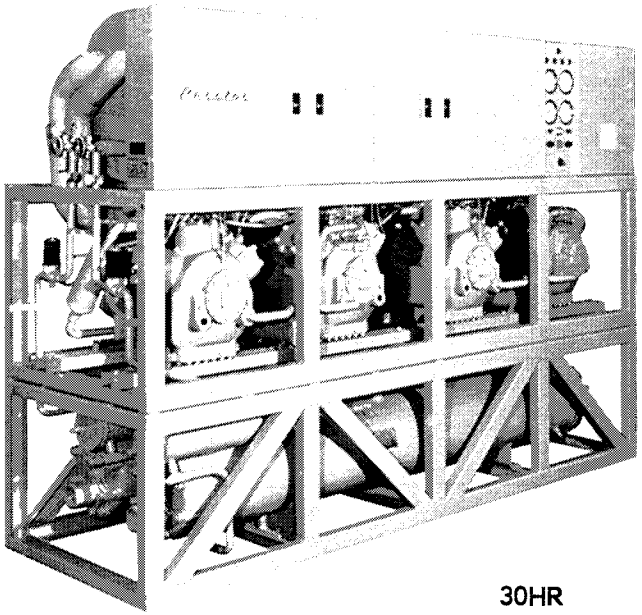
Reciprocating Liquid Chilling Packages



30HR

LOCATION

Units should not be stored where exposed to the weather because of the sensitive control mechanisms and electrical devices. Locate unit indoors where temperature is at least 40 degrees.

See Fig. 1 for door clearances and space requirements. Leave a clearance of 3 to 4 feet on each side and ends for connections and service access. Provide clearance at one end for removal of tubes (Fig. 1).

Floor must be strong enough to support operating weight. If necessary, add supporting structure (steel beams or reinforced concrete slabs) to floor to transfer weight to nearest beams.

All units have spring vibration isolators and mufflers. Interconnecting piping must be flexible enough to prevent vibration transmission. If vibration still exists, use isolators on unit itself. If unit is installed on upper floors where vibration cannot be transmitted to ground, use field-purchased vibration mountings under each mounting hole. Each corner supports one-fourth of the weight. Back off mounting lock bolts to allow compressors mounted on rails to float freely from the unit, otherwise, excessive vibration will result.

Move unit on its skids to final location. If using chain hoist, use a spreader bar so that control boxes will not be damaged by sling. Place sling under skids. Do not attach sling to piping or components. Move unit in upright position, lower gently from truck or rollers. Use enough pipes to support skid when rolling.

Figure 1 shows location of mounting holes. Areas where corners will be located must be level before unit is placed. Level unit with spirit level on frame channels. Bolt unit to floor (recommended for basement or ground floor installations that transmit vibration to ground without affecting building structure).

CONDENSER

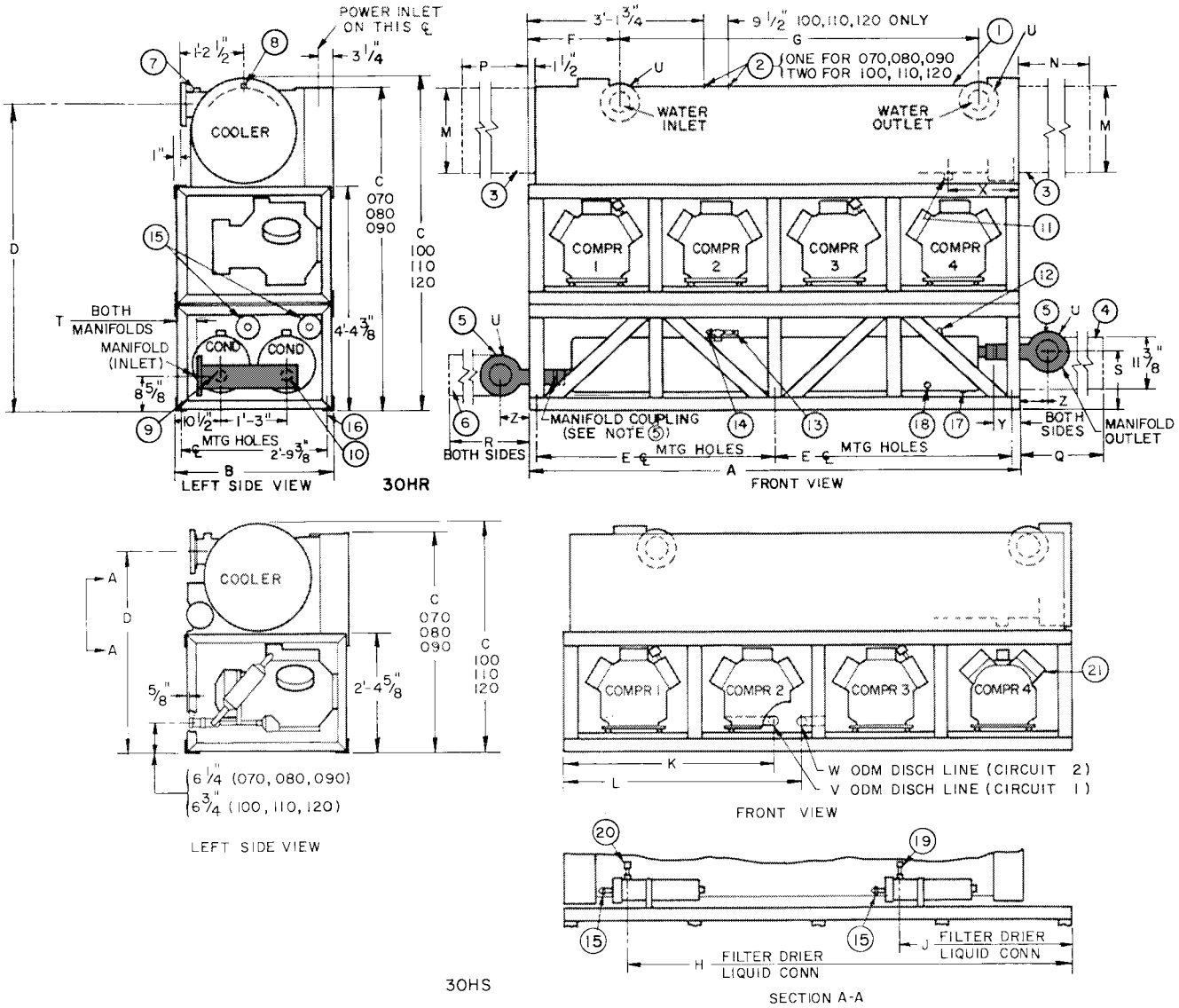
Run water supply lines as short as possible. Size lines according to head pressure available (not necessarily connection size), especially on cooling tower applications. See System Design Manual, Part 3, Piping Design.

For installations requiring a water regulating valve, a separate valve is required (not supplied by Carrier) for each refrigerant circuit. Water regulating valve must be installed on cooling tower application where low outdoor ambients affect head pressure.

The 30HS units using air-cooled or evaporative condensers should have adequate means for head pressure control when operating below 60 F outdoor ambient.

Use accessory water manifold packages, with Flexmaster couplings, to manifold two condensers on 30HR units. Connections are shown in Fig. 1. Each package contains two manifolds and four couplings. Manifolds should not be used where regulating valves are required because separate valves must be used on each condenser circuit.

Set water regulating valve to maintain designed head pressure. Do not adjust to compensate for high head pressures caused by fouled condenser tubes, excess refrigerant or the presence of noncondensables. Due to changes in water temperature, it may be necessary to adjust the valve seasonally. After adjusting for designed head pressure, shut unit down. Water regulating valve should shut off flow of water in a few minutes. If it does not, it will be necessary to raise the head pressure setting. Make sure that capillary tube from each water regulating valve is connected to the proper condenser purge valve.



UNIT 30HR, HS		070	080	090	100	110	120
OPER WT (lb)	HR	4963	5149	5289	6436	6575	6714
	HS	3467	3525	3583	4470	4528	4586

Dimensions (ft-in.)*

DIM.	30HR, HS 070, 080 090	30HR, HS 100, 110 120	DIM.	30HR, HS 070, 080 090	30HR, HS 100, 110 120
A	8–6	9– 4	M (Diam)	1–3-1/2	1–5-1/2
B	2–11-7/8		N	6–1-3/4	7–3-3/4
C (HR)	6–3-1/2	6– 5-1/8	P	5–4-1/8	6–5-1/8
C (HS)	4–2-7/8	4– 4-1/2	Q (HR)	7–4-3/4	6–1
D (HR)	5–9-1/2	5–11-1/2	R (HR)	1–4	1–4-1/4
D (HS)	3–8-7/8	3–10-7/8	S (HR)	1–2-3/8	1–2-1/4
E	4–1-1/2	4– 6-1/2	T (HR)	0–5-1/8	0–4-3/4
F	2–0-3/8	1– 9-3/8	U‡	0–4	0–5
G	6–1	6– 8	V (HS)	**	††
H (HS)	7–9-7/8	8– 4	W (HS)	0–1-3/8	††
J (HS)	†	3– 3-1/4	X	1–9-5/8	1–4-5/8
K (HS)	4–6-5/8	3–10	Y (HR)	0–7-5/8‡‡	0–5-1/8
L (HS)	5–0-1/8	4– 3-1/2	Z (HR)	0–6-3/4	0–6-1/2

*Apply to both HR and HS except as noted.
†070: 2–9-1/4; 080: 3–2-7/8; 090: 3–3-1/2
‡150-lb ASA flat face flanged water connection.
**070: 0–1-5/8; 080: 0–1-5/8; 090: 0–2-1/8
††100: 0–1-5/8; 110: 0–2-1/8; 120: 0–2-1/8
‡‡Outlet end 0–7-7/8

NOTES:

1. Two 7/8-in. diam knockouts in top of control box for any field control wiring from accessory equipment interlocks and for 115-v control wiring.
2. Power wiring inlet(s). Cut hole(s) for electrical connections to suit in removable plate.
3. Space required to remove cooler tubes.
4. Space required to remove condenser tubes, (either end).
5. Water manifold (Accessory Package) provided with flexible coupling. Dimensions "R" and "Z" are nominal.
6. Space required to remove water manifold (both ends).
7. Temperature controller bulb. Both inlet and outlet have wells, but controls are set for return water temp (inlet).
8. Low water temperature cutout bulb (far end only).
9. Both ends 3-in. diam sch 40 steel pipe.
10. For 070,080,090: 2-1/2-in. diam sch 40 steel pipe (both ends); 100, 110,120: 3-in. diam sch 40 steel pipe (both ends).
11. 1-in. MPT water drain connection.
12. Two 1/4-in. purge valves.
13. Two 5/8-in. SAE flare relief valves.
14. 1/4-in. flare conn for water reg valves.
15. 1/4-in. SAE flare field charging valve.
16. 3/4-in. diam (6 mtg holes).
17. 3/8-in. pipe plug drain each end.
18. Liquid level test cock.
19. 1-1/8-in. ODM refrigerant liquid inlet from condenser (circuit No. 1).
20. 7/8-in. ODM (070,080,090), 1-1/8 in. ODM (100,110,120) refrigerant liquid inlet from condenser (circuit No. 2).
21. Oil pressure safety switch, all compressors (HS only).

Fig. 1 - Dimensions

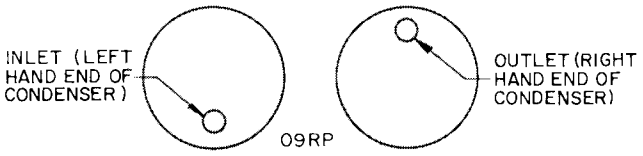


Fig. 2 - Condenser Water Connections

Condenser water must enter where shown in Fig. 2 for proper operation of the internal subcooler in the bottom of the condenser.

The relief valve is located on the side of the condenser. If the high pressure cutout fails and excessive pressure develops in the refrigeration system, the safety valve will open to relieve pressure. Most local codes require piping from valve to outdoors. Outlet is 5/8 inch FPT and discharge pipe must not be sized smaller than this.

Water leaving condenser under pressure should not be connected directly into sewer lines because water may back up into other fixtures. Check local codes.

NOTE: Provide means for draining system in winter and for repairs.

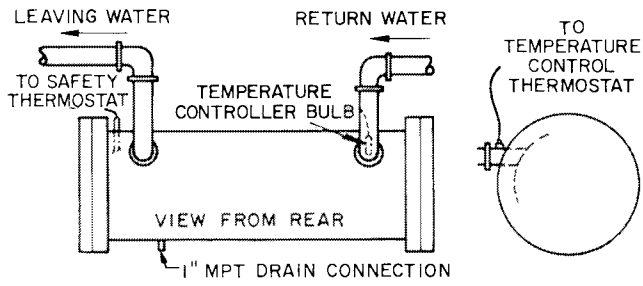


Fig. 3 - Cooler Water Piping

COOLER

Each cooler has flanged connections. Chilled water temperature controller (in control box) has bulb in return water connection. It should be left there. See Fig. 3.

CAUTION: All cams on sequence controller must be reset if bulb is placed in leaving water line.

See Carrier System Design Manual, Part 3, "Piping" for chilled water piping details.

Plan piping for minimum number of changes in elevation. Install manual or automatic vent valve at high points in line. Maintain system pressure by using a pressure tank or combination relief and reducing valve.

Install thermometers in entering and leaving lines. Provide drain connections at all low points to permit complete drainage of system. Connect shut-off valve to drain line before operating unit. Install shut-off valves near entering and leaving water connections. Use flexible connections on condenser and cooler piping to reduce vibration transmission.

Insulate piping after leak testing to prevent heat loss and sweating. Cover insulation with moisture seal.

REFRIGERANT CHARGE

Do not open condenser liquid valves or compressor discharge valves until it is determined that the charge (positive pressure) is found in the remainder of the system. The 30HR units are factory charged with a full operating charge. The 30HS units must be field charged. Check liquid line sight glasses when unit is started to be sure unit is fully charged.

Leak-test unit and piping. See Standard Service Techniques Manual, Chapter 1, Refrigerants.

If there has been a leak, system must be evacuated. See Standard Service Techniques Manual, Chapter 1, Refrigerants.

If unit needs extra charge, use liquid charging method. See Standard Service Techniques Manual, Chapter 1, Refrigerants.

CAUTION: When charging, circulate water thru condenser and chiller at all times to prevent freezing. Freezing damage is considered abuse and is not covered by Carrier Warranty.

OIL CHARGE

All units are charged with oil at the factory. Observe the level closely at start-up and add oil, if required, to bring level in crankcase to middle of bull's-eye during steady operation. To add or remove oil see Standard Service Techniques Manual, Chapter I, Refrigerants.

START-UP

Unit should be started only under the supervision of a refrigeration mechanic who is familiar with the accepted operating practices for refrigeration systems. Procedure is outlined in publication, "Start-up and Service," 30HR-1SS.

ELECTRICAL

Control circuit voltage is 115 volts on all 30HR,HS 60-cycle units. Accessory transformer package is available to allow 115 volts to be taken directly from unit circuit breaker. Mount transformer in control box as shown on wiring diagram.

All units wired for XL start. Units 208-, 230-volt are wired thru two starter contactors. Part winding start may be obtained by adding a 1-1/4 second time delay relay to actuate the second contactor (HN67SK001 for 208-, 240-volt; HN67SK002 for 120-volt).

Table 1 - Electrical and Compressor Data

VOLTS/PHASE		208/3			230/3			460/3			575/3		
NDSV		208			220-240			440-480			550-600		
MODEL		-A140			-A150			-A160			-A110		
30HR	KW	FLA	WSA	ICF	FLA	WSA	ICF	FLA	WSA	ICF	FLA	WSA	ICF
070	75.4	238.0	263	601	215.1	237	544	107.1	119	271	86.4	96	218
080	86.0	270.2	295	633	243.6	266	573	122.1	134	286	97.8	107	229
090	96.6	302.4	328	666	272.1	295	601	137.1	149	301	109.2	118	241
100	107.6	338.8	364	602	305.8	328	544	152.8	164	272	122.8	132	218
110	118.2	371.0	396	734	334.3	357	664	167.8	179	332	134.2	143	266
120	128.8	403.2	428	766	362.8	385	692	182.8	194	347	145.6	155	277
30HS													
070	83.6	262.2	290	617	241.6	268	559	122.2	135	280	98.6	109	225
080	95.4	294.9	322	650	275.3	301	592	139.4	152	297	111.4	122	238
090	107.1	327.6	355	682	309.0	335	626	156.6	170	314	124.2	135	251
100	119.3	371.4	399	682	344.6	371	625	174.4	187	314	140.0	150	251
110	131.1	404.1	432	759	378.3	404	695	191.6	205	349	152.8	163	279
120	142.8	436.8	464	792	412.0	438	729	208.8	222	367	165.6	176	292
COMPRESSOR		400			500			600			100		
06EA, EB	KW	FLA	TA	LRA	FLA	TA	LRA	FLA	TA	LRA	FLA	TA	LRA
150 (HR)	21.6	68.6	96	332	62.2	87	300	30.7	43	150	25.0	35	120
250 (HS)	23.95	76.5	107	387	69.3	97	350	35.0	49	175	28.6	40	140
275 (HR)	32.2	100.8	141	464	90.7	127	420	45.7	64	210	36.4	51	168
275 (HS)	35.7	109.2	153	464	103.0	144	420	52.2	73	210	41.4	58	168

Unit model no., example: 30HR070-A140; compressor model no., example: 06EA250400.

Maximum incremental current inrush is the LRA for the compressor (in the unit) with the largest LRA value.

Terminal Blocks –

460-, 575-v, all units: one block, 3 wires, 350 MCM max.

208-, 230-v, 3-compressor units: one block, 3 wires, 500 MCM max.

208-, 230-v, 4-compressor units: two blocks, 6 wires, 350 MCM max.

NDSV – Nominal Distribution System Voltage (Application Range). Motors and controls will operate satisfactorily 10% above and 10% below NDSV.

KW – Maximum Power Input

FLA – Full Load Amps

WSA – Wire Size Amps per NEC

ICF – Maximum Instantaneous Current Flow (sum of LRA for last compressor to start plus FLA for all other compressors in the unit).

TA – Trip Amps (factory-installed circuit breaker)

LRA – Locked Rotor Amps