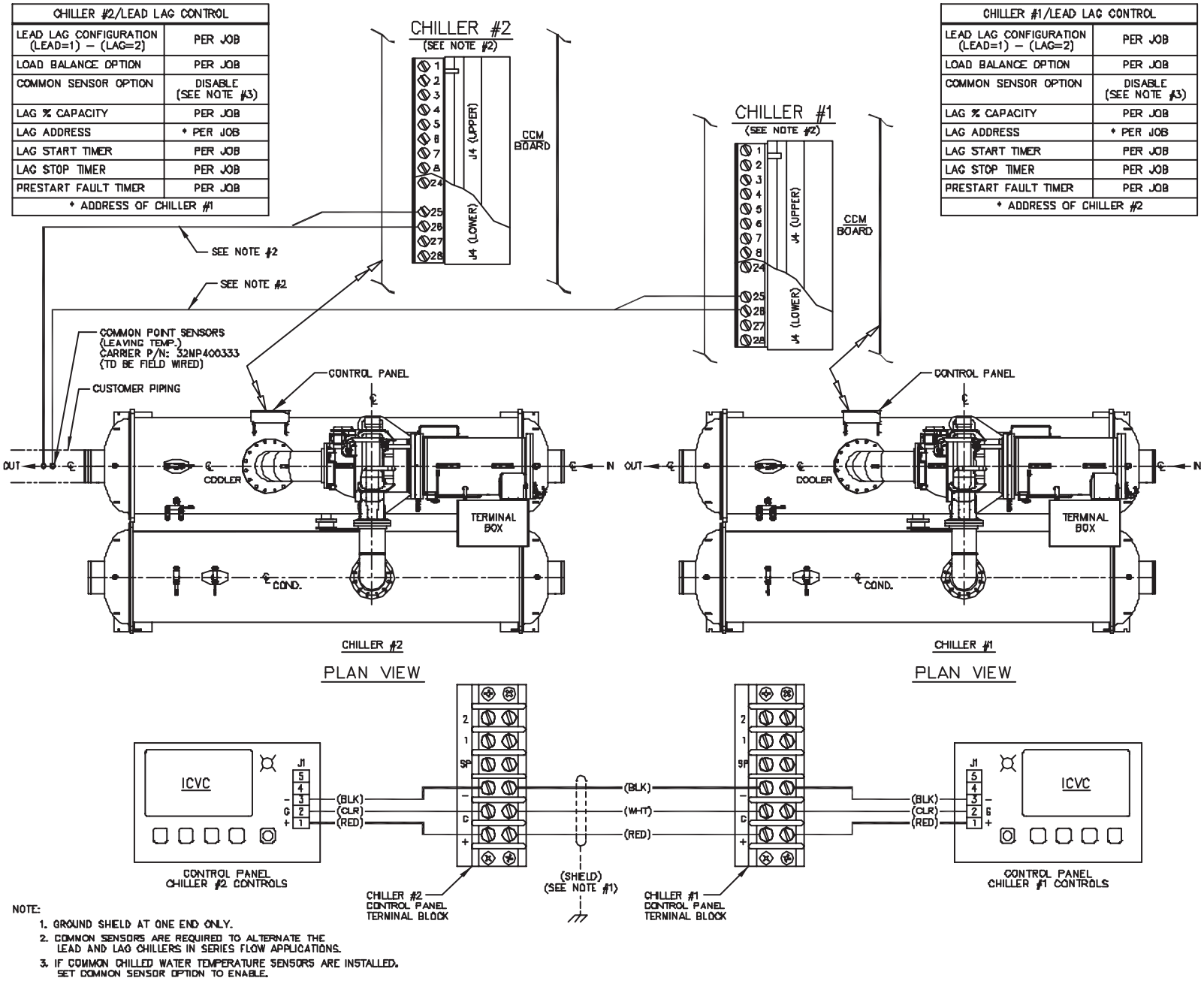


Fig. 43B — 19XRV Lead Lag Schematic Series Cooler Flow

Install Field Insulation

⚠ CAUTION

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

When installing insulation at the jobsite, insulate the following components:

- compressor motor
- cooler shell
- cooler tube sheets
- suction piping
- motor cooling drain
- oil reclaim piping
- oil cooler refrigerant side tubing
- refrigerant liquid line to cooler

NOTE: Insulation of the waterbox covers is applied only at the jobsite by the contractor. When insulating the covers, make sure there is access for removal of waterbox covers for servicing. See Fig. 44.

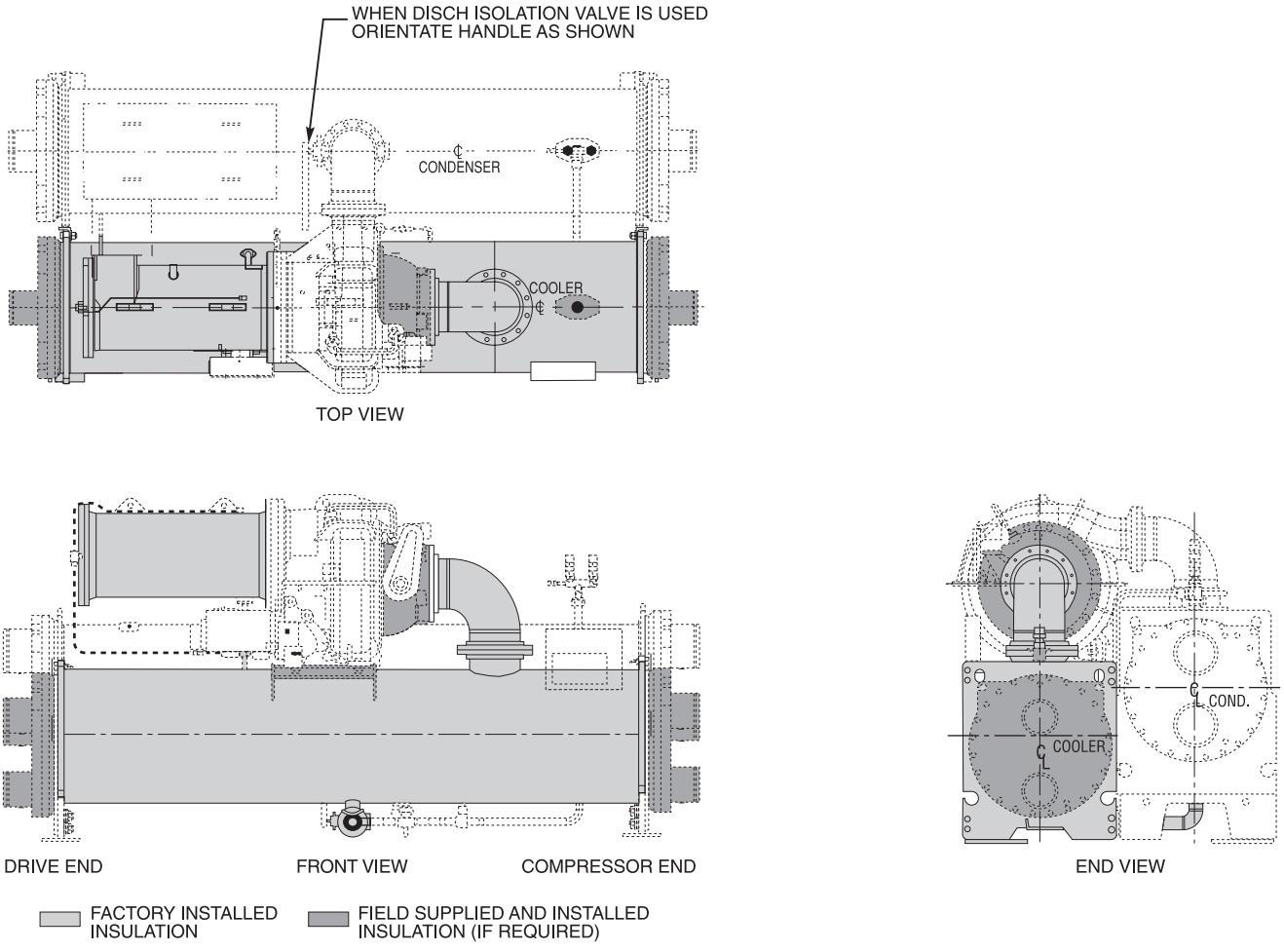


Fig. 44 — 19XRV Insulation Area

INSTALLATION START-UP REQUEST CHECKLIST

Machine Model Number: 19XRV Serial Number: _____

To: _____

_____

_____

Attn: _____

Date _____

_____
Project Name

_____
Carrier Job Number

The following information provides the status of the chiller installation.

	YES/NO (N/A)	DATE TO BE COMPLETED
1. The machine is level.		
2. The machine components are installed and connected in accordance with the installation instructions.		
3. The isolation package and grouting (if necessary) are installed.		
4. The relief valves are piped to the atmosphere.		
5. All piping is installed and supported. Direction of flow is indicated in accordance with the installation instructions and job prints.		
a. Chilled water piping		
b. Condenser water piping		
c. Waterbox drain piping		
d. Pumpout unit condenser piping (if installed)		
e. Other _____		
6. Gages are installed as called for on the job prints required to establish design flow for the cooler and condenser.		
a. Water pressure gages IN and OUT		
b. Water temperature gages IN and OUT		
7. The machine's VFD wiring is complete. The wiring is installed per installation instructions and certified prints.		
a. Power wiring to VFD circuit breaker. (If chiller was disassembled during installation, motor leads must not be taped until the Carrier technician megger tests the motor.)		
b. Oil pump wiring		
c. Oil heater/control wiring		
d. Carrier controls can independently energize water pumps and tower fan		
e. Line side voltage is within ±10% of chiller nameplate voltage		
f. Other _____		

COMMENTS:

_____

_____

_____

_____

TESTING	YES/NO	DATE TO BE COMPLETED
1. The cooling tower fan has been checked for blade pitch and proper operation.		
2. The chilled water and condenser water lines have been:		
a. Filled		
b. Tested		
c. Flushed		
d. Vented		
e. Strainers cleaned		
3. The chilled water and condenser water pumps have been checked for proper rotation and flow.		
4. The following cooling load will be available for start-up:		
a. 25%		
b. 50%		
c. 75%		
d. 100%		
5. The refrigerant charge is at the machine.		
6. Services such as electrical power and control air will be available at start-up.		
7. The electrical and mechanical representatives will be available to assist in commissioning the machine.		
8. The customer's operators will be available to receive instructions for proper operation of the chiller after start-up.		

Concerns about the installation/request for additional assistance:

_____

_____

_____

_____

_____

I am aware that the start-up time for a Carrier chiller can take between 2 and 6 days depending on the model of the machine and the options and accessories used with it.

Your contact at the jobsite will be _____

Phone number _____

Pager/Cell number _____

Fax number _____

In accordance with our contract, we hereby request the services of your technician to render start-up services per contract terms for this job on _____ (Date). I understand that the technician's time will be charged as extra services due to correcting items in this checklist that are incomplete.

Signature of Purchaser _____

Signature of Jobsite Supervisor _____

CUT ALONG DOTTED LINE

CUT ALONG DOTTED LINE