AquaEdge®
19DV High-Efficiency Semi-Hermetic Centrifugal Liquid Chillers with Greenspeed® Intelligence, PIC6 Controls, and HFO R-1233zd(E)
350 to 1,150 Nominal Tons (1,231 to 4,044 kW) 50/60 Hz

Installation Instructions

CONTENTS

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

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

DO NOT VENT refrigerant relief devices within a building. Outlet from rupture disc, relief valve, purge unit, or fusible plugs must be vented outdoors in accordance with the latest edition of ANSI/ASHRAE 15 (American National Standards Institute/American Society of Heating, Refrigerating 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. Open the power supply disconnect before touching motor leads or terminals and wait for capacitors to fully discharge.

⚠ WARNING

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

DO NOT USE TORCH to remove any component. System contains refrigerant which can be under pressure.

To remove a component, wear protective gloves and goggles and other necessary safety equipment, and proceed as follows.

a. Shut off electrical power to unit.
b. Recover refrigerant from system using both high-pressure and low-pressure ports.
c. Traces of vapor should be displaced with nitrogen and the work area should be well ventilated. Refrigerant in contact with an open flame produces toxic gases.
d. Cut component connection tubing with tubing cutter and remove component from unit.
e. Carefully unsweat remaining tubing stubs when necessary.

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, variable frequency drives (VFDs), or compressors until you are sure ALL POWER IS OFF and no residual voltage can leak from capacitors.

LOCK OPEN AND TAG electrical circuits during servicing. IF WORK IS INTERRUPTED, confirm that all circuits are de-energized 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.

BEFORE ADDING INHIBITOR to the unit, be sure to check the type. Using the wrong type could result in damage to the unit. Factory unit comes supplied with inhibitor.

DO NOT ATTEMPT TO REMOVE fittings, covers, etc., with refrigerant in the machine or while machine is running. Be sure pressure is at 0 psig (0 kPa) before breaking any refrigerant connection. Note that at 65°F (18°C) the machine is at near 0 psig (0 kPa) so ensure to properly check for the existence of refrigerant in the machine.

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

⚠ WARNING

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

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.

Prior to installing or servicing this equipment ensure that personal protective equipment (PPE) is worn as required per OSHA or other local regulations.

For servicing or installing components where there is a risk of arc flash the technicians must wear personal protective equipment as identified in NFPA (National Fire Protection Association) 70E or other local country-specific requirements for arc flash protection.

⚠ CAUTION

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

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. Ensure to slope piping way from relief device.

DO NOT re-use compressor purge oil or any oil that has been exposed to the atmosphere. Dispose of oil and refrigerant per local codes and regulations.

DO NOT introduce oil to the refrigerant circuit with refrigerant recovery containers, vacuum pump, or other means.

DO NOT leave refrigerant system open to air any longer than the actual time required to service the equipment. Seal circuits being serviced and charge with dry nitrogen to prevent contamination when timely repairs cannot be completed.

INTRODUCTION

General

The 19DV unit is factory assembled, wired, and leak tested. Installation 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. The refrigerant charge will be installed by the Carrier Start-up Technician during the start-up process.

Job Data

Necessary information consists of:

- job contract or specifications
- machine location prints
- rigging information
- piping prints and details
- field wiring drawings
- starter manufacturer's installation details
- Carrier certified print

CHILLER FAMILIARIZATION

Chiller Information Nameplate

The information nameplate is located on the left side of the chiller control panel. Refer to Fig. 1 for model number identification.

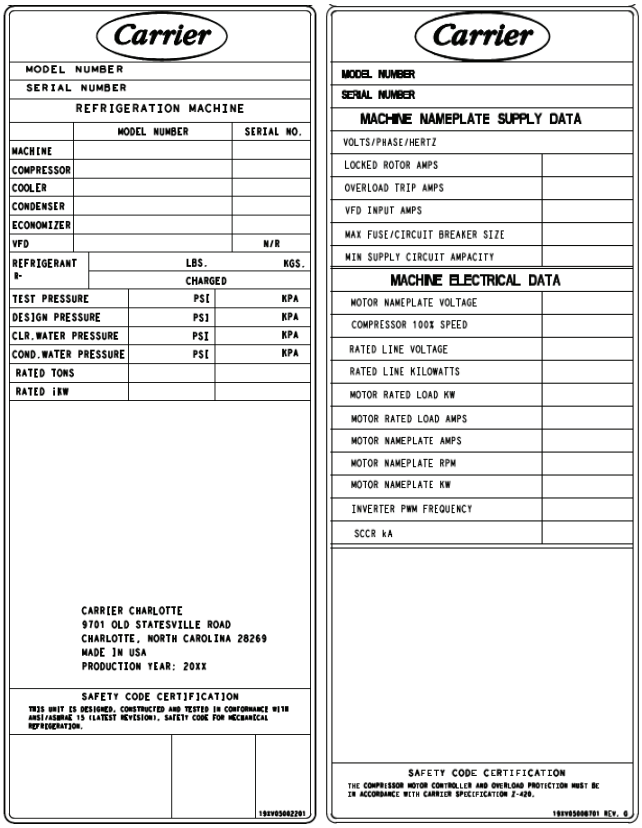


Fig. 1 — 19DV Refrigeration Machine Nameplate

System Components

The main components include the evaporator and condenser heat exchangers in separate vessels, compressor, refrigerant lubrication system, control panel, economizer, VFD, and purge system.

Evaporator

This heat exchanger (also known as the evaporator) is located underneath the compressor. The evaporator is maintained at lower refrigerant temperature/pressure so evaporating refrigerant can remove heat from water flowing through its internal tubes.

Condenser

This heat exchanger operates at a higher refrigerant temperature/pressure than the evaporator and has water flowing through its internal tubes in order to remove heat from the refrigerant.

Compressor

This component maintains system temperature and pressure differences and moves the heat carrying refrigerant from the evaporator to the condenser. The 19DV unit has a back to back two-stage, direct drive, and economized compressor.

Economizer

This chamber reduces the refrigerant temperature to an intermediate level between the evaporator and condenser vessels. In the economizer, vapor is separated from the liquid, the separated vapor flows to the inlet of the second stage of the compressor, and the liquid flows into the evaporator. The energy removed from the vaporized refrigerant in the economizer allows the liquid refrigerant in the evaporator to absorb more heat when it evaporates and benefits the overall cooling efficiency cycle.

VFD

The VFD provides a pulse width modulated signal that results in variable frequency and voltage to the compressor motor. It is controlled and monitored from the PIC6 control system.

Purge System

The purge system is an independent assembly located under the condenser. The 19DV chiller system components normally operate in a vacuum. The purge assembly will automatically remove air and other non-condensables which may have leaked into the system to maintain chiller performance. It is controlled through the PIC6 control system.

PIC6 Touch Screen Panel

This panel is the user interface for controlling the chiller and has the following functions:

- Chiller operation
- Chiller diagnostic
- Chiller status display
- Chiller parameter configuration
- Open protocol interface to outside building management system (BMS)

Control Panel

This control panel includes the input and output boards (IOB), control transformer, relays, contactors, and circuit breakers. It provides the power distribution and protection to the electrical component installed on chiller, and has the following functions:

- Communication with PIC6 touch screen
- Communication with purge panel
- Communication with VFD
- Sensor input and outputs
- Actuators control
- Refrigerant pump control

Purge Control Panel

The purge panel includes an input and output boards, control transformers, relays, and contactors. It provides the power distribution and protection to the electrical components which installed in the purge system and has the following functions:

- Communication with PIC6 touch screen
- Sensor input and outputs
- Solenoid valve control

- Control of purge compressor, vacuum pump, heater, and fan control

Lube Assembly

The lube assembly refers to the filter, strainer and pump package with automatic valve actuator control located under the condenser. The objective of the lube assembly is to provides lubricating liquid refrigerant to the compressor bearings.

INSTALLATION

Step 1 — Receive the Machine

INSPECT SHIPMENT

⚠ CAUTION

Do not open any valves or loosen any connections. The 19DV machine may be shipped with a nitrogen holding charge. Damage to machine may result.

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 installation. All openings are closed with covers or plugs to prevent dirt and debris from entering machine components during shipping. A full operating inhibitor charge is placed in the unit before shipment from the factory.

IDENTIFY MACHINE

The machine model number, serial number, and heat exchanger sizes are shown on machine identification nameplate (Fig. 1-3). Check this information against shipping papers and job data.

INSTALLATION REQUIREMENTS

Prior to starting chiller electrical installation, certain requirements should be checked. Input power wire sizes, branch circuit protection, and control wiring are all areas that need to be evaluated. See Fig. 3 for typical compressor chiller components and Fig. 4 for typical compressor chiller liquid bypass details.

Determine 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 regulations). General recommendations are included in the Carrier field wiring drawings. Consult drawing for termination lug sizes.

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 any panels. Knockouts are provided on the enclosure. The VFD entry plate is designed to be removed before any holes are made to prevent particulate from entering the cabinet.

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 Gauge). Recommended terminal tightening torque is 7 to 9 in.-lb (0.79 to 1.02 N-m).

Required 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 an enclosure.

Service Clearances

Verify that service clearances are adequate as identified in Fig. 5.

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 and to the design data sheet provided by the equipment salesman. Verify all electrical inputs against design data sheets. The VFD electrical data nameplate is located on the right side of the VFD enclosure.

PROVIDE MACHINE PROTECTION

Store machine and VFD indoors, protected from construction dirt and moisture as identified in the long term storage requirements. Inspect under shipping tarps, bags, or crates to be sure that water has not collected during transit. Keep protective shipping covers in place until machine is ready for installation.

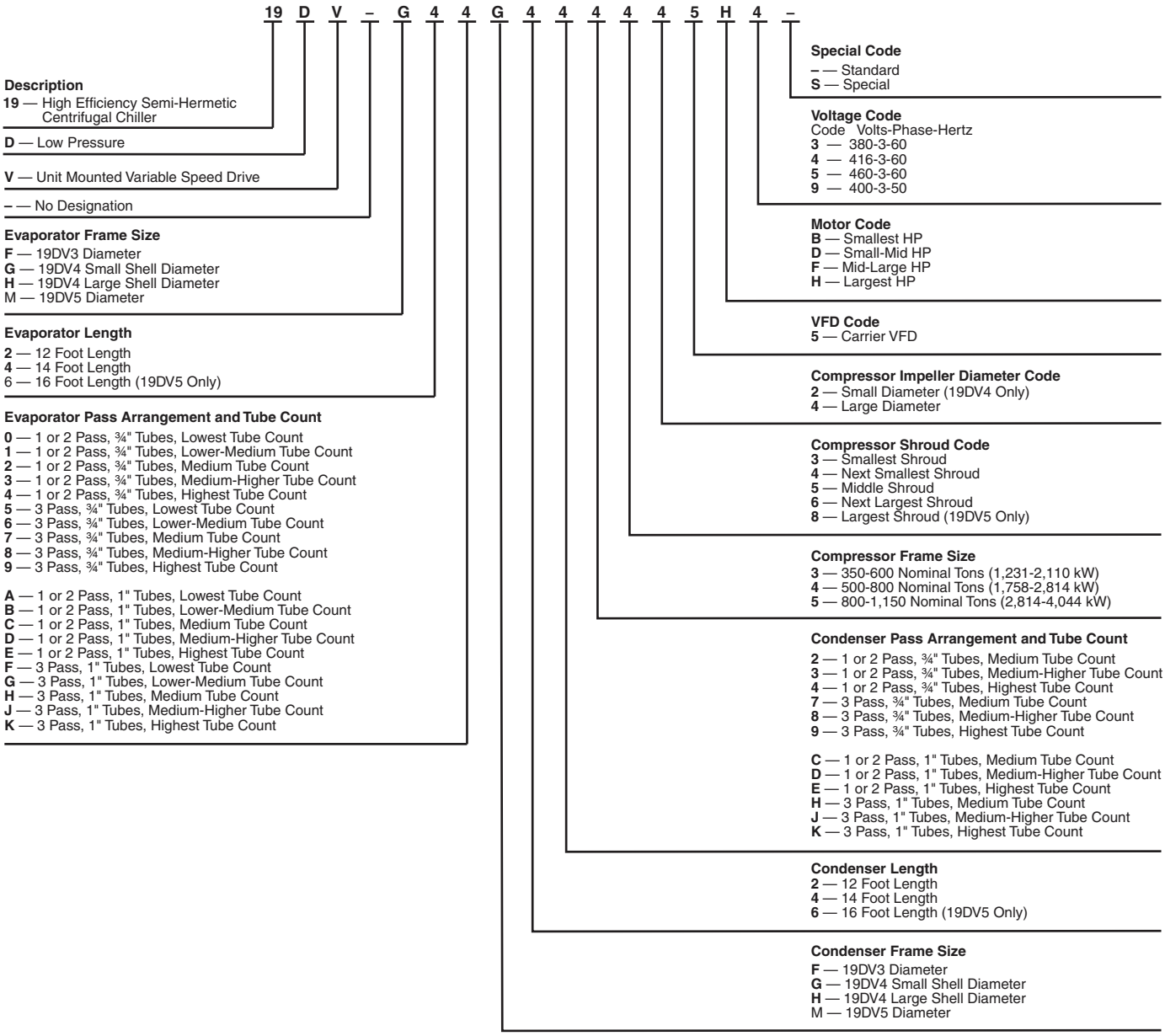
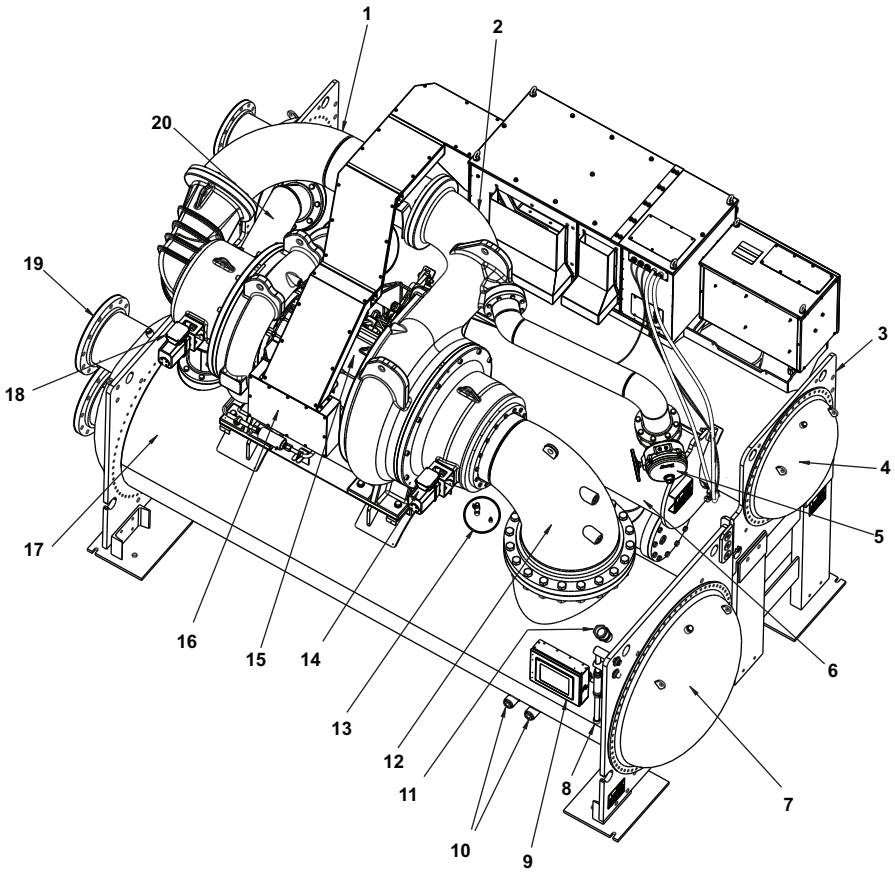
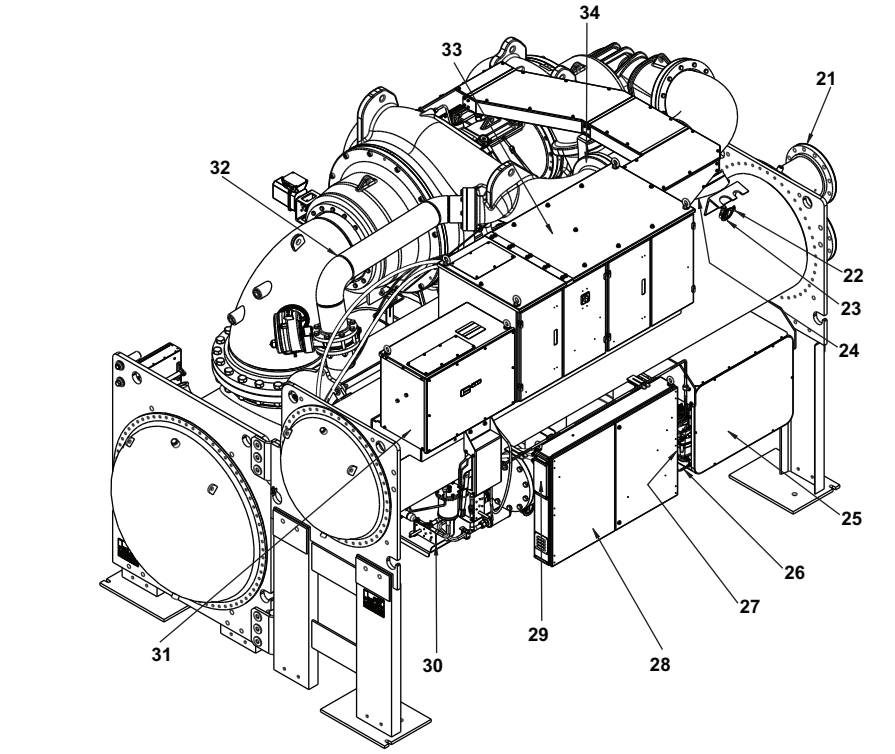


Fig. 2 — 19DV Chiller Model Number Identification



FRONT VIEW

1 — Interconnecting Compressor Piping
2 — VFD Drain (Field Drain Piping Required)
3 — Condenser
4 — Condenser Waterbox Return End
5 — Economizer Isolation Valve (Option)
6 — Economizer
7 — Evaporator Waterbox Return End
8 — Vacuum/Charging Valve (Hidden)
9 — PIC6 HMI Touchscreen Panel
10 — Evaporator Bundle Sight Glasses
11 — Rupture Disc
12 — Suction Elbow
13 — Evaporator Charging Valve and Evaporator Pressure Transducer
14 — First Stage Guided Vane Actuator
15 — Compressor Motor
16 — Moisture Indicator (Hidden)
17 — Evaporator
18 — Second Stage Guided Vane Actuator
19 — Evaporator Waterbox Nozzles
20 — Free Cooling Pipe (Option)



REAR VIEW

21 — Condenser Waterbox Nozzles
22 — Condenser Pressure Transducer
23 — Condenser Charging Valve
24 — Envelope Stability Control Pipe
25 — Purge Assembly
26 — Purge Vent (Hidden)
27 — Motor VFD Cooling Moisture Indicator (Hidden)
28 — Control Panel
29 — Chiller Name Plate Label
30 — Lubrication Assembly
31 — Pull Box* (replaced by Active Harmonic Filter if selected)
32 — Economizer Pipe
33 — VFD
34 — Discharge Pipe

* Pull Box available on DV4 only.

Fig. 3 — Typical 19DV Compressor Chiller Components

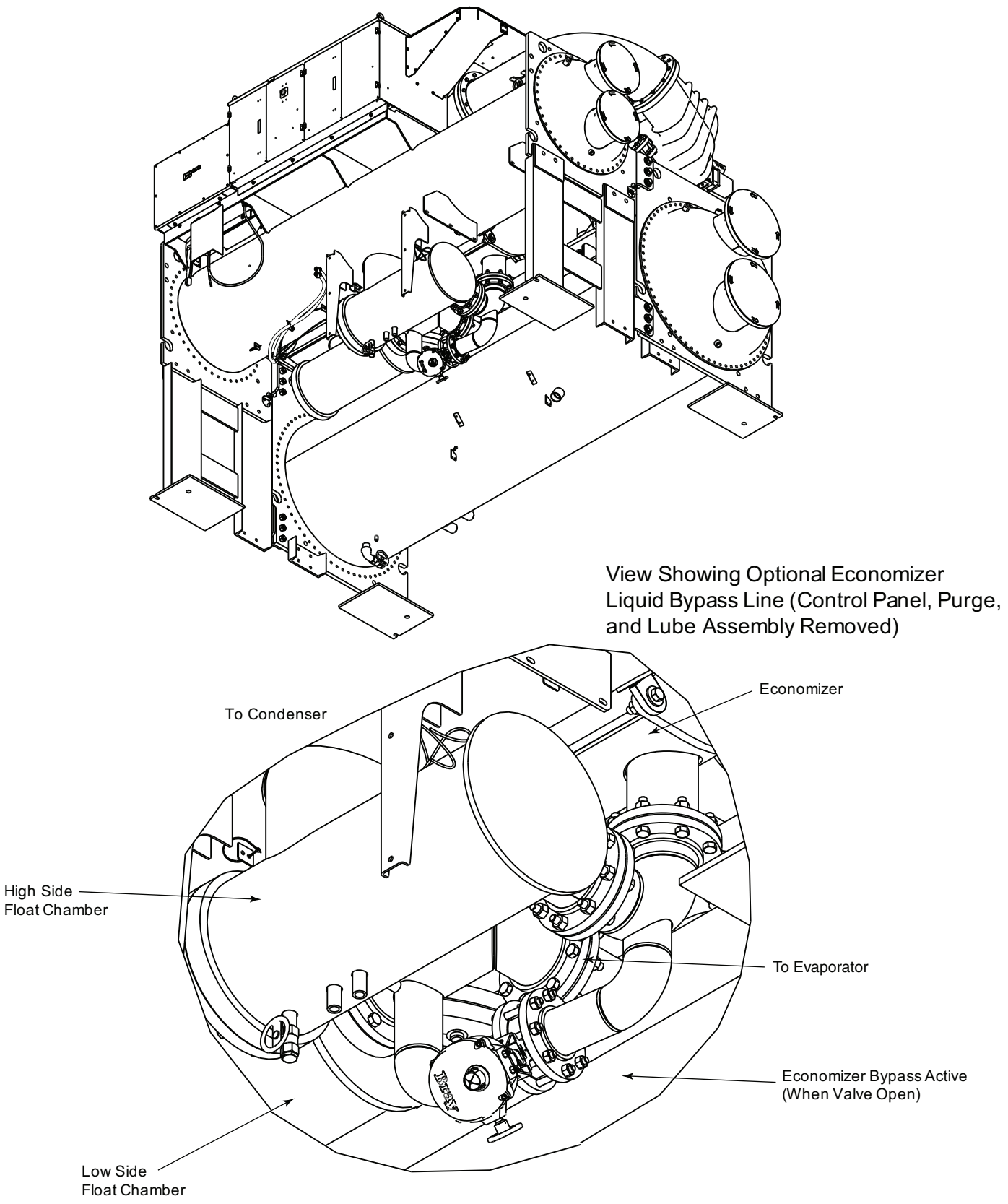
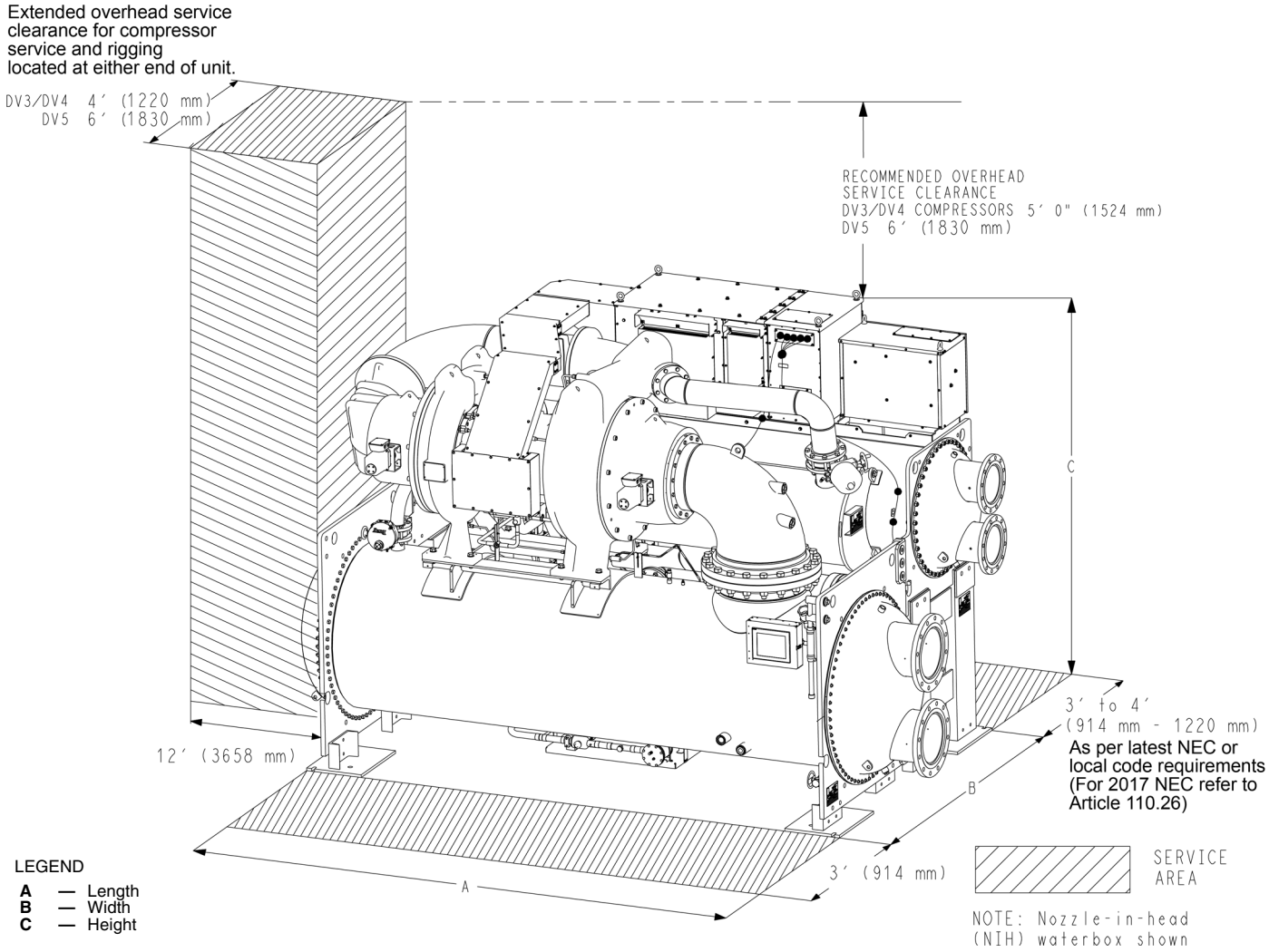


Fig. 4 — Typical 19DV Compressor Chiller Liquid Bypass



NOTES:

1. Dished head (NIH) waterbox shown.
2. Service areas are minimum space required.
   DV3/DV4: For compressor service either end allow 4 feet (1220 mm) on the evaporator side of the chiller or provide free space above the tube pull area equal to the height of the chiller plus 5 feet (1524 mm).
   DV5: For compressor service either end allow 6 feet (1830 mm) on the evaporator side of the chiller or provide free space above the tube pull area equal to the height of the chiller plus 6 feet (1830 mm).
3. Tube pull area:
   Length = length of heat exchanger
   Width = width of heat exchanger.
   Tube pull area can be located at either end of the evaporator or condenser; it extends past the tubesheet the same length as the heat exchanger.

Fig. 5 — 19DV Service Clearances

⚠ CAUTION

Freezing water can damage equipment. If machine can be or possibly has been exposed to freezing temperatures after water circuits have been installed, open waterbox drains and remove all water from evaporator and condenser. Leave drains open until system is ready to be filled.

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

Operating Environment

Chiller should be installed in an indoor environment where the ambient temperature is between 40 and 104°F (4 and 40°C) with a relative humidity of 95% or less, non-condensing. To ensure that electrical components operate properly, do not locate the chiller in an area exposed to dust, dirt, corrosive fumes, or excessive heat and humidity.

NOTE: NEMA Type 1 enclosures are constructed for indoor use to provide a degree of protection to personnel against incidental contact with the enclosed equipment and to provide a degree of protection against falling dirt. This type of enclosure does not protect against water, dust, moisture or airborne contaminants.

Step 2 — Rig the Machine

The 19DV machine can be rigged as an entire assembly. It also has connections that allow the compressor, evaporator, and condenser sections to be separated and rigged individually.

RIG MACHINE ASSEMBLY

See rigging instructions on label attached to machine. Refer to rigging guide (Fig. 6), dimensions in Fig. 5, and physical data in Tables 1-12. *Lift machine only from the points indicated in rigging guide.*

IMPORTANT: Verify with company performing the rigging that they have access to required spreader beam for 4 point lift. Carrier is not responsible for rigging damage.

Each lifting cable or chain must be capable of supporting the entire weight of the machine.

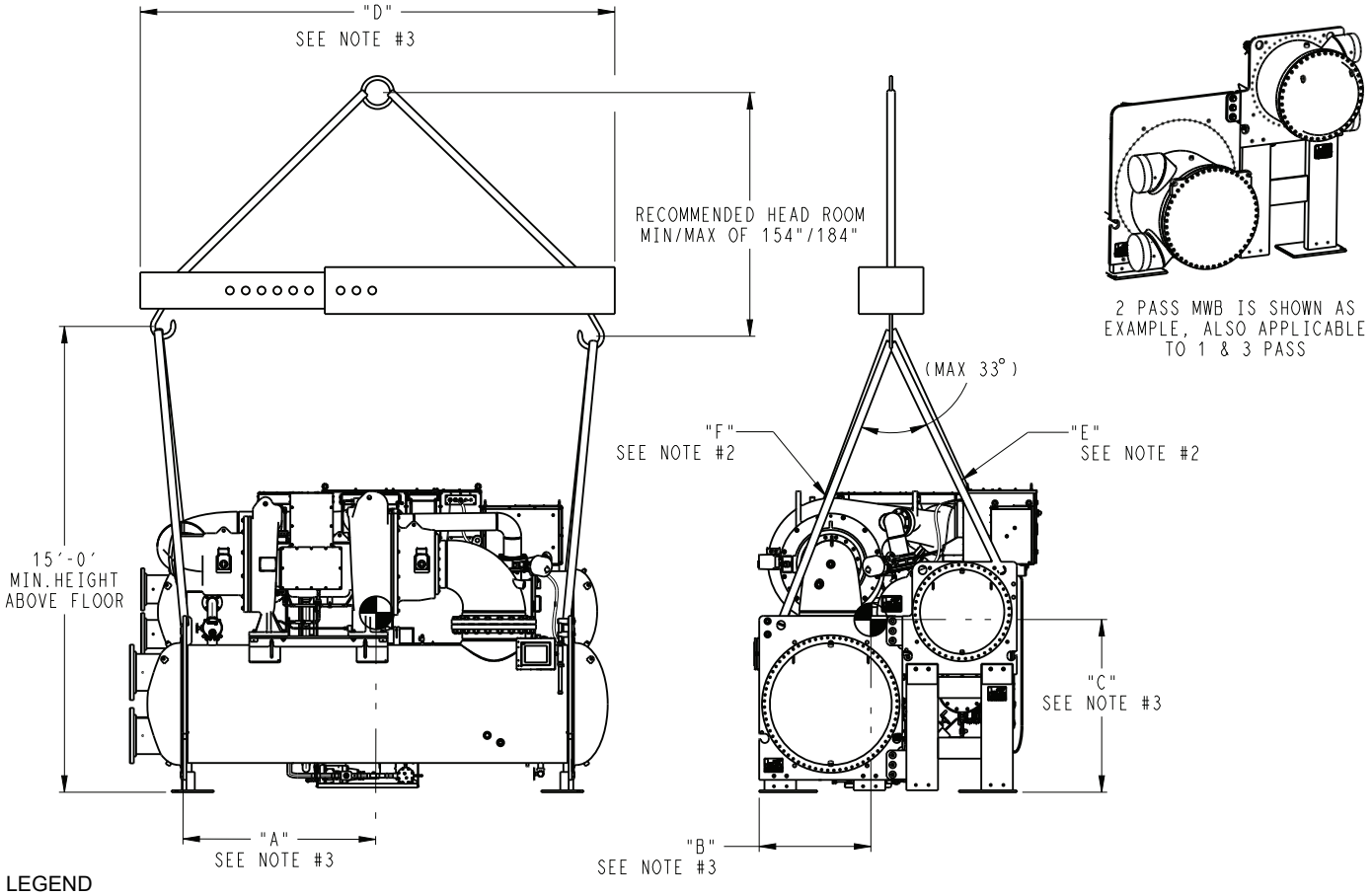
Contractors are not authorized to disassemble any part of the chiller without Carrier's supervision. Any request otherwise must be approved in writing by the Carrier Technical Service Manager. Non-conformance to this requirement may result in loss of product warranty.

NOTE: If transmission of vibrations from mechanical equipment is of concern and is not the responsibility of the manufacturer, Carrier suggests that a structural engineer be consulted.

⚠ WARNING

Lifting chiller or components from points other than those specified may result in serious damage to the machine or personal injury. Rigging equipment and procedures must be adequate for maximum chiller weight. See Fig. 6 for maximum chiller and component weights.

COMPRESSOR FRAME	EVAPORATOR CODE	NIH MAX. WEIGHT lb	MWB MAX. WEIGHT lb	VESSEL LENGTH ft	DIM. "A" in.	DIM. "B" in.	DIM. "C" in.	DIM. "D" in.	CHAIN LENGTH "E" in.	CHAIN LENGTH "F" in.
3	F2A~F2K, F20~F29	29,000	31,500	12	70	44	54	168	106	126
	F4A~F4K, F40~F49	30,500	33,000	14	80	43	54	188	106	126
4	G2A~G2K, G20~G29	35,900	38,000	12	92	35	58	168	106	126
	G4A~G4K, G40~G49	38,000	40,100	14	100	34	57	188	106	126
	H2A~H2K, H20~H29	38,700	41,100	12	72	50	66	168	106	126
	H4A~H4K, H40~H49	41,200	43,500	14	75	55	64	188	106	126
5	M4A~M4K, M40~M49	56,170	58,080	14	80	63	75	192	103	117
	M6A~M6K, M60~M69	59,150	61,060	16	89	62	74	216	103	117



LEGEND

MWB — Marine Waterbox
NIH — Nozzle in Head

NOTES:

1. Each chain must be capable of supporting the entire weight of the machine. See chart for maximum weights. (The maximum weights shown cover weights from steel and copper tubing, insulation, and refrigerant charge, excluding water weight.)
2. Chain lengths shown are typical for 15 ft lifting height. Some minor adjustments may be required.
3. Dimensions "A" and "B" define distance from machine center of gravity to tube sheet outermost surfaces.
   Dimension "C" defines distance from machine center of gravity to floor.
   Dimension "D" defines distance measured between the chain lifting hooks.
4. Marine waterbox values are for 150 PSI rated.

Fig. 6 — Machine Rigging Guide

Table 1 — 19DV Dimensions (Nozzle-In-Head Waterbox)[a,b,c,d,e,f,g,h]

HEAT EXCHANGER SIZE	PASSES	A (LENGTH)		B (WIDTH)		C (HEIGHT)	
		in.	mm	in.	mm	in.	mm
F2[i]	1 pass	186.0	4724.4	100.4	2549.0	111.1	2821.8
	2 pass	178.5	4534.7				
	3 pass	185.6	4714.2				
F4[i]	1 pass	206.5	5245.1	96.5	2450.1	111.1	2821.8
	2 pass	199.0	5055.4				
	3 pass	206.1	5234.9				
G2[i]	1 pass	189.0	4800.6	108.4	2753.4	117.0	2971.8
	2 pass	180.9	4594.9				
	3 pass	185.5	4711.7				
G4[i]	1 pass	209.5	5321.3	99.9	2537.5	117.0	2971.8
	2 pass	201.4	5115.6				
	3 pass	206.0	5232.4				
H2[i]	1 pass	190.8	4846.3	114.0	2896.6	123.9	3147.1
	2 pass	183.4	4658.4				
	3 pass	187.5	4762.5				
H4[i]	1 pass	211.3	5367.0	110.3	2801.6	123.9	3147.1
	2 pass	203.9	5179.1				
	3 pass	208.0	5283.2				
M4	1 pass	—	—	131.6	3343.0	147.4	3745.0
	2 pass	206.1	5234.0				
	3 pass	—	—				
M6	1 pass	—	—	131.6	3343.0	147.4	3745.0
	2 pass	225.9	5736.0				
	3 pass	—	—				

NOTE(S):

a. Service access should be provided per American Society of Heating, Refrigerating, and Air-Conditioning Engineers (ASHRAE) 15, latest edition, National Fire Protection Association (NFPA) 70, local safety code, and Carrier drawings.
b. Overhead clearance for service rigging compressor should be at minimum 3 ft (914 mm) with 5 ft (1524 mm) recommended for easier overhead access.
c. Dimensions are approximate. Certified drawings available upon request.
d. Marine waterboxes typically add to the width of the machine. See certified drawings for details.
e. 'A' length dimensions shown are for standard 150 psig (1034 kPa) design and flanged connections. See certified drawings.
f. 19DV unit heights can vary depending on the configuration. Check 19DV certified drawings for height information.
g. Table contains heat exchanger dimensions. For arrangements where the compressor motor housing extends past the waterbox, consult the 19DV certified drawings.
h. Consult factory for configurations not listed in the above table.
i. Assumes both evaporator and condenser nozzles on same end of chiller; nozzle-in-head waterboxes, 150 psi rated.

Table 2 — 19DV Nozzle Size

HEAT EXCHANGER FRAME SIZE	NOZZLE SIZE (in.) (Nominal Pipe Size)					
	Evaporator			Condenser		
	1-Pass	2-Pass	3-Pass	1-Pass	2-Pass	3-Pass
F	14	12	12	10	10	8
G	14	14	12	12	10	10
H	14	14	12	12	12	10
M	—	16	—	—	14	—

Table 3 — 19DV Dimensions (Marine Waterbox, 150 psig)[a,b,c,d,e,f]

HEAT EXCHANGER SIZE	PASSES	A (LENGTH)		B (WIDTH)		C (HEIGHT)	
		in.	mm	in.	mm	in.	mm
F2[g]	1 pass	209.7	5326.4	100.4	2549.0	111.1	2821.8
	2 pass	188.1	4777.7				
	3 pass	204.7	5199.4				
F4[g]	1 pass	230.2	5847.1	97.9	2487.2	111.1	2821.8
	2 pass	208.6	5298.4	96.8	2458.5		
	3 pass	225.2	5720.1	96.5	2450.1		
G2[g]	1 pass	218.5	5549.9	108.4	2753.4	117.0	2971.8
	2 pass	192.3	4884.4				
	3 pass	210.8	5354.3				
G4[g]	1 pass	239.0	6070.6	102.2	2595.9	117.0	2971.8
	2 pass	212.8	5405.1				
	3 pass	231.3	5875.0				
H2[g]	1 pass	220.5	5600.7	114.0	2896.6	123.9	3147.1
	2 pass	194.2	4932.7				
	3 pass	212.5	5397.5				
H4[g]	1 pass	241.0	6121.4	112.9	2867.7	123.9	3147.1
	2 pass	214.7	5453.4				
	3 pass	233.0	5918.2				
M4	1 pass	—	—	131.6	3343.0	147.4	3745.0
	2 pass	230.1	5845.0				
	3 pass	—	—				
M6	1 pass	—	—	131.6	3343.0	147.4	3745.0
	2 pass	245.1	6455.0				
	3 pass	—	—				

NOTE(S):

a. Service access should be provided per American Society of Heating, Refrigerating, and Air-Conditioning Engineers (ASHRAE) 15, latest edition, National Fire Protection Association (NFPA) 70, local safety code, and Carrier drawings.
b. Overhead clearance for service rigging compressor should be at minimum 3 ft (914 mm) with 5 ft (1524 mm) recommended for easier overhead access.
c. Dimensions are approximate. Certified drawings available upon request.
d. Marine waterboxes typically add to the width of the machine. See certified drawings for details.
e. 19DV unit height can vary depending on the configuration. Check 19DV certified drawings for height information.
f. The table does not take into account equipment overhang or nozzle configurations with nozzles on opposite ends of chiller or mix of waterbox types. See certified drawings for final unit dimensions.
g. Assumes both evaporator and condenser nozzles on same end of chiller; marine waterboxes, 150 psi rated.

Table 4 — Component Weights

COMPONENT	COMPRESSOR							
	DV3 Frame F		DV4 Frame G		DV4 Frame H		DV5 Frame M	
	lb	kg	lb	kg	lb	kg	lb	kg
SUCTION PIPE ASSEMBLY (includes flanges)	410	186	569	259	584	265	682	309
INTERSTAGE PIPING (section only from flange to flange)	316	144	346	157	335	152	1019	462
DISCHARGE PIPING	5	2	5	2	5	2	197	89
HMI PANEL	72	33	72	33	72	33	80	36
CONTROL PANEL	170	77	170	77	170	77	200	91
HIGH SIDE FLOAT CHAMBER COVER	64	29	82	37	82	37	79	36
LOW SIDE FLOAT CHAMBER COVER	64	29	82	37	82	37	79	36
PURGE ASSEMBLY	263	120	263	120	263	120	270	122
ENVELOP CONTROL VALVE	30	14	97	44	97	44	34	15
ECONOMIZER BYPASS VALVE	85	39	121	55	121	55	62	28
FREE COOLING VALVE	62	28	200	91	200	91	75	34
FREE COOLING PIPE	91	41	276	125	285	130	257	117
ECONOMIZER VENT LINE PIPING	73	33	111	50	118	54	144	65
VFD 32VSS0680	1354	615	—	—	—	—	—	—
VFD 32VSS0900	—	—	1321	599	1321	599	1321	599
VFD 32VSS1060	—	—	—	—	—	—	1321	599
VFD 32VSS1200	—	—	—	—	—	—	1616	733
VFD PULLBOX	184	84	184	84	184	84	184	84
VFD ACTIVE HARMONIC FILTER	650	295	650	295	650	295	800	363
VFD CABLE	150	68	200	91	200	91	286	130
VFD TRAY	100	45	124	56	124	56	30	14

Table 5 — 19DV Compressor and Motor Weights[a] — High-Efficiency Motors

MOTOR CODE	ENGLISH			SI		
	Compressor Weight[b] (lb)	Stator and Housing Weight (lb)	Rotor and Shaft Weight (lb)	Compressor Weight[b] (kg)	Stator and Housing Weight (kg)	Rotor and Shaft Weight (kg)
DV3						
Voltage: 380/460						
B	5605	926	242	2542	420	110
D	5605	926	242	2542	420	110
F	5605	1041	281	2542	472	127
H	5605	1093	302	2542	496	137
DV4						
Voltage: 380/460						
B	6195	1090	330	2810	494	150
D	6195	1150	340	2810	522	154
F	6195	1230	350	2810	558	159
H	6195	1316	364	2810	597	165
DV5						
Voltage: 380/460						
B	10677	1956	584	4843	887	265
D	10677	1991	593	4843	903	269
F	10677	2025	603	4843	919	273
H	10677	2094	622	4843	950	282

NOTE(S):

a. Total compressor weight is the sum of the compressor aerodynamic components (compressor weight column), stator, rotor, and end bell cover weights.
b. Compressor aerodynamic component weight only, motor weight not included. Applicable to standard compressors only.

Table 6 — 19DV Heat Exchanger Weights (English)[a,b]

CODE[c]	DRY RIGGING WEIGHT (LB)[d]		REFRIGERANT WEIGHT (LB)		WATER WEIGHT (LB)	
	Evaporator Only	Condenser Only	Evaporator Only[e]	Condenser Only	Evaporator Only	Condenser Only
F20	7272	—	—	—	1311	—
F21	7376	—	—	—	1359	—
F22	7529	6127	—	311	1432	1156
F23	7684	6356	—	319	1504	1248
F24	7837	6534	—	326	1577	1321
F25	7287	—	—	—	1290	—
F26	7399	—	—	—	1342	—
F27	7536	5999	—	311	1408	1008
F28	7691	6189	—	319	1480	1085
F29	7845	6398	—	326	1553	1170
F40	7856	—	—	—	1384	—
F41	7975	—	—	—	1440	—
F42	8151	6625	—	386	1522	1259
F43	8330	6888	—	395	1605	1365
F44	8506	7092	—	403	1688	1447
F45	7865	—	—	—	1361	—
F46	7993	—	—	—	1420	—
F47	8151	6476	—	386	1495	1103
F48	8329	6695	—	395	1578	1191
F49	8506	6934	—	403	1660	1288
F2A	6972	—	—	—	1346	—
F2B	7072	—	—	—	1414	—
F2C	7169	5666	—	288	1481	1222
F2D	7269	5796	—	292	1548	1300
F2E	7372	5975	—	298	1615	1405
F2F	6972	—	—	—	1306	—
F2G	7062	—	—	—	1367	—
F2H	7169	5548	—	288	1441	1054
F2J	7261	5678	—	292	1501	1132
F2K	7379	5866	—	298	1582	1243
F4A	7513	—	—	—	1425	—
F4B	7629	—	—	—	1502	—
F4C	7741	6099	—	349	1578	1335
F4D	7857	6249	—	354	1655	1423
F4E	7975	6455	—	361	1731	1543
F4F	7505	—	—	—	1380	—
F4G	7608	—	—	—	1448	—
F4H	7733	5961	—	349	1532	1156
F4J	7838	6111	—	354	1601	1244
F4K	7975	6328	—	361	1693	1371
G20	8611	—	—	—	1723	—
G21	8772	—	—	—	1799	—
G22	8942	6713	—	360	1879	1332
G23	9111	6956	—	370	1959	1430
G24	9330	7222	—	379	2063	1539
G25	8677	—	—	—	1695	—
G26	8802	—	—	—	1754	—
G27	8972	6669	—	360	1834	1245
G28	9147	6884	—	370	1917	1333
G29	9339	7140	—	379	2007	1437
G40	9260	—	—	—	1808	—
G41	9446	—	—	—	1895	—
G42	9641	7275	—	437	1986	1453
G43	9836	7555	—	448	2076	1566
G44	10,088	7860	—	459	2195	1689
G45	9326	—	—	—	1780	—
G46	9470	—	—	—	1847	—
G47	9665	7220	—	437	1938	1363
G48	9867	7467	—	448	2032	1463
G49	10,087	7760	—	459	2135	1581
G2A	8225	—	—	—	1740	—
G2B	8324	—	—	—	1807	—
G2C	8433	6198	—	397	1881	1424
G2D	8540	6402	—	403	1952	1544
G2E	8699	6585	—	411	2059	1653
G2F	8236	—	—	—	1675	—
G2G	8331	—	—	—	1739	—
G2H	8450	6180	—	397	1819	1340

Table 6 — 19DV Heat Exchanger Weights (English)[a,b] (cont)

CODE[c]	DRY RIGGING WEIGHT (LB)[d]		REFRIGERANT WEIGHT (LB)		WATER WEIGHT (LB)	
	Evaporator Only	Condenser Only	Evaporator Only[e]	Condenser Only	Evaporator Only	Condenser Only
G2J	8580	6359	—	403	1907	1446
G2K	8710	6504	—	411	1994	1532
G4A	8818	—	—	—	1827	—
G4B	8933	—	—	—	1904	—
G4C	9059	6688	—	462	1988	1558
G4D	9182	6922	—	469	2068	1696
G4E	9365	7133	—	477	2191	1819
G4F	8821	—	—	—	1757	—
G4G	8931	—	—	—	1830	—
G4H	9068	6663	—	462	1922	1471
G4J	9218	6869	—	469	2021	1591
G4K	9368	7036	—	477	2121	1690
H20	9572	—	—	—	2127	—
H21	9755	—	—	—	2213	—
H22	9936	7933	—	484	2298	1726
H23	10,177	8253	—	495	2412	1856
H24	10,420	8601	—	507	2527	1996
H25	9518	—	—	—	2101	—
H26	9697	—	—	—	2185	—
H27	9906	7815	—	484	2284	1678
H28	10,115	8125	—	495	2383	1803
H29	10,356	8450	—	507	2497	1936
H40	10,315	—	—	—	2235	—
H41	10,526	—	—	—	2334	—
H42	10,734	8618	—	484	2430	1882
H43	11,011	8985	—	495	2560	2029
H44	11,291	9384	—	507	2690	2189
H45	10,253	—	—	—	2205	—
H46	10,459	—	—	—	2302	—
H47	10,700	8482	—	563	2414	1827
H48	10,940	8837	—	576	2527	1969
H49	11,218	9211	—	590	2657	2121
H2A	9025	—	—	—	2111	—
H2B	9149	—	—	—	2195	—
H2C	9294	7294	—	431	2293	1852
H2D	9453	7532	—	439	2400	1991
H2E	9623	7791	—	448	2514	2143
H2F	8990	—	—	—	2088	—
H2G	9115	—	—	—	2172	—
H2H	9253	7210	—	431	2266	1802
H2J	9402	7425	—	439	2363	1929
H2K	9568	7675	—	448	2477	2075
H4A	9692	—	—	—	2218	—
H4B	9835	—	—	—	2313	—
H4C	10002	7889	—	499	2424	2025
H4D	10,185	8163	—	508	2546	2183
H4E	10,381	8461	—	518	2676	2356
H4F	9652	—	—	—	2191	—
H4G	9795	—	—	—	2286	—
H4H	9956	7792	—	499	2393	1969
H4J	10,126	8040	—	508	2504	2113
H4K	10,318	8327	—	518	2634	2279
M40	12,453	—	—	—	2395	—
M41	12,734	—	—	—	2529	—
M42	13,053	12,679	—	551	2679	2538
M43	13,366	13,245	—	571	2829	2773
M44	13,767	13,869	—	594	3018	3032
M60	13,520	—	—	—	2568	—
M61	13,845	—	—	—	2721	—
M62	14,213	13,889	—	684	2892	2835
M63	14,576	14,543	—	708	3064	3105
M64	15,038	15,264	—	734	3280	3400
M4A	11,155	—	—	—	1828	—
M4B	11,287	—	—	—	1895	—
M4C	11,446	10,196	—	543	1977	1578
M4D	11,624	10,475	—	557	2068	1703
M4E	11,830	10,781	—	572	2171	1840
M6A	12,032	—	—	—	1919	—

Table 6 — 19DV Heat Exchanger Weights (English)[a,b] (cont)

CODE[c]	DRY RIGGING WEIGHT (LB)[d]		REFRIGERANT WEIGHT (LB)		WATER WEIGHT (LB)	
	Evaporator Only	Condenser Only	Evaporator Only[e]	Condenser Only	Evaporator Only	Condenser Only
M6B	12,186	—	—	—	1996	—
M6C	12,373	11,051	—	677	2090	1739
M6D	12,581	11,376	—	693	2194	1882
M6E	12,820	11,735	—	711	2311	2038

NOTE(S):

a. Evaporator weight includes two-pass Victaulic dished heads.
b. Condenser weight includes the high side float chamber, discharge pipe, and two-pass Victaulic dished heads; does not include economizer weight.
c. See Model Number Nomenclature.
d. Rigging weights are for standard Super B5LSL and Super C5 tubes of standard wall thickness (0.025-in. [0.635 mm] wall) and do not include refrigerant weight.
e. Actual evaporator refrigerant charge weight is calculated based on pass and nozzle arrangement as well as selected capacity. Therefore charge weight is not included in this publication. Charge weight for condenser and economizer are for reference only. User must consult unit name plate or the as sold performance sheet or E-Cat selection sheet in order to obtain accurate refrigerant charge information.

Table 7 — 19DV Heat Exchanger Weights (SI)[a,b]

CODE[c]	DRY RIGGING WEIGHT (kg)[d]		REFRIGERANT WEIGHT (kg)		WATER WEIGHT (kg)	
	Evaporator Only	Condenser Only	Evaporator Only[e]	Condenser Only	Evaporator Only	Condenser Only
F20	3299	—	—	—	595	—
F21	3346	—	—	—	616	—
F22	3415	2779	—	141	650	524
F23	3485	2883	—	145	682	566
F24	3555	2964	—	148	715	599
F25	3305	—	—	—	585	—
F26	3356	—	—	—	609	—
F27	3418	2721	—	141	639	457
F28	3489	2807	—	145	671	492
F29	3558	2902	—	148	704	531
F40	3563	—	—	—	628	—
F41	3617	—	—	—	653	—
F42	3697	3005	—	175	690	571
F43	3778	3124	—	179	728	619
F44	3858	3217	—	183	766	656
F45	3568	—	—	—	617	—
F46	3626	—	—	—	644	—
F47	3697	2937	—	175	678	500
F48	3778	3037	—	179	716	540
F49	3858	3145	—	183	753	584
F2A	3162	—	—	—	611	—
F2B	3208	—	—	—	641	—
F2C	3252	2570	—	131	672	554
F2D	3297	2629	—	132	702	590
F2E	3344	2710	—	135	733	637
F2F	3162	—	—	—	592	—
F2G	3203	—	—	—	620	—
F2H	3252	2517	—	131	654	478
F2J	3294	2575	—	132	681	513
F2K	3347	2661	—	135	718	564
F4A	3408	—	—	—	646	—
F4B	3460	—	—	—	681	—
F4C	3511	2766	—	158	716	606
F4D	3564	2834	—	161	751	645
F4E	3617	2928	—	164	785	700
F4F	3404	—	—	—	626	—
F4G	3451	—	—	—	657	—
F4H	3508	2704	—	158	695	524
F4J	3555	2772	—	161	726	564
F4K	3617	2870	—	164	768	622
G20	3906	—	—	—	782	—
G21	3979	—	—	—	816	—
G22	4056	3045	—	163	852	604
G23	4133	3155	—	167	889	649
G24	4232	3276	—	172	936	698
G25	3936	—	—	—	769	—
G26	3993	—	—	—	796	—
G27	4070	3025	—	163	832	565
G28	4149	3123	—	167	870	605
G29	4236	3239	—	172	910	652
G40	4200	—	—	—	820	—
G41	4285	—	—	—	860	—
G42	4373	3300	—	198	901	659
G43	4462	3427	—	203	942	710
G44	4576	3565	—	208	996	766
G45	4230	—	—	—	807	—
G46	4296	—	—	—	838	—
G47	4384	3275	—	198	879	618
G48	4476	3387	—	203	922	664
G49	4575	3520	—	208	968	717
G2A	3731	—	—	—	789	—
G2B	3776	—	—	—	820	—
G2C	3825	2811	—	180	853	646
G2D	3874	2904	—	182	885	700
G2E	3946	2987	—	186	934	750
G2F	3736	—	—	—	760	—
G2G	3779	—	—	—	789	—
G2H	3833	2803	—	180	825	608

Table 7 — 19DV Heat Exchanger Weights (SI)[a,b] (cont)

CODE[c]	DRY RIGGING WEIGHT (kg)[d]		REFRIGERANT WEIGHT (kg)		WATER WEIGHT (kg)	
	Evaporator Only	Condenser Only	Evaporator Only[e]	Condenser Only	Evaporator Only	Condenser Only
G2J	3892	2884	—	182	865	656
G2K	3951	2950	—	186	904	695
G4A	4000	—	—	—	829	—
G4B	4052	—	—	—	864	—
G4C	4109	3034	—	209	902	707
G4D	4165	3140	—	212	938	769
G4E	4248	3235	—	216	994	825
G4F	4001	—	—	—	797	—
G4G	4051	—	—	—	830	—
G4H	4113	3022	—	209	872	667
G4J	4181	3116	—	212	917	722
G4K	4249	3191	—	216	962	767
H20	4342	—	—	—	965	—
H21	4425	—	—	—	1004	—
H22	4507	3599	—	220	1042	783
H23	4616	3744	—	225	1094	842
H24	4726	3901	—	230	1146	905
H25	4317	—	—	—	953	—
H26	4399	—	—	—	991	—
H27	4493	3545	—	220	1036	761
H28	4588	3685	—	225	1081	818
H29	4698	3833	—	230	1133	878
H40	4679	—	—	—	1014	—
H41	4774	—	—	—	1058	—
H42	4869	3909	—	220	1102	853
H43	4995	4075	—	225	1161	920
H44	5121	4256	—	230	1220	993
H45	4651	—	—	—	1000	—
H46	4744	—	—	—	1044	—
H47	4853	3847	—	255	1095	829
H48	4962	4008	—	261	1146	893
H49	5088	4178	—	268	1205	962
H2A	4094	—	—	—	958	—
H2B	4150	—	—	—	996	—
H2C	4216	3308	—	195	1040	840
H2D	4288	3416	—	199	1089	903
H2E	4365	3534	—	203	1140	972
H2F	4078	—	—	—	947	—
H2G	4134	—	—	—	985	—
H2H	4197	3270	—	195	1028	818
H2J	4265	3368	—	199	1072	875
H2K	4340	3481	—	203	1124	941
H4A	4396	—	—	—	1006	—
H4B	4461	—	—	—	1049	—
H4C	4537	3578	—	226	1100	919
H4D	4620	3703	—	230	1155	990
H4E	4709	3838	—	235	1214	1069
H4F	4378	—	—	—	994	—
H4G	4443	—	—	—	1037	—
H4H	4516	3535	—	226	1086	893
H4J	4593	3647	—	230	1136	958
H4K	4680	3777	—	235	1195	1034
M40	5648	—	—	—	1087	—
M41	5776	—	—	—	1147	—
M42	5921	5751	—	250	1215	1151
M43	6063	6008	—	259	1283	1258
M44	6244	6291	—	269	1369	1375
M60	6132	—	—	—	1165	—
M61	6280	—	—	—	1234	—
M62	6447	6300	—	310	1312	1286
M63	6612	6596	—	321	1390	1408
M64	6821	6924	—	333	1488	1542
M4A	5060	—	—	—	829	—
M4B	5120	—	—	—	859	—
M4C	5192	4625	—	246	897	716
M4D	5273	4751	—	253	938	773
M4E	5366	4890	—	259	985	835
M6A	5458	—	—	—	871	—

Table 7 — 19DV Heat Exchanger Weights (SI)[a,b] (cont)

CODE[c]	DRY RIGGING WEIGHT (kg)[d]		REFRIGERANT WEIGHT (kg)		WATER WEIGHT (kg)	
	Evaporator Only	Condenser Only	Evaporator Only[e]	Condenser Only	Evaporator Only	Condenser Only
M6B	5528	—	—	—	905	—
M6C	5612	5013	—	307	948	789
M6D	5706	5160	—	314	995	854
M6E	5815	5323	—	323	1048	925

NOTE(S):

a. Evaporator weight includes two-pass Victaulic dished heads.
b. Condenser weight includes the high side float chamber, discharge pipe, and two-pass Victaulic dished heads; does not include economizer weight.
c. See Model Number Nomenclature.
d. Rigging weights are for standard Super B5LSL and Super C5 tubes of standard wall thickness (0.025-in. [0.635 mm] wall) and do not include refrigerant weight.
e. Actual evaporator refrigerant charge weight is calculated based on pass and nozzle arrangement as well as selected capacity. Therefore charge weight is not included in this publication. Charge weight for condenser and economizer are for reference only. User must consult unit name plate or the as sold performance sheet or E-Cat selection sheet in order to obtain accurate refrigerant charge information.

Table 8 — 19DV Economizer Weight

COMPRESSOR SIZE	DRY WEIGHT (lb)[a]	REFRIGERANT WEIGHT (lb)	OPERATION WEIGHT (lb)	DRY WEIGHT (kg)[a]	REFRIGERANT WEIGHT (kg)	OPERATION WEIGHT (kg)
DV3	1501	227	1728	681	103	784
DV4	1931	342	2273	876	155	1031
DV5	2785	570	3355	1263	259	1522

NOTE(S):

a. Includes standard economizer weight and all connecting piping to compressor.

Table 9 — Additional Weights for 19DV 150 psig (1034 kPa) Marine Waterboxes[a,b] — English (lb)

FRAME	NUMBER OF PASSES	EVAPORATOR			CONDENSER		
		Rigging Weight		Water Weight	Rigging Weight		Water Weight
		Victaulic	Flange		Victaulic	Flange	
F	1	352	426	961	255	293	561
	2	397	509	930	311	381	596
	3	356	411	886	233	259	457
G	1	365	441	1142	323	380	779
	2	450	598	1212	337	413	689
	3	375	432	1056	305	340	661
H	1	460	534	1236	397	453	927
	2	466	614	1317	462	575	981
	3	381	437	1132	382	417	787
M	2	1008	1201	2517	760	910	2009

Table 10 — Additional Weights for 19DV 150 psig (1034 kPa) Marine Waterboxes[a,b] — SI (kg)

FRAME	NUMBER OF PASSES	EVAPORATOR			CONDENSER		
		Rigging Weight		Water Weight	Rigging Weight		Water Weight
		Victaulic	Flange		Victaulic	Flange	
F	1	160	193	436	116	133	254
	2	180	231	422	141	173	270
	3	161	186	402	106	117	207
G	1	166	200	518	147	172	353
	2	204	271	550	153	187	313
	3	170	196	479	138	154	300
H	1	209	242	561	180	205	420
	2	211	279	597	210	261	445
	3	173	198	513	173	189	357
M	2	457	545	1142	345	413	911

NOTE(S):

a. Add to evaporator and condenser weights for total weights. Evaporator and condenser weights may be found in Table 7. The first digit of the heat exchanger code (first column) is the heat exchanger frame size.
b. Values are for Victaulic nozzles, two-pass dished head design.

Table 11 — 19DV Waterbox Cover Weights — English (lb)[a]

WATERBOX	PASSES	EVAPORATOR								CONDENSER							
		Frame F		Frame G		Frame H		Frame M		Frame F		Frame G		Frame H		Frame M	
		Flange	Victaulic	Flange	Victaulic	Flange	Victaulic	Flange	Victaulic	Flange	Victaulic	Flange	Victaulic	Flange	Victaulic	Flange	Victaulic
NIH Dished Cover, 150 psig	1	406	328	494	417	515	437	—	—	191	154	232	172	249	187	—	—
	2	536	419	682	528	714	560	—	—	294	220	308	235	390	273	717	523
	2 return	315		404		424		—		134		154		168		404	
	3	459	401	557	499	588	529	—	—	212	186	247	210	268	232	—	—
MWB Flat Cover, 150 psig	1	426	352	668		759		—		293	255	138		172		—	
	2	509	397					476		381	311	172		214		476	
	2 return	315		404		422		436		134		154		168		436	
	3	411	356	668		759		—		259	233	172		215		—	

NOTE(S):

a. Weights for dished head cover and MWB end cover 150 psig are included in the heat exchanger weights shown in Table 6.

Table 12 — 19DV Waterbox Cover Weights — SI (kg)[a]

WATERBOX	PASSES	EVAPORATOR								CONDENSER							
		Frame F		Frame G		Frame H		Frame M		Frame F		Frame G		Frame H		Frame M	
		Flange	Victaulic	Flange	Victaulic	Flange	Victaulic	Flange	Victaulic	Flange	Victaulic	Flange	Victaulic	Flange	Victaulic	Flange	Victaulic
NIH Dished Cover, 150 psig	1	184	149	224	189	234	198	—	—	87	70	105	78	113	85	—	—
	2	243	190	309	239	324	254	—	—	133	100	140	107	177	124	325	237
	2 return	143		183		192		—		61		70		76		183	
	3	208	182	253	226	267	240	—	—	96	84	112	95	122	105	—	—
MWB Flat Cover, 150 psig	1	193	160	303		344		—		133	116	63		78		—	
	2	231	180					216		173	141	78		97		216	
	2 return	143		183		191		198		61		70		76		198	
	3	186	161	303		344		—		117	106	78		98		—	

NOTE(S):

a. Weights for dished head cover and MWB end cover 1034 kPa are included in the heat exchanger weights shown in Table 7.

LEGEND

MWB — Marine Waterbox
NIH — Nozzle-in-Head Waterbox

RIG MACHINE COMPONENTS

Refer to instructions below, Fig. 7-9, and Carrier Certified Prints for machine component disassembly.

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

⚠ WARNING

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

⚠ CAUTION

Before rigging the compressor, disconnect all wires connected to the control panel to avoid damage to electrical components.

NOTE: If the evaporator, economizer, 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.

NOTE: Wiring must also be disconnected. Label each wire before removal (see Carrier Certified Prints). In order to disconnect the VFD from the machine, remove wiring between the VFD and the refrigerant pump, control panel, purge power, and the main motor leads at the starter lugs.

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

NOTE: All factory units have inhibitor in the lubrication assembly. Both bearing supply and HS float chamber ball valves are shut at factory to contain the inhibitor (see Fig. 10). Should it be required to remove the lubrication assembly prior to start-up, do not cut any low piping without prior removal of inhibitor to avoid spilling on the floor.

To Separate Evaporator and Condenser:

1. Place a support plate under each tube sheet leg to keep each vessel level.
2. Cut tubing between high side float chamber and motor/VFD cooling.
3. Cut tubing between high side float chamber and lube assembly.
4. Disconnect the compressor discharge pipe.
5. Disconnect bolted connection between the low side float chamber and the evaporator.
6. Disconnect bolted economizer pipe between economizer and second stage compressor inlet.
7. Cut tubing between purge and compressor volute.
8. Cut tubing between purge regeneration line and motor drain.
9. Cover all openings.
10. Disconnect all wires and cables that cross from evaporator side of the machine to the condenser side.
11. Disconnect the marriage brackets connecting the evaporator and condenser tubesheets (both ends).

To Separate the Compressor from the Evaporator:

1. Unbolt motor drain flange.
2. Unbolt suction pipe flange.
3. Unbolt discharge pipe flange.
4. Cut tubing from purge to compressor volute.
5. Disconnect O-ring face seal from bearing drain (near motor drain).
6. Cut bearing supply tubing from lube assembly.
7. Cut motor cooling supply line tubing from high side float chamber.
8. Disconnect inhibitor reclaim line running from compressor to near bottom of evaporator.
9. Disconnect all power and control wires connected to the compressor.
10. Cover all openings.
11. Disconnect compressor motor power cables from VFD to motor.
12. Unbolt compressor mounting from the evaporator.

Additional Notes

1. Use silicone grease on new O-rings when refitting.
2. Use gasket sealant on new gaskets when refitting.

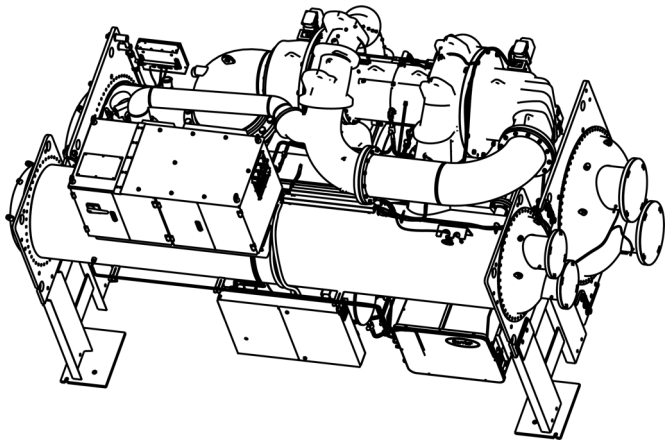


Fig. 7 — 19DV, Side View (DV4 Shown)

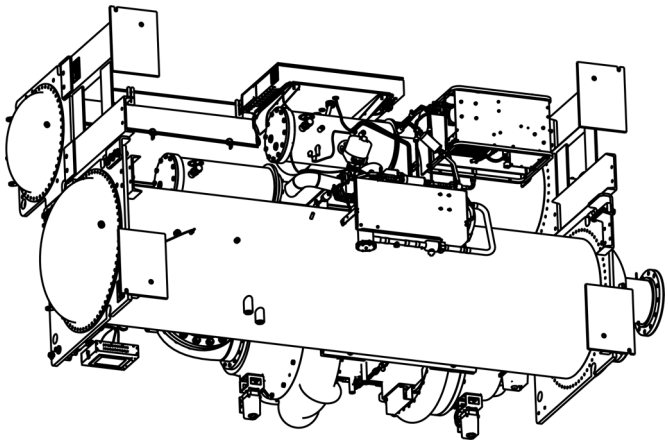
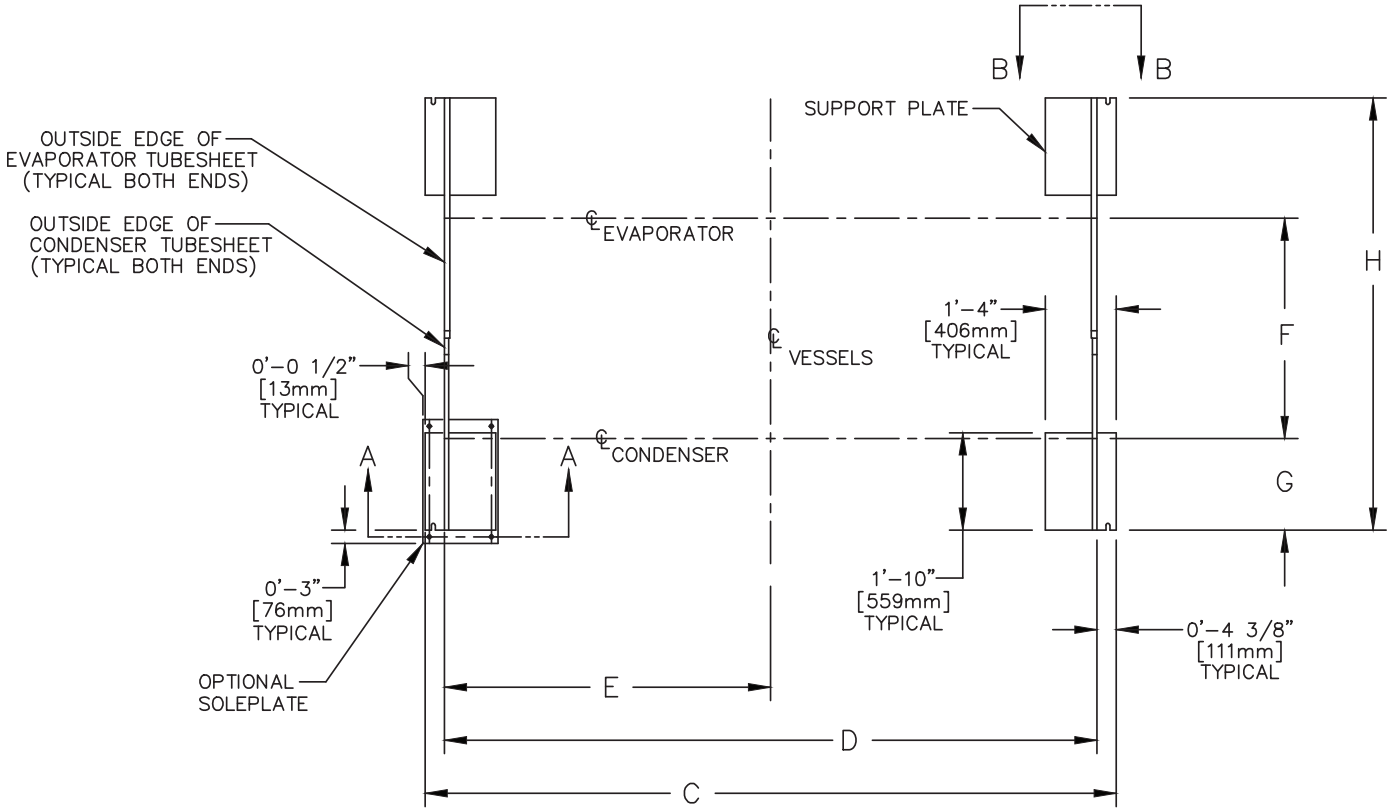


Fig. 8 — 19DV, Bottom View (DV4 Shown)



A-A dimension refers to accessory soleplate. See page 23.
B-B dimension refers to standard support plate. See page 23.

	DIMENSION C		DIMENSION D		DIMENSION E		DIMENSION F		DIMENSION G		DIMENSION H	
	ft-in.	mm	ft-in.	mm	ft-in.	mm	ft-in.	mm	ft-in.	mm	ft-in.	mm
F2[a]	13-0-1/4	3969	12-3-1/2	3747	6-1-3/4	1873	3-11-3/4	1211	1-6	457	7-5-7/8	2283
F4[a]	14-8-3/4	4490	14-0	4267	7-0	2134	3-11-3/4	1211	1-6	457	7-5-7/8	2283
G2[a]	13-0-1/4	3969	12-3-1/2	3747	6-1-3/4	1873	4-1-7/8	1267	1-8-3/4	530	8-1-3/4	2483
G4[a]	14-8-3/4	4489	14-0	4267	7-0	2134	4-1-7/8	1267	1-8-3/4	530	8-1-3/4	2483
H2[a]	13-0-1/4	3969	12-3-1/2	3747	6-1-3/4	1873	4-5-3/4	1365	1-10-1/4	565	8-9-1/4	2673
H4[a]	14-8-3/4	4489	14-0	4267	7-0	2134	4-5-3/4	1365	1-10-1/4	565	8-9-1/4	2673
M2[a]	14-6-1/4	4427	14-0	4267	7-0	2134	7-7-1/2	2324	2-5-3/8	746	10-5-7/8	3197
M4[a]	16-6-1/4	5037	16-0	4877	8-0	2439	7-7-1/2	2324	2-5-3/8	746	10-5-7/8	3197

NOTE(S):

a. Assumes both evaporator and condenser nozzles on same end of chiller; nozzle-in-head waterboxes, 150 psi rated.

Fig. 9 — 19DV Machine Footprint

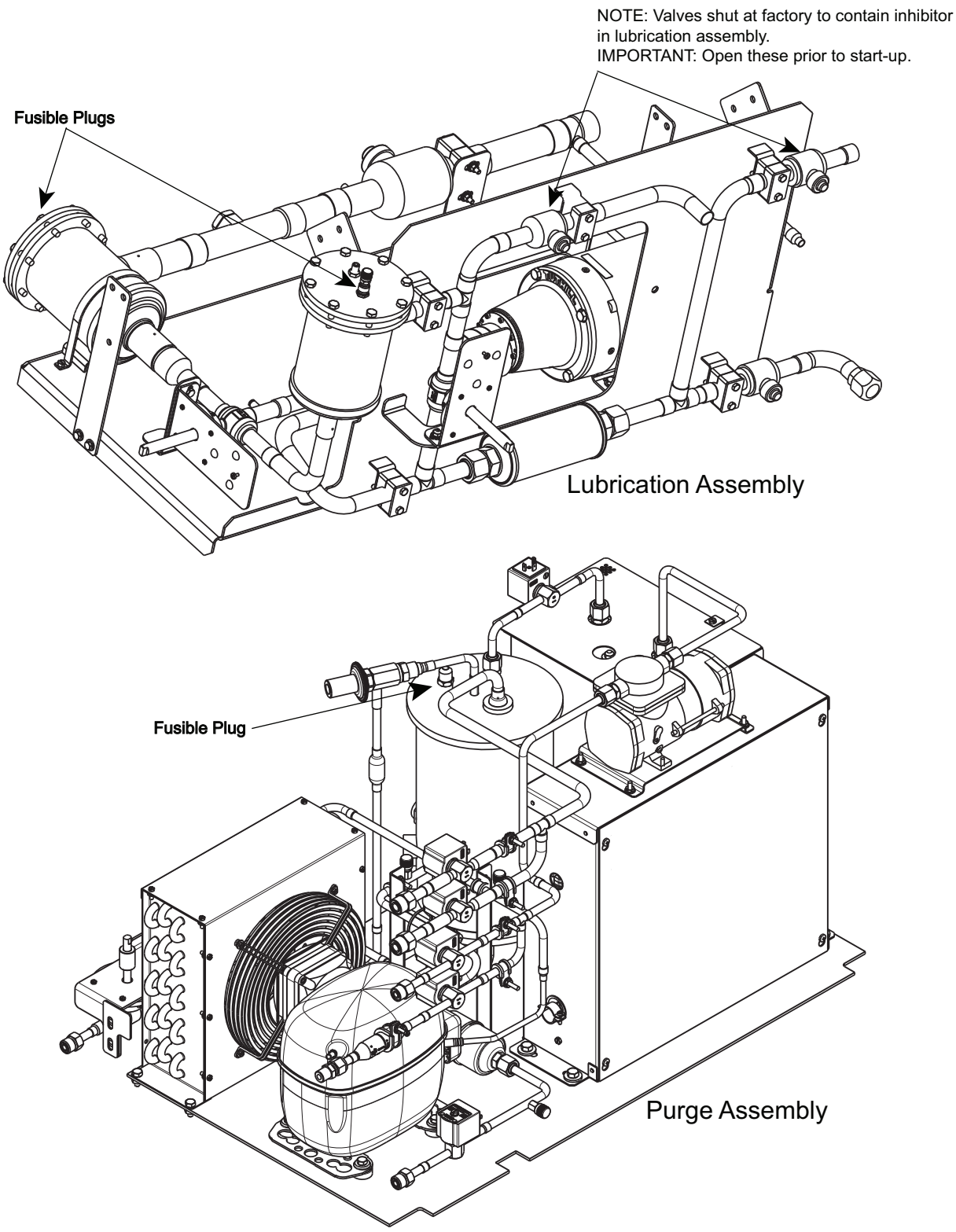


Fig. 10 — Location of Fusible Plugs in Lubrication Assembly and Purge Assembly

Step 3 — Install Machine Supports

INSTALL STANDARD ISOLATION

Figure 9 shows the position of support plates and shear flex pads, which together form the standard machine support system.

IMPORTANT: Chiller housekeeping pad, anchor bolts, and attachment points that are designed by others must be in accordance with all applicable national and local codes.

INSTALL ACCESSORY ISOLATION (IF REQUIRED)

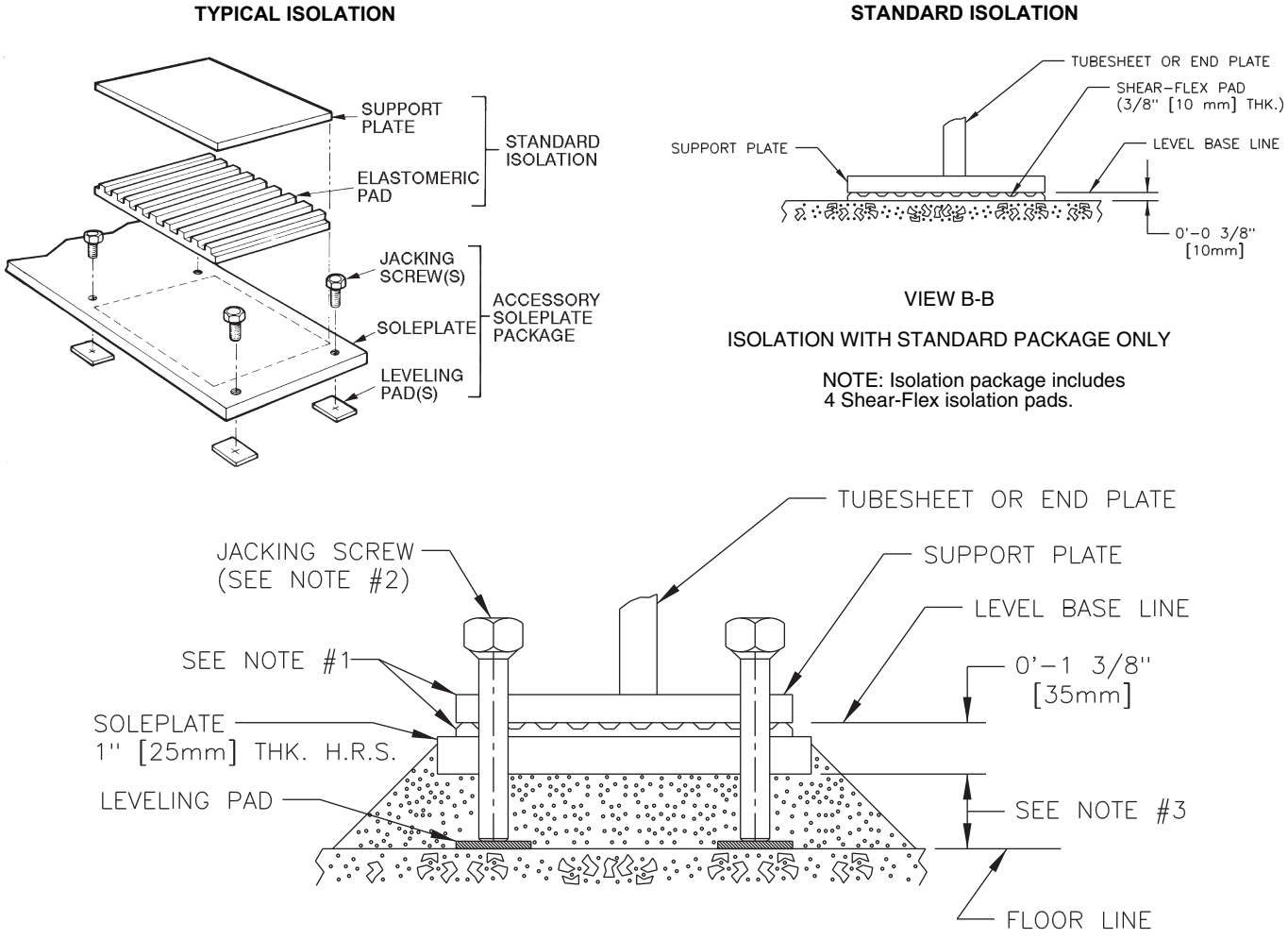
Uneven floors or other considerations may dictate the use of accessory soleplates (supplied by Carrier for field installation) and leveling pads. Refer to Fig. 11.

Chiller support plates must be level within 1/4-in. (6 mm) from one end to the other.

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.



NOTES:

1. Optional soleplate package includes 4 soleplates, 16 jacking screws, and 16 leveling pads. Isolation package is also required.
2. Jacking screws to be removed after grout has set.
3. Thickness of grout will vary, depending on the amount necessary to level chiller. Use only pre-mixed non-shrinking grout, Ceilcote[1] 748 OR Embeco[2] 636 Plus, 0'-1-1/2" (38.1 mm) to 0'-2-1/2" (57 mm) thick.

1. Ceilcote is a registered trademark of Azko Nobel Coatings International.
2. Embeco is a registered trademark of Construction Research and Technology GMBH Corp.

Fig. 11 — Accessory Isolation with Soleplate Package

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. 12. 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.

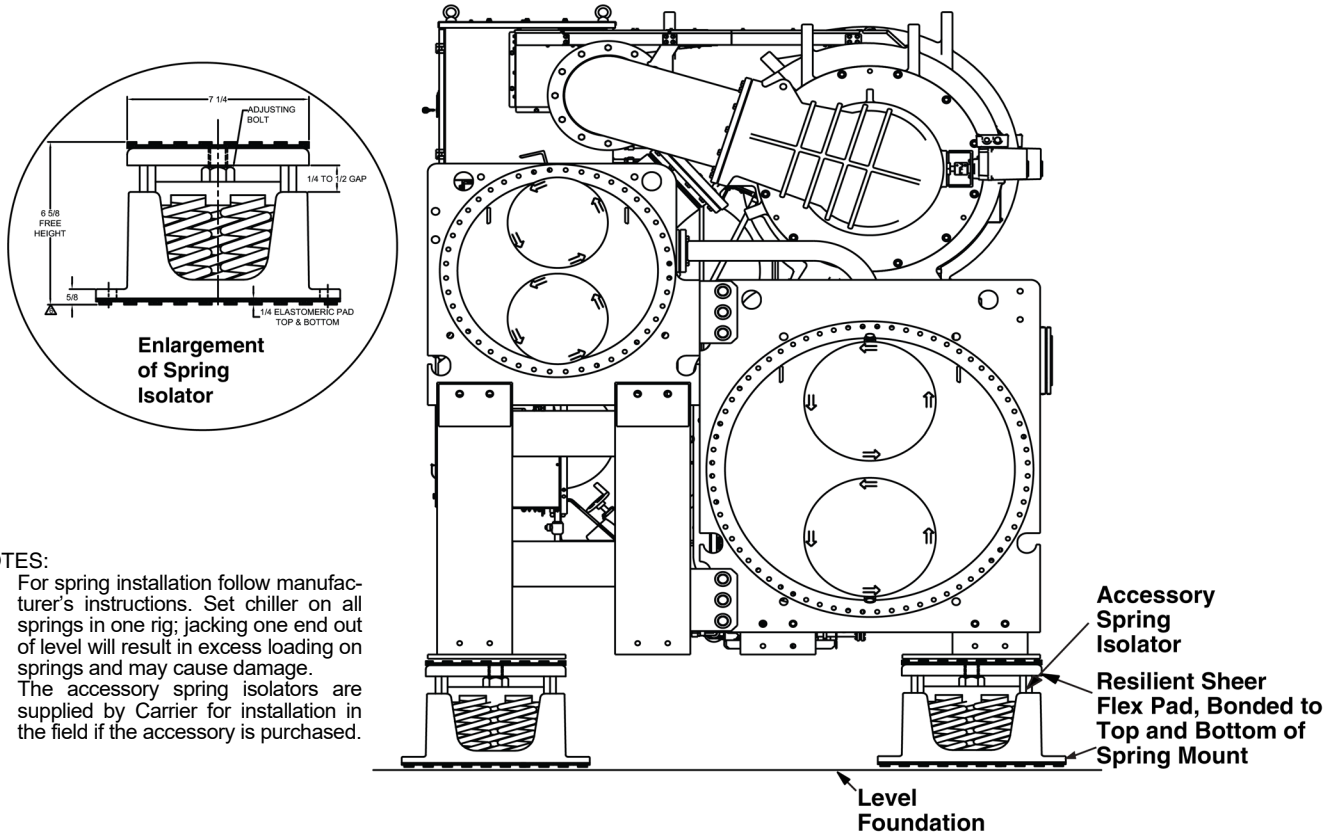
NOTE: The springs are designed to support the weight of the chiller only. Connected piping must be supported independently of the chiller.

NOTE: It is recommended that any installation other than the ground floor should have spring isolation for the chiller and piping vibration isolation.

NOTE: These isolators are not intended for seismic duty, but are intended to reduce the vibration and noise levels transmitted from the chiller to the surrounding environment. For installations adjacent to areas that are sensitive to noise and/or vibration, use the services of a qualified consulting engineer or acoustics expert to determine whether these springs will provide adequate noise/vibration suppression.

INSTALL TOP HAT (FOR 32VSH VFD - AHF OPTION AND 680 AMP DRIVE).

For DV5 units, the top hat is factory installed. For DV3/4 units, the top hat is shipped separately (strapped to chiller leg). To install, remove existing cover on top of the AHF and install top hat with removable access cover facing outwards. Cut holes in top cover as appropriate for the selected conduit size and run the individual wires to the appropriate termination points. See Fig. 13.



NOTES:
1. For spring installation follow manufacturer's instructions. Set chiller on all springs in one rig; jacking one end out of level will result in excess loading on springs and may cause damage.
2. The accessory spring isolators are supplied by Carrier for installation in the field if the accessory is purchased.

Fig. 12 — 19DV Accessory Spring Isolation (Shown with Accessory Soleplates)

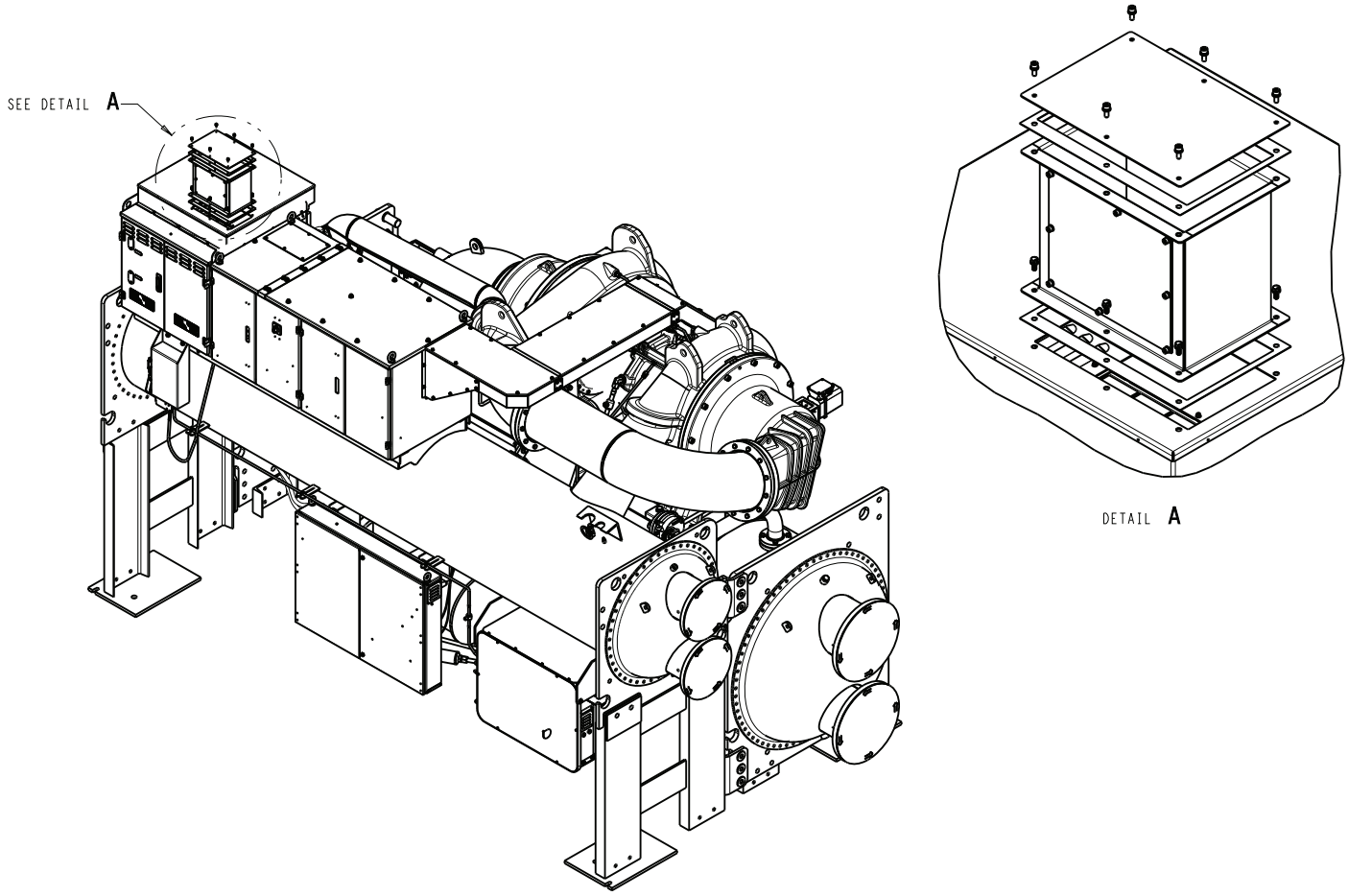


Fig. 13 — Top Hat Installation

Step 4 — Connect Piping

INSTALL WATER PIPING TO HEAT EXCHANGERS

Install piping using job data, piping drawings, and procedures outlined below. A typical piping installation is shown in Fig. 14.

⚠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

To prevent damage to sensors, remove evaporator and condenser water temperature sensors before welding connecting piping to water nozzles. Replace sensors after welding is complete.

⚠CAUTION

When flushing the water systems, isolate the chiller from the water circuits to prevent damage to the heat exchanger tubes.

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 compressor because service access will be blocked.
2. Provide openings in water piping for required pressure gauges 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. Field-installed piping must be arranged and supported to avoid stress on the equipment and transmission of vibration from the equipment. Piping must be installed to prevent interference with routine access for the reading, adjusting, and servicing of the equipment. Provisions should be made for adjusting the piping in each plane for periodic and major servicing of the equipment.
5. Water flow direction must be as specified in Fig. 15 and 16.

NOTE: Entering water is always the lower of the 2 nozzles. Leaving water is always the upper nozzle for evaporator or condenser for two and three pass arrangements.

6. Install waterbox vent and drain piping according to individual job data. Consult certified drawings for connection size.
7. Isolation valves are recommended on the evaporator and condenser piping to each chiller for service.
8. Apply appropriate torque on the retaining bolts in a crisscross pattern for the water box covers before insulating the water box cover. The gasket can relax during transportation and storage and the water box cover requires retightening of the bolts during installation.

INSTALL VENT PIPING TO RELIEF DEVICES

The 19DV chiller is factory equipped with a rupture disc on the evaporator shell. Additionally for fire protection there are fusible plugs on the refrigerant lube assembly and purge assembly; see Fig. 10. Outlet size for these plugs is 1/4-in. SAE Flare (male) for lubrication assembly and 3/8-in. SAE flare on the purge tank. Refer to Table 13 and Fig. 17 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.
5. If the vent tubing from the purge unit is connected to the rupture disk vent piping, the piping should be sloped away from the rupture disk to prevent liquid refrigerant from condensing and accumulating on the atmospheric side of the rupture disk causing potential damage to the relief device.
6. If modulating valves are installed on the evaporator or condenser, they should be installed on the outlet piping.

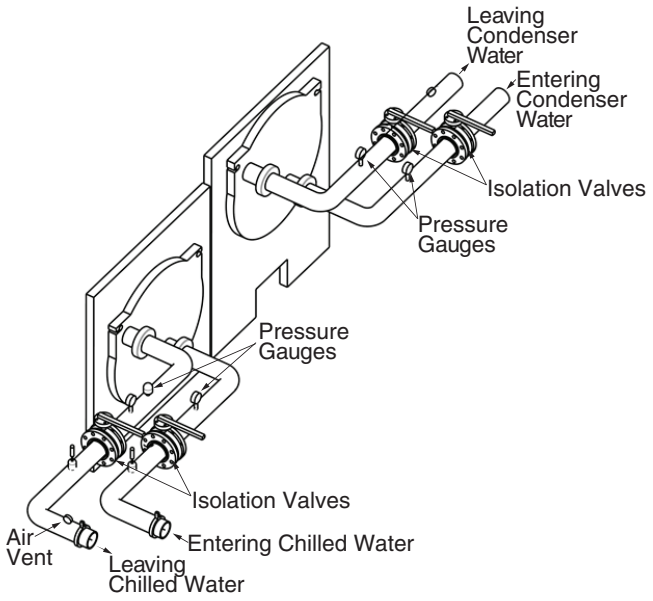
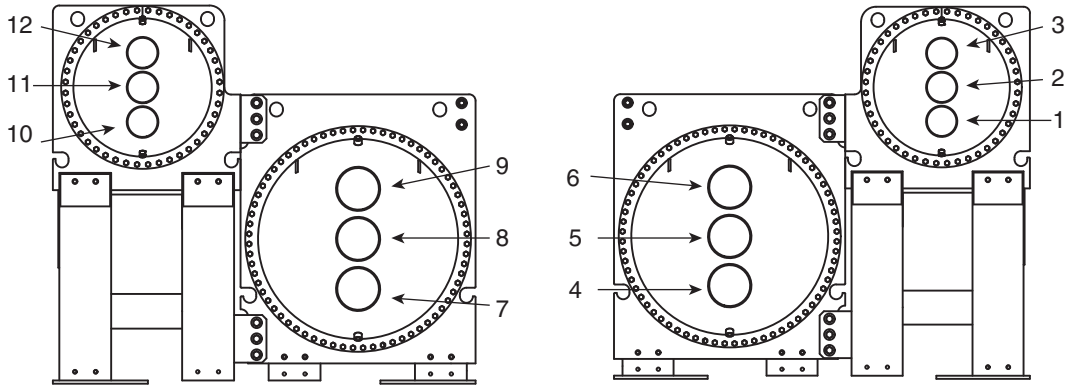


Fig. 14 — Typical Nozzle Piping

Nozzle-in-Head (NIH) Waterboxes



NOZZLE ARRANGEMENT CODES FOR 19DV NOZZLE-IN-HEAD WATERBOXES

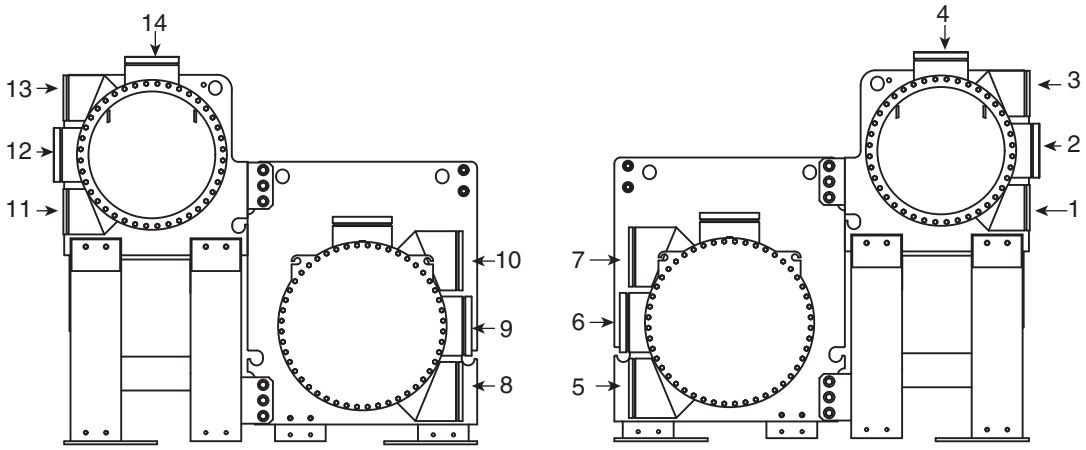
PASS	EVAPORATOR WATERBOXES			CONDENSER WATERBOXES		
	In	Out	Arrangement Code[a]	In	Out	Arrangement Code[a]
1	8	5	A	11	2	P
	5	8	B	2	11	Q
2	7	9	C	10	12	R
	4	6	D	1	3	S
3	7	6	E	10	3	T
	4	9	F	1	12	U

NOTE(S):

a. Refer to certified drawings.

Fig. 15 — Nozzle Arrangement Codes for 19DV Nozzle-in-Head Waterboxes

Marine Waterboxes (MWB)



NOZZLE ARRANGEMENT CODES

EVAPORATOR MARINE WATERBOXES			
PASS	In	Out	Arrangement Code[a]
1	**9**	6	A
	6	9	B
2	**8**	10	C
	5	7	D
3	**8**	7	E
	5	10	F

CONDENSER MARINE WATERBOXES			
PASS	In	Out	Arrangement Code[a]
1	**12**	2	P
	2	12	Q
2	**11**	13	R
	1	3	S
	11	14	V
	1	4	W
3	**11**	3	T
	1	13	U

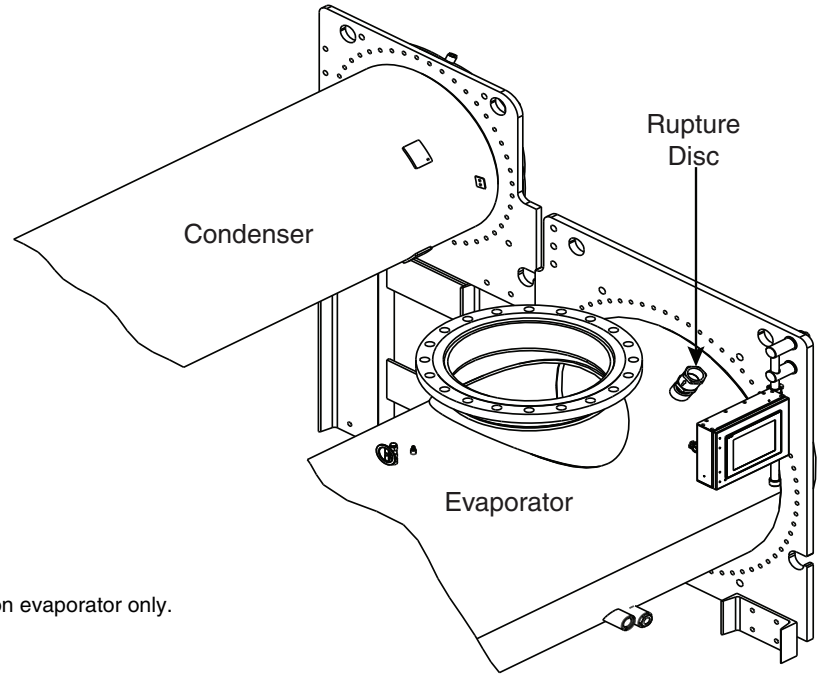
NOTE(S):

a. Refer to certified drawings.

Fig. 16 — Nozzle Arrangement Codes for 19DV Marine Waterboxes

Table 13 — Relief Device Locations

LOCATION	FRAME SIZE	PRESSURE RELIEF DEVICE OUTLET SIZE
EVAPORATOR	F, G, H, M	2-in. NPT Female Connector
OPTIONAL STORAGE TANK	N/A	1-1/4-in. NPT Female Connector



NOTE: Relief valve device on evaporator only.

Fig. 17 — Relief Device Arrangements

Step 5 — Install Disconnect Switch Handle (DV4 Units without AHF Shown)

The 32VS pullbox requires installation of a handle extension. For shipment, the handle is strapped to the VFD mounting assembly under the pullbox. Install by ensuring clamp is tightly secured to the switch handle, then connect the handle with the associated hardware. See Fig. 18.

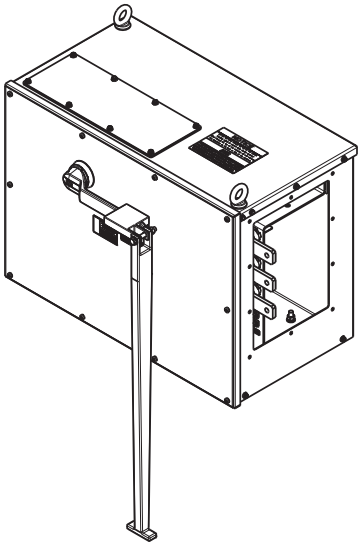


Fig. 18 — Disconnect Switch Handle

Step 6 — Make Electrical Connections

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

⚠ CAUTION

Do not run any hazardous voltage wiring in the control panel sections associated with extra-low voltage wiring. Damage to machine could occur as a result.

Wiring diagrams in this publication 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 any motor (even for a rotation check) or apply test voltage of any kind to the VFD or motor while the chiller is under a dehydration vacuum. Motor insulation breakdown and serious damage may result.

NOTE: The dry contacts for the field inputs should be located as close to the unit as possible. The field wiring should be capable of preventing electrical noise or induced voltage and should not be routed with any wires with voltage over 50 v.

CONNECT CONTROL INPUTS

Wiring may be specified for a spare safety switch, and a remote start/stop contact can be wired to the terminal strip. Additional spare sensors and control modules may be specified as well. Carrier Comfort Network® (CCN) communication is wired to the machine HMI panel as indicated in Fig. 19 and 20.

CONNECT CONTROL OUTPUTS

Connect auxiliary equipment, chilled and condenser water pumps, and spare alarms as required and indicated on job wiring drawings. Terminal block 5TB is factory wired for low voltage field connections.

With fourth IOB configured, the hydraulic control function will be available; with this function, the tower fan can be controlled through the Carrier controller. It also will support three types of water flow measurement: water flow switch, water flow meter, and water pressure differential sensor. See Fig. 21-27. Control board contact output can control loads rated 1 amp AC RMS steady state and 4 amps surge. Coil voltage of output relay is 24 vac. Be sure to use pilot relays to avoid damage to the IOBs for outputs to devices such as evaporator pump, condenser pump, tower fan low, tower fan high, and other outputs with large starters. Suggested rating of pilot relay is 10 amps; for example, 19XV05005503.

⚠ CAUTION

Provision for Carrier to start water pumps and establish flows must be provided to assure machine protection. If primary pump and flow are controlled by other means, also provide parallel means for control by Carrier. Failure to do so could result in machine freeze-up or overpressure and loss of warranty.

CONNECT VFD

The 19DV chiller has a unit-mounted, factory-installed VFD starter. Attach power leads by connecting them from inside the VFD cabinet to the line side terminals (Fig. 28). See the notes for "19DV with 32VS VFD" on page 38, VFD Conductor Usage Table, for specifics.

NOTE: For 32VSH (AHF option) a top hat is required to be installed to the top of the AHF for adequate wire installation space (Fig. 13).

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. The only acceptable power supply to this chiller is a transformer with a wye secondary with solidly grounded neutral configuration. If there is a different type of power supply, the chiller may require an isolation transformer to be installed to prevent damage to the VFD.

⚠ CAUTION

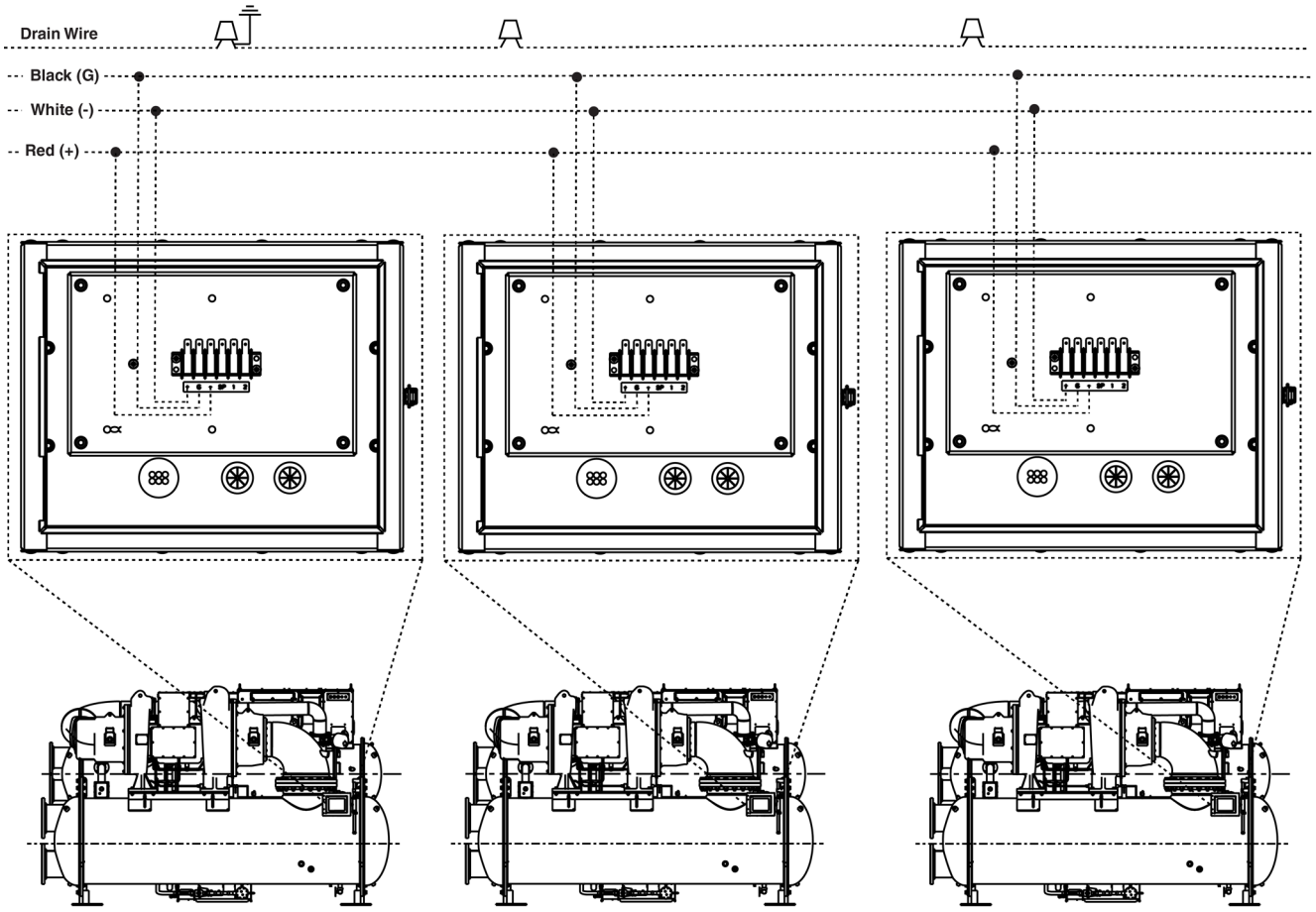
Use the knockouts provided in the control panels for wiring connections. Do not punch holes or drill into the top surface of any control enclosure. Damage to machine could result and could require component replacement.

⚠ CAUTION

Do not punch holes or drill into the top surface of power panel. Damage to machine could result. Use knockouts provided in the bottom of the power panels for wiring connections.

⚠ WARNING

For a control transformer built to Carrier specifications, do not connect an outside source of control power. 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. Severe injury could result.



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

Fig. 19 — CCN Communication Wiring for Multiple Chillers (Typical)

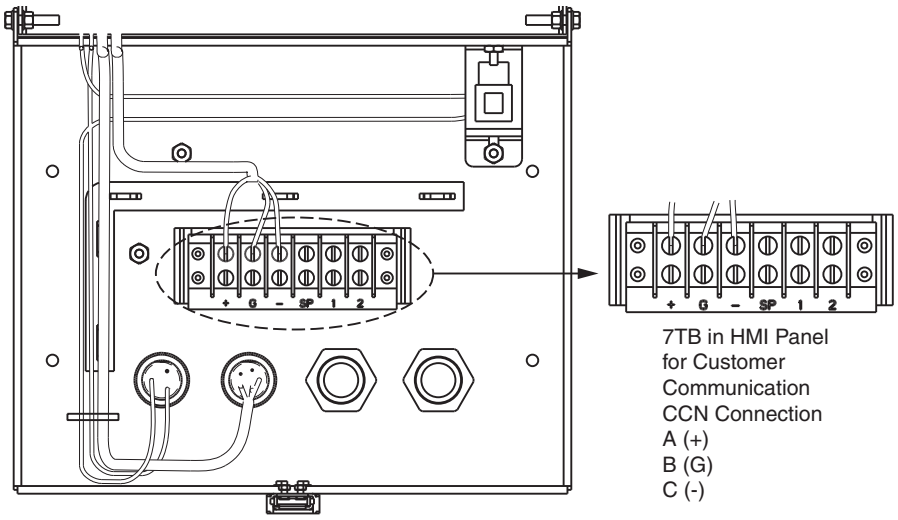


Fig. 20 — HMI Panel

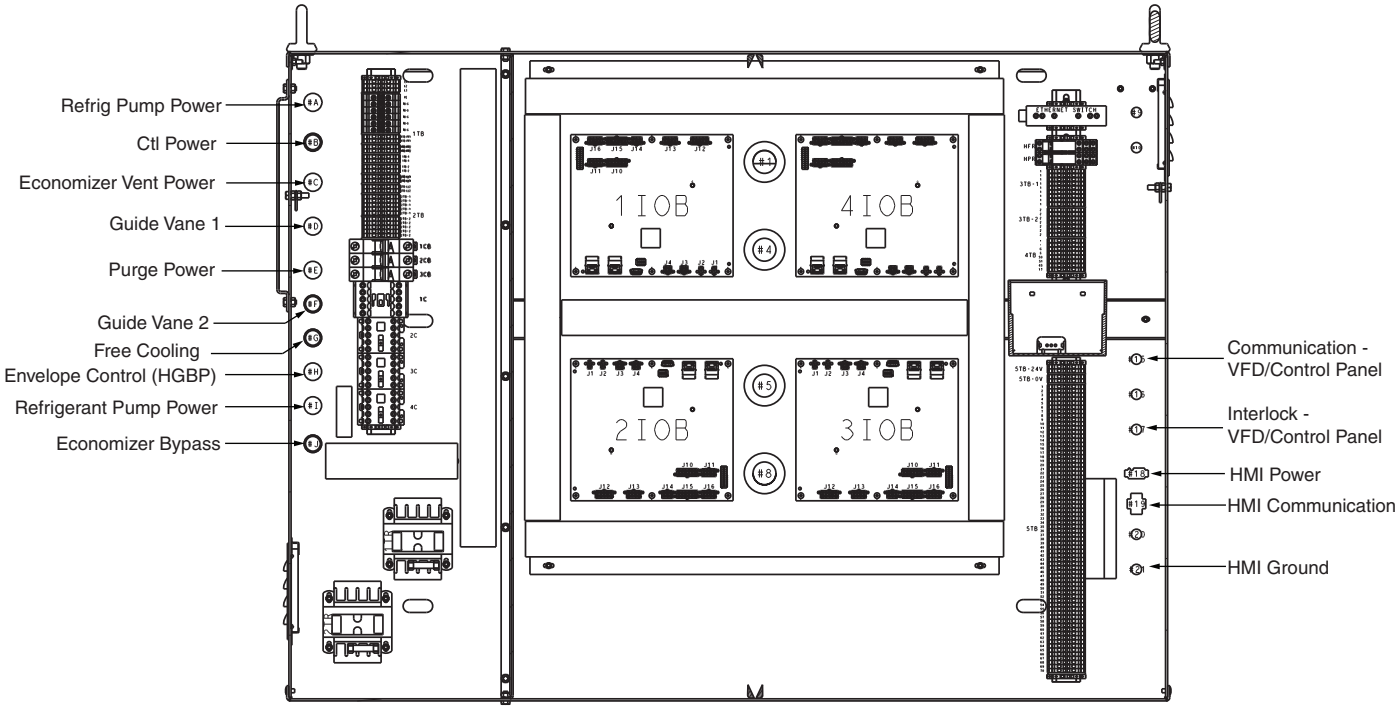
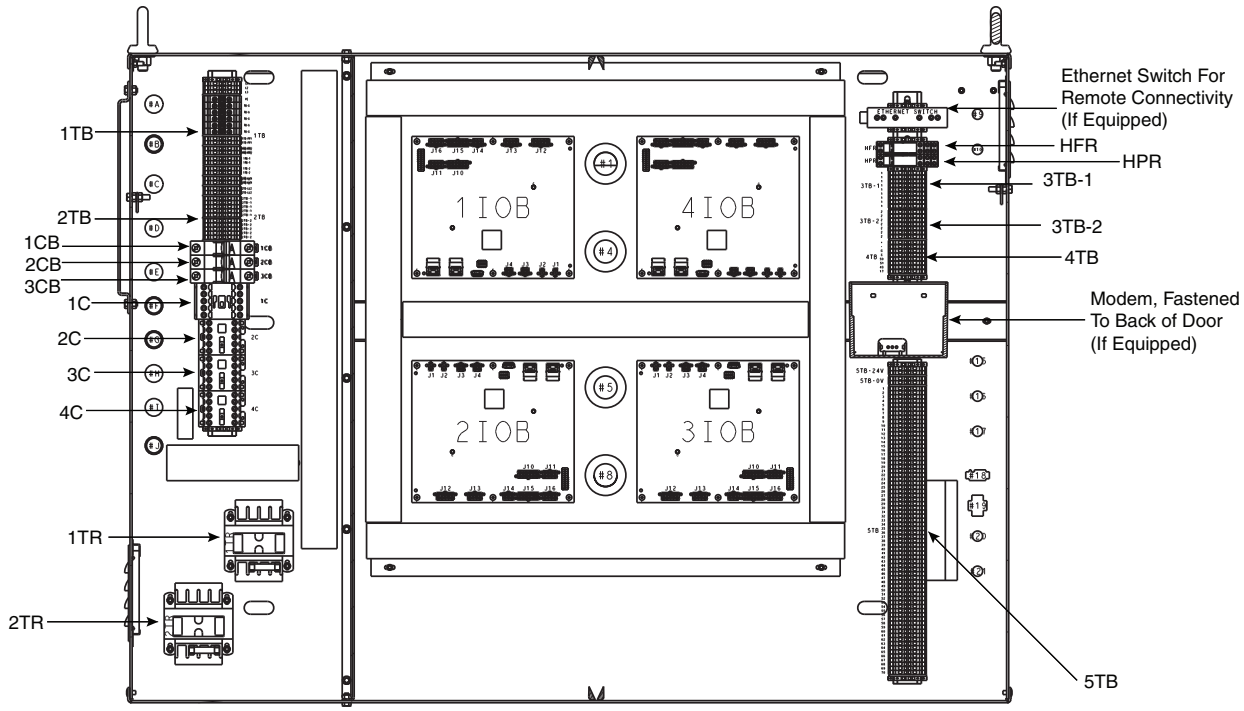


Fig. 21 — Control Panel, IOB Layer



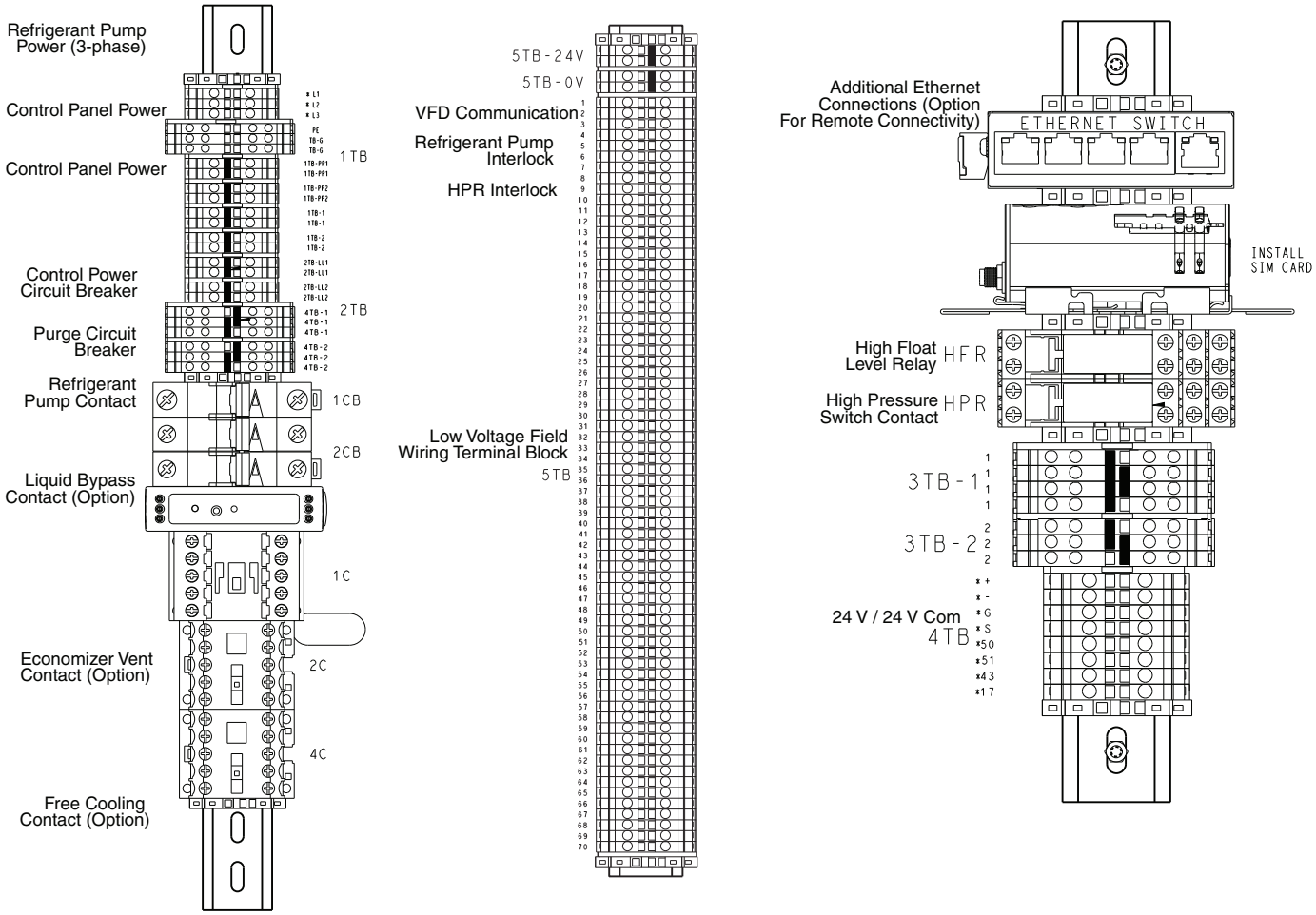


Fig. 22 — Control Panel Layout

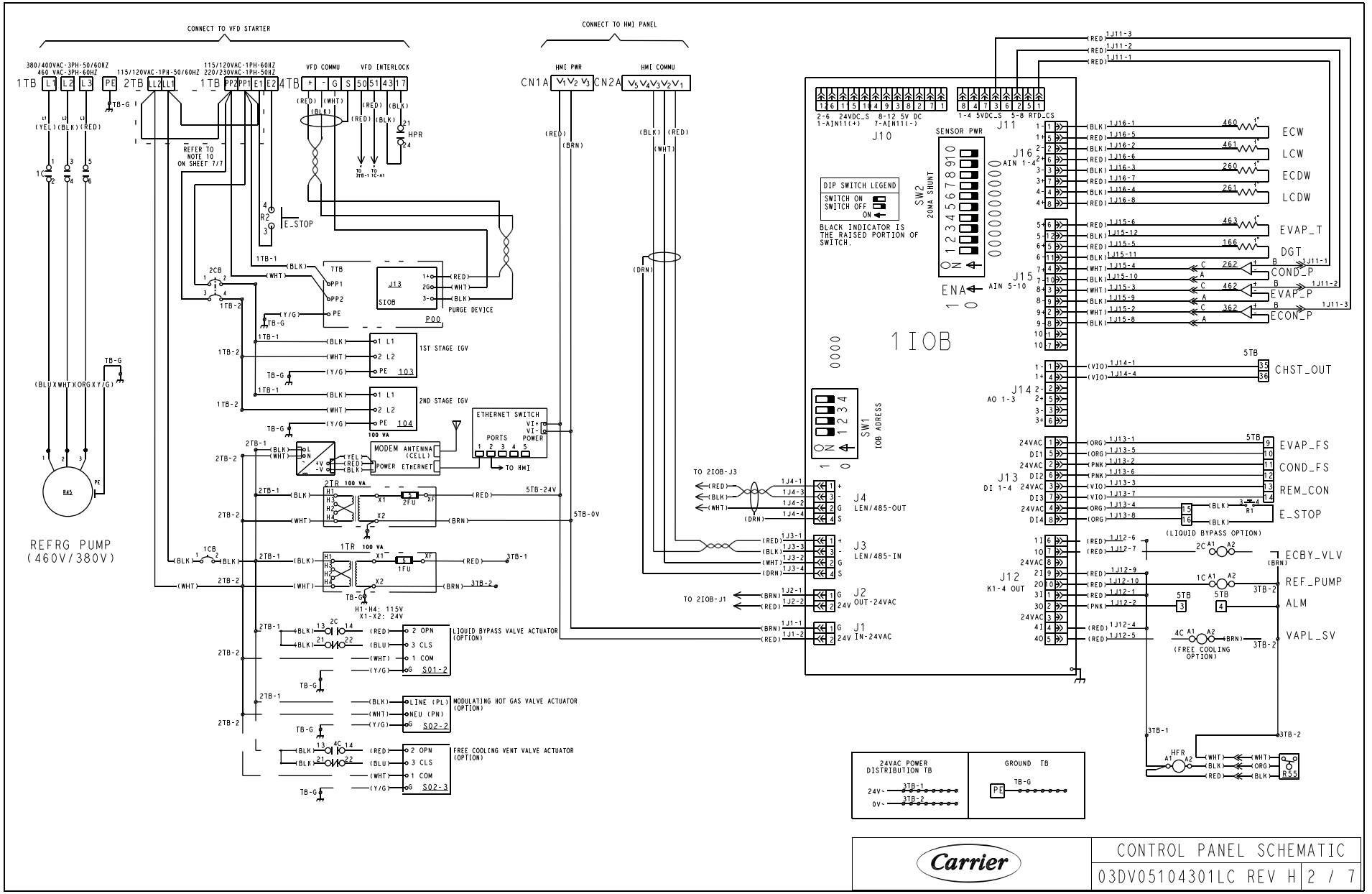
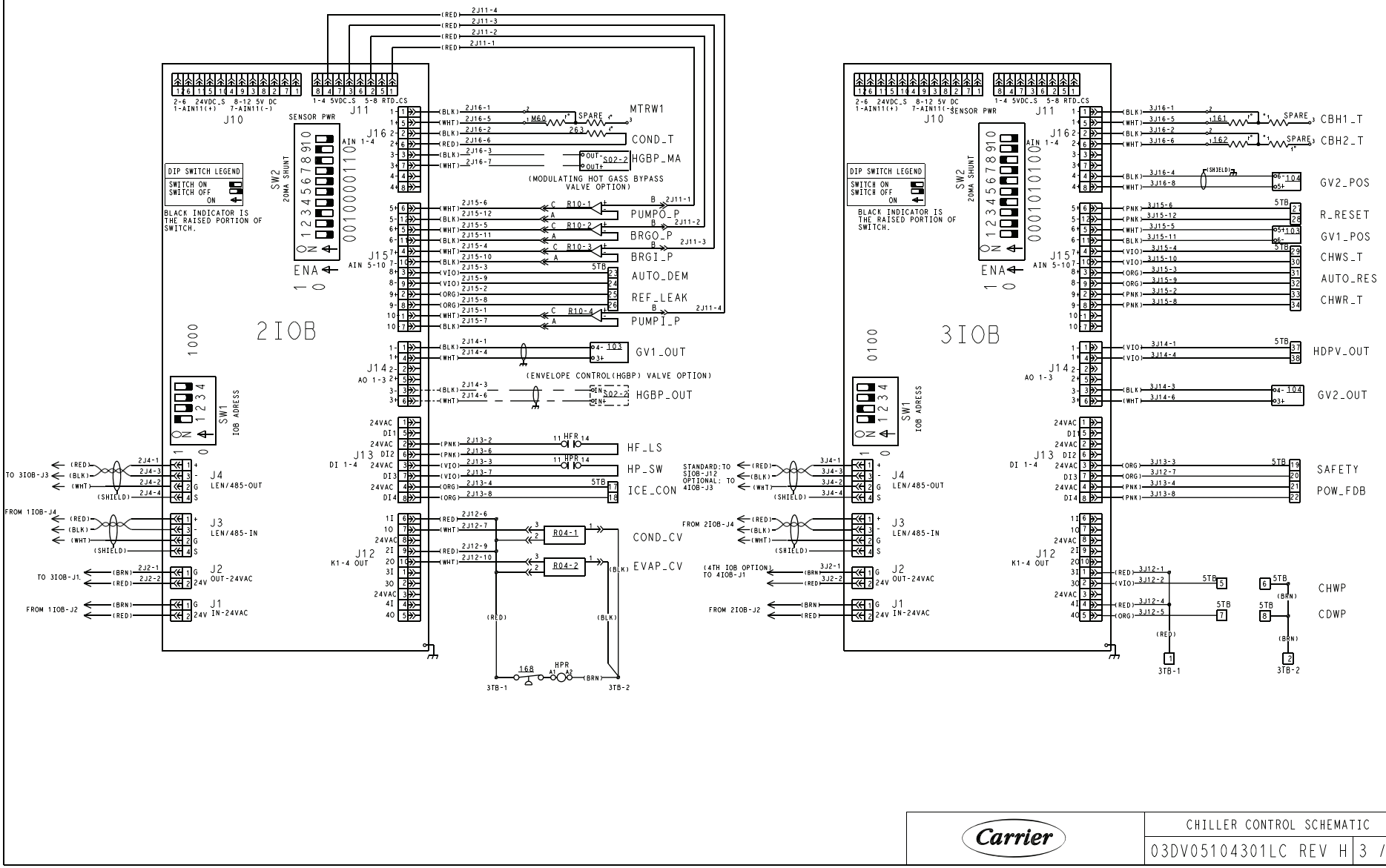

CONNECT TO VFD STARTER
CONNECT TO HMI PANEL
1TB
2TB
4TB
VFD COMMU
VFD INTERLOCK
HMI PWR
HMI COMMU
CN1A
CN2A
HPR
E-STOP
REFER TO NOTE 10 ON SHEET 7/7
REFRG PUMP (460V/380V)
1CB
2CB
7TB
SIOB
PURGE DEVICE
1ST STAGE IGV
2ND STAGE IGV
ETHERNET SWITCH
MODEM ANTENNA (CELL)
TO HMI
1TR 100 VA
2TR 100 VA
H1-H4: 115V
X1-X2: 24V
LIQUID BYPASS VALVE ACTUATOR (OPTION)
MODULATING HOT GAS VALVE ACTUATOR (OPTION)
FREE COOLING VENT VALVE ACTUATOR (OPTION)
5TB-24V
5TB-0V
TO 2IOB-J3
TO 2IOB-J1
J4 LEN/485-OUT
J3 LEN/485-IN
J2 OUT-24VAC
J1 IN-24VAC
J10
J11
J16
J15
J14
J13
J12
SENSOR PWR
DIP SWITCH LEGEND
SWITCH ON
SWITCH OFF
BLACK INDICATOR IS THE RAISED PORTION OF SWITCH.
SW2
20MA SHUNT
ENA
SW1
IOB ADRESS
1IOB
ECW
LCW
ECDW
LCDW
EVAP_T
DGT
COND_P
EVAP_P
ECON_P
CHST_OUT
EVAP_FS
COND_FS
REM_CON
E_STOP
(LIQUID BYPASS OPTION)
ECBY_VLV
REF_PUMP
ALM
VAPL_SV
(FREE COOLING OPTION)
HFR
24VAC POWER DISTRIBUTION TB
GROUND TB
Carrier
CONTROL PANEL SCHEMATIC
03DV05104301LC REV H
2 / 7

Fig. 23 — IOB1

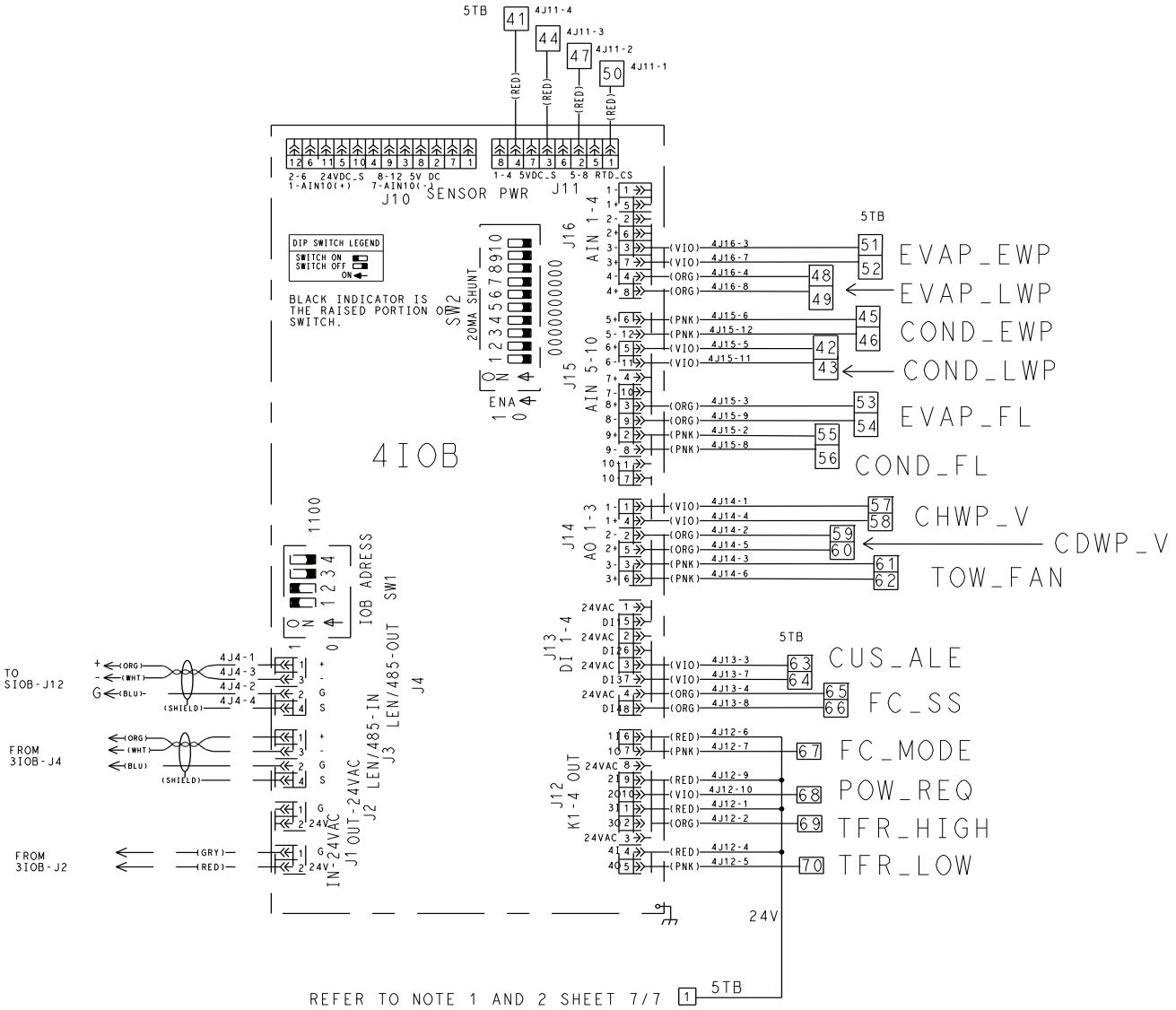


Carrier

CHILLER CONTROL SCHEMATIC

03DV05104301LC REV H | 3 / 7

Fig. 24 — IOB2 and IOB3



THIS TYPICAL DRAWING SHOWS THE CARRIER STANDARD PRESSURE TRANSDUCER WHICH IS 5VDC POWER SUPPLY.

Carrier	CONTROL PANEL SCHEMATIC
	03DV05104301LC REV H | 4 / 7

Fig. 25 — IOB 4

LEGEND FOR Fig. 21-25

Control Abbreviations

ALM	—	Chiller Alarm
AUTO_DEM	—	Demand Limit Input
AUTO_RES	—	Auto Water Temp Reset
BRGI_P	—	Bearing Inlet Pressure
BRGI_T	—	Bearing Ref Supply Temp
BRGO_P	—	Bearing Outlet Pressure
CBH1_T	—	1st Stage Bearing Temp
CBH2_T	—	2st Stage Bearing Temp
CDWP	—	Condenser Water Pump
CDWP_V	—	Condenser Water Pump (Variable Speed)
CHST_OUT	—	Chiller Running (On/Off/Ready)
CHWP	—	Chilled Water Pump
CHWP_V	—	Chilled Water Pump (Variable Speed)
COND_CV	—	Condenser Control Valve
COND_DCV	—	Condenser Drain Valve
COND_EWP	—	Entering Condenser Water Pressure
COND_FL	—	Condenser Water Flow Measurement
COND_FS	—	Condenser Water Flow Switch
COND_LWP	—	Leaving Condenser Water Pressure
COND_P	—	Condenser Pressure
CUS_ALE	—	Customer Alert
DGT	—	Compressor Discharge Temperature
ECBY_VLV	—	Economizer Bypass Valve
ECDW	—	Entering Condenser Water Temperature
ECON_IV	—	Economizer Vent Valve Actuator
ECW	—	Entering Chilled Water Temperature
EVAP_CV	—	Evaporator Control Valve
EVAP_EWP	—	Entering Evaporator Water Pressure
EVAP_FL	—	Evaporator Water Flow Measurement
EVAP_FS	—	Evaporator Water Flow Switch
EVAP_LWP	—	Leaving Evaporator Water Pressure
EVAP_P	—	Evaporator Pressure
EVAP_T	—	Evaporator Refrigerant Temperature
FC_MODE	—	Free Cooling Mode
FC_SS	—	Free Cooling Start Switch
FS_LOCK	—	Fire Alarm Interlock
GV1/2_OUT	—	IGV 1/2 Output
GV1/2_POS	—	IGV 1/2 Actual Position
HDPV_OUT	—	Head Pressure Output
HGBP_MA	—	Modulating Hot Gas Valve Feedback
HGBP_OUT	—	Modulating Hot Gas Valve Output mA
HF_LS	—	High Float Liquid Level Switch
HP_SW	—	High Pressure Switch
ICE_CON	—	Ice Build Contact
IGV	—	Integrated Guide Vane
LCDW	—	Leaving Condenser Water Temperature
LCW	—	Leaving Chilled Water Temperature
MTRW1	—	Motor Winding Temperature 1
PUMPI_P	—	Pump Inlet Pressure
PUMPO_P	—	Pump Outlet Pressure
REF_LEAK	—	Refrigerant Leak Sensor
REF_PUMP	—	Refrigerant Pump
REM_CON	—	Remote Contact Input
TFR_HIGH	—	Tower Fan High
TFR_LOW	—	Tower Fan Low
TOW_FAN	—	Tower Fan (Variable Speed)
VAPL_SV	—	Vapor Venting Line SV

Instrument Code (Within Control Panel)

1C	—	Refrigerant Pump Contactor
2C	—	Liquid Bypass Valve Relay
3C	—	Economizer Vent Valve Relay
4C	—	Free Cooling Vent Valve Relay
1-3CB	—	Micro Circuit Breaker
1FU	—	Fuse, 5A, Time-Delay, 13/32” x 1-1/2”
2FU	—	Fuse, 5A, Time-Delay, 13/32” x 1-1/2”
1-4 IOB	—	1-4 Input Output Board 1-4
1TB	—	Terminal Block for Power Connection
2TB	—	Internal 115/120-v Terminal Block
3TB	—	Internal 24-v Terminal Block
4TB	—	Terminal Block for VFD Connection
5TB	—	Terminal Block for Customer Optional Connection
7TB	—	230/115-v Terminal Block (Purge Panel)
1TR	—	Transformer 1 230/115-24-v 100 va
2TR	—	Transformer 2 230/115-24-v 100 va
CN1A/B	—	Connector for HMI Power
CN2A/B	—	Connector for HMI Communication
HFR	—	High Float Level Switch
HPR	—	High Pressure Switch Relay
HMI	—	HMI Touch Screen and Main Board SAIA
SIOB	—	Standard Input Output Board (Purge Panel)
TB-G	—	Copper Terminal Block for Ground

Symbols

○	Component Terminal
→)(←	Conductor Male/Female Connector
— —	Field Wiring
- - - -	Optional Wiring
—·· —	Component/Panel Enclosure
	Shield Wire
	Twisted Wire
□	Terminal Block Connection
●	Wire Splice or Junction
∅	Internal Terminal Block/Terminal

BLK	Black
BLU	Blue
BRN	Brown
GRN	Green
GRY	Gray
RED	Red
ORG	Orange
WHT	White
YEL	Yellow
G/Y	Green/yellow

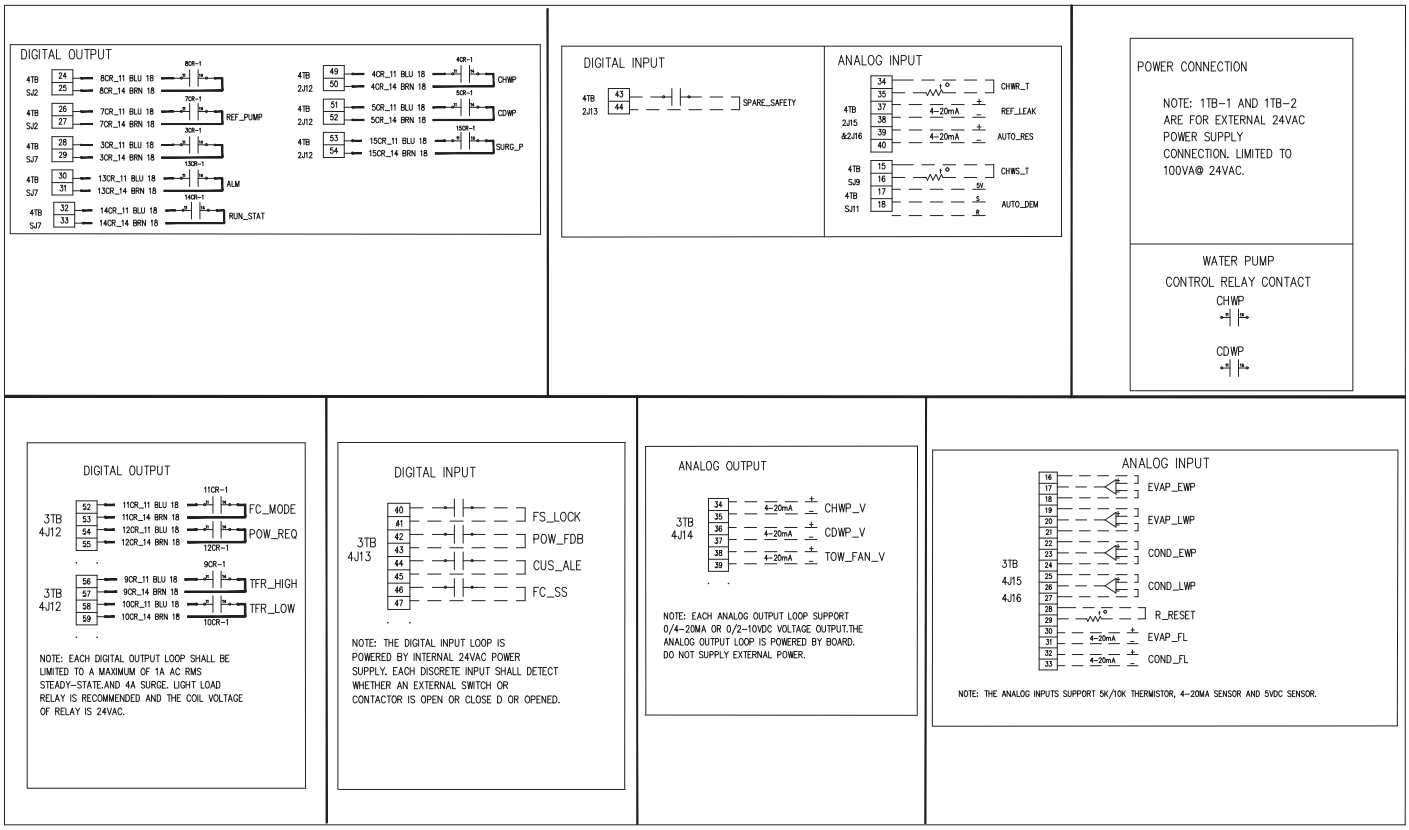


Fig. 26 — Optional Field Wiring

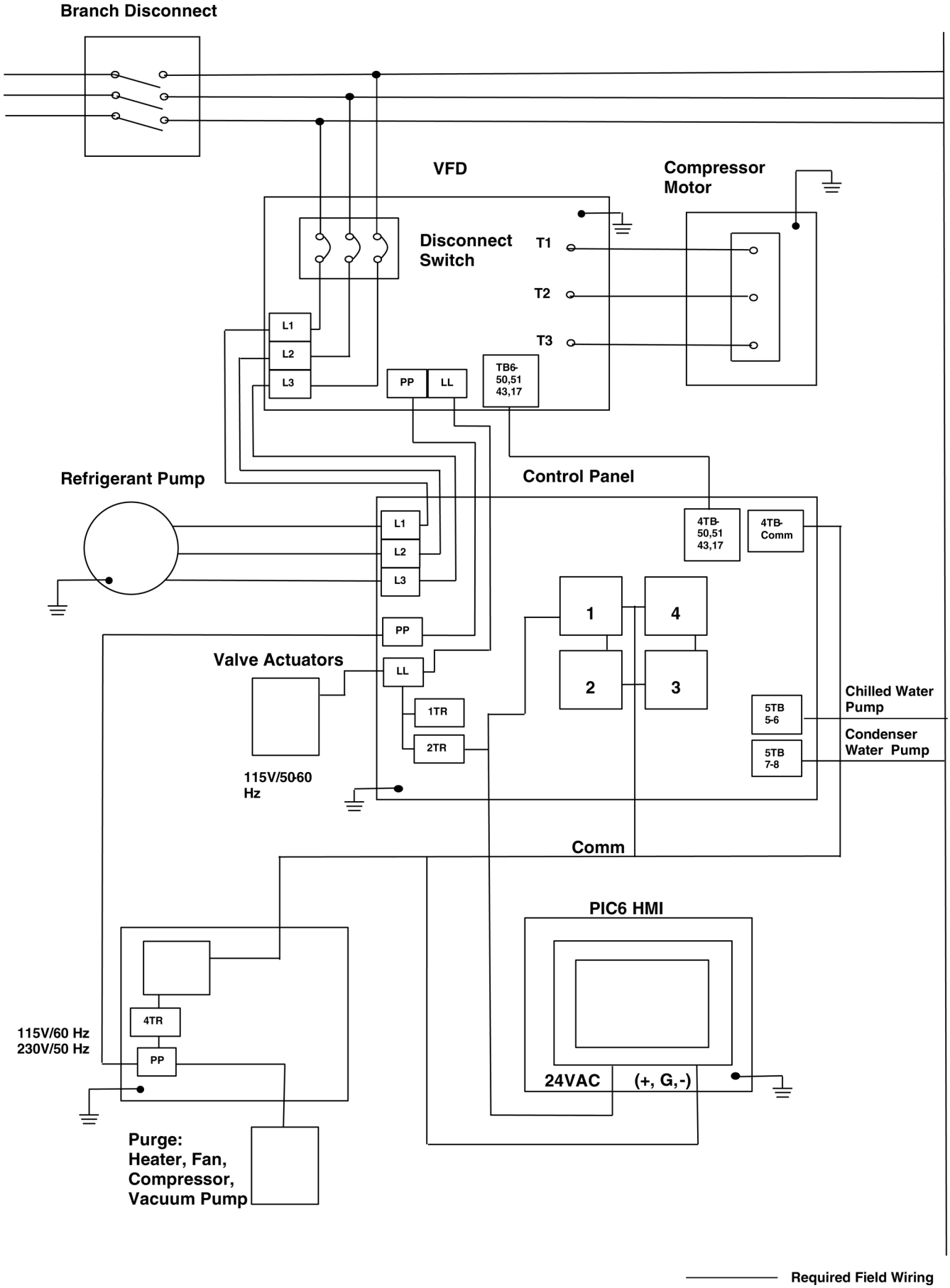


Fig. 27 — Typical 19DV VFD — Factory Unit Mounted

NOTES FOR FIG. 23-27
19DV WITH 32VS VFD

I. General

1.0 Variable Frequency Drive (VFD) shall be designed and manufactured in accordance with Carrier engineering requirement.
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 bus bar 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. Lugs will accommodate the quantity (#) and size cables (per phase) as follows. If larger lugs are required, they may be purchased from the manufacturer of the circuit breaker. See VFD Conductor Usage table for lug sizes.
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 Gauge) 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 Each integrated contact output can control loads (VA) for evaporator pump, condenser pump, tower fan low, tower fan high, and alarm annunciator devices rated 1 amp AC RMS steady-state and 4 amps surge. Coil voltage of relay is 24 vac. Be sure to use pilot relays to avoid damage to the IOBs. Suggested rating of pilot relay is 10 amps; for example, 19XV05005503.

⚠ 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.

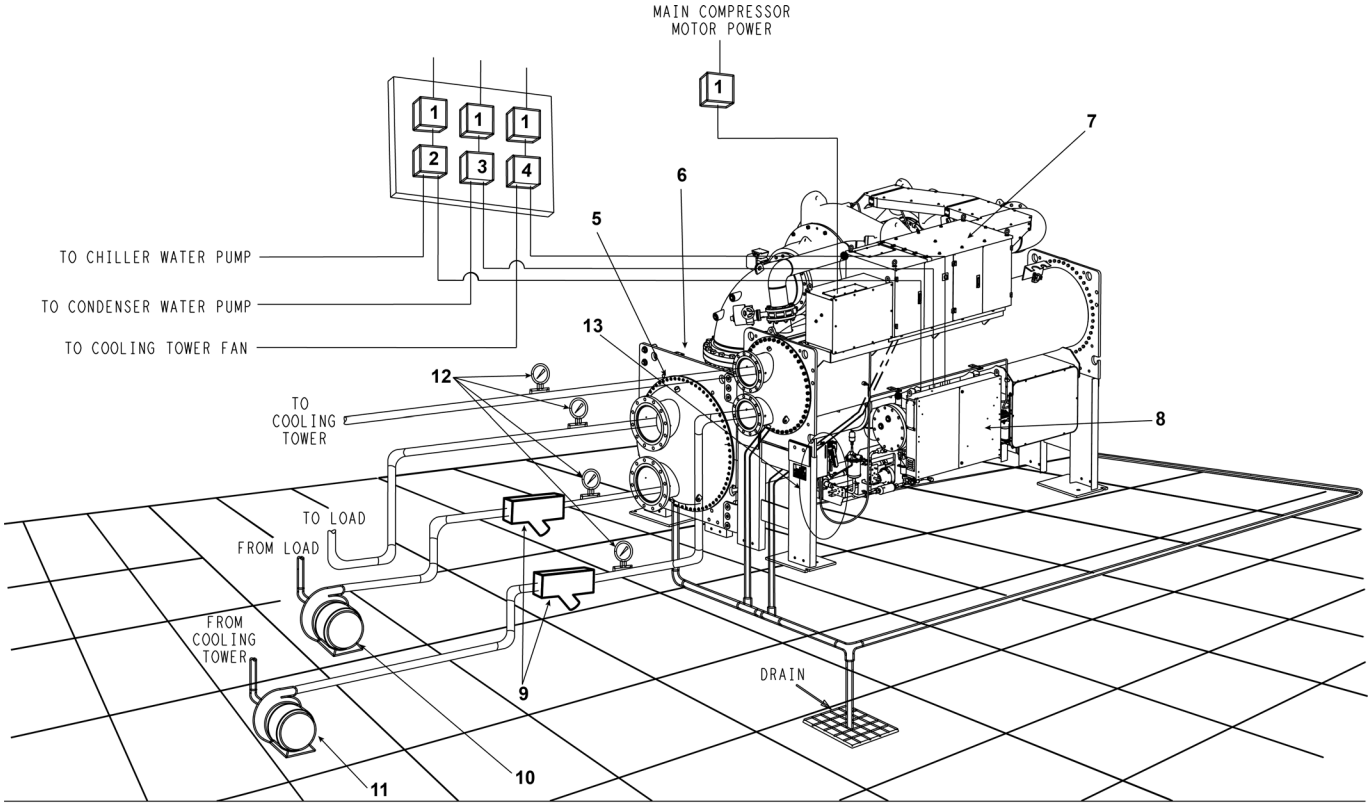
3.3 Do not use control transformers in the VFD enclosure or control panel as the power source for external or field-supplied contactor coils, actuator motors or any other loads.
3.4 Do not route control wiring carrying 30 v or less within a conduit which has wires carrying 50 v or higher or along side wires carrying 50 v or higher.
3.5 Head pressure 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.

VFD CONDUCTOR USAGE

VFD MAX INPUT AMPS	STANDARD 100 kAIC LUG CAPACITY (PER PHASE)		
	NO. OF CONDUCTORS	CONDUCTOR RANGE	GROUND CONNECTOR
Carrier 32VSS0680	2	4/0 to 500 kcmil	2/0[a]
Carrier 32VSH0680	4	4/0 to 500 kcmil	2/0[a]
Carrier 32VSS0850	4	4/0 to 500 kcmil	2/0[a]
Carrier 32VSH0850	4	4/0 to 500 kcmil	2/0[a]
Carrier 32VSS0900	4	4/0 to 500 kcmil	2/0[a]
Carrier 32VSH0900	4	4/0 to 500 kcmil	2/0[a]
Carrier 32VSS1060	4	4/0 to 500 kcmil	2/0[a]
Carrier 32VSH1060	4	4/0 to 500 kcmil	2/0[a]
Carrier 32VSS1200	4	#2 to 600 kcmil	3/0

NOTE(S):

a. Two ground lugs each capable of 2x #2-600 kcmil per lug.



LEGEND

1 — Disconnect
2 — Chilled Water Pump Starter
3 — Condenser Water Pump Starter
4 — Cooling Tower Fan Starter (Low Fan, High Fan)
5 — Vents
6 — HMI (hidden)
7 — Unit-Mounted VFD
8 — Control Panel
9 — Strainers
10 — Chilled Water Pump
11 — Condenser Water Pump
12 — Pressure Gauges
13 — Local Disconnect
Piping
Control Wiring
Power Wiring

NOTES:
1. Wiring and piping shown are for general point-of-connection only and are not intended to show details for a specific installation. Certified field wiring and dimensional diagrams are available on request.
2. All wiring must comply with applicable codes.
3. Wiring not shown for optional devices such as:
   • Remote Start/Stop
   • Remote Alarms
   • Optional Safety Device
   • 4 to 20 mA Resets
   • Optional Remote Sensors
4. IMPORTANT: Carrier suggests that a structural engineer be consulted if transmission of vibrations from mechanical equipment is of concern.
5. Isolation valves are recommended on the evaporator and condenser water piping to each chiller for service.
6. Operating environment — Chiller should be installed in an indoor environment where the ambient temperature is 40 to 104°F (4 to 40°C) with a relative humidity (non-condensing) of 95% or less. To ensure that electrical components operate properly, do not locate the chiller in an area exposed to dust, dirt, corrosive fumes, or excessive heat and humidity.
7. Be sure to pipe 3/8-in. VFD condensate pipe to drain.

Fig. 28 — 19DV Chiller with VFD

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. 19 for location of the CCN network connections on the terminal strip labeled CCN.

NOTE: Conductors and drain wire must be 20 AWG (American Wire Gauge) minimum stranded, tinned copper. Individual conductors must be insulated with PVC, PVC/nylon, vinyl, Teflon[1], 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.

1. Teflon is a registered trademark of DuPont.

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

To connect the 19DV chiller to the network, proceed as follows (see Fig. 19 and 20):

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 Network interface located in the control panel.

Step 7 — 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
- economizer
- evaporator shell
- evaporator tube sheets
- suction piping
- motor cooling drain
- inhibitor reclaim piping
- purge tank and connecting tubing
- low side of purge system independent refrigerant circuit
- refrigerant liquid line to evaporator

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. 29 and 30.

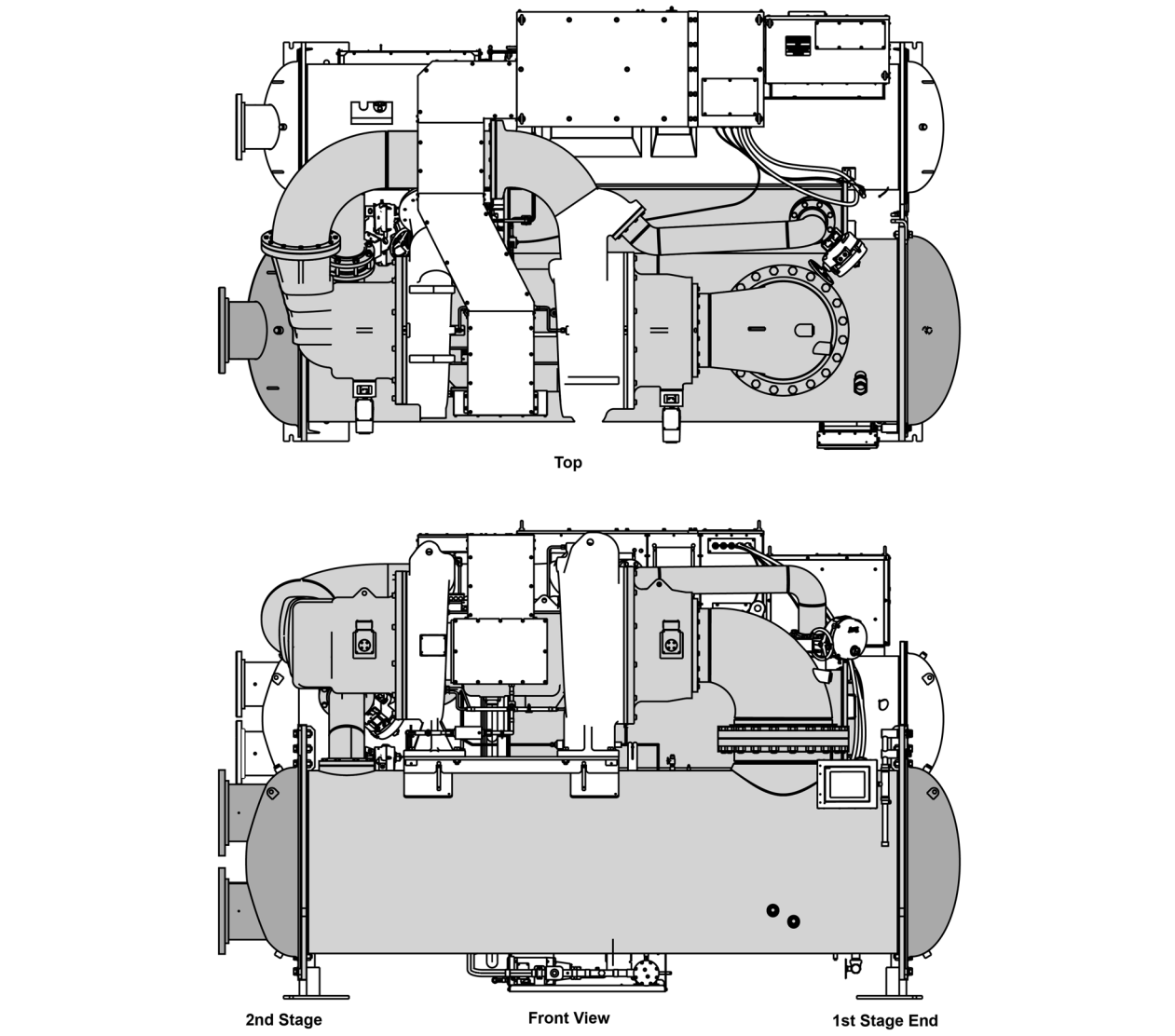


Fig. 29 — 19DV Standard Insulation Area

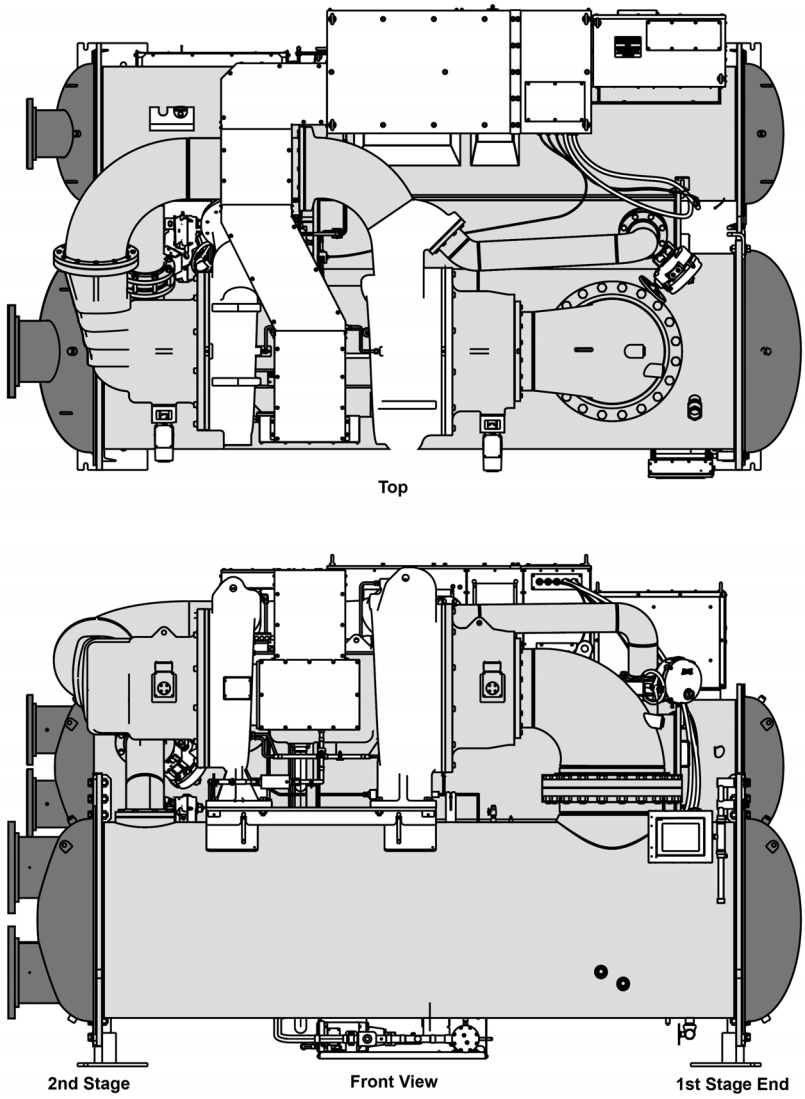


Fig. 30 — 19DV Free-Cooling Insulation Area

INSTALLATION START-UP REQUEST CHECKLIST

NOTE: To avoid injury to personnel and damage to equipment or property when completing the procedures listed in this start-up checklist, use good judgment, follow safe practices, and adhere to the safety considerations/ information as outlined in the preceding sections of this Controls, Start-Up, Operation and Troubleshooting document.

Machine Model Number: _____

19DV Serial Number: _____

To: _____ Date: _____

_____

_____ Project Name: _____

Attn: _____

Carrier Sales Order Number _____

The following information provides the status of the chiller installation.

	YES/NO (N/A)	DATE TO BE COMPLETED
The machine is level.		
The machine components are installed and connected in accordance with the installation instructions.		
The isolation package and grouting (if necessary) are installed.		
The relief devices are piped to the atmosphere.		
All piping is installed and supported. Direction of flow is indicated in accordance with the installation instructions and job prints.		
Chilled water piping		
Condenser water piping		
Waterbox drain piping		
Pumpout unit piping (if installed)		
VFD drain piping		
Other _____		
Gauges are installed as called for on the job prints required to establish design flow for the evaporator and condenser.		
Water pressure gauges IN and OUT		
Water temperature gauges IN and OUT		
The machine's wiring is complete. The wiring is installed per installation instructions and certified prints.		
Power wiring to VFD line side completed. (If chiller was disassembled during installation, motor leads must not be taped until the Carrier technician megger-tests the motor.)		
Carrier controls can independently energize water pumps.		
The transformer feeding the VFD is confirmed to have a Wye secondary with a solidly grounded Neutral. Immediately contact Carrier Service if this is not the case.		
Line side voltage is within ±10% of chiller nameplate voltage		
Other _____		
Was the chiller disassembled/reassembled during the installation?		
Was this work supervised by a Carrier Service Representative?		

Comments:

_____

_____

_____

_____

_____

_____

TESTING

	YES/NO	DATE TO BE COMPLETED
The cooling tower fan has been checked for blade pitch and proper operation.		
The chilled water and condenser water lines have been:		
Filled		
Tested		
Flushed		
Vented		
Strainers cleaned		
Chemically treated		
The chilled water and condenser water pumps have been checked for proper rotation and flow.		
The following cooling load will be available for start-up:		
25%		
50%		
75%		
100%		
The refrigerant charge identified and will be available near machine for commissioning. Rigging is available to lift refrigerant drums.		
Services such as electrical power and control air will be available at start-up, up over evaporator for gravity feed.		
The building automation system is operational.		
The electrical, building automation and mechanical representatives will be available to assist in commissioning the machine. Note that while BACnet/Modbus is included with PIC6 the integration with building automation system (BAS) is not included in the standard startup time. Please coordinate with the local Carrier Service Office that will be performing the equipment startup, for control technician pricing associated with the BAS integration.		
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