



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 solid state or inside-delta mechanical starter 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, starters, 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/ASHRAE15 (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 STARTER, TOWER FAN, OR PUMPS. Open the disconnect *ahead of* the starter, 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.

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INTRODUCTION

General — The 19XR 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
- starter manufacturer's installation details
- Carrier certified print

INSTALLATION

Receiving the Machine

INSPECT SHIPMENT

⚠ CAUTION

Do not open any valves or loosen any connections. The standard 19XR machine is 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 machine identification nameplate (Fig. 1 and 2). Check this information against shipping papers and job data.

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

If machine is 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.

Rigging the Machine — The 19XR 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 guide (Fig. 3 and 4), physical data in Fig. 5, and Tables 1-8B. *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. 3 and 4 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 4-8B for machine component weights.

IMPORTANT: Ensure that rigging cable is over the guide bolt or cable hook on the motor end cover before lifting if cooler size is 10 through 67.

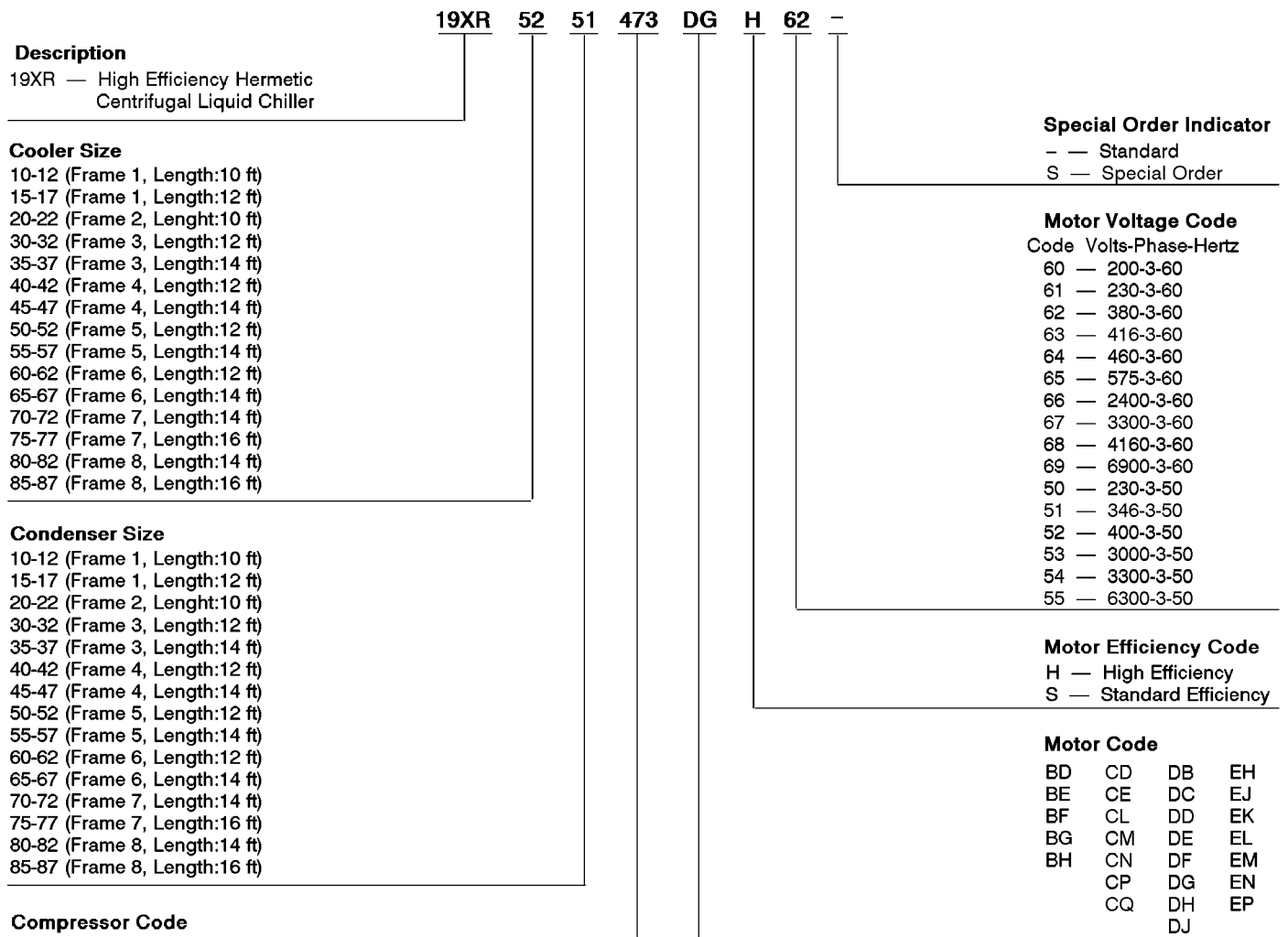
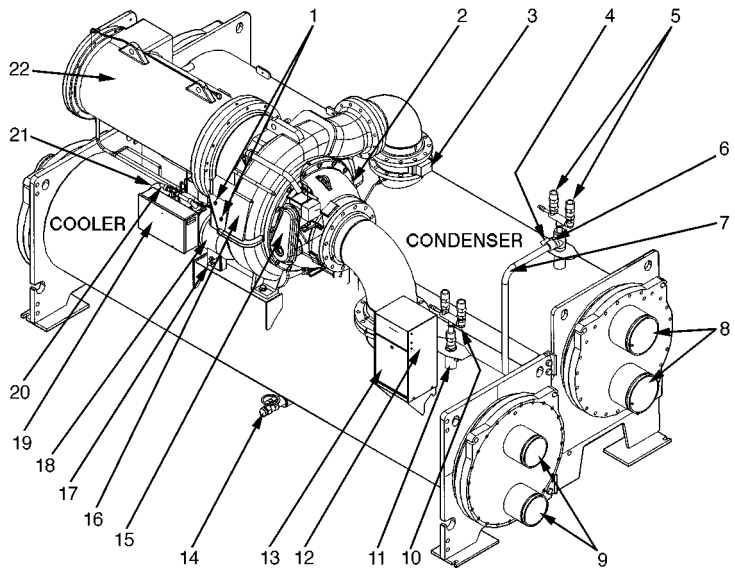


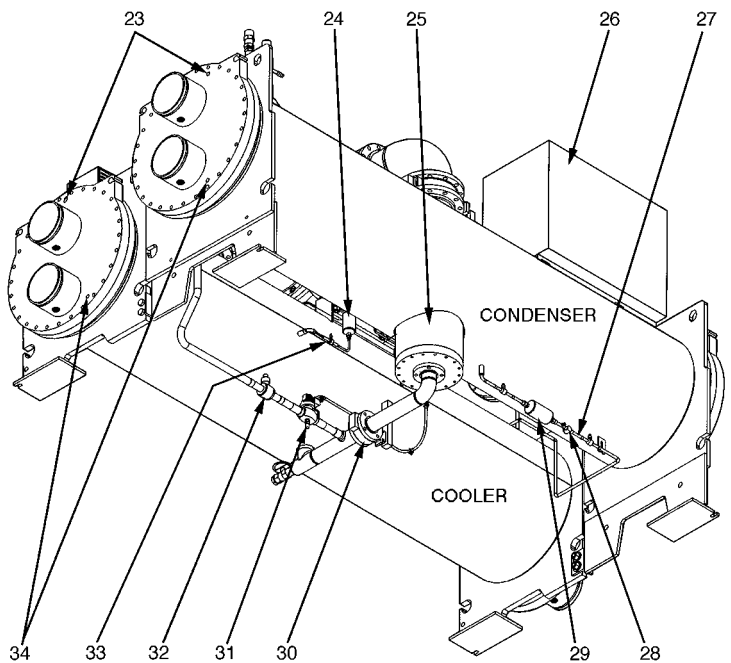
Fig. 1 — Model Number Identification

FRONT TOP VIEW



- 1 — Oil Level Sight Glass
- 2 — Diffuser Actuator (Hidden/19XR5 Only)
- 3 — Discharge Isolation Valve
- 4 — Condenser Pumpout Connection
- 5 — Condenser Safety Relief Valves
- 6 — Three-Way Condenser Relief Valve
- 7 — Hot Gas Bypass Line
- 8 — Condenser Waterbox Nozzles
- 9 — Cooler Waterbox Nozzles
- 10 — Cooler Safety Relief Valves
- 11 — Cooler Pumpout Connection
- 12 — Machine Identification Nameplate
- 13 — Control Panel
- 14 — Refrigerant Charging Valve
- 15 — Guide Vane Actuator
- 16 — Compressor/Transmission
- 17 — Oil Drain/Charging Valve
- 18 — Oil Pump
- 19 — Auxillary Power Panel
- 20 — Oil Filter Isolation Valve
- 21 — Oil Filter
- 22 — Motor

BOTTOM REAR VIEW

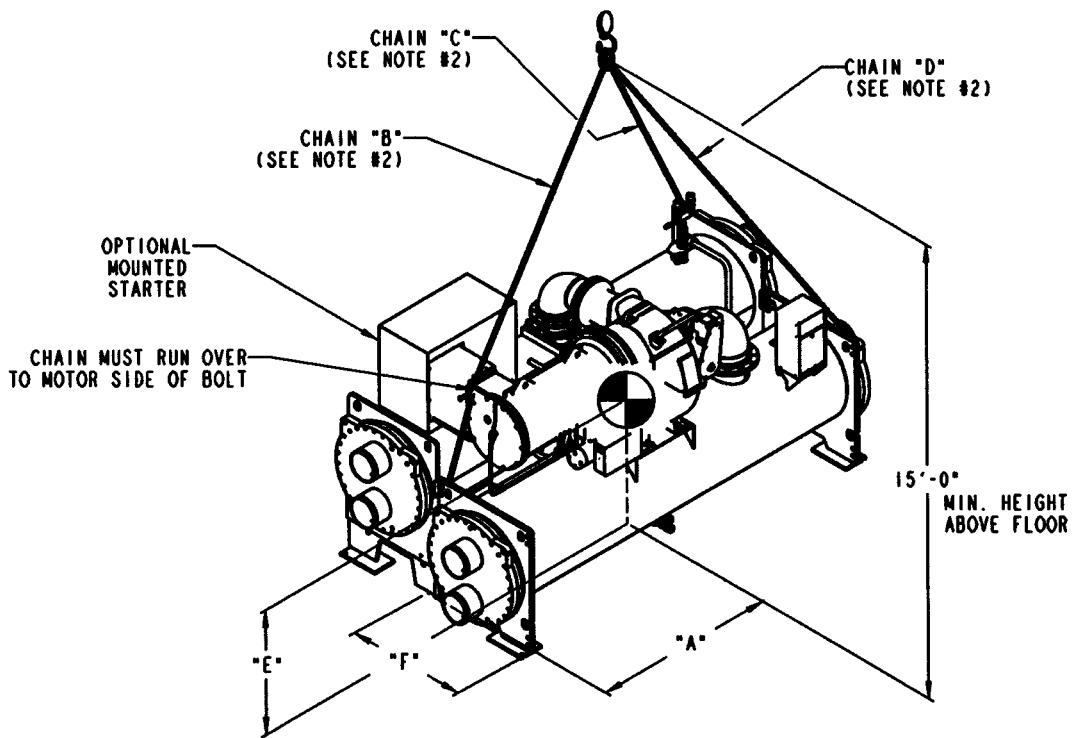


- 23 — Waterbox Vents
- 24 — Oil Reclaim Filter
- 25 — Float Chamber
- 26 — Unit Mounted Starter
- 27 — Refrigerant Filter/Drier Isolation Valves
- 28 — Sight Glass/Moisture Indicator
- 29 — Refrigerant Filter/Drier
- 30 — Cooler Liquid Line Isolation Valve
- 31 — Hot Gas Bypass Valve (Option)
- 32 — Hot Gas Bypass Isolation Valve (Option)
- 33 — Oil Reclaim Filter Isolation Valve
- 34 — Waterbox Vents

Fig. 2 — Typical 19XR Installation

COMPRESSOR FRAME SIZE*	COOLER SIZE	MAXIMUM WEIGHT (lb)	VESSEL LENGTH	DIM. "A"	CHAIN LENGTH			DIM. "E"	DIM. "F"
					"B"	"C"	"D"		
2	10-12	18,500	10'	4'- 7"	12'-7"	13'-0"	13'-0"	2'-3"	2'-6"
	15-17	19,000	12'	5'- 9"	13'-6"	13'-2"	13'-3"		
	20-22	19,500	10'	4'- 7"	12'-7"	13'-0"	13'-0"		
2 or 3	30-32	21,000	12'	5'- 9"	13'-6"	13'-2"	13'-3"	3'-1"	2'-4"
	35-37	22,500	14'	7'- 4"	14'-2"	13'-4"	13'-4"		
3	40-42	29,700	12'	5'- 9"	12'-8"	12'-8"	13'-4"	3'-2"	2'-7"
	45-47	31,800	14'	6'-10"	13'-1"	13'-2"	13'-8"		
	50-52	32,200	12'	5'- 9"	12'-7"	12'-9"	13'-5"		
	55-57	33,200	14'	6'-10"	13'-1"	18'-3"	15'-9"		
4	50-52	32,530	12'	5'- 9"	13'-1"	12'-9"	13'-4"	3'-4"	2'-8"
	55-57	34,230	14'	6'- 2"	13'-7"	13'-1"	14'-4"		
	60-62	39,950	12'	5'- 9"	13'-1"	12'-9"	13'-4"		
	65-67	36,950	14'	6'- 2"	13'-7"	13'-1"	14'-4"		

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



MACHINE RIGGING GUIDE

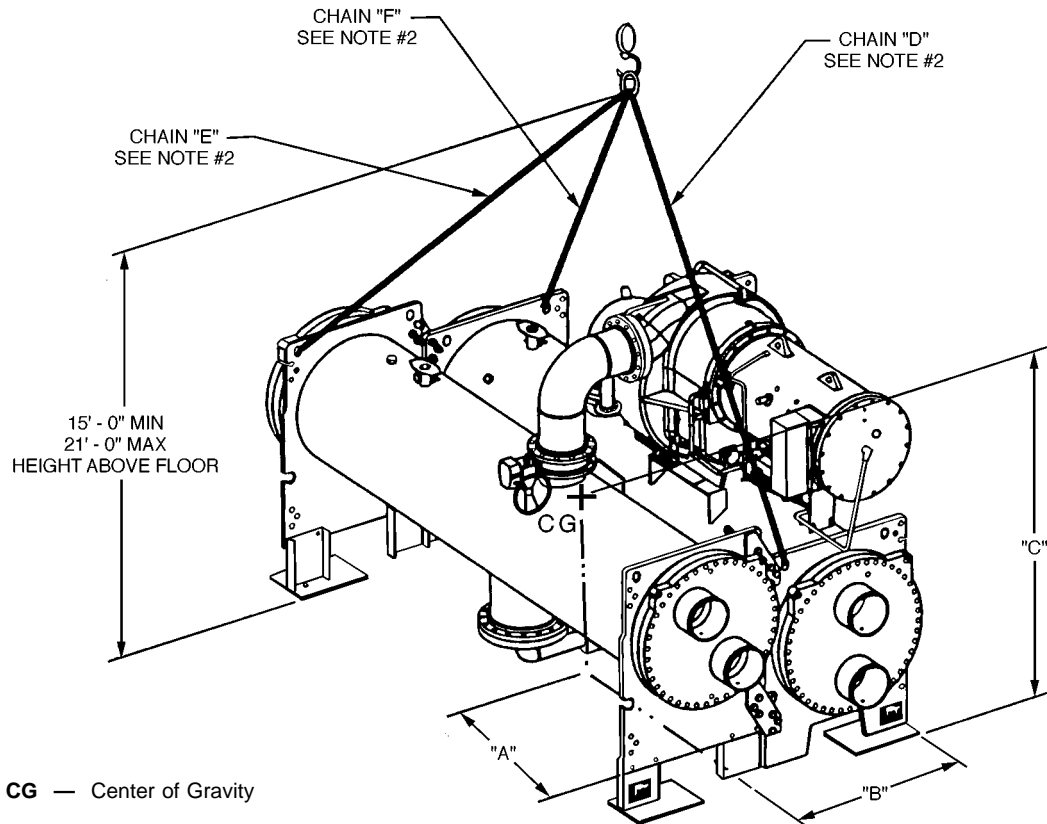
NOTES:

1. Each cable 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. 3 — Machine Rigging Guide (Cooler Size 10 Through 67)

COMPRESSOR FRAME SIZE*	COOLER SIZE	MAXIMUM WEIGHT (lb)	VESSEL LENGTH	DIM. "A"	DIM. "B"	DIM. "C"	CHAIN LENGTH		
							"D"	"E"	"F"
4	70-72	40,410	14'	6'- 6"	3'-4"	3'-5"	11'-6"	12'-5"	12'-9"
	75-77	44,210	16'	7'- 5"	3'-5"	3'-5"	12'-0"	13'-3"	13'-6"
5	70-72	45,600	14'	6'- 2"	3'-6"	3'-7"	11'-6"	12'-5"	12'-9"
	75-77	49,400	16'	6'-11"	3'-6"	3'-6"	12'-0"	13'-3"	13'-6"
	80-82	54,900	14'	6'- 2"	3'-6"	3'-7"	11'-6"	12'-5"	12'-9"
	85-87	58,300	16'	6'-11"	3'-6"	3'-6"	12'-0"	13'-3"	13'-6"

*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.
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.

Fig. 4 — Machine Rigging Guide (Cooler Size 70 Through 87)

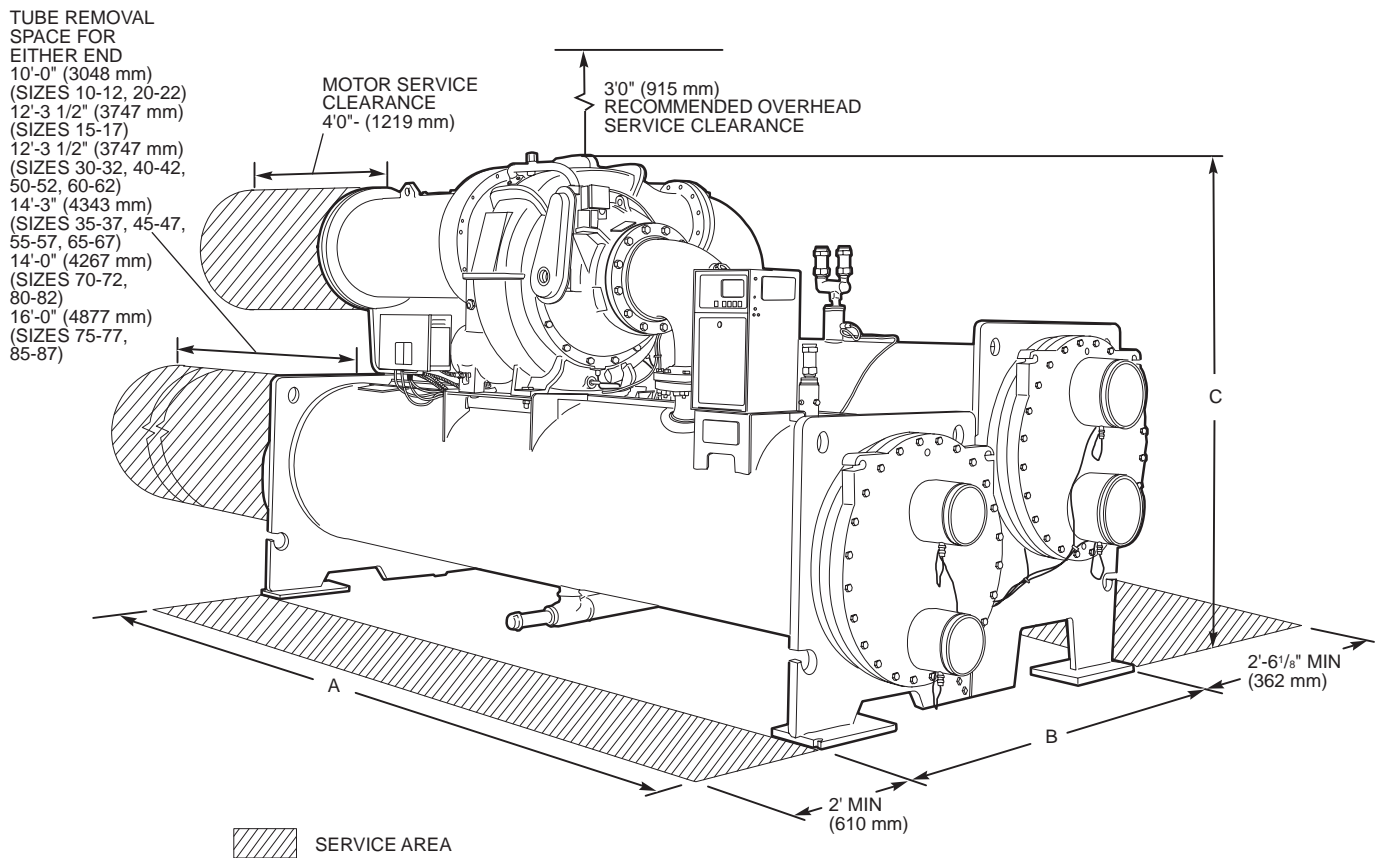


Fig. 5 — 19XR Dimensions (Refer to Tables 1 Through 3)

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

HEAT EXCHANGER SIZE	A (Length, with Nozzle-in-Head Waterbox)				B (Width)		C (Height)	
	2-Pass*		1 or 3 Pass†		ft-in.	mm	ft-in.	mm
	ft-in.	mm	ft-in.	mm				
10 to 12	11- 3/8	3451	11-10 3/4	3626	4-11 3/4	1518	6- 1 1/4	1861
15 to 17	13- 7 3/8	4150	14- 2 1/4	4324	4-11 3/4	1518	6- 1 1/4	1861
20 to 22	11- 5 1/8	3483	12- 0 1/2	3670	5- 5 3/4	1670	6- 3 1/4	1911
30 to 32	13- 8 1/4	4172	14- 3 1/4	4350	5- 5 3/4	1670	6- 9 5/8	2073
35 to 37	15- 4 3/4	4693	15-11 3/4	4870	5- 5 3/4	1670	6- 9 5/8	2073
40 to 42	13-11	4242	14- 6 1/4	4426	6- 2	1880	7- 0 3/4	2153
45 to 47	15- 7 1/2	4763	16- 2 3/4	4947	6- 2	1880	7- 0 3/4	2153
50 to 52	13-11 1/4	4248	14- 6 3/4	4439	6- 6 1/2	1994	7- 2 7/8	2207
55 to 57	15- 7 3/4	4769	16- 3 1/4	4959	6- 6 1/2	1994	7- 2 7/8	2207
60 to 62	13-11 3/4	4261	14- 7 1/4	4451	6-10 1/2	2096	7- 4 7/8	2257
65 to 67	15- 8 1/4	4782	16- 3 3/4	4972	6-10 1/2	2096	7- 4 7/8	2257
70 to 72	16- 4	4978	17- 0 1/2	5194	7-11 1/2	2426	9- 9 1/2	2985
75 to 77	18- 4	5588	19- 0 1/2	5804	7-11 1/2	2426	9- 9 1/2	2985
80 to 82	16- 4 3/4	4997	17- 1 1/2	5220	8-10 3/4	2711	9-11 1/4	3029
85 to 87	18- 4 3/4	5607	19- 1 1/2	5829	8-10 3/4	2711	9-11 1/4	3029

*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 (ASHRAE) 15, latest edition, National Fire Protection Association (NFPA) 70, and local safety code.
2. Allow at least 3 ft (915 mm) overhead clearance for service rigging.
3. Certified drawings available upon request.

Table 2 — 19XR Dimensions (Marine Waterbox)

HEAT EXCHANGER SIZE	A (Length, Marine Waterbox — not shown)			
	2-Pass*		1 or 3 Pass†	
	ft-in.	mm	ft-in.	mm
10 to 12	NA	NA	NA	NA
15 to 17	NA	NA	NA	NA
20 to 22	12- 6 ⁵ / ₈	3826	14- 3	4343
30 to 32	14- 9	4496	16- 4 ³ / ₄	4997
35 to 37	16- 5 ¹ / ₂	5017	18- 1 ¹ / ₄	5518
40 to 42	15- 0 ¹ / ₄	4591	16- 8 ³ / ₄	5099
45 to 47	16- 8 ³ / ₄	5099	18- 5 ¹ / ₄	5620
50 to 52	15- 0 ¹ / ₄	4591	16- 8 ³ / ₄	5099
55 to 57	16- 8 ³ / ₄	5099	18- 5 ¹ / ₄	5620
60 to 62	15- 0 ³ / ₄	4591	16- 9 ¹ / ₄	5111
65 to 67	16- 9 ¹ / ₄	5112	18- 5 ³ / ₄	5632
70 to 72	17- 8	5385	19-10 ¹ / ₂	6058
75 to 77	19- 8	5994	21-10 ¹ / ₂	6668
80 to 82	17- 8 ¹ / ₂	5398	20- 1	6121
85 to 87	19- 8 ¹ / ₂	6007	22- 1	6731

*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 (ASHRAE) 15, latest edition, National Fire Protection Association (NFPA) 70, and local safety code.
2. Allow at least 3 ft (915 mm) overhead clearance for service rigging.
3. Certified drawings available upon request.

Table 3 — 19XR Nozzle Size

FRAME SIZE	NOZZLE SIZE (in.) (Nominal Pipe Size)					
	Cooler			Condenser		
	1-Pass	2-Pass	3-Pass	1-Pass	2-Pass	3-Pass
1	8	6	6	8	6	6
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

Table 4 — 19XR Compressor Weights

MOTOR CODE	ENGLISH		SI	
	Total Compressor Weight* (lb)		Total Compressor Weight* (kg)	
	60 Hz	50 Hz	60 Hz	50 Hz
BD	3,755	3,755	1703	1703
BE	3,805	3,805	1726	1726
BF	3,870	3,870	1755	1755
BG	3,950	3,950	1792	1792
BH	3,950	3,950	1792	1792
CD	4,659	4,756	2134	2153
CE	4,685	4,771	2155	2165
CL	4,710	4,842	2137	2167
CM	4,737	4,868	2149	2209
CN	4,751	4,883	2156	2215
CP	4,806	4,898	2181	2212
CQ	4,874	4,898	2211	2212
DB	6,112	6,158	2772	2793
DC	6,138	6,224	2822	2823
DD	6,216	6,262	2819	2840
DE	6,224	6,351	2823	2881
DF	6,274	6,412	2846	2908
DG	6,364	6,466	2886	2933
DH	6,412	6,868	2908	3115
DJ	6,466	6,977	2933	3165
EH	8,025	11,135	3640	5051
EJ	11,085	11,265	5028	5110
EK	11,160	11,282	5062	5118
EL	11,181	11,435	5072	5187
EM	11,271	11,435	5113	5187
EN	11,335	11,635	5142	5278
EP	11,434	11,605	5186	5264

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

NOTE: For medium voltage motors (over 600 v), add 490 lb (222 kg).

Table 5 — 19XR 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	50	23	54	24	175	79	210	95
Discharge Elbow	60	27	46	21	157	71	140	63
Control Cabinet*	30	14	30	14	30	14	30	14
Optional Unit-Mounted Starter†	800	363	800	363	800	363	800	363
Optional Isolation Valves	115	52	115	52	115	52	115	52

*Included in total cooler weight.

†Weight of optional factory-mounted starter is not included and must be added to the heat exchanger weight.

Table 6 — 19XR Heat Exchanger Data

CODE	ENGLISH						SI					
	Dry Rigging Weight (lb)		Machine Charge				Dry Rigging Weight (kg)		Machine Charge			
	Cooler Only	Condenser Only	Refrigerant Weight		Water Volume (gal)		Cooler Only	Condenser Only	Refrigerant Weight		Water Volume	
			Cooler	Condenser	Cooler	Condenser			Cooler	Condenser	Cooler	Condenser
10	2,742	2,704	290	200	34	42	1244	1227	132	91	129	158
11	2,812	2,772	310	200	37	45	1276	1257	141	91	140	170
12	2,883	2,857	330	200	40	49	1308	1296	150	91	152	185
15	3,003	2,984	320	250	39	48	1362	1354	145	113	149	183
16	3,089	3,068	340	250	43	52	1401	1392	154	113	163	198
17	3,176	3,173	370	250	47	57	1441	1439	168	113	178	216
20	3,442	3,523	345	225	48	48	1561	1598	156	102	183	181
21	3,590	3,690	385	225	55	55	1628	1674	175	102	207	210
22	3,746	3,854	435	225	62	63	1699	1748	197	102	234	239
30	4,137	3,694	350	260	55	55	1877	1676	159	118	208	210
31	4,319	3,899	420	260	64	65	1959	1769	190	118	242	246
32	4,511	4,100	490	260	72	74	2046	1860	222	118	271	282
35	4,409	4,606	400	310	61	62	2000	2089	181	141	232	233
36	4,617	4,840	480	310	70	72	2094	2195	218	141	266	273
37	4,835	5,069	550	310	80	83	2193	2299	249	141	301	314
40	5,898	6,054	560	280	89	96	2675	2746	254	127	338	365
41	6,080	6,259	630	280	97	106	2757	2839	286	127	368	400
42	6,244	6,465	690	280	105	114	2832	2933	313	127	396	433
45	6,353	6,617	640	330	98	106	2881	3001	290	150	372	403
46	6,561	6,851	720	330	108	117	2976	3108	327	150	407	442
47	6,748	7,085	790	330	116	127	3060	3214	358	150	438	481
50	7,015	7,285	750	400	115	128	3181	3304	340	181	435	483
51	7,262	7,490	840	400	126	137	3293	3397	381	181	477	518
52	7,417	7,683	900	400	133	136	3364	3484	408	181	502	552
55	7,559	7,990	870	490	127	142	3428	3624	395	222	481	536
56	7,839	8,214	940	490	139	152	3555	3725	426	222	527	575
57	8,016	8,434	980	490	147	162	3635	3825	445	222	557	613
60	8,270	8,286	940	420	144	159	3751	3758	426	190	546	601
61	8,462	8,483	980	420	153	168	3838	3847	445	190	578	636
62	8,617	8,676	1020	420	160	177	3908	3935	463	190	604	669
65	8,943	9,204	1020	510	160	176	4056	4174	463	231	605	668
66	9,161	9,428	1060	510	169	187	4155	4276	481	231	641	707
67	9,338	9,648	1090	510	177	197	4235	4376	494	231	671	745
70	12,395	13,139	1220	780	224	209	5622	5960	553	354	848	791
71	12,821	13,568	1340	780	243	229	5816	6154	608	354	919	867
72	13,153	13,969	1440	780	257	248	5966	6336	653	354	974	937
75	13,293	14,211	1365	925	245	234	6030	6446	619	420	927	885
76	13,780	14,702	1505	925	266	257	6251	6669	683	420	1009	971
77	14,159	15,160	1625	925	283	278	6423	6877	737	420	1072	1052
80	16,156	15,746	1500	720	285	264	7328	7142	680	327	1080	1000
81	16,530	16,176	1620	720	302	284	7498	7337	735	327	1143	1075
82	16,919	16,606	1730	720	319	304	7674	7532	785	327	1208	1150
85	17,296	17,001	1690	860	313	295	7845	7712	767	390	1183	1118
86	17,723	17,492	1820	860	331	318	8039	7934	826	390	1254	1205
87	18,169	17,984	1940	860	351	341	8241	8158	880	390	1329	1291

*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 (LID), suction elbow, and ½ the distribution piping weight.
2. Condenser includes float valve and sump, discharge elbow, and ½ the distribution piping weight.
3. For special tubes refer to the 19XR Computer Selection Program.
4. All weights for standard 2 pass NIH (nozzle-in-head) design.

Table 7 — 19XR 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)
FRAME 2, 1 AND 2 PASS	150	730	84	1034	331	318
FRAME 2, 2 PASS	150	365	42	1034	166	159
FRAME 3, 1 AND 2 PASS	150	730	84	1034	331	317
FRAME 3, 2 PASS	150	365	42	1034	166	159
FRAME 4, 1 AND 3 PASS	150	1060	123	1034	481	465
FRAME 4, 2 PASS	150	530	61	1034	240	231
FRAME 5, 1 AND 3 PASS	150	1240	139	1034	562	526
FRAME 5, 2 PASS	150	620	69	1034	281	263
FRAME 6, 1 AND 3 PASS	150	1500	162	1034	680	612
FRAME 6, 2 PASS	150	750	81	1034	340	306
FRAME 7, 1 AND 3 PASS	150	2010	326	1034	912	1234
FRAME 7, 2 PASS	150	740	163	1034	336	617
FRAME 8, 1 AND 3 PASS	150	1855	406	1034	841	1537
FRAME 8, 2 PASS	150	585	203	1034	265	768
FRAME 2, 1 AND 3 PASS	300	860	84	2068	390	318
FRAME 2, 2 PASS	300	430	42	2068	195	159
FRAME 3, 1 AND 3 PASS	300	860	84	2068	390	317
FRAME 3, 2 PASS	300	430	42	2068	195	159
FRAME 4, 1 AND 3 PASS	300	1210	123	2068	549	465
FRAME 4, 2 PASS	300	600	61	2068	272	231
FRAME 5, 1 AND 3 PASS	300	1380	139	2068	626	526
FRAME 5, 2 PASS	300	690	69	2068	313	263
FRAME 6, 1 AND 3 PASS	300	1650	162	2068	748	612
FRAME 6, 2 PASS	300	825	81	2068	374	306
FRAME 7, 1 AND 3 PASS	300	3100	326	2068	1406	1234
FRAME 7, 2 PASS	300	2295	163	2068	1041	617
FRAME 8, 1 AND 3 PASS	300	2745	405	2068	1245	1533
FRAME 8, 2 PASS	300	1630	203	2068	739	768

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

NOTES:

1. Weight adder shown is the same for cooler and condenser of equal frame size.
2. For the total weight of a vessel with a marine waterbox, add these values to the heat exchanger weights (or volumes).

Table 8A — 19XR Waterbox Cover Weights

ENGLISH (lb)

HEAT EXCHANGER	WATERBOX DESCRIPTION	FRAME 1		FRAME 2		FRAME 3	
		Standard Nozzles	Flanged	Standard Nozzles	Flanged	Standard Nozzles	Flanged
COOLER/ CONDENSER	NIH, 1 Pass Cover, 150 psig	177	204	320	350	320	350
	NIH, 2 Pass Cover, 150 psig	185	218	320	350	320	350
	NIH, 3 Pass Cover, 150 psig	180	196	300	340	300	340
	NIH/MWB End Cover, 150 psig	136	136	300	300	300	300
	NIH, 1 Pass Cover, 300 psig	248	301	411	486	411	486
	NIH, 2 Pass Cover, 300 psig	255	324	411	518	411	518
	NIH, 3 Pass Cover, 300 psig	253	288	433	468	433	468
	NIH/MWB End Cover, 300 psig	175	175	400	400	400	400

HEAT EXCHANGER	WATERBOX DESCRIPTION	FRAME 4		FRAME 5		FRAME 6	
		Standard Nozzles	Flanged	Standard Nozzles	Flanged	Standard Nozzles	Flanged
COOLER/ CONDENSER	NIH, 1 Pass Cover, 150 psig	485	521	616	652	802	838
	NIH, 2 Pass Cover, 150 psig	487	540	590	663	770	843
	NIH, 3 Pass Cover, 150 psig	504	520	629	655	817	843
	NIH/MWB End Cover, 150 psig	379	379	428	428	583	583
	NIH, 1 Pass Cover, 300 psig	593	668	764	655	880	956
	NIH, 2 Pass Cover, 300 psig	594	700	761	839	844	995
	NIH, 3 Pass Cover, 300 psig	621	656	795	838	901	952
	NIH/MWB End Cover, 300 psig	569	569	713	713	833	833

HEAT EXCHANGER	WATERBOX DESCRIPTION	FRAME 7 COOLER		FRAME 7 CONDENSER	
		Standard Nozzles	Flanged	Standard Nozzles	Flanged
COOLER/ CONDENSER	NIH, 1 Pass Cover, 150 psig	1392	1469	1205	1282
	NIH, 2 Pass Cover, 150 psig	1345	1461	1163	1279
	NIH, 3 Pass Cover, 150 psig	1434	1471	1222	1280
	NIH/MWB End Cover, 150 psig	1022	1022	920	920
	NIH, 1 Pass Cover, 300 psig	1985	2150	1690	1851
	NIH, 2 Pass Cover, 300 psig	1934	2174	1628	1862
	NIH, 3 Pass Cover, 300 psig	2009	2090	1714	1831
	NIH/MWB End Cover, 300 psig	1567	1567	1923	1923

HEAT EXCHANGER	WATERBOX DESCRIPTION	FRAME 8 COOLER		FRAME 8 CONDENSER	
		Standard Nozzles	Flanged	Standard Nozzles	Flanged
COOLER/ CONDENSER	NIH, 1 Pass Cover, 150 psig	1831	1909	1682	1760
	NIH, 2 Pass Cover, 150 psig	1739	1893	1589	1744
	NIH, 3 Pass Cover, 150 psig	1851	1909	1702	1761
	NIH/MWB End Cover, 150 psig	1480	1480	1228	1228
	NIH, 1 Pass Cover, 300 psig	2690	2854	2394	2549
	NIH, 2 Pass Cover, 300 psig	2595	2924	2269	2578
	NIH, 3 Pass Cover, 300 psig	2698	2861	2417	2529
	NIH/MWB End Cover, 300 psig	1440	1440	1767	1767

LEGEND

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

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

RIG MACHINE COMPONENTS — Refer to instructions below, Fig. 6-9, 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 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.

Table 8B — 19XR Waterbox Cover Weights

SI (kg)

HEAT EXCHANGER	WATERBOX DESCRIPTION	FRAME 1		FRAME 2		FRAME 3	
		Standard Nozzles	Flanged	Standard Nozzles	Flanged	Standard Nozzles	Flanged
COOLER/ CONDENSER	NIH, 1 Pass Cover, 150 psig	80	93	145	159	145	159
	NIH, 2 Pass Cover, 150 psig	84	99	145	159	145	159
	NIH, 3 Pass Cover, 150 psig	82	89	136	154	140	154
	NIH/MWB End Cover, 150 psig	62	62	136	136	136	136
	NIH, 1 Pass Cover, 300 psig	112	137	186	220	186	220
	NIH, 2 Pass Cover, 300 psig	116	147	186	235	186	235
	NIH, 3 Pass Cover, 300 psig	115	131	196	212	196	212
	NIH/MWB End Cover, 300 psig	79	79	181	181	181	181

HEAT EXCHANGER	WATERBOX DESCRIPTION	FRAME 4		FRAME 5		FRAME 6	
		Standard Nozzles	Flanged	Standard Nozzles	Flanged	Standard Nozzles	Flanged
COOLER/ CONDENSER	NIH, 1 Pass Cover, 150 psig	220	236	279	296	364	380
	NIH, 2 Pass Cover, 150 psig	221	245	268	301	349	382
	NIH, 3 Pass Cover, 150 psig	229	236	285	297	371	381
	NIH/MWB End Cover, 150 psig	172	172	194	194	265	265
	NIH, 1 Pass Cover, 300 psig	269	303	347	381	399	434
	NIH, 2 Pass Cover, 300 psig	269	318	345	398	383	451
	NIH, 3 Pass Cover, 300 psig	282	298	361	380	409	432
	NIH/MWB End Cover, 300 psig	258	258	323	323	378	378

HEAT EXCHANGER	WATERBOX DESCRIPTION	FRAME 7 COOLER		FRAME 7 CONDENSER	
		Standard Nozzles	Flanged	Standard Nozzles	Flanged
COOLER/ CONDENSER	NIH, 1 Pass Cover, 150 psig	631	666	547	582
	NIH, 2 Pass Cover, 150 psig	610	663	528	580
	NIH, 3 Pass Cover, 150 psig	650	667	554	581
	NIH/MWB End Cover, 150 psig	464	464	417	417
	NIH, 1 Pass Cover, 300 psig	900	975	767	840
	NIH, 2 Pass Cover, 300 psig	877	986	738	845
	NIH, 3 Pass Cover, 300 psig	911	948	777	831
	NIH/MWB End Cover, 300 psig	711	711	872	872

HEAT EXCHANGER	WATERBOX DESCRIPTION	FRAME 8 COOLER		FRAME 8 CONDENSER	
		Standard Nozzles	Flanged	Standard Nozzles	Flanged
COOLER/ CONDENSER	NIH, 1 Pass Cover, 150 psig	831	866	763	798
	NIH, 2 Pass Cover, 150 psig	789	859	721	791
	NIH, 3 Pass Cover, 150 psig	840	866	772	799
	NIH/MWB End Cover, 150 psig	671	671	557	557
	NIH, 1 Pass Cover, 300 psig	1220	1295	1086	1156
	NIH, 2 Pass Cover, 300 psig	1177	1326	1029	1169
	NIH, 3 Pass Cover, 300 psig	1224	1298	1096	1147
	NIH/MWB End Cover, 300 psig	653	653	802	802

LEGEND

NIH — Nozzle-in-Head
MWB — Marine Waterbox

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

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.

NOTE: Wiring must also be disconnected. Label each wire before removal (see Carrier Certified Prints). In order to disconnect the starter from the machine, remove wiring for the oil pump, oil heater, control wiring at the power panel, 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.

To Separate Cooler and Condenser:

1. Place a support plate under each tube sheet to keep each vessel level (Fig. 6, Item 6).
2. Cut the refrigerant motor cooling line at the location shown (Fig. 6, Item 7).

3. Disconnect the compressor discharge elbow at the compressor (Fig. 7, Item 3).
4. Cut the hot gas bypass line at the location shown (Fig. 6, Item 1).
5. Unbolt the cooler liquid feed line at the location shown (Fig. 6, Item 10).
6. Cover all openings.
7. 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. 9, Item 1)
 - b. condenser transducer cable at the transducer (Fig. 7, Item 4)
 - c. motor power wires at the starter (Fig. 6, Item 4)
 - d. wires and cable housings at the power panel that cross from the starter to the power panel (Fig. 7, Item 2).
8. Disconnect the rabbit-fit connectors on the tube sheets (Fig. 6, Item 5).
9. Rig the vessels apart.

To Separate the Compressor from the Cooler:

1. Unbolt the compressor suction elbow at the cooler flange (Fig. 6, Item 2).
2. Cut the refrigerant motor cooling line at the location shown (Fig. 6, Item 7).

3. Disconnect the motor refrigerant return line (Fig. 6, Item 8).
4. Disconnect the following:
 - a. compressor oil sump temperature sensor cable (Fig. 8, Item 4)
 - b. bearing temperature sensor cable (Fig. 8, Item 2).
 - c. motor temperature sensor cable (Fig. 8, Item 1)
 - d. wires and cable housings that cross from the power panel to the starter and control panel (Fig. 7, Item 2)
 - e. discharge temperature sensor cable (Fig. 8, Item 6)
 - f. compressor oil sump pressure cable (Fig. 8, Item 3)
 - g. compressor oil discharge pressure cable (Fig. 8, Item 5)
 - h. guide vane actuator cable (Fig. 7, Item 1).
 - i. diffuser actuator cable (Frame 5 compressor only — not shown)
5. Disconnect the flared fitting for the oil reclaim line (Fig. 6, Item 3).
6. Unbolt the compressor discharge elbow (Fig. 7, Item 3).
7. Cover all openings.
8. Disconnect motor power cables at the starter lugs (Fig. 6, Item 4).
9. Unbolt the compressor mounting from the cooler (Fig. 6, Item 9).
10. Rig the compressor.

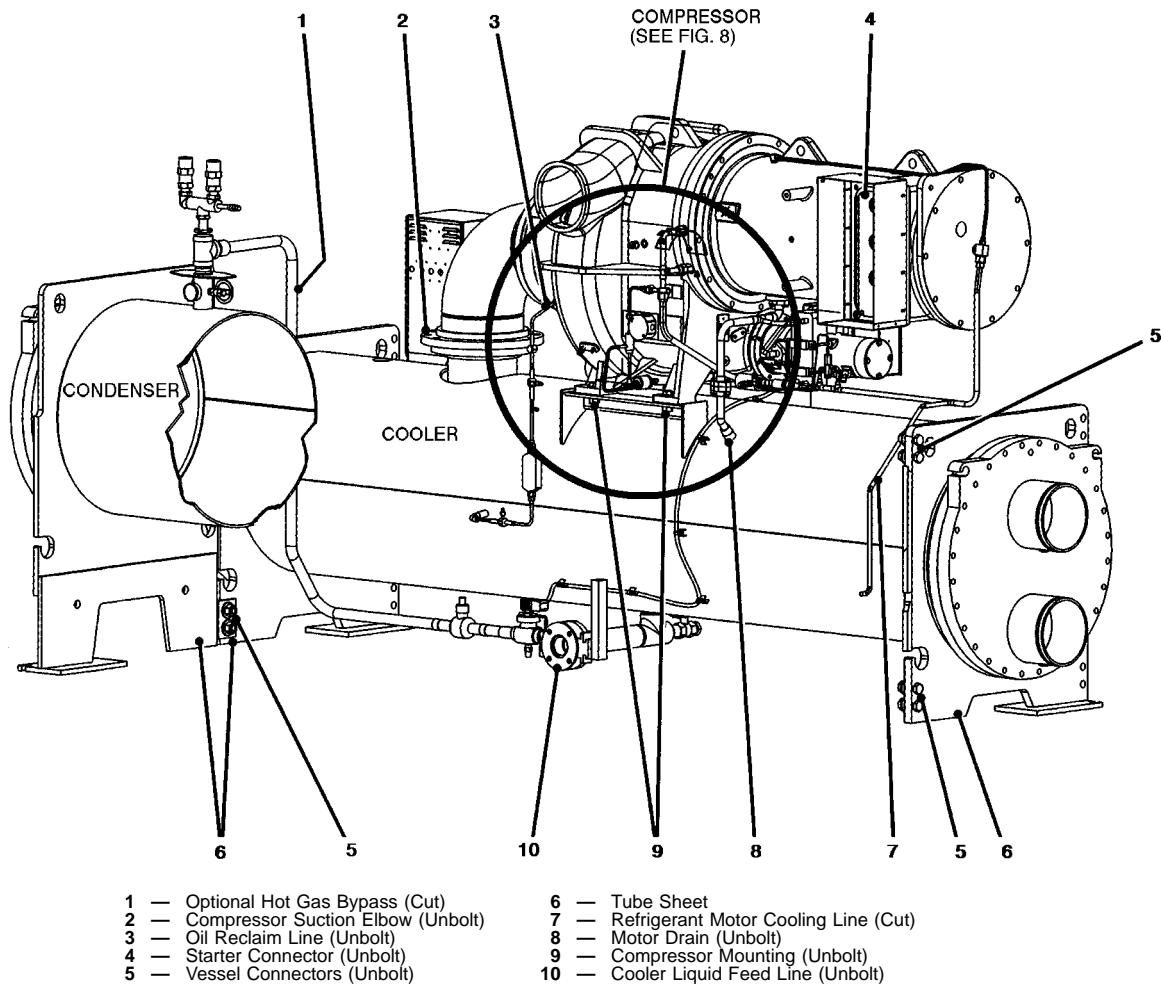
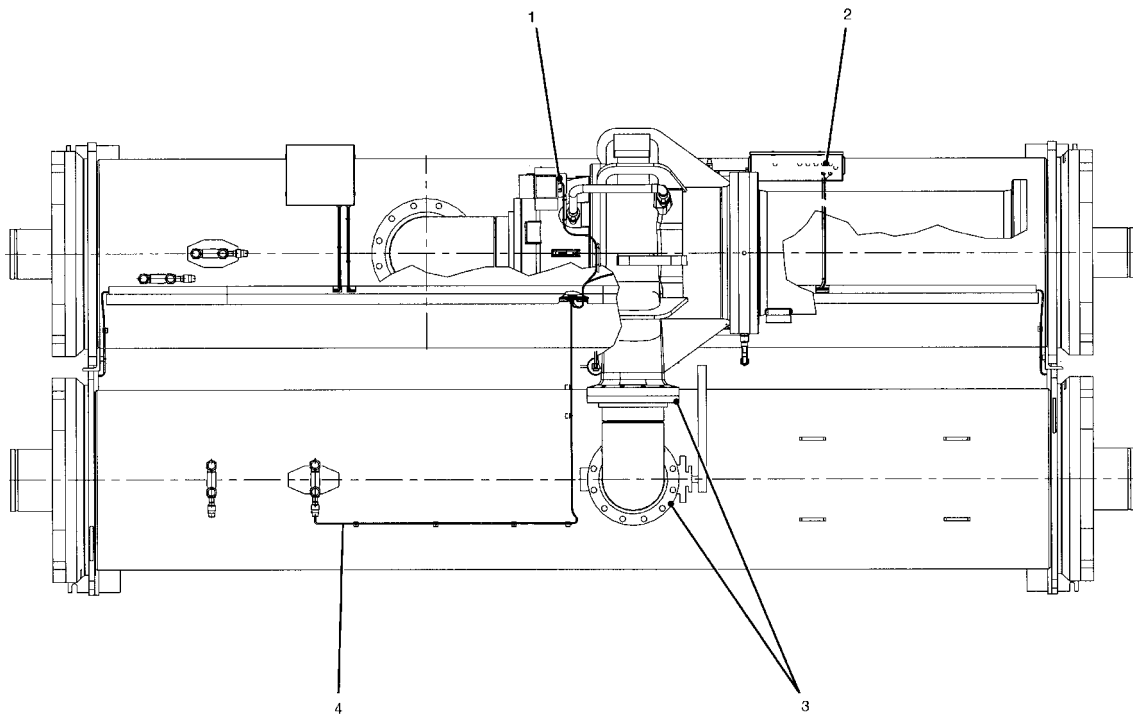


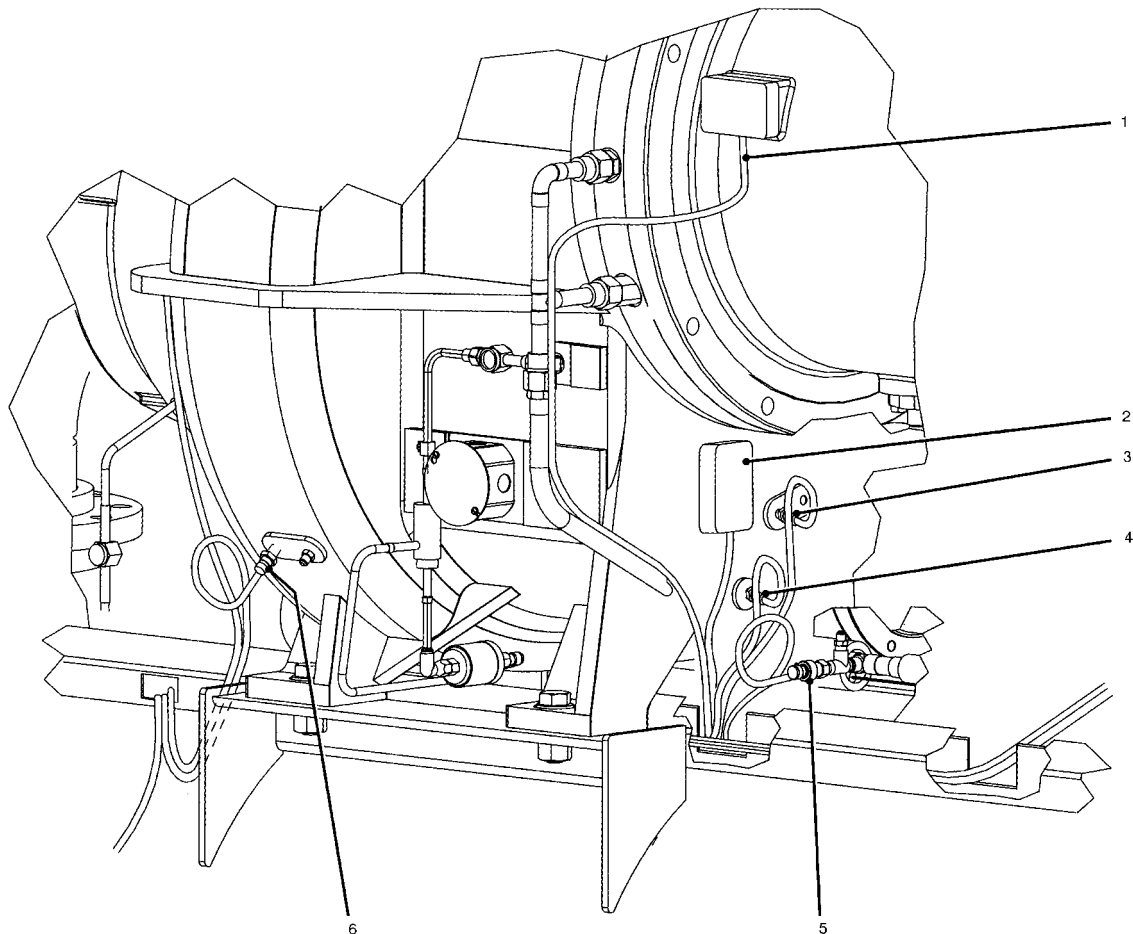
Fig. 6 — Cooler, Side View



- 1 — Guide Vane Actuator Cable
- 2 — Power Panel to Starter Cables (Oil Pump Power, Control Power, and Communication)

- 3 — Compressor Discharge Elbow Joints
- 4 — Condenser Transducer Cable

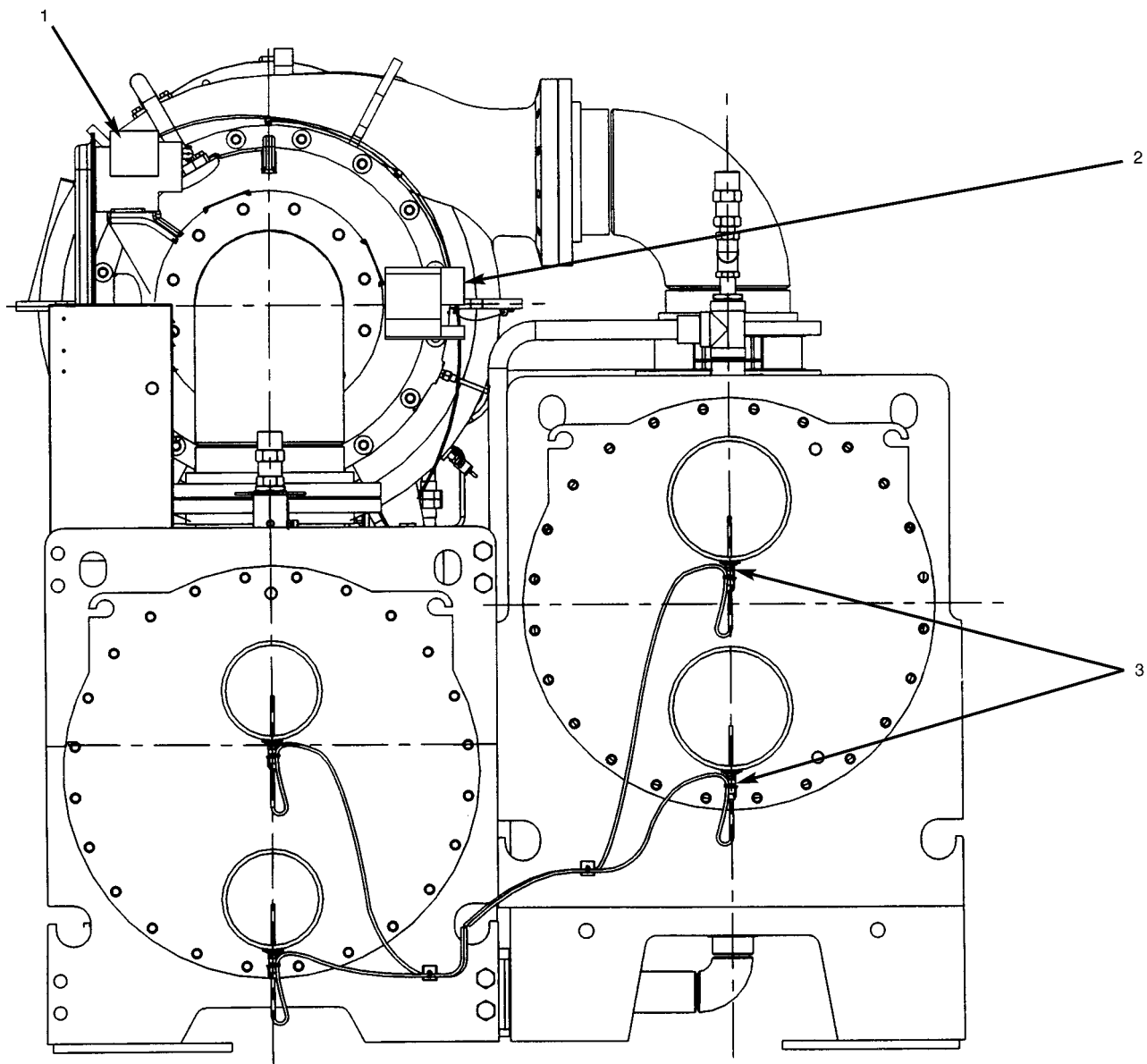
Fig. 7 — 19XR Chiller Top View



- 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

Fig. 8 — Compressor Detail



- 1 — Guide Vane Actuator
- 2 — Diffuser Actuator
- 3 — Water Temperature Sensor Cables

Fig. 9 — Chiller End View

To Rig Compressor

NOTE: The motor end of the 19XR 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.

Additional Notes

1. Use silicon grease 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.

Install Machine Supports

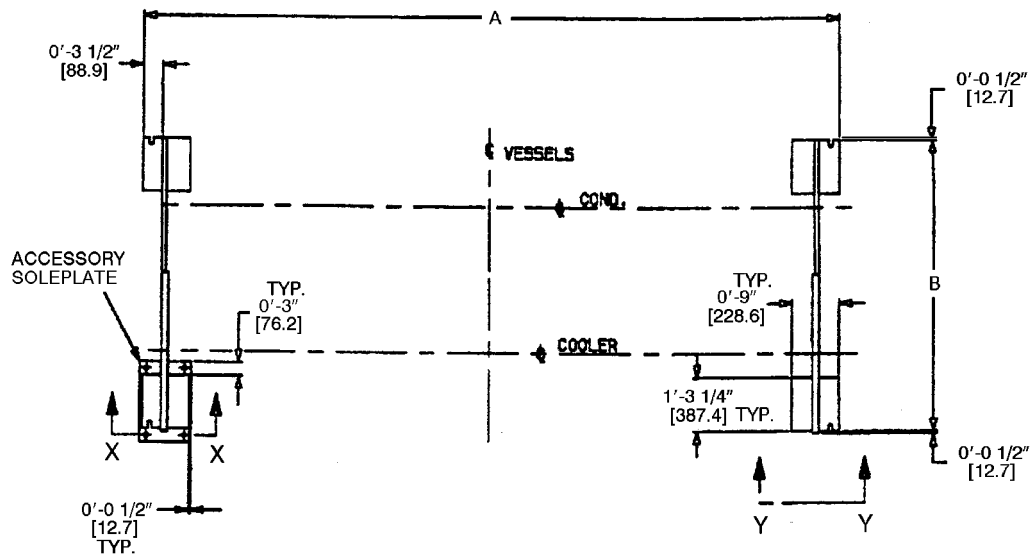
INSTALL STANDARD ISOLATION — Figures 10 and 11 show the position of support plates and shear flex pads, which together form the standard machine support system.

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. Refer to Fig. 10 and 12.

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.

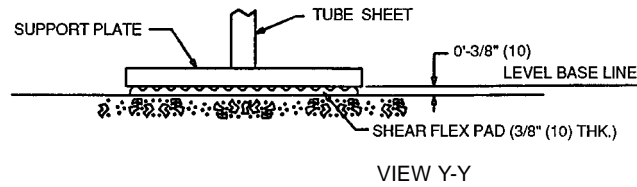


HEAT EXCHANGER SIZE	DIMENSIONS (ft.-in.)	
	A	B
10-12	10- 7¼	4-11¼
15-17	12-10¾	4-11¼
20-22	10- 7¼	5- 5¼
30-32	12-10¾	5- 4¼
35-37	14- 7¼	5- 4¼
40-42	12-10¾	6- 0
45-57	14- 7¼	6- 0
50-52	12-10¾	6- 5½
55-57	14- 7¼	6- 5½
60-62	12-10¾	6- 9½
65-67	14- 7¼	6- 9½
70-72	15- 1⅞	7-10½
75-77	17- 1⅞	7-10½
80-82	15- 1⅞	8- 9¾
85-87	17- 1⅞	8- 9¾

Fig. 10 — 19XR Machine Footprint

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. 13. Consult job data for specific arrangement. Low profile spring isolation assemblies can be field supplied to keep the machine at a convenient working height.

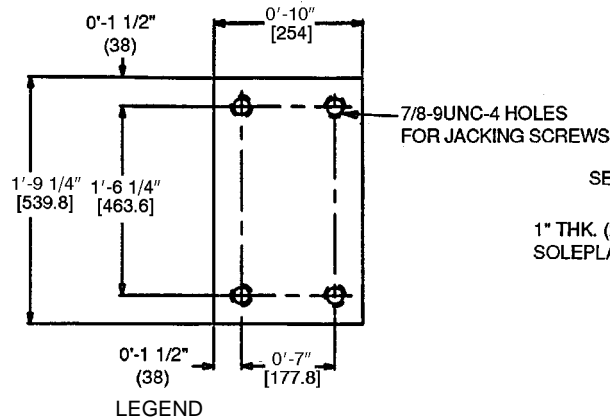
Obtain specific details on spring mounting and machine weight distribution from job data. Also, check job data for methods to support and isolate pipes that are attached to spring isolated machines.



NOTES:

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

Fig. 11 — Standard Isolation

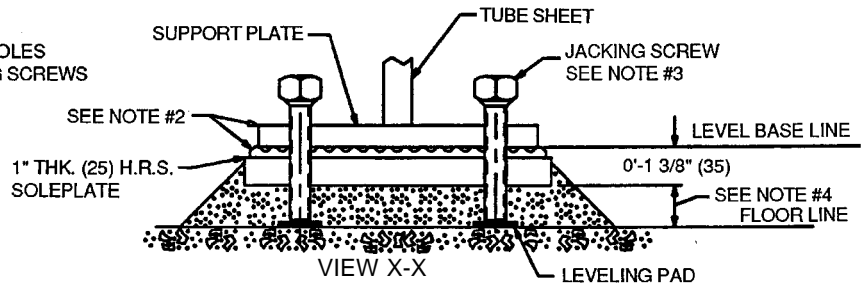


HRS — Hot Rolled Steel

NOTES:

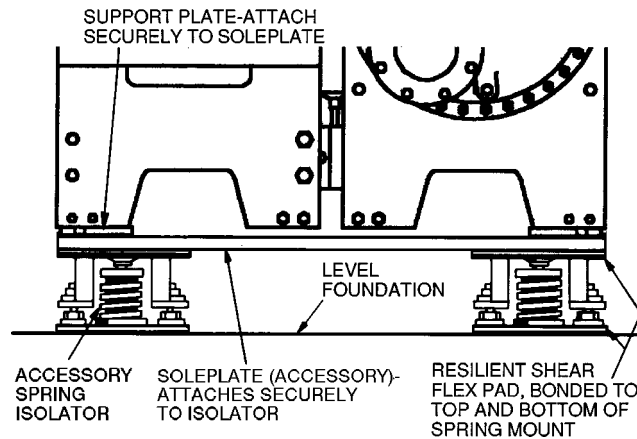
1. Dimensions in () are in millimeters.
2. Accessory (Carrier supplied, field installed) soleplate package includes 4 soleplates, 16 jacking screws and leveling pads.

ACCESSORY SOLEPLATE DETAIL



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, Ceilcoat 648CP 0'-1 1/2" (38.1) to 0'-2 1/4" (57) thick.

Fig. 12 — Accessory Isolation



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

Fig. 13 — 19XR Accessory Spring Isolation (Shown with Accessory Soleplates)

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

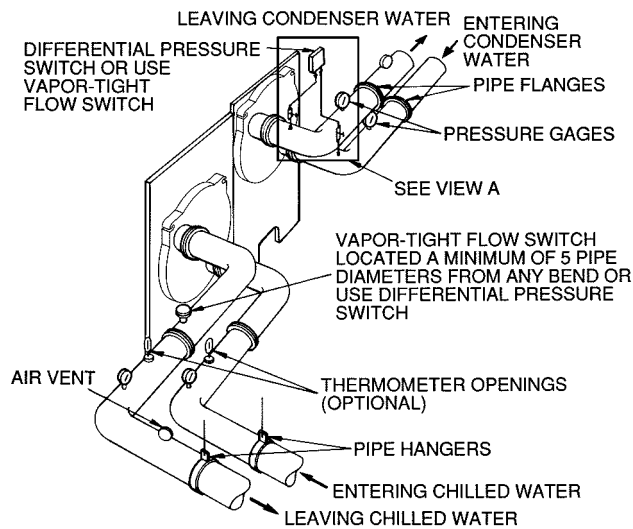
Factory-supplied insulation is not flammable but can be damaged by welding sparks and open flame. Protect insulation with a wet canvas cover.

⚠ CAUTION

Remove chilled and condenser water sensors before welding connecting piping to water nozzles. Refer to Fig. 9. 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. 15-18.
NOTE: Entering water is always the lower of the 2 nozzles. Leaving water is always the upper nozzle for cooler or condenser.
6. Water flow switches must be of vapor-tight construction and must be installed on top of pipe in a horizontal run and at least 5 pipe diameters from any bend.
7. Install waterbox vent and drain piping in accordance with individual job data. All connections are $\frac{3}{4}$ -in. FPT.
8. Install waterbox drain plugs in the unused waterbox drains and vent openings.
9. Install optional pumpout system or pumpout system and storage tank as shown in Fig. 19-22.



LEGEND

COM — Common
N.O. — Normally Open

*Do not tap connections after shutoff valve.

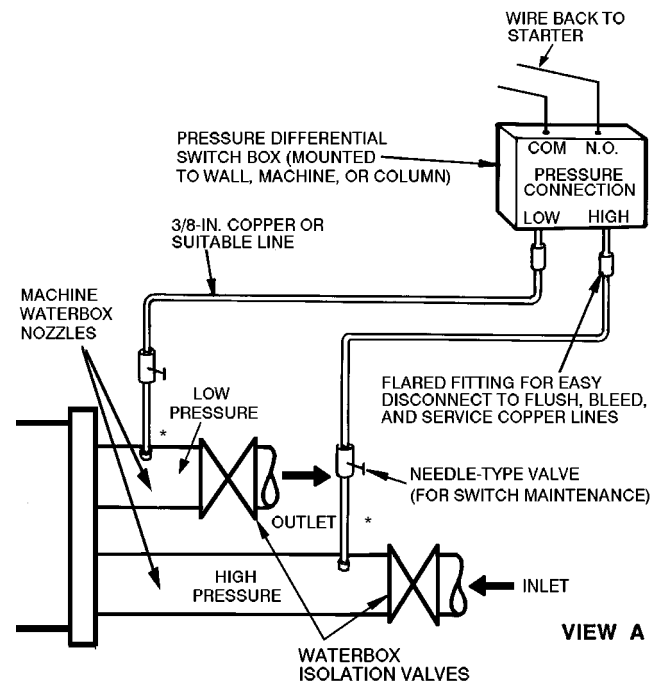
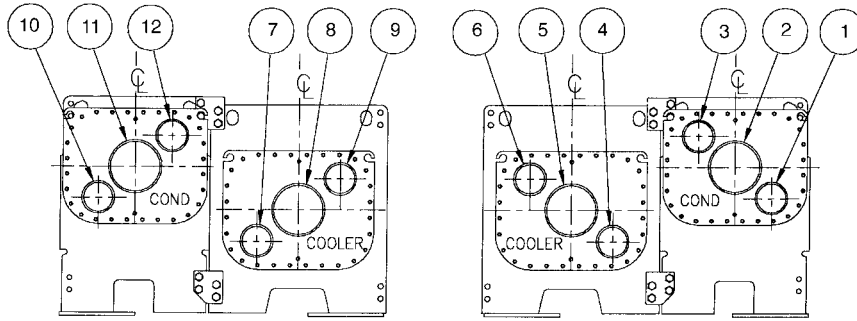


Fig. 14 — Typical Nozzle Piping

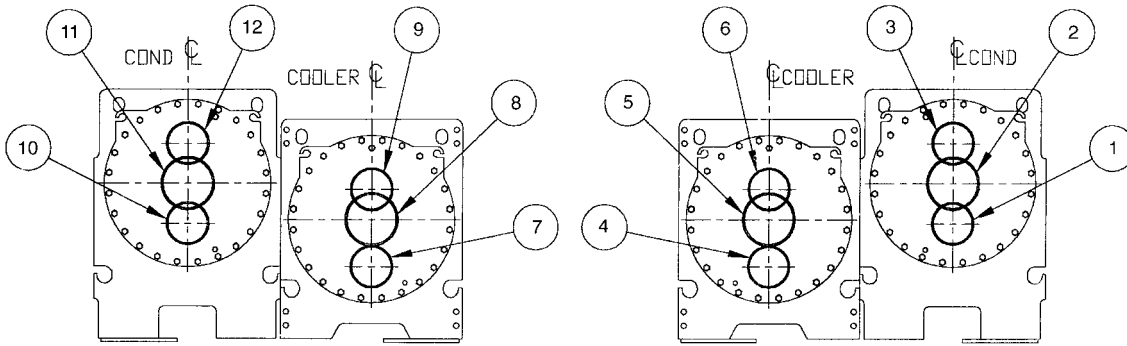
NOZZLE-IN HEAD WATERBOXES



DRIVE END

COMPRESSOR END

FRAMES 1, 2, AND 3



DRIVE END

COMPRESSOR END

FRAMES 4, 5, AND 6

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

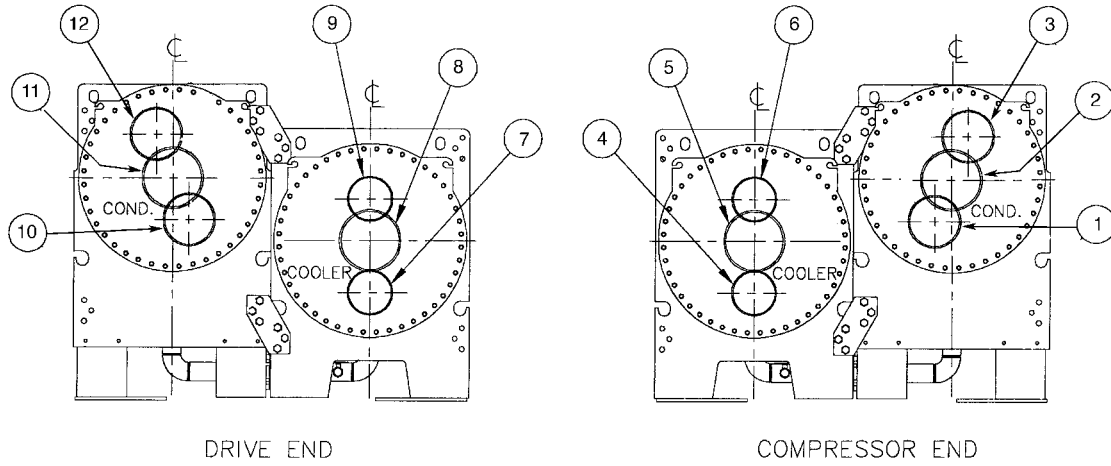
PASS	COOLER WATERBOXES		
	In	Out	Arrangement Code*
1	8	5	A
	5	8	B
2	7	9	C
	4	6	D
3	7	6	E
	4	9	F

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. 15 — Piping Flow Data (NIH, Frames 1 Through 6)

NOZZLE-IN-HEAD WATERBOXES



FRAMES 7 AND 8

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

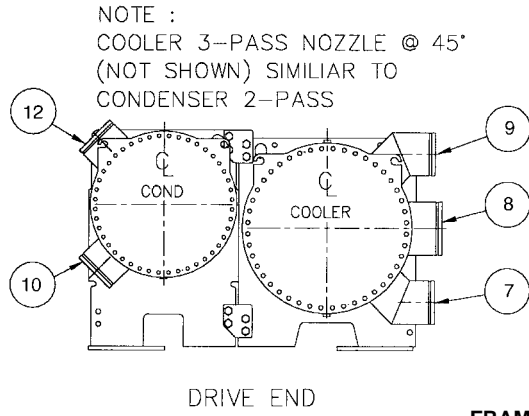
PASS	COOLER WATERBOXES		
	In	Out	Arrangement Code*
1	8	5	A
	5	8	B
2	7	9	C
	4	6	D
3	7	6	E
	4	9	F

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

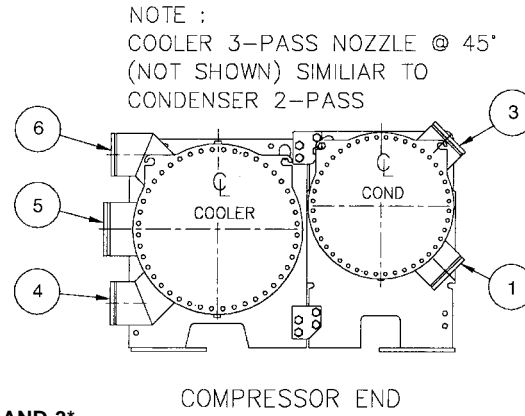
*Refer to certified drawings.

Fig. 16 — Piping Flow Data (NIH, Frames 7 and 8)

MARINE WATERBOXES



FRAMES 2 AND 3*



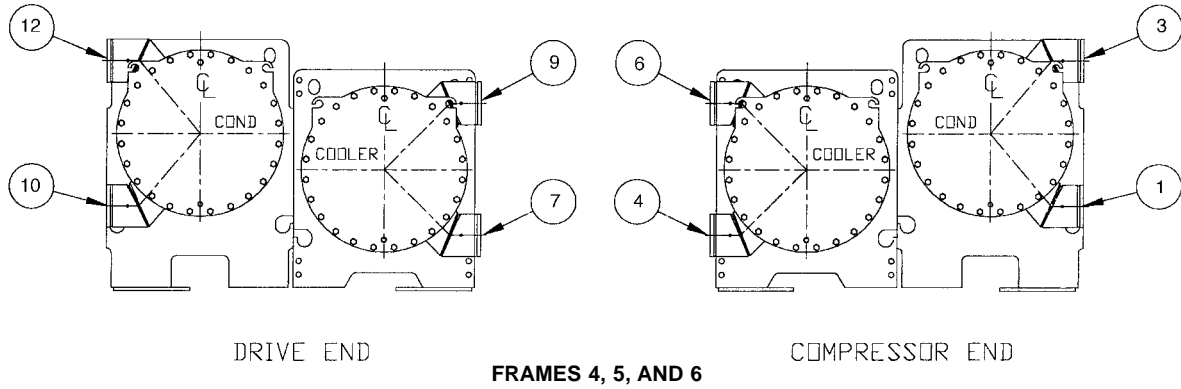
*There is no Frame 1 marine waterbox.

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	—	—	—

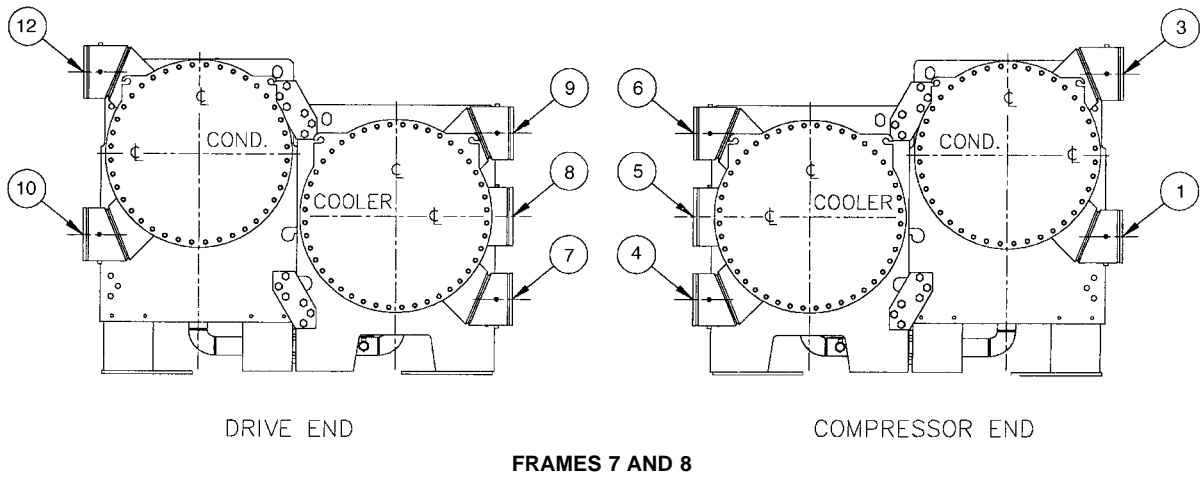
Fig. 17 — Piping Flow Data (MWB, Frames 2 and 3)

MARINE WATERBOXES (cont)



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	—	—	—



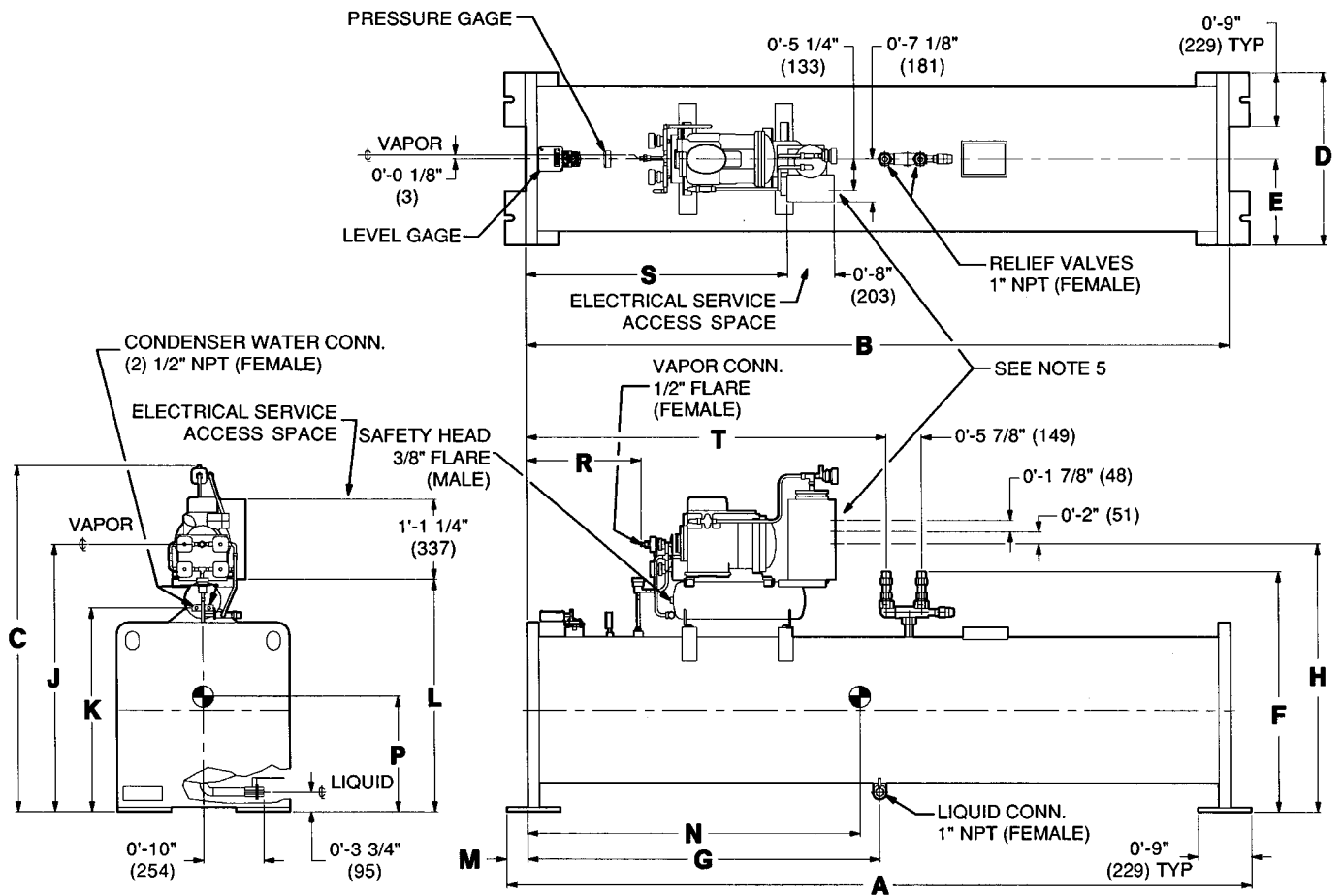
NOZZLE ARRANGEMENT CODES

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

Table 9 — 19XR Waterbox Nozzle Sizes

FRAME SIZE	PRESSURE psig (kPa)	PASS	NOMINAL PIPE SIZE (in.)		ACTUAL PIPE ID (in.)	
			Cooler	Condenser	Cooler	Condenser
1	150/300 (1034/2068)	1	8	8	7.981	7.981
		2	6	6	6.065	6.065
		3	6	6	6.065	6.065
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	11.750
		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




DIMENSIONS
ENGLISH (ft-in.)

TANK SIZE	A	B	C	D	E	F	G	H	J	K	L	M	N	P	R	S	T
0428	10- 5	9-10	4-9	2-4 ³ / ₄	1-2 ³ / ₈	3-1 ³ / ₁₆	4-11	3-8 ¹ / ₈	3- 8	2-9 ⁷ / ₁₆	3-2	0-3 ¹ / ₂	4-8 ³ / ₄	1-7 ⁷ / ₈	1-7 ⁵ / ₁₆	3-7 ³ / ₄	5-0 ¹ / ₄
0452	14-11 ¹ / ₄	14- 4 ¹ / ₂	5-0 ⁷ / ₈	2-8 ¹ / ₂	1-4 ¹ / ₄	3-4 ⁷ / ₁₆	7- 2 ¹ / ₄	4-0	3-11 ⁷ / ₈	3-1 ⁵ / ₁₆	3-5 ⁷ / ₈	0-3 ³ / ₈	7-1 ¹ / ₂	1-8 ³ / ₄	1-7 ⁹ / ₁₆	3-8	5-0 ¹ / ₂

SI (mm)

TANK SIZE	A	B	C	D	E	F	G	H	J	K	L	M	N	P	R	S	T
0428	3175	2997	1448	730	365	945	1499	1121	1118	849	965	89	1442	505	491	1111	1530
0452	4553	4382	1546	826	413	1027	2191	1219	1216	948	1064	86	2172	528	497	1118	1537

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. The available conduit knockout sizes are:

QTY	TRADE SIZE	LOCATION
1	1/2"	top
1	3/4"	bottom
1	1"	middle
1	1 1/4"	middle

Fig. 19 — 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	2380	1860	1716
0452	27.25	3460	3563	3286

SI (kg)

TANK SIZE	TANK OD (mm)	DRY WEIGHT* (kg)	MAXIMUM REFRIGERANT CAPACITY (kg)	
			ANSI/ASHRAE 15	UL 1963
0428	610	1080	844	778
0452	592	1569	1616	1491

LEGEND

- 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 210 lbs (95 kg).

Fig. 19 — Optional Pumpout Unit and Storage Tank (cont)

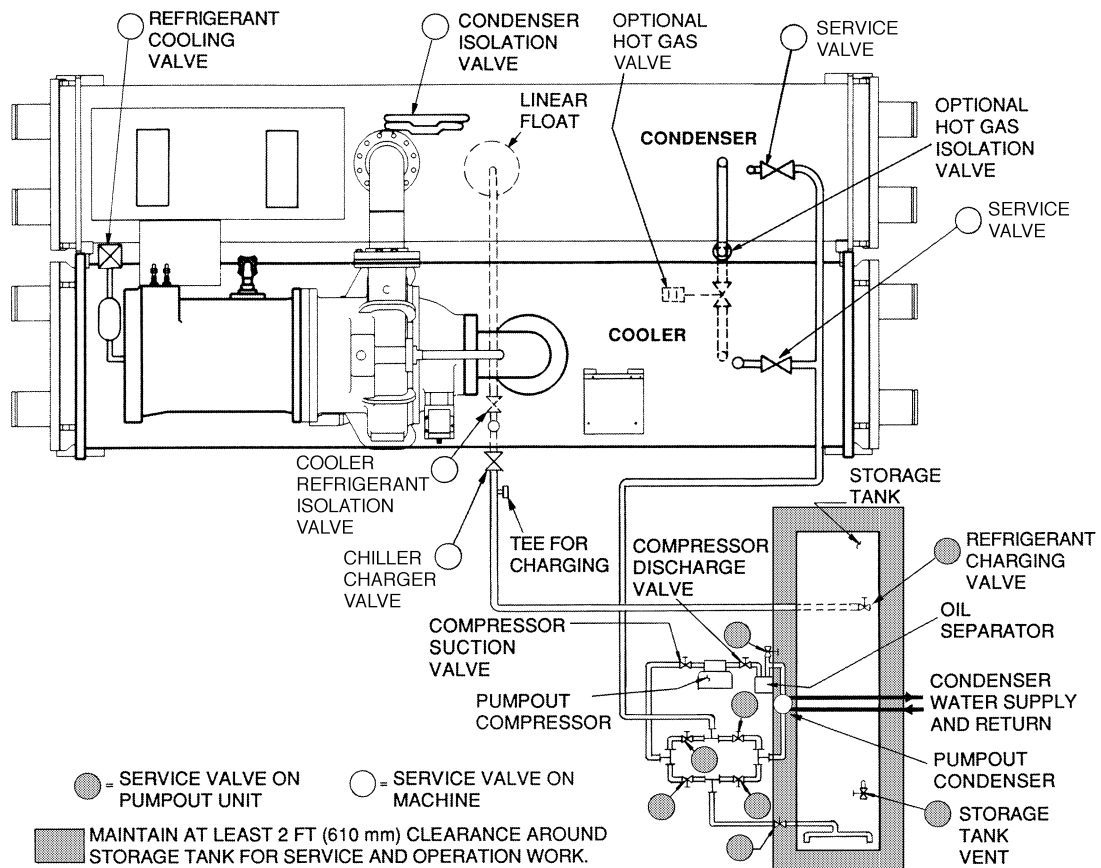


Fig. 20 — Optional Pumpout System Piping Schematic with Storage Tank

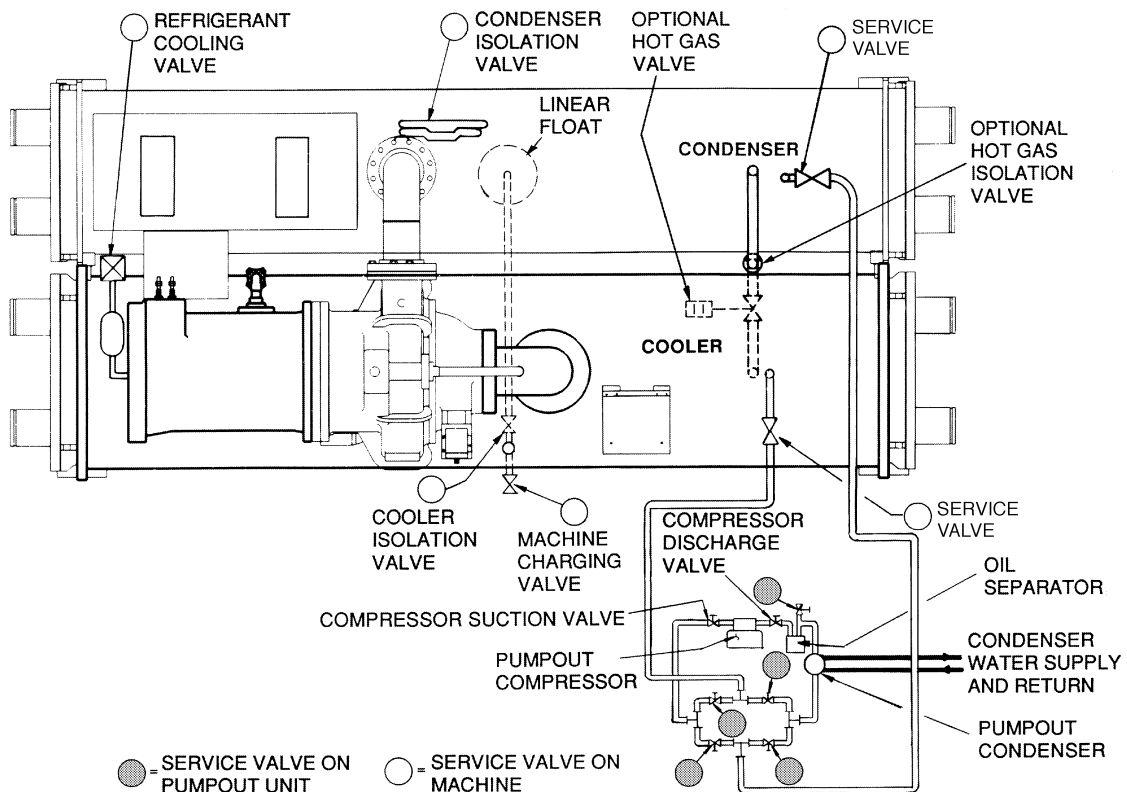


Fig. 21 — Optional Pumpout System Piping Schematic without Storage Tank

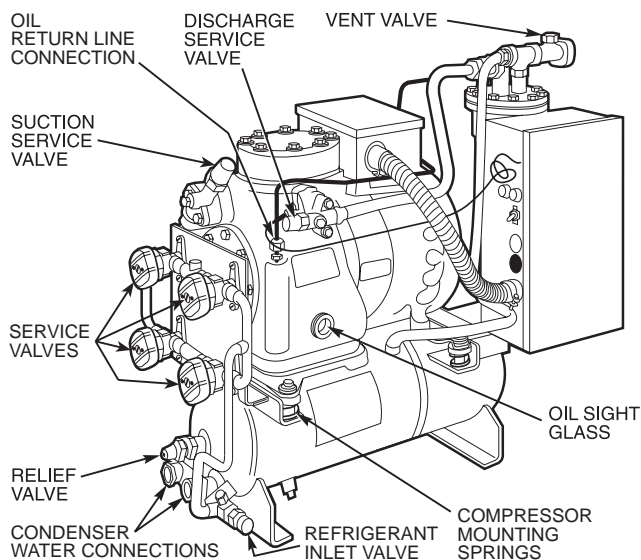


Fig. 22 — Pumpout Unit

INSTALL VENT PIPING TO RELIEF VALVES — The 19XR chiller is factory equipped with relief devices on the cooler and condenser shells. Refer to Fig. 23 and Table 10 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

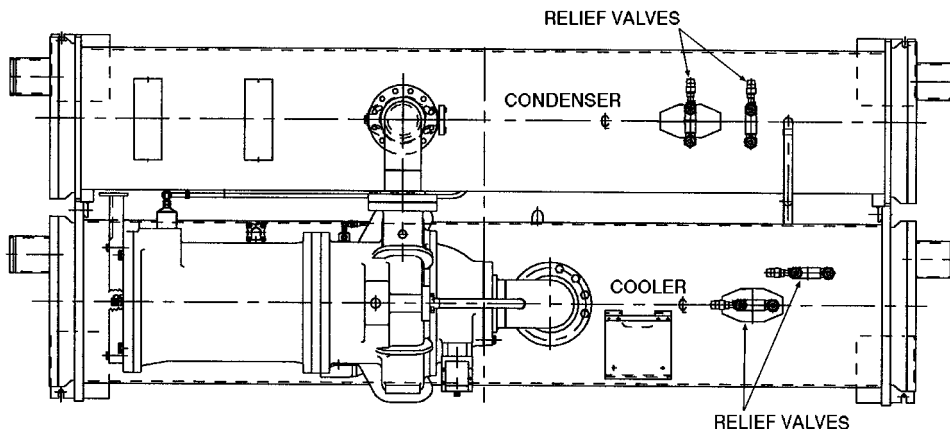


Fig. 23 — Relief Valve Locations

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.

Table 10 — Relief Device Locations

RELIEF VALVE OUTLET SIZE	LOCATION	QUANTITY	
		Frame 5 Compressor With Frame 7 or 8 Heat Exchanger	All Others
1-in. NPT FEMALE CONNECTOR	Cooler	4	2
1-in. NPT FEMALE CONNECTOR	Condenser	4	2
1-in. NPT FEMALE CONNECTOR	Optional Storage Tank	2	2

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

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. 24-31) are for reference only and are not intended for use during actual installation; follow job specific wiring diagrams.

⚠ WARNING

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 — Connect the control input wiring from the chilled and condenser water flow switches to the starter terminal strip. Wiring may also be specified for a spare safety switch, and a remote start/stop contact can be wired to the starter terminal strip. Additional spare sensors and Carrier Comfort Network modules may be specified as well. These are wired to the machine control panel as indicated in Fig. 24 and 25.

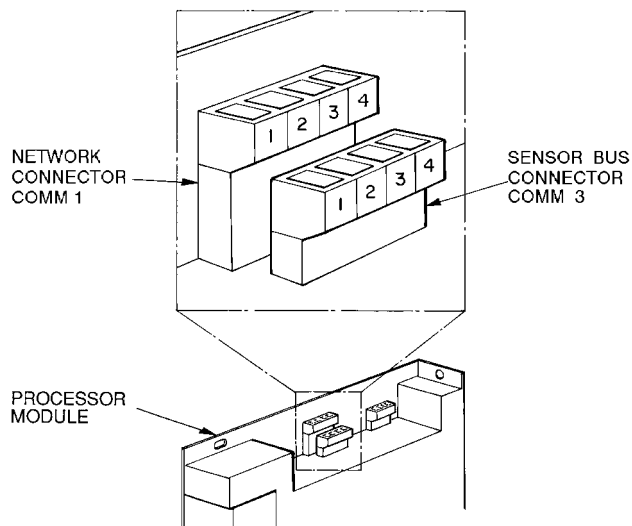
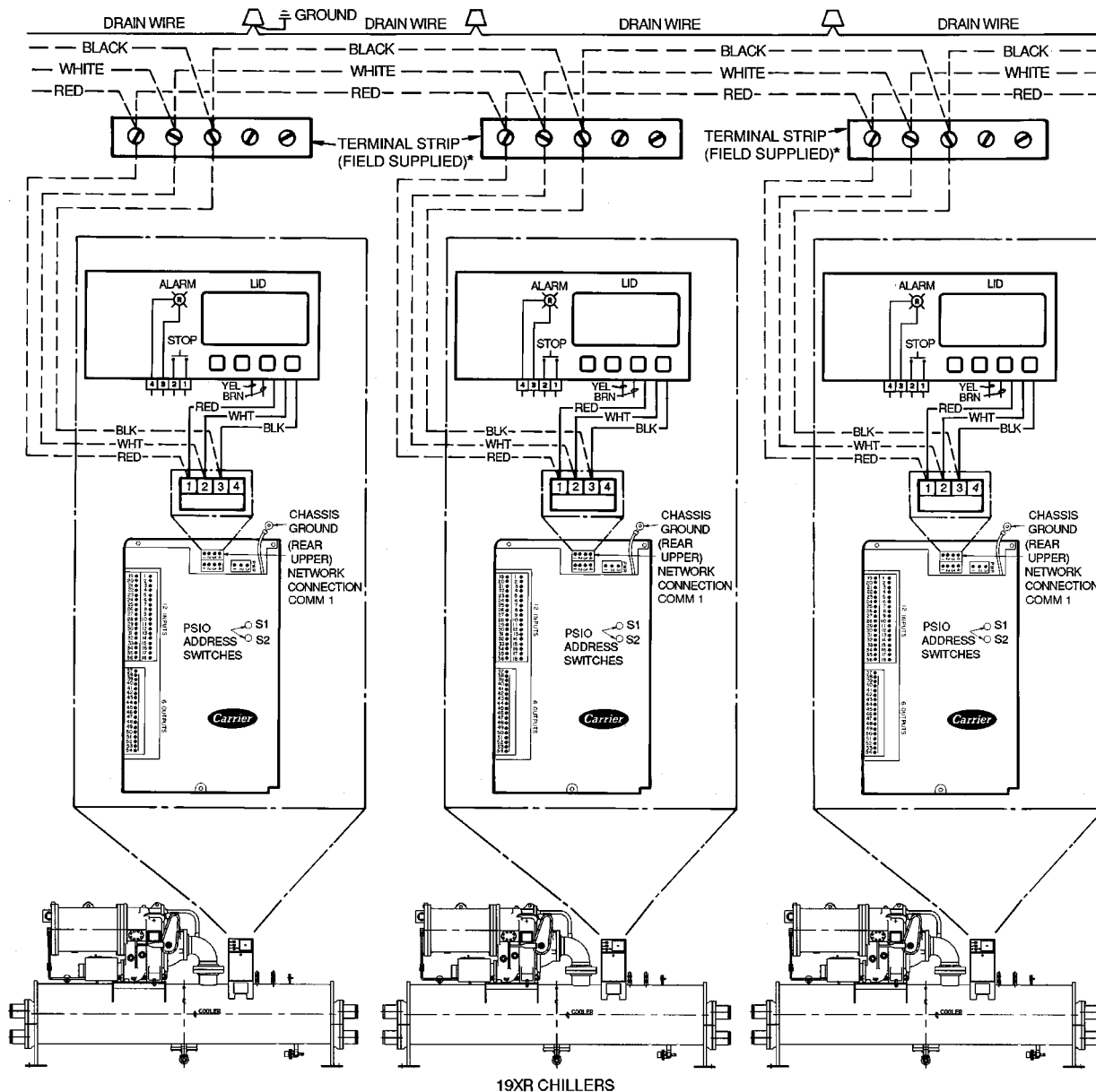


Fig. 24 — Carrier Comfort Network Communication Bus Wiring



LEGEND
 ——— Factory Wiring
 - - - - Field Wiring

*Field supplied terminal strip must be located in control panel.

Fig. 25 — COMM1 CCN Communication Wiring For Multiple Chillers (Typical)

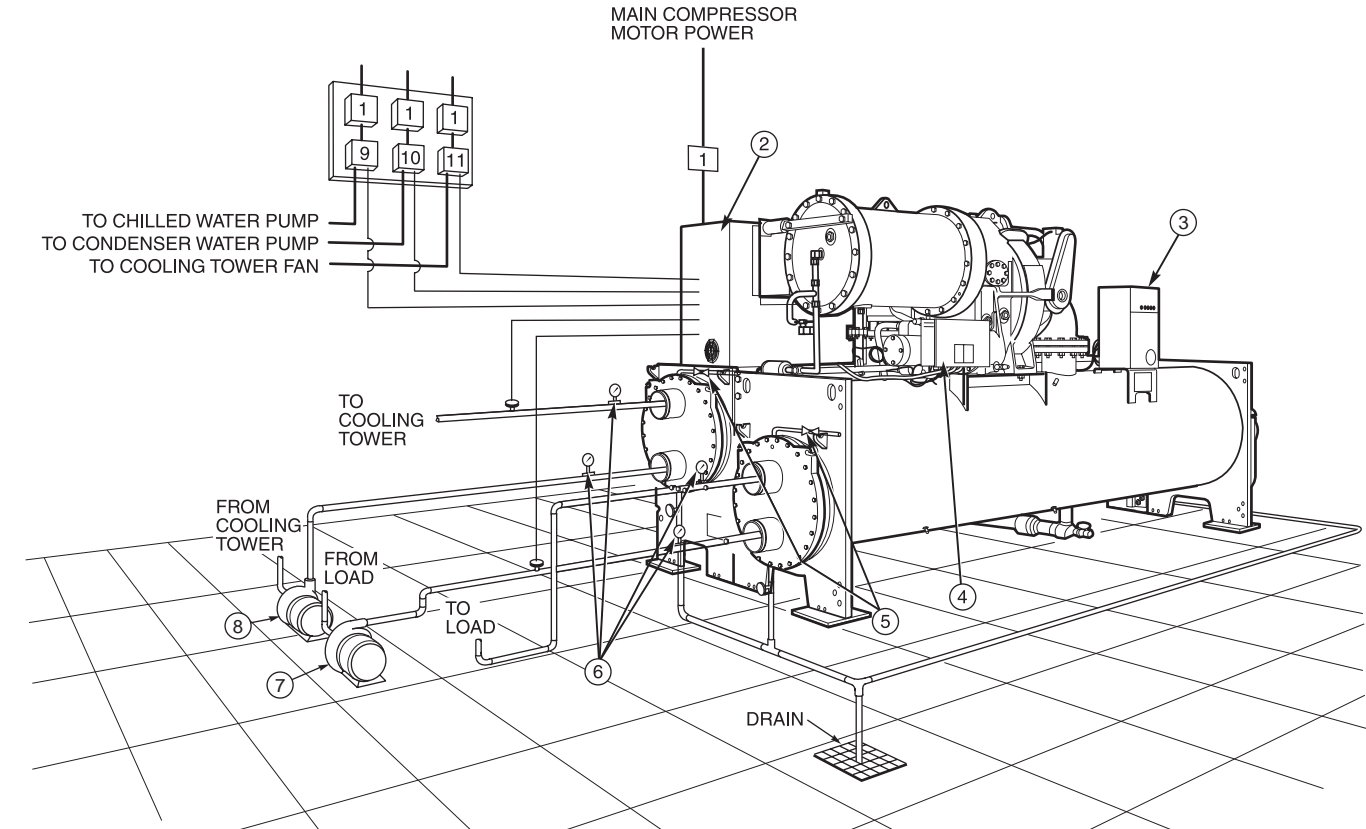
CONNECT CONTROL OUTPUTS — Connect auxiliary equipment, chilled and condenser water pumps, and spare alarms as required and indicated on job wiring drawings.

CONNECT STARTER — The 19XR is available with either a unit-mounted, factory-installed starter or a free-standing, field-installed starter (Fig. 28 and 29).

Unit Mounted, Factory-Installed Starter — Attach power leads by connecting them from inside the starter cabinet to the line side circuit breaker terminals. See Fig. 26 and 28. Machines with electro-mechanical starters (wye-delta) will have a top hat shipped with the machine if the RLA (rated load amps) is greater than 935 amps. If the machine is equipped with a solid-state starter, a top hat is provided if the RLA exceeds

740 amps. The top hat is shipped in the knocked-down position and must be assembled and installed on top of the starter cabinet, over the line side circuit breaker. During assembly, remove the access plate and use it as the cover piece of the top hat. The top hat provides additional wire bending space to attach line side power leads to the circuit breaker within the starter.

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.



- Piping
- Control Wiring
- Power Wiring

LEGEND

- 1 — Disconnect
- 2 — Unit Mounted Starter
- 3 — Control Cabinet
- 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 resets
 - optional remote sensors

Fig. 26 — 19XR with Optional Unit-Mounted Starter

Free-Standing, Field-Installed Starter — Assemble and install compressor terminal box in desired orientation, and cut necessary conduit openings in conduit support plates. See Fig. 27 and 29. Attach power leads to compressor terminals in accordance with job wiring drawings, observing caution label in terminal box. Use only copper conductors. The motor must be grounded in accordance with NEC (National Electrical Code), applicable local codes, and job wiring diagrams. Installer is responsible for any damage caused by improper wiring between starter and compressor motor.

IMPORTANT: Do not insulate terminals until wiring arrangement has been checked and approved by Carrier start-up personnel. Also, make sure correct phasing is followed for proper motor rotation.

Insulate Motor Terminals and Lead Wire Ends — Insulate compressor motor terminals, lead wire ends, and electrical wires to prevent moisture condensation and electrical arcing. For low-voltage units (up to 600 v), obtain insulation material from machine shipping package consisting of 3 rolls of insulation putty and one roll of vinyl tape.

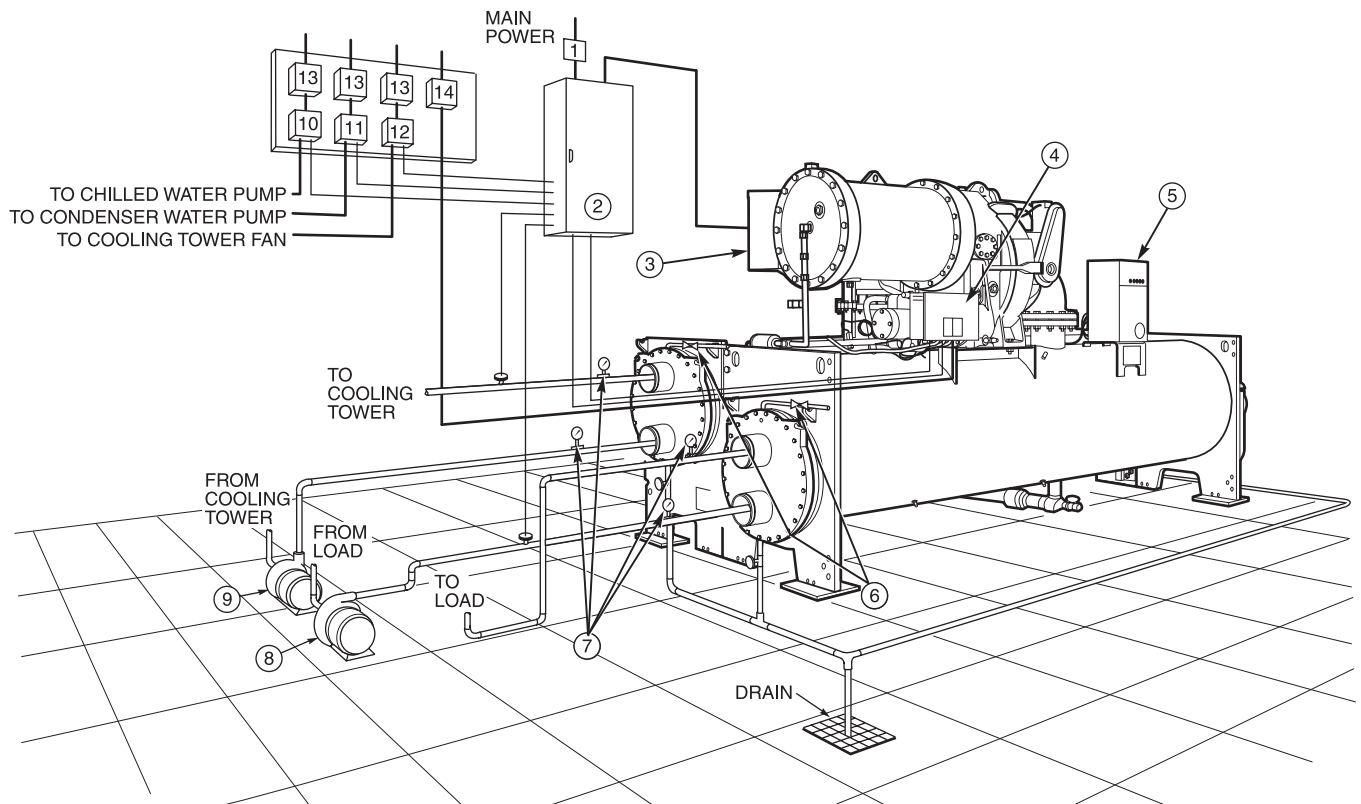
1. Insulate each terminal by wrapping with one layer of insulation putty.
2. Overwrap putty with 4 layers of vinyl tape.

High Voltage Units — High-voltage units require special terminal preparation. Follow local electrical codes for high-voltage installation. Vinyl tape is not acceptable; a high voltage terminal method must be used.

Connect Power Wires to Oil Pump Starter — See Fig. 30. Connect power wires to oil pump starter mounted in machine power panel. Use separate fused disconnect or circuit breaker as shown on job wiring diagrams and Fig. 30. Check that power supply voltage agrees with oil pump voltage. Follow correct phasing for proper motor 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

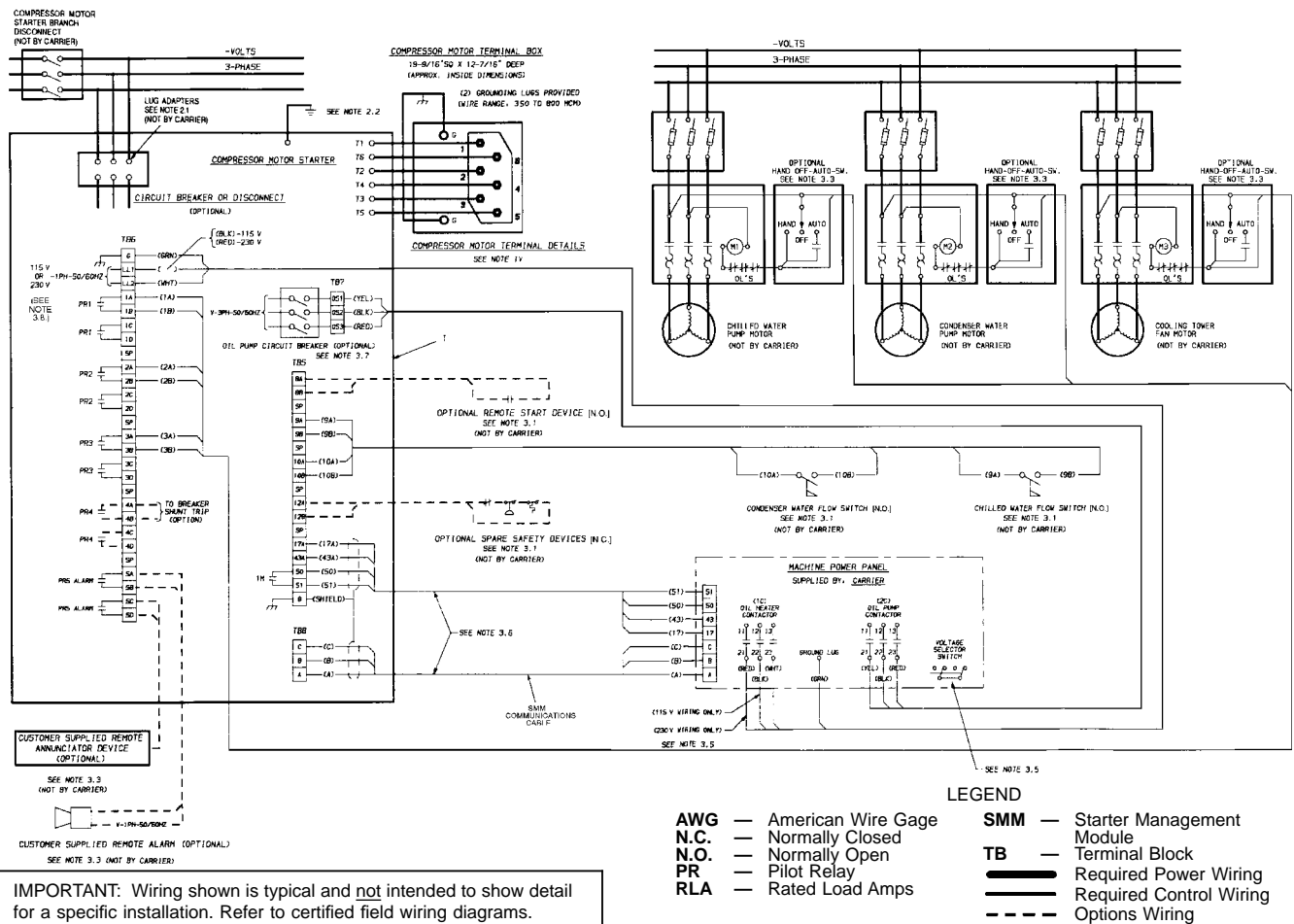
- 1 — Disconnect
- 2 — Free-Standing Compressor Motor Starter
- 3 — Compressor Motor Terminal Box
- 4 — Chiller Power Panel
- 5 — Control Cabinet
- 6 — Vents
- 7 — Pressure Gages
- 8 — Chilled Water Pump
- 9 — Condenser Water Pump
- 10 — Chilled Water Pump Starter
- 11 — Condensing Water Pump Starter
- 12 — Cooling Tower Fan Starter
- 13 — Disconnect
- 14 — Oil Pump Disconnect (see Note 4)

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 resets
 - optional remote sensors
4. Oil pump disconnect may be located within the enclosure of Item 2 — Free-Standing Compressor Motor Starter.

Fig. 27 — 19XR with Free-Standing Starter



IMPORTANT: Wiring shown is typical and not intended to show detail for a specific installation. Refer to certified field wiring diagrams.

NOTES:

I. GENERAL

- 1.0 Starters shall be designed and manufactured in accordance with Carrier Engineering Requirement Z-375.
- 1.1 All field-supplied conductors, devices, field-installation wiring, and termination of conductors and devices must be 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 shut down.
- 1.5 **WARNING** — Do not use aluminum conductors.
- 1.6 Installer is responsible for any damage caused by improper wiring between starter and machine.

II. POWER WIRING TO STARTER

- 2.0 Power conductor rating must meet minimum unit nameplate voltage and compressor motor RLA.
When (3) conductors are used:
Minimum ampacity per conductor = 1.25 x compressor RLA
When (6) conductors are used:
Minimum ampacity per conductor = 0.721 x compressor RLA
- 2.1 Lug adapters may be required if installation conditions dictate that conductors be sized beyond the minimum ampacity required. Contact starter supplier for lug information.
- 2.2 Compressor motor and controls must be grounded by using equipment grounding lugs provided inside starter enclosure.

III. CONTROL WIRING

- 3.0 Field supplied control conductors to be at least 18 AWG or larger.
- 3.1 Chilled water and condenser water flow switch contacts, optional remote start device contacts, and optional spare safety device contacts must have 24 vdc 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 12A and 12B before connecting auxiliary safeties between these terminals.
- 3.3 Pilot relays can control cooler and condenser pump and tower fan motor contactor coil loads rated 10 amps at 115 vac up to 3 amps at 600 vac. Control wiring required for Carrier to start pumps and tower fan motors must be provided to assure machine protection. If primary pump and tower fan motor are controlled by other means, also provide a parallel means for control by Carrier. Do not use starter control transformer as the power source for pilot relay 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 alongside wires carrying 50 v or higher.
- 3.5 Voltage selector switch in machine power panel is factory set for 115 v control power source. When 230 v control power source is used, set switch to 230 v position.
- 3.6 Control wiring cables between starter and power panel must be shielded with minimum rating of 600 v, 80 C. Ground shield at starter.
- 3.7 If optional oil pump circuit breaker is not supplied within the starter enclosure as shown, it must be located within sight of the machine with wiring routed to suit.
- 3.8 For 19XR chillers with free-standing starts, voltage to terminals LL1 and LL2 comes from a control transformer in a starter 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 produces input level voltage at the transformer primary terminals.

IV. POWER WIRING BETWEEN STARTER AND COMPRESSOR MOTOR

- 4.0 Low voltage (600 v or less) compressor motors have (6) 3/4 in. terminal studs (lead connectors not supplied by Carrier). Either 3 or 6 leads must be run between compressor motor and starter, depending on type of motor starter employed. If only 3 leads are required, jumper motor terminals as follows: 1 to 6, 2 to 4, 3 to 5. Center to center distance between terminals is 2 1/16 inches. Compressor motor starter must have nameplate stamped as conforming with Carrier requirement Z-375.
- 4.1 When more than one conduit is used to run conductors from starter to compressor motor terminal box, one conductor from each phase must be in each conduit to prevent excessive heating. (e.g., conductors to motor terminals 1, 2 & 3 in one conduit, and those to 4, 5 & 6 in another.)
- 4.2 Compressor motor power connections can be made through top, top rear, or sides of compressor motor terminal box using holes cut by contractor to suit conduit. Flexible conduit should be used for the last few feet to the terminal box for unit vibration isolation. Use of stress cones or 12 conductors larger than 500 MCM may require an oversize (special) motor terminal box (not supplied by Carrier). Lead connections between 3-phase motors and their starters must not be insulated until Carrier personnel have checked compressor and oil pump rotations.
- 4.3 Compressor motor frame to be grounded in accordance with the National Electrical Code (NFPA-70) and applicable codes. Means for grounding compressor motor is a pressure connector for No. 4 to 500 MCM wire, supplied and located in the back lower left side corner of the compressor motor terminal box.
- 4.4 Do not allow motor terminals to support weight of wire cables. Use cable supports and strain reliefs as required.
- 4.5 Use backup wrench when tightening lead connectors to motor terminal studs. Torque to 45 lb-ft max.

Fig. 29 — 19XR Typical Field Wiring with Free-Standing Starter

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. Refer to Fig. 31 and wiring label on the machine power panel.

⚠ WARNING

Voltage to terminals LL1 and LL2 comes from a control transformer in a starter 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 from Starter to Power Panel — Connect control wiring from main motor starter to the machine power panel. 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.

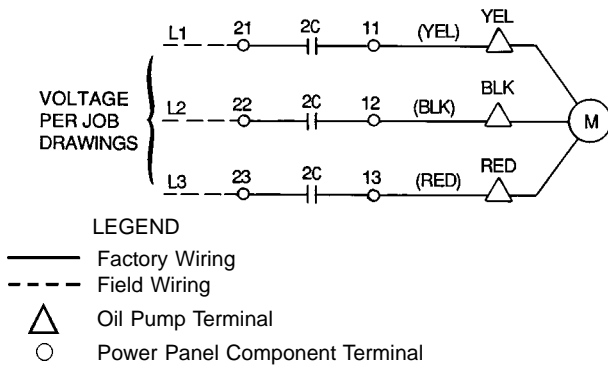
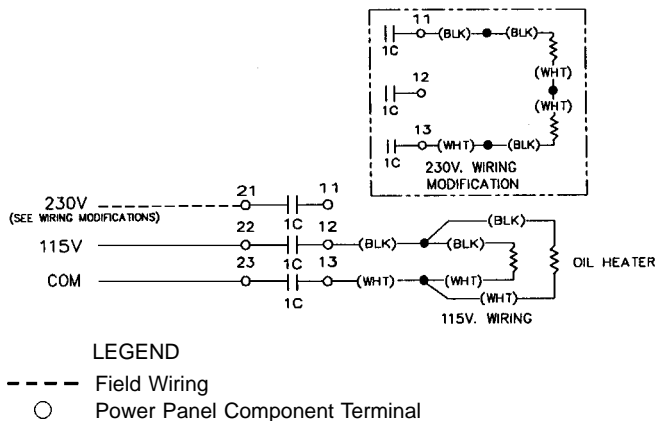


Fig. 30 — Oil Pump Wiring



NOTE: The voltage selector switch in the machine power panel is factory set for 115 v control power source. When a 230 v control power source is used, set the voltage selector switch at 230 v.

Fig. 31 — 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. 24 for location of the CCN network connector (COMM1) on the processor module.

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	COMM1 PLUG PIN NO.
+	Red	1
Ground	White	2
-	Black	3

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. 25. 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 19XR chiller to the network, proceed as follows (Fig. 24 and 25):

1. Cut power to the PIC control panel.
2. Remove the COMM1 plug from the processor module.
3. Cut a CCN wire and strip the ends of the RED, WHITE, and BLACK conductors.
4. Using a wirenut, connect the drain wires together.
5. Insert and secure the RED wire to Terminal 1 of the COMM1 plug.
6. Insert and secure the WHITE wire to Terminal 2 of the COMM1 plug.
7. Insert and secure the BLACK wire to Terminal 3 of the COMM1 plug.
8. Mount a terminal strip in a convenient location.
9. Connect the opposite ends of each conductor to separate terminals on the terminal strip.
10. Cut another CCN wire and strip the ends of the conductors.
11. Connect the RED wire to the matching location on the terminal strip.
12. Connect the WHITE wire to the matching location on the terminal strip.
13. Connect the BLACK wire to the matching location on the terminal strip.

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 (Fig. 32).

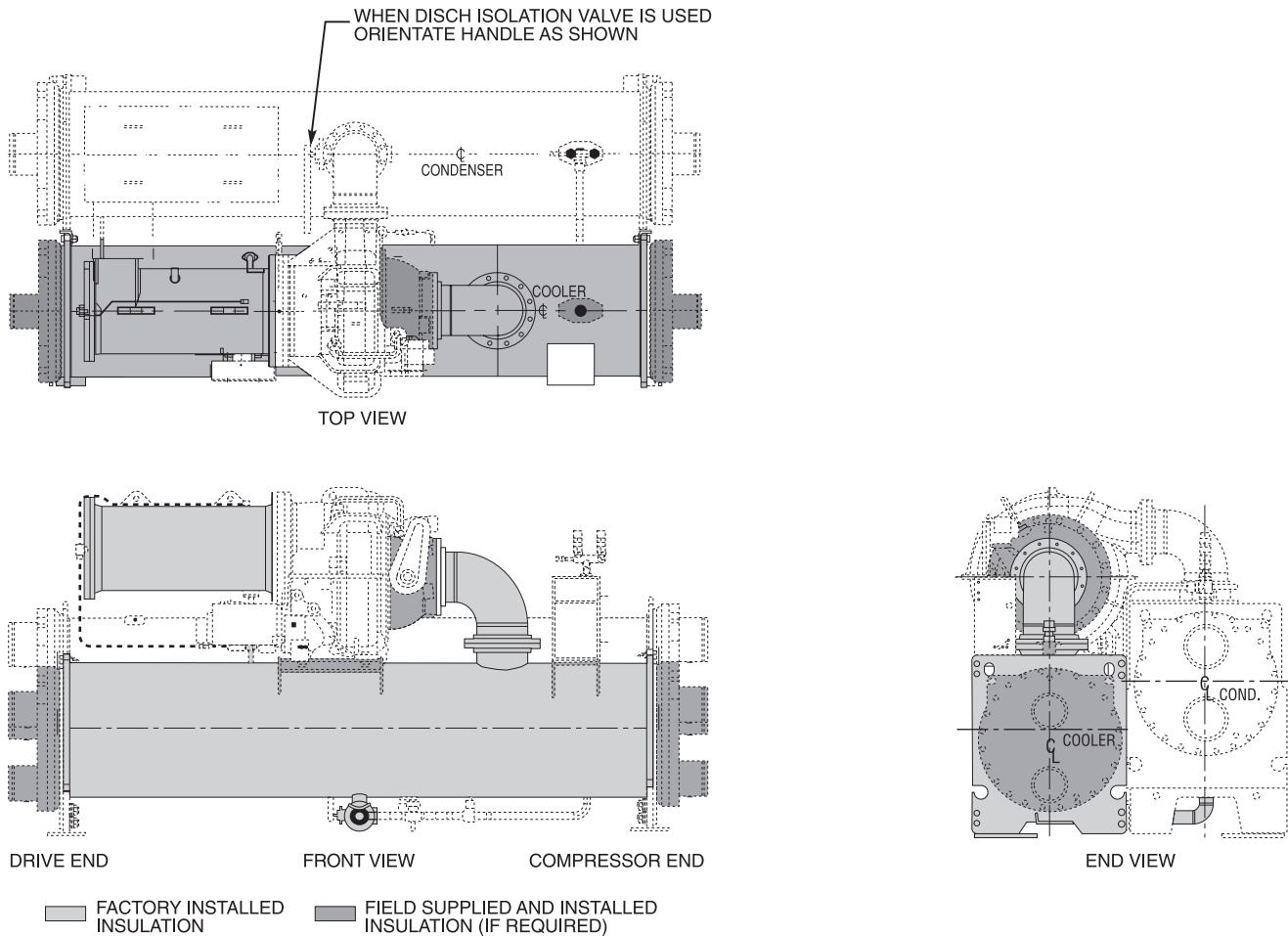


Fig. 32 — 19XR Insulation Area

INSTALLATION START-UP REQUEST CHECKLIST

Machine Model Number: 19XR Serial Number: _____

To: _____

Date _____

Project Name _____

Attn: _____

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 starter wiring is complete. The wiring is installed per installation instructions and certified prints.		
a. Power wiring to compressor motor. (Motor leads will not be taped until the Carrier technician megger tests the motor.)	_____	_____
b. Oil pump wiring	_____	_____
c. Oil heater/control wiring	_____	_____
d. Other _____	_____	_____
8. The motor starter has not been supplied by Carrier. It has been installed according to the manufacturer's instructions.	_____	_____
9. The motor starter has not been supplied by Carrier and it has been checked for proper operation.	_____	_____

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 _____

Beeper 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

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